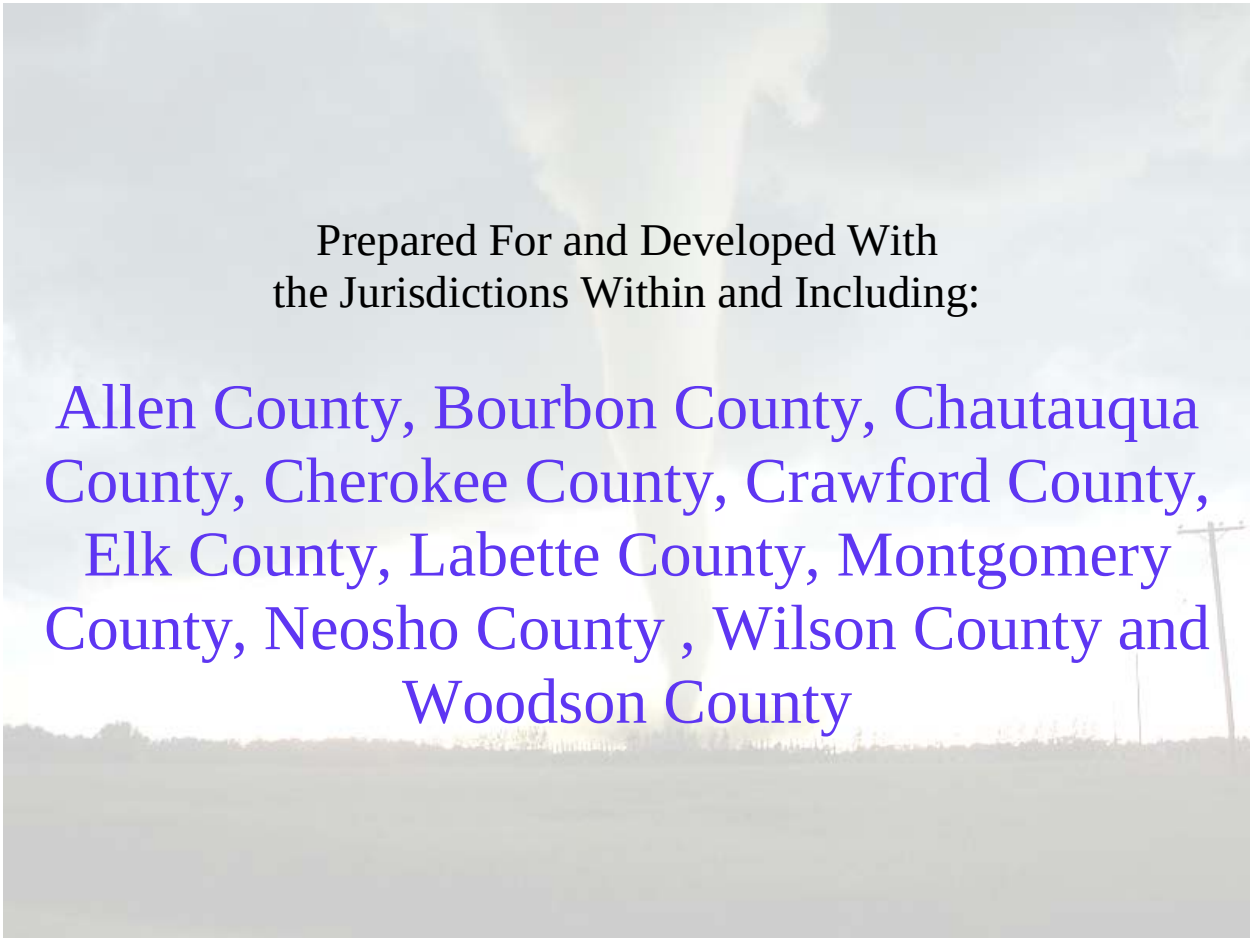
# Southeast Kansas
# (Homeland Security Region H)
# Multi-Hazard, Multi-Jurisdictional
# Mitigation Plan



Prepared For and Developed With
the Jurisdictions Within and Including:

## Allen County, Bourbon County, Chautauqua County, Cherokee County, Crawford County, Elk County, Labette County, Montgomery County, Neosho County , Wilson County and Woodson County

November, 2013

Prepared By:

Blue
Umbrella

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**APPENDIX**


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# List of Acronyms

| Acronym | Meaning |
|---|---|
| ANFO | Ammonium Nitrate/Fuel Oil |
| BATF | Bureau of Alcohol, Tobacco and Firearms |
| BSE | Bovine Spongiform Encephalopathy |
| CAFO | Concentrated Animal Feeding Operation |
| CDBG | Community Development Block Grant |
| CDC | Centers for Disease Control and Prevention |
| CFR | Code of Federal Regulations |
| CPRI | Calculated Priority Risk Index |
| CRS | Community Rating System |
| CWPP | Community Wildfire Protection Plans |
| DASC | Data Access and Support Center |
| DFIRM | Digital Flood Insurance Rate Map |
| DWR | Division of Water Resources |
| EAP | Emergency Action Plan |
| EF | Enhanced Fujita |
| EMAP | Emergency Management Accreditation Program |
| EPA | Environmental Protection Agency |
| ESA | Endangered Species Act |
| ºF | Fahrenheit |
| FIA | Flood Insurance Administration |
| FIRM | Flood Insurance Rate Map |
| FMA | Flood Mitigation Assistance |
| GIS | Geographic Information System |
| HFRA | Healthy Forests Restoration Act |
| HMA | Hazard Mitigation Assistance |
| HMGP | Hazard Mitigation Grant Program |
| HMPC | Hazard Mitigation Planning Committee |
| IPSR | Institute for Policy and Social Research |
| K.S.A | Kansas Statutes Annotated |
| KCC | Kansas Corporation Commission |
| KCP&L | Kansas City Power and Light |
| KDA | Kansas Department of Agriculture |
| KDEM | Kansas Division of Emergency Management |
| KDHE | Kansas Department of Health and Environment |
| KDOT | Kansas Department of Transportation |
| km | Kilometer |

| Acronym | Meaning |
|---|---|
| KWO | Kansas Water Office |
| LAMP | Levee Analysis Mapping Procedures |
| LEPC | Local Emergency Planning Committee |
| LSP | Levee Safety Program |
| MH 2.1 | Multi Hazard version 2.1 |
| MLI | Mid-Term Levee Inventory |
| MPH | Miles per Hour |
| NCDC | National Climatic Data Center |
| NFIP | National Flood Insurance Program |
| NFIRS | National Fire Incident Reporting System |
| NGO | Non-Governmental Organization |
| NLD | National Levee Database |
| NOAA | National Oceanic and Atmospheric Administration |
| NSFHA | No Special Flood Hazard Area |
| NWS | National Weather Service |
| ONA | Other Needs Assistance |
| PA | Public Assistance |
| PAL | Provisionally Accredited Levee |
| PDM | Pre-Disaster Mitigation |
| PDSI | Palmer Drought Severity Index |
| PIO | Public Information Officer |
| REC | Rural Electric Cooperative |
| RMP | Risk Management Plan |
| SBA | Small Business Administration |
| SHMO | State Hazard Mitigation Officer |
| SoVI | Social Vulnerability Index |
| SRL | Severe Repetitive Loss |
| STAPLEE | Social, Technical, Administrative, Political, Legal, Economic and Environmental |
| USACE | United States Army Corps of Engineers |
| USD | Unified School District |
| USDA | United States Department of Agriculture |
| USGS | United States Geological Survey |
| WUI | Wildland Urban Interface |

# EXECUTIVE SUMMARY

Mitigation is commonly defined as sustained action taken to reduce or eliminate long-term risk to people and their property from hazards and their effects. Hazard mitigation planning provides communities with a roadmap to aid in the creation and revision of policies and procedures, and the use of available resources, to provide long-term, tangible benefits to the community. A well designed hazard mitigation plan provides communities with realistic actions that can be taken to reduce potential vulnerability and exposure to identified hazards.

In order to create an effective, realistic and useful plan, a methodical and thoughtful planning process that included regional and local stakeholders and followed Federal Emergency Management Agency (FEMA) Guidelines has been completed.

This is a multi-hazard, multi-jurisdictional mitigation plan combination and update covering Kansas Homeland Security Region H. Region H is comprised of eleven participating (11) counties and is located within the southeast corner of the State. This plan was prepared to meet the requirements of the Disaster Mitigation Act of 2000 (DMA 2000), as defined in regulations set forth by the Interim Final Rule (44 Code of Federal Regulation (CFR) Part 201.6).

A regional Hazard Mitigation Planning Committee (HMPC), formed by participating County Emergency Managers and State of Kansas Mitigation Planners, conducted a regional risk assessment that identified and characterized potential hazards, suggested incorporation of review elements from previous plans into new regional plan, conducted a regional vulnerability analysis, and proposed and explored potential mitigation actions. The outcome was a mitigation plan that combined each discrete county plan into one regional plan.

It is worth noting that all neighboring Kansas counties are undergoing a similar mitigation planning effort, and as part of this statewide process all county and state planners are working together toward common mitigation goals. During the creation and adoption of this plan communication channels were opened to facilitate the cross pollination of ideas, to incorporate neighboring regions concerns, and to ensure the overall preparedness of the State of Kansas.

The following table presents a list of participating counties, cities and townships, by county:

**Participating Counties, Cities and Townships**

| **Allen County** |
|---|
| City of Elsmore |
| City of Gas |
| City of Humboldt |
| City of Iola |
| City of LaHarpe |
| City of Moran |
| City of Savonburg |

**Participating Counties, Cities and Townships, Continued**

| **Bourbon County** |
|---|
| City of Bronson |
| City of Fort Scott |
| City of Fulton |
| City of Mapleton |
| City Redfield |
| City of Uniontown |
| **Chautauqua County** |
| City of Cedar Vale |
| City of Peru |
| City of Sedan |
| **Cherokee County** |
| City of Columbus |
| City of Baxter Springs |
| City of Galena |
| City of Roseland |
| City of Scammon |
| City of Treece |
| City of Weir |
| City of West Mineral |
| **Crawford County** |
| City of Arcadia |
| City of Arma |
| City of Cherokee |
| City of Franklin |
| City of Frontenac |
| City of Girard |
| City of Hepler |
| City of McCune |
| City of Mulberry |
| City of Pittsburg |
| Grant Township |
| Osage Township |
| Sheridan Township |
| Sherman Township |

**Participating Counties, Cities and Townships, Continued**

| **Elk County** |
|---|
| City of Grenola |
| City of Howard |
| City of Longton |
| City of Moline |
| **Labette County** |
| City of Altamont |
| City of Chetopa |
| City of Edna |
| City of Labette |
| City of Mound Valley |
| City of Oswego |
| City of Parsons |
| **Montgomery County** |
| City of Caney |
| City of Cherryvale |
| City of Coffeyville |
| City of Dearing |
| City of Elk City |
| City of Havana |
| City of Independence |
| City of Liberty |
| **Neosho County** |
| City of Chanute |
| City of Erie |
| City of Galesburg |
| City of St. Paul |
| City of Stark |
| City of Thayer |
| **Wilson County** |
| City of Altoona |
| City of Benedict |
| City of Buffalo |
| City of Fredonia |
| City of Neodesha |
| City of New Albany |
| **Woodson County** |
| City Of Toronto |
| City of Yates Center |

The following table presents a list of participating colleges, universities and Unified School Districts (USDs). The information also presents the district cover, if applicable, and the county:

**Participating Colleges, Universities, and USDs**

| School, College or University | District |
|---|---|
| **Allen County** | |
| Allen County Community College | - |
| USD 256 | Marmaton Valley |
| USD 257 | Iola |
| USD 258 | Humboldt |
| **Bourbon County** | |
| Fort Scott Community College | - |
| USD 234 | Fort Scott |
| USD 235 | Uniontown |
| **Chautauqua County** | |
| USD 285 | Cedar Vale |
| USD 286 | Chautauqua County |
| **Cherokee County** | |
| USD 404 | Riverton |
| USD 493 | Columbus |
| USD 499 | Galena |
| USD 508 | Baxter Springs |
| **Crawford County** | |
| Fort Scott Community College | - |
| Pittsburg State University | - |
| USD 246 | Arma |
| USD 247 | Cherokee |
| USD 248 | Girard |
| USD 249 | Frontenac |
| USD 250 | Pittsburg |
| USD 609 | Greenbush |
| **Elk County** | |
| USD 282 | West Elk |
| USD 283 | Elk Valley |
| **Labette County** | |
| Labette County Community College | - |
| USD 503 | Parsons |
| USD 504 | Oswego |
| USD 505 | Chetopa-St. Paul |
| USD 506 | Labette County |

**Participating Colleges, Universities, and USDs, Continued**

| Montgomery County | |
|---|---|
| Coffeyville Community College | - |
| Independence Community College | - |
| USD 436 | Caney |
| USD 445 | Coffeyville |
| USD 446 | Independence |
| USD 447 | Cherryvale |
| **Neosho County** | |
| Neosho County Community College | - |
| USD 101 | Erie |
| USD 413 | Chanute |
| USD 447 | Cherryvale |
| **Wilson County** | |
| USD 387 | Altoona-Midway |
| USD 461 | Neodesha |
| USD 484 | Fredonia |
| **Woodson County** | |
| USD 366 | Woodson County |

In addition to the above noted jurisdictions, many special districts are covered under the participation and adoption by the overarching county. These entities include:

- Fire Districts
- Sewer Districts
- Water Districts
- Watershed Districts

Some of the above noted special districts went above and beyond and participated independently in the planning process. These entities are noted below.

**Participating Special Districts**

| Allen County |
|---|
| Allen County Rural Water District #1 |
| Allen County Rural Water District #2 |
| Allen County Rural Water District #3 |
| Allen County Rural Water District #4 |
| Allen County Rural Water District #6 |
| Allen County Rural Water District #7 |
| Allen County Rural Water District #8 |
| Allen County Rural Water District #9 |
| Allen County Rural Water District #10 |

**Participating Special Districts, Continued**

| |
|---|
| Allen County Rural Water District #11 |
| Allen County Rural Water District #13 |
| Allen County Rural Water District #15 |
| Allen County Rural Water District #16 |
| Anderson Rural Water District #5 |
| Bourbon Rural Water District #4 |
| Neosho Rural Water District #2 |
| Woodson Rural Water District #1 |
| **Cherokee County** |
| Cherokee County Rural Water District #1 |
| Cherokee County Rural Water District #3 |
| Cherokee County Rural Water District #4 |
| Cherokee County Rural Water District #5 |
| Cherokee County Rural Water District #7 |
| Cherokee County Rural Water District #8 |
| Cherokee County Rural Water District #9 |
| Cherokee County Rural Water District #19 |
| **Crawford County** |
| Crawford County Fire District #1 |
| Crawford County Fire District #2 |
| Crawford County Fire District #3 |
| Crawford County Fire District #4 |
| Crawford County Rural Water District #2 |
| Crawford County Rural Water District #3 |
| Crawford County Rural Water District #5 |
| Crawford County Rural Water District #7 |
| Crawford County Sewer District #1 |
| Crawford County Sewer District #2 |
| Crawford County Sewer District #3 |
| Hepler Rural Fire District |
| **Elk County** |
| Elk County Rural Fire District |
| **Labette County** |
| Labette County Rural Water District #7 |
| Public Wholesale Water Supply District #4 |
| **Montgomery County** |
| Montgomery County Rural Fire District #1 |
| Montgomery County Water District #6 |
| Montgomery County Water District #7 |
| Montgomery County Water District #8 |
| Montgomery County Water District #10 |

**Participating Special Districts, Continued**

| |
|---|
| Montgomery County Water District #12 |
| Montgomery County Water District #13 |
| Public Wholesale Water Supply District #4 |
| **Neosho County** |
| Neosho County Rural Water District #1 |
| Neosho County Rural Water District #4 |
| Neosho County Rural Water District #5 |
| Neosho County Rural Water District #6 |
| Neosho County Rural Water District #7 |
| Neosho County Rural Water District #9 |
| Neosho County Rural Water District #12 |
| Neosho County Rural Water District #23 |
| Public Wholesale Water Supply District #23 |
| **Wilson County** |
| Wilson County Rural Fire District |
| Wilson County Rural Water District #1 |
| Wilson County Rural Water District #2 |
| Wilson County Rural Water District #3 |
| Wilson County Rural Water District #4 |
| Wilson County Rural Water District #5 |
| Wilson County Rural Water District #6 |
| Wilson County Rural Water District #7 |
| Wilson County Rural Water District #8 |
| Wilson County Rural Water District #9 |
| Wilson County Rural Water District #10 |
| Wilson County Rural Water District #11 |
| Wilson County Rural Water District #12 |
| Wilson County Rural Water District #13 |
| **Woodson County** |
| Woodson County Rural Fire |
| Woodson County Rural Water District #1 |

It is important to note that while special districts are not required to individually adopt the mitigation plan, in doing so they retain the ability to control and oversee any grant funding received. In not adopting, the special districts cede control to the overarching county.

The following table presents a list of participating hospital and health agencies:

**Participating Hospitals or Health Agencies**

| Hospital or Health Agency | County |
|---|---|
| Allen County Hospital | Allen |
| Girard Medical Center | Crawford |
| Labette Health | Labette |
| Oswego Community Hospital | Labette |
| Labette Center for Mental Health Services | Labette |
| Coffeyville Regional Medical Center | Montgomery |
| Mercy Hospital | Montgomery |
| SEK Multi-County Health Department | Wilson |

Additionally, numerous private, non-profit and charitable organizations also participated in this planning effort. Many of these stakeholders have footprints across multiple counties, including:

**Private and Non-Profit Participating Stakeholders**

| Stakeholder |
|---|
| American Red Cross |
| Caney Valley Electric Cooperative |
| Great Plains Industrial Park |
| Heartland Rural Electric Cooperative |
| Independence Bible School |
| Lyon-Coffey Rural Electric Cooperative |
| Radiant Electrical Cooperative |
| Salvation Army |
| Southern Star Central Gas Pipeline |
| Twin Valley Electrical Cooperative |

The following jurisdictions, identified as participating in the last hazard mitigation planning process for their respective counties, elected not to participate in this planning iteration: The cities of Chautauqua and Niotaze, Chautauqua County, Greenwood County, the cities of Climax, Eureka, Fall River, Hamilton, Madison, Severy and Virgil, Greenwood County, and USDs 282, 386, 389 and 390, Greenwood County. Please note that USD 282 did participate in Elk County. Because this is a regional plan data from these non-participating jurisdictions may be included throughout the plan. Each of these jurisdictions will be encouraged to participate in future plan iterations.

## GOALS

Based upon the research conducted to complete this document, the HMPC identified goals and objectives to reduce potential risks associated with identified hazards. The goals and objectives of this multi-hazard mitigation plan are to:

- **Goal 1:** Reduce and/or eliminate the risk to the people and property of southeast Kansas from the identified hazards in this plan.
- **Goal 2:** Strive to protect all of the vulnerable populations, structures, and critical facilities in southeast Kansas from the impacts of the identified hazards.
- **Goal 3:** Improve public outreach initiatives to include education, awareness and partnerships with all willing entities in order to enhance understanding of t he risks southeast Kansas faces due to the impacts of the identified hazards.
- **Goal 4:** Enhance communication and coordination among all agencies and between agencies and the public.

To accomplish the above identified goals, the HMPC has developed a series of robust and achievable mitigation actions. These actions are discussed in detail in Section 5 of this plan.

## HAZARD MITIGATION PLANNING COMMITTEE

The following table presents the members of the southeast HMPC. Each planning committee member served as a point of contact for their county, assisting with the direction and dissemination of information concerning the planning effort. A special thanks is afforded to these people who made the successful completion and adoption of this plan possible.

**Hazard Management Planning Committee**

| Participant | Title | Organization |
|---|---|---|
| Pam Beasley | Emergency Manager | Allen County |
| Terri Coop | Emergency Manager | Bourbon County |
| Matt Hartley | Emergency Manager | Chautauqua County |
| Jason Allison | Emergency Manager | Cherokee County |
| Eldon Bedene | Emergency Manager | Crawford County |
| Byrdee Miller-Marcic | Emergency Manager | Elk County |
| Levi Vinson | Emergency Manager | Greenwood County |
| Larry Steeby | Emergency Manager | Labette County |
| Jim Miller | Emergency Manager | Montgomery County |
| Byron Shultz | Emergency Manager | Neosho County |
| Terry Lyons | Emergency Manager | Wilson County |
| Scott Wiltse | Emergency Manager | Woodson County |
| Jeanne Bunting | Mitigation Planner | Kansas Division of Emergency Management |
| Matt Eyer | Plan Author | Blue Umbrella Solutions |

In addition to these HMPC members, representatives from each participating jurisdiction deserve a special thanks for assisting in this planning effort. Through their submission of data, participation in discussions and meetings, and feedback on plan revisions they assisted in making a robust Plan.

# RESOLUTIONS OF ADOPTION

*44 CFR Requirement 201.6(c)(5): Documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council). For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.*

Upon review and approved pending adoption status by FEMA Region VII adoption resolutions will be signed by the participating jurisdictions and added to the Appendix documents. Additionally, the following table will be completed noting adoption date for each participating jurisdiction and, if applicable, resolution number.

| | Adoption Date | Resolution Number |
|---|---|---|
| **Allen County** | | |
| City of Elsmore | | |
| City of Gas | | |
| City of Humboldt | | |
| City of Iola | | |
| City of LaHarpe | | |
| City of Moran | | |
| City of Savonburg | | |
| Allen County Community College | | |
| USD 256 - Marmaton Valley | | |
| USD 257 - Iola Public Schools | | |
| USD 258 - Humboldt | | |

| | Adoption Date | Resolution Number |
|---|---|---|
| **Bourbon County** | | |
| City of Bronson | | |
| City of Fort Scott | | |
| City of Fulton | | |
| City of Mapleton | | |
| City Redfield | | |
| City of Uniontown | | |
| Fort Scott Community College | | |
| USD 234 - Fort Scott | | |
| USD 235 - Uniontown | | |

| | Adoption Date | Resolution Number |
|---|---|---|
| **Chautauqua County** | | |
| City of Cedar Vale | | |
| City of Peru | | |
| City of Sedan | | |
| USD 285 – Cedar Vale | | |
| USD 286 – Chautauqua County | | |

| | Adoption Date | Resolution Number |
|---|---|---|
| **Cherokee County** | | |
| City of Baxter Springs | | |
| City of Columbus | | |
| City of Galena | | |
| City of Roseland | | |
| City of Scammon | | |
| City of Treece | | |
| City of Weir | | |
| City of West Mineral | | |
| USD 404 - Riverton | | |
| USD 493 - Columbus | | |
| USD 499 - Galena | | |
| USD 508 - Baxter Springs | | |

| | Adoption Date | Resolution Number |
|---|---|---|
| **Crawford County** | | |
| City of Arcadia | | |
| City of Arma | | |
| City of Cherokee | | |
| City of Franklin | | |
| City of Frontenac | | |
| City of Girard | | |
| City of Hepler | | |
| City of McCune | | |
| City of Mulberry | | |
| City of Pittsburg | | |
| Grant Township | | |
| Osage Township | | |
| Sheridan Township | | |
| Sherman Township | | |
| Fort Scott Community College | | |
| Pittsburg State University | | |
| USD 246 - Arma | | |
| USD 247 - Cherokee | | |
| USD 248 - Girard | | |
| USD 249 - Frontenac | | |
| USD 250 Pittsburg | | |
| USD 609 - SE KS Education Services | | |

| | Adoption Date | Resolution Number |
|---|---|---|
| **Elk County** | | |
| City of Grenola | | |
| City of Howard | | |
| City of Longton | | |
| City of Moline | | |
| USD 282 - West Elk | | |
| USD 283 - Elk Valley | | |

| | Adoption Date | Resolution Number |
|---|---|---|
| **Labette County** | | |
| City of Altamont | | |
| City of Chetopa | | |
| City of Edna | | |
| City of Labette | | |
| City of Mound Valley | | |
| City of Oswego | | |
| City of Parsons | | |
| Labette County Community College | | |
| USD 503 - Parsons | | |
| USD 504 - Oswego | | |
| USD 505 - Chetopa-St. Paul | | |
| USD 506 - Labette County | | |

| | Adoption Date | Resolution Number |
|---|---|---|
| **Montgomery County** | | |
| City of Caney | | |
| City of Cherryvale | | |
| City of Coffeyville | | |
| City of Dearing | | |
| City of Elk City | | |
| City of Havana | | |
| City of Independence | | |
| City of Liberty | | |
| Coffeyville Community College | | |
| Independence Community College | | |
| USD 436 - Caney | | |
| USD 445 - Coffeyville | | |
| USD 446 - Independence | | |
| USD 447 - Cherryvale | | |

| | Adoption Date | Resolution Number |
|---|---|---|
| **Neosho County** | | |
| City of Chanute | | |
| City of Erie | | |
| City of Galesburg | | |
| City of St. Paul | | |
| City of Thayer | | |
| Neosho County Community College | | |
| USD 101 - Erie | | |
| USD 413 - Chanute | | |
| USD 447 - Cherryvale | | |
| USD 505 - Chetopa-St. Paul | | |

| | Adoption Date | Resolution Number |
|---|---|---|
| **Wilson County** | | |
| City of Altoona | | |
| City of Benedict | | |
| City of Buffalo | | |
| City of Fredonia | | |
| City of Neodesha | | |
| City of New Albany | | |
| USD 387 - Altoona-Midway | | |
| USD 461 - Neodesha | | |
| USD 484 - Fredonia | | |

| | Adoption Date | Resolution Number |
|---|---|---|
| **Woodson County** | | |
| City Of Toronto | | |
| City of Yates Center | | |
| USD 366 - Woodson County | | |

Unincorporated cities and townships and agencies that are part of a larger entity, such as a county health department or public works department, will be considered as adopting when the umbrella county adopts the plan. It is important to note that while special districts are not required to individually adopt the mitigation plan, in doing so they retain the ability to control and oversee any grant funding received. In not adopting, the special districts cede control to the overarching county. In addition, there are no adoption requirements for private or non-profit jurisdictions.

| | Adoption Date | Resolution Number |
|---|---|---|
| **Allen County** | | |
| Allen County Rural Water District #1 | | |
| Allen County Rural Water District #2 | | |
| Allen County Rural Water District #3 | | |
| Allen County Rural Water District #4 | | |
| Allen County Rural Water District #6 | | |
| Allen County Rural Water District #7 | | |
| Allen County Rural Water District #8 | | |
| Allen County Rural Water District #9 | | |
| Allen County Rural Water District #10 | | |
| Allen County Rural Water District #11 | | |
| Allen County Rural Water District #13 | | |
| Allen County Rural Water District #15 | | |
| Allen County Rural Water District #16 | | |
| Anderson Rural Water District #5 | | |
| Bourbon Rural Water District #4 | | |
| Neosho Rural Water District #2 | | |
| Woodson Rural Water District #1 | | |
| **Cherokee County** | | |
| Cherokee County Rural Water District #1 | | |
| Cherokee County Rural Water District #3 | | |
| Cherokee County Rural Water District #4 | | |
| Cherokee County Rural Water District #5 | | |
| Cherokee County Rural Water District #7 | | |
| Cherokee County Rural Water District #8 | | |
| Cherokee County Rural Water District #9 | | |
| Cherokee County Rural Water District #19 | | |
| **Crawford County** | | |
| Crawford County Fire District #1 | | |
| Crawford County Fire District #2 | | |
| Crawford County Fire District #3 | | |
| Crawford County Fire District #4 | | |
| Crawford County Rural Water District #2 | | |
| Crawford County Rural Water District #3 | | |
| Crawford County Rural Water District #5 | | |
| Crawford County Rural Water District #7 | | |
| Crawford County Sewer District #1 | | |
| Crawford County Sewer District #2 | | |
| Crawford County Sewer District #3 | | |
| Hepler Rural Fire District | | |

| | Adoption Date | Resolution Number |
|---|---|---|
| **Elk County** | | |
| Elk County Rural Fire District | | |
| **Labette County** | | |
| Labette County Rural Water District #7 | | |
| Public Wholesale Water Supply District #4 | | |
| **Montgomery County** | | |
| Montgomery County Rural Fire District #1 | | |
| Montgomery County Water District #6 | | |
| Montgomery County Water District #7 | | |
| Montgomery County Water District #8 | | |
| Montgomery County Water District #10 | | |
| Montgomery County Water District #12 | | |
| Montgomery County Water District #13 | | |
| Public Wholesale Water Supply District #4 | | |
| **Neosho County** | | |
| Neosho County Rural Water District #1 | | |
| Neosho County Rural Water District #4 | | |
| Neosho County Rural Water District #5 | | |
| Neosho County Rural Water District #6 | | |
| Neosho County Rural Water District #7 | | |
| Neosho County Rural Water District #9 | | |
| Neosho County Rural Water District #12 | | |
| Neosho County Rural Water District #23 | | |
| Public Wholesale Water Supply District #23 | | |
| **Wilson County** | | |
| Wilson County Rural Fire District | | |
| Wilson County Rural Water District #1 | | |
| Wilson County Rural Water District #2 | | |
| Wilson County Rural Water District #3 | | |
| Wilson County Rural Water District #4 | | |
| Wilson County Rural Water District #5 | | |
| Wilson County Rural Water District #6 | | |
| Wilson County Rural Water District #7 | | |
| Wilson County Rural Water District #8 | | |
| Wilson County Rural Water District #9 | | |
| Wilson County Rural Water District #10 | | |
| Wilson County Rural Water District #11 | | |
| Wilson County Rural Water District #12 | | |
| Wilson County Rural Water District #13 | | |
| **Woodson County** | | |
| Woodson County Rural Fire | | |
| Woodson County Rural Water District #1 | | |

Completed resolutions of adoption may be found in Appendix A.

## EXAMPLE RESOLUTION OF ADOPTION

The following presents an example resolution of adoption for participating jurisdictions to use as a template, if necessary.

**Model Resolution**

Resolution # _____: **Adopting the Southeast Kansas (Region H) Multi-Hazard, Multi-Jurisdictional Hazard Mitigation Plan**

**Whereas**, the (Name of Government/District/Organization) recognizes the threat that natural hazards pose to people and property within our community; and

**Whereas,** undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

**Whereas,** the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

**Whereas,** the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

**Whereas,** an adopted Multi-Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple Federal Emergency Management Agency (FEMA) pre- and post-disaster mitigation grant programs; and

**Whereas,** the (Name of Government/District/Organization) fully participated in the FEMA prescribed mitigation planning process to prepare this Multi-Hazard Mitigation Plan; and

**Whereas,** the Kansas Division of Emergency Management and FEMA Region VII officials have reviewed the Southeast Kansas (Region H) Multi-Hazard, Multi-Jurisdictional Hazard Mitigation Plan, and approved it contingent upon this official adoption of the participating governing body; and

**Whereas,** the (Name of Government/District/Organization) desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the Southeast Kansas (Region H) Multi-Hazard, Multi-Jurisdictional Hazard Mitigation Plan; and

**Whereas,** adoption by the governing body for the (Name of Government/District/Organization) demonstrates the jurisdictions' commitment to fulfilling the mitigation goals and objectives outlined in this plan, and

**Whereas,** adoption of this legitimizes the plan and authorizes responsible agencies to carry out their responsibilities under the plan.

**Now, therefore, be it resolved,** that the (Name of Government/District/Organization) adopts the Southeast Kansas (Region H) Multi-Hazard, Multi-Jurisdictional Hazard Mitigation Plan as an official plan; and

**Be it further resolved,** the (Name of Government/District/Organization) will submit this Adoption Resolution to the Kansas Division of Emergency Management and FEMA Region VII officials to enable the plan's final approval.

_____ Passed

_____ Certifying Official

# 1.0 INTRODUCTION AND PLANNING PROCESS

## 1.1 INTRODUCTION

Eleven participating counties within the southeast Kansas region (Kansas Homeland Security Region H) prepared this Regional Multi-Hazard Mitigation Plan (Plan) to provide sustained actions to eliminate or reduce risk to people and property from the effects of natural and man-made hazards. This Plan documents southeast Kansas's planning process and identifies applicable hazards, vulnerabilities, and hazard mitigation strategies. This Plan will serve to direct available community and regional resources towards creating policies and actions that provide long-term benefits to the community. Local and regional officials can refer to the Plan when making decisions regarding regulations and ordinances, granting permits, and in funding capital improvements and other community initiatives.

This Plan was also developed to make participating jurisdictions with southeast Kansas eligible for applicable federal disaster assistance, including the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program, Pre-Disaster Mitigation program, and Flood Mitigation Assistance program. Additionally, this regional Plan will serve as the basis for the State of Kansas to prioritize available grant funding.

This Plan has been prepared in coordination with the Federal Emergency Management Agency (FEMA) Region VII and the Kansas Division of Emergency Management (KDEM).

This Plan has been designed to be a living document, a document that will evolve to reflect regional changes, correct any omissions, and constantly strive to ensure the safety of southeast Kansas's citizens. In addition, this document allows each participating jurisdiction to integrate the data, information and hazard mitigation goals and actions from the plan into other planning mechanisms.

## 1.2 BACKGROUND

Southeast Kansas is vulnerable to a wide range of natural and man-made hazards, including flooding, tornadoes, drought, and winter storms. These hazards threaten the safety of citizens and have the potential to damage or destroy property and disrupt local and regional economies. For a majority of the identified hazards, their occurrence is natural and there is little we can do to control their force and intensity. Each year some of these hazards cause disasters that cost hundreds of lives, cause countless injuries, and cost taxpayers billions of dollars to help communities recover. And while the intensity of these natural disasters cannot be controlled, there are many actions that can be taken to minimize their potential impacts to the region. Actions taken to reduce the potential impact of a hazard can greatly diminish the possibility that the hazard will result in a disaster. The practice of minimizing risks to people and property from identified hazards is referred to as hazard mitigation. FEMA describes hazard mitigation as "sustained action taken to reduce or eliminate long-term risk to people and their property from hazards and their effects."

## 1.3 DISASTER MITIGATION ACT OF 2000

In an effort to reduce natural disaster losses the United States Congress passed the Disaster Mitigation Act of 2000 (DMA 2000) in order to amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act). DMA 2000 amended the Stafford Act by repealing the previous Mitigation Planning section (409) and replacing it with a new Mitigation Planning section (322). Section 322 of the DMA makes the development of a hazard mitigation plan a specific eligibility requirement for any local government applying for Federal mitigation grant funds.

This Plan was prepared to meet the requirements of the DMA 2000, as defined in regulations set forth by the Interim Final Rule (44 CFR Part 201.6).

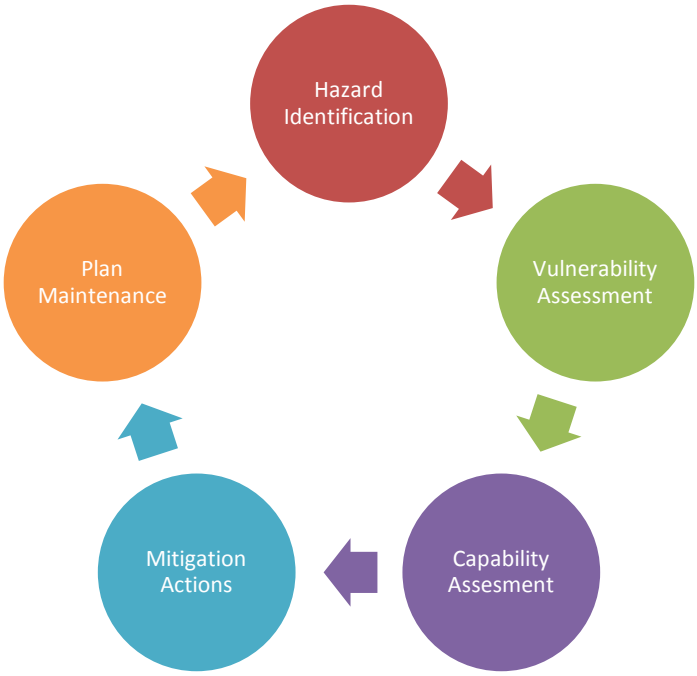
## 1.4 HAZARD MITIGATION PLANNING PROCESS

*44 CFR 201.6(c)(1) Documentation of the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.*

The Kansas Division of Emergency Management contracted with Blue Umbrella Solutions in November 2012 to assist southeast Kansas in developing a multi-jurisdictional, multi-hazard mitigation plan. Blue Umbrella Solutions and the southeast Kansas HMPC worked together in developing this Plan to meet the requirements of the DMA 2000, as defined in regulations set forth by the Interim Final Rule (44 CFR Part 201.6). As part of this process, the following tasks were conducted:

- Consultation with FEMA Region VII on Plan development
- Review of current mitigation plans for all participating jurisdictions
- Incorporation of review elements into new regional plan
- Delivery of organizational and planning meetings
- Solicitation of public input as to Plan development
- Assessment of potential regional risks
- Assessment of vulnerabilities and assets
- Development of the mitigation actions
- Development of a draft multi-jurisdictional, multi-hazard mitigation plan
- Implementation, adoption, and maintenance of the Plan

In general, the following diagram shows the planning cycle:




## 1.5 PLANNING PROCESS PARTICIPATION REQUIREMENTS

*44 CFR 201.6(a)(4): Multi-jurisdictional plans may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan.*

All eligible jurisdictions within southeast Kansas were invited to participate in the organization, drafting, completion and adoption of this Plan. Invitees included, but were not limited to, elected officials, relevant State of Kansas agencies, counties, cities, school districts, universities and community colleges, special districts, including rural fire and water districts, non-profit agencies, and businesses.

In order to have an approved hazard mitigation plan, DMA 2000 requires that each jurisdiction participate in the planning process. Each jurisdiction choosing to participate in the development of the Plan were required to meet detailed participation requirements, which included the following:

- When practical and affordable, participation in planning meetings
- Provision of information to support the Plan development
- Identification of relevant mitigation actions
- Review and comment on Plan drafts
- Formal adoption of the plan

County Emergency Managers were designated as HMPC representatives for each participating jurisdiction within their county. Jurisdiction provision of i nformation, identification of

mitigation actions and Plan review and comment are detailed throughout this Plan and were, in general coordinated by each relevant HMPC member.

Jurisdictions who were unable to attend meetings due to budgetary or time constraints were contacted by their HMPC member via email or phone to discuss hazard mitigation planning, including the process, goals, mitigation actions, local planning concerns and Plan review.

Multiple methods of communication with HMPC members, participating jurisdictions, and the public were used during the planning process. Communications used include:

- On-site meetings
- Telephone
- Email
- Internet resources
- Social media

## 1.6 CONSULTATION WITH FEMA REGION VII

Upon initiation of the planning process, a meeting was held with FEMA Region VII to review current and pending planning requirements and to discuss methods to provide for a smooth planning and review process. The meetings were held on January 3 and 4, 2013 at the FEMA Region VII offices, and the following participants were in attendance:

| Participant | Organization |
|---|---|
| Joe Chandler | FEMA Region VII |
| Michelle Wolf | FEMA Region VII |
| Jeanne Bunting | State of Kansas |
| Matthew Eyer | Blue Umbrella Solutions |

## 1.7 REVIEW OF PREVIOUS MITIGATION PLANS AND OTHER PLANNING DOCUMENTS

*44 CFR 201.6(b):(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.*

Prior to the delivery of the southeast Kansas project kickoff meetings, all relevant southeast Kansas hazard mitigation plans and applicable planning documents were reviewed and mined for data to be used in the consolidation and creation of the new regional Plan, and for use to guide kickoff meeting discussions. In addition to the regional mitigation plans, the Kansas State Hazard Mitigation Plan and available relevant data from state and federal agencies was reviewed. These sources are noted throughout the Plan.

## 1.8 ORGANIZATIONAL AND PLANNING MEETINGS

*44 CFR 201.6(b): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: ..... (2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process.*

Within southeast Kansas there are many jurisdictions and organizations who have a vested interest in participating in the creation and adoption of the hazard mitigation plan. An integral part of the planning process included the identification, development, and coordination of all of these entities. As such, a series of three organizational and planning meetings were scheduled and all past and potential future participants were notified by the State of Kansas as to the dates and locations of the meetings. In addition, communities neighboring the region were invited to participate in the planning process.

It is worth noting that all neighboring Kansas counties are undergoing a similar mitigation planning effort, and as part of this statewide process all county and state planners are working together toward common mitigation goals. During the creation and adoption of this plan communication channels were opened to facilitate the cross pollination of ideas, to incorporate neighboring regions concerns, and to ensure the overall preparedness of the State of Kansas.

The following table presents the date, location and purpose of each planning meeting.

| Meeting Number | Dates | Locations | Purpose |
|---|---|---|---|
| 1 | 4/15/2013 | Pittsburg | Review of planning process, project coordination, scope, participation requirements, strategies for public involvement. Formation of HMPC. Discussion and review of potential hazards. |
| | 4/16/2013 | Chanute | |
| | 4/22/2103 | Howard | |
| 2 | 8/28/2013 | Sedan | Results of the hazard identification, classification, and delineation discussed Sections of the Plan were made available for review and comment. Development of mitigation goals and actions. |
| 3 | 10/16/2013 | Pittsburg | Review of completed draft Plan. Review of public comments. Incorporation of any changes. Discussion of approval and adoption timeframes. |
| | 10/24/2013 | Chanute | |
| | 10/25/2103 | Howard | |

A copy of the meeting sign-in forms and agenda are attached in Appendix B.

A series of kick-off meetings were held with available representatives from jurisdictions within the planning region in attendance. At the kickoff meeting, the planning process, project coordination, scope, participation requirements, strategies for public involvement, and schedule were discussed in detail. Additionally, the HMPC was created to include the Emergency

Manager from each participating county along with relevant State of Kansas partners. HMPC members were tasked with the following roles and responsibilities that continued for the duration of the planning process:

- Meeting attendance and facilitation assistance
- Data collection and submission
- Assistance in soliciting public involvement and input
- Draft and final Plan review
- Oversight of facilitation of final Plan adoption by respective jurisdictions

During the meeting, participants were led through a guided discussion concerning hazard data sourced from their previous hazard mitigation plans. Additionally, research was conducted prior to the meeting on recent regional hazard events to further inform the discussion. Participants were encouraged to discuss past hazard events, past impacts, and the future probability for all identified hazards. Based on this discussion, a comprehensive list of regional hazards was created.

At the conclusion of the meeting, all participants were provided with a data collection forms to solicit information needed to properly complete the Plan. The forms asked for information concerning data on historic hazard events, at risk populations and properties, and available capabilities. Additionally, participating jurisdictions were provided with their mitigation actions from the previous plans for review and comment, and asked to identify any additional mitigation actions.

Each participating jurisdiction was required to complete and return the forms and actions to be considered as participating. These forms were used in the development of this Plan.

A series of mid-term planning meetings were held with HMPC representatives in attendance. Based upon the initial research, discussions held during the kickoff meetings, information obtained from the data collection forms, additional research, and subsequent discussion with HMPC members, the results of the hazard identification, classification, and delineation were discussed in detail. In addition, sections of the Plan were made available for review and comment. Based on the supplied hazard information, participants were asked to assist in the development and review of mitigation goals and actions.

A final planning meeting was held with representatives from jurisdictions within the planning region in attendance. The completed draft Plan was made available for review and comment.

## 1.9 PUBLIC OUTREACH

*44 CFR Requirement 201.6(b): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval*

As part of the overall planning process, the general public were provided with numerous opportunities to contribute and comment on the creation and adoption of the Plan. These opportunities include:

- SurveyMonkey (online survey)
- Facebook
- Meeting with local emergency managers

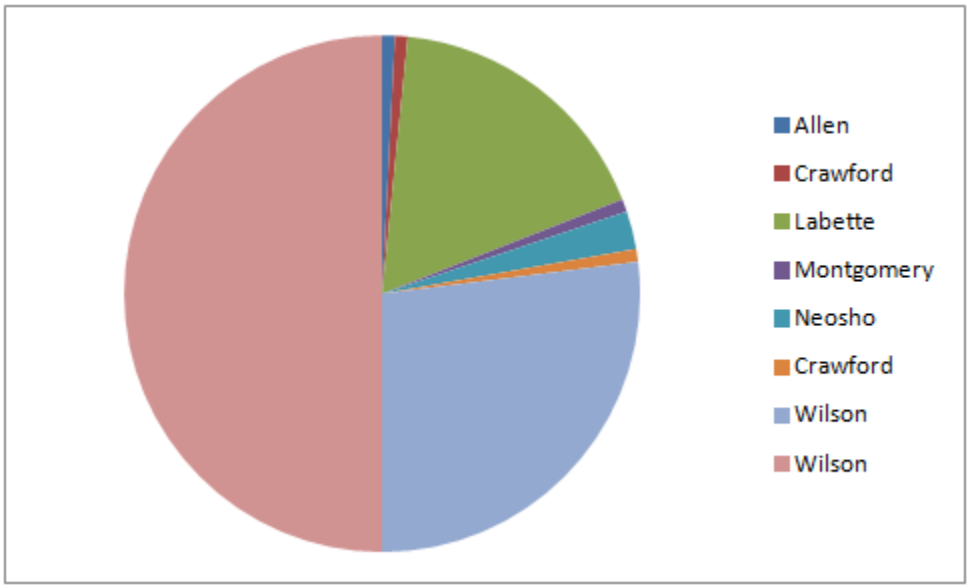
As history has shown that open public meetings were poorly attended the region elected to not hold them.

Input from the general public provided the HMPC with a clearer understanding of regional concerns, increased the likelihood of citizen buy-in concerning proposed mitigation actions, and provided elected officials with a guide and tool to set regional ordinances and regulations. This public outreach effort was also an opportunity for adjacent jurisdictions and entities to be involved in the planning process.

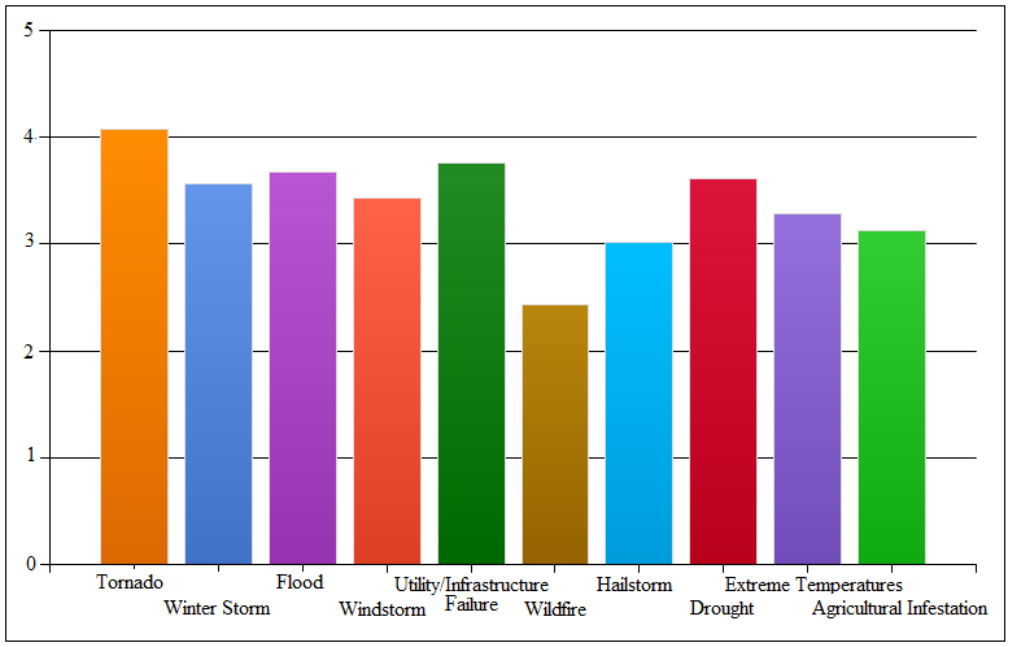
Additionally, as citizens were made more aware of potential hazards and the local and regional process to mitigation against their impacts, it was believed that they would take a stronger role in making their homes, neighborhoods, schools, and businesses safer from the potential effects of natural hazards.

The following graphics show the results of the received public input from the SurveyMonkey online survey for the region for each question asked.

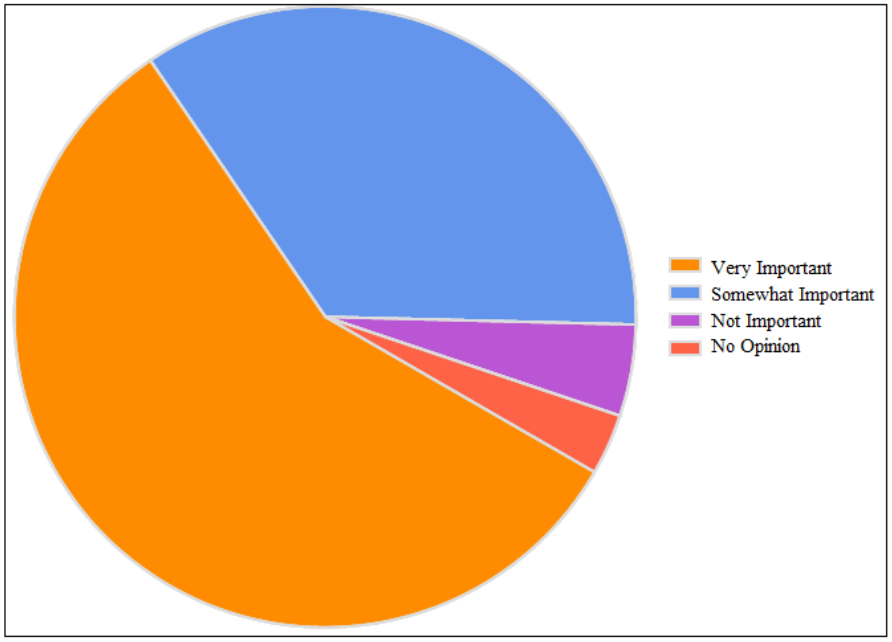
**Question 1:** What County and jurisdiction do you live in?



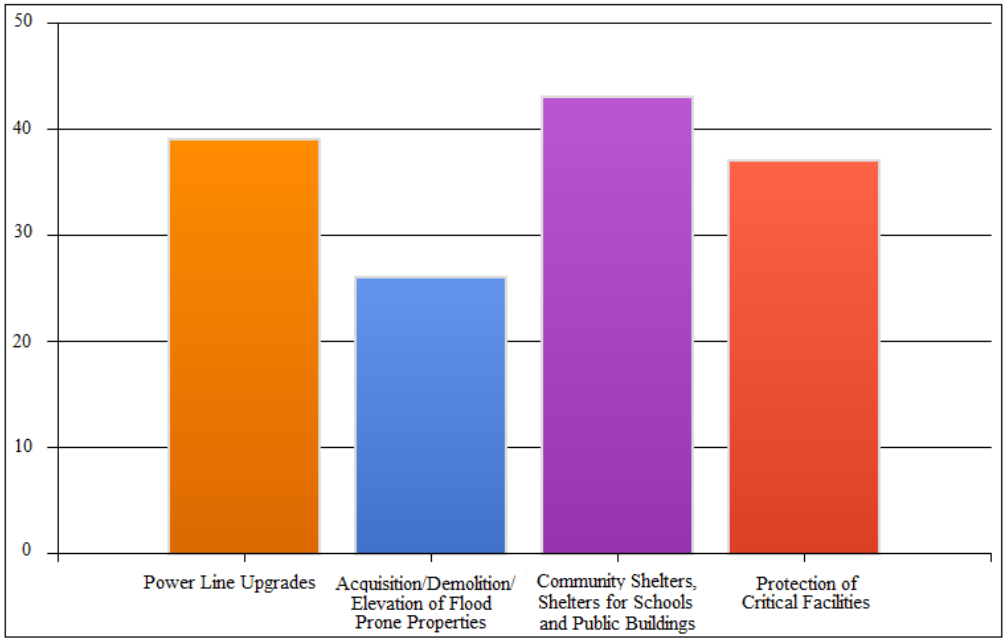
**Question 2:** In region consisting of Allen, Bourbon, Chautauqua, Cherokee, Crawford, Elk, Greenwood, Labette, Montgomery, Neosho, Wilson and Woodson counties, the planning committee has determined that the hazards listed below are of significance to the area. Please indicate the level of risk, or extent of potential impacts, in the Region, that you perceive for each hazard.



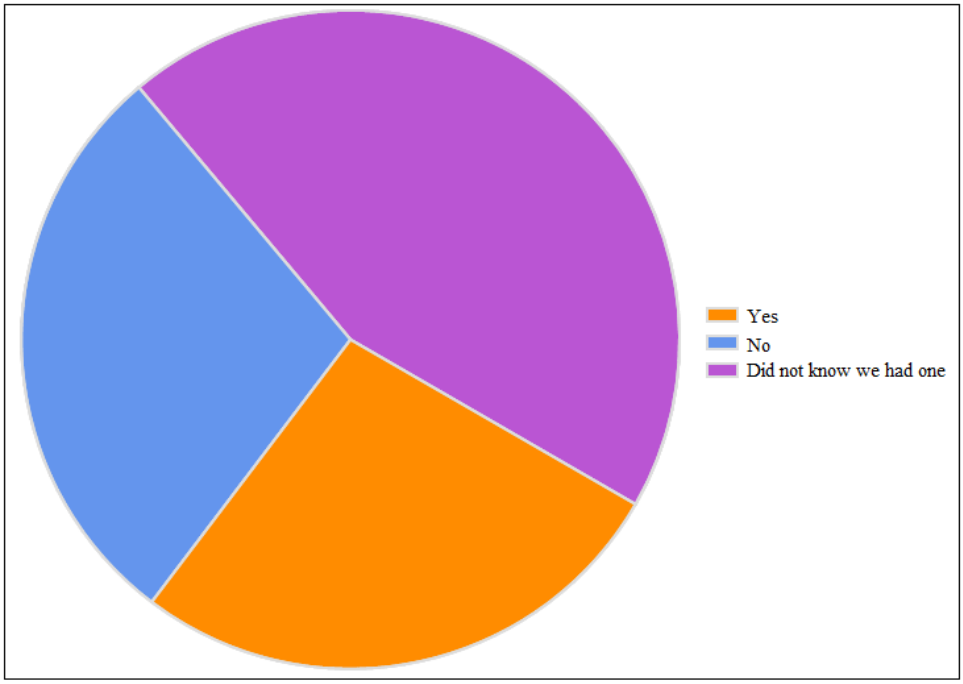

**Question 3:** In the region, the planning committee has determined that a flood event is the third most critical hazard. How important to you is it that your participate or continue to participate in the National Flood Insurance Program?



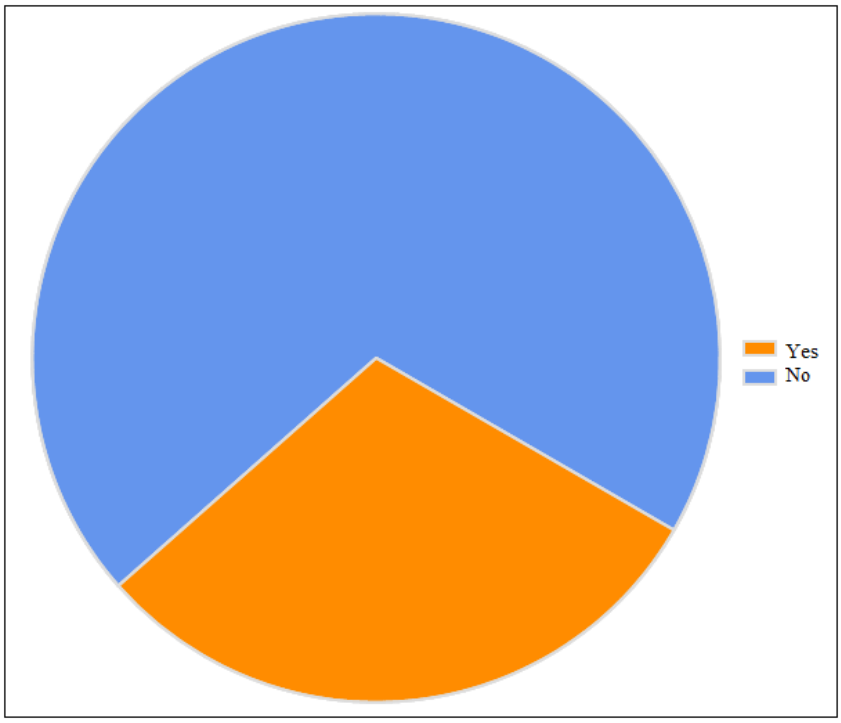
**Question 4:** Funding requests for FEMA Hazard Mitigation Grant Program funds are currently reviewed initially by the Kansas Division of Emergency Management. Listed below are their current funding priorities. Please check those that benefit your community.




**Question 5:** Have you had an opportunity to read your current Hazard Mitigation Plan?



**Question 6:** Do you know where the mitigation plan for your county can be found if you wanted to look at it?




In addition, the following comments relating to mitigation planning were from interested citizens of the region. Please note that questions answered with a "none," "non applicable," or similar response, or left blank are not reported.

**Question 7:** Your input is valuable to this planning process. Please comment on any other issues that the planning committee should consider in developing a strategy to reduce future losses caused by natural hazard events.

"Thank you for seeking our input."

"While power line upgrades are important is own region, as the number of brown outs and fluctuation of power seems to happen often, I also have seen a lot of issues in our town which result from rain water penetrating into our with old and needed upgraded sewer lines and then coming back into houses and businesses resulting in a property flooded by sewer water, in which the city takes no responsibility except in the acknowledgment that their sewer is in need of repair, I am surprised there isn't some sort of regulation that would force the city to repair lines in areas that have a constant flooding of sewer water into their properties. I would love to see something done about this."

"Rural low water bridges should be raised. More tornado shelters."

"I responded frequently to emergencies for the Red Cross and participate in those each time in Southeast Kansas. The saying that goes around is if a town will be without power, it will be Fredonia. It is without power frequently. I called in personally a tree limb on the lines twice before it was fixed in the country I drive by everyday. We really need an overhaul of the power lines for Fredonia."

"Public Tornado shelters in Oswego!!!"

"Get a full-time emergency manager. If some of these disasters strike, the fire chief will (or should) be too busy to do both jobs, and he is best suited for managing fires."

"School safety (weather)"

"Get the right player on the mitigation planner team."

**Question 8:** Do you have any mitigation projects you would like to see implemented and what are they?

"Most any project related to utilities (water and/or electric infrastructure) would be positive."

"Really the power lines are an issue. I do not know if the lines can be gone over or if it is the utility company's fault."

"Get an accurate flood map and use it."

"1. City of New Albany (pop. 60) has no outdoor warning siren. 2. PWWSD#23 water plant was flooded in Jun 2007 and within 2 feet of being flooded in August 2013. The plant needs to be moved to a higher elevation. 3. School Safe rooms in 8 schools in Wilson County. 4. General bank stabilization projects at various locations at bridges and roads in Wilson County. 5. City of Neodesha needs a new water intake site for their water plant."

"Safe rooms in schools"

"Storm shelter in the school/ storm siren in the small community in Crawford county"

A copy of the surveymonkey.com questionnaire may be found in Appendix C.

In addition, upon completion of the final draft of this Plan participating counties made the draft available for a two week period for public comment. No comments were received.

## 1.10 RISK ASSESSMENT

*44 CFR 201.6(c) Plan Content. The plan shall include the following: (2) A risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards. The risk assessment shall include: (i) A description of the type, location, and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.*

*44 CFR 201.6(c)(2)(iii) For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.*

As part of the mitigation planning effort, the hazards that could potentially impact jurisdictions in southeast Kansas were identified based on historical data, past occurrences, and local and regional knowledge. Identified hazards were then provided with a risk ranking using a weighted formula whose parameters included probability of occurrence, potential magnitude/severity of the event, event duration, warning time of occurrence.

Initially, participants of the kickoff meetings discussed hazard data sourced from their previous hazard mitigation plans and any recent regional hazard events. In general, participants were asked to consider:

- Previously identified mitigation plan hazards
- State of Kansas mitigation plan identified hazards
- FEMA identified hazards
- Recent hazard events, including declared disasters

Participants were encouraged to discuss past hazard events, including magnitude and severity, past impacts, and the future probability for all identified hazards. Based on this discussion, a comprehensive list of regional hazards was created. It should be noted that all discussed hazards did not warrant inclusion in the southeast Kansas Plan.

Finally, a data collection form to solicit and further develop the discussed hazards was provided to participants. Based upon the initial research, discussion held during the kickoff meetings, information obtained from the data collection forms, additional research, and subsequent discussion with HMPC members, a complete profile was developed for each selected hazard, and each hazard was assigned a risk ranking. HMPC participants were asked to review the profiled and developed hazards at the second planning meeting to further refine the information.

Further discussion of hazards, and justification for hazard omission may be found in Section 3.

## 1.11 VULNERABILITY ASSESSMENT AND LOSS ESTIMATION

*44 CFR 201.6(c)(2)(ii) A description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community. All plans approved after October 1, 2008 must also address NFIP insured structures that have been repetitively damaged by floods. The plan should describe vulnerability in terms of: (A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; (B) An estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate; (C) Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.*

As part of the information collection process, participating jurisdictions created an inventory of assets that could be potentially impacted by identified hazards, including a total number, identified values and potential losses, and development trends if available. Based on the gathered information a southeast Kansas assets at risk inventory was created.

Identified assets include:

- Critical facilities
- Critical infrastructure
- Historic structures and locations
- Economic assets
- Vulnerable populations
- Special needs populations

Further discussion of vulnerabilities and loss may be found throughout the Plan.

## 1.12 CAPABILITY ASSESSMENT

A capability assessment was conducted to determine the abilities, policies, and available resources of local and regional jurisdictions to implement mitigation actions. The following information was researched as part of the capability assessment:

- Existing and proposed local and regional ordinances, regulations, and policies
- Active and proposed plans related to mitigation, regional and local planning
- Current and proposed public outreach measures and programs
- Available personnel
- Available resources, including technological capabilities
- Available financial resources related to mitigation activities

Additionally, this assessment assisted in identifying any roadblocks, limitations or conflicts that could potentially obstruct mitigation actions and in identifying those activities that could be enhanced to further mitigation goals.

Further discussion of regional capabilities may be found in Section 4.

## 1.13 DEVELOPMENT OF MITIGATION GOALS

*44 CFR 201.6(c)(3) A mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools. This section shall include: (i) A description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.*

Based upon the developed regional hazards the HMPC and participating jurisdictions were asked during the second planning meeting to assist in developing a set of goals related to future hazard event outcomes. Research conducted prior to the meeting provided participants with a list of goals from previous planning efforts as a starting point for development. In general, the goals and objectives of this Plan are to:

- **Goal 1:** Reduce and/or eliminate the risk to the people and property of southeast Kansas from the identified hazards in this plan.
- **Goal 2:** Strive to protect all of the vulnerable populations, structures, and critical facilities in southeast Kansas from the impacts of the identified hazards.
- **Goal 3:** Improve public outreach initiatives to include education, awareness and partnerships with all willing entities in order to enhance understanding of the risks southeast Kansas faces due to the impacts of the identified hazards.
- **Goal 4:** Enhance communication and coordination among all agencies and between agencies and the public.

The above identified goals are discussed in detail in Section 5 of this Plan.

## 1.14 DEVELOPMENT OF MITIGATION ACTIONS

*44 CFR 201.6(c)(3)(ii) A section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. All plans approved by FEMA after October 1, 2008, must also address the jurisdiction's participation in the NFIP, and continued compliance with NFIP requirements, as appropriate. (iii) An action plan describing how the actions identified in paragraph (c)(3)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs. (iv) For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.*

To accomplish the above identified goals, the HMPC has developed a list of robust and achievable m itigation actions for each participating jurisdiction that address hazard vulnerabilities that exist today and in the foreseeable future.

The mitigation actions noted in this Plan include both structural and non-structural measures. Examples include:

- Requiring resistant new construction
- Relocation of structures
- Structural modification
- Construction of shelters
- Construction of barrier, deflection, or retention systems
- Detection and warning systems
- Regulatory measures
- Community awareness and education programs
- Behavioral modification

Mitigation actions were prioritized by the responsible jurisdiction based on both historical and new information and jurisdictional capabilities.

A complete discussion of the development of mitigation actions can be found in Section 5.

## 1.15 DEVELOPMENT OF SOUTHEAST KANSAS MULTI-HAZARD MITIGATION PLAN

*44 CFR 201.6(d) Plan review.(1) Plans must be submitted to the State Hazard Mitigation Officer (SHMO) for initial review and coordination. The State will then send the plan to the appropriate FEMA Regional Office for formal review and approval. Where the State point of contact for the FMA program is different from the SHMO, the SHMO will be responsible for coordinating the local plan reviews between the FMA point of contact and FEMA.*

Information obtained from previous mitigation plans, research, meetings, data collection forms, conversations, and public input was used to complete a draft of the Plan. The Plan was made available online for review for public comment. Valid comments and suggestions received from stakeholders were integrated into the final Plan. The Plan was then submitted to the Kansas Division of Emergency Management SMHO for initial review. The SMHO then submitted the Plan to FEMA Region VII for review and approval.

## 1.16 PLAN ADOPTION, REVIEW AND MAINTENANCE

*44 CFR 201.6(c)(4) A plan maintenance process that includes: (i) A section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle. (ii) A process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate. (iii) Discussion on how the community will continue public participation in the plan maintenance process.*

*44 CFR 201.6(c)(5) Documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council). For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.*

In order to have an approved hazard mitigation plan, DMA 2000 requires that each jurisdiction officially adopt the Plan. After FEMA Region VII review and Approval Pending Adoption status participating jurisdictions were tasked with formally adopting the Plan. Information concerning adoption dates and, if applicable, resolution number were presented in the Resolutions of Adoption section and copies of the resolutions are presented in Appendix A.

Prior the Plan adoption process, the HMPC developed a long-term maintenance strategy. This strategy is discussed in detail in Section 6.

## 1.17 PLANNING PROCESS PARTICIPATION

*44 CFR 201.6(a)(4): Multi-jurisdictional plans may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan.*

The following jurisdictions have met or exceeded the required participation criteria.

### 1.17.1 ALLEN COUNTY

| | Meeting Attendance or Communication with HMPC Representative | Data Submission (When Applicable) | Mitigation Action |
|---|---|---|---|
| **Allen County** | x | x | x |
| City of Elsmore | x | x | x |
| City of Gas | x | x | x |
| City of Humboldt | x | x | x |
| City of Iola | x | x | x |
| City of LaHarpe | x | x | x |
| City of Moran | x | x | x |
| City of Savonburg | x | x | x |
| Allen County Community College | x | x | x |
| USD 256 - Marmaton Valley | x | x | x |
| USD 257 - Iola Public Schools | x | x | x |
| USD 258 - Humboldt | x | x | x |
| Allen County Hospital | x | x | x |
| Allen County Rural Water District #1 | x | x | x |
| Allen County Rural Water District #2 | x | x | x |
| Allen County Rural Water District #3 | x | x | x |
| Allen County Rural Water District #4 | x | x | x |
| Allen County Rural Water District #6 | x | x | x |
| Allen County Rural Water District #7 | x | x | x |
| Allen County Rural Water District #8 | x | x | x |
| Allen County Rural Water District #9 | x | x | x |
| Allen County Rural Water District #10 | x | x | x |
| Allen County Rural Water District #11 | x | x | x |
| Allen County Rural Water District #13 | x | x | x |
| Allen County Rural Water District #15 | x | x | x |
| Allen County Rural Water District #16 | x | x | x |
| Anderson Rural Water District #5 | x | x | x |
| Bourbon Rural Water District #4 | x | x | x |
| Neosho Rural Water District #2 | x | x | x |
| Woodson Rural Water District #1 | x | x | x |

### 1.17.2 BOURBON COUNTY

| | Meeting Attendance or Communication with HMPC Representative | Data Submission (When Applicable) | Mitigation Action |
|---|---|---|---|
| **Bourbon County** | x | x | x |
| City of Bronson | x | x | x |
| City of Fort Scott | x | x | x |
| City of Fulton | x | x | x |
| City of Mapleton | x | x | x |
| City Redfield | x | x | x |
| City of Uniontown | x | x | x |
| Fort Scott Community College | x | x | x |
| USD 234 - Fort Scott | x | x | x |
| USD 235 - Uniontown | x | x | x |

### 1.17.3 CHAUTAUQUA COUNTY

| | Meeting Attendance or Communication with HMPC Representative | Data Submission (When Applicable) | Mitigation Action |
|---|---|---|---|
| **Chautauqua County** | x | x | x |
| City of Cedar Vale | x | x | x |
| City of Peru | x | x | x |
| City of Sedan | x | x | x |
| USD 285 – Cedar Vale | x | x | x |
| USD 286 – Chautauqua County | x | x | x |

### 1.17.4 CHEROKEE COUNTY

| | Meeting Attendance or Communication with HMPC Representative | Data Submission (When Applicable) | Mitigation Action |
|---|---|---|---|
| **Cherokee County** | x | x | x |
| City of Baxter Springs | x | x | x |
| City of Columbus | x | x | x |
| City of Galena | x | x | x |
| City of Roseland | x | x | x |
| City of Scammon | x | x | x |
| City of Treece | x | x | x |
| City of Weir | x | x | x |
| City of West Mineral | x | x | x |
| USD 404 - Riverton | x | x | x |
| USD 493 - Columbus | x | x | x |
| USD 499 - Galena | x | x | x |
| USD 508 - Baxter Springs | x | x | x |

| | Meeting Attendance or Communication with HMPC Representative | Data Submission (When Applicable) | Mitigation Action |
|---|---|---|---|
| Cherokee County Rural Water District #1 | x | x | x |
| Cherokee County Rural Water District #3 | x | x | x |
| Cherokee County Rural Water District #4 | x | x | x |
| Cherokee County Rural Water District #5 | x | x | x |
| Cherokee County Rural Water District #7 | x | x | x |
| Cherokee County Rural Water District #8 | x | x | x |
| Cherokee County Rural Water District #9 | x | x | x |
| Cherokee County Rural Water District #19 | x | x | x |

### 1.17.5 CRAWFORD COUNTY

| | Meeting Attendance or Communication with HMPC Representative | Data Submission (When Applicable) | Mitigation Action |
|---|---|---|---|
| **Crawford County** | x | x | x |
| City of Arcadia | x | x | x |
| City of Arma | x | x | x |
| City of Cherokee | x | x | x |
| City of Franklin | x | x | x |
| City of Frontenac | x | x | x |
| City of Girard | x | x | x |
| City of Hepler | x | x | x |
| City of McCune | x | x | x |
| City of Mulberry | x | x | x |
| City of Pittsburg | x | x | x |
| Grant Township | x | x | x |
| Osage Township | x | x | x |
| Sheridan Township | x | x | x |
| Sherman Township | x | x | x |
| Fort Scott Community College | x | x | x |
| Pittsburg State University | x | x | x |
| USD 246 - Arma | x | x | x |
| USD 247 - Cherokee | x | x | x |
| USD 248 - Girard | x | x | x |
| USD 249 - Frontenac | x | x | x |
| USD 250 Pittsburg | x | x | x |
| USD 609 - SE KS Education Services Center | x | x | x |
| Crawford County Fire District #1 | x | x | x |
| Crawford County Fire District #2 | x | x | x |
| Crawford County Fire District #3 | x | x | x |
| Crawford County Fire District #4 | x | x | x |

| | Meeting Attendance or Communication with HMPC Representative | Data Submission (When Applicable) | Mitigation Action |
|---|---|---|---|
| Crawford County Rural Water District #2 | x | x | x |
| Crawford County Rural Water District #3 | x | x | x |
| Crawford County Rural Water District #5 | x | x | x |
| Crawford County Rural Water District #7 | x | x | x |
| Crawford County Sewer District #1 | x | x | x |
| Crawford County Sewer District #2 | x | x | x |
| Crawford County Sewer District #3 | x | x | x |
| Hepler Rural Fire District | x | x | x |
| Girard Medical Center | x | x | x |

### 1.17.6 ELK COUNTY

| | Meeting Attendance or Communication with HMPC Representative | Data Submission (When Applicable) | Mitigation Action |
|---|---|---|---|
| **Elk County** | x | x | x |
| City of Grenola | x | x | x |
| City of Howard | x | x | x |
| City of Longton | x | x | x |
| City of Moline | x | x | x |
| USD 282 - West Elk | x | x | x |
| USD 283 - Elk Valley | x | x | x |
| Elk County Rural Fire District | x | x | x |

### 1.17.7 LABETTE COUNTY

| | Meeting Attendance or Communication with HMPC Representative | Data Submission (When Applicable) | Mitigation Action |
|---|---|---|---|
| **Labette County** | x | x | x |
| City of Altamont | x | x | x |
| City of Chetopa | x | x | x |
| City of Edna | x | x | x |
| City of Labette | x | x | x |
| City of Mound Valley | x | x | x |
| City of Oswego | x | x | x |
| City of Parsons | x | x | x |
| Labette County Community College | x | x | x |
| USD 503 - Parsons | x | x | x |
| USD 504 - Oswego | x | x | x |
| USD 505 - Chetopa-St. Paul | x | x | x |
| USD 506 - Labette County | x | x | x |

| | Meeting Attendance or Communication with HMPC Representative | Data Submission (When Applicable) | Mitigation Action |
|---|---|---|---|
| Labette County Rural Water District #7 | x | x | x |
| Public Wholesale Water Supply District #4 | x | x | x |
| Labette Center for Mental Health Services | x | x | x |
| Labette Health | | | |
| Oswego Community Hospital | | | |

### 1.17.8 MONTGOMERY COUNTY

| | Meeting Attendance or Communication with HMPC Representative | Data Submission (When Applicable) | Mitigation Action |
|---|---|---|---|
| **Montgomery County** | x | x | x |
| City of Caney | x | x | x |
| City of Cherryvale | x | x | x |
| City of Coffeyville | x | x | x |
| City of Dearing | x | x | x |
| City of Elk City | x | x | x |
| City of Havana | x | x | x |
| City of Independence | x | x | x |
| City of Liberty | x | x | x |
| Coffeyville Community College | x | x | x |
| Independence Bible School | x | x | x |
| Independence Community College | x | x | x |
| USD 436 - Caney | x | x | x |
| USD 445 - Coffeyville | x | x | x |
| USD 446 - Independence | x | x | x |
| USD 447 - Cherryvale | x | x | x |
| Montgomery County Rural Fire District #1 | x | x | x |
| Montgomery County Water District #6 | x | x | x |
| Montgomery County Water District #7 | x | x | x |
| Montgomery County Water District #8 | x | x | x |
| Montgomery County Water District #10 | x | x | x |
| Montgomery County Water District #12 | x | x | x |
| Montgomery County Water District #13 | x | x | x |
| Public Wholesale Water Supply District #4 | x | x | x |
| Coffeyville Regional Medical Center | x | x | x |
| Mercy Hospital | x | x | x |

### 1.17.9 NEOSHO COUNTY

| | Meeting Attendance or Communication with HMPC Representative | Data Submission (When Applicable) | Mitigation Action |
|---|---|---|---|
| **Neosho County** | x | x | x |
| City of Chanute | x | x | x |
| City of Erie | x | x | x |
| City of Galesburg | x | x | x |
| City of St. Paul | x | x | x |
| City of Thayer | x | x | x |
| Neosho County Community College | x | x | x |
| USD 101 - Erie | x | x | x |
| USD 413 - Chanute | x | x | x |
| USD 447 - Cherryvale | x | x | x |
| USD 505 - Chetopa-St. Paul | x | x | x |
| Neosho County Rural Water District #1 | x | x | x |
| Neosho County Rural Water District #4 | x | x | x |
| Neosho County Rural Water District #5 | x | x | x |
| Neosho County Rural Water District #6 | x | x | x |
| Neosho County Rural Water District #7 | x | x | x |
| Neosho County Rural Water District #9 | x | x | x |
| Neosho County Rural Water District #12 | x | x | x |
| Neosho County Rural Water District #23 | x | x | x |
| Public Wholesale Water Supply District #23 | x | x | x |

### 1.17.10 WILSON COUNTY

| | Meeting Attendance or Communication with HMPC Representative | Data Submission (When Applicable) | Mitigation Action |
|---|---|---|---|
| **Wilson County** | x | x | x |
| City of Altoona | x | x | x |
| City of Benedict | x | x | x |
| City of Buffalo | x | x | x |
| City of Fredonia | x | x | x |
| City of Neodesha | x | x | x |
| City of New Albany | x | x | x |
| USD 387 - Altoona-Midway | x | x | x |
| USD 484 - Fredonia | x | x | x |
| USD 461 - Neodesha | x | x | x |

| | Meeting Attendance or Communication with HMPC Representative | Data Submission (When Applicable) | Mitigation Action |
|---|---|---|---|
| SEK Multi-County Health Department | x | x | x |
| Wilson County Rural Fire District | x | x | x |
| Wilson County Rural Water District #1 | x | x | x |
| Wilson County Rural Water District #2 | x | x | x |
| Wilson County Rural Water District #3 | x | x | x |
| Wilson County Rural Water District #4 | x | x | x |
| Wilson County Rural Water District #5 | x | x | x |
| Wilson County Rural Water District #6 | x | x | x |
| Wilson County Rural Water District #7 | x | x | x |
| Wilson County Rural Water District #8 | x | x | x |
| Wilson County Rural Water District #9 | x | x | x |
| Wilson County Rural Water District #10 | x | x | x |
| Wilson County Rural Water District #11 | x | x | x |
| Wilson County Rural Water District #12 | x | x | x |
| Wilson County Rural Water District #13 | x | x | x |

### 1.17.11 WOODSON COUNTY

| | Meeting Attendance or Communication with HMPC Representative | Data Submission (When Applicable) | Mitigation Action |
|---|---|---|---|
| **Woodson County** | x | x | x |
| City Of Toronto | x | x | x |
| City of Yates Center | x | x | x |
| USD 366 - Woodson County | x | x | x |
| Woodson County Rural Fire | x | x | x |
| Woodson County Rural Water District #1 | x | x | x |

### 1.17.12 STAKEHOLDERS

The following list includes stakeholders involved in the planning process, including private, non-profit and charitable organizations.

| Stakeholder | Meeting Attendance or Communication with HMPC Representative | Data Submission (When Applicable) | Mitigation Action |
|---|---|---|---|
| American Red Cross | x | | x |
| Caney Valley Electric Cooperative | x | | x |
| Great Plains Industrial Park | x | | x |
| Heartland Rural Electric Cooperative | x | | x |
| Independence Bible School | x | | x |
| Lyon-Coffey Rural Electric Cooperative | x | | x |
| Radiant Electrical Cooperative | x | | x |
| Salvation Army | x | | x |
| Southern Star Central Gas Pipeline | x | | x |
| Twin Valley Electrical Cooperative | x | | x |

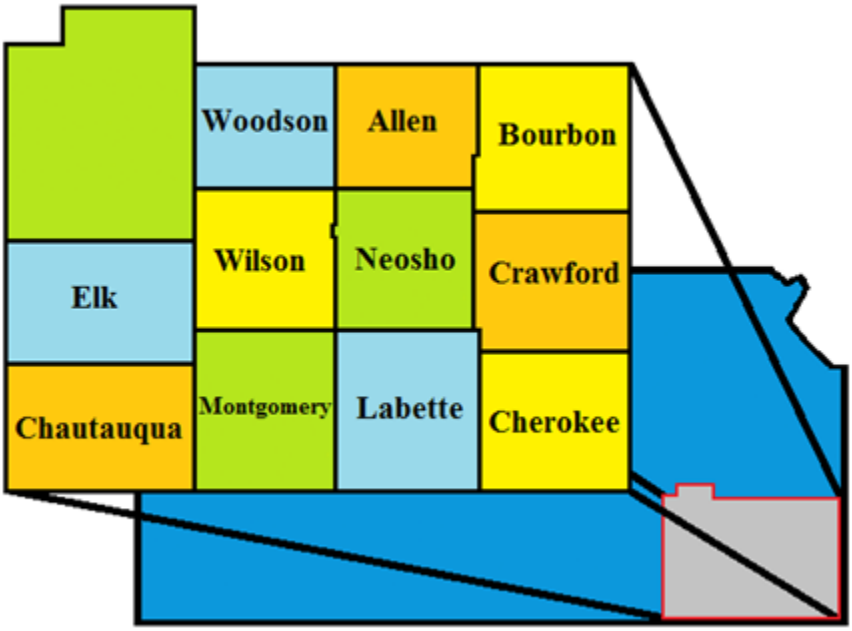
## 1.18 NON-PARTICIPATING JURISDICTIONS

The following jurisdictions, identified as participating in the last hazard mitigation planning process for their respective counties, elected not to participate in this planning iteration: The cities of Chautauqua and Niotaze, Chautauqua County, Greenwood County, the cities of Climax, Eureka, Fall River, Hamilton, Madison, Severy and Virgil, Greenwood County, and USDs 282, 386, 389 and 390, Greenwood County. Please note that USD 282 did participate in Elk County. Because this is a regional plan data from these non-participating jurisdictions may be included throughout the plan. Each of these jurisdictions will be encouraged to participate in future plan iterations.

# 2.0 REGIONAL PROFILE

## 2.1 PLANNING REGION

The southeastern Kansas planning region includes Allen, Bourbon, Chautauqua, Cherokee, Crawford, Elk, Labette, Montgomery, Wilson and Woodson counties, as well as the cities and towns located within these counties. The counties and majority of the cities participating in the 2013 hazard mitigation plan update plan are briefly summarized in the following sections.




## 2.2 COUNTY PROFILES

The following includes a general discussion of participating counties.

**Allen County**



Allen County is located in southeastern Kansas approximately 109 miles south of Kansas City and encompasses 505 square miles, with approximately 2 square miles being covered by water. In extent it is twenty-one miles from north to south and twenty-four miles from east to west. It is bound to the north by Anderson County, to the south by Neosho County, to the east by Bourbon County, and to the west by Woodson County.

Early inhabitants of Allen County and the greater

southeastern Kansas region included members of the Osage, Sac, and Fox Native American tribes. Allen County was first organized in 1855 and takes its name from William Allen, a U.S. Senator from Ohio. The first town and county seat was Cofachique, formed in 1855 on the high land east of the Neosho River, south of the mouth of Elm Creek. There was a heavy trade with the neighboring tribes of Native Americans for a brief period but the town's prospects began to decline in 1857, and the county seat was eventually moved two miles north to the new town of Iola.

The main water course is the Neosho River, which flows through the western part of the county from north to south. Its tributaries include Indian Creek, Elm Creek, Rock Creek and other small creeks. The Marmaton River rises near the town of Moran and flows through the southeastern part of the county. The Little Osage River rises in the northeast corner of the county and generally flows eastward in to Bourbon County.

Major roads include Highway 54, an east-west route passing through the cities of Moran, La Harpe, Gas, and Iola and Highway 169 which passes through western portions of the county and bypasses to the east of the cities of Iola, Bassett, and Humboldt.

According to the 2010 United States Census (Census), the population estimate for Allen County was 13,371 (a 7% decline from a 2000 Census population of 14,385), with a population density of 26 people per square mile.

**Bourbon County**

Bourbon County is located in southeastern Kansas approximately 100 miles south of Kansas City and encompasses 638 square miles, with approximately 2 square miles being covered by water. It is bound to the north by Linn County, to the south by Crawford County, to the east by Vernon County, Missouri , and to the west by Allen and Neosho Counties.



Bourbon County was organized in 1855, with Fort Scott as the County Seat. The county derived its name from Bourbon County, Kentucky and as a compliment to the Bourbon dynasty of France, a prince of that family (then on the throne) having rendered the American colonies important aid in men and money in their great struggle for independence.

The main water courses are the Little Osage River and Marmaton River. Major lakes include Bourbon State Fishing Lake, Lake Fort Scott, Elm Creek Lake, and Cedar Creek Reservoir.

Major roads include Highway 54, an east-west route passing through the cities of Bronson and Fort Scott and Highway 69, a north-south route which passes through the center of the county through Fort Scott and Edward.

According to the 2010 United States Census, the population estimate for Bourbon County was 15,173 (statistically unchanged from a 2000 Census population of 15,379), with a population density of 24 people per square mile.

**Chautauqua County**

Chautauqua County is located in southeastern Kansas to the southeast of Wichita along the Oklahoma Border. The county encompasses 644 square miles, with approximately 3 square miles being covered by water. It is bound to the north by Elk County, to the south by Osage County, Oklahoma, to the east by Montgomery County, and to the west by Cowley County.

Chautauqua County was organized in 1875, with Sedan as the County Seat. The county derived its name from Chautauqua County, New York and was created form the breakup of Howard County into Elk and Chautauqua Counties.



The main water course is the Caney River. Major lakes include the New and Old Sedan City Lakes.

Major roads include Highway 66, an east-west route passing through the cities of Sedan and Niotaze and Highway 69, a north-south route which passes through the center of the county through Sedan.

According to the 2010 United States Census, the population estimate for Chautauqua County was 3,669 (a 16% decrease from a 2000 Census population of 4,359), with a population density of 6 people per square mile.

**Cherokee County**

Cherokee County is located in southeastern Kansas along the state borders of Missouri and Oklahoma. The county encompasses 591 square miles, with approximately 4 square miles being covered by water. It is bound to the north by Crawford County, to the south by Ottawa County, Oklahoma, to the east by Jasper County, Missouri, and to the west by Labette County.



Cherokee County was organized in 1866, with Columbus as the County Seat. The county derived its name from the fact that a large portion of the "Cherokee neutral lands," reservation of that tribe of Indians, was included in the geographical area of the county.

The main water course are the Spring River, in the southeast corner of the county and the Neosho River, along the western border of the county. Major lakes include the Columbus VFW Lake and the Riverton-Empire Lake.

Major roads include Highway 59, an east-west route passing through Columbus, Highway 166, an east-west route passing through Baxter Springs, and Highway 69, a north-south route which passes through Baxter Springs.

According to the 2010 United States Census, the population estimate for Cherokee County was 21,603 (a 4% decrease from a 2000 Census population of 22,605), with a population density of 37 people per square mile.

**Crawford County**

Crawford County is located in southeastern Kansas. The county encompasses 595 square miles, with approximately 2 square miles being covered by water. It is bound to the north by Bourbon County, to the south by Cherokee County, to the east by Barton County, Missouri, and to the west by Neosho County.

Crawford County was organized in 1867, with Girard as the County Seat. By act of the legislature the county was created out of the northern half of Cherokee, which prior to that date reached to Bourbon. It was named in honor of Samuel J. Crawford who was elected Governor in 1864, a nd served nearly four years.



The main water course are the Spring River, the Neosho River and the Marmaton River. Major lakes include the Bronson Reservoir, Frisco Lake and Crawford Lake.

Major roads include Highway 400, an east-west route along the southern county border, and Highway 69, a north-south route which passes through Arma and Pittsburg.

According to the 2010 United States Census, the population estimate for Crawford County was 39,134 (a 2% increase from a 2000 Census population of 38,242), with a population density of 66 people per square mile.

**Elk County**

Elk County is located in southeastern Kansas, approximately 25 miles north of the Oklahoma state line. It is approximately 21 miles east to west and 31 miles north to south at the widest points. The county encompasses 650 square miles, with approximately 3 square miles being covered by water. It is bound to the north by Greenwood County, to the south by Chautauqua County, to the east by Wilson and Montgomery Counties, and to the west by Butler and Cowley Counties.

Elk County was organized in 1875, with Howard as the County Seat. The county was created out of the northern portion of what had been Howard County. The county was named for the Elk River, which traverses its area from northwest to southeast.



The main water courses are the Elk River which enters in the northwest corner and runs to the southeast corner, the Caney River which runs southward into Chautauqua County and the Fall River which passes through the extreme northeast corner of t he county. The primary surface water bodies include Polk Daniels Lake and Santa Fe Lake.

Major roads include Highway 160, an east-west route passing through Moline and Elk Falls, and Highway 99, a north-south route which passes through Howard.

According to the 2010 United States Census, the population estimate for Elk County was 2,882 (a 12% decrease from a 2000 Census population of 3,261), with a population density of 4 people per square mile.

**Labette County**

Labette County is located in southeastern Kansas on the Kansas-Oklahoma border, approximately 150 miles south of Kansas City and 150 miles east of Wichita. The county encompasses 653 square miles, 26 miles north-south and 25 miles east-west, with approximately 4 square miles being covered by water. It is bound to the north by Neosho and Crawford Counties, to the south by Craig and Nowata Counties, Oklahoma, to the east by Cherokee and Crawford Counties, and to the west by Montgomery County.




Labette County was organized in 1867, with Oswego as the County Seat. The county derived its name from the French word La Bette, and signifies "the beet."

The main water course is the Neosho River, which runs north to south approximating the boundary with Cherokee County to the east. The primary surface water body includes Big Hill Lake.

Major roads include Highway 160, an east-west route passing through Altamont and Oswego, Highway 166, an east-west route that travels along the southern edge of the county, and Highway 59, a north-south route which passes through Parsons and Oswego.

According to the 2010 United States Census, the population estimate for Labette County was 21,607 (a 5% decrease from a 2000 Census population of 22,835), with a population density of 33 people per square mile.

**Montgomery County**

Montgomery County is located in southeastern Kansas on the Kansas-Oklahoma border. The county encompasses 651 square miles, 26 miles north-south and 24 miles east-west, with approximately 4 square miles being covered by water. It is bound to the north by Wilson County, to the south by Osage and Nowata Counties, Oklahoma, to the east by Labette County, and to the west by Elk and Chautauqua Counties.



Montgomery County was organized in 1869, with Independence as the County Seat. The county was named for Gen. Richard Montgomery, one of the eight generals to command the revolutionary army, who was killed in the attack on Quebec, December 31, 1775, shouting "Death or Liberty!"

The main water courses are the Verdigris River which runs north to south across the county and the Elk River, which runs to the west until meeting with the Verdigris at the city of Independence. The primary surface water body includes the Elk City Lake.

Major roads include Highway 160, an east-west route passing through Altamont and Oswego, Highway 166, an east-west route that travels along the southern edge of the county, and Highway 59, a north-south route which passes through Parsons and Oswego.

According to the 2010 United States Census, the population estimate for Montgomery County was 35,471 (a 2% decrease from a 2000 Census population of 36,252), with a population density of 54 people per square mile.

**Neosho County**

Neosho County is located in southeastern Kansas, approximately 30 miles west of the Missouri state line. The county encompasses 578 square miles, with approximately 6 square miles being covered by water. It is bound to the north by Allen County, to the south by Labette County, to the east by Bourbon and Crawford Counties, and to the west by Wilson County.



Neosho County was organized in 1864, with Erie as the County Seat. The county was originally called Dorn, and changed in 1861 to Neosho, after the river which traverses the county from northwest to southeast.

The main water course is the Neosho River which runs northwest to southeast through the county. The primary surface water bodies includes the Parsons Lake and State Lake.

Major roads include Highway 39, an east-west route passing through Chanute, Highway 169, Highway 59, a north-south route, and Highway 169 which passes through Earlton and Thayer.

According to the 2010 United States Census, the population estimate for Neosho County was 16,512 (a 2% decrease from a 2000 Census population of 16,997), with a population density of 29 people per square mile.

**Wilson County**

Wilson County is located in southeastern Kansas. The county encompasses 575 square miles, with approximately 1 square mile being covered by water. It is bound to the north by Woodson County, to the south by Montgomery County, to the east by Neosho County, and to the west by Elk and Greenwood Counties.



Wilson County was organized in 1855, with Fredonia as the County Seat. The county was named in honor of Colonel Hiero T. Wilson who lived in Fort Scott from September 1843.

The main water courses are the Verdigris and Fall Rivers, which generally flow in a southeasterly direction through the county. The primary surface water bodies include the Wilson State Fishing Lake and State Lake.

Major roads include Highways 39 and 400, east-west routes, Highway 47, an east-west route passing through Fredonia, and Highway 75, a north-south route which passes through Altoona and Neodesha.

According to the 2010 United States Census, the population estimate for Wilson County was 9,409 (a 9% decrease from a 2000 Census population of 10,332), with a population density of 16 people per square mile.

**Woodson County**

Woodson County is located in southeastern Kansas. The county encompasses 505 square miles, with approximately 5 square mile being covered by water. It is bound to the north by Coffey County, to the south by Wilson County, to the east by Allen County, and to the west by Greenwood County.

Woodson County was organized in 1855, with Yates Center as the County Seat. The county was named in honor of Daniel Woodson, who was Secretary of the Territory, and for some time acting Governor, after the resignation of Governor Shannon in 1856.

The main water courses are the Verdigris River, which generally flow in a southeasterly direction through the county, and Owl Creek, which generally flows in a southeast direction. The primary surface water bodies include the Wilson State Fishing Lake, Toronto Lake, and State Lake.



Major roads include Highway 54, an east-west route passing through Batesville, Yates Center and Athens, and Highway 75, a north-south route which passes through Yates Center.

According to the 2010 United States Census, the population estimate for Wilson County was 3,309 (a 13% decrease from a 2000 Ce nsus population of 3,788), with a population density of 7 people per square mile.

## 2.3 CITY PROFILES




The following includes a brief discussion of participating cities, broken down by county.

**Allen County**

**Gas** was originally platted in 1898 and is located in central Allen County on U.S. Highway 54, two miles east of Iola and 72 miles south of Lawrence. According to the United States Census Bureau (USCB) the city has a total area of 0.73 square miles.

**Humboldt** is located in western Allen County off U.S. Highway 169 on Route 224 just east of the Neosho River. Humboldt is approximately 8 miles southwest of Iola. According to the USCB the city has a total area of 1.45 square miles.

**Iola** is located in central Allen County on the eastern bank of the Neosho River at the junction of U.S. Highway 54 and U.S. Highway 169. It was founded in 1859 and is the largest city in Allen County and the county seat. According to the USCB the city has a total area of 4.81 square miles.

**LaHarpe** is located in central Allen County off U.S. Highway 54, 7 miles east of Iola. It was founded in 1881 as a railway stop and rural service center but became an industrial town in 1897. According to the USCB the city has a total area of 0.82 square miles.

**Moran** is located in eastern Allen County at the junction of U.S. Highway 54 and U.S. Highway 59 at the head of the Marmaton River. According to the USCB the city has a total area of 0.42 square miles.

**Savonburg** is located in southeastern Allen County east of U.S. Highway 59 three miles south of Elsmore. According to the USCB the city has a total area of 0.2 square miles.

**Bourbon County**

**Bronson** is the second largest city in Bourbon County, and lies 21 miles west from Fort Scott. According to the USCB the city has a total area of 0.4 square miles. Bronson was settled in 1885 and is a shipping and supply hub for the local agricultural district.

**Fort Scott** is a densely populated rural community that serves as Bourbon County seat. Fort Scott's economy is largely derived from agriculture but also is a small industry and insurance center. Fort Scott was originally established as a U.S. Army fort garrisoned to protect the Permanent Indian Frontier from 1842-1853.

**Fulton** is the fourth largest city in Bourbon County and lies 12 miles north from Fort Scott. According to the USCB the city has a total area of 0.2 square mile. Fulton was founded in 1869 in the northeastern part of the county on the St. Louis & San Fransisco Railroad.

**Mapleton** is the sixth largest incorporated community in Bourbon County and lies 16 miles northwest from Fort Scott. According to the USCB the city has a total area of 0.5 square miles. Originally settled in May of 1857.

**Redfield** is the fifth largest incorporated community in Bourbon County and lies 10 miles west from Fort Scott. According to the USCB the city has a total area of 0.1 square miles. Redfield was initially established as a station on the St. Louis, Wichita, and Fort Scott Railroads.

**Uniontown** is the third largest city in Bourbon County, and lies 15 miles west from Fort Scott. According to the USCB the city has a total area of 0.2 square miles. Uniontown was established in 1856.

**Chautauqua County**

**Cedar Vale** is located on highway US166 along the western edge of the county. It was founded in 1869. According to the USCB the city has a total area of 0.43 square miles.

**Peru** is located along highway 166 approximately 7 miles southeast of Sedan. Peru is a station on the Atchison, Topeka & Santa Fe and the Missouri Pacific railroads, and is located on the Middle Caney river. Peru was founded in 1870. According to the USCB the city has a total area of 0.32 square miles.

**Sedan** is the county seat and is located on business US 166 and K-99. Farming, ranching, and petroleum are all important parts of the local economy. The city of Sedan was established in 1876. According to the USCB the city has a total area of 0.81 square miles.

**Cherokee County**

**Baxter Springs** is a city situated along the Spring River in the extreme southeastern part of the county. It is the most populous city of Cherokee County. The city is situated along the western bank of the Spring River and is at the junction of U.S. Route 69 Alternate and U.S. Route 166. The center of town is less than two miles from the Kansas-Oklahoma state border. According to the USCB the city has a total area of 3.2 square miles.

**Columbus** is the second largest city and county seat. Columbus was a railroad junction for the Saint Louis and San Francisco, and the Missouri, Kansas, and Texas railroads. It was named after Christopher Columbus because the railroad allowed people to travel A ccording to the USCB the city has a total area of 2.4 square miles.

**Galena** was named after the lead ore galena found here in 1877. G alena is located in the southeastern corner of the county, along the Kansas-Missouri border. According to the USCB, the city has a total area of 4.6 square miles.

**Roseland** was named after Louis Rose. According to the USCB the city has a total area of 0.8 square miles. Roseland is on K-102, west of its junction with K-7 in the center of the county.

**Scammon** is located in the center of the county, near the junction of routes K-102 and K-7. According to the USCB the city has a total area of 0.6 square miles

**Treece** is located in the south of the county, along the Kansas-Oklahoma border. According to the USCB the city has a total area of 0.1 square miles.

**Weir** is south of U.S. Route 400 and is located on K-103 near the center of the county. According to the USCB the city has a total area of 1.0 square miles.

**West Mineral** is located along the northern county boundary along Route 102. It is the home of Big Brutus, the second largest electric shovel in the world. According to the USCB the city has a total area of 0.3 square miles.

**Crawford County**

**Arcadia** is located on the eastern edge of the county, along the Kansas- Missouri state line. According to the USCB the city has a total area of 0.4 square miles.

**Arma** is located on the eastern edge of the county, along Highway 169 near the Kansas-Missouri state line. It is located about 6 minutes' drive north of Frontenac, and about 8 minutes' drive east of Girard. According to the USCB the city has a total area of 1.0 square miles.

**Cherokee** is located northeast of the junction of Highways 7 and 400, a few miles to the southwest of Pittsburg and near the Kansas-Missouri state line. According to the USCB the city has a total area of 0.7 square miles (1.8 km²), all of it land.

**Frontenac** is a small town to the northeast of Pittsburg, along the Kansas-Missouri state line. According to the USCB the city has a total area of 4.0 square miles.

**Girard** is located at the junction of Highways 7 and 47, a few miles to the northwest of Pittsburg According to the USCB the city has a total area of 1.9 square miles

**Hepler** is located along Highway 3 on the northern border of the county. According to the USCB the city has a total area of 0.8 square miles.

**McCune** is located at the junction of Highways 126 and 400 along the western border of the county. According to the USCB the city has a total area of 0.3 square miles.

**Mulberry** is located along County Road 174 on the Kansas-Missouri border. According to the USCB the city has a total area of 0.5 square miles.

**Pittsburg** is located at the intersection of Highways 69 and 126. It is the most populous city in Crawford County and in southeastern Kansas. It was founded on May 20, 1876 and named after and in honor of the city of Pittsburgh, Pennsylvania. Pittsburg is the home to Pittsburg State University. According to the USCB the city has a total area of 12.5 square miles.

**Elk County**

**Grenola** is located in the southwest corner of Elk County just south of US Highway 160. Grenola was formed in 1879 when the two communities of Greenfield and Canola relocated along the new railroad line. According to the USCB the city has a total area of 0.48 square miles.

**Howard** is the County Seat of Elk County and was established in 1870. It is centrally located in and is west of Kansas Highway 99. According to the USCB the city has a total area of 0.70 square miles.

**Longton** is located about 12 miles southeast of Howard in the southeast corner of the county. It is located along highway 160. According to the USCB the city has a total area of 1.16 square miles.

**Moline** is located in south central Elk County at the intersection of US Highway 160 and Kansas Highway 99. The city was established in1879 after the railroad extended westward from Independence. According to the USCB the city has a total area of 0.35 square miles.

**Labette County**

**Altamont** is an incorporated city established in 1884 located in central Labette County off of Highway 160. According to the USCB the city has a total area of 1.66 square miles.

**Chetopa** is located on the Neosho River at the junction of U.S. 166 and U.S. 59, approximately 40 miles west of Joplin, Missouri. According to the USCB the city has a total area of 1.34 square miles.

**Labette** is an incorporated city in northeastern Labette County. According to the USCB the city has a total area of 0.22 square miles.

**Mound Valley** is located in west central Labette County off of U.S. Highway 160. According to the USCB the city has a total area of 0.65 square miles.

**Oswego** is the Labette County Seat and is located off U.S. Highway 160. The organization of Oswego as a city of the third class took place in February 1870. The town was made a city of the second class by proclamation of the governor in 1880. According to the USCB the city has a total area of 2.30 square miles.

**Parsons** is the most populous city of Labette County, and is the second most populous city in the southeastern region of Kansas. The town was named for the president of the Missouri, Kansas & Texas Railroad, and it is still a transportation hub served by the Union Pacific and highways US-59 and US-400. According to the USCB the city has a total area of 10.7 square miles.

**Montgomery County**

**Caney** is an incorporated city located in southwestern Montgomery County at the junction of Highways 75 and 166, 23 miles southwest of Independence and 115 miles southeast of Wichita. Caney is set in a valley surrounded by the Chautauqua Hills on the West, Oklahoma Lakes on the south and prairie grasses on the north and east. According to the USCB the city has a total area of 1.35 square miles.

**Cherryvale** is an incorporated city in northeastern Montgomery County off Highway 169, 11 highway miles northeast of Independence and 120 miles east of Wichita. The City is situated near the confluence of Cherry and Drum Creeks and was incorporated in 1871. According to the USCB the city has a total area of 1.92 square miles.

**Coffeyville** is an incorporated city in southeastern Montgomery County at the junction of Highways 169 and 166, 22 miles south of Independence and 140 miles southeast of Wichita. The City is located approximately two miles from the Kansas-Oklahoma border. According to the USCB the city has a total area of 7.43 square miles.

**Dearing** located in southern Montgomery County near the confluence of Onion Creek and Biscuit Creek, 130 miles southeast of Wichita. Highway 166 is just south of Dearing with Coffeyville approximately five miles to the east. According to the USCB the city has a total area of 1.52 square miles.

**Elk City** is located in northwestern Montgomery County near the confluence of Elk River and Duck Creek, 105 miles southeast of Wichita. U.S. Highway 160 runs just east of town with Independence 12 miles to the east. According to the USCB the city has a total area of 0.34 square miles.

**Havana** is located in southwestern Montgomery County off U.S. Highway 75, 24 miles southwest of Independence and 125 miles east of Wichita. Bee Creek runs just west of town on a southerly course to its confluence with Cotton Creek. According to the USCB the city has a total area of 0.13 square miles.

**Independence** is the county seat, located in central Montgomery County at the junction of Highways 75 and 160, 114 miles east of Wichita and 135 miles south of Topeka. The Verdigris River runs east of the City and the Elk River borders the City to the north. According to the USCB the city has a total area of 7.75 square miles.

**Liberty** is located in eastern Montgomery County off Highway 169, 11 highway miles southeast of Independence and 130 miles east of Wichita. The City is situated between Big Hill Creek to the west, 1 Cotton Creek to the east, and Liberty Lakes to the north. According to the USCB the city has a total area of 0.26 square miles.

**Neosho County**

**Chanute** is located in northwest Neosho County off of Highway 169 and is the largest city in the county. Chanute was chartered in 1873 with the Southern Kansas Railroad locating a division headquarters in Chanute. According to the USCB the city has a total area of 7.15 square miles.

**Erie** is located in the center east of the county along Highway 59 and serves as the county seat. The town of Erie was organized by a decree of the Probate Court in 1869. According to the USCB the city has a total area of 1.21 square miles.

**St Paul** is located along highway 47 near the eastern county line. According to the USCB the city has a total area of 1.22 square miles.

**Thayer** is located along Highway 169 in the southwest of the county. According to the USCB the city has a total area of 0.80 square miles.

**Wilson County**

**Buffalo** is located in northern Wilson County on U.S. Highway 75, 15 miles northeast of Fredonia and approximately 100 miles south of Topeka. The town was founded in 1857 and incorporated in 1898. According to the USCB the city has a total area of 0.33 square miles.

**Fredonia** is located southwest of the center of the County, 90 miles east of Wichita. Fredonia is the County seat and is the second largest city in the County. In May 1871, the town was incorporated as a city of the third class. According to the USCB the city has a total area of 2.44 square miles.

**Neodesha** is located in the south-central portion of the county. It is situated at the confluence of the Verdigris and Fall rivers. Neodesha is approximately 90 miles east of Wichita and 15 miles north of Independence. According to the USCB the city has a total area of 1.35 square miles.

**Woodson County**

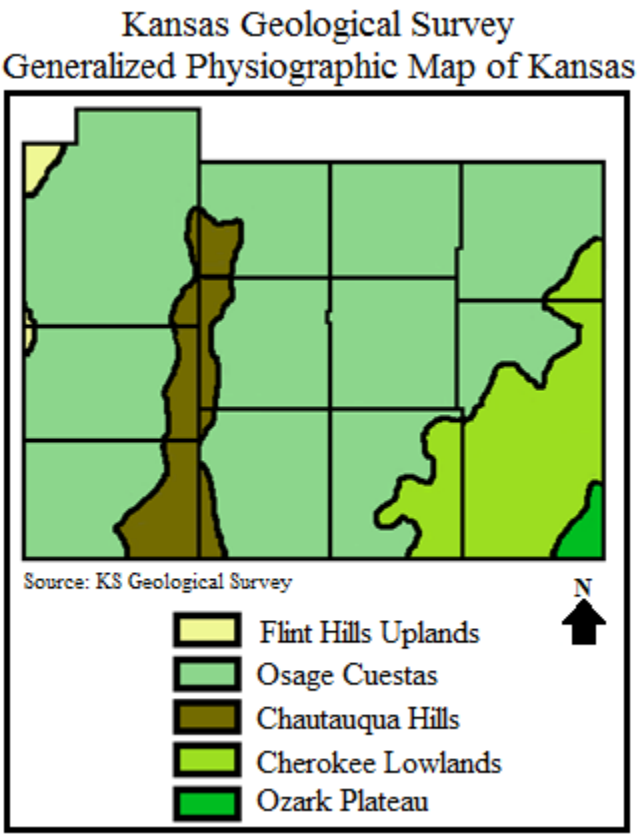
**Toronto** is located along the Verdigris River, south of Highway 54 along highway 105 on the western edge of the county. According to the USCB the city has a total area of 0.36 square miles.

**Yates Center** is the county seat of Woodson County and is located at the junction of Highways 54 and 75. According to the USCB the city has a total area of 3.05 square miles.

## 2.4 REGIONAL GEOLOGY AND HYDROLOGY

The Kansas landscape was formed by alternating periods of deposition and erosion. The southeast corner of Kansas contains five distinct physiographic regions. Each region is

differentiated by underlying rock formations, overlying soil types, and land use suitability. The following physiographic regions are found within southeast Kansas.




The **Chautauqua Hills** region is approximately 10 miles wide and extends from the Kansas-Oklahoma border in Montgomery and Chautauqua counties north to the middle of Woodson and Greenwood counties. This region is a rolling upland that that was formed primarily in thick sandstones. During the Pennsylvanian period rivers flowed into the surrounding intermittent sea resulting in the sand and other sediments collecting in estuaries and deltas. Over time, the sediments were buried and compacted into sandstone and shale. Eventually, uplift and erosion exposed the more resistant sandstone and easily erodible shale resulting in a series of low hills, rock outcrops and narrow valleys. Because of rock outcrops, this region is generally used for pasture and grazing purposes.





The **Cherokee Lowlands** is a gently rolling plain crossed by shallow stream valleys, occupying roughly 1,000 square miles in Bourbon, Crawford, Cherokee, and Labette counties. The lowlands developed on the easily eroded shale and sandstone which were deposited during the early part of the Pennsylvanian period. The

region is characterized by deep, well drained, fertile soils, which are good for farming. Additionally, the rocks of the Cherokee Group are rich in coal, and the Cherokee Lowlands is the largest area of coal mining in Kansas.

The **Flint Hills** were formed by the erosion of Permian-age limestone and shale when shallow seas covered much of the state. Because much of the limestone in the region contains bands of flint, which is much less soluble than the limestone, weathering has resulted in a clayey soil full of flinty gravel. This gravelly soil generally tends to make the land in this region better suited to ranching rather than farming. As a result, the region is still largely native prairie grassland, one of the last great preserves in the country.



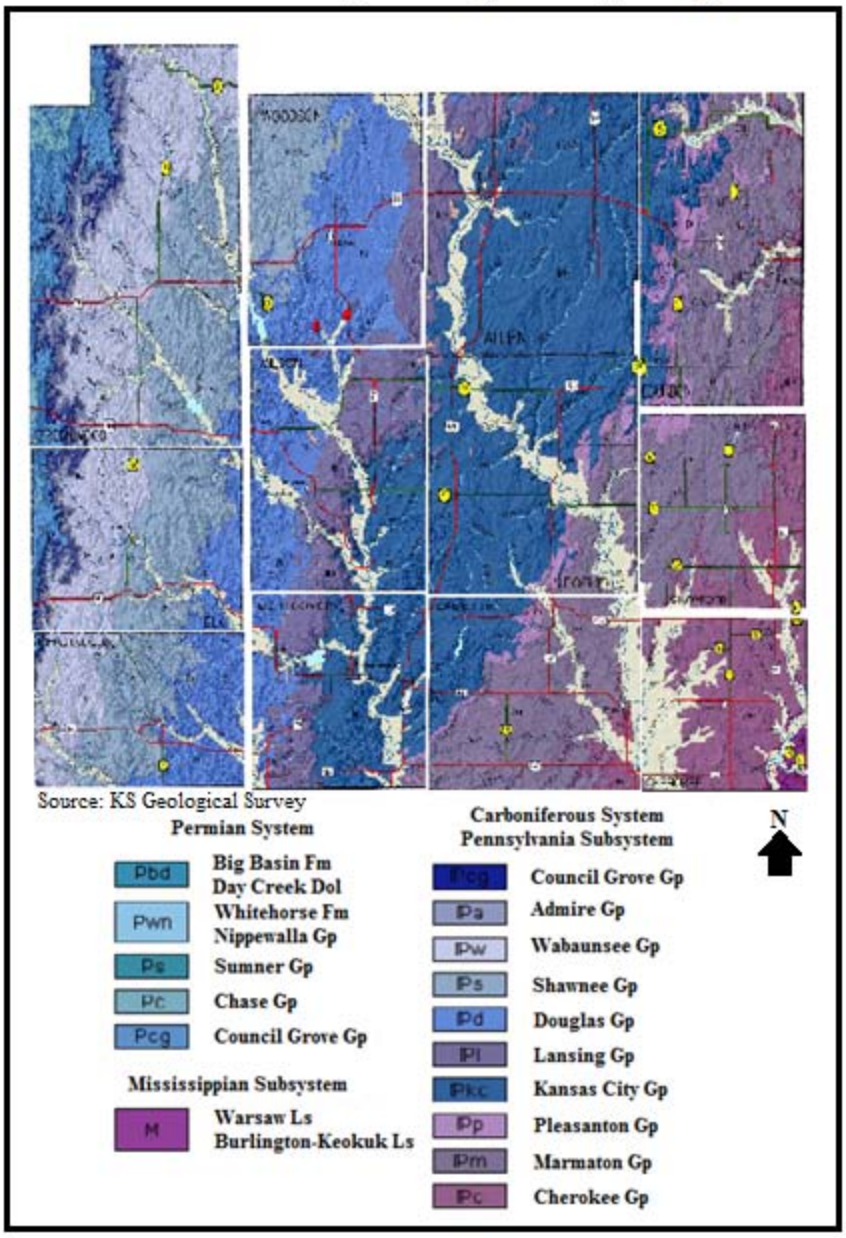
The **Osage Cuesta** region covers a large portion of southeast Kansas. The region is characterized by east facing ridges or cliffs with gentle slopes on the other (generally west) side of the ridge The region derives its name from the Spanish word Cuesta, meaning hill or cliff. During the Pennsylvanian and Permian periods this area was covered by shallow seas. These seas would grow and shrink over time resulting in the deposition of differing sediment layers of hard and soft materials. Uplift and erosion have now exposed these strata resulting in the distinctive surface topography.

The **Ozark Plateau** covers approximately 55 square miles in the extreme southeast corner of Cherokee County. During the late Mississippian period, the rising seas deposited limestone and shale. When the sea retreated the deposited material was eroded. The deposited limestone in this region contain a dense, hard, difficult to erode flint which has resulted in a blanket of flinty gravel found throughout the region. The rocky soil and steep slopes makes most of the region generally unsuitable for farming. Many of the hillsides are covered with hardwood forests and dense foliage.



The soils of Kansas are very diverse, with over 300 different soil types across 52 million-acres. In general, the soils of southeast Kansas are weathered, shallow clay-pan soils. The following map shows the predominant soils types identified in southeastern Kansas.

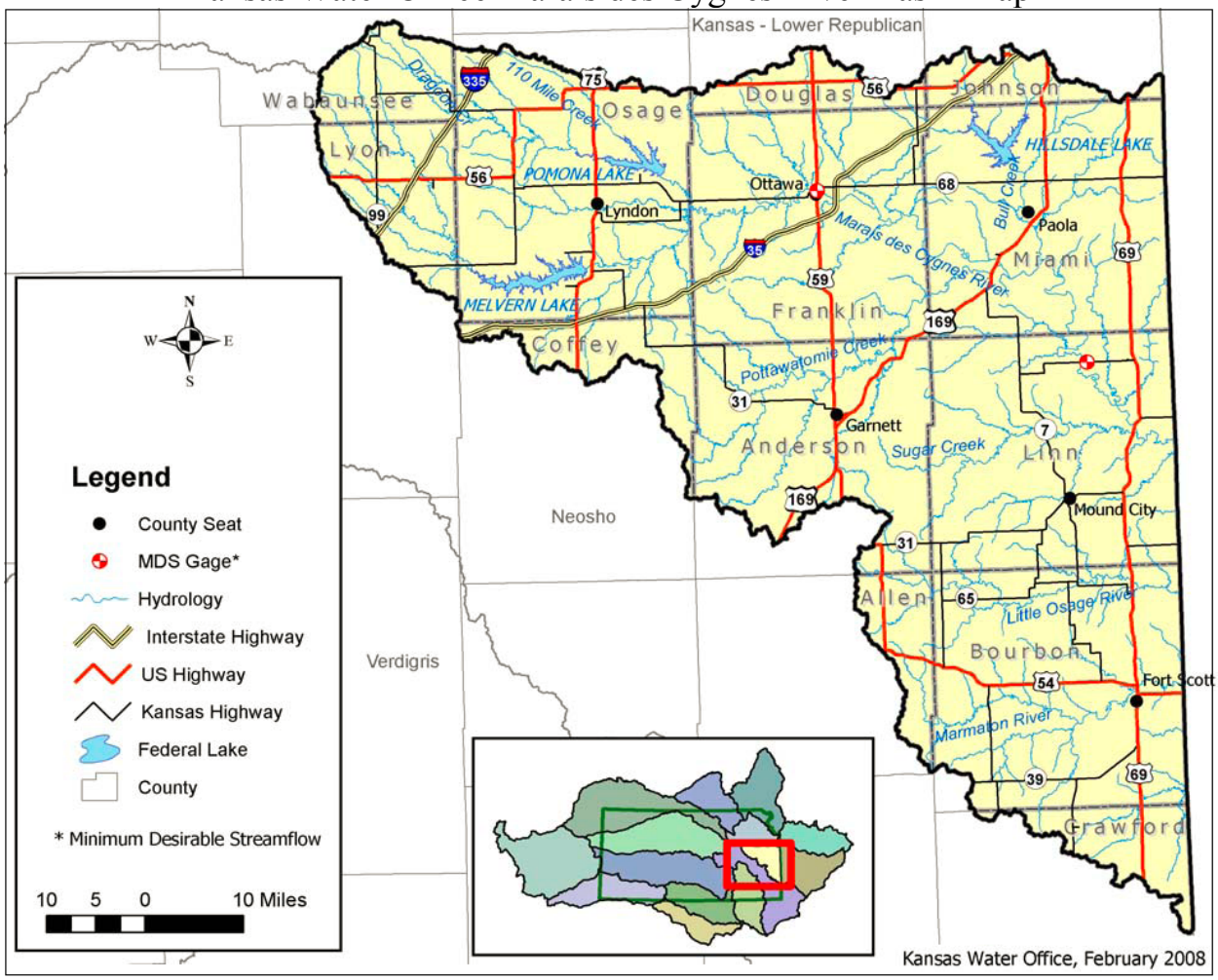
Kansas Geologic Survey Geologic Maps




Kansas soils are known around the world for their exceptional qualities. But even though Kansas has abundant and productive soils, erosion by wind and water continue to diminish this resource. According to the United States Department of Agriculture (USDA) Natural Resources Conservation Service about 190 million tons of topsoil are degraded each year through human activities. Unfortunately, soils are not easily renewed and it takes about 500 years for an inch of topsoil to develop under prairie grasses.

Three river basins cover southeastern Kansas, the Neosho, Marais des Cygnes, and Verdigris basins.

Kansas Water Office Marais des Cygnes River Basin Map

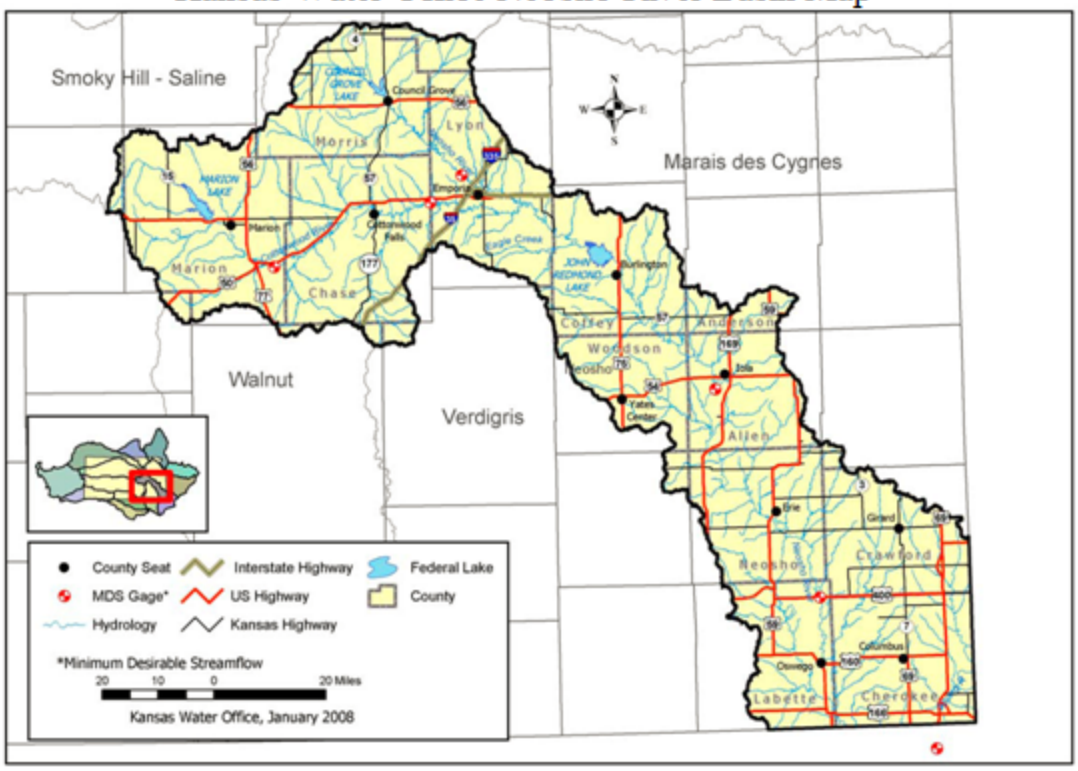



The **Marais des Cygnes River** (basin) rises in Wabaunsee County and flows east and south to join the Little Osage River in Bates County, Missouri.

According to the Kansas Water Office (KWO), the basin covers 4,304 square miles of east-central and southeast Kansas and includes all of Bourbon County and the northeast corner of and Crawford County. Major cities in the basin include Fort Scott.

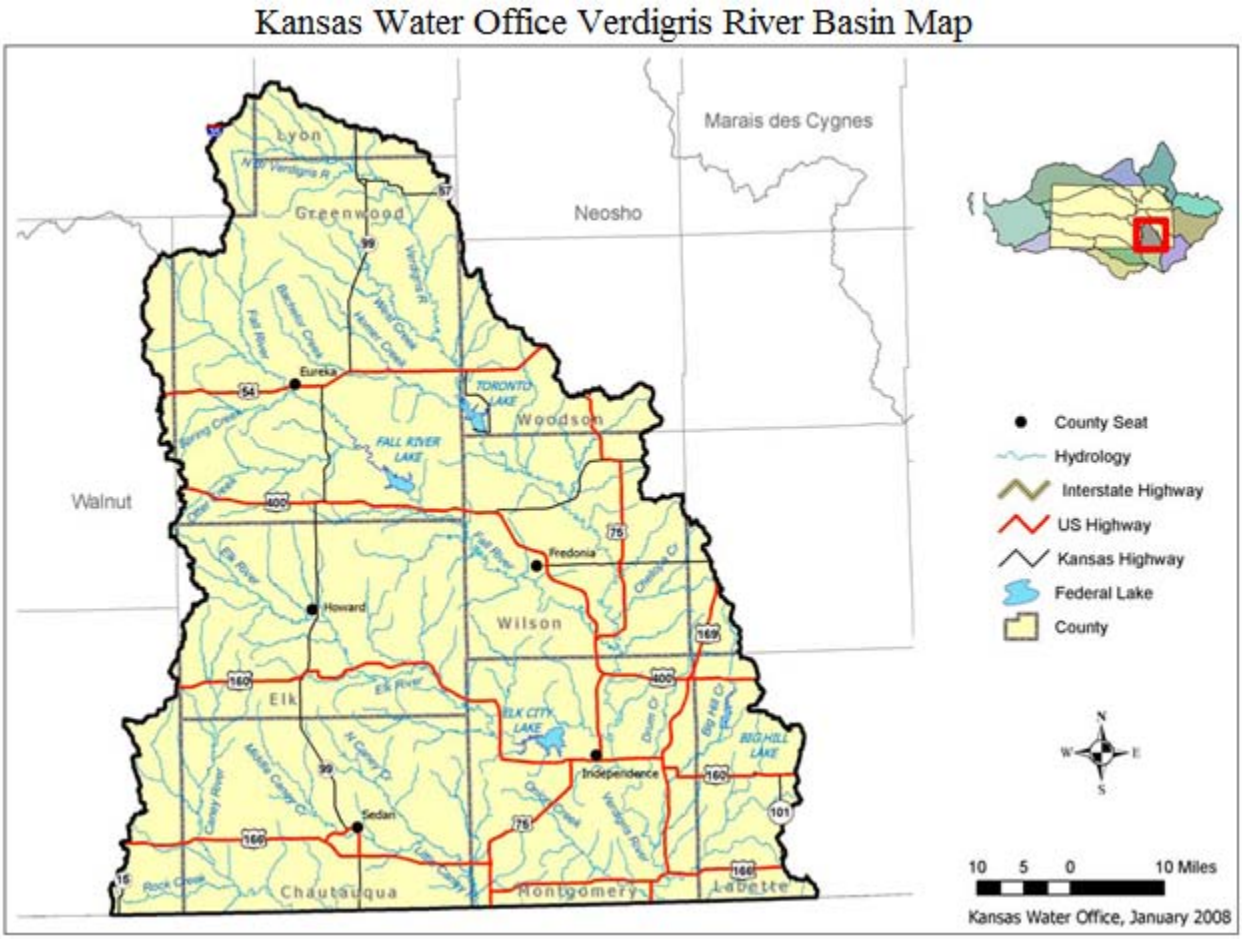
The Marmaton and Little Osage Rivers originate in Kansas and exit the state in Cherokee County on the eastern border with Missouri. The two rivers then join in Missouri just above their confluence with the Marais des Cygnes to become the Osage River.

Kansas Water Office Neosho River Basin Map




According the to the KWO, the **Neosho River Basin** covers approximately 6,300 square miles and encompasses all or parts Woodson, Allen, Neosho, Crawford and Labette Counties. Major cities in the basin include Iola, Chanute, Parsons, Oswego, Pittsburg, Galena and Baxter Springs.

The major rivers draining the basin are the Neosho River, Cottonwood River and Spring River. The Neosho River forms in Morris County and flows to the southeast and exits Kansas just south of Chetopa (Labette County) in Cherokee County. It then joins the Arkansas River near Muskogee, Oklahoma. The Cottonwood River rises in Marion County and joins the Neosho River in Lyon County. The Spring River originates in Missouri and drains about 500 square miles Cherokee County in Kansas. It enters Cherokee County in the east, flows across the southeastern corner and exits the state south of Baxter Springs. It then joins the Neosho River in Oklahoma just over the state line.




The **Verdigris River** (basin) rises in Chase County and flows in a generally southeasterly direction for about 350 miles until it exits the state just south of Coffeyville in Montgomery County. Further on, it joins with the Arkansas River near Muskogee, Oklahoma.

According to the KWO, the Verdigris Basin in Kansas covers approximately 4,440 square miles and encompasses all or parts of 11 counties including Greenwood, Wilson, Elk, Woodson, Chautauqua, Montgomery, Crawford and Labette Counties. Major cities in the basin include Independence, Coffeyville, Eureka, Neodesha and Fredonia

As shown on the above maps, four federal reservoirs are found within the southeast region of the basin. The federal reservoirs are:

- Fall River Lake in Greenwood County
- Toronto Lake in Woodson County
- Elk City Lake in Montgomery County
- Big Hill Lake in Labette County

Additionally, approximately 50 miles south of the state line in Cherokee County, near Grove, Oklahoma, the Verdigris River is dammed to form Oolagah Reservoir.

## 2.5 REGIONAL CLIMATE

The Midwest climate region is known for extremes in both temperature and precipitation. In particular, Kansas lacks any mountain ranges that could act as a barrier to cold air masses from the north or hot, humid air masses from the south or any oceans or large bodies of water that could provide a moderating effect on the climate. The polar jet stream is often located over the region during the winter, bring frequent storms and precipitation. In the summer the jet stream migrates north, resulting in the collision of air masses with differing temperatures and moisture levels. The result if this is often severe thunderstorms, high winds and tornados, with peak severe weather season from May to June.

Kansas summers are generally warm and humid due to the clockwise air rotation caused by Atlantic high pressure systems bringing warm humid air up from the Gulf of Mexico. In general, summer also tends to have the most rain. Historically, precipitation has been reasonably predicable and adequate, however the region is noted for severe droughts such as is occurring now. Winter months can bring severe weather in the form of snow and ice storms. All seasons are noted for damaging high winds.

Data from the following High Plains Regional Climate Center weather stations from the first available date (in parenthesis) to 2012 was obtained a create regional average:

- Iola, Allen County (1904)
- Fort Scott, Bourbon County (1895)
- Pittsburg, Crawford County (1948)
- Sedan, Chautauqua County (1895)
- Eureka, Greenwood County (1895)
- Parsons, Labette County (1925)
- Independence, Montgomery County (1893)
- Chanute, Neosho County (1894)
- Fredonia, Wilson County (1902)

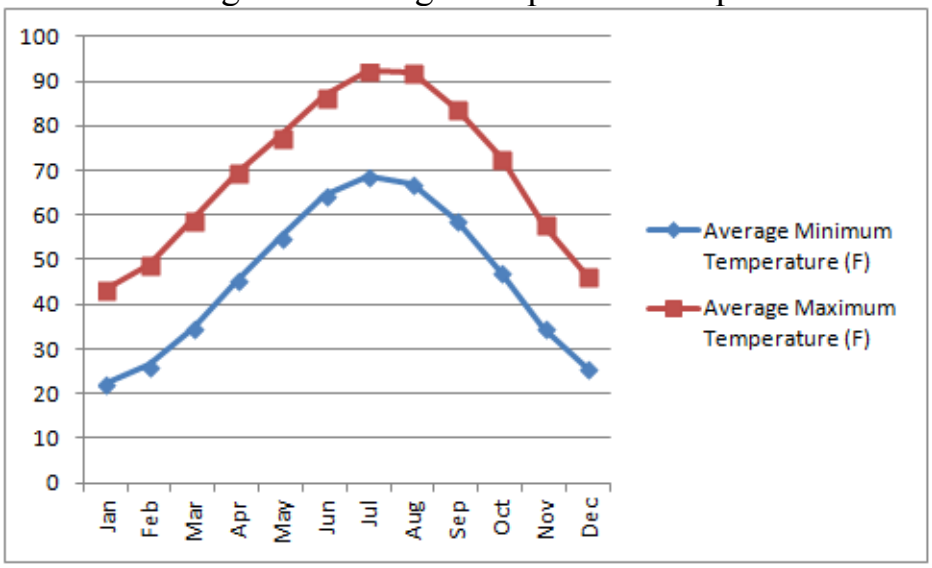
The following tables and charts present average climate data for the southeastern Kansas.

**Regional Average Temperatures**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Minimum Temperature (F) | 22º | 26º | 35º | 46º | 55º | 64º | 68º | 67º | 59º | 47º | 35º | 26º | 46º |
| Average Maximum Temperature (F) | 43º | 49º | 59º | 70º | 78º | 87º | 92º | 92º | 84º | 73º | 58º | 46º | 69º |

Source: High Plains Regional Climate Center

Regional Average Temperature Graph



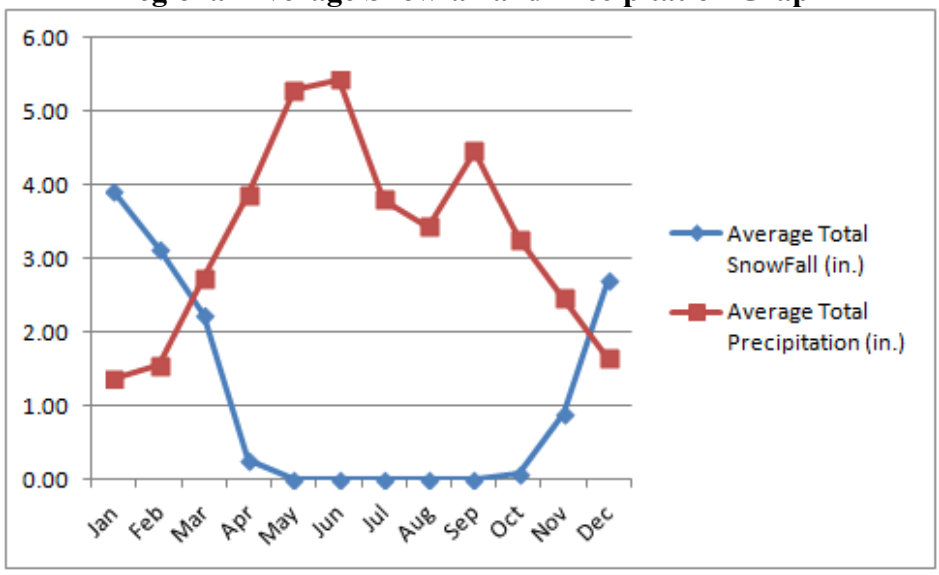

Source: High Plains Regional Climate Center

**Regional Average Snowfall and Precipitation**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Total Snowfall (in.) | 3.91" | 3.14" | 2.23" | 0.27" | 0.00" | 0.00" | 0.00" | 0.00" | 0.00" | 0.07" | 0.90" | 2.72" | 1.10" |
| Average Total Precipitation (in.) | 1.36" | 1.56" | 2.73" | 3.87" | 5.29" | 5.43" | 3.81" | 3.44" | 4.46" | 3.27" | 2.46" | 1.65" | 3.28" |

Source: High Plains Regional Climate Center

**Regional Average Snowfall and Precipitation Graph**




Source: High Plains Regional Climate Center

When discussing weather patterns, climate change should be taken into account as it may markedly change future weather related events. There is a scientific consensus that climate

change is occurring, and recent climate modeling results indicate that extreme weather events may become more common. Rising average temperatures produce a more variable climate system which may result in an increase in the frequency and severity of some extreme weather events including longer and hotter heat waves (and by correlation, an increased risk of wildfires), higher wind speeds, greater rainfall intensity, and increased tornado activity. As climate modeling improves, future plan updates should include climate change as a factor in the ranking of natural hazards as these are expected to have a significant impact on southeastern Kansas communities.

## 2.6 REGIONAL POPULATION AND DEMOGRAPHICS

In general, southeastern Kansas is a rural area with a few large metropolitan areas. According to the Census, the estimated regional population for 2011 is 187,423 persons. This represents a 4.4% regional decline from the 2000 census.

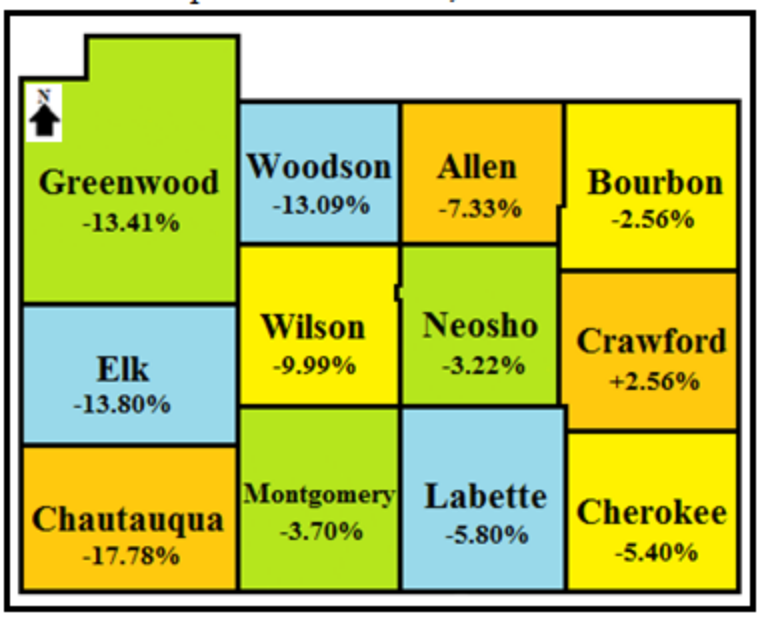
The region accounts for approximately 6.5% of the State of Kansas' population. Additionally, the region occupies approximately 7,737 square miles (representing 9.5% of the total land area of the state, at 81,759 square miles). Based on the large land area, and the small population base, the 2011 regional population density is calculated at 24 people per square mile. This is well below the state average of 35 people per square mile, and the United States average of 87 people per square mile.

**Regional Population Data**

| County | Population (2000) | Population (2010) | Population (2011) | Population (2040 Projection) |
|---|---|---|---|---|
| Allen | 14,385 | 13,371 | 13,331 | 9,498 |
| Bourbon | 15,379 | 15,173 | 14,985 | 13,698 |
| Chautauqua | 4,359 | 3,669 | 3,584 | 2,108 |
| Cherokee | 22,605 | 21,603 | 21,385 | 16,749 |
| Crawford | 38,242 | 39,134 | 39,220 | 44,067 |
| Elk | 3,261 | 2,882 | 2,811 | 2,102 |
| Greenwood | 7,673 | 6,689 | 6,644 | 3,737 |
| Labette | 22,835 | 21,607 | 21,511 | 19,833 |
| Montgomery | 36,252 | 35,471 | 34,911 | 29,054 |
| Neosho | 16,997 | 16,512 | 16,449 | 14,388 |
| Wilson | 10,332 | 9,409 | 9,300 | 7,707 |
| Woodson | 3,788 | 3,309 | 3,292 | 2,261 |
| Kansas | 2,688,418 | 2,853,118 | 2,870,386 | 3,238,356 |

Source: University of Kansas Institute for Policy and Social Research Kansas County Profile and United States Census Bureau

Population Variance, 2000 - 2011




Source: United States Census Bureau

The following table indicates the levels of education for citizens of the region.

**Regional Educational Data**

| County | High school graduate or higher, age 25+ (2007-2011) | Bachelor's degree or higher, age 25+ (2007-2011) |
|---|---|---|
| Allen | 89.30% | 16.60% |
| Bourbon | 88.20% | 21.50% |
| Chautauqua | 85.80% | 15.50% |
| Cherokee | 85.80% | 13.40% |
| Crawford | 88.70% | 27.80% |
| Elk | 89.50% | 16.80% |
| Greenwood | 90.80% | 15.40% |
| Labette | 87.80% | 18.00% |
| Montgomery | 87.10% | 18.60% |
| Neosho | 88.00% | 15.50% |
| Wilson | 81.80% | 11.40% |
| Woodson | 89.40% | 16.40% |
| Kansas | 89.50% | 29.70% |

Source: United States Census Bureau

The following information provides a snapshot of regional housing trends. In general, the region enjoys a high percentage of home ownership. Additionally, available data indicates a small proportion of available housing units are in the form of multi-unit spaces.

**Regional Housing Data**

| County | Housing Units (2011) | Multi Unit Percentage (2007-2011) | Homeownership Rate (2007-2011) | Households (2007-2011) | Persons per Household (2007-2011) |
|---|---|---|---|---|---|
| Allen | 6,221 | 9.00% | 77.50% | 5,598 | 2.33 |
| Bourbon | 7,137 | 9.90% | 73.80% | 5,727 | 2.58 |
| Chautauqua | 2,137 | 3.90% | 77.10% | 1,545 | 2.3 |
| Cherokee | 9,828 | 4.20% | 78.80% | 8,189 | 2.6 |
| Crawford | 17,739 | 13.60% | 63.70% | 15,354 | 2.41 |
| Elk | 1,738 | 7.80% | 80.80% | 1,289 | 2.19 |
| Greenwood | 4,028 | 2.40% | 76.20% | 2,944 | 2.26 |
| Labette | 10,044 | 9.00% | 72.50% | 8,781 | 2.38 |
| Montgomery | 16,483 | 12.20% | 72.30% | 14,179 | 2.41 |
| Neosho | 7,545 | 7.10% | 75.10% | 6,686 | 2.38 |
| Wilson | 4,632 | 8.10% | 75.60% | 3,830 | 2.43 |
| Woodson | 2,010 | 6.60% | 74.60% | 1,562 | 2.06 |
| Kansas | 1,237,651 | 17.60% | 69.00% | 1,104,479 | 2.49 |

Source: United States Census Bureau

## 2.7 REGIONAL ECONOMY

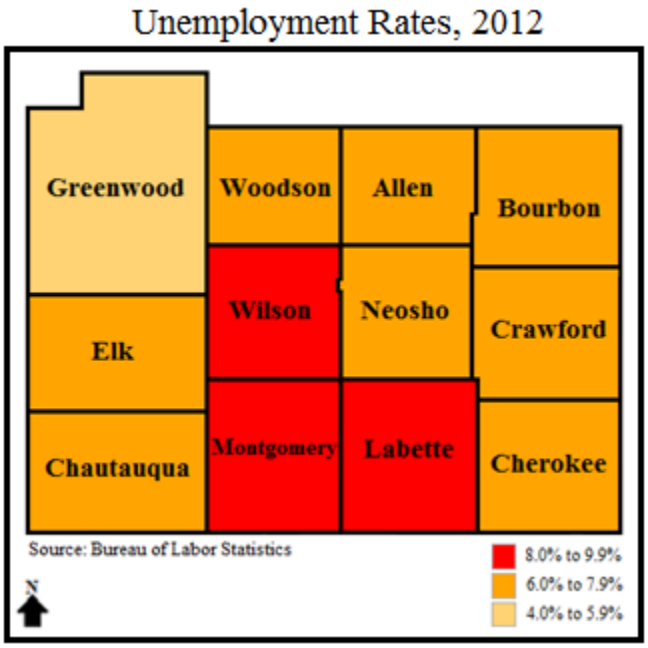
Data from the University of Kansas Institute for Policy and Social Research Kansas County Profile reports indicate that in general, the number of business establishments in southeast region are decreasing on a yearly basis. From 2000 to 2010 the average rate of decrease was -7.8%. Major sources of employment include construction, manufacturing, retail, transportation, health care, and utilities. The average regional unemployment rate of 8% in 2011 was higher than the average State of Kansas unemployment rate of 6.5%.

**Regional Business and Unemployment Data**

| County | Total Number of Business (2000) | Total Number of Business (2010) | 01 - 19 Staff (2010) | 20 - 99 Staff (2010) | 100+ Staff (2010) | Average Wage (2010) | Unemployment Rate (2011) | Building Permits (2011) |
|---|---|---|---|---|---|---|---|---|
| Allen | 416 | 376 | 340 | 29 | 7 | $30,172 | 7.4% | 42 |
| Bourbon | 437 | 372 | 325 | 35 | 12 | $29,065 | 7.5% | 1 |
| Chautauqua | 90 | 89 | 82 | 7 | 0 | $24,543 | 7.8% | 0 |
| Cherokee | 401 | 359 | 307 | 41 | 11 | $34,580 | 7.8% | 4 |
| Crawford | 1,017 | 931 | 799 | 113 | 19 | $29,651 | 7.7% | 59 |
| Elk | 65 | 76 | 74 | 2 | 0 | $23,310 | 7.1% | 0 |
| Greenwood | 228 | 190 | 180 | 9 | 1 | $28,820 | 6.8% | 0 |
| Labette | 525 | 485 | 412 | 60 | 13 | $31,191 | 9.2% | 4 |
| Montgomery | 1,023 | 891 | 774 | 98 | 19 | $31,941 | 10.0% | 24 |
| Neosho | 538 | 475 | 423 | 44 | 8 | $30,442 | 7.9% | 61 |
| Wilson | 260 | 238 | 216 | 17 | 5 | $32,162 | 10.3% | 0 |
| Woodson | 109 | 100 | 96 | 4 | 0 | $27,364 | 6.8% | 0 |

Source: University of Kansas Institute for Policy and Social Research Kansas County Profile and U.S. Census

Data obtained from the United States Department of Labor, Bureau of Labor Statistics indicates that the unemployment rate has dropped from 2011 to 2012.




Data was obtained from the Office of Local Government, Kansas State Research and Extension office concerning capital expenditures on infrastructure. The data indicates that generally spending has increased across the board. However, the data and general observations indicate that the increase in spending is on increased maintenance rather than new construction.

**Regional Capital Infrastructure Expenditures, 2001 to 2011**

| County | Road & Bridge Expenditure (2001) | Road & Bridge Expenditure (2011) | Percent Change |
|---|---|---|---|
| Allen | $2,358,852 | $2,330,241 | -1% |
| Bourbon | $2,311,518 | $2,400,540 | 4% |
| Chautauqua | $1,072,514 | $1,148,740 | 7% |
| Cherokee | $2,911,419 | $3,977,303 | 37% |
| Crawford | $3,191,537 | $2,624,733 | -18% |
| Elk | $833,760 | $1,320,064 | 58% |
| Greenwood | $1,339,897 | $1,350,885 | 1% |
| Labette | $2,915,052 | $3,644,401 | 25% |
| Montgomery | $3,745,801 | $5,348,948 | 43% |
| Neosho | $1,671,195 | $6,086,700 | 264% |
| Wilson | $1,872,583 | $1,509,742 | -19% |
| Woodson | $1,509,645 | $1,556,430 | 3% |

Source: Office of Local Government, Kansas State Research and Extension

## 2.8 REGIONAL AGRICULTURE AND LIVESTOCK

Agriculture is a major component of the economy of southeast Kansas. According to the Kansas Department of Agriculture:

- Kansas farmers typically produce more wheat than any other state in the nation
- In 2009, Kansas wheat accounted for more than 16 percent of all wheat produced
- Kansas ranks first in grain sorghum produced
- Kansas ranks second in cropland
- Kansas ranks sixth in hay produced
- One in five Kansans work in jobs related to agriculture and food production

The following table presents information from the USDA National Agricultural Statistics Service relating to farm totals and agricultural acreage for southeast Kansas.

**Farm, Crop and Livestock Information, 2007**

| County | Number of Farms | Total Farm Acreage | Total Cropland Acreage | Pasture Acres |
|---|---|---|---|---|
| Allen | 611 | 267,409 | 109,958 | 114,361 |
| Bourbon | 928 | 327,534 | 96,770 | 183,516 |
| Chautauqua | 359 | 308,232 | 27,339 | 257,610 |
| Cherokee | 809 | 324,383 | 215,595 | 73,397 |
| Crawford | 911 | 342,349 | 153,589 | 150,564 |
| Elk | 361 | 316,707 | 35,900 | 261,912 |
| Greenwood | 539 | 608,891 | 72,526 | 507,285 |
| Labette | 1,052 | 371,115 | 139,573 | 177,134 |
| Montgomery | 994 | 313,947 | 101,329 | 155,409 |
| Neosho | 775 | 321,520 | 112,921 | 153,412 |
| Wilson | 553 | 333,202 | 142,719 | 142,369 |
| Woodson | 339 | 261,607 | 94,299 | 145,261 |

Source: USDA National Agricultural Statistics Service

Major production crops include corn, hay, soybeans, wheat, sorghum and milk. Information obtained from the USDA National Agricultural Statistics Service for the period 2010 to 2012 indicates that corn production has remained relatively steady, sorghum and soybean production has dropped, and oat and wheat production have increased. Please note that the data presented includes information for Butler and Cowley county as they are included in the southeast district data.

**Crop Information, Southeast District, 2010-2012**

| Crop | Unit | 2012 | 2011 | 2010 |
|---|---|---|---|---|
| Corn Planted | Acres | 455,000 | 480,000 | 425,000 |
| Corn, Grain Harvested | Acres | 426,000 | 410,000 | 410,000 |
| Irrigated Corn Planted | Acres | 7,000 | 9,000 | - |
| Irrigated Corn, Grain Harvested | Acres | 6,500 | 8,000 | - |
| Non-Irrigated Corn Planted | Acres | 448,000 | 471,000 | - |
| Non-Irrigated Corn, Grain Harvested | Acres | 419,500 | 402,000 | - |
| Oats Planted | Acres | 8,400 | 3,500 | 4,000 |
| Oats Harvested | Acres | 6,000 | 2,000 | 2,000 |
| Sorghum Planted | Acres | 50,000 | 55,000 | 65,000 |
| Sorghum, Grain Harvested | Acres | 44,000 | 46,000 | 62,000 |
| Soybeans Planted | Acres | 715,000 | 715,000 | 770,000 |
| Soybeans Harvested | Acres | 685,000 | 660,000 | 760,000 |
| Winter Wheat Planted | Acres | 480,000 | 340,000 | 155,000 |
| Winter Wheat Harvested | Acres | 465,000 | 330,000 | 145,000 |

Source: USDA National Agricultural Statistics Service

Additionally, the rearing of cattle play a major role in the regional economy. According to the Kansas Department of Agriculture:

- Kansas produces more than 19 percent of all U.S. beef
- Kansas ranks third in cattle and calves on farms and third in cattle and calves on grain feed
- Kansas ranks 16th in milk produced

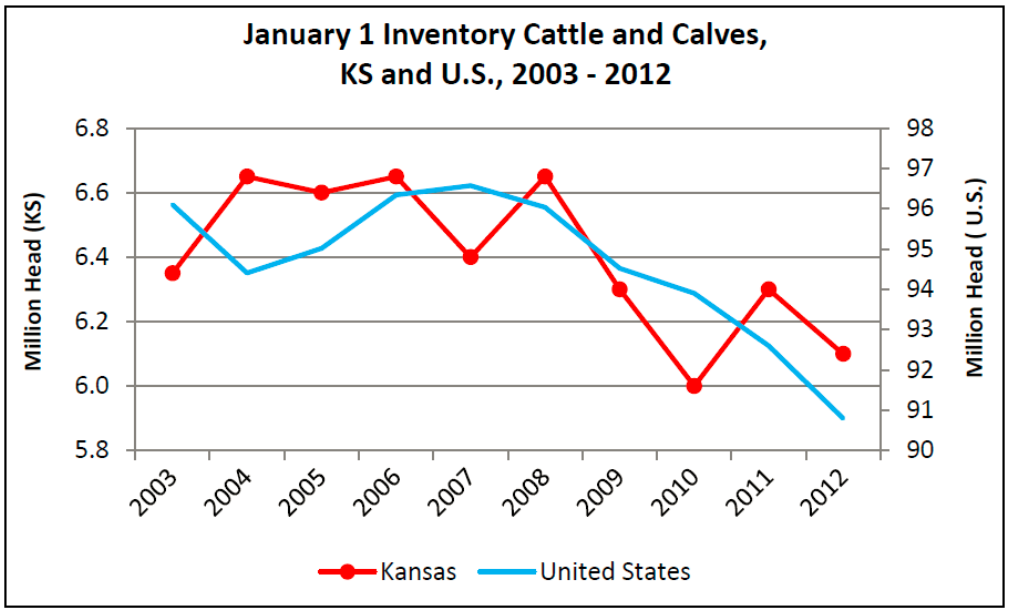
The following table presents information relating to cattle production on southeast Kansas, with data obtained from the USDA National Agricultural Statistics Service.

**Cattle Information, January 1, 2012**

| County | All Cattle | Beef Cows That Have Calved | Milk Cows That Have Calved | Cattle on Feed |
|---|---|---|---|---|
| Allen | 28,000 | 14,600 | 500 | |
| Bourbon | 56,000 | 24,000 | | 1,000 |
| Chautauqua | 36,500 | | | |
| Cherokee | 33,500 | 20,500 | | |
| Crawford | 53,000 | 21,500 | | 1,300 |
| Elk | 37,000 | 17,000 | | |
| Greenwood | 60,000 | 21,500 | | 2,000 |
| Labette | 72,000 | 27,500 | | |
| Montgomery | 33,000 | 20,000 | | 700 |
| Neosho | 54,000 | 22,500 | | |
| Wilson | 29,000 | 15,000 | | |
| Woodson | 45,000 | 13,000 | | 600 |

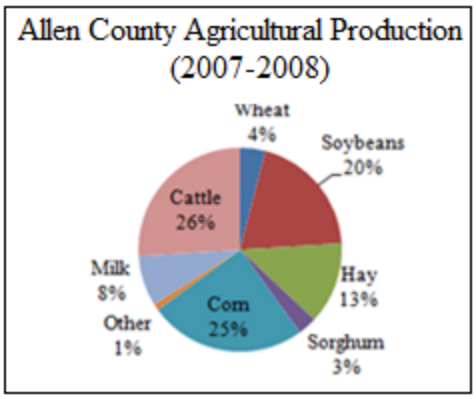
Source: USDA National Agricultural Statistics Service

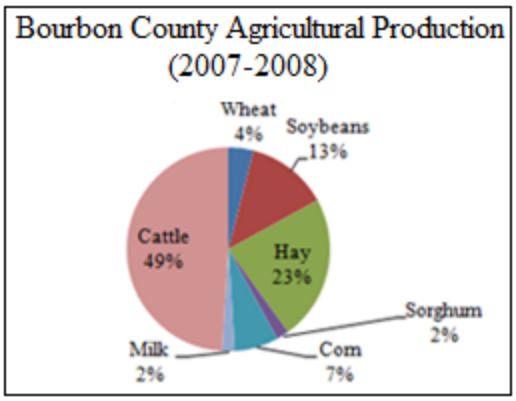
Regional data indicate that the number of cattle has been falling over the past five years, following a trend in the State of Kansas and the United States as a whole. The following chart from the USDA National Agricultural Statistics Service Kansas Field Office produced in 2012 indicates this trend.

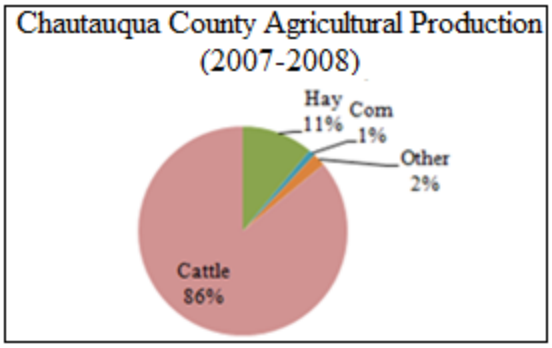


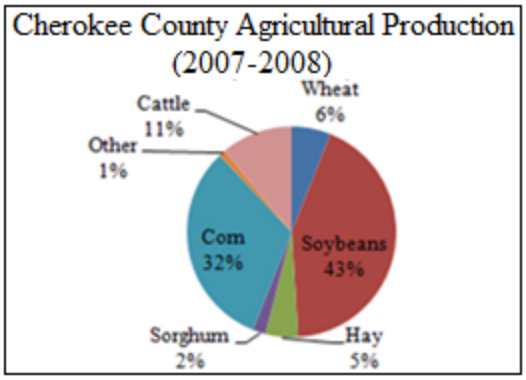

Source: US Department of Agriculture National Agricultural Statistics Service, Kansas Field Office, 2012

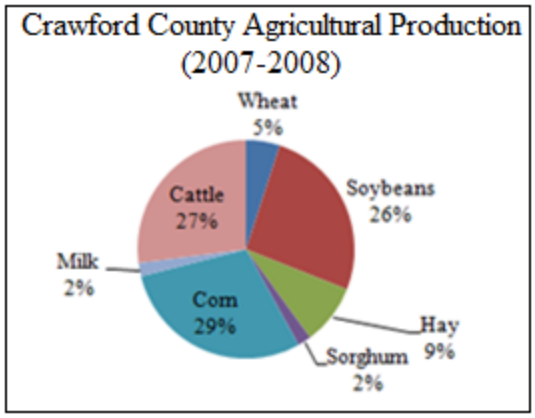
The following charts present an overview of agricultural production for each county in the region. Information comes from the USDA National Agricultural Statistics Service 2007 Crop Year County Farm Facts booklet.

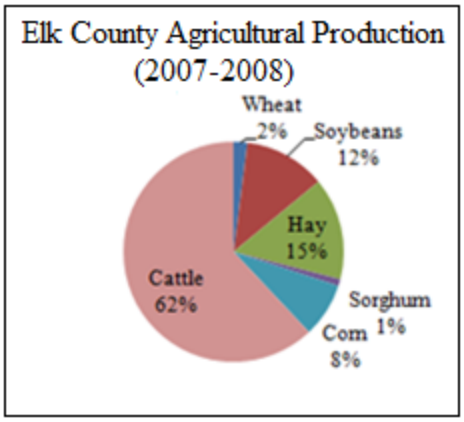

Allen County Agricultural Production
(2007-2008)
Wheat 4%
Soybeans 20%
Cattle 26%
Milk 8%
Hay 13%
Corn 25%
Other 1%
Sorghum 3%

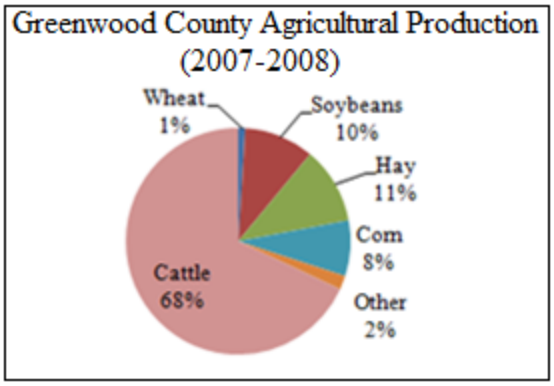

Bourbon County Agricultural Production
(2007-2008)
Wheat 4%
Soybeans 13%
Cattle 49%
Hay 23%
Sorghum 2%
Milk 2%
Corn 7%

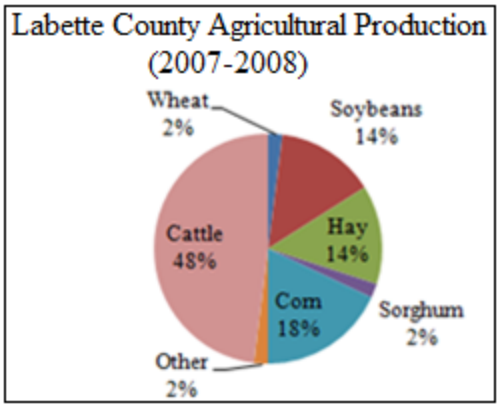

Chautauqua County Agricultural Production
(2007-2008)
Hay 11%
Corn 1%
Other 2%
Cattle 86%

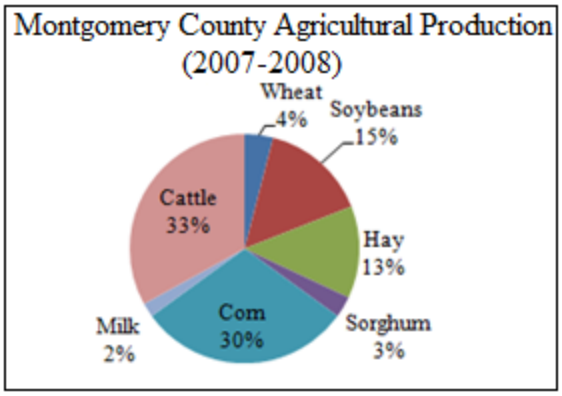

Cherokee County Agricultural Production
(2007-2008)
Wheat 6%
Cattle 11%
Other 1%
Corn 32%
Soybeans 43%
Sorghum 2%
Hay 5%

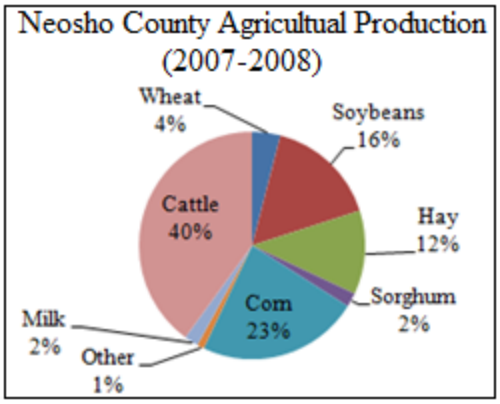

Crawford County Agricultural Production
(2007-2008)
Wheat 5%
Cattle 27%
Soybeans 26%
Milk 2%
Corn 29%
Hay 9%
Sorghum 2%

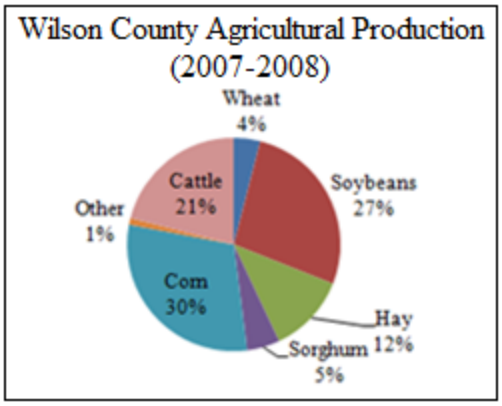

Elk County Agricultural Production
(2007-2008)
Wheat 2%
Soybeans 12%
Hay 15%
Cattle 62%
Sorghum 1%
Corn 8%

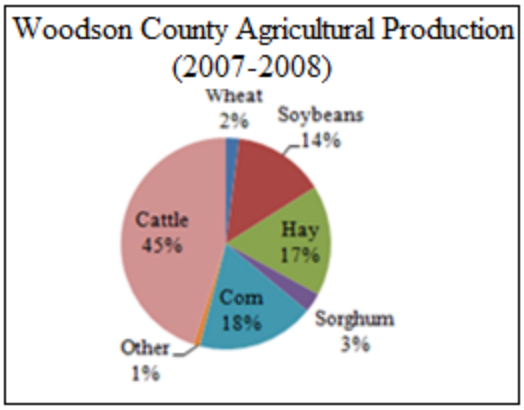

Greenwood County Agricultural Production
(2007-2008)
Wheat 1%
Soybeans 10%
Hay 11%
Corn 8%
Cattle 68%
Other 2%


Labette County Agricultural Production
(2007-2008)
Wheat 2%
Soybeans 14%
Cattle 48%
Hay 14%
Corn 18%
Sorghum 2%
Other 2%



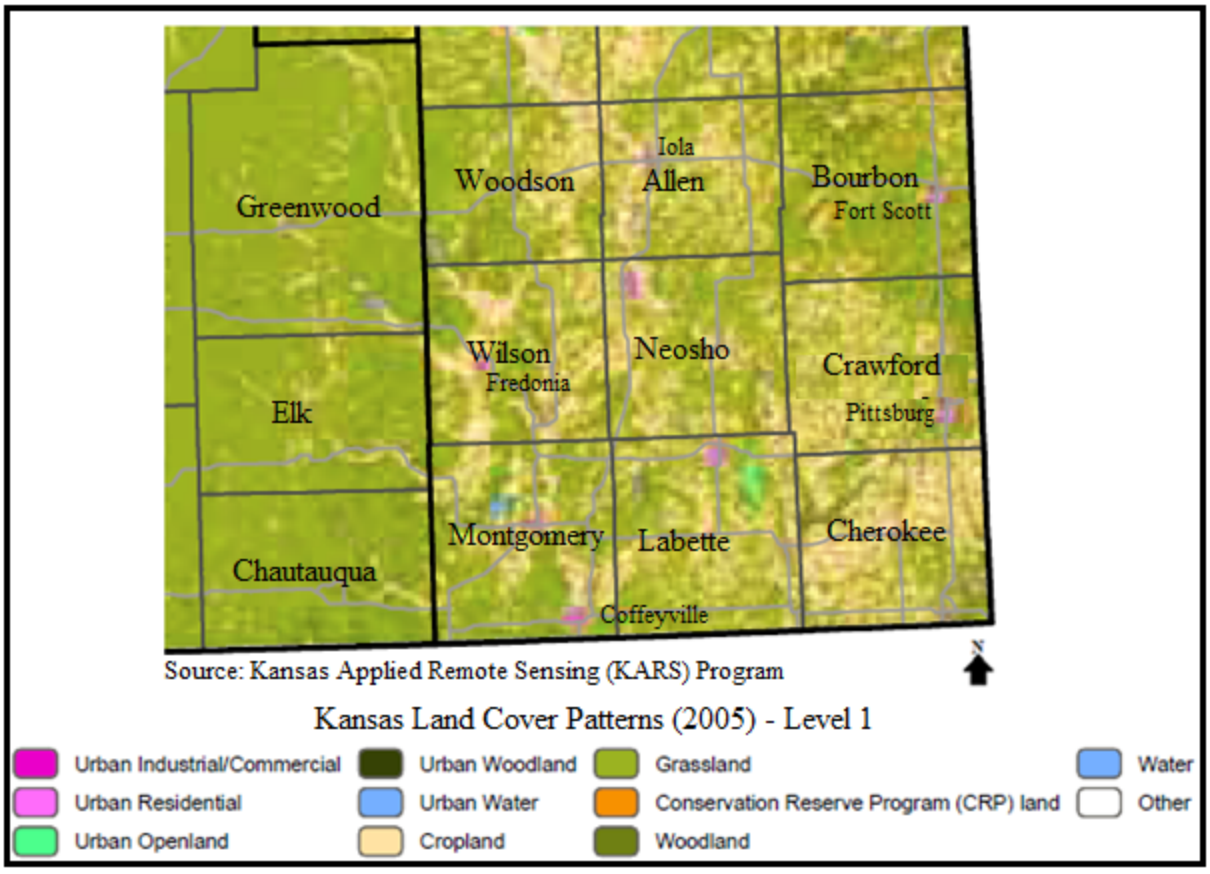




## 2.9 REGIONAL LAND USE AND DEVELOPMENT TRENDS

*44 CFR 201.6 (C) Plan Content. The plan shall include the following: (2)(ii)(C) Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.*

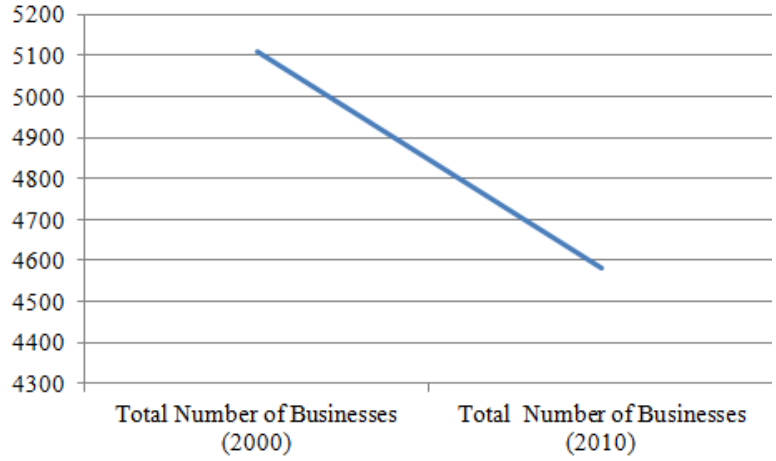
Land use patterns in southeastern Kansas have remained relatively stable over many years. The 2005 Kansas Applied Remote Sensing Kansas Land Cover Patterns map shows the majority of the region is covered by cropland and grassland. Urban, residential, commercial and industrial uses comprise only a small fraction of the land cover and are primarily found around major towns and cities. In general, most development is regulated by local entities. However, it should be noted that large sections of the region are unregulated as to building and development.

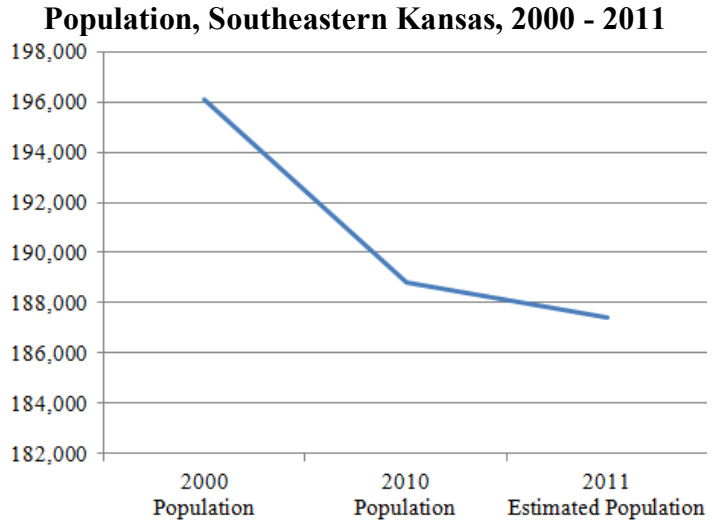
Southeast Kansas Land Cover Map

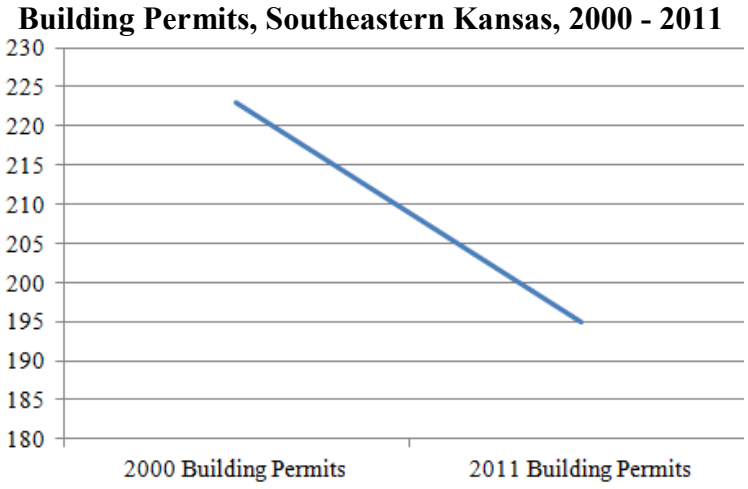



Southeastern Kansas has experienced an overall decrease in population, with a -4.4% regional decline from the 2000 census. In addition, the region has seen a decrease in the number of businesses. From 2000 to 2010 the average rate of decrease was -7.8%. While forecasting future population movement and growth is challenging, past trends can be used to assist in predicting future development. The following graphs indicate declines in total number of business in the region, regional population, and building permits, using data from the above referenced tables.

**Number of Businesses, Southeastern Kansas, 2000 - 2010**






Based on these historical rates, it is unlikely that any major land use changes or major land development initiatives will be completed in the region in the foreseeable future.

## 2.10 STRUCTURES EXPOSED TO POTENTIAL HAZARDS

This section quantifies the buildings exposed to potential hazards in southeast Kansas. The following tables provide the value of the region's built environment and contents, which in addition to the population information presented above, forms the basis of the vulnerability and risk assessment presented in this plan. This information was derived from inventory data associated with FEMA's loss estimation software HAZUS-MH 2.1 (February 2012). HAZUS-MH classifies building stock types into seven categories: residential, commercial, industrial, agriculture, religion, government, and education. Values associated with each of these categories reflect 2006 valuations, published by R.S. Means Company (Means Square foot Costs, 2006) with replacement costs. According to the HAZUS-MH 2.1 inventory, the total estimated replacement value of buildings within the southeast Kansas region is $12.9 billion and the total buildings content's estimated value within the southeast Kansas region is $8.7 billion. The

exposure value of buildings is incorporated as a factor in vulnerability assessments for hailstorm, tornado, windstorm, and winter storm hazards that are profiled later in this plan.

**Estimated Replacement Value of Buildings by Category (2006 Valuations)**

| County | Residential ($1,000s) | Commercial ($1,000s) | Industrial ($1,000s) | Agriculture ($1,000s) | Religion ($1,000s) | Government ($1,000s) | Education ($1,000s) |
|---|---|---|---|---|---|---|---|
| Allen | $701,522 | $148,407 | $60,217 | $11,273 | $29,083 | $6,382 | $26,894 |
| Bourbon | $767,220 | $168,356 | $107,198 | $10,217 | $30,164 | $6,970 | $12,363 |
| Chautauqua | $193,474 | $35,226 | $7,131 | $32,499 | $8,514 | $3,039 | $5,555 |
| Cherokee | $962,249 | $158,649 | $90,630 | $19,757 | $29,268 | $8,177 | $25,023 |
| Crawford | $1,840,563 | $439,540 | $168,664 | $22,743 | $53,594 | $18,124 | $45,589 |
| Elk | $152,928 | $17,704 | $2,115 | $2,964 | $3,402 | $3,122 | $5,056 |
| Greenwood | $386,754 | $55,505 | $16,046 | $8,890 | $12,789 | $2,580 | $8,848 |
| Labette | $1,081,414 | $207,539 | $79,040 | $15,976 | $33,147 | $13,710 | $23,024 |
| Montgomery | $1,724,172 | $379,203 | $182,182 | $12,813 | $71,150 | $15,148 | $47,515 |
| Neosho | $809,459 | $186,576 | $92,952 | $17,176 | $31,563 | $15,514 | $20,910 |
| Wilson | $446,126 | $84,941 | $79,574 | $12,879 | $27,804 | $6,897 | $12,838 |
| Woodson | $161,245 | $21,209 | $5,858 | $6,278 | $4,097 | $3,093 | $6,125 |

**Estimated Replacement Value of Building's Contents by Category (2006 Valuations)**

| County | Residential ($1,000s) | Commercial ($1,000s) | Industrial ($1,000s) | Agriculture ($1,000s) | Religion ($1,000s) | Government ($1,000s) | Education ($1,000s) |
|---|---|---|---|---|---|---|---|
| Allen | $352,109 | $156,635 | $86,967 | $11,273 | $29,083 | $6,382 | $32,220 |
| Bourbon | $384,413 | $184,017 | $156,819 | $10,217 | $30,164 | $7,154 | $13,029 |
| Chautauqua | $96,970 | $40,473 | $9,903 | $32,499 | $8,514 | $3,253 | $5,555 |
| Cherokee | $482,340 | $164,087 | $130,146 | $19,757 | $29,268 | $8,973 | $25,438 |
| Crawford | $922,065 | $481,518 | $240,745 | $22,743 | $53,594 | $19,793 | $51,813 |
| Elk | $76,791 | $18,969 | $2,651 | $2,964 | $3,402 | $3,521 | $5,056 |
| Greenwood | $194,060 | $59,227 | $21,527 | $8,890 | $12,789 | $2,931 | $8,848 |
| Labette | $541,840 | $229,768 | $113,476 | $15,976 | $33,147 | $15,860 | $23,643 |
| Montgomery | $863,799 | $412,325 | $261,208 | $12,813 | $71,150 | $16,791 | $56,121 |
| Neosho | $405,581 | $191,302 | $132,997 | $17,176 | $31,563 | $17,071 | $22,551 |
| Wilson | $223,657 | $90,980 | $114,750 | $12,879 | $27,804 | $7,467 | $12,838 |

## 2.11 CRITICAL FACILITIES AND ASSETS

This section details the critical facilities and assets that may be at risk by county and available jurisdiction for the region. A critical facility is essential in providing utility or direction either during the response to an emergency or during the recovery operation. Facilities were determined from jurisdictional feedback, historic research, available data from the State of Kansas and

HAZUS-MH 2.1. Critical assets are equipment or systems that may be needed during a response or recovery effort and may be at risk of damage or destruction from a hazard. In addition, jurisdictions considered facilities that, if damaged or destroyed, would result in a high economic, human, or societal losses. Finally, jurisdictions also considered transportation facilities and corridors that would provide critical lifelines in the event of a hazard event. The following are examples of critical facilities and assets:

- Hospitals and other medical facilities
- Police stations
- Fire stations
- Emergency operations centers
- Power plants
- Dams and levees
- Military installations
- Hazardous material sites
- Schools
- Shelters
- Day care centers
- Nursing homes
- Highways, bridges, and tunnels
- Railroads and facilities
- Airports
- Water treatment facilities
- Natural gas and oil facilities and pipelines
- Communications facilities
- Community facilities

Participating jurisdictions were given the option to supply as much information as possible relating to critical facilities, however they were not compelled to provide any information, up to and including name, address, replacement value and occupancy. A detailed list of critical facilities may be found in Appendix D. Appendix D has been deemed sensitive information, and as such access is restricted with Appendix D being unavailable to the public.

## 2.12 HISTORICALLY SIGNIFICANT STRUCTURES AND LOCATIONS

The following sections detail structures that have local historical significance. Historic structure means any structure that is:

- Listed in the National Register of Historic Places or preliminarily determined as meeting the requirements for listing
- Certified as contributing to the historical significance of a registered historic district
- Listed on a state inventory of historic places
- Listed on a local inventory of historic places
- Deemed by the community as a locally historic structure

These structures may warrant a greater degree of protection due to their unique and irreplaceable nature. Additionally, the rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.

### 2.12.1 ALLEN COUNTY

| Name of Historical Property | Address or Location | City | Certification Date |
|---|---|---|---|
| Schleichers Branch Stone Arch Bridge | Unnamed Road over Slack Creek (Schleichers Br.), East of Humboldt | Humboldt | 2/25/2004 |
| Allen County Jail | 204 North Jefferson Street | Iola | 1/25/1971 |
| Funston Home | 4 miles North of Iola on U.S. 69 | Iola | 4/21/1995 |
| Northrup House | 318 East Street | Iola | 5/12/1997 |

### 2.12.2 BOURBON COUNTY

| Name of Historical Property | Address or Location | City | Certification Date |
|---|---|---|---|
| First Congregational Church | 502 South National Avenue | Fort Scott | 3/23/2005 |
| First Presbyterian Church | 308 South Crawford | Fort Scott | 7/2/2008 |
| Fort Scott Downtown Historic District | Oak to 3rd St., Scott Ave. to National Avenue | Fort Scott | 12/18/2009 |
| Fort Scott National Cemetery | 900 East National Avenue | Fort Scott | 7/15/1999 |
| Fort Scott National Historic Site | Old Fort Blvd. | Fort Scott | 10/15/1966 |
| Fort Scott Public Carnegie Library | 201 South National | Fort Scott | 8/18/1987 |
| Marmaton Bridge | 1 mile North East of Fort Scott | Fort Scott | 5/11/1982 |
| Moody Building | 15 East 2nd Street | Fort Scott | 11/9/1977 |
| Union Block | 24 South Main Street | Fort Scott | 4/26/1972 |
| Ware, Eugene, Elementary School | 900 East Third Street | Fort Scott | 6/9/2005 |
| Long Shoals Bridge | Over Little Osage River, East of Fulton | Fulton | 1/4/1990 |

### 2.12.3 CHAUTAUQUA COUNTY

| Name of Historical Property | Address or Location | City | Certification Date |
|---|---|---|---|
| Adam, L.C., Mercantile Building | 618 Cedar Street | Cedar Vale | 4/18/2007 |
| Hewins Park Pavilion | 101 Salebarn Road | Cedar Vale | 6/27/2007 |
| Otter Creek Bridge | FAS 95 over Otter Creek, 3.0 miles North of Cedar Vale | Cedar Vale | 1/4/1990 |
| Cedar Creek Bridge | FAS 96 | Elgin | 3/10/1983 |
| Niotaze Methodist Episcopal Church | 301 North F Street | Niotaze | 1/11/2006 |
| Bradford Hotel | 103 North Chautauqua | Sedan | 11/28/2007 |

### 2.12.4 CHEROKEE COUNTY

| Name of Historical Property | Address or Location | City | Certification Date |
|---|---|---|---|
| Baxter Springs Independent Oil and Gas Service Station | 940 Military Avenue | Baxter Springs | 8/29/2003 |
| Brush Creek Bridge | North of Baxter Springs | Baxter Springs | 3/10/1983 |
| Johnston Library | 210 West 10th Street | Baxter Springs | 11/21/1976 |
| Niles, Rial A., House | 605 East 12th Street | Baxter Springs | 9/6/2006 |
| Columbus Public Carnegie Library | 205 North Kansas | Columbus | 6/25/1987 |
| Kansas Route 66 Historic District--East Galena | US 66 | Galena | 8/29/2003 |
| Schermerhorn, Edgar Backus, House | 803 East 5th Street | Galena | 8/21/1989 |
| Williams' Store | 7109 SE Highway 66 | Riverton | 8/29/2003 |

### 2.12.5 CRAWFORD COUNTY

| Name of Historical Property | Address or Location | City | Certification Date |
|---|---|---|---|
| Cato District No. 4 School | Junction of 200th Street and 720th Avenue | Cato | 9/6/2006 |
| Franklin Sidewalk | Parallel to Bus US 69 between Franklin and Arma | Franklin | 3/16/2007 |
| Crawford County Courthouse | 111 East Forest, Courthouse Square | Girard | 4/22/2009 |
| First Presbyterian Church | 202 North Summit | Girard | 7/8/2009 |
| Girard Carnegie Library | 128 West Prairie | Girard | 6/25/1987 |
| Hudgeon Bridge | 10 miles South and 3.2 miles West of Girard | Girard | 7/2/1985 |
| Raymond, J.E., House | 301 Osage Street | Girard | 4/3/2007 |
| St. John's Episcopal Church | South East corner of Buffalo and Summit | Girard | 4/22/2009 |
| State Bank of Girard | 105 East Prairie | Girard | 8/7/2009 |
| S-W Supply Company | 215 East Prairie | Girard | 5/21/2009 |
| Wayland, Julius A., House | 721 North Summit | Girard | 11/21/1976 |
| Besse Hotel | 121 East 4th Street | Pittsburg | 4/16/2008 |
| Colonial Fox Theatre | 409 North Broadway | Pittsburg | 4/16/2008 |
| Hotel Stilwell | 707 Broadway | Pittsburg | 4/30/1980 |
| Pittsburg Public Library | 4th and Walnut Street s | Pittsburg | 11/9/1977 |
| Washington Grade School | 209 South Locust Street | Pittsburg | 4/16/2008 |
| Whitesitt-Shirk Historic District | 116 East Lindburg and 120 East Lindburg | Pittsburg | 3/20/2002 |
| Little Walnut Creek Bowstring | Over Little Walnut Creek, North East of Walnut | Walnut | 1/4/1990 |

### 2.12.6 ELK COUNTY

| Name of Historical Property | Address or Location | City | Certification Date |
|---|---|---|---|
| Elk River Archeological District | Address Restricted | Elk City | 9/13/1978 |
| Elk Falls Pratt Truss Bridge | Off Montgomery St., across the Elk River | Elk Falls | 5/6/1994 |
| Grenola Mill and Elevator | Railroad Avenue | Grenola | 7/11/2002 |
| Elk County Courthouse | 127 North Pine | Howard | 4/22/2009 |
| Durbin Archeological Site | Address Restricted | Moline | 5/2/1975 |

### 2.12.7 LABETTE COUNTY

| Name of Historical Property | Address or Location | City | Certification Date |
|---|---|---|---|
| Harmon Site | Address Restricted | Chetopa | 5/9/1983 |
| Harmon Site No. 2 (14LT323) | Address Restricted | Chetopa | 5/7/1984 |
| Big Hill Archeological District | Address Restricted | Dennis | 11/23/1977 |
| First State Bank | South West corner of Delaware and Main Streets | Edna | 11/1/1982 |
| Pumpkin Creek Tributary Bridge | Off KS 22 2 miles West of Mound Valley | Mound Valley | 7/2/1985 |
| East Side School | Iowa Street | Oswego | 8/16/2010 |
| Oswego Public Carnegie Library | 704 Fourth Street | Oswego | 6/25/1987 |
| Riverside Park | North Oregon Street | Oswego | 7/17/2012 |
| US Post Office--Oswego | 819 4th Street | Oswego | 10/17/1989 |
| Carnegie Library | 17th and Broadway | Parsons | 4/14/1976 |
| Labette Creek Tributary Bridge | Off US 160 2.3 miles West of Parsons | Parsons | 7/2/1985 |
| Parsons Filled Arch Bridge | Off US 160, 1 mile East and 1.2 miles South of Parsons | Parsons | 7/2/1985 |
| Parsons Katy Hospital | 400 Katy Avenue | Parsons | 1/31/2008 |

### 2.12.8 MONTGOMERY COUNTY

| Name of Historical Property | Address or Location | City | Certification Date |
|---|---|---|---|
| Cherryvale Carnegie Free Library | 329 East Main | Cherryvale | 8/18/1987 |
| Ball, Charles M., House | 702 Spruce Street | Coffeyville | 2/7/2011 |
| Bethel African Methodist Episcopal Church | 202 West 12th Street | Coffeyville | 7/28/1995 |
| Brown, W. P., Mansion | South Walnut and Eldridge Streets | Coffeyville | 12/12/1976 |
| Coffeyville Carnegie Public Library Building | 415 West Eighth | Coffeyville | 6/25/1987 |

| Name of Historical Property | Address or Location | City | Certification Date |
|---|---|---|---|
| Condon National Bank | 811 Walnut Street | Coffeyville | 1/12/1973 |
| Hotel Dale | 206 West 8th Street | Coffeyville | 1/31/2008 |
| Midland Theater | 212-214 West 8th Street | Coffeyville | 2/9/2005 |
| Onion Creek Bridge | Over Onion Creek, South of Coffeyville | Coffeyville | 1/4/1990 |
| Terminal Building | 717 Walnut | Coffeyville | 6/14/1982 |
| Archeological Site Number 14MY1320 | Address Restricted | Independence | 7/9/1982 |
| Archeological Site Number 14MY365 | Address Restricted | Independence | 7/9/1982 |
| Blakeslee Motor Company Building | 211 West Myrtle | Independence | 8/25/1989 |
| Booth Hotel | 201-209 West Main Street | Independence | 4/28/1983 |
| Booth Theater | 119 West Myrtle Street | Independence | 10/13/1988 |
| Brown Barn | 5879 Co. Rd. 4300 | Independence | 4/8/2009 |
| Cook's Hotel | 113 West Myrtle | Independence | 3/8/2006 |
| Dewlen-Spohnhauer Bridge | Old US 160 | Independence | 3/10/1983 |
| Independence Bowstring | Over the Verdigris River, N of junction of Burns and Myrtle Streets | Independence | 1/4/1990 |
| Independence Downtown Historic District | Chestnut, Laurel, Myrtle, Main, Maple between 5th and 9th | Independence | 7/19/2006 |
| Independence Junior High School | 300 West Locust Street | Independence | 12/30/2009 |
| Independence Public Carnegie Library | 220 East Maple | Independence | 1/11/1988 |
| Infinity Archeological Site | Address Restricted | Independence | 3/24/1971 |
| Memorial Hall | Junction of Pennsylvania Avenue and East Locust Street | Independence | 6/10/2005 |
| Pennsylvania Avenue Rock Creek Bridge | Pennsylvania Avenue over Rock Creek | Independence | 7/2/1985 |
| Union Implement and Hardware Building--Masonic Temple | 121-123 West Main | Independence | 10/13/1988 |
| Federal Building--US Post Office | 123 North 8th | Independence | 10/19/1988 |
| Archeological Site Number 14MY1385 | Address Restricted | Liberty | 7/9/1982 |
| Archeological Site Number 14MY1 | Address Restricted | Little River | 7/9/1982 |

### 2.12.9 NEOSHO COUNTY

| Name of Historical Property | Address or Location | City | Certification Date |
|---|---|---|---|
| Austin Bridge | West side Santa Fe Street south of 21st Street over Little Turkey Creek | Chanute | 9/15/1977 |
| Murray Hill School | 400 West 3rd Street | Chanute | 8/23/2011 |
| Tioga Inn | 12 East Main Street | Chanute | 2/23/1990 |
| State Steet Bridge | State Street over Neosho River tributary | Erie | 7/2/1985 |
| Maxwell's Slough Bridge | Off KS 57 .5 miles W and 1 mile South of Street Paul | St. Paul | 7/2/1985 |
| Osage Mission Infirmary | 325 Main Street | St. Paul | 9/6/2005 |

### 2.12.10 WILSON COUNTY

| Name of Historical Property | Address or Location | City | Certification Date |
|---|---|---|---|
| Brush Creek Bridge | 0.5 mile South of Coyville | Coyville | 7/2/1985 |
| Flack, Dr. A. C., House | 303 North 8th Street | Fredonia | 9/21/1989 |
| Gold Dust Hotel | 402 North Seventh Street | Fredonia | 11/1/1991 |
| US Post Office--Fredonia | 428 Madison Street | Fredonia | 10/17/1989 |
| Brown Hotel | 523 Main Street | Neodesha | 7/21/1995 |
| Brown Hotel (Boundary Increase) | 519-523 Main Street | Neodesha | 7/3/2008 |
| Norman No. 1 Oil Well Site | E. Mill Street | Neodesha | 8/28/1974 |
| US Post Office--Neodesha | 123 North Fifth Street | Neodesha | 10/17/1989 |

### 2.12.11 WOODSON COUNTY

| Name of Historical Property | Address or Location | City | Certification Date |
|---|---|---|---|
| Stockbrands and Kemmerer Department Store | 100 East Rutledge | Yates Center | 10/17/1985 |
| Woodson County Courthouse | Courthouse Square between Main, Rutledge, State, and Butler Streets | Yates Center | 10/10/1985 |
| Yates Center Carnegie Library | 218 North Main | Yates Center | 6/25/1987 |
| Yates Center Courthouse Square Historic District | Courthouse Square | Yates Center | 5/20/1986 |

## 2.13 REGIONAL AT RISK POPULATIONS

In general, at risk populations may have difficulty with medical issues, poverty, extremes in age, and communications due to language barriers. Several principles may be considered when discussing potentially at risk populations, including:

- Not all people who are considered at risk are at risk
- Outward appearance does not necessarily mark a person as at risk
- The hazard event will, in many cases, affect at risk population in differing ways

The National Response Framework defines at risk populations as "populations whose members may have additional needs before, during, and after an incident in functional areas, including but not limited to: maintaining independence, communication, transportation, supervision, and medical care."

The following tables present information on potential at risk populations within southeastern Kansas.

**Potential At Risk Population Data**

| County | 2011 Population | Population 5 and Under (2011) | Population 18 and Under (2011) | Population 65+ (2011) | Population 85+ (2011) | Food Stamp Beneficiaries (2011) | Estimated People in Poverty (2011) | Person Speaking Language Other Than English At Home |
|---|---|---|---|---|---|---|---|---|
| Allen | 13,331 | 853 | 3,148 | 2,426 | 406 | 2,026 | 2,367 | 107 |
| Bourbon | 14,985 | 1,094 | 3,866 | 2,607 | 420 | 2,700 | 2,329 | 288 |
| Chautauqua | 3,584 | 179 | 758 | 853 | 139 | 413 | 556 | 114 |
| Cherokee | 21,385 | 1,304 | 5,389 | 3,443 | 456 | 3,668 | 4,280 | 562 |
| Crawford | 39,220 | 2,471 | 8,725 | 5,491 | 1,022 | 6,092 | 7,166 | 2270 |
| Elk | 2,811 | 143 | 2,267 | 711 | 105 | 297 | 518 | 81 |
| Greenwood | 6,644 | 379 | 1,477 | 1,475 | 217 | 868 | 1,143 | 54 |
| Labette | 21,511 | 1,398 | 5,262 | 3,657 | 612 | 3,320 | 3,680 | 778 |
| Montgomery | 34,911 | 2,339 | 8,399 | 6,144 | 1,065 | 5,423 | 6,353 | 1490 |
| Neosho | 16,449 | 1,119 | 4,082 | 2,862 | 463 | 2,491 | 2,606 | 446 |
| Wilson | 9,300 | 577 | 2,293 | 1,841 | 289 | 1,324 | 1,474 | 198 |
| Woodson | 3,292 | 174 | 658 | 714 | 144 | 410 | 557 | 23 |

Source: University of Kansas Institute for Policy and Social Research Kansas County Profile and the United States Census Bureau

**Potential At Risk Population Data, Care Facilities**

| County | Number of Hospitals (2011) | Number of Hospital Beds (2011) | Adult Care Homes (2011) | Adult Care Beds (2011) | Assisted Living Homes (2011) | Assisted Living Beds (2011) | Child Care Facilities (2011) |
|---|---|---|---|---|---|---|---|
| Allen | 1 | 25 | 3 | 154 | 4 | 99 | 51 |
| Bourbon | 1 | 61 | 2 | 111 | 2 | 105 | 39 |
| Chautauqua | 1 | 25 | 1 | 80 | 0 | 0 | 3 |
| Cherokee | 1 | 18 | 4 | 211 | 4 | 136 | 49 |
| Crawford | 2 | 149 | 6 | 457 | 6 | 215 | 83 |
| Elk | 0 | 0 | 1 | 40 | 0 | 0 | 1 |
| Greenwood | 1 | 25 | 1 | 76 | 1 | 46 | 15 |
| Labette | 3 | 267 | 6 | 272 | 3 | 94 | 60 |
| Montgomery | 2 | 128 | 6 | 402 | 7 | 218 | 81 |
| Neosho | 1 | 25 | 4 | 226 | 4 | 109 | 59 |
| Wilson | 2 | 49 | 2 | 97 | 2 | 59 | 25 |
| Woodson | 0 | 0 | 1 | 45 | 0 | 0 | 6 |

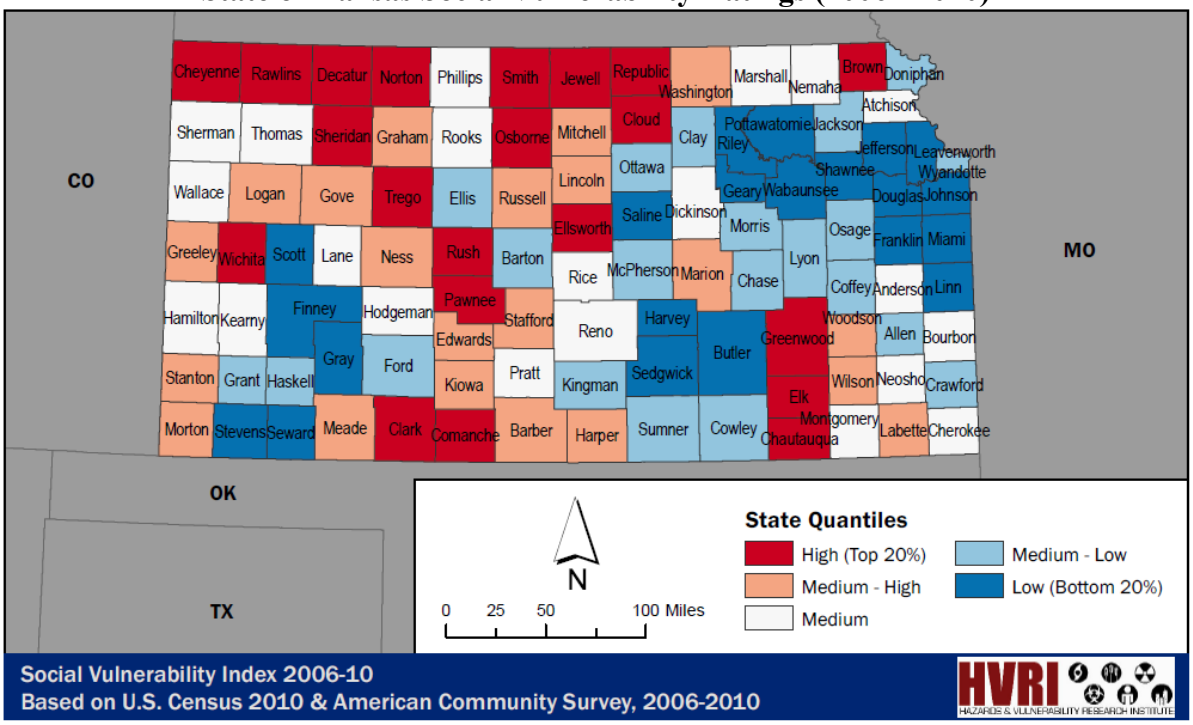
Source: University of Kansas Institute for Policy and Social Research Kansas County Profile and the United States Census Bureau

The Social Vulnerability Index (SoVI) 2006 - 2010 compiled by the Hazards and Vulnerability Research Institute in the Department of Geography at the University of South Carolina measures the social vulnerability of counties to environmental hazards. The index synthesizes 30 socioeconomic variables, including social, economic, demographic, and housing characteristics, which may contribute to reduction in a community's ability to prepare, respond and recover from a hazard. The major data source for this index is primarily the United States Census Bureau.

After obtaining the relevant data, a principle components analysis is used to reduce the data into set of components. All components are added together to determine a numerical value that represents the social vulnerability for each county. Scores in the top 20% of the United States are more vulnerable counties (red) and scores in the bottom 20% of the United States indicate the least vulnerable counties (blue).

The following map illustrates social vulnerability ratings for Kansas counties.

**State of Kansas Social Vulnerability Ratings (2006 - 2010)**




The following table presents the SoVi rating and national percentile for each county. In general, the higher the national percentile the higher the vulnerability.

**County Social Vulnerability Ratings**

| County | SoVI Score (2006 - 2010) | National Percentile (2006 - 2010) |
|---|---|---|
| Allen | 0.182386 | 54.34% |
| Bourbon | 0.797543 | 65.51% |
| Chautauqua | 3.173417 | 90.04% |
| Cherokee | 0.523907 | 61.09% |
| Crawford | 0.018269 | 50.94% |
| Elk | 2.078646 | 80.88% |
| Greenwood | 2.656608 | 86.00% |
| Labette | 0.941763 | 67.45% |
| Montgomery | 0.881111 | 66.66% |
| Neosho | 0.668561 | 63.60% |
| Wilson | 1.754 | 77.76% |
| Woodson | 1.974606 | 80.34% |

Source: Hazards and Vulnerability Research Institute, University of South Carolina

## 2.14 SCHOOL DISTRICT INFORMATION AND BOUNDARIES

The following tables present participating USD enrollment information, the number of staff and faculty, and the number of offices and schools.

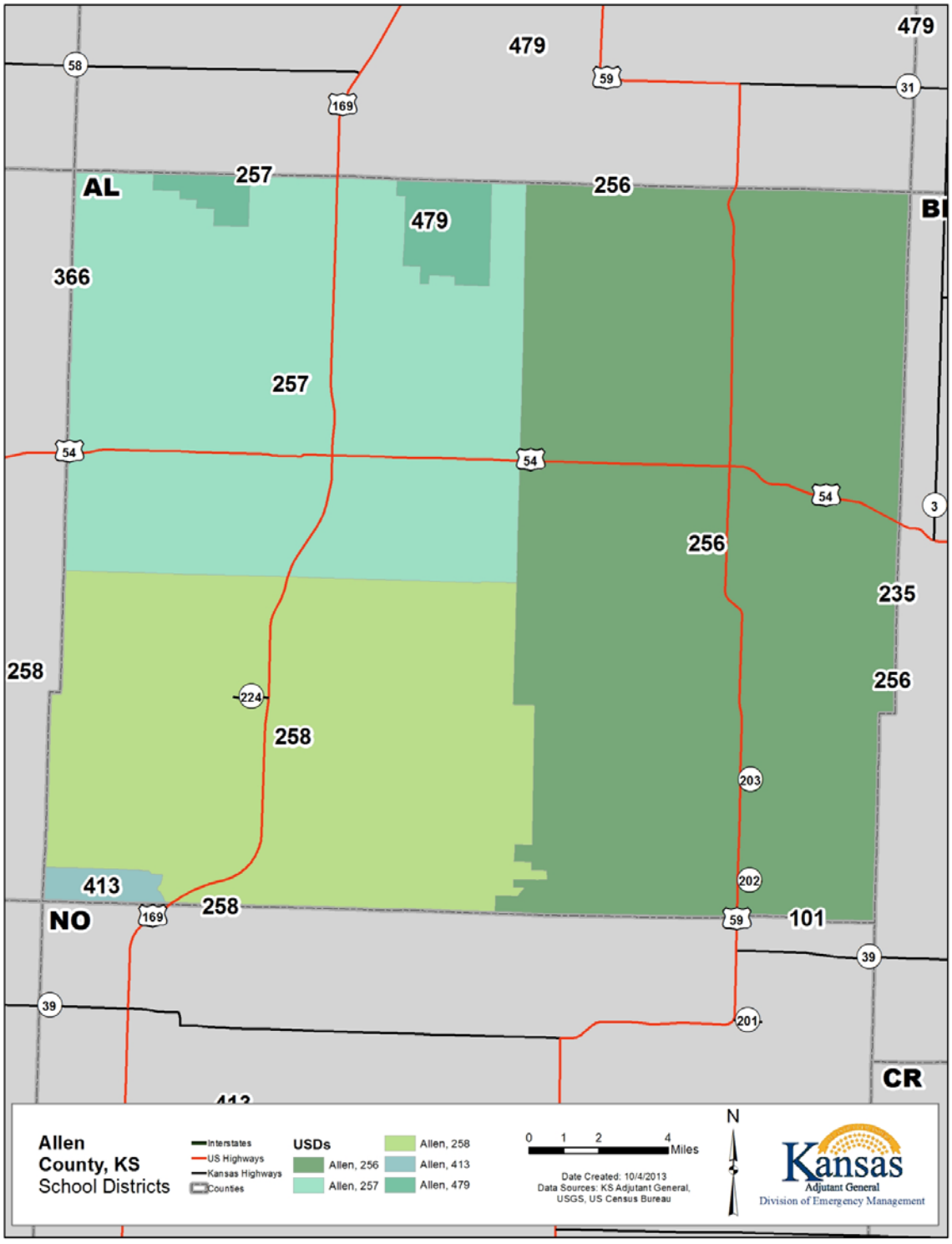
**Participating USD Information**

| School , College or University | Total Enrollment (2013-2104) | Staff and Faculty (2011-2012) | Number of Offices and Schools (2013) |
|---|---|---|---|
| **Allen County** | | | |
| USD 256 - Marmaton Valley | 294 | 32 | 8 |
| USD 257 - Iola Public Schools | 1,347 | 114 | 13 |
| USD 258 - Humboldt | 778 | 45 | 9 |
| **Bourbon County** | | | |
| USD 234 - Fort Scott | 1,938 | 167 | 13 |
| USD 235 - Uniontown | 457 | 45 | 6 |
| **Chautauqua County** | | | |
| USD 285 – Cedar Vale | 173 | 17 | 6 |
| USD 286 – Chautauqua County | 361 | 35 | 8 |
| **Cherokee County** | | | |
| USD 404 - Riverton | 772 | 80 | 9 |
| USD 493 - Columbus | 1,042 | 87 | 9 |
| USD 499 - Galena | 858 | 73 | 9 |
| USD 508 - Baxter Springs | 1,035 | 74 | 7 |
| **Crawford County** | | | |
| USD 246 - Arma | 503 | 57 | 6 |
| USD 247 - Cherokee | 650 | 63 | 8 |
| USD 248 - Girard | 1,023 | 78 | 10 |
| USD 249 - Frontenac | 928 | 72 | 9 |
| USD 250 Pittsburg | 3,021 | 217 | 15 |
| USD 609 - SE Kansas Education Services Center | - | - | - |
| **Elk County** | | | |
| USD 282 - West Elk | 335 | 47 | 7 |
| USD 283 - Elk Valley | 151 | 19 | 8 |
| **Labette County** | | | |
| USD 503 - Parsons | 1,325 | 100 | 12 |
| USD 504 - Oswego | 489 | 44 | 10 |
| USD 505 - Chetopa-St. Paul | 478 | 54 | 9 |
| USD 506 - Labette County | 1552 | 115 | 11 |
| **Montgomery County** | | | |
| USD 436 - Caney | 830 | 67 | 8 |
| USD 445 - Coffeyville | 1,844 | 138 | 10 |
| USD 446 - Independence | 2,211 | 140 | 12 |
| USD 447 - Cherryvale | 948 | 71 | 7 |
| **Neosho County** | | | |
| USD 101 - Erie | 532 | 50 | 9 |
| USD 413 - Chanute | 1,920 | 136 | 10 |

**Participating USD Information**

| School , College or University | Total Enrollment (2013-2104) | Staff and Faculty (2011-2012) | Number of Offices and Schools (2013) |
|---|---|---|---|
| **Wilson County** | | | |
| USD 387 - Altoona-Midway | 201 | 23 | 8 |
| USD 461 - Neodesha | 701 | 64 | 8 |
| USD 484 - Fredonia | 688 | 60 | 9 |
| **Woodson County** | | | |
| USD 366 - Woodson County | 466 | 41 | 6 |

The following maps present regional school district boundaries by county. Note that not all participating counties and jurisdictions had this information available for use. Capability information for each participating district is presented Section 4.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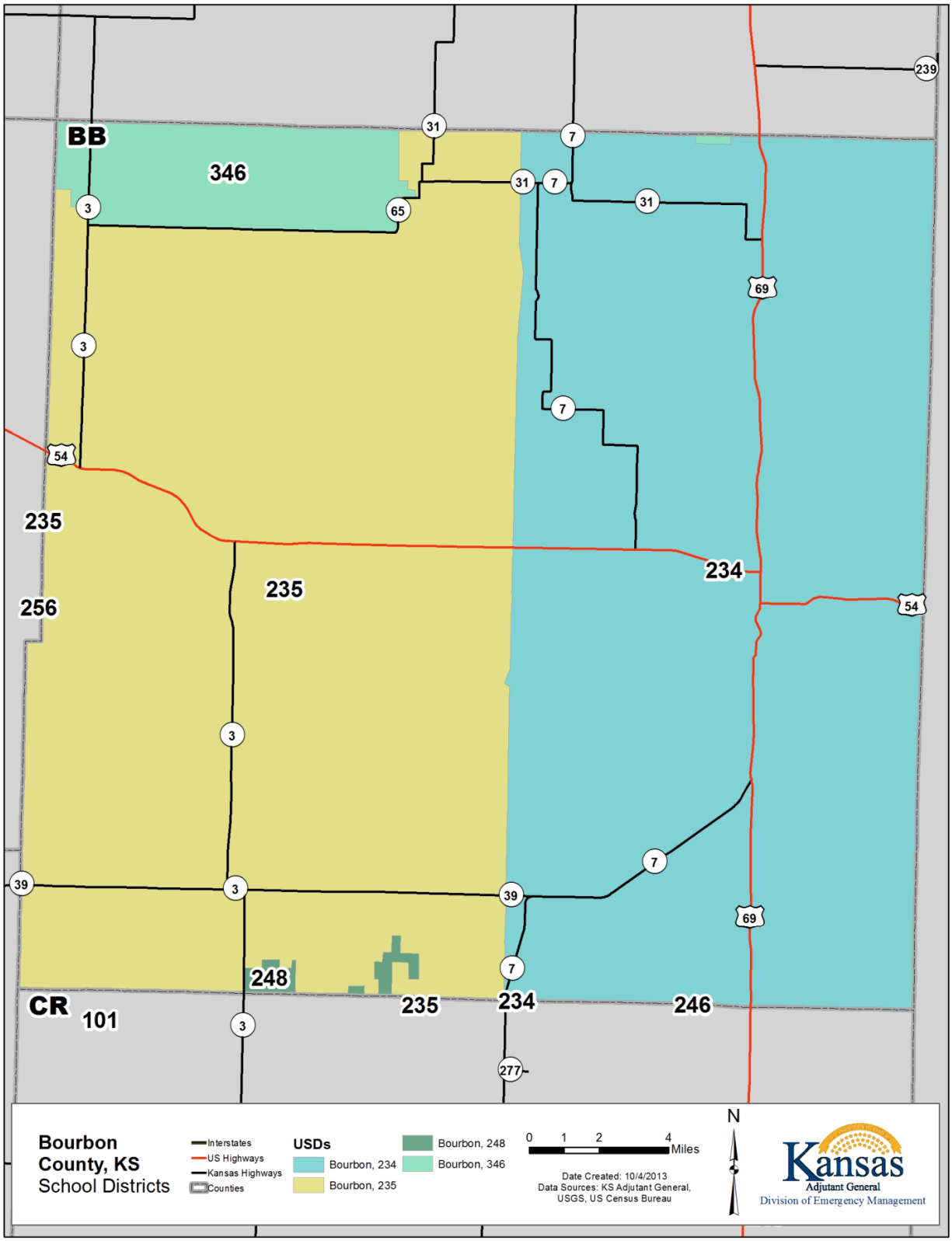
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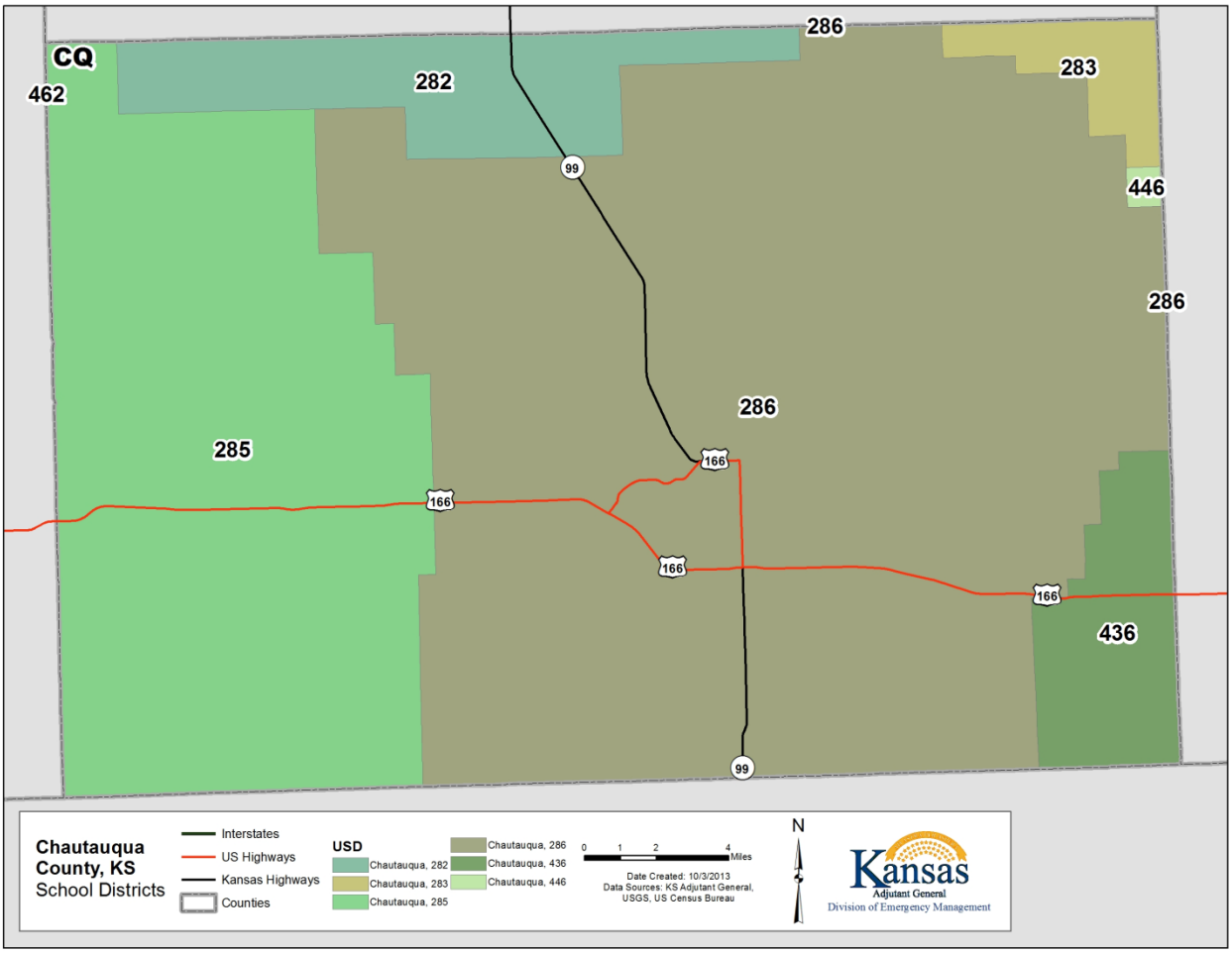
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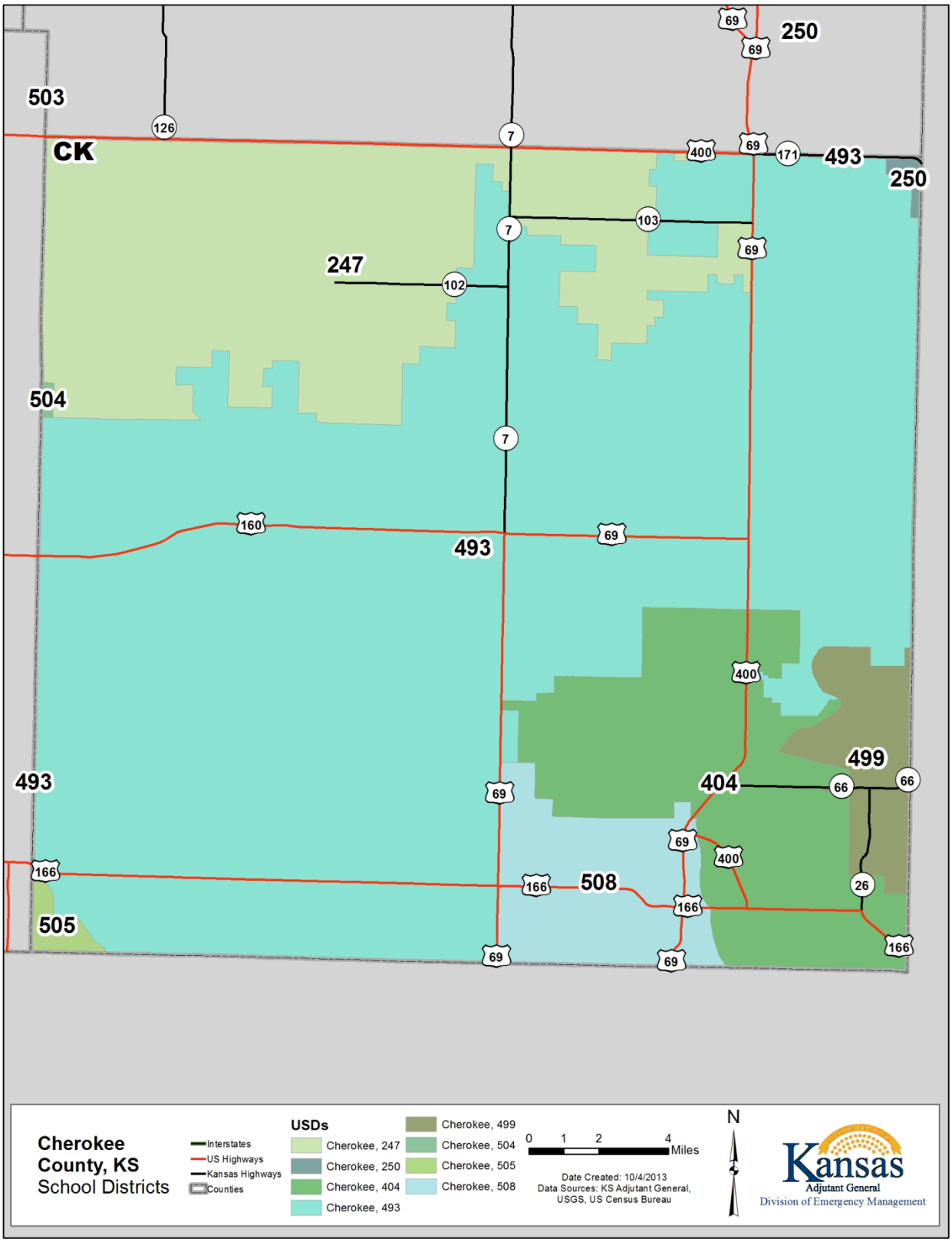

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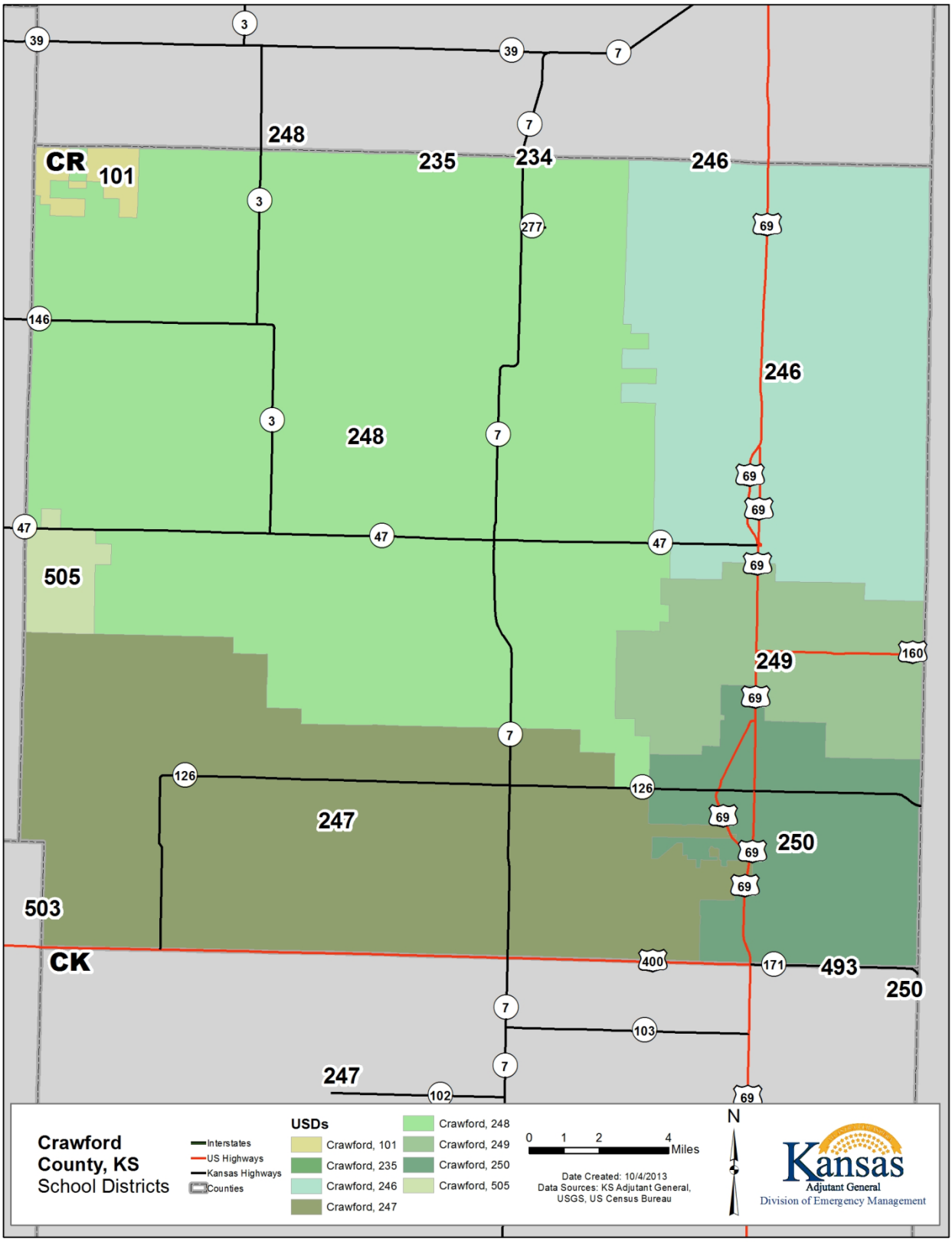

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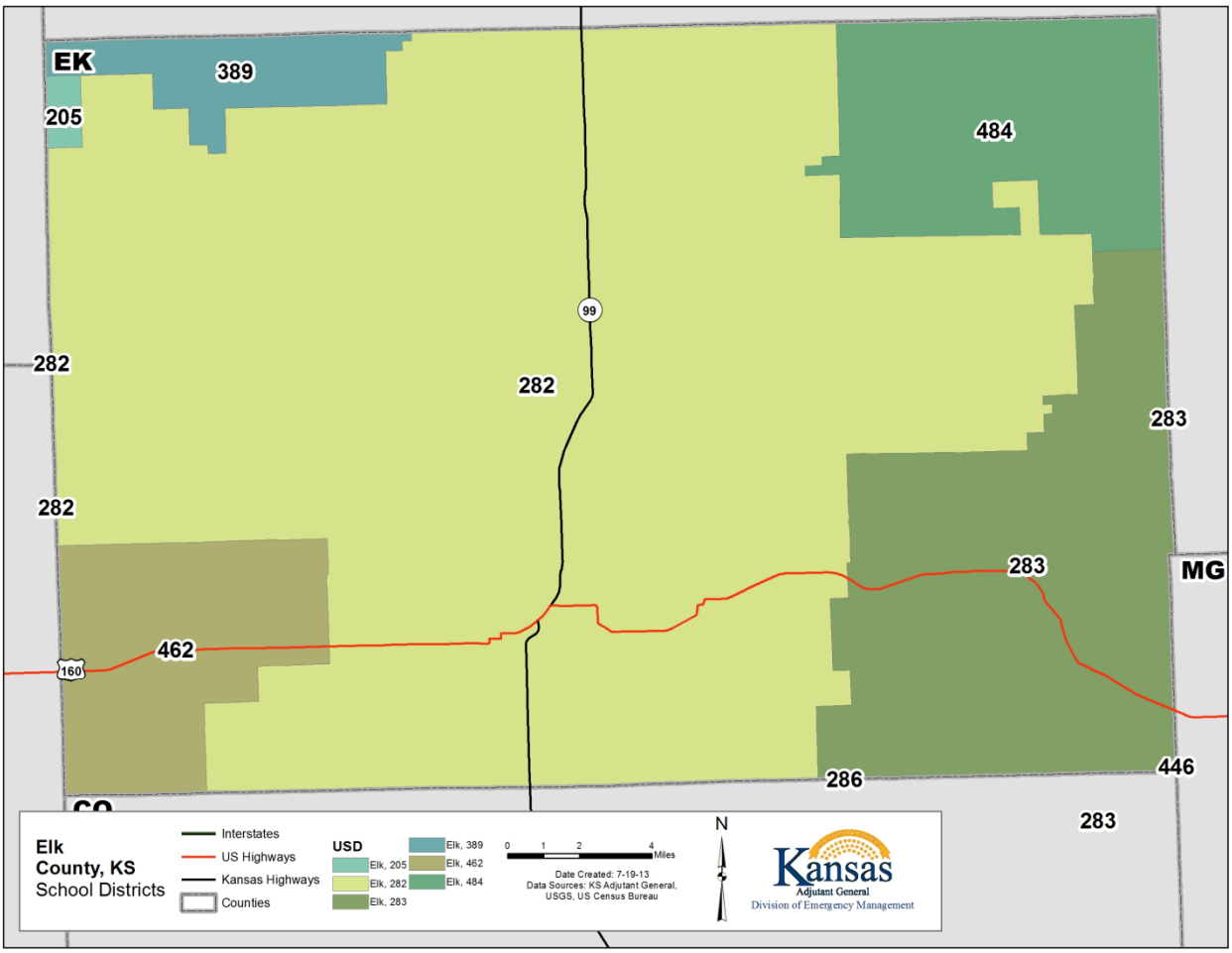
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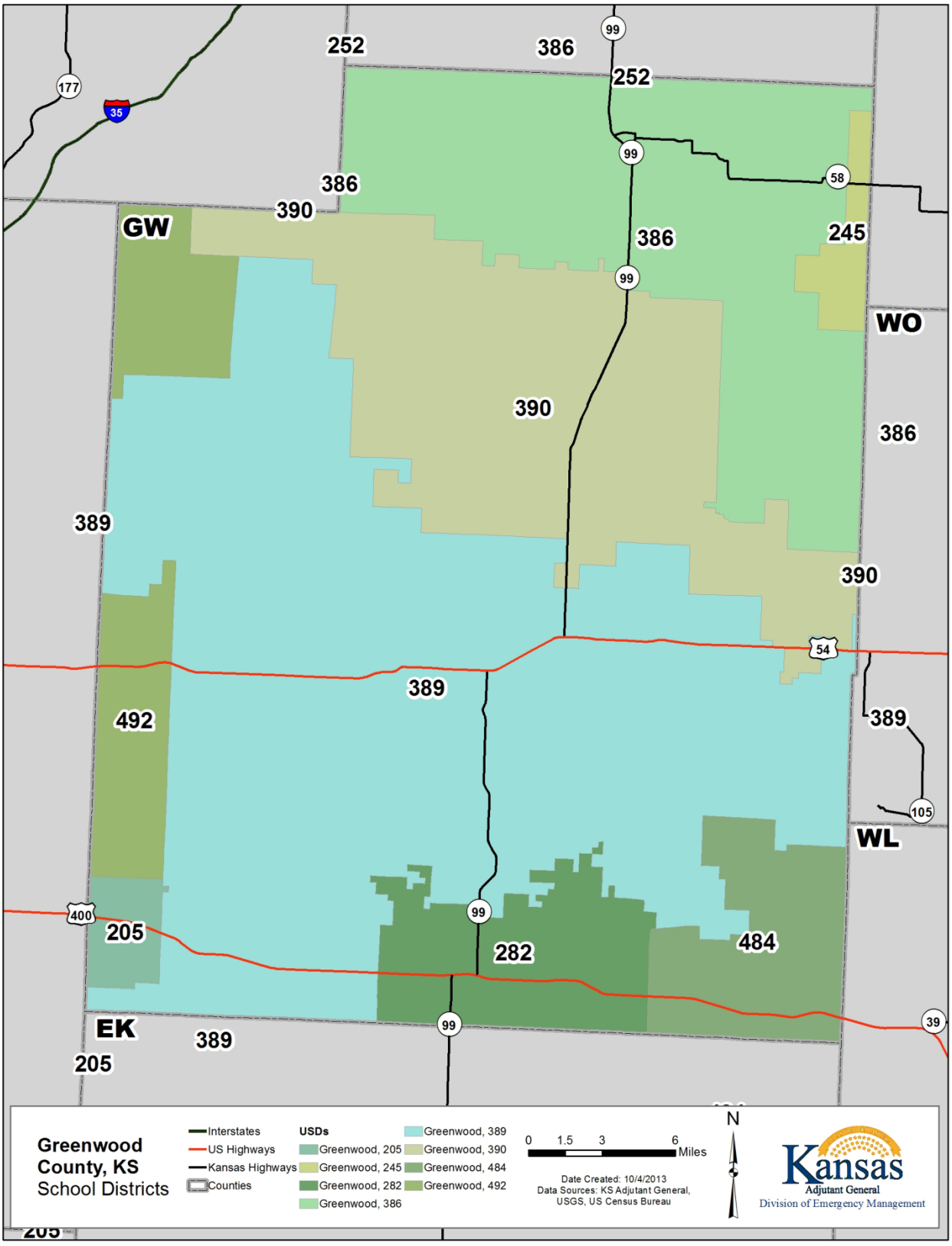

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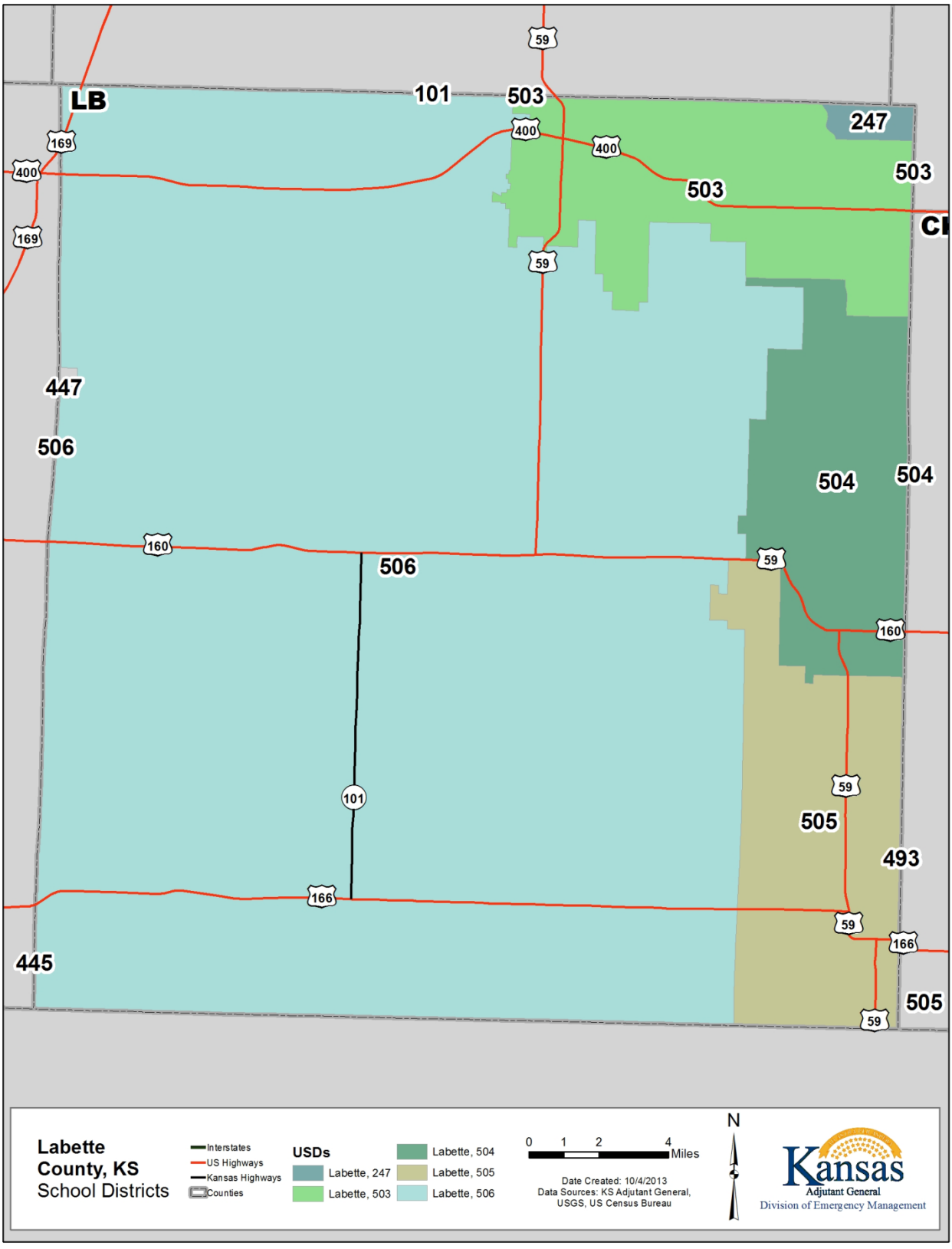
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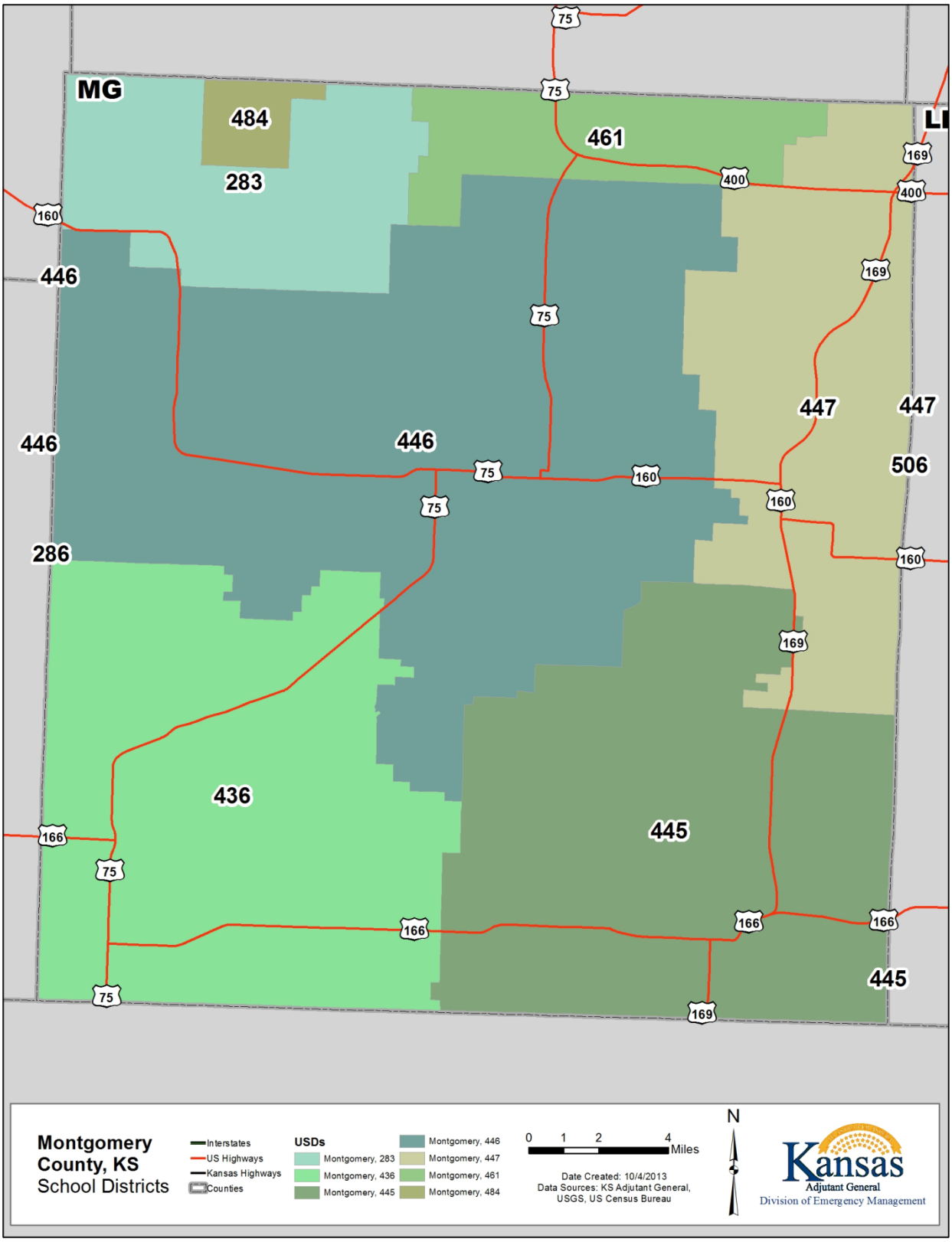
Division of Emergency Management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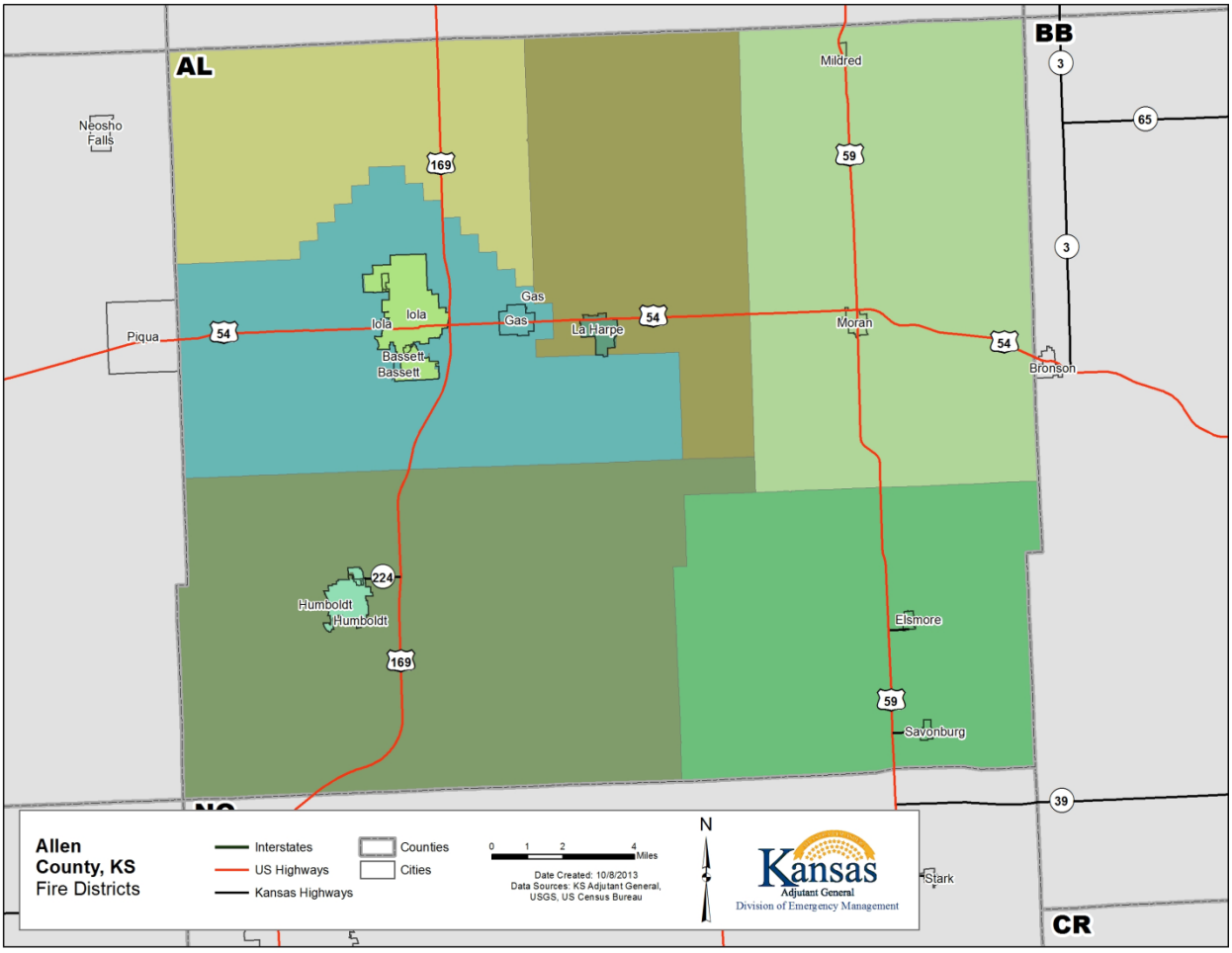
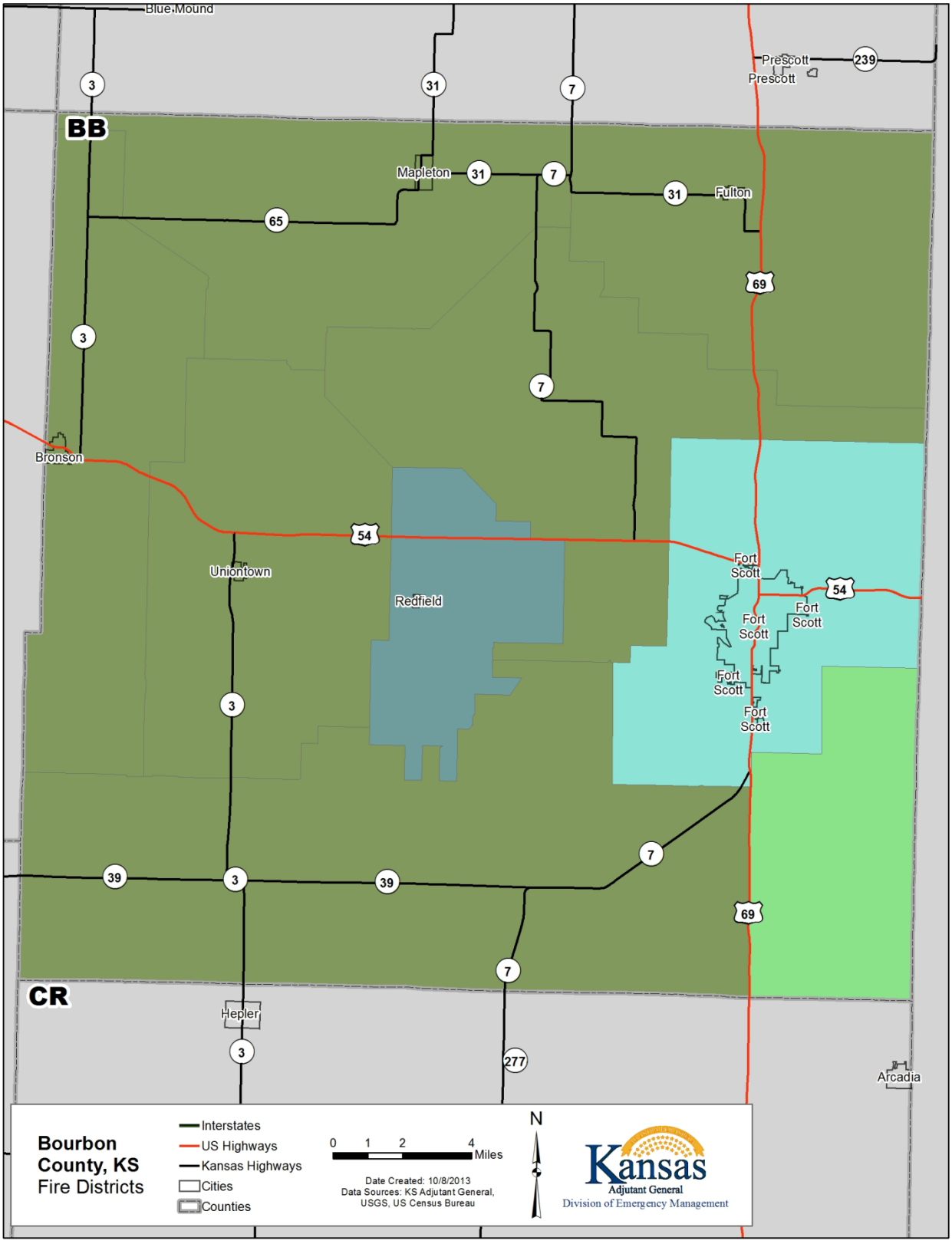
## 2.15 FIRE DISTRICT BOUNDARIES

The following maps present regional school district boundaries by county. Note that not all participating counties and jurisdictions had this information available for use.

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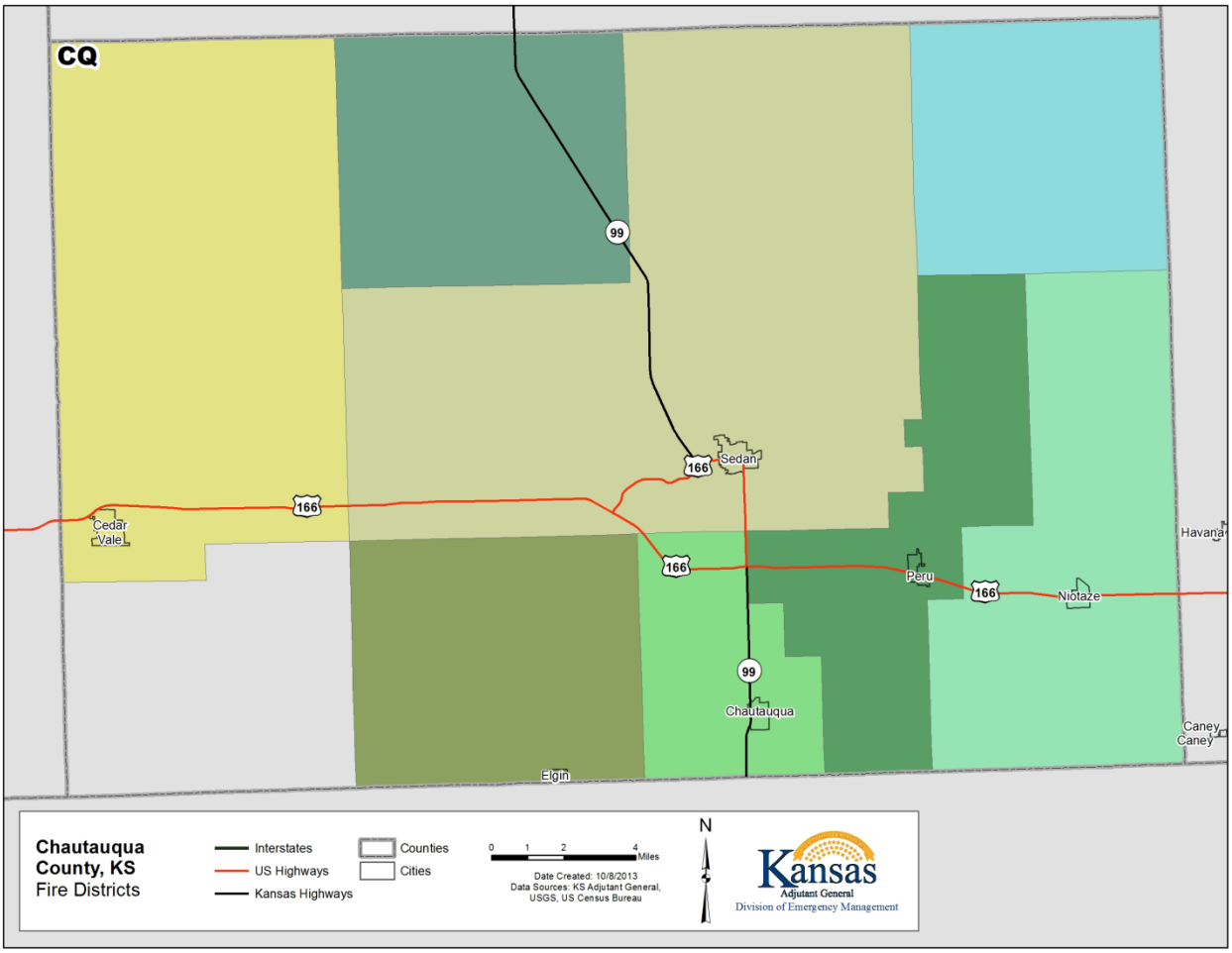
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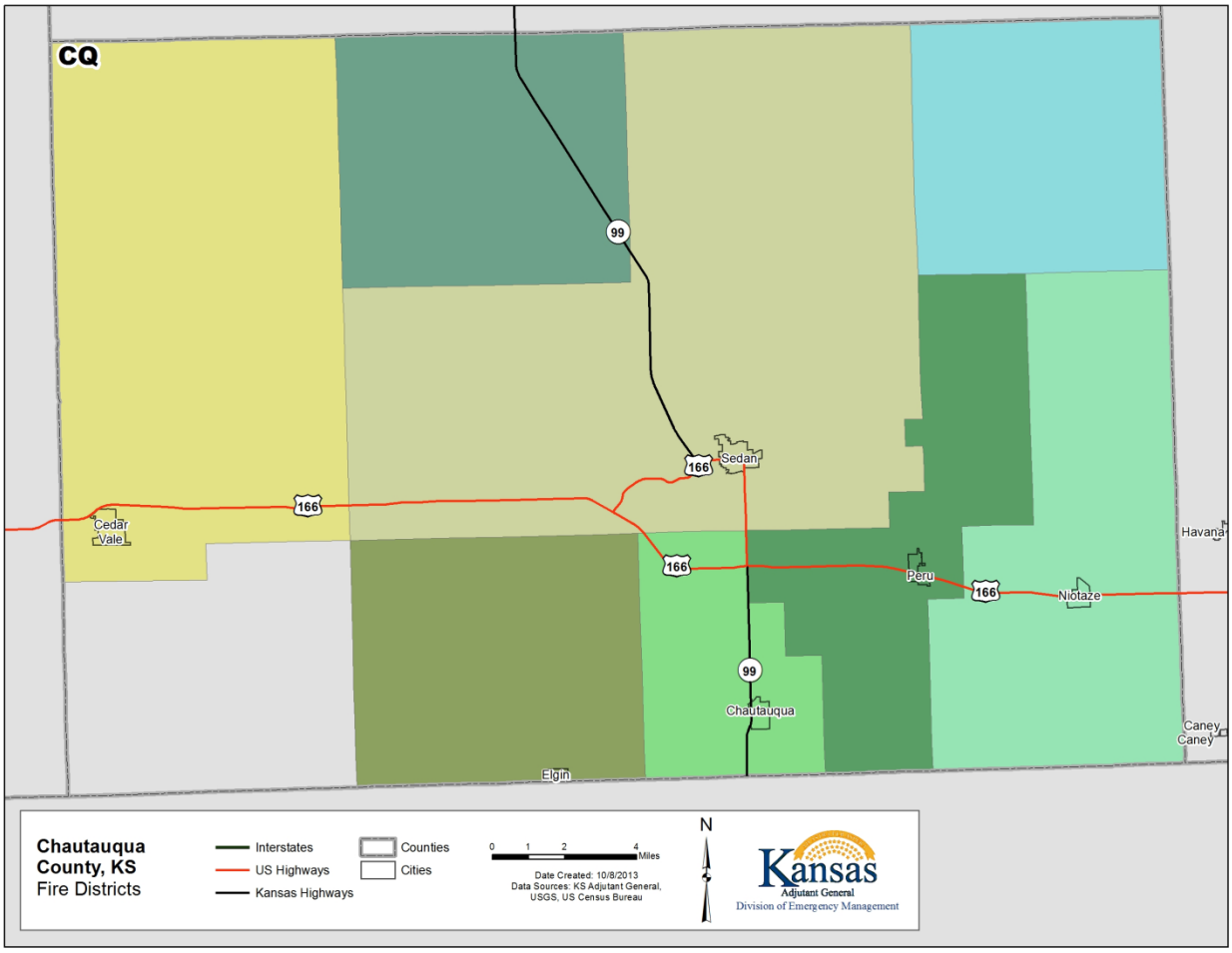
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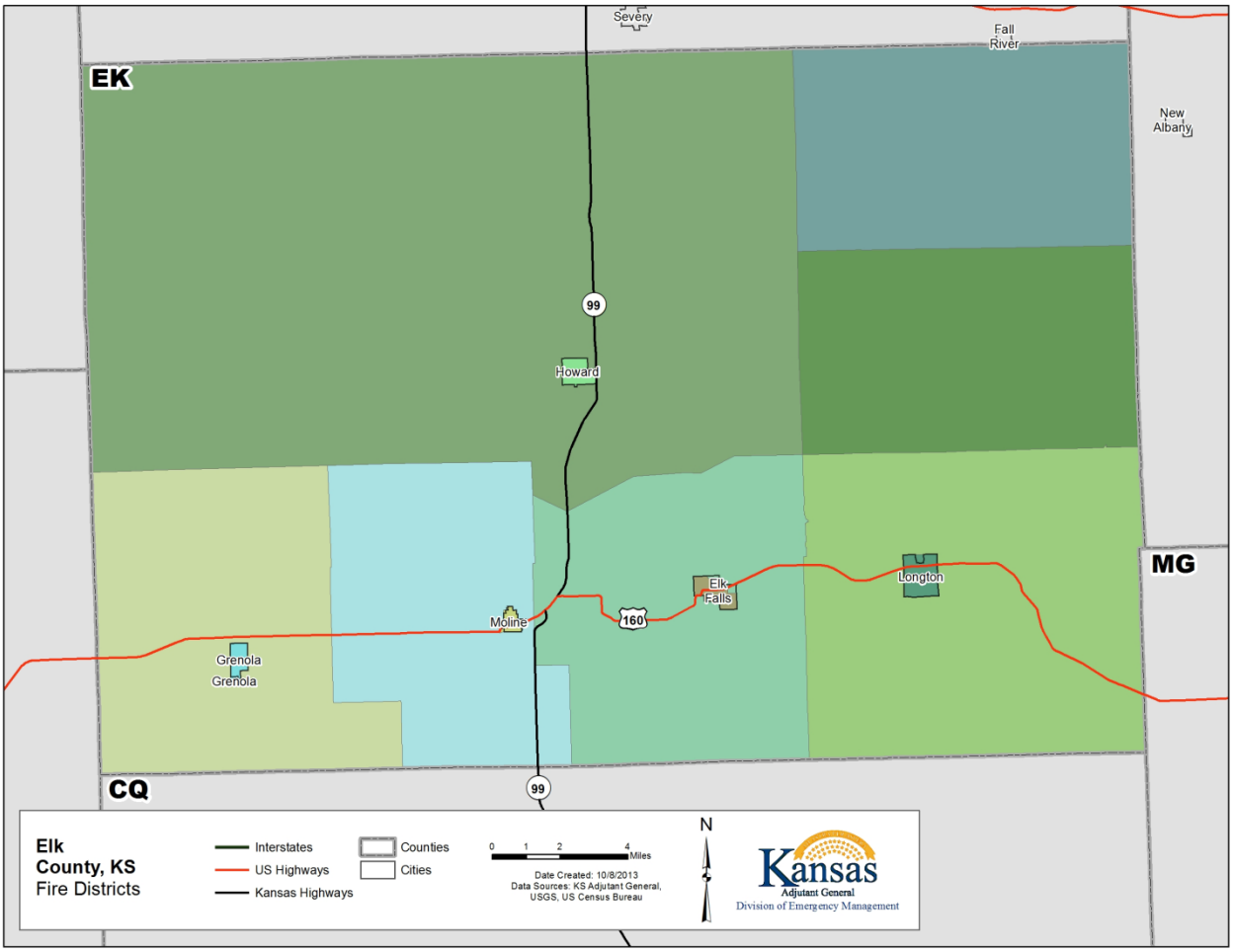



## 2.16 REGIONAL THREATENED AND ENDANGERED SPECIES

The Endangered Species Act (ESA) established a Federal program to conserve, protect, and restore threatened or endangered plants and animals, as well as their habitats. ESA specifically charges Federal agencies with the responsibility of using their authority to conserve threatened or endangered species. Jurisdictions using funding from the Federal government cannot authorize any actions that jeopardize the existence of an endangered or threatened species, or result in the destruction of habitats for these species. The following provide definitions for endangered and threatened species:

- **Endangered species:** any species of wildlife whose continued existence as a viable component of the state's wild fauna is determined to be in jeopardy. That term shall also include any species of wildlife determined to be an endangered species pursuant to Pub. L. No. 93-205 (December 28, 1973), the Endangered Species Act of 1973, and amendments thereto
- **Threatened species:** any species of wildlife which appears likely, within the foreseeable future, to become an endangered species. That term shall also include any species of

wildlife determined to be a threatened species pursuant to Pub. L. No. 93-205 (December 28, 1973), the Endangered Species Act of 1973, and amendments thereto.

The following table is a list of the endangered or threatened species for the region.

- American Burying Beetle
- Arkansas Darter
- Gray Bat
- Mead's Milkweed
- Neosho Madtom
- Neosho Mucket
- Topeka Shiner

# 3.0 RISK ASSESSMENT

## 3.1 INTRODUCTION

*44 CFR 201.6(C) Plan content. The plan shall include the following: (2) risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.*

The ultimate purpose of this Hazard Mitigation Plan is to minimize the loss of life and property in the planning region. In order to accomplish this all relevant hazards, potential vulnerabilities and exposures for the region have been identified. Once potential hazards, vulnerabilities and exposure have been identified communities within the region are able to conceptualize their potential risks as part of a risk assessment process. Based on this understanding of risk, communities can then develop a strategy to identify and prioritize mitigation action to defend against these potential risks. The following table presents a definition of terms used within this section.

**Definition of Terms**

| Term | Definition |
|---|---|
| Hazard | A potential source of injury, death or damage |
| Vulnerability | Susceptibility to injury, death or damage |
| Exposure | People and property within the area the potential hazard could affect |
| Risk | Function of potential hazard, vulnerability and exposure, it is the likelihood of a hazard event resulting in injury, death or damage |
| Risk Mitigation | A systematic reduction in the exposure and vulnerability to a potential hazard |

## 3.2 METHODOLOGY

The risk assessment for southeastern Kansas followed the methodology described in the FEMA Local Mitigation Planning Handbook (March 2013)." FEMA recommends the following steps be taken, with each step described in further detail in the following sections:



## 3.3 IDENTIFY POTENTIAL HAZARDS

*44 CFR 201.6(C)(2)(i) A description of the type, location, and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.*

The hazard identification was compiled by investigating the various hazard occurrences within the southeastern Kansas region. The HMPC identified 21 natural hazards that may affect the planning area and organized these hazards to be consistent with the Kansas Hazard Mitigation Plan (2013). These hazards are listed below and profiled in further detail in the next sections.

- Agricultural Infestation
- Civil Disorder
- Drought
- Earthquake
- Expansive Soils
- Extreme Temperatures
- Flood
- Hailstorm
- Hazardous Materials
- Land Subsidence
- Landslide
- Lightning
- Major Disease Outbreak
- Radiological
- Soil Erosion and Dust
- Terrorism/Agri-terrorism
- Tornado
- Utility/Infrastructure Failure
- Wildfire
- Wind Storm
- Winter Storm

For purposes of this multi-jurisdictional plan, hazards were identified initially by county to include all participating jurisdictions within that county, and then expanded to a regional basis.

Based on discussion with the HMPC and a lack of identified risk or history, numerous FEMA identified hazards, such as avalanche, coastal erosion, hurricane, tsunami and volcano, were not included in the scope of this plan.

## 3.4 PROFILE HAZARD EVENTS

Based on the identification of potential hazards, each hazard is profiled to provide data concerning previous occurrences, the probability of future occurrence and the threat to the

planning area. As Southeast Kansas is generally uniform in terms of climate, topography, building characteristics and development trends, overall hazards and vulnerability do not vary greatly across the planning area. Weather-related hazards such as drought, extreme temperatures, hail, tornados, windstorms and winter storms affect the entire planning area. As such, one general profile will be created for these hazards. However, some hazards such as dam and levee failure, flood and landslide may have local variances and multiple profiles may be developed if the risk does not match with the entire planning area .

For each identified hazard the following information is provided:

- Hazard Description: a general discussion of the hazard and includes information on potential warning time, the potential duration of the event, and potential impacts
- Hazard Location: the geographic extent or location of the hazard in the planning area
- Previous Occurrences and Extent: information on historic incidents and their impacts
- Hazard Vulnerability and Impact: discussion of the vulnerability of the region, or specific jurisdiction as appropriate, and potential impacts of identified hazards
- Future Development: potential results of future development related to hazards
- Probability of Future Occurrence: frequency of past events used to gauge the likelihood of future occurrences
- Consequence Analysis: analysis the potential impacts using set criteria

***Calculated Priority Risk Index***

The southeast Kansas HMPC used the calculated priority risk index (CPRI) methodology to prioritize each of the identified hazards. CPRI prioritization considers the following four elements of risk:

- Probability
- Magnitude/Severity
- Warning Time
- Duration

The following tables provide a summary for each of the risk elements, including a rationale behind each numerical rating.

| | Rating | Rating Parameters |
|---|---|---|
| **Probability** | **4** Highly Likely | Event is probable within the calendar year |
| | | Event has up to 1 in 1 year chance of occurring (1/1=100%) |
| | | History of events is greater than 33% likely per year |
| | | Event is "highly likely" to occur |
| | **3** Likely | Event is probable within the next three years |
| | | Event has up to 1 in 3 years chance of occurring (1/3=33%) |
| | | History of events is greater than 20% but less than or equal to 33% likely per year |
| | | Event is "likely" to occur |
| | **2** Occasional | Event is probable within the next five years |
| | | Event has up to 1 in 5 years chance of occurring (1/5=20%) |
| | | History of events is greater than 10% but less than or equal to 20% likely per year |
| | | Event could "possibly" occur |
| | **1** Unlikely | Event is possible within the next 10 years |
| | | Event has up to 1 in 10 years chance of occurring (1/10=10%) |
| | | History of events is less than or equal to 10% likely per year |
| | | Event is "unlikely" but occurrence is possible |

| | Rating | Rating Parameters |
|---|---|---|
| **Magnitude /Severity** | **4** Catastrophic | Multiple deaths |
| | | Complete shutdown of facilities for 30 or more days |
| | | More than 50 percent of property is severely damaged |
| | **3** Critical | Injuries and/or illnesses result in permanent disability |
| | | Complete shutdown of critical facilities for at least two weeks |
| | | 25–50 percent of property is severely damaged |
| | **2** Limited | Injuries and/or illnesses do not result in permanent disability |
| | | Complete shutdown of critical facilities for more than one week |
| | | 10–25 percent of property is severely damaged |
| | **1** Negligible | Injuries and/or illnesses are treatable with first aid |
| | | Minor quality of life lost |
| | | Shutdown of critical facilities and services for 24 hours or less |
| | | Less than 10 percent of property is severely damaged |

| Warning Time | Rating | Rating Parameters |
|---|---|---|
| | 4 | Less than 6 hours |
| | 3 | 6-12 hours |
| | 2 | 12-24 hours |
| | 1 | 24+ hours |

| Duration | Rating | Rating Parameters |
|---|---|---|
| | 4 | More than 1 week |
| | 3 | Less than 1 week |
| | 2 | Less than 1 day |
| | 1 | Less than 6 hours |

Using the rankings described in the tables above, the following weighted formula was used to determine each hazard's CPRI:

**(Probability x 0.45)** + **(Magnitude/Severity x 0.30)** + **(Warning Time x 0.15)** + **(Duration x 0.10)**

Based on their CPRI, each hazard was assigned a planning significance category. Each planning significance category was assigned a CPRI range, with a higher score indicating greater planning criticality. The following table details planning significance CPRI ranges.

**CPRI Range Planning Significance**

| | CPRI Range | |
|---|---|---|
| **Planning Significance** | **Low CPRI** | **High CPRI** |
| **High** | 3.0 | 4.0 |
| **Moderate** | 2.0 | 2.9 |
| **Low** | 1.0 | 1.9 |

The terms high, moderate and low indicate the level of prioritization of planning effort for each hazard, and do not indicate the potential impact of a hazard occurring. Hazards rated with moderate or high planning significance were more thoroughly investigated and discussed due to the availability of data and historic occurrences, while those with a low planning significance were generally addressed due to lack of available data and historical occurrences. The following table shows previous CPRI ratings for each county. Based on discussions with the HMPC, the CPRIs were reviewed and approved or modified as required

## County Specific Calculated Hazard CPRI Planning Significance

| | Allen | Bourbon | Chautauqua | Cherokee | Crawford | Elk | Greenwood | Labette | Montgomery | Neosho | Wilson | Woodson |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Agricultural Infestation** | 1.6 | 1.6 | 2.05 | 1.6 | 2.05 | 2.5 | 1.6 | 2.5 | 2.5 | 2.95 | 1.6 | 2.05 |
| **Civil Disorder** | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 |
| **Dam and Levee Failure** | 2.05 | 2 | 2 | 1.3 | 1.75 | 2.5 | 2 | 2.05 | 2.6 | 2.65 | 1.75 | 1.55 |
| **Drought** | 2.35 | 2.5 | 2.5 | 2.95 | 2.5 | 2.05 | 2.5 | 2.8 | 2.8 | 2.5 | 2.35 | 1.75 |
| **Earthquake** | 1.45 | 1.6 | 1.45 | 1.45 | 1.75 | 1.9 | 1.6 | 1.45 | 1.45 | 1.45 | 1.45 | 1.45 |
| **Expansive Soils** | 1.3 | 1.3 | 1.3 | 1.3 | 2.5 | 1.75 | 1.3 | 2.2 | 1.75 | 1.75 | 1.75 | 1.3 |
| **Extreme Temperature** | 1.95 | 2.4 | 1.8 | 3 | 2.5 | 1.95 | 2.3 | 2.4 | 2.4 | 2.4 | 2.4 | 2.05 |
| **Flood** | 2.85 | 3.3 | 2.55 | 3.6 | 3 | 2.55 | 3.3 | 3.3 | 2.85 | 2.85 | 2.85 | 2.55 |
| **Hailstorm** | 2.05 | 3.1 | 2.8 | 3.25 | 2.95 | 2.5 | 3.1 | 2.5 | 2.5 | 2.8 | 1.6 | 2.8 |
| **Hazardous Materials** | 1.85 | 1.85 | 1.85 | 3.1 | 2.75 | 1.85 | 1.85 | 1.85 | 1.85 | 1.85 | 1.85 | 1.85 |
| **Land Subsidence** | 1.9 | 1.9 | 1.9 | 1.9 | 3.4 | 1.75 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 |
| **Landslide** | 1.75 | 1.75 | 1.75 | 1.75 | 1.3 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 |
| **Lightning** | 1.9 | 1.9 | 2.35 | 1.45 | 1.9 | 2.05 | 1.9 | 2.5 | 2.05 | 2.05 | 1.9 | 2.35 |
| **Major Disease Outbreak** | 1.9 | 1.9 | 1.9 | 2.2 | 2.5 | 1.9 | 1.9 | 1.9 | 2.65 | 1.9 | 1.9 | 1.9 |
| **Radiological** | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 |
| **Soil Erosion & Dust** | 1.75 | 1.75 | 1.75 | 1.75 | 1.6 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.6 |
| **Terrorism, Agri-Terrorism** | 1.75 | 2 | 1.75 | 1.75 | 1.75 | 1.75 | 2 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 |
| **Tornado** | 3.7 | 2.95 | 2.95 | 3.25 | 3.25 | 2.95 | 2.95 | 3.4 | 3.4 | 3.4 | 3.25 | 2.8 |
| **Utility / Infrastructure Failure** | 2.75 | 2.1 | 2.8 | 2.75 | 2.85 | 2.85 | 2.1 | 2.85 | 2.85 | 2.85 | 2.75 | 3.7 |
| **Wildfire** | 2.3 | 3.6 | 2.65 | 3 | 3.2 | 2.9 | 3.6 | 2.45 | 2.45 | 2.45 | 2 | 2.2 |
| **Windstorm** | 2.15 | 3.05 | 3.2 | 3.35 | 3.2 | 2.6 | 2.6 | 2.15 | 3.05 | 2.9 | 2.15 | 3.2 |
| **Winter Storm** | 3 | 3 | 3.1 | 3.3 | 2.85 | 3 | 3.1 | 3 | 3 | 3 | 3 | 3.4 |

Based on the above noted county specific CPRIs, a regional CPRI was calculated for the region. The following table summarizes CPRI rating for each identified hazard.

**Regional Calculated Hazard CPRI Planning Significance**

| Hazard | Probability | Magnitude/ Severity | Warning Time | Duration | CPRI |
|---|---|---|---|---|---|
| Agricultural Infestation | 2.00 | 2.00 | 1.00 | 4.00 | **2.05** |
| Civil Disorder | 1.00 | 2.00 | 4.00 | 1.00 | **1.75** |
| Dam and Levee Failure | 1.58 | 2.33 | 2.25 | 2.67 | **2.02** |
| Drought | 2.75 | 2.25 | 1.00 | 4.00 | **2.46** |
| Earthquake | 1.08 | 1.42 | 3.50 | 1.00 | **1.54** |
| Expansive Soils | 1.67 | 1.08 | 1.00 | 4.00 | **1.63** |
| Extreme Temperature | 2.75 | 1.92 | 1.17 | 3.08 | **2.30** |
| Flood | 3.25 | 2.92 | 2.17 | 3.00 | **2.96** |
| Hailstorm | 3.75 | 1.50 | 2.83 | 1.00 | **2.66** |
| Hazardous Materials Event | 1.42 | 2.00 | 4.00 | 1.92 | **2.03** |
| Land Subsidence | 2.17 | 1.08 | 2.08 | 4.00 | **2.01** |
| Landslide | 1.17 | 1.75 | 3.75 | 1.00 | **1.71** |
| Lightning | 2.50 | 1.25 | 2.83 | 1.00 | **2.03** |
| Major Disease Outbreak | 1.25 | 3.08 | 1.00 | 4.00 | **2.04** |
| Radiological Event | 1.00 | 1.00 | 4.00 | 4.00 | **1.75** |
| Soil Erosion & Dust | 1.83 | 1.17 | 1.00 | 4.00 | **1.73** |
| Terrorism, Agri-Terrorism | 1.17 | 2.00 | 3.67 | 1.17 | **1.79** |
| Tornado | 3.25 | 3.42 | 4.00 | 1.00 | **3.19** |
| Utility / Infrastructure Failure | 2.83 | 2.17 | 3.67 | 2.92 | **2.77** |
| Wildfire | 3.17 | 1.67 | 4.00 | 2.08 | **2.73** |
| Windstorm | 3.58 | 1.83 | 2.92 | 2.00 | **2.80** |
| Winter Storm | 3.92 | 2.25 | 2.00 | 3.25 | **3.06** |

***Emergency Management Accreditation Program Consequence Analysis***

The Emergency Management Accreditation Program (EMAP) is a voluntary review process for local emergency management program. EMAP accreditation is a means of demonstrating that a program meets national standards for emergency management programs. In an effort to foster EMAP accreditation, a consequence analysis of the potential for detrimental impacts of hazard was conducted. In this analysis the potential impacts of all 21 of the above referenced hazards have been addressed in regards to:

- Health and safety of persons in the area of the incident
- Responders
- Continuity of Operations
- Property, Facilities, and Infrastructure
- Delivery of Services

- Environment
- Economic Conditions
- Public Confidence in Governance

Available data and estimations of potential future events for each of the identified hazards was used to provide guidance for a consequence analysis. The ranking elements are categorized as Minimal, Moderate, or Severe, with a methodology for the rankings provided in the following table.

**EMAP Ranking Methodology**

| Impact On | Minimal | Moderate | Severe |
|---|---|---|---|
| Public | Less than 5 people | Between 5 to 14 people | 15 people or greater |
| Responders | Less than 5 people | Between 5 to 14 people | 15 people or greater |
| Continuity of Operations | 0 days | 1 to 7 days | 8 or greater days |
| Delivery of Services | Less than 1 day | 1 to 7 days | 8 or greater days |
| Property, Facilities, & Infrastructure | Less than $1.37 per capita | $1.37 to $10.00 per capita | Greater than $10.01 per capita |
| Environment | Less than 10% | 10% to 20% | Greater than 20.01% |
| Economy | Less than 8% unemployment | 8% to 15% unemployment | Greater than 15% unemployment |
| Public Confidence | Less than 1% | 1.0% to 10% | Greater than 10.01% |

The ratings are meant to be only a guide due to the variances that could apply such as population, location, time, hazard type, and the amount of jurisdictions within the hazard area. The results of the EMAP consequence analysis are presented in each hazard profile's Consequence Analysis Section.

## 3.5 REGIONAL VULNERABILITY ASSESSMENT

*(ii) A description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community. All plans approved after October 1, 2008 must also address NFIP insured structures that have been repetitively damaged by floods. The plan should describe vulnerability in terms of:*

*(A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas;*

*(B) An estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate;*

*(C) Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.*

*(iii) For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.*

Each identified hazard is detailed to meet the above stated criteria, including potential regional variances. For these variances, where the risk may vary on a local basis, a discussion is included identifying the unique risk or concern under the relevant hazard. In addition, a complete discussion of regional population, business, land use, special needs and development trends as part of the regional vulnerability assessment is presented in Section 2.

## 3.6 HISTORICAL DISASTER DECLARATIONS

The HMPC reviewed federal and state disaster declarations to assist in hazard identification. Federal and state declarations may be enacted when local governments are unable to cope with the magnitude of an event. In those cases a state disaster declaration may be issued, allowing for state assistance. In more extreme cases, when both the local and state governments' abilities are inadequate; a federal disaster declaration may be issued allowing federal assistance. These federal disaster declarations may be issued through a variety of agencies based on the scale and sectors affected.

The following information on past declared disasters is presented to provide a historical perspective on potential hazards that could impact southeast Kansas. The information was obtained from the FEMA and KDEM. Many of the disaster events reported in the following tables were multi-regional or statewide. As a result, the reported costs do not solely reflect losses to southeast Kansas. Further discussion of disasters and events may be found under the relevant hazard in the following sections.

**Major Disaster Declarations**

| Declaration Number | Declaration Date* | Disaster Description | Regional Counties Involved | Total Cost** |
|---|---|---|---|---|
| 1932 | 8/10/2010 (6/7-7/21/2010) | Severe Storms, Flooding and Tornados | Elk, Greenwood, Wilson and Woodson | $9,279,257 |
| 1885 | 3/9/2010 (12/9/2009-1/8/2010) | Severe Winter Storms and Snowstorm | Allen, Bourbon, Brown, Cherokee, Crawford, Elk, Greenwood, Labette, Neosho, Wilson and Woodson | $19,100,658 |
| 1860 | 9/30/2009 (7/8-7/14/2009) | Severe Storms and Flooding | Anderson and Bourbon, | $3,347,662 |
| 1849 | 6/25/2009 (4/25-5/16/2009) | Severe Storms, Flooding, Straight-line Winds, and Tornados | Anderson, Bourbon, Cherokee, Crawford, Elk, Greenwood, Labette, Montgomery, Neosho and Wilson | $15,013,488 |
| 1848 | 6/24/2009 (3/26-29/2009) | Severe Winter Storm and Record and Near Record Snow | Chautauqua, Elk, Greenwood and Woodson | $20,174,657 |
| 1808 | 10/31/2008 | Severe Storms, Flooding, and Tornados | Greenwood | $4,167,044 |

**Major Disaster Declarations, Continued**

| Declaration Number | Declaration Date* | Disaster Description | Counties Involved | Disaster Cost** |
|---|---|---|---|---|
| 1741 | 2/1/2008 | Severe Winter Storms | Cherokee, Crawford, Labette and Woodson. | $359,557,345 |
| 1711 | 7/2/2007 (6/26-30/2007) | Severe Storms and Flooding | Allen, Bourbon, Chautauqua, Cherokee, Crawford, Elk, Greenwood, Labette, Montgomery, Neosho, Wilson and Woodson | $40,238,600 |
| 1699 | 5/6/2007 (5/4/2007) | Severe Storms, Tornados, and Flooding | Cherokee | $117,565,269 |
| 1600 | 8/23/2005 (6/30-7/1/2005) | Severe Storms and Flooding | Cherokee, Crawford, Neosho | $4,344,569 |
| 1579 | 2/8/2005 (1/4-6/2005) | Severe Winter Storm, Heavy Rains, and Flooding | Chautauqua, Crawford, Elk, Greenwood, and Woodson | $106,873,672 |
| 1535 | 8/3/2004 (6/12-7/25/2004) | Severe Storms, Flooding, and Tornados | Cherokee, Labette and Woodson | $12,845,892 |
| 1462 | 5/6/2003 (5/4-30/2003) | Severe Storms, Tornados, and Flooding | Allen, Cherokee, Crawford, Labette, Neosho and Woodson | $988,056 |
| 1402 | 2/6/2002 (1/29-2/15/2002) | Ice Storm | Allen, Bourbon, Chautauqua, Cherokee, Crawford, Elk, Greenwood, Labette, Montgomery, Neosho, Wilson and Woodson | $60,185,754 |
| 1327 | 5/3/2000 (4/19/2000) | Severe Storms and Tornados | Crawford, Labette, Neosho | $2,542,209 |
| 1258 | 11/5/1998 (10/30-11/15/1998) | Severe Storms and Flooding | Greenwood, Neosho, Wilson and Woodson | $16,688,650 |
| 1254 | 10/14/1998 (10/1-10/8/1998) | Severe Storms, Flooding, and Tornados | Bourbon, Cherokee | $9,770,769 |
| 1000 | 7/22/1993 (6/28-10/5/1993) | Flooding, Severe Storms | Cherokee and Crawford, | $99,790,368 |
| 780 | 10/22/1986 (10/2-10/4/1986) | Severe Storms, Flooding | Allen, Bourbon, Chautauqua, Cherokee, Elk, Labette, Montgomery, Neosho and Wilson | $2,344,121 |

**Major Disaster Declarations, Continued**

| Declaration Number | Declaration Date* | Disaster Description | Counties Involved | Disaster Cost** |
|---|---|---|---|---|
| 514 | 7/13/1976 | Severe Storms, High Winds, Flooding | Cherokee, Crawford, Elk, Greenwood, Labette, Neosho, Montgomery and Wilson | $1,794,942 |
| 378 | 5/2/1973 | Severe Storms, Flooding | Bourbon, Chautauqua, Cherokee, Crawford, Greenwood, Labette, Montgomery and Woodson | $1,954,624 |
| 229 | 7/18/1967 | Tornados, Severe Storms, Flooding | Crawford | $847,439 |

Sources: FEMA and Kansas Division of Emergency Management

* Incident dates are in parentheses.

** Disaster costs include Public Assistance and Individual Assistance

## 3.7 HAZARD PROFILES

Each identified hazard is profiled in this section, with the level of detail varying based on available information. Sources of information have been generally cited in the above sections and are specifically cited in the detailed hazard profiles below.

Each profile describes the hazard and its location, previous occurrences, potential impact, and its probability of future hazard events. Additionally, the profiles explore regional vulnerability analysis, estimates of potential losses, development in hazard prone areas and the hazard impact overview. The magnitude of the impact caused by a hazard event (actual and perceived) is related directly to the vulnerability of the people, property, and the environment. This is a function of when the event occurs, the jurisdictions and community sectors affected, the resilience of the community, and the effectiveness of the emergency response and disaster recovery efforts.

For this 2013 Hazard Mitigation update, each profile was updated with additional historical impact information, where available. The vulnerability assessment and state estimates of potential losses have been expanded for all hazards addressed in the plan where sufficient data is available. In addition, statewide flood and earthquake losses have been quantified using HAZUS-MH 2.1.

With each update of this plan, new information will be incorporated to provide for better evaluation and prioritization of the hazards that affect southeast Kansas.

The following hazards are presented in alphabetical order, and not by CPRI planning significance rating, for ease of reference.

### 3.7.1 AGRICULTURAL INFESTATION

| | Probability | Magnitude/Severity | Warning Time | Duration | CPRI |
|---|---|---|---|---|---|
| Agricultural Infestation | 2.00 | 2.00 | 1.00 | 4.00 | **2.05** |

**Description**

Agricultural infestation is a naturally occurring infection of crops or livestock that may cause them to be unusable. Numerous factors influence the severity and longevity of agricultural infestations, including rainfall amount, drought conditions, seasonal patterns, and movement of materials. Typical causes can include:

- Fungus
- Insects
- Rodents and vermin
- Transmissible animal diseases

A reasonable level of agricultural infestation is expected by regional farmers and ranchers who have readily available methods to mitigate against the impact. However, if levels of routine infestation rapidly increase, or a novel form of infestation were to appear, normal methods of mitigation may fail to control the outbreak.

The onset of agricultural infestation can be rapid and controlling the rate of spread is important to limiting impacts. Methods to limit the rate of spread include:

- Early harvest
- Crop destruction
- Culling of a herd
- Quarantine

The duration of an infestation depends on the degree to which the infestation is controlled from the onset, but is generally over a period of weeks and months. The warning time of an infestation is affected by the timely monitoring and reporting of potential outbreaks by both the community, industry groups and governmental agencies.

***Animal Disease***

The southeast region has a moderate number of cattle, 537,000 as of January 1, 2012 according to the USDA National Agricultural Statistics Service. The University of Kansas Institute for Policy and Social Research (IPSR) reports that cattle and milk production in region averaged nearly $15.2 million per year from 2002-2006. This accounts for approximately 0.49% of the state of Kansas average of $3.1 billion for the same period.
Because cattle are both raised locally and imported from into the region from other localities within Kansas and other states the potential for highly contagious diseases poses a threat to the regional economy. Currently the southeast region, and the state of Kansas, is Brucellosis,

Tuberculosis and Pseudorabies free. However, of concern are two economically devastating animal diseases, foot and mouth disease and bovine spongiform encephalopathy (BSE). Infection with these, and other animal diseases, could result in a decline in milk production, spontaneous abortion, and animal death. It would not only affect farmer and ranchers, but support and related industries as well. With a medium sized agricultural industry throughout the region, the potential for infestation of livestock poses a moderate risk to the regional economy.

According to the Kansas Department of Health & Environment (KDHE), Bureau of Water, Livestock Waste Management the southeast region has 16 concentrated animal feeding operation facilities (CAFOs) with 300 or more animal units. There have been substantial changes in the animal production industry over the past several decades, with the total number of CAFOs decreasing through consolidation resulting in operations of increasing in size. This is a potential concern as high concentration of animals in proximity enhances potential transmission of disease among members of the group. Many experts fear that intentional, criminal introduction of a disease such as foot and mouth would result in very rapid spread of the disease throughout the nation and could have very severe economic consequences to the industry. The following is a list of the number of CAFOs per county in the region:

- Allen: 1
- Bourbon: 1
- Crawford: 3
- Greenwood: 5
- Labette: 2
- Montgomery: 2
- Woodson: 2

Knowing where diseased and at-risk animals are, where they've been and when, is important to ensuring a rapid response when animal disease events take place. The Kansas Department of Agriculture, Division of Animal Health monitors and reports on animal reportable diseases. Producers are required by state law to report any of the reportable animal diseases. Additionally, the USDA and the Kansas Department of Agriculture (KDA), Division of Animal Health have implemented the Animal Disease Traceability system. In order to aid in rapid reporting and identification of animal borne disease, this system establishes minimum national official identification and documentation requirements for the traceability of livestock. Animals moved interstate, unless otherwise exempt, must be officially identified and accompanied by an interstate certificate of veterinary inspection.

There are also several fatal diseases that can affect the deer or captive elk population in Kansas. These disease include Chronic Wasting Disease and Hemorrhagic Disease. There have been 48 positive cases of Chronic Wasting Disease found in Kansas since surveillance started in 1996. The exact number of deaths caused by Hemorrhagic Disease is not known, but generally 25 percent of the deer population affected with this disease die. There are no wildlife management tools or strategies available to prevent or control of these diseases other than the prevention of transport of infected deer.

Other diseases such as bovine tuberculosis and a host of detrimental parasites such as exotic lice, meningeal worms, flukes, and stomach worms are fatal to deer and are transmitted more efficiently when deer are concentrated in a small area. These diseases can seriously damage the populations of the captive deer and elk farms and the wild deer populations but also affect the annual $350 million dollar hunting economy in Kansas.

***Crop Disease and Insect Infestation***

The University of Kansas Institute Policy and Social Research reports that the value of field crops in the region averaged approximately $18.4 million per year from 1997-2007. This accounts for approximately 0.5% of the state of Kansas average of $3.7 billion for the same period.

Field crops can be subject to infestation, including leaf rust, wheat streak mosaic, barley yellow dwarf virus, strawbreaker, and tan spot. According to the KDA, Plant Protection and Weed Control Division, the following are the highest risk crop pests to Kansas:

- Corn – Aspergillus Ear Rot (Alfatoxin)
- Soybean – Austro-Asian Rust
- Wheat – Black Stem Rust, Blast – South American strains, Stripe Rust, Leaf Rust, Karnal Bunt

Additionally, both crops in the field and harvested crops may be subject to insect infestation. The estimated damage to stored grain from the lesser grain borer, rice weevil, red flour beetle, and rusty grain beetle in the United States is approximately $500 million annually.

The significance of this agricultural sector in the local and regional economy makes crop infestation a moderate concern.

***Tree Pests***

According to the KDA, Plant Protection and Weed Control Division, the following are the highest risk plant pests by host to Kansas:

- Ash Trees – Emerald Ash Borer
- Maple, Birch, Willow, Mimosa, Ash, Sycamore & Poplar Trees – Asian Longhorned Beetle
- Walnut Trees – Thousand Cankers

The Emerald Ash Borer, a emerald green beetle that is ½ inch long, is a pest of ash trees. This pest is responsible for the destruction of approximately 20 million ash trees in the United States and Canada. In 2012 the pest was confirmed at the Wyandotte County Lake in Wyandotte County, Kansas. Immediately after confirmation by USDA, the Kansas Secretary of Agriculture implemented an emergency intrastate quarantine for Wyandotte County. Financially, the United States risks an economic loss of $20 billion to $60 billion because of this pest. According to the

2011 Kansas Forest Action Plan ash trees are the third most common species of trees, with 56.1 million (60.8 million cubic feet) green and white ash found in Kansas.

The Asian Longhorned Beetle is an exotic insect that threatens a wide variety of hardwood trees. It has not been detected in Kansas yet.

The Thousand Cankers is newly recognized disease in 2008 and first noticed in the western U.S. Currently it is located in both the east and western parts of the U.S. It has not been detected in Kansas. This disease is caused by a combination of a fungus and the walnut twig beetle. There are an estimated 26.2 million (35.3 million cubic feet) black walnut trees in Kansas.

***Wildlife Pests***

Kansas farmers also lose a significant amount of crops each year as a result of wildlife foraging. This can be particularly problematic in areas where natural habitat has been diminished or in years where weather patterns such as early/late frost deep snow, or drought has caused the wild food sources to be limited. Wildlife pests can include:

- Birds
- Deer
- Hogs
- Rodents

Many of these wildlife pests can be controlled through simple measures including fencing, netting, baiting, and herd management through culling. According to the USDA, a particular success story has been the control of feral hogs. Feral hogs caused an estimated $1.6 billion in damage to crops, lawns, wildlife habitat and by introducing diseases to domestic animals in 2011. It is estimated that in 2006, there were 2,500 feral hogs in where in Kansas. As of 2012 that figure has dropped to 1,000.

| | Warning Time |
|---|---|
| Agricultural Infestation | 1.00 |

| | Duration |
|---|---|
| Agricultural Infestation | 4.00 |

**Hazard Location**

The entire planning area may be affected by agricultural infestation. The following table presents regional information on farms, agricultural acreage and cattle.

**Farm, Crop and Livestock Information, 2007**

| | Number of Farms | Total Farm Acreage | Total Cropland Acreage | Pasture Acres |
|---|---|---|---|---|
| Region | 8,231 | 4,096,896 | 1,302,518 | 2,322,230 |

Source: United States Department of Agriculture National Agricultural Statistics Service

**Cattle Information, January 1, 2012**

| | All Cattle | Beef Cows That Have Calved | Milk Cows That Have Calved | Cattle on Feed |
|---|---|---|---|---|
| Region | 537,000 | 217,100 | 500 | 5,600 |

Source: United States Department of Agriculture National Agricultural Statistics Service

While rural areas within the region are more susceptible to crop and livestock infestation, urban and suburban areas are also at risk. Agricultural infestation does not cause damage to buildings or critical facilities.

**Previous Occurrences and Extent**

The following is a list of notable agricultural infestation events in southeast Kansas.

> **Summer 2012:** Scrapie was found in two sheep at a regulatory slaughter test in Kansas. The sheep were from two unrelated flocks. There had not been any cases in Kansas for more than two years.
>
> **2001:** A major infestation of webworms attacked the State's alfalfa crop, particularly in eastern Kansas.
>
> **1989:** Gray leaf spot of corn was first identified in the State in the Republican River Valley. The disease reached economic threshold levels by 1992 and has caused economic damages somewhere in the State every year from 1992 to 1998. In 1998, it was the most severe in northeast Kansas and in the irrigated areas of south central and southwest Kansas.

**Hazard Vulnerability and Impact**

The following table provides an indication of the potential magnitude of agricultural infestation southeast Kansas.

**Total Insured Crop Insurance Paid per County from 2002-2011, Top Livestock Inventory Number and Top Crop in Acres from USDA Census 2007**

| County | Annualized Crop Insurance Paid for Infestation Damages | All Goats Inventory | Cattle & Calves Inventory | Hogs & Pigs Inventory | Horses & Ponies Inventory | Sheep & Lambs, Inventory, Wool Production | Corn Harvested in Acres | Forage Harvested in Acres | Sorghum for Grain Harvested in Acres | Soybeans for Beans Harvested in Acres | Wheat Harvested in Acres |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Allen | $34,890 | 1,011 | 30,306 | 497 | 442 | 137 | 18,197 | 33,887 | 2,735 | 36,443 | 24,399 |
| Bourbon | $16,130 | 560 | 59,770 | (D) | 1,300 | 173 | 5,945 | 51,807 | 2,143 | 28,055 | 11,076 |
| Chautauqua | $6,221 | 940 | 39,559 | (D) | 973 | 849 | 1,926 | 21,620 | 0 | 2,125 | (D) |
| Cherokee | $19,966 | 467 | 36,191 | (D) | 1,253 | 85 | 53,046 | 0 | 0 | 0 | 64,450 |
| Crawford | $89,662 | 657 | 60,668 | 345 | 922 | 311 | 39,707 | 38,748 | 3,714 | 59,148 | 31,538 |
| Elk | $1,204 | 267 | 40,114 | 100 | 872 | 86 | 4,065 | 21,917 | 602 | 6,991 | 3,962 |
| Greenwood | $1,682 | 586 | 64,269 | 1,783 | 5,542 | 133 | 8,551 | 45,254 | 1,076 | 13,681 | 7,591 |
| Labette | $3,765 | 2,598 | 77,106 | 950 | 1,974 | 2,268 | 26,421 | 52,132 | 6,816 | 30,519 | 34,830 |
| Montgomery | $4,437 | 1,359 | 35,619 | 36,961 | 1,666 | 430 | 24,245 | 35,218 | 3,472 | 21,534 | 23,355 |
| Neosho | $9,213 | 1,219 | 58,334 | 2,208 | 985 | 458 | 25,138 | 34,955 | 4,384 | 27,782 | 26,943 |
| Wilson | $5,091 | 1,051 | 32,762 | (D) | 433 | 34 | 28,302 | 39,958 | 7,719 | 47,562 | 28,255 |
| Woodson | $6,327 | 159 | 48,760 | 77 | 349 | 396 | 15,855 | 43,824 | 4,663 | 18,229 | 15,829 |

Source: USDA Risk Management Agency, 2012; USDA Census of Agriculture, 2007
Note: (D) indicates data cannot be disclosed

This table only reflects insured losses that were claimed. According to the 2011 Kansas Crop Insurance Profile Report issued by the USDA Risk Management Agency, 82 percent of Kansas row crops were insured in 2011 (there is no information available for the 18 percent of uninsured crop losses). Data regarding the number or value of livestock and wildlife lost to disease or infestation was not available for this planning effort.

| | Magnitude/Severity |
|---|---|
| Agricultural Infestation | 2.00 |

**Future Development**

Data suggests that the acres of land in farms in decreasing in southeastern Kansas. The average regional decrease in harvested acres from 1997 to 2007 was 31,737 acres. Additionally, regional data (presented in Section 2.8) indicate that the number of cattle has been falling over the past five years. These decreases would further lessen the likelihood of damaging infestation.

**Probability of Future Occurrences**

The region experiences minor agricultural losses every year as a result of naturally-occurring diseases that impact animals and livestock. Based on historical data available, there have been three major recorded events in Kansas over the past 25 years. . This equates to a 12% probability of occurrence in the next year for the entire state. Therefore, it is possible the event could occur within the upcoming years.

| | Probability |
|---|---|
| Agricultural Infestation | 2.00 |

**Consequence Analysis**

The information in the following table provides the Consequence Analysis.

**Agricultural Infestation Consequence Analysis**

| Subject | Ranking | Impacts of Agricultural Infestation |
|---|---|---|
| Health and Safety of Persons in the Area of the Incident | Minimal | Impact for this incidence on persons in the area would be minimal. If the infestation is unrecognized, then there is the potential for the food supply to be contaminated. |
| Responders | Minimal | Impact to responders would be minimal with protective clothing, gloves, etc as these diseases cause no risk to humans. |
| Continuity of Operations | Minimal | Minimal expectation of execution of the COOP. |
| Property, Facilities, and Infrastructure | Minimal | Localized impact to facilities and infrastructure in the incident area is minimal to non-existent. |
| Delivery of Services | Minimal | Impacts to the delivery of services would be non-existent to minimal. Impact could be larger depending on the extent of the contaminated crop/crop loss. |
| Environment | Minimal to Severe | Impact could be severe to the incident area, specifically, plants, trees, bushes, and crops. |
| Economic Conditions | Minimal to Severe | Impacts to the economy will depend on the severity of the infestation. The potential for economic loss to the community and state could be severe if the infestation is hard to contain, eliminate, or reduce. Impact could be minimized due to crop insurance. |
| Public Confidence in Governance | Minimal to Severe | Confidence could be in question depending on timeliness and steps taken to warn the producers and public, and treat/eradicate the infestation. |

### 3.7.2 CIVIL DISORDER

| | Probability | Magnitude/Severity | Warning Time | Duration | CPRI |
|---|---|---|---|---|---|
| Civil Disorder | 1.00 | 2.00 | 4.00 | 1.00 | **1.75** |

**Description**

Civil disorder is a term that generally refers to a public disturbance by three or more people involving acts of violence that cause immediate danger, damage, or injury to others or their property. However, it is important to remember that gatherings in protest are recognized rights of any person or group, and this right is protected under the United States Constitution.

Civil disorder can take many shapes, including demonstrations, civil unrest, public disorder, and riots. These event may happen for a number of reasons, including:

- Economic hardships
- Social injustices
- Objections to organizations or governments
- Political grievances
- Ideological grievances

An event can be triggered by a single or combination of causes, with demonstrations ranging from simple, nonviolent protests to events that turn into full-scale riots. Most protesters are law-abiding citizens who intend that their protests be nonviolent, but some individuals or groups within an organized demonstration may have the intent to cause disruption, incite violence, destroy property, and/or provoke the authorities. Violence is often the result of demonstrators beginning to conduct unlawful or criminal acts and authorities enforcing the laws of the municipality, state, or nation.

A crowd is defined as a large number of persons gathered temporarily together. There are many types of crowds which are based on their reasons for getting together

- **Causal crowds:** This type has no common bond other than the immediate reason for being present. An example would be a football game or a symphony orchestra performance where the only bond is enjoyment.
- **Planned crowds:** Planned crowds are likely to be more organized. A leader will call a meeting to establish a goal in which members have a common interest.
- **Mob:** The extreme crowd behavior is a mob. A mob is a crowd whose members have lost their concern for law and authority and follow their leaders into unlawful and disruptive acts.

Normally, when a crowd is orderly, not violating any laws and not causing a threat to life or property it does not represent a problem. Crowds, however, are subject to control by skillful troublemakers and therefore capable of violence and disregard for law and order. If problems exist, they usually fall into the following three categories:

- **Public disorder:** Public disorder is a basic breach of civic order. Individuals or small groups assembling have a tendency to disrupt the normal flow of things around them.
- **Public disturbance:** Public disturbance is designed to cause turmoil on top of the disruption. Individuals and groups assembling into a crowd begin chanting, yelling, singing, and voicing individual or collective opinions.
- **Riot:** A riot is a disturbance that turns violent. Assembled crowds become a mob that violently expresses itself by destroying property, assaulting others, and creating an extremely volatile environment.

In general, civil disorder have some important similarities. Most disturbances start from minor incidents and can spread quickly and gain in strength and force. Any crowd, regardless of its purpose, is a potentially violent group. As such, there is very little warning time for a crowd to turn violent. However, with effective law enforcement the duration of a civil unrest event would likely be very short.

| | Warning Time |
|---|---|
| Civil Disorder | 4.00 |

| | Duration |
|---|---|
| Civil Disorder | 1.00 |

**Hazard Location**

In the United States, civil disorder has been most commonly associated with urban areas and college campuses. And while the entire planning area may be affected by civil disorder, with its generally small population, lack of major population centers, and low population density, the magnitude of such an event would likely be limited.

With human-caused hazards such as this that can have multiple variables involved, increases in development and increases in the replacement cost of the built environment can be a factor in increases cost of the event. The cost for such an event is largely related to the location and the level of violence the crowd chooses.

**Previous Occurrences and Extent**

Notable previous occurrences in southeast Kansas which could be described as Civil Disorder are listed below.

> **1920 Independence, Kansas**: An Independence grocer was murdered in his store, presumably by a African-American, who was caught in the act of robbing the cash register within the store. Several suspects were arrested, and one was identified as the man seen within the store of the murdered man. Soon after crowds began to gather within the vicinity of the jail, and threats of violence were heard. Armed African-Americans, who claimed they came to offer their services to the police officials in the protection of the prisoner from mob violence, as well as armed whites who had been

engaged in the hunt for the murderer, or were attracted by the threats of violence were present. An attempt by police officials to pacify and disperse the crowd was ineffective. A shot was fired, and immediately a series of shots were exchanged between the whites and blacks, resulting in the killing of one African-American, two whites, and the serious wounding of three other whites. The local police officers realized that they were unable to successfully control with situation and called for volunteers to assist in restoring order and upholding the law. A force approximating 450 men was organized and controlled the situation until the arrival of National Guard troops. After this event, National Guard troops were ordered into active service to suppress lawlessness and assist civil authorities in upholding the law upon two different occasions within the year.

**Hazard Vulnerability and Impact**

Economic impacts and human injury or death are the primary concern with civil disorder. Increases in population or the hosting of major political, economic or social events could increase the likelihood and severity of a civil disturbance.

In general, it is difficult to quantify potential losses of Civil Disorder due to the many variables and human elements and lack of historical precedence. Therefore, for the purposes of this plan, the loss estimates will take into account a hypothetical scenario. **Please note that the hypothetical scenario is included for illustrative purposes only.**

**Event:** City organizers set up a two-block long fan zone near the local sporting arena. Two big screen TVs were set up for fans to watch the game. Temporary fences and gates were set up to provide checkpoints where police could control access to the area and check for alcohol. Crowds, estimated to be at 5,000 people, had been generally well-behaved in the fan zone, however people found ways to enter the zone without being checked for alcohol. Planned corridors to allow movement of emergency vehicles became impassable.

**Riot:** The riot began to take shape as the game came to a close, with some spectators throwing bottles and other objects at the large screens in the viewing area. Flags and jerseys were set alight, and soon some rioters overturned a vehicle A group was heard chanting "let's go riot" as early as the first period of the game were among those responsible for flipping the first car. People began jumping on the car that had been first overturned, and then it was set afire. Fist fights broke out when people standing on porta-potties fell when others tipped them over. With a crowd of onlookers chanting "burn the truck", a second vehicle in the same area was set on fire. Firemen were able to put it out, but the truck was again set alight after it was overturned. In a nearby parking lot, two police cars were later also set on fire. Riot police eventually managed to disperse the rioters.

**Results:** One man was sent to hospital in critical condition after he attempted to jump from a second story window. Ten people required hospitalization for non-life threatening injuries. Numerous rioters had injuries that did not require hospitalization. The Police Department made 101 arrests during the riot. 85 people were arrested for disturbing the

peace, eight for public intoxication and eight for breaking and entering, assault or theft. In total, 17 cars were burned, including police cars. Windows were smashed in a bank and various businesses along the fan zone corridor, some of which were also looted. After event estimates suggested the losses due to vandalism, theft, and damage to property to be nearly $4.2 million.

Overall magnitude and severity is considered limited.

| | Magnitude/Severity |
|---|---|
| Civil Disorder | 2.00 |

**Future Development**

In general, data suggests that the total population of southeast Kansas is in decline, with the exception of larger population centers. Future development and population in the centers would tend to increase the likelihood of a civil disorder event. Those areas experiencing population decline may be less likely to experience civil disorder events.

**Probability of Future Hazard Events**

It is possible that southeast Kansas will experience marches, protests, demonstrations, and gatherings in various cities and communities that could lead to some type of civil disorder. However, based on the region's general lack of history of civil disturbance (one event in the past 83 years, with a yearly probability at approximately 1%) and the various human factors noted above, the probability that such incidents will develop into full-scale civil disorder is considered unlikely.

| | Probability |
|---|---|
| Civil Disorder | 1.00 |

**Consequence Analysis**

The information in the following table provides the Consequence Analysis.

**Consequence Analysis of Civil Disorder**

| Subject | Ranking | Impacts of Civil Disorder |
|---|---|---|
| Health and Safety of Persons in the Area of the Incident | Severe | Impact could be severe for persons in the incident area. |
| Responders | Minimal to Severe | Impact to responders could be severe if not trained and properly equipped. Responders that are properly trained and equipped will have a low to moderate impact. |
| Continuity of Operations | Minimal to Severe | Depending on damage to facilities/personnel in the incident area, re-location may be necessary and lines of succession execution. |
| Property, Facilities, and Infrastructure | Severe | Impact within the incident area could be severe for explosion, moderate to low for Hazmat. |
| Delivery of Services | Minimal to Severe | Delivery of services could be affected within and around the affected area especially if communications, road and railways, and facilities incur damage. |
| Environment | Minimal to Severe | Localized impact within the incident area could be severe depending on the type of human caused incident. |
| Economic Conditions | Minimal to Severe | Economic conditions could be adversely affected and dependent upon time and length of clean up and investigation. |
| Public Confidence in Governance | Minimal to Severe | Impact will be dependent on whether or not the incident could have been avoided by government or non-government entities, clean-up and investigation times, and outcomes. |

### 3.7.3 DAM AND LEVEE FAILURE

| | Probability | Magnitude/Severity | Warning Time | Duration | CPRI |
|---|---|---|---|---|---|
| Dam and Levee Failure | 1.58 | 2.33 | 2.25 | 2.67 | **2.02** |

**Description**

A dam is defined by the National Dam Safety Act as an artificial barrier that impounds or diverts water and is more than 6 feet high and stores 50 acre feet or more or is 25 feet or more high and stores more than 15 acre feet. Dams are usually engineered to withstand a flood with a computed risk of occurrence. If a larger flood occurs, then that structure will likely be overtopped. If during the overtopping the dam fails or is washed out, the water behind it is released as a flash flood. Failed dams can create floods that are catastrophic to life and property because of the tremendous energy of the released water. However, dams are complicated structures, and it can be difficult to predict how a structure will respond to distress. Dams can fail for one or a combination of the following reasons:

- Overtopping caused by floods that exceed the capacity of the dam.
- Deliberate acts of sabotage.
- Structural failure of materials used in dam construction.
- Movement and/or failure of the foundation supporting the dam.
- Settlement and cracking of concrete or embankment dams.
- Piping and internal erosion of soil in embankment dams.
- Inadequate maintenance and upkeep.

There are two categories to describe dam failure.

- **Rainy day failure** involves periods of excessive precipitation leading to an unusually high runoff. This high runoff increases the reservoir of the dam and if not controlled, the overtopping of the dam or excessive water pressure can lead to dam failure. Normal storm events can also lead to rainy day failures if water outlets are plugged with debris or otherwise made inoperable.

- **Sunny day failures** occur due to poor dam maintenance, damage/obstruction of outlet systems, or vandalism. This is the worst type of failure and can be catastrophic because the breach is unexpected and there may be insufficient time to properly warn downstream residents.

Even though both types of failures can be disastrous, it can be assumed that a sunny day failure would be more catastrophic due to its unanticipated occurrence and the lack of time to warn residents downstream.

Over 95 percent of dams are non federal, with most being owned by state governments, municipalities, watershed districts, industries, lake associations, land developers, and private citizens. Dam owners have primary responsibility for the safe design, operation, and

maintenance of their dams. They also have responsibility for providing early warning of problems at the dam, for developing an effective emergency action plan, and for coordinating that plan with local officials.

***State-Regulated Dams***

In Kansas, the State has regulatory jurisdiction over non-federal dams that meet the following definition of a "jurisdictional" dam as defined by K.S.A. 82a-301 et seq, and amendments thereto:

- *any artificial barrier including appurtenant works with the ability to impound water, waste water or other liquids that has a height of 25 feet or more; or has a height of six feet or greater and also has the capacity to impound 50 or more acre feet. The height of a dam or barrier shall be determined as follows: (1) A barrier or dam that extends across the natural bed of a stream or watercourse shall be measured from the downstream toe of the barrier or dam to the top of the barrier or dam; or (2) a barrier or dam that does not extend across a stream or watercourse shall be measured from the lowest elevation of the outside limit of the barrier or dam to the top of the barrier or dam.*

The Kansas Department of Agriculture, Division of Water Resources (KDA-DWR) is the State agency responsible for regulation of jurisdictional dams. Within the Division of Water Resources, the Water Structures Program has the following Responsibilities: reviewing and approving of plans for constructing new dams and for modifying existing dams, ensuring quality control during construction, and monitoring dams that, if they failed, could cause loss of life, or interrupt public utilities or services

Dam classifications have been developed to describe the level of risk associated with dam failure. These classifications do not reflect the physical condition of the dams, but rather describe areas downstream of the dams that could be impacted in the event of failure, which is generally unlikely. The KDA-DWR classifies jurisdictional dams as follows:

- **Class A (low hazard**): A dam located in an area where failure could damage only farm or other uninhabited buildings, agricultural or undeveloped land including hiking trails, or traffic on low-volume roads that meet the requirements for hazard class A dams.

- **Class B (significant hazard)**: A "hazard class B dam" means a dam located in an area where failure could endanger a few lives, damage an isolated home, damage traffic on moderate volume roads that meet the requirements for hazard class B dams, damage low-volume railroad tracks, interrupt the use or service of a utility serving a small number of customers, or inundate recreation facilities, including campground areas intermittently used for sleeping and serving a relatively small number of persons.

- **Class C (high hazard)**: A "hazard class C dam" shall mean a dam located in an area where failure could result in any of the following: extensive loss of life, damage to more than one home, damage to industrial or commercial facilities, interruption of a public

utility serving a large number of customers, damage to traffic on high-volume roads that meet the requirements for hazard class C dams or a high-volume railroad line, inundation of a frequently used recreation facility serving a relatively large number of persons, or two or more individual hazards described in hazard class B. Emergency Action Plans (EAPs) are required for all High Hazard Dams.

***Levees***

A levee is an artificial barrier, usually an earthen embankment, constructed along rivers to protect adjacent lands from flooding. Generally, a levee is subjected water loading (a high water event) only a few days or weeks each year, unlike a dam that is retaining water most. Floodwalls are concrete structures, often components of levee systems, designed for urban areas where there is insufficient room for earthen levees.

Levees are usually engineered to withstand a flood with a computed risk of occurrence. When a larger flood occurs and/or levees and floodwalls and their structures are stressed beyond their capabilities to withstand floods, levee failure can result in loss of life and injuries as well as damages to property, the environment, and the economy.

A levee breach results when a portion of the levee breaks away, providing an opening for water to flood the landward side of the structure. Such breaches can be caused by surface erosion due to water velocities, or they can be the result of subsurface actions. Levee overtopping is similar to dam overtopping in that the flood waters simply exceed the design capacity of the structure. Such overtopping can lead to erosion on the land side which can lead to breaching. In order to prevent this type land side erosion, many levees are reinforced with rocks or concrete.

For purposes of the levee failure hazard profile and risk assessment in this hazard mitigation plan, levees in Kansas will be discussed in four categories:

1. Levees in the United States Army Corps of Engineers (USACE) Levee Safety Program
2. FEMA Accredited Levees
3. Levees that are both in the USACE Levee Safety Program and Accredited by FEMA
4. All other levees

In terms of assessing risk, levees in categories 1, 2, and 3 all undergo or have undergone some sort of inspection, certification, or accreditation that indicates the level of protection and/or structural integrity of the levee system. However, the levees in the category 4 may not be regularly monitored or inspected.

***Levees in the USACE Levee Safety Program***

The USACE created the Levee Safety Program (LSP) in 2006 to assess the integrity and viability of levees and to make sure that levee systems do not present unacceptable risks to the public, property, and environment. Under the Levee Safety Program, USACE conducts levee inspections (routine, periodic and special event). During these inspections, deficiencies may be identified

such as unsatisfactory culverts, non-compliant vegetation, encroachments, and animal burrows. USACE uses inspection findings to "rate" levee systems to determine compliance with operation and maintenance requirements, understand the overall levee condition, and determine eligibility for federal rehabilitation assistance under P.L. 84-99.

According to the National Levee Database (NLD) managed by USACE, there are currently 13 levees in southeast Kansas in the Levee Safety Program. Nine of the identified levees are not rated, 2 are rated Acceptable and 2 are rated Minimally Acceptable.

***FEMA Accredited Levees***

Many levees shown on effective Flood Insurance Rate Maps (FIRMs) were mapped in the 1970s and 1980s and have never been remapped by FEMA. Prior to 1986, levees were shown on FIRMs as providing protection from the base flood when they were designed and constructed in accordance with sound engineering practices. Since 1986, levees have been shown as accredited on FIRMs only when they meet the requirements of 44 CFR 65.10 "Mapping Areas Protected by Levee Systems", including certification by a registered professional engineer or a Federal agency with responsibility for levee design.

Levees that do not meet the requirements of 44 CFR 65.10 cannot be shown as accredited on a FIRM. Furthermore, floodplain areas behind the levee are at risk to base flood inundation and are mapped as high risk areas subject to FEMA's minimum floodplain management regulations and mandatory flood insurance purchase requirement.

In 2004, as it initiated work under the Flood Map Modernization Initiative (Map Mod), FEMA determined that analysis of the role of levees in flood risk reduction would be an important part of the mapping efforts. A report issued in 2005 noted that the status of the Nation's levees was not well understood and the condition of many levees and floodwalls had not been assessed since their original inclusion in the National Flood Insurance Program (NFIP). As a result, FEMA established policies to address existing levees.

FEMA Accredited levees generally fall into two types:

- Levees mapped on Digital Flood Insurance Rate Maps (DFIRM) since the Flood Map Modernization Initiative
- Levees, mapped prior to the Flood Map Modernization Initiative and are not mapped on DFIRMs.

As DFIRMs are developed, levees fall under one of the three following categories:

- **Accredited Levee** : With the except of areas of residual flooding (interior drainage), if the data and documentation specified in 44 CFR 65.10 is readily available and provided to FEMA, the area behind the levee will be mapped as a moderate-risk area. There is no mandatory flood insurance purchase requirement in a moderate-risk area, but flood insurance is strongly recommended.

- **Provisionally Accredited Levee (PAL)**: If data and documentation is not readily available, and no known deficiency precludes meeting requirements of 44 CFR 65.10, FEMA can allow the party seeking recognition up to two years to compile and submit full documentation to show compliance with 44 CFR 65.10. During this two-year period of provisional accreditation, the area behind the levee will be mapped as moderate-risk with no mandatory flood insurance purchase requirement.

- **De-Accredited Levees**: If the information established under 44 CFR 65.10 is not readily available and provided to FEMA, and the levee is not eligible for the PAL designation, the levee will be de-accredited by FEMA. If a levee is de-accredited, FEMA will evaluate the level of risk associated with each non-accredited levee through their Levee Analysis Mapping Procedures (LAMP) criteria to consider how to map the floodplain and which areas on the dry side of the levee will be shown as high risk. The mapping will then be updated to reflect this risk..

According to the Mid-Term Levee Inventory (MLI), the following counties have accredited levees in DFIRM:

- Allen County
- Montgomery County

***FEMA Accredited Levees not Mapped on DFIRMs***

Throughout the early days of the NFIP, little guidance was available associated with the inclusion of existing levees. Decisions were made on whether to accredit hundreds of levees across Kansas. Because there were no levee standards and accreditation of a levee was left largely to the judgments of the study contractors, many levees were accredited as providing flood protection even though they would not meet the current NFIP levee standards as stated in 44 CFR 65.10.

During subsequent re-mapping, many of these levees were re-evaluated and accredited as providing flood protection, but do not meet the standards of 44 CFR 65.10. Additionally, some levees, originally indicated as accredited have never been re-evaluated. If levees are depicted on the paper FIRMS in counties that have not been re-mapped on DFIRMs, their protection level has not been re-evaluated. Until re-evaluation occurs, these levees are considered accredited.

This information was obtained by comparing the levees in the MLI indicated as showing protection on the FIRM against the list of counties that have effective DFIRMs. It should be noted that both Dickinson and Geary Counties are included in current Watershed mapping efforts that are in the discovery phases.

***All Other Levees***

There are also levees throughout the State that are intended to mitigate low-level flooding and/or protect agricultural land that are not in the USACE Levee Safety program. Additionally, since these levees are not intended to protect populations or development from flooding from the 1%

annual chance flood, they are not, nor seek to be accredited by FEMA for flood insurance purposes. These levees may provide a false sense of security to residents behind these levees. Additionally, these levees may not be routinely inspected by levee owners. There is no agency with regulatory authority over these levees.

According to comparative analysis of the MLI and NLD, there are currently five levees that are not accredited by FEMA or in the USACE Levee Safety Program in southeast Kansas, with one in Montgomery County and four in Neosho County. Information on these levees is presented in the Regional Levees table below. There are also likely many more levees, such as agricultural levees that have not been inventoried. Populations and development behind these levees could be considered to be at a higher risk since there are no requirements for these levees to be routinely inspected and/or certified.

The inventory of levees has been compiled from the USACE NLD as well as the FEMA MLI. Please note that there may be some duplication as the names of the levees as well as the segmentation of the levees is not consistent in both inventories.

In general, dam and levee failures occur with some warming, with the exception of sunny day failures. Additionally, while the effects can be catastrophic, the duration is generally short.

| | Warning Time |
|---|---|
| Dam and Levee Failure | 2.25 |

| | Duration |
|---|---|
| Dam and Levee Failure | 2.67 |

**Hazard Location**

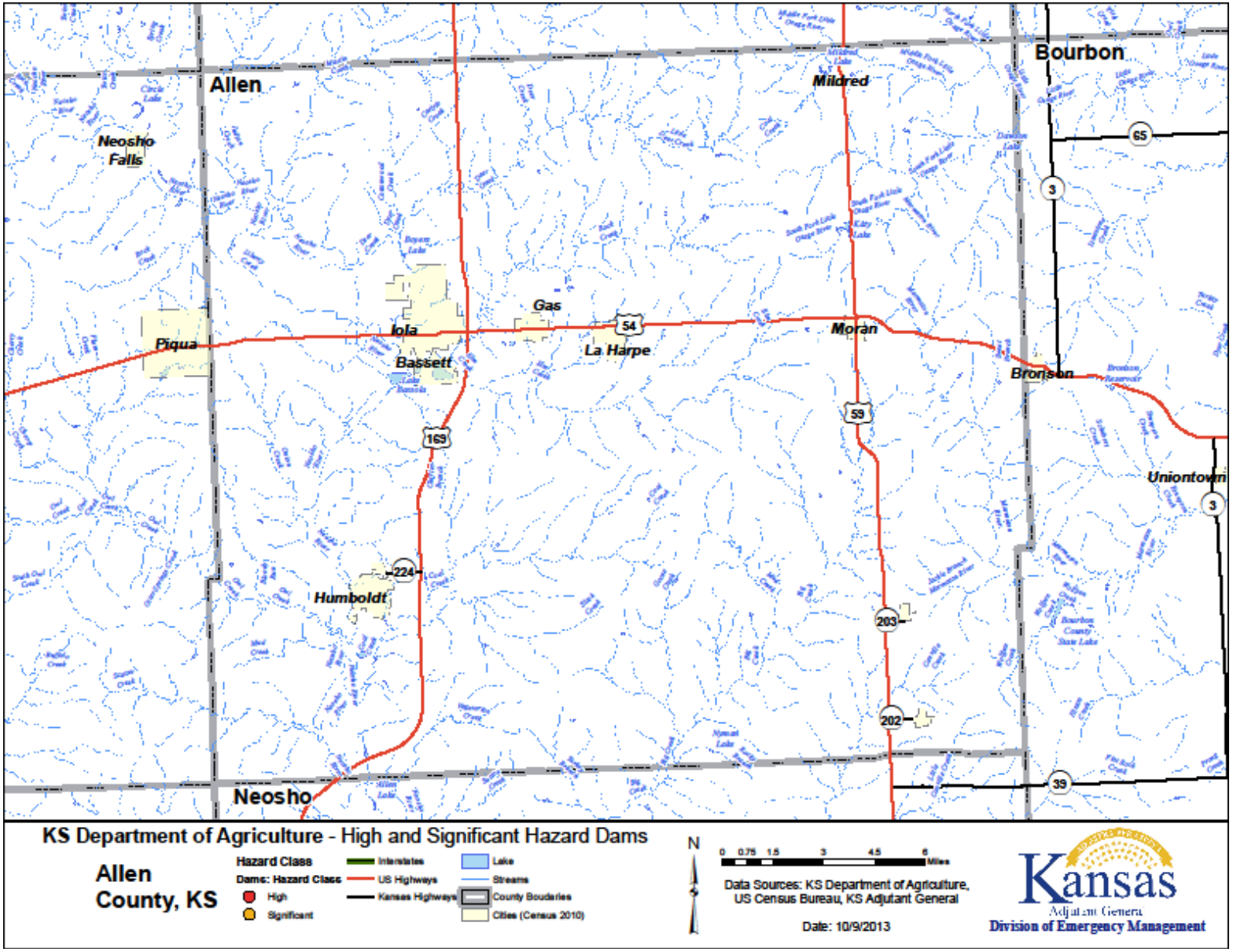
At the time this plan was developed there were 763 state-regulated jurisdictional dams in southeast Kansas. Of those, 20 were Class C (High Hazard Dams), 25 were Class B (Significant Hazard Dams), and 718 were Class A (Low Hazard Dams).

**Number of State Regulated Dams by Hazard Class in Region**

| County | Low Hazard Dams | Significant Hazard Dams | High Hazard Dams | High Hazard Dams Without Emergency Action Plan | Total Dams |
|---|---|---|---|---|---|
| Allen | 23 | 0 | 0 | 0 | 23 |
| Bourbon | 77 | 3 | 5 | 1 | 85 |
| Chautauqua | 80 | 1 | 3 | 0 | 84 |
| Cherokee | 8 | 0 | 0 | 0 | 8 |
| Crawford | 59 | 2 | 1 | 0 | 62 |
| Elk | 80 | 6 | 3 | 3 | 89 |
| Greenwood | 148 | 8 | 4 | 4 | 160 |
| Labette | 55 | 3 | 0 | 0 | 58 |
| Montgomery | 39 | 0 | 2 | 1 | 41 |
| Neosho | 64 | 1 | 1 | 1 | 66 |
| Wilson | 42 | 0 | 1 | 0 | 43 |
| Woodson | 43 | 1 | 0 | 0 | 44 |
| **Total** | **718** | **25** | **20** | **10** | **763** |

Source: Kansas Department of Agriculture, Division of Water Resources, Water Structures Program, 2012

The following maps shows significant and high hazard dams within southeast Kansas for each county.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Neosho Falls
Gas
Iola
Piqua
Bassett
La Harpe
Moran
Bronson
Uniontown
Humboldt
Neosho
54
169
224
59
65
3
203
202
39
KS Department of Agriculture - High and Significant Hazard Dams
Allen County, KS
Hazard Class
Dams: Hazard Class
High
Significant
Interstates
US Highways
Kansas Highways
Lake
Streams
County Boudaries
Cities (Census 2010)
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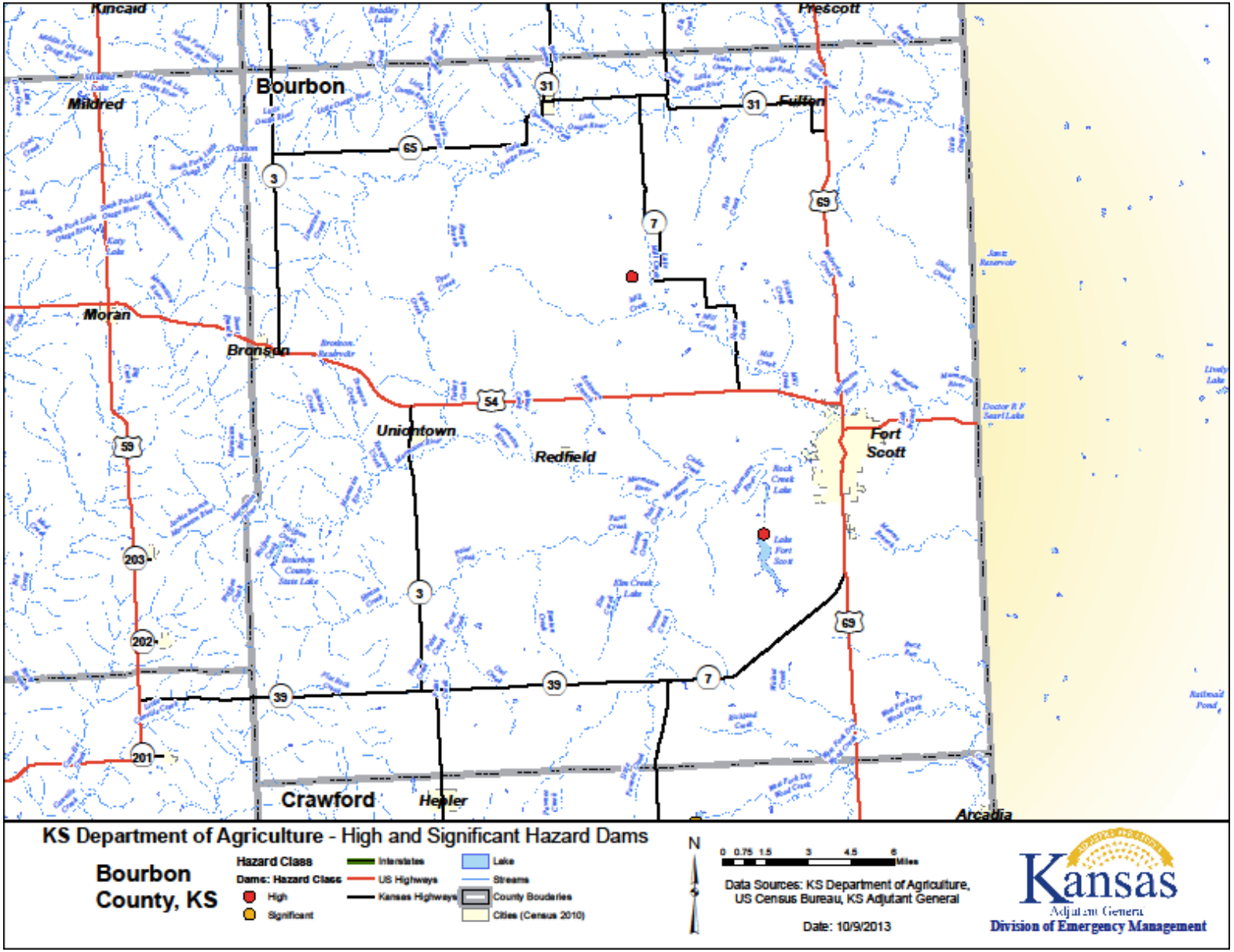
Miles
Data Sources: KS Department of Agriculture, US Census Bureau, KS Adjutant General
Date: 10/9/2013
Kansas
Adjutant General
Division of Emergency Management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Bourbon
Mildred
Fulton
Moran
Bronson
Uniontown
Redfield
Fort Scott
Crawford
Hepler
Arcadia
KS Department of Agriculture - High and Significant Hazard Dams
Bourbon County, KS
Hazard Class
Dams: Hazard Class
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Interstates
US Highways
Kansas Highways
Lake
Streams
County Boudaries
Cities (Census 2010)
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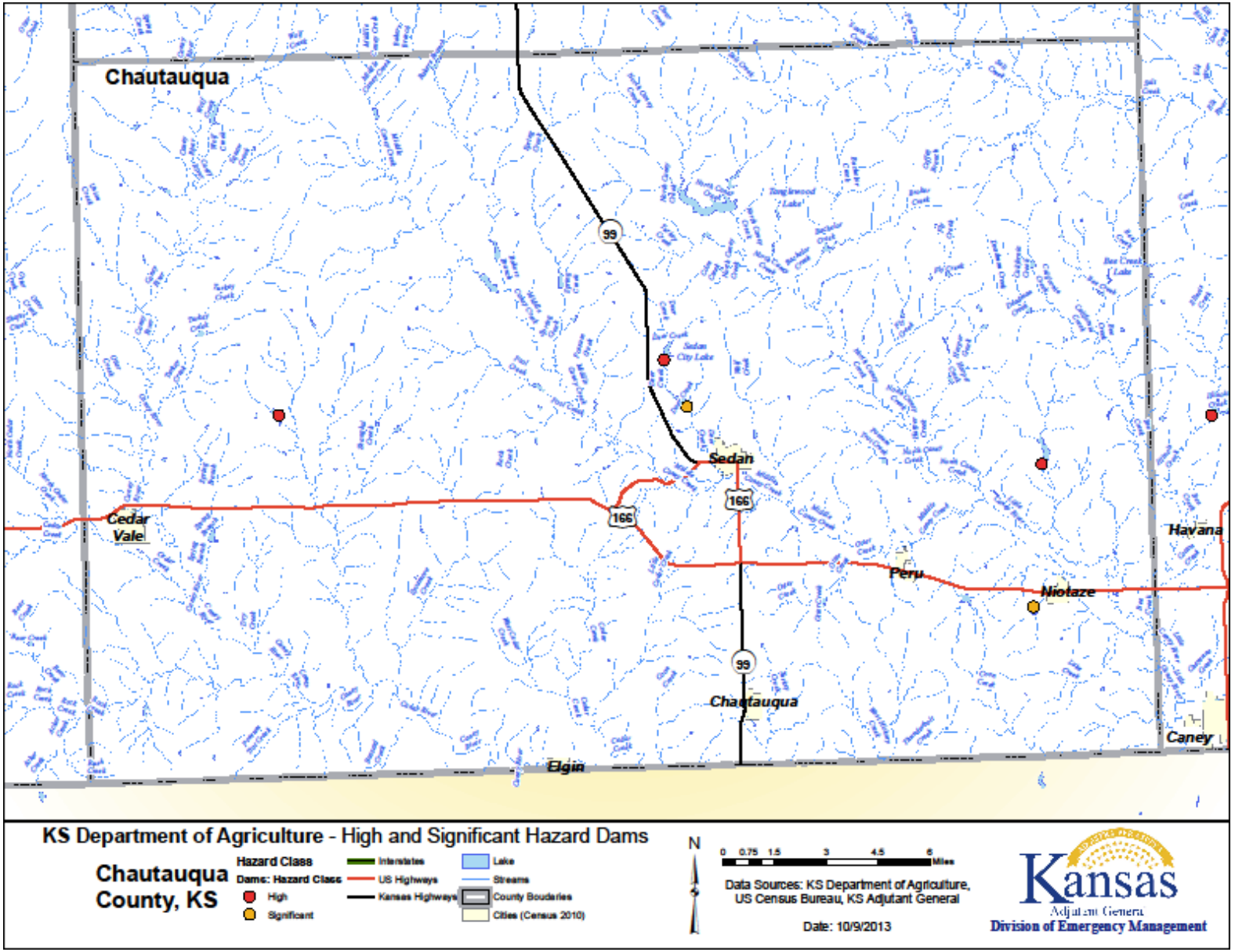
Data Sources: KS Department of Agriculture, US Census Bureau, KS Adjutant General
Date: 10/9/2013
Kansas
Adjutant General
Division of Emergency Management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Sedan
166
Cedar Vale
166
Havana
Peru
Niotaze
99
Chautauqua
Caney
Elgin
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Chautauqua County, KS
Hazard Class
Dams: Hazard Class
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Interstates
US Highways
Kansas Highways
Lake
Streams
County Boudaries
Cities (Census 2010)
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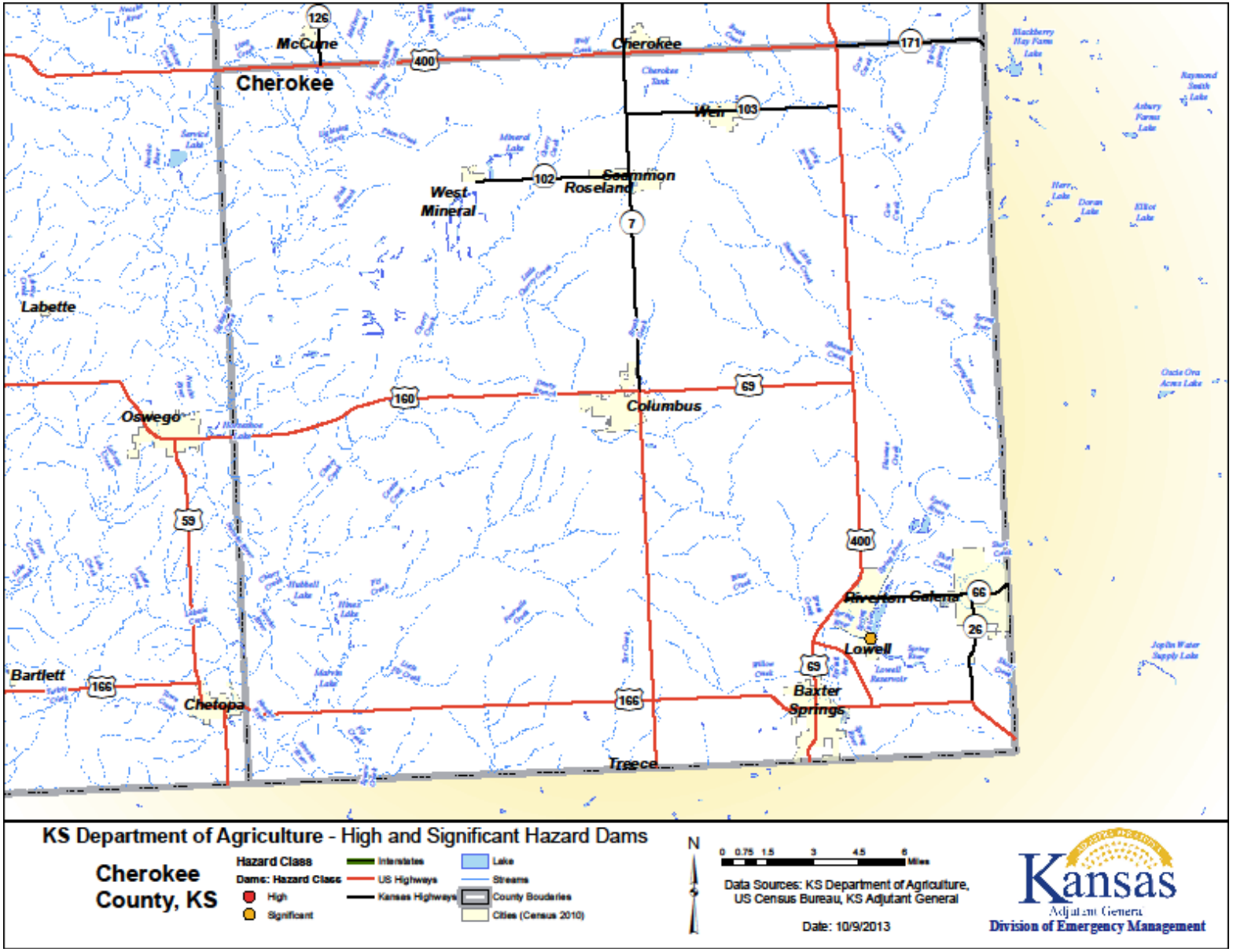
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Cherokee
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West Mineral
Scammon
Roseland
Labette
Oswego
Columbus
Riverton
Galena
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Chetopa
Treece
126
400
171
103
102
7
160
69
59
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166
166
KS Department of Agriculture - High and Significant Hazard Dams
Cherokee County, KS
Hazard Class
Dams: Hazard Class
High
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Interstates
US Highways
Kansas Highways
Lake
Streams
County Boudaries
Cities (Census 2010)
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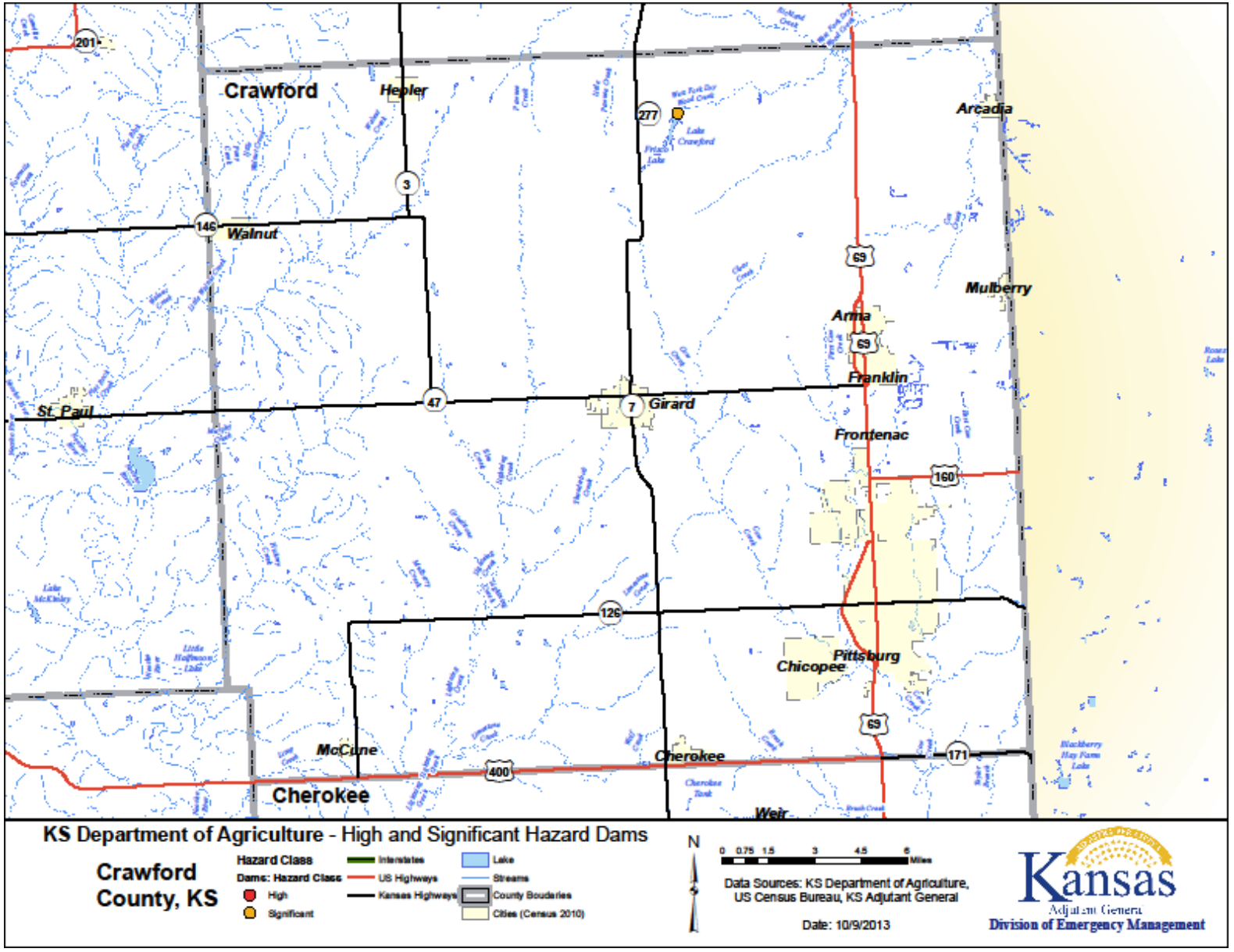
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St. Paul
Girard
Franklin
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Pittsburg
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McCune
Cherokee
Weir
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277
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KS Department of Agriculture - High and Significant Hazard Dams
Crawford County, KS
Hazard Class
Dams: Hazard Class
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Significant
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US Highways
Kansas Highways
Lake
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County Boudaries
Cities (Census 2010)
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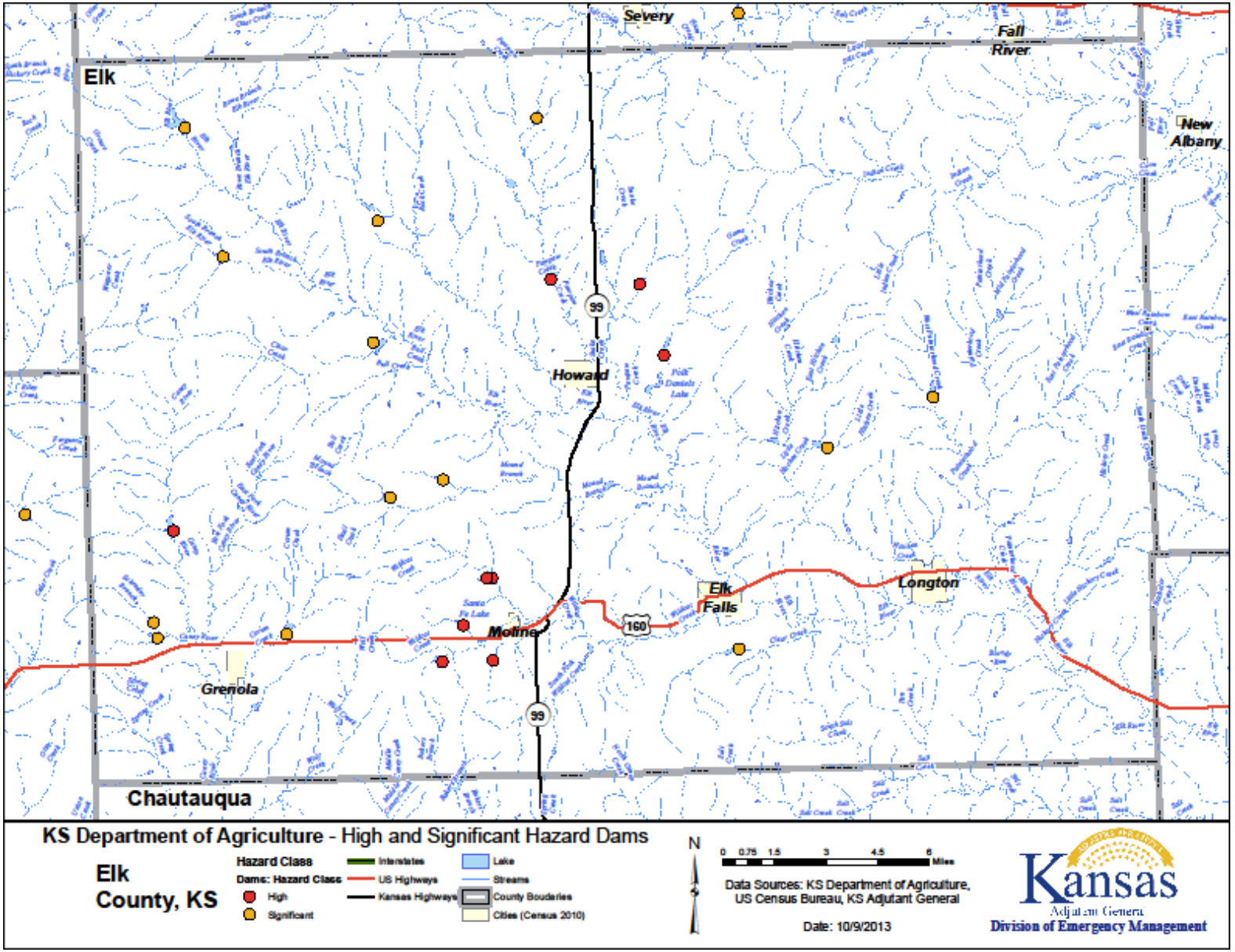
Severy
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Elk
New Albany
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Howard
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Longton
Moline
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Grenola
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Chautauqua
KS Department of Agriculture - High and Significant Hazard Dams
Elk County, KS
Hazard Class
Dams: Hazard Class
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Kansas Highways
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Cities (Census 2010)
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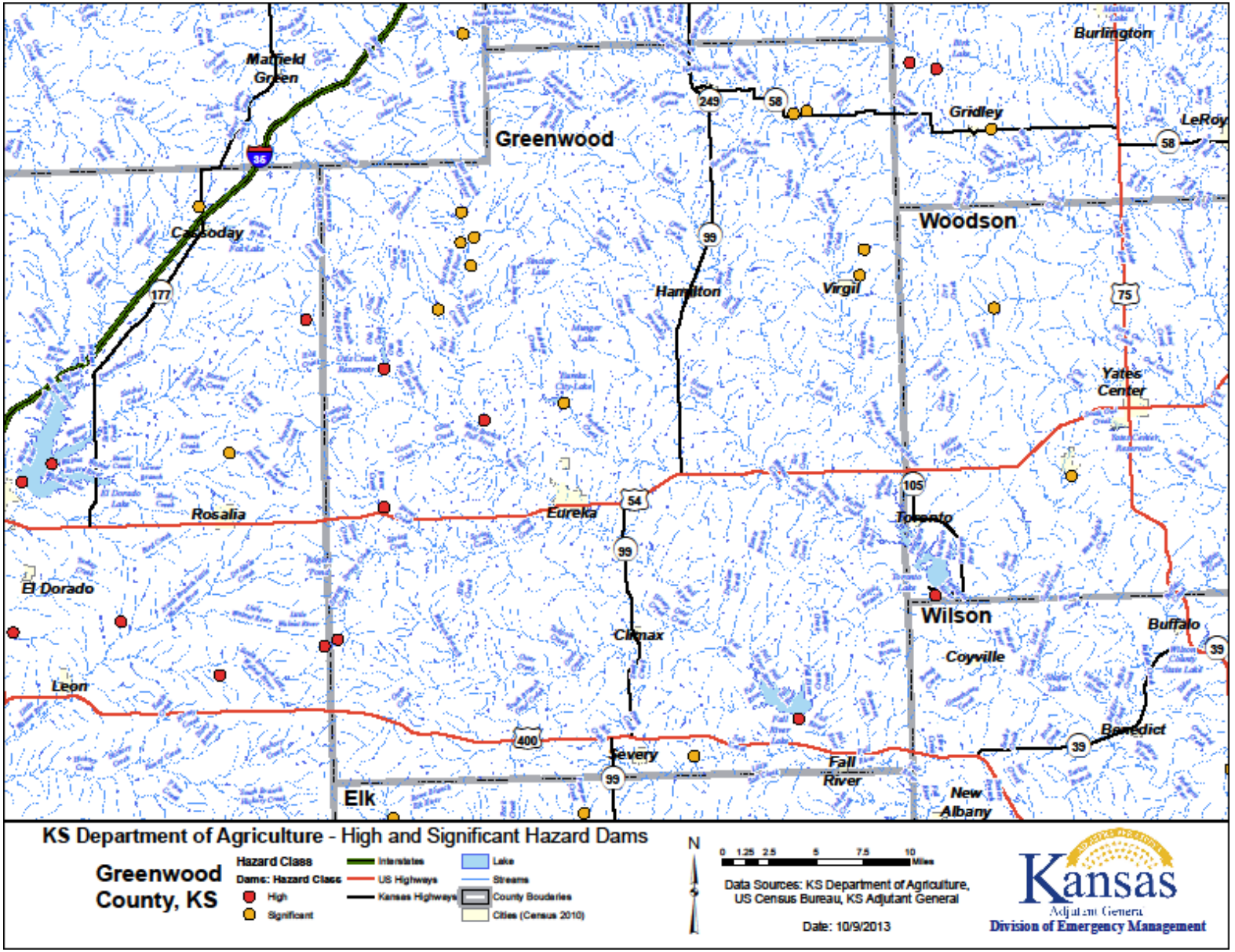
Adjutant General
Division of Emergency Management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Burlington
Gridley
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Severy
Fall River
New Albany
Coyville
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Benedict
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N
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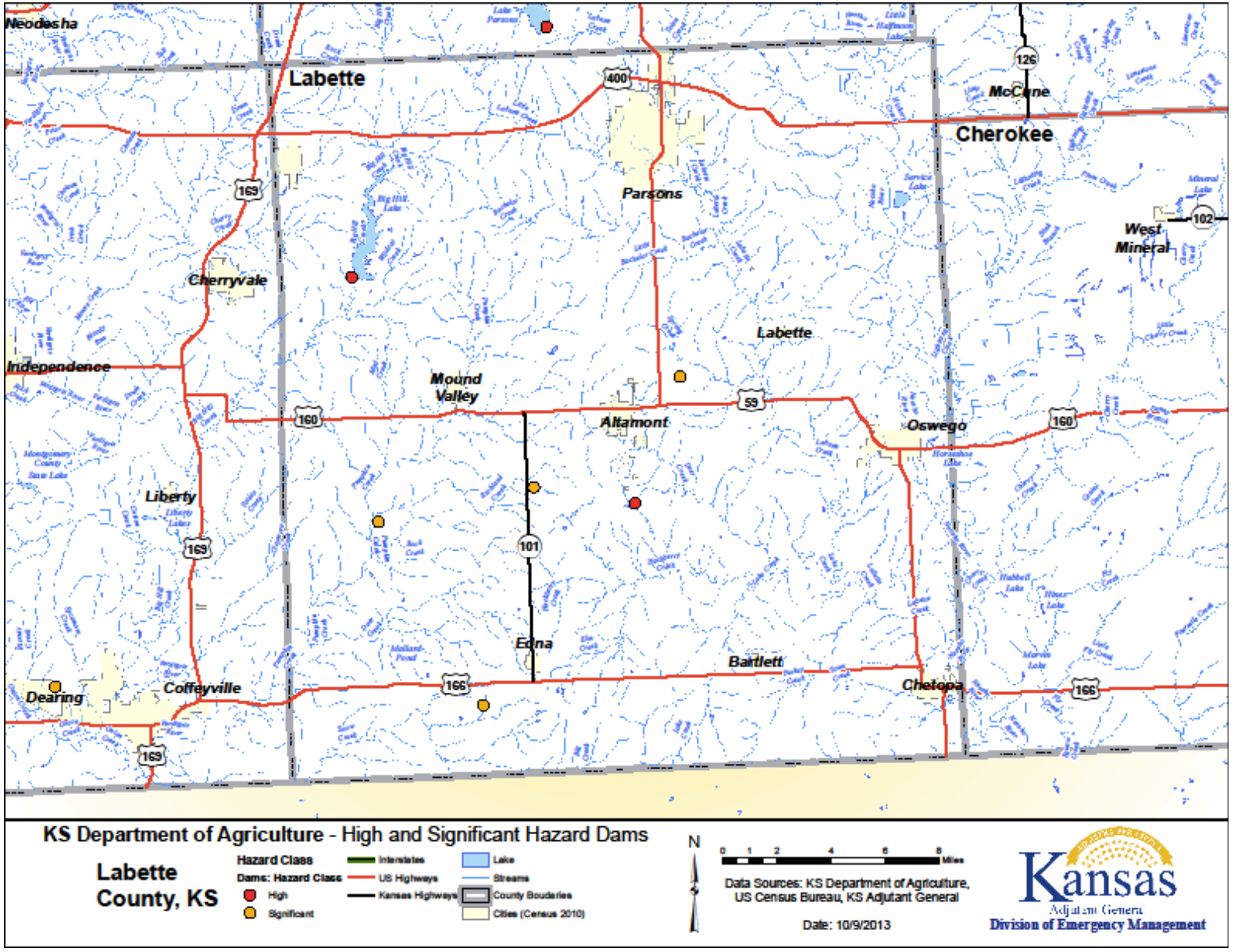
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Oswego
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Liberty
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Edna
Bartlett
Chetopa
Coffeyville
Dearing
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KS Department of Agriculture - High and Significant Hazard Dams
Labette County, KS
Hazard Class
Dams: Hazard Class
High
Significant
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Cities (Census 2010)
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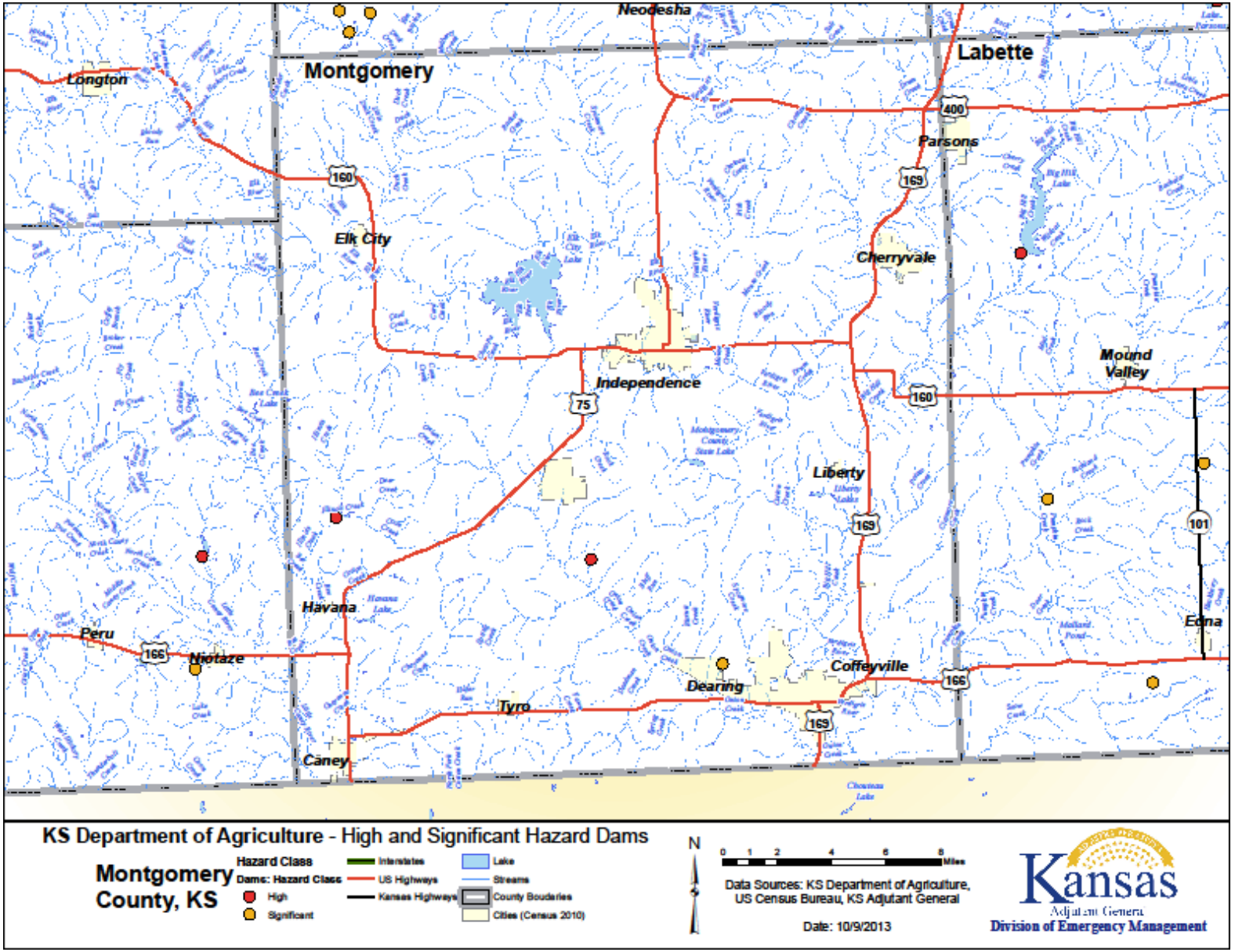
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Parsons
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Cherryvale
Mound Valley
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Havana
Peru
Niotaze
Coffeyville
Dearing
Tyro
Caney
Edna
KS Department of Agriculture - High and Significant Hazard Dams
Montgomery County, KS
Hazard Class
Dams: Hazard Class
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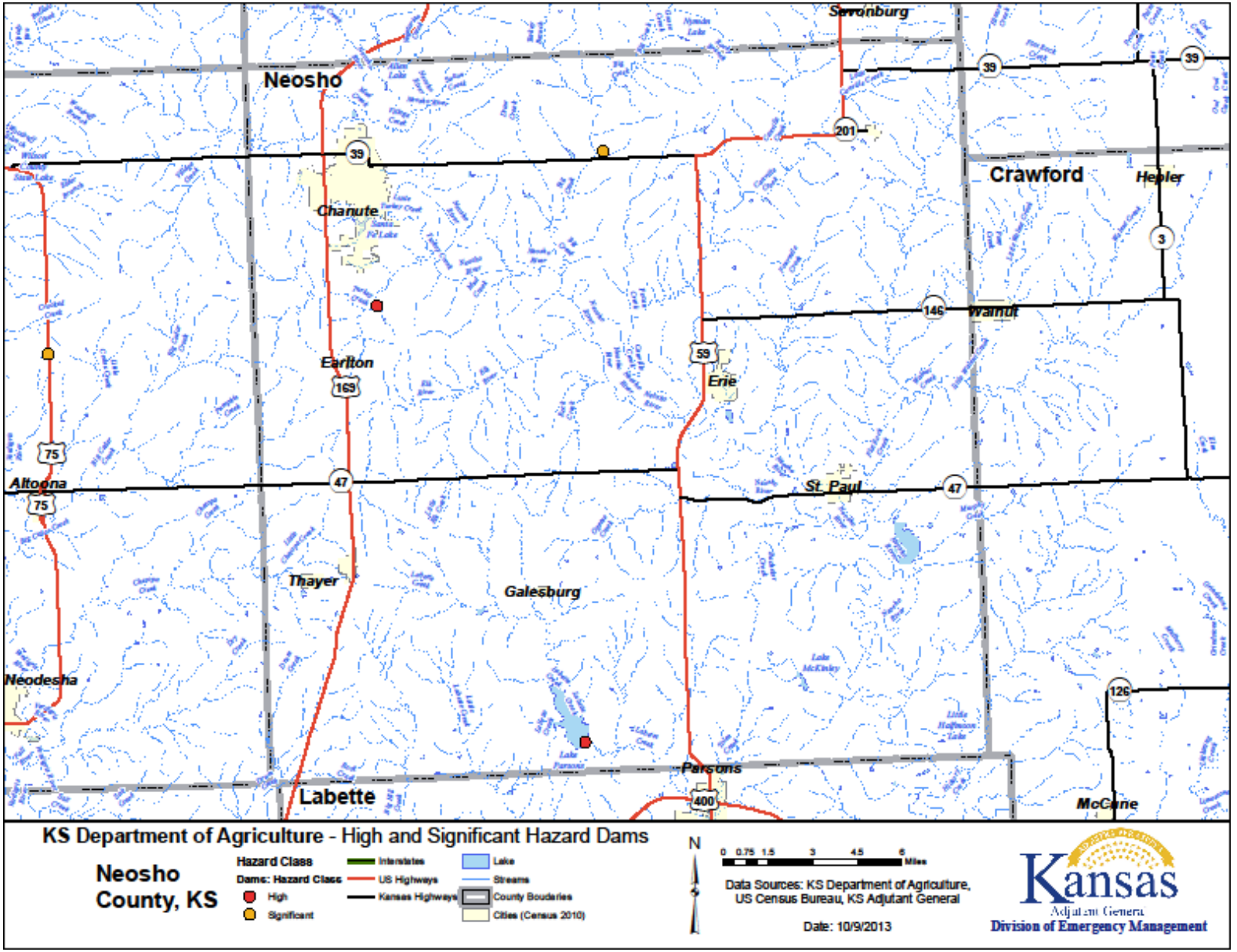
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Labette
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KS Department of Agriculture - High and Significant Hazard Dams
Neosho County, KS
Hazard Class
Dams: Hazard Class
High
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Streams
County Boudaries
Cities (Census 2010)
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Data Sources: KS Department of Agriculture, US Census Bureau, KS Adjutant General
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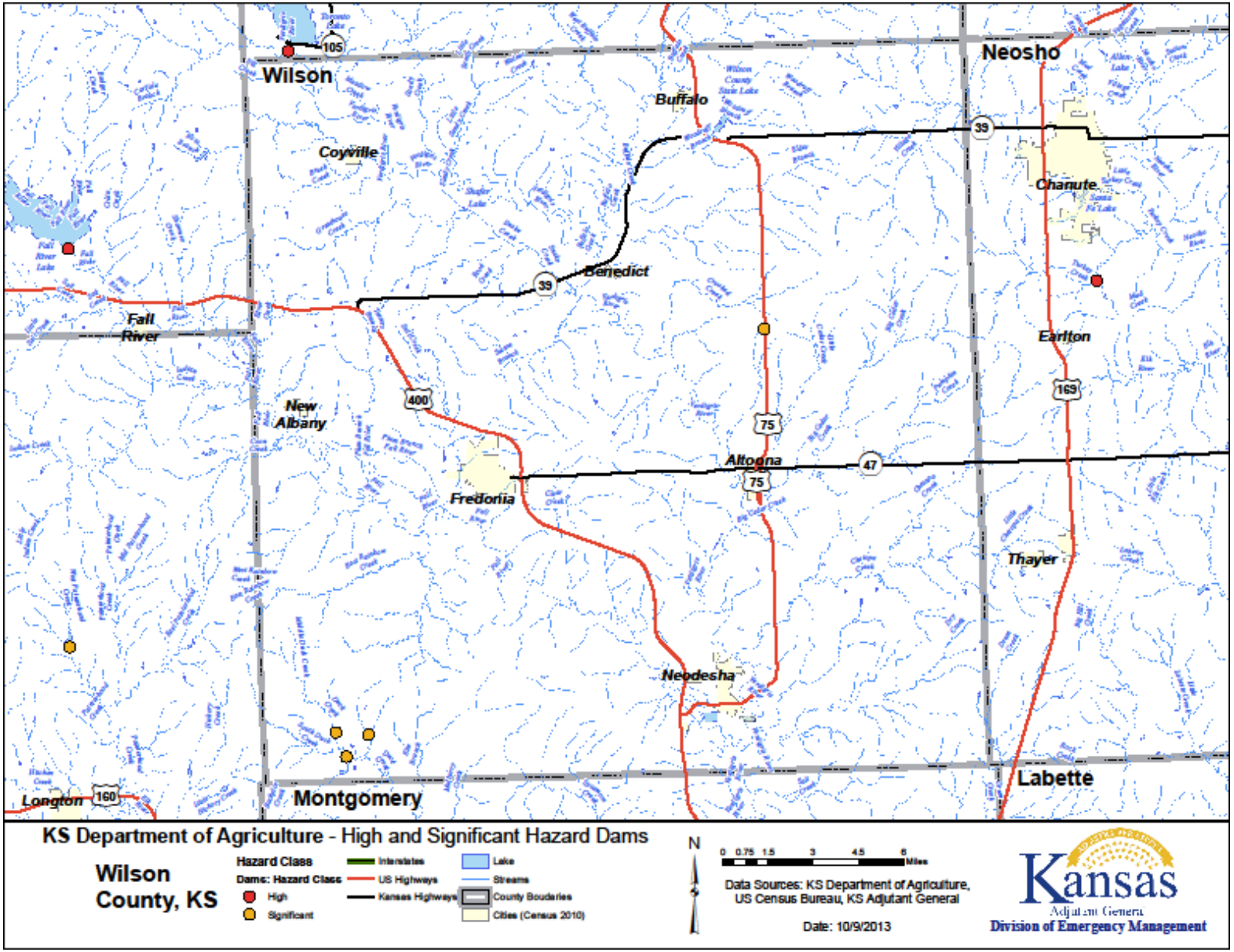
Kansas
Adjutant General
Division of Emergency Management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Earlton
New Albany
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Fredonia
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Longton
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KS Department of Agriculture - High and Significant Hazard Dams
Wilson County, KS
Hazard Class
Dams: Hazard Class
High
Significant
Interstates
US Highways
Kansas Highways
Lake
Streams
County Boudaries
Cities (Census 2010)
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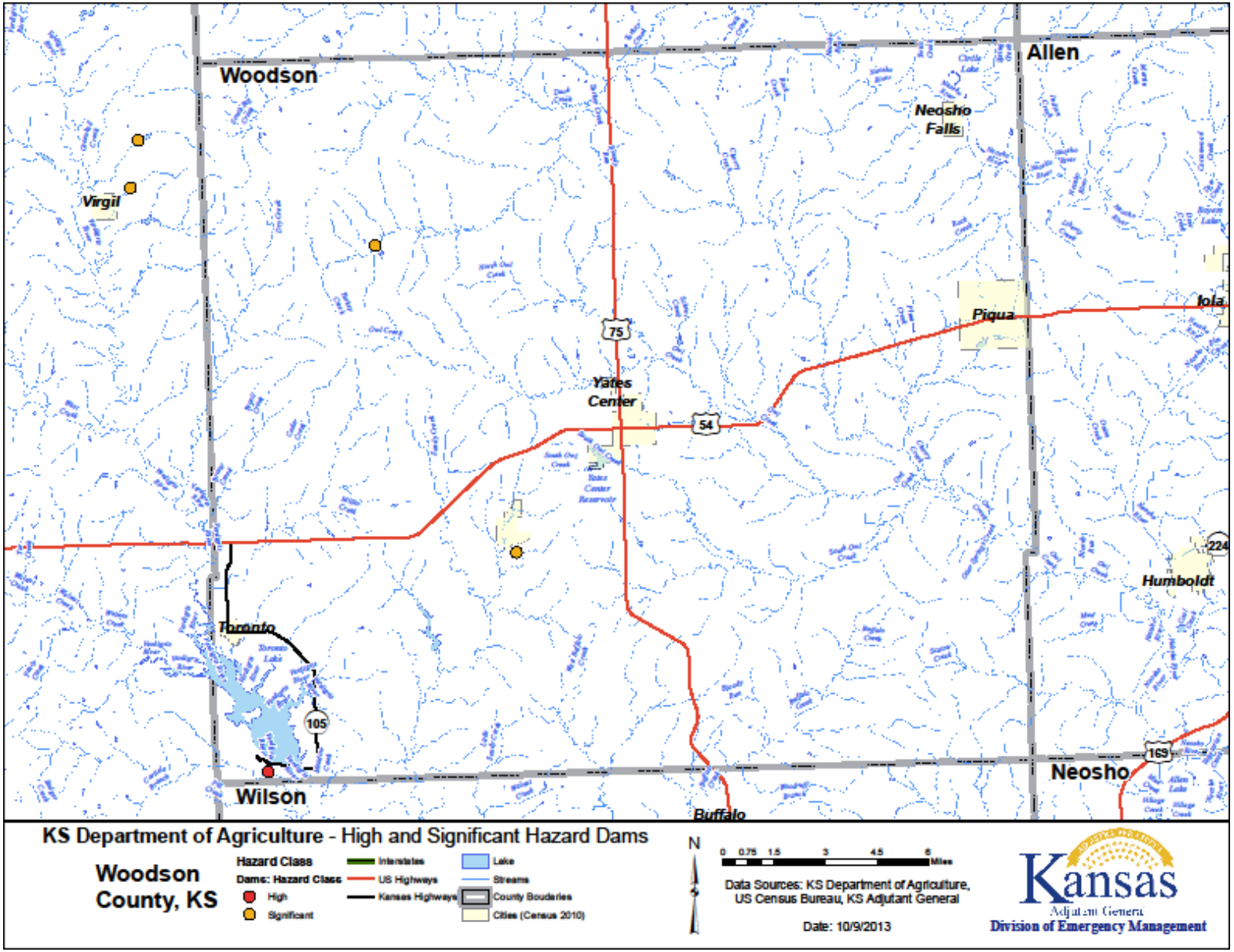
0 0.75 1.5 3 4.5 6
Miles
Data Sources: KS Department of Agriculture, US Census Bureau, KS Adjutant General
Date: 10/9/2013
Kansas
Adjutant General
Division of Emergency Management


Woodson
Allen
Neosho Falls
Virgil
Piqua
Iola
75
Yates Center
54
224
Humboldt
Toronto
105
Wilson
Buffalo
Neosho
163
KS Department of Agriculture - High and Significant Hazard Dams
Woodson County, KS
Hazard Class
Dams: Hazard Class
High
Significant
Interstates
US Highways
Kansas Highways
Lake
Streams
County Boudaries
Cities (Census 2010)
N
0 0.75 1.5 3 4.5 6 Miles
Data Sources: KS Department of Agriculture, US Census Bureau, KS Adjutant General
Date: 10/9/2013
Kansas
Adjutant General
Division of Emergency Management

### *Federal Dams*

There are also five dams in southeast Kansas that are maintained and operated by the federal government. One is maintained by the U.S. Army, and four are maintained by the USACE Tulsa District. The following table shows the Federal reservoirs within the region.

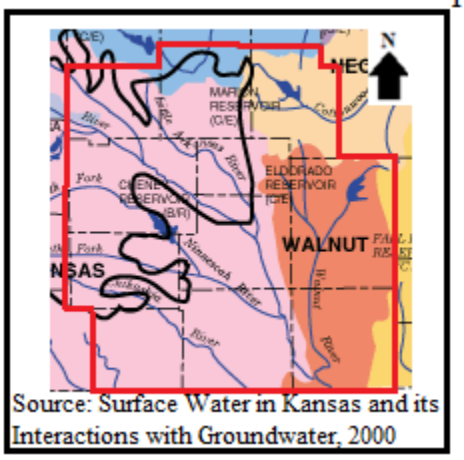
**Federal Reservoirs in Region**

| Reservoir | County | Year Storage Began | Operating Agency | River Basin | Contributing Drainage Area (Sq. miles) | Surface Area (acres) | Est. Storage Capacity (acre feet) |
|---|---|---|---|---|---|---|---|
| Ammunition Plant Dam | Labette | 1942 | US Army | - | - | - | - |
| Big Hill (Pearson-Skubitz) | Labette | 1981 | USACE-Tulsa | Arkansas | 37 | 1,192 | 26,650 |
| Elk City | Montgomery | 1966 | USACE-Tulsa | Arkansas | 634 | 4,188 | 38,385 |
| Fall River | Greenwood | 1949 | USACE-Tulsa | Arkansas | 585 | 2,329 | 19,433 |
| Toronto | Woodson | 1960 | USACE-Tulsa | Arkansas | 730 | 2,580 | 15,734 |

Source: KWO and Kansas Department of Agriculture, Division of Water Resources

The following map shows the location of federal reservoirs within southeast Kansas and in adjacent counties.

Federal Reservoir Location Map




Source: Surface Water in Kansas and its Interactions with Groundwater, 2000

### *Dams in Adjacent States*

Most of the major rivers in the region are flowing either south into Oklahoma or east into Missouri. As such, any dam breach in adjacent states would be unlikely to impact the region.

### *Levees*

In Kansas, there are hundreds of levees ranging in size from small agricultural levees that were constructed primarily to protect farmland from high frequency flooding to large urban levees that were constructed to protect people and property from larger, less frequent flooding events, such as the 100-year and 500-year flood events. Levees have been constructed across the State by public and private entities with varying levels of protection, inspection oversight, and

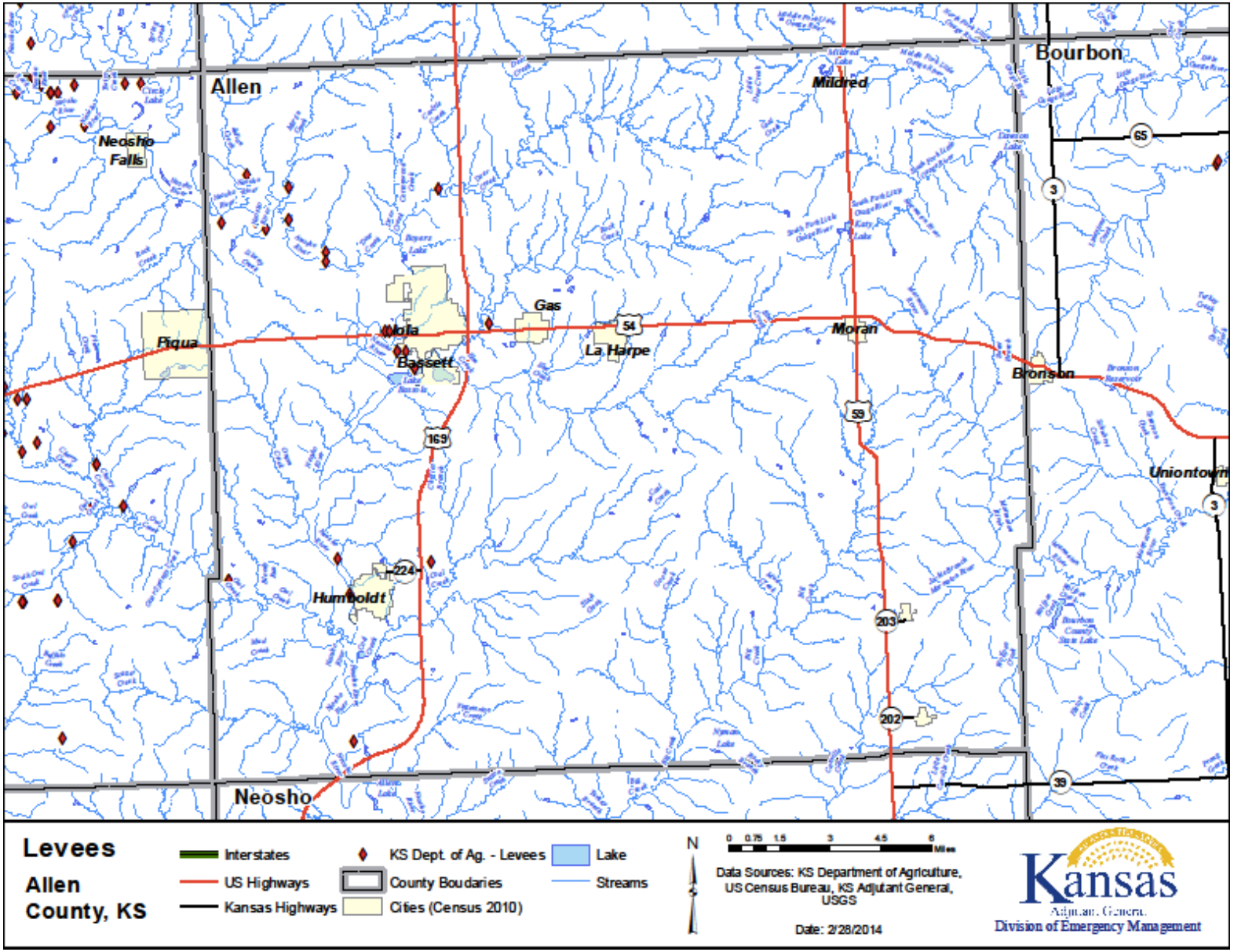
maintenance. Currently there is no one comprehensive database of all levees in the State. However, significant strides have been made toward compiling such an inventory. In 2010, FEMA published the MLI database of levees. The MLI contains levee data gathered primarily for structures that were designed to provide protection from at least the base (1-percent-annual-chance) flood. Levees that provide protection for less than the base flood event are included, but only were data was readily available. The MLI was developed to complement the USACE NLD. During development of this plan update, USACE was in the process of integrating the MLI with the NLD to provide a more comprehensive database of levees. Every effort was made during development of this plan to consider all known levees from both databases.

**Regional Levees**

| County | Levee Name | USACE Inspection Rating | Flooding Source | Accredited | DFIRM | Design Frequency |
|---|---|---|---|---|---|---|
| Allen | Iola Levee | Minimally Acceptable | Neosho River | Yes | Yes | 1% Annual Chance |
| Labette | Labette Creek Levee | N/A | Labette Creek | No | Yes | Unknown |
| Montgomery | Caney Levee* | N/A | Little Caney River | No | Yes | 1% Annual Chance |
| Montgomery | Coffeyville Levee | N/A | Verdigris River | Yes | Yes | 1% Annual Chance |
| Montgomery | Elk City Levee | N/A | Elk River | Yes | Yes | 1% Annual Chance |
| Montgomery | Elk City Reservoir Levee | N/A | Elk River | Yes | Yes | Unknown |
| Montgomery | Coffeyville Levee | Minimally Acceptable | Not Reported | No | - | Unknown |
| Montgomery | Elk City Lake | Acceptable | Not Reported | No | - | Unknown |
| Montgomery and Washington | Caney Levee | Acceptable | Not Reported | No | - | Unknown |
| Neosho | Chanute Levee* | N/A | Neosho River | No | Yes | Unknown |
| Neosho | Chanute/ Santa Fe Lake Levee* | N/A | Little Turkey Creek | No | Yes | Unknown |
| Neosho | Neosho River/ Chanute Levee* | N/A | Neosho River | No | Yes | Unknown |
| Neosho | Neosho River/ Neosho County Levee* | N/A | Neosho River | No | Yes | Unknown |

Compiled from the USACE NLD as well as the FEMA MLI
* = Not accredited by FEMA or in the USACE Levee Safety Program

The following maps show identified levee protected areas within the southeast Kansas region.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Bourbon
Neosho
Neosho Falls
Mildred
Piqua
Iola
Gas
Bassett
La Harpe
Moran
Bronson
Uniontown
Humboldt
54
169
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65
3
224
203
202
39
Levees
Allen
County, KS
Interstates
US Highways
Kansas Highways
KS Dept. of Ag. - Levees
County Boudaries
Cities (Census 2010)
Lake
Streams
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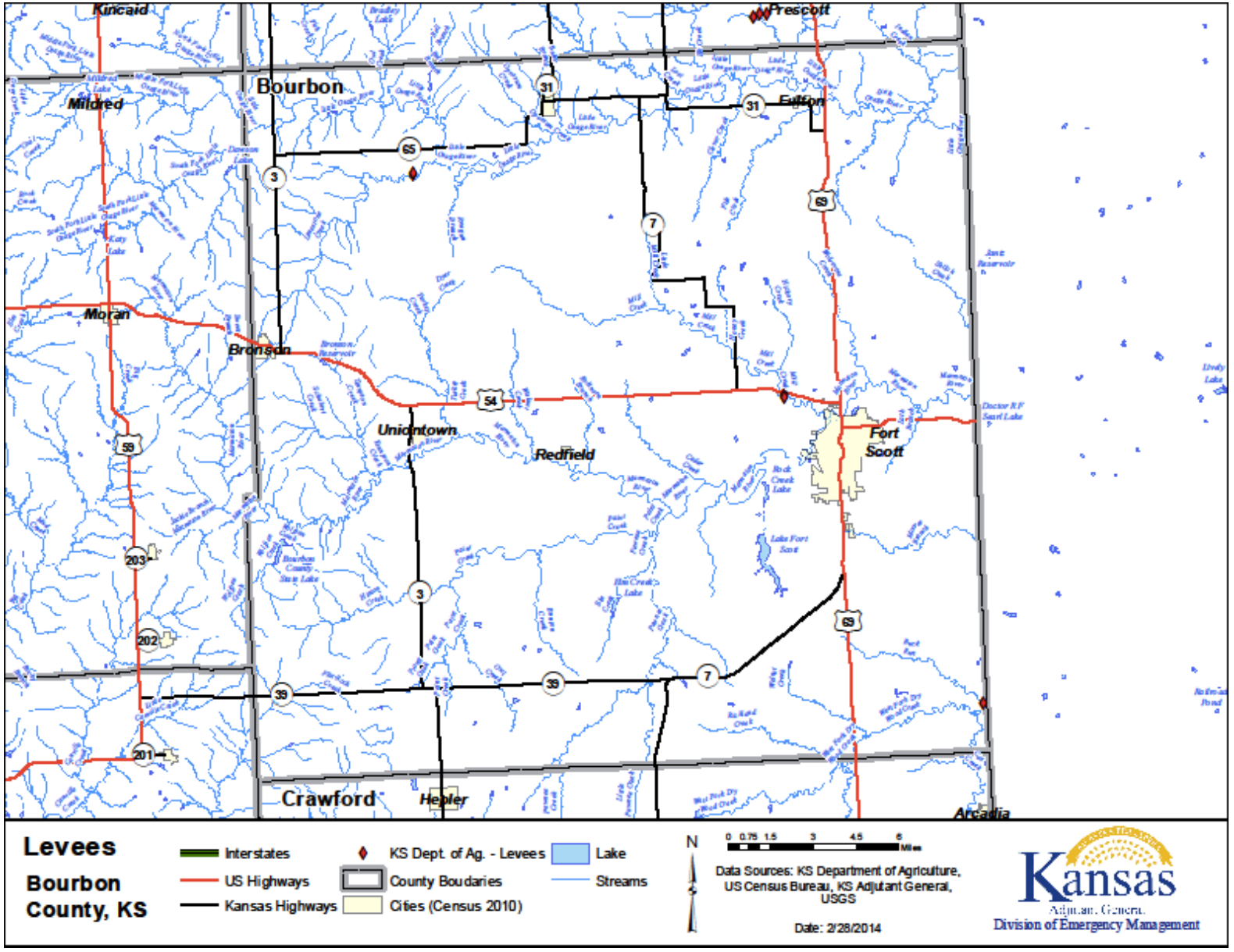
Miles
Data Sources: KS Department of Agriculture, US Census Bureau, KS Adjutant General, USGS
Date: 2/28/2014
Kansas
Adjutant General
Division of Emergency Management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Mildred
Fulton
Moran
Bronson
Uniontown
Redfield
Fort Scott
Crawford
Hepler
Arcadia
Levees
Bourbon County, KS
Interstates
US Highways
Kansas Highways
KS Dept. of Ag. - Levees
County Boudaries
Cities (Census 2010)
Lake
Streams
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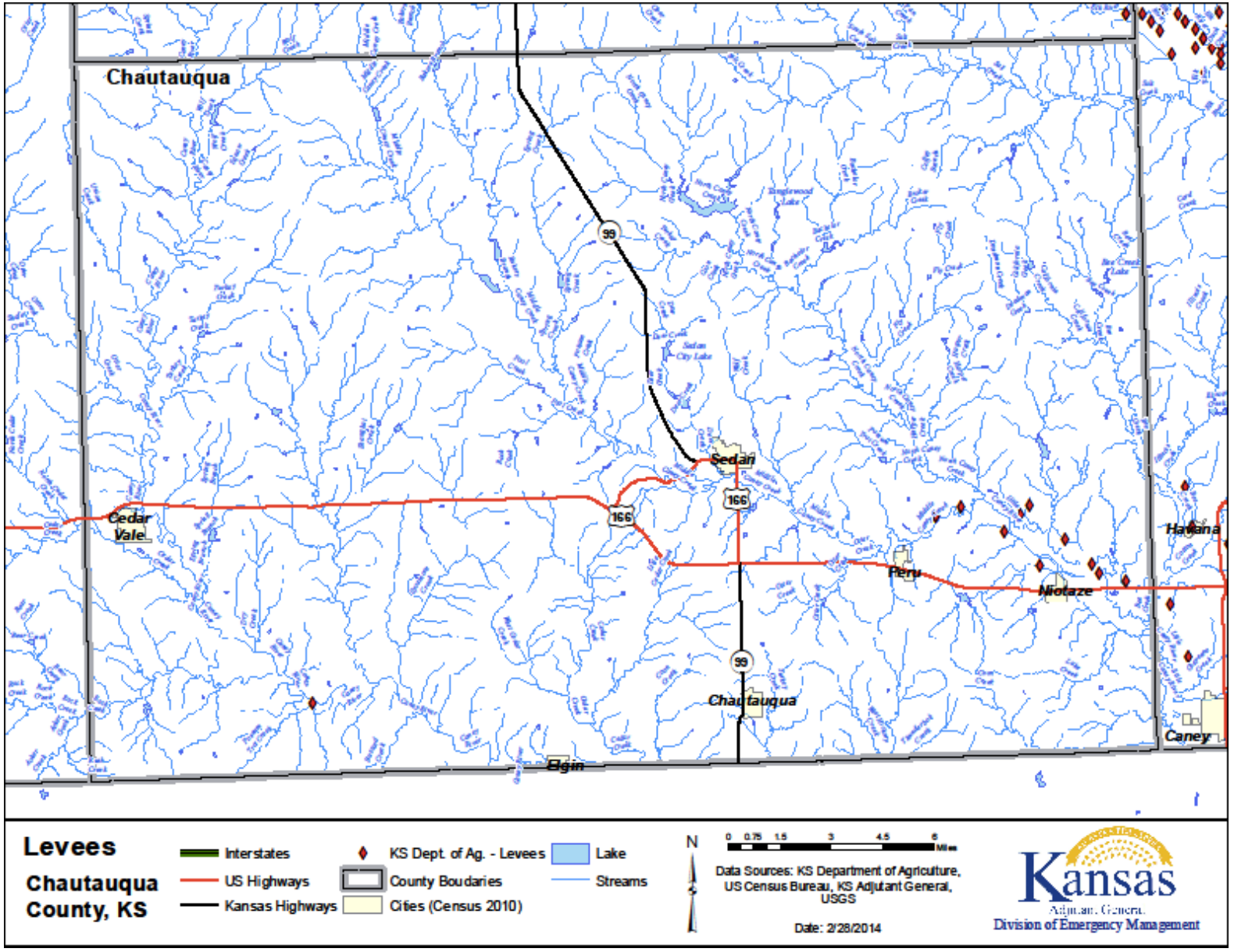
Data Sources: KS Department of Agriculture, US Census Bureau, KS Adjutant General, USGS
Date: 2/28/2014
Kansas
Adjutant General
Division of Emergency Management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99
Sedan
166
Cedar Vale
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Peru
Niotaze
Hattana
99
Chautauqua
Caney
Elgin
Levees
Chautauqua County, KS
Interstates
US Highways
Kansas Highways
KS Dept. of Ag. - Levees
County Boudaries
Cities (Census 2010)
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Streams
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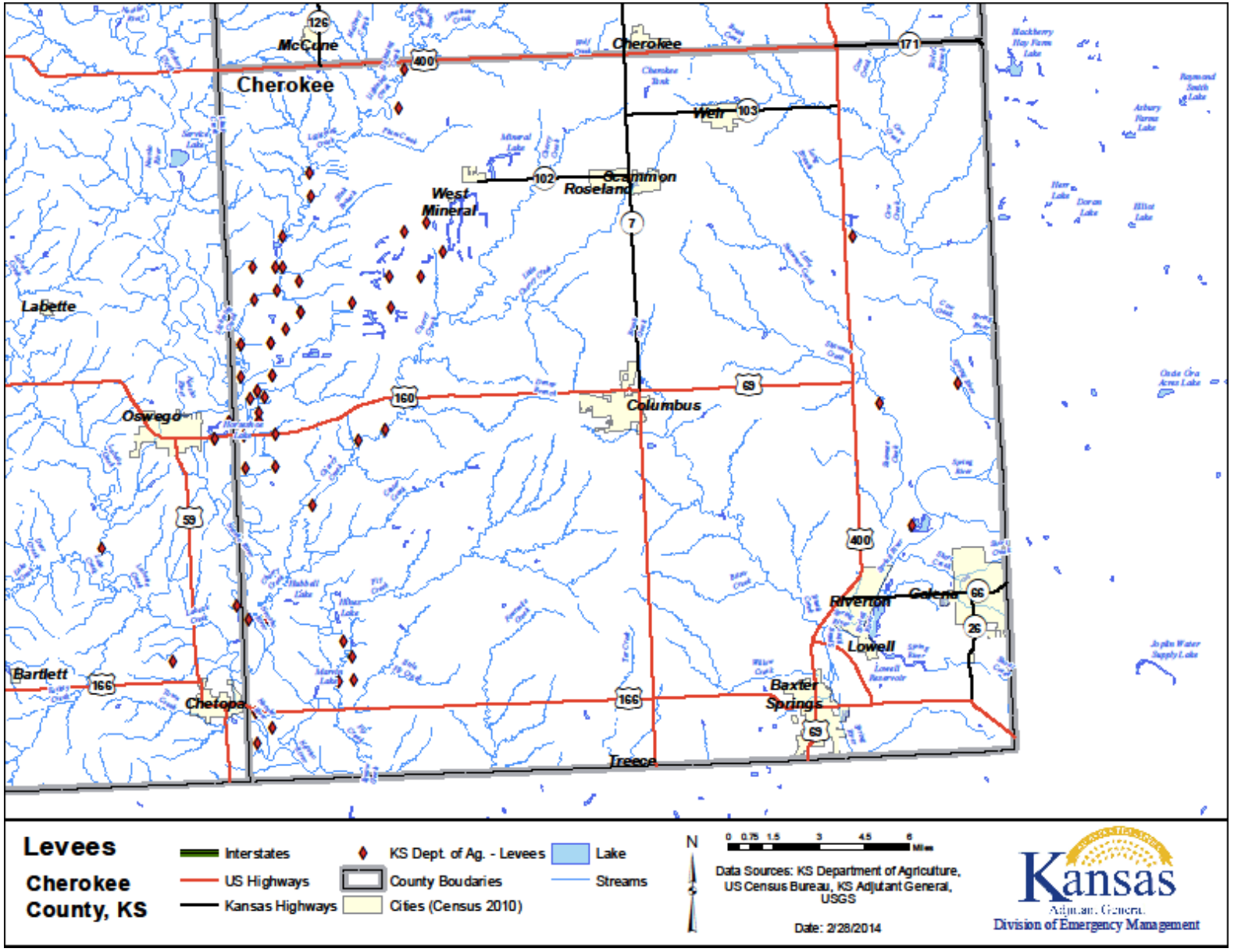
Data Sources: KS Department of Agriculture, US Census Bureau, KS Adjutant General, USGS
Date: 2/28/2014
Kansas
Adjutant General
Division of Emergency Management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Interstates
US Highways
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KS Dept. of Ag. - Levees
County Boudaries
Cities (Census 2010)
Lake
Streams
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0 0.75 1.5 3 4.5 6 Miles
Data Sources: KS Department of Agriculture, US Census Bureau, KS Adjutant General, USGS
Date: 2/28/2014
Kansas
Adjutant General
Division of Emergency Management
McCune
Cherokee
Weir
West Mineral
Scammon
Roseland
Columbus
Oswego
Labette
Bartlett
Chetopa
Treece
Baxter Springs
Lowell
Riverton
Galena
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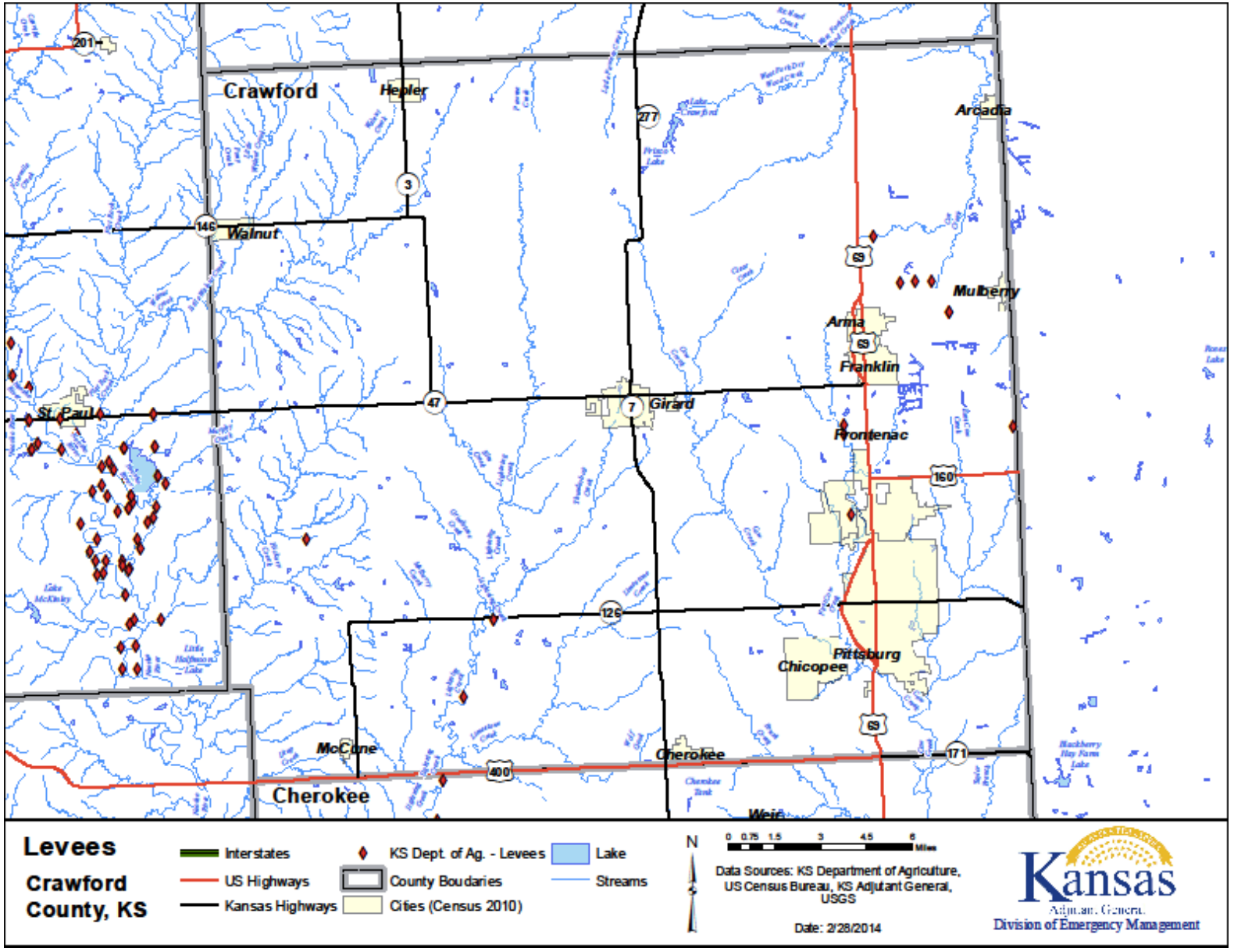
160
59
166
69
66
25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Girard
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Franklin
Frontenac
Pittsburg
Chicopee
McCune
Cherokee
Weir
201
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277
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Levees
Crawford
County, KS
Interstates
US Highways
Kansas Highways
KS Dept. of Ag. - Levees
County Boudaries
Cities (Census 2010)
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Streams
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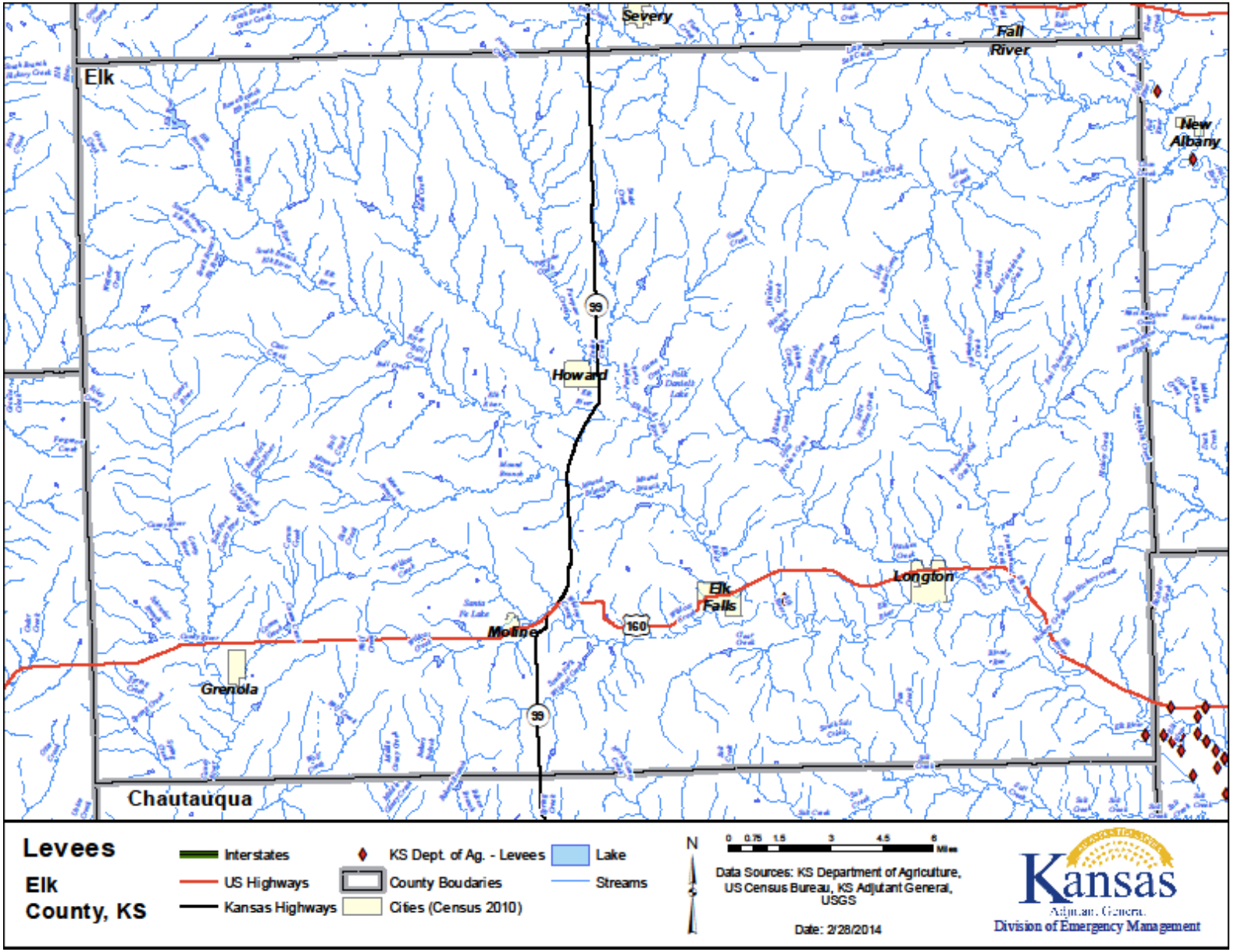
Data Sources: KS Department of Agriculture, US Census Bureau, KS Adjutant General, USGS
Date: 2/28/2014
Kansas
Adjutant General
Division of Emergency Management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Elk
New Albany
99
Howard
Elk Falls
Longton
Moline
160
Grenola
99
Chautauqua
Levees
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Interstates
US Highways
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KS Dept. of Ag. - Levees
County Boudaries
Cities (Census 2010)
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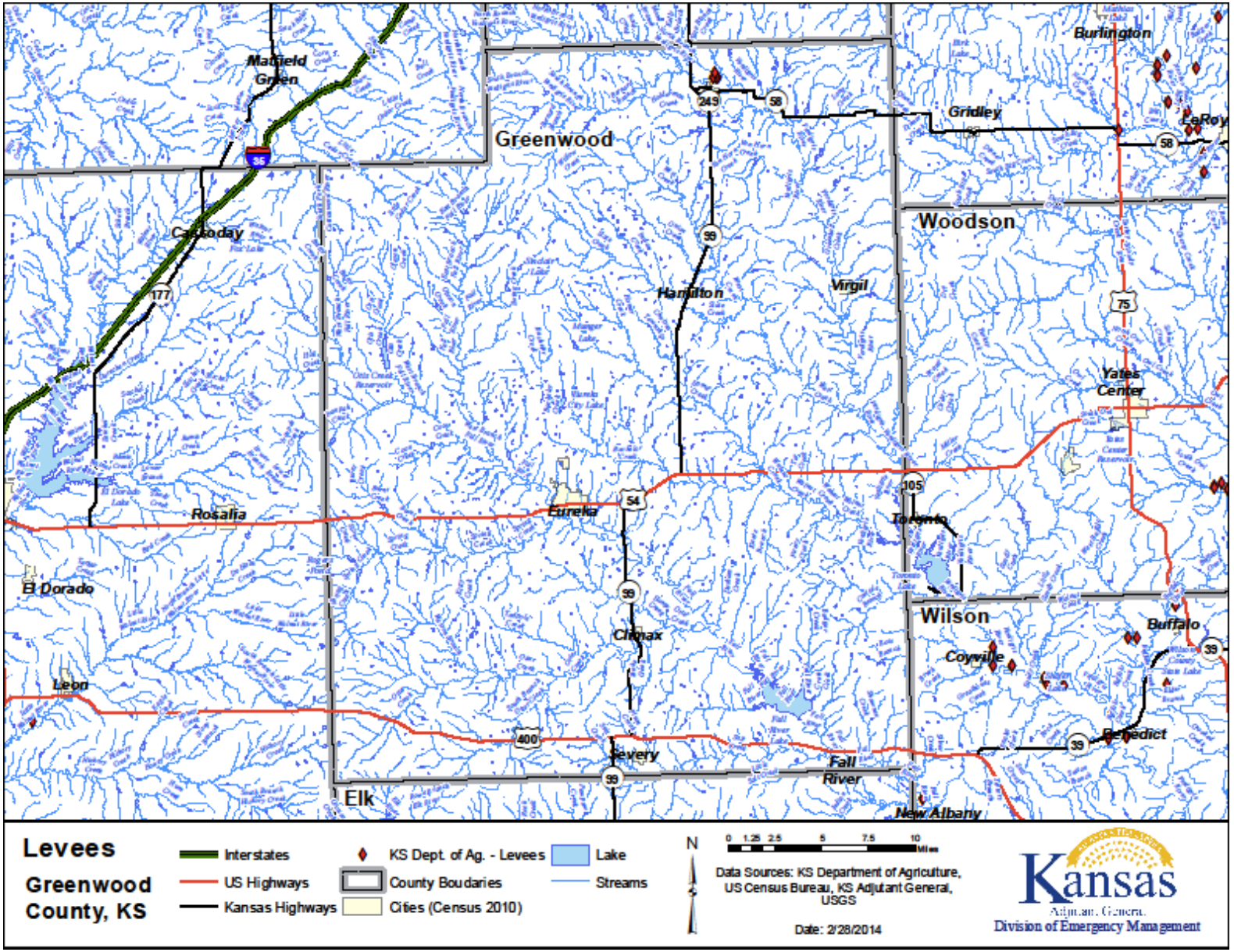
Kansas
Adjutant General
Division of Emergency Management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Elk
Burlington
LeRoy
Gridley
Hamilton
Virgil
Yates Center
Eureka
Rosalia
El Dorado
Leon
Climax
Severy
Fall River
New Albany
Buffalo
Coyville
Benedict
Toronto
Madfield Green
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Greenwood County, KS
Interstates
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KS Dept. of Ag. - Levees
County Boudaries
Cities (Census 2010)
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Date: 2/28/2014
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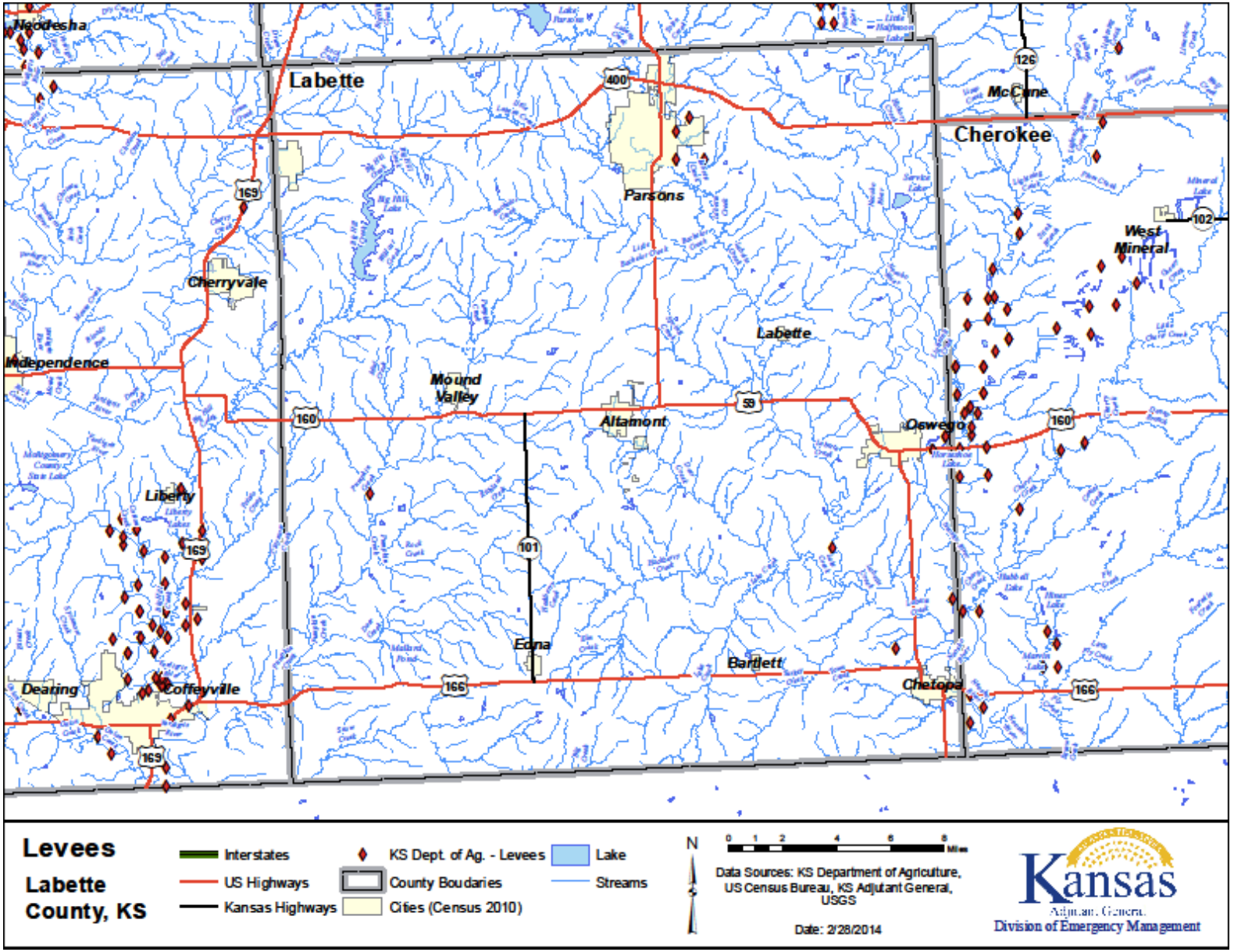
Division of Emergency Management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Parsons
McCune
West Mineral
Cherryvale
Independence
Mound Valley
Altamont
Labette
Oswego
Liberty
Edna
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Chetopa
Dearing
Coffeyville
400
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Levees
Labette County, KS
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Kansas Highways
KS Dept. of Ag. - Levees
County Boudaries
Cities (Census 2010)
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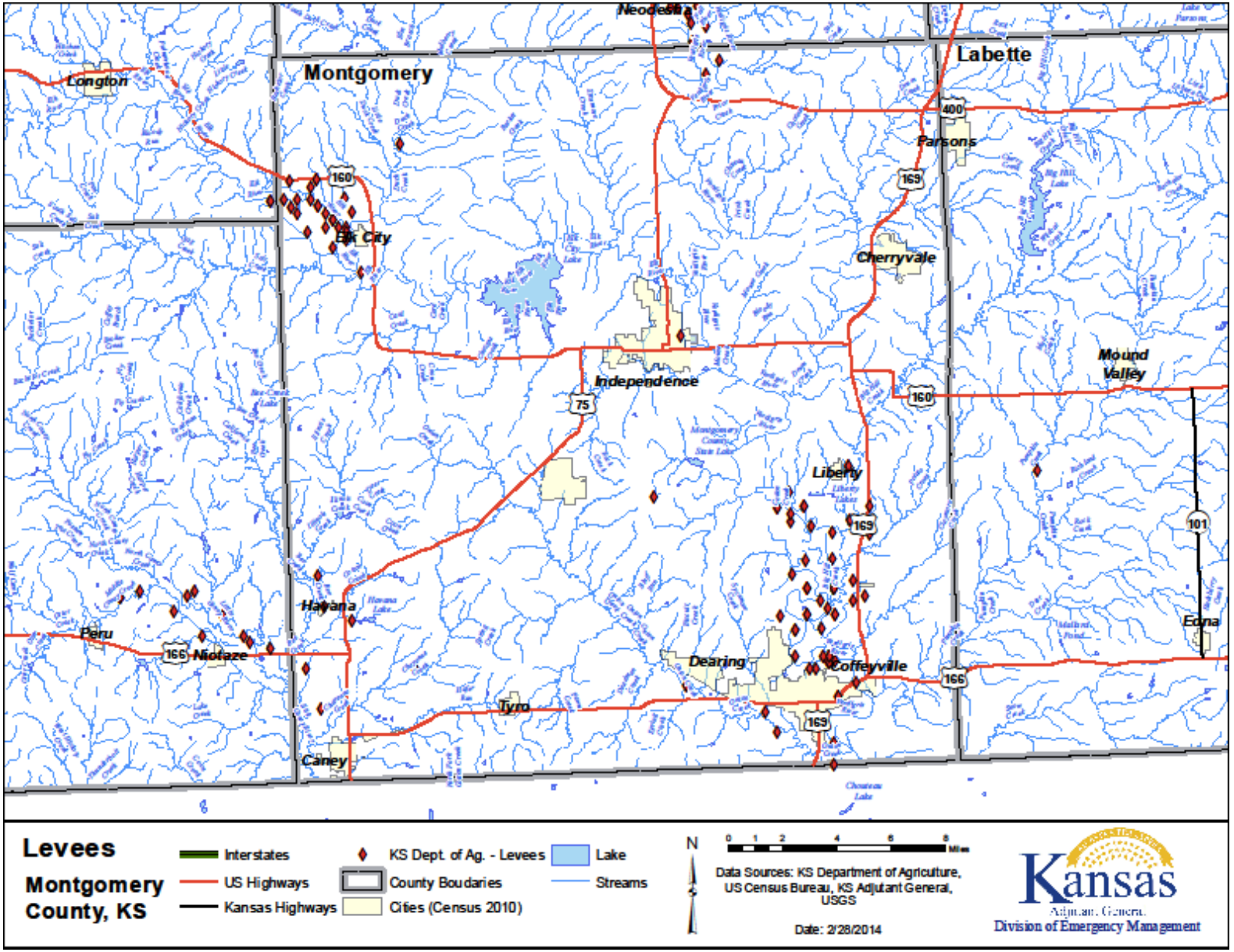
Kansas
Adjutant General
Division of Emergency Management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Independence
Mound Valley
Liberty
Havana
Peru
Niotaze
Dearing
Coffeyville
Tyro
Caney
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Elk City
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Levees
Montgomery County, KS
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KS Dept. of Ag. - Levees
County Boudaries
Cities (Census 2010)
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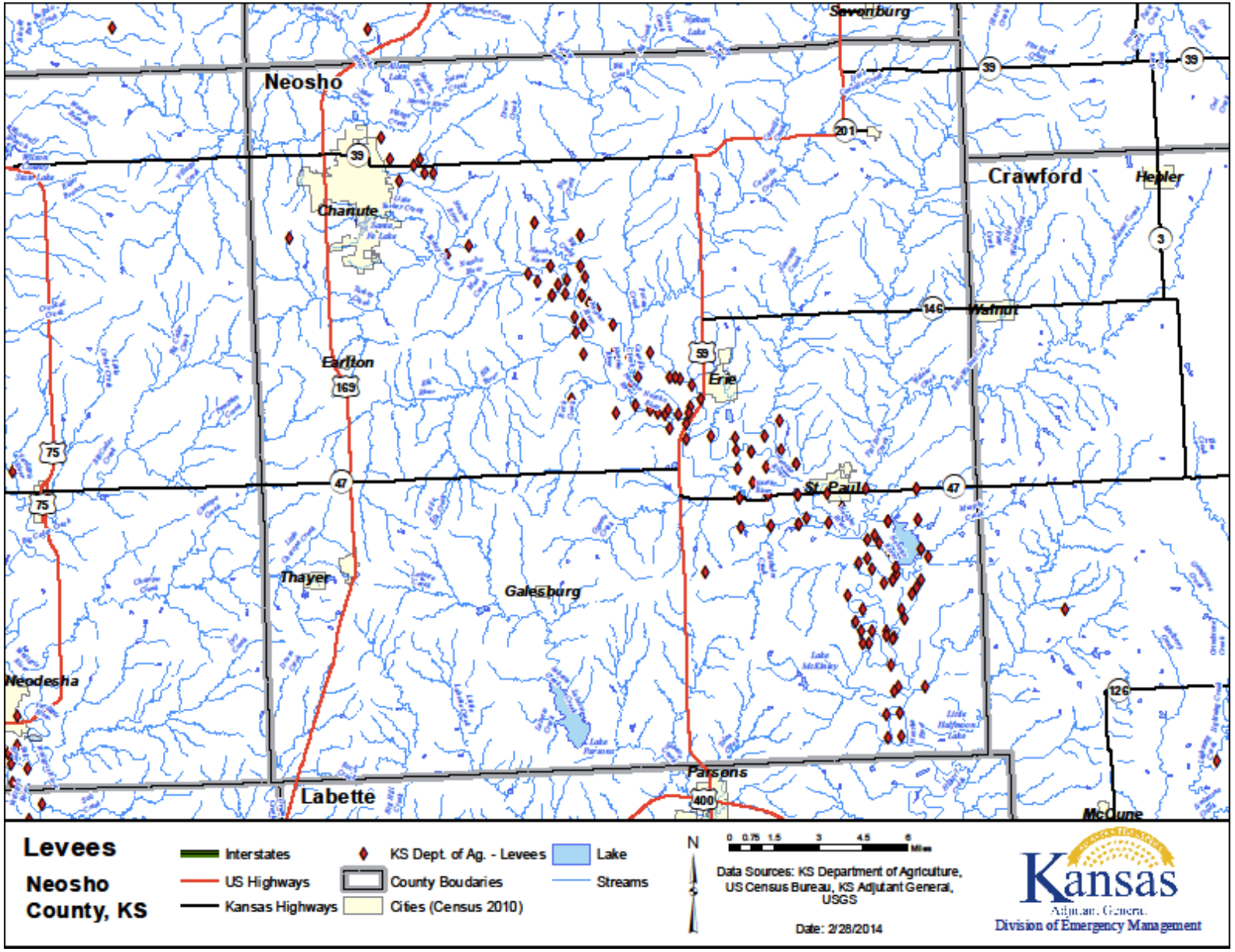
Kansas
Adjutant General
Division of Emergency Management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Hepler
Chanute
Earlton
Erie
Walnut
St. Paul
Thayer
Galesburg
Neodesha
Parsons
Labette
McCune
Levees
Neosho County, KS
Interstates
US Highways
Kansas Highways
KS Dept. of Ag. - Levees
County Boudaries
Cities (Census 2010)
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Adjutant General
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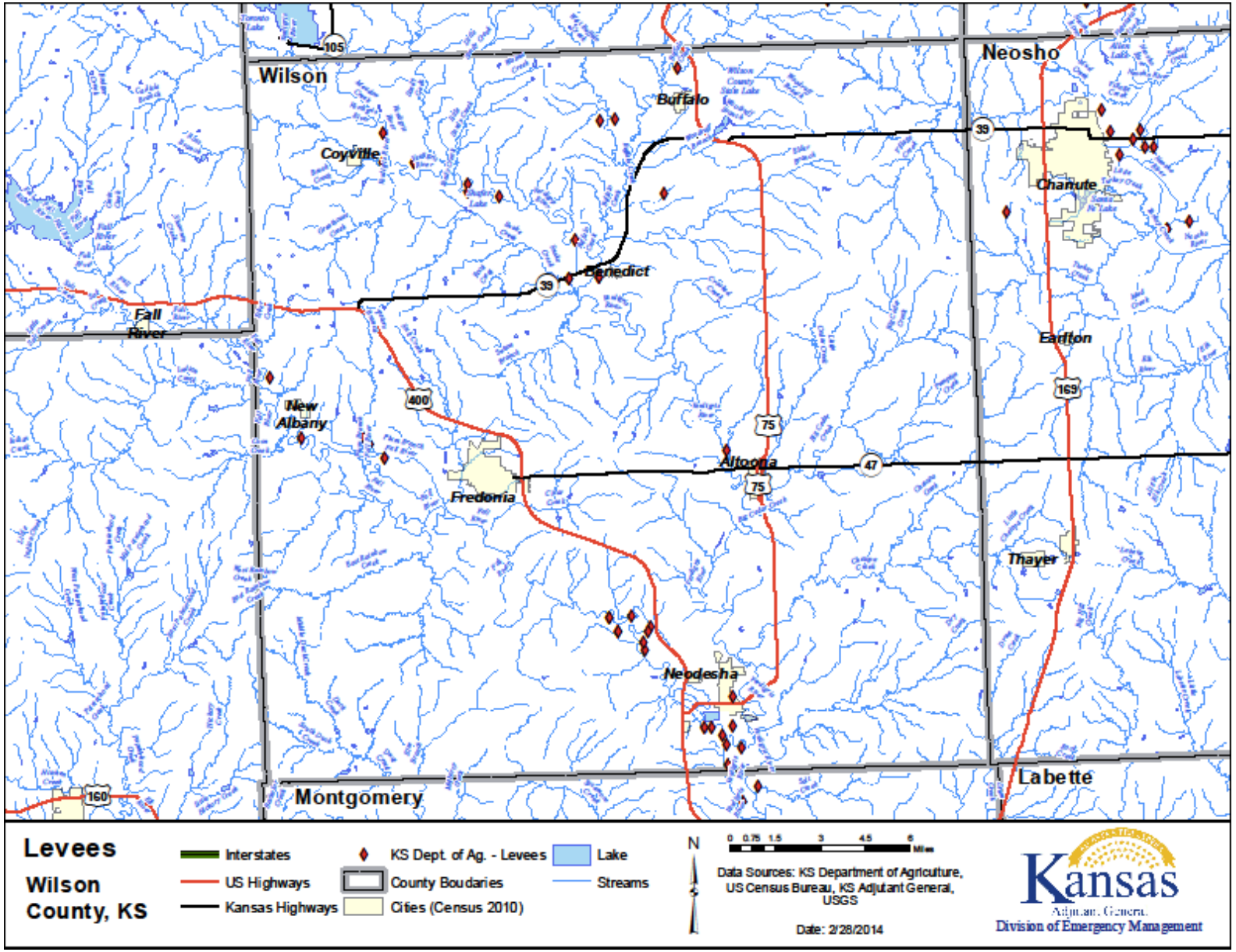
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Labette
Buffalo
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Benedict
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Altoona
Neodesha
Chanute
Earlton
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Levees
Wilson County, KS
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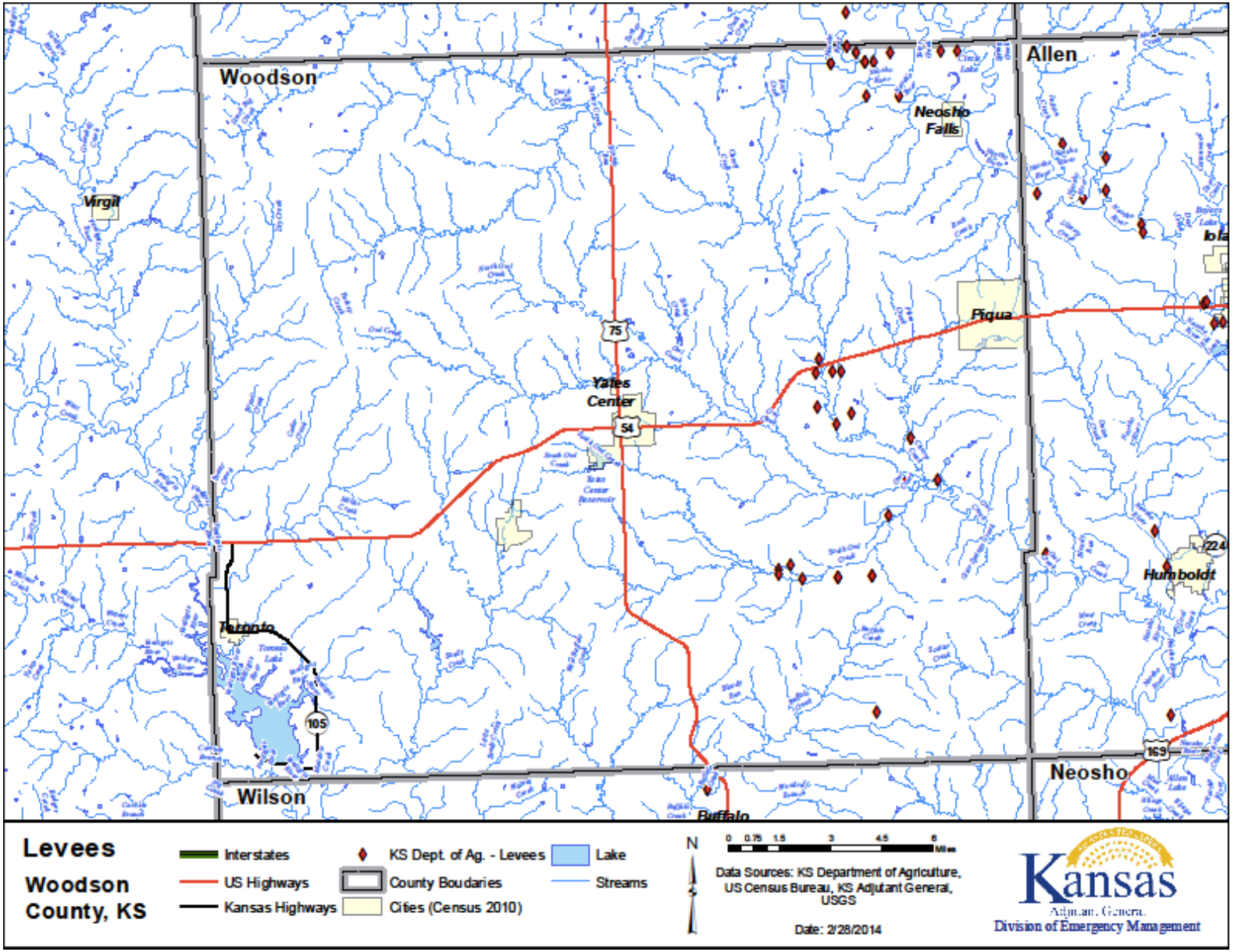
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0 0.75 1.5 3 4.5 6 Miles
Data Sources: KS Department of Agriculture, US Census Bureau, KS Adjutant General, USGS
Date: 2/28/2014
Kansas
Adjutant General
Division of Emergency Management

## Previous Occurrences and Extent

Notable previous dam and levee failures in southeast Kansas are listed below.

**Regional Dam Incidents, 1925-2012**

| County | National Inventory of Dams Number | Dam Name | Incident Date | Incident Type | Dam Failure |
|---|---|---|---|---|---|
| Woodson | KS00900 | Kansas F F And Game Commission (Kansas Dept. Of Wildlife & Parks) | 1/10/1996 | Seepage | No |
| Montgomery | KS03891 | Wheeler, C.L. & Vesta, Hadden-Wheeler Dam | 10/8/1997 | Concrete Deterioration | No |
| Greenwood | KS02308 | Upper Verdigris Watershed Dam 7-7 | 11/1/1998 | Inflow Flood - Hydrologic Event | No |
| Greenwood | KS02311 | Upper Verdigris Watershed Dam 9-2 | 11/1/1998 | Inflow Flood - Hydrologic Event | No |
| Greenwood | KS02312 | Upper Verdigris Wjd No 24, Frd No 9-3 | 11/1/1998 | Inflow Flood - Hydrologic Event | No |
| Greenwood | KS02310 | Upper Verdigris Watershed Dam 9-1 | 11/1/1998 | Inflow Flood - Hydrologic Event | No |

Source: Stanford University's National Performance of Dams Program

There are no reported major or catastrophic levee failures within the southeast Kansas region.

## Hazard Vulnerability and Impact

### *Dam Failure*

The 2009 Kansas Water Plan states that some dams are exhibiting structural deficiencies because of age, while post-construction development downstream of others has raised their hazard class. Common problems with older dams include:

- Deteriorating metal pipes and structural components,
- Inadequate hydrologic capacity,
- Increased runoff because of upstream development, and
- Increased failure hazard because of downstream development.

To complete an analysis of vulnerability to dam failure as well as attempt to describe vulnerability in terms of the jurisdictions most threatened by dam failure, points were assigned to each type of dam and then aggregated for a total point score for each county. Points were assigned as follows for each dam: Low Hazard Dams, 1 point, Significant Hazard Dams, 2 points, High Hazard Dams, 3 points, High Hazard Dams without an Emergency Action Plan (EAP), an additional 2 points, Federal Reservoir Dams, 3 points. This analysis does not intend to demonstrate vulnerability in terms dam structures that are likely to fail, but rather provides a general overview of the counties that have a high number of dams, with weighted consideration

given to dams whose failure would result in greater damages. The following table show the results of this analysis.

**Dam Failure Vulnerability Analysis**

| County | Low Hazard Dams | Significant Hazard Dams | High Hazard Dams | High Hazard Dams Without EAP | Federal Reservoirs | Vulnerability Rating | Vulnerability Level |
|---|---|---|---|---|---|---|---|
| Allen | 23 | 0 | 0 | 0 | | 23 | Low |
| Bourbon | 77 | 3 | 5 | 1 | | 100 | Medium |
| Chautauqua | 80 | 1 | 3 | 0 | | 91 | Medium |
| Cherokee | 8 | 0 | 0 | 0 | | 8 | Low |
| Crawford | 59 | 2 | 1 | 0 | | 66 | Medium |
| Elk | 80 | 6 | 3 | 3 | | 107 | Medium-High |
| Greenwood | 148 | 8 | 4 | 4 | 1 | 187 | Medium-High |
| Labette | 55 | 3 | 0 | 0 | 2 | 67 | Medium |
| Montgomery | 39 | 0 | 2 | 1 | 1 | 50 | Medium-Low |
| Neosho | 64 | 1 | 1 | 1 | | 71 | Medium |
| Wilson | 42 | 0 | 1 | 0 | | 45 | Medium-Low |
| Woodson | 43 | 1 | 0 | 0 | 1 | 48 | Medium-Low |
| Regional Total | 718 | 25 | 20 | 10 | 5 | 863 | |

Source: Analysis utilizing data from: Kansas Department of Agriculture, Division of Water Resources, Water Structures program; USACE; Bureau of Reclamation; U.S. Army, U.S. Fish and Wildlife

The state requires EAPs for all high and significant hazard dams.

During the development of this plan, the Kansas Department of Agriculture, Division of Water Resources was working on a project to complete dam inundation mapping for High and Significant hazard dams. This project is ongoing and based on available funding. As such, neither statewide nor regional dam inundation maps were available at this time. As information becomes available it will be included in subsequent plan updates.

***Levee Failure***

To complete an analysis of vulnerability to levee failure as well as attempt to describe vulnerability in terms of the jurisdictions most threatened by levee failure, the MLI geodatabase along with census block data available in HAZUS MH 2.1 to determine the number of people and the value of development in these identified levee protected areas. This analysis does not attempt to evaluate which levees are more prone to overtopping or failure, but rather provide a general picture of those counties that have more people and property protected by levees and therefore the potential for more damage if failure or overtopping were to occur.

The following table presents the calculated value of structure and the contents of the structures protected by levees within the region, by applicable county. This data is to be used only for

general determination of those areas of the state that could suffer the greatest losses in the event of levee failure events. Data limitations prevent a more accurate analysis including: lack of delineation of protected areas for all levees and, lack of statewide parcel-type data which would provide more accurate results in determining structures and values within levee protected areas.

**Regional Populations and Values Protected by Levees**

| County | Structures Exposure | Contents Exposure | Total Exposure | Population Exposed |
|---|---|---|---|---|
| Allen | $787,000 | $525,000 | $1,312,000 | 20 |
| Montgomery | $133,263,000 | $100,311,000 | $233,574,000 | 1,581 |

Source: FEMA MLI, 2010

To estimate potential losses associated with levee failure, 20 percent loss was considered for all development (structure and contents) in levee protected areas as defined on the MLI. The 20 percent damage estimation is based on FEMA Flood Insurance Administration (FIA) depth-damage curves for a one-story structure with no basement flooded to two feet. Again, this analysis does not intend to make a determination as to specific levees that are prone to failure, but rather demonstrate an overall worst case scenario for those counties if they were all to fail in an event causing an average 20 percent in damages to the development protected by those levees.

**Estimate of Potential Loss Due to Levee Failure**

| County | Value of Development in Levee Protected Areas | Loss Estimates at 20% Damage |
|---|---|---|
| Montgomery | $233,574,000 | $46,715,000 |
| Allen | $1,312,000 | $262,000 |

Source: FEMA FIA

Economic impacts and human injury or death are the primary concern with dam and levee failure. The future construction of dams and levees within the region and/or the development of additional structures or infrastructure within areas with dams or protected by levees would likely increase the impact of an event. Items of additional concern include:

- Private levees and dams are a consideration when the risk of failure is analyzed. These levees and dams are normally maintained by their owners, which can often cost a great deal of money.
- The USACE maintains many levees in and around the planning area, however, there are also levees that are not federally maintained, so local jurisdictions or private property owners are responsible for maintaining the structures. As the levees age, the costs to repair and rebuild them will increase.

| | Magnitude/Severity |
|---|---|
| Dam and Levee Failure | 2.33 |

**Local Concerns**

The following detail specific local concerns as related to dam and levee failure:

- In Bourbon County, the City of Baxter Springs is downstream from the Shoal Creek Dam. A failure or breach could cause damage to residential and business property, loss of water and electric services to the community, roadway destruction and flooding.

- In Elk County there are five high hazard dams located around the town of Moline. These dams are MPD Number 21 to the north, Santa Fe Lake Dam, FRD Number 20 and Moline City Lake Dam to the west and FRD Number 19 to the south.

- In Labette County the City of Edna is one mile downstream from KSO7691, a significant hazard dam, the City of Coffeyville is 12 miles downstream of the James O. Bussman Dam, a significant hazard dam, and the Chetopa is which is 16 miles downstream of the Mosler Dam, a significant hazard dam.

- In Montgomery County, a levee protects Elk City from flooding on Duck Creek. This levee is designed to provide protection from the 100-year flood hazard however the flood gate on a culvert passing through the levee allows floodwaters to flow on the landward side of the levee. In addition, a levee protects the city of Coffeyville from flooding on the Verdigris River. This levee is designed to provide protection from the 100-year flood hazard. The levee is included in the USACE Rehabilitation and Inspection Program.

- In Neosho County, a levee constructed along the Neosho River and along portions of Little Turkey Creek and Chanute Drain in and around the City of Chanute serve to contain low-frequency flooding but may not be adequate for major floods.

- In Wilson County, the City of Neodesha is located 12 miles downstream of Multipurpose Dam #1 (Thayer Lake Dam), a significant hazard dam located on Chetopa Creek.

**Future Development**

Future development and population increase would tend to increase the likelihood of the population being impacted by a dam or levee failure. event. However, data suggests that the population of the southeast Kansas region in general, and specifically rural areas, is in decline, as is the rate of development. In regional areas where there are reported population increase, mainly larger population centers, any increase in development in potential inundation areas would increase potential of being impacted by a dam or levee failure.

**Probability of Future Occurrences**

The variability of the size and construction of the dams in southeast Kansas makes estimating the probability of dam failure difficult on any scale less than a case-by-case basis. The limited data on previous occurrences indicates that in the last 87 years, there have been 7 recorded dam failure events in all of Kansas, which is less than 1 event in 10 years.

Although both federal and nonfederal levees have been damaged in previous regional flood events such as the floods in 1993, 2007, and 2011, the damage has not resulted in catastrophic

failure and/or damages. Levees in Kansas that have been constructed to protect development and populations from the 1-percent annual chance flood are routinely inspected and maintained. Based on current historical data pertaining to damaging/significant levee failure incidents in the State of Kansas, this hazard's CPRI probability is unlikely.

| | Probability |
|---|---|
| Dam and Levee Failure | 1.58 |

**Consequence Analysis**

When a dam fails, the stored water can be suddenly released and have catastrophic effects on life and property downstream. Homes, bridges, and roads can be demolished in minutes. Emergency plans written for dams include procedures for notification and coordination with law enforcement and other governmental agencies, information on the potential inundation area, plans for warning and evacuation, and procedures for making emergency repairs.

The impact of levee failure during a flooding event can be very similar to a dam failure in that the velocity of the water caused by sudden release as a result of levee breach can result in a flood surge or flood wave that can cause catastrophic damages. If the levee is overtopped as a result of flood waters in excess of the levee design, impacts are similar to flood impacts.

The information in the following table provides the Consequence Analysis.

**Dam Failure Consequence Analysis**

| Subject | Ranking | Impacts of Dam and Levee Failure |
|---|---|---|
| Health and Safety of Persons in the Area of the Incident | Severe | Localized impact expected to be severe for the inundation area and moderate to minimal for other affected areas. |
| Responders | Minimal | Impact to responders is expected to be minimal with proper training. Impact could be severe if there is lack of training. |
| Continuity of Operations | Minimal | Temporary relocation may be necessary if inundation affects government facilities. |
| Property, Facilities, and Infrastructure | Minimal to Severe | Localized impact could be severe in the inundation area of the incident to facilities and infrastructure. The further away from the incident area the damage lessens to minimal to moderate. |
| Delivery of Services | Minimal to Severe | Delivery of services could be affected if there is any disruption to the roads and/or utilities due to the inundation. Minimal to severe depending on area size and location affected. |
| Environment | Severe | Impact will be severe for the immediate impacted area. Impact will lessen as distance increases from the immediate incident area. |
| Economic Conditions | Minimal to Severe | Impacts to the economy will greatly depend on the scope of the inundation and the amount of time it takes for the water to recede. |
| Public Confidence Governance | Minimal to Severe | Depending on the perception of whether the failure could have been prevented, warning time, and the time it takes for response and recovery will greatly impact the public's confidence. |

### 3.7.4 DROUGHT

| | Probability | Magnitude/Severity | Warning Time | Duration | CPRI |
|---|---|---|---|---|---|
| Drought | 2.75 | 2.25 | 1.00 | 4.00 | **2.46** |

**Description**

In general, drought can be defined as a condition of moisture levels significantly below normal for an extended period of time over a large area that adversely affects plants, animal life, and humans. Because these dry conditions develop gradually, and impact regions differently, there is no standard way to determine when a drought begins or ends, or to objectively determine its severity.

Drought can also be defined in terms of meteorology, agricultural, hydrological and socio-economic. The first three definitions apply to ways to measure drought as a physical phenomenon. The last deals with drought in terms of supply and demand, tracking the effects on socioeconomic systems

- **Meteorological Drought:** The degree of dryness as related to an average amount of moisture, and the duration of the dry period. Definitions of meteorological drought must be considered as region specific since the atmospheric conditions that result in deficiencies of precipitation are highly variable.
- **Hydrological Drought:** The effects of periods of precipitation shortfalls on surface or subsurface water supply. The frequency and severity of hydrological drought is often defined on a watershed or river basin scale. Hydrological droughts are usually out of phase with or lag the occurrence of meteorological and agricultural droughts. It takes longer for precipitation deficiencies to show up in components of the hydrological system such as soil moisture, streamflow, and groundwater and reservoir levels.
- **Agricultural Drought:** Links the characteristics of meteorological and/or hydrological drought to agricultural impacts, focusing on precipitation shortages, differences between actual and potential evapotranspiration, soil water deficits, reduced groundwater or reservoir levels, and so forth.
- Socioeconomic Drought: The lack of available water has a direct effect on the population. In general, this results in the demand for an economic good exceeding the supply as a result of a weather-related shortfall in water supply.

The impacts of drought can be categorized as economic, environmental, or social. Many economic impacts occur in agriculture and related sectors, including increasing food prices globally. In addition to obvious losses in yields in both crop and livestock production, drought is associated with increases in insect infestations, plant disease, and wind erosion. Droughts also bring increased problems with insects and disease to forests and reduce growth. The incidence of wildfires increases substantially during extended droughts, which in turn places both human and wildlife populations at higher levels of risk. Income loss is another indicator used in assessing the impacts of drought because so many sectors are affected.

Although environmental losses are difficult to quantify, increasing public awareness and concern for environmental quality has forced public officials to focus greater attention and resources on these effects. Environmental losses are the result of damages to plant and animal species, wildlife habitat, and air and water quality, wildfires, degradation of landscape quality, loss of biodiversity, and soil erosion. Some of the effects are short-term and conditions quickly return to normal following the end of the drought. Other environmental effects linger for some time or may even become permanent. Wildlife habitat, for example may be degraded through the loss of wetlands, lakes, and vegetation. However, many species will eventually recover from this temporary aberration. The degradation of landscape quality, with increased soil erosion, may lead to a more permanent loss of biological productivity of the landscape.

Periods of drought are normal occurrences in southeast Kansas. Drought in southeast Kansas is caused by severely inadequate amounts of precipitation that adversely affect farming and ranching, surface and ground water supplies, and uses of surface waters for navigation and recreation.

The most widely used tool to measure and report drought conditions is the Palmer Drought Severity Index (PDSI). The PDSI combines temperature, precipitation, evaporation, transpiration, soil runoff and soil recharge data for a given region to produce a single negative number representing conditions there. This index serves as an estimate of soil moisture deficiency, which roughly correlates with a drought's severity, and thus, its impacts.

The U.S. Drought Monitor, an organization run by government and academic partners that maintains a nationwide drought map, uses the PDSI to categorize dry weather into five levels of severity:

**U.S. Drought Monitor Severity Rating**

| Designation | Category | PDSI Rating |
|---|---|---|
| Abnormally Dry | D0 | -1.0 to -1.9 |
| Moderate Drought | D1 | -2.0 to -2.9 |
| Severe Drought | D2 | -3.0 to -3.9 |
| Extreme Drought | D3 | -4.0 to -4.9 |
| Exceptional Drought | D4 | -5.0 to -5.9 |

The effects range from slow crop and pasture growth to widespread crop failure and water emergencies. Additionally, the Drought Monitor defines droughts as either short-term, if they have lasted less than six months, and long-term for prolonged events.

The State of Kansas Operations Plan (June 30, 2012) utilizes a phased response to drought and identifies specific program actions related to each drought stage. The following provides a brief summary of this phased response approach.

- **Drought Watch** – Impacts include some damage to crops and pastures, high rangeland fire danger and a growing threat of public water supply shortages. The Governor is

notified and the Governor's Drought Response Team assembled. Open outdoor burning bans may be imposed. Public water systems may ask for voluntary water use restrictions.

- **Drought Warning** – Crop and pasture losses are likely with some stock water shortages and very high rangeland fire danger. Public water supply shortages are present and some stream flow targets are not being met. Public water systems may impose mandatory water use restrictions. Urgent Kansas Water Marketing Program surplus water supply contracts can be authorized for municipal and industrial users. The Governor may request emergency haying and grazing authorization for Conservation Reserve Program acres.

- **Drought Emergency** – Widespread major crop and pasture losses are accompanied by stock water shortages and extreme rangeland fire danger. Severe public water supply shortages are widespread with many stream flow targets not met. The Governor may declare an outdoor burning ban. Public water systems may impose additional mandatory water use restrictions. Emergency Kansas Water Marketing Program surplus water supply contracts can be authorized for municipal and industrial users. Emergency water withdrawals from Corps of Engineers reservoirs and state fishing lakes can be authorized. Corps of Engineers emergency water assistance to municipalities is available if needed. The Governor may request a USDA Secretarial disaster designation for drought.

| | Warning Time |
|---|---|
| Drought | 1.00 |

| | Duration |
|---|---|
| Drought | 4.00 |

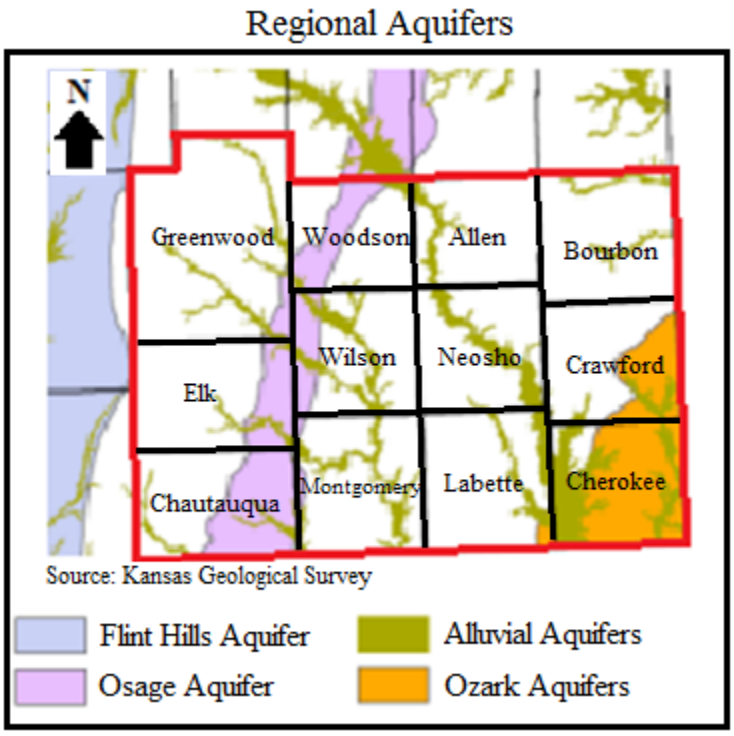
**Hazard Location**

Drought tends to affect broad regions and the entire planning area is subject to drought occurrence at roughly equal probability. The impacts of prolonged drought are most significant in agricultural areas of the region. In addition to impacts on the region's agricultural areas, drought can affect cities by severely limiting public water supplies due to depletion of natural water sources and greatly increased demand.

As of April 2, 2013, the KWO has indicated the following drought conditions and advisories for the entire planning region.

- All Kansas counties remain under an Emergency Drought Stage by Executive Order 12-10 issued by the on Governor July 25, 2012.
- The latest Drought Monitor continues to indicate severe drought or worse for the entire state of Kansas.
- Latest Seasonal Drought Outlook indicates drought conditions are predicted to persist through June 2013 in the southwest, with possible improvement in central and expected improvement in the eastern portion of Kansas.
- All 105 Kansas counties have been declared federal disaster areas due to drought in 2013.

In eastern Kansas, the primary source of water is surface water: rivers, federal reservoirs, multipurpose small lakes, and municipal lakes. The following map shows the aquifers in southeast Kansas and adjacent counties.




The following U.S. Drought Monitor map from March 26, 2013 shows that all of southeast Kansas is currently in drought conditions, ranging from Moderate to Extreme.

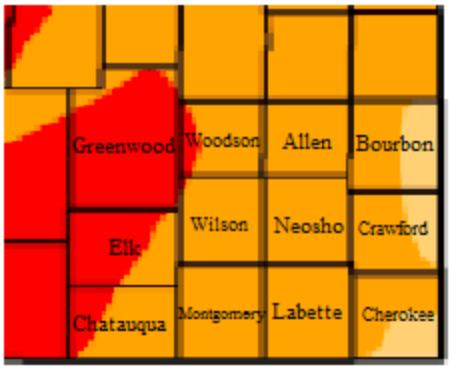
# U.S. Drought Monitor

**March 26, 2013**
Valid 7 a.m. EST

## Kansas

*Drought Conditions (Percent Area)*

| | None | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4 |
|---|---|---|---|---|---|---|
| Current | 0.00 | 100.00 | 100.00 | 95.10 | 64.28 | 17.04 |
| Last Week (03/19/2013 map) | 0.00 | 100.00 | 100.00 | 96.41 | 64.28 | 21.41 |
| 3 Months Ago (12/25/2012 map) | 0.00 | 100.00 | 100.00 | 100.00 | 79.36 | 35.97 |
| Start of Calendar Year (01/01/2013 map) | 0.00 | 100.00 | 100.00 | 100.00 | 79.36 | 35.97 |
| Start of Water Year (09/25/2012 map) | 0.00 | 100.00 | 100.00 | 100.00 | 88.34 | 51.04 |
| One Year Ago (03/20/2012 map) | 27.53 | 72.47 | 37.32 | 16.56 | 8.64 | 0.22 |




*Intensity:*

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

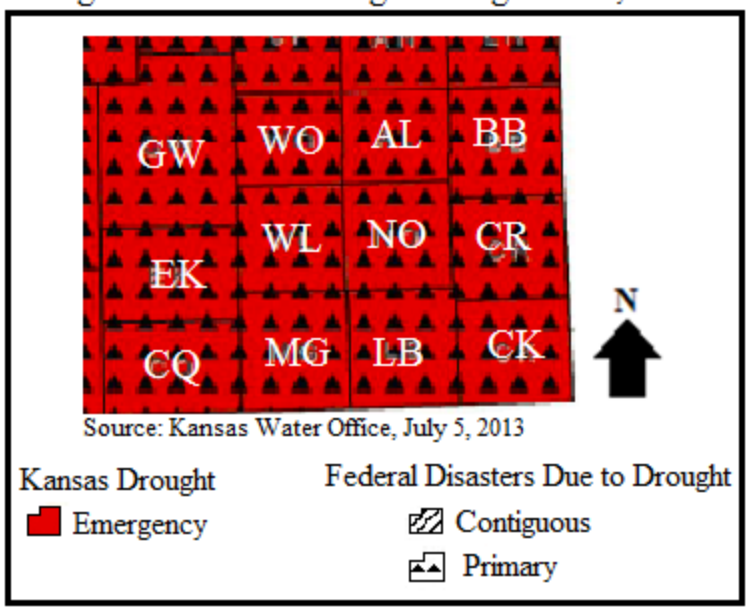
*The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.*

***Released Thursday, March 28, 2013***

**http://droughtmonitor.unl.edu** ***Anthony Artusa, NOAA/NWS/NCEP/Climate Prediction Center***

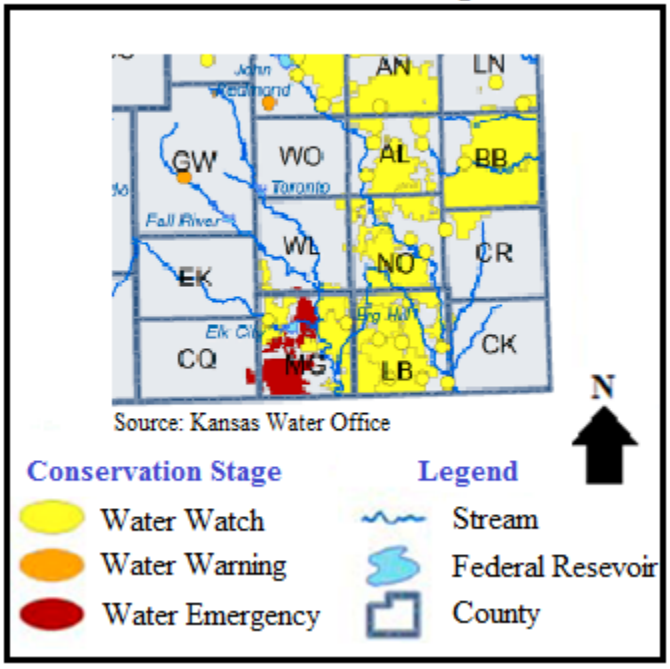
The following map from January 16, 2013 from the KWO shows that all of southeast Kansas is under a Drought Emergency.

Regional Kansas Drought Designations, 2013




The following map from the KWO shows public water suppliers water conservation stages as of January 23, 2013.

Public Water Suppliers
Water Conservation Stages, 2013




The following table provides the latest drought designations and seasonal outlooks for the region.

**Regional Drought Designations and Outlooks**

| County | KWO Drought Designation | Kansas 2013 Secretarial Designations for Drought for Crop Loss | PDSI - U.S. Drought Monitor | Seasonal Outlook - National Weather Service Climate Prediction Center June 20 - September 30, 2013 |
|---|---|---|---|---|
| Allen | Emergency | Primary | None-D3 (Severe) | Removal from Drought Designation |
| Bourbon | Emergency | Primary | None | Removal from Drought Designation |
| Chautauqua | Emergency | Primary | D1-D2 (Moderate-Severe) | Removal from Drought Designation |
| Cherokee | Emergency | Primary | None | Removal from Drought Designation |
| Crawford | Emergency | Primary | None | Removal from Drought Designation |
| Elk | Emergency | Primary | D1-D2 (Moderate-Severe) | Removal from Drought Designation |
| Greenwood | Emergency | Primary | D1-D2 (Moderate-Severe) | Removal from Drought Designation |
| Labette | Emergency | Primary | None to D0 (Abnormally Dry) | Removal from Drought Designation |
| Montgomery | Emergency | Primary | D0-D1(Abnormally Dry- Moderate) | Removal from Drought Designation |
| Neosho | Emergency | Primary | None-D2 (Severe) | Removal from Drought Designation |
| Wilson | Emergency | Primary | D1 (Moderate) | Removal from Drought Designation |
| Woodson | Emergency | Primary | D1 (Moderate) | Removal from Drought Designation |

Source: KWO Kansas 2013 Drought Update ( July 5, 2013)

The following tables provide information from the KWO Kansas 2013 Drought Update on Known Conservation Stages, January 23, 2013. Stage 1 indicates voluntary water conservation while Stage 2 indicates restrictions on outdoor water usage.

**KWO, Known Conservation Stages, January 23, 2013**

| County | Public Water Supply | 2012 Stage | Conservation Stage Designation |
|---|---|---|---|
| Allen | Allen RWD 04 | 2 | Water Warning |
| Allen | Allen RWD 06 | 2 | Water Warning |
| Allen | Allen RWD 08 | 2 | Water Warning |
| Allen | Allen RWD 16 | 2 | Water Warning |
| Allen | Humbolt | 2 | Water Warning |
| Allen | Iola | 2 | Water Warning |
| Allen | La Harpe | 2 | Water Warning |
| Allen | Moran | 2 | Water Warning |
| Allen | PWWSD No. 05 | 2 | Water Warning |
| Bourbon | Bourbon Consolidated RWD 02 | 1 | Water Watch |

**KWO, Known Conservation Stages, January 23, 2013, Continued**

| County | Public Water Supply | 2012 Stage | Conservation Stage Designation |
|---|---|---|---|
| Bourbon | Fort Scott | 1 | Water Watch |
| Bourbon | Prescott | 1 | Water Watch |
| Bourbon | Uniontown | 1 | Water Watch |
| Crawford | Walnut | 2 | Water Warning |
| Greenwood | Eureka | 2 | Water Warning |
| Labette | Chetopa | 2 | Water Warning |
| Labette | Parsons | 2 | Water Warning |
| Labette | Altamont | 1 | Water Watch |
| Labette | Bartlett | 1 | Water Watch |
| Labette | Edna | 1 | Water Watch |
| Labette | Labette RWD 02 | 1 | Water Watch |
| Labette | Labette RWD 03 | 1 | Water Watch |
| Labette | Labette RWD 05 | 1 | Water Watch |
| Labette | Labette RWD 06 | 1 | Water Watch |
| Labette | Labette RWD 07 | 1 | Water Watch |
| Labette | Labette RWD 08 | 1 | Water Watch |
| Labette | Mound Valley | 1 | Water Watch |
| Montgomery | Independence | 3 | Water Emergency |
| Montgomery | Montgomery RWD 01 | 3 | Water Emergency |
| Montgomery | Montgomery RWD 01C | 3 | Water Emergency |
| Montgomery | Montgomery RWD 04 | 3 | Water Emergency |
| Montgomery | Montgomery RWD 08 | 3 | Water Emergency |
| Montgomery | Montgomery RWD 01c | 1 | Water Watch |
| Montgomery | Montgomery RWD 09 | 1 | Water Watch |
| Montgomery | Montgomery RWD 13 | 1 | Water Watch |
| Montgomery | Cherryvale | 1 | Water Watch |
| Montgomery | Coffeyville | 1 | Water Watch |
| Montgomery | Elk City | 1 | Water Watch |
| Montgomery | Montgomery RWD 02 | 1 | Water Watch |
| Montgomery | Montgomery RWD 06 | 1 | Water Watch |
| Montgomery | Montgomery RWD 12 | 1 | Water Watch |
| Montgomery | PWWSD No. 04 | 1 | Water Watch |

**KWO, Known Conservation Stages, January 23, 2013, Continued**

| County | Public Water Supply | 2012 Stage | Conservation Stage Designation |
|---|---|---|---|
| Neosho | Chanute | 2 | Water Warning |
| Neosho | Erie | 2 | Water Warning |
| Neosho | Neosho-Allen RWD 02 | 2 | Water Warning |
| Neosho | Neosho RWD 04 | 2 | Water Warning |
| Neosho | Neosho RWD 06 | 2 | Water Warning |
| Neosho | Neosho RWD 07 | 2 | Water Warning |
| Neosho | Neosho RWD 09 | 2 | Water Warning |
| Neosho | Neosho RWD 12 | 2 | Water Warning |
| Neosho | St. Paul | 2 | Water Warning |

Source: KWO Kansas 2013 Drought Update ( January 24, 2013)

Drought can severely challenge a public water supplier through depletion of the raw water supply and greatly increased customer water demand. Even if the raw water supply remains adequate, problems due to limited treatment capacity or limited distribution system capacity may be encountered. A 2007 assessment of 800 city or rural water district drinking water systems by the KWO found 132 to be drought vulnerable. Also, in the drought of 2012, there are 197 communities and rural water districts, some that are also on the 2007 list, that have triggered some sort of water conservation to extend their supply.

The following table shows regional water suppliers that may be vulnerable to drought conditions. The following are the drought limitation categories associated with this information:

- **Basic Source Limitation** - The supplier's primary raw water source is particularly sensitive to drought as evidenced by depleted streamflow, depleted reservoir inflow and storage, or by declining water levels in wells. Restrictions imposed due to inability to use a well(s) because water quality problems were considered indicative of a basic source limitation.
- **Contractual Limitation** - The supplier's sole water source is purchased from another system that is drought vulnerable and there is a drought-cut-off clause in their water purchase contract. In such situations where there is not a drought cut-off clause, the purchaser is considered drought vulnerable under the same limitation category as the seller.
- **Distribution System Limitation** - The supplier has difficulty or is unable to meet drought-induced customer demand for water because of inadequate finished water storage capacity, inadequate finished water pumping capacity, inadequate transmission line sizes.
- **Minimum Desirable Streamflow** - The supplier reported imposing restrictions because of minimum desirable streamflow administration. Water rights junior to those granted for maintenance of established minimum desirable flows are subject to such administration.
- **Single Well Source** - The supplier relies upon a single well as its sole source for raw water. Suppliers with one active well and one emergency well were considered drought vulnerable because emergency wells are not a dependable long-term water source. Excessive hours of operation to meet drought-induced customer demand for water will

result in the increased likelihood of mechanical breakdown with no alternative water supply source available.

- **Treatment Capacity Limitation** - The supplier has difficulty or is unable to meet drought-induced customer demand for water due to inadequate raw water treatment capacity.
- **Water Right Limitation** - The supplier reported imposing restrictions because the quantity of water they are authorized to divert under their water right(s) was insufficient to meet customer demands.

**Regional Drought Vulnerable Public Water Suppliers**

| County | Public Water Supplier | 2007 Limitation Category List and/or 2012 Conservation Stage | 2007 List | 2012 Conservation Stage |
|---|---|---|---|---|
| Allen | Allen RWD 04 | Water Warning | | X |
| Allen | Allen RWD 06 | Water Warning | | X |
| Allen | Allen RWD 08 | Water Warning | | X |
| Allen | Allen RWD 16 | Water Warning | | X |
| Allen | Iola | Water Warning | | X |
| Allen | La Harpe | Water Warning | | X |
| Allen | Moran | Watch Warning | | X |
| Allen | PWWSD No. 05 | Water Warning | | X |
| Bourbon | Bourbon Consolidated RWD 02 | Distribution System, Water Watch | X | X |
| Bourbon | Fort Scott | Water Watch | | X |
| Bourbon | Fulton | Unknown | X | |
| Bourbon | Prescott | Water Watch | | |
| Bourbon | Uniontown | Unknown & Water Watch | X | X |
| Crawford | Walnut | Water Warning | | X |
| Elk | Howard | Basic Source | X | |
| Elk | Longton | Basic Source | X | |
| Greenwood | Hamilton | Unknown | X | |
| Greenwood | Madison | Basic Source | X | |
| Labette | Altamont | Water Watch | | X |
| Labette | Bartlett | Water Watch | | X |
| Labette | Edna | Water Watch | | X |
| Labette | Labette RWD 02 | Water Watch | | X |
| Labette | Labette RWD 03 | Water Watch | | |
| Labette | Labette RWD 05 | Water Watch | | X |
| Labette | Labette RWD 06 | Water Watch | | X |
| Labette | Labette RWD 07 | Water Watch | | X |
| Labette | Labette RWD 08 | Water Watch | | X |
| Labette | Mound Valley | Water Watch | | X |
| Labette | Parsons | Water Warning | | X |
| Montgomery | Cherryvale | Water Watch | | X |
| Montgomery | Coffeyville | Water Watch | | X |

**Regional Drought Vulnerable Public Water Suppliers, Continued**

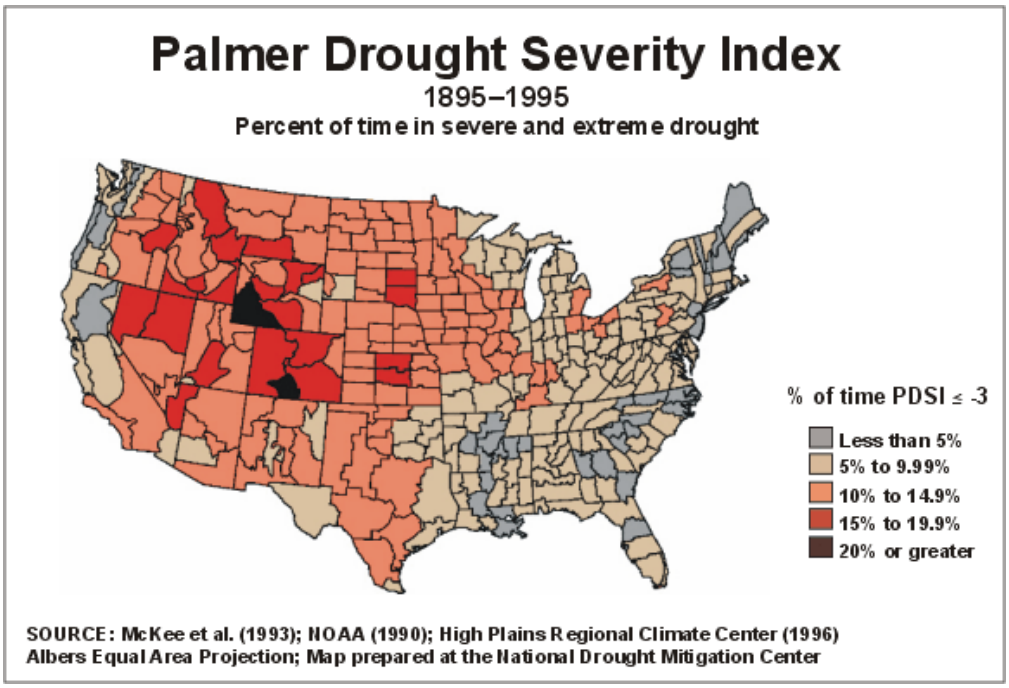
| County | Public Water Supplier | 2007 Limitation Category List and/or 2012 Conservation Stage | 2007 List | 2012 Conservation Stage |
|---|---|---|---|---|
| Montgomery | Elk City | Water Watch | | X |
| Montgomery | Independence | Minimum Desirable Streamflow, Water Emergency | X | X |
| Montgomery | Montgomery RWD 01 | Water Emergency | | X |
| Montgomery | Montgomery RWD 01C | Water Emergency | | X |
| Montgomery | Montgomery RWD 02 | Water Watch | | |
| Montgomery | Montgomery RWD 04 | Water Emergency | | X |
| Montgomery | Montgomery RWD 06 | Water Watch | | X |
| Montgomery | Montgomery RWD 08 | Water Emergency | | X |
| Montgomery | Montgomery RWD 09 | Water Watch | | X |
| Montgomery | Montgomery RWD 12 | Water Watch | | X |
| Montgomery | Montgomery RWD 13 | Water Watch | | X |
| Montgomery | PWWSD No. 04 | Water Watch | | |
| Neosho | Erie | Water Warning | | X |
| Neosho | Neosho RWD 04 | Water Warning | | X |
| Neosho | Neosho RWD 06 | Water Warning | | X |
| Neosho | Neosho RWD 07 | Water Warning | | X |
| Neosho | Neosho RWD 09 | Water Warning | | X |
| Neosho | Neosho RWD 12 | Water Warning | | X |
| Neosho | Neosho-Allen RWD 02 | Water Warning | | X |
| Wilson | Neodesha | Unknown | X | |
| Wilson | Wilson RWD 01 | Contractual | X | |
| Wilson | Wilson RWD 02 | Contractual | X | |
| Wilson | Wilson RWD 05 | Contractual | X | |
| Wilson | Wilson RWD 07 | Contractual | X | |

Source: KWO

Areas that appear to be the most vulnerable to drought are the focus of the Governor's Drought Response Team for planning, management and mitigation activities. While drought does not usually cause damage to buildings and critical facilities, work and living locations do affect people. However, as regional counties experience decreases and agricultural activities it could potentially create lower demands on public water suppliers.

**Previous Occurrences and Extent**

As is indicated in the following PDSI map, droughts are common throughout the southeast Kansas planning region. For the period of 1895 to 1995, southeast Kansas has had a PDSI rating of less than -3 (Severe Drought) 10% to 14.95% of the time.




The following are notable instances of drought in the planning region:

**2013:** All Kansas counties remain under an Emergency Drought Stage by Executive Order 12-10 issued by the on Governor July 25, 2012.

**2012:** The Governor signed three executive orders this year for drought with all southeast Kansas counties being declared in emergency drought status with the last order. USDA agricultural disaster due to drought was declared for all regional counties based on crop losses through a series of six designations in July and August.

**2012:** USDA agricultural disaster due to drought was declared for all 105 counties in Kansas based on crop losses through a series of six designations in July and August 2012. This makes producers eligible for certain emergency. The crop losses were estimated at $1.5 billion for the State. At least 197communities and rural water districts in Kansas had voluntary or mandatory restrictions on water use as drought and high demand depleted public water supplies and challenged treatment and distribution. Mandatory restrictions were placed on water right holders junior to minimum desirable streamflow in as many as 17 locations affecting 540 water appropriations. Livestock ponds, feed and pasture were insufficient to meet needs. Contingencies for feed and water were made available to producers through hay networks, motor carrier authorities and emergency water from state fishing lakes and federal reservoirs. Despite these efforts, livestock numbers in June marked the lowest cattle inventory since 1973. The risk of wildfires was high throughout the State with as many as 78 counties issuing burn bans over some period of 2012. At least 41,000 acres burned. Dry conditions in the fall of 2012 resulted in dust storms visible by satellite.

**2011:** Precipitation for 2011 was -8.92 inches below normal for the year statewide, with climatic divisions varying from -3.51 to -14.36 inches below normal. The Governor signed six executive orders between April and November for various drought stages over the year, increasing the number of counties to 100 in the November order including 40 counties in emergency stage. The year began with extraordinarily low winter moisture and the very little precipitation continued throughout the year. Throughout the year the severity and area affected varied. Conditions improved slightly through the end of the year. USDA agricultural disaster due to drought was declared for 70 counties in Kansas based on crop losses. Kansas agricultural losses were estimated by the Kansas Department of Agriculture at over $1.77 billion due to drought. Statewide, soil moisture was around 50 percent adequate as 2011 began but never exceeded 55 percent for topsoil moisture until November. Significant portions of southern Kansas had below normal monthly-average stream flows begin to occur in April, increasing in area and or severity each month until peaking in July.

**October 2006:** Kansas also experienced drought conditions in 2006. In October 2006, the U.S. Department of Agriculture designated 57 Kansas counties primary natural disaster areas because of losses caused by the combined effects of various disasters that occurred during the past year, including a late spring freeze, drought, high winds, and extreme temperatures. Eighteen contiguous counties were also eligible for assistance. Earlier that year, in June, Cherokee and Morton Counties were designated as primary disaster areas because of losses caused by drought, high winds, wildfires, and above normal temperatures. Contiguous counties Crawford, Labette, Stanton, and Stevens were also eligible for assistance. Two declarations in 2007 for 2006 made 15 more counties eligible for assistance as primary natural disaster areas and 19 more as contiguous counties. Provisional stream flow data from the U.S. Geological Survey indicated that several long-term low stream flow records were broken in July.

**1988–1992:** The severity of this drought varied across the state. It was most severe in the southwestern, central, and northeastern parts of the state but minimal in the northwestern and southeastern parts. Surface-water supplies were sufficient to meet demands through the end of water year 1988, but rainfall during this period was less than 50% of the long-term average, so quantities were insufficient to maintain soil moisture or contribute to ground-water supplies. Estimated drought-related losses to 1988 crops were $1 billion. Water levels in shallow aquifers declined rapidly and led to the abandonment of many domestic water wells. The drought of 1988 continued into the 1990s, but at a reduced level.

**1974–1982:** This appeared to be a series of relatively short droughts at some stream gauging stations, but longer droughts at others (similar to the 1962–1972 droughts). The recurrence interval of this drought was greater than 25 years in the north-central and southeastern parts but was between 10 and 25 years across the remaining eastern two-thirds of the state. The severity of this drought could not be determined for the western third of the state.

**1962–1972:** The duration of this regional drought varied considerably across Kansas. Many of the streamflow records indicated alternating less than average and greater-than-average flows, while others indicated less than average flows for the entire period. The recurrence interval was generally greater than 25 years but was between 10 and 25 years in parts of the northwestern, northeastern, southern, and southeastern areas of the state.

**1952–1957:** This regional drought had a recurrence interval greater than 25 years statewide. One exception was in the Big Blue River Basin, where the recurrence interval was 10-25 years. Because of its severity and areal extent, this drought is used as the base period for studies of reservoir yields in Kansas. In 1954, 41 counties were declared eligible for aid under the Emergency Feed program. During this period, 175 cities reported water shortages, most of which restricted water use.

**1929–1942:** This drought, which includes the Dust Bowl of the 1930s, was regional in scale and affected many of the Midwestern and western states. Nevertheless, it ranks among the most significant national events of the twentieth century. The recurrence interval was greater than 25 years throughout Kansas. Drought, wind, and poor agricultural practices combined to result in enormous soil erosion. Agricultural losses were extreme, and many farms were abandoned. Effects of the drought sent economic and social ripples throughout the country, contributing to the economic, physical, and emotional hardships of the Great Depression.

**Local Events**

**Summer 2001 and 2012: Labette County:** Drought impacted the county and region resulting in water issues and negative effects on agriculture.

**Hazard Vulnerability and Impact**

Droughts have historically had the greatest impact on the largest number of people of all weather phenomenon, according to the National Climatic Data Center (NCDC). Recent droughts, such as in 1988 and 2000, have had serious economic impacts. Between 1980 and today, 16 identified drought events within the United States have cost a combined $210 billion. In June 2012, 55.79 percent of the land in the lower 48 U.S. states, including the southeast region of Kansas, were in a drought. This represents the highest figure in the 12-year history of the U.S. Drought Monitor.

The following statistical analysis uses two significant factors in determining the drought vulnerability for southeast Kansas. One is the USDA Risk Management Agency's annualized insured crop losses as a result of drought conditions during the ten-year period of 2002-2011, with the ratio being all sums paid as indemnities under any eligible crop insurance policy to that portion of the premium designated for anticipated losses and a reasonable reserve, other than that portion of the premium designated for operating and administrative expenses, and the number of drought vulnerable public water suppliers in Kansas from the information provided above. It was determined that all counties in southeast Kansas have either insured crop loss and/or drought vulnerable public water suppliers thus all counties are rated at least at a medium vulnerability

rating since agriculture is a major economic factor in most southeastern Kansas counties and public water supply is an essential service to all southeast Kansans.

The rating values of the two factors were divided by 50 percent to determine the total drought vulnerability rating. The total drought vulnerability rating put all counties in either the medium, medium-high or high category. The following table provides the factors considered and the rating values assigned.

**Ranges for Drought Vulnerability Factor Ratings**

| Factors Considered | Low (1) | Low-Medium (2) | Medium (3) | Medium-High (4) | High (5) |
|---|---|---|---|---|---|
| Crop Loss Ratio Rating | .599 to 2.817 | 2.818 to 4.595 | 4.596 to 6.373 | 6.374 to 8.151 | 8.152 to 14 |
| Drought Vulnerable Public Water Supplies Ratio Rating | 1 | 2 | 3-6 | 7-9 | 10-14 |
| Total Drought Vulnerability Rating | n/a | n/a | 1 | 2 to 3 | 4 to 5 |

The following table shows the variance of drought conditions by county in southeast Kansas. Allen, Bourbon , Labette, Montgomery, and Neosho counties have a high drought vulnerability rating.

**Regional Drought Vulnerability Rating**

| County | Crop Exposure (2007 Census of Agriculture) | Annualized Crop Insurance Paid/Drought Damage | Annual Crop Claims Ratio | Crop Loss Ratio Rating | Number of Drought Vulnerable Public Water Suppliers | Drought Vulnerable Public Water Suppliers Rating | Total Rating (Crops & Water Suppliers) | Vulnerability Rating |
|---|---|---|---|---|---|---|---|---|
| Allen | $15,462,000 | $1,533,937 | 9.92% | 5 | 9 | 4 | 9 | High |
| Bourbon | $9,918,000 | $646,995 | 6.52% | 4 | 5 | 3 | 7 | High |
| Chautauqua | $4,971,000 | $132,876 | 2.67% | 1 | 0 | 0 | 1 | Medium |
| Cherokee | $53,420,000 | $2,617,162 | 4.90% | 3 | 0 | 0 | 3 | Medium-High |
| Crawford | $34,463,000 | $2,116,197 | 6.14% | 3 | 1 | 1 | 4 | Medium-High |
| Elk | $0 | $260,036 | 0.00% | 0 | 2 | 2 | 2 | Medium |
| Greenwood | $8,087,000 | $641,647 | 7.93% | 4 | 2 | 2 | 6 | Medium-High |
| Labette | $22,765,000 | $1,610,514 | 7.08% | 4 | 12 | 5 | 9 | High |
| Montgomery | $16,616,000 | $1,131,518 | 6.81% | 4 | 14 | 5 | 9 | High |
| Neosho | $17,811,000 | $1,418,849 | 7.97% | 4 | 7 | 4 | 8 | High |
| Wilson | $26,882,000 | $1,447,752 | 5.39% | 3 | 5 | 3 | 6 | Medium-High |
| Woodson | $14,486,000 | $940,203 | 6.49% | 4 | 0 | 0 | 4 | Medium-High |
| Total | $224,881,000 | $14,497,684 | - | - | 57 | - | - | - |

Source: USDA Risk Management Agency

Note: Elk, County was not published in the Crop Exposure 2007 Census to avoid disclosure of individual operations. Thus the vulnerability rating for these counties is not a true reflection of their drought vulnerabilities.

A drought period can last for months, years, or even decades. It is rarely a direct cause of death, though the associated heat, dust, and stress can all contribute to increased mortality. Also, as counties experience decreases in population it will create lower demands on public water suppliers.

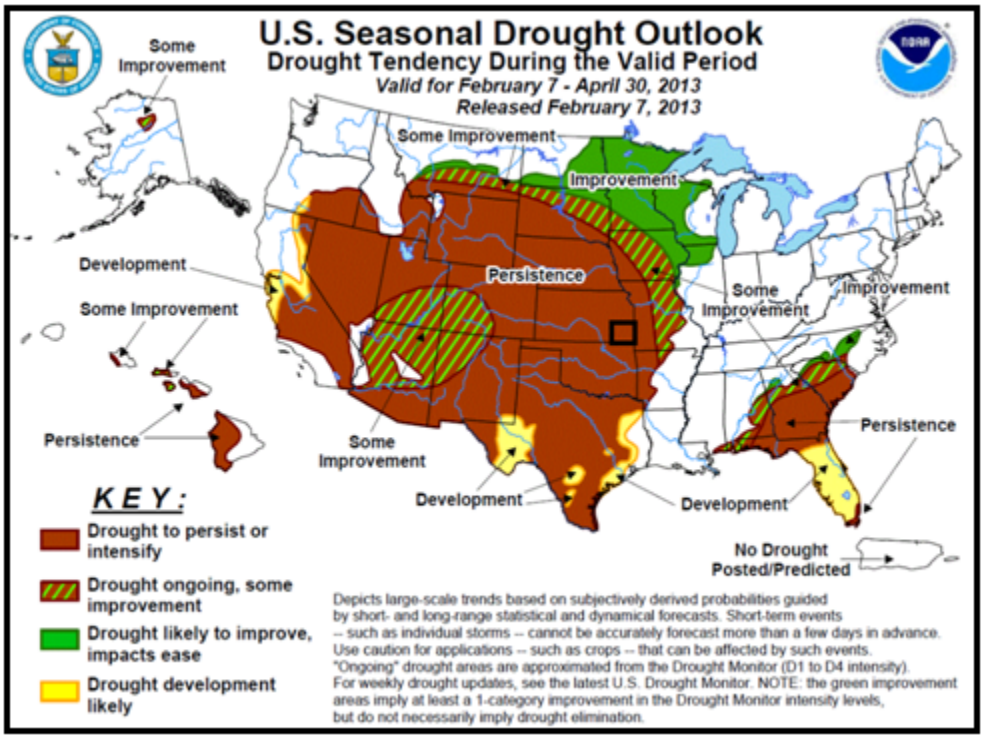
| | Magnitude/Severity |
|---|---|
| Drought | 2.25 |

**Future Development**

Future development of agricultural resources and/or increases in population would tend to increase the risk of this hazard. However, data suggests that the acres of land in farms in decreasing in southeastern Kansas. Additionally, regional data indicate that the number of cattle has been falling over the past five years. Finally, data suggests that the region in total is experiencing a decline in population, with the exception of major population centers, which could potentially lessen the demand for water.

**Probability of Future Occurrences**

Although drought is not predictable, the National Oceanic and Atmospheric Administration (NOAA) long-range outlooks indicate a persistent likelihood of drought.




In recent years, drought has affected certain regional counties on a more reoccurring basis. With the possibility of climate change, this hazard may affect more areas of the region more often.

Based on historical Kansas Drought Stage Declarations, (26 declarations in 11 years), and the Drought Impact Reporter reporting 363 drought impacts in Kansas between January 2002 and September 2012, southeast Kansas can expect a drought occurrence at a minimum of every 3 years.

| | Probability |
|---|---|
| Drought | 2.75 |

**Consequence Analysis**

The information in the following table provides the Consequence Analysis.

**Drought Consequence Analysis**

| Subject | Ranking | Impacts of Drought |
|---|---|---|
| Health and Safety of Persons in the Area of the Incident | Minimal - Moderate | Drought impact tends to be agricultural however, because of the lack of precipitation water supply disruptions can occur which can affect people. Impact is expected to be minimal. |
| Responders | Minimal | Impact to responders is expected to be minimal. |
| Continuity of Operations | Minimal | Minimal expectation for utilization of the COOP. |
| Property, Facilities, and Infrastructure | Minimal to Severe | Impact to property, facilities, and infrastructure could be minimal to severe, depending on the length and intensity of the drought. Structural integrity of buildings, and buckling of roads could occur. |
| Delivery of Services | Minimal | Impact on the delivery of services should be non-existent to minimal, unless transportation nodes are affected. |
| Environment | Minimal to Severe | The impact to the environment could be severe. Drought can severely affect farming, ranching, wildlife and plants due to the lack of precipitation. |
| Economic Conditions | Minimal to Moderate | Impacts to the economy will be dependent on how extreme the drought is and how long it lasts. Communities that depend on water recreation could be tested, as well as agricultural. Minimal to Moderate. |
| Public Confidence in Jurisdiction's Governance | Minimal | Confidence could be at issue during periods of extreme drought if planning is not in place to address intake needs and loss of crops. |

### 3.7.5 EARTHQUAKE

| | Probability | Magnitude/Severity | Warning Time | Duration | CPRI |
|---|---|---|---|---|---|
| Earthquake | 1.08 | 1.42 | 3.50 | 1.00 | **1.54** |

**Description**

An earthquake is the movement, shaking or trembling of the ground produced by sudden displacement of rock in the Earth's crust. Earthquakes may result from the sudden collapse of a void within the earth, landslides, or volcanic activity. However, most earthquakes are caused by the release of stresses accumulated as a result of the rupture of rocks along opposing fault planes in the Earth's outer crust. These fault planes are typically found along borders of the Earth's tectonic plates, which generally follow the outlines of the continents.

The areas of greatest tectonic instability occur at the perimeters of the slowly moving plates, as these locations are subjected to the greatest strains from plates traveling in opposite directions and at different speeds. Deformation along plate boundaries causes strain in the rock and the consequent buildup of stored energy. When the built-up stress exceeds the rocks' strength, a rupture occurs. The rock on both sides of the fracture is snapped, releasing the stored energy and producing seismic waves, generating an earthquake.

Concerns about induced seismicity, or earthquake activity related to hydraulic fracturing or fracking, have been raised in some areas. Fracking is a method of enhancing oil and gas recovery from wells by injecting water, sand, and chemicals into rock formations under very high pressure to fracture the rock and release trapped hydrocarbons. According to the Kansas Geological Survey, there is no evidence that hydraulic fracturing itself triggers earthquakes (Kansas Geological Survey, Public Information Circular 32).

Earthquakes can affect large areas, cause extensive damage to property, result in loss of life and injury to people within the area of the quake, and disrupt or destroy the areas infrastructure.

| | Warning Time |
|---|---|
| Earthquake | 3.50 |

| | Duration |
|---|---|
| Earthquake | 1.00 |

**Hazard Location**

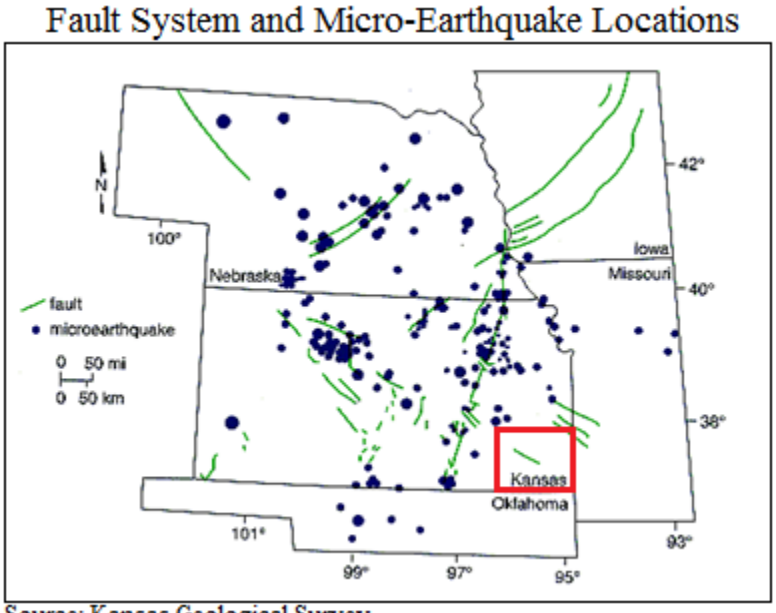
Overall, southeast Kansas is in an area of relatively low seismic activity. Based on available data, the earthquake hazard is considered roughly the same across the southeast Kansas planning area.

The closest series of major faults is called the Humboldt Fault Zone. Also known as the Nemaha Uplift, the Humboldt Fault Zone runs to the west of the region.



Source: Kansas Geological Survey, Earthquakes in Kansas

The following figure from the Kansas Geological Survey shows the locations of fault systems and micro earthquakes across the Midwest.



Source: Kansas Geological Survey

The New Madrid Seismic Zone follows the Mississippi River valley from southeastern Missouri to northwestern Mississippi, roughly 200 miles southeast of the region. While it is unlikely that

the region would receive extensive damage from a large New Madrid Seismic Zone event, it is possible that ground shaking would be noticed.

**Previous Occurrences and Extent**

Southeast Kansas is in an area of relatively low seismic activity. According to a 2006 FEMA report, Kansas ranks 44th among the states in the amount of damage caused by earthquakes in an average year and 43rd in annualized earthquake loss per year.

According to the United States Geological Survey (USGS) Earthquake Hazards Program, from 1974 to 2003 Kansas has had four earthquakes of a 3.5 or greater magnitude. This represents approximately 0.02%out of 21.080 earthquakes recorded throughout the United States during the same period.

**Hazard Vulnerability and Impact**

The effect of an earthquake on the Earth's surface is called the intensity. The intensity scale consists of a series of certain key responses such as people awakening, movement of furniture, damage to chimneys, and finally total destruction. The Modified Mercalli Intensity Scale is currently used in the United States. It was developed in 1931 by the American seismologists Harry Wood and Frank Neumann. This scale, composed of 12 increasing levels of intensity that range from imperceptible shaking to catastrophic destruction, is designated by Roman numerals. It does not have a mathematical basis; instead it is an arbitrary ranking based on observed effects.

**Modified Mercalli Intensity Scale**

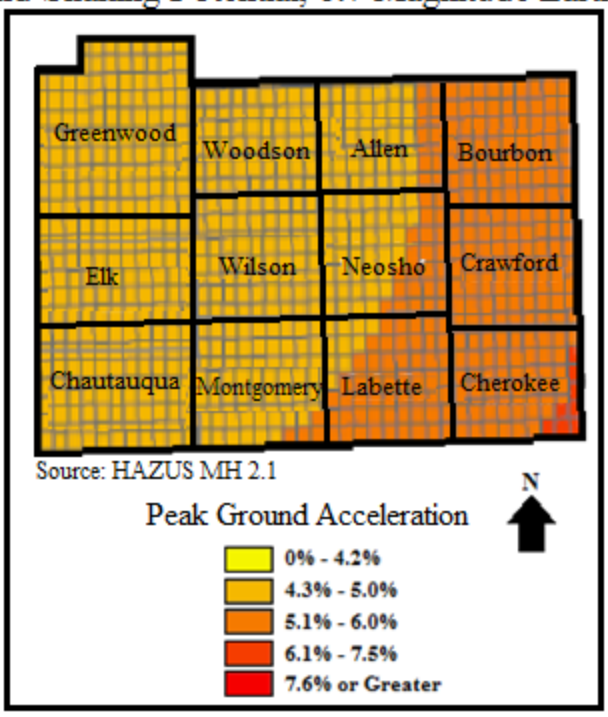
| Mercalli Rating | General Effects |
|---|---|
| I. Instrumental | Generally not felt by people unless in favorable conditions. |
| II. Weak | Felt only by a couple people that are sensitive, especially on the upper floors of buildings. Delicately suspended objects (including chandeliers) may swing slightly. |
| III. Slight | Felt quite noticeably by people indoors, especially on the upper floors of buildings. Many do not recognize it as an earthquake. Standing automobiles may rock slightly. Vibration similar to the passing of a truck. Duration can be estimated. Indoor objects (including chandeliers) may shake. |
| IV. Moderate | Felt indoors by many to all people, and outdoors by few people. Some awakened. Dishes, windows, and doors disturbed, and walls make cracking sounds. Chandeliers and indoor objects shake noticeably. The sensation is more like a heavy truck striking building. Standing automobiles rock noticeably. Dishes and windows rattle alarmingly. Damage none. |
| V. Rather Strong | Felt inside by most or all, and outside. Dishes and windows may break and bells will ring. Vibrations are more like a large train passing close to a house. Possible slight damage to buildings. Liquids may spill out of glasses or open containers. None to a few people are frightened and run outdoors. |

**Modified Mercalli Intensity Scale, Continued**

| Mercalli Rating | General Effects |
|---|---|
| VI. Strong | Felt by everyone, outside or inside; many frightened and run outdoors, walk unsteadily. Windows, dishes, glassware broken; books fall off shelves; some heavy furniture moved or overturned; a few instances of fallen plaster. Damage slight to moderate to poorly designed buildings, all others receive none to slight damage. |
| VII. Very Strong | Difficult to stand. Furniture broken. Damage light in building of good design and construction; slight to moderate in ordinarily built structures; considerable damage in poorly built or badly designed structures; some chimneys broken or heavily damaged. Noticed by people driving automobiles. |
| VIII. Destructive | Damage slight in structures of good design, considerable in normal buildings with a possible partial collapse. Damage great in poorly built structures. Brick buildings easily receive moderate to extremely heavy damage. Possible fall of chimneys, factory stacks, columns, monuments, walls, etc. Heavy furniture moved. |
| IX. Violent | General panic. Damage slight to moderate (possibly heavy) in well-designed structures. Well-designed structures thrown out of plumb. Damage moderate to great in substantial buildings, with a possible partial collapse. Some buildings may be shifted off foundations. Walls can fall down or collapse. |
| X. Intense | Many well-built structures destroyed, collapsed, or moderately to severely damaged. Most other structures destroyed, possibly shifted off foundation. Large landslides. |
| XI. Extreme | Few, if any structures remain standing. Numerous landslides, cracks and deformation of the ground. |
| XII. Catastrophic | Total destruction – everything is destroyed. Lines of sight and level distorted. Objects thrown into the air. The ground moves in waves or ripples. Large amounts of rock move position. Landscape altered, or leveled by several meters. Even the routes of rivers can be changed. |

The following map in demonstrates the ground shaking potential of a worst-case scenario 2,500-year 6.7 Magnitude earthquake. It is important to note that ground shaking potential is not only related to proximity to the fault, but also the geology involved. For example areas with high sand content are subject to higher shaking than areas with high rock content.

Ground Shaking Potential, 6.7 Magnitude Earthquake




The following table provides estimated building losses and displaced households for all counties in southeast Kansas as a result of a 2,500 year probabilistic 6.7 Magnitude earthquake followed. It should be noted that these losses are for an absolute worst-case scenario event.

**Estimated Building Losses and Displaced Households due to Magnitude 6.7 Earthquake**

| County | Total Earthquake Losses | Displaced Households |
|---|---|---|
| Allen | $11,766,000 | 4 |
| Bourbon | $16,226,000 | 7 |
| Chautauqua | $3,401,000 | <1 |
| Cherokee | $23,169,000 | 7 |
| Crawford | $45,280,000 | 24 |
| Elk | $1,863,000 | <1 |
| Greenwood | $4,809,000 | 2 |
| Labette | $19,565,000 | 8 |
| Montgomery | $31,251,000 | 12 |
| Neosho | $14,910,000 | 5 |
| Wilson | $7,851,000 | 3 |
| Woodson | $2,183,000 | <1 |
| Regional Total | $170,508,000 | <74 |

Source: HAZUS MH 2.1

Shrinking counties in southeast Kansas indicate that potentially less property and fewer people will be at risk to earthquake shaking. Although the probability of a significant damaging earthquake is unlikely, the presence of the Humboldt fault and historical occurrences along this fault indicate that the potential does exist.

| | Magnitude/Severity |
|---|---|
| Earthquake | 1.42 |

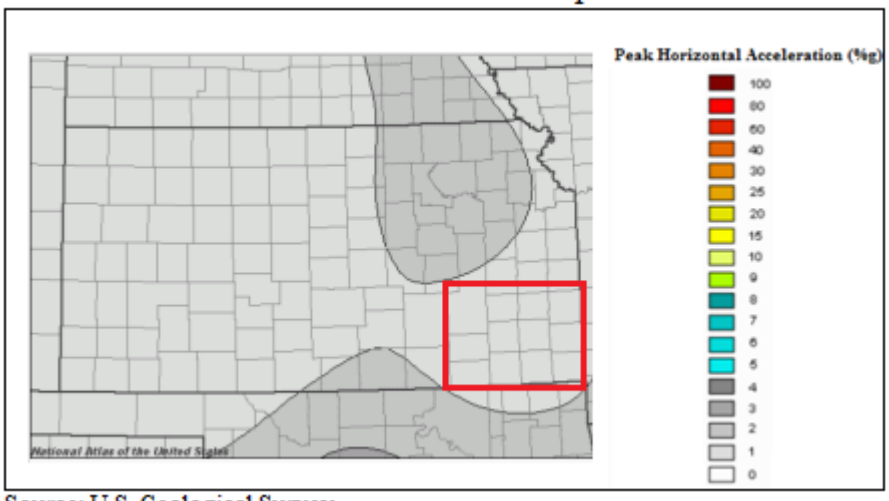
**Future Development**

Future development and population increase would tend to increase the likelihood of the population being impacted by an earthquake. However, data suggests that the region in total is experiencing a decline in population, with the exception of major population centers, which may see an increase in potential impacts due to further development. Areas with major dams or levee systems may have additional vulnerabilities.

**Probability of Future Hazard Events**

The following is a probabilistic seismic hazard map of Kansas from the USGS that depict the probability that ground motion will reach a certain level during an earthquake. The data shows peak horizontal ground acceleration (the fastest measured change in speed for a particle at ground level that is moving horizontally because of an earthquake) and shows that the shaking level that has a 10 percent chance of being exceeded over a period of 50 years.

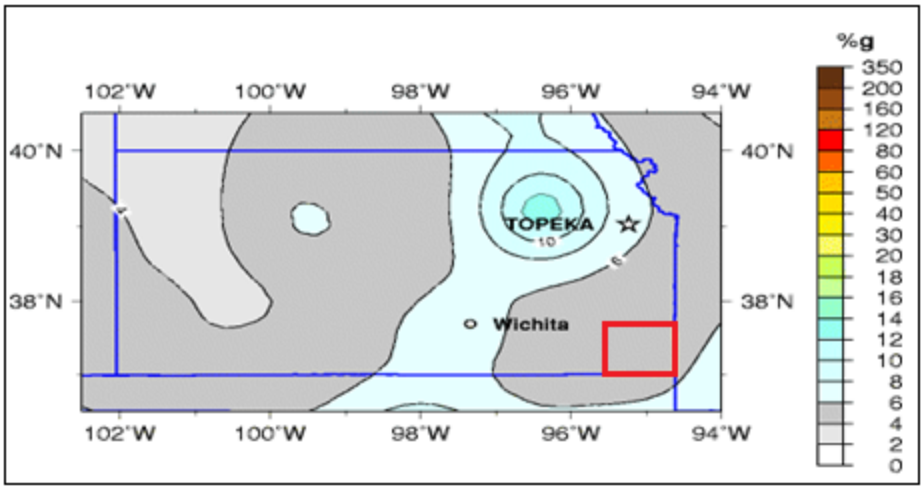
Probabilistic Seismic Hazard Map of Kansas




Source: U.S. Geological Survey

The following figure presents a worst-case scenario, depicting the shaking level that has a 2 percent chance of being exceeded over a period of 50 years. Typically, significant earthquake damage occurs when accelerations are greater than 30% of gravity.

Peak Acceleration (%g) with 2% Probability of Exceedance in 50 Years




Source: National Seismic Hazard Mapping Project

Based on available data, the probability of an damaging earthquake occurring within the southeast Kansas region is unlikely.

| | Probability |
|---|---|
| Earthquake | 1.08 |

**Consequence Analysis**

The information in the following table provides the Consequence Analysis.

**Earthquake Consequence Analysis**

| Subject | Ranking | Impacts of Earthquake |
|---|---|---|
| Health and Safety of Persons in the Area of the Incident | Minimal | Impact in the incident area expected to be minimal in the State of Kansas. |
| Responders | Minimal | With proper preparedness and protection, impact is expected to be minimal. |
| Continuity of Operations | Minimal | COOP is not expected to be activated. |
| Property, Facilities, and Infrastructure | Minimal | Impact to property, facilities, and infrastructure could be minimal. |
| Delivery of Services | Minimal | No expectation of impact on services. |
| Environment | Minimal | No expectation of environmental impact. |
| Economic Conditions | Minimal | No expectation of economic conditions being impacted. |
| Public Confidence in Governance | Minimal | No change in confidence in jurisdictions governance. |

### 3.7.6 EXPANSIVE SOILS

| | Probability | Magnitude/Severity | Warning Time | Duration | CPRI |
|---|---|---|---|---|---|
| Expansive Soils | 1.67 | 1.08 | 1.00 | 4.00 | **1.63** |

**Description**

A relatively widespread geologic hazard for southeast Kansas is the presence of soils that expand and shrink in relation to their water content. Expansive soils can cause physical damage to building foundations, roadways, and other components of the infrastructure when clay soils swell and shrink as a result of changes in moisture content. For southeast Kansas, the vulnerability to this hazard most frequently is associated with soils shrinking during periods of drought.

Highways, airport runways, streets, walkways and parking lots with layers of concrete and asphalt throughout southeast Kansas are damaged every year by the effects of expansive soils. The frequency of damage from expansive soils can be associated with the cycles of drought and heavy rainfall, which reflect changes in moisture content. Building settlements associated with drought have been noted in southeast Kansas for many years, particularly in buildings located on high ground, further from the water table.

| | Warning Time |
|---|---|
| Expansive Soils | 1.00 |

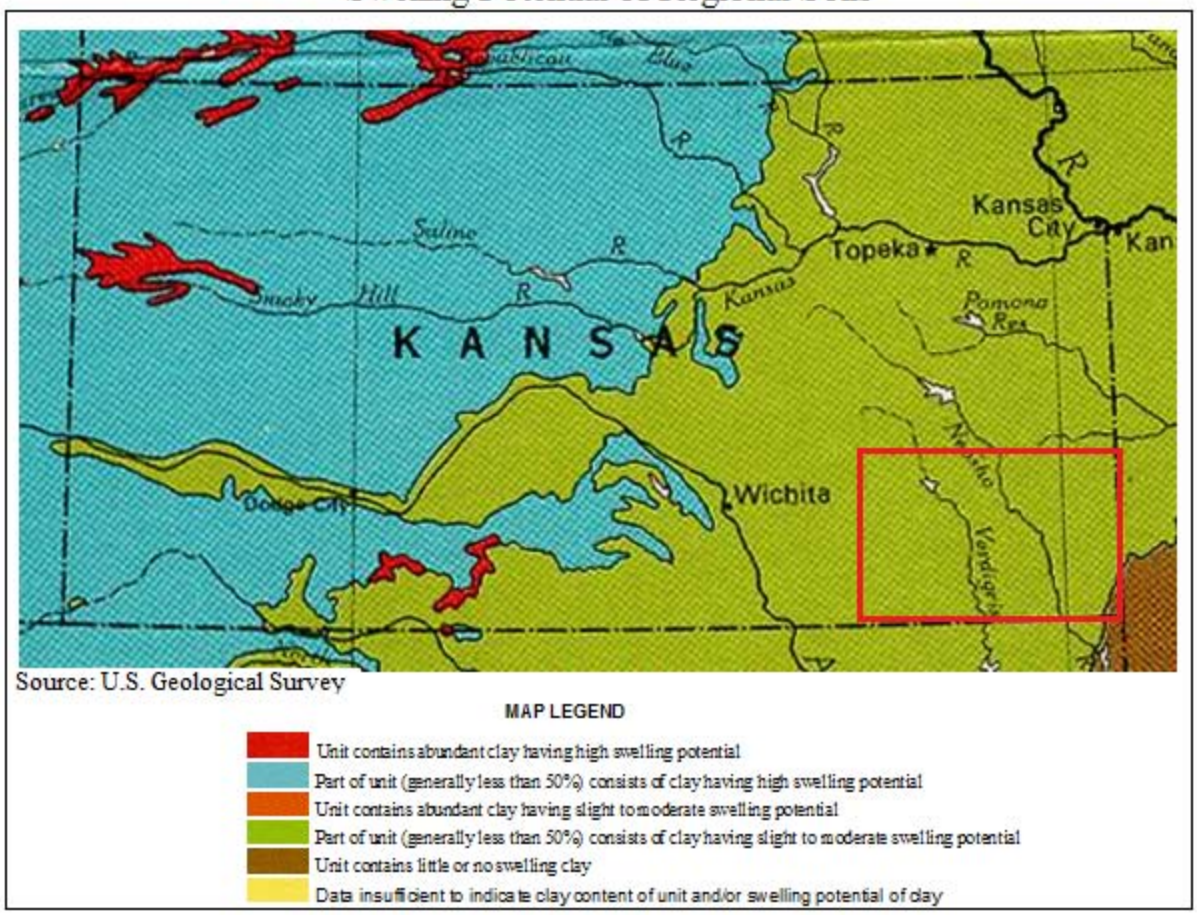
| | Duration |
|---|---|
| Expansive Soils | 4.00 |

**Hazard Location**

Southeast Kansas possesses a wide array of soils with a range of permeability from moderate to low. Generally, the permeability of the soils is related to the clay content. Clay soils tend to shrink when dry and swell when wet which has large implications on underground utility infrastructure and home foundations.

The map shows the swelling potential of soils in southeast Kansas. All of southeast Kansas is located in an area where part of the soil unit consists of clay having slight to moderate swelling potential or little or no swelling clay.

Swelling Potential of Regional Soils




Source: U.S. Geological Survey

**Previous Occurrences and Extent**

There are no expansive soil events on record in southeast Kansas to date.

**Hazard Vulnerability and Impact**

Expansive soils are so extensive within parts of the United States that alteration of the highway routes to avoid expansive soils is virtually impossible. The Midwest is particularly problematic for construction because of the varied mixture of clay soils. Each year in the United States, expansive soils cause billions of dollars in damage to buildings, roads, pipelines, and other structures. This is more damage than that typically caused by floods, hurricanes, tornados, and earthquakes combined. It is estimated that approximately 10 percent of the homes built on expansive soils experience significant damage. Because there is limited available data on this hazard and no reported occurrences it is being categorized as having a negligible magnitude/severity.

| | Magnitude/Severity |
|---|---|
| Expansive Soils | 1.08 |

**Future Development**

Future development and population increase would tend to increase the likelihood of the population being impacted by expansive soil. However, data suggests that the population of southeast Kansas is in decline, as is the rate of development.

**Probability of Future Hazard Events**

Based on the limited distribution of soil units consists of clay having slight to moderate swelling potential or little or no swelling clay, the probability of future hazard events is unlikely.

| | Probability |
|---|---|
| Expansive Soils | 1.67 |

**Consequence Analysis**

The information in the following table provides the Consequence Analysis.

**Expansive Soils Consequence Analysis**

| Subject | Ranking | Impacts of Expansive Soils |
|---|---|---|
| Health and Safety of Persons in the Area of the Incident | Minimal | Minimal impact. |
| Responders | Minimal | Minimal impact. |
| Continuity of Operations | Minimal | Minimal expectation for utilization of COOP unless structures have extensive damage. |
| Property, Facilities, and Infrastructure | Minimal to Moderate | Localized impact could be moderate, including structural integrity to be lost, and roadways, railways to buckle. |
| Delivery of Services | Minimal | Delivery of services could be impacted if infrastructure is impacted. |
| Environment | Moderate | Expansive soils could cause moderate damage to the environment, particularly dams, levees, watersheds. |
| Economic Conditions | Minimal to Moderate | Economic impacts include rebuilding of the properties and infrastructure. Drought and extreme rain events could increase impact. |
| Public Confidence in Governance | Minimal | Confidence will be dependent on development trends and mitigation efforts at reducing the effect of expansive soils on new construction. |

### 3.7.7 EXTREME TEMPERATURE

| | Probability | Magnitude/ Severity | Warning Time | Duration | CPRI |
|---|---|---|---|---|---|
| Extreme Temperature | 2.75 | 1.92 | 1.17 | 3.08 | **2.30** |

**Description**

Extreme temperature events, both hot and cold, can have severe impacts on human health and mortality, natural ecosystems, agriculture, and other economic sectors.

**Extreme Temperature Definitions**

| Term | Definition |
|---|---|
| **Extreme Heat** | Extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Ambient air temperature is one component of heat conditions, with relative humidity being the other. Humid or muggy conditions, which add to the discomfort of high temperatures, occur when an area of high atmospheric pressure traps moisture laden air near the ground. |
| **Extreme Cold** | Although no specific definition exists for Extreme Cold, an Extreme Cold event: can generally be defined as temperatures at or below freezing for an extended period of time. Extreme Cold events are usually part of Winter Storm events but can occur during anytime of the year and can have devastating effects on agricultural production. |

| | Warning Time |
|---|---|
| Extreme Temperature | 1.17 |

| | Duration |
|---|---|
| Extreme Temperature | 3.08 |

**Hazard Location**

The entire planning area is subject to extreme heat events and all participating jurisdictions can be affected. Regional climate data, including historical climate data, is fully discussed in Section 2.5.

**Previous Occurrences and Extent**

Since 1980, there have been a number of major extreme temperature events that have caused death and damage in Kansas. The following are notable heat related events for southeast Kansas.

> **Summer, 2012:** A strong ridge of high pressure settled over the central portions of the U.S. beginning in June and became the dominant weather pattern for much of the Summer of 2012. This weather pattern finally broke down after the first week of August and temperatures became more seasonable. The hottest temperatures occurred on August

2nd and 4th at 107° Fahrenheit (°F). There were 6 days where the maximum temperature reached 100°F or higher and this occurred during the first week of the month. There were 20 days where the maximum temperatures reached 90°F or above. Heat advisories and warnings were issued for portions of the area for the early portion of August.

**Summer 2011:** Southeast Kansas experienced one of the hottest summers on record.

**January 7, 2010:** An unusually cold Arctic air mass came across the area on January 6th and stayed through January 9th. Besides the cold temperatures, this Arctic air mass brought in very strong winds throughout the area. The strong winds combined with the very cold temperatures creating dangerous wind chills. Wind chills through this cold outbreak created dangerous situations for people, animals, and property that were outdoors for a long period of time. Several schools across the area were cancelled or delayed, waterline mains burst and slick driving conditions were reported.

**April 2007:** The U.S. Department of Agriculture designated 68 Kansas counties primary natural disaster areas because of losses caused by unseasonably warm temperatures followed by prolonged freezing weather that occurred from April 4 10 , 2007.

**July 16-20, 2006:** From July 16-20, a deadly heat wave gripped much southeastern Kansas. Temperatures soared into the 105-110°F range. Five lives were lost across south-central and southeast Kansas including one in Iola and one in Coffeyville. The heat unofficially claimed three other lives, one in Coffeyville, and dozens of people across southeast Kansas were treated for heat-related illnesses. That same year, a late freeze damaged at least 75% of the state's wheat crop.

**December 2000:** Much of the state experienced below normal temperatures from mid-late December into January.

The following tables present NCDC data relating to extreme temperature events for the region.

**NCDC Excessive Heat Events**

| County | Period | Event | Number of Events | Property Damage | Crop Damage |
|---|---|---|---|---|---|
| Allen | 2010-2012 | Excessive Heat | 4 | $0 | $0 |
| Bourbon | 2010-2012 | Excessive Heat | 4 | $0 | $0 |
| Chautauqua | 2010-2012 | Excessive Heat | 5 | $0 | $0 |
| Cherokee | 2010-2012 | Excessive Heat | 1 | $108,000 | $0 |
| Crawford | 2010-2012 | Excessive Heat | 5 | $0 | $0 |
| Elk | 2010-2012 | Excessive Heat | 4 | $0 | $0 |
| Greenwood | 2010-2012 | Excessive Heat | 5 | $0 | $0 |
| Labette | 2010-2012 | Excessive Heat | 5 | $0 | $0 |
| Montgomery | 2010-2012 | Excessive Heat | 5 | $0 | $0 |
| Neosho | 2010-2012 | Excessive Heat | 5 | $0 | $0 |
| Wilson | 2010-2012 | Excessive Heat | 4 | $0 | $0 |

Source: NCDC Storm Events Database

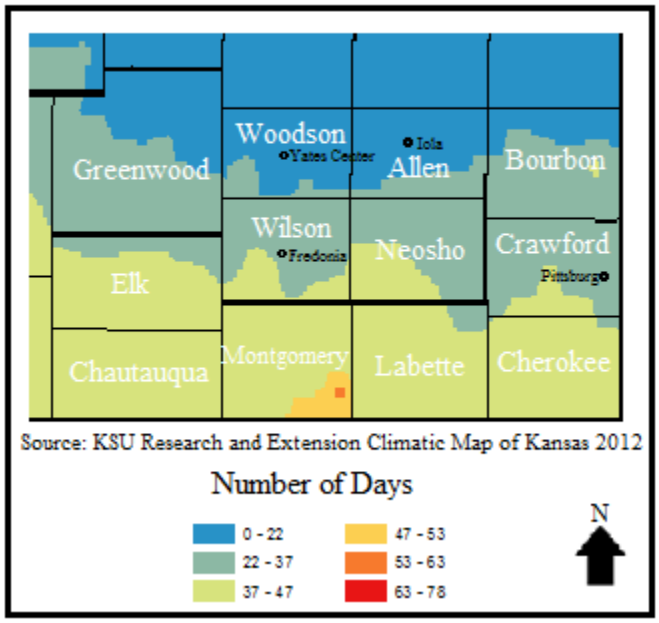
**NCDC Extreme Cold Events**

| County | Period | Event | Number of Events | Property Damage | Crop Damage |
|---|---|---|---|---|---|
| Cherokee | 2010-2012 | Extreme Cold/ Wind Chill | 1 | $0 | 0$ |

Source: NCDC Storm Events Database

The following map show the average number of days the region experience temperatures over 90 degrees Fahrenheit from 1981 to 2010.

Average Number of Days with a High Temperature Over 90°F, 1981 to 2010




For extreme heat, the KDHE's Environmental Public Health Tracking Program has kept records of the fatalities of Kansas residents since 2000. There have been at least 144 fatalities of Kansas residents since 2000 due to heat. The year of 2011 had the most recorded fatalities with 37. The following table presents statewide temperature related deaths by year, as confidentiality requirements prevent presenting the data by region.

**Temperature Related Fatalities, Statewide**

| Year | Frequency | Percent | Cumulative Frequency | Cumulative Percent |
|---|---|---|---|---|
| 2000 | 10 | 7.35 | 10 | 7.35 |
| 2001 | 5 | 3.68 | 15 | 11.03 |
| 2002 | 3 | 2.21 | 18 | 13.24 |
| 2003 | 5 | 3.68 | 23 | 16.91 |
| 2004 | 4 | 2.94 | 27 | 19.85 |
| 2005 | 6 | 4.41 | 33 | 24.26 |
| 2006 | 21 | 15.44 | 54 | 39.71 |
| 2007 | 11 | 8.09 | 65 | 47.79 |

**Temperature Related Fatalities, Statewide, Continued**

| Year | Frequency | Percent | Cumulative Frequency | Cumulative Percent |
|---|---|---|---|---|
| 2008 | 9 | 6.62 | 74 | 54.41 |
| 2009 | 10 | 7.35 | 84 | 61.76 |
| 2010 | 5 | 3.68 | 89 | 65.44 |
| 2011 | 37 | 27.21 | 126 | 92.65 |
| 2012 | 10 | 7.35 | 136 | 100 |

Source: Department of Health and Environment's Kansas Environmental Public Health Tracking Program

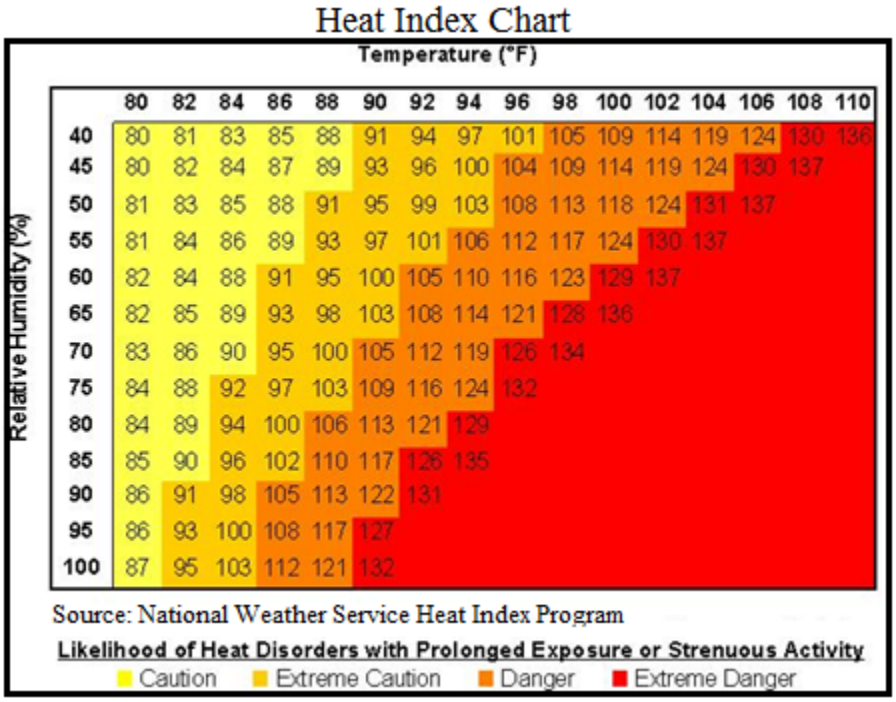
## Local Events

**March 9, 2010: City of Chetopa, Labette County:** Severe cold temperatures causing water lines to freeze and break and damage to roads from the freezing weather. Water lines at six locations within the city had to be repaired due to breaks from the severe weather. Federal funding of $3109.40 and state funding of $414.59 was made available.

## Hazard Vulnerability and Impact

The primary concerns with this hazard are human health safety issues. Specific at risk groups identified were outdoor workers, farmers, and senior citizens. Due to the potential for fatalities and the possibility for the loss of electric power due to increased strain on power generation and distribution for air conditioning, periods of extreme heat can affect the planning area.

The following Heat Index chart correlates both temperature and relative humidity to illustrate apparent, of felt, temperature.



Exposure to direct sun can increase Heat Index values by as much as 15°F. The zone above 105°F corresponds to a Heat Index that may cause increasingly severe heat disorders with continued exposure and/or physical activity. The following table discusses potential impacts on human health related to excessive heat.

**Extreme Heat Impacts on Human Health**

| Heat Index Temperature | Potential Impact on Human Health |
|---|---|
| 80-90° F | Fatigue possible with prolonged exposure and/or physical activity |
| 90-105° F | Sunstroke, heat cramps, and heat exhaustion possible with prolonged exposure and/or physical activity |
| 105-130° F | Heatstroke/sunstroke highly likely with continued exposure |

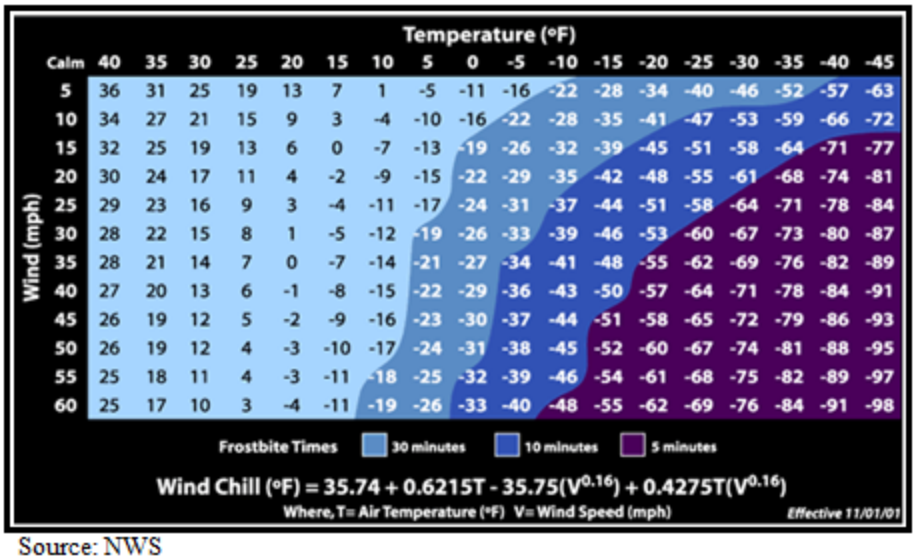
Source: National Weather Service Heat Index Program

The National Weather Service (NWS) has a system in place to initiate alert procedures when the Heat Index is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. A common guideline for issuing excessive heat alerts is when the maximum daytime Heat Index is expected to equal or exceed 105°F and the night time minimum Heat Index is 80°F or above for two or more consecutive days.

Extreme cold can cause hypothermia, an extreme lowering of the body's temperature, frostbite and death. Infants and the elderly are particularly at risk, but anyone can be affected. Other impacts of extreme cold include asphyxiation from toxic fumes from emergency heaters, household fires, which can be caused by fireplaces and emergency heaters, and frozen/burst water pipes. There are no specific data sources recording cold related deaths in southeast Kansas.

Wind can greatly amplify the impact of cold ambient air temperatures. The following figure, provided by the National Weather Service, shows the relationship of wind speed to apparent temperature and typical time periods for the onset of frostbite. The combination of these elements affects the wind chill factor. The wind chill factor is the perceived temperature.

Wind Chill Chart




Source: NWS

In addition, extreme temperatures may exacerbate agricultural and economic losses. The following table presents agricultural loss data for the region for the period 2002 to 2011, the latest available data.

**Total Insured Crop Insurance Paid per County from 2002-2011**

| County | Total Insured Crop Insurance Paid for Extreme Temperature Damages | Annualized Insured Crop Insurance Paid for Extreme Temperature Damages |
|---|---|---|
| Allen | $3,345,864 | $334,586 |
| Bourbon | $776,560 | $77,656 |
| Chautauqua | $295,019 | $29,502 |
| Cherokee | $4,351,610 | $435,161 |
| Crawford | $3,126,224 | $312,622 |
| Elk | $475,269 | $47,527 |
| Greenwood | $1,713,862 | $171,386 |
| Labette | $4,878,576 | $487,858 |
| Montgomery | $3,761,417 | $376,142 |
| Neosho | $2,897,336 | $289,734 |
| Wilson | $4,595,784 | $459,578 |
| Woodson | $1,532,523 | $153,252 |
| Regional Total | $31,750,044 | $3,175,004 |

Source: USDA Risk Management Agency

| | Magnitude/Severity |
|---|---|
| Extreme Temperature | 1.92 |

**Future Development**

Future development and population increase would tend to increase the likelihood of the population being impacted by extreme temperatures. Extreme temperatures tend to impact work and living conditions which may be affected due to increase demands, and potentially resultant failures of, utility systems. However, data suggests that the population total of southeast Kansas is in decline, as is the rate of development, with the exception of major population centers, which could potentially create lower demands on utilities. Additionally, agriculture and livestock could be impacted by extreme temperatures. However, data suggests that both are in a slight regional decline.

**Probability of Future Hazard Events**

Although periods of extreme heat and cold occur on an annual basis, events that create a serious public health risk or threaten infrastructure capacity occur less often. An extreme heat event is more likely to occur in the months of June, July, August, and September, and an extreme cold event is more likely to occur in the months of November, December, January, February, and March. Also the Environmental Protection Agency has projected that with climate changes in the Great Plains, temperatures will continue to increase and affect all southeast Kansas communities.

| | **Probability** |
|---|---|
| Extreme Temperature | 2.75 |

**Consequence Analysis**

The information in the following table provides the Consequence Analysis.

**Extreme Temperature Consequence Analysis**

| Subject | Ranking | Impacts of Extreme Temperature |
|---|---|---|
| Health and Safety of Persons in the Area of the Incident | Minimal - Severe | Depending on the duration of the event, impact is expected to be severe for unprepared and unprotected persons. Impact will be minimal to moderate for prepared and protected persons. |
| Responders | Minimal to Severe | Impact could be severe if proper precautions are not taken, i.e. hydration in heat, clothing in extreme cold. With proper preparedness and protection the impact would be minimal. |
| Continuity of Operations | Minimal | Minimal expectation for utilization of the COOP. |
| Property, Facilities, and Infrastructure | Minimal to Severe | Impact to infrastructure could be minimal to severe depending on the temperature extremes. |
| Delivery of Services | Minimal | Impact should be non-existent to minimal. |
| Environment | Severe | The impact to the environment could be severe. Extreme heat and extreme cold could seriously damage wildlife and plants, trees, crops, etc. |
| Economic Conditions | Minimal to Severe | Impacts to the economy will be dependent on how extreme the temperatures get, but only in the sense of whether people will venture out to spend money. Utility bills could increase causing more financial hardship. |
| Public Confidence in Governance | Minimal to Moderate | Confidence will be dependent on how well utilities hold up as they are stretched to provide heat and cool air, depending on the extreme. Planning and response could be challenged. |

### 3.7.8 FLOOD

| | Probability | Magnitude/Severity | Warning Time | Duration | CPRI |
|---|---|---|---|---|---|
| Flood | 3.25 | 2.92 | 2.17 | 3.00 | **2.96** |

**Description**

Flooding is the most frequent and costly natural hazard in the United States. During the twentieth century, floods were the leading natural disaster in the United States, representing 40 percent of all natural disasters in terms of number of lives lost, estimated at more than 10,000 deaths since 1990, and property damaged. Nearly 90% of presidential disaster declarations result from natural events where flooding was a major component. The USGS reports that nationwide, floods kill an average of 140 people each year and cause $6 Billion in property damage.

Floods that threaten southeast Kansas are generally the result of excessive precipitation, and can be classified under two categories:

- **Flash Flood:** The product of heavy, localized precipitation in a short time period over a given location
- **Riverine Flood:** Occurs when precipitation over a given river basin for a long period of time causes the overflow of rivers, streams, lakes and drains
- **Urban Flood:** Occurs where man-made development has obstructed the natural flow of water and decreased the ability of natural groundcover to absorb and retain surface water runoff

The severity of a flooding event is generally determined by the following factors:

- The combination of stream and river basin topography and physiography
- Precipitation and weather patterns
- Soil moisture conditions
- Degree of vegetative clearing or impermeable ground cover

***Riverine Floods***

The NWS provides the following definitions of warnings for actual and potential flood conditions for Riverine and Urban Flooding:

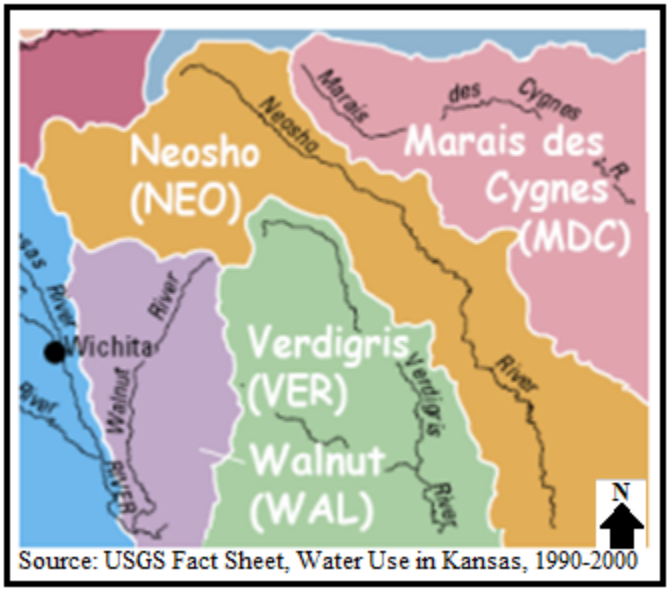
- **Flood Potential Outlook:** In hydrologic terms, An NWS outlook that is issued to alert the public of potentially heavy rainfall that could send rivers and streams into flood or aggravate an existing flood.
- **Flood Watch:** Issued to inform the public and cooperating agencies that current and developing hydro meteorological conditions are such that there is a threat of flooding, but the occurrence is neither certain nor imminent.

- **Flood Warning:** In hydrologic terms, a release by the NWS to inform the public of flooding along larger streams in which there is a serious threat to life or property. A flood warning will usually contain river stage (level) forecasts.
- **Flood Statement:** In hydrologic terms, a statement issued by the NWS to inform the public of flooding along major streams in which there is not a serious threat to life or property. It may also follow a flood warning to give later information.

Riverine flooding is defined as the overflow of rivers, streams, drains, and lakes due to excessive rainfall, rapid snowmelt or ice melt. The areas adjacent to rivers and stream banks that carry excess floodwater during rapid runoff are called floodplains. A floodplain is defined as the lowland and relatively flat area adjoining a river or stream. The terms "base flood" and "100-year flood" refer to the area in the floodplain that is subject to a one percent or greater chance of flooding in any given year. Floodplains are a larger entity called a basin, which is defined as all the land drained by a river and its branches.

A river basin is the land drained by a river and its branches. The surface waters of southeast Kansas flow through three river basins of the State as shown in the following figure.

Southeast Kansas River Basins



Source: USGS Fact Sheet, Water Use in Kansas, 1990-2000

***Flash Floods***

The NWS provides the following definitions of warnings for actual and potential flood conditions for flash floods:

- **Flash Flood Watch**: Issued to indicate current or developing hydrologic conditions that are favorable for flash flooding in and close to the watch area, but the occurrence is neither certain or imminent.

- **Flash Flood Warning**: Issued to inform the public, emergency management and other cooperating agencies that flash flooding is in progress, imminent, or highly likely.
- **Flash Flood Statement**: In hydrologic terms, a statement by the NWS which provides follow-up information on flash flood watches and warnings.

The onset of flooding varies depending on the cause and type, with flash flooding and dam/levee failure inundation occurring typically with little or no warning time, whereas flooding caused by long periods of excessive rainfall tend to have longer durations but more gradual onset. Overall warning time is usually 6-12 hours. The duration of flood conditions is generally less than one week, but in exceptional cases can extend significantly longer.

A flash flood is an event that occurs with little or no warning where water levels rise at an extremely fast rate. Most flash flooding is caused by slow-moving thunderstorms or thunderstorms repeatedly moving over the same area. Flash flooding results from intense rainfall over a brief period, sometimes combined with rapid snowmelt, ice jam release, frozen ground, saturated soil or impermeable surfaces. Flash flooding may also occur from the breaching or failure of a dam or levee.

Flash flooding is an extremely dangerous which can reach full peak in only a few minutes and allows little or no time for protective measures to be taken by those in its path. Flash flood waters move at very high speeds with walls of water that can reach heights of 10 feet. Flash flood waters and the accompanying debris can uproot trees, roll boulders, and damage or destroy buildings, bridges, and roads. Flash flooding often results in higher loss of life, both human and animal, than slower developing river and stream flooding.

Although flash floods are somewhat unpredictable, there are factors that can point to the likelihood of flash floods occurring. Weather surveillance radar is being used to improve monitoring capabilities of intense rainfall. This, along with knowledge of the watershed characteristics, modeling techniques, monitoring, and advanced warning systems increases the warning time for flash floods.

***Other Floods***

In some cases, flooding may not be directly attributable to a river, stream, or lake overflowing its banks. Rather, it may simply be the combination of excessive rainfall or snowmelt, saturated ground, and inadequate drainage. With no place to go, the water will find the lowest elevations– areas that are often not in a floodplain. This type of flooding, often referred to as sheet flooding, is becoming increasingly prevalent as development outstrips the ability of the drainage infrastructure to properly carry and disperse the water flow.

In certain areas, aging storm sewer systems are not designed to carry the capacity currently needed to handle the increased storm runoff. Typically, the result is water backing into basements, which damages mechanical systems and can create serious public health and safety concerns. This combined with rainfall trends and rainfall extremes all demonstrate the high probability, yet generally unpredictable nature of flash flooding in the planning area.

Generally, floods are usually long-term events that may last for several days.

| | Warning Time |
|---|---|
| Flood | 2.17 |

| | Duration |
|---|---|
| Flood | 3.00 |

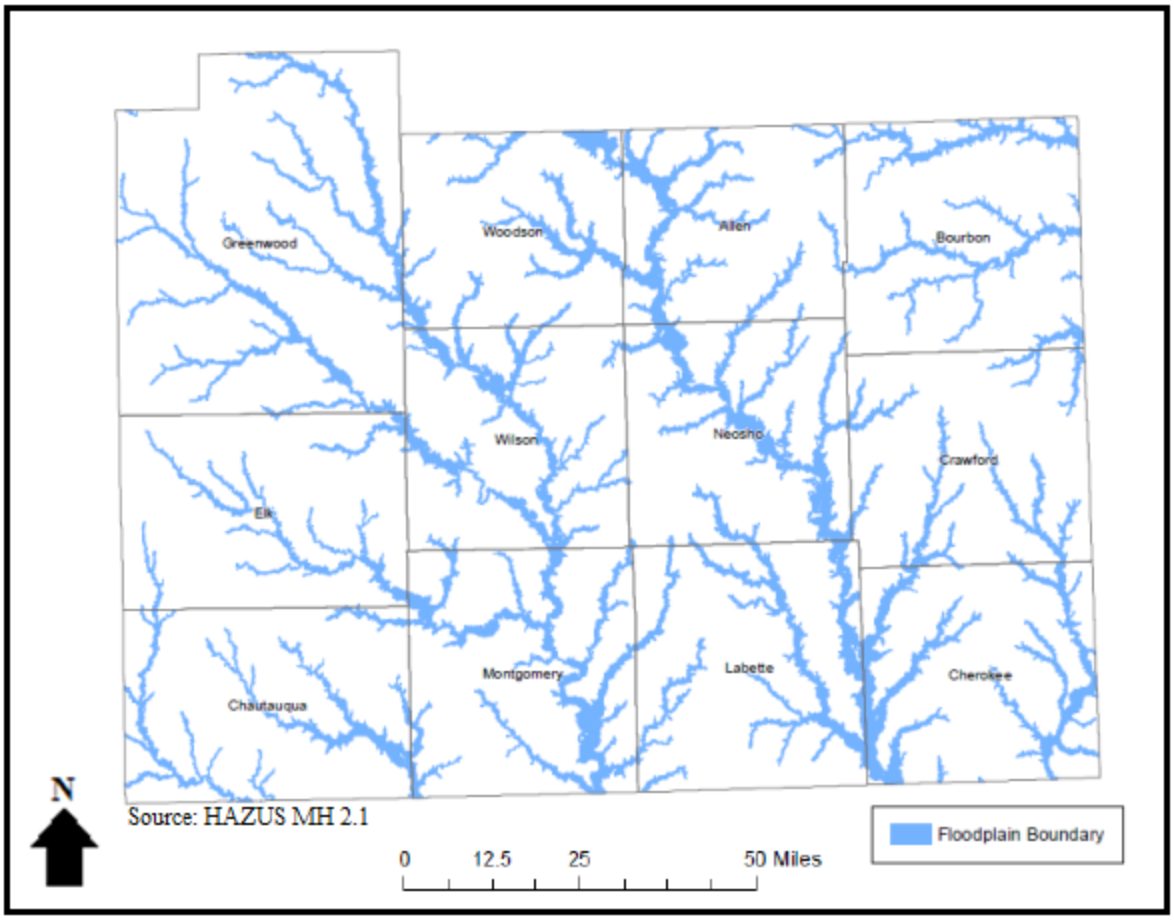
**Hazard Location**

HAZUS-MH 2.1 was utilized to update the region's risk assessment for riverine flooding. Not all of the region's counties have available DFIRMS. As such, the Hazard Mitigation Planning Team decided to utilize the latest version of HAZUS, released in February 2012, as a GIS-based tool to update the Riverine Flooding Risk Assessment. HAZUS-MH 2.1 produces a flood polygon and flood depth grid that represents the base flood. While not as accurate as utilizing DFIRMs themselves, this approach ensures an "apples to apples" analysis to describe vulnerability in terms of the jurisdictions most threatened by riverine flooding, and most vulnerable to damage and loss associated with flooding events.

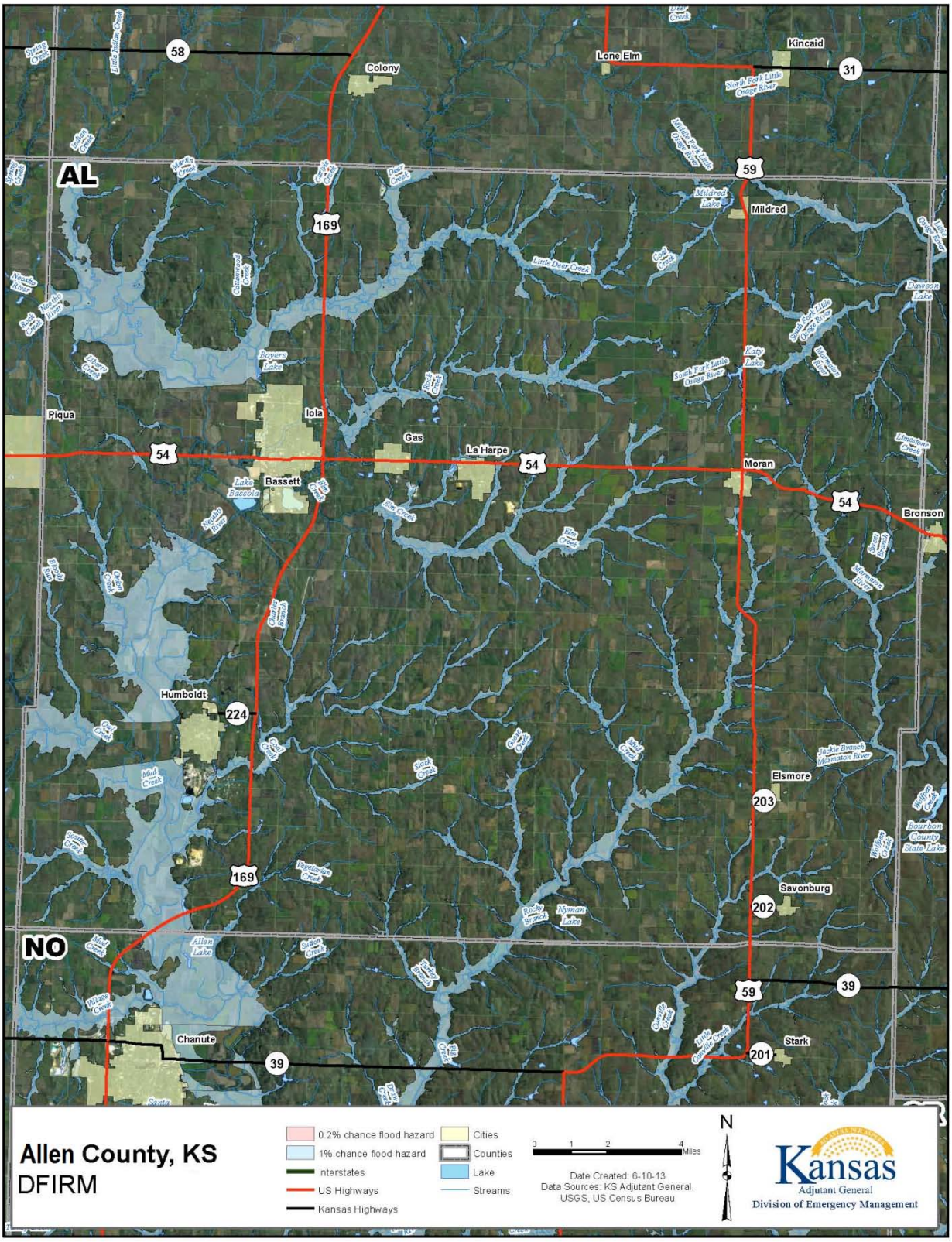
While riverine floods can and do occur at various levels, the one percent annual chance flood has been chosen as the basis for this risk assessment. This level is the accepted standard for flood insurance purposes.

Results from the HAZUS-MH 2.1 analysis will be provided throughout this section to depict floodplain areas as well as varied vulnerability and potential loss estimates. The following map provides a regional overview of the one percent annual chance floodplains in southeast Kansas, generated by HAZUS-MH 2.1.

Regional HAZUS One Percent Annual Chance Floodplains




The following are available DFIRM maps for counties within southeast Kansas. Please note that map for Chautauqua, Elk, Greenwood and Woodson counties were not available. However, where available DFIRM maps for cities within these counties are presented.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DFIRM
0.2% chance flood hazard
1% chance flood hazard
Interstates
US Highways
Kansas Highways
Cities
Counties
Lake
Streams
0 1 2 4 Miles
Date Created: 6-10-13
Data Sources: KS Adjutant General, USGS, US Census Bureau
N
Kansas
Adjutant General
Division of Emergency Management
AL
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Colony
Lone Elm
Kincaid
Mildred
Iola
Gas
La Harpe
Moran
Bassett
Bronson
Piqua
Humboldt
Elsmore
Savonburg
Stark
Chanute
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202
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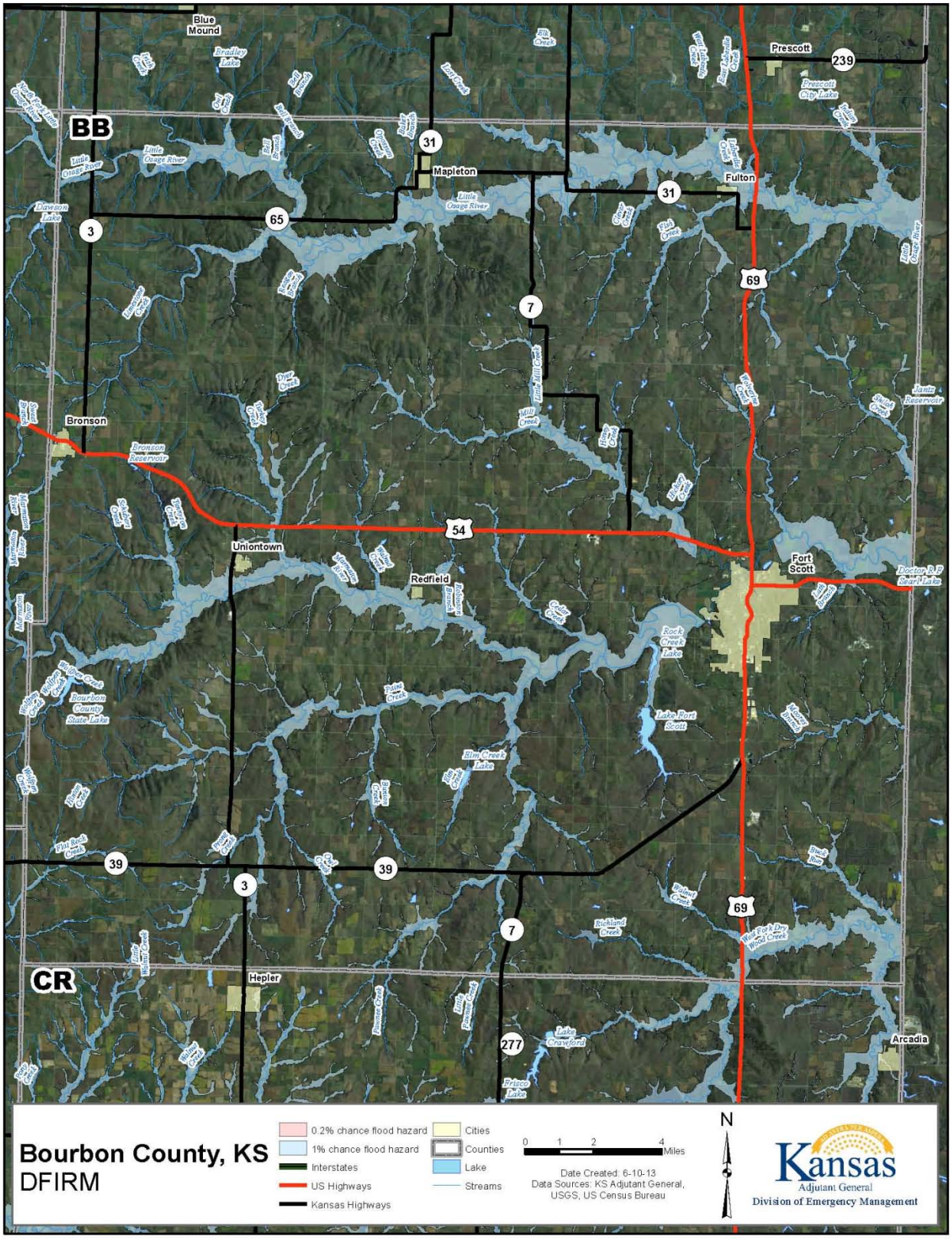
201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Prescott
239
BB
31
Mapleton
Fulton
65
3
69
7
Bronson
54
Uniontown
Redfield
Fort Scott
39
CR
Hepler
277
Arcadia
Bourbon County, KS
DFIRM
0.2% chance flood hazard
1% chance flood hazard
Interstates
US Highways
Kansas Highways
Cities
Counties
Lake
Streams
0 1 2 4 Miles
Date Created: 6-10-13
Data Sources: KS Adjutant General, USGS, US Census Bureau
N
Kansas
Adjutant General
Division of Emergency Management


CK
Chicopee
Pittsburg
McCune
Cherokee
Weir
West Mineral
Roseland
Scammon
Columbus
Oswego
Galena
Riverton
Lowell
Chetopa
Baxter Springs
Treece
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171
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160
66
26
166
Cherokee County, KS
DFIRM
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1% chance flood hazard
Interstates
US Highways
Kansas Highways
Cities
Counties
Lake
Streams
0 1 2 4 Miles
Date Created: 6-10-13
Data Sources: KS Adjutant General, USGS, US Census Bureau
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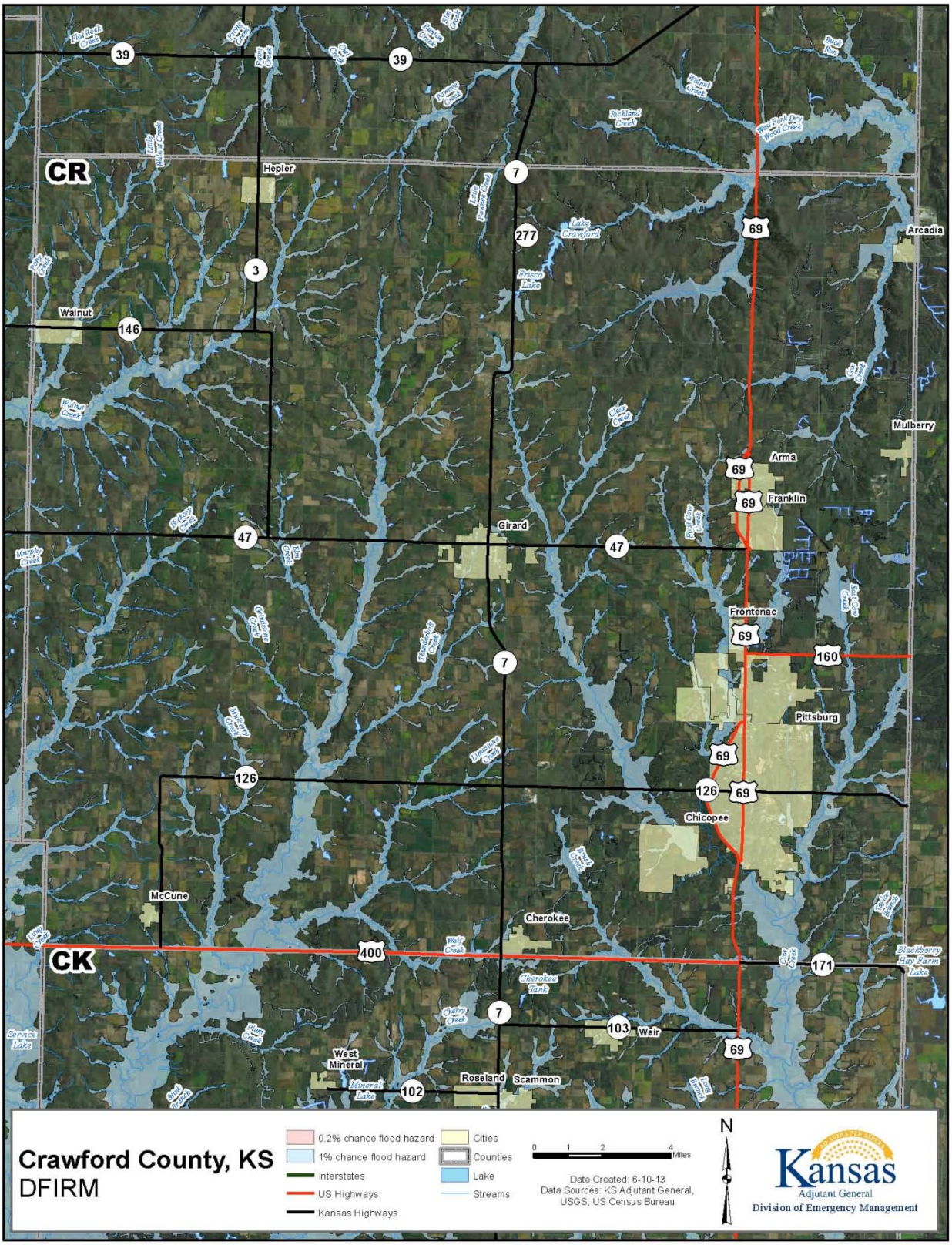
Division of Emergency Management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Hepler
Walnut
Girard
Arcadia
Arma
Franklin
Mulberry
Frontenac
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McCune
Cherokee
Weir
West Mineral
Roseland
Scammon
Lake Crawford
Frisco Lake
Blackberry Hay Farm Lake
Service Lake
Mineral Lake
Cherokee Tank
Crawford County, KS
DFIRM
0.2% chance flood hazard
1% chance flood hazard
Interstates
US Highways
Kansas Highways
Cities
Counties
Lake
Streams
0 1 2 4 Miles
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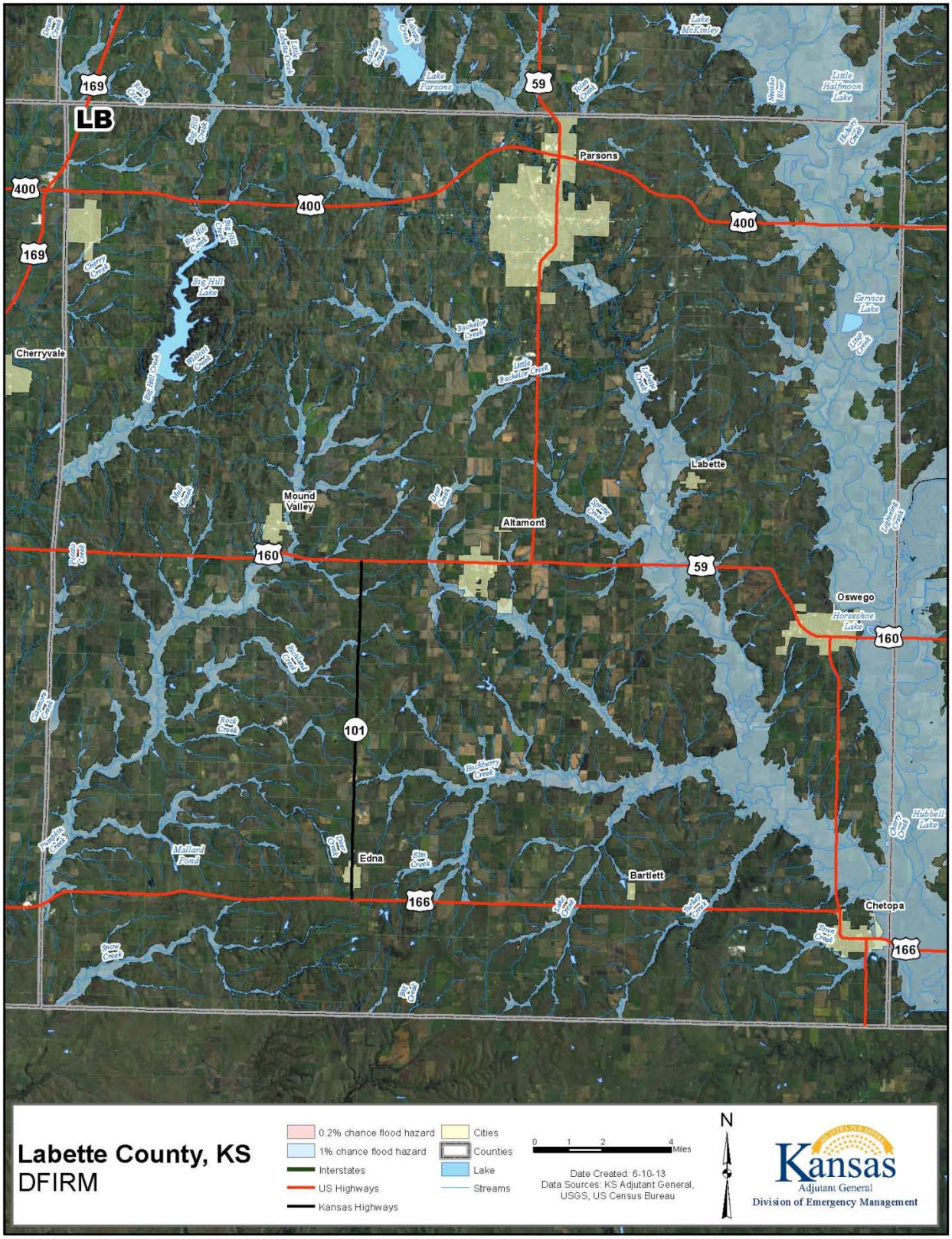
Division of Emergency Management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1% chance flood hazard
Interstates
US Highways
Kansas Highways
Cities
Counties
Lake
Streams
0 1 2 4 Miles
Date Created: 6-10-13
Data Sources: KS Adjutant General, USGS, US Census Bureau
N
Kansas
Adjutant General
Division of Emergency Management
LB
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Cherryvale
Mound Valley
Altamont
Labette
Oswego
Edna
Bartlett
Chetopa
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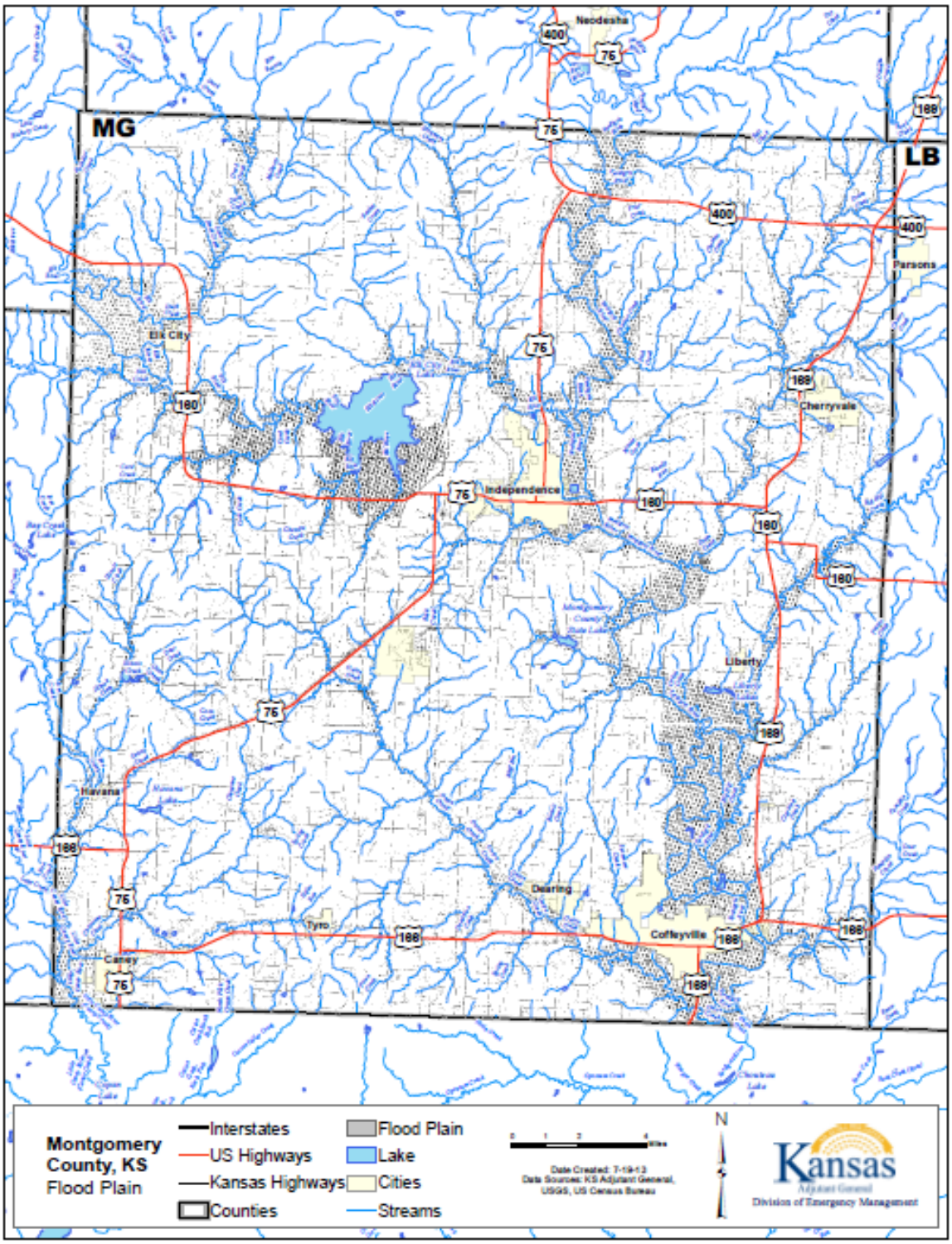
MG
LB
Neodesha
Parsons
Elk City
Cherryvale
Independence
Liberty
Havana
Dearing
Tyro
Coffeyville
Caney
Montgomery
County, KS
Flood Plain
Interstates
US Highways
Kansas Highways
Counties
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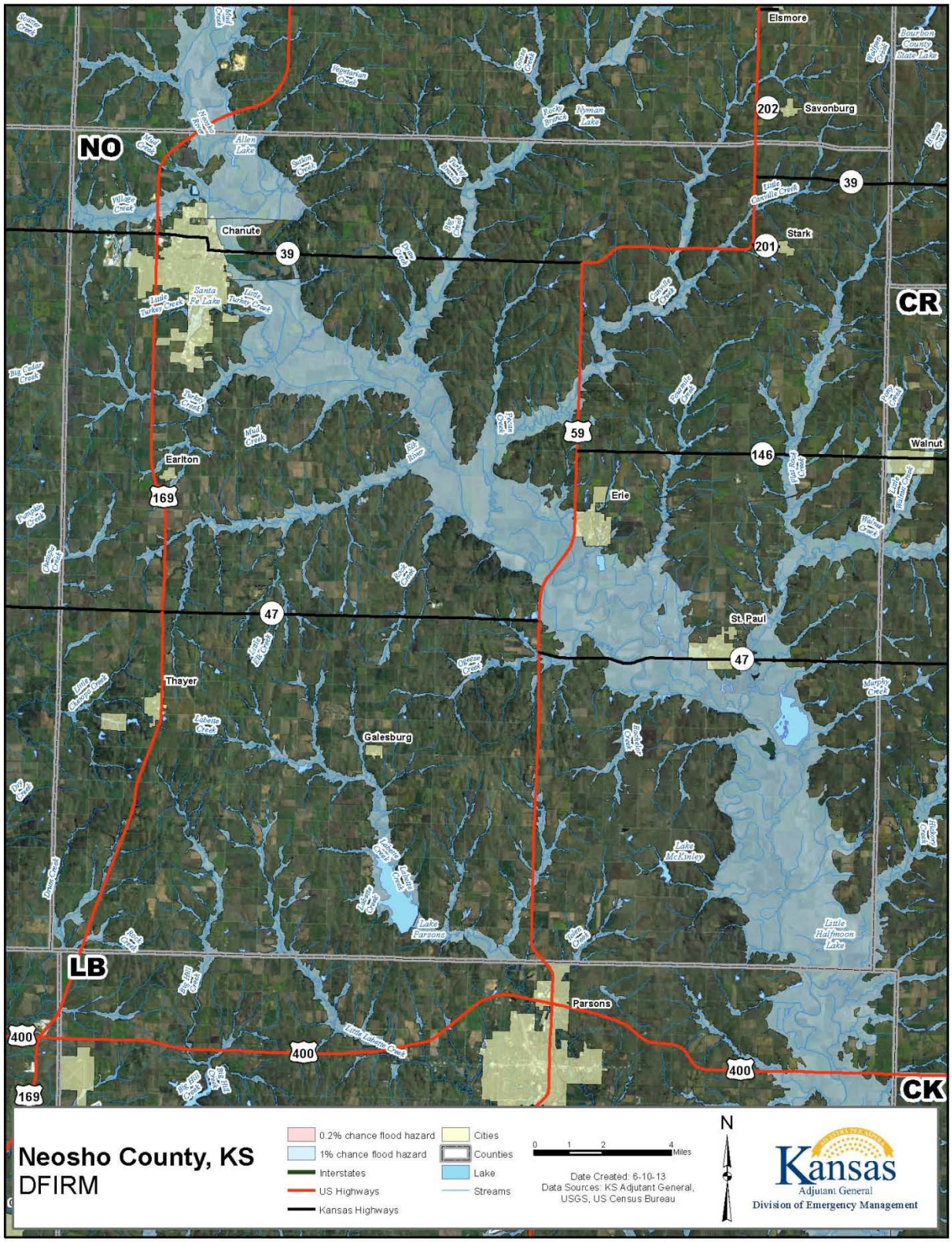
Lake
Cities
Streams
N
Kansas
Division of Emergency Management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Santa Fe Lake
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Walnut
Erie
47
St. Paul
47
Thayer
Galesburg
Lake McKinley
Lake Parsons
Little Hallmoon Lake
LB
Parsons
400
400
400
169
CK
Neosho County, KS
DFIRM
0.2% chance flood hazard
1% chance flood hazard
Interstates
US Highways
Kansas Highways
Cities
Counties
Lake
Streams
0 1 2 4 Miles
Date Created: 6-10-13
Data Sources: KS Adjutant General, USGS, US Census Bureau
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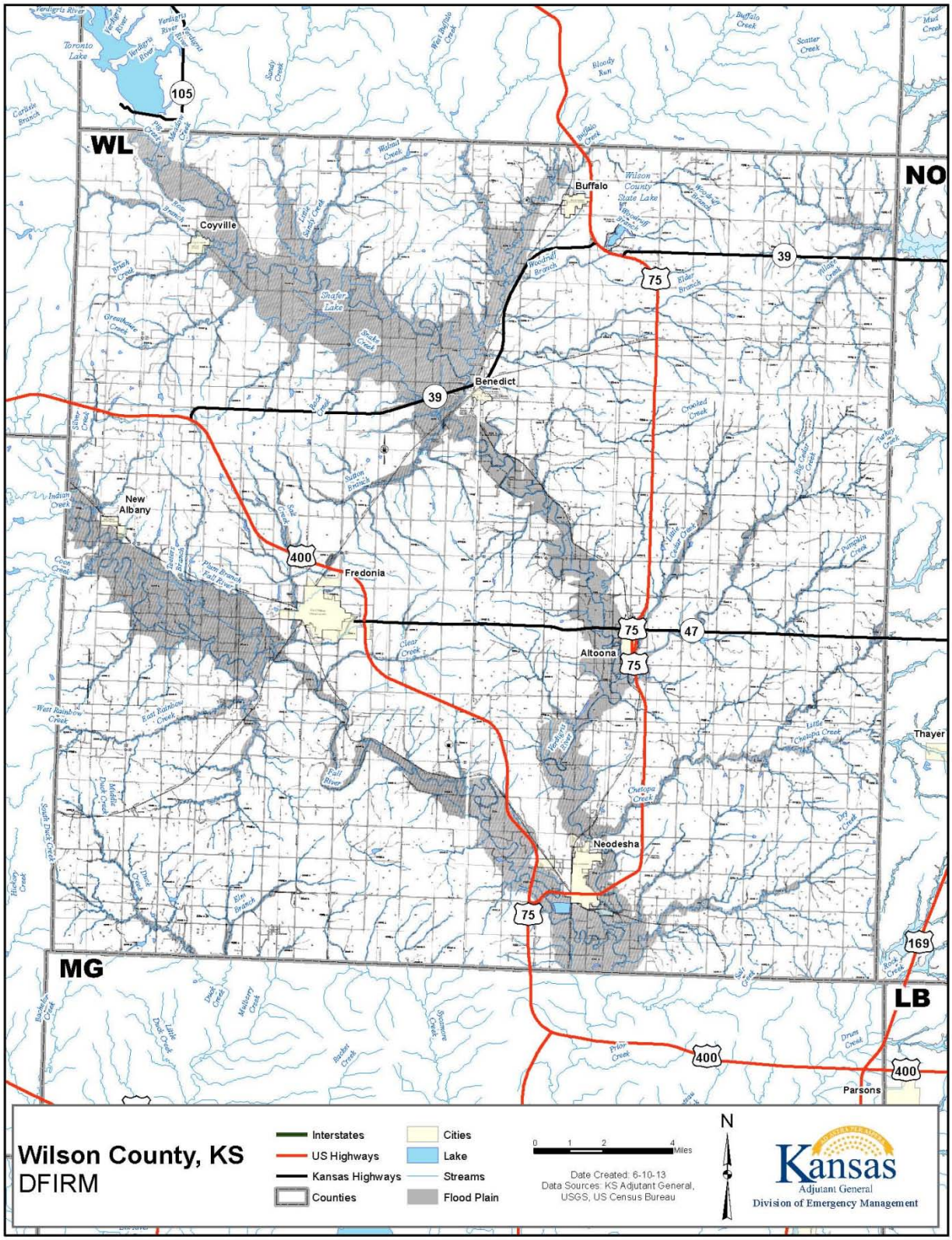
Kansas
Adjutant General
Division of Emergency Management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Benedict
New Albany
Fredonia
Altoona
Neodesha
Thayer
Parsons
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75
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47
169
Wilson County, KS
DFIRM
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US Highways
Kansas Highways
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Cities
Lake
Streams
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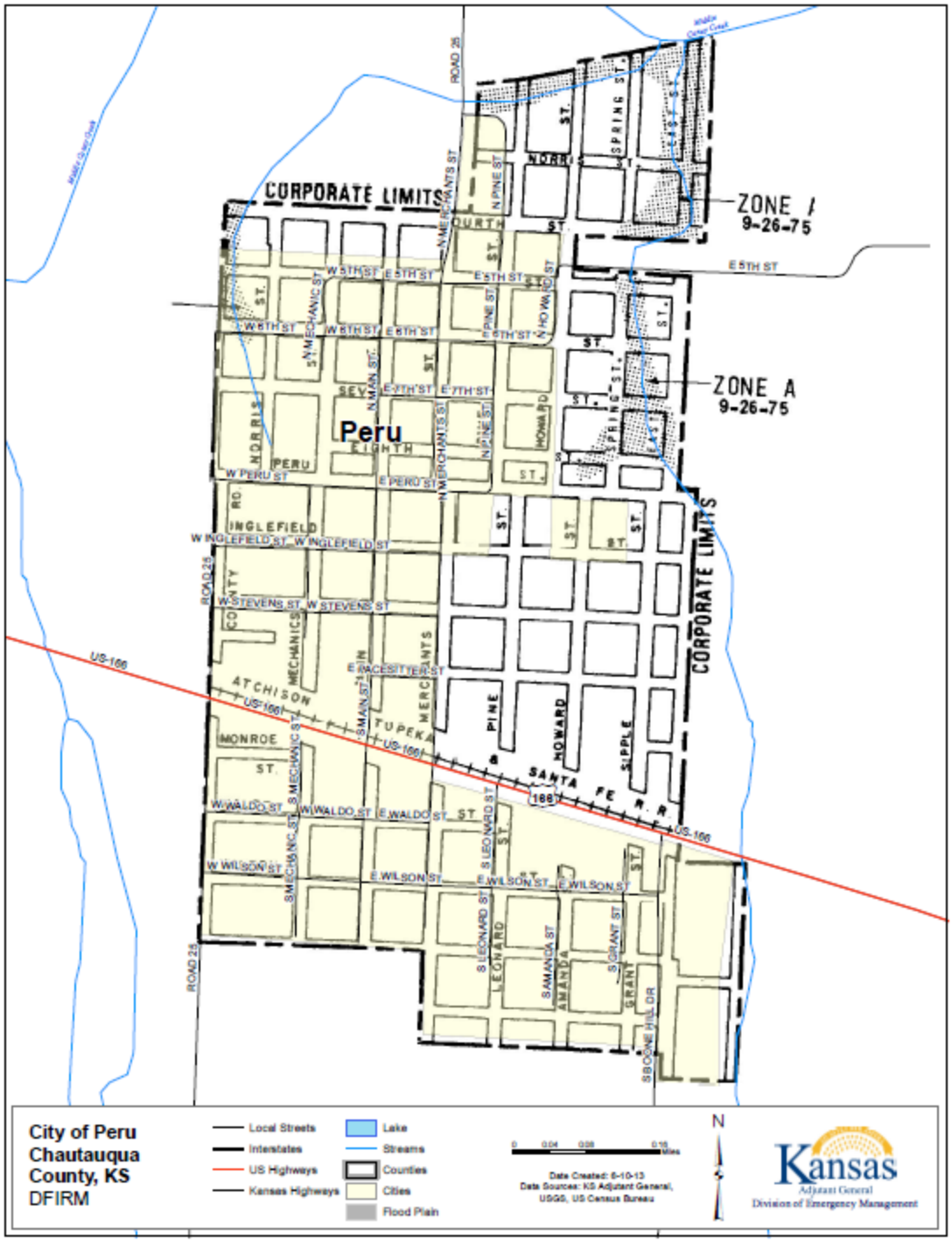
Data Sources: KS Adjutant General, USGS, US Census Bureau
Kansas
Adjutant General
Division of Emergency Management


CORPORATE LIMITS
ZONE A
9-26-75
ZONE A
9-26-75
Peru
CORPORATE LIMITS
City of Peru
Chautauqua
County, KS
DFIRM
Local Streets
Interstates
US Highways
Kansas Highways
Lake
Streams
Counties
Cities
Flood Plain
Date Created: 6-10-13
Data Sources: KS Adjutant General,
USGS, US Census Bureau
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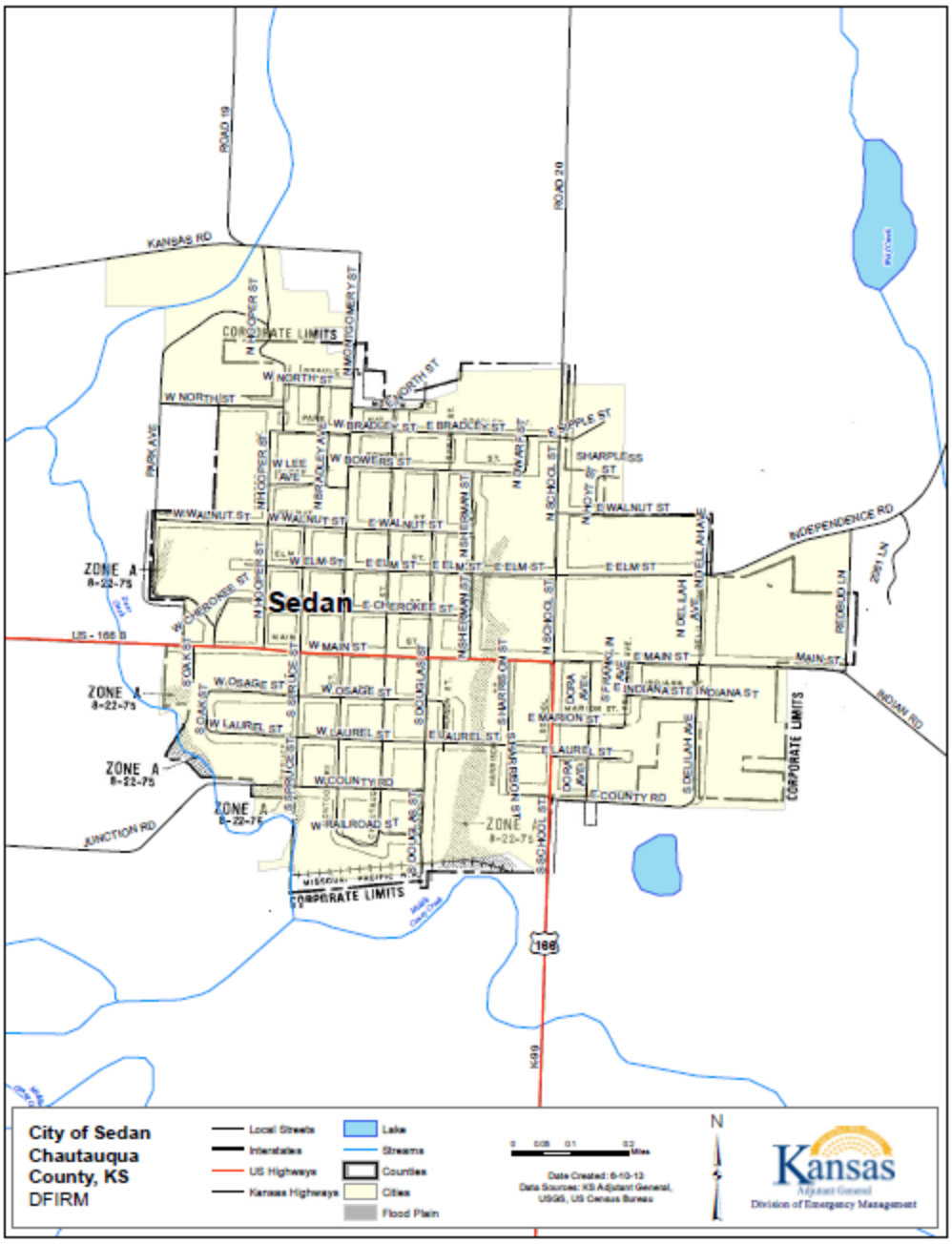
Kansas
Adjutant General
Division of Emergency Management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Chautauqua
County, KS
DFIRM
Local Streets
Interstates
US Highways
Kansas Highways
Lake
Streams
Counties
Cities
Flood Plain
Date Created: 6-10-13
Data Sources: KS Adjutant General, USGS, US Census Bureau
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Kansas
Adjutant General
Division of Emergency Management
Sedan
ZONE A
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ROAD 20
INDEPENDENCE RD
INDIAN RD
JUNCTION RD
US - 166 B
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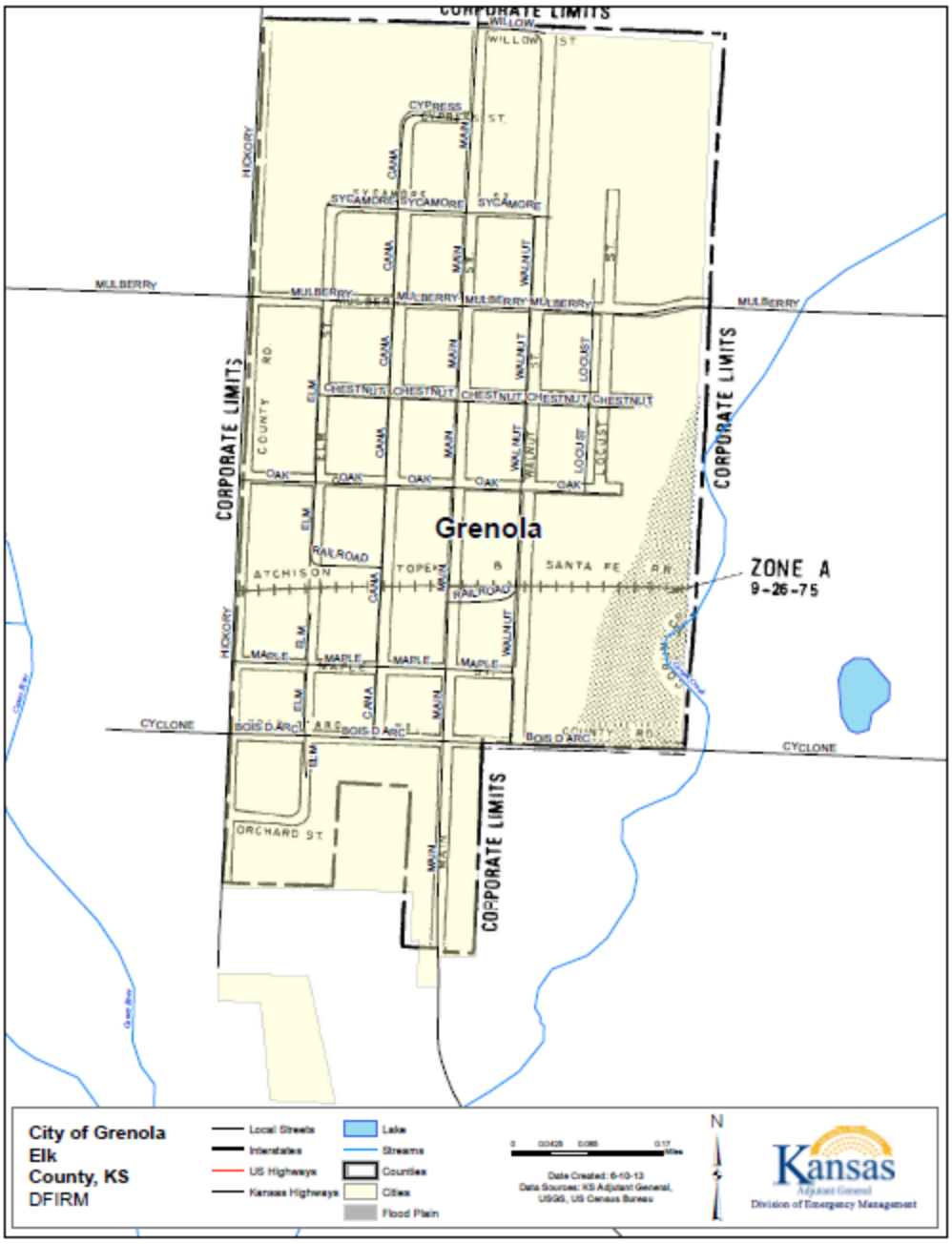
166


CORPORATE LIMITS
WILLOW ST
CYPRESS ST
SYCAMORE
MULBERRY
CHESTNUT
OAK
MAPLE
BOIS D ARC
ORCHARD ST
HICKORY
ELM
MAIN
WALNUT
LOCUST
CANA
COUNTY RD
RAILROAD
ATCHISON TOPEKA & SANTA FE RR
Grenola
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CYCLONE
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Elk
County, KS
DFIRM
Local Streets
Interstates
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Lake
Streams
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Cities
Flood Plain
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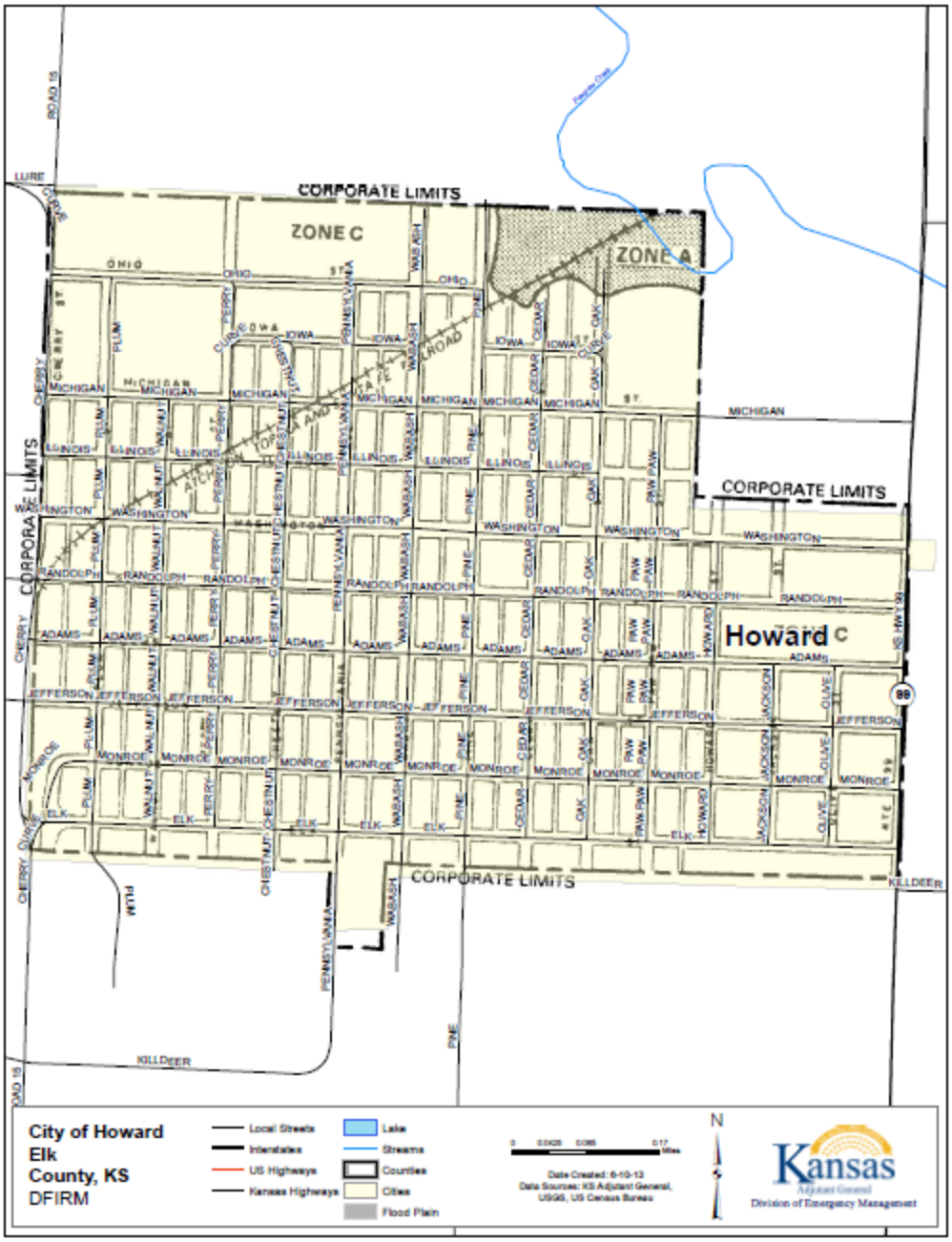
Kansas
Division of Emergency Management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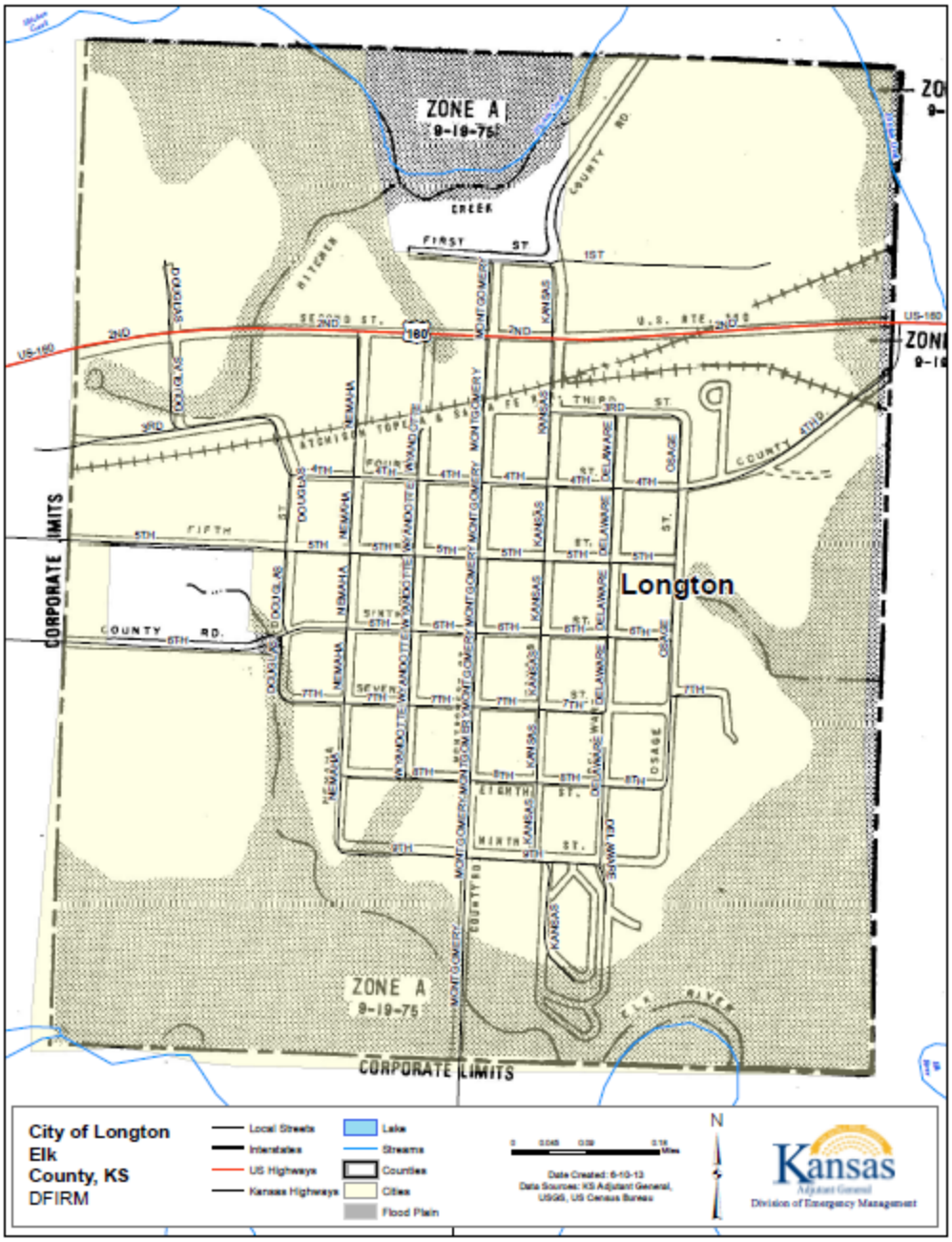
Division of Emergency Management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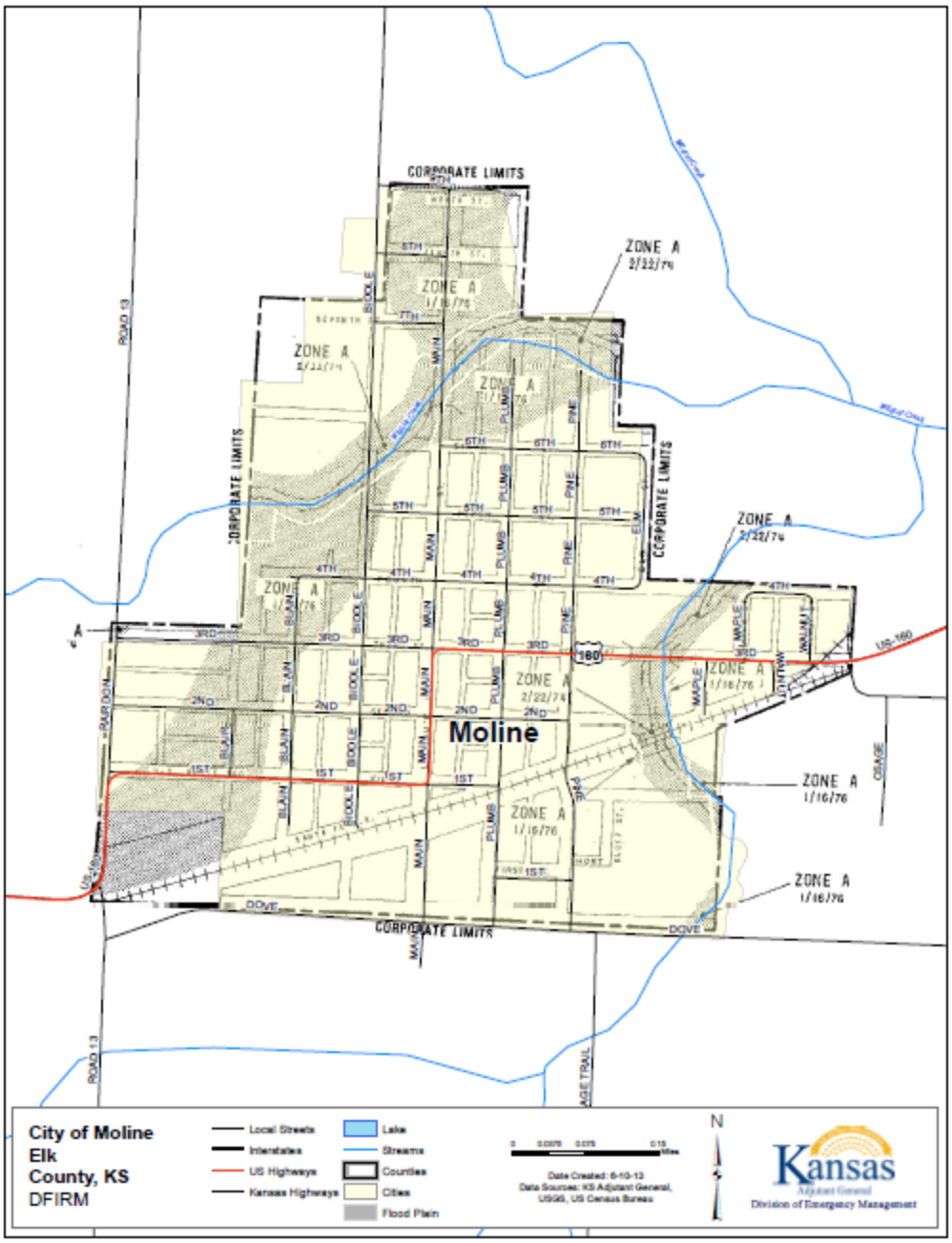
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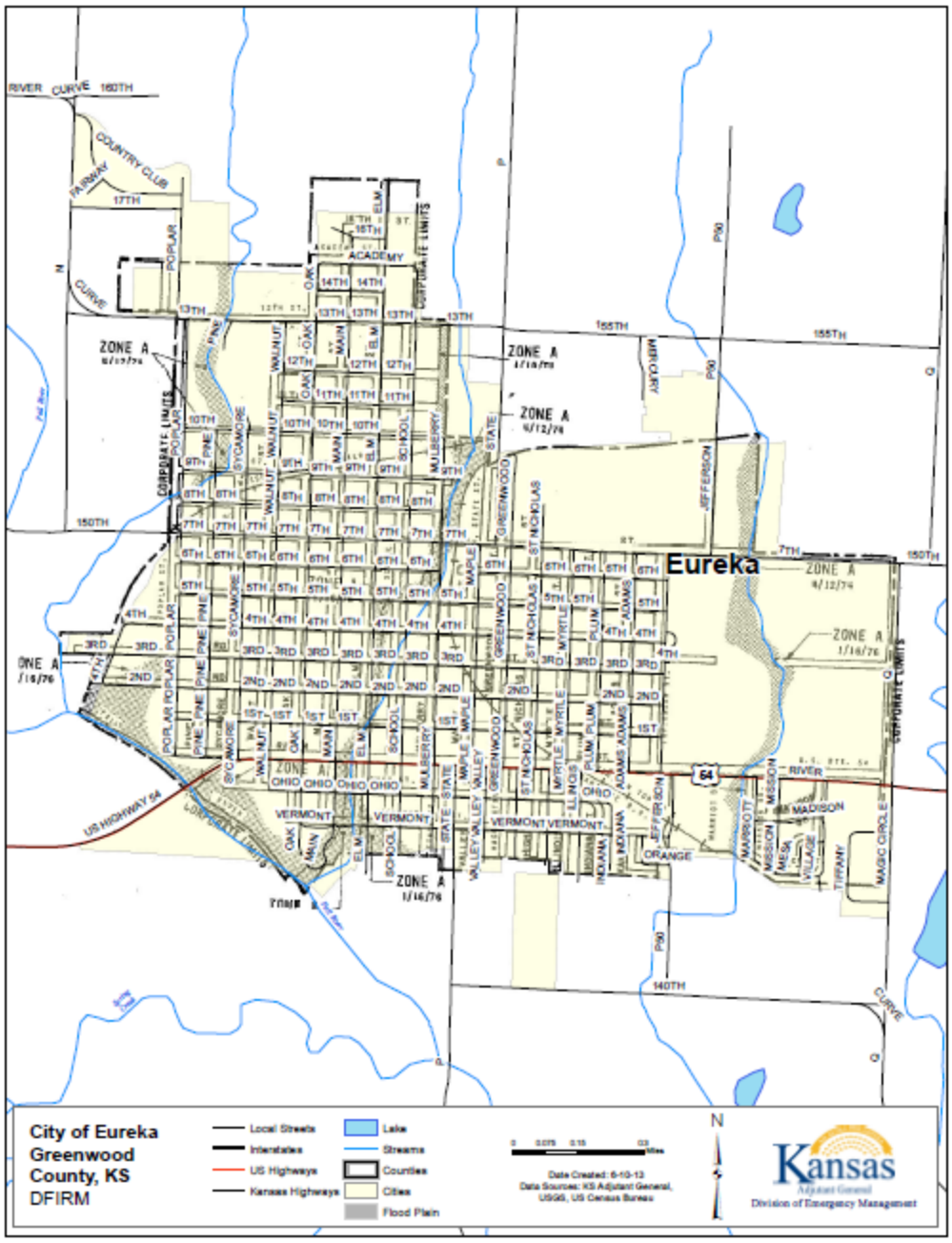
Division of Emergency Management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Date Created: 6-10-13
Data Sources: KS Adjutant General, USGS, US Census Bureau
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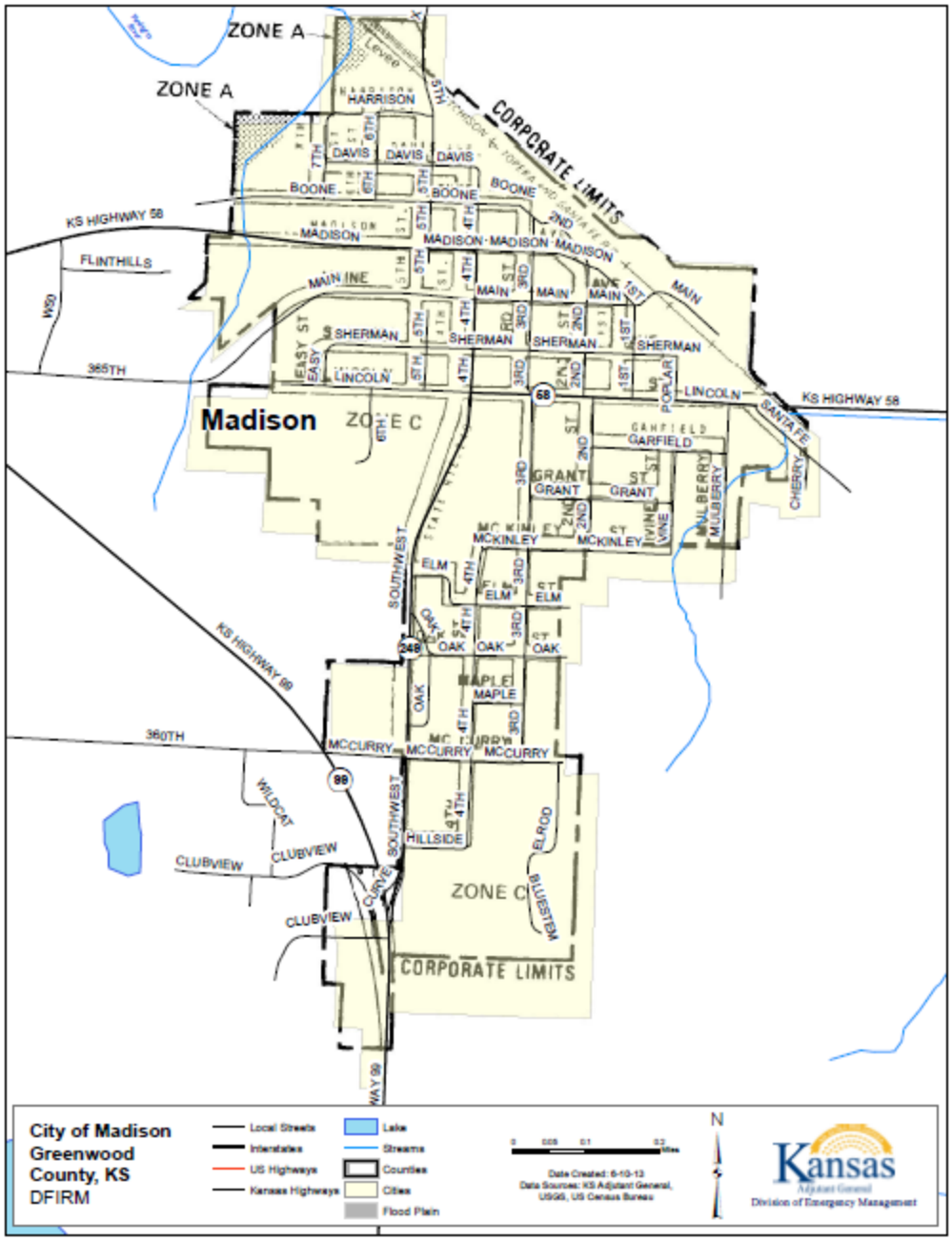
Division of Emergency Management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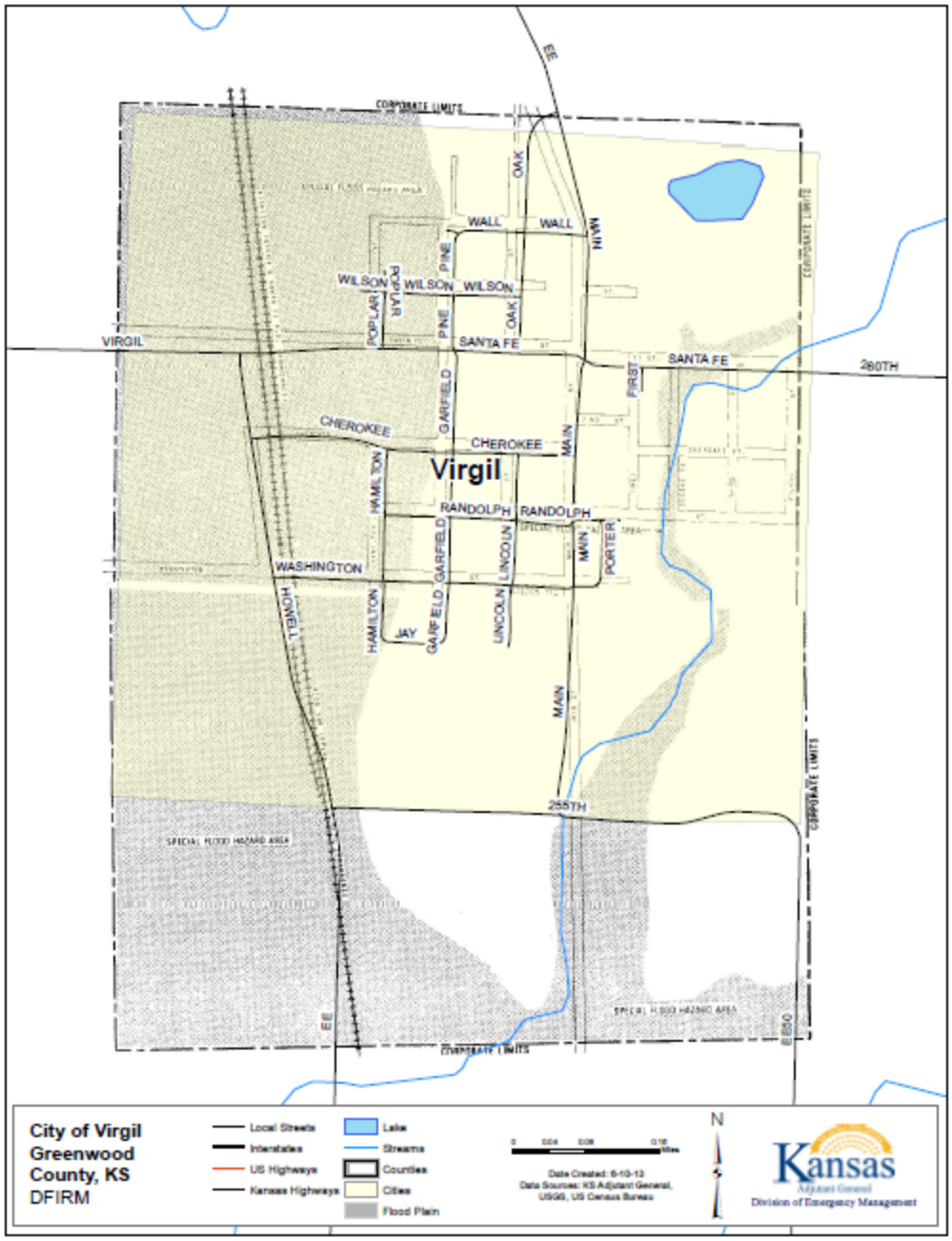



**Previous Occurrences and Extent**

In the past ten years, major floods have impacted southeast Kansas in 2003, 2004, 2005, 2007, 2008, 2009, and 2010, including eleven Presidential Disaster Declarations. Details about some of these events as well as the Presidential Disaster Declarations that included flooding can be found on the following pages. Please note that some of the Presidential Disaster Declarations included flooding (primarily flash flooding) as a secondary cause of damages**.**

**Kansas Presidential Declarations Involving Flooding**

| Declaration Number | Declaration Date* | Disaster Description | Regional Counties Involved | Disaster Cost** |
|---|---|---|---|---|
| 1932 | 08/10/2010 (6/7-7/21/2010) | Severe Storms, **Flooding** and Tornados | Cheyenne, Elk, Greenwood, Wilson and Woodson | $9,279,257 |
| 1860 | 09/30/2009 (7/8-7/14/2009) | Severe Storms and **Flooding** | Bourbon | $3,347,662 |
| 1849 | 06/25/2009 (4/25-5/16/2009) | Severe Storms, **Flooding**, Straight-line Winds, and Tornados | Bourbon, Cherokee, Crawford, Elk, Greenwood, Labette, Montgomery, Neosho and Wilson | $15,013,488 |
| 1808 | 10/31/2008 | Severe Storms, **Flooding**, and Tornados | Greenwood | $4,167,044 |
| 1776 | 07/09/2008 | Severe Storms, **Flooding**, and Tornados | Bourbon, Chautauqua, Cherokee, Crawford, Elk, Montgomery and Wilson | $70,629,544 |
| 1711 | 7/2/2007 (6/26-30/2007) | Severe Storms and **Flooding** | Allen, Bourbon, Chautauqua, Cherokee, Crawford, Elk, Greenwood, Labette, Montgomery, Neosho, Wilson and Woodson | $40,238,600 |
| 1699 | 5/6/2007 (5/4/2007) | Severe Storms, Tornados, and **Flooding** | Cherokee | $117,565,269 |
| 1600 | 8/23/2005 (6/30-7/1/2005) | Severe Storms and **Flooding** | Cherokee, Crawford and Neosho | $4,344,569 |
| 1579 | 2/8/2005 (1/4-6/2005) | Severe Winter Storm, Heavy Rains, and **Flooding** | Chautauqua, Crawford, Elk, Greenwood and Woodson | $106,873,672 |
| 1535 | 8/3/2004 (6/12-7/25/2004) | Severe Storms, **Flooding**, and Tornados | Cherokee, Labette and Woodson | $12,845,892 |
| 1462 | 5/6/2003 (5/4-30/2003) | Severe Storms, Tornados, and **Flooding** | Allen, Cherokee, Labette, Neosho and Woodson | $988,056 |

Sources: FEMA and Kansas Division of Emergency Management

* Incident dates are in parentheses.

** Disaster costs include Public Assistance and Individual Assistance and may include additional ,unlisted counties

The following provide brief discussions of the most recent Presidential Disaster Declarations for the region:

**FEMA-1932-DR**: Severe Storms, Flooding, and Tornados—August 10, 2010: From June 7 to July 21, 2010, severe storms, flooding, and tornados caused damages in 41 Kansas Counties. The primary impacts of this event were to public roads and bridges with an estimated $11.2 Million in damages.

**FEMA-1860-DR**: Severe Storms and Flooding – September 30, 2009: On September 2, 2009, Governor Mark Parkinson requested a major disaster declaration because of severe storms, accompanied by large hail, lightning, high winds, and torrential rains during the period of July 8-14, 2009. The governor requested a declaration for Public Assistance for eight counties and hazard mitigation for all counties. The primary impacts of this event were to public buildings and equipment with an estimated $3.5 million in damages.

**FEMA-1849-DR**: Severe Storms, Flooding, Straight-line Winds, and Tornados—June 25, 2009 (April 25-May 15): During the last week of April and beginning of May, severe storms and flooding impacted Kansas. Many roads and highways were inundated. In Greenwood County, a truck was swept off of a county road into the Verdigris River drowning one man. In Labette County, two people were found in Pumpkin Creek. It is believed their car was swept off a low water crossing.

**FEMA 1808-DR**: Severe Storms, Flooding, and Tornados—October 31, 2008 (Sept. 11-17): During the period of September 11-17, 2009, severe storms accompanied by tornados, lightning and torrential rains resulted in flooding and flash flooding across south central and eastern Kansas. Rainfall amounts were generally around 5 inches, however isolated amounts reached up to 11.00 inches

**FEMA 1776-DR**: Severe Storms, Flooding, and Tornados—July 9, 2008: Beginning May 22, 2008 and continuing through June 16, 2008, severe storms across Kansas produced large hail, lightning, high winds, tornados and torrential rains. The severe weather produced widespread flooding. Several high water rescues were reported as local law and fire officials had to rescue individuals from on top of their vehicles and in one instance clinging to a tree. Street flooding was reported throughout the impacted areas.

**FEMA-1711-DR**: Severe Storms and Flooding—July 2, 2007 (June 26–30): Beginning June 26 and continuing through June 30, 2007, strong storms across south central and southeast Kansas produced torrential rainfall and subsequent flooding/flash flooding. Some counties, which were still recovering from flooding in mid-May, received over a foot of rain. Up to 21 inches of rain was reported near Fredonia (Wilson County). As of the morning of June 30, 16½ inches had fallen in 48 hours in Moline (Elk County), 12½ of which fell in 24 hours. Nine inches fell in four hours in Winfield (Cowley County) on the afternoon of June 29. Wilson County was one of the hardest hit counties. Initially, Neodesha was only accessible by boat and air. Both the water and sewer plants were compromised by the flooding, which resulted in a boil water order for the area.

Approximately 3,000 people were without power in Fredonia for several days. In Miami County, the Kansas National Guard was sent to help with a mandatory evacuation of Osawatomie, one of the hardest hit communities in eastern Kansas. The town evacuated 40% of its 4,600 residents after Pottawatomie Creek and the Marais des Cygnes River rose out of their banks. In Montgomery County, the heavy rains caused the Verdigris River to overflow its banks, top protective levees, and flood the town of Coffeyville. The river crested more than 10 feet above flood stage, setting a new record for the river. Approximately 2,000 citizens and more than 200 homes were affected. In addition, the Coffeyville Resources refinery and nitrogen fertilizer plant, and many local businesses were flooded. As floodwaters rose, officials at Coffeyville Resources ordered the facilities to shut down and be evacuated. Despite their efforts to secure the refinery, an estimated 71,000 gallons of crude oil and a small amount of oil from the refinery's sewer system were swept away by flood waters. During the plant shutdown, the pump system from the east tank storage facility was shut down, but oil continued to flow because of an elevation difference, causing the main oil storage tank in the refinery to overflow. The U.S. Environmental Protection Agency conducted monitoring for the presence of volatile organic compounds in flood waters in Coffeyville and downstream, but indicated the presence of these compounds was not at a "level of concern." Contamination and health issues led local officials to prevent many people from returning to their flood damaged homes before it was determined safe.



Further descriptions and other notable flooding events are detailed below

**June 10, 2007; Cherokee County, Kniveton:** The Spring River along with smaller non-stem river and creek systems experienced major flooding across the entire county. Approximately 50 homes were flooded along the Spring River. Many of the homes that were flooded are located from Baxter Springs to Riverton. Across the western section of Cherokee County, the Neosho River along with its smaller tributaries experienced major flooding. Numerous roads and bridges in these areas were washed out or destroyed. Estimated property damage at $1,000,000.

**June 10, 2007; Cherokee County, Columbus:** Another stationary band of heavy rain occurred on the night of June 11th and the morning of June 12th. In response, significant flooding occurred in all areas of the county. The Spring and Neosho rivers remained flooded, causing damage to homes and several road systems. Estimated property damage at $1,150,000.

**July 1, 2007: Allen County, Iola:** Extremely heavy rainfall from the end of June into early July caused flash flooding throughout Allen County. The flash flooding and the ensuing river flooding caused an estimated 3 million dollars in damages to private property and 3 million dollars in damage to public infrastructure. Additionally, the flood water damaged and estimated 8,000 acres of crops. Moderate flooding occurred on the

Neosho River with a crest of 26.9 feet recorded at Iola. This was 11.9 feet above flood stage. The river remained above flood stage until the afternoon of July 3rd. Estimated property damage at $6,000,000.

**July 1, 2007: Elk County, Howard:** Extremely heavy rainfall from the end of June into early July caused flash flooding throughout Elk County. The flooding damaged or destroyed around 400 houses. This led 12 to 42 million dollars in damage. 21.49 inches of rain fell during the month of June. Much of this fell during the last few days of the month. Estimated property damage at $27,000,000.

**July 1, 2007: Montgomery County, Coffeyville:** Extremely heavy rainfall from the end of June into early July caused flash flooding throughout Montgomery County. The hardest hit areas were Independence and Coffeyville. The flash flooding combined with the ensuing record river flooding along the Verdigris River led to at least 500 homes being destroyed with another 55 sustaining major damages. Businesses in the county reported 23 million in losses and the cost to public infrastructure resulted in another 4 million in damages. Additionally, 43,000 acres of cropland were flooded. The Verdigris River also overtopped a levee protecting the refinery in Coffeyville resulting in an oily mix that inundated areas downstream. The Verdigris River at Independence crested at 52.4 feet in the morning hours of July 1st. This was 22.4 feet above flood stage. At Coffeyville the river crested at 30.7 feet the evening of July 1st which is 12.7 above flood stage. Again, both of these crests were records. The river remained above flood stage for both cities until July 7th., causing one fatality. The Coffeyville Journal and the Arkansas City Traveler contributed to this report. Estimated property damage at $81,150,000.

**July 1, 2007: Neosho County, Chanute:** Extremely heavy rainfall from the end of June into early July caused flash flooding throughout Neosho County. The flash flooding and the ensuing river flooding resulted in roughly 100 homes being destroyed and another 50 sustaining major damage. This resulted in at least 10.5 million dollars in damages. An additional 1.5 million dollars in damage was reported public infrastructure. The Neosho River reached a record crest of 40.6 feet on the morning of July 2nd. This was 11.6 feet above flood stage. Major flooding was seen on the Neosho at Chanute when a crest of 36.82 feet was recorded on the morning of July 1st. The Neosho inundated the city of Chanute with some areas under as much as 7 to 8 feet of water. The river remained above flood stage at Chanute until July 4th and at Erie until July 5th. Estimated property damage at $12,000,000.

**July 1, 2007: Wilson County, Fredonia:** Extremely heavy rainfall from the end of June into early July caused flash flooding throughout Wilson County. The flash flooding and the ensuing river flooding led to approximately 500 homes sustaining major damage which resulted in an estimated 15 million dollars in damage. Additionally, 6.6 million dollars of damage was done to public infrastructure. The Fall River at Fredonia had a record crest of 41.12 feet on the morning of June 30th. This is 24.12 feet above flood stage. The river fell below flood stage early in the morning of July 2nd. Estimated property damage at $21,600,000.

The following table presents NCDC identified flood events and the resulting damage totals in the region from the period 2001 - 2012.

**NCDC Flood Events, 2001 - 2012**

| County | Number of Flash Flood Events | Number of Flood Events | Property Damages |
|---|---|---|---|
| Allen | 13 | 5 | $6,090,200 |
| Bourbon | 40 | 4 | $125,000 |
| Chautauqua | 12 | 4 | $173,100 |
| Cherokee | 74 | 17 | $2,175,000 |
| Crawford | 40 | 4 | $135,000 |
| Elk | 15 | 7 | $27,000,800 |
| Greenwood | 14 | 7 | $87,200 |
| Labette | 21 | 12 | $1,400,100 |
| Montgomery | 19 | 17 | $81,680,500 |
| Neosho | 15 | 5 | $12,282,200 |
| Wilson | 21 | 5 | $21,923,300 |
| Woodson | 16 | 2 | $71,600 |
| **Regional Total** | **300** | **89** | **$153,144,000** |

Source: NCDC Storm Events Database

**Local Events**

**2012: USD 505, Labette County:** A flash flood from a microburst resulted in the temporary relocation of 15-20 residents due to flooding as well as closing local roads.

**March 2012: City of Chetopa, Labette County:** Excessive rain causing flooding. Several homes were damaged by flood waters. Several roads were closed with water running over them and there were reports of livestock deaths.

**Spring, 2012: Labette County:** Flooding impacted the entire county causing damage to 15-20 homes and infrastructure including dams, roads and bridges. Insurance losses were estimated at $500,000.

**April 25 - May 16, 2009: City of Oswego, Labette County:** Flooding of the Neosho River caused damage to the Oswego City Dam. Federal aid for received was $364,691.

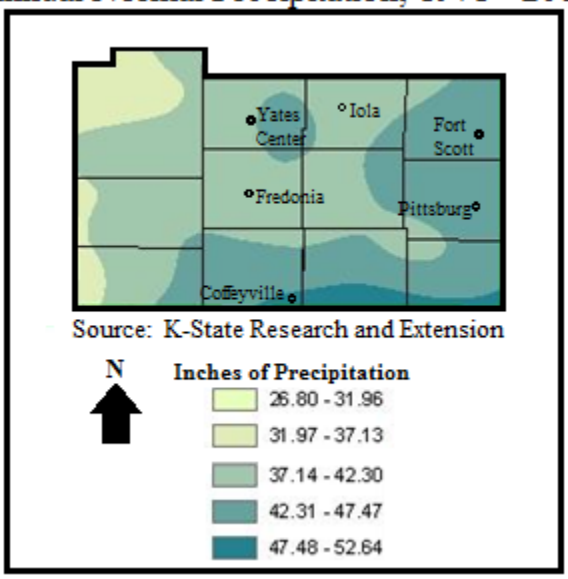
**June 30, 2007: City of Oswego, Labette County:** Excessive rain fall, flooded roads resulted in limited travel.

**2007: City of Peru, Labette County:** The City of Peru had low levels of flooding in low lying areas for 1 week. Structures, vehicles and agriculture were noted as impacted.

**Hazard Vulnerability and Impact**

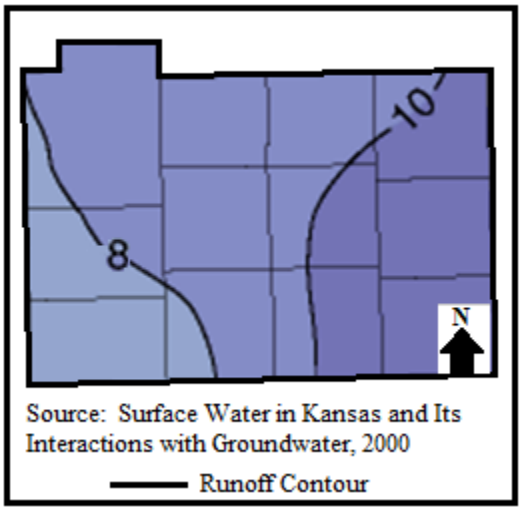
Flash flooding occurs in those locations of the in the planning area that are low-lying and/or do not have adequate drainage to carry away the amount of water that falls during intense rainfall events. The average annual precipitation varies significantly across the region. Precipitation in the eastern part of the state exceeds an average of 40 inches. The following map shows how the annual normal precipitation varies across the region.

Annual Normal Precipitation, 1971 - 2000




The following map shows the distribution of water runoff in southeast Kansas. This data indicates the approximate amount of water that does not infiltrate the ground and is potentially carried to streams and rivers. Although the climatically controlled rainfall variation is significant, average annual runoff across the state varies much more than the precipitation. The average runoff ranges from approximately 8 to 10 inches in the region. Both precipitation and runoff can impact flash flooding.

Distribution of Water Runoff in Southeast Kansas



The region acquired data from the USDA's Risk Management Agency to provide crop loss data based on crop insurance payments. Data was requested for the 10-year period from 2002 to 2011 for the State of Kansas. During this period, $321,995,951 in crop insurance payments was made to Kansas farmers as a result of flood, excess moisture/precipitation/rain, and hurricane/tropical depression. This translates to $32,199,595 annually. The most damaging year during this time-frame was 2007 which coincides with Presidential Declaration 1711 for major flooding in southeast Kansas. The following table provides the crop insurance payments by year for this ten-year period. Please note that this data only applies to insured crops and for the entire State. According to the *2011 Kansas Crop Insurance Profile Report* issued by the USDA Risk Management Agency 82 percent of Kansas' row crops were insured in 2011.

**USDA Risk Management Agency Crop Insurance Payments Due to Flood Excess Moisture/Precipitation/Rain, and Hurricane/Tropical Depression**

| Year | Statewide Crop Insurance Paid |
|---|---|
| 2011 Total | $16,554,331 |
| 2010 Total | $51,325,423 |
| 2009 Total | $69,363,919 |
| 2008 Total | $58,422,531 |
| 2007 Total | $86,141,405 |
| 2006 Total | $1,510,143 |
| 2005 Total | $15,082,104 |
| 2004 Total | $16,276,418 |
| 2003 Total | $4,944,342 |
| 2002 Total | $2,375,336 |
| **Statewide Total** | **$321,995,951** |

Source: USDA Risk Management Agency, 2012;

To determine vulnerability to flooding and the jurisdictions most threatened by flooding and most vulnerable to damage and losses, the region analyzed data from several sources including:

- NCDC Storm Events Database
- USDA Risk Management Agency Crop Loss Statistics
- HAZUS-MH 2.1 100-year Flood Scenario
- NFIP Flood Insurance Claims
- Repetitive Loss Properties/Severe Repetitive Loss Properties

The NCDC Storm Events Database was the primary source of data to complete the vulnerability analysis of flash flood in the State; while the HAZUS-MH 2.1 analysis was utilized to describe vulnerability to riverine flooding.

Flash flooding is not considered to be a "geographic" hazard. Due to the large number of variables that occur in rainfall amounts and intensity, it is not possible to predict all specific locations that are vulnerable to flash flooding. However, it is known that certain low-lying areas with poor drainage are more vulnerable than areas higher in elevation with good drainage.

Additionally, historical statistics of areas that have been prone to flash flooding in the past can be utilized to determine potential vulnerability to future flash flooding.

The following table provides total crop insurance payments and annualized crop insurance payments for flood damage for each county over the 10-year period from 2002 to 2011. The USDA does not differentiate damages from riverine flooding and flash flooding. As such, these losses include combined losses for both types of flooding. The crop exposure value from the 2007 Census of Agriculture is provided to provide the basis for an annualized ratio of insurance payments to total value. Please note that this data only applies to insured crops. According to the *2011 Kansas Crop Insurance Profile Report* issued by the USDA Risk Management Agency 82 percent of Kansas' row crops were insured in 2011. The crop exposure values have not been adjusted in the table below.

**Flood-Related Crop Insurance Payments Analysis, 2002-2011**

| County | Crop Exposure Value (2007 Census of Agriculture) | Flood-Related Crop Insurance Payments 2002-2011 | Annualized Crop Insurance Payments | Annualized Flood-Related Crop Insurance Payment Ratio |
|---|---|---|---|---|
| Allen | $15,462,000 | $7,982,055 | $798,206 | 5.16% |
| Bourbon | $9,918,000 | $2,806,791 | $280,679 | 2.83% |
| Chautauqua | $4,971,000 | $863,520 | $86,352 | 1.74% |
| Cherokee | $53,420,000 | $13,778,492 | $1,377,849 | 2.58% |
| Crawford | $34,463,000 | $7,962,886 | $796,289 | 2.31% |
| Elk | Not Reported | $1,069,536 | $106,954 | Not Reported |
| Greenwood | $8,087,000 | $2,631,378 | $263,138 | 3.25% |
| Labette | $22,765,000 | $13,326,554 | $1,332,655 | 5.85% |
| Montgomery | $16,616,000 | $10,566,250 | $1,056,625 | 6.36% |
| Neosho | $17,811,000 | $10,762,454 | $1,076,245 | 6.04% |
| Wilson | $26,882,000 | $12,179,233 | $1,217,923 | 4.53% |
| Woodson | $14,486,000 | $3,391,458 | $339,146 | 2.34% |
| **Regional Total** | **$224,881,000** | **$87,320,607** | **$8,732,061** | - |

Source: USDA Risk Management Agency; 2007 USDA Census of Agriculture;

### *HAZUS-MH 2.1 One-Percent Annual Chance Food Scenario*

According to the HAZUS-MH 2.1 one percent annual chance flood scenario results, there are 539 buildings and 5,828 people in the one percent annual chance floodplain. The following table provides the HAZUS-MH 2.1 results for the number of vulnerable buildings and population vulnerable to displacement for each county in southeast Kansas.

**Vulnerable Buildings and Population, HAZUS One Percent Annual Chance Flood Scenario**

| County | Vulnerable Buildings | Population Vulnerable to Displacement |
|---|---|---|
| Allen | 45 | 546 |
| Bourbon | 3 | 362 |
| Chautauqua | 9 | 192 |
| Cherokee | 67 | 901 |
| Crawford | 70 | 750 |
| Elk | 1 | 101 |
| Greenwood | 28 | 291 |
| Labette | 200 | 1,096 |
| Montgomery | 86 | 895 |
| Neosho | 21 | 285 |
| Wilson | 8 | 292 |
| Woodson | 1 | 117 |
| **Regional Total** | **539** | **5,828** |

Source: HAZUS MH 2.1

***NFIP Flood Insurance Claims Analysis***

The region analyzed NFIP flood-loss data to determine areas of southeast Kansas with the greatest flood risk. Southeastern Kansas NFIP participation and flood loss statistics were obtained from FEMA's Policy and Claim Statistics for Flood Insurance (which provides losses from 1978 to the present). As of October 2012, 63 communities were NFIP participants, including nine that do not have special flood hazard areas and 29 that are only minimally flood-prone. The following table presents southeast Kansas NFIP communities.

**Southeast Kansas NFIP Communities**

| Community | Initial Flood Hazard Boundary Map Identified | Initial Flood Insurance Rate Map Identified | Current Effective Map Date |
|---|---|---|---|
| **Allen County** | | | |
| Allen County | 5/24/1977 | 9/28/1990 | 7/18/2011 |
| City of Bassett | - | 9/28/1990 | 7/18/2011 |
| City of Gas | 12/20/1974 | 9/28/1990 | (NSFHA) |
| City of Humboldt | 12/7/1973 | 9/1/1978 | 9/25/2009 |
| City of Iola | 12/14/1973 | 9/15/1978 | 7/18/2011 |
| City of LaHarpe | 8/22/1975 | 9/28/1990 | 9/25/2009 |
| City of Moran | 3/26/1976 | 9/28/1990 | (NSFHA) |
| **Bourbon County** | | | |
| Bourbon County | 10/25/1977 | 6/1/1988 | 1/2/2009 |
| City of Bronson | 7/18/1975 | 1/2/2009 | 01/02/09(M) |
| City of Fort Scott | 12/28/1973 | 9/1/1978 | 1/2/2009 |
| City of Fulton | 1/10/1975 | 1/2/2009 | 01/02/09(M) |
| City of Mapleton | - | 1/2/2009 | 1/2/2009 |

**Southeast Kansas NFIP Communities, Continued**

| Community | Initial Flood Hazard Boundary Map Identified | Initial Flood Insurance Rate Map Identified | Current Effective Map Date |
|---|---|---|---|
| City of Redfield | 12/27/1974 | 8/1/1986 | 01/02/09(M) |
| City of Uniontown | 9/26/1975 | 1/2/2009 | (NSFHA) |
| **Chautauqua County** | | | |
| City of Peru | 9/26/1975 | - | 9/26/1975 |
| City of Sedan | 8/22/1975 | 6/1/1988 | 06/01/88(L) |
| **Cherokee County** | | | |
| Cherokee County | 5/10/1977 | 8/5/1991 | 11/19/2008 |
| City of Baxter Springs | 5/24/1974 | 3/18/1986 | 11/19/08(M) |
| City of Columbus | 3/1/1974 | 5/15/1986 | 11/19/08(M) |
| City of Galena | 5/24/1974 | 5/15/1986 | 11/19/08(M) |
| City of Roseland | - | 11/19/2008 | 11/19/2008 |
| City of Scammon | 9/19/1975 | 11/19/2008 | 11/19/08(M) |
| City of Weir | 9/19/1975 | 11/19/2008 | 11/19/2008 |
| City of West Mineral | - | 11/19/2008 | 11/19/2008 |
| **Crawford County** | | | |
| Crawford County | 5/17/1977 | 5/1/1990 | 4/16/2009 |
| City of Arcadia | 8/15/1975 | 4/1/1989 | 04/16/09(M) |
| City of Arma | 3/26/1976 | 4/16/2009 | 04/16/09(M) |
| City of Cherokee | 3/26/1976 | 4/16/2009 | 04/16/09(M) |
| City of Frontenac | 7/30/1976 | 4/16/2009 | 04/16/09(M) |
| City of Girard | 8/8/1975 | 4/16/2009 | 04/16/09(M) |
| City of Hepler | - | 4/16/2009 | 4/16/2009 |
| City of McCune | - | 4/16/2009 | NSFHA |
| City of Pittsburg | 2/15/1974 | 5/1/1979 | 4/16/2009 |
| City of Walnut | 8/22/1975 | 8/19/1986 | 4/16/2009 |
| **Elk County** | | | |
| Elk County | - | - | 1/1/1950 |
| City of Grenola | 9/26/1975 | - | 9/26/1975 |
| City of Howard | 8/8/1975 | 4/8/1977 | 04/08/77(M) |
| City of Longton | 9/19/1975 | 5/1/1990 | 05/01/90(L) |
| City of Moline | 2/22/1974 | 2/1/2008 | 02/01/08(L) |
| **Greenwood County** | | | |
| Greenwood County | - | - | 1/1/1950 |
| City of Eureka | 4/12/1974 | 9/1/1991 | 09/01/91(L) |
| City of Madison | 7/19/1974 | 3/5/1990 | 3/5/1990 |
| City of Virgil | 1/10/1975 | 9/1/1986 | 09/01/86(L) |
| **Labette County** | | | |
| Labette County | 10/25/1977 | 9/1/1990 | 1/2/2009 |
| City of Altamont | 3/26/1976 | 1/2/2009 | 01/02/09(M) |
| City of Chetopa | 9/19/1975 | 9/4/1985 | 01/02/09(M) |
| City of Edna | - | 1/2/2009 | NSFHA |

**Southeast Kansas NFIP Communities, Continued**

| Community | Initial Flood Hazard Boundary Map Identified | Initial Flood Insurance Rate Map Identified | Current Effective Map Date |
|---|---|---|---|
| City of Mound Valley | 8/22/1975 | 1/2/2009 | 01/02/09(M) |
| City of Oswego | 9/19/1975 | 1/2/2009 | 01/02/09(M) |
| City of Parsons | 2/1/1974 | 7/16/1979 | 1/2/2009 |
| City of Labette | - | 1/2/2009 | 1/2/2009 |
| **Montgomery County** | | | |
| Montgomery County | 10/18/1977 | 6/1/1988 | 06/01/88(L) |
| City of Caney | 2/15/1974 | 7/3/1986 | 07/03/86(M) |
| City of Cherryvale | 2/15/1974 | - | NSFHA |
| City of Coffeyville | 5/3/1974 | 3/12/1976 | 3/12/1976 |
| City of Dearing | 7/25/1975 | 6/1/1988 | 6/1/1988 |
| City of Elk City | 10/29/1976 | 4/1/1989 | 04/01/89(L) |
| City of Independence | 12/14/1973 | 6/15/1979 | 12/19/1995 |
| **Neosho County** | | | |
| Neosho County | 11/1/1977 | 2/1/2005 | 1/20/2010 |
| City of Chanute | 12/7/1973 | 1/3/1979 | 1/20/2010 |
| City of Earlton | - | 1/20/2010 | 1/20/2010 |
| City of Erie | 1/23/1974 | 7/17/1978 | 1/20/2010 |
| City of Galesburg | - | 1/20/2010 | NSFHA |
| City of St. Paul | 1/19/1975 | 9/5/1990 | 01/20/10(M) |
| City of Thayer | 7/2/1976 | 1/20/2010 | 1/20/2010 |
| **Wilson County** | | | |
| Wilson County | 6/7/1977 | 4/1/1989 | 04/01/89(L) |
| City of Altoona | 7/30/1976 | 4/1/1989 | 04/01/89(L) |
| City of Buffalo | 9/5/1975 | - | 1/1/1950 |
| City of Fredonia | 1/9/1974 | 6/17/1986 | 6/17/1986 |
| City of Neodesha | 1/9/1974 | 8/15/1978 | 8/15/1978 |
| **Woodson County** | | | |
| Woodson County | - | - | 1/1/1950 |
| City of Neosho Falls | 1/31/1975 | 4/1/1989 | 04/01/89(L) |
| City of Toronto | 9/19/1975 | - | NSFHA |
| City of Yates Center | 8/15/1975 | - | NSFHA |

Notes: NSFHA: No Special Flood Hazard Area - All Zone C
(L): Original FIRM by letter - All Zone A, C and X
(M): No elevation determined - All Zone A, C and X

There are likely communities in southeast Kansas that have flood hazard areas, but have not yet been mapped by FEMA to show where those hazard areas are.

Kansas flood-loss information was pulled from FEMA's "Policy and Loss Data by Community with County and State Data," which documents losses from 1978 through August 31, 2012. There are several limitations to this data, including:

- Only losses to participating NFIP communities are represented
- Communities joined the NFIP at various times since 1978
- The number of flood insurance policies in effect may not include all structures at risk to flooding
- Some of the historical loss areas have been mitigated with property buyouts

Some properties are under-insured. The flood insurance purchase requirement is for flood insurance in the amount of federally-backed mortgages, not the entire value of the structure. Additionally, contents coverage is not required.

Despite these limitations, the data depicts a pattern of historical flood losses in the region. The following table shows the details of NFIP policy and loss statistics for each county in southeast Kansas. Loss statistics include losses from 1978 through August 31, 2012.

**Kansas NFIP Policy and Loss Statistics, As of August 31, 2012**

| County | Number of Policies in Force | Insurance in Force | Number of Closed Losses | Total Payments |
|---|---|---|---|---|
| Allen | 131 | $15,930,500 | 74 | $2,716,750 |
| Bourbon | 39 | $6,833,400 | 51 | $2,421,935 |
| Chautauqua | 3 | $231,000 | 0 | $0 |
| Cherokee | 120 | $15,882,900 | 58 | $699,011 |
| Crawford | 165 | $23,633,800 | 94 | $1,508,156 |
| Elk | 8 | $282,500 | 1 | $25,000 |
| Greenwood | 12 | $880,400 | 3 | $5,931 |
| Labette | 165 | $18,639,300 | 70 | $1,013,769 |
| Montgomery | 248 | $38,089,300 | 228 | $5,175,681 |
| Neosho | 136 | $14,506,900 | 54 | $1,169,996 |
| Wilson | 86 | $11,392,000 | 50 | $780,146 |
| Woodson | 1 | $63,500 | 0 | $0 |
| Regional Total | 1,114 | $146,365,500 | 683 | $15,516,375 |

Source: FEMA, Policy and Loss Data by Community with County and State Data

***Repetitive Loss Analysis***

A high priority in southeast Kansas and nationwide is the reduction of losses to repetitive loss structures. These structures strain the National Flood Insurance Fund. The NFIP defines a repetitive loss property as "any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling 10-year period, since 1978. At least two of the claims must be more than 10 days apart."

The following table illustrates the number and location of southeast Kansas' repetitive loss properties. The table ranks counties by claim amounts paid.

**Southeast Kansas Repetitive Loss Properties**

| County | Number of Repetitive Loss Properties | Number Mitigated | Number Insured | Number of Losses | Total Paid |
|---|---|---|---|---|---|
| Montgomery | 28 | 4 | 9 | 82 | $1,799,438 |
| Crawford | 12 | 2 | 2 | 34 | $630,320 |
| Bourbon | 9 | 2 | 0 | 25 | $815,594 |
| Labette | 7 | 3 | 1 | 18 | $151,083 |
| Cherokee | 5 | 2 | 0 | 17 | $189,902 |
| Wilson | 2 | 1 | 1 | 6 | $74,753 |
| Allen | 1 | 1 | 0 | 2 | $4,116 |
| Neosho | 1 | 0 | 1 | 2 | $11,725 |
| Regional Total | 65 | 15 | 14 | 186 | $3,676,931 |

Source: Flood Insurance Administration, as of October 2, 2012

Southeast Kansas has made mitigation of repetitive loss properties a priority use of mitigation funds. Of the 65 properties that meet the definition of repetitive loss, 15 have been mitigated.

***Severe Repetitive Loss Analysis***

The Flood Insurance Reform Act of 2004 identified another category of repetitive loss, categorized as Severe Repetitive Loss (SRL). The definition of severe repetitive loss as applied to this program was established in section 1361A of the National Flood Insurance Act, as amended, 42 U.S.C. 4102a. An SRL property is defined as a residential property that is covered under an NFIP flood insurance policy and:

- That has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or
- For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

For both of the above, at least two of the referenced claims must have occurred within any ten-year period, and must be greater than ten days apart.

As of October 1, 2012, there are three validated insured residential properties in southeast Kansas that meet the qualifications of SRL and the requirements to be considered for possible mitigation activities under FEMA's SRL criteria. The following table provides additional information on these three properties.

**Verified Residential Insured Severe Repetitive Loss Properties**

| County | Community Name | Total Paid | Losses | SRL Status |
|---|---|---|---|---|
| Montgomery | City of Coffeyville | $96,890 | 4 | Validated |
| Montgomery | City of Coffeyville | $58,585 | 5 | Validated |
| Montgomery | City of Coffeyville | $82,606 | 3 | Validated |

Source: Flood Insurance Administration

***History of Severe Repetitive Loss***

In addition to the verified residential, insured properties above, the NFIP tracks other categories of properties, including unverified properties, commercial properties, previously mitigated properties, and currently uninsured properties that meet the loss criteria.

As of October 2012, including the three verified, residential, insured properties on the official SRL list, there are eight validated properties that have incurred flood-related damage for which four or more separate claims payments have been paid under flood insurance coverage with the amount of each claim payment exceeding $5,000 and with cumulative amounts of such claims payments exceeding $20,000; or for which at least two separate claims payments have been made with the cumulative amount of such claims exceeding the reported value of the property. An additional two properties are pending validation. With 41 combined losses, total payments to these ten properties equaled $1,026,404.

**Regional Severe Repetitive Loss Properties**

| County | Community Name | Total Paid | Losses | SRL Status |
|---|---|---|---|---|
| Bourbon | City of Fort Scott | $114,731 | 4 | VNU |
| Bourbon | City of Fort Scott | $139,903 | 2 | PN |
| Bourbon | City of Fort Scott | $54,242 | 4 | VNU |
| Cherokee | Cherokee County | $69,117 | 5 | VU |
| Crawford | City of Pittsburg | $76,738 | 5 | VNU |
| Crawford | City of Pittsburg | $194,025 | 3 | PU |
| Montgomery | City of Coffeyville | $96,890 | 4 | V* |
| Montgomery | City of Coffeyville | $58,585 | 5 | V* |
| Montgomery | City of Coffeyville | $82,606 | 3 | V* |
| Montgomery | City of Coffeyville | $139,566 | 6 | VU |
| **Regional Total** | **-** | **$1,026,404** | **41** | **-** |

Source: Flood Insurance Administration, current as of October 2, 2012

Notes: **V**- Validated, **VU**-Validated Uninsured, **VNU**-Validated Nonresidential Uninsured, **PU**-Pending Uninsured, **PN**-Pending Non Residential

Of the 10 properties with an SRL status, none have been mitigated.

***Riverine Flooding***

The results of the HAZUS-MH 2.1 analysis were utilized to estimate potential losses for riverine flooding. The intent of this analysis was to enable the region to estimate where flood losses could occur and the degree of severity using a consistent methodology. The HAZUS-MH 2.1 model helps quantify risk along known flood-hazard corridors as well as lesser streams and rivers that have a drainage area of ten square miles or more.

The HAZUS-MH 2.1 analysis provides the number of buildings impacted, estimates of the building repair costs, as well as the associated loss of building contents and business inventory. Building damage can also cause additional losses to a community as a whole by restricting a building's ability to function properly. Income loss data accounts for losses such as business interruption and rental income losses as well as the resources associated with damage repair and job and housing losses. These losses are calculated by HAZUS-MH 2.1 using a methodology based on the building damage estimates.

Among other factors, flood damage is related to the depth of flooding. HAZUS-MH 2.1 takes into account flood depth when modeling damage (based on FEMA's depth-damage functions). The HAZUS-MH 2.1 reports capture damage by occupancy class (in terms of square footage impacted) by damage percent classes. Occupancy classes in HAZUS-MH 2.1 include agriculture, commercial, education, government, industrial, religion, and residential. Damage percent classes are grouped by 10 percent increments 1-10 percent, 11-20 percent, etc., up to 50 percent. Buildings that sustain more than 50 percent damage are considered to be "substantially" damaged.

The displaced population is based on the inundation area. Individuals and households will be displaced from their homes even when the home has suffered little or no damage either because they were evacuated or there was no physical access to the property because of flooded roadways. Displaced people using shelters will most likely be individuals with lower incomes and those who do not have family or friends within the immediate area. HAZUS MH-2.1 does not model flood casualties.

The following table provides the HAZUS-MH 2.1 results for vulnerable populations and the population estimated to seek short term shelter as well as the numbers of damaged and substantially damaged buildings for each southeastern Kansas county.

**HAZUS-MH 2.1 Flood Scenario Displaced Population and Number of Damaged Buildings**

| County | Population Vulnerable to Displacement (Number of People) | Short Term Shelter Needs (Number of People) | Vulnerable Buildings | Damaged Buildings | Substantially Damaged Buildings |
|---|---|---|---|---|---|
| Allen | 546 | 97 | 45 | 20 | 6 |
| Bourbon | 362 | 59 | 3 | 2 | 2 |
| Chautauqua | 192 | 24 | 9 | 5 | 1 |
| Cherokee | 901 | 263 | 67 | 41 | 25 |
| Crawford | 750 | 271 | 70 | 27 | 11 |
| Elk | 101 | 0 | 1 | 0 | 0 |
| Greenwood | 291 | 16 | 28 | 7 | 0 |
| Labette | 1,096 | 464 | 200 | 45 | 4 |
| Montgomery | 895 | 160 | 86 | 10 | 5 |
| Neosho | 285 | 49 | 21 | 1 | 0 |
| Wilson | 292 | 22 | 8 | 2 | 1 |
| Woodson | 117 | 16 | 1 | 0 | 0 |
| Regional Total | 5,828 | 1,441 | 539 | 160 | 55 |

Source: HAZUS-MH 2.1

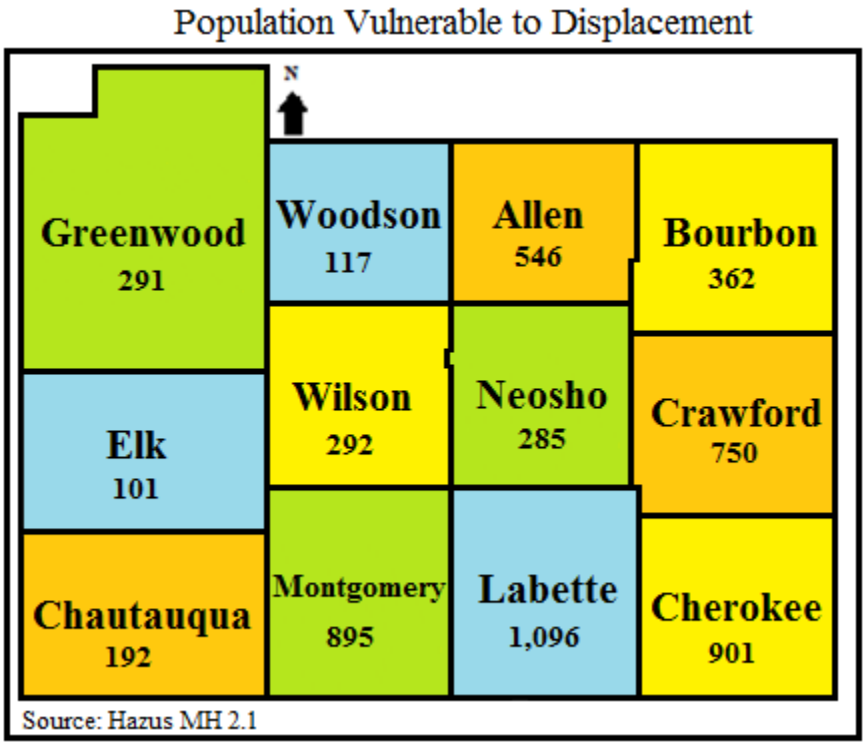
The following table provides total direct building loss and income loss for each southeastern Kansas county.

**HAZUS-MH 2.1 Flood Scenario Direct Building and Income Losses**

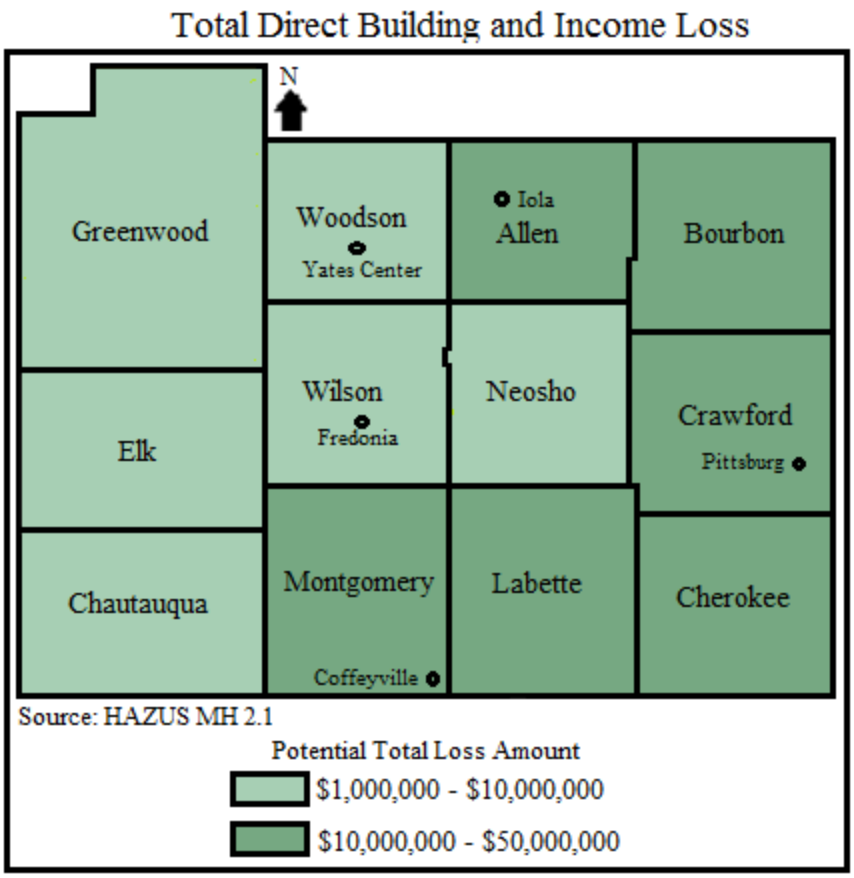
| County | Structural Damage | Contents Damage | Inventory Loss | Total Direct Loss | Total Income Loss | Total Direct and Income Loss | Structure and Contents Loss Ratio |
|---|---|---|---|---|---|---|---|
| Allen | $11,529,000 | $15,621,000 | $2,200,000 | $29,350,000 | $39,000 | $29,389,000 | 0.94% |
| Bourbon | $7,047,000 | $5,644,000 | $160,000 | $12,851,000 | $11,000 | $12,862,000 | 0.30% |
| Chautauqua | $2,927,000 | $2,249,000 | $116,000 | $5,292,000 | $1,000 | $5,293,000 | 0.47% |
| Cherokee | $16,772,000 | $14,426,000 | $866,000 | $32,064,000 | $49,000 | $32,113,000 | 0.67% |
| Crawford | $10,915,000 | $11,761,000 | $644,000 | $23,320,000 | $45,000 | $23,365,000 | 0.27% |
| Elk | $1,143,000 | $637,000 | $1,000 | $1,781,000 | $1,000 | $1,782,000 | 0.21% |
| Greenwood | $4,936,000 | $3,685,000 | $67,000 | $8,688,000 | $12,000 | $8,700,000 | 0.46% |
| Labette | $17,041,000 | $28,121,000 | $2,316,000 | $47,478,000 | $187,000 | $47,665,000 | 1.16% |
| Montgomery | $12,339,000 | $11,195,000 | $939,000 | $24,473,000 | $25,000 | $24,498,000 | 0.27% |
| Neosho | $4,171,000 | $3,630,000 | $184,000 | $7,985,000 | $8,000 | $7,993,000 | 0.18% |
| Wilson | $3,557,000 | $3,189,000 | $87,000 | $6,833,000 | $67,000 | $6,900,000 | 0.27% |
| Woodson | $1,181,000 | $858,000 | $52,000 | $2,091,000 | $0 | $2,091,000 | 0.25% |
| Regional Total | $93,558,000 | $101,016,000 | $7,632,000 | $202,206,000 | $445,000 | $202,651,000 | - |

Source: HAZUS MH-2.1

The following map depicts the potential population vulnerable to displacement




The following map illustrates the potential total direct building and income loss according to the HAZUS-MH 2.1 results for the region.

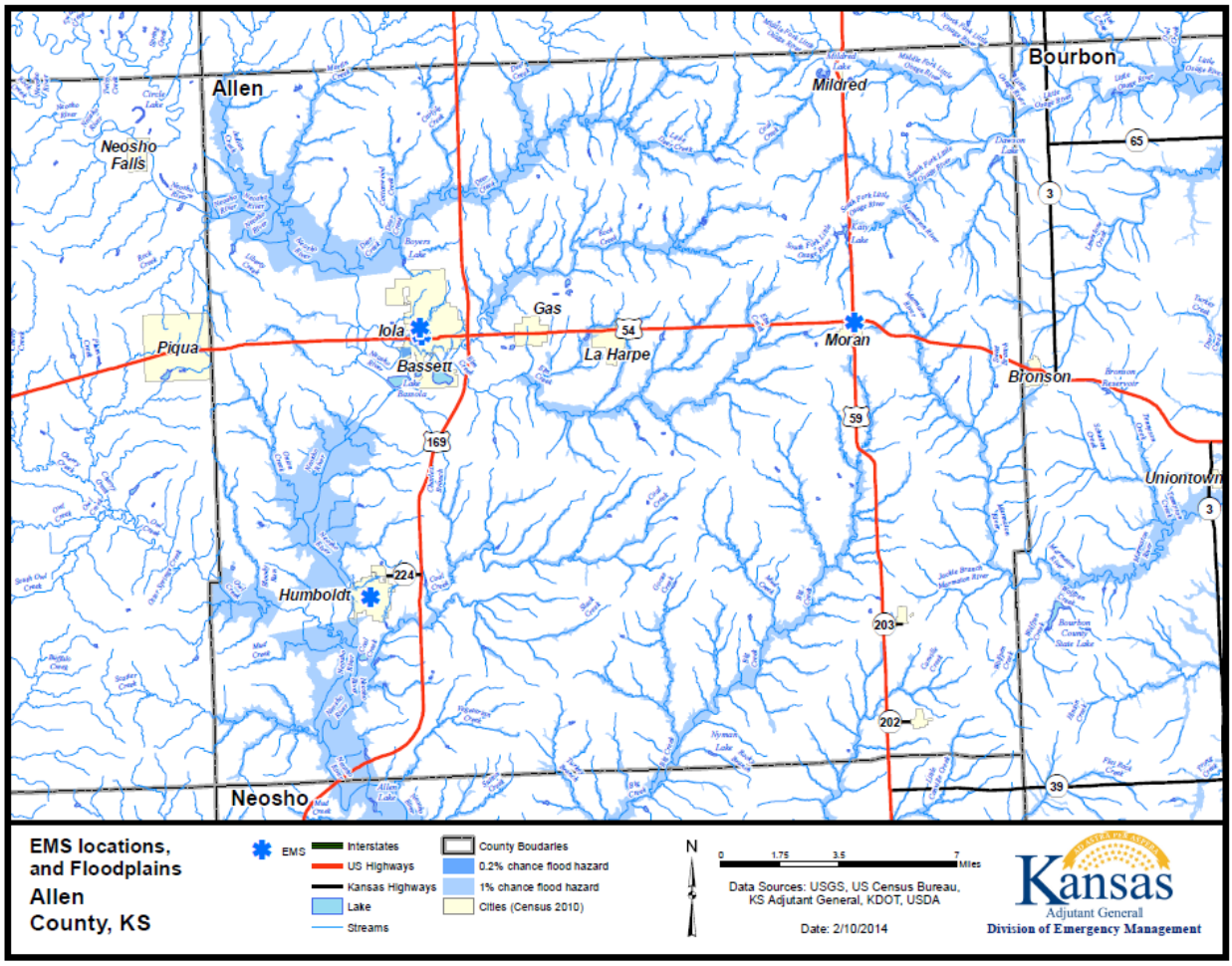



**Critical Facilities in Flood Plains**

The following county maps show critical facilities located in flood plains. Identified critical facilities include:

- Schools
- Police Stations
- Fire Stations
- Hospitals (if information made available)
- Elderly care facilities (if information made available)

Please note that not all participating counties and/or jurisdictions had this data available.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EMS locations, and Floodplains
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Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA
Date: 2/10/2014
Kansas
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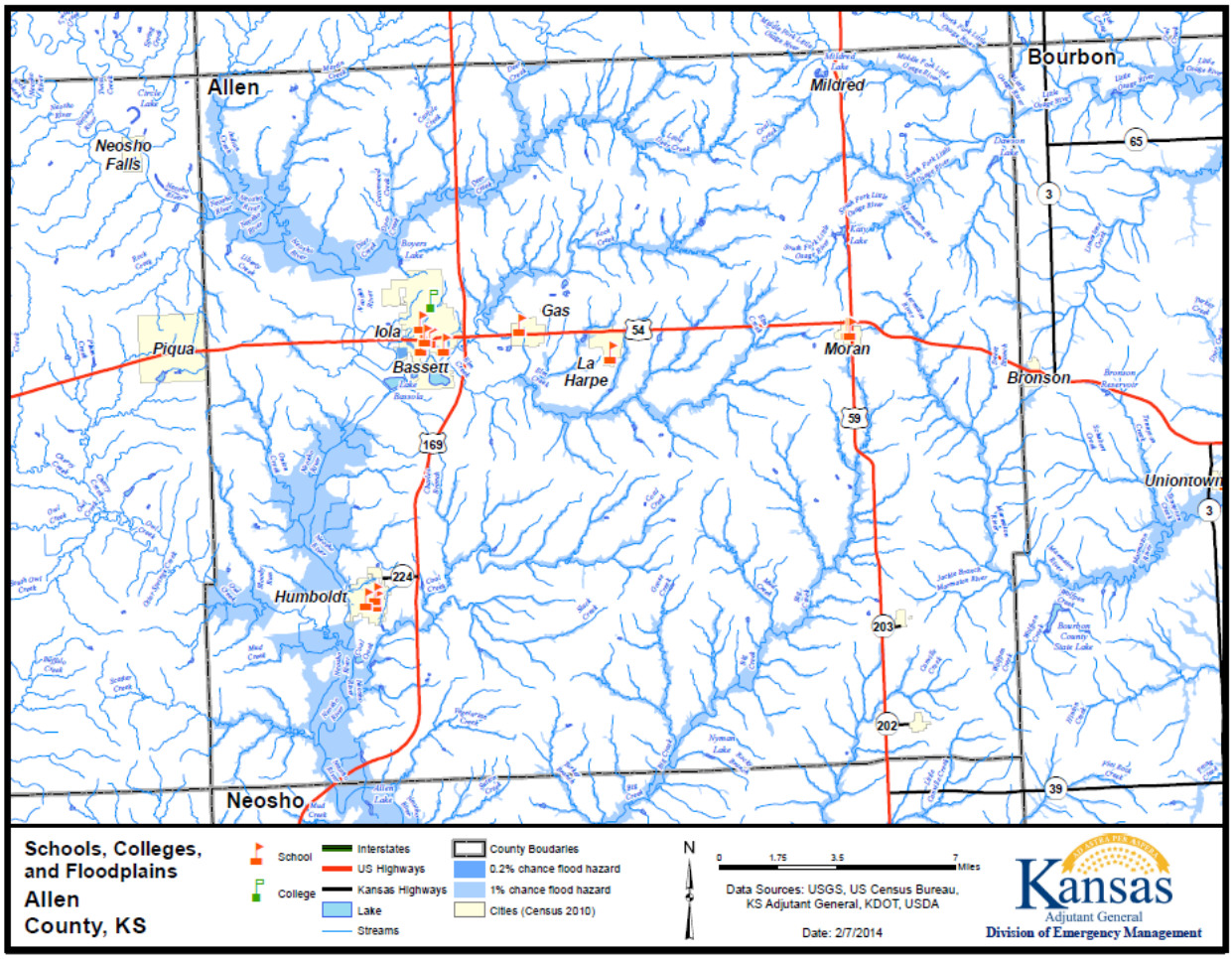
Division of Emergency Management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Schools, Colleges, and Floodplains
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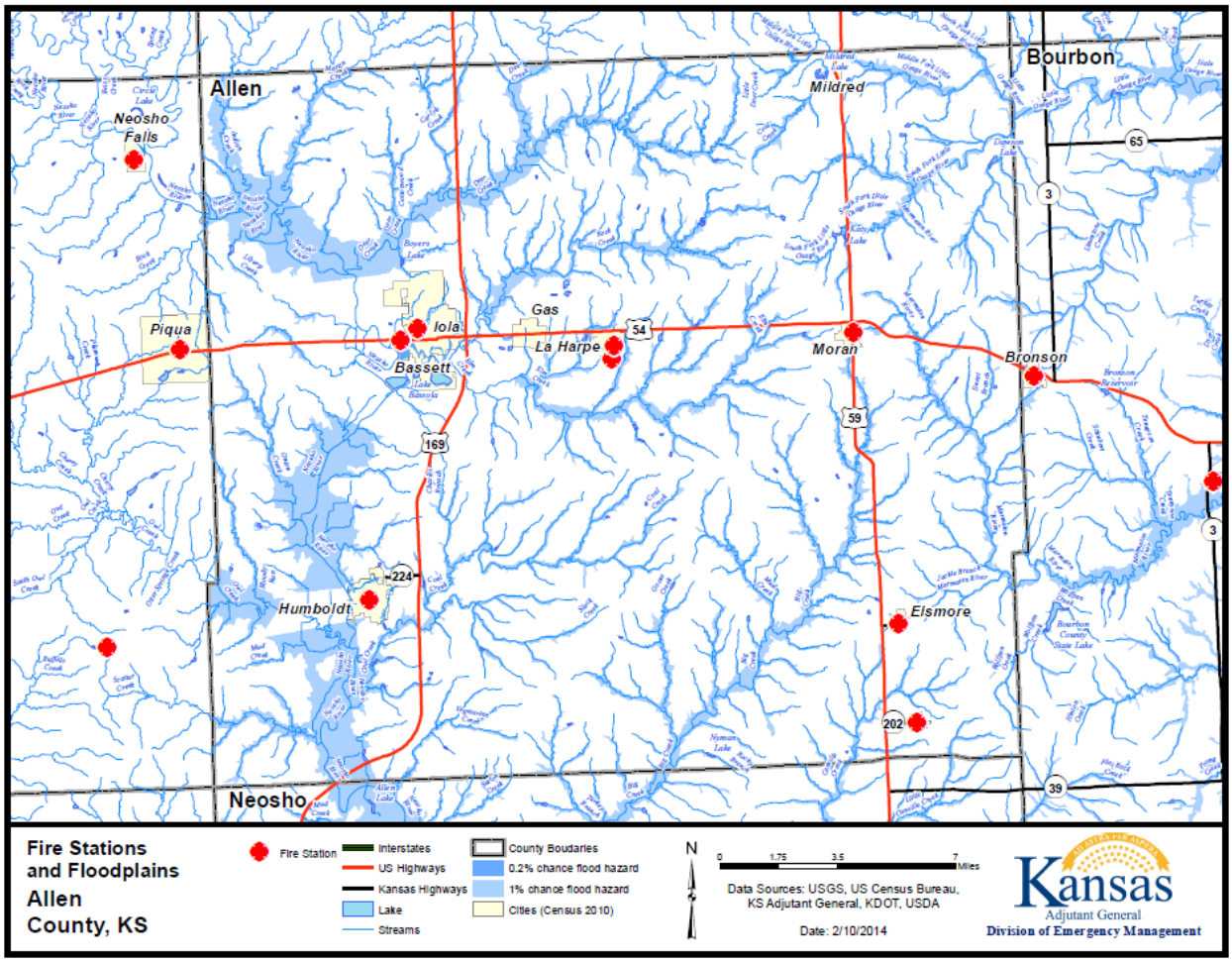
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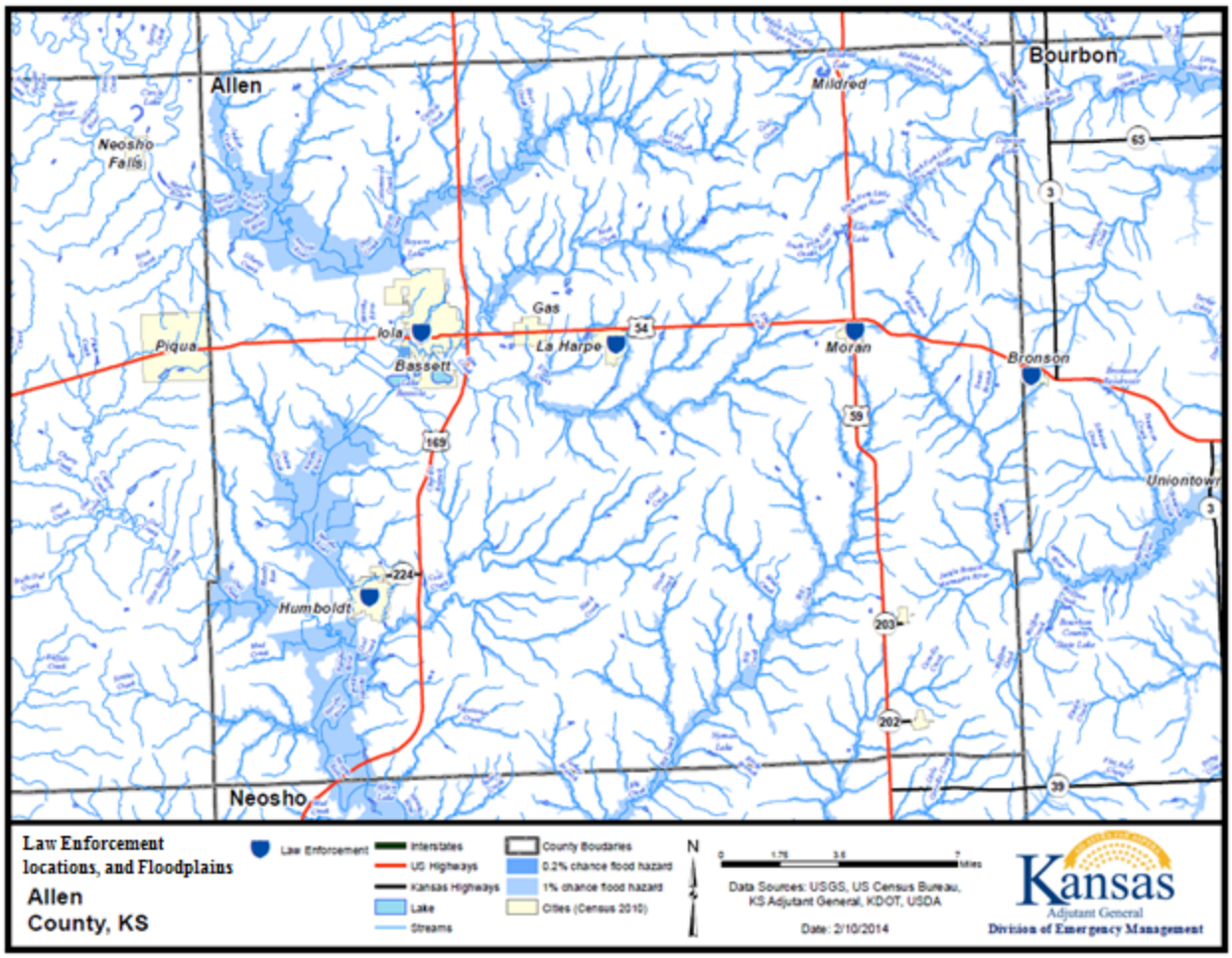
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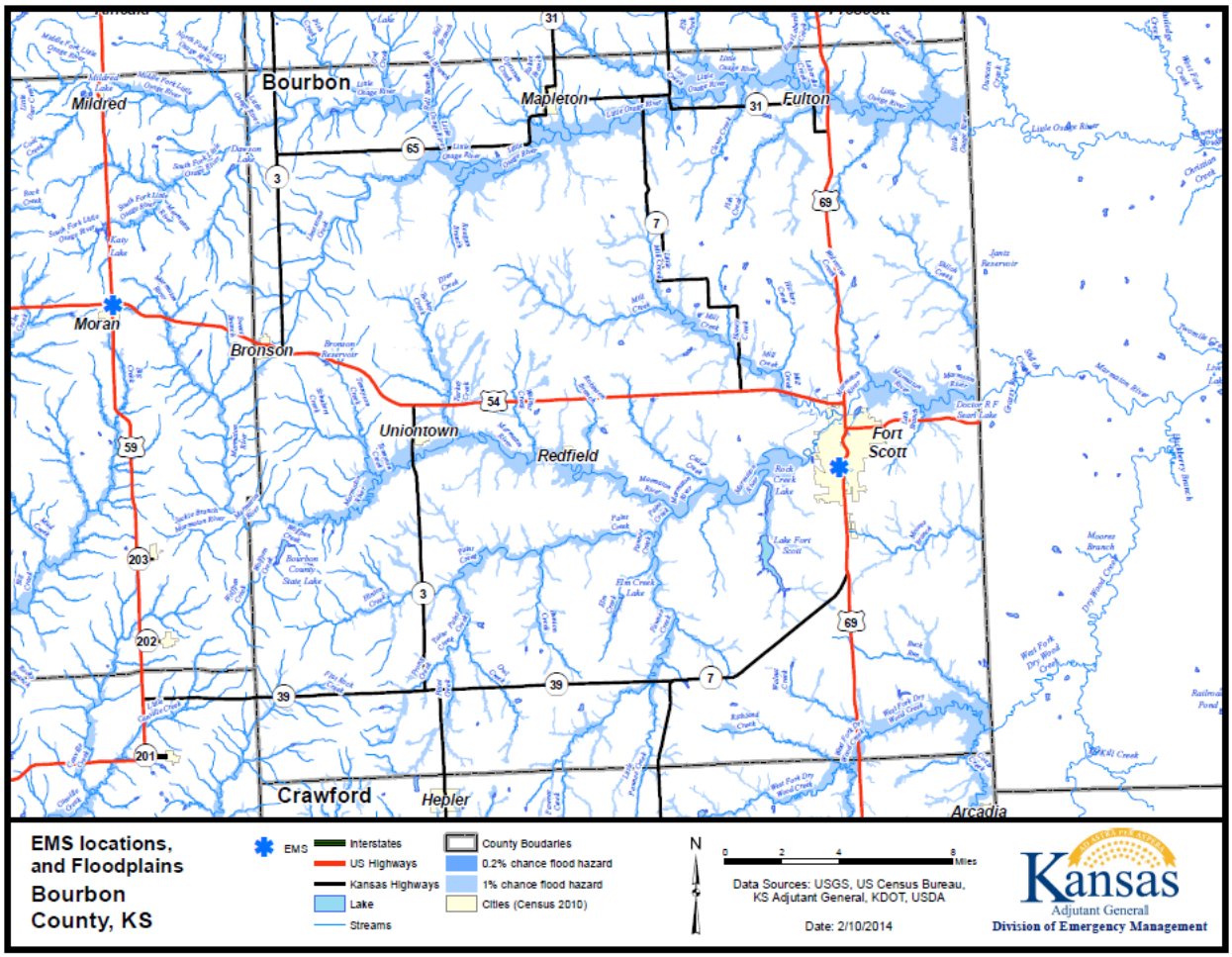
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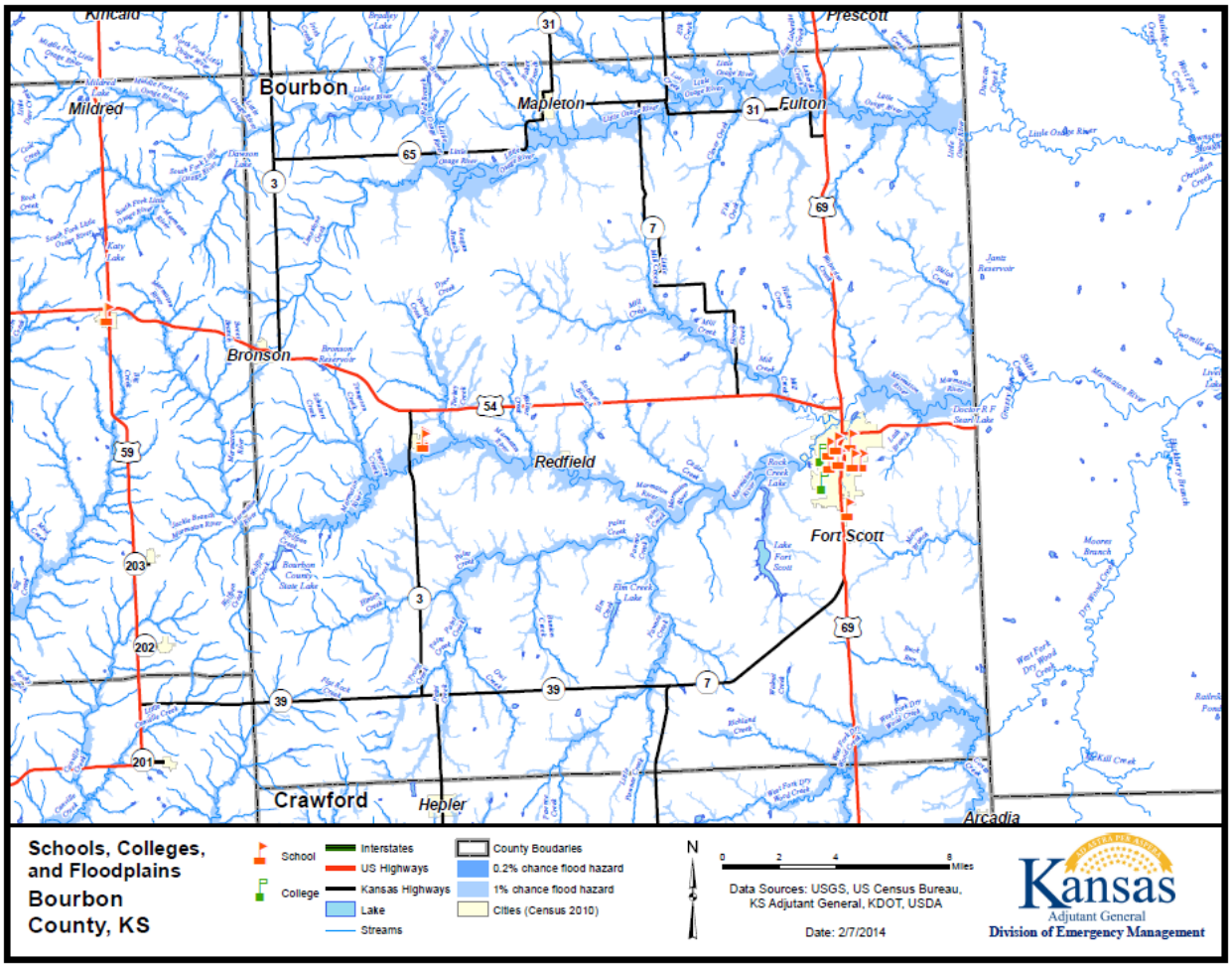
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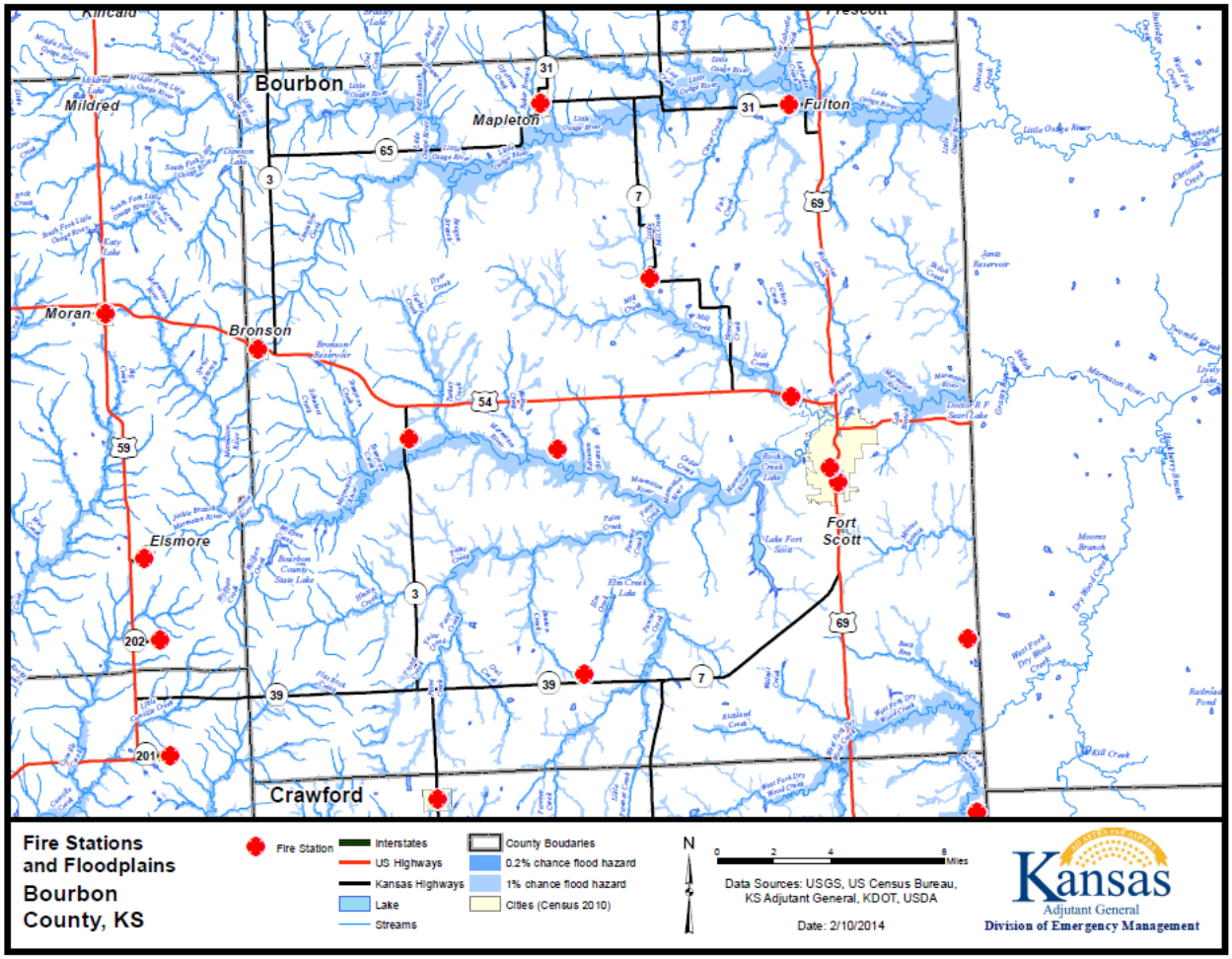
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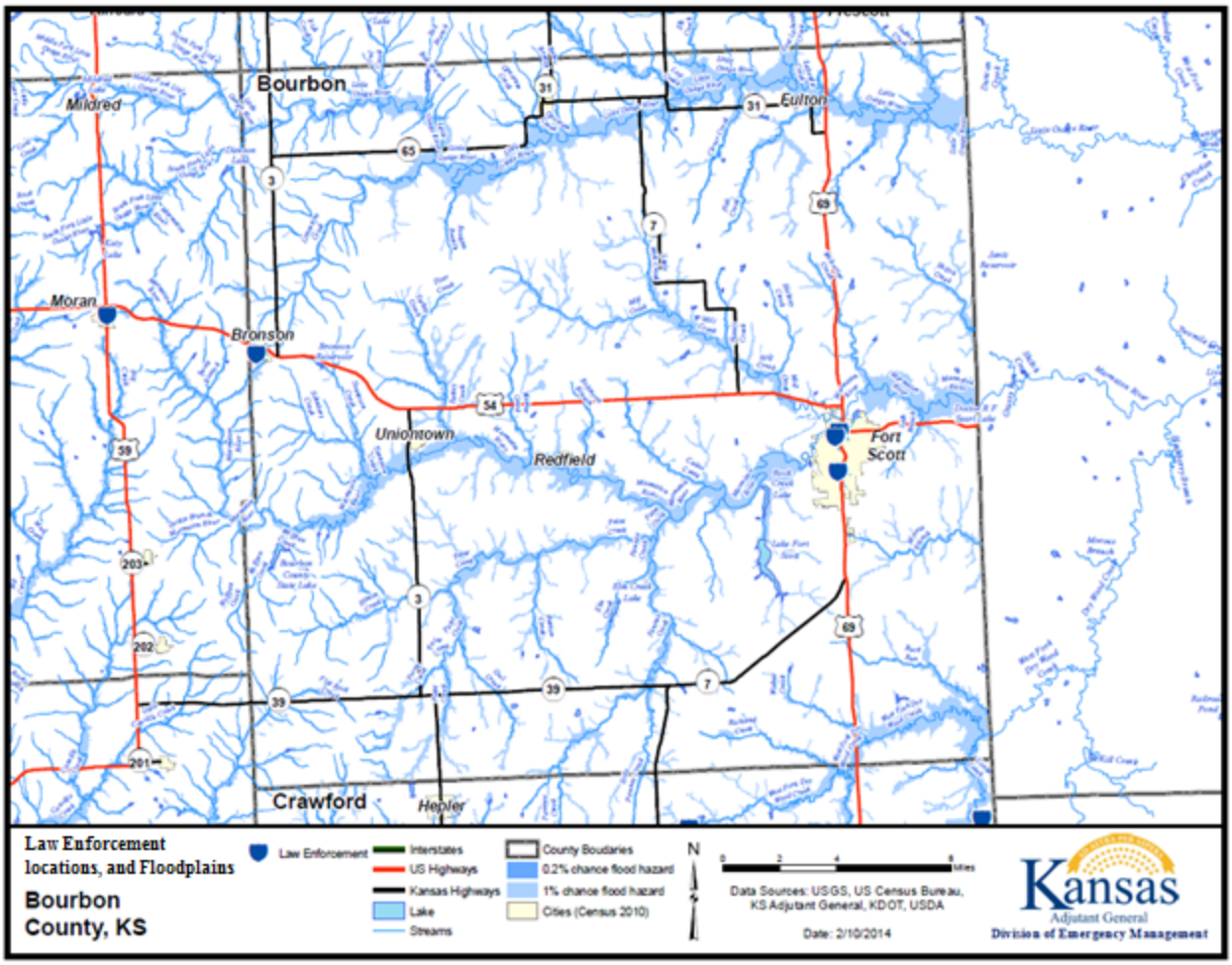
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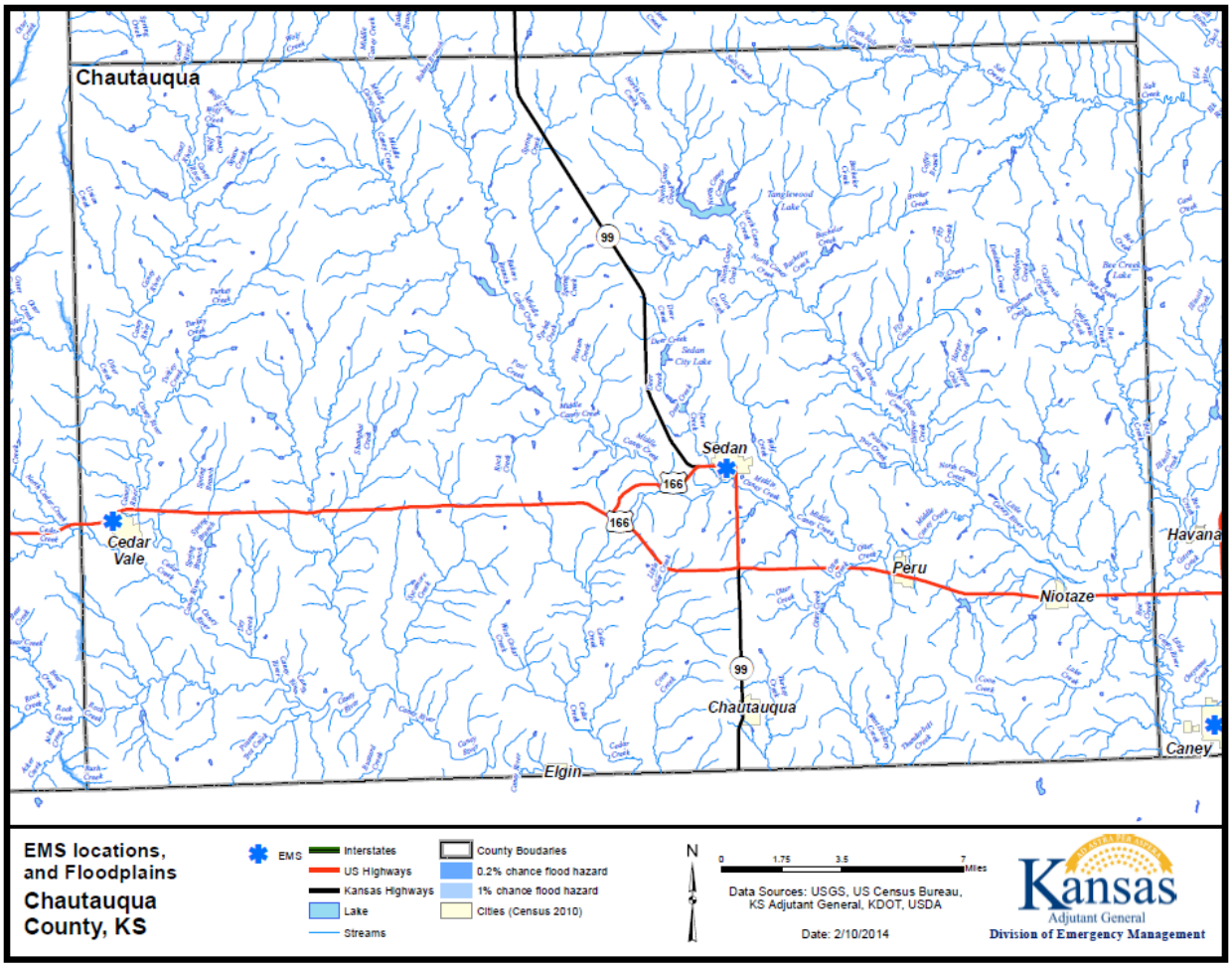
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EMS locations, and Floodplains
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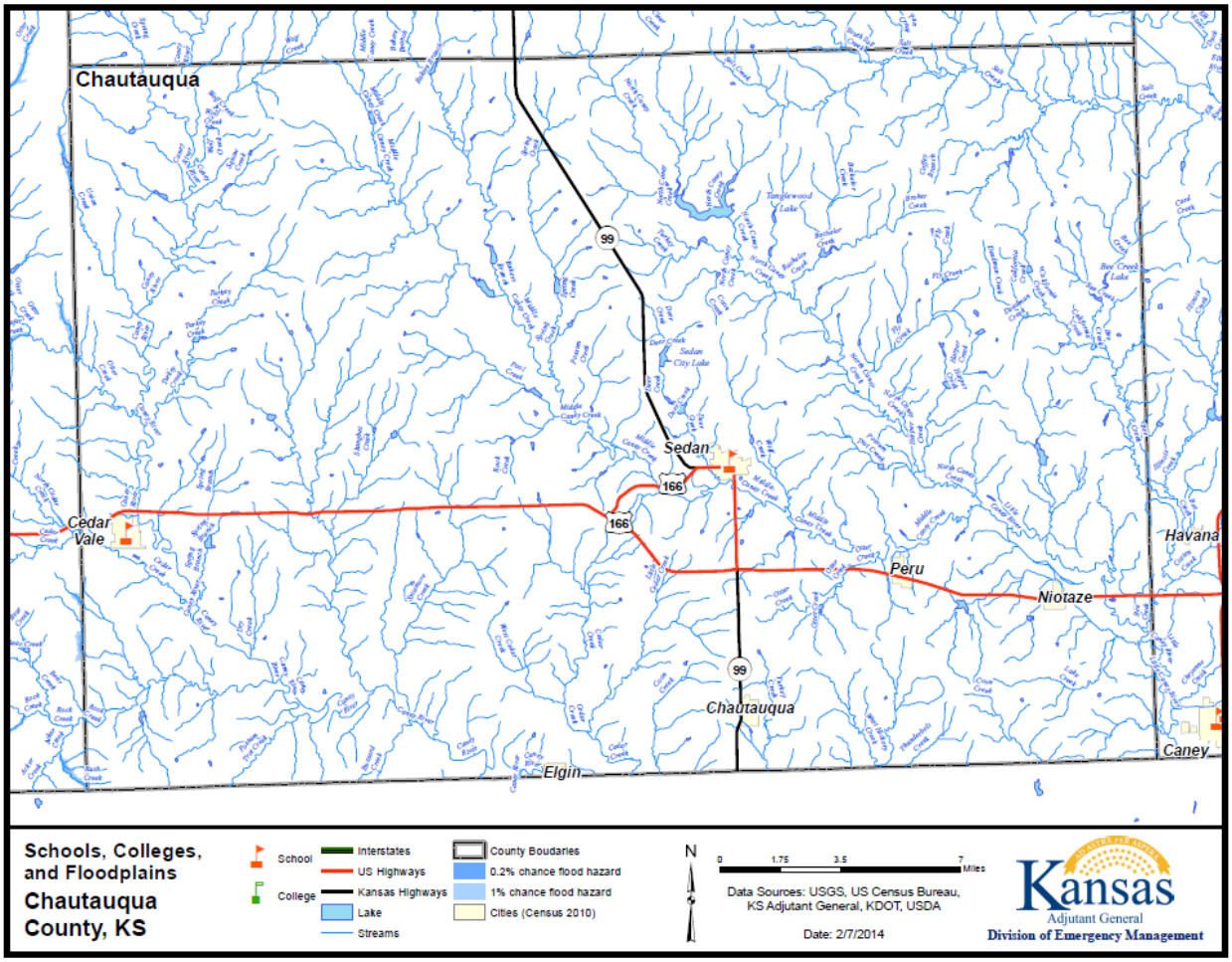
Adjutant General
Division of Emergency Management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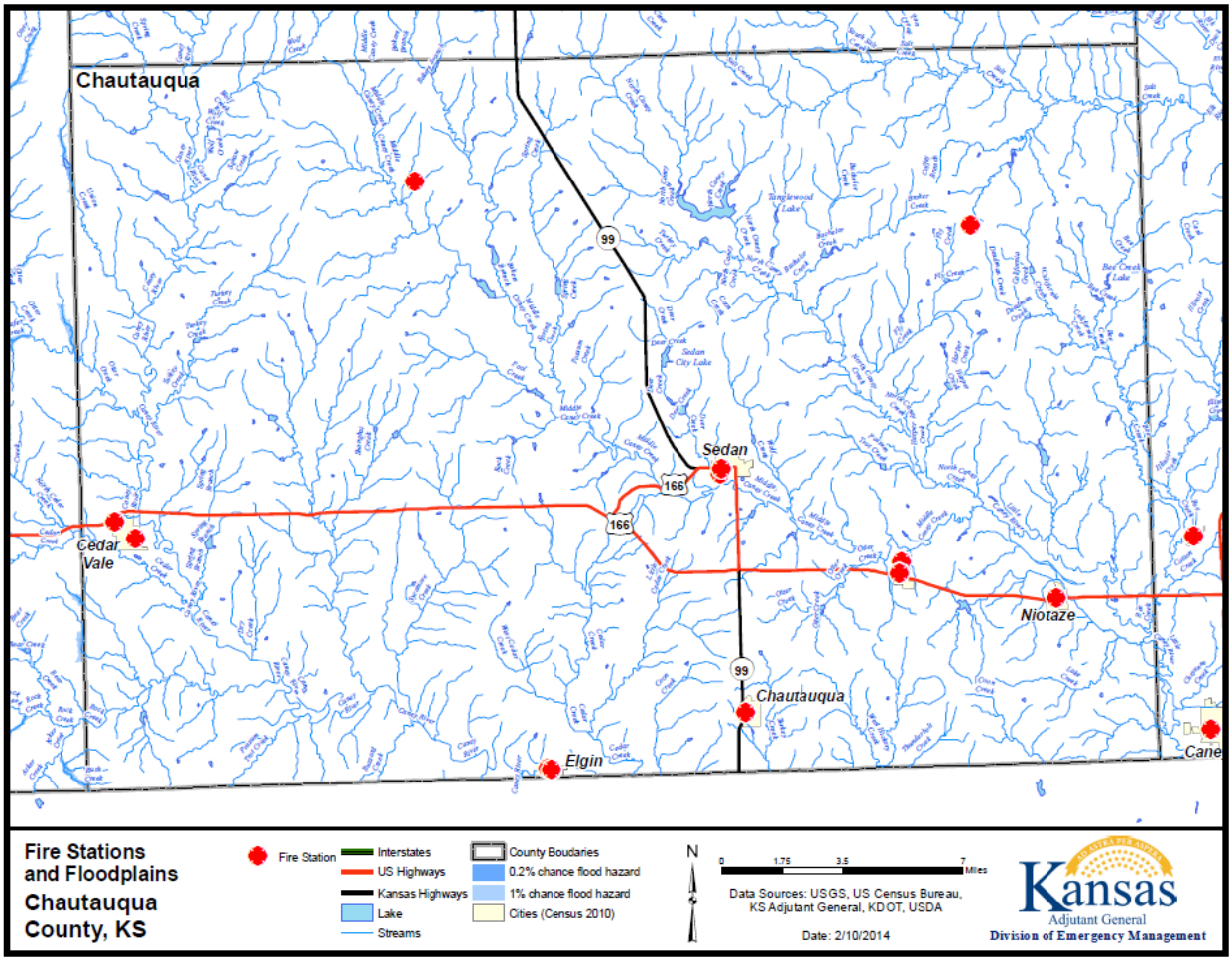
Sedan
Cedar Vale
Peru
Niotaze
Havana
Chautauqua
Caney
Elgin
99
166
Schools, Colleges, and Floodplains
Chautauqua County, KS
School
College
Interstates
US Highways
Kansas Highways
Lake
Streams
County Boudaries
0.2% chance flood hazard
1% chance flood hazard
Cities (Census 2010)
N
0 1.75 3.5 7 Miles
Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA
Date: 2/7/2014
Kansas
Adjutant General
Division of Emergency Management


Chautauqua
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Sedan
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Cedar Vale
Niotaze
99
Chautauqua
Elgin
Cane
Fire Stations and Floodplains
Chautauqua County, KS
Fire Station
Interstates
US Highways
Kansas Highways
Lake
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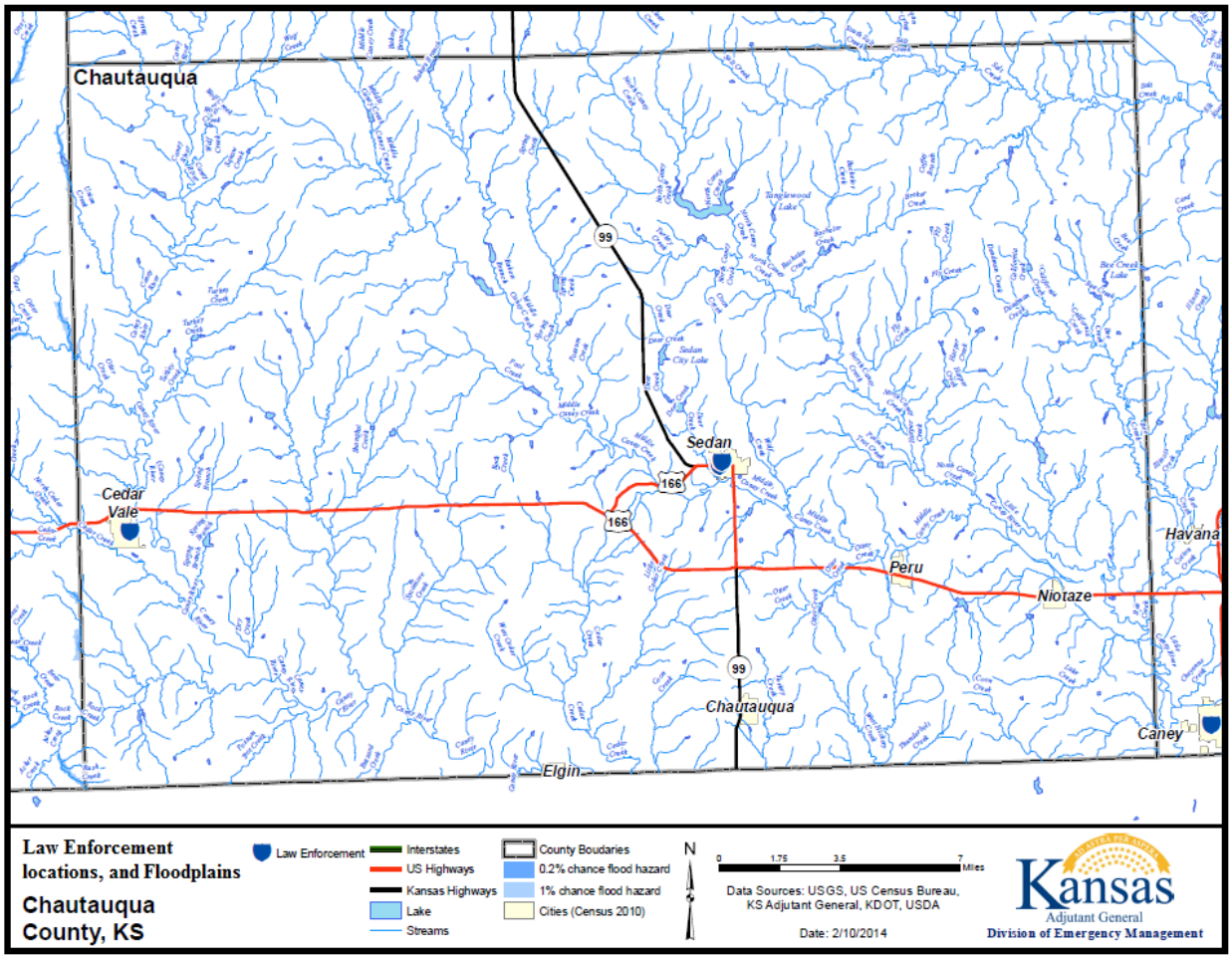
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Sedan
Cedar Vale
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99
166
Law Enforcement locations, and Floodplains
Chautauqua County, KS
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Interstates
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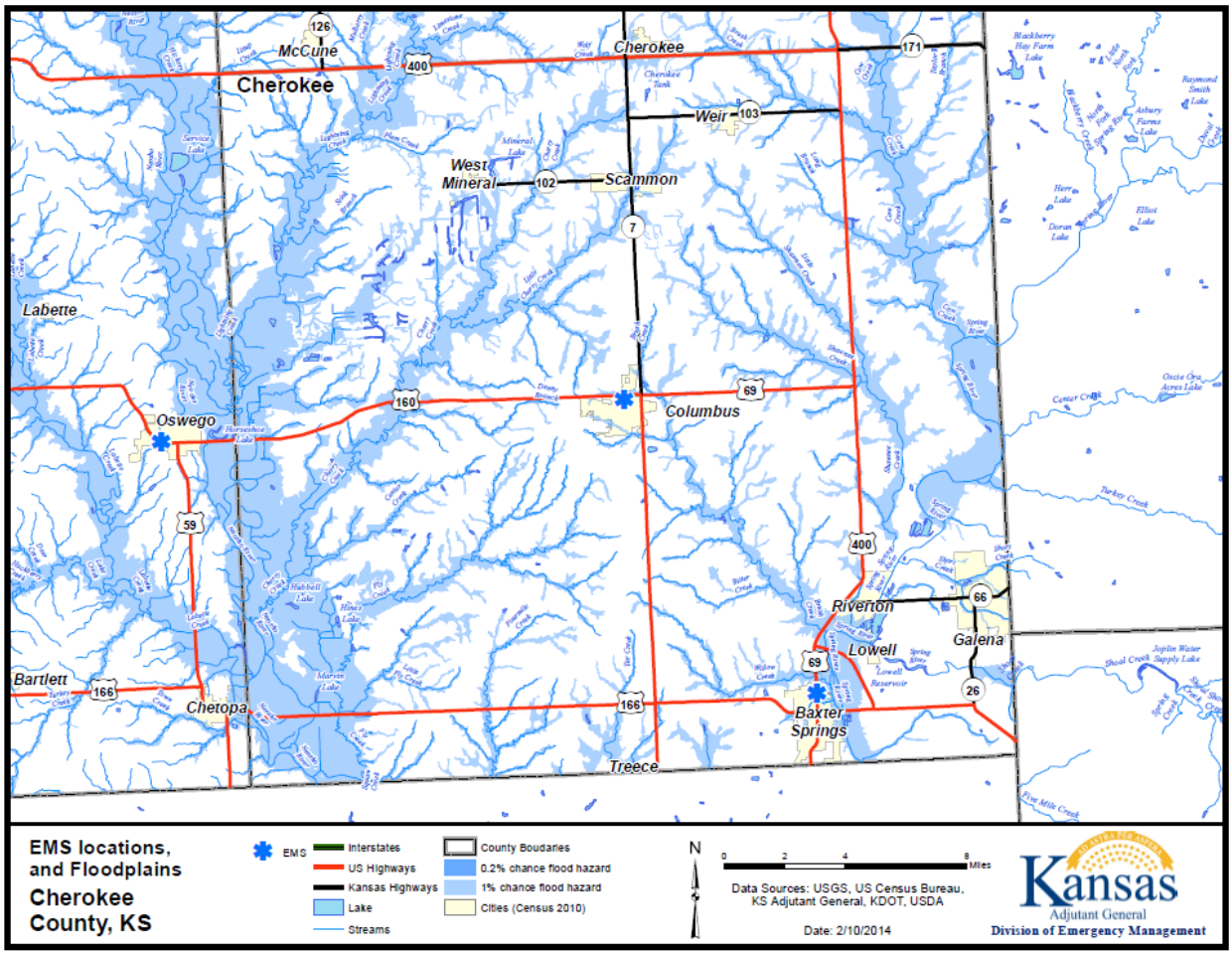
Division of Emergency Management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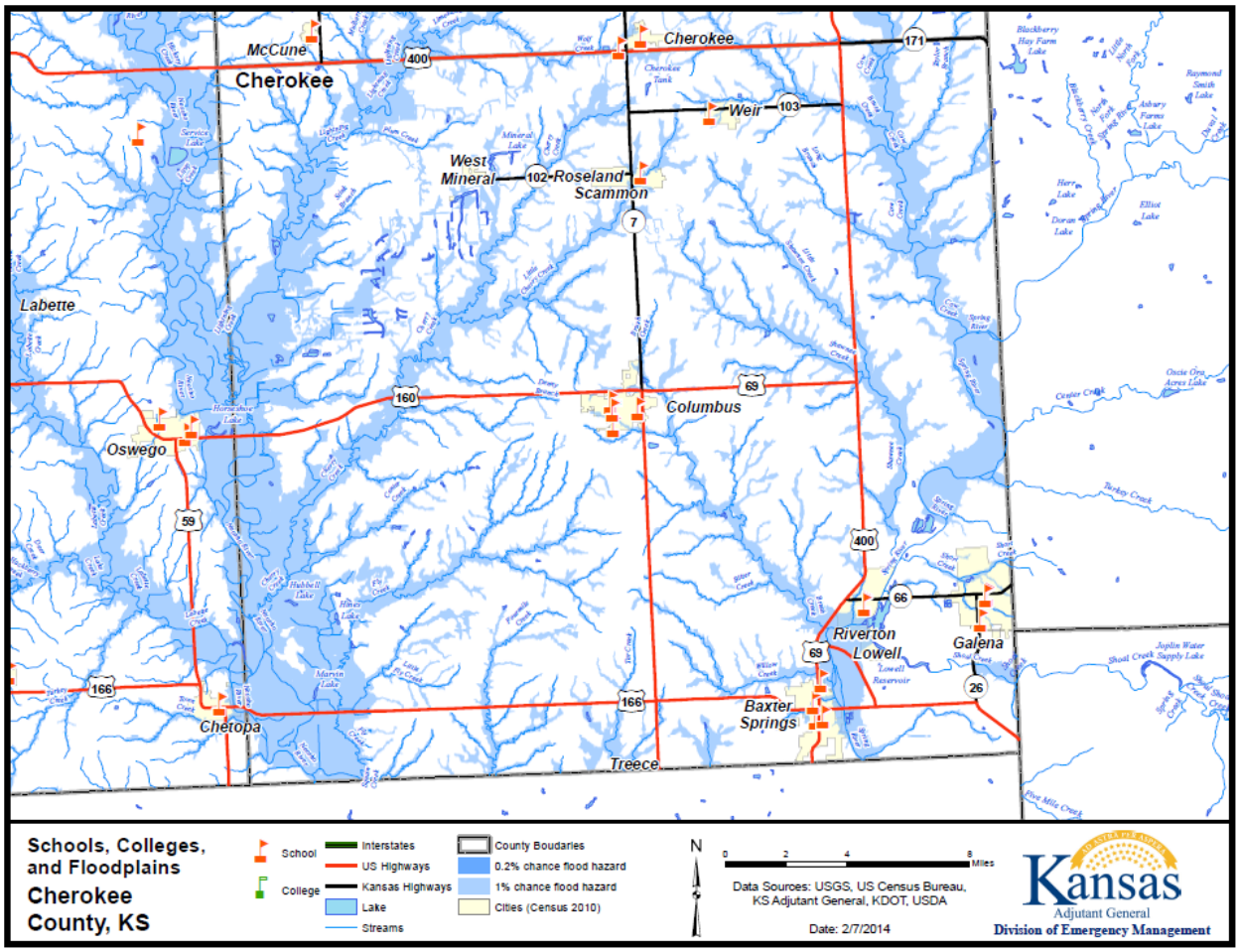
Cherokee
Cherokee
Weir
West Mineral
Scammon
Labette
Oswego
Columbus
Riverton
Galena
Lowell
Bartlett
Chetopa
Baxter Springs
Treece
126
400
171
103
102
7
160
69
59
400
66
69
26
166
166
EMS locations, and Floodplains
Cherokee County, KS
EMS
Interstates
US Highways
Kansas Highways
Lake
Streams
County Boudaries
0.2% chance flood hazard
1% chance flood hazard
Cities (Census 2010)
N
0 2 4 8 Miles
Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA
Date: 2/10/2014
Kansas
Adjutant General
Division of Emergency Management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West Mineral
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Scammon
Labette
Columbus
Oswego
Riverton
Lowell
Galena
Baxter Springs
Cherokee
Treece
400
171
103
102
7
160
69
59
400
66
69
166
166
26
Schools, Colleges, and Floodplains
Cherokee County, KS
School
College
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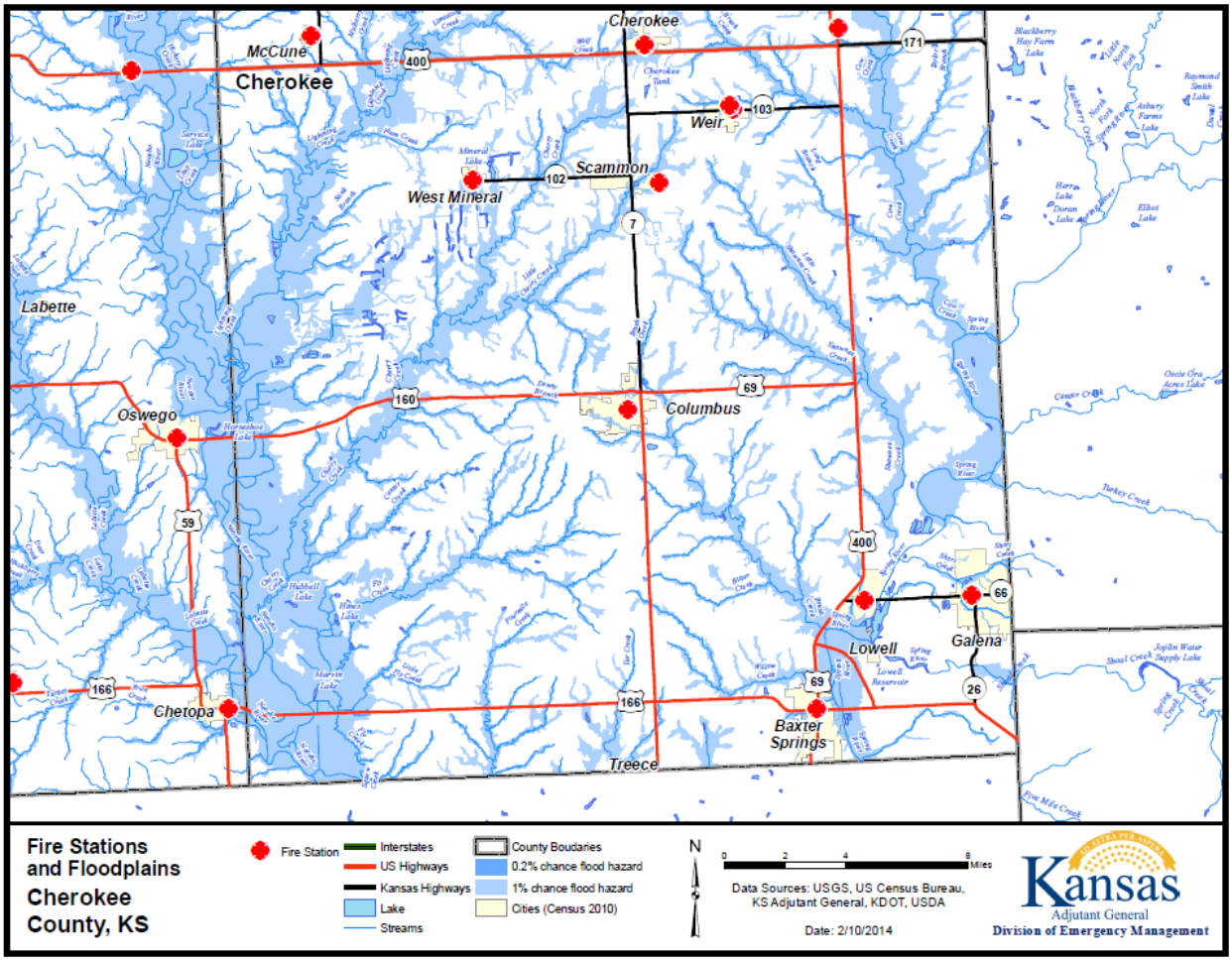
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McCune
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Scammon
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Labette
Oswego
Columbus
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Galena
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Fire Stations and Floodplains
Cherokee County, KS
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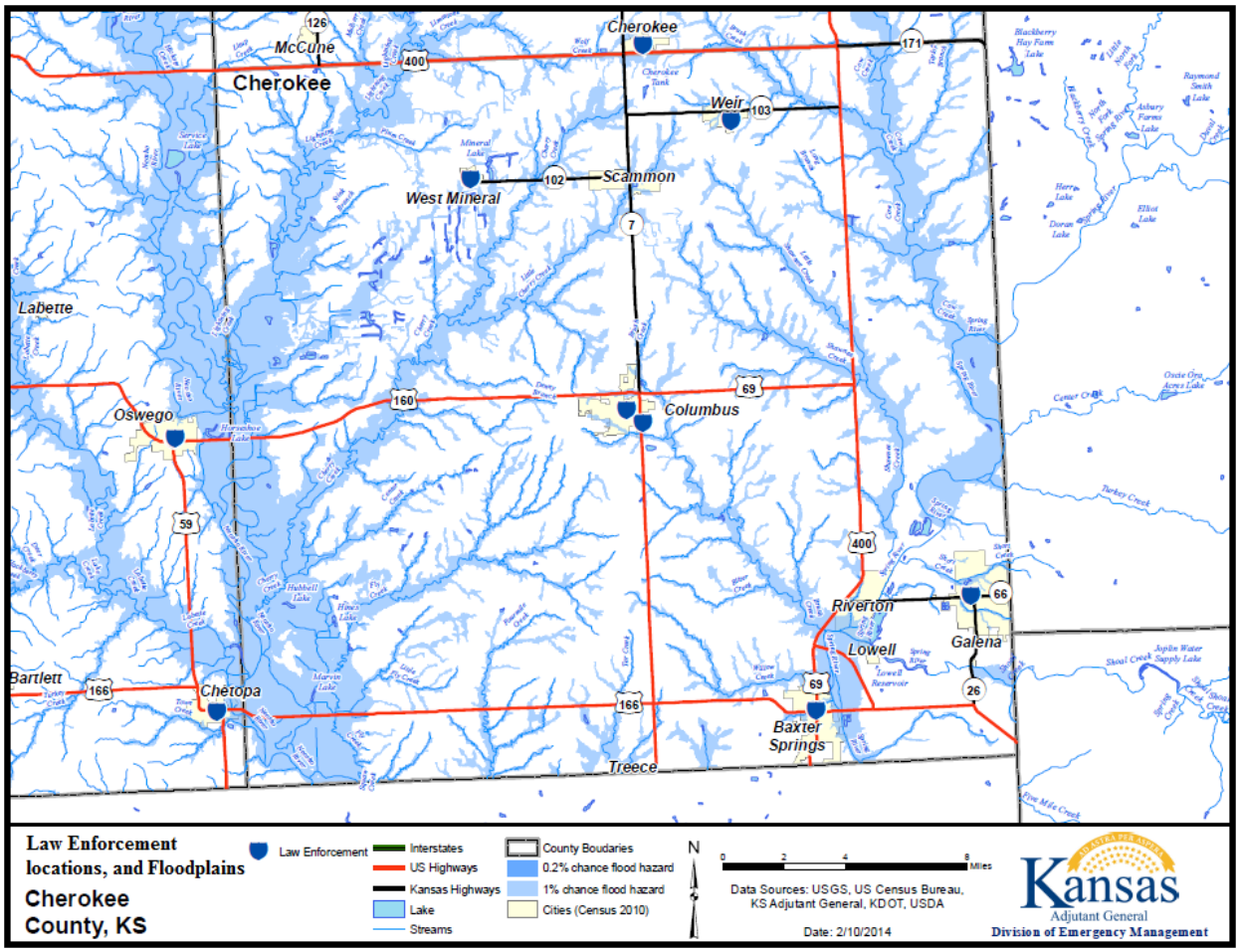
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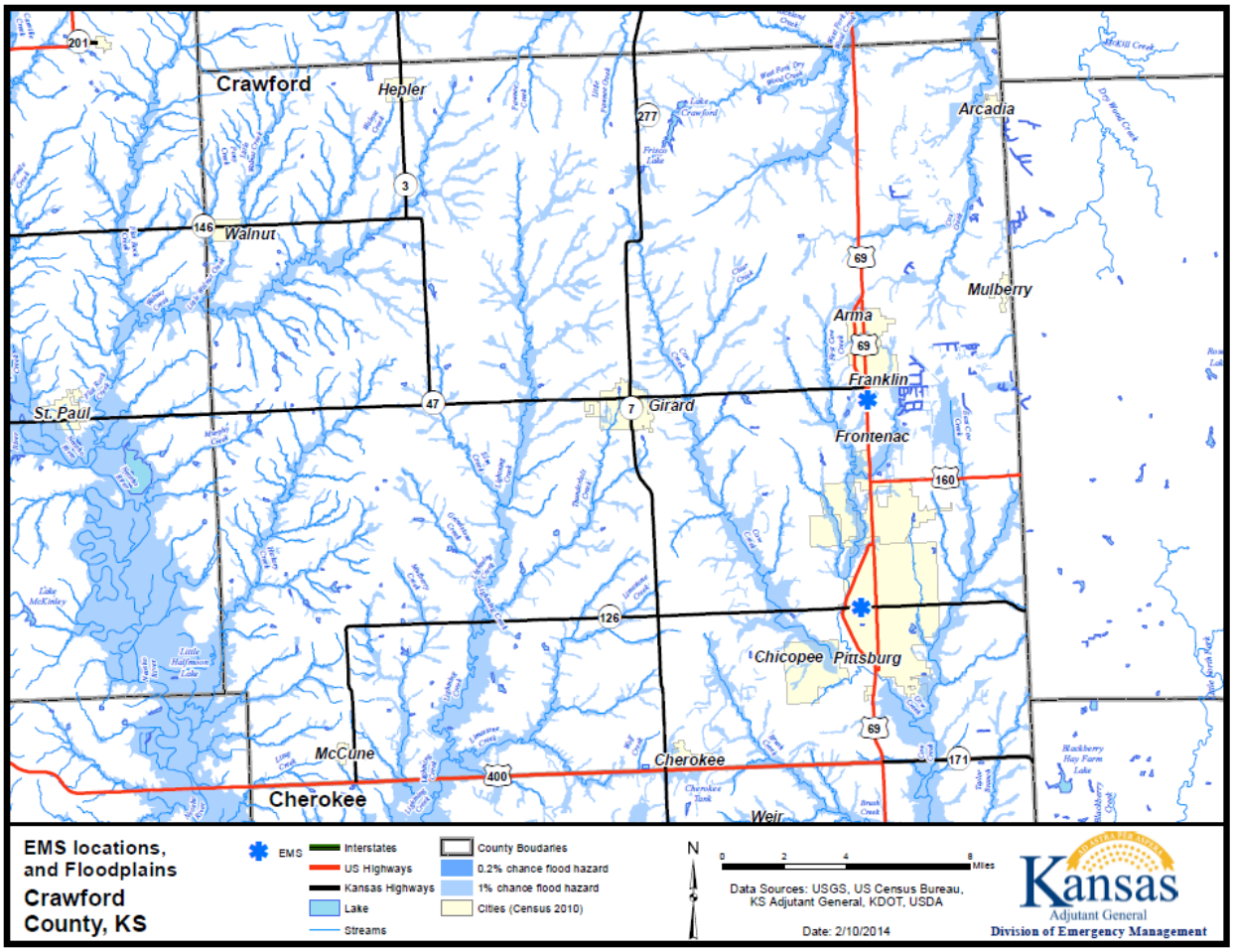
Crawford
Hepler
Walnut
St. Paul
Girard
Arcadia
Mulberry
Arma
Franklin
Frontenac
Chicopee
Pittsburg
McCune
Cherokee
Weir
201
277
3
146
47
7
69
160
126
400
171
EMS locations, and Floodplains
Crawford County, KS
EMS
Interstates
US Highways
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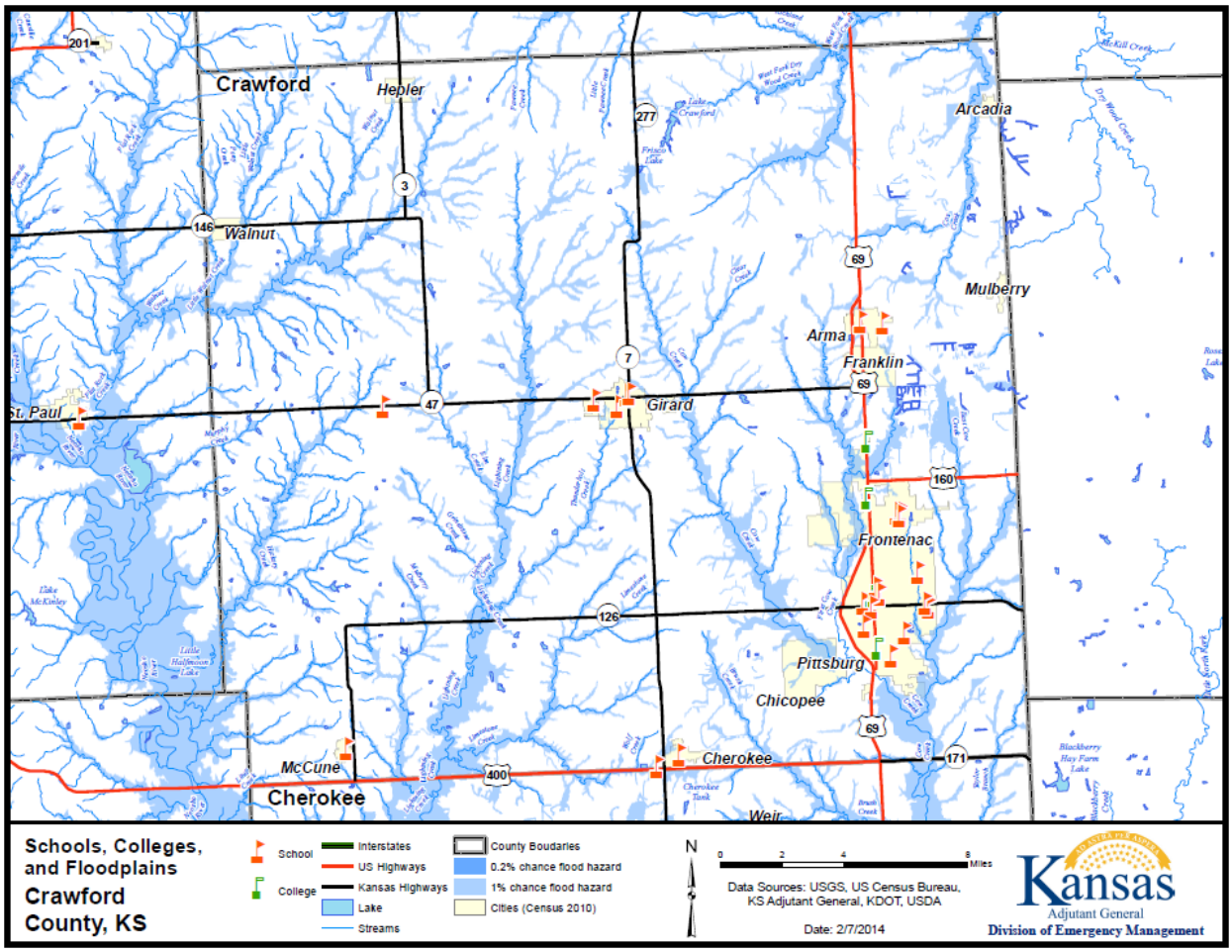
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Mulberry
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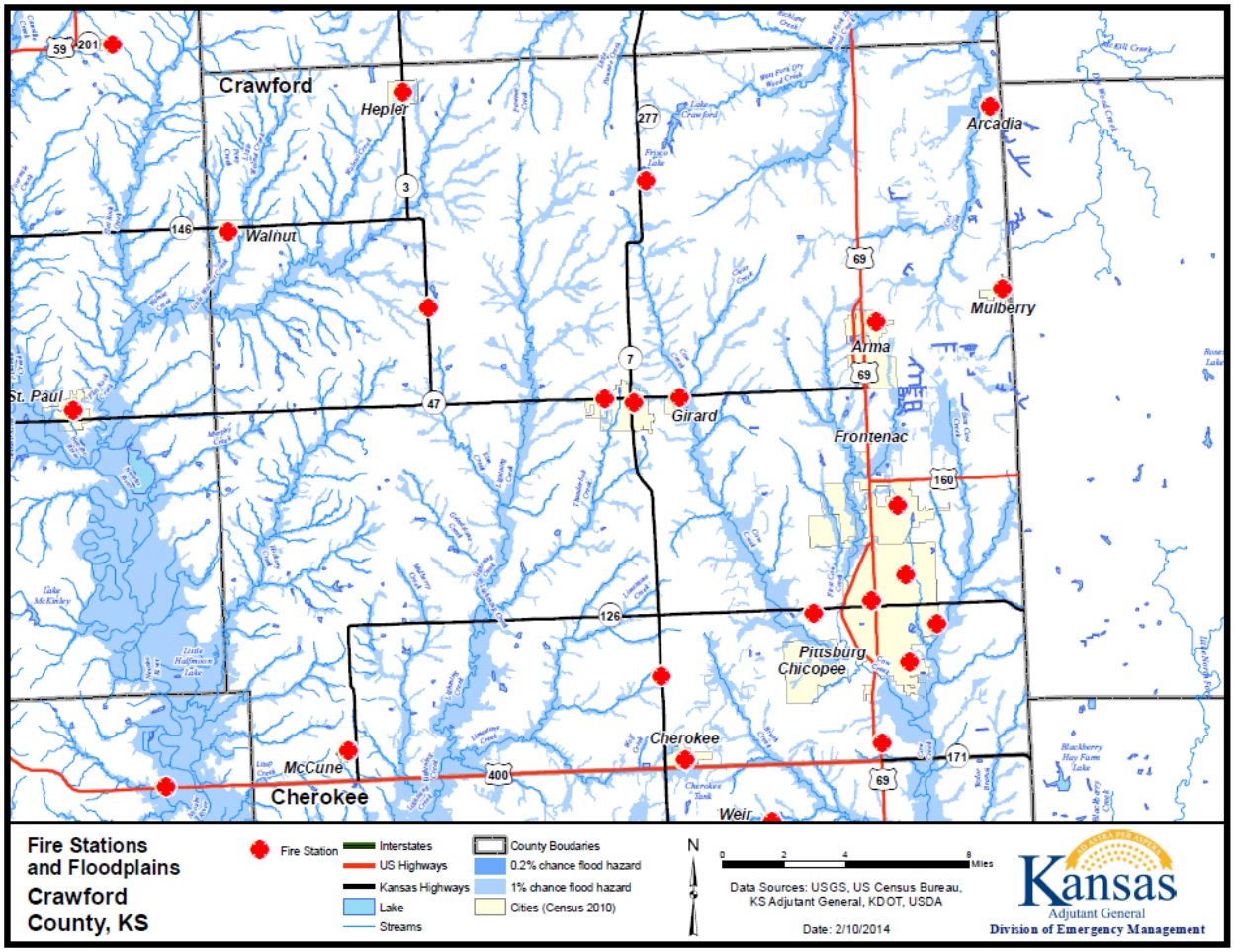
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Mulberry
Arma
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Chicopee
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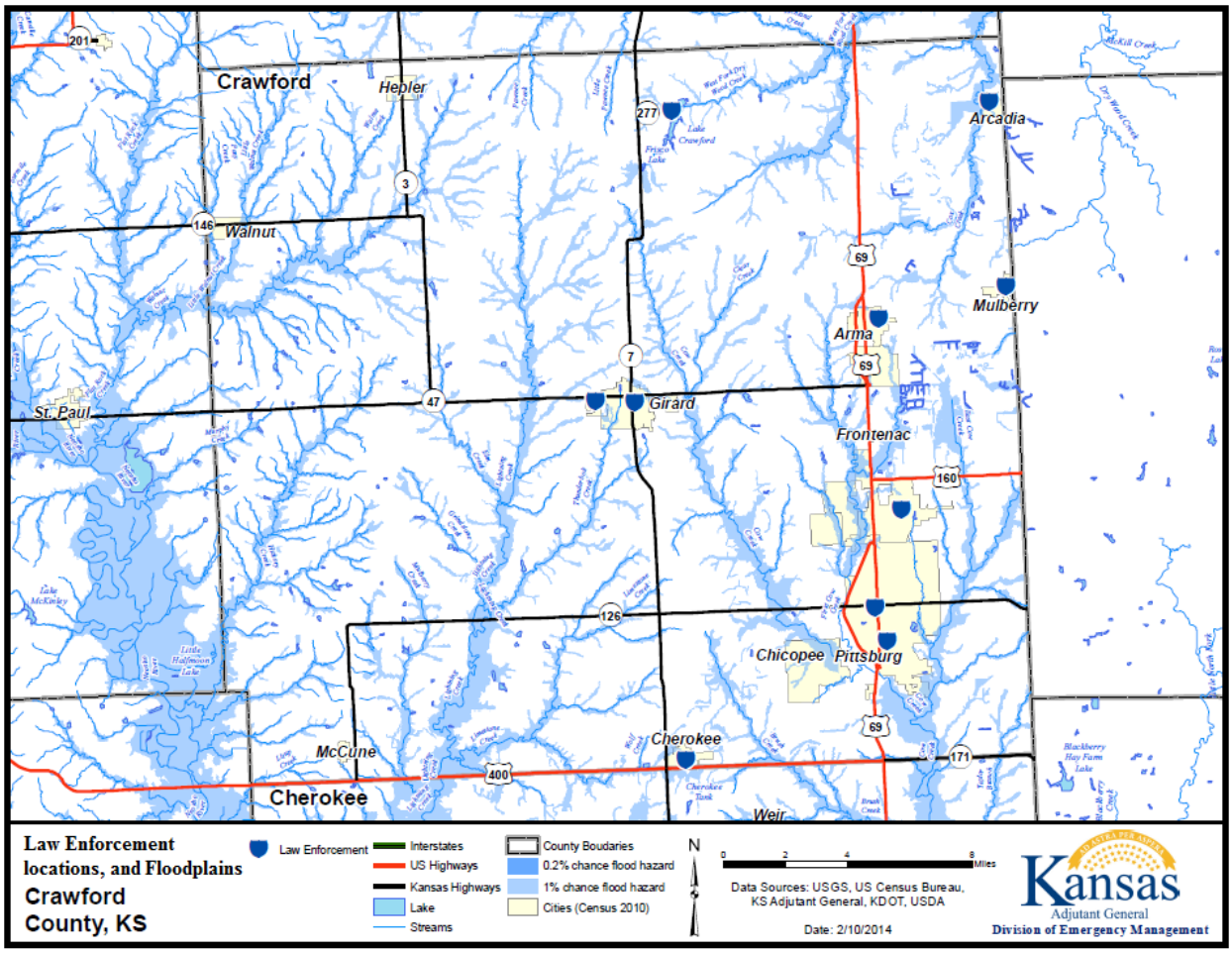
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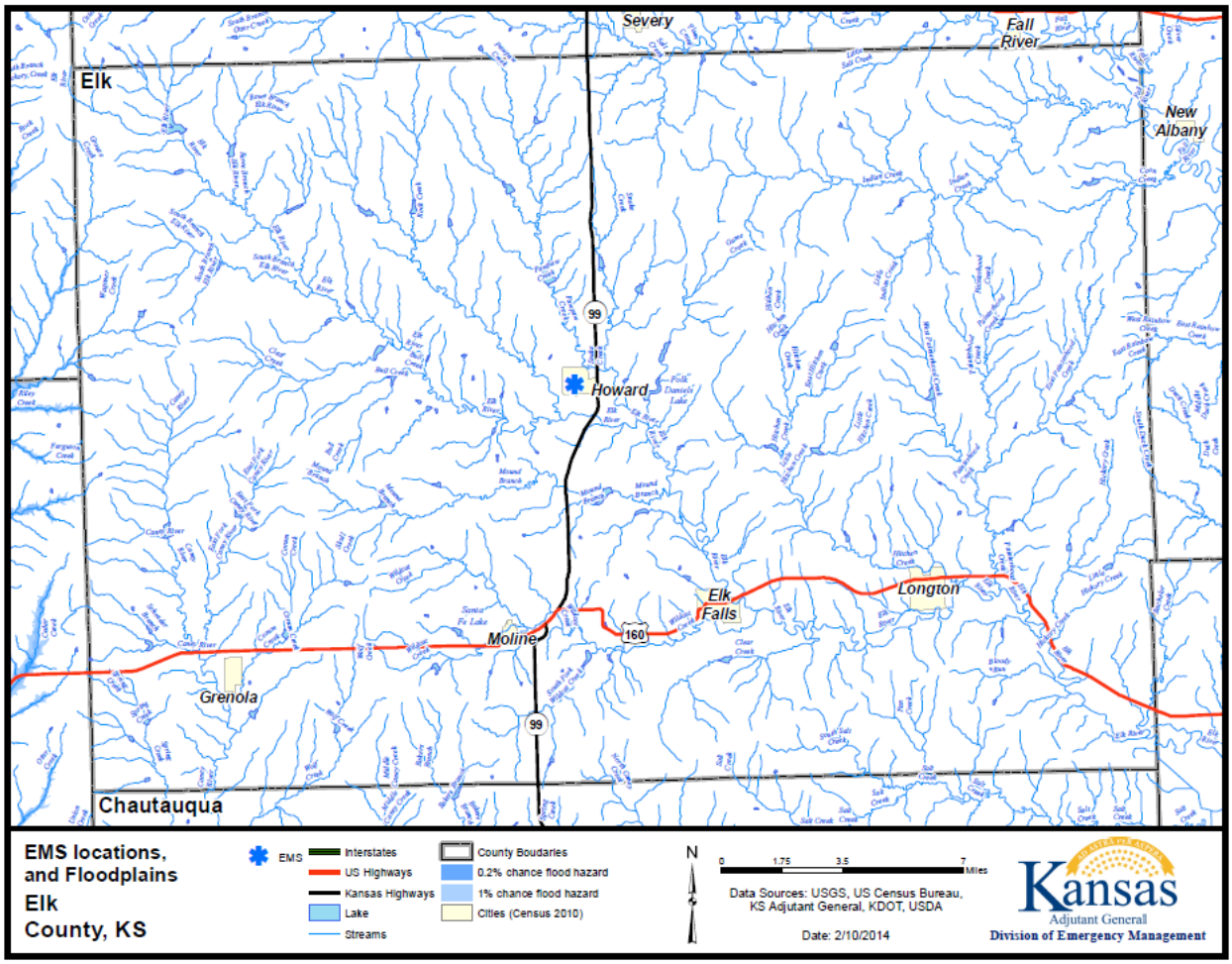
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Fall River
Elk
New Albany
99
Howard
Elk Falls
Longton
Moline
160
Grenola
99
Chautauqua
EMS locations, and Floodplains
Elk
County, KS
EMS
Interstates
US Highways
Kansas Highways
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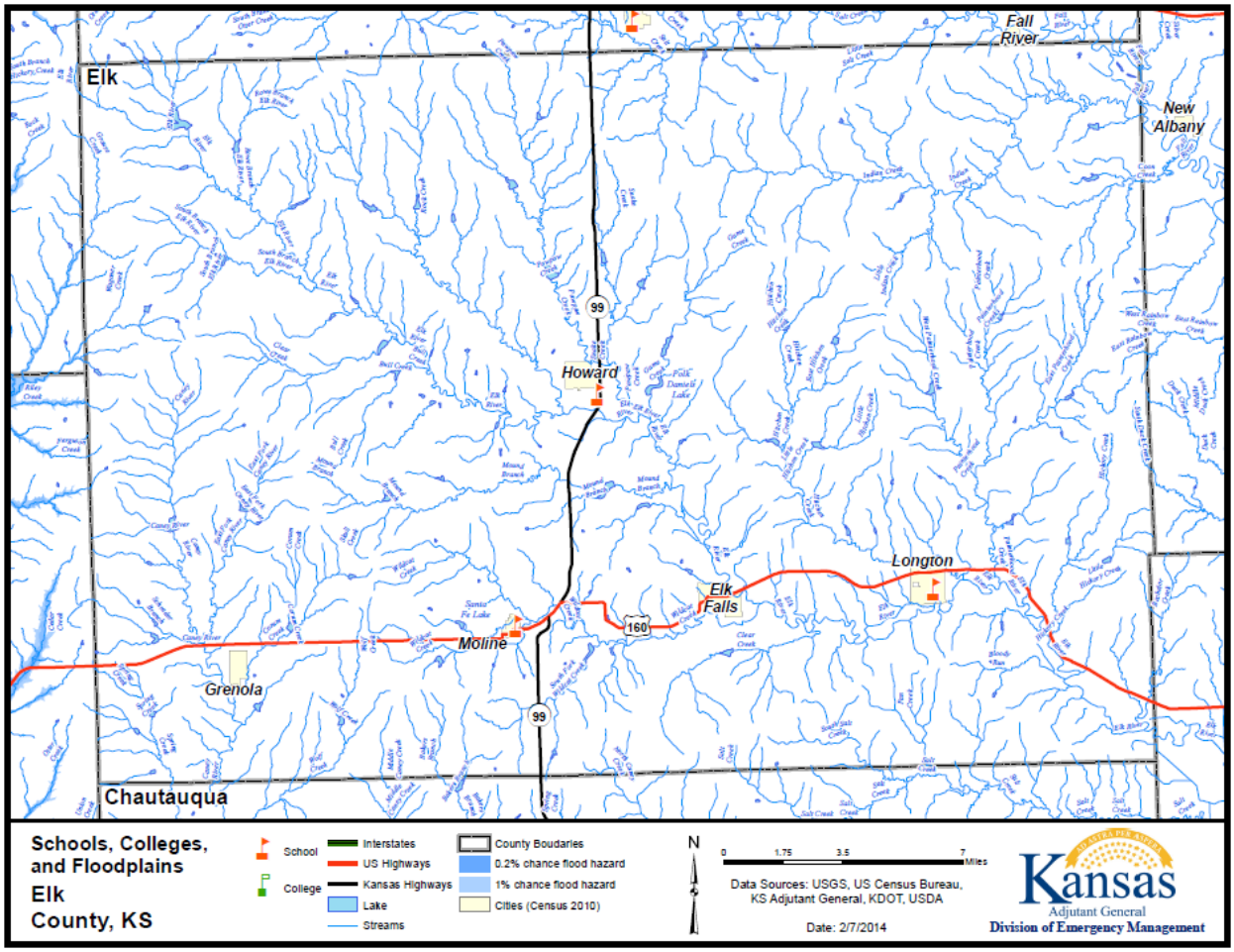
Date: 2/10/2014
Kansas
Adjutant General
Division of Emergency Management


Elk
Fall River
New Albany
Howard
Longton
Elk Falls
Moline
Grenola
Chautauqua
99
160
99
Schools, Colleges, and Floodplains
Elk
County, KS
School
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7
Miles
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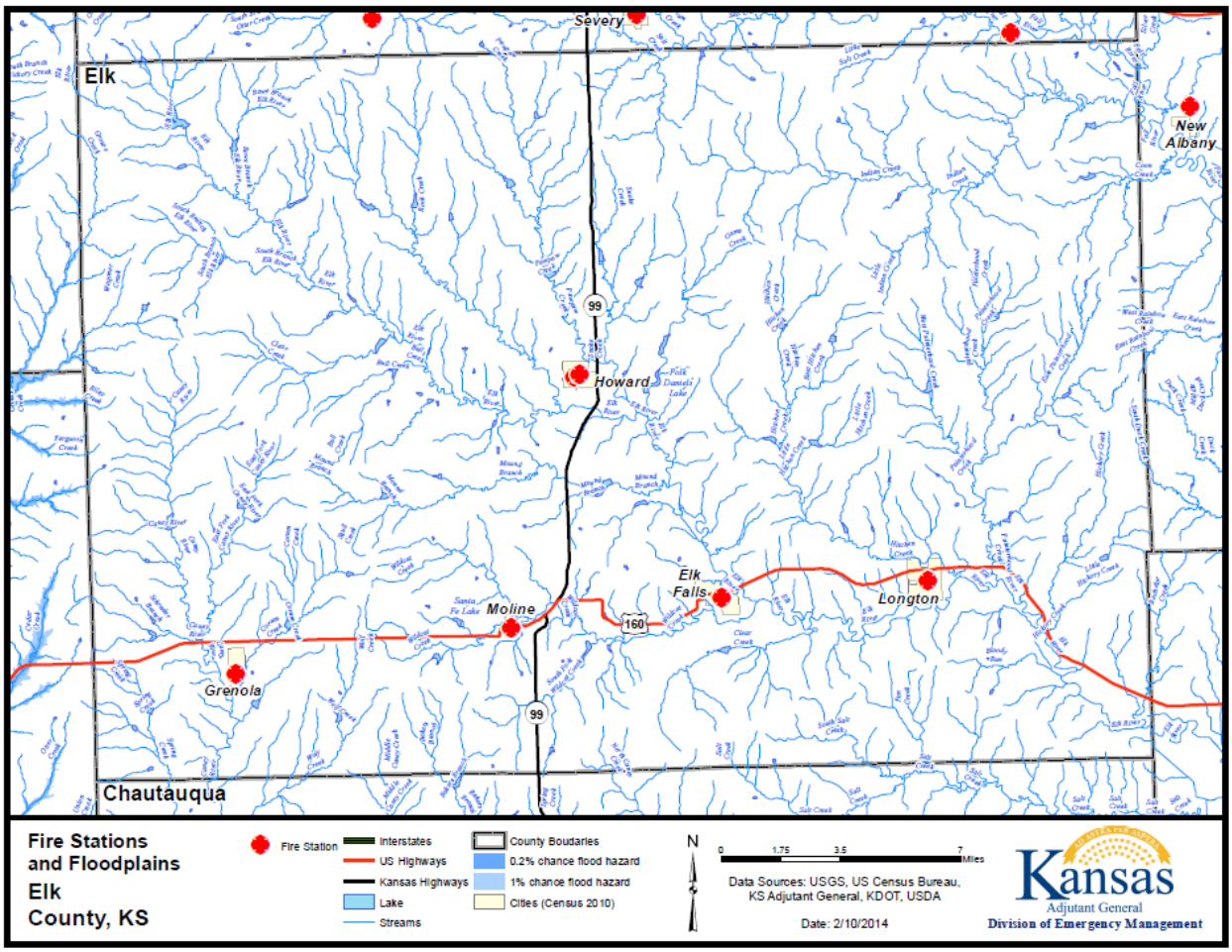
Kansas
Adjutant General
Division of Emergency Management


Severy
Elk
New Albany
99
Howard
Elk Falls
Moline
160
Longton
Grenola
99
Chautauqua
Fire Stations and Floodplains
Elk
County, KS
Fire Station
Interstates
US Highways
Kansas Highways
Lake
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0.2% chance flood hazard
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3.5
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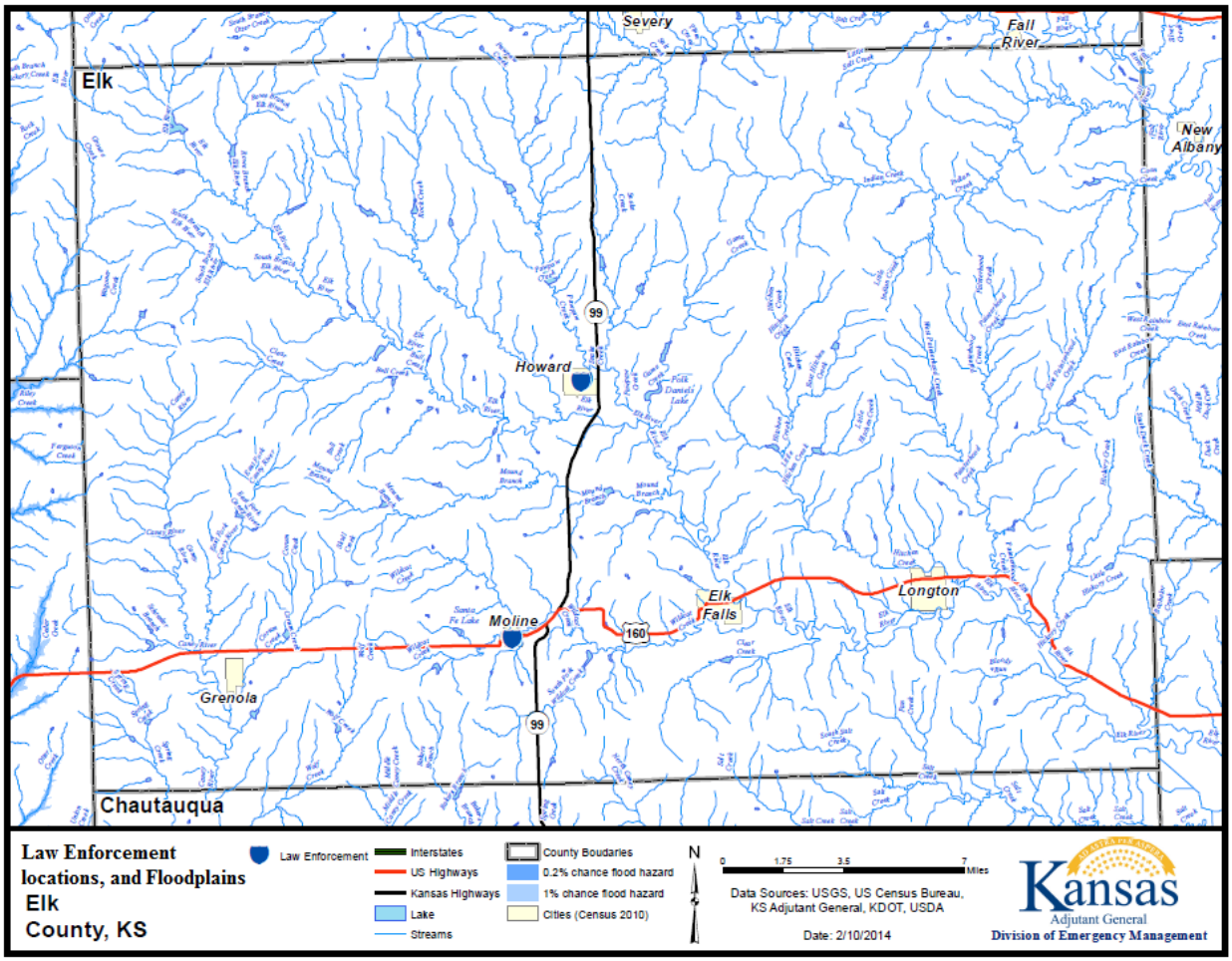
Kansas
Adjutant General
Division of Emergency Management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Fall River
Elk
New Albany
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Howard
Elk Falls
Longton
Moline
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Grenola
99
Chautauqua
Law Enforcement locations, and Floodplains Elk County, KS
Law Enforcement
Interstates
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Kansas Highways
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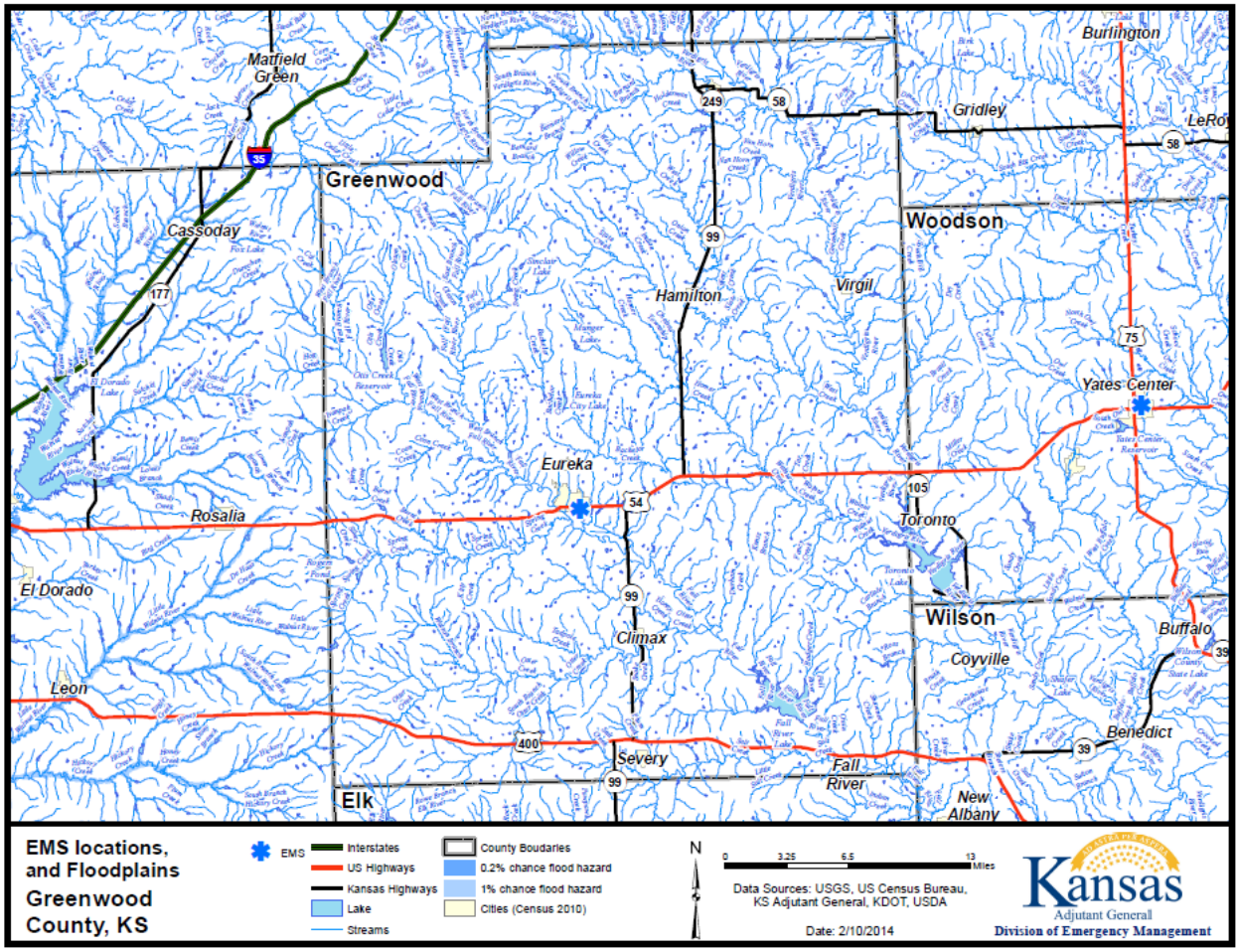
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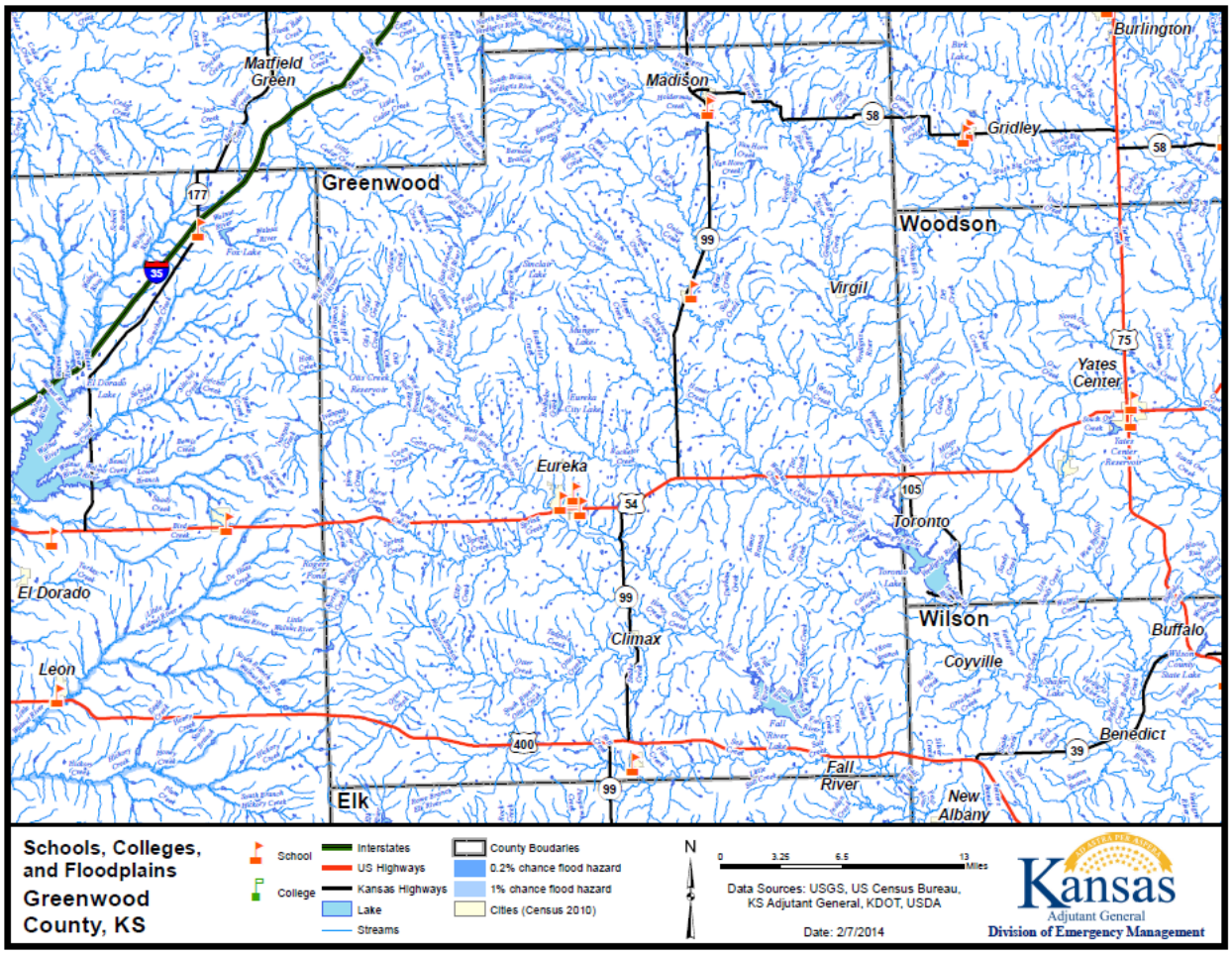
Greenwood
Cassoday
Burlington
Gridley
LeRoy
Woodson
Hamilton
Virgil
Yates Center
Eureka
Rosalia
Toronto
El Dorado
Wilson
Buffalo
Coyville
Climax
Leon
Benedict
Severy
Fall River
New Albany
Elk
249
58
35
99
177
75
54
105
400
39
EMS locations, and Floodplains
Greenwood County, KS
EMS
Interstates
US Highways
Kansas Highways
Lake
Streams
County Boudaries
0.2% chance flood hazard
1% chance flood hazard
Cities (Census 2010)
N
0 3.25 6.5 13 Miles
Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA
Date: 2/10/2014
Kansas
Adjutant General
Division of Emergency Management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Matfield Green
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Gridley
Greenwood
Woodson
Virgil
Yates Center
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Toronto
El Dorado
Wilson
Buffalo
Coyville
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177
35
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58
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Schools, Colleges, and Floodplains
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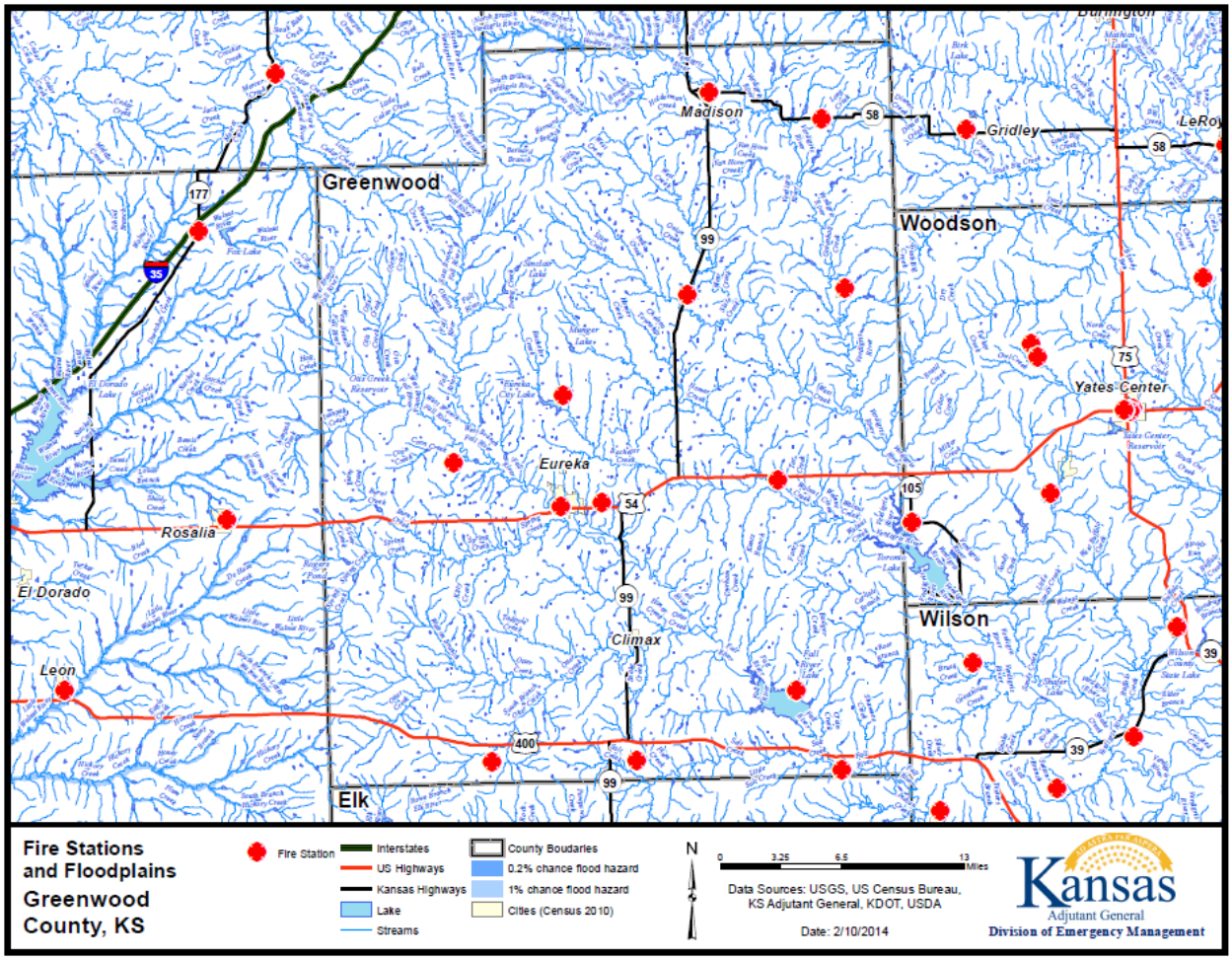
Greenwood
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Fire Stations
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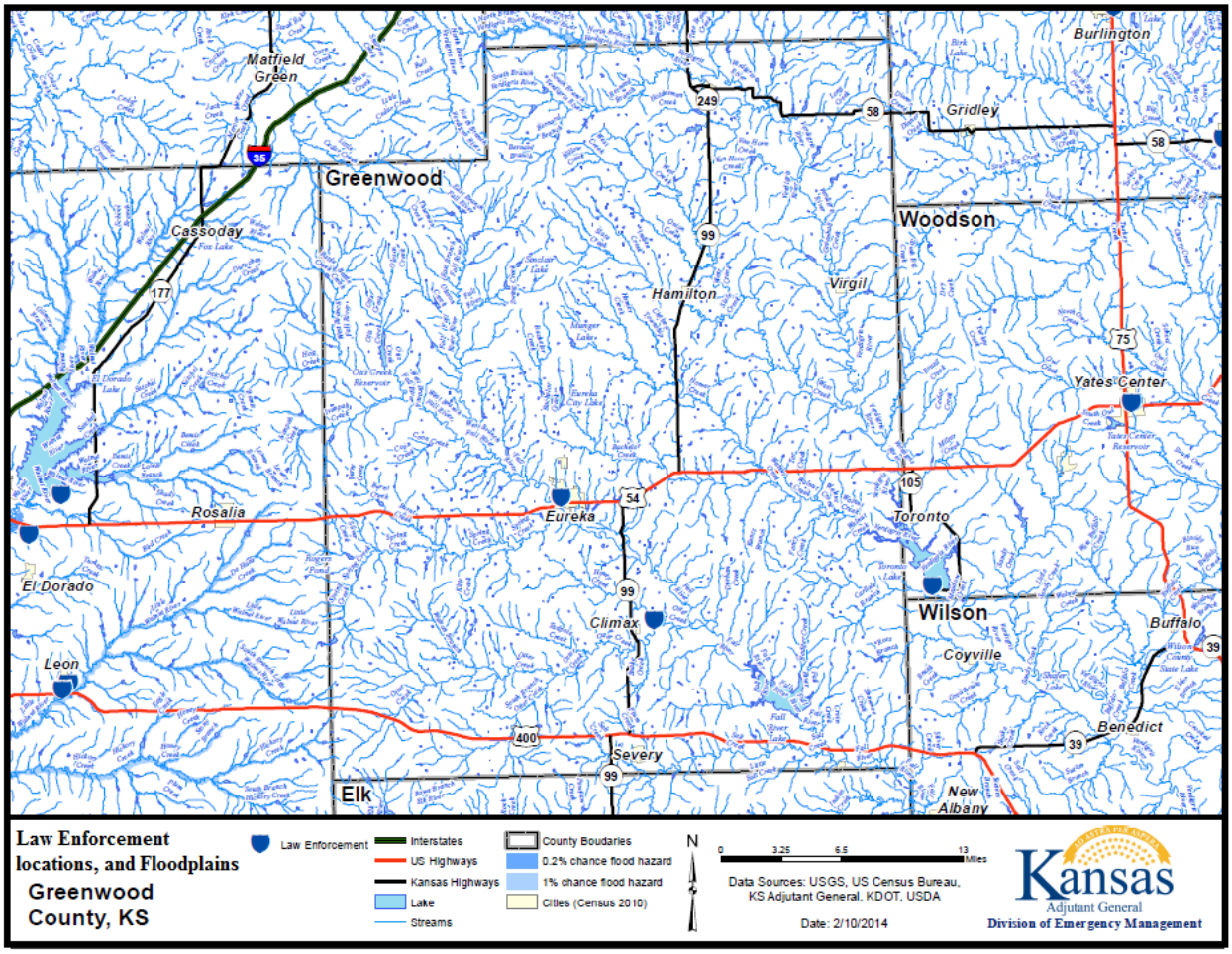
Law Enforcement locations, and Floodplains
Greenwood County, KS
Law Enforcement
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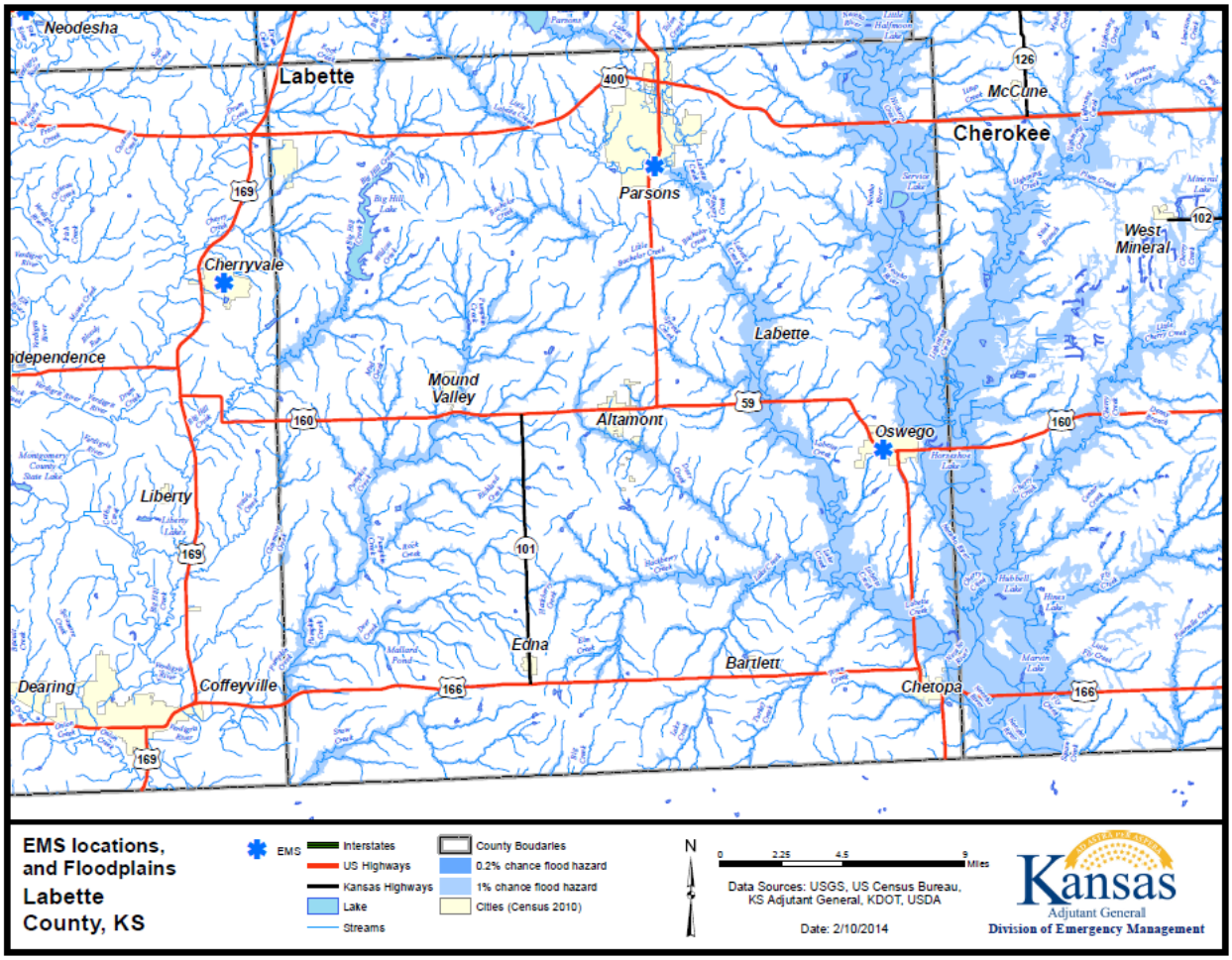
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Labette
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McCune
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Parsons
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102
West Mineral
Cherryvale
Labette
Mound Valley
59
160
Altamont
Oswego
160
Liberty
169
101
Edna
Bartlett
Dearing
Coffeyville
166
Chetopa
166
169
EMS locations, and Floodplains
Labette County, KS
EMS
Interstates
US Highways
Kansas Highways
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Streams
County Boudaries
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Cities (Census 2010)
N
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2.25
4.5
9
Miles
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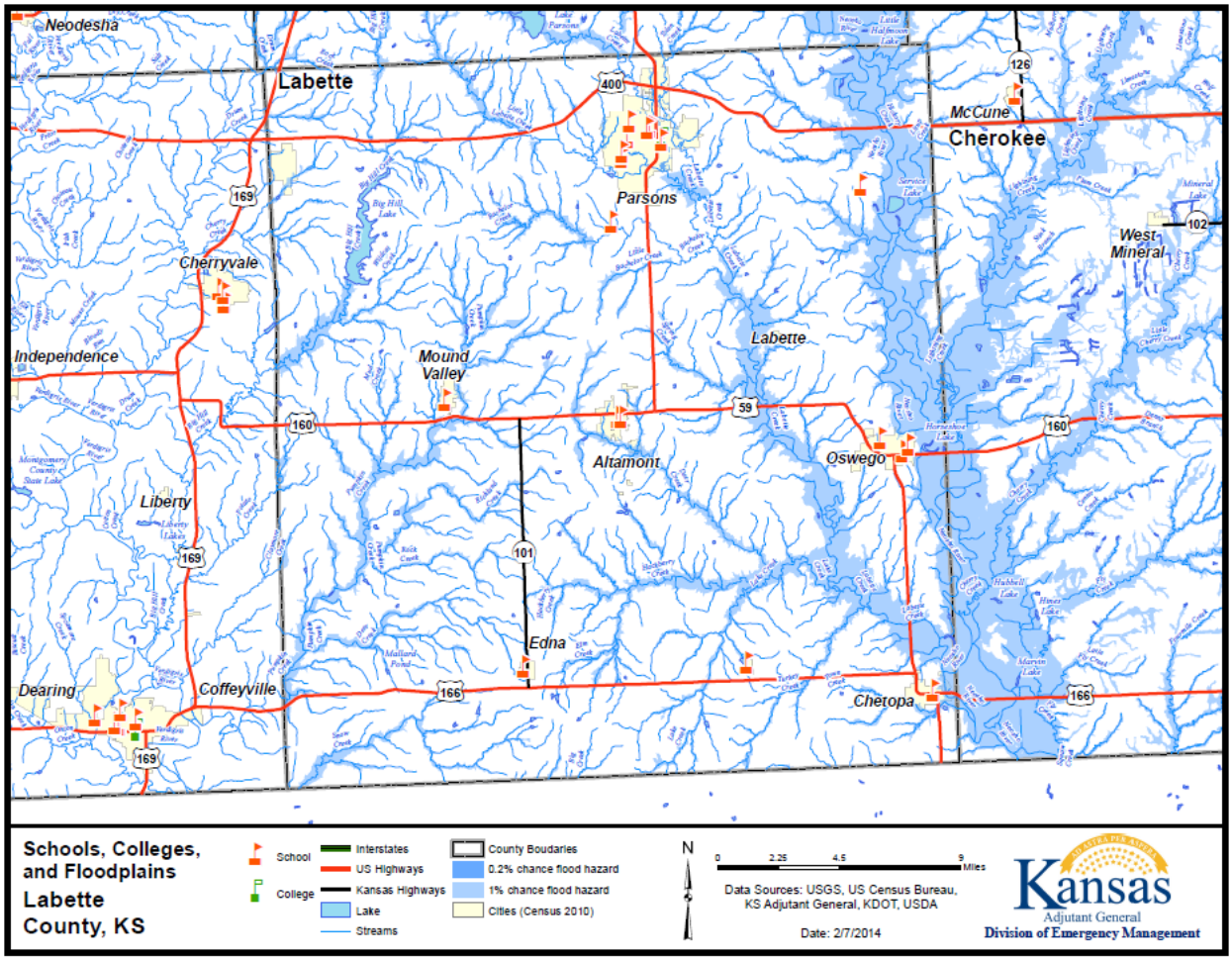
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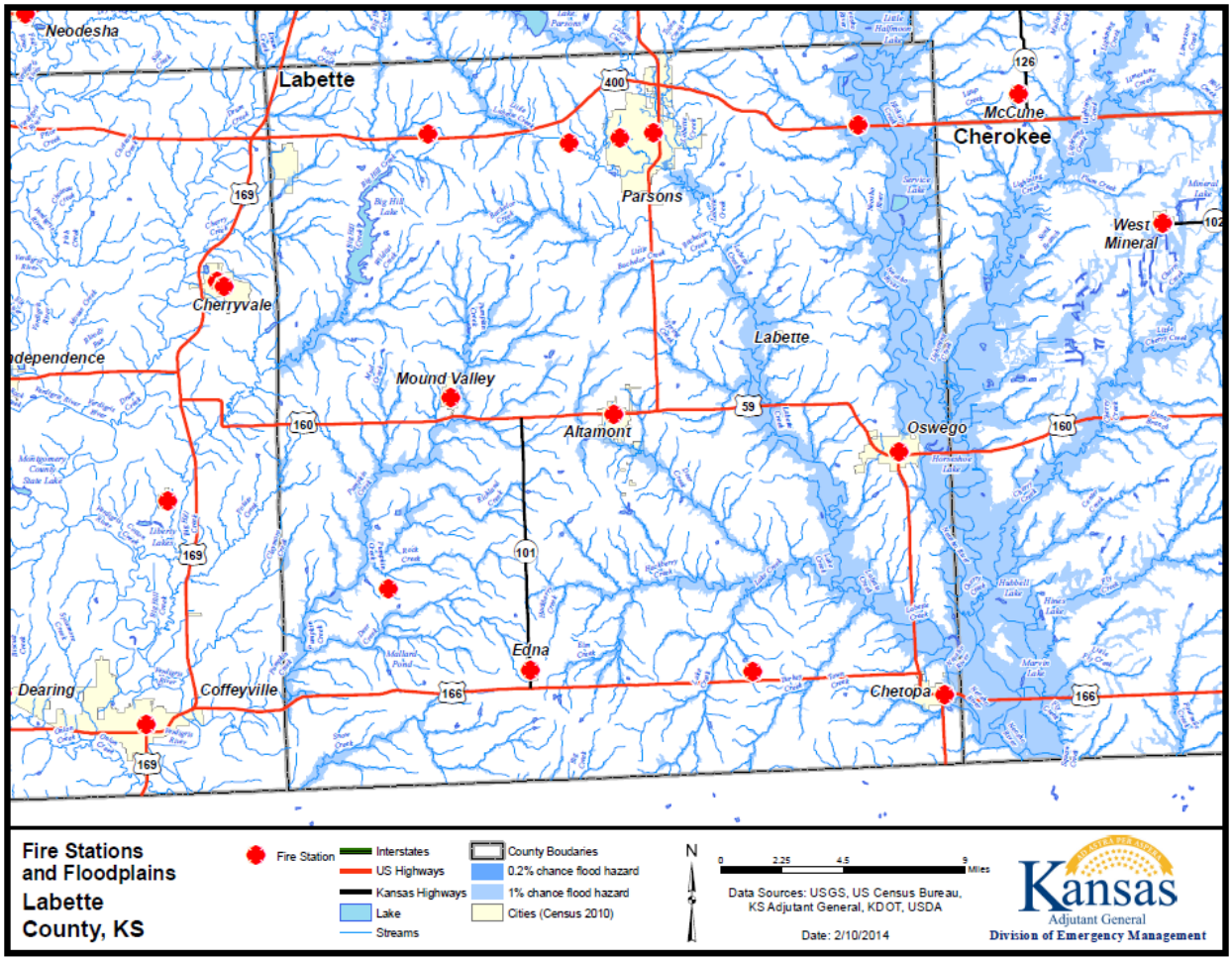
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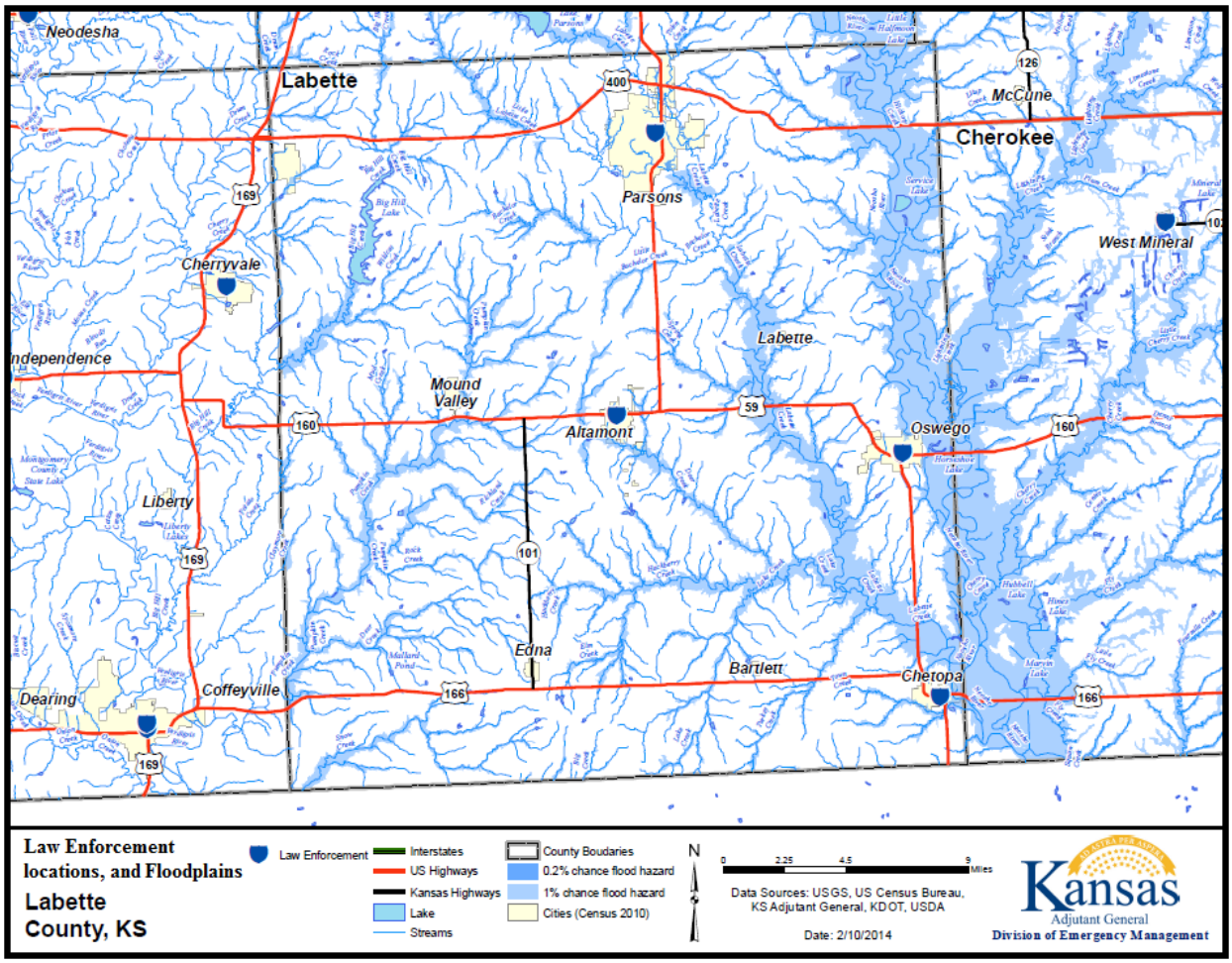
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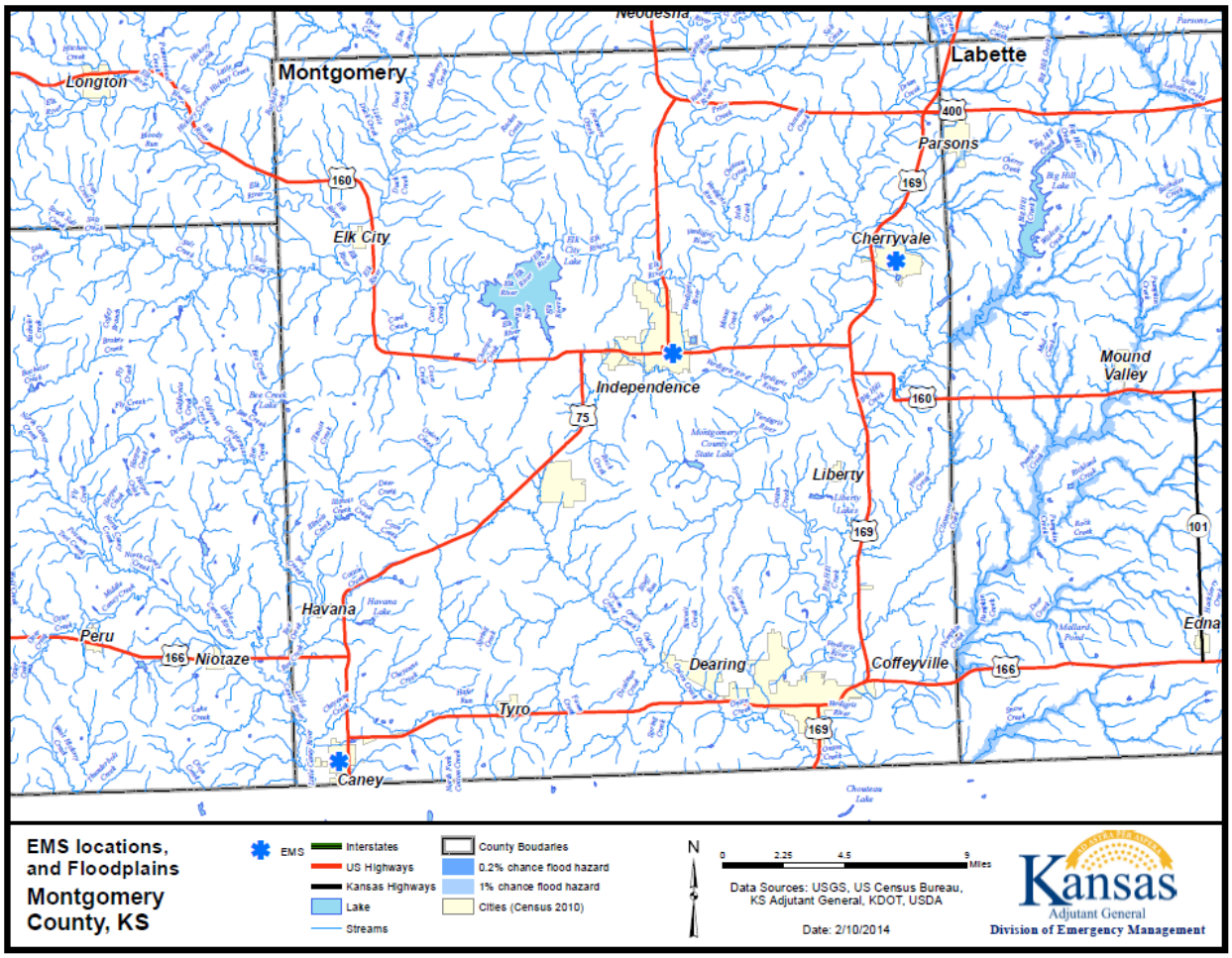
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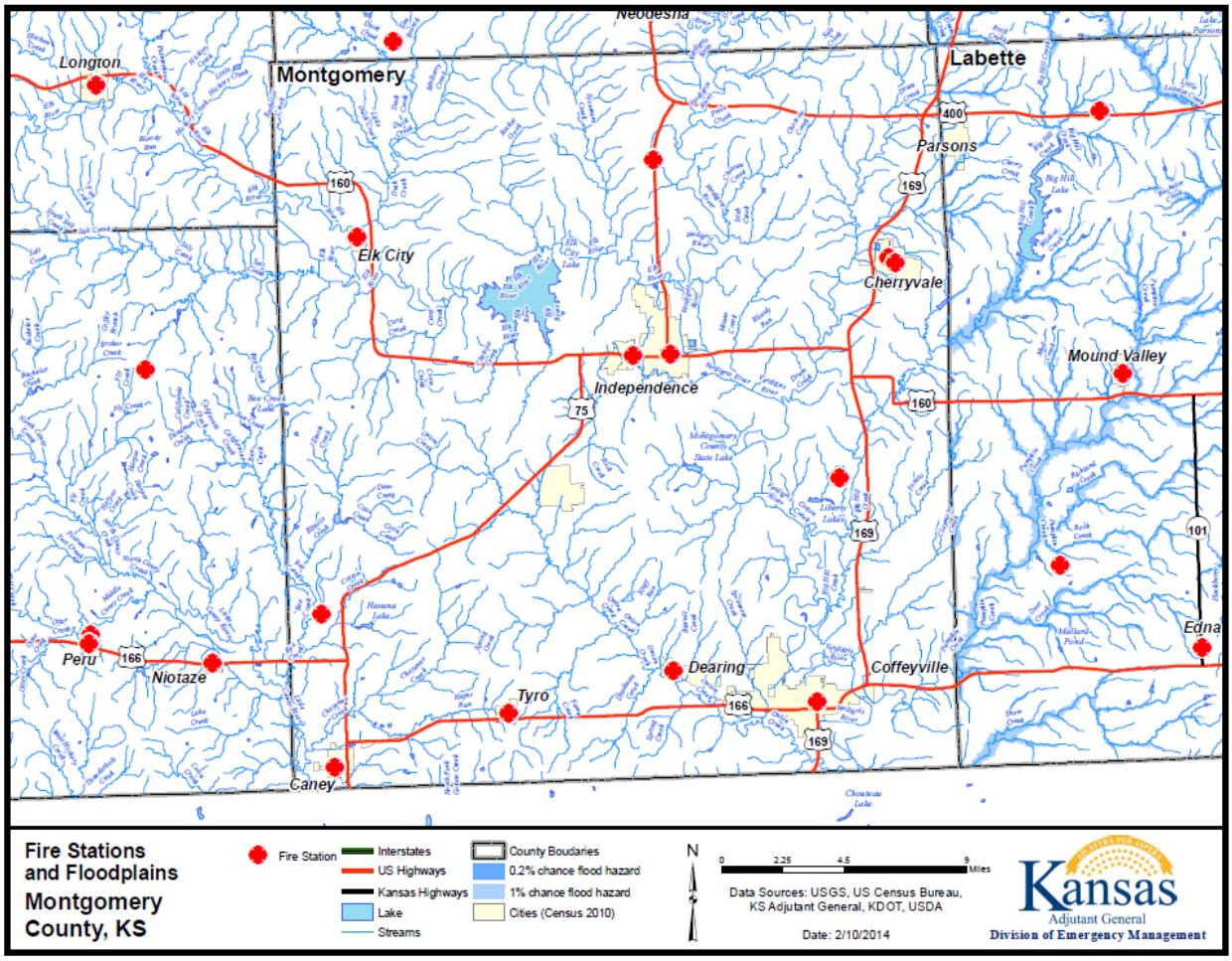
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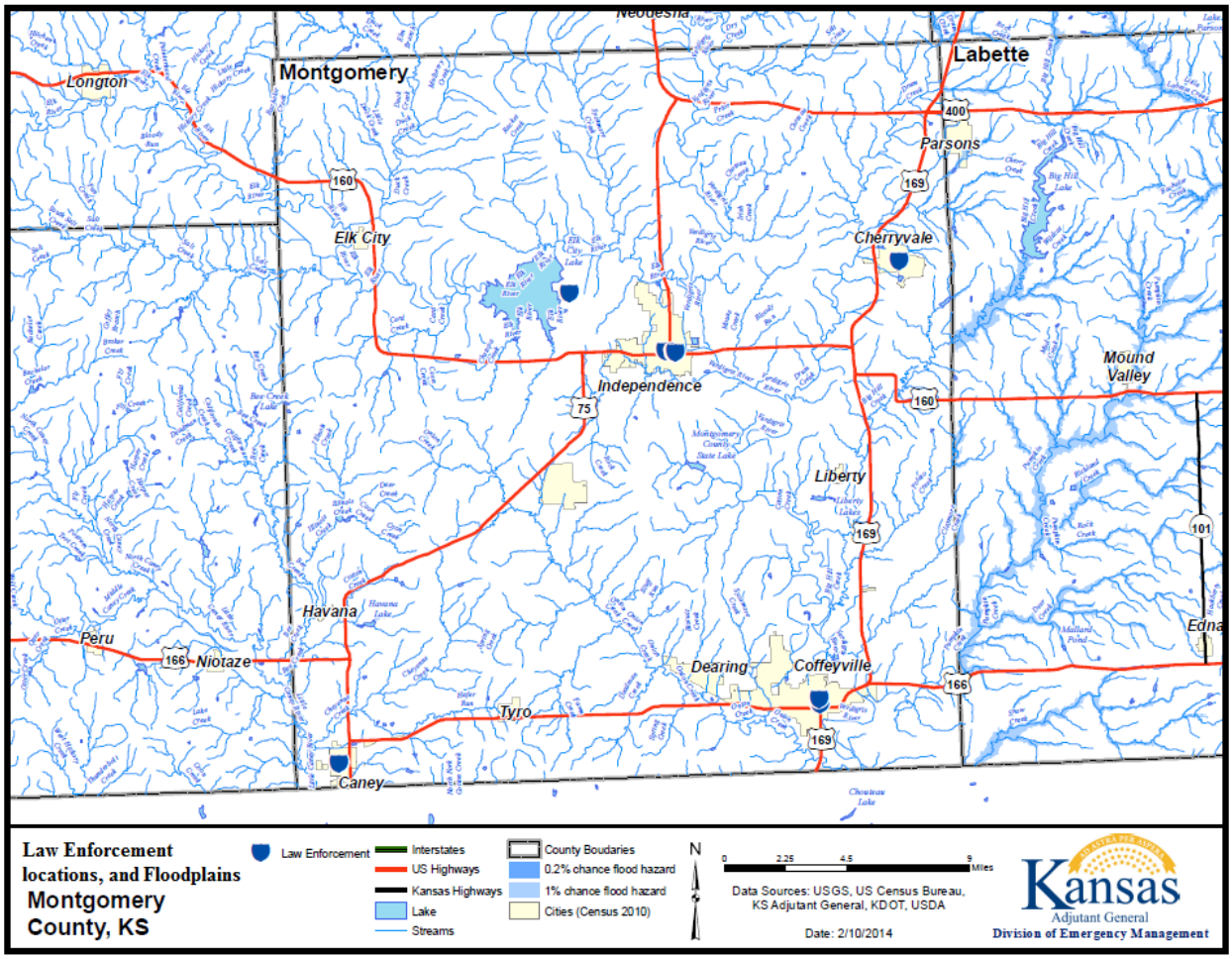
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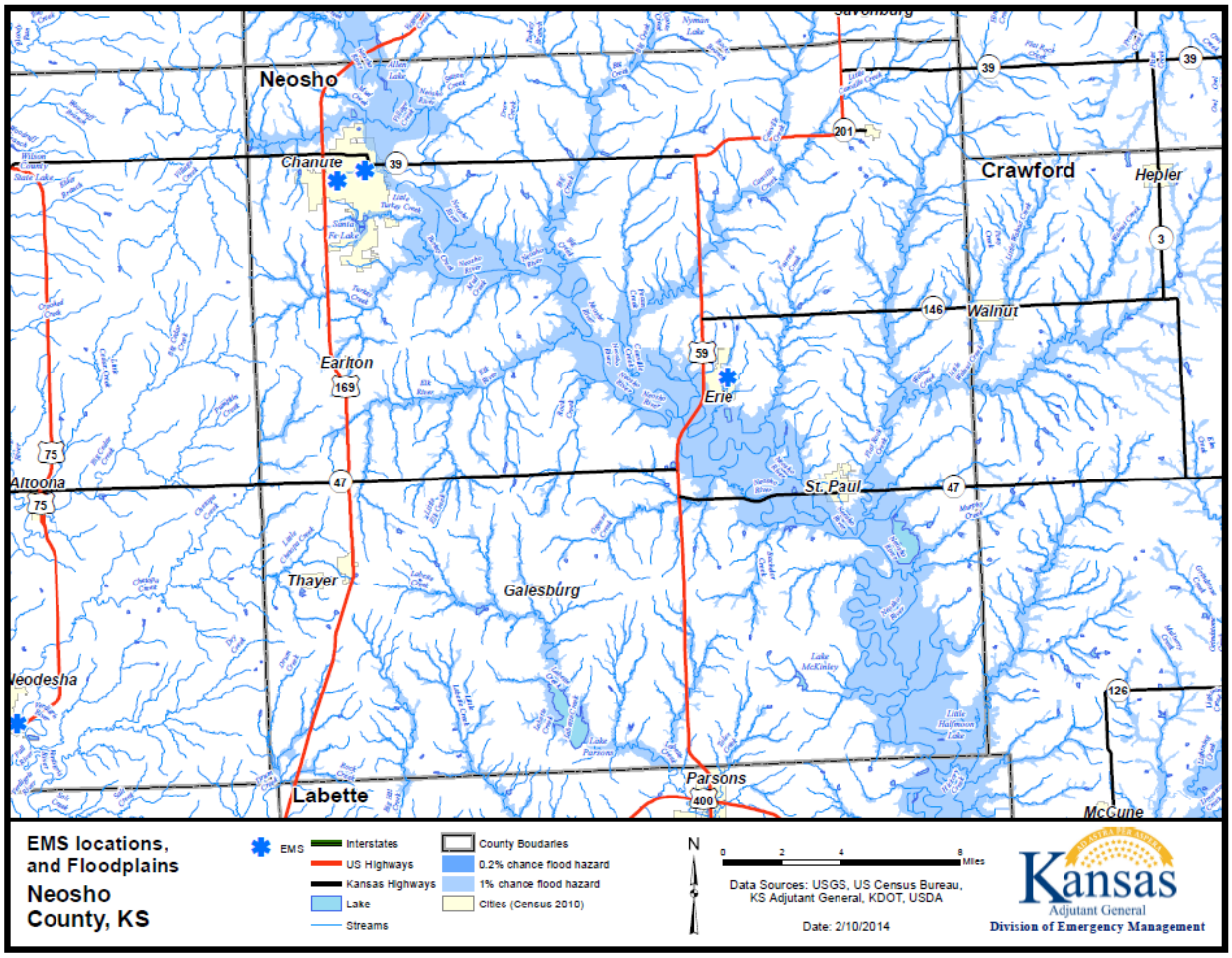
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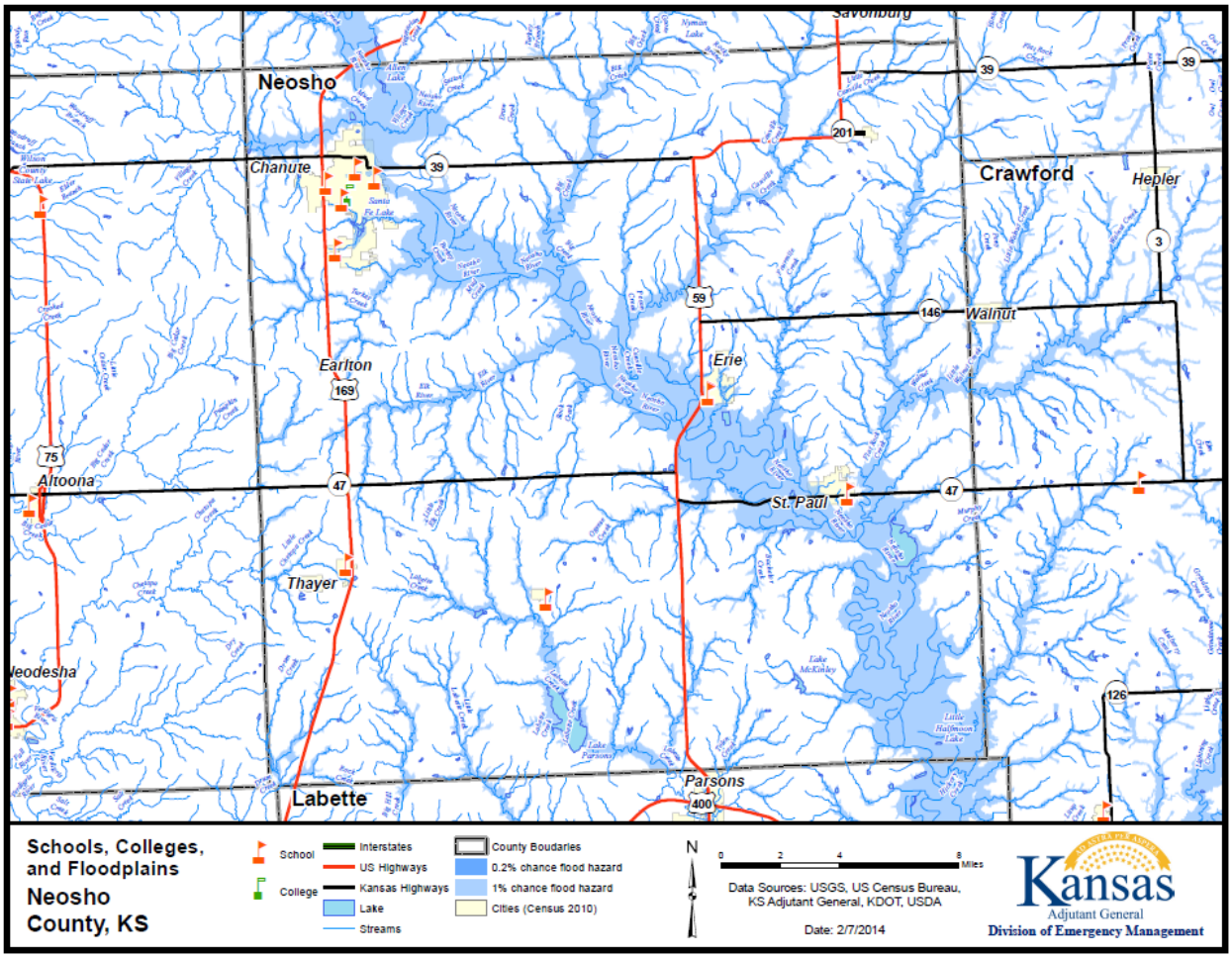
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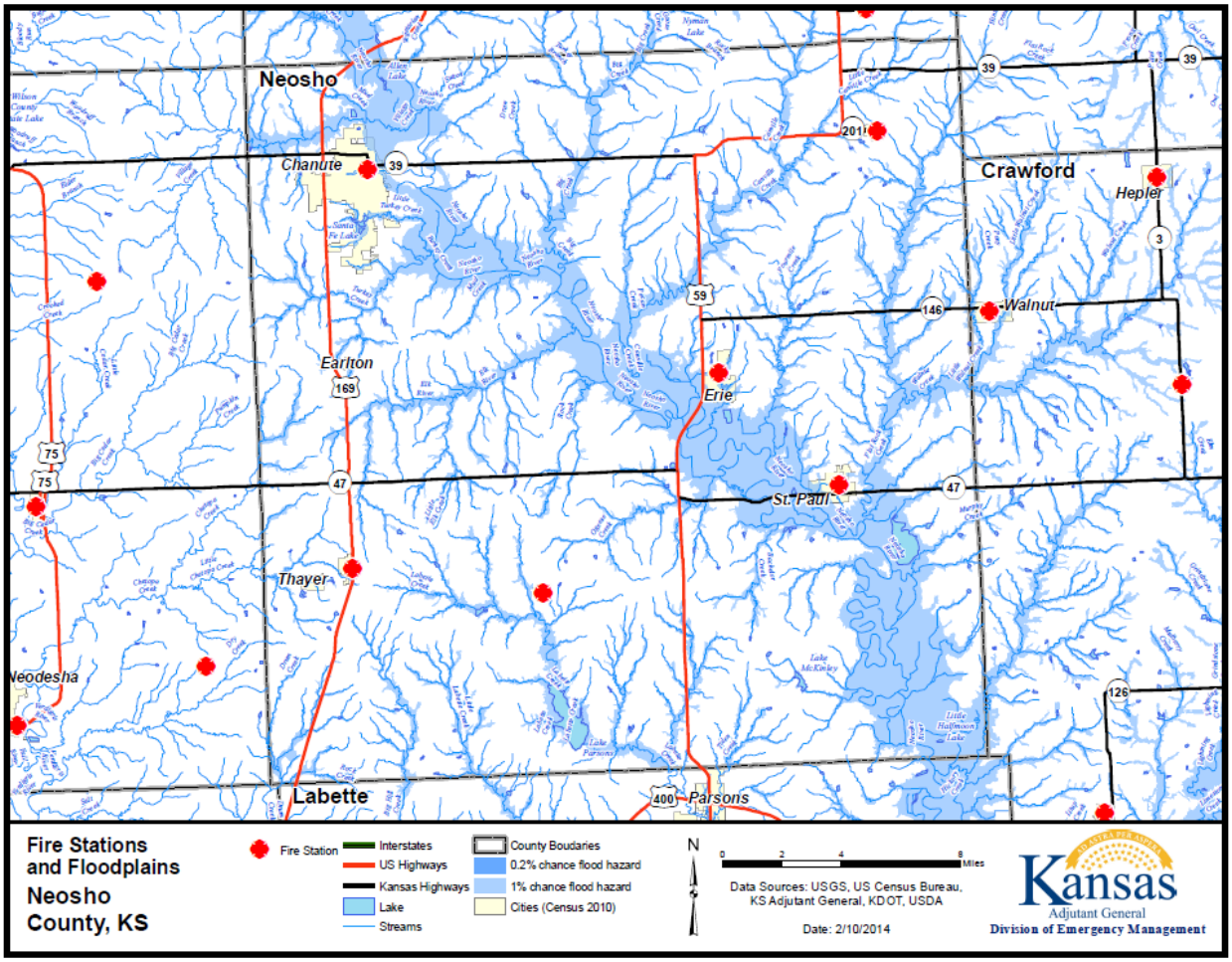
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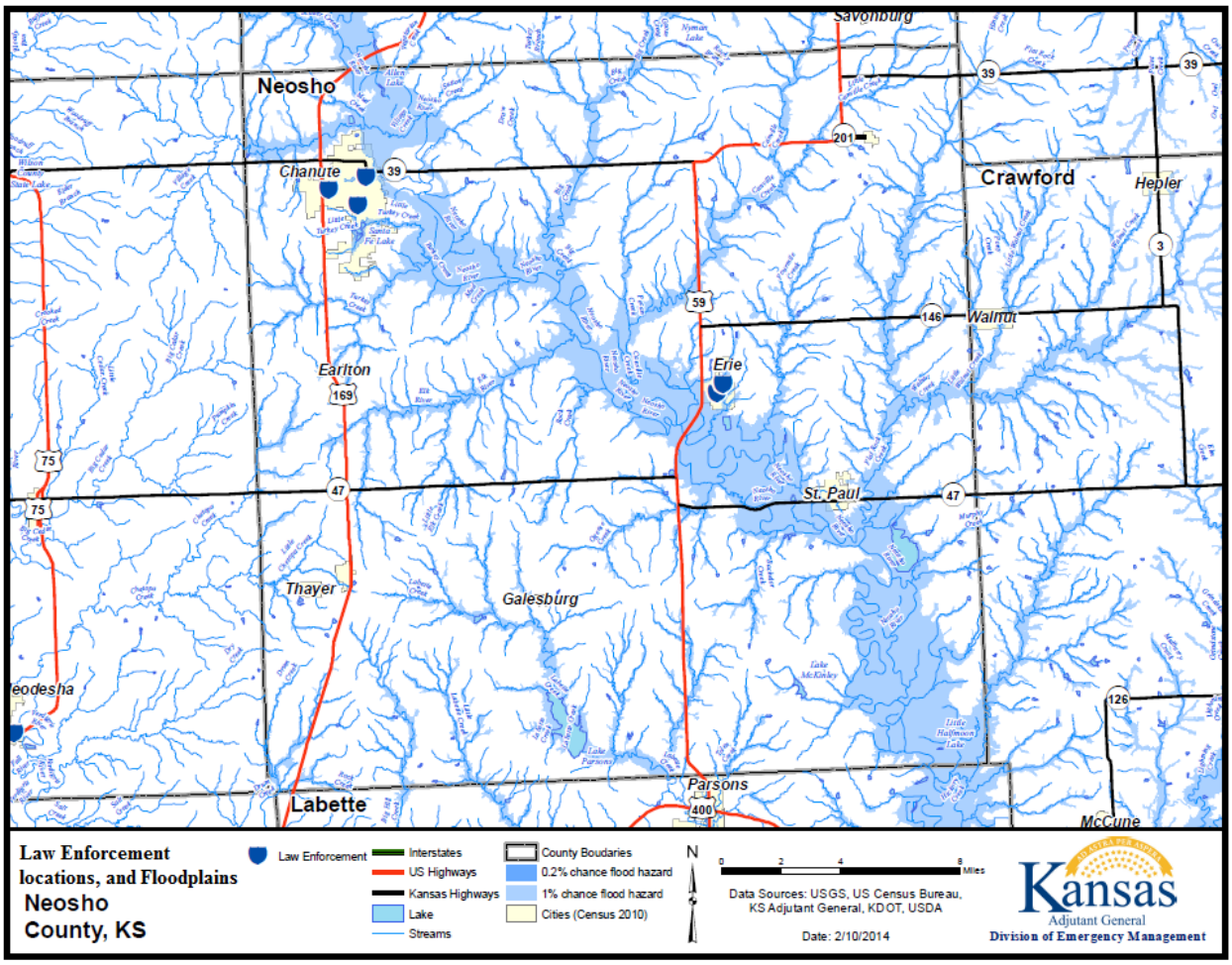
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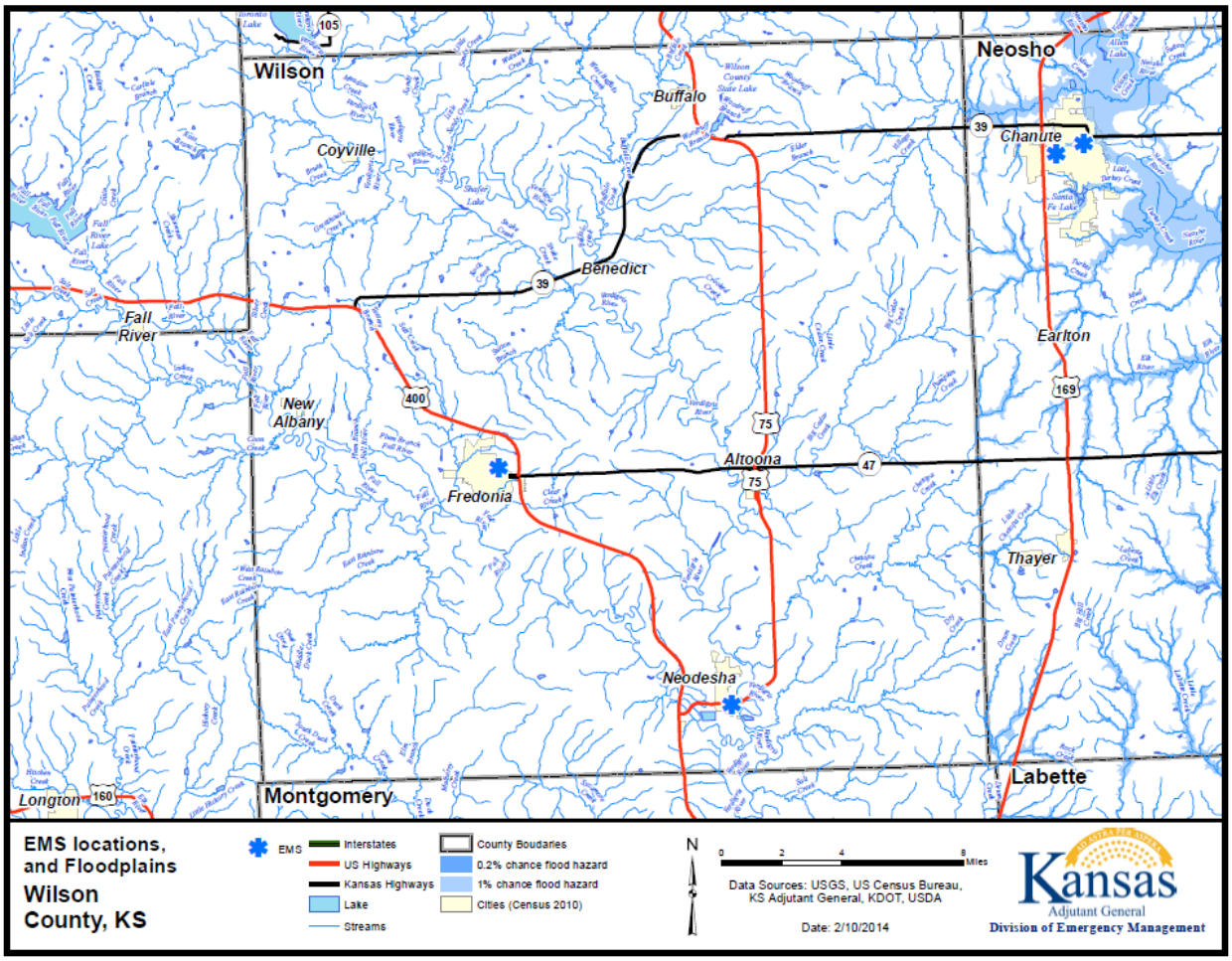
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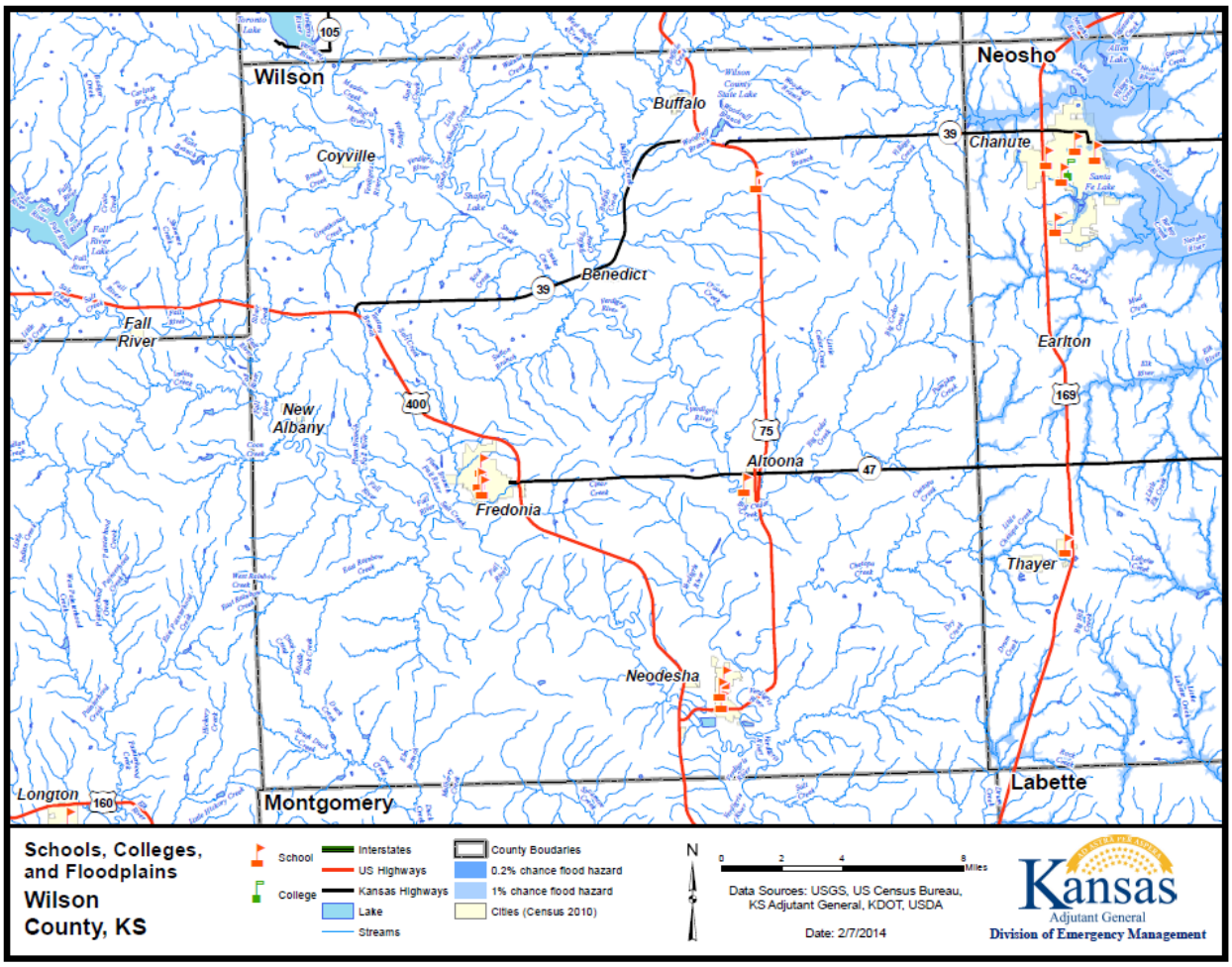
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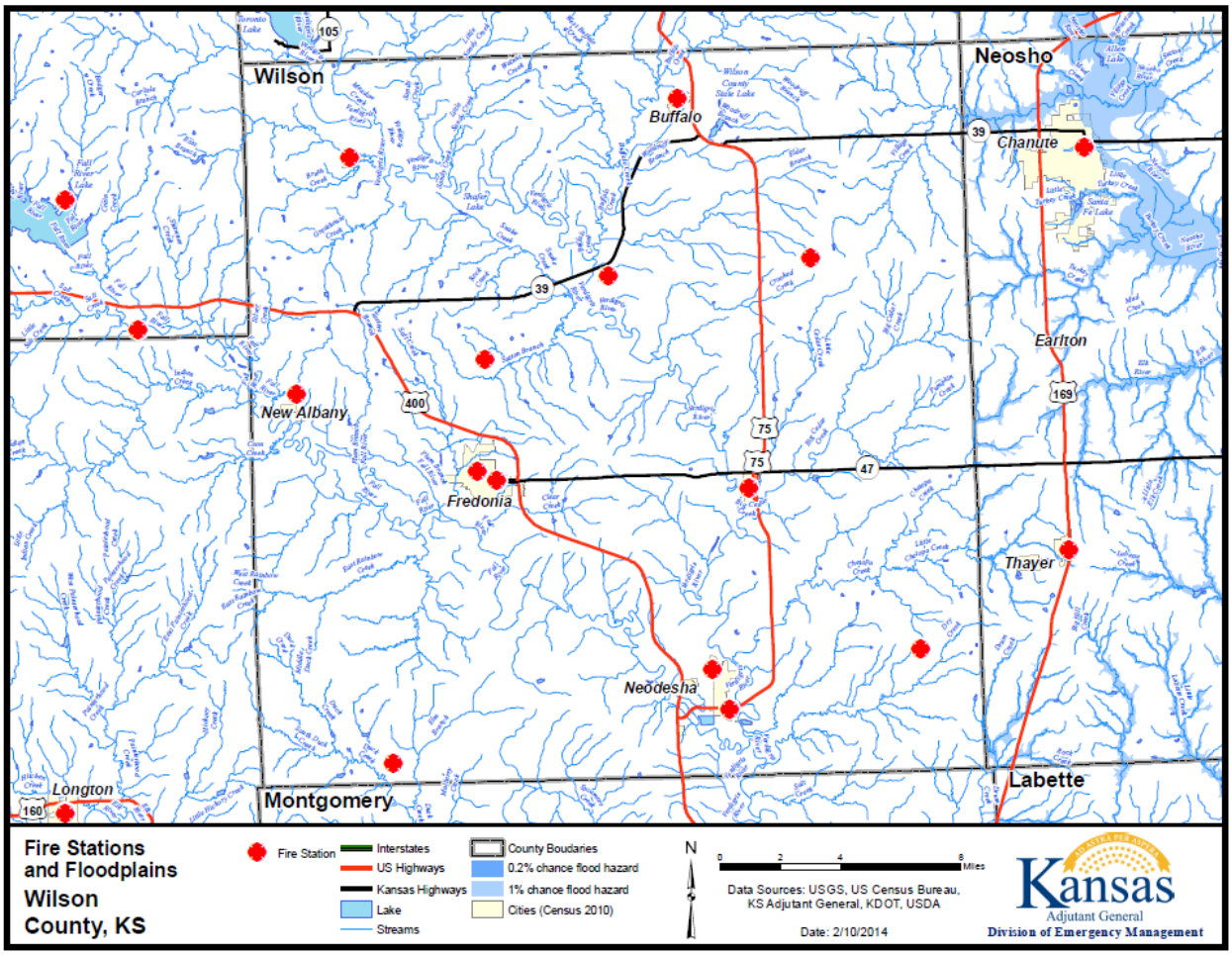
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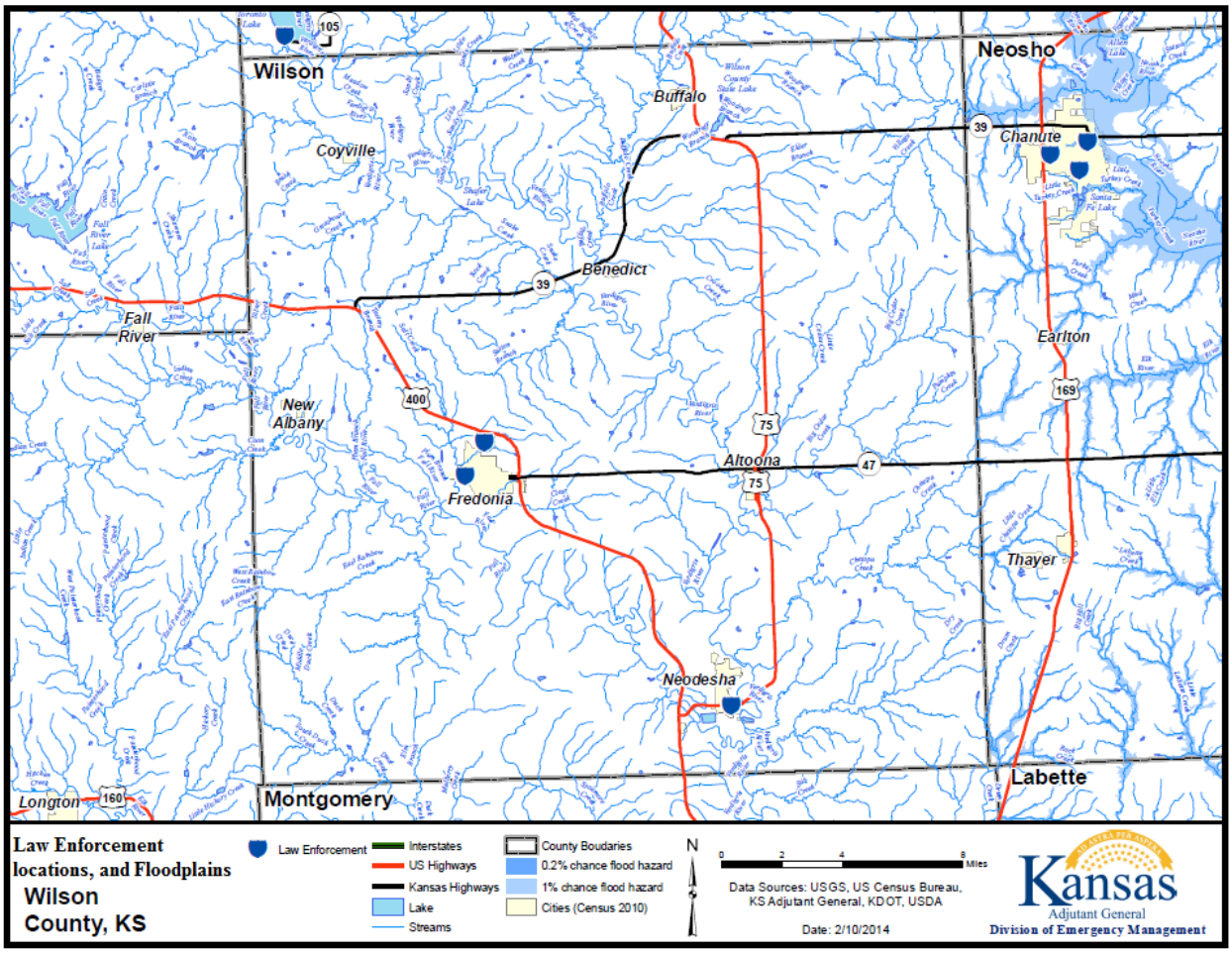
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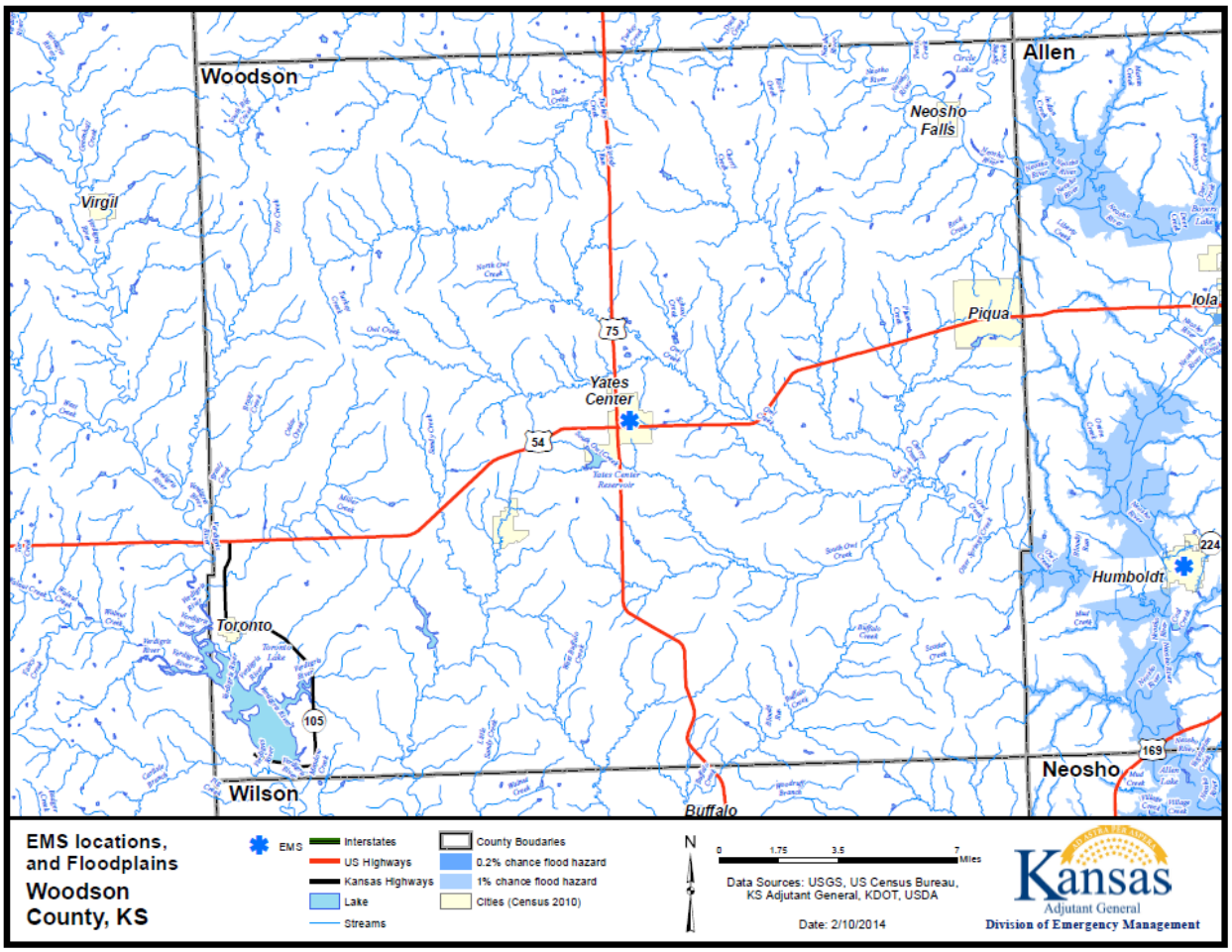
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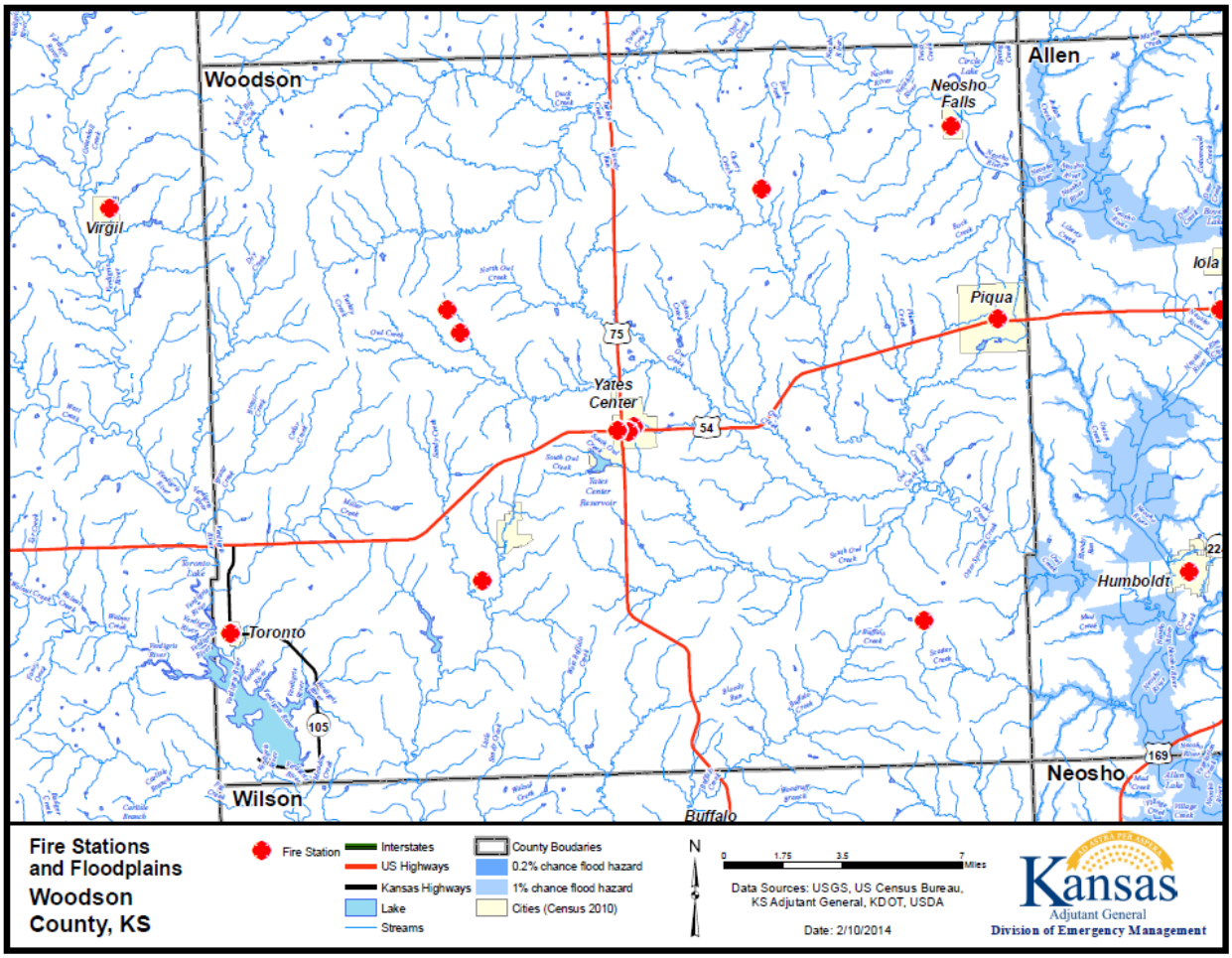
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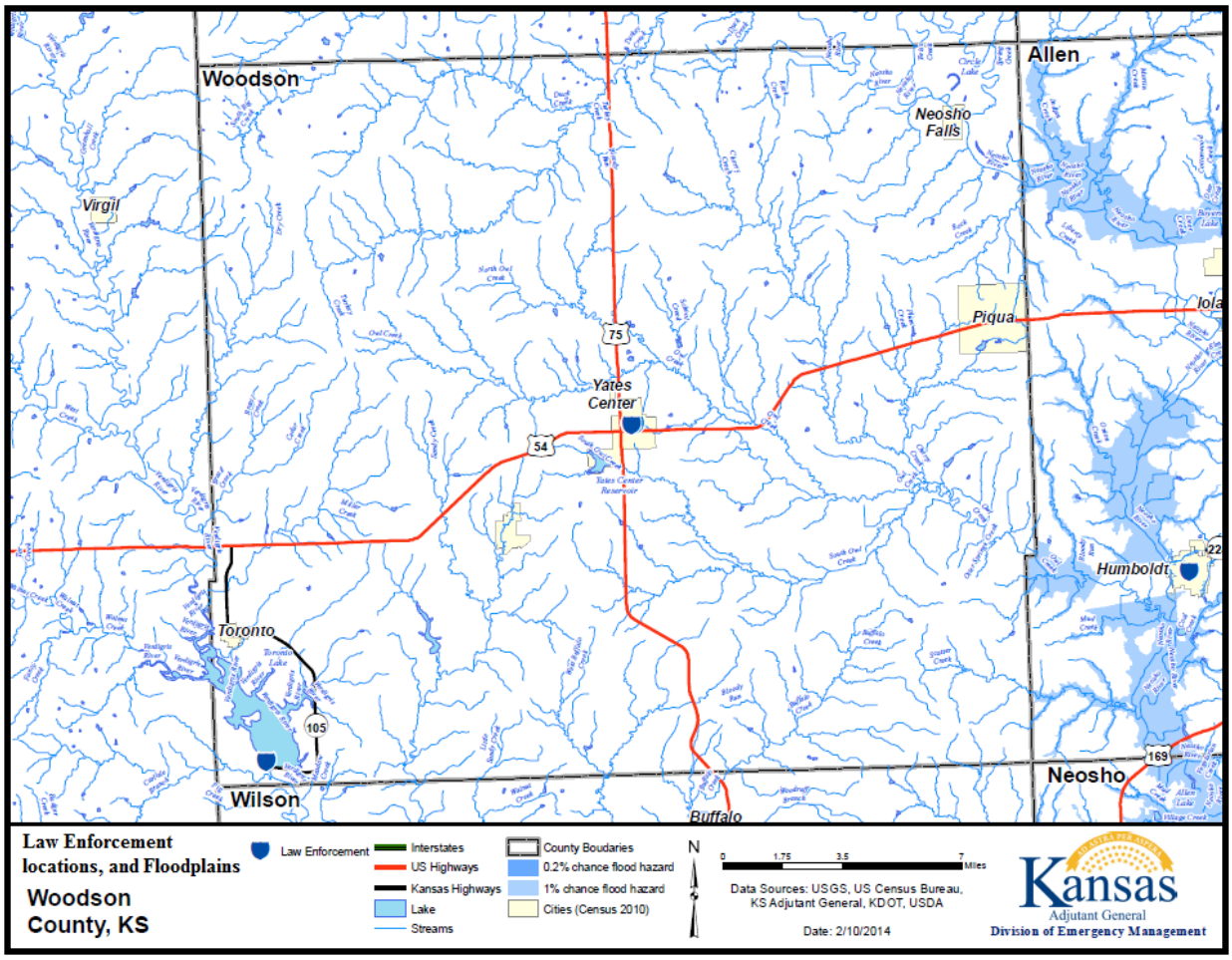



| | Magnitude/Severity |
|---|---|
| Flood | 2.92 |

## Local Concerns

The following detail specific local concerns as related to flooding:

- In Allen County, major flood problems occur in the low-lying areas of Iola and Humboldt and the Neosho River floodplain between the two towns. The flooding in June/July 2007 demonstrated the high vulnerability of local roads and highways, particularly in Iola, where transportation access was cut off by floodwaters and commercial, residential, and public structures were damaged.

- In Bourbon County, Fort Scott is at risk of flooding from the Marmaton River and its tributaries. Particular areas of concern include the west and north sides of the town, the central portion of the city in a south to north direction, and the northeast section of the city along East Creek. In the City of Fulton, approximately half of the land east of third street is within a potential flood area. In the City of Mapleton a flood zone is located in

the southwest quadrant of town. The City of Redfield has two identified special flood hazard areas created by an unnamed tributary of the Marmaton River.

- In Crawford County, the City of Pittsburg is vulnerable to flooding from First Cow Creek, Taylor Branch and East Fork Taylor Branch. Taylor Branch, East Fork Taylor Branch and South Drain are responsible for short-term flooding produced by locally heavy rainstorms. Flooding along Taylor Branch is compounded by undersized culverts at the Kansas City Southern Railway and the Missouri Pacific railroad for large frequency flows.

- In Elk County, the City of Moline and vicinity has approximately 30 residences at risk to flooding.

- In Labette County, the floodplain of Labette Creek near the City of Parsons covers city's water treatment and sewage disposal plants. Within the City of Parsons, the floodplain includes several residences and an industrial park in the northern area. The floodplain of Little Labette Creek also includes several residences and an industrial park.

- In Montgomery County, the Verdigris River flows along the eastern boundary of the city of Independence and the eastern outskirts of Coffeyville. Floods on the Verdigris River are generally caused by relatively low intensity rainfall several days in duration. In the City of Cherryvale, an inadequate storm water management system that fails during heavy rains is a primary cause of flooding, particularly impacting two city blocks on the city's west side.

- In Wilson County, most occurs along the Fall and Verdigris Rivers and their tributaries. It is most severe at the confluence of the two rivers in the southeast part of the County near the City of Neodesha.

**Future Development**

Continuing land development in southeast Kansas could place more people and property in flood-prone areas, unless floodplain management is implemented. It is not known how much development is occurring in flood hazard areas, but for communities in these counties that participate in the NFIP, any development in the floodplain should be built according to its corresponding floodplain management ordinance. According to the State's minimum standards, the first floor elevations of residential property must be a minimum of one foot above the base flood elevation. For non-residential properties, the standard is to either elevate or flood proof to one foot above the base flood elevation.

The Department of Agriculture, Division of Water Resources conducts Community Assistance Contacts which offer assistance to the participating communities and assess the floodplain program. Community Assistance Visits which are similar to full audits, are also conducted by the Division of Water Resources in order to ensure communities are in compliance with the floodplain management program.

Of note, southeast Kansas, in general, is not densely populated. Additionally, data suggests that the population in rural areas of southeast Kansas is in decline, as is the rate of development, which could potentially limit future development in flood prone areas. However, larger population centers are showing an increase in population and may be at greater risk to this hazard if development is not regulated in flood prone areas.

**Probability of Future Hazard Events**

Based on the NCDC historical data available from 2001 to 2012, there were 389 flood and flash flood events in the region. On average, this equates to 32 events per year. And while past occurrences are no guarantee of future occurrences, considering that there are floods and flash floods occurring every year regionally, it is reasonable to determine that the overall probability of future flooding occurrence is likely.

| | Probability |
|---|---|
| Flood | 3.25 |

**Consequence Analysis**

The information in the following table provides the Consequence Analysis:

**Flood Consequence Analysis**

| Subject | Ranking | Impacts of Flood |
|---|---|---|
| Health and Safety of Persons in the Area of the Incident | Severe | Impact dependent on the level of flood waters. Individuals further away from the incident area are at a lower risk. Casualties are dependent on warning time. |
| Responders | Minimal | Impact to responders is expected to be minimal unless responders live within the affected area. |
| Continuity of Operations | Minimal to Severe | Temporary relocation may be necessary if inundation affects government facilities. |
| Property, Facilities, and Infrastructure | Severe | Localized impact could be severe in the inundation area of the incident to facilities and infrastructure. The further away from the incident area the damage lessens. |
| Delivery of Services | Minimal to Severe | Delivery of services could be affected if there is any disruption to the roads and/or utilities. |
| Environment | Severe | Impact will be severe for impacted area. Impact will lessen with distance. |
| Economic Conditions | Minimal to Severe | Impacts to the economy depend on the area flooded, depth of water, and amount of time for water to recede. |
| Public Confidence in Governance | Minimal to Severe | Perception of whether the flood could have been prevented, warning time, and response and recovery time will greatly impact the public's confidence. |

### 3.7.9 HAILSTORM

| | Probability | Magnitude/Severity | Warning Time | Duration | CPRI |
|---|---|---|---|---|---|
| Hailstorm | 3.75 | 1.50 | 2.83 | 1.00 | **2.66** |

**Description**

According to NOAA, hail is precipitation that is formed when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere causing them to freeze. The raindrops form into small frozen droplets and then continue to grow as they come into contact with super-cooled water which will freeze on contact with the frozen rain droplet. This frozen rain droplet can continue to grow and form hail. As long as the updraft forces can support or suspend the weight of the hailstone, hail can continue to grow. At the time when the updraft can no longer support the hailstone, it will fall down to the earth.

In the United States, hail causes more than $1 billion in damage to property crops and livestock each year. Because of the large agricultural industry in south-east Kansas, crop damage and livestock losses due to hail are of great concern to the region. Even relatively small hail can cause serious damage to crops and trees. Vehicles, roofs of buildings and homes, and landscaping are the other things most commonly damaged by hail. Hail has been known to cause injury and the occasional fatality to humans, often associated with traffic accidents.

| | Warning Time |
|---|---|
| Hailstorm | 2.83 |

| | Duration |
|---|---|
| Hailstorm | 1.00 |

**Hazard Location**

Hailstorms occur over broad geographic regions. The entire planning area, including all participating jurisdictions, is at risk to hailstorms.

**Previous Occurrences**

The following detail notable regional hail events.

> **3/28/2012: Madison, Greenwood County**: Hail stone diameters ranged from golfball size to just over three-inches in Madison. Widespread roof and car damage likely occurred. Property damage estimated at $1,000,000.
>
> **2/28/2012: Cherryvale, Montgomery County**: Winds estimated around 70 mph in conjunction with hail ranging from golf ball to baseball size produced extensive damage across Cherryvale. The wind-driven hail produced widespread roof, siding, car and

window damage with hundreds of structures sustaining some type of damage. Property damage estimated between $4 million and $5 million dollars.

**6/26/2011: Cherokee County**: The Baxter Springs Fire Chief reported windshields broken at the intersection of Highways 166 and 69. Estimated $20,000 in property damage.

**5/22/2011: Columbus, Cherokee County**: A strong upper level trough across the central plains region and a strong upper level disturbance along with a frontal boundary in the area produced numerous severe storms with a few supercells across southeast Kansas. Estimated $50,000 in property damage.

**5/12/2011: Arma, Crawford County**: Numerous severe storms and a few supercells which produced very large hail and high wind gusts developed over the region. Estimated $20,000 in property damage.

**3/19/2011: Coffeyville, Montgomery County**: Golf ball to ping-pong ball size hail pelted Coffeyville during the early morning hours of the 19th. The hail dented numerous vehicles across town, damaged air conditioning units at the Public Library and City Hall, and also damaged about 40 globes on downtown street lights. Property damage amounts are rough estimates. Estimated $50,000 in property damage.

**7/8/2009: Bronson, Bourbon County**: A supercell thunderstorm produced golf ball sized hail over the community of Bronson. Nearly every home in Bronson sustained window damage and siding damage from this wind driven large hail. Estimated $2,000,000 in property damage.

**6/30/2005: Weir, Cherokee County**: A supercell thunderstorm tracked southeast across Cherokee County, which spawned two weak tornados that mainly affected open farm land. A National Weather Service storm survey revealed that mainly tree damage occurred from the tornados. Along with the tornados, a swath of golf ball size hail occurred along the storm track. Estimated $60,000 in property damage.

**6/30/2005: Yates Center, Woodson County**: Crops affected/Estimated Acreage/Percent of Yield Losses: Corn: 4,000/2.2%; Soybeans: 4,000/6.3%; Hay (all types): 1,000/4%; Grain sorghum: 1,000/2.2%. Other land damages: 120 Acres. Estimated $415,000 in crop damage.

**5/22/2005: Moline, Elk County**: Unspecified number of vehicles damaged with windows broken out of homes, businesses and vehicles.

**6/12/2004: Yates Center, Woodson County**: Sixteen farm dwellings & service buildings ($96,000), three pieces of equipment ($1,200), and an estimated 4,800 acres of

land (800 acres of corn,1,400 acres or wheat; 1,200 acres of soybeans; 1,200 acres of grain; 200 acres of hay) ($21,600) due primarily to gullying and erosion sustained damage. Additional damage included broken windows in numerous buildings, including the courthouse, damage to roofs and siding on numerous homes and damage to trees and other foliage. Estimated $97,200 in property damage and $21,600 in crop damage.

**5/6/2003: Humbolt, Allen County**: The roofs of approximately 80% of all buildings, require replacement and approximately 50% of all vehicles were damaged. Estimated $500,000 in property damage.

**6/3/2001: Crestline, Cherokee County**: Trees were uprooted around Crestline and quarter sized hail was reported near Scammon. Sheriff's officers reported both the wheat and corn crops were damaged as quarter sized hail piled up across the northeast part of the county. Estimated $250,000 in crop damage.

The following table details NCDC hail event information.

**NCDC Hail Events, 2000 - 2012**

| County | Number of Hail Events | Maximum Amount, in Inches | Property Damages | Crop Damages |
|---|---|---|---|---|
| Allen | 101 | 4.25 | $512,500 | $50,000 |
| Bourbon | 93 | 4.25 | $2,006,000 | $50,000 |
| Chautauqua | 117 | 2.75 | $0 | $0 |
| Cherokee | 107 | 2.75 | $145,000 | $250,000 |
| Crawford | 108 | 2.75 | $10,000 | $0 |
| Elk | 97 | 2.75 | $25,000 | $0 |
| Greenwood | 88 | 4.25 | $1,000,000 | $0 |
| Labette | 119 | 4.5 | $500 | $0 |
| Montgomery | 153 | 3 | $5,050,000 | $0 |
| Neosho | 82 | 2.75 | $0 | $0 |
| Wilson | 115 | 3 | $0 | $8,000 |
| Woodson | 74 | 2.75 | $97,200 | $436,600 |
| Regional Total | 1,254 | - | $8,846,200 | $794,600 |

Source: NCDC Storm Events Database

**Local Events**

**April 2012: USD 503, Labette County**: Hail struck air conditioning units on USD 503 buildings resulting in $17,682 in damages.

**March 2012: Independence Bible School, Montgomery County:** A hailstorm damaged the roof of all buildings resulting in $168,000 of insured losses.

**July 2007: City of Fredonia in Wilson County.** A severe flood resulted in damage to buildings and infrastructure, including the power plant, sewer plant and water plant. It also resulted in the temporary relocation of citizens and the closure of roads.

**Hazard Vulnerability and Impact**

Based on information provided by the Tornado and Storm Research Organization, the following table describes typical damage impacts of the various sizes of hail.

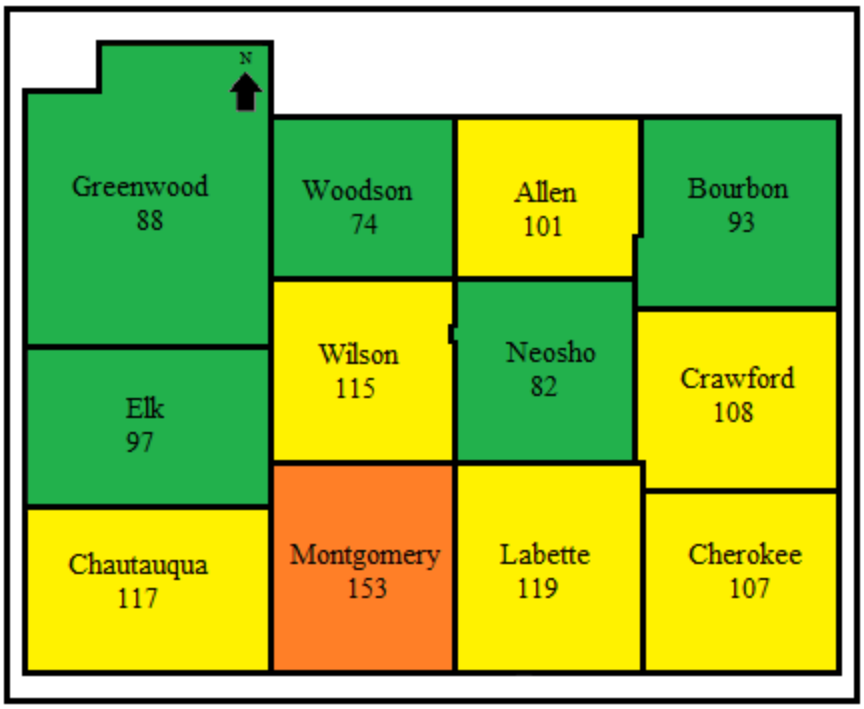
**Tornado and Storm Research Organization Hail Damage Descriptions**

| Intensity Category | Diameter (inches) | Size Description | Typical Damage Impacts |
|---|---|---|---|
| Hard Hail | 0.2-0.4 | Pea | No damage |
| Potentially Damaging | 0.4-0.6 | Mothball | Slight general damage to plants, crops |
| Significant | 0.6-0.8 | Marble, grape | Significant damage to crop and vegetation |
| Severe | 0.8-1.2 | Walnut | Severe damage to crops, damage to glass and plastic, paint and wood scored |
| Severe | 1.2-1.6 | Pigeon's egg > squash ball | Widespread glass damage, vehicle bodywork damage |
| Destructive | 1.6-2.0 | Golf ball > Pullet's egg | Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries |
| Destructive | 2.0-2.4 | Hen's egg | Bodywork of grounded aircraft dented, brick walls pitted |
| Destructive | 2.4-3.0 | Tennis ball > cricket ball | Severe roof damage, risk of serious injuries |
| Destructive | 3.0-3.5 | Large orange > Soft ball | Severe damage to aircraft bodywork |
| Super Hailstorms | 3.6-3.9 | Grapefruit | Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open |
| Super Hailstorms | 4.0+ | Melon | Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open |

Source: Tornado and Storm Research Organization

The following map show the number of hail events in each county from 2000 - 2012, as per NCDC data.

NCDC Number of Hail Events, 2000 - 2012




The following are the data sources for the rating factors: Social Vulnerability Index for Kansas counties from the Hazards and Vulnerability Research Institute at the University of South Carolina, NCDC storm events (2006 – 2012), U.S. Census Bureau (2010), USDA's Census of Agriculture (2007) and USDA Risk Management Agency (2002 – 2011). Please note that the data on crop losses only applies to insured crops. According to the *2011 Kansas Crop Insurance Profile Report* issued by the USDA Risk Management Agency 82 percent of Kansas' row crops were insured in 2011.

It was determined that since hail is a common occurrence in Kansas, that using historical events and property damages from 2006 forward provides adequate events to describe the hail hazard in southeast Kansas.

**Vulnerability Factor Amounts for Hail**

| County | SoVI Rating (1-5) | Prior Events 2006-2012 | Property Damages | Annualized Property Damages | Total Building Exposure ($000) | Population Density | Crop Exposure (2007 Census of Agriculture) | Crop Insurance Paid for Hail | Annualized Crop Insurance Paid |
|---|---|---|---|---|---|---|---|---|---|
| Allen | 3 | 18 | $12,500 | $1,786 | $983,778 | 27 | $15,462,000 | $439,019 | $43,902 |
| Bourbon | 4 | 51 | $2,000,000 | $285,714 | $1,102,488 | 24 | $9,918,000 | $198,706 | $19,871 |
| Chautauqua | 5 | 63 | $0 | $0 | $285,438 | 5.7 | $4,971,000 | $12,323 | $1,232 |
| Cherokee | 4 | 60 | $20,000 | $2,857 | $1,293,753 | 37 | $53,420,000 | $436,412 | $43,641 |
| Crawford | 3 | 54 | $0 | $0 | $2,588,817 | 66 | $34,463,000 | $853,832 | $85,383 |
| Elk | 5 | 56 | $0 | $0 | $187,291 | 4.5 | $0 | $25,277 | $2,528 |
| Greenwood | 5 | 59 | $3,000,100 | $428,586 | $491,412 | 5.9 | $8,087,000 | $16,880 | $1,688 |
| Labette | 4 | 54 | $0 | $0 | $1,453,850 | 34 | $22,765,000 | $177,131 | $17,713 |
| Montgomery | 4 | 90 | $5,050,000 | $721,429 | $2,432,183 | 55 | $16,616,000 | $209,878 | $20,988 |
| Neosho | 4 | 43 | $0 | $0 | $1,174,150 | 29 | $17,811,000 | $780,420 | $78,042 |
| Wilson | 4 | 58 | $0 | $0 | $671,059 | 17 | $26,882,000 | $179,567 | $17,957 |
| Woodson | 5 | 31 | $0 | $0 | $207,905 | 6.6 | $14,486,000 | $103,964 | $10,396 |
| Regional Total | | 637 | $10,082,600 | $1,440,371 | $12,872,124 | | $224,881,000 | $3,433,409 | $343,341 |

Note: The Census of Agriculture did not publish crop exposure in Elk county to avoid disclosure of individual operations.

Using the above information, a value of 1-10 was assigned to the data obtained for each factor and then weighted equally and factored together to obtain overall vulnerability scores for comparison and to determine the greatest vulnerable counties. The Social Vulnerability Index is in a range of 1- 5. To give Social Vulnerability Index the same weight as the other factors, the numbers were multiplied by two.

**Hail Data Rating Determination**

| Ratings | Social Vulnerability | NCDC Prior Events | Annualized Property Damage | Building Exposure Valuation | Population Density * | Crop Exposure | Annualized Crop Loss |
|---|---|---|---|---|---|---|---|
| 1 | | 18 - 55 | 0 - $10,000 | $117,421 - $4,492,825 | 1.6 - 116.3 | 0 - $18,548,500 | 0 - $100,000 |
| 2 | 1 | 56 - 90 | $10,001 - $50,000 | $4,492,826 - $8,868,229 | 116.4 - 231.1 | $18,548,501 - $32,126,000 | $100,001 - $300,000 |
| 3 | | 91 - 125 | $50,001 - $100,000 | $8,868,230 - $13,243,634 | 231.2 - 345.9 | $32,126,001 - $45,703,500 | $300,000 - $500,000 |
| 4 | 2 | 126 - 160 | $100,001 - $300,000 | $13,243,635 - $17,619,039 | 346 - 460.7 | $45,703,501 - $59,281,000 | $500,001 - $700,000 |
| 5 | | 161 - 195 | $300,001 - $500,000 | $17,619,040 - $21,994,444 | 460.8 - 575.5 | $59,281,001 - $72,858,500 | $700,001 - $900,000 |
| 6 | 3 | 196 - 230 | $500,001 - $700,000 | $21,994,445 - $26,369,848 | 575.6 - 690.3 | $72,858,501 - $86,436,000 | $900,001 - $1,100,000 |
| 7 | | 231 - 265 | $700,001 - $900,000 | $26,369,849 - $30,745,253 | 690.4 - 805.1 | $86,436,001 - $100,013,500 | $1,100,001 - $1,300,000 |
| 8 | 4 | 266 - 300 | $900,001 - $1,100,000 | $30,745,254 - $35,120,658 | 805.2 - 919.9 | $100,031,501 - $113,591,000 | $1,300,001 - $1,700,000 |
| 9 | | 301 - 335 | $1,000,001 - $4,000,000 | $35,120,659 - $39,496,062 | 920- 1,034.7 | $113,591,001 - $127,168,500 | $1,700,001 - $2,100,000 |
| 10 | 5 | 336 - 370 | $4,000,000 - $32,012,357 | $39,496,063 - $43,871,468 | 1,034.8 - 1,149.6 | $127,168,501 - $140,746,000 | $2,100,000 - $2,300,000 |

Based on the above ratings system, ranges were applied to each county to determine their potential vulnerability. The following related the scoring to a vulnerability assessment:

- **Low:** Score range of 9 -14
- **Medium-Low:** Score range of 15 - 21
- **Medium:** Score range of 22 - 28
- **Medium-High:** Score range of 29 - 35
- **High:** Score range of 36 - 41

**Vulnerability of Regional Counties to Hail**

| County | SoVi Rating | NCDC Prior Event Rating | Annualized Property Damage Rating | Bldg Exposure Valuation Rating | Population Density Rating | Crop Exposure Rating | Annualized Crop Loss Rating | Overall Vulnerability Rating | Hail Vulnerability |
|---|---|---|---|---|---|---|---|---|---|
| Allen | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 12 | Low |
| Bourbon | 8 | 1 | 4 | 1 | 1 | 1 | 1 | 17 | Medium-Low |
| Chautauqua | 10 | 2 | 1 | 1 | 1 | 1 | 1 | 17 | Medium-Low |
| Cherokee | 8 | 2 | 1 | 1 | 1 | 4 | 1 | 18 | Medium-Low |
| Crawford | 6 | 1 | 1 | 1 | 1 | 3 | 1 | 14 | Low |
| Elk | 10 | 2 | 1 | 1 | 1 | 1 | 1 | 17 | Medium-Low |
| Greenwood | 10 | 2 | 5 | 1 | 1 | 1 | 1 | 21 | Medium-Low |
| Labette | 8 | 1 | 1 | 1 | 1 | 2 | 1 | 15 | Medium-Low |
| Montgomery | 8 | 2 | 7 | 1 | 1 | 1 | 1 | 21 | Medium-Low |
| Neosho | 8 | 1 | 1 | 1 | 1 | 1 | 1 | 14 | Low |
| Wilson | 8 | 2 | 1 | 1 | 1 | 2 | 1 | 16 | Medium-Low |
| Woodson | 10 | 1 | 1 | 1 | 1 | 1 | 1 | 16 | Medium-Low |

| | Magnitude/Severity |
|---|---|
| Hailstorm | 1.50 |

**Future Development**

Future development of agricultural resources and/or increases in population would tend to increase the risk of this hazard. However, data suggests that the acres of land in farms in decreasing in southeastern Kansas. Additionally, regional data indicate that the number of cattle has been falling over the past five years. Increase in development on population centers would tend to increase the risk of this hazard due to increased housing and business stock.

**Probability of Future Hazard Events**

Severe thunderstorms that create hail events are a common occurrence throughout southeast Kansas. According to the NCDC there were 1,254 hail events in southeast Kansas between 2000 and 2012. Based on this information, there is a high probability that at least one hail event could occur in southeast Kansas in any given year.

| | Probability |
|---|---|
| Hailstorm | 3.75 |

**Consequence Analysis**

The information in the following table provides the Consequence Analysis.

| Subject | Ranking | Impacts of Hailstorm |
|---|---|---|
| Health and Safety of Persons in the Area of the Incident | Severe | Impact of the immediate area could be severe for affected areas and moderate to light for other less affected areas depending on whether individuals are caught outside during the event. |
| Responders | Minimal | Impact to responders is expected to be non-existent to minimal. |
| Continuity of Operations | Minimal to Moderate | Temporary relocation may be necessary if government facilities experience damage. |
| Property, Facilities, and Infrastructure | Severe | Localized impact could be severe to facilities and infrastructure in the incident area. Utility lines, roads, residential and business properties will be most affected. |
| Delivery of Services | Minimal to Severe | Delivery of services could be affected if there is any disruption to the roads and/or utilities due to damages sustained. |
| Environment | Severe | Impact could be severe for the immediate impacted area, depending on the size of the event. Impact will lessen as distance increases from the immediate incident area. |
| Economic Conditions | Minimal to Severe | Local economy and finances may be adversely affected, depending on damages sustained. |
| Public Confidence in Governance | Minimal to Moderate | Response and recovery will be in question if not timely and effective. Warning systems in place and the timeliness of those warnings could be questioned. |

### 3.7.10 HAZARDOUS MATERIALS

| | Probability | Magnitude/Severity | Warning Time | Duration | CPRI |
|---|---|---|---|---|---|
| Hazardous Materials | 1.42 | 2.00 | 4.00 | 1.92 | **2.03** |

**Description**

Hazardous materials and waste are a concern for southeast Kansas because a sudden accidental or intentional release of such materials can be dangerous to human health, to nearby property, and to the quality of the environment. Such releases may come from both fixed sources, such as a manufacturing or storage facility, or from a transportation source, such as a truck or pipeline. Generally, with a fixed facility, the hazards are pre-identified, and the facility is required by law to prepare a risk management plan and provide a copy to the Local Emergency Planning Committee (LEPC) and local fire departments. Accidental releases may be due to equipment failure, human error, or a natural or manmade hazard event.

Agricultural facilities throughout southeast Kansas are likely to have dangerous materials present that could pose a threat to surrounding populations in the event of an emergency or disaster. Facilities that store or use chemicals considered unusually dangerous to human safety are required by Section 112R of the Clear Air Act Amendments to assess the potential impacts of an accidental release of the chemical at their facility and to prepare risk management plan (RMP). Of particular interest to southeast Kansas is that ammonia is one of the covered hazardous materials. Numerous southeast Kansas ammonia storage and distribution facilities have filed an RMP with the U.S. Environmental Protection Agency (EPA). A database with information about southeast Kansas facilities that have RMPs is available through the EPA.

The primary agency responsible for hazardous materials within the State of Kansas is the KDHE, Division of Environment. The Kansas Response Plan, Emergency Support Function #10 – Oil and Hazardous Materials is another resource for response information. (The Kansas Response Plan has not been added as an appendix to this mitigation plan for security reasons.)

| | Warning Time |
|---|---|
| Hazardous Materials | 4.00 |

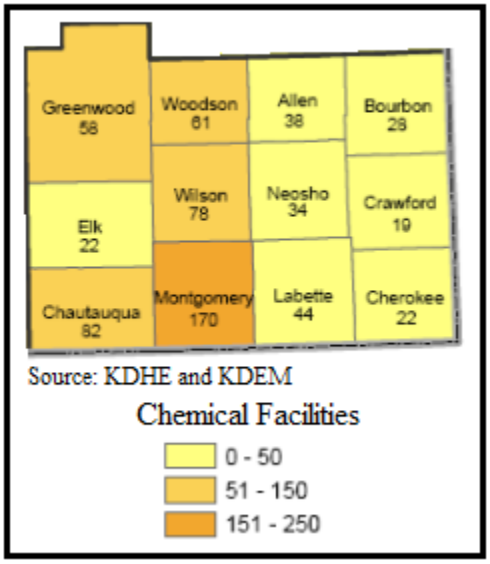
| | Duration |
|---|---|
| Hazardous Materials | 1.92 |

**Hazard Location**

Hazardous materials pose a threat to communities in southeast Kansas. Localities where hazardous materials are fabricated, processed, and stored as well as those where hazardous waste is treated, stored, and disposed of are most at risk for hazardous materials incidents. Additionally, localities along transportation corridors that carry these materials to their final destinations are also at risk.

In 2011, there were 656 facilities housing hazardous chemicals in southeast Kansas identified by the Community Right to Know Act. The number of facilities is illustrated in the following figure.

Number of Facilities Housing Hazardous Chemicals




The following table details EPA Superfund sites in southeast Kansas. A Superfund site is an uncontrolled or abandoned location where hazardous waste is located which may affect local ecosystems and/or people. One southeast Kansas site is currently on the Superfund National Priority list. The proposed date and final date are the National Priority Listing history information.

**Regional Superfund Sites**

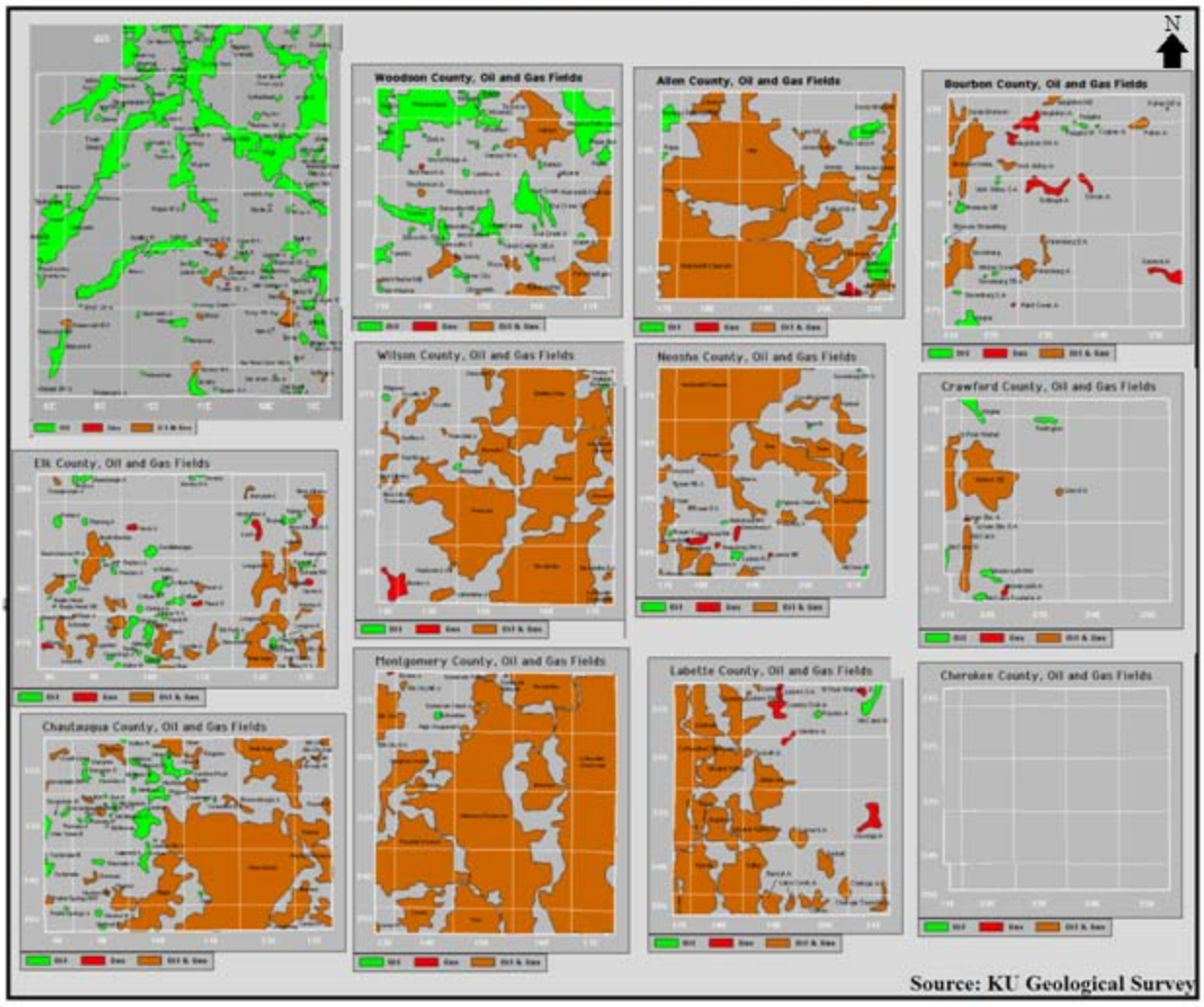
| National Priority List Sites | Cities | County | Proposed Date | Final Date |
|---|---|---|---|---|
| Cherokee County (Tri-state Mining District, Tar Creek Area) | Galena, Baxter Springs, Treece, Badger, Lawton, Waco, Crestline | Cherokee | 12/30/1982 | 9/8/1983 |

Source: U.S. EPA

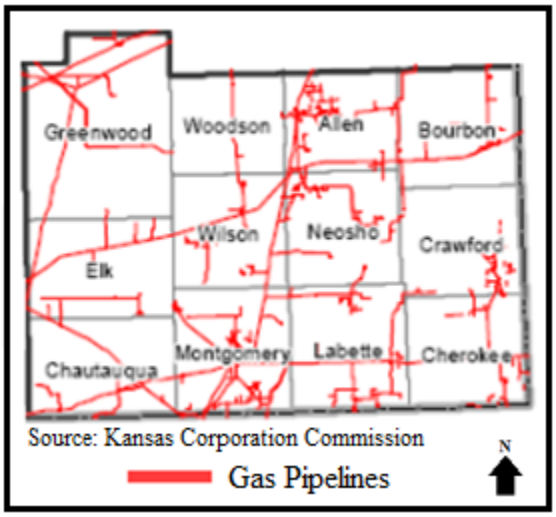
***Pipelines and Production Fields***

The following figures show production field locations, natural gas and oil pipelines in southeast Kansas.

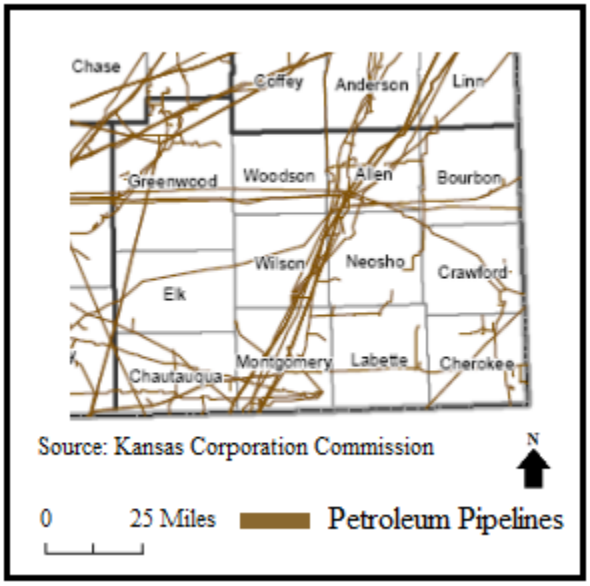
## Regional Oil and Gas Production Fields




## Regional Gas Pipelines



Regional Petroleum Pipelines




The following table details the amount of gas and liquid pipeline miles per county in southeast Kansas.

**2011 Pipeline Mileage**

| County | Gas Miles | Liquid Miles |
|---|---|---|
| Allen | 81 | 202 |
| Bourbon | 27 | 3 |
| Chautauqua | 67 | 115 |
| Cherokee | 94 | 31 |
| Crawford | 22 | 36 |
| Elk | 63 | 0 |
| Greenwood | 194 | 106 |
| Labette | 75 | 2 |
| Montgomery | 126 | 304 |
| Neosho | 18 | 90 |
| Wilson | 61 | 89 |
| Woodson | 1 | 23 |
| Regional Total | 829 | 1,001 |

Source: United States Department of Transportation Pipeline and Hazardous Materials Safety Administration

**Previous Occurrences and Extent**

Regionally, hazardous materials accidents are infrequent events. The following are notable hazardous material events in southeast Kansas.

**August 1, 2011:** In Cedar Vale, Chautauqua County officials noticed an unknown film layer on one of the city's sewer lagoons, accompanied by an odd odor. While trenching a sewer line to identify the problem it filled with liquid gasoline. It was determined that a leaking above ground storage tank containing gasoline caused fumes and vapors to enter the sewer system. These vapors reached explosive levels which prompted the evacuation of approximately 150 residents. One resident was hospitalized from fume exposure.

**June 26-30, 2007:** In Montgomery County, heavy rains caused the Verdigris River to overflow its banks, top protective levees, and flood the town of Coffeyville. As floodwaters rose, officials at the Coffeyville Resources refinery and nitrogen fertilizer plant ordered the facilities shut down and evacuated. Despite their efforts to secure the refinery, an estimated 71,000 gallons of crude oil and a small amount of oil from the refinery's sewer system were swept away by flood waters. During the plant shutdown, the pump system from the east tank storage facility was shut down, but oil continued to flow because of an elevation difference, causing the main oil storage tank on the refinery to overflow. The U.S. Environmental Protection Agency conducted monitoring for the presence of volatile organic compounds in flood waters in Coffeyville and downstream, but indicated the presence of these compounds was not at a "level of concern." Contamination and health issues led local officials to prevent many people from returning to their flood-damaged homes before it was determined safe.

### Local Events

**May 2012; Moran City, Allen County:** A train derailment resulted in a hazardous material event. One wheat field was affected.

### Hazard Vulnerability and Impact

According to the KDEM, Technological Hazards Section there are over 36 facilities subject to the Risk Management Plan requirements in southeast Kansas as of December 2012. The following facilities are listed and ranked based on population affected according to the Risk Management Plan's Worst Case Scenario. Information concerning these facilities is limited in this plan because of security and liability.

**Worst Scenario Facilities, 2012**

| County | Type of Facility |
|---|---|
| Cherokee | Chemical Production and Processing |
| Montgomery | Refinery |
| Montgomery | Fertilizer Manufacturing |
| Crawford | Water Treatment |
| Montgomery | Fertilizer Manufacturing |

Source: KDEM Technological Hazards Section

In estimating potential losses, the most significant loss potential with hazardous materials incidents concerns people. Special populations are particularly vulnerable to the impacts of a hazardous materials incident because of the potential difficulties involved in the evacuation. The following shows the number of special population facilities in each county that is located within ½ mile of a chemical facility. The locations of colleges, educational and correctional institution facilities is from the Kansas Data Access & Support Center (DASC), health facilities is from FEMA's HAZUS-MH 2.1, aging facilities is from KDEM and child care facilities is from KDHE. A comparison was completed with the latitude and longitude of the facilities with the hazardous chemical facilities in Kansas.

**Number of Special Population Facilities within One-Half Mile of a Chemical Facility**

| County | Health Facilities | Colleges | Educational Facilities | Aging Facilities | Child Care | Correctional Institutions |
|---|---|---|---|---|---|---|
| Allen | 1 | 0 | 11 | 2 | 48 | 1 |
| Bourbon | 0 | 1 | 4 | 3 | 27 | 1 |
| Chautauqua | 1 | 0 | 4 | 2 | 4 | 1 |
| Cherokee | 1 | 0 | 7 | 3 | 33 | 2 |
| Crawford | 1 | 0 | 14 | 5 | 35 | 1 |
| Elk | 0 | 0 | 1 | 2 | 2 | 1 |
| Greenwood | 1 | 0 | 5 | 3 | 14 | 1 |
| Labette | 2 | 1 | 10 | 4 | 53 | 3 |
| Montgomery | 0 | 2 | 15 | 7 | 71 | 3 |
| Neosho | 0 | 1 | 10 | 3 | 66 | 1 |
| Wilson | 0 | 0 | 5 | 2 | 14 | 0 |
| Woodson | 0 | 0 | 2 | 1 | 3 | 1 |
| Regional Total | 7 | 5 | 88 | 37 | 370 | 16 |

Source: DASC, HAZUS, KDHE, and KDEM

The following table lists the number of hazardous materials incidents, injuries, fatalities and people evacuated from the public and facilities by county in southeast Kansas over the 10-year period of 2003-2012.

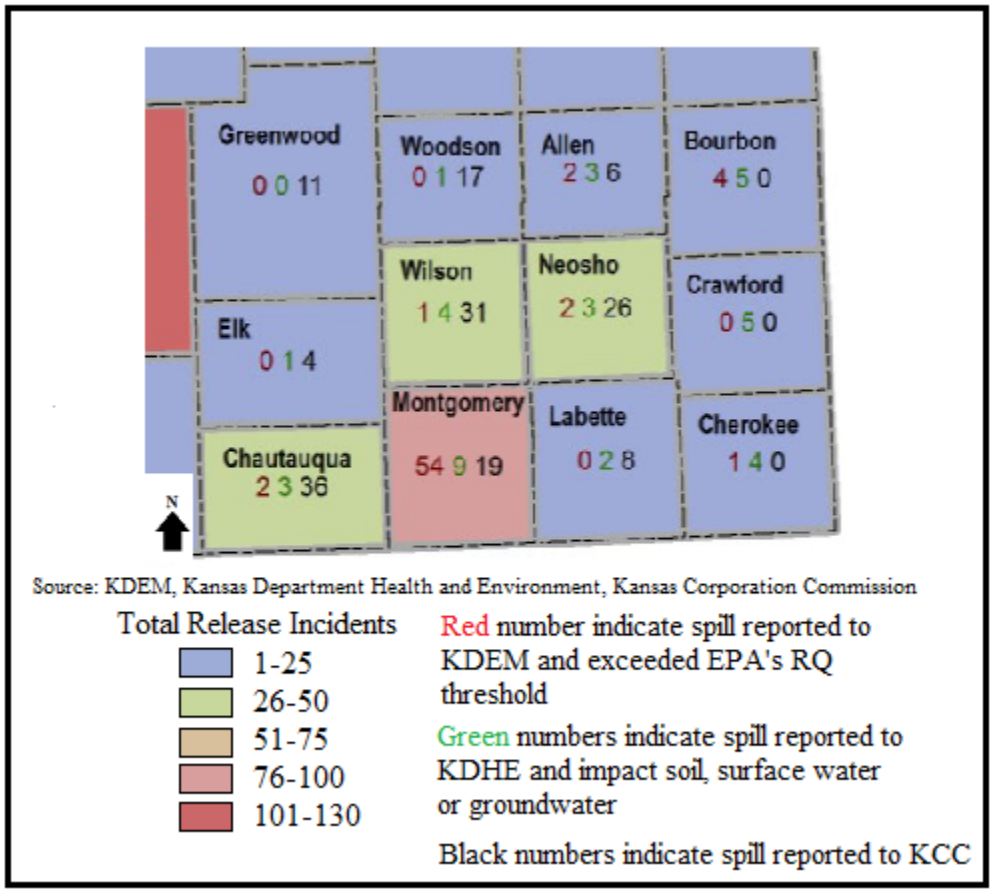
**Number of Hazardous Material Incidents, Injuries, Fatalities and Evacuations**

| Incident County | Incidents | Injuries | Fatalities | People Evacuated |
|---|---|---|---|---|
| Allen | 22 | 2 | 1 | 1 |
| Bourbon | 19 | 4 | 3 | 0 |
| Chautauqua | 8 | 0 | 0 | 0 |
| Cherokee | 11 | 0 | 0 | 76 |
| Crawford | 8 | 0 | 0 | 16 |
| Elk | 2 | 0 | 0 | 0 |
| Greenwood | 4 | 1 | 0 | 0 |
| Labette | 10 | 0 | 0 | 25 |
| Montgomery | 1,461 | 12 | 0 | 161 |
| Neosho | 14 | 1 | 0 | 20 |
| Wilson | 18 | 9 | 0 | 100 |
| Woodson | 4 | 1 | 0 | 1 |
| Regional Total | 1,581 | 30 | 4 | 400 |

Source: KDEM, Technological Hazards Section

The following map shows the number of release incidents per county for the year 2012.

Release Incidents per County, 2012 Totals



In general, the spiller is responsible to report to all the appropriate agencies depending on the material and volume spilled. To satisfy the requirement of Kansas Regulation K.A.R. 28-48 all spills that impact the soils or waters must be reported to the KDHE or in the case that it originates from an oil or gas production leases, be reported to the Kansas Corporation Commission (KCC). If the release is not contained or threatens the health or safety of the local population, the LEPC within the county of the release, must be notified first by dialing 911. Hazardous materials spills and air releases that meet federal reportable quantities and oil and petroleum spills over 110 gallons must also be reported to KDEM.

The following shows that the major cause of hazardous material incidents from 2003-2012.

**Causes of Hazardous Materials Incidents in Kansas, 2003-2012**

| Year | Explosion | Fire | Spill | Equipment Failure | Operator Error | Natural | Dumping | Other |
|---|---|---|---|---|---|---|---|---|
| 2003 | 6 | 14 | 194 | 191 | 29 | 6 | 2 | 51 |
| 2004 | 5 | 10 | 58 | 355 | 31 | 2 | 1 | 315 |
| 2005 | 1 | 5 | 49 | 181 | 21 | 2 | 6 | 0 |
| 2006 | 0 | 3 | 46 | 214 | 18 | 1 | 3 | 89 |
| 2007 | 1 | 6 | 41 | 238 | 13 | 3 | 0 | 94 |
| 2008 | 3 | 7 | 59 | 168 | 27 | 9 | 1 | 110 |
| 2009 | 1 | 7 | 142 | 207 | 25 | 14 | 4 | 112 |
| 2010 | 2 | 7 | 234 | 120 | 20 | 2 | 2 | 105 |
| 2011 | 1 | 6 | 154 | 91 | 10 | 3 | 2 | 21 |
| 2012 | 1 | 8 | 153 | 69 | 23 | 1 | 3 | 94 |
| **Total** | **21** | **73** | **1130** | **1834** | **217** | **43** | **24** | **991** |
| **Average** | **2.1** | **7.3** | **113** | **183.4** | **21.7** | **4.3** | **2.4** | **99.1** |

Source: KDEM, Technological Hazards Section

*Managing the Risk: 2011 Kansas Commission on Emergency Planning and Response Annual Report*, shows the number of hazardous material releases reported to all three Kansas agencies of KDEM, the KDHE and the KCC.

Reports from the U.S. Department of Transportation's Pipeline & Hazardous Materials Safety Administration provides detail and incident history for the pipeline systems in southeast Kansas between 2001 and 2012. Significant incidents are those incidents reported by pipeline operators with any of the following conditions met:

- Fatality or injury requiring in-patient hospitalization
- $50,000 or more in total costs, measured in 1984 dollars
- Highly volatile liquid releases of five or more barrels or other liquid releases of 50 or more barrels
- Liquid releases resulting in an unintentional fire or explosion

According to these reports there were 14 incidents that caused one fatality, four injuries and $9,659,774 in damages over the 12 year period (2001-2012). The following table gives the incident details.

**Regional Pipeline Incidents, 2001 - 2012**

| County | Total Natural Gas Transmission Incidents | Total Natural Gas Distribution Incidents | Total Hazardous Liquid Incidents | Total Fatalities | Total Injuries | Total Damage | Gross Barrels Lost | Total Barrels Recovered |
|---|---|---|---|---|---|---|---|---|
| Allen | 0 | 1 | 2 | 0 | 0 | $1,430,431 | 845 | 628 |
| Bourbon | 0 | 0 | 0 | 0 | 0 | $0 | 0 | 0 |
| Chautauqua | 0 | 1 | 0 | 0 | 0 | $276,360 | 0 | 0 |
| Cherokee | 0 | 0 | 0 | 0 | 0 | $0 | 0 | 0 |
| Crawford | 1 | 0 | 0 | 0 | 0 | $99,064 | 0 | 0 |
| Elk | 0 | 0 | 0 | 0 | 0 | $0 | 0 | 0 |
| Greenwood | 0 | 0 | 1 | 0 | 0 | $6,900 | 142 | 2 |
| Labette | 0 | 1 | 0 | 1 | 0 | $396,797 | 0 | 0 |
| Montgomery | 0 | 0 | 45 | 0 | 0 | $7,335,410 | 3,501 | 2,329 |
| Neosho | 0 | 1 | 0 | 0 | 1 | $113,319 | 0 | 0 |
| Wilson | 1 | 0 | 0 | 0 | 1 | $1,493 | 0 | 0 |
| Woodson | 0 | 0 | 0 | 0 | 0 | $0 | 0 | 0 |
| Regional Total | 2 | 4 | 8 | 1 | 2 | $9,659,774 | 4,488 | 2,959 |

Source: U.S. Department of Transportation's Pipeline & Hazardous Materials Safety Administration

In general, it is difficult to quantify potential losses of hazardous materials events due to the many variables and human elements. For example, a spill of a toxic airborne chemical in a populated area could have great potential for loss of life while a spill of a very small amount of a chemical in a rural agricultural area would be much less costly and possible limited to remediation of soil. Therefore, for the purposes of this plan, the loss estimates will take into account a hypothetical scenario. Please note that the hypothetical scenario is included for illustrative purposes only.

The impact of this type of disaster will likely be localized to the immediate area surrounding the incident. The initial concern will be for people and then the environment. If contamination occurs, the spiller is responsible for the cleanup actions and will work close with local responders, KDHE, KCC, KDEM, and EPA to ensure that cleanup is done safely and in accordance with federal and state laws.

For discussion purposes, the materials needed for a spill at a fixed facility at an easily remediated area are listed in the following table. The costs for the cleanup are estimated from the current State of Kansas Unified HazMat Response Program statewide contract # 35167.

**Hypothetical Cost Estimate For Hazardous Materials Spill Remediation**

| Classification | Rates Per Hour/Unit | Number of Hours/Units | Total Cost |
|---|---|---|---|
| Project Manager | $90.00 | 24 | $2,160 |
| Health & Safety Supervisor | $86.00 | 24 | $2,064 |
| Environmental Tech | $50.00 | 12 | $600 |
| Foreman | $55.00 | 24 | $1,320 |
| Equipment Operator | $56.50 | 24 | $1,356 |
| Laborer | $45.00 | 24 | $1,080 |
| Truck, 4 wheel drive | $680/wk | 1 | $680 |
| Backhoe, Case 416B | $320.00/day | 2 | $640 |
| Forklift, 3 ton all terrain | $160.00/day | 2 | $320 |
| Skimmer | $250.00/day | 2 | $500 |
| Pump, 4” | $80.00/day | 3 | $240 |
| Drums, chemical, 17H or E | $90.00 | 25 | $2,250 |
| Drums, 95 gallon | $295.00 | 25 | $7,375 |
| Vermiculite per bag | $15.00 | 6 | $90 |
| Acid Suits | $70.00/each | 6 | $420 |
| Gloves | $4.00/pair | 30 | $120 |
| Total | | | $21,215 |

Source: State of Kansas Unified HazMat Response Program statewide contract # 35167

| | Magnitude/Severity |
|---|---|
| Hazardous Materials | 2.00 |

**Future Development**

Future development along transportation corridors or locations of hazardous materials storage, use or transfer would tend to increase the risk of this hazard. In addition, the slight growth in population centers with major transportation routes may also increase the risk of this hazard due to increased traffic.

**Probability of Future Hazard Events**

People, livestock and vegetation in close proximity to facilities fabricating, processing and storing as well as those where hazardous waste is treated, stored and disposed of are most at risk for hazardous materials incidents. Additionally, localities along transportation corridors that carry these materials to their final destinations are at risk. Populations downstream, downwind and downhill of a released substance are particularly vulnerable. Depending on the characteristics of the substance released, a larger area may be in damage from explosion, absorption, injection or inhalation. Occupants of areas previously contaminated by a persistent

material may also be harmed either directly or through consumption of contaminated food and water.

While there have been a high number of occurrences over the past ten years (1,581), they have resulted in very few fatalities (4), injuries (30) and evacuations (400). Additonally, due to the relatively light regional population density, lack of any major highway transportation arterials, lack of any major historical occurrences, and declining population, the probability of future occurrences that will impact even small populations has been determine as unlikely.

| | Probability |
|---|---|
| Hazardous Materials | 1.42 |

**Consequence Analysis**

The information in the following table provides the Consequence Analysis.

**Hazardous Material Event Consequence Analysis**

| Subject | Ranking | Impacts of Hazardous Material Event |
|---|---|---|
| Health and Safety of Persons in the Area of the Incident | Severe | Impact of the immediate area could be severe for affected areas. |
| Responders | Severe | Impact to responders is expected to be severe. |
| Continuity of Operations | Minimal to Moderate | Temporary relocation may be necessary if government facilities experience damage. |
| Property, Facilities, and Infrastructure | Severe | Localized impact could be severe in the incident area. Streams, open bodies of water, aquifers, roads, residential and business properties will be most affected. |
| Delivery of Services | Minimal to Severe | Delivery of services could be affected if there is any disruption to the roads and/or utilities. |
| Environment | Severe | Impact could be severe for the immediate area. Impact will lessen with distance. |
| Economic Conditions | Minimal to Severe | Local economy and finances may be adversely affected, depending on damages. |
| Public Confidence in Governance | Minimal to Moderate | Response and recovery will be in question if not timely and effective. Warning systems and the timeliness of those warnings could be questioned. |

### 3.7.11 LAND SUBSIDENCE

| | Probability | Magnitude/Severity | Warning Time | Duration | CPRI |
|---|---|---|---|---|---|
| Land Subsidence | 2.17 | 1.08 | 2.08 | 4.00 | **2.01** |

**Description**

Land subsidence is caused when the ground above manmade or natural voids collapses. Subsidence can be related to mine collapse, water and oil withdrawal, or natural causes such as shrinking of expansive soils, salt dissolution (which may also be related to mining activities), and cave collapses. The surface depression is known as a sinkhole. If sinkholes appear beneath developed areas, damage or destruction of buildings, roads and rails, or other infrastructure can result. The rate of subsidence, which ranges from gradual to catastrophic, correlates to its risk to public safety and property damage.

The development of sinkhole and subsidence areas can be grouped into three major categories:

- Natural dissolution of soluble minerals
- Extraction of minerals by either solution mining or shaft mining
- Downward drainage of fresh water, via a drill hole or unplugged oil or gas well which penetrates a soluble mineral formation and has an outlet for the solution cavity water to be disposed.

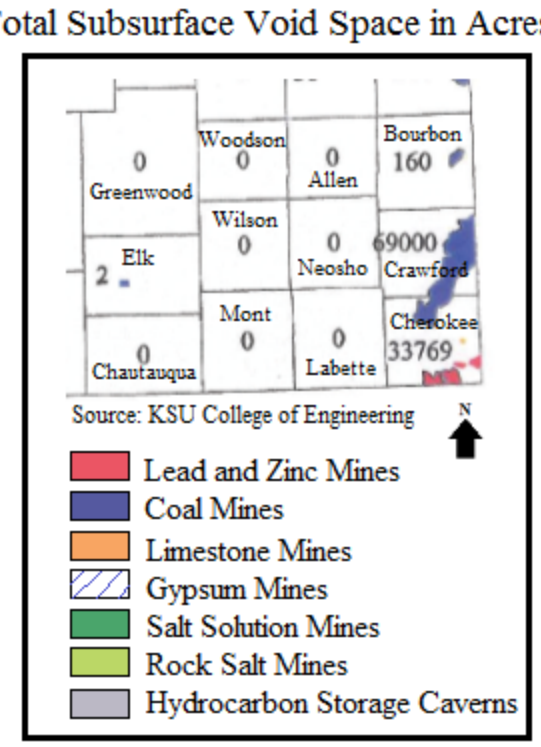
Major materials or minerals present in southeast Kansas that are associated with subsidence and sinkhole development include salt, limestone and dolomite, gypsum, coal, lead and zinc. Some isolated incidents of subsidence have been associated with high volume pumping of water wells.

| | Warning Time |
|---|---|
| Land Subsidence | 2.08 |

| | Duration |
|---|---|
| Land Subsidence | 4.00 |

**Hazard Location**

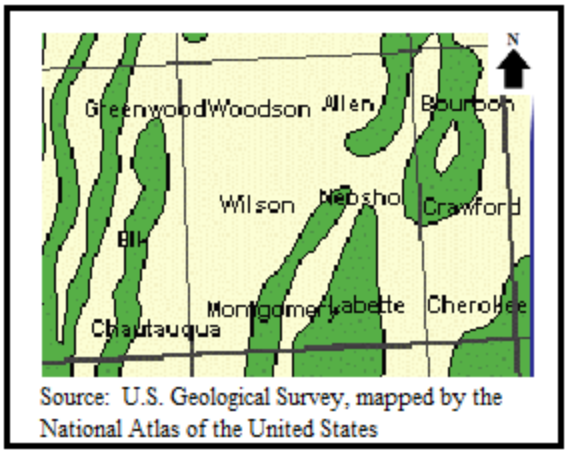
The KDHE in 2006 prepared a report on "Subsurface Void Space and Sinkhole/Subsidence Area Inventory for the State of Kansas." The report inventoried subsurface void space from oil and gas exploration and production, natural sources, shaft mining, and solution mining. Since publication of the report, the acres of subsurface void space for Reno and Rice Counties have been corrected as there were errors in the original report. The revised total void space inventory for all sources in the state is 119,136 acres. The distribution of total acres and major cause of void spaces are shown for each county in the following map.




Areas of karst, a terrain or type of topography generally underlain by soluble rocks, such as limestone, gypsum, and dolomite, in which the topography is chiefly formed by dissolving the rock, are also particularly prone to sinkholes.

The following map illustrates the location of karst features and features analogous to karst in southeast Kansas. The green areas shown in the map show fissures, tubes, and caves generally less than 1,000 feet long with 50 feet or less vertical extent in gently dipping to flat-lying carbonate rock. Brown areas have similar features in gently dipping to flat lying gypsum beds. Light pink colored areas are features analogous to karst with fissures and voids present to a depth of 250 feet or more in areas of subsidence from piping in thick unconsolidated material. Darker pink areas contain fissures and voids (analogous to karst) to a depth of 50 feet. There are limited documented problems associated with natural limestone subsidence and sinkholes in southeast Kansas, however the region has anthropogenic risk associated with limestone mines.

Regional Karst Features




Source: U.S. Geological Survey, mapped by the National Atlas of the United States

**Previous Occurrences and Extent**

The following is the one notable incidence of land subsidence within the southeast Kansas region.

> **2006**: A mine collapse occurred in an alley behind the Green Parrot Bar in downtown Galena (Cherokee County). Subsidence from an abandoned lead and zinc mine took the alley and the 114-year old building with it.

**Hazard Vulnerability and Impact**

Data was obtained from KDHE for the following:

- Lead and Zinc Mines that required filling
- Coal Subsidence Projects
- Coal Emergency Program Projects

This emergency program provides for the remediation of sites which are an immediate threat to the health and safety of the general public. The following table illustrates the number of projects and associated costs for applicable regional counties

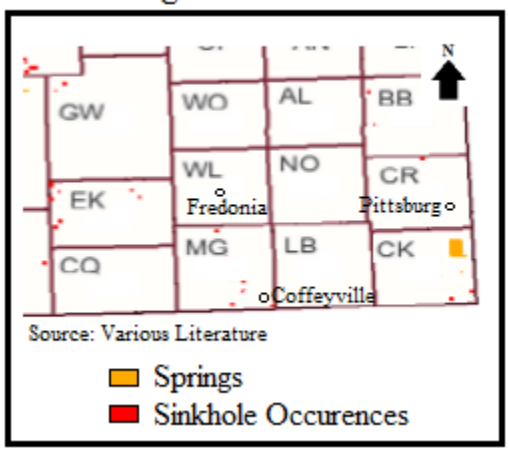
**Coal Emergency Fund Expenditures 1980 to October 2012**

| County | Number of Projects | Cost |
|---|---|---|
| Bourbon | 9 | $58,815 |
| Cherokee | 734 | $2,880,030 |
| Crawford | 1851 | $4,535,670 |
| Crawford/ck | 1 | $723 |
| Neosho | 1 | $0 |

Source: KDHE Surface Mining Section

The following map illustrates known or documented sinkhole occurrences and the locations of springs that may increase the likelihood of sinkholes. Colored areas show one-mile square sections of land in the southeast Kansas where sinkhole locations have been documented in literature. Sections in red indicate sinkhole occurrences (yellow indicates springs). In general, areas of documented previous occurrences of sinkholes are in areas with void space from mines, karst features, and the "lost circulation zone".

Regional Sinkholes




With the known number of acres in each risk category for each county with documented subsurface void spaces, a weighted vulnerability calculation was completed. Acreage in risk Category I (High Risk) received a multiplier of three, acreage in risk Category II (Moderate Risk) received a multiplier of two and acreage in risk Category III (Low Risk) received a multiplier of one.

**Subsurface Void Space Vulnerability Analysis**

| County | Lead/ Zinc Category I Acres | Coal Category I Acres | Coal Category II Acres | Coal Category III Acres | Total Subsurface Void Space Acres | Weighted Calculation |
|---|---|---|---|---|---|---|
| Bourbon | 0 | 0 | 160 | 0 | 160 | 320 |
| Chautauqua | 0 | Void Space Unknown | | | 0 | 0 |
| Cherokee | 2,700 | 15,517 | 15,550 | 0 | 33,769 | 85,753 |
| Crawford | 0 | 12,100 | 56,900 | 0 | 69,000 | 150,100 |
| Elk | 0 | 0 | 2 | 0 | 2 | 4 |
| Neosho | 0 | Void Space Unknown | | | 0 | 0 |
| Regional Total | 2,700 | 27,617 | 72,612 | 0 | 10,2931 | 236,177 |

Source: Data from KDHE, "Subsurface Void Space and Sinkhole/Subsidence Area Inventory for the State of Kansas" November 2006.

Notes: Data tabulated and assigned weighted scores

Void Space Unknown indicates that known coal mines are present. However subsurface void space is not known.

The above annualized amounts of historical costs capture only the remediation costs eligible for KDHE's programs. The potential for other structural damage and economic impacts exists for all counties that have subsurface void spaces. Damages will be more isolated in general compared to other hazards, but future disruptions to transportation and other infrastructure as well as structural damage are possible. The following table presents annualized costs for applicable regional counties.

**Annualized Cost for Abandoned Mine Land Program**

| County | Total Annualized |
|---|---|
| Bourbon | $1,782.27 |
| Cherokee | $270,223.64 |
| Crawford | $158,760.55 |
| Crawford/Cherokee | $21.91 |
| Regional Total | $430,788.37 |

Source: KDHE Surface Mining Section

| | Magnitude/Severity |
|---|---|
| Land Subsidence | 1.08 |

**Future Development**

Future development would tend to increase the risk of this hazard. However data suggests that the region, in general, is experiencing decline in population and development.

**Probability of Future Hazard Events**

Based on historical records, land subsidence events occur in southeast Kansas on a sporadic basis (one event within the past ten years, with a probability of occurrence for the next year at 10%). Due to underlying surface conditions and subsurface activities there is probable that a land subsidence event will occur on an occasional basis.

| | Probability |
|---|---|
| Land Subsidence | 2.17 |

**Consequence Analysis**

The information in the following table provides the Consequence Analysis.

**Land Subsidence Consequence Analysis**

| Subject | Ranking | Impacts of Land Subsidence |
|---|---|---|
| Health and Safety of Persons in the Area of the Incident | Moderate to Severe | Local impact expected to be moderate to severe for the incident area. |
| Responders | Minimal | Impact to responders would be minimal. |
| Continuity of Operations | Minimal | Minimal expectation of execution of the COOP, unless a facility is impacted. |
| Property, Facilities, and Infrastructure | Severe | Localized impact to facilities and infrastructure in the incident area has the potential to do severe damage. |
| Delivery of Services | Minimal | Impacts to the delivery of services could be severe if roads/utilities are affected. Otherwise impact would be non-existent to minimal. |
| Environment | Minimal | Impact to the area would be minimal. |
| Economic Conditions | Minimal | Impacts to the economy will depend on the severity of the damage. |
| Public Confidence in Governance | Minimal to Severe | Local development policies will be questioned. |

### 3.7.12 LANDSLIDE

| | Probability | Magnitude/Severity | Warning Time | Duration | CPRI |
|---|---|---|---|---|---|
| Landslide | 1.17 | 1.75 | 3.75 | 1.00 | **1.71** |

**Description**

A landslide is the downhill movement of masses of soil and rock by gravity. The basic ingredients for landslides are gravity, susceptible soil or rock, sloping ground, and water. Typically, as the slope angle increases, so does the potential for landslides. Anything that increases the slope angle can trigger a landslide, including a stream actively eroding a hill or construction practices. Landslides may occur when soil on hillsides is saturated following extended periods of rainfall or snow melt, and may also be caused by:

- Earthquakes
- Fire (and resulting loss of vegetation)
- Excavation and mining
- Irrigation
- Construction activities

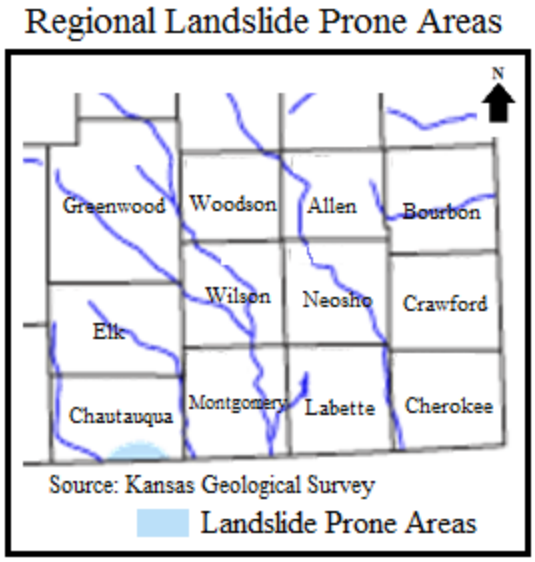
Landslides can damage or destroy structures, roadways, and utilities as well as block roadways with debris.

| | Warning Time |
|---|---|
| Landslide | 3.75 |

| | Duration |
|---|---|
| Landslide | 1.00 |

**Hazard Location**

Areas prone to landslides can cover broad geographic regions, but occurrences are generally localized. The entire planning area, including all participating jurisdictions, is at risk to landslides. However, landslides require an earth or rock covered slope. The following map shows regional slide prone areas.




**Previous Occurrences and Extent**

The following is the only recent, notable landslide event in southeast Kansas.

**2007:** Flooding caused small landslides in southeast Kansas

**Hazard Vulnerability and Impact**

Losses due to landslides in southeast Kansas will continue in those areas of the region that are prone to this hazard. Landslide losses are primarily related to damage to property. However, if a sudden landslide impacts an inhabited structure, injuries or deaths could occur. Historically, landslides in southeast Kansas have been isolated events impacting a few properties or a particular area. Often, damages in terms of estimated losses are not reported. Additionally, there is not a repository for damages to be reported, other than NCDC. The NCDC database does not include any previous landslide events in Kansas. This is likely because the events are generally isolated and do not impact large areas.

If construction is occurring in or near landslide hazard areas, more structures/population will be at risk to damage/injury from landslides. The effects of landslides on people and structures can be lessened by total avoidance of landslide hazard areas or by restricting, prohibiting, or imposing conditions on hazard-zone activity. The hazard from landslides can be reduced by avoiding construction on steep slopes and existing landslides, or by stabilizing the slopes. Stability increases when ground water is prevented from rising in the landslide mass by covering the landslide with an impermeable membrane, directing surface water away from the landslide, draining ground water away from the landslide, and minimizing surface irrigation. Slope stability is also increased when a retaining structure and/ or the weight of a soil/rock berm are placed at the toe of the landslide or when mass is removed from the top of the slope.

It is not possible at this time to determine quantitative estimates for potential losses associated with the landslide hazard as there is no centralized data source upon which to base analysis.

| | Magnitude/Severity |
|---|---|
| Landslide | 1.75 |

**Future Development**

Future development in landslide prone areas would tend to increase the risk of this hazard. However data suggests that the region, in general, is experiencing decline in population and development.

**Probability of Future Hazard Events**

There has been one reported landslide event in the region over the past 10 years, resulting in a probability of occurrence for the next year at 10%. However, no other events have been documented preceding this event, and the documented event was very minor in scale with no major damages or injuries reported. As such, it is unlikely that a future landslide event will cause a measurable impact.

| | Probability |
|---|---|
| Landslide | 1.17 |

**Consequence Analysis**

The information in the following table provides the Consequence Analysis.

**Landslide Consequence Analysis**

| Subject | Ranking | Impacts of Landslide |
|---|---|---|
| Health and Safety of Persons in the Area of the Incident | Moderate to Severe | Localized impact could be moderate to severe for the incident area. |
| Responders | Minimal | Impact to responders would be minimal. |
| Continuity of Operations | Minimal | Minimal expectation of execution of the COOP, unless a facility is impacted. |
| Property, Facilities, and Infrastructure | Minimal to Severe | Localized impact to facilities and infrastructure in the incident area has the potential to do severe damage if they are on, or in, the area of the landslide. |
| Delivery of Services | Minimal | Impacts to the delivery of services could be severe if roads/utilities are affected. Otherwise impact would be non-existent to minimal. |
| Environment | Minimal | Impact to the area would be minimal other than the immediate area. |
| Economic Conditions | Minimal | Impacts to the economy will depend on the severity of the damage, i.e., are roads blocked, did any businesses get caught in the landslide. |
| Public Confidence in Governance | Minimal to Severe | Local development policies will be questioned. |

### 3.7.13 LIGHTNING

| | Probability | Magnitude/Severity | Warning Time | Duration | CPRI |
|---|---|---|---|---|---|
| Lightning | 2.50 | 1.25 | 2.83 | 1.00 | **2.03** |

**Description**

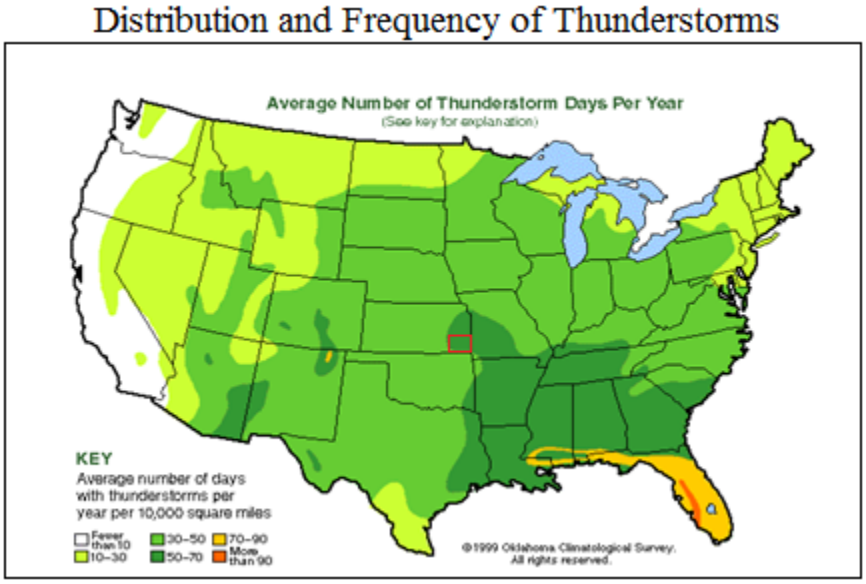
Lightning is a discharge of atmospheric electricity that is triggered by a buildup of differing charges within a cloud. According to the NWS, lightning is one of the most underrated severe weather hazards and is the second deadliest weather killer in the United States. Of the estimated 1,000 people who are struck by lightning each year on the U.S., only 10 percent are killed, but survivors may suffer life-long disabilities.

| | Warning Time |
|---|---|
| Lightning | 2.83 |

| | Duration |
|---|---|
| Lightning | 1.00 |

**Hazard Location**

Severe thunderstorms strike southeast Kansas on a regular basis. Lightning often accompanies thunderstorms and can cause injury, death, property damage and wildfires. The widespread and frequent nature of thunderstorms makes lightning a relatively common occurrence. Of particular concern to southeast Kansas is protection of facilities and communications systems that are important to emergency response operations, protection of public health and maintenance of the region's economy. Most of southeast Kansas has an average 50-70 thunderstorm days per year.



Lightning occurs over broad geographic regions. The entire planning area, including all participating jurisdictions, is at risk to lightning.

**Previous Occurrences and Extent**

Information measured by the National Lightning Detection Network between 1997 and 2011 ranks Kansas 16th among the continental states in terms of cloud-to-ground flash densities with 934,368 flashes per year (11.4 flashes per square mile). According to the NCDC Storm Events database, there were 23 lightning events in southeast Kansas between 2000 and 2012 that resulted in property damage**.** The NCDC receives storm data from the NWS, which receives information from a variety of sources, which include but are not limited to county, state, and federal emergency management officials, local law enforcement officials, Skywarn spotters, NWS damage surveys, newspaper clipping services, the insurance industry and the general public. Reporting of events and the historic events detailed here are likely not a true reflection of all the damaging lightning strikes.

**NCDC Lightning Events 01/11/2000 to 12/31/2012**

| County | Location | Date | Property Damage | Crop Damage |
|---|---|---|---|---|
| Allen County | Gas | 12/27/2008 | $150,000 | $0 |
| Bourbon County | Fort Scott | 6/8/2010 | $3,000 | $0 |
| Bourbon County | Marmaton | 7/6/2010 | $2,000 | $0 |
| Bourbon County | Fort Scott | 9/15/2010 | $15,000 | $0 |
| Bourbon County | Edward | 3/19/2011 | $2,000 | $0 |
| Bourbon County | Devon | 5/24/2011 | $5,000 | $0 |
| Elk County | Howard | 6/14/2001 | $50,000 | $0 |
| Labette County | Parsons | 8/23/2002 | $25,000 | $0 |
| Labette County | Parsons | 8/28/2003 | $20,000 | $0 |
| Labette County | Parsons | 9/14/2005 | $1,000 | $0 |
| Labette County | Bartlett | 8/20/2009 | $100,000 | $0 |
| Labette County | Altamont | 5/19/2010 | $7,000 | $0 |
| Montgomery County | Coffeyville | 7/22/2002 | $30,000 | $0 |
| Montgomery County | Coffeyville | 4/28/2003 | $1,000 | $0 |
| Montgomery County | Tyro | 8/5/2003 | $100,000 | $0 |
| Montgomery County | Independence | 8/28/2003 | $25,000 | $0 |
| Montgomery County | Independence | 8/29/2003 | $5,000 | $0 |
| Neosho County | Chanute | 5/13/2004 | $5,000 | $0 |
| Neosho County | Chanute | 6/1/2007 | $22,000 | $0 |
| Neosho County | Earlton | 8/19/2009 | $25,000 | $0 |
| Wilson County | Fredonia | 8/20/2005 | $150,000 | $0 |
| Wilson County | Fredonia | 6/1/2007 | $10,000 | $0 |
| Wilson County | Fredonia | 7/3/2011 | $2,000 | $0 |

Source: NCDC Storm Events Database

According to the USDA's Risk Management Agency, there have not been any payments for insured crop losses specifically for lightning. The NCDC database lists $0 for crop damages in the 2000-2012 timeframe.

Based on NCDC data, showing $607,008 in damages over the 13 year period from 2000 to 2012, southeast Kansas can expect approximately $46,593 in lightning-related losses each year.

According to the NCDC, there have been no reported deaths or injuries from lightning in southeast Kansas from 2000 to the present.

Notable Lightning Events include:

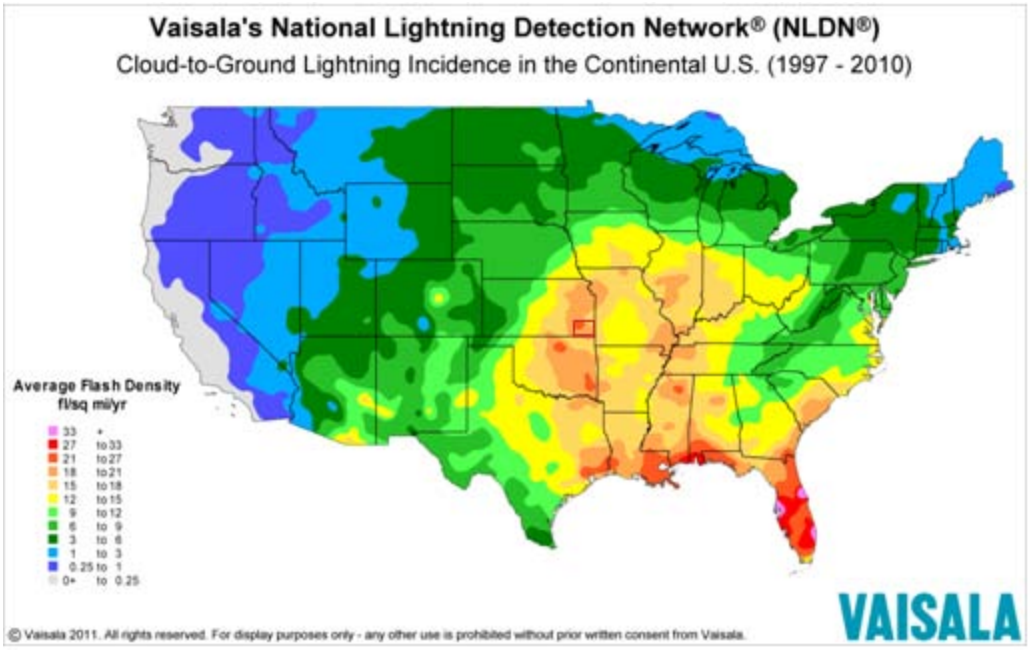
> **September 15, 2010:** Lightning struck the Bourbon County Courthouse in the city of Ft. Scott which caused damage to the roof and significant damage to electronics inside the courthouse.
>
> **December 27 2008:** Lightning from a broken line of strong to severe thunderstorms sparked a house fire in the community of Colony during the predawn hours of the 27th. The residence was completely destroyed. Fortunately, no one was home at the time. Information courtesy of the Iola Register.

***Local Events***

> **April 16, 2013:** Lightning struck pole mounted lights around the track at Parsons High School. The cost of repair was $8,000.
>
> **September 4, 2011:** Lightning struck parking lot lights and security camera at Parsons High School. Insurance losses were calculated at $21,005.

**Hazard Vulnerability and Impact**

In general, the frequency of occurrence of lightning is similar to the pattern of thunderstorm frequency. Data suggests that there are 18 to 21 flashes per square mile per year in southeast Kansas. The following figure, which is based on data from 1997 to 2010, shows that the distribution of lightning throughout the U.S.




A statistical analysis method was used to refine and assess the relative vulnerability of each of region's counties to lightning. The region assigned ratings to pertinent factors including social vulnerability index, prior events, prior annualized property damage, building exposure valuation, population density and crop exposure (annualized crop losses were not used since USDA did not have insured crop loss amounts to use in the tabulation).

The following information was used for this analysis:

- Social Vulnerability Index for Kansas from the Hazards and Vulnerability Research Institute at the University of South Carolina
- NCDC storm events 2000 – 2012
- U.S. Census Bureau (2010)
- USDA's Census of Agriculture (2007).

**Vulnerability Factor Amounts for Lightning**

| County | SoVI Rating (1-5) | Prior Events 2006-2012 | Property Damages | Annualized Property Damages | Total Building Exposure ($000) | Population Density | Crop Exposure (2007 Census of Agriculture) |
|---|---|---|---|---|---|---|---|
| Allen | 3 | 1 | $150,000 | $11,538 | $983,778 | 26 | $15,462,000 |
| Bourbon | 4 | 5 | $27,000 | $2,077 | $1,102,488 | 24 | $9,918,000 |
| Chautauqua | 5 | 0 | $0 | $0 | $285,438 | 6 | $4,971,000 |
| Cherokee | 4 | 0 | $0 | $0 | $1,293,753 | 37 | $53,420,000 |
| Crawford | 3 | 0 | $0 | $0 | $2,588,817 | 66.4 | $34,463,000 |
| Elk | 5 | 1 | $50,000 | $3,846 | $187,291 | 4 | $0 |
| Greenwood | 5 | 0 | $0 | $0 | $491,412 | 6 | $8,087,000 |
| Labette | 4 | 5 | $153,000 | $11,769 | $1,453,850 | 33 | $22,765,000 |
| Montgomery | 4 | 5 | $131,000 | $10,077 | $2,432,183 | 54 | $16,616,000 |
| Neosho | 4 | 3 | $53,000 | $4,077 | $1,174,150 | 29 | $17,811,000 |
| Wilson | 4 | 3 | $52,000 | $4,000 | $671,059 | 16 | $26,882,000 |
| Woodson | 5 | 0 | $0 | $0 | $207,905 | 7 | $14,486,000 |

Using the above information, a value of 1-10 was assigned to the data obtained for each factor and then weighted equally and factored together to obtain overall vulnerability scores for comparison and to determine the greatest vulnerable counties. The Social Vulnerability Index is in a range of 1- 5. To give Social Vulnerability Index the same weight as the other factors, the numbers were multiplied by two.

**Lightning Data Rating Determination**

| Ratings | Social Vulnerability | NCDC Prior Events | Annualized Property Damage | Building Exposure Valuation | Population Density * | Crop Exposure |
|---|---|---|---|---|---|---|
| 1 | | 1 | $143 - $3,600 | $117,421 - $4,492,825 | 1.6 - 116.3 | 0 - $18,548,500 |
| 2 | 1 | 2 | $3,601 - $7,200 | $4,492,826 - $8,868,229 | 116.4 - 231.1 | $18,548,501 - $32,126,000 |
| 3 | | 3 | $7,201 - $10,800 | $8,868,230 - $13,243,634 | 231.2 - 345.9 | $32,126,001 - $45,703,500 |
| 4 | 2 | 4 | $10,801 - $14,400 | $13,243,635 - $17,619,039 | 346 - 460.7 | $45,703,501 - $59,281,000 |
| 5 | | 5 | $14,401 - $18,000 | $17,619,040 - $21,994,444 | 460.8 - 575.5 | $59,281,001 - $72,858,500 |
| 6 | 3 | 6 | $18,001 - $21,600 | $21,994,445 - $26,369,848 | 575.6 - 690.3 | $72,858,501 - $86,436,000 |
| 7 | | n/a | $21,601 - $ 25,200 | $26,369,849 - $30,745,253 | 690.4 - 805.1 | $86,436,001 - $100,013,500 |
| 8 | 4 | n/a | $25,201 - $28,000 | $30,745,254 - $35,120,658 | 805.2 - 919.9 | $100,031,501 - $113,591,000 |
| 9 | | n/a | $28,801 - $33,000 | $35,120,659 - $39,496,062 | 920- 1,034.7 | $113,591,001 - $127,168,500 |
| 10 | 5 | n/a | $33,001 and up | $39,496,063 - $43,871,468 | 1,034.8 - 1,149.6 | $127,168,501 - $140,746,000 |

Note: n/a relates to not applicable because no county had more than 5 prior events

Based on the above ratings system, ranges were applied to each county to determine their potential vulnerability. The following related the scoring to a vulnerability assessment:

- **Low:** Score range of 7 -13
- **Medium-Low:** Score range of 14 - 18
- **Medium:** Score range of 19 - 23
- **Medium-High:** Score range of 24 - 28
- **High:** Score range of 29 - 34

**Vulnerability of Kansas Counties to Lightning**

| County | SoVi Rating | NCDC Prior Event Rating | Annualized Property Damage Rating | Bldg Exposure Valuation Rating | Population Density Rating | Crop Exposure Rating | Overall Vulnerability Rating | Lightning Vulnerability |
|---|---|---|---|---|---|---|---|---|
| Allen | 6 | 1 | 4 | 1 | 1 | 1 | 14 | Medium-Low |
| Bourbon | 8 | 5 | 1 | 1 | 1 | 1 | 17 | Medium-Low |
| Chautauqua | 10 | 0 | 1 | 1 | 1 | 1 | 14 | Medium-Low |
| Cherokee | 8 | 0 | 1 | 1 | 1 | 4 | 15 | Medium-Low |
| Crawford | 6 | 0 | 1 | 1 | 1 | 3 | 12 | Low |
| Elk | 10 | 1 | 2 | 1 | 1 | 1 | 16 | Medium-Low |
| Greenwood | 10 | 0 | 1 | 1 | 1 | 1 | 14 | Medium-Low |
| Labette | 8 | 5 | 4 | 1 | 1 | 2 | 21 | Medium |
| Montgomery | 8 | 5 | 3 | 1 | 1 | 1 | 19 | Medium |
| Neosho | 8 | 3 | 2 | 1 | 1 | 1 | 16 | Medium-Low |
| Wilson | 8 | 3 | 2 | 1 | 1 | 2 | 17 | Medium-Low |
| Woodson | 10 | 2 | 1 | 1 | 1 | 1 | 16 | Medium-Low |

| | Magnitude/Severity |
|---|---|
| Lightning | 1.25 |

**Future Development**

Future development would tend to increase the risk of this hazard. Severe thunderstorms and the associated lightning events will continue to cause damage to anything exposed to the weather elements. Lightning can damage many types of infrastructure, including electric lines/poles/transformers, telephone lines and radio communication equipment. These pieces of infrastructure are needed by both first response agencies and the general community to ensure safe transport, habitable homes and good communications abilities.

Residential and business properties are liable to receive damage either as a result of a lightning strike causing a fire or other type of direct damage or by overloading electronic equipment. The latter concern is especially important to business and government, which rely on computers and other electronic equipment for day to day operations. Virtually all structures and electrical components in southeast Kansas are vulnerable to lightning. Fires, electrical fires, electricity loss and damage to equipment are a few of the problems associated with lightning strikes.

Any increase in development will lead to a greater exposure to this hazard.

**Probability of Future Hazard Events**

According to the NCDC, there have been 23 reported lightning events in the region causing reportable damage over the past 13 years, or approximately two events per year. However, the

actual number of lightning strikes is likely much greater. The NWS reports that in an average year, over 22,000,000 lightning strikes hit the contiguous United States. Ignoring all unreported strikes, the probability of occurrence for the next year is 176%. However, as the number of documented and impactful events is relatively small considering the area of the planning region it is expected that only occasionally will a future lightning event causing a measurable impact.

| | Probability |
|---|---|
| Lightning | 2.50 |

**Consequence Analysis**

The information in the following table provides the Consequence Analysis.

**Lightning Consequence Analysis**

| Subject | Ranking | Impacts of Lightning |
|---|---|---|
| Health and Safety of Persons in the Area of the Incident | Minimal to Moderate | Impact to the health and safety of persons could be minimal to moderate if within the incident area. |
| Responders | Minimal | Impact to responders is expected to be minimal unless responders live within the affected area. |
| Continuity of Operations | Minimal | Temporary relocation may be necessary if government facilities experience damage. |
| Property, Facilities, and Infrastructure | Minimal to Severe | Impact could be severe if property, facilities or infrastructure take a direct hit which could result in fire or destruction. |
| Delivery of Services | Minimal to Severe | Delivery of services could be affected if there is any disruption to the roads and/or utilities due to damages sustained. |
| Environment | Minimal to Severe | Impact will be isolated, yet severe to any trees, animals, etc., that takes a direct hit, or is in the path of any fire that may be generated due to the lighting strike. |
| Economic Conditions | Minimal | Local economy impact should be fairly minimal, unless the lightening causes fires which damage businesses and stops revenue. |
| Public Confidence in Governance | Minimal | Response and recovery will be in question if not timely and effective, specifically if electricity and other utilities are affected. |

### 3.7.14 MAJOR DISEASE OUTBREAK

| | Probability | Magnitude/Severity | Warning Time | Duration | CPRI |
|---|---|---|---|---|---|
| Major Disease Outbreak | 1.25 | 3.08 | 1.00 | 4.00 | **2.04** |

**Description**

Infectious diseases are human illnesses caused by microscopic agents, including viruses, bacteria, parasites, and fungi or by their toxins. They may be spread by direct contact with an infected person or animal, ingesting contaminated food or water, vectors such as mosquitoes or ticks, contact with contaminated surroundings such as animal droppings, infected droplets, or by aerosolization

While there are a number of biological diseases/agents that are of concern to the southeast Kansas, the following categories of disease are being addressed in this plan: vaccine preventable disease, food borne disease, and community associated infections as having significant recurring impact on the morbidity of southeast Kansans. The following descriptions are general and it should be noted that individuals may experience more or less severe consequences based upon their own circumstances.

**Vaccine Preventable:**

- **Measles:** a respiratory disease caused by a virus spread through the air by breathing, coughing or sneezing. It is so contagious that any child who is exposed to it and is not immune will probably get the disease.

- **Mumps:** a contagious disease that causes fever, headache, muscle aches, tiredness, and loss of appetite, and is followed by swelling of salivary glands. Most people with mumps recover fully.

- **Pertussis:** a highly communicable, vaccine-preventable disease that is typically results in severe coughing, whooping, and vomiting. Major complications are most common among infants and young children and include hypoxia, apnea, pneumonia, seizures, encephalopathy, and malnutrition. Young children can die from pertussis, with most deaths occur among unvaccinated children or children too young to be vaccinated.

- **Influenza:** a viral infection of the nose, throat, bronchial tubes, and lungs. There are two main types of virus, A and B, with each type including many different strain which tend to change each year. Influenza is highly contagious and is easily transmitted through contact with droplets from the nose and throat of an infected person during coughing and sneezing.

- **Pandemic Influenza:** A pandemic influenza is a influenza virus that causes a global outbreak of serious illness. A influenza pandemic occurs when a new virus

emerges for which people have little or no immunity, and for which there is no vaccine. Infection rate and mortality may be markedly higher than a normal influenza.

**Food Borne Disease:**

- **Norovirus:** a group of related viruses that cause acute gastroenteritis in humans, including diarrhea, vomiting, and stomach pain. Noroviruses are transmitted primarily through the fecal-oral route, either by consumption of fecal contaminated food or water or by direct person-to-person spread.

- **Salmonellosis:** an infection with bacteria that causes diarrhea, fever, and abdominal cramps. The illness usually lasts four to seven days, and most persons recover without treatment.

| | Warning Time |
|---|---|
| Major Disease Outbreak | 1.00 |

| | Duration |
|---|---|
| Major Disease Outbreak | 4.00 |

**Hazard Location**

The entire planning area is susceptible to a disease outbreak. However, more densely populated areas are more susceptible to the diseases that are transmitted person to person.

**Previous Occurrences and Extent**

There have been four a pandemics in the past century that have impacted southeast Kansas:

**2009 H1N1 Influenza:** The 2009 H1N1 Pandemic Influenza began in Kansas with the first identified case on April 24, 2009. Kansas was the third state to positively identify this novel strain of influenza.

**1968–69: Hong Kong flu (H3N2):** This strain caused approximately 34,000 deaths in the United States. It was first detected in Hong Kong in early 1968 and spread to the United States later that year.

**1957–58: Asian flu (H2N2):** This virus was quickly identified because of advances in technology, and a vaccine was produced. In total, there were about 70,000 deaths in the United States. Information about how this pandemic affected Kansas was not available.

**1918–19: Spanish flu (H1N1):** This flu is estimated to have sickened 20-40% of the world's population, causing the death of 500,000 Americans. Recently, the origin of the

pandemic was traced to an outbreak of influenza in Haskell County, Kansas, in January 1918. By the end of 1918, the Kansas death toll was around 12,000.

Southeast Kansas is also impacted by a variety of communicable and non-communicable diseases. The following tables provide the numbers of reportable diseases by county from 2002 to 2011. Diseases with zero occurrence are not listed.

**2002 - 2011 Reportable Diseases**

| County | Campylobacteriosis | Chlamydia | Cryptosporidiosis | Ehrlichiosis/Anaplasmosis | Giardiasis | Gonorrhea | H. influenzae, invasive | Haemophilus influenzae, invasive disease | Hemolytic Uremic Syndrome | Hepatitis A | Hepatitis B, acute | Hepatitis C, acute | Lyme Disease |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Allen | 1 | 28 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| Bourbon | 6 | 34 | 2 | 1 | 7 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Chautauqua | 1 | 8 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Cherokee | 3 | 56 | 1 | 2 | 3 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Crawford | 13 | 128 | 1 | 5 | 2 | 13 | 0 | 0 | 0 | 0 | 0 | 1 | 2 |
| Elk | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Greenwood | 1 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Labette | 1 | 67 | 1 | 0 | 0 | 16 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Montgomery | 3 | 114 | 0 | 1 | 5 | 20 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Neosho | 1 | 44 | 0 | 0 | 1 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Wilson | 1 | 18 | 0 | 1 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Woodson | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Regional Total | 31 | 514 | 5 | 12 | 19 | 61 | 1 | 2 | 1 | 1 | 2 | 3 | 5 |

Source: KDHE

**2002 - 2011 Reportable Diseases, Continued**

| County | Meningitis, non-HiB, non-Neisseria | Meningococcal Disease | Pertussis | Rabies, animal | Salmonellosis | Shiga toxin-producing E. coli | Shigellosis | Spotted fever rickettsiosis 2012 Only | Strep., Group A, invasive | Strep. pneumoniae, invasive | Tuberculosis, active | Tularemia | Varicella |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Allen | 0 | 0 | 2 | 0 | 8 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| Bourbon | 1 | 1 | 9 | 0 | 6 | 1 | 4 | 1 | 0 | 1 | 0 | 0 | 0 |
| Chautauqua | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| Cherokee | 0 | 0 | 3 | 0 | 9 | 2 | 8 | 6 | 0 | 0 | 0 | 0 | 4 |
| Crawford | 0 | 0 | 6 | 0 | 13 | 5 | 13 | 9 | 0 | 0 | 0 | 2 | 0 |
| Elk | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Greenwood | 0 | 0 | 2 | 1 | 1 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Labette | 0 | 0 | 5 | 0 | 7 | 2 | 0 | 4 | 0 | 0 | 0 | 0 | 4 |
| Montgomery | 0 | 0 | 4 | 0 | 3 | 2 | 3 | 10 | 0 | 1 | 0 | 0 | 8 |
| Neosho | 0 | 0 | 1 | 0 | 8 | 1 | 1 | 2 | 0 | 0 | 1 | 0 | 0 |
| Wilson | 1 | 0 | 1 | 0 | 2 | 2 | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| Woodson | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Regional Total | 2 | 1 | 33 | 1 | 61 | 18 | 29 | 43 | 1 | 2 | 1 | 3 | 16 |

Source: KDHE

**Local Events**

**Fall 2012: Labette County:** A Tuberculosis outbreak caused a house to be quarantined.

**2012: Labette County:** An Pertussis outbreak caused the closure of school weight rooms over the summer.

**October 2009 - 2010:** Chautauqua County administered a mass H1N1 vaccination to prevent illness.

**2009: Labette County:** An H1N1 outbreak affected 1% of the population. Immunizations were provided to the population.

**Hazard Vulnerability and Impact**

All people within the southeast Kansas region would be susceptible to a major disease outbreak. As the type of disease cannot be known in advance it is impossible to predict if any segment of the population would be a greater risk. However, the following generalities may be made:

- Population density will affect the rate of spread of a transmissible pathogen
- The young and old are usually more susceptible to deleterious effects of disease
- Access to medical care will impact the outcomes for infected individuals
- The novelty of the disease will impact availability of treatments and vaccines
- Inherent immunity may be present in some populations

As evidenced by annual infectious disease summaries (http://www.kdheks.gov/epi/index.html) and reports of investigations (http://www.kdheks.gov/epi/outbreaks.htm) completed by the KDHE Bureau of Epidemiology and Public Health Informatics, many southeast Kansas counties experience one or multiple disease outbreaks each year. Potential casualty losses are anticipated to be greatest in counties with higher populations, higher pediatric populations and higher elderly populations. Health professional shortage areas and rural areas are more susceptible to having limited medical capabilities and by extension are more susceptible to the possibility of being overwhelmed because of a large surge of patients seeking care.

Although infectious diseases do not respect geographic boundaries, several populations in southeast Kansas are at specific risk to infectious diseases. Communicable diseases are most likely to spread quickly in institutional settings such as dormitories, long-term care facilities, day care facilities, and schools.

The HMPC ranked the disease outbreak as catastrophic based on a pandemic scenario. The magnitude of an infectious disease outbreak is related to the ability of the public health and medical communities to stop the spread of the disease. Most disease outbreaks that cause catastrophic numbers of deaths are infectious in nature, meaning that they are spread from person to person. The key to reducing the catastrophic nature of the event is to stop the spread of disease. This is generally done in three ways:

- Identification and isolation of the ill
- Quarantine of those exposed to the illness
- Education of the public about methods to prevent transmission.

The public health and health care providers in southeast Kansas routinely utilize all three methods to reduce morbidity and mortality from infectious disease. However, the capacity of the health care system is limited. For example, local health departments have specific pandemic influenza response plans, and mass prophylaxis plans, but most departments have only a few staff members. Most local health departments would need to rely on volunteers, pre-scripted messages and procedures and the cooperation of the public in order to respond effectively to a large scale pandemic. Similarly, hospitals in southeast Kansas have emergency response and pandemic influenza plans, but little excess capacity exists to care for and/or isolate hundreds,

even thousands of patients. Because of these limitations in personnel and equipment, the health care community is planning to utilize “community containment” measures. These measures which could include closure of schools, day cares and other public events would have far-reaching economic impacts on the community and might shutdown facilities for 30 days or more. Closure of the day cares or schools would have a serious impact on business as parents might not be able to find child care elsewhere.

According to "The Annual Impact of Seasonal Influenza in the US: Measuring Disease Burden and Costs" by NA Molinari, nationally the economic burden of influenza medical costs, medical costs plus lost earnings, and the total economic burden were $10.4 billion, $26.8 billion and $87.1 billion respectively. The financial burden of healthcare-associated infections nationally has been estimated at $33 billion annually. There is no data currently available on the economic impact of previous illness in southeast Kansas. Using pandemic influenza as the worst case scenario for estimating potential losses, the KDHE’s Pandemic Influenza Planning includes the following vulnerability estimates. It has been estimated that a medium-level pandemic could cause, in Kansas:

- Between 229,203 and 534,807 persons may require outpatient care
- Between 5,016 and 11,706 may require hospitalization
- Between 1,163 and 2,714 individuals may die

The majority of these deaths and hospitalizations would occur in more highly populated counties.

The U.S. Centers for Disease Control and Prevention (CDC) estimates 76 million people suffer food borne illnesses each year in the United States, accounting for 325,000 hospitalizations and more than 5,000 deaths. Food borne disease is extremely costly. Health experts estimate that the yearly cost of all food borne diseases in this country is $5 to $6 billion in direct medical expenses and lost productivity. Infections with the bacteria *Salmonella* alone account for $1 billion yearly in direct and indirect medical costs.

| | **Magnitude/Severity** |
|---|---|
| Major Disease Outbreak | 3.08 |

**Future Development**

Future development and population increases would tend to increase the risk of this hazard due to the potential for a more rapid spread of an agent or disease. Additionally, the further development of transportation infrastructure would increase the risk of a major disease event due to an influx of travelers to the region. As the population of Kansas ages, the vulnerability to this hazard is likely to increase. The impacts and potential losses are largely economic and are dependent on the type, extent, and duration of the illness.

**Probability of Future Hazard Events**

Each year, the KDHE produces a report that details the legally “reportable diseases” in each county in Kansas. While over time this report can serve as a predictor of the likelihood of future

disease, it is impossible to predict outbreaks. Based on the relatively limited/controlled outbreak history in the state the possibility of a large-scale major disease outbreak is unlikely.

| | Probability |
|---|---|
| Major Disease Outbreak | 1.25 |

**Consequence Analysis**

The information in the following table provides the Consequence Analysis.

**Major Disease Outbreak Consequence Analysis**

| Subject | Ranking | Impacts of Major Disease Outbreak |
|---|---|---|
| Health and Safety of Persons in the Area of the Incident | Severe | Impact over a widespread area could be severe depending on type of outbreak and whether it is a communicable disease. Casualties are dependent on warning systems, warning times and the availability of vaccines, antidotes, & medical services. |
| Responders | Severe | Impact to responders could be severe, especially if they reside in the area or they are exposed during response. With proper precautions and safety nets in place the impact is lessened. |
| Continuity of Operations | Minimal | Continuity of Operations will be greatly dependent on availability of healthy individuals. |
| Property, Facilities, and Infrastructure | Minimal | Access to facilities and infrastructure could be affected until decontamination is completed |
| Delivery of Services | Minimal | Delivery of services could be affected if there are road blocks or mass hysteria of any level. |
| Environment | Severe | Impact could be severe for the immediately impacted area depending on the source of the outbreak. Impact could have far-reaching implications if disease is transferable between humans and animals or to wildlife. |
| Economic Conditions | Severe | Impacts to the economy could be severe if the disease is communicable. Loss of tourism, revenue, and business as usual will greatly affect the local economy and the state as a whole. |
| Public Confidence in Governance | Severe | Response and recovery will be in question if not timely and effective. Availability of medical supplies, vaccines, and treatments will come into question. |

### 3.7.15 RADIOLOGICAL EVENT

| | Probability | Magnitude/Severity | Warning Time | Duration | CPRI |
|---|---|---|---|---|---|
| Radiological Event | 1.00 | 1.00 | 4.00 | 4.00 | **1.75** |

**Description**

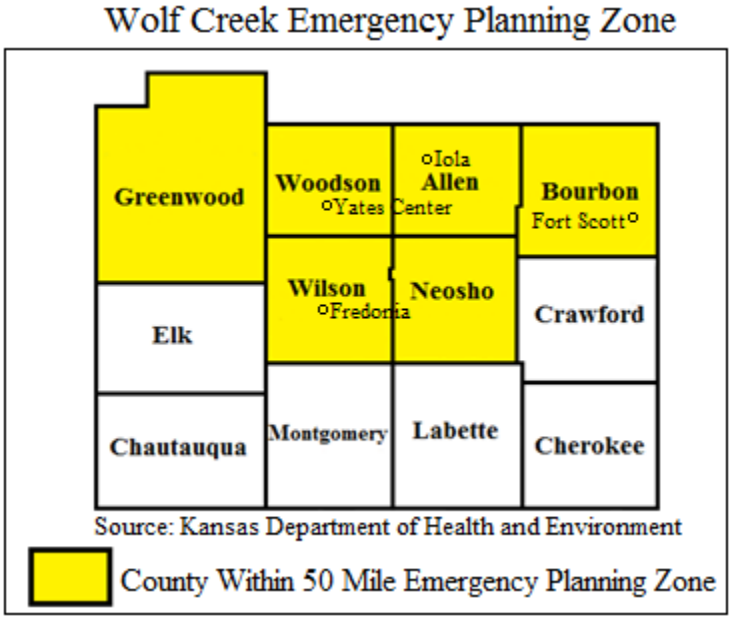
An accident involving radioactive materials could occur from a variety of sources, including nuclear reactors, transportation accidents, industrial and medical uses and lost or stolen sources. Radiological accidents could cause injury or death, contaminate property and valuable environmental resources, as well as disrupt the functioning of communities and their economies.

| | Warning Time |
|---|---|
| Radiological Event | 4.00 |

| | Duration |
|---|---|
| Radiological Event | 4.00 |

**Hazard Location**

The entire planning region is at risk from a radiological event due to transportation accidents. Additionally, there are six southeast Kansas counties within the 50 mile emergency planning zone for the Wolf Creek Nuclear Power Plant.




**Previous Occurrences and Extent**

There have been no reported radiological events in southeast Kansas.

## Hazard Vulnerability and Impact

There are over 300 licensees of various sizes for radioactive material within the State of Kansas. In general, the major usage of radioactive materials in southeast Kansas are for medical diagnostics and therapy, soil density testing in the construction industry, and in radiography cameras in pipeline construction and repair.

It is common for materials, including pharmaceuticals, industrial sources and nuclear fuel rods destined to nuclear reactors, to be transported across southeastern Kansas highways and railroads. Areas near interstates and major highways have an increased risk of transportation accidents. Remote areas also have to account for long response times from hazardous materials and health physics personnel.

Counties within the 50-mile Emergency Planning Zone for commercial nuclear power plants (Allen, Bourbon, Greenwood, Neosho, Wilson and Woodson) have a slightly higher radiological risk than other counties within the region, but the potential for an incident is extremely low. Federal regulations require emergency planning for the area within up to a 50-mile radius of a nuclear power plant. The potential danger from an accident is exposure to radiation. This exposure could come from the release of radioactive material from the plant into the environment, usually characterized by a plume of radioactive gases and particles. The major hazards to people in the vicinity of the plume are radiation exposure to the body from the cloud and particles deposited on the ground, inhalation of radioactive materials and ingestion of radioactive materials.

During all lawful operations of radioactive materials, the licensee is responsible for ensuring that the area around the source material is cordoned off or shielding is used to prevent unnecessary exposures. Inspections of practices and security measures are regularly conducted to ensure compliance and conformity to regulations in order to protect the public. The frequency of inspections can be adjusted in response to perceived risk. Public risk can be reduced by minimizing the duration of exposure, shielding the source material and maximizing the distance from the source.

| | Magnitude/Severity |
|---|---|
| Radiological Event | 1.00 |

## Future Development

Additional development in the counties within the 50 mile Emergency Planning Zone for the Wolf Creek Nuclear Power Plant, or additional development near major transportation arteries could potentially increase the risk posed by this hazard.

## Probability of Future Hazard Events

Based on there being zero notable radiological events in southeast Kansas, the probability of an event occurring is unlikely within the next ten years.

| | Probability |
|---|---|
| Radiological Event | 1.00 |

**Consequence Analysis**

The information in the following table provides the Consequence Analysis.

| Subject | Ranking | Impacts of Radiological Event |
|---|---|---|
| Health and Safety of Persons in the Area of the Incident | Severe | Impact expected to be severe for persons within the incident area. Protection capabilities and warning times will greatly affect the severity. |
| Responders | Severe | Impact to responders could be severe if not trained and properly equipped. Responders that are properly trained and equipped will have a low to moderate impact. |
| Continuity of Operations | Minimal to Severe | Temporary relocation could be necessary if government facilities are in close proximity to the incident area. This temporary relocation could become significant depending on clean-up. |
| Property, Facilities, and Infrastructure | Severe | Impact within the incident area could be severe to property, facilities, and infrastructure. |
| Delivery of Services | Minimal to Severe | Delivery of services could be affected within and around the affected area. |
| Environment | Severe | Localized impact within the incident area could be severe to native plants, wildlife and natural habitats. Clean up and remediation will be required. |
| Economic Conditions | Minimal to Severe | Economic conditions could be adversely affected and dependent upon time and length of clean up and investigation. |
| Public Confidence in Governance | Minimal to Severe | Impact will be dependent on whether or not the incident could have been avoided by government or non-government entities, clean-up and investigation times, and outcomes. |

### 3.7.16 SOIL EROSION AND DUST

| | Probability | Magnitude/Severity | Warning Time | Duration | CPRI |
|---|---|---|---|---|---|
| Soil Erosion & Dust | 1.83 | 1.17 | 1.00 | 4.00 | **1.73** |

**Description**

Soil erosion and dust are both ongoing problems for southeast Kansas. Both can cause significant loss of valuable agricultural soils, damage crops, harm environmental resources and have adverse economic impacts. Soil erosion in southeast Kansas is largely associated with periods of drought, when winds are able to move tremendous quantities of exposed dry soil (wind erosion), and flooding (stream bank erosion). Improper agricultural and grazing practices can also contribute to soil erosion.

The United States is losing soil 10 times faster than the natural replenishment rate, and related production losses cost the country about $37.6 billion each year. On average, wind erosion is responsible for about 40 percent of this loss and can increase markedly in drought years. Wind erosion physically removes the lighter, less dense soil constituents such as organic matter, clays and silts. Thus it removes the most fertile part of the soil and lowers soil productivity, which can result in lower crop yields or poorer grade pastures and increase economic costs.

Stream bank erosion, which can remove agricultural land and damage or destroy roads and bridges and utility lines, occurs each year, particularly in the spring when high runoff is most common. A large proportion of all eroded soil material ends up in rivers, streams and lakes, which makes waterways more prone to flooding and contamination and reduces water supply storage space.

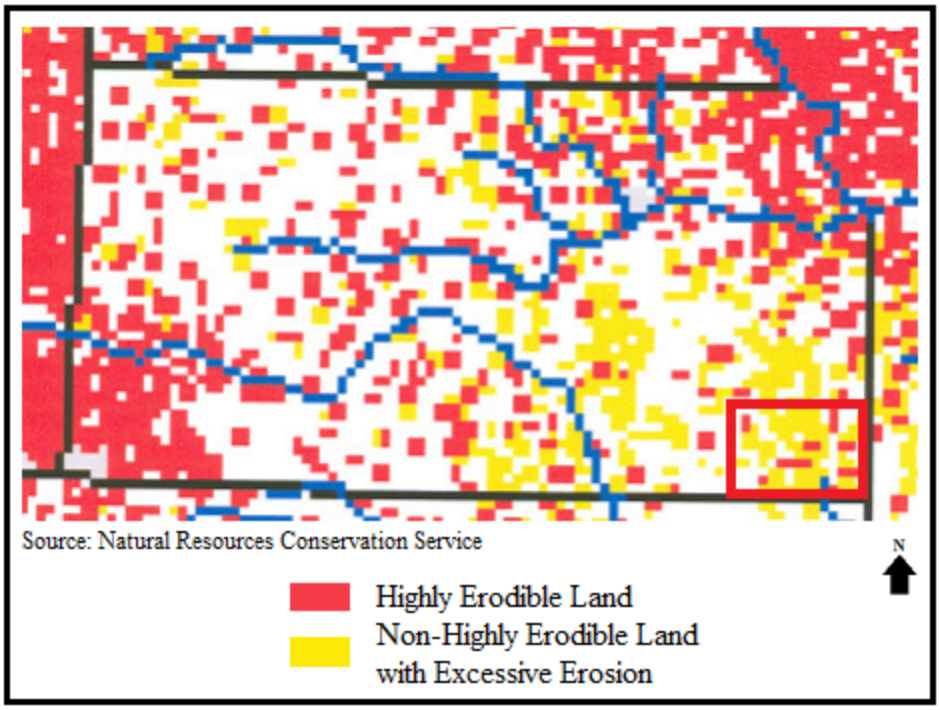
| | Warning Time |
|---|---|
| Soil Erosion & Dust | 1.00 |

| | Duration |
|---|---|
| Soil Erosion & Dust | 4.00 |

**Hazard Location**

The following figure shows areas of excessive erosion of farmland in Kansas based on a 1997 analysis. Each red dot represents 5,000 acres of highly erodible land, and each yellow dot represents 5,000 acres of non-highly erodible land with excessive erosion above the tolerable soil erosion rate. While southeast Kansas does not have many areas of highly erodible land, the entire area is susceptible to soil erosion and dust.

Regional Farmland Erosion




**Previous Occurrences**

The most prominent soil erosion and dust event in southeast Kansas, known as the Dust Bowl, occurred across the mid-western United States from 1930-1936. Southeast Kansas is situated to the east of the most severely impacted region (100 million acre across Oklahoma, the Texas panhandle, New Mexico, eastern Colorado and western Kansas) but was nonetheless significantly affected. Sustained drought, loss of native prairie and the agricultural practices of the time were primary causes for this unmitigated disaster. During the Dust Bowl years millions of tons of fertile soils were lost as well as a significant percentage of the region's population via migration, dust pneumonia and malnutrition. More recently, the Kansas State Hazard Mitigation Plan reports that during the 1970s and in the spring of 1996 wind erosion seriously damaged agricultural land throughout the Great Plains.

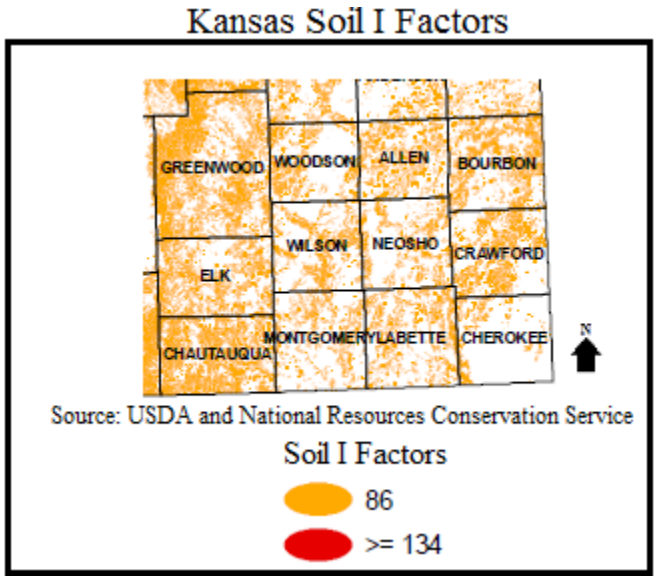
Notable historical erosion events include:

**2007:** According to the 2007 Natural Resources Inventory (NRI) by the Natural Resources Conservation Service, Kansas lost 1.734 tons per acre to wind erosion on cultivated cropland.

**1930s:** Kansas is well known for its role in the 1930s Dust Bowl, in which the Central Plains states suffered drought and resulting wind erosion for about a decade. It is estimated that 21.5 million acres were lost during this time.

## Hazard Vulnerability and Impact

The map below indicates all southeast Kansas soils that have an "I" value, or wind erodibility index, of 86 or greater. In general, the higher the I value, the more susceptible it is to wind erosion. These are soils that should be further evaluated before recommending the use of emergency tillage or not. The evaluation of these soils will need to take into account the predominate particle size (i.e. classification of "sandy" would cause the soil to have characteristics more like a 134 soil), as well as the ability for the soil to form a stable clod (unfortunately, this is largely dependent on soil moisture).




There have not been any state-wide studies to estimate the dollar value of top soil lost to soil erosion and dust.

The 2007 Natural Resources Inventory by the Natural Resources Conservation Service shows the historical estimates for tons per acres soil lost annually for cultivated cropland, non-cultivated cropland and pastureland. This estimate can continue as potential soil losses in Kansas.

**Kansas Average Wind Erosion in Tons per Acre per Year by Broad Cover/Use**

| Broad Cover/Use | 1982 | 1987 | 1992 | 1997 | 2002 | 2007 |
|---|---|---|---|---|---|---|
| Cultivated Cropland | 2.747 | 2.963 | 2.062 | 1.482 | 1.463 | 1.734 |
| Non-Cultivated Cropland | 0.907 | 0.830 | .887 | 0.339 | 0.413 | 0.501 |
| Pastureland | 0.009 | 0.016 | .022 | 0.015 | 0.019 | 0.034 |

Source: 2007 National Resources Inventory, April 22, 2010

Note: Estimated average annual wind erosion is tons per acre per year with margins of error

The following table presents regional acreage data for cropland and pastureland .

**Regional Acreage Data (2007)**

| Cover | Acreage |
|---|---|
| Total Cropland (2007) | 1,302,518 |
| Total Pasture Acres (2007) | 2,322,230 |

Source: USDA National Agricultural Statistics Service

Based on the statewide wind erosion average figures and the total cropland and pasture acreage for the region, the following can be extrapolated for the southeast Kansas:

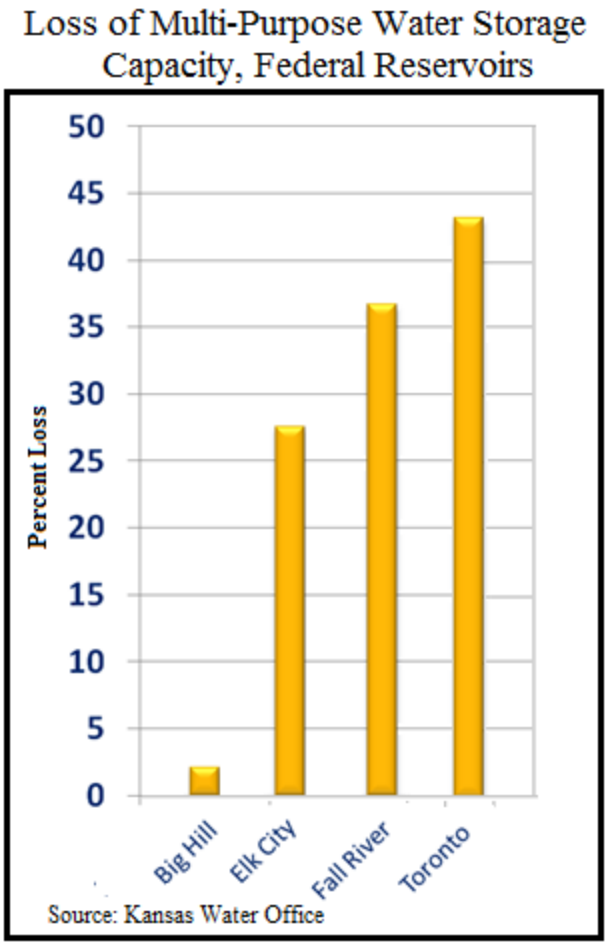
**Regional Estimated Soil Tonnage Lost To Wind Erosion, 1982 - 2007**

| Description | 1982 | 1987 | 1992 | 1997 | 2002 | 2007 |
|---|---|---|---|---|---|---|
| Estimated Regional Tonnage Lost to Wind Erosion, Cultivated and Non-Cultivated Cropland | 4,759,400 | 4,940,451 | 3,841,126 | 2,371,885 | 2,443,524 | 2,911,128 |
| Estimated Regional Tonnage Lost to Wind Erosion, Pastureland | 20,900 | 37,156 | 51,089 | 34,833 | 44,122 | 78,956 |

Calculated using USDA and 2007 National Resources Inventory data

Soil erosion has also affected the regional federal reservoirs, with erosion depositing large quantities of sediment in these reservoirs, impacting water supply and quality as well as flood storage. Because of differing climatic conditions, land uses, and physical attributes in the various watersheds, sedimentation rates vary among the reservoirs.

In 2001, the KWO completed a report that projected the affect of sedimentation on state-owned storage in federal reservoirs. By the year 2040, sedimentation was projected to reduce the total amount of state-owned storage from 1.2 million acre-feet to roughly 857,000 acre-feet, a rate of loss of 6,260 acre-feet per year. The following graph shows the percentage loss of storage capacity for regional reservoirs.




Current information on sedimentation also is lacking for most small reservoirs in Kansas. However, the U.S. Army Corps of Engineers completed a resurvey of 34 small reservoirs in 2001. Results indicated that water-storage capacity lost because of sedimentation ranged from negligible to low for southeast Kansas.

**Characteristics of Small Municipal Reservoirs**

| Reservoir | Community Served | County | Year Built | Original capacity (acre-feet) | 2000 capacity (acre-feet) | Percent Difference |
|---|---|---|---|---|---|---|
| Buffalo City Reservoir | Buffalo | Wilson | 1960 | --- | 1,631 | N/A |
| Eureka Reservoir | Eureka | Greenwood | 1939 | 3,690 | 3,125 | 15.31% |
| Fort Scott City Lake | Fort Scott | Bourbon | 1959 | --- | 7,200 | N/A |
| Madison City Lake | Madison | Greenwood | 1970 | 1,445 | 1,333 | 7.75% |
| Moline Reservoir | Moline | Elk | 1937 | --- | 1,590 | N/A |
| Parsons Lake | Parsons | Labette | 1938 | 10,050 | 8,500 | 15.42% |
| Polk Daniels Lake | Howard | Elk | 1935 | 777 | 640 | 17.63% |

**Characteristics of Small Municipal Reservoirs, Continued**

| Reservoir | Community Served | County | Year Built | Original capacity (acre-feet) | 2000 capacity (acre-feet) | Percent Difference |
|---|---|---|---|---|---|---|
| Sedan City South Lake | Sedan | Chautauqua | 1965 | 780 | 770 | 1.28% |
| Severy City Lake | Severy | Greenwood | 1938 | --- | 115 | N/A |
| Thayer New City Lake | Thayer | Neosho | 1960 | --- | 560 | N/A |
| Yates Center City Lake | Yates Center | Woodson | 1990 | 2,720 | 2,241 | 17.61% |

Source: KWO (2001)

| | Magnitude/Severity |
|---|---|
| Soil Erosion & Dust | 1.17 |

**Future Development**

Future development of agricultural resources and/or increases in population would tend to increase the risk of this hazard. However, data suggests that the acres of land in farms in decreasing in southeastern Kansas. Additionally, regional data indicate that the number of cattle has been falling over the past five years.

**Probability of Future Hazard Events**

Based on data concerning historical occurrences and data on regional growth and development trends in agriculture and livestock, the probability of future occurrences of this hazard causing a measurable impact has been determined as unlikely.

| | Probability |
|---|---|
| Soil Erosion & Dust | 1.83 |

**Consequence Analysis**

The information in the following table provides the Consequence Analysis.

**Soil Erosion and Dust Consequence Analysis**

| Subject | Ranking | Impacts of Soil Erosion and Dust |
|---|---|---|
| Health and Safety of Persons in the Area of the Incident | Minimal | Impact tends to be agricultural; however, dust can be a danger to susceptible individuals in the form of air pollutants. |
| Responders | Minimal | With proper preparedness and protection, impact to the responders is expected to be minimal. |
| Continuity of Operations | Minimal | Minimal expectation for utilization of the COOP. |
| Property, Facilities, and Infrastructure | Minimal to Moderate | Impact to property, facilities, and infrastructure could be severe, depending on the site of the soil erosion. This could adversely affect utility poles/lines, and facilities. Dust can also adversely affect machinery, air conditioners, etc. |
| Delivery of Services | Minimal | Impact on the delivery of services should be non-existent to minimal, unless roads and utilities are affected. |
| Environment | Severe | The impact to the environment could be severe. Soil erosion and dust can severely affect farming, ranching, wildlife and plants due to production losses and habitat changes. |
| Economic Conditions | Minimal | Impacts to the economy will be dependent on how extreme the soil erosion and dust are. Potentially it could severely affect crop yield and productivity. Seedling survival and growth is stressed by erosion and dust, as is the top soil which agriculture is dependent on. |
| Public Confidence in Governance | Minimal | Planning, response, and recovery may be questioned if not timely and effective. |

### 3.7.17 TERRORISM, AGRI-TERRORISM

| | Probability | Magnitude/Severity | Warning Time | Duration | CPRI |
|---|---|---|---|---|---|
| Terrorism, Agri-Terrorism | 1.17 | 2.00 | 3.67 | 1.17 | **1.79** |

**Description**

The United States does not have a standardized definition of terrorism that is agreed upon by all agencies. The Federal Bureau of Investigation generally defines terrorism as:

> "the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives."

The USA Patriot Act expanded this definition to include domestic terrorism, defined as:

> "acts dangerous to human life that are a violation of the criminal laws of the United States or of any State" intended to "intimidate or coerce a civilian population," "influence the policy of a government by intimidation or coercion" or "affect the conduct of a government by mass destruction, assassination, or kidnapping" that are conducted primarily within the jurisdiction of the United States."

The Homeland Security Act of 2002, which created the Department of Homeland Security, extended the definition of terrorism further by including any act that:

> "involves an act that dangerous to human life or potentially destructive to critical infrastructure or key resources, and is a violation of the criminal laws of the United States or of any state or other subdivision of the United States and appears to be intended to intimidate or coerce a civilian population to influence the policy of a government by intimidation or coercion, or to affect the conduct of a government by mass destruction, assassination, or kidnapping"

The statement "potentially destructive to critical infrastructure or key resources" indicates that the act does not need to be dangerous to human life for it to be considered an act of terrorism. Terrorists may use a range of possible actions, including:

- Chemical attacks
- Biological attacks
- Radiological attacks
- Nuclear attacks
- Cyber-terrorism
- Agri-terrorism

| | Warning Time |
|---|---|
| Terrorism, Agri-Terrorism | 3.67 |

| | Duration |
|---|---|
| Terrorism, Agri-Terrorism | 1.17 |

**Hazard Location**

Kansas is home to a wide variety of criminal extremist groups. The Southern Poverty Law Center reported that in 2012, there were three active hate groups in Kansas: one neo-Nazi group, the National Socialist Movement in Lansing, one racist skinhead group, the Midland Hammerskins in Wichita, and one anti-homosexual group, the Westboro Baptist Church in Topeka. Other groups, such as the Animal Liberation Front, Earth Liberation Front, and People for the Ethical Treatment of Animal may have sympathizers in the region. Although no major terrorist acts have been attributed to any of these latter groups, their involvement in violent acts is meant to disrupt governmental functions and cannot be discounted.

None of these groups is known to have an active presence in southeast Kansas.

**Previous Occurrences**

There have been no previous terrorist events in southeast Kansas.

**Hazard Vulnerability and Impact**

Of particular concern to southeast Kansas is agri-terrorism Agri-terrorism consists of acts to intentionally contaminate, ruin, or otherwise make agricultural products unfit or dangerous for consumption or further use. The introduction of a biological agent into an animal or crop would be financially devastating and would have a major impact on the food supply of the state region , state and nation. Potential terrorists' targets for livestock disease introduction would be concentration points, such as the region's licensed feedlots and livestock markets. Additionally, Kansas has over 120 agricultural crop-dusters, many of which are configured for chemical spraying.

It is not possible to calculate a specific vulnerability for each county in southeast Kansas. However, because of the desire for publicity following attacks, it is more likely that counties with greater population densities would be the target of attacks. Sparsely populated rural counties are less desirable targets for publicity-seeking terrorists. It is expected that the likelihood of attack is directly related to population density or more likely to an event that is occurring or to a specific location of importance to the attacker. For example, a large venue event, such as a sporting event attended by tens of thousands of people might be considered a desirable target. Most large public venues occur in densely populated areas since those areas are able to provide the infrastructure support (hotels, eateries, etc) for large numbers of people.
Potential losses from Terrorism/Agri-terrorism include all infrastructure, critical facilities, crops, humans and animals. The degree of impact would be directly related to the type of incident and the target. Potential losses could include cost of repair or replacement of damaged facilities, lost economic opportunities for businesses, loss of human life, injuries to persons, loss of food supplies, disruption of the food supply chain, and immediate damage to the surrounding

environment. Secondary effects of infrastructure failure could include public safety hazards, spread of disease, increased morbidity and mortality among the local and distant populations, public panic and long-lasting damage to the environment. Terrorism events are rare occurrences and specific amounts of estimated losses for previous occurrences are not available due to the complexity and multiple variables associated with these types of hazards. In some instances, information about these events is secure and unavailable to the public in order to maintain national security and prevent future attacks.

In general, it is difficult to quantify potential losses of terrorism due to the many variables and human elements and lack of historical precedence. Therefore, for the purposes of this plan, the loss estimates will take into account three hypothetical scenarios. The estimated impact of each event was calculated using the Electronic Mass Casualty Assessment and Planning Scenarios developed by Johns Hopkins University. The Electronic Mass Casualty Assessment and Planning Scenarios system usually rates the of worried well as equal to 9 times the number of infected cases. However, as most major population centers in southeast Kansas have a small population base it is unlikely that number would be approached. As such, the number of worried well is not estimated as part of these scenarios.

Please note that the hypothetical scenarios are included for illustrative purposes only.

***Scenario #1: Mustard Gas Release***

**Event:** Mustard gas is released from a light aircraft onto the stadium during a home football game. The agent directly contaminates the stadium and the immediate surrounding area. This attack would cause harm to humans and could render portions of the stadium unusable for a short time period in order to allow for a costly clean-up. There might also be a fear by the public of long-term contamination of the stadium and subsequent boycott of games resulting in a loss of revenue and tourism dollars.

**Event Assumptions:** For this scenario the number of people in the stadium is 8,343 with an additional 500 persons remain outside the stadium in the adjacent parking areas. The agent used, mustard gas, is extremely toxic and may damage eyes, skin and respiratory tract with death sometimes resulting from secondary respiratory infections. Death rate from exposure estimated to be 3%. The estimated decontamination cost is $12 person. For this scenario it is assumed that all persons with skin injuries will require decontamination.

**Results:** The following table presents the estimated human and economic impacts of the scenario.

**Estimated Impact of Scenario #1, Mustard Gas Release**

| Impact | Post Exposure Onset Time | Effect |
|---|---|---|
| Severe Eye Injuries (1-2 hours) | 1 -2 Hours | 6,636 persons |
| Severe Airway Injuries (1-2 hours) | 1 - 2 Hours | 6,636 persons |
| Severe Skin Injuries (2 hrs to days) | 2 Hours to Days | 7,963 persons |
| Deaths | Immediate to Days | 177 persons |
| Cost of Decontamination | N/A | $95,556 |

***Scenario #2: Pneumonic Plague***

**Event:** Four Canisters containing aerosolized pneumonic plague bacteria are opened in public bathrooms of heavily populated buildings (airports, stadiums, etc.). Each release location will directly infect 110 people; hence, the number of release locations dictates the initial infected population. The secondary infection rate is used to calculate the total infected population. This attack method would not cause damages to buildings or other infrastructure, only to human populations.

**Event Assumptions:**

Each canister contains 650 mL of pneumonic plague bacteria. The type of infectious agent used is identified on Day 4. After identification, the fatality rate is 10% for new cases. Pneumonic plague has a 1-15 percent mortality rate in treated cases and a 40-60 percent mortality rate in untreated cases.

**Results:** The following table presents the estimated human impacts of the scenario.

**Estimated Impact of Scenario #2, Pneumonic Plague Release**

| Impact | Effect |
|---|---|
| Initial Infected Population | 440 persons |
| Secondary Infected Population | 883 persons |
| Deaths (7% of Infected) | 62 |

***Scenario #3: Improvised Explosive Device***

**Event:** An improvised explosive device utilizing an ammonium nitrate/fuel oil (ANFO) mixture is carried in a panel van to a parking area during a time when stadium patrons are leaving their cars and entering the stadium and detonated. Potential losses with this type of scenario include both human and structural assets.

**Event Assumptions:**

The quantity of ANFO used is 4,500 pounds. The population density of the lot is assumed to be 1 person per every 25 square feet. The Lethal Air Blast Range for such a vehicle is estimated to be 50 feet according to the Bureau of Alcohol, Tobacco, Firearms and Explosives (BATF) Standards. The Falling Glass Hazard distance is estimated at 600 feet according to BATF Explosive Standards. In this event, damage would occur to vehicles, and depending on the proximity of other structures, damages would occur to the stadium complex itself. The exact amount of these damages is difficult to predict because of the large numbers of factors, including the type of structures nearby and the amount of insurance held by vehicle owners. It is estimated that the average replacement cost for a vehicle is $20,000 and the average repair cost for damaged vehicles would be $4,000.

**Results:** The following table presents the estimated human impacts of the scenario.

**Estimated Impact of Scenario #3, Improvised Explosive Device**

| Impact | Effect |
|---|---|
| Deaths | 347 persons |
| Trauma Injuries | 608 persons |
| Urgent Care Injuries | 2,983 |
| Injuries not Requiring Hospitalization | 1,116 |
| Repair Costs for 30 Vehicles | $600,000 |
| Replacement Costs for 90 Vehicles | $360,000 |

| | Magnitude/Severity |
|---|---|
| Terrorism, Agri-Terrorism | 2.00 |

**Future Development**

In general, acts of terrorism have historically been conducted in major population centers or on targets of high significance within the United States. Regional development data indicates that the both population and growth have been declining, with the exception of major population centers. If more large public events are held in southeast Kansas, more potential may exist for these venues to become targets of attack. With human-caused hazards such as this that can have multiple variables involved, increases in development are not necessarily always factors in determining risk, although the physical cost of the event may increase with the increased or newly developed areas.

**Probability of Future Hazard Events**

By nature, acts of terrorism are difficult to foresee. However, based on the lack of any historic events throughout the region the probability of future major regional terrorist attacks is unlikely.

| | Probability |
|---|---|
| Terrorism, Agri-Terrorism | 1.17 |

**Consequence Analysis**

The information in the following table provides the Consequence Analysis.

**Terrorism, Agri-Terrorism Consequence Analysis**

| Subject | Ranking | Impacts of Terrorism, Agri-Terrorism |
|---|---|---|
| Health and Safety of Persons in the Area of the Incident | Severe | Impact could be severe for persons in the incident area. |
| Responders | Minimal to Severe | Impact to responders could be severe if not trained and properly equipped. Responders that are properly trained and equipped will have a low to moderate impact. |
| Continuity of Operations | Minimal to Severe | Depending on damage to facilities/personnel in the incident area, re-location may be necessary and lines of succession execution. |
| Property, Facilities, and Infrastructure | Severe | Impact within the incident area could be severe for explosion, moderate to low for Hazmat. |
| Delivery of Services | Minimal to Severe | Delivery of services could be affected if communications, road and railways, and facilities incur damage. |
| Environment | Minimal to Severe | Localized impact within the incident area could be severe depending on the type of incident. |
| Economic Conditions | Minimal to Severe | Economic conditions could be adversely affected and dependent upon time and length of clean up and investigation. |
| Public Confidence in Governance | Minimal to Severe | Impact will be dependent on whether or not the incident could have been avoided by government or non-government entities, clean-up and investigation times, and outcomes. |

### 3.7.18 TORNADO

| | Probability | Magnitude/Severity | Warning Time | Duration | CPRI |
|---|---|---|---|---|---|
| Tornado | 3.25 | 3.42 | 4.00 | 1.00 | **3.19** |

**Description**

The NWS defines a tornado as "a violently rotating column of air extending from a thunderstorm to the ground." Tornados are the most violent of all atmospheric storms and are capable of tremendous destruction. Wind speeds can exceed 250 mph, and damage paths can be more than one mile wide and 50 miles long.

Although tornados have been documented on every continent, they occur most frequently in the United States east of the Rocky Mountains. Southeast Kansas is situated in an area that is generally known as “Tornado Alley.” Climatological conditions are such that warm and cold air masses meet in the center of the country to create conditions of great instability and fast moving air at high pressure that can ultimately result in formation of tornado funnels.

In southeast Kansas, most tornados and tornado-related deaths and injuries occur during the months of April, May, and June. However, tornados have struck in every month. Similarly, while most tornados occur between 3:00 p.m. and 9:00 p.m., a tornado can strike at any time.

Tornados are classified according to the Enhanced Fujita (EF) Scale. The EF scale ranks tornados according to wind speed and the resulting damage caused. This system is an update to the original Fujita Scale, and was implemented on February 1, 2007. The following table illustrates the changes in the scaling systems.

**Fujita Scale and Enhanced Fujita Scale Comparison**

| Fujita Scale | | | Derived EF Scale | | Operational EF Scale | |
|---|---|---|---|---|---|---|
| F Number | Fastest 1/4-mile (mph) | 3 Second Gust (mph) | EF Number | 3 Second Gust (mph) | EF Number | 3 Second Gust (mph) |
| 0 | 40-72 | 45-78 | 0 | 65-85 | 0 | 65-85 |
| 1 | 73-112 | 79-117 | 1 | 86-109 | 1 | 86-110 |
| 2 | 113-157 | 118-161 | 2 | 110-137 | 2 | 111-135 |
| 3 | 158-207 | 162-209 | 3 | 138-167 | 3 | 136-165 |
| 4 | 208-260 | 210-261 | 4 | 168-199 | 4 | 166-200 |
| 5 | 261-318 | 262-317 | 5 | 200-234 | 5 | Over 200 |

Source: NWS

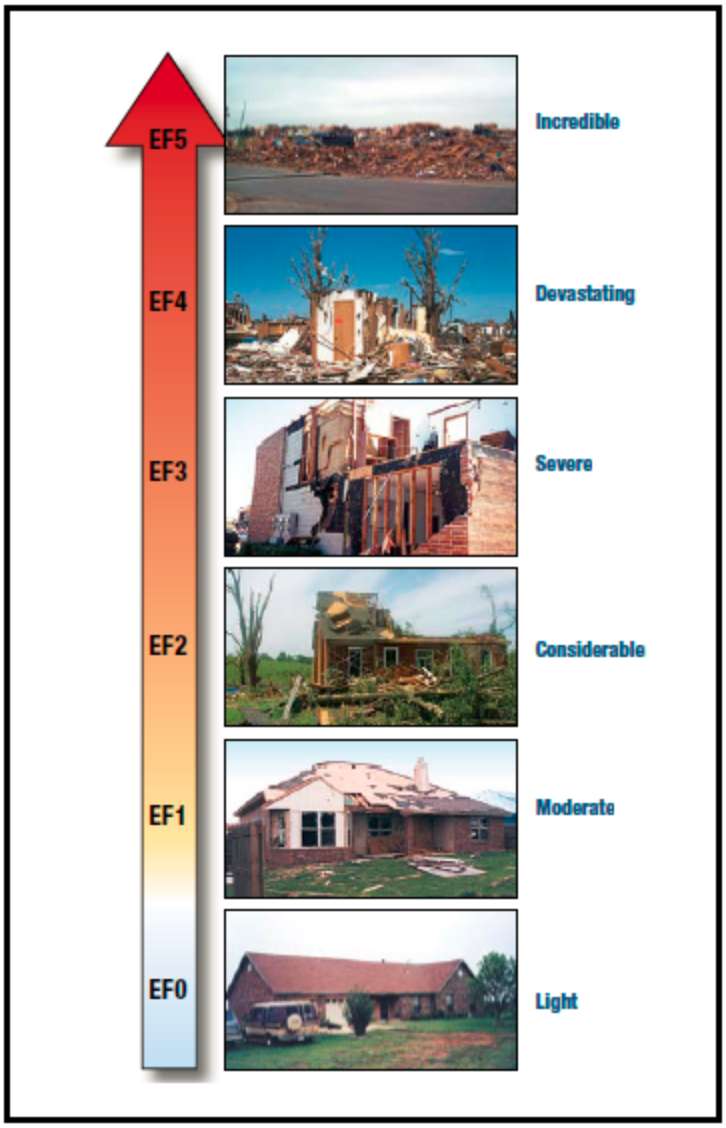
The wind speeds for the EF scale and damage descriptions are based on information from the NOAA Storm Prediction Center. The damage descriptions are summaries. For the actual EF scale it is necessary to look up the damage indicator (type of structure damaged) and refer to the degrees of damage associated with that indicator.

**Enhanced Fujita Scale**

| Scale | Wind Speed (mph) | Relative Frequency | Potential Damage |
|---|---|---|---|
| EF0 | 65-85 | 53.5% | Light. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over. Confirmed tornados with no reported damage (i.e. those that remain in open fields) are always rated EF0. |
| EF1 | 86-110 | 31.6% | Moderate. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken. |
| EF2 | 111-135 | 10.7% | Considerable. Roofs torn off well constructed houses; foundations of frame homes shifted; mobile homes complete destroyed; large trees snapped or uprooted; light object missiles generated; cars lifted off ground. |
| EF3 | 136-165 | 3.4% | Severe. Entire stores of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance. |
| EF4 | 166-200 | 0.7% | Devastating. Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated. |
| EF5 | >200 | <0.1% | Explosive. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 300 ft.; steel reinforced concrete structure badly damaged; high rise buildings have significant structural deformation; incredible phenomena will occur. |

Source: NOAA Storm Prediction Center

The following picture, provided by FEMA, visually indicates expected damage from each tornado type.




Source: FEMA, Taking Shelter From the Storm, 2008

The best lead time for a tornado is about 30 minutes. Tornados have been known to change paths very rapidly, thus limiting the time in which to take shelter. Tornados may not be visible on the ground due to evening hours, blowing dust or driving rain and hail. Therefore, there is very little, or no, warning of when a specific tornado may be on the ground.

| | Warning Time |
|---|---|
| Tornado | 4.00 |

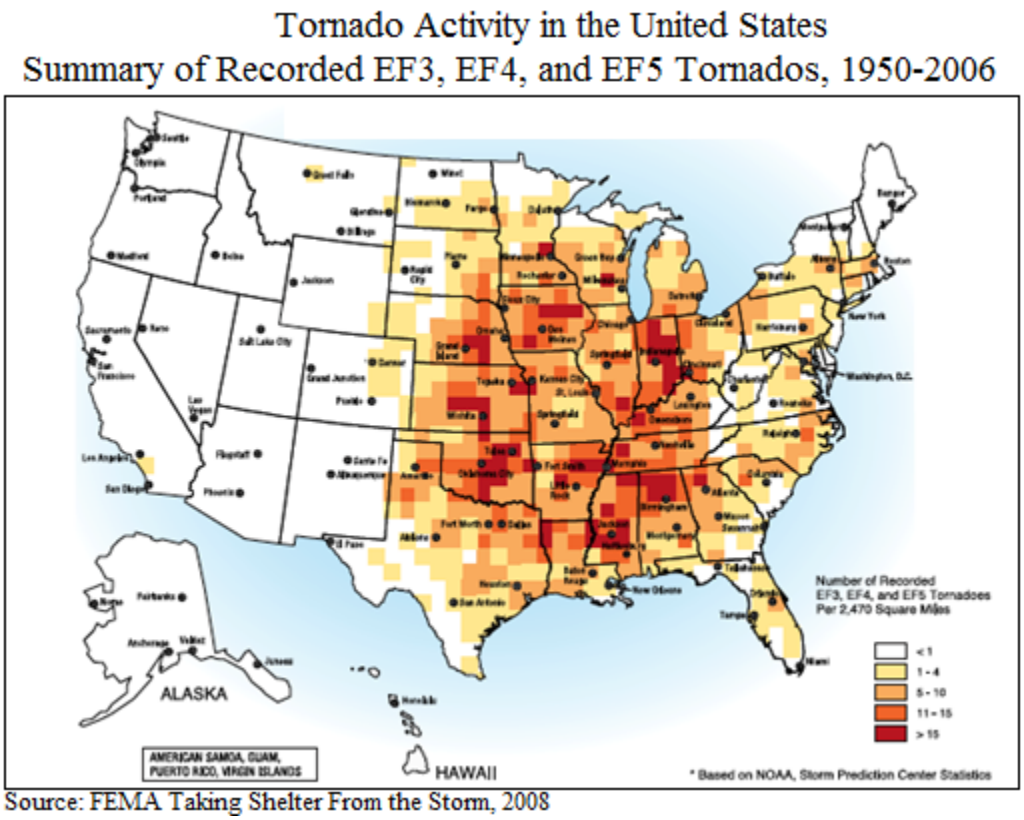
| | Duration |
|---|---|
| Tornado | 1.00 |

**Hazard Location**

Although tornados have been documented on every continent, they occur most frequently in the United States east of the Rocky Mountains. Southeast Kansas is situated in an area that is generally known as Tornado Alley.

While tornados can occur in all areas of the State of Kansas, historically, some areas of the state have been more susceptible to this type of damaging storm. All of southeast Kansas, including all of the participating jurisdictions, is at risk to tornados.

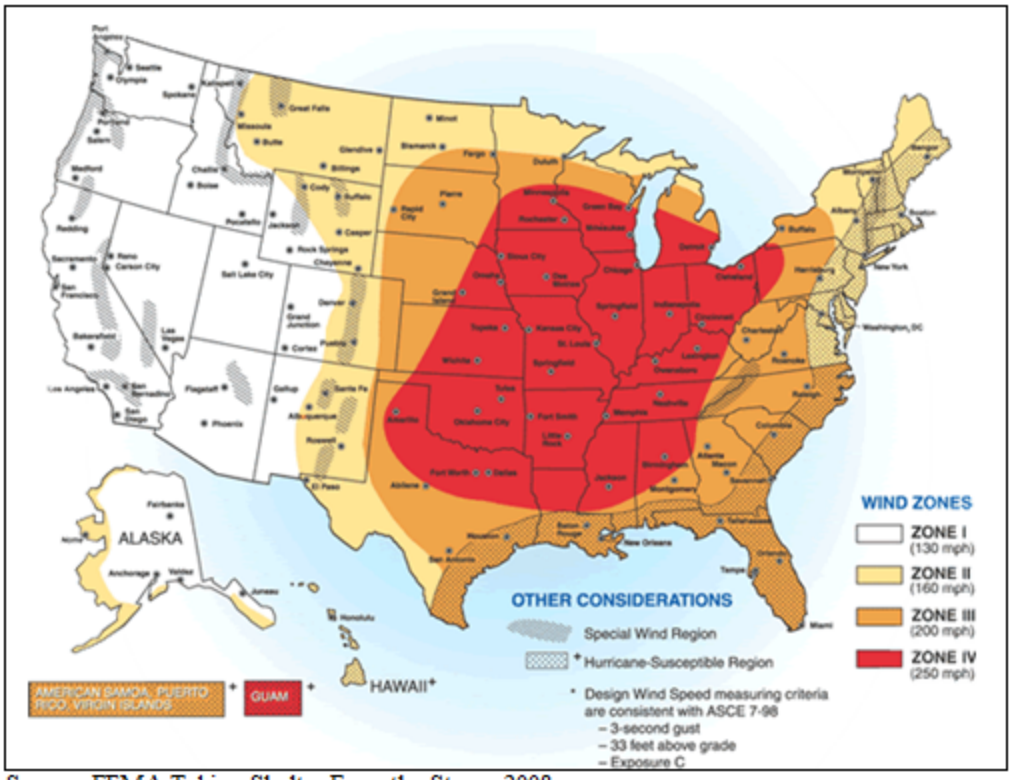
The following figure illustrates the number of F3, F4, and F5 tornados recorded in the United States between 1950 and 2006. Each colored block indicates an area of approximately 2,470 square miles. Data from the map indicates the southeast Kansas region falls within two classifications, light orange with 5 to 10 recorded events and dark orange with 11 to 15 recorded events.



Source: FEMA Taking Shelter From the Storm, 2008

Additionally, the following figure shows that southeast Kansas is in Wind Zone IV, indicating that the area has the strongest and most frequent tornado activity.

Wind Zones in the United States




Source: FEMA Taking Shelter From the Storm, 2008

By using the data derived from the above maps and the risk rating table from FEMA, it is possible to see that southeast Kansas is in a high risk area for tornados.

**Area Risk Rating**

| | | Wind Zone | | | |
|---|---|---|---|---|---|
| | | I | II | III | IV |
| Number of Tornados Per 2,470 Square Miles | <1 | Low Risk | Low Risk | Low Risk | Moderate Risk |
| | 1-4 | Low Risk | Moderate Risk | High Risk | High Risk |
| | 5-10 | Low Risk | Moderate Risk | High Risk | High Risk |
| | 11-15 | High Risk | High Risk | High Risk | High Risk |
| | >15 | High Risk | High Risk | High Risk | High Risk |

Source: Taking Shelter from the Storm, FEMA, 2008

**Previous Occurrences and Extent**

In the past ten years, tornados have impacted southeast Kansas repeatedly, including twelve Presidential Disaster Declarations since 1967. Details about some of these events as well as the Presidential Disaster Declarations that included tornados can be found on the following pages.

**Kansas Presidential Declarations Involving Tornados**

| Declaration Number | Declaration Date* | Disaster Description | Regional Counties Involved | Disaster Cost** |
|---|---|---|---|---|
| 1932 | 08/10/2010 (6/7-7/21/2010) | Severe Storms, Flooding and **Tornados** | Elk, Greenwood, Wilson and Woodson | $9,279,257 |
| 1849 | 06/25/2009 (4/25-5/16/2009) | Severe Storms, Flooding, Straight-line Winds, and **Tornados** | Bourbon, Cherokee, Crawford, Elk, Greenwood, Labette, Montgomery, Neosho and Wilson | $15,013,488 |
| 1808 | 10/31/2008 (09/11-09/17/2008) | Severe Storms, Flooding, and **Tornados** | Greenwood | $4,167,044 |
| 1776 | 07/09/2008 (05/22-06/16/2008) | Severe Storms, Flooding, and **Tornados** | Bourbon, Chautauqua, Cherokee, Crawford, Elk, Montgomery and Wilson | $70,629,544 |
| 1699 | 5/6/2007 (5/4/2007) | Severe Storms, **Tornados**, and Flooding | Cherokee | $117,565,269 |
| 1535 | 8/3/2004 (6/12-7/25/2004) | Severe Storms, Flooding, and **Tornados** | Cherokee, Labette and Woodson, | $12,845,892 |
| 1462 | 5/6/2003 (5/4-30/2003) | Severe Storms, **Tornados**, and Flooding | Allen, Cherokee, Crawford, Labette, Neosho and Woodson, | $988,056 |
| 1327 | 5/3/2000 (4/19/2000) | Severe Storms and **Tornados** | Crawford, Labette, Neosho | $2,542,209 |
| 1254 | 10/14/1998 (10/1-10/8/1998) | Severe Storms, Flooding, and **Tornados** | Bourbon and Cherokee | $9,770,769 |
| 403 | 9/28/1973 | Severe Storms, **Tornados**, Flooding | Greenwood and Woodson, | $4,296,913 |
| 267 | 7/15/1969 | **Tornados**, Severe Storms, Flooding | Allen, Bourbon, Crawford, Neosho and Woodson | $733,524 |
| 229 | 7/18/1967 | **Tornados**, Severe Storms, Flooding | Crawford | $847,439 |

Sources: FEMA and Kansas Division of Emergency Management

* Incident dates are in parentheses.

** Disaster costs include Public Assistance and Individual Assistance and may include additional ,unlisted counties

The following are brief descriptions of some of the above referenced tornado events:

**FEMA-1932-DR:** Severe Storms, Flooding and Tornados – August 10, 2010 (June 7 to July 21, 2010): There were thunderstorms that developed Tornados during this timeframe, but no widespread tornado damage. The majority of the declaration damage was from flooding to public roads and bridges.

**FEMA-1849-DR:** Severe Storms, Flooding, Straight-line Winds and Tornados – June 25, 2009 (April 25 to May 16, 2009): On Aril 29th, severe thunderstorms produced very large hail and 5 Tornados.

**FEMA-1808-DR:** Severe Storms, Tornados and Flooding—October 31, 2008 (September 11 to September 17, 2008): On October 22, 2008, Governor Kathleen Sebelius requested a major disaster declaration because of severe storms accompanied by tornados, lightning and torrential rains resulting in flooding and flash flooding during the period of September 11-18, 2008.

**FEMA-1776-DR:** Severe Storms, Flooding and Tornados- July 9, 2008 (May 22 to June 16, 2008): A series of intense supercell thunderstorms moved north across northwest Kansas during the afternoon and early evening hours of May 23rd. Long-track tornados, flash flooding, large hail and damaging winds were reported.

**FEMA-1699-DR:** Severe Storms, Tornados, and Flooding—May 6, 2007 (May 4): A 1.7 mile-wide EF5 tornado with wind estimated at 205 mph struck Greensburg in Kiowa County, destroying approximately 90 percent of the town and severely damaging the remaining 10 percent. Tornado sirens sounded in the City twenty minutes before the tornado struck, and a tornado emergency was issued, undoubtedly saving many lives in the town of 1,580. Nevertheless, the storm killed 12 people, 10 in Greensburg, one in Pratt, and one in Stafford, and hospitalized 13 others.

**FEMA-1462-DR:** Severe Storms, Tornados, and Flooding—May 6, 2003 (May 4–30): In two separate storm events, May 4 and 15, tornados and flooding occurred across eastern Kansas. There was widespread property damage, seven fatalities, and more than 50 injuries. About a third of the town of Franklin in Crawford County was destroyed.



Image from: www.franklinkansas.com

**FEMA-1327-DR:** Severe Storms and Tornados—May 3, 2000 (April 19): On April 19, damaging tornados struck communities in Crawford, Labette, Neosho and Montgomery Counties. Tornados caused extensive damage in Parsons and in Neosho County. An F3 destroyed an area of 30-square blocks, and 30-60-square blocks sustained moderate damage. More than 30 injuries were reported from all the tornados combined, most of them in Parsons.

The following provide further descriptions and other notable tornado events.

**April 13, 2009: Bronson, Bourbon County**: A NWS storm survey revealed that an EF-1 tornado impacted rural sections of western Bourbon County. The tornado damaged five large hay barns, several outbuildings, and uprooted numerous trees. The wind speed was estimated at 90 mph. Estimated property damage $100,000.

**March 30, 2006: Havana, Montgomery County**: The tornado produced F2 damage four miles north of Wayside, and again two miles southwest of Sycamore. Several homes and mobile homes were damaged or destroyed along its 16 mile path. The most concentrated damage occurred roughly two to three miles southwest of Sycamore in the township of Radical, where several homes and mobile homes sustained damage, some of which was major. Additionally, numerous trailers were overturned at Elk City Lake, along with damage at Elk City Lake State Park. One man was seriously injured three miles southwest of Sycamore, when his home was hit by the tornado. Average path width ranged from 75 to 125 yards. Estimated property damage $1,000,000.

**March 30, 2006: Coyville, Wilson County**: Damaged a barn, carport, and some trees. Estimated property damage $20,000.

**April 21, 2005: Galesburg, Neosho County**: This tornado destroyed two barns, two out-buildings, two mobile homes, one garage and one shed, damaged one barn, dislodged one frame house from its foundation, unroofed and collapsed two exterior walls of a frame house, and caused tree damage. Estimated property damage $200,000.

**November 27, 2005: Erie, Neosho County**: Shortly after touchdown approximately two miles northeast of Erie, the tornado produced F1 damage to homes, outbuildings and trees. Thereafter, the tornado lost some of its intensity, and subsequent damage was rated F0. Estimated property damage $120,000.

**May 8, 2003: Toronto, Woodson County**: This tornado caused the following damage: Toronto: Outbuildings destroyed, trees & limbs downed. Batesville: Large trees uprooted and sheared off, sheet metal in trees, old wood shed destroyed, oil tank 12-15 feet high toppled (leaked profusely), power pole blown over, house destroyed, two vehicles heavily damaged, pair of two to three foot diameter trees stripped four feet off ground, cattle barn and garage destroyed, windows blown out of house, large pick-up truck rolled onto side. Yates Center: House & barn destroyed on Highway 75, horse trailer flipped over, large trees uprooted or snapped off at bases, broke or toppled 70 grave markers at the cemetery, two-story house and three barns destroyed, trees completely shredded, five homes destroyed and 30 damaged. Two of the three injuries occurred at one residence with both requiring transport to a hospital. Forty-five miles of fence damaged. Stored hay contaminated by embedding of wiring and nails. Estimated crop losses: Corn: 300 acres. Wheat: 100 acres. Pasture: 1312 acres. Hay: 655 acres. Of the estimated $2.5 million

damage, $1.506 million inflicted upon farming facilities. Farming facility damage breakdown: Dwellings and Service Buildings: $900,000; Structures: $6,000; Machinery & equipment: $600,000. USDA Flash Situation Report contributed greatly to this narrative. This tornado would cross just barely into extreme Northwest Allen County. Estimated property damage $2,500,000.

**May 8, 2003: Iola, Allen County**: This tornado toppled an oil tank, flipped over a farm vehicle, shredded several trees, and snapped power poles. Estimated property damage $150,000.

**May 8, 2003: Hamilton, Greenwood County**: A tornado moved north of Hamilton causing roof damage to one home and a few other farm buildings. Estimated property damage $75,000.

**May 4, 2003: McCune, Crawford County**: This storm is known to have initiated the unforgettable series of events. This classic supercell rapidly developed over Montgomery County, eventually moving into southwestern Crawford County where it spawned a very large and destructive tornado. This tornado laid out a path of destruction for 27 miles through Crawford County. This event also claimed three lives and injured 20 in eastern sections of the county, where the tornado had strengthened to F-4 status. Estimated property damage $7,200,000 and estimated crop damage $1,000,000.

**May 4, 2003: Melrose, Cherokee County**: A classic supercell thunderstorm moved out of southern Labette County, Kansas and into southwest Cherokee County, Kansas. Intermittent, brief tornado touch downs were observed from storm spotters in rural sections of southeast Labette County. The storm eventually produced a long lived tornado that initially touched down north of Melrose and progressed through rural areas of central and east central Cherokee County. This large and destructive tornado is accountable for 19 injuries and three fatalities. Estimated property damage $2,700,000 and estimated crop damage $1,000,000.

**April 19, 2000: Walnut, Crawford County:** An F2 tornado entered western Crawford County about three miles south of Walnut and moved through the northwest portion of the county. The damage path was intermittent and about 200 yards wide. The tornado stayed mainly over rural areas and uprooted trees and damaged or destroyed three homes and several outbuildings. The tornado exited the county just east of Hepler and moved into southern Bourbon County. Estimated property damage $200,000.

**April 19, 2000: McCune, Crawford County**: An F2 tornado entered the southwest corner of Crawford County west of McCune and traveled northeast over the southwest section of the county. The intermittent damage path was 300 yards wide. Although the tornado stayed over rural areas, it still managed to severely damage or destroy five homes

and several outbuildings. Four persons were injured by flying debris. Estimated property damage $300,000.

**April 19, 2000: Dennis, Labette County**: This tornado formed three miles south of Cherryvale in eastern Montgomery County and entered western Labette County. Moving northeast the tornado passed four miles south of Dennis and entered southwest Parsons where it inflicted major damage to a law enforcement center, a movie theater, and a carnival. In all, 750 buildings were damaged of which 633 were homes. Of the homes, 53 were destroyed, 112 sustained major damage and 468 received minor damage. Of the 117 commercial buildings that sustained damage, 20 were destroyed, 28 received major damage, and 69 received minor damage. Total damage estimate: $40 million. A total of 27 people were injured, most were minor. This same tornado would continue moving northeast, clipping southeast Neosho County. Estimated property damage $71,500,000.

**April 19, 2000: Erie, Neosho County**: Forming six miles southwest of Erie, the tornado moved northeast passing just south of Erie. F2 intensity for much of its track, the tornado injured 3 people on the southern periphery of Erie as it destroyed or heavily damaged 12 homes, several mobile homes, and a few trees. This tornado then crossed into Crawford county. Estimated property damage $1,800,000.

The following table shows NCDC information for the 11 years from 2003 to 2013. Additionally, the strongest rated tornado event is indicated.

**NCDC Tornado Events, 2000-2012**

| County | Number of Tornados | Strongest Tornado Event | Deaths | Total Property Damage | Total Crop Damage |
|---|---|---|---|---|---|
| Allen | 10 | F1 | 0 | $150,000 | $0 |
| Bourbon | 4 | F1 | 0 | $1,000 | $0 |
| Chautauqua | 6 | F0 | 0 | $0 | $0 |
| Cherokee | 12 | F3 | 3 | $2,835,000 | $1,000,000 |
| Crawford | 8 | F4 | 3 | $7,700,000 | $1,000,000 |
| Elk | 6 | F0 | 0 | $0 | $0 |
| Greenwood | 9 | F1 | 0 | $95,000 | $0 |
| Labette | 20 | F3 | 0 | $73,755,000 | $0 |
| Montgomery | 11 | F2 | 0 | $1,100,000 | $0 |
| Neosho | 12 | F3 | 0 | $21,750,000 | $0 |
| Wilson | 5 | F1 | 0 | $20,000 | $0 |
| Woodson | 4 | F3 | 0 | $2,500,000 | $261,000 |
| Regional Total | 107 | - | 6 | $109,906,000 | $2,261,000 |

Source: NCDC Storm Events Database

**Hazard Vulnerability and Impact**

To refine and access the relative vulnerability of each of southeast Kansas' counties to tornados, ratings were assigned to pertinent factors at the county level. These factors are: social vulnerability index, prior events, prior annualized property damage, building exposure valuation, population density, crop exposure and annualized crop loss. Then a rating value of 1-10 was assigned to the data obtained for each factor and then weighted equally and factored together to obtain overall vulnerability scores for comparison and to determine the most vulnerable counties.

Tornados that touch-down can create a unique path of destruction. So using the prior events as a factor can give the perception that a county has a higher overall vulnerability to tornados.

The following information was used for this analysis:

- Social Vulnerability Index for Kansas from the Hazards and Vulnerability Research Institute at the University of South Carolina
- NCDC storm events 2000 – 2012
- U.S. Census Bureau (2010)
- USDA's Census of Agriculture (2007).

**Regional Counties Tornado Vulnerability Factors**

| County | SoVI Rating | Prior Events 1993-2012 | Property Damages | Annualized Property Damage | Total Building Exposure ($000) | Population Density | Crop Exposure | Crop Loss Insurance Paid | Annualized Crop Loss Insurance Paid |
|---|---|---|---|---|---|---|---|---|---|
| Allen | 3 | 10 | $150,000 | $7,500 | $983,778 | 26 | $15,462,000 | $0 | $0 |
| Bourbon | 4 | 4 | $100,000 | $5,000 | $1,102,488 | 24 | $9,918,000 | $0 | $0 |
| Chautauqua | 5 | 6 | $0 | $0 | $285,438 | 6 | $4,971,000 | $0 | $0 |
| Cherokee | 4 | 13 | $2,935,000 | $146,750 | $1,293,753 | 37 | $53,420,000 | $0 | $0 |
| Crawford | 3 | 9 | $7,800,000 | $390,000 | $2,588,817 | 66.4 | $34,463,000 | $2,673 | $267 |
| Elk | 5 | 5 | $0 | $0 | $187,291 | 4 | $0 | $0 | $0 |
| Greenwood | 5 | 14 | $95,000 | $4,750 | $491,412 | 6 | $8,087,000 | $0 | $0 |
| Labette | 4 | 20 | $73,755,000 | $3,687,750 | $1,453,850 | 33 | $22,765,000 | $0 | $0 |
| Montgomery | 4 | 11 | $1,110,000 | $55,500 | $2,432,183 | 54 | $16,616,000 | $2,830 | $283 |
| Neosho | 4 | 12 | $2,175,000 | $108,750 | $1,174,150 | 29 | $17,811,000 | $0 | $0 |
| Wilson | 4 | 5 | $20,000 | $1,000 | $671,059 | 16 | $26,882,000 | $12,437 | $1,244 |
| Woodson | 5 | 4 | $2,500,000 | $125,000 | $207,905 | 7 | $14,486,000 | $268 | $27 |
| Regional Total | - | 113 | $90,640,000 | $4,532,000 | $12,872,124 | - | $224,881,000 | $18,208 | $1,821 |

Note: The Census of Agriculture did not publish crop exposure in Elk County

Using the above information, a value of 1-10 was assigned to the data obtained for each factor and then weighted equally and factored together to obtain overall vulnerability scores for comparison and to determine the greatest vulnerable counties. The Social Vulnerability Index is in a range of 1- 5. To give Social Vulnerability Index the same weight as the other factors, the numbers were multiplied by two.

**Ranges for Tornado Vulnerability Ratings**

| Ratings | Social Vulnerability | Prior Events | Annualized Property Damage | Building Exposure Valuation | Population Density * | Crop Exposure | Annualized Crop Loss Insurance Paid |
|---|---|---|---|---|---|---|---|
| 1 | | 3 - 7 | $500 - $500,000 | $117,421 - $4,492,825 | 1.6 - 116.3 | 0 - $18,548,500 | $0 - $1,000 |
| 2 | 1 | 8 - 12 | $500,001 - $1,000,000 | $4,492,826 - $8,868,229 | 116.4 - 231.1 | $18,548,501 - $32,126,000 | $1,001 - $2,000 |
| 3 | | 13 - 17 | $1,000,001 - $1,300,000 | $8,868,230 - $13,243,634 | 231.2 - 345.9 | $32,126,001 - $45,703,500 | $2,001 - $3,000 |
| 4 | 2 | 18 - 22 | $1,300,001 - $2,000,000 | $13,243,635 - $17,619,039 | 346 - 460.7 | $45,703,501 - $59,281,000 | $3,001 - $4,000 |
| 5 | | 23 - 27 | $2,000,001 - $3,000,000 | $17,619,040 - $21,994,444 | 460.8 - 575.5 | $59,281,001 - $72,858,500 | $4,0001- $5,000 |
| 6 | 3 | 28 - 32 | $3,000,001 - $4,000,000 | $21,994,445 - $26,369,848 | 575.6 - 690.3 | $72,858,501 - $86,436,000 | $5,001 - $6,000 |
| 7 | | 33 - 37 | $4,000,001 - $7,000,000 | $26,369,849 - $30,745,253 | 690.4 - 805.1 | $86,436,001 - $100,013,500 | $6,001 - $7,000 |
| 8 | 4 | 38 - 42 | $8,000,001 - $11,000,000 | $30,745,254 - $35,120,658 | 805.2 - 919.9 | $100,031,501 - $113,591,000 | $7,001 - $8,000 |
| 9 | | 43 - 47 | $11,000,001 - $13,000,000 | $35,120,659 - $39,496,062 | 920- 1,034.7 | $113,591,001 - $127,168,500 | $8,001 - $9,000 |
| 10 | 5 | 48 - 54 | Above $13,000,001 | $39,496,063 - $43,871,468 | 1,034.8 - 1,149.6 | $127,168,501 - $140,746,000 | $9,001 and up |

Based on the above ratings system, ranges were applied to each county to determine their potential vulnerability. The following related the scoring to a vulnerability assessment:

- **Medium:** Score range of 9 - 19
- **Medium-High:** Score range of 20 - 29
- **High:** Score range of 30 - 40

**Vulnerability of Regional Counties to Tornados**

| County | SoVi Rating | Prior Event Rating | Annualized Property Damage Rating | Bldg Exposure Valuation Rating | Population Density Rating | Crop Exposure Rating | Annualized Crop Insurance Rating | Overall Vulnerability Rating | Tornado Vulnerability |
|---|---|---|---|---|---|---|---|---|---|
| Allen | 8 | 1 | 1 | 1 | 1 | 1 | 1 | 14 | Medium |
| Bourbon | 10 | 1 | 0 | 1 | 1 | 1 | 1 | 15 | Medium |
| Chautauqua | 8 | 3 | 1 | 1 | 1 | 4 | 1 | 19 | Medium |
| Cherokee | 6 | 2 | 1 | 1 | 1 | 3 | 1 | 15 | Medium |
| Crawford | 10 | 1 | 0 | 1 | 1 | 1 | 1 | 15 | Medium |
| Elk | 10 | 3 | 1 | 1 | 1 | 1 | 1 | 18 | Medium |
| Greenwood | 8 | 4 | 6 | 1 | 1 | 2 | 1 | 23 | Medium-High |
| Labette | 8 | 2 | 1 | 1 | 1 | 1 | 1 | 15 | Medium |
| Montgomery | 8 | 2 | 1 | 1 | 1 | 1 | 1 | 15 | Medium |
| Neosho | 8 | 1 | 1 | 1 | 1 | 2 | 2 | 16 | Medium |
| Wilson | 10 | 1 | 1 | 1 | 1 | 1 | 1 | 16 | Medium |
| Woodson | 10 | 2 | 1 | 1 | 1 | 1 | 1 | 16 | Medium |

Between 2001 and 2010 by tornados, 51 percent of those killed by tornados were living in mobile homes, according to NOAA. The *2012 Kansas Severe Weather Awareness Week* reports people living in mobile homes are killed by tornados at a rate 20 times higher than people living in permanent homes. The following table represents the number of mobile homes per county, and the percentage of total housing stock.

**Percentage of Mobile Homes per Regional County**

| County | Number of Housing Units | Number of Mobile Homes | Percentage Mobile Homes |
|---|---|---|---|
| Allen | 6,221 | 694 | 11.2% |
| Bourbon | 7,137 | 571 | 8.0% |
| Chautauqua | 2,137 | 228 | 10.7% |
| Cherokee | 9,828 | 1,444 | 14.7% |
| Crawford | 17,739 | 1,370 | 7.7% |
| Elk | 1,738 | 167 | 9.6% |
| Greenwood | 4,028 | 427 | 10.6% |
| Labette | 10,044 | 658 | 6.6% |
| Montgomery | 16,483 | 1,442 | 8.7% |
| Neosho | 7,545 | 714 | 9.5% |
| Wilson | 4,632 | 582 | 12.6% |
| Woodson | 2,010 | 287 | 14.3% |
| Regional Total | 89,542 | 8,584 | 9.6% |

Sources: United States Census Bureau and U.S. Census Bureau American Community Survey 2005 – 2009

| | Magnitude/Severity |
|---|---|
| Tornado | 3.42 |

**Future Development**

Future development, increases in population, and additional development of agricultural resources and would tend to increase the risk of this hazard. However, data suggests that the region is experiencing a decline in population and in development. Additionally, the acres of land in farms in decreasing and the number of cattle has been falling over the past five years.

**Probability of Future Hazard Events**

According to the NCDC, there were 107 tornados in southeast Kansas between 2000 and 2012. Based on this information, the probability that at least one tornado will occur in southeast Kansas in any given year very high.

**The following calculations of probability are used for illustrative purposes only.** The calculations were sourced from the FEMA Benefit-Cost Analysis Reengineering Tornado Safe Room Module Methodology Report, Version 4.5 Final, Dated May 2009. Revisions to the calculation methodology include using the entire area of the county as opposed to the 80 km by 80 km cell sized. Additionally, tornados reported on the Fujita Scale were converted to the Enhanced Fujita Scale using available data. Finally, probabilities were not calculated for EF class tornados with zero occurrence.

The following equation was used to determine probabilities equation:

***Prob. Tornado(EF) = (EF count * EF area) / (Cell area * Years)***

Where:

- EF count = Estimate tornado count for EF class from mapping
- EF area = Area of tornado for EF class in (kilometer) km2
- Cell area = Area of analysis cell, county size in $km^2$
- Years = Years of record from 2000 to 2012 or 13 years

**Mean Tornado Length and Width**

| EF Class | Length ($km^2$) | Width ($km^2$) | EF Area |
|---|---|---|---|
| EF0 | 1.4 | 0.0284 | 0.03976 |
| EF1 | 4.7 | 0.064 | 0.3008 |
| EF2 | 10.7 | 0.1259 | 1.34713 |
| EF3 | 22.5 | 0.2636 | 5.931 |
| EF4 | 43.6 | 0.4607 | 20.08652 |
| EF5 | 54.6 | 0.5555 | 30.3303 |

The following table details the illustrative calculated probability for the occurrence of a tornado in each regional county.

**Illustrative Calculated Probability of Tornado**

| County | Approximate Area ($km^2$) | Tornado Rating (EF Scale) | Tornado Area ($km^2$) | Number of Occurrences | Number of Years | Probability |
|---|---|---|---|---|---|---|
| Allen | 1,308 | 0 | 0.03976 | 9 | 13 | 0.00210% |
| | | 1 | 0.30080 | 1 | 13 | 0.00177% |
| Bourbon | 1,652 | 0 | 0.03976 | 2 | 13 | 0.00037% |
| | | 1 | 0.30080 | 1 | 13 | 0.00140% |
| | | 2 | 1.34713 | 1 | 13 | 0.00627% |
| Chautauqua | 1668 | 0 | 0.03976 | 6 | 13 | 0.00110% |
| Cherokee | 1531 | 0 | 0.03976 | 9 | 13 | 0.00180% |
| | | 1 | 0.30080 | 2 | 13 | 0.00302% |
| | | 3 | 5.93100 | 1 | 13 | 0.02980% |
| Crawford | 1541 | 0 | 0.03976 | 5 | 13 | 0.00100% |
| | | 2 | 1.34713 | 2 | 13 | 0.01345% |
| | | 4 | 20.08652 | 1 | 13 | 0.10027% |
| Elk | 1683 | 0 | 0.03976 | 6 | 13 | 0.00109% |
| Greenwood | 2984 | 0 | 0.03976 | 8 | 13 | 0.00082% |
| | | 1 | 0.30080 | 1 | 13 | 0.00078% |
| Labette | 1691 | 0 | 0.03976 | 8 | 13 | 0.00145% |
| | | 1 | 0.30080 | 1 | 13 | 0.00137% |
| | | 3 | 5.93100 | 1 | 13 | 0.02698% |
| Montgomery | 1686 | 0 | 0.03976 | 9 | 13 | 0.00163% |
| | | 1 | 0.30080 | 1 | 13 | 0.00137% |
| | | 2 | 1.34713 | 1 | 13 | 0.00615% |
| Neosho | 1497 | 0 | 0.03976 | 8 | 13 | 0.00163% |
| | | 1 | 0.30080 | 2 | 13 | 0.00309% |
| | | 2 | 1.34713 | 1 | 13 | 0.00692% |
| | | 3 | 5.93100 | 1 | 13 | 0.03048% |
| Wilson | 1489 | 0 | 0.03976 | 4 | 13 | 0.00082% |
| | | 1 | 0.30080 | 1 | 13 | 0.00155% |
| Woodson | 1308 | 0 | 0.03976 | 3 | 13 | 0.00070% |
| | | 3 | 5.93100 | 1 | 13 | 0.03488% |

| | Probability |
|---|---|
| Tornado | 3.25 |

**Consequence Analysis**

The information in the following table provides the Consequence Analysis.

**Tornado Consequence Analysis**

| Subject | Ranking | Impacts of Tornado |
|---|---|---|
| Health and Safety of Persons in the Area of the Incident | Severe | Impact of the immediate area could be severe depending on whether individuals were able to seek shelter and get out of the trajectory of the tornado. Casualties are dependent on warning systems and warning times. |
| Responders | Minimal | Impact to responders is expected to be minimal unless responders live within the affected area. |
| Continuity of Operations | Minimal to Severe | Temporary to permanent relocation may be necessary if government facilities experience damage. |
| Property, Facilities, and Infrastructure | Minimal to Severe | Localized impact could be severe in the trajectory path. Roads, buildings, and communications could be adversely affected. Damage could be severe. |
| Delivery of Services | Minimal to Severe | Delivery of services could be affected if there is any disruption to the roads and/or utilities due to damages sustained. Depending on the incident size the damage could be severe. |
| Environment | Minimal to Severe | Impact will be severe for the immediate impacted area. Impact will lessen as distance increases from the immediate incident area. |
| Economic Conditions | Minimal to Severe | Impacts to the economy will greatly depend on the trajectory of the tornado. If a jurisdiction takes a direct hit then the economic conditions will be severe. With an indirect hit the impact could be low to severe. |
| Public Confidence in Governance | Minimal to Severe | Response and recovery will be in question if not timely and effective. Warning systems and warning time will also be questioned. |

### 3.7.19 UTILITY/INFRASTRUCTURE FAILURE

| | Probability | Magnitude/Severity | Warning Time | Duration | CPRI |
|---|---|---|---|---|---|
| Utility/Infrastructure Failure | 2.83 | 2.17 | 3.67 | 2.92 | **2.77** |

**Description**

Critical infrastructure involves several different types of facilities and systems including:

- Electric power
- Transportation routes
- Natural gas and oil pipelines
- Water and sewer systems, storage networks
- Internet/telecommunications systems

Failure of utilities or infrastructure components in southeast Kansas can seriously impact public health, functioning of communities and the region's economy. Disruptions to utilities can occur from many of the hazards detailed in this plan, but the most likely causes include:

- Floods
- Lightning
- Tornados and Windstorms
- Winter Storms

In addition to being impacted by another listed hazard, utilities and infrastructure can fail as a result of faulty equipment, lack of maintenance, degradation over time, or accidental damage.

| | Warning Time |
|---|---|
| Utility / Infrastructure Failure | 3.67 |

| | Duration |
|---|---|
| Utility / Infrastructure Failure | 2.92 |

**Hazard Location**

All of southeast Kansas is at risk for utility and/or infrastructure failure. The following sections discuss the major utilities in further detail.

***Electric Power***

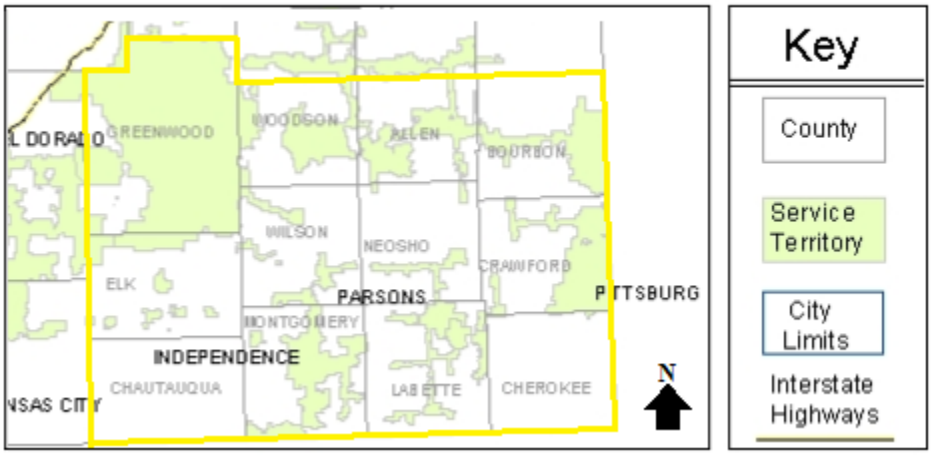
The most common hazards analyzed in this plan that may disrupt the power supply are flood, lightning, tornado, windstorm, and winter weather. In addition, extreme heat can disrupt power supply when air conditioning use spikes during heat waves resulting in brownouts or rolling blackouts.

Electricity in southeast Kansas is provided by either investor-owned utilities or rural electric cooperatives. Electric utilities in Kansas are regulated by both the KCC and the Federal Energy Regulatory Commission.

Three investor-owned utilities in Kansas operated by public corporations provide service in southeast Kansas, Westar Energy, Kansas City Power & Light (KCP&L), and the Empire District Electric Company.

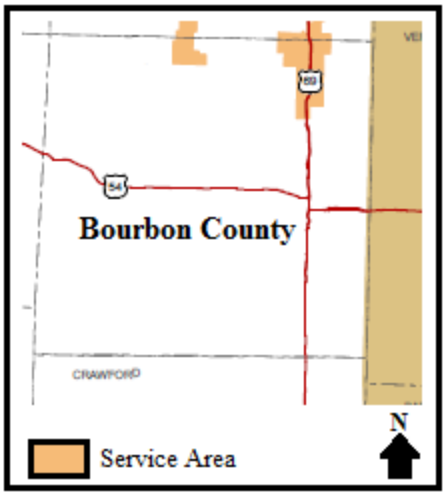
Westar operates 12 power plants and owns over 33,000 miles of transmission and distribution lines. Its service territory covers about 10,130 square miles in east and east-central Kansas, and they provide electricity to more than 675,000 customers.

Westar Energy Territory Map



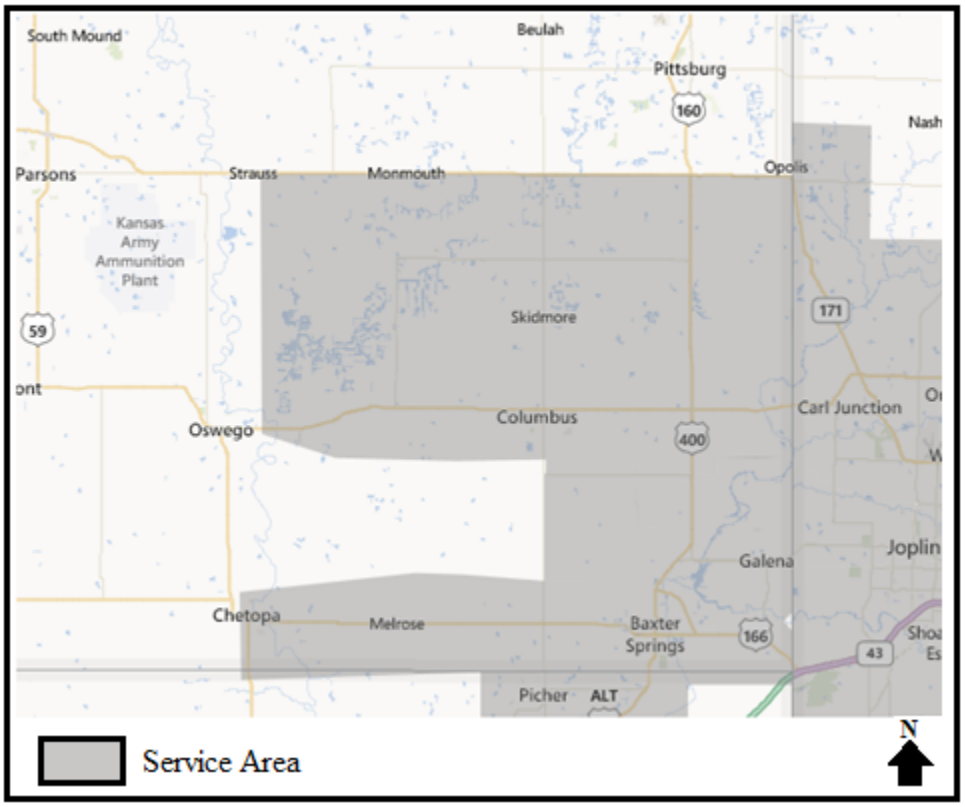

KCP&L is based out of Kansas City, Missouri, and serves a small portion of northern Bourbon County.

KCP&L Service Territory Map



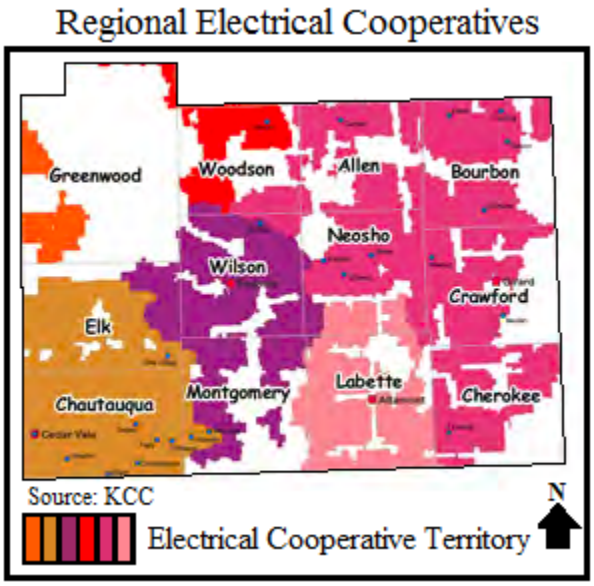

The Empire District Electric Company provides electric, natural gas, water, and fiber optics services for part of Cherokee County.

Empire District Company Service Map



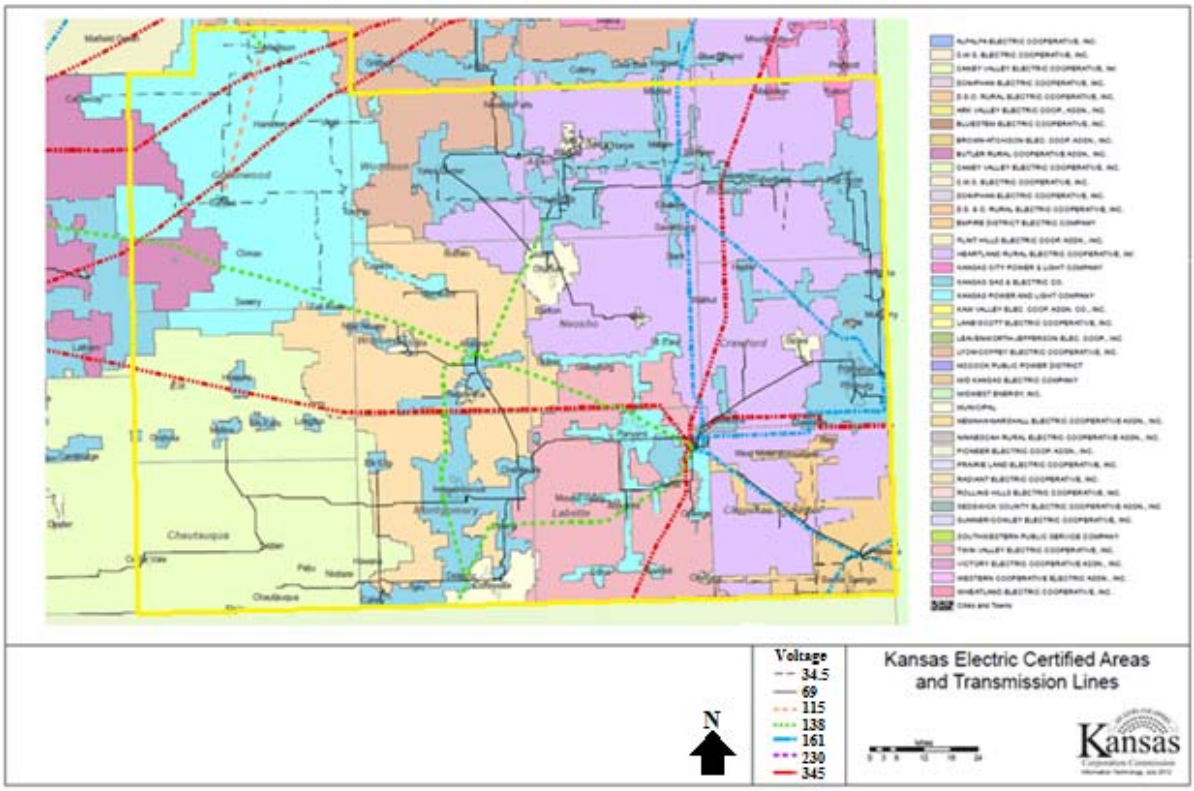

Rural electric cooperatives (RECs) are not-for-profit, member-owned electric utilities. Distribution cooperatives deliver electricity to consumers. Generation and transmission

cooperatives generate and transmit electricity to distribution co-ops. Kansas RECs are governed by a board of trustees elected from the membership. Most Kansas RECs were set up under the Kansas Electric Cooperative Act, which, together with the federal Rural Electrification Act of 1934, made electric power available to rural customers. The following map shows the coverage are of regional RECs

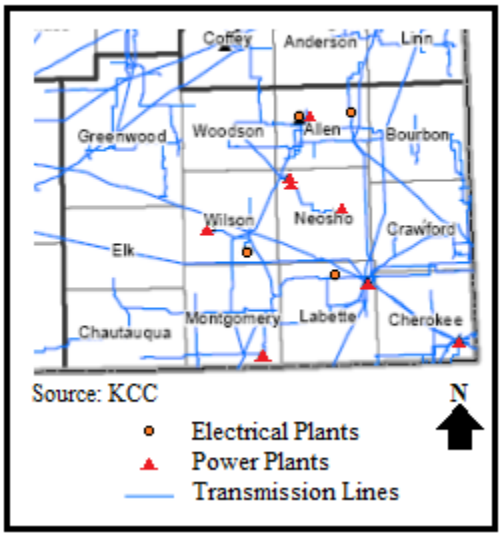


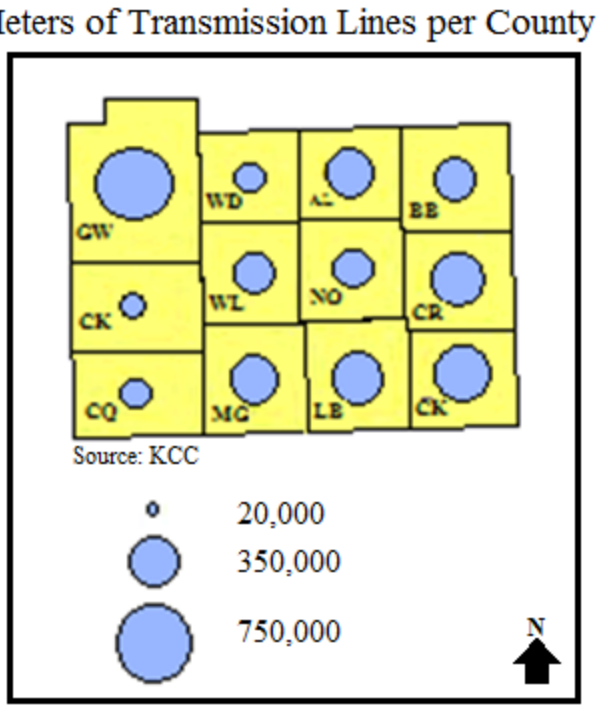

The following maps indicate the locations of electric certified areas, transmission lines and power plants in southeast Kansas.

## Electric Certified Areas and Transmission Lines




## Electrical Transmission Lines and Power Plants



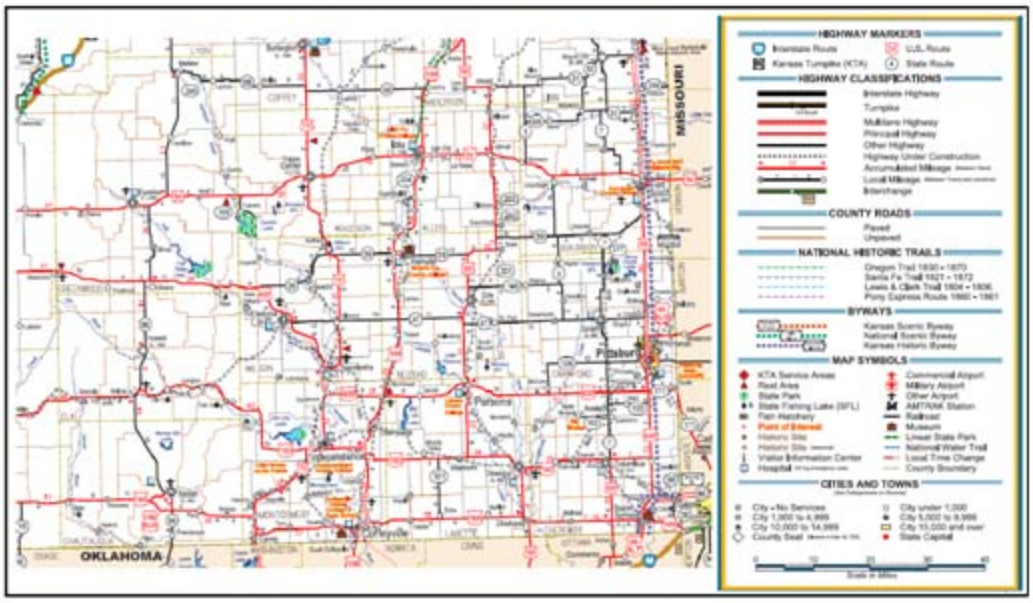



***Transportation Routes***

Transportation routes can also be impacted by many of the hazards discussed in this plan. The primary hazards that impact transportation are flood, hazardous materials, and winter weather. Flood events can make roads and bridges impassible due to high water. Flood waters can also erode or scour road beds and bridge abutments. Highway and railroad accidents that involve hazardous materials can impact transportation routes through closures and/or evacuations. Winter weather frequently impacts transportation as roads become treacherous or impassible due to ice and snow. Other hazards that impact transportation routes include dam and levee failures if routes are in inundation areas, extreme temperatures that can cause damage to pavement, land subsidence that can damage roads/railroads, landslides that can cause debris and rock falls onto roadways, terrorism that can target routes, tornados that can directly damage infrastructure or deposit debris in routes, wildfires that can cause decreased visibility on transportation routes due to smoke, and windstorms that can cause vehicle accidents or overturning.

The following figure shows the highways in southeast Kansas.

Regional Highway Map

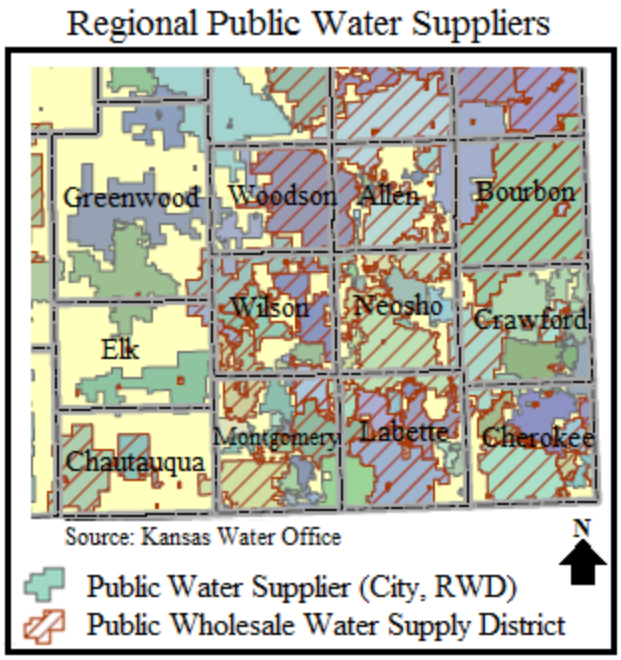



***Natural Gas and Oil Pipelines***

Hazards that can impact natural gas and oil pipelines include earthquakes, expansive soils, land subsidence, landslide, and terrorism. Natural gas and oil pipelines have been previously discussed.

***Water and Sewer Systems***

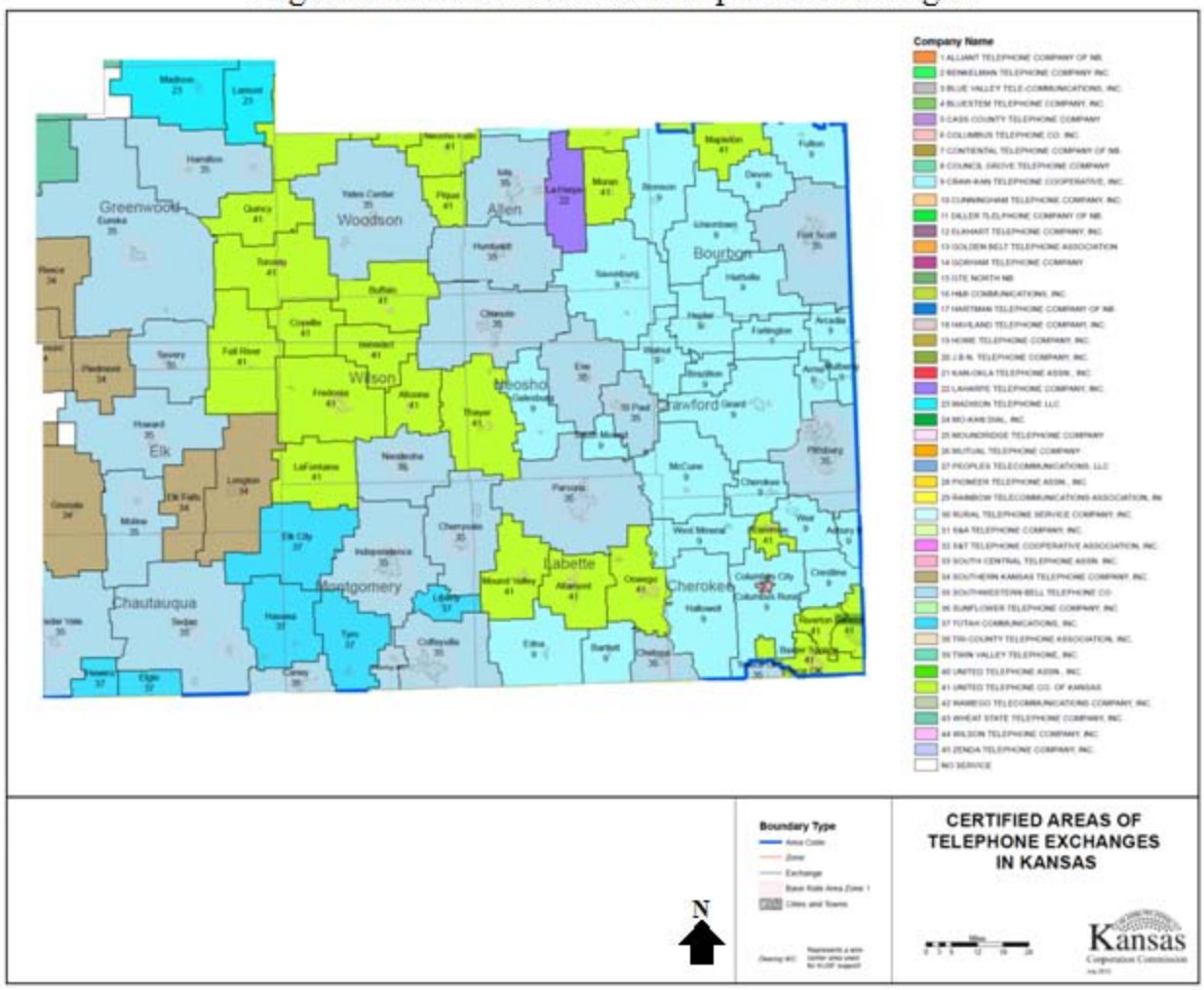
The primary hazards that can impact water supply systems include drought, floods, hazardous materials, and terrorism. The following figure provides a map of public water suppliers in southeast Kansas.




***Internet and Telecommunications***

Internet and telecommunications infrastructure can be impacted by floods, lightning, tornados, windstorms, and winter weather. Land line phone lines often utilize the same poles as electric lines, so when weather events such as windstorm or winter weather cause lines to break both electricity and telephone services may experience outages. With the increasing utilization of cellular phones, hazard events such as tornado that can damage cellular repeaters can cause outages. In addition, during any hazard event, internet and telecommunications systems can become overwhelmed due to the surge in call and usage volume. The following map indicates telephone service providers in southeast Kansas.

Regional Certified Areas of Telephone Exchanges




**Previous Occurrences and Extent**

Each year disruptions to utility services ranging from minor to serious are a secondary result of other hazard events including drought, flood, tornado, windstorm, winter storm, lightning, and extreme heat. The following provide discussions of previous events that resulted in a utility or infrastructure failure.

> **FEMA-1741-DR—February, 2008 (December 6-19, 2007):** An ice storm caused numerous power outages and approximately 130,000 Kansas customers were without power. Specifically, Kansas Rural Electric Cooperatives reported 49,000 customers without power, Westar reported 76,000 customers, Kansas City Power & Light reported 4,300 customers, and Kansas City, Kansas Board of Public Utilities reported 800 customers without power. FEMA's Public Assistance costs were $355,651,857 for this disaster. Countywide per capita impact: Cherokee County ($240.56), Crawford County ($18.24), Labette County ($277.18), Woodson County ($20.33)

**FEMA-1711-DR: Severe Storms and Flooding—July 2, 2007 (June 26–30):** This event was major flooding in southeast Kansas. Initially, Neodesha, in Wilson County was only accessible by boat and air. Both the water and sewer plants were compromised by the flooding, which resulted in a boil water order for the area. Approximately 3,000 people were without power in Fredonia for several days. In Montgomery County, the Coffeyville Resources refinery and nitrogen fertilizer plant, and many local businesses were flooded.

**FEMA-1626-DR—January 26, 2006 (November 27-28, 2005):** Much of the state was affected by this storm. Winds of 40 to 60 mph combined with two to seven inches of snow resulted in a blizzard, which raged across parts of north central Kansas. The wind whipped the snow into drifts 10 to 15 feet high in some places. Interstate 70 was closed west of Russell, and numerous other highways were impassable during the storm. There were several reports of auto accidents, including a 25-car pileup, and sporadic power outages. At least three auto-related deaths were attributed to the storm. FEMA's Public Assistance costs were $50,281,517 for this disaster.

**FEMA-1579-DR—February 8, 2005 (January 4-6):** Although freezing rain was the primary culprit, sleet also played a vital role in coating nearly the entire region with one-two inches of ice, which caused incredible damage to trees, power lines, and power poles. Many areas were without power for more than a week. The storm caused an estimated $30 million damage. FEMA's Public Assistance costs were $106,873,672 for this disaster.

**FEMA-1402-DR: Ice Storm—February 6, 2002 (January 29–February 15):** Beginning on January 29, a three-day severe winter storm hit 35 Kansas counties in the southeast corner of the state with freezing rain, drizzle, sleet, and snow. With one to two inches of ice accumulation, utility poles and power lines snapped, transportation was treacherous, and fallen trees damaged many structures. The resulting power outages affected nearly the entire region and lasted nearly a week in some areas. Loss of power was particularly problematic for many nursing homes. There were seven casualties, and property damage approximated $32 million. FEMA's Public Assistance costs were $45,020,240 for this disaster.

## Local Events

**February 22, 2012: City of Oswego, Labette County:** Utility failure resulted in a loss of power to city and outlying areas.

## Hazard Vulnerability and Impact

While every community in the region is at risk to utility/infrastructure failure, the vulnerability is somewhat mitigated in southeast Kansas due to the lower population density, development, and economic activities that would be disrupted by a major infrastructure failure event.

However, the regionally smaller utility suppliers generally have limited resources for mitigation. Thus, the large number of small electric providers could mean greater vulnerability in the event of a major, widespread disaster, such as a major flood, severe winter storm or ice storm. In recent years, regional electric power grid system failures in the western and northeastern United States have demonstrated that similar failures could happen in southeast Kansas. This vulnerability is most appropriately addressed on a multi-state regional or national basis.

Since utility/infrastructure failure is generally a secondary or cascading impact of other hazards, it is not possible to quantify estimated potential losses specific to this hazard due to the variables associated with affected population, duration of outages, etc..

Although the limitless variables make it difficult to estimate future losses on a statewide basis, FEMA has developed standard loss of use estimates in conjunction with their Benefit-Cost Analysis methodologies to estimate the cost of lost utilities on a per-person, per-use basis.

**FEMA Benefit-Cost Analysis**

| Loss of Electric Power | Cost of Complete Loss of Service |
|---|---|
| Total Economic Impact | $126 per person per day |
| Loss of Potable Water Service | Cost of Complete Loss of Service |
| Total Economic Impact | $93 per person per day |
| Loss of Wastewater Service | Cost of Complete Loss of Service |
| Total Economic Impact | $41 per person per day |
| Loss of Road/Bridge Service | Cost of Complete Loss of Service |
| Vehicle Delay Detour Time | $38.15 per vehicle per hour |
| Vehicle Delay Mileage | $0.55 per mile (or current federal mileage rate) |

Source: FEMA BCA Reference Guide, June 2009, Appendix C

| | Magnitude/Severity |
|---|---|
| Utility / Infrastructure Failure | 2.17 |

## Future Development

Future development and increases in population would increase the risk of this hazard.

## Probability of Future Hazard Events

Utility/infrastructure failures are generally related to the occurrence of other hazard events including extreme temperatures, floods, tornados, wind storms and winter storms. Based on historical records, utility/infrastructure failures occur annually across the region. However, a

majority of the failure events tend to be small, localized and generally short lived. As such, it is expected that while utility/infrastructure failures will occur annually, only on an occasional basis will large scale failures occur.

| | Probability |
|---|---|
| Utility / Infrastructure Failure | 2.83 |

**Consequence Analysis**

The information in the following table provides the Consequence Analysis.

**Utility/Infrastructure Failure Consequence Analysis**

| Subject | Ranking | Impacts of Utility / Infrastructure Failure |
|---|---|---|
| Health and Safety of Persons in the Area of the Incident | Moderate to Severe | Localized impact will be moderate to severe for persons with functional and access needs, and the elderly, depending on length of failure and time of year. |
| Responders | Minimal | Impact to responders will be minimal if properly trained and equipped. |
| Continuity of Operations | Minimal | COOP plans are not expected to be activated If the recovery time is excessive than temporary relocation may become necessary. |
| Property, Facilities, and Infrastructure | Minimal | Impact is dependent on the nature of the incident, and electric, water, sewage, gas and communication disruptions. |
| Delivery of Services | Minimal | Delivery of services could be affected within and around the affected area. |
| Environment | Minimal | Impact should be minimal. |
| Economic Conditions | Minimal | Economic conditions could be adversely affected depending on extent of damage. |
| Public Confidence in Governance | Minimal | Impact will be dependent on whether response, recovery, and planning were timely and effective. |

### 3.7.20 WILDFIRE

| Hazard | Probability | Magnitude/Severity | Warning Time | Duration | CPRI |
|---|---|---|---|---|---|
| Wildfire | 3.17 | 1.67 | 4.00 | 2.08 | **2.73** |

**Description**

Wildfires in southeast Kansas typically originate in pasture or prairie areas following the ignition of dry grasses (by natural or human sources). On occasion, ranchers and farmers intentionally ignite vegetation to restore soil nutrients or alter the existing vegetation growth. These fires have the potential to erupt into wildfires. Wildfires are also associated with lightning and drought conditions, as dry conditions make vegetation more flammable. Wildfires may also originate, or spread to forested areas, or other areas with concentrations of woody fuel that can cause wildfires to increase in intensity and spread. Since protecting people and structures takes priority, a wildfire's cost to natural resources, crops, and pastured livestock can be ecologically and economically devastating. In addition to the health and safety impacts to those directly affected by fires, the region is also concerned about the health effects of smoke emissions to surrounding areas.

The region experiences most of its wildfires in March and April when people are conducting controlled burns in grassland and fields; such as the annual burning of the Flint Hills to control invasive plants and restore natural tallgrass prairies. When the plant mass gets greener later in the summer and the humidity is higher, the risk of wildfires is generally lower. This trend, however, does not continue in years of extreme drought when hot and dry weather prevail.

The wildland/urban interface is the area where human improvements such as homes, ranches and farms come in contact with the wildlands. Urban expansion has driven the increased building of homes in wildland areas. Wherever people are living in or adjacent to wildland areas, the threat of wildfire exists. As the rural population increases, so does the risk to life and property from wildfire.

| | Warning Time |
|---|---|
| Wildfire | 4.00 |

| | Duration |
|---|---|
| Wildfire | 2.08 |

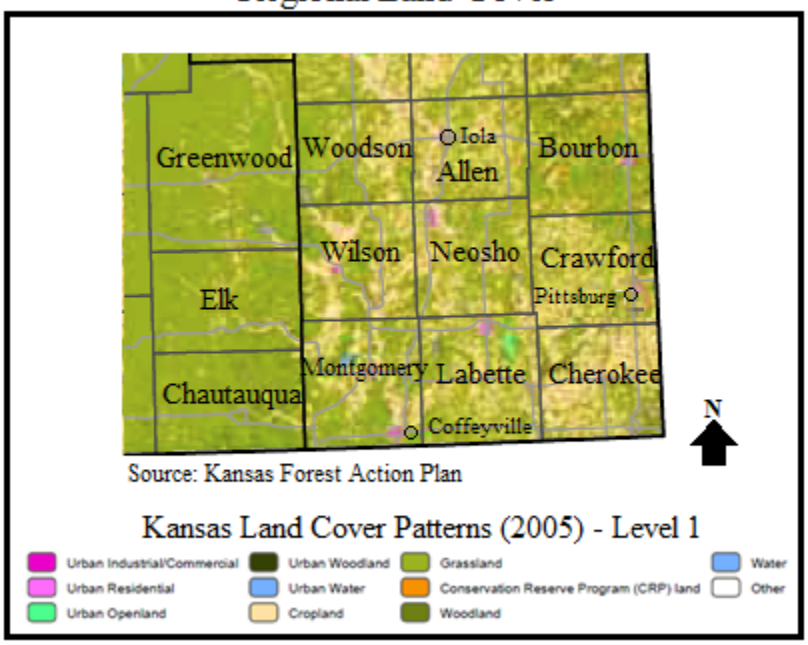
**Hazard Location**

Wildfires in southeast Kansas typically originate in pasture or prairie areas following the ignition of dry grasses (by natural or human sources). The Eastern Red Cedar is of particular concern in southeast Kansas. This invasive evergreen species can take over fence rows and un-planted fields, adding to wildfire fuel and risk. Additionally, this type of fuel, as well as other tree plantings near structures can cause structures to be consumed by wildfires, putting inhabitants at risk.

Due to the primarily rural and agricultural characteristics of the region, as well as the existence of wild land and grassland areas, the entire region is susceptible to wildfires. However, due to lower population densities the number of people potentially affected by a wildfire is often minimal.

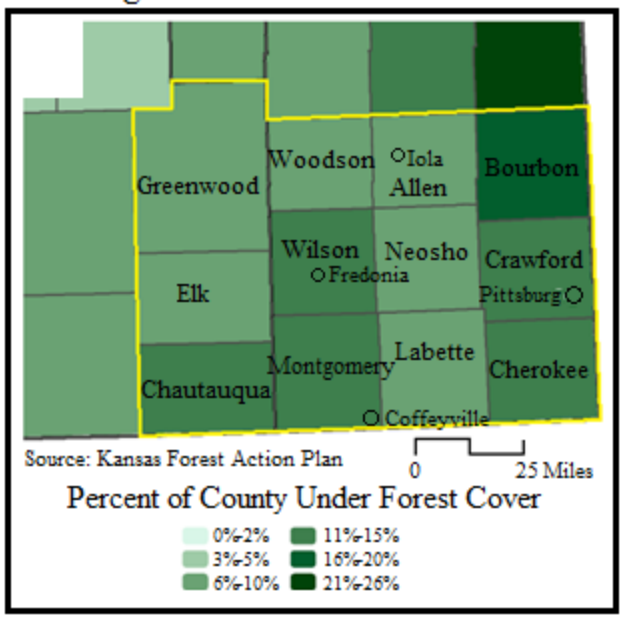
According to the 2011 *Kansas Forest Action Plan*, with the exception of Eastern Redcedar/hardwood, most forest types in Kansas do not pose significant fire management issues. However, grasslands which make up a majority of the open areas in southeast Kansas due pose fire management issues.. These areas, and the wild land-urban interface where development has occurred, are the focus of wild land fire management issues in Kansas. The following figure shows the land cover in southeast Kansas

Regional Land Cover



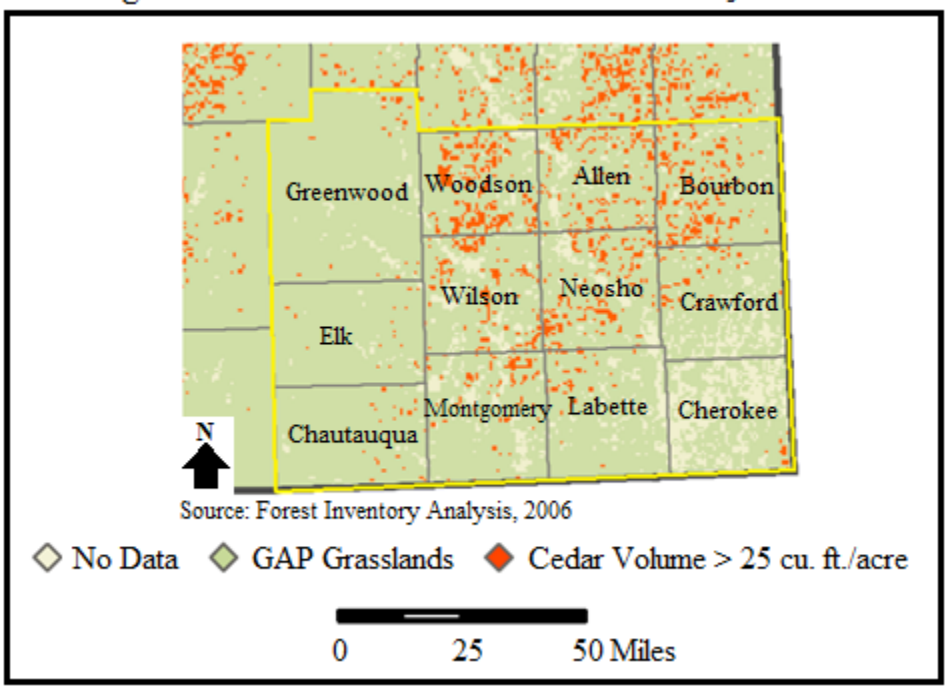

Forests have increased in volume by a billion cubic feet and in density by 106 percent since 1965 with an estimated 74 million dry tons of total biomass. Growing stock volume has been increasing steadily for the past 40 years. The average age of Kansas forests is getting younger with the majority of volume and trees occurring between 30 and 59 years of age. The following figure shows the percent forest cover in southeast Kansas counties.

Regional Percent Forest Cover




Although eastern redcedar makes up less than 4 percent of forest types, it has increased in volume by 23,000 percent since 1965 and is the primary specie of concern in grasslands. The following figure shows the occurrence of Eastern Red Cedar by volume.

Regional Occurence of Eastern Redcedar by Volume



**Previous Occurrences and Extent**

The following provide brief details on notable regional wildfire events.

> **2012**: More than 41,000 acres and 26 structures burned across the state from April through September due to extreme drought conditions. This places 2012 as one of the worst years for wildfires in Kansas on record.
>
> **April 12, 2010 –** A firefighter was killed while fighting a rural brush fire just to the west of Peru, Kansas.
>
> **March 15, 2010 -** A Fredonia woman was found dead after a field fire trapped her in rural Labette County. When deputies arrived, they found that numerous people had been conducting a controlled burn on a grassy field and that a woman had become trapped by the fire and died.

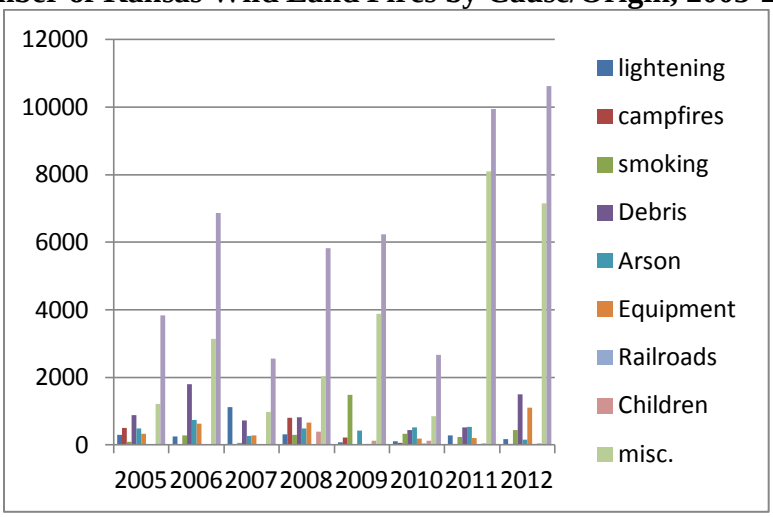
**Local Events**

> **August 23 and 24, 2012; Moran City, Allen County:** A wildfire caused damage to one abandoned structure and agricultural crops.
>
> **June and July 2012:** Allen County had wildfires throughout the county in June and July 2012. These large fires that threatened several structures and closed Highway 54 between 3600 and 3800 for 5 hours with traffic being re-routed

**Hazard Vulnerability and Impact**

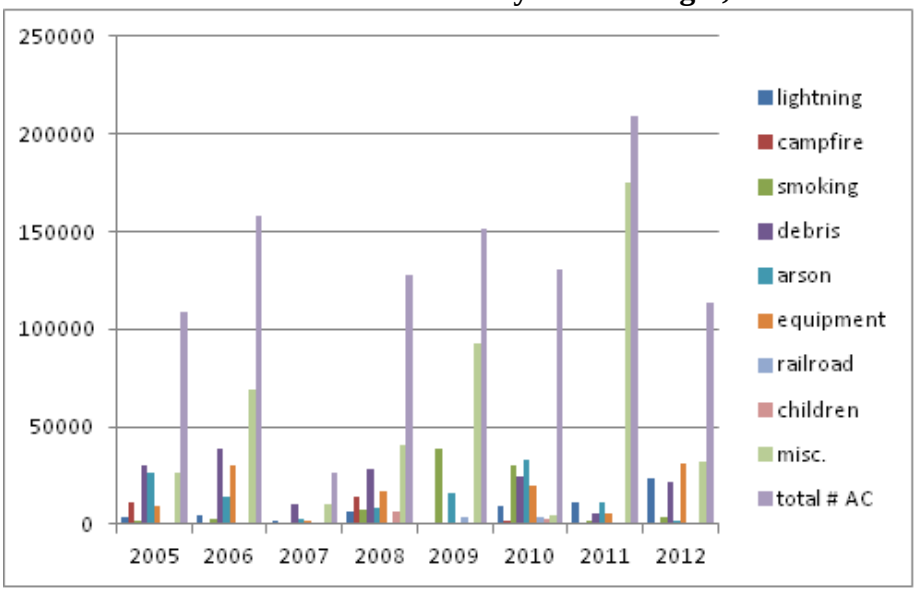
The Kansas Forest Service provided the following charts based on statistics from the National Fire Incident Reporting System regarding occurrence of wildfires in Kansas from 2005-2012. The first figure provides the total number of wild land fires in Kansas by cause/origin and the second figure provides the number of acres burned in Kansas each year by cause/origin.

**Number of Kansas Wild Land Fires by Cause/Origin, 2005-2012**




Source: Kansas Forest Service

**Number of Kansas Acres Burned by Cause/Origin, 2005-2012**




Source: Kansas Forest Service

The following table provides data from USDA's Risk Management Agency on Crop insurance payments for loss of crops due to wildfire. According to the data for the available reporting period, 2011 had the most crop insurance payments for wildfire by far. Data for 2012 was not yet available during development of this plan. However, it is anticipated that crop insurance claims due to wildfire were even higher in 2012 due to the extreme drought conditions.

**USDA Crop Insurance Payments as a Result of Wildfire**

| Crop Year | County Name | Crop Name | Cause of Loss | Crop Insurance Paid |
|---|---|---|---|---|
| 2005 | Cherokee | Soybeans | Fire | $1,084 |
| 2004 | Cherokee | Wheat | Fire | $193 |

Source: USDA Risk Management Agency, 2012

Although some data is available from the National Fire Incident Reporting System (NFIRS) in terms of previous events, this data has limitations in providing useful statistical data for an overview regional vulnerability analysis. The most problematic issues are that not all fire departments report to NFIRS and of those that report, not all incidents are reported. This current lack of local level requirements and a past lack of enforcement of state statutes has led to a lack of fire occurrence data for both prescribed burns and wildfires being available in southeast Kansas. Changes in enforcement of wildfire reporting requirements at the state level, as well as prescribed fire reporting requirements that are part of the EPA-mandated Kansas Flint Hills Smoke Management Plan (approved in 2011) will give the Kansas Forest Service a much greater opportunity to begin using real-time fire occurrence data to assist in making the best fire management decisions.

In light of the data limitations associated with available statistics, and with the publication of the 2011 *Kansas Forest Action Plan*, it has been determined that the best available data for the regional vulnerability analysis is the weighted sum analysis that was completed and utilized to develop a wildfire risk composite layer as part of the Forest Action Plan. The weighted sum analysis combined six data layers produced from a combination of eight separate datasets. In close consultation with the Kansas Forest Service's Fire Management Coordinator and other Fire Management staff six data inputs were developed to represent Wildfire Risk in Kansas. These data inputs and their corresponding analysis weight are listed below:

**Kansas Forest Action Plan Wildfire Data Sets and Weighted Sums**

| Data Set | Analysis Weight |
|---|---|
| Wildland Urban Interface | 0.85 |
| ISO Fire Station Coverage Gaps | 0.75 |
| Conservation Reserve Program Lands | 0.60 |
| Eastern Redcedar in Grasslands | 0.75 |
| Moderate Fire Potential risk | 0.53 |
| High Fire Potential risk | 0.80 |

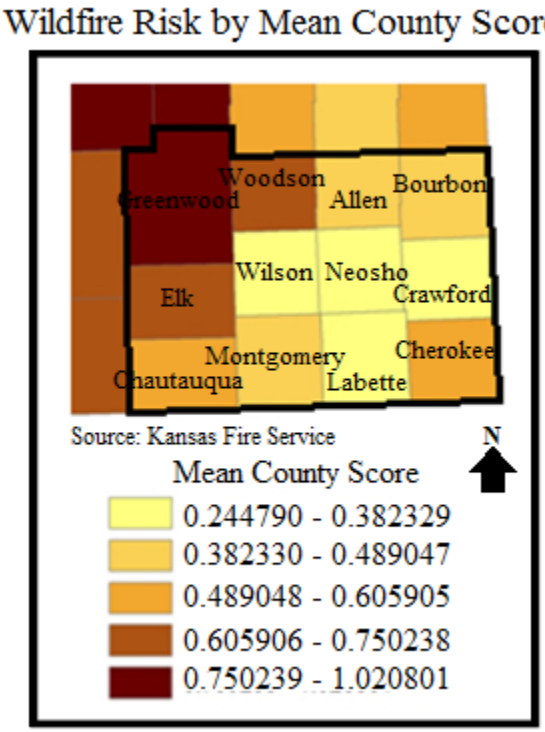
Source: *Kansas Forest Action Plan,*

The resulting score contains values ranging from 0 to 3.48, with the higher the numbers indicating higher wildfire risk. The following table provides the mean score for each county within the southeast Kansas region.

**Wildfire Risk Score**

| County | Mean Wildfire Risk Score |
|---|---|
| Allen | 0.40892705321 |
| Bourbon | 0.46224874258 |
| Chautauqua | 0.58948814869 |
| Cherokee | 0.50862157345 |
| Crawford | 0.31517902017 |
| Elk | 0.66811245680 |
| Greenwood | 0.84238952398 |
| Labette | 0.34831532836 |
| Montgomery | 0.41717612743 |
| Neosho | 0.37931758165 |
| Wilson | 0.24478954077 |
| Woodson | 0.69705641270 |
| Region Average | 0.49013512582 |

The following figure provides a map indicating the mean score for each county.

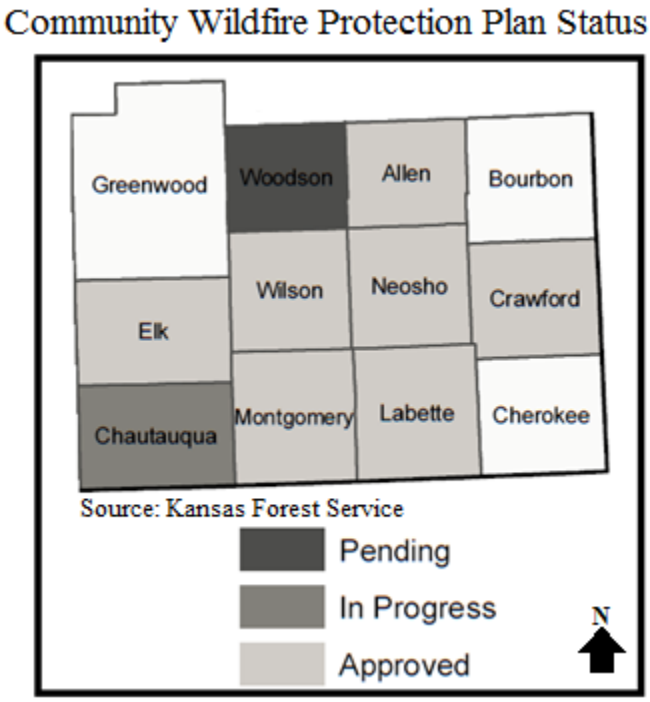



***Community Wildfire Protection Plans***

One way for communities at risk to wildfire to reduce their overall vulnerability is development of Community Wildfire Protection Plans (CWPP) to identify specific areas at risk and actions that can be taken to reduce risk. The Healthy Forests Restoration Act (HFRA) provided

communities with an opportunity to influence where and how federal agencies implement fuel reduction projects on federal lands. A CWPP is the most effective way to take advantage of this opportunity. Additionally, communities with Community Wildfire Protection Plans in place are given priority for funding of HFRA hazardous fuels reduction projects.

The following figure shows the status of CWPPs in southeast Kansas counties.




| | Magnitude/Severity |
|---|---|
| Wildfire | 1.67 |

**Local Concerns**

The following detail specific local concerns as related to wildfires:

- In Allen County, areas of moderate vulnerability to wildfires include Humboldt, Iola, and LaHarpe with each of these cities receiving moderate fire hazard ratings due to concentrated fuel loads near developed areas.

- In Crawford County, lake front housing at Farlington Lake is at particular risk to wildfires as the terrain features volatile vegetation close the structures and access issues. In the City of Arcadia grass fuels in close proximity to structures increase the wildfire risk to the community.

- In Woodson County, the City of Toronto could benefit from collaborative wildland/urban interface protection planning in the form of a program such as FIREWISE Communities USA.

**Future Development**

Future development and increases in population would tend to increase the risk of this hazard. As cities continue to expand they often build in areas that are prone to wildfires and may not have adequate fire coverage. Larger urban centers are seeing a slight increase in population which would tend to increase the risk of this hazard, especially if development is not properly planned.

**Probability of Future Hazard Events**

Since wildfires occur on an annual basis (five regional events within the past four years), this hazard's probability is likely within the calendar year. However, although wildfires occur every year, the outlook through August 2013 for southeast Kansas from the National Interagency Fire Center Predictive Services for a wildfire event in Kansas that will require mobilization of additional resources from outside the area in which the fire situation originated is considered to be in the normal range.

| | **Probability** |
|---|---|
| Wildfire | 3.17 |

**Consequence Analysis**

The information in the following table provides the Consequence Analysis.

**Wildfire Consequence Analysis**

| Subject | Ranking | Impacts of Wildfire |
|---|---|---|
| Health and Safety of Persons in the Area of the Incident | Severe | Impact of the immediate area could be severe for affected areas. |
| Responders | Minimal to Severe | Impact to responders is could be severe depending on the size and scope of the fire, especially for fire fighters. Impact will be low to moderate for support responders with the main threat being smoke inhalation. |
| Continuity of Operations | Minimal to Severe | Temporary relocation may be necessary if government facilities experience damage. |
| Property, Facilities, and Infrastructure | Severe | Localized impact could be severe to facilities and infrastructure in the incident area as are all vulnerable to destruction by wildfire. |
| Delivery of Services | Minimal to Severe | Delivery of services could be affected if there is any disruption to the roads and/or utilities due to damages sustained. |
| Environment | Severe | Impact will be severe for the immediate area with regards to trees, bushes, animals, and crops. Impact will lessen as distance increases. |
| Economic Conditions | Minimal to Moderate | Impacts to the economy could be moderate in the immediate area. |
| Public Confidence in Governance | Minimal to Severe | Response and recovery will be in question if not timely and effective. Evacuation orders and shelter availability could be called in to question. |

### 3.7.21 WINDSTORM

| Hazard | Probability | Magnitude/Severity | Warning Time | Duration | CPRI |
|---|---|---|---|---|---|
| Windstorm | 3.58 | 1.83 | 2.92 | 2.00 | **2.80** |

**Description**

Relatively frequent strong winds are a weather characteristic of southeast Kansas. High winds, often accompanying severe thunderstorms, can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss.

Straight-line winds are generally any thunderstorm wind that is not associated with rotation. It is these winds, which can exceed 100 mph that represent the most common type of severe weather and are responsible for most wind damage related to thunderstorms. Since thunderstorms do not have narrow tracks like tornados, the associated wind damage can be extensive and affect entire counties or regions. Objects like trees, barns, outbuildings, high-profile vehicles, and power lines/poles can be toppled or destroyed, and roofs, windows, and homes can be damaged as wind speeds increase. In 2005, hail and wind damage made up 45% of homeowners' insurance losses. One type of straight-line wind is the downburst, which can cause damage equivalent to a strong tornado and can be extremely dangerous to aviation.

Thunderstorms over southeast Kansas typically happen between late April and early September, but, given the right conditions, they can develop as early as March. They are usually produced by supercell thunderstorms or a line of thunderstorms that typically develop on hot and humid days.

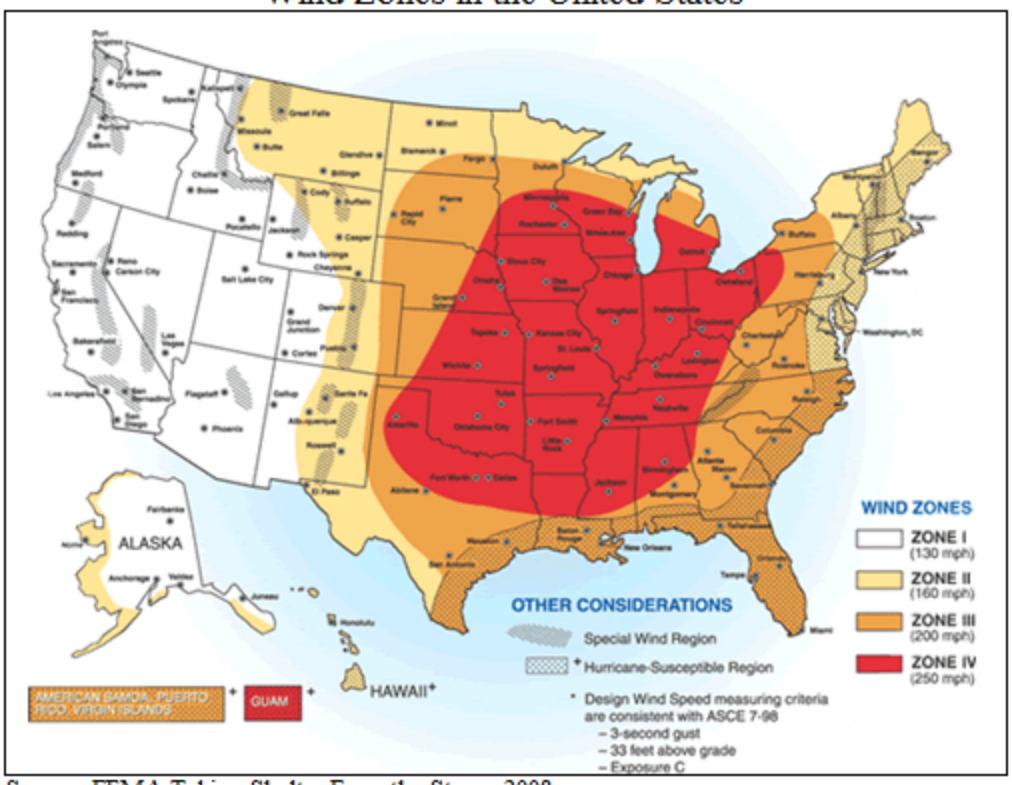
| | Warning Time |
|---|---|
| Windstorm | 2.92 |

| | Duration |
|---|---|
| Windstorm | 2.00 |

**Hazard Location**

The following figure shows the wind zones of the United States based on maximum wind speeds. Southeast Kansas is located within wind zones IV, the highest inland category.

Wind Zones in the United States




Source: FEMA Taking Shelter From the Storm, 2008

**Previous Occurrences and Extent**

The following are notable high wind events that have occurred in the region.

**February 28, 2012:** A powerful storm system produced widespread severe weather across portions of central, south central and southeast Kansas during the evening hours. A center pivot irrigation system was overturned in the 70 mph winds in Kingman County. Cherryvale in Montgomery County was hard hit as well as a large portion of Labette County. Straight-line winds of 100 to 120 mph occurred near Pittsburg. Numerous tree damage, power pole damage or snapped off and building damage reports were recorded.

**August 2006:** Pulse thunderstorms impacted the area on August 9 and 26. Power lines were downed from microburst winds in Crawford and Cherokee Counties. Power pole damage was estimated at $17,000.

**March 12, 2006:** A severe thunderstorm produced straight-line winds of up to 90 mph and damage throughout Lawrence. Seventy buildings on the University of Kansas campus were damaged, semi-trailers were overturned, 60-foot silos fell, and homes and trees were damaged. Damage was estimated at $8 million. Severe straight-line winds in Frontenac caused structure damage estimated at $20,000.

**June 30, 2005:** In Neosho County, severe thunderstorms unleashed 90 mph winds that blew roofs off many homes and businesses in Chanute. In Erie and St. Paul, large trees

were uprooted and fell onto other homes, destroying one. Many barns and sheds were also destroyed. Total damage in all three towns was $2 million.

**July 4, 2004:** A damaging wind storm known as a derecho tracked across extreme southeast Kansas. The most significant damage was in Cherokee County where several homes were destroyed or severely damaged.

**July 10, 2003:** Straight-line winds from a downburst occurred near the Wichita Greyhound Park north of Wichita. Portions of the roof were peeled off, numerous vehicles were damaged, and power lines were blown down. Significant wind damage also occurred around El Dorado, where trees and power lines were blown down and shingles were blown off a Pizza Hut. Another long swath of wind damage started near Douglass and continued through Atlanta and on into southeast Kansas. A hangar was blown over at the airport in Eureka, and considerable tree damage was observed around Independence.

**March 9, 2002:** Winds in south-central Kansas gusted up to 87 mph in Cowley County. Large power poles were knocked down and a semi was overturned on the Kansas Turnpike in Butler County. Significant wind damage occurred in Coffeyville in Montgomery County. A large section of roof was blown off a church onto an adjacent building, and part of a stadium was damaged. A few downtown buildings also had windows broken as a result of the strong wind gusts.

**June 14, 2001:** A line of damaging winds, estimated between 70 and 80 mph caused considerable damage and injured two people near Yates Center on June 14. These winds lifted a couple into the air and blown debris knocked them unconscious.

According to the NCDC Storm Events database, there were 928 high wind, strong wind and thunderstorm wind events in southeast Kansas between 2000 and 2012. The average recorded high wind over that period was 81.42 mph, with the strongest wind measured at 96 mph. Total property damage for events between 2000 and 2012 is estimated at $21,827,250 with an estimated $3,005,000 in crop damages The data reported below is from the NCDC who receives storm data from the NWS, which receives information` from a variety of sources, which include but are not limited to county, state, and federal emergency management officials, local law enforcement officials, Skywarn spotters, NWS damage surveys, newspaper clipping services, the insurance industry and the general public. The wind events represent wind reports, not necessarily individual storms, and thus likely over count the actual number of windstorms.

**NCDC Wind Events, 2000- 2012**

| County | Number of Wind Events (2000-2012) | Strongest Measured Wind (Knots) | Total Property Damage | Total Crop Damage |
|---|---|---|---|---|
| Allen | 50 | 78 | $697,250 | $1,000,000 |
| Bourbon | 72 | 70 | $1,299,000 | $0 |
| Chautauqua | 86 | 70 | $202,100 | $0 |
| Cherokee | 104 | 78 | $5,774,200 | $500,000 |
| Crawford | 94 | 89 | $4,481,000 | $1,500,000 |
| Elk | 43 | 70 | $254,950 | $0 |
| Greenwood | 78 | 87 | $436,500 | $0 |
| Labette | 111 | 96 | $2,858,000 | $0 |
| Montgomery | 110 | 87 | $1,046,150 | $0 |
| Neosho | 88 | 87 | $3,510,100 | $5,000 |
| Wilson | 59 | 87 | $937,000 | $0 |
| Woodson | 33 | 78 | $331,000 | $0 |
| Regional | 928 | 81 (Average) | $21,827,250 | $3,005,000 |

Source: NCDC Storm Events Database

**Local Events**

**April 2012: Labette County:** High winds resulted in building damage.

**February 28, 2012: City of Pittsburg, Crawford County:** High winds caused extensive property and infrastructure damage and destroyed a 200 room hotel. Additionally, the wind storm caused a short term electrical utility failure.

**May 2009:** A wind storm in the City of Fredonia, Wilson County caused tree and utility line damage resulting in road closures and short term utility loss.

**May 2009: Labette County:** High winds resulted in 3 injuries, damage to 15-20 homes and approximately $400,000 in damages and $900,000 in insurance claims.

**2009:** City of New Albany in Wilson County experiences straight winds that resulted in one death and the destruction of 8 buildings.

**July 4, 2004: City of Oswego, Labette County:** A windstorm knocked down trees in the town and damaged approximately 60% of the properties in the town. Estimated insurance losses were $180,000.

**Hazard Vulnerability and Impact**

All counties in southeast Kansas are vulnerable to windstorms. To refine and access the relative vulnerability of each of southeast Kansas' counties to wind events, the region assigned ratings to pertinent factors that were examined at the county level. These factors are: social vulnerability index, prior events, prior annualized property damage, building exposure valuation, population density, crop exposure and annualized crop loss. Then a rating value of 1-10 was assigned to the data obtained for each factor and then weighted equally and factored together to obtain overall vulnerability scores for comparison and to determine the most vulnerable counties.

The following information was used for this analysis:

- Social Vulnerability Index for Kansas from the Hazards and Vulnerability Research Institute at the University of South Carolina
- NCDC storm events 2006 – 2012
- U.S. Census Bureau (2010)
- USDA's Census of Agriculture (2007).

**Vulnerability Factor Amounts for Wind**

| County | SoVI Rating (1-5) | Prior Events 2006-2012 | Property Damages | Annualized Property Damages | Total Building Exposure ($000) | Population Density | Crop Exposure (2007 Census of Agriculture) | Crop Insurance Paid for Wind | Annualized Crop Insurance Paid |
|---|---|---|---|---|---|---|---|---|---|
| Allen | 3 | 24 | $199,250 | $28,464 | $983,778 | 26.7 | $15,462,000 | $5,428 | $543 |
| Bourbon | 4 | 43 | $1,169,000 | $167,000 | $1,102,488 | 23.9 | $9,918,000 | $21,587 | $2,159 |
| Chautauqua | 5 | 39 | $120,600 | $17,229 | $285,438 | 5.7 | $4,971,000 | $0 | $0 |
| Cherokee | 4 | 70 | $5,567,200 | $795,314 | $1,293,753 | 36.8 | $53,420,000 | $555 | $56 |
| Crawford | 3 | 62 | $3,326,500 | $475,214 | $2,588,817 | 66.4 | $34,463,000 | $21,656 | $2,166 |
| Elk | 5 | 18 | $454,750 | $64,964 | $187,291 | 4.5 | $0 | $0 | $0 |
| Greenwood | 5 | 42 | $222,500 | $31,786 | $491,412 | 5.9 | $8,087,000 | $14,411 | $1,441 |
| Labette | 4 | 53 | $467,000 | $66,714 | $1,453,850 | 33.5 | $22,765,000 | $2,921 | $292 |
| Montgomery | 4 | 55 | $771,150 | $110,164 | $2,432,183 | 55.1 | $16,616,000 | $21,185 | $2,119 |
| Neosho | 4 | 35 | $395,000 | $56,429 | $1,174,150 | 28.9 | $17,811,000 | $1,841 | $184 |
| Wilson | 4 | 29 | $3,350,500 | $478,643 | $671,059 | 16.5 | $26,882,000 | $6,528 | $653 |
| Woodson | 5 | 9 | $3,500 | $500 | $207,905 | 6.6 | $14,486,000 | $0 | $0 |

Using the above information, a value of 1-10 was assigned to the data obtained for each factor and then weighted equally and factored together to obtain overall vulnerability scores for comparison and to determine the greatest vulnerable counties. The Social Vulnerability Index is

in a range of 1- 5. To give Social Vulnerability Index the same weight as the other factors, the numbers were multiplied by two.

**Wind Data Rating Determination**

| Ratings | Social Vulnerability | NCDC Prior Events | Annualized Property Damage | Building Exposure Valuation | Population Density | Crop Exposure | Annualized Crop Loss |
|---|---|---|---|---|---|---|---|
| 1 | | 9 - 34 | $0 - $200,000 | $117,421 - $4,492,825 | 1.6 - 116.3 | 0 - $18,548,500 | 19 - $40,800 |
| 2 | 1 | 35 - 56 | $200,001 - $400,000 | $4,492,826 - $8,868,229 | 116.4 - 231.1 | $18,548,501 - $32,126,000 | $40,801 - $81,576 |
| 3 | | 57 - 78 | $400,001 - $600,000 | $8,868,230 - $13,243,634 | 231.2 - 345.9 | $32,126,001 - $45,703,500 | $81,577 - $122,352 |
| 4 | 2 | 79 - 100 | $600,001 - $800,000 | $13,243,635 - $17,619,039 | 346 - 460.7 | $45,703,501 - $59,281,000 | $122,353 - $163,128 |
| 5 | | 101 - 122 | $800,001 - $1,000,000 | $17,619,040 - $21,994,444 | 460.8 - 575.5 | $59,281,001 - $72,858,500 | $163,129 - $203,904 |
| 6 | 3 | 123 - 144 | $1,000,001 - $3,000,000 | $21,994,445 - $26,369,848 | 575.6 - 690.3 | $72,858,501 - $86,436,000 | $203,905 - $244,680 |
| 7 | | 145 - 165 | $3,000,001 - $5,000,000 | $26,369,849 - $30,745,253 | 690.4 - 805.1 | $86,436,001 - $100,013,500 | $244,681 - $285,456 |
| 8 | 4 | 166 - 187 | $5,00,001 - $7,000,000 | $30,745,254 - $35,120,658 | 805.2 - 919.9 | $100,031,501 - $113,591,000 | $285,457 - $326,232 |
| 9 | | 188 - 209 | $7,000,001 - $9,000,000 | $35,120,659 - $39,496,062 | 920- 1,034.7 | $113,591,001 - $127,168,500 | $326,233 - $367,008 |
| 10 | 5 | 210 - 232 | $9,000,001 - $25,460,428 | $39,496,063 - $43,871,468 | 1,034.8 - 1,149.6 | $127,168,501 - $140,746,000 | $367,009 - $407,783 |

Based on the above ratings system, ranges were applied to each county to determine their potential vulnerability. The following related the scoring to a vulnerability assessment:

- **Low:** Score range of 9 -14
- **Medium-Low:** Score range of 15 - 19
- **Medium:** Score range of 20 - 24
- **Medium-High:** Score range of 25 - 29
- **High:** Score range of 30 - 35

The following table provides the factor's amount per county that are considered for wind vulnerability.

**Vulnerability of Southeast Kansas Counties to Wind**

| County | SoVi Rating | NCDC Prior Event Rating | Annualized Property Damage Rating | Bldg Exposure Valuation Rating | Population Density Rating | Crop Exposure Rating | Annualized Crop Loss Rating | Overall Vulnerability Rating | Wind Vulnerability |
|---|---|---|---|---|---|---|---|---|---|
| Allen | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 12 | Low |
| Bourbon | 8 | 2 | 1 | 1 | 1 | 1 | 1 | 15 | Medium-Low |
| Chautauqua | 10 | 2 | 1 | 1 | 1 | 1 | 0 | 16 | Medium-Low |
| Cherokee | 8 | 3 | 4 | 1 | 1 | 4 | 1 | 22 | Medium |
| Crawford | 6 | 3 | 3 | 1 | 1 | 3 | 1 | 18 | Medium-Low |
| Elk | 10 | 1 | 1 | 1 | 1 | 1 | 0 | 15 | Medium-Low |
| Greenwood | 10 | 2 | 1 | 1 | 1 | 1 | 1 | 17 | Medium-Low |
| Labette | 8 | 2 | 1 | 1 | 1 | 2 | 1 | 16 | Medium-Low |
| Montgomery | 8 | 2 | 1 | 1 | 1 | 1 | 1 | 15 | Medium-Low |
| Neosho | 8 | 2 | 1 | 1 | 1 | 1 | 1 | 15 | Medium-Low |
| Wilson | 8 | 1 | 3 | 1 | 1 | 2 | 1 | 17 | Medium-Low |
| Woodson | 10 | 1 | 1 | 1 | 1 | 1 | 0 | 15 | Medium-Low |

The Census of Agriculture did not publish crop exposure in Elk County to avoid disclosure of individual operations.

| | Magnitude/Severity |
|---|---|
| Windstorm | 1.83 |

**Future Development**

Future development projects should consider windstorm hazard at the planning, engineering and architectural design stage with the goal of reducing vulnerability. However, regional data suggests that both population and development are decreasing in rural areas, thus minimizing potential future exposure. Larger urban centers are seeing a slight increase in population which would tend to increase the risk of this hazard, especially if development is not properly engineered.

**Probability of Future Hazard Events**

Available data suggests that southeast Kansas has experienced 928 high wind event over the 13 year period from 2000 to 2012, with a total damage amount of $24,832,250. This would equate to an average of 71 events per year with an average loss of $1,910,173 per year. As such, the probability of this hazard occurring during future years is likely.

| | Probability |
|---|---|
| Windstorm | 3.58 |

**Consequence Analysis**

The information in the following table provides the Consequence Analysis.

**Windstorm Consequence Analysis**

| Subject | Ranking | Impacts of Windstorm |
|---|---|---|
| Health and Safety of Persons in the Area of the Incident | Minimal to Moderate | Impact of the immediate area could be minimal to moderate for affected areas. |
| Responders | Minimal | Impact to responders is expected to be minimal unless responders live within the affected area. |
| Continuity of Operations | Minimal | Temporary relocation may be necessary if government facilities experience damage. |
| Property, Facilities, and Infrastructure | Minimal to Severe | Localized impact could be minimal to moderate in the incident area. Utility lines would likely be severely affected. |
| Delivery of Services | Minimal | Delivery of services could be affected if there is any disruption to the roads and/or utilities.. |
| Environment | Minimal to Severe | Impact may be severe for the immediate impacted area with regards to trees, bushes, and crops. Impact will lessen as distance increases from the immediate incident area. |
| Economic Conditions | Minimal to Severe | Impacts to the economy will greatly depend on the trajectory of the windstorm. Revenue could be impacted if businesses are halted due to structural damages and infrastructure damage. |
| Public Confidence in Governance | Minimal | Response and recovery will be in question if not timely and effective. Warning systems in place and the timeliness of those warnings could be questioned. |

### 3.7.22 WINTER STORM

| Hazard | Probability | Magnitude/Severity | Warning Time | Duration | CPRI |
|---|---|---|---|---|---|
| Winter Storm | 3.92 | 2.25 | 2.00 | 3.25 | **3.06** |

**Description**

Winter storms in southeast Kansas usually come in the form of heavy snow or freezing rain. Regardless of form, they can have significant impacts to the region and its residents for days, weeks or months. They can immobilize a region by blocking roads and railways and closing airports, which can disrupt emergency and medical services, hamper the flow of supplies and isolate homes and farms. Heavy snow can collapse roofs and knock down trees and power lines. Unprotected livestock may be lost. Economic impacts include cost of snow removal, damage repair, business and crop losses, and power failures.

A major winter storm can last for several days and be accompanied by high winds, freezing rain or sleet, heavy snowfall, and cold temperatures. The NWS describes different types of winter storm events as follows:

- **Blizzard**—Winds of 35 mph or more with snow and blowing snow reducing visibility to less than 1/4 mile for at least three hours.
- **Blowing Snow**—Wind-driven snow that reduces visibility. Blowing snow may be falling snow and/or snow on the ground picked up by the wind.
- **Snow Squalls**—Brief, intense snow showers accompanied by strong, gusty winds. Accumulation may be significant.
- **Snow Showers**—Snow falling at varying intensities for brief periods of time. Some accumulation is possible.
- **Freezing Rain**—Rain that falls onto a surface with a temperature below freezing. This causes it to freeze to surfaces forming a coating or glaze of ice. Most freezing-rain events are short lived and occur near sunrise between the months of December and March.
- **Sleet**—Rain drops that freeze into ice pellets before reaching the ground. Sleet usually bounces when hitting a surface and does not stick to objects.

Heavy accumulations of ice, often the result of freezing rain, can bring down trees, utility poles, and communications towers and disrupt communications and power for days. Even small accumulations of ice can be extremely dangerous to motorists and pedestrians.

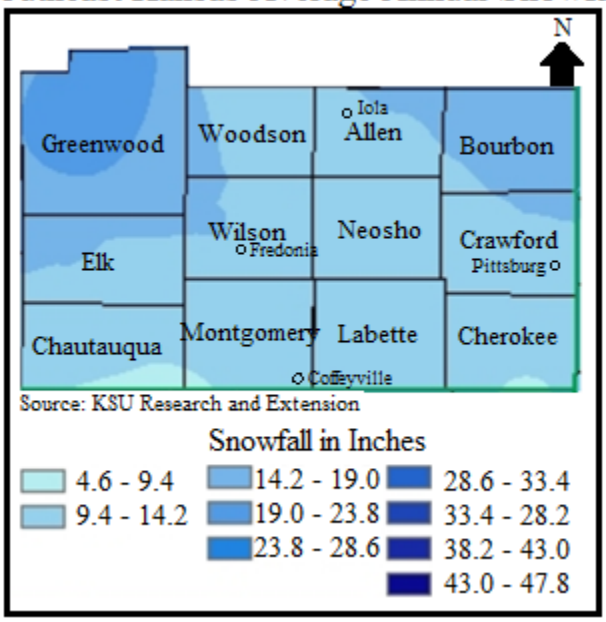
| | Warning Time |
|---|---|
| Winter Storm | 2.00 |

| | Duration |
|---|---|
| Winter Storm | 3.25 |

**Hazard Location**

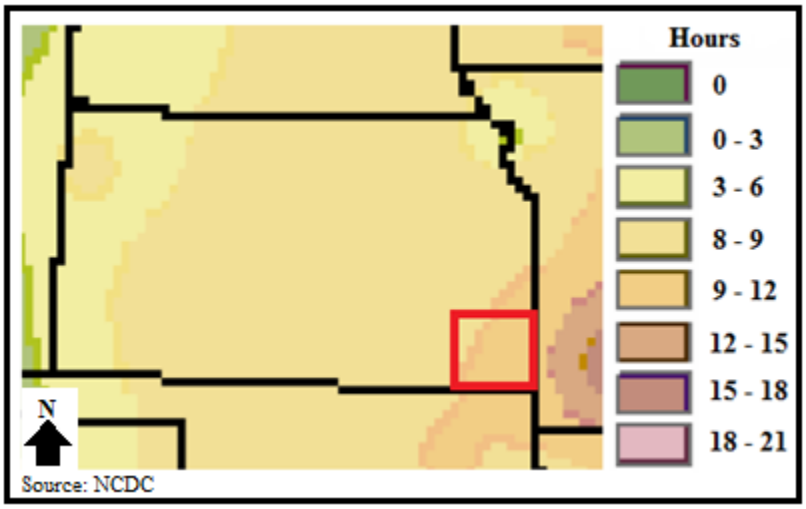
The entire planning region is vulnerable to heavy snow and freezing rain. The following map illustrates the average annual snowfall for the region.

Southeast Kansas Average Annual Snowfall




Freezing rains occurs frequently in southeast Kansas. The following map indicates the average number of hours of freezing rain per year.

Southeast Kansas Average Number of Hours with Freezing Rain




In recent years, except the winter of 2011-2012, the weather patterns have created significant snow accumulations and ice storms throughout the region. Also future development could

potentially increase vulnerability to this hazard by increasing the demand on the utilities and increasing the exposure of aging infrastructure networks.

**Previous Occurrences and Extent**

The following table lists the five most recent presidential disaster declarations for southeast Kansas.

**Presidential Disaster Declarations, Winter Storm**

| Declaration Number | Declaration Date* | Disaster Description | Regional Counties Involved | Disaster Cost** |
|---|---|---|---|---|
| 1885 | 03/09/2010 (12/9/2009-1/8/2010) | **Severe Winter Storms and Snowstorm** | Allen, Bourbon, Cherokee, Crawford, Elk, Greenwood, Labette, Neosho, Wilson and Woodson | $19,100,658 |
| 1848 | 06/24/2009 (3/26-29/2009) | **Severe Winter Storm and Record and Near Record Snow** | Chautauqua, Elk, Greenwood and Woodson | $20,174,657 |
| 1741 | 02/01/2008 (12/6-12/19/2008) | **Severe Winter Storms** | Cherokee, Crawford, Labette, and Woodson. | $359,557,345 |
| 1579 | 2/8/2005 (1/4-6/2005) | **Severe Winter Storm,** Heavy Rains, and Flooding | Chautauqua, Crawford, Elk, Greenwood and Woodson | $106,873,672 |
| 1402 | 2/6/2002 (1/29-2/15/2002) | **Ice Storm** | Allen, Bourbon, Chautauqua, Cherokee, Crawford, Elk, Greenwood, Labette, Montgomery, Neosho, Wilson, and Woodson | $60,185,754 |

Sources: FEMA and KDEM

* Incident dates are in parentheses.

** Disaster costs include Public Assistance and Individual Assistance for all impacted counties, including those not shown

The following are brief discussions of the above noted events.

**FEMA-1885-DR—March 9, 2010 (December 21, 2009—January 10, 2010):** Beginning December 22nd a strong, slow moving storm moved into the western Kansas leaving heavy snow causing icy and snow packed roads in portions of northwestern Kansas. The storm system continued easterly and continued to significantly impact portions of north central, northeastern, and southeastern areas of the State. This storm system created blizzard conditions with dangerously high winds causing blowing/drifting snow, treacherous travel conditions, and impassable roads. Two fatalities and three injuries occurred in two of the more severe accidents. FEMA Public Assistance funding for this disaster was $19,100,658.

**FEMA-1848-DR— June 24, 2009 (March 26-29,2009):** A late March blizzard produced record or near record snowfall of one to two feet across parts of central, south central and southwest Kansas. The heavy snow and high wind resulted in blizzard conditions on Friday into Saturday. Meanwhile, significant accumulations of ice from freezing rain and sleet also affected the Flint Hills and southeast Kansas, with some snow accumulations before the wintry precipitation ended Saturday evening. Several areas reported power outages due to the snow, ice and wind. FEMA Public Assistance funding for this disaster was $20,174,657.

**FEMA-1741-DR—February, 2008 (December 6-19, 2007):** Winter weather started across central and southeast Kansas with two different ice storms that moved across the area and produced significant accumulations. The ice caused numerous power outage and approximately 130,000 Kansas customers were without power. Specifically, Kansas Rural Electric Cooperatives reported 49,000 customers without power, Westar reported 76,000 customers, Kansas City Power & Light reported 4,300 customers, and Kansas City, Kansas Board of Public Utilities reported 800 customers without power. Then a major winter storm moved through Kansas during the evening hours of December 14th and the heaviest snow targeted areas still suffering from the ice storm that hit earlier in the week. FEMA Public Assistance funding for this disaster was $355,651,857.

**FEMA-1579-DR—February 8, 2005 (January 4-6):** This was one of the worst ice storms on record to hit central, south central, and southeast Kansas. Although freezing rain was the primary culprit, sleet also played a vital role in coating nearly the entire region with one-two inches of ice, which caused incredible damage to trees, power lines, and power poles. Roads and highways were blocked by tree debris and downed power poles and lines. Many areas were without power for more than a week. Between three and five inches of snow accumulated in Russell, Lincoln and Saline Counties. Particularly hard hit were Butler and Sedgwick Counties, which sustained an estimated $8.5 Million and $15 Million damage, respectively. Three deaths were attributed to the storm. FEMA Public Assistance funding for this disaster was $106,873,672.

**FEMA-1402-DR: Ice Storm—February 6, 2002 (January 29–February 15):** Beginning on January 29, a three-day severe winter storm hit 35 Kansas counties in the southeast corner of the State with freezing rain, drizzle, sleet and snow. With one to two inches of ice accumulation, utility poles and power lines snapped, transportation was

treacherous and fallen trees damaged many structures. The resulting power outages affected nearly the entire region and lasted nearly a week in some areas. Loss of power was particularly problematic for many nursing homes. There were seven fatalities. This was the worst ice storm in the metropolitan Kansas City area. FEMA Public Assistance funding for this disaster was $45,020,240.

The following provide further descriptions and other notable winter storm events.

**March 27, 2009**: Greenwood County: A wintry mix of sleet and freezing rain affected the county from the early to mid morning hours on the 27th through the early morning hours on the 28th. The wintry mix eventually changed over to all snow from west to east during the morning hours on the 28th, and persisted into the afternoon hours. Widespread ice accumulations ranged from one-quarter to three quarters of an inch, with isolated 1 inch amounts. Total sleet and snow accumulations on top of the ice ranged from 1 to 3 inches. Stout north to northeast winds resulted in some blowing snow and reduced visibilities during the morning and afternoon hours on the 28th. The weight of the ice downed more than 80 power poles in the Piedmont area. Estimated property damage $2,000,000.

**January 26, 2009**: Woodson County: A wintry mix of freezing rain and periodic sleet affected the county from the early to mid morning hours on the 27th through the early morning hours on the 28th. The wintry mix eventually changed over to snow from west to east for a relatively brief period during the morning and afternoon hours on the 28th. Widespread ice accumulations ranged from one-quarter to three quarters of an inch. Total sleet and snow accumulations on top of the ice ranged from 1 to 3 inches, highest over far eastern portions of the county. Stout north to northeast winds resulted in some blowing snow, reducing visibilities during the morning and afternoon hours on the 28th. The weight of the ice in concert with the stout winds downed numerous tree limbs, along with some power poles and power lines, which resulted in widespread power outages. The Yates Center News and Wilson County Citizen Paper contributed to this report. Estimated property damage $150,000.

**January 26, 2009**: Allen County: Sleet accumulated to about one-half inch across the county, with a light glaze of ice underneath the sleet due to periodic freezing drizzle and freezing rain. Even though no reports of automobile accidents were received, it is probable that at least some occurred across the county due to the widespread slick road conditions. Estimated property damage $75,000.

**January 26, 2009**: Chautauqua County: One-quarter inch of ice and sleet accumulated across the county due to periodic freezing drizzle, freezing rain and sleet. Additionally, a trace to one inch of light snow accumulated on top of the ice, making for extremely slick road conditions. Numerous automobile accidents occurred countywide, but no injuries were reported. Estimated property damage $250,000.

**January 26, 2009:** Labette County: One-quarter to one-half inch of ice accumulated across the county due to periodic freezing drizzle, freezing rain and sleet. Additionally,

one to two inches of snow accumulated on top of the ice, making for extremely slick road conditions. Numerous automobile accidents occurred countywide, but no reports of injuries were received. Estimated property damage $500,000.

**January 26, 2009**: Montgomery County: One-quarter inch of ice and sleet accumulated across the county due to periodic freezing drizzle, freezing rain and sleet. Additionally, light snow accumulations on top of the ice made for extremely slick road conditions. Numerous automobile accidents occurred countywide, one of which produced an injury. On the evening of the 26th, A Caney man was injured when he lost control of his vehicle on the icy road while driving southbound on Highway 169, north of County Road 3420 near Liberty. The vehicle went into the ditch and overturned. Information courtesy of the Independence Daily Reporter. Estimated property damage $500,000.

**January 26, 2009**: Neosho County: Ice accumulated to about one-quarter inch across mainly southern portions of the county, due to periodic freezing drizzle and freezing rain. Light snow accumulated to about one-half inch. Numerous automobile accidents occurred countywide, but no reports of injuries were received. Estimated property damage $250,000.

**January 26, 2009**: Wilson County: One-quarter inch of ice and sleet accumulated across the county due to periodic freezing drizzle, freezing rain and sleet. Additionally, light snow accumulations on top of the ice made for extremely slick road conditions. Numerous automobile accidents occurred countywide, but no injuries were reported. Estimated property damage $200,000.

**December 11, 2007**: Greenwood County: One to one and a half inches of ice accumulated across mainly northern Greenwood County during the ice storm. This resulted in approximately 100 downed power poles and 400 downed lines. Damage to the electrical infrastructure is estimated at $1.9 million. There was also widespread damage to trees but the cost of the damage is unknown. Estimated property damage $1,900,000.

**Kansas Severe Winter Storms (EM-3282)**, Incident period: Thursday, December 6, 2007 to Wednesday, December 19, 2007, Emergency Declaration declared on December 12, 2007

**December 9, 2007**: Crawford County: Intermittent periods of freezing rain from the morning of 9 December to around noon on 10 December caused ice accumulations up to an inch over Crawford County. The south and east sections of the county acquired the most ice, while north and west sections only accumulated around one quarter to one half inch. South and east sections of the county experiences a few power outages. Estimated property damage $700,000.

**December 9, 2007**: Cherokee County: Ice accumulations of up to two inches were observed over much of Cherokee County. The cities of Columbus, Baxter Springs, and Riverton were hit the hardest. Nearly 100% of the county lost power for several days, as widespread tree and power line damage occurred. The Sheriff Department's 300 foot

tower located two miles north of Riverton collapsed due to the weight of the ice.. Estimated property damage $6,000,000.

**January 30, 2002:** Greenwood County: The same winter storm that all but paralized south-central Kansas hit southeast Kansas early on the morning of the 30th and lasted well into the morning of the 31st. Freezing rain was almost solely responsible for ice accumulations of 1-2 inches that caused widespread tree and power line damage. The resulting power outages affected nearly all of the region and lasted, in some cases, nearly a week. Estimated property damage $2,000,000.

**January 30, 2002:** Crawford County: A large scale ice storm event developed over southeast Kansas and west central Missouri during the early morning hours of January 30, 2002. Light to moderate rainfall fell over the sub-freezing surface temperatures for nearly 36 hours. Ice begun accumulating on trees and power lines from southeast Kansas into west central Missouri Wednesday morning. The storm system began to wind down Thursday morning as temperatures rose above freezing. However, additional ice related problems continued through the early afternoon as the melting ice fell on homes, cars and businesses. Estimated property damage $2,000,000.

According to the NCDC there were 136 winter storms (blizzard, extreme wind chill, freeze, ice, sleet, and snow events) in southeast Kansas between 2000 and 2012. Total property damage during that period was estimated by the NCDC is estimated at $36,205,000. The total public assistance and individual assistance from the five Presidential Declarations listed above totaled over $565,892,077 for all involved counties, including the counties from the southeast Kansas region. This indicates that there is a much greater number of winter storm events recorded in NCDC than declarations, and that damages to NCDC are likely under-reported.

**NCDC Winter Storm Events**

| County | Number of Winter Weather Events (2000-2012) | Total Property Damage Winter Weather and Storms | Number of Ice Storm Events (2000-2012) | Total Property Damage, Ice Storms |
|---|---|---|---|---|
| Allen | 12 | $185,000 | 2 | $0 |
| Bourbon | 8 | $0 | 9 | $605,000 |
| Chautauqua | 12 | $280,000 | 2 | $0 |
| Cherokee | 9 | $0 | 7 | $6,000,000 |
| Crawford | 10 | $0 | 7 | $2,700,000 |
| Elk | 13 | $180,000 | 2 | $0 |
| Greenwood | 15 | $2,030,000 | 3 | $26,900,000 |
| Labette | 11 | $512,000 | 3 | $0 |
| Montgomery | 15 | $615,000 | 3 | $0 |
| Neosho | 11 | $290,000 | 3 | $0 |
| Wilson | 11 | $258,000 | 3 | $0 |
| Woodson | 9 | $150,000 | 2 | $0 |
| Regional Total | 136 | $4,500,000 | 46 | $36,205,000 |

Source: NCDC Storm Events Database

**Local Events**

**February 26, 2013:** A winter storm caused the cancellation of one day of classes at Allen County Community College.

**February 21 and 22, 2013:** A winter storm caused the cancellation of two days of classes at Allen County Community College.

**February 1 and 2, 2013:** Snow and ice caused power outages, school closings, and city and county office closings in Allen County.

**January 2013: City of Savonburg, Allen County:** A winter storm knocked over electrical poles and damaged a transformer.

**February 2, 2011: City of Pittsburg, Crawford County:** A severe winter storm resulted in the closure of roads and schools.

**February 2011: Labette County :** A severe winter storm resulted in school and road closures. Additionally, downed utility lines resulted in short term power disruptions.

**December 2010; Labette County:** A severe winter storm resulted in school and road closures. Additionally, downed utility lines resulted in short term power disruptions.

**Winter 2010: USD 505, Labette County:** A severe winter storm caused electrical failure that resulted in school closures.

**2010: USD 505, Labette County:** A severe winter storm resulted in the school closures.

**2010: Labette City, Labette County:** A severe winter storm resulted in electrical utility damage.

**December 6, 2007:** An ice storm caused the trimming and removal of several trees in the City of Edna, Labette County.

**January 2002: City of Gas, Allen County:** An ice storm struck the city rsulting in the closure of schools for a few days.

**February 2002:** An ice storm in the City of Fredonia, Wilson County caused damage to trees and utility lines and a loss of power for one week.

**January 2002: City of Toronto, Wilson County:** A severe winter storm/ice storm caused the loss of power for 5 days.

**Hazard Vulnerability and Impact**

All counties in southeast Kansas are vulnerable to winter storms. To refine and access the relative vulnerability of each of southeast Kansas' counties to winter storm events, the region assigned ratings to pertinent factors that were examined at the county level. These factors are: social vulnerability index, prior events, prior annualized property damage, building exposure valuation, population density, crop exposure and annualized crop loss. Then a rating value of 1-10 was assigned to the data obtained for each factor and then weighted equally and factored together to obtain overall vulnerability scores for comparison and to determine the most vulnerable counties.

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- NCDC storm events 1993 – 2012
- U.S. Census Bureau (2010)
- USDA's Census of Agriculture (2007).

**Vulnerability Factor Amounts for Winter Storm**

| County | SoVI Rating (1-5) | Prior Events 1993-2012 | Property Damages | Annualized Property Damages | Total Building Exposure ($000) | Population Density | Crop Exposure (2007 Census of Agriculture) | Crop Insurance Paid for Wind | Annualized Crop Insurance Paid |
|---|---|---|---|---|---|---|---|---|---|
| Allen | 3 | 18 | $2,100,000 | $105,000 | $983,778 | 26 | $15,462,000 | $1,658,942 | $165,894 |
| Bourbon | 4 | 25 | $8,745,000 | $437,250 | $1,102,488 | 24 | $9,918,000 | $432,574 | $43,257 |
| Chautauqua | 5 | 21 | $1,933,000 | $96,650 | $285,438 | 6 | $4,971,000 | $207,675 | $20,768 |
| Cherokee | 4 | 25 | $6,195,000 | $309,750 | $1,293,753 | 37 | $53,420,000 | $3,028,377 | $302,838 |
| Crawford | 3 | 25 | $8,755,000 | $437,750 | $2,588,817 | 66 | $34,463,000 | $1,498,817 | $149,882 |
| Elk | 5 | 24 | $1,925,000 | $96,250 | $187,291 | 4 | $0 | $283,961 | $28,396 |
| Greenwood | 5 | 26 | $3,855,000 | $192,750 | $491,412 | 6 | $8,087,000 | $328,973 | $32,897 |
| Labette | 4 | 14 | $275,000 | $13,750 | $1,453,850 | 33 | $22,765,000 | $2,170,952 | $217,095 |
| Montgomery | 4 | 24 | $378,000 | $18,900 | $2,432,183 | 54 | $16,616,000 | $1,925,856 | $192,586 |
| Neosho | 4 | 23 | $2,193,000 | $109,650 | $1,174,150 | 29 | $17,811,000 | $1,243,377 | $124,338 |
| Wilson | 4 | 22 | $2,183,000 | $109,150 | $671,059 | 16 | $26,882,000 | $2,203,182 | $220,318 |
| Woodson | 5 | 18 | $1,925,000 | $96,250 | $207,905 | 7 | $14,486,000 | $641,703 | $64,170 |

Using the above information, a value of 1-10 was assigned to the data obtained for each factor and then weighted equally and factored together to obtain overall vulnerability scores for comparison and to determine the greatest vulnerable counties. The Social Vulnerability Index is in a range of 1- 5. To give Social Vulnerability Index the same weight as the other factors, the numbers were multiplied by two.

**Winter Storm Data Rating Determination**

| Ratings | Social Vulnerability | NCDC Prior Events | Annualized Property Damage | Building Exposure Valuation | Population Density | Crop Exposure | Annualized Crop Loss |
|---|---|---|---|---|---|---|---|
| 1 | | 14 - 21 | $2,000 - $50,000 | $117,421 - $4,492,825 | 1.6 - 116.3 | 0 - $18,548,500 | 0 - $200,000 |
| 2 | 1 | 21 - 29 | $50,001 - $100,000 | $4,492,826 - $8,868,229 | 116.4 - 231.1 | $18,548,501 - $32,126,000 | $200,001 - $400,000 |
| 3 | | 30 - 36 | $100,001 - $300,000 | $8,868,230 - $13,243,634 | 231.2 - 345.9 | $32,126,001 - $45,703,500 | $400,000 - $600,000 |
| 4 | 2 | 37 - 44 | $300,001 - $500,000 | $13,243,635 - $17,619,039 | 346 - 460.7 | $45,703,501 - $59,281,000 | $600,001 - $800,000 |
| 5 | | 45 - 52 | $500,001 - $700,000 | $17,619,040 - $21,994,444 | 460.8 - 575.5 | $59,281,001 - $72,858,500 | $800,001 - $1,000,000 |
| 6 | 3 | 53 - 60 | $700,001 - $900,000 | $21,994,445 - $26,369,848 | 575.6 - 690.3 | $72,858,501 - $86,436,000 | $1,100,001 - $1,300,000 |
| 7 | | 61 - 69 | $900,001 - $1,100,000 | $26,369,849 - $30,745,253 | 690.4 - 805.1 | $86,436,001 - $100,013,500 | $1,300,001 - $1,500,000 |
| 8 | 4 | 70 - 77 | $1,100,001 - $1,700,000 | $30,745,254 - $35,120,658 | 805.2 - 919.9 | $100,031,501 - $113,591,000 | $1,500,001 - $1,700,000 |
| 9 | | 78 - 85 | $1,700,001 - $2,200,000 | $35,120,659 - $39,496,062 | 920- 1,034.7 | $113,591,001 - $127,168,500 | $1,700,001 - $2,700,000 |
| 10 | 5 | 86 - 93 | $2,200,001 - $2,800,000 | $39,496,063 - $43,871,468 | 1,034.8 - 1,149.6 | $127,168,501 - $140,746,000 | $2,700,001 - $3,700,000 |

Based on the above ratings system, ranges were applied to each county to determine their potential vulnerability. The following related the scoring to a vulnerability assessment:

- **Low:** Score range of 13 -17
- **Medium-Low:** Score range of 18 - 22
- **Medium:** Score range of 23 - 27
- **Medium-High:** Score range of 28 - 32
- **High:** Score range of 33 - 37

The following table provides the factor's amount per county that are considered for winter storm vulnerability.

**Regional Vulnerability to Winter Storms**

| County | SoVI Converted Rating | Prior Event Rating | Annualized Property Damage Rating | Bldg Exposure Valuation Rating | Population Density Rating | Crop Exposure Rating | Annualized Crop Insurance Rating | Overall Vulnerability Rating | Winter Storm Vulnerability |
|---|---|---|---|---|---|---|---|---|---|
| Allen | 6 | 1 | 3 | 1 | 1 | 1 | 1 | 14 | Low |
| Bourbon | 8 | 2 | 4 | 1 | 1 | 1 | 1 | 18 | Medium-Low |
| Chautauqua | 10 | 1 | 2 | 1 | 1 | 1 | 1 | 17 | Low |
| Cherokee | 8 | 2 | 4 | 1 | 1 | 4 | 2 | 22 | Medium-Low |
| Crawford | 6 | 2 | 4 | 1 | 1 | 3 | 1 | 18 | Medium-Low |
| Elk | 10 | 2 | 2 | 1 | 1 | | 1 | 17 | Low |
| Greenwood | 10 | 2 | 3 | 1 | 1 | 1 | 1 | 19 | Medium-Low |
| Labette | 8 | 1 | 1 | 1 | 1 | 2 | 2 | 16 | Low |
| Montgomery | 8 | 2 | 1 | 1 | 1 | 1 | 1 | 15 | Low |
| Neosho | 8 | 2 | 3 | 1 | 1 | 1 | 1 | 17 | Low |
| Wilson | 8 | 2 | 3 | 1 | 1 | 2 | 2 | 19 | Medium-Low |
| Woodson | 10 | 1 | 2 | 1 | 1 | 1 | 1 | 17 | Low |

In addition, the Kansas Department of Transportation (KDOT) incurs statewide annual costs for snow and ice removal. The average cost per year for snow and ice efforts for fiscal years 2008-2011 is $15.9 million for labor, equipment and materials. However, the cost for snow and ice efforts in fiscal year 2012 was only $6.7 million because it was a mild winter (source: Translines Express, KDOT, April 11, 2012).

| | Magnitude/Severity |
|---|---|
| Winter Storm | 2.25 |

**Future Development**

Future development projects should consider winter storm hazard at the planning, engineering and architectural design stage with the goal of reducing vulnerability. However, regional data suggests that both population and development are decreasing in rural areas, thus minimizing potential future exposure. For larger population centers, which are experiencing slight growth, the potential of this hazard having an impact increases with increased development.

**Probability of Future Hazard Events**

According to the NCDC there were 136 winter storms (blizzard, extreme wind chill, freeze, ice, sleet, and snow events) in southeast Kansas between 2000 and 2012. This equates to approximately 10 events per year, with a probability of occurrence for next year at 100%. Based

on this information, it is likely that at least one winter storm will occur in southeast Kansas in any given year.

| | Probability |
|---|---|
| Winter Storm | 3.92 |

**Consequence Analysis**

The information in the following table provides the Consequence Analysis.

**Winter Storm Consequence Analysis**

| Subject | Ranking | Impacts of Winter Storm |
|---|---|---|
| Health and Safety of Persons in the Area of the Incident | Severe | Impact of the immediate area could be severe for affected areas and moderate to light for other less affected areas. |
| Responders | Minimal | Impact to responders could be severe for unprotected personnel and moderate to light for prepared personnel. |
| Continuity of Operations | Minimal | Minimal expectation of execution of the COOP. |
| Property, Facilities, and Infrastructure | Minimal to Severe | Localized impact to facilities and infrastructure in the incident area. Utility lines most affected. |
| Delivery of Services | Minimal to Severe | Delivery of services could be affected if there is any disruption to the roads and/or utilities due to damages sustained. |
| Environment | Severe | Greatest impact will be to trees, bushes, foliage, crops, and wildlife, which could be severe. |
| Economic Conditions | Minimal to Severe | Impacts to the economy will greatly depend on the severity of the winter storm, longevity of the storm, and any damages sustained such as utilities and roads. |
| Public Confidence in Governance | Minimal to Severe | Response and recovery will be in question if not timely and effective. Utility failure could be called in to question if outages are persistent. |

## 3.8 DATA SOURCES

The following table details the data sources used for this section.

Data on the past impacts and future probability of these hazards in the southeast Kansas planning area was collected from the following sources:

- Bureau of Alcohol, Tobacco, Firearms and Explosives Standards
- Electronic Mass Casualty Assessment and Planning Scenarios developed by Johns Hopkins University
- Emergency Management Accreditation Program
- Environmental Protection Agency
- Federal Bureau of Investigation
- Federal Emergency Management Agency
- Federal Emergency Management Agency Benefit-Cost Analysis Reengineering Tornado Safe Room Module Methodology Report, Version 4.5 Final, Dated May 2009
- Federal Emergency Management Agency Flood Insurance Administration
- Federal Emergency Management Agency Flood Insurance Rate Maps
- Federal Emergency Management Agency HAZUS-Multi Hazard-2.1
- Federal Emergency Management Agency Mid-Term Levee Inventory
- Federal Emergency Management Agency National Flood Insurance Program
- Federal Emergency Management Agency National Flood Insurance Program
- Federal Emergency Management Agency "Local Mitigation Planning Handbook, March 2013"
- Federal Emergency Management Agency, Taking Shelter From the Storm, 2008
- Federal Emergency Management Agency's "Policy and Loss Data by Community with County and State Data"
- Federal Emergency Management Agency's Policy and Claim Statistics for Flood Insurance
- Hazards and Vulnerability Research Institute at the University of South Carolina
- Homeland Security Act of 2002
- Kansas Corporation Commission
- Kansas Data Access & Support Center
- Kansas Department of Agriculture, Division of Animal Health
- Kansas Department of Agriculture, Division of Water Resources
- Kansas Department of Agriculture, Division of Water Resources, Water Structures Program
- Kansas Department of Agriculture, Plant Protection and Weed Control Division
- Kansas Department of Health & Environment, Bureau of Water, Livestock Waste Management
- Kansas Department of Health and Environment "Subsurface Void Space and Sinkhole/Subsidence Area Inventory for the State of Kansas", 2006
- Kansas Department of Health and Environment Bureau of Epidemiology and Public Health Informatics

- Kansas Department of Health and Environment Surface Mining Section
- Kansas Department of Health and Environment, Division of Environment
- Kansas Department of Health and Environment's Kansas Environmental Public Health Tracking Program
- Kansas Division of Emergency Management
- Kansas Division of Emergency Management 2012 Kansas Severe Weather Awareness Week
- Kansas Division of Emergency Management, Technological Hazards Section
- Kansas Fire Service
- Kansas Flint Hills Smoke Management Plan
- Kansas Forest Action plan
- Kansas Forest Service
- Kansas Geological Survey
- Kansas Geological Survey, "Earthquakes in Kansas"
- Kansas Operations Plan
- Kansas Response Plan
- Kansas State University College of Engineering
- Kansas State University Research and Extension Climatic Map of Kansas
- Kansas Statutes Annotated
- Kansas Unified HazMat Response Program Statewide Contract # 35167
- Kansas Water Office
- Kansas Water Office Kansas Drought Stage Declarations
- Kansas Water Office, 2009 Kansas Water Plan
- Kansas Water Office, Kansas 2013 Drought Update
- Kansas University Geological Survey
- Kansas Commission on Emergency Planning and Response Annual Report, Managing the Risk: 2011
- Modified Mercalli Intensity Scale
- National Climatic Data Center
- National Dam Safety Act
- National Drought Mitigation Center Drought Impact Reporter
- National Fire Incident Reporting System
- National Fire Incident Reporting System
- National Interagency Fire Center Predictive Services
- National Oceanic and Atmospheric Administration Storm Prediction Center
- National Oceanic and Atmospheric Administration
- National Resources Conservation Service
- National Seismic Hazard Mapping Project
- National Weather Service
- National Weather Service Heat Index Program
- Oklahoma Climatological Survey
- Palmer Drought Severity Index

- Spatial Hazard Event and Loss Database
- Stanford University's National Performance of Dams Program
- "Surface Water in Kansas and its Interactions with Groundwater" 2000 M. A. Sophocleous, B. B. Wilson
- "The Annual Impact of Seasonal Influenza in the US: Measuring Disease Burden and Costs" by NA Molinari
- The Southern Poverty Law Center
- Tornado and Storm Research Organization
- Translines Express, Kansas Department of Transportation, April 11, 2012
- United States Army Corps of Engineers
- United States Army Corps of Engineers Levee Safety Program
- United States Army Corps of Engineers National Levee Database
- United States Bureau of Reclamation
- United States Census Bureau
- United States Census Bureau
- United States Census Bureau American Community Survey 2005 – 2009
- United States Centers for Disease Control and Prevention
- United States Department of Agriculture 2011 Kansas Crop Insurance Profile Report
- United States Department of Agriculture National Resources Inventory
- United States Department of Agriculture, Division of Water Resources
- United States Department of Agriculture, National Agricultural Statistics Service
- United States Department of Agriculture, Risk Management Agency
- United States Department of Agriculture's Census of Agriculture
- United States Department of Transportation Pipeline and Hazardous Materials Safety Administration
- United States Drought Monitor
- United States Fish and Wildlife Service
- United States Geological Survey Fact Sheet, "Water Use in Kansas 1990-2000"
- United States Geological Survey, Earthquake Hazards Program
- University of Kansas Institute for Policy and Social Research
- USA Patriot Act
- Vaisala's National Lightning Detection Network
- Other agencies and data collections as noted

# 4.0 CAPABILITY ASSESSMENT

## 4.1 INTRODUCTION

*44 CFR 201.6 does not require a capability assessment to be completed for local hazard mitigation plans. However, 201.6(c)(3) states "A mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tool."*

This section of the plan discusses the current capacity of the communities of southeast Kansas to mitigate the effects of identified hazards. A capability assessment is conducted to determine the ability of a jurisdiction to execute a comprehensive mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects. This assessment includes a comprehensive examination of the following capabilities:

- Planning Capabilities
- Policies and Ordinances
- Programs
- Studies, Reports and Maps
- Departmental Staff
- Non-Governmental Organizations (NGOs)
- Financial Resources

A capability assessment helps to determine which mitigation actions are practical based on a jurisdictions fiscal, staffing and political resources. A capability assessment consists of:

- An inventory of relevant plans, ordinances, or programs already in place
- An analysis capacity to carry them out.

A thoughtful review of jurisdictional capabilities will assist in determining gaps that could limit current or proposed mitigation activities, or potentially aggravate a jurisdictions vulnerability to an identified hazard. Additionally, a capability assessment can detail current successful mitigation actions that should continue to receive support.

For the 2013 update each participating jurisdiction was given an opportunity to review and revise their capability assessment information presented from their previous plan.

## 4.2 METHODOLOGY

In order to facilitate this plan update and consolidation jurisdictions were asked if they had the following capabilities:

**Planning Capabilities**

| |
|---|
| Comprehensive Plan |
| Capital Improvement Plan |
| City Emergency Operations Plan |
| County Emergency Operations Plan |
| Local Recovery Plan |
| County Recovery Plan |
| Debris Management Plan |
| Economic Development Plan |
| Transportation Plan |
| Land-use Plan |
| Flood Mitigation Assistance Plan |
| Watershed Plan |
| Firewise or other fire mitigation plan |
| Critical Facilities Plan (Mitigation/Response/Recovery) |

**Policies/Ordinances**

| |
|---|
| Zoning Ordinance |
| Building Code |
| Floodplain Ordinance |
| Subdivision Ordinance |
| Tree Trimming Ordinance |
| Nuisance Ordinance |
| Storm Water Ordinance |
| Drainage Ordinance |
| Site Plan Review Requirements |
| Historic Preservation Ordinance |
| Landscape Ordinance |
| Wetlands / Riparian Areas Conservation Plan |

**Programs**

| |
|---|
| Zoning/Land Use Restrictions |
| Codes Building Site/Design |
| Hazard Awareness Program |
| National Flood Insurance Program |
| Community Rating System program under the National Flood Insurance Program |
| National Weather Service Storm Ready Certification |
| Firewise Community Certification |
| Building Code Effectiveness Grading |
| ISO Fire Rating |
| Economic Development Program |
| Land Use Program |
| Public Education/Awareness |

**Programs, Continued**

| |
|---|
| Property Acquisition |
| Planning/Zoning Boards |
| Stream Maintenance Program |
| Tree Trimming Program |
| Engineering Studies for Streams (Local/County/Regional) |
| Mutual Aid Agreements |

**Studies/Reports/Maps**

| |
|---|
| Hazard Analysis/Risk Assessment (City) |
| Hazard Analysis/Risk Assessment (County) |
| Evacuation Route Map |
| Critical Facilities Inventory |
| Vulnerable Population Inventory |
| Land Use Map |

**Staff/Department**

| |
|---|
| Building Code Official |
| Building Inspector |
| Mapping Specialist (GIS) |
| Engineer |
| Development Planner |
| Public Works Official |
| Emergency Management Coordinator |
| NFIP Floodplain Administrator |
| Bomb and/or Arson Squad |
| Emergency Response Team |
| Hazardous Materials Expert |
| Local Emergency Planning Committee |
| County Emergency Management Commission |
| Sanitation Department |
| Transportation Department |
| Economic Development Department |
| Housing Department |
| Historic Preservation |

**NGOs**

| |
|---|
| American Red Cross |
| Salvation Army |
| Veterans Groups |
| Local Environmental Organization |
| Homeowner Associations |
| Neighborhood Associations |
| Chamber of Commerce |
| Community Organizations (Lions, Kiwanis, etc.) |

**Financial Resources**

| |
|---|
| Apply for Community Development Block Grants |
| Fund projects thru Capital Improvements funding |
| Authority to levy taxes for specific purposes |
| Fees for water, sewer, gas, or electric services |
| Impact fees for new development |
| Incur debt through general obligation bonds |
| Incur debt through special tax bonds |
| Incur debt through private activities |
| Withhold spending in hazard prone areas |

Gathering this information from participating southeast Kansas jurisdictions assisted in assessing capabilities and served as a guide to potential future changes to create robust policies, procedures, plans and teams to strengthen hazard mitigation planning.

## 4.3 REGIONAL SCHOOLS, COLLEGES AND UNIVERSITIES

In order to facilitate this plan update and consolidation participating schools, colleges and universities were asked if they had the following capabilities:

**Schools, Colleges and Universities Capability Questions**

| |
|---|
| Full-time building official (i.e. Principal) |
| Emergency Manager |
| Grant Writer |
| Public Information Officer |
| Capital improvements project funding |
| Local funds |
| General obligation bonds |
| Special tax bonds |
| Private activities/donations |
| State and federal funds |

## 4.4 GOVERNANCE

The planning area is comprised of eleven participating counties in southeast Kansas, along with participating jurisdictions within those counties. All of the counties in the planning area operate under a county commissioner form of governance. In this form of government, the elected board of commissioners oversee county operations. The following table details each counties form of governance.

**County Governance**

| Jurisdiction | Government Structure | Number of Commissioners |
|---|---|---|
| Allen County | Commission | 3 |
| Bourbon County | Commission | 3 |
| Chautauqua County | Commission | 3 |
| Cherokee County | Commission | 3 |
| Crawford County | Commission | 3 |
| Elk County | Commission | 3 |
| Labette County | Commission | 3 |
| Montgomery County | Commission | 3 |
| Neosho County | Commission | 3 |
| Wilson County | Commission | 3 |
| Woodson County | Commission | 3 |

In general, the participating towns and cities operate either under a Mayoral form of governance or an elected city council form of governance.

## 4.5 JURISDICTIONAL CAPABILITIES

Information as to the current capacity of participating jurisdictions is summarized in the following sections and tables. All capability information was provided by jurisdictional officials through the above referenced questions and through outreach from the HMPC.

The ability of a local government to develop and implement mitigation projects, policies, and programs is directly tied to its ability to direct staff time and resources for that purpose. Administrative capability can be evaluated by determining how mitigation-related activities are assigned to local departments and if there are adequate personnel resources to complete these activities. The degree of intergovernmental coordination among departments will also affect administrative capability for the implementation and success of proposed mitigation activities.

Many smaller jurisdictions have very limited to no planning, management, response or mitigation capabilities. Often these jurisdiction rely on the county or nearby larger municipalities for assistance. This lack of capabilities is reflected in the following tables. Additionally, many very small or extremely limited participating small jurisdictions, largely townships, are not listed on the capability list. **This in no way diminishes the participation in the process of these jurisdictions.** Finally, special district capabilities are included in their overarching counties.

### 4.5.1 PLANNING CAPABILITIES

The planning capability assessment is designed to provide a general overview of the key planning and regulatory tools or programs in place or under development. This information helps identify opportunities to address existing planning gaps and provides an opportunity to review areas that mitigation planning actions can be utilized with existing plans. Jurisdictions were asked if they had completed the following plans:

***Comprehensive Plan***

A comprehensive plan establishes the overall vision for a jurisdiction and serves as a guide to governmental decision making. A comprehensive plan generally contains information on demographics, land use, transportation, and facilities. As a comprehensive plan is broad in scope the integration of hazard mitigation measures can enhance the likelihood of achieving risk reduction goals.

***Capital Improvement Plan***

A capital improvement plan guides scheduling of, and spending on, public improvements. A capital improvement plan can guide future development away from identified hazard areas, an effective mitigation strategy.

***Emergency Operations Plan***

An emergency operations plan outlines responsibilities, means and methods by which resources are deployed during and following an emergency or disaster.

***Recovery Plan***

A disaster recovery plan guides the recovery and reconstruction process following a disaster. Hazard mitigation principles should be incorporated into disaster recovery plans to assist in breaking the cycle of disaster loss.

***Debris Management Plan***

A debris management plan covers the response and recovery from debris-causing incidents such as tornados or floods. Planning considerations include debris removal and disposal, disposal locations, equipment availability, and personnel training.

***Economic Development Plan***

An economic development plan assists in advancing a strong and sustainable economy over the long term. This plan provides strategies, programs, and policies that will foster the jurisdictions business climate.

***Transportation Plan***

A transportation plan aids with the evaluation, review, design and locating of transportation infrastructure, including streets, highways, public transport lines, and transportation centers.

***Land Use Plan***

Land-use planning is used to regulate land use in an efficient and equitable manner, and to assist jurisdictions in managing the development of land within their boundaries.

### *Flood Mitigation Assistance Plan*

The purpose of the flood mitigation assistance plan is to reduce or eliminate the long-term risk of flood damage to buildings and other structures insured under the National Flood Insurance Program.

### *Watershed Management Plan*

A watershed management plan is used to provide assessment and management information for a geographically defined watershed.

### *Fire Mitigation Plan*

A fire mitigation plan is used to mitigate a jurisdictions wildfire risk and vulnerability In The plan documents areas with an elevated risk of wildfires, and identifies the actions taken to decrease the risk.

### *Critical Facilities Plan*

A critical facilities plan is used to identify a jurisdictions critical facilities, including fire stations, police stations, hospitals, schools, day care centers, senior care facilities, major roads and bridges, critical utility sites, and hazardous material storage areas. Additionally, this plan is used to determine methods to mitigate damage to these facilities.

The table below summarizes relevant local plans.

**Jurisdictional Planning Capabilities**

| Jurisdiction | Comprehensive Plan | Capital Improvement Plan | City Emergency Operations Plan | County Emergency Operations Plan | Local Recovery Plan | County Recovery Plan | Debris Management Plan | Economic Development Plan | Transportation Plan | Land-use Plan | Flood Mitigation Assistance Plan | Watershed Plan | Firewise or other fire mitigation plan | Critical Facilities Plan (Mitigation/Response/ Recovery) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Allen County** | x | | | x | x | x | | | | | x | x | x | x |
| City of Elsmore | | | | | | | | | | | | | | |
| City of Gas | | x | | | | | | x | | | | | | |
| City of Humboldt | x | x | x | | x | | x | | | x | x | | x | |
| City of Iola | | | | | | | | | | | | | | |
| City of LaHarpe | | | | | | | | | | | | | | |
| City of Moran | | | | | | | | | | | | | | |
| City of Savonburg | | | | | | | | | | | | | | |
| **Bourbon County** | | | | x | | | | x | | | | | | |
| City of Bronson | | | x | | | | x | | | | | | | x |
| City of Fort Scott | x | x | x | x | | | | x | | x | x | x | | |
| City of Fulton | | | | | | | | | | | | | | |
| City of Mapleton | | | | | | | | | | | | | | |
| City Redfield | | | | | | | | | | | | | | |
| City of Uniontown | | | x | | | | | | | | x | | | |
| **Chautauqua County** | | | | | | | | | | | | | | |
| City of Cedar Vale | | | | | | | | | | | | | | |
| City of Peru | | | | | | | | | | | | | | |
| City of Sedan | | | | | | | | | | | | | | |

| Jurisdiction | Comprehensive Plan | Capital Improvement Plan | City Emergency Operations Plan | County Emergency Operations Plan | Local Recovery Plan | County Recovery Plan | Debris Management Plan | Economic Development Plan | Transportation Plan | Land-use Plan | Flood Mitigation Assistance Plan | Watershed Plan | Firewise or other fire mitigation plan | Critical Facilities Plan (Mitigation/Response/ Recovery) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Cherokee County** | | x | | x | | x | | x | x | | x | x | | x |
| City of Baxter Springs | | x | x | | | | | x | | | x | | | x |
| City of Columbus | | x | | | | | | x | | | x | | | x |
| City of Galena | x | x | x | | | | | x | | | x | | | x |
| City of Roseland | | | | | | | | | | | | | | |
| City of Scammon | | | x | | | | | | | | | | | x |
| City of Treece | | | | | | | | | | | | | | |
| City of Weir | | | x | | | | | | | | x | | | x |
| City of West Mineral | | | | x | | | | | | | | | x | x |
| | | | | | | | | | | | | | | |
| **Crawford County** | x | | x | x | x | x | x | | x | x | x | x | | x |
| City of Arcadia | | | x | | | | | | | | | | | |
| City of Arma | | | | | | | | | | | | | | |
| City of Cherokee | | | | | | | | | | | | | | |
| City of Franklin | | | | | | | | | | | | | | |
| City of Frontenac | | | x | x | | | x | x | | x | x | | | |
| City of Girard | | x | | x | | | | | | | | | | |
| City of Hepler | | | x | | | | | | | | | | | |
| City of McCune | | | | | | | | | | | | | | |
| City of Mulberry | | | x | | | | | | | | | | | x |
| City of Pittsburg | x | x | x | | | | x | x | | x | | | | x |

| Jurisdiction | Comprehensive Plan | Capital Improvement Plan | City Emergency Operations Plan | County Emergency Operations Plan | Local Recovery Plan | County Recovery Plan | Debris Management Plan | Economic Development Plan | Transportation Plan | Land-use Plan | Flood Mitigation Assistance Plan | Watershed Plan | Firewise or other fire mitigation plan | Critical Facilities Plan (Mitigation/Response/ Recovery) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grant Township | | | | | | | | | | | | | | |
| Osage Township | | | | | | | | | | | | | | |
| Sheridan Township | | | | | | | | | | | | | | |
| Sherman Township | | | | | | | | | | | | | | |
| **Elk County** | | | | x | | | | | | | | | | |
| City of Grenola | | | | x | | | | | | | | | | |
| City of Howard | | | | | | | | | | | | | | |
| City of Longton | | | x | x | | | | | | | | | | |
| City of Moline | | | x | x | | | | | | x | x | x | | x |
| **Labette County** | | | | x | | | | | | | | | | |
| City of Altamont | | | x | x | x | x | x | | x | | x | x | x | x |
| City of Chetopa | | | | | | | | | | | | | | |
| City of Edna | | | | | | | | | | | | | | |
| City of Labette | | | | | | | | | | | | | | |
| City of Mound Valley | | | | | | | | | | | | | | |
| City of Oswego | x | x | | | | | | | | | | | | |
| City of Parsons | x | x | x | x | | | | x | x | x | | | | x |
| **Montgomery County** | | | | x | | | | | | | | | | |
| City of Caney | x | | x | | | | | | | | | | | |
| City of Cherryvale | | x | x | | | | | x | | | | | | |
| City of Coffeyville | x | | x | | | | | | | | | | | |

| Jurisdiction | Comprehensive Plan | Capital Improvement Plan | City Emergency Operations Plan | County Emergency Operations Plan | Local Recovery Plan | County Recovery Plan | Debris Management Plan | Economic Development Plan | Transportation Plan | Land-use Plan | Flood Mitigation Assistance Plan | Watershed Plan | Firewise or other fire mitigation plan | Critical Facilities Plan (Mitigation/Response/Recovery) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| City of Dearing | | | x | | | | x | | | | | | | |
| City of Elk City | x | | x | | | | | | | | | | | |
| City of Havana | | | | | | | | | | | | | | |
| City of Independence | x | | x | | | | | | | | | | | |
| City of Liberty | | | | | | | | | | | | | | |
| **Neosho County** | | | | x | | | x | | | | | | | |
| City of Chanute | x | x | x | x | x | | | | | | | | | x |
| City of Erie | x | x | x | | | | | x | | | x | | | |
| City of St. Paul | | | x | x | | | | | | | x | x | x | x |
| City of Stark | | | | | | | | | | | | | | |
| City of Thayer | | | | x | | | | | | | | | | |
| **Wilson County** | | | | | | | | | | | | | | |
| City of Altoona | | | | x | | | | | | | | | | |
| City of Benedict | | | | | | | | | | | | | | |
| City of Buffalo | | | x | | | | | | | | | | | |
| City of Fredonia | | | | | | | | | | | | | | |
| City of Neodesha | | | | | | | | | | | | | | |
| City of New Albany | | | | | | | | | | | | | | |
| **Woodson County** | x | | x | x | x | x | x | x | | x | | x | x | x |
| City Of Toronto | x | | | x | | | | | | | | | | |
| City of Yates Center | x | x | x | x | | | | x | | x | | | | |

### 4.5.2 POLICIES AND ORDINANCES

In implementing a mitigation plan or specific action, a local jurisdiction may utilize any or all of the four broad types of government authority granted by the State of Kansas. The four types are defined as:

- Regulation
- Acquisition
- Taxation
- Spending

***Regulation***

The scope of this local authority is subject to constraints, however, as all of Kansas' political subdivisions must not act without proper delegation from the State. Under a principle known as "Dillon's Rule," all power is vested in the State and can only be exercised by local governments to the extent it is delegated.

***Acquisition***

The power of acquisition can be a useful tool for pursuing local mitigation goals. Local governments may find the most effective method for completely "hazard-proofing" a particular piece of property or area is to acquire the property, thus removing the property from the private market and eliminating or reducing the possibility of inappropriate development occurring. Kansas legislation empowers cities, towns, counties to acquire property for public purpose by gift, grant, devise, bequest, exchange, purchase, lease or eminent domain (County Home Rule Powers, K.S.A. 19-101, 19-101a, 19-212).

***Taxation***

The power to levy taxes and special assessments is an important tool delegated to local governments by Kansas law. The power of taxation extends beyond merely the collection of revenue, and can have a profound impact on the pattern of development in the community. Communities have the power to set preferential tax rates for areas which are more suitable for development in order to discourage development in otherwise hazardous areas. Local units of government also have the authority to levy special assessments on property owners for all or part of the costs of acquiring, constructing, reconstructing, extending or otherwise building or improving flood control within a designated area. This can serve to increase the cost of building in such areas, thereby discouraging development. Because the usual methods of apportionment seem mechanical and arbitrary, and because the tax burden on a particular piece of property is often quite large, the major constraint in using special assessments is political. Special assessments seem to offer little in terms of control over land use in developing areas. They can, however, be used to finance the provision of necessary services within municipal or county boundaries. In addition, they are useful in distributing to the new property owners the costs of the infrastructure required by new development.

### *Spending*

The Kansas General Assembly allocated the ability to local governments to make expenditures in the public interest. Hazard mitigation principles can be made a routine part of all spending decisions made by the local government, including the adoption of annual budgets and a Capital Improvement Plan. A Capital Improvement Plan is a schedule for the provision of municipal or county services over a specified period of time. Capital programming, by itself, can be used as a growth management technique, with a view to hazard mitigation. By tentatively committing itself to a timetable for the provision of capital to extend services, a community can control growth to some extent. In addition to formulating a timetable for the provision of services, a local community can regulate the extension of and access to services. A Capital Improvement Plan that is coordinated with extension and access policies can provide a significant degree of control over the location and timing of growth. These tools can also influence the cost of growth. If the Capital Improvement Plan is effective in directing growth away from environmentally sensitive or high hazard areas.

Based on the types of state of Kansas government authority granted, participating jurisdictions were asked if the following ordinances and plans were enacted and enforced.

### *Zoning*

Zoning is the traditional and most common tool available to local jurisdictions to control the use of land. State of Kansas statutes grant municipalities and counties authority to engage in zoning for land use. Counties may also regulate inside municipal jurisdiction at the request of a municipality. Zoning is used to promote health, safety, and the general welfare of the community. Zoning is used to dictate the type of land use and to set minimum specifications for use such as lot size, building height and setbacks, and density of population. Local governments are authorized to divide their jurisdiction into districts, and to regulate and restrict the erection, construction, reconstruction, alteration, repair or use of buildings, structures, or land within those districts. Districts may include general use districts, overlay districts, special use districts or conditional use districts. Zoning ordinances consist of maps and written text.

### *Building Code*

Many structural mitigation measures involve constructing and retrofitting homes, businesses and other structures according to standards designed to make the buildings more resilient to the impacts of natural hazards. Many of these standards are imposed through the building code. Kansas does not have state mandatory building codes. However, municipalities and counties may adopt codes for their respective areas if approved by the state as providing "adequate minimum standards." Local governments in Kansas are also empowered to carry out building inspections, and may empower cities and counties to create an inspection department to enforce construction codes and ordinances.

### *Floodplain Ordinance*

In 1992 the Kansas General Assembly approved legislation for floodplain management (Kansas Statutes Annotated 12-766, "Floodplain Management") authorizing the Department of Agriculture, Division of Water Resources as the primary department to oversee and approve local zoning regulation. The regulation requires planning and approval to prevent inappropriate development in the one hundred-year floodplain and to reduce flood hazards. The purpose of the law is to:

- Minimize the extent of floods by preventing obstructions that inhibit water flow and increase flood height and damage
- Prevent and minimize loss of life, injuries, and property damage in flood hazard areas
- Promote the public health, safety and welfare of citizens of Kansas in flood hazard areas.

The statute affects local governments by directing, them to:

- Manage planned growth
- Adopt local ordinances to regulate uses in flood hazard areas
- Enforce those ordinances
- Grant permits for use in flood hazard areas that are consistent with the ordinance

The act also makes certain that local ordinances meet the minimum requirements of participation in the NFIP. The incentive for local governments adopting such ordinances is that they will afford their residents the ability to purchase flood insurance through the NFIP. In addition, communities with such ordinances in place will be given priority in the consideration of applications for loans and grants from the Clean Water Revolving Loan and Grant Fund.

### *Subdivision Ordinance*

Subdivision regulations control the division of land into parcels for the purpose of building development or sale. Flood-related subdivision controls typically require that sub-dividers install adequate drainage facilities and design water and sewer systems to minimize flood damage and contamination. They prohibit the subdivision of land subject to flooding unless flood hazards are overcome through filling or other measures, and they prohibit filling of floodway areas. Subdivision regulations require that subdivision plans be approved prior to the division and/or sale of land. Subdivision regulations are a more limited tool than zoning and only indirectly affect the type of use made of land and the specifications for structures on that land.

Broad subdivision control authority resides with the county for areas outside of municipalities and municipal extra-territorial planning jurisdictions. Subdivision is defined as all divisions of a tract or parcel of land divided into two or more lots and all divisions involving new streets.

### *Tree Trimming Ordinance*

These ordinances may place requirements for the removal, pruning, planting, and other tree work depending upon whether the tree is in the public right-of-way or on a private lot as well as tree size or species, and property zoning.

### *Nuisance Ordinance*

Kansas' local governments have been granted broad regulatory powers in their jurisdictions. Kansas General Statutes bestow the general police power on local governments, allowing them to enact and enforce ordinances which define, prohibit, regulate or abate acts, omissions, or conditions detrimental to the health, safety, and welfare of the people, and to define and abate nuisances. Since hazard mitigation can be included under the police power (as protection of public health, safety and welfare), towns, cities, and counties may include requirements for hazard mitigation in local ordinances. Local governments may also use their ordinance-making power to abate "nuisances," which could include, by local definition, any activity or condition making people or property more vulnerable to any hazard.

### *Stormwater Ordinance*

The purpose of a stormwater ordinance is to protect the quality and quantity of local, regional and state waters from the potential harm of unmanaged stormwater. Stormwater ordinances include protection from activities that result in the degradation of properties, water quality, stream channels, and other natural resources.

### *Drainage Ordinance*

The purpose of a drainage ordinance is to improve storm sewer systems for the management and control of storm water runoff to prevent polluted waters from entering the water supply and other receiving waters.

### *Site Plan Review Ordinance*

The purpose of a site plan review ordinance is to ensure orderly growth, and to minimize the adverse effects growth that could be caused by the development of commercial, industrial, retail or institutional structures.

### *Historic Preservation Ordinance*

The purpose of a preservation ordinance is created to protect buildings and neighborhoods from destruction or modifications. A preservation ordinance protects designated historic properties through review requirements for renovations and protects historic neighborhoods through design guidelines for new development.

***Landscape Ordinance***

A landscape ordinance generally provides rules and procedures for t he protection and maintenance of vegetation and landscaping.

***Wetlands/Riparian Areas Conservation Plan***

The purpose of a Wetlands/Riparian A reas Conservation Plan is to preserve and protect wetlands, water resources, and adjacent upland areas.

The table below summarizes relevant local policies and ordinances.

**Jurisdictional Policies and Ordinances**

| Jurisdiction | Zoning Ordinance | Building Code | Floodplain Ordinance | Subdivision Ordinance | Tree Trimming Ordinance | Nuisance Ordinance | Storm Water Ordinance | Drainage Ordinance | Site Plan Review Requirements | Historic Preservation Ordinance | Landscape Ordinance | Wetlands / Riparian Areas Conservation Plan |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Allen County** | x | | x | x | | x | | | x | | | |
| City of Elsmore | | | | | | | | | | | | |
| City of Gas | x | | | | | x | | | | | | |
| City of Humboldt | x | x | x | x | | x | | | x | | x | |
| City of Iola | | | | | | | | | | | | |
| City of LaHarpe | x | x | x | | | x | x | x | | | | |
| City of Moran | | x | x | | x | x | x | x | | | | |
| City of Savonburg | x | | | | x | x | | | | | | |
| | | | | | | | | | | | | |
| **Bourbon County** | | | x | | | | | | | | | |
| City of Bronson | | | x | | | x | | | | | | |
| City of Fort Scott | x | x | x | x | | x | x | x | x | x | x | |
| City of Fulton | | | x | | | | | | | | | |
| City of Mapleton | | | | | | | | | | | | |
| City of Redfield | | | x | | | | | | | | | |
| City of Uniontown | | x | x | | | x | | | | | | |
| | | | | | | | | | | | | |
| **Chautauqua County** | | | | | | | | | | | | |
| City of Cedar Vale | | | | | | x | x | x | | | x | |
| City of Peru | | | | | | | | | | | | |
| City of Sedan | | | | | | x | x | | | | | |

| Jurisdiction | Zoning Ordinance | Building Code | Floodplain Ordinance | Subdivision Ordinance | Tree Trimming Ordinance | Nuisance Ordinance | Storm Water Ordinance | Drainage Ordinance | Site Plan Review Requirements | Historic Preservation Ordinance | Landscape Ordinance | Wetlands / Riparian Areas Conservation Plan |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Cherokee County** | | | x | x | | | x | | | | | x |
| City of Baxter Springs | x | x | x | | | x | | | | | | |
| City of Columbus | | | x | x | x | x | | | | | | |
| City of Galena | x | x | x | x | x | x | | | | | | |
| City of Roseland | | | | | | | | | | | | |
| City of Scammon | | | x | | | x | | | | | | |
| City of Treece | | | | | | | | | | | | |
| City of Weir | | | x | | x | x | | | | | | |
| City of West Mineral | | | | | | x | | | | | | |
| **Crawford County** | x | | | | | x | | | x | x | | |
| City of Arcadia | x | | x | | | | | | | | | |
| City of Arma | x | | x | x | x | x | x | x | x | | x | |
| City of Cherokee | | | | | | | | | | | | |
| City of Franklin | | | | | | | | | | | | |
| City of Frontenac | x | x | x | x | x | x | | | x | | x | |
| City of Girard | x | x | | | | x | | | | | | |
| City of Hepler | | | x | | | | | | | | | |
| City of McCune | | | | | | | | | | | | |
| City of Mulberry | x | | | | | x | | | | | | |
| City of Pittsburg | x | x | x | x | | x | x | x | x | x | x | |
| Grant Township | | | | | | | | | | | | |
| Osage Township | | | | | | | | | | | | |
| Sheridan Township | | | | | | | | | | | | |

| Jurisdiction | Zoning Ordinance | Building Code | Floodplain Ordinance | Subdivision Ordinance | Tree Trimming Ordinance | Nuisance Ordinance | Storm Water Ordinance | Drainage Ordinance | Site Plan Review Requirements | Historic Preservation Ordinance | Landscape Ordinance | Wetlands / Riparian Areas Conservation Plan |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sherman Township | | | | | | | | | | | | |
| **Elk County** | | | | | | | | | | | | |
| City of Grenola | | | | | | | | | | | | |
| City of Howard | | | | | | x | | | | | | |
| City of Longton | | | x | | | x | | | | | | |
| City of Moline | | | x | | | x | | | | | | |
| **Labette County** | x | x | x | | | | | | | | | |
| City of Altamont | | | x | x | x | x | | | x | | x | |
| City of Chetopa | | | x | x | x | x | | | | | | |
| City of Edna | | | | | | x | | | | | | |
| City of Labette | | | | | | | | | | | | |
| City of Mound Valley | | | | | | | | | | | | |
| City of Oswego | x | x | x | x | x | x | | | | | | |
| City of Parsons | x | x | x | x | x | x | x | x | x | | x | x |
| **Montgomery County** | x | | x | x | | | | | | | | |
| City of Caney | x | | x | | | | | | | | | |
| City of Cherryvale | x | x | x | | | | | | x | | | |
| City of Coffeyville | x | x | x | | | | | | x | | | |
| City of Dearing | x | | x | | | x | x | x | | | | |
| City of Elk City | | | x | | | | | | | | | |
| City of Havana | | | | | | | | | | | | |

| Jurisdiction | Zoning Ordinance | Building Code | Floodplain Ordinance | Subdivision Ordinance | Tree Trimming Ordinance | Nuisance Ordinance | Storm Water Ordinance | Drainage Ordinance | Site Plan Review Requirements | Historic Preservation Ordinance | Landscape Ordinance | Wetlands / Riparian Areas Conservation Plan |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| City of Independence | x | x | x | x | | | | | | | | |
| City of Liberty | | | | | | | | | | | | |
| **Neosho County** | | | | | | | | | | | | |
| City of Chanute | x | x | x | | x | x | x | x | x | x | | |
| City of Erie | x | x | x | | | x | | | x | | | |
| City of St. Paul | x | | x | | | x | | | | | x | |
| City of Stark | | | | | | x | | | | | | |
| City of Thayer | | x | | | | x | | | | | | |
| **Wilson County** | | | | | | | | | | | | |
| City of Altoona | x | | | | | x | | | | | | |
| City of Benedict | | | | | | | | | | | | |
| City of Buffalo | | | | | | x | | | | | | |
| City of Fredonia | x | x | x | | | x | | | | | | |
| City of Neodesha | | x | x | | | | | | | | | |
| City of New Albany | | | | | | x | | | | | | |
| **Woodson County** | x | | x | x | | | | | x | | | |
| City Of Toronto | x | | x | | | | | | | | | |
| City of Yates Center | x | | x | x | | | | | x | | | |

### 4.5.3 PROGRAMS

This part of the capabilities assessment includes the identification and evaluation of existing programs. Many of the programs have been generally discussed in the previous sections.

***Hazard Awareness Program***

A program designed to inform citizens as to the nature and extent of local and regional natural and manmade hazards.

***National Flood Insurance Program***

In 1968, Congress created the NFIP to help provide a means for property owners to financially protect themselves. The NFIP offers flood insurance to homeowners, renters, and business owners if their community participates in the NFIP. Participating communities agree to adopt and enforce ordinances that meet or exceed FEMA requirements to reduce the risk of flooding.

***Community Rating System program under the National Flood Insurance Program***

The NFIP's Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. Participants are offered flood insurance premium rates at a discount to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS. These goals are the reduction of flood damage to insurable property, the strengthening and support of insurance aspects of the NFIP, and the encouragement of a comprehensive approach to floodplain management.

***Firewise Community Certification***

The Firewise Communities Program encourages local solutions for safety by involving homeowners in taking individual responsibility for preparing their homes from the risk of wildfire. Firewise is a key component of Fire Adapted Communities, a collaborative approach that connects all those who play a role in wildfire education, planning and action with comprehensive resources to help reduce risk. The program is co-sponsored by the USDA Forest Service, the US Department of the Interior, and the National Association of State Foresters.

***Building Code Effectiveness Grading***

The Building Code Effectiveness Grading Schedule assesses the building codes in effect and how the community enforces its building codes, with special emphasis on mitigation of losses from natural hazards.

***ISO Fire Rating***

ISO’s Fire Rating gauges the fire protection capability of the local fire department to respond to fires.

***Land Use Program***

A Land Use Program is designed with the goal of balancing environmental protection with economic development. This program, coupled with various other planning efforts, provides resources to local leaders to establish policies to guide the development of the community, including annexation, expansion, and building.

***Public Education/Awareness***

Education programs for the public that provide education and awareness about hazards, hazard planning and mitigation efforts.

***Stream Maintenance Program***

Programs designed to keep streams free from debris and blockages to prevent or minimize flooding.

***Engineering Studies for Streams (Local/County/Regional)***

Studies that detail information concerning flow data, potential trouble spots, and improvement recommendations for streams.

***Mutual Aid Agreements***

Mutual Aid Agreements are understanding among localities to lend assistance across jurisdictional boundaries. This may occur due to an emergency response that exceeds local resources, such as a disaster. Mutual aid may be requested only when such an emergency occurs. Or may be a formal standing agreement on a continuing basis.

The table below summarizes relevant local programs.

**Jurisdictional Programs**

| Jurisdiction | Zoning/Land Use Restrictions | Codes Building Site/Design | Hazard Awareness Program | National Flood Insurance Program | Community Rating System program under the National Flood Insurance Program | National Weather Service Storm Ready Certification | Firewise Community Certification | Building Code Effectiveness Grading | ISO Fire Rating | Economic Development Program | Land Use Program | Public Education/ Awareness | Property Acquisition | Planning/Zoning Boards | Stream Maintenance Program | Tree Trimming Program | Engineering Studies for Streams | Mutual Aid Agreements |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Allen County** | x | | x | x | | | | | 9 | | | x | x | x | | | | x |
| City of Elsmore | | | | | | | | | | | | | | | | | | |
| City of Gas | x | | | x | | | | | | x | | | | x | | | | |
| City of Humboldt | x | x | x | | | | x | | | | x | x | x | x | | | | x |
| City of Iola | | | | | | | | | | | | | | | | | | |
| City of LaHarpe | x | | | | | | | | | x | | | | | | | | |
| City of Moran | | | x | x | | | | | 8 | | | | | | | x | | x |
| City of Savonburg | | | | | | | | | | | | | | | | x | | |
| **Bourbon County** | | | | | | | | | | | | | | | | | | |
| City of Bronson | | | | x | | | | | 6 | | | | x | | | x | | x |
| City of Fort Scott | x | x | | x | | | | | 4 | x | x | x | x | x | | | x | x |
| City of Fulton | | | | | | | | | | | | | | | | | | |
| City of Mapleton | | | | | | | | | | | | | | | | | | |
| City of Redfield | | | | | | | | | | | | | | | | | | |
| City of Uniontown | | x | | | | | | | 6 | | | | | | | | | x |
| **Chautauqua County** | | | | x | | | | | | x | | | | | | | | **x** |
| City of Cedar Vale | | | | | | | | | | | | | | | | | | x |
| City of Peru | | | | | | | | | 3 | | | | | | | | | x |
| City of Sedan | | | x | x | | x | | | 7 | x | | x | | | | x | x | x |

| Jurisdiction | Zoning/Land Use Restrictions | Codes Building Site/Design | Hazard Awareness Program | National Flood Insurance Program | Community Rating System program under the National Flood Insurance Program | National Weather Service Storm Ready Certification | Firewise Community Certification | Building Code Effectiveness Grading | ISO Fire Rating | Economic Development Program | Land Use Program | Public Education/ Awareness | Property Acquisition | Planning/Zoning Boards | Stream Maintenance Program | Tree Trimming Program | Engineering Studies for Streams | Mutual Aid Agreements |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Cherokee County** | | | x | x | x | | | | 9 | x | | x | x | | | | | x |
| City of Baxter Springs | x | x | | x | x | | | x | 6 | x | | x | | x | | | | x |
| City of Columbus | x | | | x | | | | | 4 | x | | x | | | | | | x |
| City of Galena | x | x | | x | | | | | 4 | x | | x | | x | | | | x |
| City of Roseland | | | | | | | | | | | | | | | | | | x |
| City of Scammon | | | | | | | | | 7 | | | | | | | | | x |
| City of Treece | | | | | | | | | | | | | | | | | | |
| City of Weir | | | | | | | | | 7 | | | | | | | | | x |
| City of West Mineral | | | | | | x | | | 7 | | | | | | | | | x |
| **Crawford County** | x | | x | | | | | | | x | x | x | x | x | x | | x | x |
| City of Arcadia | | | | x | | | | | 7 | | | | | | | | | |
| City of Arma | | | | x | | | | | 5 | | | | x | x | | | | x |
| City of Cherokee | | | | x | | | | | | | | | | | | | | |
| City of Franklin | | | | | | | | | | | | | | | | | | x |
| City of Frontenac | x | x | | x | | | | | 5 | | x | | | x | | x | | x |
| City of Girard | x | x | | x | | | | | 6 | | | x | x | x | | | | x |
| City of Hepler | | | | x | | | | | 9 | | | | | | | | | |
| City of McCune | | | | x | | | | | 10 | | | | | | | | | |
| City of Mulberry | | x | | | | | | | 7 | | | x | | | | x | | x |
| City of Pittsburg | x | x | | x | | | | | 3 | x | x | x | x | x | | x | | x |
| Grant Township | | | | | | | | | | | | | | | | | | |
| Osage Township | | | | | | | | | | | | | | | | | | |

| Jurisdiction | Zoning/Land Use Restrictions | Codes Building Site/Design | Hazard Awareness Program | National Flood Insurance Program | Community Rating System program under the National Flood Insurance Program | National Weather Service Storm Ready Certification | Firewise Community Certification | Building Code Effectiveness Grading | ISO Fire Rating | Economic Development Program | Land Use Program | Public Education/ Awareness | Property Acquisition | Planning/Zoning Boards | Stream Maintenance Program | Tree Trimming Program | Engineering Studies for Streams | Mutual Aid Agreements |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sheridan Township | | | | | | | | | | | | | | | | | | |
| Sherman Township | | | | | | | | | | | | | | | | | | |
| **Elk County** | | | | x | | | | | 10 | x | | x | | | | | | x |
| City of Grenola | | | | x | | | | | 7 | | | | | | | | | x |
| City of Howard | | | | x | | | | | 7 | | | | | | | | | x |
| City of Longton | | | | | | | | | 7 | | | | | | | | | x |
| City of Moline | | | | x | x | | | | 9 | | | | | | | | | x |
| **Labette County** | x | x | | x | | | | | | | | x | | x | | | | x |
| City of Altamont | | | x | x | x | x | x | | 6 | x | | x | | | | x | | x |
| City of Chetopa | | | | x | | | | | 7 | | | | | | | x | | x |
| City of Edna | | | | x | | | | | 6 | | | | | | | | | x |
| City of Labette | | | | | | | | | 10 | | | | | | | | | |
| City of Mound Valley | | | | | | | | | 6 | | | | | | | | | x |
| City of Oswego | | | | | | | | | | | | | | x | | | | |
| City of Parsons | x | x | x | x | | x | | x | 4 | x | x | x | x | x | | x | x | x |
| **Montgomery County** | | | | x | | | | | | | | | | | | | | |
| City of Caney | | | | x | | | | | 5 | | | | | | | | | |
| City of Cherryvale | | | | x | | | | | 5 | | | | | | | | | |
| City of Coffeyville | x | x | | x | | | | | | | | | | | | | | |

| Jurisdiction | Zoning/Land Use Restrictions | Codes Building Site/Design | Hazard Awareness Program | National Flood Insurance Program | Community Rating System program under the National Flood Insurance Program | National Weather Service Storm Ready Certification | Firewise Community Certification | Building Code Effectiveness Grading | ISO Fire Rating | Economic Development Program | Land Use Program | Public Education/ Awareness | Property Acquisition | Planning/Zoning Boards | Stream Maintenance Program | Tree Trimming Program | Engineering Studies for Streams | Mutual Aid Agreements |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| City of Dearing | | | | x | | | | | 6 | x | | | | | | | | |
| City of Elk City | | | | x | | | | | | | | | | | | | | |
| City of Havana | | | | | | | | | | | | | | | | | | |
| City of Independence | | x | | x | | | | | 5 | | | | | | | | | |
| City of Liberty | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| **Neosho County** | | | | x | | | | | | x | | x | | | | | | |
| City of Chanute | x | x | | x | | | | | 4 | | | x | x | x | | x | | x |
| City of Erie | x | x | | x | | | | | 5 | x | | x | x | x | | x | | x |
| City of St. Paul | | | x | x | | x | x | | 8 | | | x | | x | | | | x |
| City of Stark | | | | | | | | | 9 | | | | | | | | | |
| City of Thayer | x | | | | | | | | | | | | | | | | | x |
| | | | | | | | | | | | | | | | | | | |
| **Wilson County** | x | | | x | | | | | 10 | x | | x | x | x | | | | x |
| City of Altoona | | | | x | x | | | | | | | | | | | x | | x |
| City of Benedict | | | | | | | | | | | | | | | | | | |
| City of Buffalo | | | | x | | | | | 7 | | | | | | | | | x |
| City of Fredonia | x | x | | | | | | | 6 | | | | | x | | x | | x |
| City of Neodesha | | | | x | | | | | 6 | | | | | | | | | |
| City of New Albany | x | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| **Woodson County** | | | | x | | | | | 8 | | | | | | | | | |
| City Of Toronto | | | | x | | | | | 8 | | | | | | | | | |
| City of Yates Center | | | | x | | x | x | | 5 | | | | | | | | | |

### 4.5.4 AVAILABLE STUDIES, REPORTS AND MAPS

Mitigation planning can be informed by existing information for a jurisdiction. This information of takes the form of studies, reports or maps. The following is a brief description of the types of usable studies, reports or maps that may be available to a jurisdiction.

***Hazard Analysis/Risk Assessment***

A hazard analysis is the identification of different type of hazards that may affect a jurisdiction. A risk assessment is the determination of quantitative or qualitative value of risk related to a situation and a recognized hazard.

***Evacuation Route Map***

A map detailing the evacuation routes for a jurisdiction, often incorporating road, services, and travel time information.

***Critical Facilities Inventory***

A list of all critical facilities within a jurisdictions, which may include fire stations, police stations, hospitals, schools, day care centers, senior care facilities, major roads and bridges, critical utility sites, and hazardous material storage areas.

***Vulnerable Population Inventory***

A vulnerable population inventory may include members of the jurisdictions population who are elderly, limited in functional capacity, homeless, or have limited financial means. Th ese populations may be poorly equipped with the resources and capabilities necessary to prepare for, and respond to, disasters without additional assistance.

***Land Use Map***

A jurisdictional map detailing current land uses.

The table below summarizes relevant local studies, reports and maps.

**Available Jurisdictional Studies, Reports and Maps**

| Jurisdiction | Hazard Analysis/Risk Assessment (City) | Hazard Analysis/Risk Assessment (County) | Evacuation Route Map | Critical Facilities Inventory | Vulnerable Population Inventory | Land Use Map |
|---|---|---|---|---|---|---|
| Allen County | | x | x | x | x | x |
| City of Elsmore | | | | | | |
| City of Gas | | | | | | |
| City of Humboldt | | | | | | x |
| City of Iola | | | | | | |
| City of LaHarpe | | | | | x | |
| City of Moran | x | x | | | | |
| City of Savonburg | | | | | | |
| **Bourbon County** | | x | | | | |
| Bronson | | | | x | | |
| Fort Scott | | | | x | | x |
| Fulton | | | | | | |
| Mapleton | | | | | | |
| Redfield | | | | | | |
| Uniontown | | | | | | |
| Chautauqua County | | | | | | |
| City of Cedar Vale | x | x | | | | |
| City of Peru | | | | | | |
| City of Sedan | x | | x | x | x | |
| **Cherokee County** | | x | | x | x | |
| City of Baxter Springs | x | | | x | | |
| City of Columbus | x | | | x | | |
| City of Galena | x | | | x | | |
| City of Roseland | | | | | | |
| City of Scammon | | | | | | |
| City of Treece | | | | | | |
| City of Weir | | | | | | |
| City of West Mineral | | | | | | |

| Jurisdiction | Hazard Analysis/Risk Assessment (City) | Hazard Analysis/Risk Assessment (County) | Evacuation Route Map | Critical Facilities Inventory | Vulnerable Population Inventory | Land Use Map |
|---|---|---|---|---|---|---|
| **Crawford County** | | x | x | x | x | x |
| City of Arcadia | | | | | | |
| City of Arma | | x | | x | | x |
| City of Cherokee | | | | | | |
| City of Franklin | | | | | | |
| City of Frontenac | x | x | x | x | | x |
| City of Girard | | | | | | |
| City of Hepler | | | | | | |
| City of McCune | | | | | | |
| City of Mulberry | x | | | | x | |
| City of Pittsburg | x | | | x | x | x |
| Grant Township | | | | | | |
| Osage Township | | | | | | |
| Sheridan Township | | | | | | |
| Sherman Township | | | | | | |
| **Elk County** | | x | x | x | x | x |
| City of Grenola | | x | | | | |
| City of Howard | | x | | | | |
| City of Longton | | | x | | | |
| City of Moline | | | | x | x | |
| **Labette County** | | x | x | x | x | x |
| City of Altamont | x | x | x | x | x | |
| City of Chetopa | | | | | | |
| City of Edna | | | | | | |
| City of Labette | | | | | | |
| City of Mound Valley | | | | | | |
| City of Oswego | | | | | | x |
| City of Parsons | | | x | x | x | x |

| Jurisdiction | Hazard Analysis/Risk Assessment (City) | Hazard Analysis/Risk Assessment (County) | Evacuation Route Map | Critical Facilities Inventory | Vulnerable Population Inventory | Land Use Map |
|---|---|---|---|---|---|---|
| **Montgomery County** | | | | | | |
| City of Caney | | | | | | |
| City of Cherryvale | | | | | | |
| City of Coffeyville | | | | | | |
| City of Dearing | | | | | | |
| City of Elk City | | | | | | |
| City of Havana | | | | | | |
| City of Independence | | | | | | |
| City of Liberty | | | | | | |
| **Neosho County** | | x | x | x | | |
| City of Chanute | | | | x | | |
| City of Erie | x | | | | | |
| City of St. Paul | | | | | | |
| City of Stark | | | | | | |
| City of Thayer | | | | | | |
| **Wilson County** | | x | | x | x | x |
| City of Altoona | | | | x | | x |
| City of Benedict | | | | | | |
| City of Buffalo | | | | | | x |
| City of Fredonia | | | | | | |
| City of Neodesha | | | | x | | x |
| City of New Albany | | | | | | |
| **Woodson County** | | | | | | |
| City Of Toronto | | | | | | |
| City of Yates Center | | | | | | |

### 4.5.5 STAFFING AND DEPARTMENTAL CAPABILITIES

A comprehensive mitigation program relies on many skilled professionals. These professionals include:

- Planners
- Engineers
- Inspectors
- Emergency managers
- floodplain managers
- GIS personnel

While exact responsibilities differ from jurisdiction to jurisdiction, the general duties of applicable departments are described below.

***Building Code Official***

Building officials are generally are the jurisdictional administrator of building and construction codes, engineering calculation supervision, permits, facilities management, and accepted construction procedures.

***Building Inspector***

A building inspector is an official who inspects structures to ensure compliance with the plans and to check workmanship as well as code compliance,

***GIS Mapping Specialist***

A geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data. A GIS mapping specialist uses this data to create county maps, including flood plain, fire hazard, drought and other mitigation maps.

***Engineer***

An engineer may be the responsible for the oversight, management and development of jurisdictions' road and infrastructure network

***Development Planner***

A development planner may be responsible for guiding a jurisdictions wroth and development through the application of codes, ordinances, building regulations and public input.

***Public Works Official***

Public works officials usually provide management and oversight of infrastructure projects such as public buildings (municipal buildings, schools, hospitals), transport infrastructure (roads, railroads, bridges, pipelines, airports), public spaces (public squares, parks), public services (water supply, sewage, electrical grid, dams), and other, physical assets and facilities.

***Emergency Management Coordinator***

The Emergency Management office is responsible for the mitigation, preparedness, response and recovery operations that deal with both natural and man-made disaster events. The formation of an emergency management department in each county is mandated under Kansas General Statutes.

***NFIP Floodplain Administrator***

The NFIP floodplain administrator ensures a jurisdictions is meeting the minimum requirements of participation in the NFIP, and often is tasked with applying for funding or grants.

***Bomb or Arson Squad***

A bomb or arson squad is used to respond to, and investigate the cause of, fire and bomb events.

***Emergency Response Team***

A emergency response team is used to respond to emergency events.

***Hazardous Materials Expert***

A hazardous material expert provides response and recovery information for hazardous material events.

***Local Emergency Planning Committee***

Local Emergency Planning Committees are generally housed at the county or municipal level. They do not function in actual emergency situations, but attempt to identify and catalogue potential hazards, identify available resources, mitigate hazards when feasible, and write emergency plans. The role of the LEPC is to anticipate and plan the initial response for foreseeable disasters in their jurisdiction.

***Sanitation Department***

Sanitation Departments are generally the agency responsible for garbage collection and recycling collection. Sanitation departments may also be tasked with street cleaning and snow removal.

***Transportation Department***

In general, transportation departments are responsible for road and bridge maintenance and transportation planning. Transportation departments may also be tasked with snow removal..

***Economic Development Department***

The economic development department is generally responsible for g uiding a jurisdictions economic policies, fostering business development, and nurturing existing business'.

***Housing Department***

Duties of a housing department may include enforcing fair housing laws, assisting low income citizens with finding housing, and managing jurisdictional housing properties.

***Historic Preservation***

A historic preservation department or society may provide expertise on environmental impacts to cultural resources, administer historic preservation grants, encourage h istoric preservation through local governments, and provide technical assistance for historic rehabilitation.

The table below summarizes relevant local staffing and departmental capabilities.

**Staffing and Departmental Capabilities**

| Jurisdiction | Building Code Official | Building Inspector | Mapping Specialist (GIS) | Engineer | Development Planner | Public Works Official | Emergency Management Coordinator | NFIP Floodplain Administrator | Bomb and/or Arson Squad | Emergency Response Team | Hazardous Materials Expert | Local Emergency Planning Committee | County Emergency Management Commission | Sanitation Department | Transportation Department | Economic Development Department | Housing Department | Historic Preservation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Allen County** | | | x | | | x | x | x | | x | x | x | | | x | | | x |
| City of Elsmore | | | | | | | | | | | | | | | | | | |
| City of Gas | x | x | | | | x | | | | | | | | x | | | | |
| City of Humboldt | x | x | | | | x | | x | | | | x | | x | | | | |
| City of Iola | | | | | | | | | | | | | | | | | | |
| City of LaHarpe | x | x | | | | x | | | | | | x | | | | | | |
| City of Moran | x | x | | | | x | x | | | x | x | | x | x | x | | | |
| City of Savonburg | | | | | | | | | | | | | | | | | | |
| **Bourbon County** | | | | | | x | x | x | | | | | | | | | | |
| City of Bronson | | | | | | x | | x | | | | | | | | | | |
| City of Fort Scott | x | x | x | x | x | x | x | | | x | | x | x | | | x | x | x |
| City of Fulton | | | | | | | | | | | | | | | | | | |
| City of Mapleton | | | | | | | | | | | | | | | | | | |
| City of Redfield | | | | | | | | | | | | | | | | | | |
| City of Uniontown | | | | | | x | | | | | | | | | | | | |
| **Chautauqua County** | | | x | | | | x | | | x | | x | | x | x | | x | x |
| City of Cedar Vale | x | | | | | x | x | | | | | | | | | | | |
| City of Peru | | | | | | x | x | | | x | | | | | | | | |
| City of Sedan | | | | | | x | x | | | x | | x | x | | | x | | x |

| Jurisdiction | Building Code Official | Building Inspector | Mapping Specialist (GIS) | Engineer | Development Planner | Public Works Official | Emergency Management Coordinator | NFIP Floodplain Administrator | Bomb and/or Arson Squad | Emergency Response Team | Hazardous Materials Expert | Local Emergency Planning Committee | County Emergency Management Commission | Sanitation Department | Transportation Department | Economic Development Department | Housing Department | Historic Preservation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Cherokee County** | | | x | x | | x | x | x | | x | x | x | x | x | x | x | x | |
| City of Baxter Springs | x | x | | x | | x | | x | | | x | | | x | x | | x | |
| City of Columbus | X | X | | X | | X | | x | | | | | | x | | x | | |
| City of Galena | x | x | | x | | x | | x | | | | x | | x | | x | | |
| City of Roseland | | | | | | | | | | | | | | | | | | |
| City of Scammon | | | | | | x | | x | | | | | | | | | | |
| City of Treece | | | | | | | | | | | | | | | | | | |
| City of Weir | | | | | | x | x | x | | | | | | | | | | |
| City of West Mineral | | | | | | x | | | | x | | | x | x | | | | |
| **Crawford County** | | | x | | x | | x | x | | x | | x | | x | | | | x |
| City of Arcadia | | | | | | | | | | | | | | | | | | |
| City of Arma | x | x | | x | | x | x | | | | | | x | | | | | |
| City of Cherokee | | | | | | | | | | | | | | | | | | |
| City of Franklin | | x | | | | | | | | | | | | | | | | |
| City of Frontenac | x | x | x | x | | x | x | x | | x | x | | x | | | | | |
| City of Girard | x | x | | x | | x | x | | | x | | x | | | | | | |
| City of Hepler | | | | | | | | | | | | | | | | | | |
| City of McCune | | | | | | | | | | | | | | | | | | |
| City of Mulberry | | x | | | | x | | | | x | | | | x | | | | |
| City of Pittsburg | x | x | x | x | x | x | x | x | | x | x | x | x | | x | x | x | x |
| Grant Township | | | | | | | | | | | | | | | | | | |
| Osage Township | | | | | | | | | | | | | | | | | | |

| Jurisdiction | Building Code Official | Building Inspector | Mapping Specialist (GIS) | Engineer | Development Planner | Public Works Official | Emergency Management Coordinator | NFIP Floodplain Administrator | Bomb and/or Arson Squad | Emergency Response Team | Hazardous Materials Expert | Local Emergency Planning Committee | County Emergency Management Commission | Sanitation Department | Transportation Department | Economic Development Department | Housing Department | Historic Preservation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sherman Township | | | | | | | | | | | | | | | | | | |
| **Elk County** | | | x | x | | x | x | x | | | | x | | x | | x | | |
| City of Grenola | | | | | | x | | x | | | | | | | | | | |
| City of Howard | | | | | | x | | x | | | | x | | x | | | | |
| City of Longton | x | | | | | x | | | | | | | | | | | x | x |
| City of Moline | | x | | x | | x | x | x | | x | x | | | | | | | x |
| **Labette County** | x | x | x | | | x | x | x | | x | x | x | | x | | | | |
| City of Altamont | | | | | | x | x | x | x | x | x | x | x | x | | | | |
| City of Chetopa | | x | x | x | | | | x | | x | | | | x | | | x | |
| City of Edna | | | | | | x | | | | x | | | | x | | | | |
| City of Labette | | | | | | | | | | | | | | | | | | |
| City of Mound Valley | | | | | | x | | x | | | | | | | | | | |
| City of Oswego | x | | | | | x | | x | | | | | | x | | x | x | |
| City of Parsons | x | x | x | | x | x | x | x | x | x | x | x | | x | | x | x | x |
| Montgomery County | | | x | x | x | | x | x | | | | | | | | | | |
| City of Caney | | | | | | | | x | | | | | | | | | | |
| City of Cherryvale | | | | | | x | | x | | | | | | | | | | |
| City of Coffeyville | x | | | x | x | x | | x | | | | | | | | | | |
| City of Dearing | | | | | | | | | | x | x | | | | | | | |
| City of Elk City | | | | | | x | | | | | | | | | | | | |
| City of Havana | | | | | | | | | | | | | | | | | | |
| City of Independence | x | | | x | | | x | x | | | | | | | | | | |

| Jurisdiction | Building Code Official | Building Inspector | Mapping Specialist (GIS) | Engineer | Development Planner | Public Works Official | Emergency Management Coordinator | NFIP Floodplain Administrator | Bomb and/or Arson Squad | Emergency Response Team | Hazardous Materials Expert | Local Emergency Planning Committee | County Emergency Management Commission | Sanitation Department | Transportation Department | Economic Development Department | Housing Department | Historic Preservation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| City of Liberty | | | | | | x | | | | | | | | | | | | |
| **Neosho County** | | | x | x | | x | x | x | | x | x | x | | | | | | |
| City of Chanute | x | x | x | | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| City of Erie | x | x | | | | x | | x | | | | x | | | | | | |
| City of St. Paul | | | | | | x | x | x | | x | | x | x | x | | x | | x |
| City of Stark | | | | | | | | | | | | | | | | | | |
| City of Thayer | | | | | | x | | | | | | | | | | | | |
| **Wilson County** | x | | x | x | | x | x | x | | | | x | | x | x | x | | |
| City of Altoona | x | | | | | x | | x | | | | x | | x | x | | | |
| City of Benedict | | | | | | | | | | | | | | | | | | |
| City of Buffalo | | x | | | | x | | | | | | | | x | | | | |
| City of Fredonia | x | | | | | x | | x | | | | x | | x | | | | |
| City of Neodesha | | | x | | | x | x | x | | | | | | | | | | |
| City of New Albany | | | | | | | | | | | | | | | | | | |
| **Woodson County** | | | x | | | x | x | x | | | | | | | | | x | |
| City Of Toronto | | | | | | | | | | | | | | | | | | |
| City of Yates Center | | | | | | | | | | | | | | | | | | |

### 4.5.6 NON-GOVERNMENTAL ORGANIZATIONS

NGOs are legally constituted corporations that operate independently from any form of government and are not conventional for-profit businesses. In the cases in which NGOs are funded totally or partially by a government agency, the NGO maintains its non-governmental status by excluding government representatives from membership in the organization.

There are many types of NGOs, including:

- **Charitable**: Generally directed toward meeting the needs of the poor or those impacted by disasters
- **Service**: Generally directed toward providing health, family planning or education services
- **Participatory**: Generally directed toward in self-help and/or community development projects

NGOs can further be divided into community, local or national organizations. The following is a brief discussion of NGOs operating within southeast Kansas.

***American Red Cross***

The American Red Cross is a humanitarian organization that provides emergency assistance, disaster relief and education. In addition to domestic disaster relief, the American Red Cross offers services in five other areas: community services that help the needy; communications services and comfort for military members and their family members; the collection, processing and distribution of blood and blood products; educational programs on preparedness, health, and safety; and international relief and development programs.

***Salvation Army***

The Salvation Army is a Christian denomination and international charitable organization with a worldwide membership of over 1.5 million. In addition to being among the first to arrive with help after natural or man-made disasters, the Salvation Army runs charity shops and operates shelters for the homeless

***Veterans Groups***

Generally veteran groups are local chapters of national groups that provide aid to active and retired soldiers and provide charitable support to target communities.

***Local Environmental Organizations***

An environmental organization may seek to protect, analyze or monitor the environment against misuse or degradation.

### *Homeowners Associations*

Homeowner associations are residents of a community who form a board to monitor, control and oversee many aspects of a building, area or development. An association may have elected leaders and often has mandatory dues

### *Neighborhood Associations*

Neighborhood associations are groups of residents or property owners who advocate for or organize activities within a neighborhood. An association may have elected leaders and voluntary dues.

### *Chamber of Commerce*

A chamber of commerce is generally a group of a local businesses whose goal is to further the interests of businesses. Business owners in towns and cities form these local societies to advocate on behalf of the business community. Local businesses are members, and they elect a board of directors or executive council to set policy for the chamber. The board or council then hires a President, CEO or Executive Director, plus staffing appropriate to size, to run the organization.

### *Community Organizations*

Generally community organizations are local chapters of national groups, such as the Elks, Shriners, or Kiwanis, that provide charitable support to citizens in need.

The table below summarizes the presence of relevant local NGOs.

**Jurisdictional NGOs**

| Jurisdiction | American Red Cross | Salvation Army | Veterans Groups | Local Environmental Organization | Homeowner Associations | Neighborhood Associations | Chamber of Commerce | Community Organizations (Lions, Kiwanis) |
|---|---|---|---|---|---|---|---|---|
| **Allen County** | x | | x | x | | | x | x |
| City of Elsmore | | | | | | | | x |
| City of Gas | | | | | | | | |
| City of Humboldt | | | | | | | x | x |
| City of Iola | | | | | | | | |
| City of LaHarpe | | | x | | | | | x |
| City of Moran | | x | x | | | | | x |
| City of Savonburg | | | | | | | | |
| **Bourbon County** | | | | | | | | |
| City of Bronson | | | | | | | | |
| City of Fort Scott | x | | x | x | x | x | x | x |
| City of Fulton | | | | | | | | |
| City of Mapleton | | | | | | | | |
| City of Redfield | | | | | | | | |
| City of Uniontown | | | | | | | | x |
| **Chautauqua County** | | | x | | | | x | x |
| City of Cedar Vale | | | | | | | x | x |
| City of Peru | | | | | | | | |
| City of Sedan | | | | | | | x | x |
| **Cherokee County** | | | x | x | x | | | x |
| City of Baxter Springs | | | x | | x | x | x | x |
| City of Columbus | | | x | | | | x | x |
| City of Galena | | | x | x | x | | x | x |
| City of Roseland | | | | | | | | |
| City of Scammon | | | | | | | | |
| City of Treece | | | | | | | | |
| City of Weir | | | x | | | | | |
| City of West Mineral | | | | | | | | |
| **Crawford County** | x | x | x | x | x | x | | |
| City of Arcadia | | | | | | | | |
| City of Arma | | | | | | | | |
| City of Cherokee | | | | | | | | |

| Jurisdiction | American Red Cross | Salvation Army | Veterans Groups | Local Enviromental Organization | Homeowner Associations | Neighborhood Associations | Chamber of Commerce | Community Organizations (Lions, Kiwanis) |
|---|---|---|---|---|---|---|---|---|
| City of Franklin | | | | | | | | |
| City of Frontenac | x | x | x | | x | | x | x |
| City of Girard | | | x | | | | x | x |
| City of Hepler | | | | | | | | |
| City of McCune | | | | | | | | |
| City of Mulberry | x | x | | | | | | |
| City of Pittsburg | x | x | x | | x | x | x | x |
| Grant Township | | | | | | | | |
| Osage Township | | | | | | | | |
| Sheridan Township | | | | | | | | |
| Sherman Township | | | | | | | | |
| **Elk County** | | | x | | | | x | x |
| City of Grenola | | | | | | | | |
| City of Howard | | | x | | | | x | x |
| City of Longton | | | | | | | | x |
| City of Moline | | | | | | | x | |
| **Labette County** | x | | x | | | | x | x |
| City of Altamont | x | x | x | | | | x | x |
| City of Chetopa | x | | x | | | x | x | x |
| City of Edna | | | | | | | | x |
| City of Labette | | | | | | | | |
| City of Mound Valley | | | | | | | | |
| City of Oswego | x | | x | | | | x | x |
| City of Parsons | x | | x | x | | | x | x |
| **Montgomery County** | | | | | | | | |
| City of Caney | | | | | | | | |
| City of Cherryvale | | | | | | | | |
| City of Coffeyville | | | | | | | | |
| City of Dearing | | | | | | | | |
| City of Elk City | | | | | | | | |
| City of Havana | | | | | | | | |
| City of Independence | | | | | | | | |
| City of Liberty | | | | | | | | |

| Jurisdiction | American Red Cross | Salvation Army | Veterans Groups | Local Enviromental Organization | Homeowner Associations | Neighborhood Associations | Chamber of Commerce | Community Organizations (Lions, Kiwanis) |
|---|---|---|---|---|---|---|---|---|
| **Neosho County** | x | x | x | | | | x | x |
| City of Chanute | x | | x | | | | x | x |
| City of Erie | x | | x | | | | x | x |
| City of St. Paul | | | | | | | | x |
| City of Stark | | | | | | | | |
| City of Thayer | | | | | | | | |
| **Wilson County** | | | | | | | x | x |
| City of Altoona | | | | | | | | |
| City of Benedict | | | | | | | | |
| City of Buffalo | | | | | | | | |
| City of Fredonia | | | x | | | | x | x |
| City of Neodesha | | | | | | | | |
| City of New Albany | | | | | | | | |
| **Woodson County** | | | | | | | | |
| City Of Toronto | | | | | | | | |
| City of Yates Center | | | | | | | | |

### 4.5.7 FISCAL CAPABILITIES

In general, the jurisdictions of southeast Kansas receive the majority of their revenue through state and local sales tax and federal and state pass through dollars. Based on available revenue information, and given that both the state and counties are experiencing budget deficits, funding for mitigation programs and disaster response is at a premium. Adding to the budget crunch is the increased reliance on local accountability by the federal government.

The following provide brief definitions of applicable fiscal programs.

***Community Development Block Grant***

The Community Development Block Grant (CDBG) is a U.S. Department of Housing and Urban Development program that funds local community development activities such as affordable housing, anti-poverty programs, and infrastructure development. CDBG, like other block grant programs, differ from categorical grants, made for specific purposes, in that they are subject to less federal oversight and are largely used at the discretion of the state and local governments and their sub-grantees.

***Capital Improvement Funding***

A Capital Improvement Plan is generally a short-range plan, usually four to ten years, which identifies capital projects and equipment purchases, provides a planning schedule and identifies options for financing the plan. Essentially, the plan provides a link between a municipality, school district, parks and recreation department and/or other local government entity and a comprehensive and strategic plans and the entity's annual budget. Funding may be drawn from this plan, if funding has been set aside as part of the planning process, if the action works with the overall planning objectives and goals.

***Authority to Levy Taxes***

The authority to levy taxes would allow the jurisdiction to tax it's population base.

***Impact Fees for New Developments***

Impact fees for new developments allow a jurisdiction to charge fees to developers to mitigate against any impact that development may have.

***Incur Debt through General Obligation Bonds***

General obligation bonds are issued with the belief that a municipality will be able to repay its debt obligation through taxation or revenue from projects. No assets are used as collateral.

***Incur Debt through Special Tax Bonds***

A government bond where repayment is guaranteed by a tax that the issuer levies specifically for that purpose.

***Incur Debt through General Private Activities***

In general, these tend to be tax-exempt bonds issued by or on behalf of local or state government for the purpose of providing special financing benefits for qualified projects. The financing is most often for projects of a private user, and the government generally does not pledge its credit.

***Withhold Spending in Hazard Prone Areas***

The ability of a jurisdiction to not provide funding for activities or actions in an area that is known to be prone to specific hazards.;

The following table highlights each jurisdiction's fiscal capabilities.

**Jurisdictional Fiscal Capabilities**

| Jurisdiction | Apply for Community Development Block Grants | Fund projects thru Capital Improvements funding | Authority to levy taxes for specific purposes | Fees for water, sewer, gas, or electric services | Impact fees for new development | Incur debt through general obligation bonds | Incur debt through special tax bonds | Incur debt through private activities | Withhold spending in hazard prone areas |
|---|---|---|---|---|---|---|---|---|---|
| **Allen County** | x | x | x | | x | x | x | x | x |
| City of Elsmore | | | | | | | | | |
| City of Gas | x | x | x | x | | x | | | |
| City of Humboldt | x | x | x | x | | x | x | x | |
| City of Iola | | | | | | | | | |
| City of LaHarpe | x | x | x | x | | x | | | |
| City of Moran | x | x | x | x | | x | x | x | |
| City of Savonburg | | | | x | | | | | |
| **Bourbon County** | x | | x | | | | | | |
| City of Bronson | x | x | x | x | x | x | x | | |
| City of Fort Scott | x | x | x | x | x | x | x | x | x |
| City of Fulton | | | | | | | | | |
| City of Mapleton | | | | | | | | | |
| City of Redfield | | | | | | | | | |
| City of Uniontown | x | x | x | x | | x | x | | |
| **Chautauqua County** | x | | x | x | | x | x | | |
| City of Cedar Vale | x | | x | x | | x | | | |
| City of Peru | | | x | x | | | | | |
| City of Sedan | x | x | x | x | | | | | x |
| **Cherokee County** | x | x | x | | x | x | x | x | |
| City of Baxter Springs | x | x | x | x | | x | x | | |
| City of Columbus | x | x | x | x | | x | x | | |
| City of Galena | x | x | x | x | | x | x | | |
| City of Roseland | x | x | x | x | | x | x | | |
| City of Scammon | x | x | x | x | | x | x | | |
| City of Treece | | | | | | | | | |
| City of Weir | x | x | x | x | | x | x | | x |
| City of West Mineral | x | | x | x | | | | | |
| **Crawford County** | x | x | x | x | x | x | x | | |
| City of Arcadia | x | x | | x | | x | | | x |

| Jurisdiction | Apply for Community Development Block Grants | Fund projects thru Capital Improvements funding | Authority to levy taxes for specific purposes | Fees for water, sewer, gas, or electric services | Impact fees for new development | Incur debt through general obligation bonds | Incur debt through special tax bonds | Incur debt through private activities | Withhold spending in hazard prone areas |
|---|---|---|---|---|---|---|---|---|---|
| City of Arma | x | x | x | x | x | x | x | x | |
| City of Cherokee | x | | | x | x | x | x | | |
| City of Franklin | | | x | x | | | | | |
| City of Frontenac | x | x | x | x | x | x | x | x | |
| City of Girard | x | x | x | x | | x | x | | |
| City of Hepler | x | x | x | x | | x | | | |
| City of McCune | | | | | | | | | |
| City of Mulberry | x | x | x | x | | x | x | | |
| City of Pittsburg | x | x | x | x | | x | x | | |
| Grant Township | | | | | | | | | |
| Osage Township | | | | | | | | | |
| Sheridan Township | | | | | | | | | |
| Sherman Township | | | | | | | | | |
| **Elk County** | x | x | x | | | x | x | | |
| City of Grenola | x | | x | x | | x | x | x | |
| City of Howard | x | x | x | x | | x | x | x | |
| City of Longton | x | x | x | x | x | x | x | | x |
| City of Moline | x | x | x | x | | x | x | | |
| **Labette County** | x | | x | x | | x | x | | |
| City of Altamont | x | x | x | x | x | x | x | | |
| City of Chetopa | x | x | x | x | | x | x | | |
| City of Edna | x | | x | x | | x | x | x | |
| City of Labette | x | | x | x | | x | x | x | |
| City of Mound Valley | x | x | x | x | | x | x | x | |
| City of Oswego | x | x | x | x | | x | x | x | |
| City of Parsons | x | x | x | x | | x | x | x | x |
| **Montgomery County** | x | | x | x | | x | x | x | x |
| City of Caney | x | x | x | x | | x | x | | |
| City of Cherryvale | x | x | x | x | | x | x | x | x |
| City of Coffeyville | x | x | x | x | | x | x | x | |
| City of Dearing | | x | x | x | x | x | x | | |

| Jurisdiction | Apply for Community Development Block Grants | Fund projects thru Capital Improvements funding | Authority to levy taxes for specific purposes | Fees for water, sewer, gas, or electric services | Impact fees for new development | Incur debt through general obligation bonds | Incur debt through special tax bonds | Incur debt through private activities | Withhold spending in hazard prone areas |
|---|---|---|---|---|---|---|---|---|---|
| City of Elk City | x | x | x | | | | | | |
| City of Havana | | | | | | | | | |
| City of Independence | x | | x | x | | x | x | | |
| City of Liberty | | | | | | | | | |
| **Neosho County** | x | x | x | | | x | x | | |
| City of Chanute | x | x | x | x | x | x | x | x | x |
| City of Erie | x | x | x | x | | x | x | x | |
| City of St. Paul | x | x | x | x | | x | | | |
| City of Stark | x | x | x | x | x | x | x | x | |
| City of Thayer | x | | x | x | | x | x | | |
| **Wilson County** | x | x | x | | x | x | x | | |
| City of Altoona | x | x | x | x | | x | x | | x |
| City of Benedict | | | | | | | | | |
| City of Buffalo | x | x | x | x | | x | x | | x |
| City of Fredonia | x | x | x | x | | x | x | x | x |
| City of Neodesha | x | x | x | x | x | x | x | | x |
| City of New Albany | | | | | | | | | |
| Woodson County | x | x | x | | | x | x | x | |
| City Of Toronto | | | x | x | | x | | | |
| City of Yates Center | x | | x | x | | x | x | | |

### 4.5.8 SCHOOL, COLLEGE OR UNIVERSITY CAPABILITY ASSESSMENT

Participating schools, colleges and universities were provided with a different set of questions that participating governmental jurisdictions. These questions were asked to ascertain the level of preparedness of the institution.

The following provides brief definitions of terms used in the capability assessment of schools, colleges and universities.

***Grant Writer***

A grant writer writes applications for grant funding from an institution such as a government department, corporation, foundation or trust.

***Public Information Officer***

Public Information Officers (PIOs) are the communications coordinators or spokespersons. The primary responsibility of a PIO is to provide information to the media and public as required by law and according to the standards of their profession.

***General Obligation Bond***

A general obligation bond is a common type of municipal bond that is secured by a state or local government's pledge to use legally available resources, including tax revenues, to repay bond holders.

***Special Tax Bond***

A type of bond that is repaid by revenues derived from taxation of a particular activity or asset. These bonds are repaid with either excise taxes or special assessment taxes.

Information as to the current capacity of participating schools, colleges and universities is summarized in the following table.

**School, College or University Capability Assessment**

| School , College or University | Master Plan | Capital Improvement Plan | School Emergency Plan, Shelter in Place Protocols, Evacuation Protocols | Weapons Policy | Full-time building official (i.e. Principal) | Emergency Manager | Grant Writer | Public Information Officer | Capital improvements project funding | Local funds | General obligation bonds | Special tax bonds | Private activities/donations | State and federal funds |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Allen County** | | | | | | | | | | | | | | |
| Allen County Community College | x | x | x | x | x | x | | x | | x | x | | x | x |
| USD 256 - Marmaton Valley | | | x | | x | | | | | | | | | |
| USD 257 - Iola Public Schools | | | x | | x | | | | | | | | | |
| USD 258 - Humboldt | | | x | | x | | | | | | | | | |
| **Bourbon County** | | | | | | | | | | | | | | |
| Fort Scott Community College | | | | | | | | | | | | | | |
| USD 234 - Fort Scott | x | x | x | x | x | | | x | x | x | x | | x | |
| USD 235 - Uniontown | | | x | x | x | | | x | | | | | | |
| **Chautauqua County** | | | | | | | | | | | | | | |
| USD 285 – Cedar Vale | x | | x | x | x | | | | | | | | | |
| USD 286 – Chautauqua County | x | x | x | x | x | | x | x | x | x | | | | |
| **Cherokee County** | | | | | | | | | | | | | | |
| USD 404 - Riverton | x | | x | x | | x | x | x | | | | | | |
| USD 493 - Columbus | x | | x | x | | x | x | x | | | | | | |
| USD 499 - Galena | x | | x | x | | x | x | x | | | | | | |
| USD 508 - Baxter Springs | x | | x | x | | x | x | x | | | | | | |
| **Crawford County** | | | | | | | | | | | | | | |
| Fort Scott Community College | x | x | x | x | x | x | | x | | x | | | | x |
| Pittsburg State University | x | x | x | x | | x | x | x | | x | | | x | x |
| USD 246 - Arma | | | x | x | x | | | | | x | x | | | x |
| USD 247 - Cherokee | | | x | x | x | | | | | x | | | | x |
| USD 248 - Girard | x | x | x | x | x | | | | x | | | | | |
| USD 249 - Frontenac | x | x | x | x | x | x | | x | | x | | | | x |
| USD 250 Pittsburg | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| USD 609 - SE Kansas Education Services Center | x | x | x | x | x | x | x | x | x | x | | | x | x |

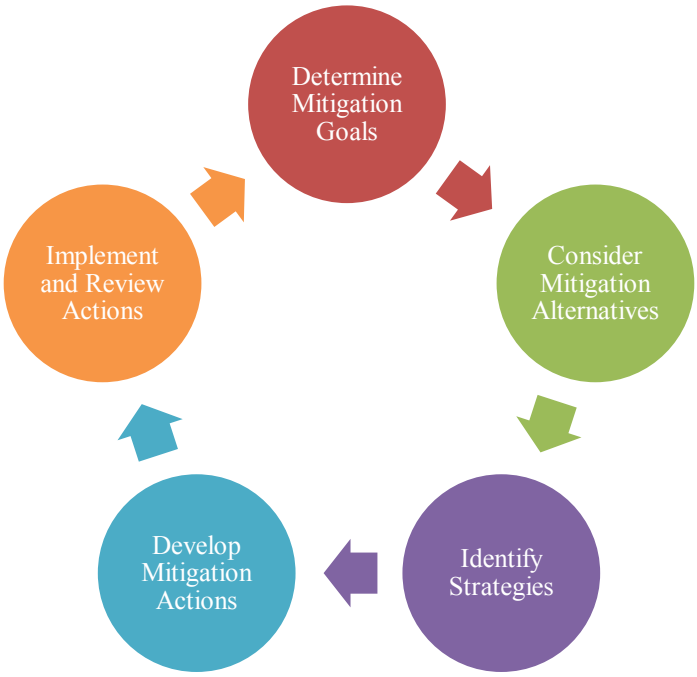
| School , College or University | Master Plan | Capital Improvement Plan | School Emergency Plan, Shelter in Place Protocols, Evacuation Protocols | Weapons Policy | Full-time building official (i.e. Principal) | Emergency Manager | Grant Writer | Public Information Officer | Capital improvements project funding | Local funds | General obligation bonds | Special tax bonds | Private activities/donations | State and federal funds |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Elk County** | | | | | | | | | | | | | | |
| USD 282 - West Elk | | | x | x | x | x | x | x | x | x | | | | |
| USD 283 - Elk Valley | | | x | x | x | | x | | x | | | | | |
| **Labette County** | | | | | | | | | | | | | | |
| Labette County Community College | x | | x | x | x | x | | x | | x | | | x | x |
| USD 503 - Parsons | x | x | x | x | x | x | | x | x | x | | | x | x |
| USD 504 - Oswego | x | x | x | x | x | | | x | x | x | | | x | x |
| USD 505 - Chetopa-St. Paul | x | x | x | x | x | x | | | x | | x | | x | x |
| USD 506 - Labette County | x | x | x | x | x | x | | x | x | x | | | x | x |
| **Montgomery County** | | | | | | | | | | | | | | |
| Coffeyville Community College | x | | | | x | x | x | | | | | | | |
| Independence Bible School | x | | x | x | x | | | | x | x | | | x | |
| Independence Community College | x | x | | | | | | | x | | x | | | |
| USD 436 - Caney | | | | | x | | | | | | x | | | |
| USD 445 - Coffeyville | | x | | | x | | | | | | x | | | |
| USD 446 - Independence | | | | | x | | | | | | x | | | |
| USD 447 - Cherryvale | x | x | x | | x | | | | | | x | | | |
| **Neosho County** | | | | | | | | | | | | | | |
| Neosho County Community College | x | x | x | x | x | x | x | x | x | x | x | | x | x |
| USD 101 - Erie | x | | x | x | x | x | | x | x | x | | | | x |
| USD 413 - Chanute | x | x | x | x | x | | | x | x | x | x | | x | x |
| USD 447 - Cherryvale | | | | | x | | | | | | | | | |
| USD 505 - Chetopa-St. Paul | x | x | x | x | x | x | | | x | | x | | x | x |
| **Wilson County** | | | | | | | | | | | | | | |
| USD 387 - Altoona-Midway | | | x | x | x | | | | x | x | | | | |
| USD 461 - Neodesha | | | | | x | | | | | | | | | |
| USD 484 - Fredonia | x | x | x | x | x | | | | x | x | x | | x | x |
| **Woodson County** | | | | | | | | | | | | | | |
| USD 366 - Woodson County | x | | x | x | x | x | | x | x | x | x | x | x | x |

# 5.0 MITIGATION ACTIONS

## 5.1 INTRODUCTION

*44 CFR 201.6 (c)(3) requires "A mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tool."*

This section of the Plan describes development of a Mitigation Strategy for each participating jurisdiction, and the region as a whole. In general, developing a comprehensive strategy consists of:




To ensure that a comprehensive mitigation strategy was developed, a thorough review of potential regional and local hazards and current policies, procedures and regulations was conducted to help participating jurisdictions identify and achieve their goals. Additionally, this review assists participating jurisdictions in linking relevant policies, procedures, regulations, ordinances and planning documents to help establish priorities and meet desired implementation deadlines.

For the 2013 regional combination and update, historical goals, objectives, and strategies were re-examined, and where applicable combined, and new goals and strategies were identified and included.

## 5.2 IDENTIFICATION OF GOALS

*44 CFR 201.6 (c)(3)(i) A description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.*

The HMPC developed goals and objectives to provide direction for reducing hazard-related losses both locally and regionally. The following definitions of goals and objectives were provided by FEMA in publication 386-3, *Developing a Mitigation Plan* (2002):

- **Goal:** General guidelines that explain what you want to achieve. Goals are defined before considering how to accomplish them so that they are not dependent on the means of achievement. They are usually long-term, broad, policy-type statements.

Identified goals and objectives were based on known hazards and a review of goals and objectives from previously approved county mitigation plans and the 2010 Kansas Hazard Mitigation Plan. This review was conducted to ensure that this region's goals were both obtainable and practical.

Through a group discussion at their second meeting, the HMPC identified and refined four primary, cross-jurisdictional goals. Each of these goals was then further explored by the HMPC to determine reasonable objectives to achieve each identified goal. The identified goals and objectives are as follows:

- **Goal 1:** Reduce and/or eliminate the risk to the people and property of southeast Kansas from the identified hazards in this plan.
- **Goal 2:** Strive to protect all of the vulnerable populations, structures, and critical facilities in southeast Kansas from the impacts of the identified hazards.
- **Goal 3:** Improve public outreach initiatives to include education, awareness and partnerships with all willing entities in order to enhance understanding of the risks southeast Kansas faces due to the impacts of the identified hazards.
- **Goal 4:** Enhance communication and coordination among all agencies and between agencies and the public.

## 5.3 IDENTIFICATION AND ANALYSIS OF MITIGATION ACTIONS

*44 CFR 201.6 (c)(3)(ii) A section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. All plans approved by FEMA after October 1, 2008, must also address the jurisdiction's participation in the NFIP, and continued compliance with NFIP requirements, as appropriate.*

For this plan update and regional combination participating jurisdictions were provided with a complete list of their previous mitigation actions and asked to review them to determine if they had been achieved, are in process or on hold, or had been cancelled. Additionally, participating

jurisdictions were provided with forms to identify and incorporate newly identified actions. Participating jurisdictions priorities were developed based on past damages, existing exposure to risk, other community goals, and weaknesses identified by the local government capability assessments.

In preparing the region's mitigation strategy all reasonable and obtainable mitigation actions were considered to help achieve the general regional goals. A dditionally, each participating jurisdiction was invited to identify relevant actions.

In identifying and reviewing mitigation actions, the following activities recommended by the EMAP were considered:

- The use of applicable building construction standards
- Hazard avoidance through appropriate land-use practices
- Relocation, retrofitting, or removal of structures at risk
- Removal or elimination of the hazard
- Reduction or limitation of the amount or size of the hazard
- Segregation of the hazard from that which is to be protected
- Modification of the basic characteristics of the hazard
- Control of the rate of release of the hazard
- Provision of protective systems or equipment for both cyber or physical risks
- Establishment of hazard warning and communication procedures
- Redundancy or duplication of essential personnel, critical systems, equipment, and information materials.

In addition, participating jurisdictions were provided with information on types of mitigation actions. A handout was provided at the first meeting, and upon request, with types of mitigation actions which originated from the NFIP's Community Rating System. The follow provides a brief explanation of each action.

**Prevention:** Administrative or regulatory actions or processes that influence the way land and buildings are developed and built, including:

- Planning and zoning
- Building codes
- Open space preservation
- Floodplain regulations
- Stormwater management regulations
- Drainage system maintenance
- Capital improvements programming
- Shoreline and riverine setbacks

**Property protection:** Actions that involve the modification of existing buildings or structures to protect them from a hazard or remove them from the hazard area, including:

- Acquisition
- Relocation
- Building elevation
- Critical facilities protection
- Retrofitting
- Safe room and shatter-resistant glass
- Insurance

**Structural:** Actions that involve the construction of structures to reduce the impact of hazard, including:

- Reservoirs
- Dams and levees
- Diversion, detention and/or retention
- Channel modification
- Storm sewers

**Natural resource protection:** Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems, including

- Floodplain protection
- Watershed management
- Riparian buffers
- Forest/vegetation management
- Erosion and sediment control
- Wetland preservation and restoration
- Habitat preservation
- Slope stabilization

**Emergency services**: Although not typically considered a "mitigation" technique, theses are actions that protect people and property during and immediately after a disaster or hazard event, including:

- Warning systems
- Evacuation planning and management
- Emergency response training and exercises
- Sandbagging for flood protection
- Installing temporary shutters for wind protection

**Public education and awareness:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them, including:

- Outreach projects
- Speaker and/or demonstration events
- Hazard map information
- Real estate disclosure
- Library materials
- School children educational programs

## 5.4 PRIORITIZING MITIGATION ACTIONS

*44 CFR 201.6 (c)(3) (iii) An action plan describing how the actions identified in paragraph (c)(3)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.*

In formulating a regional mitigation strategy, a wide range of activities was considered to help achieve identified goals and to lessen the vulnerability of the region to the effects identified hazards.

Through a series of jurisdictional meetings, phone discussions, electronic communications and self analysis participating jurisdictions were asked to review the previously determined regional and local mitigation actions to determine if they had been completed, were on-going, or had been cancelled. In addition, jurisdictions were asked to review the initial STAPLEE (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) analysis to see if the ranking were still applicable. Participating jurisdictions were asked to submit any new mitigation actions with an analysis while newly participating jurisdictions were required, as per FEMA, to submit new mitigation actions.

A self analysis method was used for reviewing and prioritizing mitigation action alternatives. This methodology takes all local considerations into account to ensure that, based on a jurisdictions' capabilities, funding, public wishes, political climate, and legal framework and context reasonable actions are determined. The flowing provides a brief description of each consideration:

- Are all people within the jurisdiction being treated equally and fairly?
- Will the action disrupt the social fabric of the jurisdiction?
- Does the proposed action work and is it technically feasible?
- Does the action offer a long term solution to the problem?
- Does the jurisdiction have adequate staffing
- Is there someone to coordinate and lead the effort?
- Is there sufficient funding available?
- Are there ongoing administrative requirements that need to be met?
- Does the action have political and public support?
- Does the jurisdiction have the legal authority to implement the action?
- Will the jurisdiction be liable for the action or for any inaction?

- Could the action face any legal challenges?
- What are the costs and benefits of this action?
- Do the benefits exceed the costs?
- Has funding for the action been identified?

Identified actions were prioritized by the participating jurisdiction and were given one of the following rankings:

- **High:** Actions that should be implemented as soon as possible
- **Medium:** Actions that should be implemented in the long-term
- **Low:** Actions that should be implemented if and when funding becomes available

Of major concern to all participating jurisdictions was the potential or identified cost of each action. In general, identified actions were proposed to reduce future damages. As such, it is critical that selected and implemented actions provide a greater saving over the life of the action than the initial cost.

For structural and property protection actions, cost effectiveness is primarily is assessed on:

- Likelihood of damages occurring
- Severity of the damages
- Potential effectiveness

For all other type of actions, including legislative actions, codes and ordinances, maintenance and education, cost effectiveness is primarily assessed on likely future benefits as these actions may not easily result in a quantifiable reduction in damage

Although detailed analysis was not conducted during the mitigation action development process, these factors were of primary concern when selecting measures.

Each participating jurisdiction's mitigation actions, including newly identified actions and reviewed actions, can be found in the following sections listed by county.

Where a strategy's status is blank, either updates were not received from the jurisdiction, or the jurisdiction has elected not to participate in this process.

## 5.5 FUNDING SOURCES

It is generally recognized that mitigation actions help communities realize long term savings by preventing future losses due to hazard events. However, many mitigation actions are beyond the budgetary capabilities of a single jurisdiction. This section provides a general description of some of the avenues available to jurisdictions to defray the cost of implementing mitigation actions. The following are potential available funding streams:

- Hazard Mitigation Grant Program (HMGP): The HMGP assists in implementing long-term hazard mitigation measures following Presidential disaster declarations. Funding is available to implement projects in accordance with State, Tribal, and local priorities.

- Pre-Disaster Mitigation (PDM): The PDM program provides funds on an annual basis for hazard mitigation planning and the implementation of mitigation projects prior to a disaster. The goal of the PDM program is to reduce overall risk to the population and structures, while at the same time, also reducing reliance on Federal funding from actual disaster declarations.

- Flood Mitigation Assistance (FMA): FMA provides funds on an annual basis so that measures can be taken to reduce or eliminate risk of flood damage to buildings insured under the NFIP.

- Public Assistance (PA) Grant Program: The mission of FEMA's PA program is to provide assistance to State, Tribal and local governments, and certain types of Private Nonprofit organizations so that communities can quickly respond to and recover from major disasters or emergencies declared by the President. Through the PA program, FEMA provides supplemental Federal disaster grant assistance for debris removal, emergency protective measures, and the repair, replacement, or restoration of disaster-damaged, publicly owned facilities and the facilities of certain Private Non-Profit (PNP) organizations. The PA Program also encourages protection of these damaged facilities from future events by providing assistance for hazard mitigation measures during the recovery process. The Federal share of assistance is not less than 75% of the eligible cost for emergency measures and permanent restoration. The grantee (usually the State) determines how the non-Federal share (up to 25%) is split with the eligible applicants.

- Small Business Administration (SBA) Disaster Loans: The SBA provides low-interest disaster loans to homeowners, renters, businesses of all sizes, and most private nonprofit organizations. SBA disaster loans can be used to repair or replace the following items damaged or destroyed in a declared disaster: real estate, personal property, machinery and equipment, and inventory and business assets.

- HUD provides flexible grants to help cities, counties, and States recover from presidentially declared disasters, especially in low-income areas, subject to availability of supplemental appropriations.

- Community Development Block Grant Program - The CDBG program is a flexible program that provides communities with resources to address a wide range of unique community development needs. Beginning in 1974, the CDBG program is one of the longest continuously run programs at HUD. The CDBG program provides annual grants on a formula basis to 1209 general units of local government and States. The United States Department of Housing and Urban Development provides flexible grants to help cities, counties, and States recover from presidentially declared disasters, especially in low-income areas, subject to availability of supplemental appropriations.

- Individual & Households, Other Needs Assistance (ONA) Program: The ONA program provides financial assistance to individuals or households who sustain damage or develop serious needs because of a natural or man-made disaster. The funding share is 75% federal funds and 25% state funds. The ONA program provides grants for necessary expenses and serious needs that cannot be provided for by insurance, another federal program, or other source of assistance. The current maximum allowable amount for any one disaster to individuals or families is $25,000. The program gives funds for disaster-related necessary expenses and serious needs, including the following categories:

    - Personal property
    - Transportation
    - Medical and dental
    - Funeral
    - Essential tools
    - Flood insurance
    - Moving and storage

- Wildland Urban Interface (WUI) Grants: The 10-Year Comprehensive Strategy focuses on assisting people and communities in the WUI to Medium the threat of catastrophic fire through the four broad goals of improving prevention and suppression, reducing hazardous fuels, restoring fire-adapted ecosystems, and promoting community assistance. The WUI Grant may be used to apply for financial assistance towards hazardous fuels and educational projects within the four goals of: improved prevention, reduction of hazardous fuels, restoration of fire-adapted ecosystems and promotion of community assistance.

## 5.6 JURISDICTIONAL MITIGATION ACTIONS

*(iv) For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.*

Information as to the identified mitigation actions for participating jurisdictions is summarized in the following sections and tables. All mitigation action information was provided by jurisdictional officials through the outreach from the HMPC. For each action presented the current status is provided. Actions listed as on-going are carried over from the previous plan and are awaiting funding or opportunity to start. Actions that are listed as completed have been finished. Actions listed as deleted have been removed from consideration. New actions are actions that have been added for this plan and are identified as such. Any information listed with a "-" is either no longer relevant or unavailable. Finally, some actions have been reassigned and are noted as such. In these cases not all information is provided under the original listing, rather the newly assigned responsible entity has been given the opportunity to detail the requested information.

### 5.6.1 ALLEN COUNTY

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Multi-Jurisdictional-1 | Evaluate and update mitigation plan during each annual review of the Allen County Basic Operations Plan. | Multi-Hazard | Emergency Management Coordinator | High | - | - | - | - | Reassigned to Multiple Jurisdictions |
| Multi-Jurisdictional-2 | Expand and enhance warning sirens to alert the public of emergency events | Tornado | Emergency Management Coordinator | Low | - | - | - | - | Completed |
| Multi-Jurisdictional-3 | Require all new school construction in Allen County to include the construction of a tornado safe room | Multi-Hazard | Allen County Commission Chair | Low | - | - | - | - | Deleted |
| Multi-Jurisdictional-4 | Identify, prioritize, and seek funding to address safe room needs in existing schools and public buildings | Tornado | USD 257 Superintendant | Low | - | - | - | - | Deleted |
| Multi-Jurisdictional-5 | Increase radio repeaters to expand radio coverage throughout the County | Multi-Hazard | Allen County Sheriff | Low | - | - | - | - | Deleted |
| Multi-Jurisdictional-6 | Upgrade Heartland Rural Electric Cooperative power lines in Allen County | Multi-Hazard | Heartland Rural Electric Cooperative President | High | - | - | - | - | Reassigned to Heartland REC |
| Multi-Jurisdictional-7 | Promote National Flood Insurance Program | Flood | Allen County Flood Plain Director | Medium | - | - | - | - | Reassigned to Multiple Jurisdictions |
| Multi-Jurisdictional-8 | Develop public education program on hazards and risk in Allen County and preparedness and mitigation activities | Multi-Hazard | Emergency Management Coordinator | Medium | - | - | - | - | Reassigned to Multiple Jurisdictions |
| Multi-Jurisdictional-9 | Purchase NOAA weather radios for special needs citizens or organizations in Allen County | Multi-Hazard | Emergency Management Coordinator | Low | - | - | - | - | Completed |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Multi-Jurisdictional-10 | Implement the Reverse 911 System in Allen County Community College | Multi-Hazard | Allen Community College Vice President of Student Affair | Medium | - | - | - | - | Completed |
| Multi-Jurisdictional-11 | Identify staff training and exercise needs | Multi-Hazard | Emergency Management Coordinator | Medium | - | - | - | - | Reassigned to Multiple Jurisdictions |
| Multi-Jurisdictional-12 | Increase public and fire department training on wildland-urban interface fires | Wildfire | Emergency Management Coordinator | Low | - | - | - | - | Reassigned to Multiple Jurisdictions |
| Multi-Jurisdictional-13 | Provide homeowner education on wildfire mitigation measures in the wildland-urban interface. | Wildfire | Emergency Management Coordinator | Low | - | - | - | - | Reassigned to Multiple Jurisdictions |
| Multi-Jurisdictional-14 | Reduce hazardous fuels in prioritized wildfire risk areas | Wildfire | Iola Fire Department Chief | Low | - | - | - | - | Deleted |
| County-1 | Implement buyout program for flood damaged properties | Flood | Allen County Flood Plain Director | High | - | - | - | - | Completed |
| County-2 | Review and update or strengthen floodplain ordinance when adopting new digital flood insurance rate maps (DFIRMs) | Flood | Allen County Flood Plain Director | High | - | - | - | - | Completed |
| County-3 | Obtain portable generators for critical facilities and infrastructure to maintain operations of government and health related services | Multi-Hazard | Allen County Commission Chair | Medium | - | - | - | - | Deleted |
| County-4 | Evaluate and update mitigation plan during each annual review of the Allen County Basic Operations Plan. | Multi-Hazard | Emergency Management Coordinator | High | 1, 4 | Staff Time | None Identified | Annually, beginning in January 2009 | On-Going |
| County-5 | Promote National Flood Insurance Program | Flood | Allen County Flood Plain Director | Medium | 3 | $1,000 | Local funding and staff time | 12 months, then ongoing. | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| County-6 | Develop public education program on hazards and risk in Allen County and preparedness and mitigation activities | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $5,000 | Local funding and staff time | One year and ongoing | On-Going |
| County-7 | Identify staff training and exercise needs | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $15,000 | U.S. Department of Homeland Security grants, local funds | Two years | On-Going |
| County-7 | Increase public and fire department training on wildland-urban interface fires | Wildfire | Emergency Management Coordinator | Low | 3 | $30 per student per training session | The Kansas Forest Service, along with its state and federal partners, can assist with providing these training opportunities. | Three to five years | On-Going |
| County- | Provide homeowner education on wildfire mitigation measures in the wildland-urban interface. | Wildfire | Emergency Management Coordinator | Low | 1, 3 | $500 | Kansas Forest Service and federal grants | Three to five 9years | On-Going |
| Elsmore-1 | Replace storm siren | Tornado | City of Elsmore Council | Medium | 1, 2 | Unknown | Unknown | Unknown | New |
| Elsmore-2 | Replace electric poles | Multi-Hazard | City of Elsmore Council | Medium | 1, 2 | Unknown | Unknown | Unknown | New |
| Elsmore-3 | Evaluate and update mitigation plan during each annual review of the Allen County Basic Operations Plan. | Multi-Hazard | Emergency Management Coordinator | High | 1, 4 | Staff Time | None Identified | Annually, beginning in January 2009 | On-Going |
| Elsmore-4 | Promote National Flood Insurance Program | Flood | Allen County Flood Plain Director | Medium | 3 | $1,000 | Local funding and staff time | 12 months, then education would be ongoing. | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Elsmore-5 | Develop public education program on hazards and risk in Allen County and preparedness and mitigation activities | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $5,000 | Local funding and staff time | One year and ongoing | On-Going |
| Elsmore-6 | Identify staff training and exercise needs | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $15,000 | U.S. Department of Homeland Security grants, local funds | Two years | On-Going |
| Elsmore-7 | Increase public and fire department training on wildland-urban interface fires | Wildfire | Emergency Management Coordinator | Low | 3 | $30 per student per training session | The Kansas Forest Service, along with its state and federal partners, can assist with providing these training opportunities. | Three to five years | On-Going |
| Elsmore-8 | Provide homeowner education on wildfire mitigation measures in the wildland-urban interface. | Wildfire | Emergency Management Coordinator | Low | 1, 3 | $500 | Kansas Forest Service and federal grants | Three to five years | On-Going |
| Gas-1 | Construct a safe room in Gas City Hall building | Tornado | City of Gas Council | High | 1, 2 | Unknown | Unknown | Unknown | Completed |
| Gas-2 | Construct a safe room in the Crossroads School building | Tornado | USD 257 Superintendant | High | 1, 2 | Unknown | Unknown | Unknown | Completed |
| Gas-3 | Construct a standalone community shelter in the Gas City Park | Tornado | City of Gas Council | Medium | 1, 2 | Unknown | Unknown | Unknown | Completed |
| Gas-4 | Evaluate and update mitigation plan during each annual review of the Allen County Basic Operations Plan. | Multi-Hazard | Emergency Management Coordinator | High | 1, 4 | Staff Time | None Identified | Annually, beginning in January 2009 | On-Going |
| Gas-5 | Promote National Flood Insurance Program | Flood | Allen County Flood Plain Director | Medium | 3 | $1,000 | Local funding and staff time | 12 months, then education would be ongoing. | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Gas-6 | Develop public education program on hazards and risk in Allen County and preparedness and mitigation activities | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $5,000 | Local funding and staff time | One year and ongoing | On-Going |
| Gas-7 | Identify staff training and exercise needs | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $15,000 | U.S. Department of Homeland Security grants, local funds | Two years | On-Going |
| Gas-8 | Increase public and fire department training on wildland-urban interface fires | Wildfire | Emergency Management Coordinator | Low | 3 | $30 per student per training session | The Kansas Forest Service, along with its state and federal partners, can assist with providing these training opportunities. | Three to five years | On-Going |
| Gas-9 | Provide homeowner education on wildfire mitigation measures in the wildland-urban interface. | Wildfire | Emergency Management Coordinator | Low | 1, 3 | $500 | Kansas Forest Service and federal grants | Three to five years | On-Going |
| Humboldt-1 | Construct a standalone community tornado shelter near the youth baseball complex | Tornado | City of Humboldt City Administrator | High | 1, 2 | Unknown | Unknown | Unknown | Completed |
| Humboldt-2 | Construct a second outdoor warning tower and siren at the south end of town. | Multi-Hazard | City of Humboldt City Administrator | Medium | 1, 2 | Unknown | Unknown | Unknown | Completed |
| Humboldt-3 | Construct a storage shelter to house emergency generators. | Multi-Hazard | City of Humboldt Administrator's Office, Administrator | Low | 2 | Unknown | Unknown | Unknown | Completed |
| Humboldt-4 | Evaluate and update mitigation plan during each annual review of the Allen County Basic Operations Plan. | Multi-Hazard | Emergency Management Coordinator | High | 1, 4 | Staff Time | None Identified | Annually, beginning in January 2009 | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Humboldt-5 | Promote National Flood Insurance Program | Flood | Allen County Flood Plain Director | Medium | 3 | $1,000 | Local funding and staff time | 12 months, then education would be ongoing. | On-Going |
| Humboldt-6 | Develop public education program on hazards and risk in Allen County and preparedness and mitigation activities | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $5,000 | Local funding and staff time | One year and ongoing | On-Going |
| Humboldt-7 | Identify staff training and exercise needs | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $15,000 | U.S. Department of Homeland Security grants, local funds | Two years | On-Going |
| Humboldt-8 | Increase public and fire department training on wildland-urban interface fires | Wildfire | Emergency Management Coordinator | Low | 3 | $30 per student per training session | The Kansas Forest Service, along with its state and federal partners, can assist with providing these trainings. | Three to five years | On-Going |
| Humboldt-9 | Provide homeowner education on wildfire mitigation measures in the wildland-urban interface. | Wildfire | Emergency Management Coordinator | Low | 1, 3 | $500 | Kansas Forest Service and federal grants | Three to five years | On-Going |
| Iola-1 | Implement buyout program for flood damaged properties | Flood | City of Iola Codes Services Department Supervisor | High | 1 | $4,000,000 | FEMA HMGP, CDBG, State funding, City funds | One year | On-Going |
| Iola-2 | Construct flood wall to protect municipal power and water treatment utilities complex | Flood | City of Iola Codes Services Department Supervisor | High | 2 | $3,000,000 | U.S. Army Corps of Engineers, FEMA HMGP and PDM Program, revenue from rates and utility reserves | Two years | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Iola-3 | Reconstruct Coon Creek channel throughout the City to prevent future flooding | Flood | City of Iola Codes Services Department Supervisor | Medium | 1 | $10,000,000 | FEMA HMGP and PDM Program, State funding, City funds | Five years | On-Going |
| Iola-4 | Construct a water detention structure at the headwaters of Coon Creek | Flood | City of Iola Code Services Department Supervisor | Medium | 1 | $2,500,000 | U.S. Army Corps of Engineers , FEMA HMGP and PDM Program, State funding, City funds | Three years | On-Going |
| Iola-5 | Develop underground electric distribution | Multi-Hazard | City of Iola Electric Department Director and City Administrator Office | Low | 1, 2 | $60,000,000 | FEMA HMGP and PDM, CDBG Program, revenue from rates and utility reserves | 10 years | On-Going |
| Iola-6 | Evaluate and update mitigation plan during each annual review of the Allen County Basic Operations Plan. | Multi-Hazard | Emergency Management Coordinator | High | 1, 4 | Staff Time | None Identified | Annually, beginning in January 2009 | On-Going |
| Iola-7 | Promote National Flood Insurance Program | Flood | Allen County Flood Plain Director | Medium | 3 | $1,000 | Local funding and staff time | 12 months, then education would be ongoing. | On-Going |
| Iola-8 | Develop public education program on hazards and risk in Allen County and preparedness and mitigation activities | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $5,000 | Local funding and staff time | One year and ongoing | On-Going |
| Iola-9 | Identify staff training and exercise needs | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $15,000 | U.S. Department of Homeland Security grants, local funds | Two years | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Iola-10 | Increase public and fire department training on wildland-urban interface fires | Wildfire | Emergency Management Coordinator | Low | 3 | $30 per student per training session | The Kansas Forest Service, along with its state and federal partners, can assist with providing these training opportunities. | Three to five years | On-Going |
| Iola-11 | Provide homeowner education on wildfire mitigation measures in the wildland-urban interface. | Wildfire | Emergency Management Coordinator | Low | 1, 3 | $500 | Kansas Forest Service and federal grants | Three to five years | On-Going |
| LaHarpe-1 | Assess adequacy of existing community tornado shelters and community needs | Tornado | City of LaHarpe Council | High | 1 | Unknown | Unknown | Unknown | Completed |
| LaHarpe-2 | Install backup generator at emergency shelter | All Hazards | Electrical Department Director | High | 1 | $4,000 | Unknown | 12 months | New |
| LaHarpe-3 | Evaluate and update mitigation plan during each annual review of the Allen County Basic Operations Plan. | Multi-Hazard | Emergency Management Coordinator | High | 1, 4 | Staff Time | None Identified | Annually, beginning in January 2009 | On-Going |
| LaHarpe-4 | Promote National Flood Insurance Program | Flood | Allen County Flood Plain Director | Medium | 3 | $1,000 | Local funding and staff time | 12 months, then education would be ongoing. | On-Going |
| LaHarpe-5 | Develop public education program on hazards and risk in Allen County and preparedness and mitigation activities | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $5,000 | Local funding and staff time | One year and ongoing | On-Going |
| LaHarpe-6 | Identify staff training and exercise needs | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $15,000 | U.S. Department of Homeland Security grants, local funds | Two years | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| LaHarpe-7 | Increase public and fire department training on wildland-urban interface fires | Wildfire | Emergency Management Coordinator | Low | 3 | $30 per student per training session | The Kansas Forest Service, along with its state and federal partners, can assist with providing these training opportunities. | Three to five years | On-Going |
| LaHarpe-8 | Provide homeowner education on wildfire mitigation measures in the wildland-urban interface. | Wildfire | Emergency Management Coordinator | Low | 1, 3 | $500 | Kansas Forest Service and federal grants | Three to five years | On-Going |
| Moran-1 | Construct five community tornado shelters in Moran | Tornado | City of Moran City Council | High | 2 | Unknown | Unknown | Unknown | Completed |
| Moran-2 | Increase water storage capacity in Moran | Multi-Hazard | City of Moran City Council | Medium | 1, 2 | $675,000 | Loan, grants, and City funds | One year | On-Going |
| Moran-3 | Prevent damage to power lines through upgrades, burying, etc. | Multi-Hazard | City of Moran City Council | Medium | 1, 2 | $71,340 | FEMA HMGP and PDM, CDBG Program, revenue from rates and other City funds | Three years | On-Going |
| Moran-4 | Construct community storm shelter | Multi-Hazard | City of Moran City Clerk and City Council | High | 2 | $35,000 - $150,000 | Unknown | 6-18 months | New |
| Moran-5 | Evaluate and update mitigation plan during each annual review of the Allen County Basic Operations Plan. | Multi-Hazard | Emergency Management Coordinator | High | 1, 4 | Staff Time | None Identified | Annually, beginning in January 2009 | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Moran-6 | Promote National Flood Insurance Program | Flood | Allen County Flood Plain Director | Medium | 3 | $1,000 | Local funding and staff time | The initial program about 12 months, then education would be ongoing. | On-Going |
| Moran-7 | Develop public education program on hazards and risk in Allen County and preparedness and mitigation activities | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $5,000 | Local funding and staff time | One year and ongoing | On-Going |
| Moran-8 | Identify staff training and exercise needs | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $15,000 | U.S. Department of Homeland Security grants, local funds | Two years | On-Going |
| Moran-9 | Increase public and fire department training on wildland-urban interface fires | Wildfire | Emergency Management Coordinator | Low | 3 | $30 per student per training session | The Kansas Forest Service, along with its state and federal partners, can assist with providing these training opportunities. | Three to five years | On-Going |
| Moran-10 | Provide homeowner education on wildfire mitigation measures in the wildland-urban interface. | Wildfire | Emergency Management Coordinator | Low | 1, 3 | $500 | Kansas Forest Service and federal grants | Three to five years | On-Going |
| Savonburg-1 | Assess and plan for community tornado shelter needs | Tornado | City of Savonburg City Council | High | 1 | Unknown | Unknown | Unknown | Completed |
| Savonburg-2 | Upgrade and enhance power lines to endure ice and wind conditions and provide back-up power and pole replacement | Winter storm, Windstorm | City of Savonburg Electric Department, Director | High | 1 | $20,000 | Unknown | 1 month | New |
| Savonburg-3 | Construct safe house for safety of residents | Tornado | City of Savonburg Council | High | 1 | $50,000 | Unknown | 2 years | New |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Savonburg-4 | Evaluate and update mitigation plan during each annual review of the Allen County Basic Operations Plan. | Multi-Hazard | Emergency Management Coordinator | High | 1, 4 | Staff Time | None Identified | Annually, beginning in January 2009 | On-Going |
| Savonburg-5 | Promote National Flood Insurance Program | Flood | Allen County Flood Plain Director | Medium | 3 | $1,000 | Local funding and staff time | The initial program would cover about 12 months, then education would be ongoing. | On-Going |
| Savonburg-6 | Develop public education program on hazards and risk in Allen County and preparedness and mitigation activities | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $5,000 | Local funding and staff time | One year and ongoing | On-Going |
| Savonburg-7 | Identify staff training and exercise needs | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $15,000 | U.S. Department of Homeland Security grants, local funds | Two years | On-Going |
| Savonburg-8 | Increase public and fire department training on wildland-urban interface fires | Wildfire | Emergency Management Coordinator | Low | 3 | $30 per student per training session | The Kansas Forest Service, along with its state and federal partners, can assist with providing these training opportunities. | Three to five years | On-Going |
| Savonburg-9 | Provide homeowner education on wildfire mitigation measures in the wildland-urban interface. | Wildfire | Emergency Management Coordinator | Low | 1, 3 | $500 | Kansas Forest Service and federal grants | Three to five years | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Allen County CC-1 | Implement emergency notification system | Multi-Hazard | Allen County Community College, Student Affairs Director | Medium | 4 | $6,800 | Allen County Community College general funds | 3 years | New |
| Allen County CC-2 | Evaluate and update mitigation plan during each annual review of the Allen County Basic Operations Plan. | Multi-Hazard | Emergency Management Coordinator | High | 1, 4 | Staff Time | None Identified | Annually, beginning in January 2009 | On-Going |
| Allen County CC-3 | Develop public education program on hazards and risk in Allen County and preparedness and mitigation activities | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $5,000 | Local funding and staff time | One year and ongoing | On-Going |
| Allen County CC-4 | Identify staff training and exercise needs | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $15,000 | U.S. Department of Homeland Security grants, local funds | Two years | On-Going |
| USD 256-1 | Identify, prioritize, and seek funding to address tornado shelter needs in existing school buildings | Tornado | Marmaton Valley Schools USD 256 Superintendant | High | 1, 2 | $500,000 | FEMA HMGP and PDM Program, CDBG Program, revenue from rates and other City funds | Three to five years | On-Going |
| USD 256-2 | Evaluate and update mitigation plan during each annual review of the Allen County Basic Operations Plan. | Multi-Hazard | Emergency Management Coordinator | High | 1, 4 | Staff Time | None Identified | Annually, beginning in January 2009 | On-Going |
| USD 256-3 | Develop public education program on hazards and risk in Allen County and preparedness and mitigation activities | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $5,000 | Local funding and staff time | One year and ongoing | On-Going |
| USD 256-4 | Identify staff training and exercise needs | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $15,000 | U.S. Department of Homeland Security grants, local funds | Two years | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| USD 257-1 | Construct safe rooms in new schools currently being planned | Tornado | Iola Public Schools USD 257 Superintendant | High | 1, 2 | Elementary School $900,850, Middle School $504,175, and High School $614,900 | FEMA HMGP and PDM Program. Local funds would come from a school district bond referendum and/or capital outlay funds. | Three years. | On-Going |
| USD 257-2 | Evaluate and update mitigation plan during each annual review of the Allen County Basic Operations Plan. | Multi-Hazard | Emergency Management Coordinator | High | 1, 4 | Staff Time | None Identified | Annually, beginning in January 2009 | On-Going |
| USD 257-3 | Develop public education program on hazards and risk in Allen County and preparedness and mitigation activities | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $5,000 | Local funding and staff time | One year and ongoing | On-Going |
| USD 257-4 | Identify staff training and exercise needs | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $15,000 | U.S. Department of Homeland Security grants, local funds | Two years | On-Going |
| USD 258-1 | Evaluate the construction of a safe room | Tornado | Humboldt School USD 258, Superintendant | High | 1, 2 | $500,000 | FEMA HMGP and PDM, CDBG Program, revenue from rates and other City funds | Three to five years | On-Going |
| USD 258-2 | Evaluate and update mitigation plan during each annual review of the Allen County Basic Operations Plan. | Multi-Hazard | Emergency Management Coordinator | High | 1, 4 | Staff Time | None Identified | Annually, beginning in January 2009 | On-Going |
| USD 258-3 | Develop public education program on hazards and risk in Allen County and preparedness and mitigation activities | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $5,000 | Local funding and staff time | One year and ongoing | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| USD 258-4 | Identify staff training and exercise needs | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $15,000 | U.S. DHS grants, local funds | Two years | On-Going |
| American Red Cross-1 | Train volunteers in disaster response | Multi-Hazard | American Red Cross, Director | Medium | 3 | Minimal | American Red Cross | Unknown | New |
| American Red Cross-2 | Evaluate and update mitigation plan during each annual review of the Allen County Basic Operations Plan. | Multi-Hazard | Emergency Management Coordinator | High | 1, 4 | Staff Time | None Identified | Annually, beginning in January 2009 | On-Going |
| American Red Cross-3 | Develop public education program on hazards and risk in Allen County and preparedness and mitigation activities | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $5,000 | Local funding and staff time | One year and ongoing | On-Going |
| American Red Cross-4 | Identify staff training and exercise needs | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $15,000 | U.S. Department of Homeland Security grants, local funds | Two years | On-Going |
| Heartland-1 | Upgrade Heartland Rural Electric Cooperative power lines in Allen County | Multi-Hazard | Heartland Rural Electric Cooperative President | High | 2 | $3,330,000 | FEMA HMGP, State funding, local funding | Four years | On-Going |
| Southern Star-1 | Evaluate and update mitigation plan during each annual review of the Allen County Basic Operations Plan. | Multi-Hazard | Emergency Management Coordinator | High | 1, 4 | Staff Time | None Identified | Annually, beginning in January 2009 | On-Going |
| Southern Star-2 | Develop public education program on hazards and risk in Allen County and preparedness and mitigation activities | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $5,000 | Local funding and staff time | One year and ongoing | On-Going |
| Southern Star-3 | Identify staff training and exercise needs | Multi-Hazard | Emergency Management Coordinator | Medium | 3 | $15,000 | U.S. Department of Homeland Security grants, local funds | Two years | On-Going |

### 5.6.2 BOURBON COUNTY

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Multi-Jurisdictional-1 | The County and local governments will work with the Kansas Department of Agriculture - Division of Water Resources to educate and promote local jurisdictional participation in the National Flood Insurance Program | Flood | - | - | - | - | - | - | Reassigned to County |
| Multi-Jurisdictional-2 | Continued participation and compliance with the NFIP | Flood | - | - | - | - | - | - | Reassigned to County |
| Multi-Jurisdictional-3 | Advertise and promote the availability of flood insurance to property owners by direct mail once a year. | Flood | - | - | - | - | -- | - | Reassigned to County |
| Multi-Jurisdictional-4 | Collect educational materials on individual and family preparedness / mitigation measures for property owners, and display at both the library and routinely visited government offices. | Flood | Emergency Management / City Emergency Services | High | 4 | No Cost / Low Cost | Local | Continuous | Complete |
| Multi-Jurisdictional-5 | Annually host a public "hazards workshop" in combination with local festivals, fairs, or other appropriate events. | Multi-hazard | - | - | - | - | - | - | Reassigned to County |
| Multi-Jurisdictional-6 | Encourage the construction of safe rooms and storm shelters in public and private schools, day care centers and senior care facilities. | Multi-hazard | - | - | - | - | - | - | Reassigned to County |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Multi-Jurisdictional-7 | Educate residents about driving in winter storms and handling winter-related health effects. | Multi-hazard | - | - | - | - | - | - | Reassigned to County |
| Multi-Jurisdictional-8 | Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues that can severely impact the county and regional economies, and develop and implement plans to address these issues. | Terrorism and Civil Disorder | - | - | - | - | - | - | Reassigned to County |
| Multi-Jurisdictional-9 | Develop an annex to the Local Emergency Operations Plan (LEOP) for dam failure response and evacuation plans for high hazard dams in Bourbon County. | Dam/Levee Failure | - | - | - | - | - | - | Reassigned to County |
| Multi-Jurisdictional-10 | Coordinate county and local government mitigation efforts with Rural Electric Cooperatives (RECs), encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies. | Utility/Infrastructure Failure | - | - | - | - | - | - | Reassigned to County |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Multi-Jurisdictional-11 | Prepare and adopt an Outdoor Warning Sirens Plan for the county, including consideration of the unique geographical locations, technical requirements, system types and operational procedures of each local jurisdiction. The plans should include a review of existing outdoor warning siren coverage and recommend new locations if and where there are coverage gaps. Seek funding to install new warning sirens in accordance with the plan recommendations. | Tornado | - | - | - | - | - | - | Reassigned to County |
| County-1 | Appoint a committee to research and recommend appropriate building codes for the County that include wind-resistant design techniques for new construction. | Multi-hazard | County Officials | Medium | - | - | - | - | Deleted |
| County-2 | Appoint a planning committee to research and recommend development of a Comprehensive Land Use Plan for Bourbon County. | Flood | County Officials | Medium | 1, 2 | Unknown | Local | 2018 | On-Going |
| County-3 | Develop a program to acquire and preserve parcels of land subject to repetitive flooding from willing and voluntary property owners. | Flood | County Officials | Low | 1, 2, 3 | Unknown | FEMA, KDEM, Local | 2018 | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| County-4 | On an annual basis, contact owners identified in high-risk flood areas and inform them of potential availability of assistance through the Federal Flood Mitigation Assistance program, in addition to other flood protection measures. | Flood | City-County Officials | High | 3, 4 | No Cost / Low Cost | Local | Continuous | On-Going |
| County-5 | Identify flood prone areas and recommend flood reduction measures to county planners. | Flood | County Officials | High | 1, 2 | No Cost / Low Cost | Local | 2018 | On-Going |
| County-6 | Research and design an appropriate stream buffer ordinance to further protect the jurisdiction's water resources and to limit future flood damages adjacent to major waterways. | Multi-hazard | County Officials | Medium | 1, 2 | No Cost / Low Cost | FEMA/State/Local | 2018 | On-Going |
| County-7 | Identify the County's most at-risk critical facilities, and evaluate potential mitigation techniques for protecting each facility to the maximum extent possible. | Multi-hazard | Emergency Manager | Low | 1, 3 | Unknown | Local | 2018 | On-Going |
| County-8 | Conduct an inventory/survey for the emergency response services to identify any existing needs or shortfalls in terms of personnel, equipment or required resources. | Multi-hazard | Emergency Manager / City Emergency Services Officials | High | 1 | $208,000 | Local / State | 2018 | On-Going |
| County-9 | Research and recommend an ordinance/resolution to require tornado shelters for new major manufactured and/or mobile home parks with more than 10 mobile home spaces. | Multi-hazard | County Officials | High | - | - | - | - | Deleted |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| County-10 | Develop cross-departmental information collection capabilities, and incorporate cadastral (building/parcel) data utilizing a GIS for purposes of conducting more detailed hazard risk assessments and for tracking permitting / land use patterns, buildings and infrastructure replacement costs, and overall structural accounting for the county. | Multi-hazard | County Appraiser | Medium | - | - | - | - | Deleted |
| County-11 | Develop and implement a wildfire prevention/education program. In addition to providing education to the general public, the program should also target children, fire and equipment users, builders and developers, and homeowners. | Wildfire | Fire Officials/ Emergency Manager | Medium | 3 | Unknown | Local | Continuous | On-Going |
| County-12 | Examine the current agreements within the county and assess the need to expand or update cooperative agreements for firefighting resources. Include agreements with local, state and federal agencies. | Wildfire | Fire Officials/ Emergency Manager | Medium | 1, 3 | No Cost / Low Cost | Local | Continuous | On-Going |
| County-13 | Create a working group to evaluate the firefighting water supply resources within the County. This should include both fixed and mobile supply issues. | Wildfire | Fire Officials/ Emergency Manager | High | 1, 3, 4 | No Cost / Low Cost | Local | 2018 | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| County-14 | Contact all owners of high hazard dams in Bourbon County and inform them of their responsibility to complete and provide Emergency Action Plans (EAPs) to the Bourbon County Emergency Management Department as prescribed by the Kansas Department of Agriculture – Water Resources Division, Chief Engineer. | Dam/Levee Failure | Bourbon County Emergency Manager / Mill Creek WD No.98 Officials/ Marmaton WJD No. 102 Officials | Medium | 1, 3 | Unknown | Local | 2018 | On-Going |
| County-15 | Seek funding for the purchase of equipment to maintain drainage channels along roadways. | Flood | Emergency Manager / Roads and Bridges Director | Low | - | - | - | - | Deleted |
| County-16 | Assess flood prone areas along major county roadways and seek funding to purchase traffic gates in order to prevent vehicles from passing through these areas during times of flooding. | Flood | Road and Bridge Director / Emergency Manager | Low | - | - | - | - | Deleted |
| County-17 | Plan and fund animal sheltering facilities adjacent to existing storm shelters. | Multi-hazard | Emergency Manager | Medium | 2 | Unknown | Local / State / Federal | 2018 | On-Going |
| County-18 | Develop a County Animal Rescue Team. | Multi-hazard | Emergency Manager | Medium | 2 | Unknown | Local / State / Federal | 2018 | On-Going |
| County-19 | Seek funding to purchase an equipped emergency response trailer. | Multi-hazard | Emergency Manager | Medium | - | - | - | - | Deleted |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| County-20 | Seek funding for emergency generators for county sanitation systems. | Multi-hazard | Emergency Manager | Medium | 1, 3 | Unknown | Local / State / Federal | 2018 | On-Going |
| County-22 | Seek funding to complete a study and fund a county-wide emergency alert system that includes a reverse 911 system. | Multi-hazard | Emergency Manager | Medium | - | - | - | - | Deleted |
| County-23 | Seek funding for the purchase and installation of fire danger signs. | Wildfire | Emergency Manager / Public Works Officials | Medium | 1, 3 | Unknown | Local / State / Federal | 2018 | On-Going |
| County-24 | Seek funding for training of the Bourbon County Search and Rescue Team to include water rescue. | Multi-hazard | Emergency Manager | High | 1, 3 | No Cost / Low Cost | Local / State / Federal | 2018 | On-Going |
| County-25 | Seek funding for an all purpose training facility for the Bourbon County Search and Rescue Team. | Multi-hazard | Emergency Manager | Medium | - | - | - | - | Deleted |
| County-26 | The County and local governments will work with the Kansas Department of Agriculture - Division of Water Resources to educate and promote local jurisdictional participation in the National Flood Insurance Program | Flood | Emergency Manager / Local Officials | Medium | 1, 3 | No Cost / Low Cost | Local / State | 2018 | On-Going |
| County-27 | Continued participation and compliance with the NFIP | Flood | City / County Officials | High | 1 | No Cost / Low Cost | State/FEMA/Program Grants | 2018 | On-Going |
| County-28 | Advertise and promote the availability of flood insurance to property owners by direct mail once a year. | Flood | City / County Officials | High | 3 | No Cost / Low Cost | Local | Continuous | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| County-29 | Collect educational materials on individual and family preparedness / mitigation measures for property owners, and display at both the library and routinely visited government offices. | Flood | Emergency Manager / City Emergency Services Officials | High | 3 | No Cost / Low Cost | Local | Continuous | Complete |
| County-30 | Annually host a public "hazards workshop" in combination with local festivals, fairs, or other appropriate events. | Multi-hazard | Emergency Manager / City Officials | Medium | 3 | No Cost / Low Cost | Local | Continuous | On-Going |
| County-31 | Encourage the construction of safe rooms and storm shelters in public and private schools, day care centers and senior care facilities. | Multi-hazard | School District Superintendents/ State of Kansas/FEMA | High | 2 | No Cost / Low Cost | FEMA/State/Local | Continuous | On-Going |
| County-32 | Educate residents about driving in winter storms and handling winter-related health effects. | Multi-hazard | Emergency Manager / City Emergency Services | High | 3 | No Cost / Low Cost | Local | Continuous | On-Going |
| County-33 | Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues that can severely impact the county and regional economies, and develop and implement plans to address these issues. | Terrorism and Civil Disorder | County Emergency Manager/ Local Producers | Medium | 1, 3 | Unknown | Local / State / Federal | 2018 | On-Going |
| County-34 | Develop an annex to the Local Emergency Operations Plan (LEOP) for dam failure response and evacuation plans for high hazard dams in Bourbon County. | Dam/Levee Failure | Emergency Manager | High | 1, 2 | Unknown | Local | 2018 | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| County-35 | Coordinate county and local government mitigation efforts with Rural Electric Cooperatives, encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies. | Utility/Infrastructure Failure | Public Works Director | High | 3, 4 | No Cost / Low Cost | Local | 2018 | On-Going |
| County-36 | Prepare and adopt an Outdoor Warning Sirens Plan for the county, including consideration of the unique geographical locations, technical requirements, system types and operational procedures of each local jurisdiction. | Tornado | Emergency Manager / City Officials / County Emergency Services Officials | High | 1, 2 | Unknown | Local / State / Federal | 2018 | On-Going |
| County-37 | Update water and sewer infrastructure throughout county | Utility/ Infrastructure Failure | Rural Water District Directors and Public Wholesale Water Supply District Director | High | 1, 2 | Unknown | Unknown | Unknown | New |
| Bronson-1 | Identify flash-flood prone areas to consider flood reduction measures to the city's floodplain manager/ planning officer. | Flood | City Officials | Medium | 1, 2 | Unknown | Local | 12/31/2015 | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Bronson-2 | Incorporate the inspection and management of trees that may pose a threat to the county's routine maintenance system process. | Multi-hazard | City of Bronson Public Works | Medium | 1 | Unknown | Local | 12/31/2015 | On-Going |
| Bronson-3 | Conduct a study of the existing storm warning system and seek funding to upgrade or replace the warning sirens for the City of Bronson. The study should include a 'warning system policy' that includes the dissemination of information about the 'warning siren policy' to the community. | Tornado | City of Bronson Officials | Medium | 1, 3 | Unknown | Local / State / Federal | 12/31/2015 | On-Going |
| Bronson-4 | Seek funding for the purchase and installation of a backup power to the Bronson Community Center. | Multi-hazard | City of Bronson | Low | 1 | Unknown | Local / State / Federal | 12/31/2015 | On-Going |
| Bronson-5 | Seek funding to conduct a study for the location, design, and construction of community tornado shelters for Bronson citizens. | Tornado | City of Bronson Officials | Low | 2 | Unknown | Local / State / Federal | 12/31/2015 | On-Going |
| Bronson-6 | Seek funding to complete a stormwater drainage study/plan for the City of Bronson that will lead to a stormwater management ordinance. | Flood | City Officials | Medium | 2 | Unknown | Local / State / Federal | 12/31/2015 | On-Going |
| Bronson-7 | Seek funding to perform improvements to minimize flood damage to existing development by maximizing the effectiveness of the storm sewer infrastructure. | Flood | City of Bronson Officials | Low | 1 | Unknown | Local / State / Federal | 12/31/2015 | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Bronson-8 | The City of Bronson, Bourbon County, and Allen County will work in coordination with private property owners to conduct maintenance procedures to the wastewater lagoon system and adjacent drainage ditch. | Flood | City of Bronson Officials / Bourbon County / Allen County / Private Property Owners | Medium | 1, 2 | Unknown | Local / State / Federal | 12/31/2015 | On-Going |
| Fort Scott-1 | Identify flood prone areas to consider future flood reduction measures within the City of Fort Scott. | Flood | City Officials | Medium | 1, 2 | Unknown | Local | 12/31/2015 | On-Going |
| Fort Scott-2 | Develop and submit an Emergency Action Plan (EAP) for the High Hazard Dam owned by the City of Fort Scott. Approval is granted through the Department of Agriculture's Water Resources Division - State Engineering Office. The EAPs should be forwarded to the Bourbon County Emergency Management Department for inclusion in the Bourbon County Local Emergency Operations Plan. | Dam/Levee Failure | City of Fort Scott Officials / Emergency Management Director | Medium | 1, 2 | Unknown | Local | 2017 | On-Going |
| Fort Scott-3 | Seek funding to complete a stormwater drainage study/plan for the City of Fort Scott that will lead to a stormwater management ordinance. | Flood | City Officials | Medium | 1, 3 | Unknown | Local / State / FEMA | 12/31/2015 | Completed |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Fort Scott-4 | Develop a program to acquire and preserve parcels of land subject to repetitive flooding from willing and voluntary property owners. | Flood | City Officials | High | 1, 2, 3 | Unknown | FEMA, KDEM, Local | 2018 | On-Going |
| Fort Scott-5 | Seek funding for the purchase and installation of a backup power generators for Fort Scott critical facilities. | Multi-hazard | City Officials | Medium | 1, 2 | Unknown | Local / State / Federal | 2018 | On-Going |
| Fort Scott-6 | Build 2 community safe rooms adjacent to 2 fire station buildings | Tornado | City of Fort Scott Officials | Medium | 2 | Unknown | Local / State / Federal | 2018 | New |
| Fulton-1 | Identify flood prone areas to consider future flood reduction measures within the City of Fulton. | Flood | City Officials | Medium | 1, 2 | Unknown | Local | 2018 | On-Going |
| Fulton-2 | Seek funding to retain an engineer to design a community tornado shelter and apply for grant funding for construction. | Tornado | City Officials | Low | 2 | Unknown | Federal | 2018 | On-Going |
| Mapleton-1 | Promote the use of NOAA All Hazards Weather Radios for the entire community of Mapleton. Seek funding to subsidize purchase and distribution of weather radios. | Multi-hazard | City of Mapleton Officials | Medium | 1, 3, 4 | Unknown | Local / State / Federal | 2018 | On-Going |
| Redfield- 1 | Identify flood prone areas to consider future flood reduction measures within the City of Redfield. | Flood | City Planners | High | 1, 2 | No Cost / Low Cost | Local | 2018 | On-Going |
| Redfield- 2 | Seek funding to design and build a Safe Room(s) for the community of Redfield. | Tornado | City of Redfield Officials | Low | 2 | Unknown | State / Federal | 2018 | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Redfield- 3 | Conduct a study to determine the efficacy of the existing warning siren system within the Jurisdiction, and repair and install new sirens as needed to ensure area coverage. | Tornado | Local Officials | Medium | 1 | Unknown | Local | 2108 | On-Going |
| Redfield- 4 | Seek funding to design and construct an addition to the fire station to accommodate two new apparatus. | Multi-hazard | City of Redfield Officials | Low | 1 | Unknown | Local / State / Federal | 2108 | On-Going |
| Redfield- 5 | Seek funding for the purchase and installation of a backup power for critical facilities in Redfield. | Multi-hazard | City of Redfield Officials | Low | 1 | Unknown | Local / State / Federal | 2018 | On-Going |
| Uniontown-1 | Identify flood prone areas to consider future flood reduction measures within the City of Uniontown. | Flood | City Officials | High | 1, 2 | Unknown | Local | 12/31/2015 | On-Going |
| Uniontown-2 | Seek funding to complete a stormwater drainage study/plan for the City of Uniontown that will lead to a stormwater management ordinance. | Flood | City Officials / Professional Engineers | High | 1 | Unknown | Local / State / Federal | 12/31/2015 | On-Going |
| Uniontown-3 | Seek funding to perform improvements to minimize flood damage to existing development by maximizing the effectiveness of the storm sewer infrastructure. | Flood | City of Uniontown Officials / Professional Engineer | High | 1 | Unknown | Local / State / Federal | 12/31/2015 | On-Going |
| Uniontown-4 | Conduct a study to determine the efficacy of the existing warning siren system within the Jurisdiction, and repair and install new sirens as needed to ensure area coverage. | Tornado | Local Officials | Medium | 1, 2 | Unknown | Local / State / Federal | 12/31/2015 | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Uniontown-5 | Incorporate the inspection and management of trees into the city's routine maintenance process to remove trees that may pose a threat to people and the infrastructure. | Multi-hazard | City of Uniontown Officials | Medium | 1 | No Cost / Low Cost | Local | 12/31/2015 | On-Going |
| Uniontown-6 | Seek funding to retain an engineer to design a community tornado shelter and apply for grant funding for construction. | Tornado | City of Uniontown Officials | Medium | 2 | Unknown | Local / State / Federal | 12/31/2015 | On-Going |
| Uniontown-7 | Complete recommended repairs to the main drainage channel that runs through the middle of Uniontown as recommended by Agricultural Engineering Associates. | Flood | City of Uniontown Officials | High | 1, 2 | Unknown | Local / State / Federal | 12/31/2015 | On-Going |
| Uniontown-8 | Complete upgrades for the Uniontown wastewater lagoon facility as recommended by Agricultural Engineering Associates dated June 10, 2009. | Flood | City of Uniontown Officials | High | 1, 2 | Unknown | Local / State / Federal | 12/31/2015 | On-Going |
| Fort Scott Community College-1 | Research and pursue funding for the installation of alternative forms of public warning and mass notification systems during inclement weather. | Multi-hazard | Fort Scott Community College Official | Medium | 4 | Unknown | Local / State / Federal | 12/31/2015 | On-Going |
| Fort Scott Community College-2 | Develop and fund mitigation projects for the construction of tornado safe rooms on the campus. | Tornado | Fort Scott Community College Official/ FEMA | Low | 2 | Unknown | Local / State / Federal | 12/31/2015 | On-Going |
| Fort Scott Community College-3 | Seek funding for the purchase and installation of backup power sources for Fort Scott Community College facilities. | Multi-hazard | Fort Scott Community College Official | Low | 1, 2 | Unknown | Local / State / Federal | 12/31/2015 | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| USD 234-1 | Develop and fund mitigation projects for the construction of tornado safe rooms in USD 234 schools. | Tornado | School District Superintendent / State | Low | 2 | Unknown | Local / State / Federal | 2017 | On-Going |
| USD 235-1 | Develop and fund mitigation projects for the construction of tornado safe rooms in USD 235 schools. | Tornado | School District Superintendent / State | Low | 2 | Unknown | Local / State / Federal | 2018 | On-Going |
| USD 235-2 | Seek funding for the purchase and installation of backup power sources in USD 235 facilities. | Multi-hazard | School District Superintendent / FEMA | Low | 2 | Unknown | Local / State / Federal | 2018 | On-Going |

### 5.6.3 CHAUTAUQUA COUNTY

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| County-1 | Expand/Improve outdoor warning sirens | Tornado, Windstorm | Chautauqua County Emergency Manager | High | 2 | Unknown | State of Kansas Grants | On-Going | On-Going |
| County-2 | Public Education: Promote NOAA "All-Hazards" Weather Radios in homes & businesses | All Hazards | Chautauqua County Emergency Manager | High | 3, 4 | Unknown | Local Funding | On-Going | On-Going |
| County-3 | Enhance GIS Capabilities | All Hazards | Chautauqua County Appraiser Office and Emergency Manager | High | 1 | $25,000 | Emergency Management Performance Grant | 6-24 months | On-Going |
| County-4 | Maintain Reverse 911 | All Hazards | Chautauqua County Emergency Manager | High | 4 | Unknown | Grants, Local funds | On-Going | On-Going |
| County-5 | Build safe rooms for Quivira Boy Scout N Ranch | Tornado, Windstorm | Unknown | High | 2 | Unknown | Unknown | Unknown | On-Going |
| County-6 | Homeowner Education on Wildland Urban Interface (WUI) | Wildfire | Kansas Forest Service Officials and local Fire Department Managers | High | 3 | $500 | Kansas Forest Service and federal grants | On-Going | On-Going |
| County-7 | Increase public and fire department training on wildland urban interface fires | Wildfire | Kansas Forest Service Officials | Low | 3 | $30 per student per training session | The Kansas Forest Service, along with its state and federal partners, can assist with providing such training opportunities. | On-Going | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| County-8 | Reduce hazardous fuels in prioritized wildfire risk areas | Wildfire | Kansas Forest Service Officials and the local Fire Department Managers | Low | 1 | Approximately $85/acre for hazardous fuel reduction projects | The Kansas Forest will assist qualifying communities with pursuing federal WUI grant dollars for hazardous fuel reduction projects | On-Going | On-Going |
| Cedar Vale-1 | Construct community storm shelter (saferoom) in accordance with FEMA design standards 361. This would be free-standing shelter for approximately 200 residents during inclement weather. | Wind storms, tornados | City Maintenance Director | Medium | 2 | $150,000 | Hazard Mitigation Grant Program, CDBG, City funds & other sources | 16-24 months | On-Going |
| Cedar Vale-2 | Purchase and install 2 storm sirens | Tornado | City Maintenance Director | High | 2 | $15,000 | FEMA grant funding | 6 months | New |
| Chautauqua-1 | Promote NOAA Weather Radios in homes and businesses | All Hazards | Chautauqua County Emergency Manager | High | 3, 4 | Cost for the purchase of a radio is an individual responsibility. | Local funding | On-Going | Deleted |
| Niotaze-1 | Construct new or retrofit saferoom (storm shelter) in accordance with FEMA design standards 361. This would be free-standing shelter for approximately 100 residents during inclement weather. | Wind Storm & Tornados | City of Niotaze Officials | High | 2 | $66,000 | Hazard Mitigation Grant Program, CDBG, City funds & other sources | 1 year | Deleted |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Peru-1 | The City owns a back-up generator for the City Sewer System to be used when the electricity is out and the sewer system needs to continue to be operational. | Flooding | City Employee | High | 1, 2 | None | City funds | On-Going | On-Going |
| Peru-2 | Install a storm siren on the south side of town | Tornado | City of Peru and Fire Department Managers | High | 2 | $100,000 | Grant funding | Unknown | New |
| Peru-3 | Construct a community storm shelter | Tornado | City of Peru and Fire Department Managers | High | 2 | $3,000,000 | Grant funding | Unknown | New |
| Sedan-1 | NFIP Continued Compliance | Flood | City of Sedan | High | 1 | None | None | On-Going | On-Going |
| Sedan-2 | Purchase portable generator, train employees how to use & hook-up | Flood | City of Sedan Officials | High | 1, 2 | Unknown | City funds, HMGP, CDBG | 6 months | On-Going |
| Sedan-3 | Construct new or retrofit saferoom (storm shelter) in accordance with FEMA design standards 361. These would be shelter for residences and employees during inclement weather. | Tornado, Windstorm | City of Sedan Officials | Medium | 2 | Unknown | Hazard Mitigation Grant Program, CDBG, City funds & other sources | 1 year | On-Going |
| USD 285-1 | Create a community storm shelter within the elementary and/or high school that would be adequate to house all children and faculty at the school. | Tornado, Windstorm | USD 285 Office of Superintendent | Medium | 2 | Unknown | Hazard Mitigation Grant Program, Community Development Block Grant | 2-5 years | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| USD 286-1 | Create a community storm shelter within the elementary and/or high school that would be adequate to house all children and faculty at the school in addition to providing additional sheltering space for the public, especially during sporting events. | Tornado, Windstorm | USD 286 Office of Superintendent | Medium | 2 | Unknown | Hazard Mitigation Grant Program, Community Development Block Grant | 2-5 years | On-Going |
| Caney-1 | Tree and brush removal near power lines | Tornado, Windstorm, Winter Storm | Caney Valley Electric Cooperative Director | Medium | 1 | $200,000 | General Budget Funds | 6 months | On-Going |
| Caney-2 | Upgrade power lines to withstand ice accumulation and windstorms | Tornado, Windstorm, Winter Storm | Caney Valley Electric Cooperative Director | Medium | 1 | Single-phase - $25,000 per mile Three-phase - $40,000 per mile | FEMA, RUS | 6 months | On-Going |
| Caney-3 | Construct tie lines to enable redundant electric service | Tornado, Windstorm, Winter Storms | Caney Valley Electric Cooperative Director | Medium | 1 | Single-phase - $30,000 per mile Three-phase - $50,000 per mile | FEMA & State Hazard Mitigation funds RUS loan funds | 1 year | On-Going |

### 5.6.4 CHEROKEE COUNTY

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Multi-Jurisdictional-1 | Public Education for drought, dam failure, earthquake, extreme heat, hazardous materials, pandemic, thunderstorms, tornadoes, wildfires, winter storms | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-2 | Detention Ponds for farmers within the county | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-3 | Multi-Purpose Public Address and Warning System | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-4 | NOAA Weather Radio Program | Multi-Hazard | - | - | - | - | - | - | Reassigned to County |
| Multi-Jurisdictional-5 | Community Storm Shelters and Hazard Supply Staging Areas | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-6 | Emergency Operations Center/911 Call Center/Community Shelter | Multi-Hazard | - | - | - | - | - | - | Reassigned to County |
| Multi-Jurisdictional-7 | Watershed, Lake, and River Warning Devices | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-8 | Drainage and Storm Water Management Program | Multi-Hazard | - | - | - | - | - | - | Reassigned to County |
| Multi-Jurisdictional-9 | Continue Participation in the National Flood Insurance Program | Flood | - | - | - | - | - | - | Reassigned to County |
| Multi-Jurisdictional-10 | Debris Removal Program | Multi-Hazard | - | - | - | - | - | - | Reassigned to County |
| Multi-Jurisdictional-11 | Floodplain Property Acquisition Program | Flood | - | - | - | - | - | - | Reassigned to County |
| Multi-Jurisdictional-12 | Dredge the watersheds, lakes, and rivers | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-13 | Construct Flood Walls/levies | Multi-Hazard | - | - | - | - | - | - | Deleted |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Multi-Jurisdictional-14 | Tree Trimming and Branch Removal Program | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-15 | Backup Generator for Critical Facilities | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-16 | Individual Backup Generator Program | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-17 | Hazard Event Database | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-18 | Mitigation Tabletop Exercises | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-19 | Emergency Exercise Training | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-20 | County, City, School, and Business Systems Backup | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-21 | Determine, setup, or build animal keep zones for displaced animals after a disaster | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-22 | Develop database and setup voluntary emergency responders in the event of a disaster to respond and assist in search and rescue, evacuations, debris removal, and other emergency services that could be too large for a community to handle at the onset of the event. | Multi-Hazard | - | - | - | - | - | - | Deleted |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Multi-Jurisdictional-23 | Purchase an EM Mobile Unit to serve as a command post during a hazard event. | Multi-Hazard | - | - | - | - | - | - | Reassigned to County |
| Multi-Jurisdictional-24 | Develop a residential assessment team to evaluate residential homes for disaster prevention. | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-25 | Run a water line to a secondary water source for each of the water districts for times of drought to provide water to the public and for fire protection in the communities. | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-26 | Purchase remote weather cameras to view incoming weather events around the county. | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-27 | Amend county and city building codes to strengthen structures on new and existing buildings to reduce the effects of earthquake, high wind, and tornados. | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-28 | Above ground gas pumps for county and city vehicles in times of disasters with a backup generator. | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-29 | Set up cool/heat zones at the county, cities, and school districts where children and families can remove themselves from the cold or heat. | Winter storm and Extreme Heat | - | - | - | - | - | - | Deleted |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Multi-Jurisdictional-30 | Set up outdoor drinking sources at the parks, schools and in the communities where children and adults can re-hydrate themselves. | Extreme heat | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-31 | Provide Fans and Air Conditioners for the poor and the elderly throughout the community. | Extreme Heat | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-32 | Have a hazardous material removal day for the public which will allow them to bring all their hazardous household waste to one location in the communities to dispose of the hazardous materials properly. | Hazardous Materials | - | - | - | - | - | - | Reassigned to County |
| Multi-Jurisdictional-33 | Provide covered sidewalks at city streets and school walkways to reduce the risk of severe thunderstorms and winter storms to the public, and shield students and citizens from hail | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-34 | Provide a surge protector program to reduce the risk of electrical surges from hazard events | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-35 | Strap and bolt down large equipment and furniture at the cities and school facilities to reduce the risk of debris during severe hazard events. | Multi-Hazard | - | - | - | - | - | - | Deleted |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Multi-Jurisdictional-36 | Purchase protective window film for all county, city and school building windows to reduce the risk of airborne debris injuries during extreme hazard events. | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-37 | Purchase lightning detection systems to provide warnings at city parks, camp grounds, and school recreation areas. | Lightning | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-38 | Purchase Pumper Trucks and Fire Equipment | Wildfire and Hazardous Materials | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-39 | Individual Safe Room Program | Tornado and Windstorm | - | - | - | - | - | - | Reassigned to County |
| Multi-Jurisdictional-40 | Purchase equipment and place at locations around the cities and the schools to have hand sanitizer available for use. | Major Disease Outbreak | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-41 | Promote hurricane straps to local contractors and homeowners to reduce the risk of high wind and tornado damages to rooftops. | Tornado and Windstorm | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-42 | Develop a countywide storm shelter and safe room database with latitude and longitude of each individual safe room in the communities | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-43 | Have a communitywide Blanket, Heater and Coat Program to donate items to the poor and the elderly for wintertime. | Winter Storm | - | - | - | - | - | - | Deleted |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Multi-Jurisdictional-44 | Change ordinances to bury electrical lines from the transformer to the house on any new construction. | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-45 | Become Firewise Communities by having each community have a Firewise Plan. | Wildfire | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-46 | Have a Waterline Insulation Program where the poor or elderly could have their waterlines insulated to reduce the risk of pipe breaks during the winter months. | Winter Storm | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-47 | Work with the National Weather Service to hold storm spotter training seminar in the communities or a nearby areas to train interested individuals. | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-48 | Request volunteers from local churches, boy scouts, girl scouts, city staff, and high school students that would shovel snow for the physically handicapped and the elderly in the communities. | Winter Storm | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-49 | Construct snow fences along the highways to reduce the risk of blowing snow build up on the roads. | Winter Storm | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-50 | Conduct presentations and provide handouts to local farmers to explain the benefits to having drought insurance. | Drought | - | - | - | - | - | - | Deleted |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Multi-Jurisdictional-51 | Create a list of farmers willing to assist other farmers in developing irrigation lanes in their crop fields. | Drought and Wildfire | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-52 | Have the rural and city fire departments work with local farmers and land owners to remove wild evergreen trees from their fields. | Wildfire | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-53 | Have the rural and local fire departments work with the State Forestry Service, Kansas State University Extension Office, local farmers, land owners, and home owners to suggest low fuel vegetation seeding to decrease the risk of wildfires in the areas surrounding the outskirts of the communities. | Drought and Wildfire | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-54 | Have local landowners, where farmland meets the urban interface, to have a plowed or rocked zone from the grassland to the area meeting the local community whether it is a fence line or roadway. | Wildfire | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-55 | Have the rural and local fire departments, State Forestry Service, and area farmers conduct controlled burns on highly vegetative fields to reduce the threat of wildfires. | Drought and Wildfire | - | - | - | - | - | - | Deleted |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Multi-Jurisdictional-56 | Construct a hazardous materials dump depot for area residents to rid their households of hazardous waste. | Hazardous Materials | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-57 | Purchase storm shelter beacons through grant programs and donations to provide a distress signal when people are trapped in area shelters after a disaster. | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-58 | Purchase a reverse 911 system for the community. | Multi-Hazard | - | - | - | - | - | - | Deleted |
| County-1 | Create additional acceptable community storm shelters | Tornado and Windstorm | Emergency Manager | High | 2 | $800,000 | Unknown | 1-2 years | New |
| County-2 | Acquire outdoor tornado warning for county | Tornado | Emergency Manager | High | 2 | $250,000 | Unknown | 1 year | New |
| County-3 | Acquire audio/visual emergency communications notification systems for interior and exterior of school grounds | All Hazards | School District Administrators | Medium | 1, 4 | $300,000 | Unknown | 2 years | New |
| County-4 | Implement program for promoting the purchase of NOAA weather radios | All Hazards | Emergency Manager | Medium | 3, 4 | $250,000 | Unknown | 1 year | New |
| County-5 | Acquire and conduct structural remediation of flood prone properties | Flood | Flood Plain Administrator | Medium | 1, 2 | $750,000 | Unknown | 4-5 years | New |
| County-6 | Community Storm Shelters and Hazard Supply Staging Areas | Multi-Hazard | Hazard Mitigation Committee, Emergency Managers | Medium | 2, 3 | $200,000 to $500,000 per shelter | HMGP Grant, PDM Grant, county and city budgets, and other possible grant funding | 1-3 years | New |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| County-7 | NOAA Weather Radio Program | Multi-Hazard | Hazard Mitigation Committee, Emergency Managers and School Administrators | Medium | 3, 4 | No cost to county, cities, or schools. Residents will cover the 25% match. | HMGP Grant, PDM Grant, county and city budgets, and other possible grant funding | 1-3 years | On-Going |
| County-8 | Emergency Operations Center/911 Call Center/Community Shelter | Multi-Hazard | Hazard Mitigation Committee, Emergency Managers | Medium | 2, 3, 4 | $200,000 to $500,000 per shelter | HMGP Grant, PDM Grant, county and city budgets, and other possible grant funding | 1-5 years | On-Going |
| County-9 | Drainage and Storm Water Management Program | Multi-Hazard | Hazard Mitigation Committee, Emergency Managers | Medium | 1 | $3,000,000 | HMGP Grant, PDM Grant, county and city budgets, and other possible grant funding | 3-5 years | On-Going |
| County-10 | Continue Participation in the National Flood Insurance Program | Flood | Hazard Mitigation Committee, Emergency Managers | Medium | 1 | Staff Time | City and County Budget | 1-3 years | On-Going |
| County-11 | Debris Removal Program | Multi-Hazard | Hazard Mitigation Committee, Emergency Managers | Medium | 1, 2 | Staff Time and Equipment Usage | HMGP Grant, PDM Grant, county and city budgets, and other possible grant funding | 1-3 years | On-Going |
| County-12 | Floodplain Property Acquisition Program | Flood | Hazard Mitigation Committee, Emergency Managers | Medium | 1 | $60,000 per property | HMGP Grant, PDM Grant, county and city budgets, and other possible grant funding | 1-3 years | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| County-13 | Purchase an EM Mobile Unit to serve as a command post during a hazard event. | Multi-Hazard | Hazard Mitigation Committee, Emergency Managers | Medium | 1, 2 | $50,000 | HMGP Grant, PDM Grant, county and city budgets, and other possible grant funding | 3-5 years | On-Going |
| County-14 | Have a hazardous material removal day for the public which will allow them to bring all their hazardous household waste to one location in the communities to dispose of the hazardous materials properly. | Hazardous Materials | Hazard Mitigation Committee, Emergency Managers | Medium | 1 | $20,000 | HMGP Grant, PDM Grant, county and city budgets, and other possible grant funding | 3-5 years | On-Going |
| County-15 | Individual Safe Room Program | Tornado and Windstorm | Hazard Mitigation Committee, Emergency Managers | Medium | 2 | Staff Time | HMGP Grant, PDM Grant, county and city budgets, and other possible grant funding | 3-5 years | On-Going |
| Baxter-1 | Community Storm Shelters and Hazard Supply Staging Areas | Multi-Hazard | Hazard Mitigation Committee, Emergency Managers | Medium | 2 | $200,000 to $500,000 per shelter | HMGP Grant, PDM Grant, county and city budgets, and other possible grant funding | 1-3 years | New |
| Columbus-1 | Community Storm Shelters and Hazard Supply Staging Areas | Multi-Hazard | Hazard Mitigation Committee, Emergency Managers | Medium | 2 | $200,000 to $500,000 per shelter | HMGP Grant, PDM Grant, county and city budgets, and other possible grant funding | 1-3 years | New |
| Galena-1 | Construct a Community Storm Shelter | Tornado | Emergency Managers | Medium | 2 | $300,000 | HMGP Grant, PDM Grant, other possible grant funding | 5 to 10 years | New |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Roseland-1 | Community Storm Shelters and Hazard Supply Staging Areas | Multi-Hazard | Hazard Mitigation Committee, Emergency Managers | Medium | 2 | $200,000 to $500,000 per shelter | HMGP Grant, PDM Grant, county and city budgets, and other possible grant funding | 1-3 years | New |
| Scammon-1 | Community Storm Shelters and Hazard Supply Staging Areas | Multi-Hazard | Hazard Mitigation Committee, Emergency Managers | Medium | 2 | $200,000 to $500,000 per shelter | HMGP Grant, PDM Grant, county and city budgets, and other possible grant funding | 1-3 years | New |
| Treece-1 | Community Storm Shelters and Hazard Supply Staging Areas | Multi-Hazard | Hazard Mitigation Committee, Emergency Managers | Medium | 2 | $200,000 to $500,000 per shelter | HMGP Grant, PDM Grant, county and city budgets, and other funding | 1-3 years | New |
| Weir-1 | Upgrade and improve stormwater management system on Main Street | Flood | City Clerk, Mayor, Council | High | 1, 2 | $500,000 to $700,000 | Unknown | 6 months | New |
| Weir-2 | Create a saferoom or shelter at a school or public building | Tornado | City Clerk, Mayor | High | 2 | $300,000 to $400,000 | Grant funding and in-kind donations | 1-2 years | New |
| West Mineral-1 | Community Storm Shelters and Hazard Supply Staging Areas | Multi-Hazard | Hazard Mitigation Committee, Emergency Managers | Medium | 2 | $200,000 to $500,000 per shelter | HMGP Grant, PDM Grant, county and city budgets, and other possible grant funding | 1-3 years | New |
| USD404-1 | Community Storm Shelters and Hazard Supply Staging Areas | Multi-Hazard | Hazard Mitigation Committee, Emergency Managers | Medium | 2 | $200,000 to $500,000 per shelter | HMGP Grant, PDM Grant, county and city budgets, and other possible grant funding | 1-3 years | New |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| USD493-1 | Community Storm Shelters and Hazard Supply Staging Areas | Multi-Hazard | Hazard Mitigation Committee, Emergency Managers | Medium | 2 | $200,000 to $500,000 per shelter | HMGP Grant, PDM Grant, county and city budgets, and other possible grant funding | 1-3 years | New |
| USD 493 Columbus-1 | Create safe rooms in existing facilities | Tornado | District Superintendent | High | 2 | Unknown | Unknown | 1 year | New |
| USD 493 Columbus-2 | Create storm shelter at schools | Tornado | District Superintendent | High | 2 | Unknown | Unknown | 1 year | New |
| USD 493 Columbus-2 | Create storm shelter for residents | Tornado | District Superintendent | High | 2 | Unknown | Unknown | 1 year | New |
| USD499-1 | Community Storm Shelters and Hazard Supply Staging Areas | Multi-Hazard | Hazard Mitigation Committee, Emergency Managers | Medium | 2 | $200,000 to $500,000 per shelter | HMGP Grant, PDM Grant, county and city budgets, and other possible grant funding | 1-3 years | New |
| USD508-1 | Community Storm Shelters and Hazard Supply Staging Areas | Multi-Hazard | Hazard Mitigation Committee, Emergency Managers | Medium | 2 | $200,000 to $500,000 per shelter | HMGP Grant, PDM Grant, county and city budgets, and other possible grant funding | 1-3 years | New |
| Heartland-1 | Upgrade and Enhanced Power lines | Multi-Hazard | Heartland REC Director | Medium | 1 | $1,160,000 | HMGP Grant, PDM Grant, county and city budgets, and other possible grant funding, Heartland REC | 4 years | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Oswego Community Hospital-1 | Replace Emergency generators | Multi-Hazard | CEO | High | 1, 2 | Unknown | Federal grants | 2020 | New |
| Oswego Community Hospital-2 | Construct safe rooms and/or storm shelters | Tornados, Windstorms | CEO | High | 1, 2 | Unknown | Federal grants | 2020 | New |
| RWD#1-1 | Backup Generator for Critical Facilities | Multi-Hazard | Hazard Mitigation Committee, Emergency Managers | Medium | 1, 2 | $10,000 to $15,000 per unit | HMGP Grant, PDM Grant, county and city budgets, and other possible grant funding | 1-3 years | New |
| RWD#2-1 | Backup Generator for Critical Facilities | Multi-Hazard | Hazard Mitigation Committee, Emergency Managers | Medium | 1, 2 | $10,000 to $15,000 per unit | HMGP Grant, PDM Grant, county and city budgets, and other possible grant funding | 1-3 years | New |
| RWD#3-1 | Backup Generator for Critical Facilities | Multi-Hazard | Hazard Mitigation Committee, Emergency Managers | Medium | 1, 2 | $10,000 to $15,000 per unit | HMGP Grant, PDM Grant, county and city budgets, and other possible grant funding | 1-3 years | New |
| RWD#4-1 | Backup Generator for Critical Facilities | Multi-Hazard | Hazard Mitigation Committee, Emergency Managers | Medium | 1, 2 | $10,000 to $15,000 per unit | HMGP Grant, PDM Grant, county and city budgets, and other funding | 1-3 years | New |
| RWD#5-1 | Backup Generator for Critical Facilities | Multi-Hazard | Hazard Mitigation Committee, Emergency Managers | Medium | 1, 2 | $10,000 to $15,000 per unit | HMGP Grant, PDM Grant, county and city budgets, and other possible grant funding | 1-3 years | New |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| RWD#7-1 | Acquire permanent generator for RWD#7 | Utility Failure | RWD#7 | High | 1, 2 | $20,000 | Unknown | 6 months | New |
| RWD#7-2 | Replace water lines that are deteriorating or too small | Utility Failure | RWD#7 | Medium | 1 | $100,000 | Unknown | 1-2 years | New |
| RWD#8-1 | Backup Generator for Critical Facilities | Multi-Hazard | Hazard Mitigation Committee, Emergency Managers | Medium | 1, 2 | $10,000 to $15,000 per unit | HMGP Grant, PDM Grant, county and city budgets, and other possible grant funding | 1-3 years | New |
| RWD#9-1 | Backup Generator for Critical Facilities | Multi-Hazard | Hazard Mitigation Committee, Emergency Managers | Medium | 1, 2 | $10,000 to $15,000 per unit | HMGP Grant, PDM Grant, county and city budgets, and other possible grant funding | 1-3 years | New |
| RWD#19-1 | Backup Generator for Critical Facilities | Multi-Hazard | Hazard Mitigation Committee, Emergency Managers | Medium | 1, 2 | $10,000 to $15,000 per unit | HMGP Grant, PDM Grant, county and city budgets, and other possible grant funding | 1-3 years | New |

### 5.6.5 CRAWFORD COUNTY

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| County-1 | Identify and clearly mark evacuation routes | Dam and Levee Failure, Flood and Winter Storm | Crawford County Council | High | 2 | Unknown | Unknown | 2014 | On-Going |
| County-2 | Acquire Light Detection and Ranging (LIDAR) mapping system to assist with flood control projects. | Multi-Hazard | Crawford County Council | High | 2 | $210,000 | Unknown | Unknown | Completed |
| County-3 | Construct communication "huts" at three strategically placed locations throughout Crawford County. | Multi-Hazard | Crawford County Council | High | 3 | $280,000 | Unknown | 2015 | On-Going |
| County-4 | Develop and implement a local hazard training plan. | Multi-Hazard | Crawford County Council | High | 3 | Unknown | Unknown | 2016 | On-Going |
| County-5 | Create additional acceptable community storm shelters for residents | Extreme Temperature, Flood, Tornado | Crawford County Council | High | 2 | $250,000 per shelter | Unknown | On-Going | On-Going |
| County-6 | Acquire or conduct structural remediation of flood-prone properties in the Kirkwood area. | Flood | Crawford County Council | High | 1 | $208,000 | Unknown | On-Going | On-Going |
| County-7 | Study and implement drainage issued throughout the county in flood prone areas, and make recommendations for flood control measures, flood management procedures, and low-water crossing improvements. | Flood | Crawford County Council | High | 1 | $210,000 | Unknown | On-Going | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| County-8 | Support a program to replace existing overhead primary electric lines to underground | Tornado, Wind Storm, Winter Storm, Utility Failure | Crawford County Council | Medium | 1 | $175,000 | Unknown | 2015 | On-Going |
| County-9 | Identify and seek additional methods of financial and technical assistance for hazard mitigation projects. | Multi-Hazard | Crawford County Council | Medium | 1, 2, 3, 4 | Staff Time | Unknown | 2015 | On-Going |
| County-10 | Create a storm shelter / saferoom at the Crawford County Ambulance buildings in Girard and Pittsburg. | Extreme Temperature, Flood, Tornado, Winter Storm, Utility Failure | Crawford County Council | Medium | 2 | $5,000 per facility | Unknown | Unknown | Complete |
| County-11 | Create a storm shelter / saferoom at the Crawford County Mental Health Main Campus at 30th and Michigan. | Extreme Temperature, Flood, Tornado, Winter Storm, Utility Failure | Crawford County Council | Low | 2 | $100,000 | Unknown | Unknown | Complete |
| County-12 | Create a storm shelter / saferoom at the Crawford County Mental Health Discovery Center at 5th and Elm. | Extreme Temperature, Flood, Tornado, Winter Storm, Utility Failure | Crawford County Council | Low | 2 | $100,000 | Unknown | Unknown | On-Going |
| County-13 | Acquire outdoor warning systems and other early warning devices for unincorporated areas such as Farlington, Farlington Lake, Croweburg, Ringo, Opolis, West 4th street mobile home park, and Langdon Lane rural areas. | Tornado | Crawford County Council | Low | 2 | $35,000 per Siren | Unknown | Unknown | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| County-14 | Reverse 911 System | Multi-Hazard | Crawford County 911 Director | Medium | 4 | $40,000 | Unknown | 2015 | New |
| County-15 | Vulnerable population support | Multi-Hazard | Crawford County Emergency Management | Medium | 3 | $5,000 | Unknown | 2015 | New |
| County-16 | Purchasing salt and materials to prepare for winter storm | Winter Storm | Crawford County Road and Bridge Director | Medium | 1 | Unknown | Unknown | 2015 | New |
| County-17 | Installing a generator and transfer switch at the court house | Multi-Hazard | Crawford County Council | Medium | 1 | $100,000 | Unknown | 2105 | New |
| County-18 | Incorporate Hazard Mitigation Plan into existing County Comprehensive Plan | Multi-Hazard | Crawford County Council | - | - | - | - | - | Deleted |
| County-19 | Identify critical facilities that are vulnerable to natural and man-made hazards. | Multi-Hazard | Crawford County Council | High | 1 | Unknown | Unknown | 2014 | On-Going |
| County-20 | Upgrade and enhance power lines to endure ice and wind conditions and provide back-up power between substations. | Tornado, Wind Storm, Winter Storm, Utility Failure | County Public Works Director | High | 1 | $1,803,000 | Unknown | Unknown | Completed |
| Arcadia-1 | Continue to participate in the National Flood Insurance Program. | Flood | Arcadia Council | High | 1 | Staff Time | Unknown | On-Going | On-Going |
| Arcadia-2 | Support an electric power upgrade program designed to protect lines including tree trimming and pole replacement. | Tornado, Wind Storm, Winter Storm, Utility Failure | Arcadia Council | High | 1 | Unknown | Unknown | On-Going | On-Going |
| Arcadia-3 | Update flood damage prevention ordinance to include new FEMA digital flood insurance rate maps. | Flood | Arcadia Council | High | 1 | Staff Time | Unknown | Unknown | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Arcadia-4 | Provide additional support to the Community Rating System to raise the rating to the next level. | Flood | Arcadia Council | Medium | 1 | Staff Time | Unknown | Unknown | On-Going |
| Arma-1 | Identify and clearly mark evacuation routes | Dam and Levee Failure, Flood and Winter Storm | Arma Council | High | 2 | Unknown | Unknown | 2014 | On-Going |
| Arma-2 | Develop and implement a local hazard training plan. | Multi-Hazard | Arma Council | High | 3 | Unknown | Unknown | 2016 | On-Going |
| Arma-3 | Create additional acceptable community storm shelters for residents | Extreme Temperature, Flood, Tornado | Arma Council | High | 2 | $250,000 per shelter | Unknown | On-Going | On-Going |
| Arma-4 | Support a program to replace existing overhead primary electric lines to underground | Tornado, Wind Storm, Winter Storm, Utility Failure | Arma Council | Medium | 1 | $175,000 | Unknown | 2015 | On-Going |
| Arma-5 | Identify and seek additional methods of financial and technical assistance for hazard mitigation projects. | Multi-Hazard | Arma Council | Medium | 1, 2, 3, 4 | Staff Time | Unknown | 2015 | On-Going |
| Arma-6 | Update flood damage prevention ordinance to include new FEMA digital flood insurance rate maps. | Flood | Arma Council | Medium | 1 | Staff Time | Unknown | Unknown | On-Going |
| Arma-6 | Provide additional support to the Community Rating System to raise the rating. | Flood | Arma Council | Medium | 1 | Staff Time | Unknown | Unknown | On-Going |
| Arma-7 | Identify critical facilities that are vulnerable to natural and man-made hazards. | Multi-Hazard | Arma Council | High | 1 | Unknown | Unknown | 2014 | On-Going |
| Arma-8 | Install 2 additional tornado sires in southern part of city | Tornado | Arma City Council and Mayor | High | 2 | $80,000 | Unknown | 2014 | New |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Arma-9 | Continue to participate in the National Flood Insurance Program. | Flood | Arma Council | High | 1 | Staff Time | Unknown | On-Going | On-Going |
| Cherokee-1 | Acquire outdoor tornado warning sirens for the City of Cherokee | Tornado | City Cherokee Council | Medium | 2 | $17,000 | Unknown | Unknown | Completed |
| Cherokee-2 | Create additional acceptable storm shelters within the City of Cherokee | Tornado | City Cherokee Council | Medium | 2 | $250,000 | Unknown | Unknown | Completed |
| Crawford Health-1 | Develop an awareness plan to educate people about the dangers of naturally-occurring diseases, such as influenza and vaccine-preventable diseases. | Major Disease | Crawford County Public Health Director | High | 3 | Staff Time | Unknown | Unknown | On-Going |
| Frontenac-1 | Update flood damage prevention ordinance to include new FEMA digital flood insurance rate maps. | Flood | Frontenac Council | Medium | 1 | Staff Time | Unknown | Unknown | On-Going |
| Frontenac-2 | Provide additional support to the Community Rating System to raise the rating to the next level. | Flood | Frontenac Council | Medium | 1 | Staff Time | Unknown | Unknown | On-Going |
| Frontenac-3 | Improve channel flow characteristics and eliminate obstructions to identified areas on Cow Creek. | Flood | Frontenac Council | High | 1 | $12,000 | Unknown | 2014 | On-Going |
| Frontenac-4 | Continue to participate in the National Flood Insurance Program. | Flood | Frontenac Council | High | 1 | Staff Time | Unknown | On-Going | On-Going |
| Girard-1 | Continue to participate in the National Flood Insurance Program. | Flood | Girard Council | High | 1 | Staff Time | Unknown | On-Going | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Girard-2 | Acquire and install a permanently mounted emergency generator for the Crawford County courthouse. | Utility Failure | Girard Council | High | 1, 2 | $90,000 | Unknown | 2015 | On-Going |
| Girard-3 | Acquire /construct a building in Girard that can be used as a community building and as a long term shelter for major disasters | Tornado, Winter Storm, Utility Failure, Flood | Girard Council | High | 2 | $160,000 | Unknown | Unknown | Completed |
| Girard-4 | Update flood damage prevention ordinance to include new FEMA digital flood insurance rate maps. | Flood | Girard Council | Medium | 1 | Staff Time | Unknown | Unknown | On-Going |
| Girard-5 | Provide additional support to the Community Rating System to raise the rating to the next level. | Flood | Girard Council | Medium | 1 | Staff Time | Unknown | Unknown | On-Going |
| Grant Township-1 | Support a program to replace existing overhead primary electric lines to underground | Tornado, Wind Storm, Winter Storm, Utility Failure | Grant Township Personnel | Medium | 1 | $175,000 | Unknown | 2015 | On-Going |
| McCune-1 | Acquire outdoor tornado warning sirens for the Croweburg area. | Tornado | McCune Council | High | 2 | $40,000 | Unknown | 2015 | On-Going |
| Mulberry-1 | Create additional acceptable community storm shelters for residents | Extreme Temperature, Flood, Tornado | Mulberry Council | High | 2 | $250,000 per shelter | Unknown | On-Going | On-Going |
| Mulberry-2 | Renovate the existing fire department building to include a community storm shelter / safe room in Mulberry Kansas. | Tornado, Winter Storm, Winter Storm, Utility Failure | Mulberry Council | - | - | -n | - | - | Deleted |
| Osage Township-1 | Acquire outdoor tornado warning sirens for the Croweburg area. | Tornado | Osage Township Director | High | 2 | $40,000 | Unknown | 2015 | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Pittsburg-1 | Continue to participate in the National Flood Insurance Program. | Flood | Pittsburg Council | High | 1 | Staff Time | Unknown | On-Going | On-Going |
| Pittsburg-2 | Update flood damage prevention ordinance to include new FEMA digital flood insurance rate maps. | Flood | Pittsburg Council | Medium | 1 | Staff Time | Unknown | Unknown | On-Going |
| Pittsburg-3 | Provide additional support to the Community Rating System to raise the rating to the next level. | Flood | Pittsburg Council | Medium | 1 | Staff Time | Unknown | Unknown | On-Going |
| Pittsburg-4 | Create additional acceptable community storm shelters for residents | Tornado | City of Pittsburg Council | High | 2 | Unknown | Unknown | 5-10 years | New |
| Sheridan Township-1 | Construction of storm shelter with a back-up generator for residents of Sheridan township. | Tornado, Winter Storm | Sheridan Township Personnel | Medium | 1, 2 | Unknown | Unknown | 2014 | On-Going |
| Sherman Township-1 | Enhance a planned structure in Sherman Township with an upgrade to a basement that could be used as a FEMA storm shelter | Tornado | Sherman Township Personnel | Medium | 2 | $150,000 | Unknown | Unknown | On-Going |
| Sherman Township-2 | Acquire outdoor warning systems and other early warning devices for unincorporated areas such as Farlington, Farlington Lake, Croweburg, Ringo, Opolis, West 4th street mobile home park, and Langdon Lane rural areas. | Tornado | Sherman Township Personnel | Low | 2 | $35,000 per Siren | Unknown | Unknown | Completed |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| PSU-1 | Reduce the damage from flooding in University buildings by evaluating storm and sanitary sewers and prioritizing repairs on University grounds. | Flood | Pittsburg State University Chancellor | High | 1 | $2,000,000 | Unknown | 2015 | On-Going |
| PSU-2 | Acquire and install emergency generators for buildings prioritized on building usage for University grounds. | Utility Failure | Pittsburg State University Chancellor | High | 1, 2 | $500,000 | Unknown | 2015 | On-Going |
| PSU-3 | Evaluate cost effective solutions to assure protection of electrical and building systems during lightning storms. | Utility Failure, Lightning | Pittsburg State University Chancellor | High | 1 | $200,000 | Unknown | 2017 | On-Going |
| PSU-4 | Acquire audio and visual emergency communication and notification systems for interior and exterior of University grounds. | Multi-Hazard | Pittsburg State University Chancellor | High | 4 | $250,000 | Unknown | Unknown | Completed |
| PSU-5 | Evaluate existing buildings for safe areas from severe weather, and prioritize replacements and upgrades to existing facilities. | Tornado, Winter Storm, Flood, Extreme Temperature | Pittsburg State University Chancellor | High | 1, 2 | $500,000 | Unknown | Unknown | Completed |
| USD 246-1 | Create additional acceptable community storm shelters for residents | Extreme Temperature, Flood, Tornado | USD 246 Superintendant | High | 2 | $250,000 per shelter | Unknown | On-Going | On-Going |
| USD 246-2 | Evaluate existing buildings for safe areas from severe weather, and prioritize replacements and upgrades to existing facilities. | Tornado, Winter Storm, Flood, Extreme Temperature | USD 246 Superintendant | High | 1,2 | $500,000 | Unknown | Unknown | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| USD 246-3 | Acquire a permanent back-up generator for the USD 246 High School | Tornado, Winter Storm, Flood, Utility Failure, Lightning | USD 246 Superintendant | - | - | - | - | - | Deleted |
| USD 247-1 | Identify and clearly mark evacuation routes | Dam and Levee Failure, Flood and Winter Storm | USD 247 Superintendant | Medium | 2 | Unknown | Unknown | 2014 | On-Going |
| USD 248-1 | Conduct regular emergency preparedness drills for school children at all levels, including tornado drills, and fire evacuation drills. | Tornado, Wildfire, | USD 248 Superintendant | High | 3 | Staff Time | Unknown | Unknown | On-Going |
| USD 249-1 | Conduct regular emergency preparedness drills for school children at all levels, including tornado drills, and fire evacuation drills. | Multi-Hazard | USD 249 Superintendant | High | 3 | Staff Time | Unknown | Unknown | On-Going |
| USD 250-1 | Acquire audio and visual emergency communication and notification systems. | Multi-Hazard | USD 250 Superintendant | High | 4 | $250,000 | Unknown | Unknown | Complete |
| USD 250-2 | Create additional acceptable community storm shelters for residents | Extreme Temperature, Flood, Tornado | USD 250 Superintendant | High | 2 | $250,000 per shelter | Unknown | On-Going | On-Going |
| USD 609-1 | Create additional acceptable community storm shelters for residents | Extreme Temperature, Flood, Tornado | USD 609 Superintendant | High | 2 | $250,000 per shelter | Unknown | On-Going | On-Going |
| Ft Scott Comm Coll-1 | Develop and implement a local hazard training plan. | Multi-Hazard | Ft. Scott Community College Director | High | 3 | Unknown | Unknown | 2016 | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| RWD #2-1 | Improve coordination, planning, and investment in long-term water supplies to meet demands of ongoing growth and development. | Flood and Drought | RWD #2 Director | Low | 1, 3 | Staff Time | Unknown | Unknown | On-Going |
| RWD #3-1 | Replace water lines in jeopardy of being damaged due to expansive soils. | Expansive Soil | RWD #3 Director | Low | 1 | $10,000 | Unknown | Unknown | On-Going |
| RWD#3-1 | Acquire a permanent back-up generator for the Rural Water District #3 water plant. | Tornado, Winter Storm, Utility Failure, Flood, Lightning | RWD #3 Director | High | 1, 2 | $20,000 | Unknown | Unknown | Completed |
| RWD#5-1 | Acquire a series of variable speed pumps to assure the ability to supply water during natural and man-made disasters. | Flood, Winter Storm, Tornado, Lightning | RWD #5 Director | High | 1, 2 | $120,000 | Unknown | 2014 | On-Going |
| RWD#7-1 | Increase size of water lines from 3" to 6" for fire department | All hazards | RWD #7 Director | Medium | 1, 2 | $100,000 | Unknown | 2015 | New |
| Fire District #1-1 | Acquire permanent emergency generator power for local fire stations. | Tornado, Winter Storm, Flood, Utility Failure, Extreme Temperature | Fire District #1 Chief | High | 1, 2 | $55,000 | Unknown | 2013 | On-Going |
| Fire District #1-2 | Provide homeowner education on wildfire mitigation in wildland-urban interface | Wildfire | Kansas Forest Service and Local Fire Department Chiefs | Medium | 3 | $500 per session | Unknown | 2015 | On-Going |
| Fire District #1-3 | Increase public and fire department training on wildland-urban interface fires. | Wildfire | Kansas Forest Service and Local Fire Department Chiefs | Medium | 3 | $30 per student | Unknown | 2014 | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Fire District #1-4 | Reduce hazardous fuel loads in prioritized wildfire risk areas. | Wildfire | Kansas Forest Service and Local Fire Department Chiefs | Medium | 1 | $85 per acre | Unknown | Unknown | On-Going |
| Fire District #2-1 | Create additional acceptable community storm shelters for residents | Extreme Temperature, Flood, Tornado | Fire District #2 Chief | High | 2 | $250,000 per shelter | Unknown | On-Going | On-Going |
| Fire District #2-2 | Provide homeowner education on wildfire mitigation in wildland-urban interface | Wildfire | Kansas Forest Service and Local Fire Department Chiefs | Medium | 3 | $500 per session | Unknown | 2015 | On-Going |
| Fire District #2-3 | Increase public and fire department training on wildland-urban interface fires. | Wildfire | Kansas Forest Service and Local Fire Department Chiefs | Medium | 3 | $30 per student | Unknown | 2014 | On-Going |
| Fire District #2-4 | Reduce hazardous fuel loads in prioritized wildfire risk areas. | Wildfire | Kansas Forest Service and Local Fire Department Chiefs | Medium | 1 | $85 per acre | Unknown | Unknown | On-Going |
| Fire District #3-1 | Construction of storm shelter with a back-up generator for residents of Sheridan township. | Tornado, Winter Storm | Fire Dist #3 Chief | Medium | 2 | Unknown | Unknown | 2014 | On-Going |
| Fire District #3-2 | Provide homeowner education on wildfire mitigation in wildland-urban interface | Wildfire | Kansas Forest Service and Local Fire Department Chiefs | Medium | 3 | $500 per session | Unknown | 2015 | On-Going |
| Fire District #3-3 | Increase public and fire department training on wildland-urban interface fires. | Wildfire | Kansas Forest Service and Local Fire Department Chiefs | Medium | 3 | $30 per student | Unknown | 2014 | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Fire District #3-4 | Reduce hazardous fuel loads in prioritized wildfire risk areas. | Wildfire | Kansas Forest Service and Local Fire Department Chiefs | Medium | 1 | $85 per acre | Unknown | Unknown | On-Going |
| Fire District #4-1 | Acquire and install a permanently mounted emergency generator for the Crawford County courthouse. | Utility Failure | Fire District #4 Chief | High | 2 | $90,000 | Unknown | 2015 | On-Going |
| Fire District #4-2 | Develop a program or system for supporting vulnerable populations during emergency events. | Multi-Hazard | Fire District #4 Chief | High | 3 | Staff Time | Unknown | Unknown | On-Going |
| Fire District #4-3 | Provide homeowner education on wildfire mitigation in wildland-urban interface | Wildfire | Kansas Forest Service and Local Fire Department Chiefs | Medium | 3 | $500 per session | Unknown | 2015 | On-Going |
| Fire District #4-4 | Increase public and fire department training on wildland-urban interface fires. | Wildfire | Kansas Forest Service and Local Fire Department Chiefs | Medium | 3 | $30 per student | Unknown | 2014 | On-Going |
| Fire District #4-5 | Reduce hazardous fuel loads in prioritized wildfire risk areas. | Wildfire | Kansas Forest Service and Local Fire Department Chiefs | Medium | 1 | $85 per acre | Unknown | Unknown | On-Going |
| Girard Medical Center-1 | Install a safe room | Tornado | Engineering Supervisor | High | 1, 2 | Unknown | Unknown | Unknown | New |
| Salvation Army-1 | Purchase storage facility disaster vehicles | All Hazards | Captain | High | 1, 2 | Unknown | FEMA grants | 2015 | New |
| Salvation Army-2 | Purchase generators for facilities | All Hazards | Captain | High | 1, 2 | Unknown | FEMA grants | 2015 | New |

### 5.6.6 ELK COUNTY

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Multi-1 | Reduce hazardous fuels in prioritized wildfire risk areas | Wildfire | - | - | - | - | - | - | Reassigned to County |
| County-1 | Update culverts and bridges to address flooding issues | flooding | Elk County Road and Bridge Director | High | 1 | $200,000 | HMGP, County funds | 3-5 years | On-Going |
| County-2 | Generator for County courthouse | Winter Storm, Tornado, Utility/Infrastructure Failure, Windstorm, Flood, Lightning | Elk County Maintenance Director | High | 1,2 | $75,000 | HMGP, county budget, donations | 3-5 years | On-Going |
| County-3 | Implement reverse 911 warning system | All hazards | Elk County Sheriff | Medium | 1,3,4 | $100,000 | HMGP, KDEM, and local funds | 2 years | Complete |
| County-4 | Testing weather alert systems and public education | All hazards | Elk County Sheriff | Medium | 1,3,4 | $150 | City and county budgets | 1 year | On-Going |
| County-5 | Continued Compliance with NFIP and public education | flooding | Elk County Emergency Manager, Floodplain Administrator | Low | 1,2,3,4 | $500 | Local | On-Going | On-Going |
| County-6 | Additional Storm Spotters and NOAA Weather Radios for residents | All hazards | Elk County Emergency Manager, Floodplain Administrator | Medium | 3 | $2,000 | Grants, funds from businesses | 1 year and On-Going | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| County-7 | Promote Crop Insurance and Private Hazard Insurance | All hazards | Elk County Emergency Manager and Rolling Prairie Extension Director | Low | 3 | None | County budget for staff time | 1 year and On-Going | On-Going |
| County-8 | Obtain inundation maps and emergency action plans for all high and significant hazard dams in the county | Dam and levee failure | Elk County Emergency Manager | Low | 1, 2, 3,4 | Unknown | County Budget for staff time, State Conservation District | 1 year | On-Going |
| County-9 | Reduce hazardous fuels in prioritized wildfire risk areas | Wildfire | Kansas Forest Service Personnel and the Local Fire Department Managers | Low | 1 | $85 per acre | The Kansas Forest will assist qualifying communities with pursuing federal WUI grant dollars for hazardous fuel reduction | On-Going | New |
| County-10 | Update or replace water and sewer infrastructure throughout county | Utility/ Infrastructure Failure | Emergency Manager | High | 1, 2 | Unknown | CDBG, local funding | 2020 | New |
| Grenola-1 | Continue to participate in the NFIP | Flooding | City of Grenola Personnel | Low | 1 | None | None | On-Going | On-Going |
| Grenola-2 | Continue to test weather alert sirens | All hazards | Grenola City Council, Fire Department Personnel | Medium | 1, 3, 4 | None | None | On-Going | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Grenola-3 | Provide NOAA Weather Radios to citizens | All hazards | City of Grenola Personnel, County Emergency Manager | Medium | 1, 3, 4 | $45 for each weather radio @200 hours | HMGP, fund raiser | 1 year | On-Going |
| Grenola-4 | Construct Saferooms/public shelters in Grenola | Winter Storm, Tornado, Utility/Infrastructure Failure, Windstorm, Flood, Extreme Temperature | City of Grenola | High | 2 | $150,000 | HMGP, other grants, private donations | 6 months to 1 year | On-Going |
| Grenola-5 | Verify and/or establish mutual aid agreements | All hazards | Grenola Fire Department Personnel | Low | 1, 4 | None | None | 1 month | Completed |
| Grenola-6 | Establish first responder departments | All hazards | Grenola Fire Department Personnel | Medium | 1,2 | TBD | FEMA HMGP, homeland security grants, health services grants, private donations | 6 months to 1 year | Completed |
| Grenola-7 | Obtain facilities, equipment, and training for disaster response | All hazards | Grenola Fire Department Personnel | Medium | 1, 2, 3 | TBD | FEMA HMGP, homeland security grants, forestry grants, private donations | TBD | On-Going |
| Grenola-8 | Replace culverts | Flood | Grenola Public Works Director | Medium | 1, 2 | Unknown | Unknown | Unknown | New |
| Howard-1 | Construct above ground saferooms in Howard | Tornado, windstorm | City of Howard Council | High | 2 | $195,000 | HMGP | 2-3 years | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Howard-2 | Install generator at Cox Building | winter storm, tornado, utility/infrastructure failure, windstorm, flood, lightning | City of Howard Council | High | 1,2 | $208,000 | HMGP, fund raisers, donations | 4 years | On-Going |
| Howard-3 | Update existing outdoor warning sirens | Tornado, windstorm | Howard Fire Department Managers | Medium | 1, 2, 3 | $30,000 | Local funds and grants | 3 to 5 years | On-Going |
| Howard-4 | Establish mutual Aid Agreements and Auto Aid Agreements with Cities of Grenola and Longton | All Hazards | Howard Fire Department Managers | Low | 4 | None | None | 2 years | Completed |
| Howard-5 | Continue Participation in the NFIP | Flood | City of Howard Council | Low | 1,2 | None | None | On-Going | On-Going |
| Longton-1 | Mitigate flood damages to the Longton Clearwell/Holding Tank for treated water | Flood | City of Longton Council | - | - | - | - | - | Deleted |
| Longton-2 | Install a Generator at the Water Treatment Plant | winter storm, tornado, utility/infrastructure failure, windstorm, flood, lightning | City of Longton Council | - | - | - | - | - | Deleted |
| Longton-3 | Upgrade and/or replace culverts | Flood | City of Longton Council | High | 1, 2 | $20,000 | State of Kansas, Special Highway Tax Distribution, FEMA HMGP | 3 years | On-Going |
| Longton-4 | Upgrade the existing outdoor warning siren and/or install an additional siren | Tornado, windstorm | City of Longton Council | Medium | 2 | TBD | FEMA HMGP, Elk County General Fund, City of Longton | 3 months | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Longton-5 | Construct two community storm shelters/saferooms | Tornado, windstorm | City of Longton Council | High | 2 | TBD | Donations from citizens and nonprofit organizations, FEMA HMGP | TBD | On-Going |
| Longton-6 | Continue to participate in the NFIP and remain in good standing | Flood | City of Longton Council | Low | 1, 3 | None | None | On-Going | On-Going |
| Moline-1 | Continue to participate in the NFIP and remain in good standing | Flood | City of Moline Council | Low | 1 | None | None | On-Going | On-Going |
| Moline-2 | Repair or remove Santa Fe Lake Dam | Flood | City of Moline Council | Low | 1, 2 | $54,000 | City | On-Going | On-Going |
| Moline-3 | Construct tornado saferooms | Tornado, windstorm | City of Moline Council | High | 2 | $195,000 | FEMA HMGP, private donations | 3 years | On-Going |
| Moline-4 | Back-up power for water System | winter storm, tornado, utility/infrastructure failure, windstorm, flood, lightning | City of Moline Council | - | - | - | - | - | Deleted |
| USD-282-1 | Construct safe rooms | Tornado, windstorm | West Elk Board of Education Superintendant | High | 2 | $300,000 to $500,000 per location | District funds, FEMA HMGP, KDEM, county, and city funds | 2 years | On-Going |
| USD 283-1 | Construct safe rooms | Tornado, windstorm | Elk Valley USD 283 District Officer | High | 2 | $300,000 | FEMA and Kansas Div of Emergency Management | 1 year | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Rural Fire-1 | Wildfire public education | Wildfire | Kansas Forest Service, Elk County Rural Fire and Local Fire Departments Managers | Medium | 3 | Materials and presenter time per workshop is estimated to be about $500 | Kansas Forest Service and federal grants | On-Going | On-Going |
| Rural Fire-2 | Increase public and fire department training on wildland urban interface fires | Wildfire | Elk County Rural Fire Chief | Medium | 3, 4 | $30 per student per training session | The Kansas Forest Service, along with its state and federal partners, can assist with providing such training opportunities. | On-Going | On-Going |
| WD #24-1 | Alternative Source of Water | Drought, wildfire | Rural Water District #24 Director | Medium | 1, 2 | $500,000 | SCKEDD grants, meter deposits, public funding, HMGP | 2-3 years | Completed |
| Caney Valley-1 | Construct tie lines to enable redundant electric service | Winter storm, tornado, utility/infrastructure failure, windstorm, flood, hailstorm, lightning, extreme temperatures | Caney Valley Electric Cooperative Director | Medium | 1 | Single-phase - $30,000 per mile Three-phase - $50,000 per mile | Elk County | TBD | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Caney Valley-2 | Upgrade power lines to withstand ice accumulation and windstorms | Tornado, windstorm, winter storm | Caney Valley Electric Director | Medium | 1 | Single-phase - $25,000 per mile Three-phase - $40,000 per mile | FEMA, RUS | 6 months | On-Going |
| Caney Valley-3 | Tree and brush removal near power lines | Winter storm, tornado, utility/infrastructure failure, windstorm, lightning | Caney Valley Electric Cooperative Director | Medium | 1 | $400,000 | FEMA RUS loan funds General budget funds | 6 months | On-Going |
| Radiant Electric-1 | Installation of lightning arrestors on distribution power line structures | Lightning | Radiant Electric Cooperative Director | Medium | 1 | $90,000 | Rural Utilities Service, U.S. Department of Agriculture; General Funds for maintenance, FEMA/KDEM Mitigation (HMGP) | 1-2 years | New |
| Radiant Electric-2 | Replace copper weld wire and pole line spans to current codes and standards | Winter storm, tornado, utility/infrastructure failure, windstorm, flood, hailstorm, lightning, extreme temperatures | Radiant Electric Cooperative Director | Medium | 1 | $1,000,000 | Rural Utilities Service, U.S. Department of Agriculture; FEMA/KDEM Mitigation (HMGP) | 2 months | New |

### 5.6.7 LABETTE COUNTY

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| County-1 | Address scour on County bridges | Flood | Labette County Road and Bridge Department Director | Low | 1, 2 | $1,600 per bridge for rip rap | County budget, FEMA HMGP | On-Going | On-Going |
| County-2 | Install generator at county shop | Multi-Hazard | Labette County Road and Bridge Department Director | High | 1, 2 | $65,000 | FEMA HMGP | 1-2 years | Completed |
| County-3 | Evaluate vault located at 901 S. Huston evaluated as a potential tornado shelter | Tornado, Windstorm | Labette County Road and Bridge Department Director | High | 1, 2 | $500 | FEMA HMGP | 1 year | On-Going |
| County-4 | Evaluate County Courthouse for use as a tornado shelter | Tornado, Windstorm | Labette County Emergency Manager | High | 1, 2 | $500 | FEMA HMGP, LEPC funds | 6 months | On-Going |
| County-5 | Trim or remove tree and brush from County Right of Way | Dam Failure, Flood, Lightning, Tornado, Wildfire, Windstorm, Winter Storm | Labette County Road and Bridge Department Director | Medium | 1 | $100,000 | FEMA | 1 year and On-Going | On-Going |
| County-6 | Continue participation in the National Flood Insurance Program | Flood | Labette County Commission Chairman | Low | 1 | Unknown | Unknown | On-Going | On-Going |
| County-7 | Build certified safe room for community | Tornado, Windstorm | Health Department Director | High | 1, 2 | $500,000 | In-kind donation | 18 Months | New |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| County-8 | Educate operators, owners and citizens on the signs of agri-terrorism, proper disposal of infected animals, and proper security procedures | Agri-Terrorism | Health Department Director | High | 3 | $100,000 | In-kind donation | 2-3 years | New |
| County-9 | Long term monitoring of citizens and animals for negative effects from a radiological event | Radiological | Health Department Sanitarian | Medium | 1, 2 | $100,000 | In-kind donation | 2-3 years | New |
| County-10 | Create stockpile of supplies to treat identified responders and family member in the event of a disease outbreak | Major Disease Outbreak | Health Department Director | Medium | 1, 2 | $300,000 | SNS Stockpile from federal government, Local resources | 2-3 years | New |
| County-11 | Install riprap on channel banks above dams to control erosion | Dam/Levee Failure, Infrastructure Failure, Soil Erosion | Labette County Public Works | High | 1, 2 | $3,000,000 to $5,000,000 | Unknown | 1-5 years | New |
| County-12 | Install generator at county courthouse | Utility/ Infrastructure Failure, Windstorm, Winter Storm | Labette County Courthouse maintenance supervisor | Medium | 1, 2 | $50,000 | Unknown | 6 months - 3 years | New |
| County-13 | Update public warning systems | All Hazards | Labette County Emergency Communications Director | Medium | 1, 2 | $50,000 | Unknown | 1 year | New |
| County-14 | Update, replace and add warning sirens | Tornado | Labette County Emergency Manager | High | 1, 2 | $450,000 | Unknown | 1- 2 years | New |
| County-14 | Wildfire public education | Wildfire | Labette County Emergency Manager | Low | 3, 4 | $500 | Kansas Forest Service and federal grants | On-Going | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| County-16 | Increase public and fire department training on wildland urban interface fires | Wildfire | Labette County Emergency Manager | Low | 3, 4 | $30 per student per training session | The Kansas Forest Service, along with its state and federal partners, can assist with providing such training opportunities. | On-Going | On-Going |
| County-15 | Reduce hazardous fuels in prioritized wildfire risk areas | Wildfire | Labette County Emergency Manager | Low | 1 | Approximately $85/acre for hazardous fuel reduction projects | The Kansas Forest will assist qualifying communities with pursuing federal WUI grant dollars for hazardous fuel reduction projects | On-Going | On-Going |
| Altamont-1 | Continue participation in the National Flood Insurance Program | Flood | City Clerk | Low | 1 | None | None | On-Going | On-Going |
| Altamont-2 | Community tornado shelter with generator | Tornado, Utility/ Infrastructure Failure, Windstorm, Extreme Heat, Winter Storm | City Mayor | High | 1, 2 | $1,500,000 | FEMA HMGP | 5 years | On-Going |
| Altamont-3 | Public Information Campaign on Preparedness | All Hazards | City Clerk | High | 1, 3 | $208,000 | None | 4 years | On-Going |
| Altamont-4 | Power line clearance | Utility/ Infrastructure Failure, Windstorm, Winter Storm | City Utility Director | Medium | 1 | $40,000 every five years | City of Altamont, other identified grant programs | 6 months to 1 year | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Altamont-5 | Purchase and install storm sirens | Tornado | City Mayor | High | 1, 2, 4 | $95,000 | City of Altamont, other identified grant programs | 3-4 years | New |
| Chetopa-1 | Permanent flood-proofing of the well house | Flood, Dam Failure | City Mayor | High | 1, 2 | Unknown | HMGP | 3-5 Years | On-Going |
| Chetopa-2 | Generator installation for critical facilities and functions | Dam Failure, Extreme Heat, Flood, Lightning, Tornado, Utility /Infrastructure Failure, Windstorm, Winter Storm | City Mayor | High | 1, 2 | $5,000 | FEMA HMGP, City budget | TBD | On-Going |
| Chetopa-3 | Warning Siren Upgrades/ Public Information for camping parks | Tornado, Windstorm | City Mayor/Clerk | High | 1, 2, 3, 4 | $200,000 | City budget, state surplus, FEMA mitigation grants, other grants to be identified | 5 years | On-Going |
| Chetopa-4 | Upgrade electrical distribution system for windstorm and winter storm mitigation | Utility/ Infrastructure Failure Wind Storm, Winter Storm | City Mayor | Medium | 1 | $100,000 | City budget, FEMA HMGP | 1 year | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Chetopa-5 | Construct or modify existing community shelter | Dam Failure, Earthquake, Extreme Heat, Flood, Tornado, Utility/ Infrastructure Failure, Windstorm, Winter Storm | City Mayor | High | 1, 2 | $250,000 | City budget, FEMA HMGP, state surplus, other grants as identified | 5 years | On-Going |
| Chetopa-6 | Continue Participation in the National Flood Insurance Program | Flood | City Clerk | Low | 1, 2 | None | None | On-Going | On-Going |
| Chetopa-7 | Increase river water storage capacity and water intake | Extreme heat, drought, Utility/ Infrastructure Failure | City Mayor | High | 1, 2 | $500,000 | City funds, if available | Unknown | New |
| Edna-1 | Purchase back-up power system | Utility/Infrastructure Failure | City Mayor | High | 1, 2 | Unknown | Unknown | Unknown | New |
| Edna-2 | Construct storm shelter | Tornado | City Mayor | High | 1, 2 | Unknown | Unknown | Unknown | New |
| Labette City-1 | Install Outdoor Warning Siren | Tornado, Wind Storm | Labette City Mayor | High | 1, 2, 4 | $50,000 | FEMA HMGP or other grant funding identified | 1 year | Completed |
| Mound Valley-1 | Construct a Community Safe Room | Tornado, Wind Storm | City Mayor | High | 1, 2 | TBD | FEMA HMGP | 1 year | On-Going |
| Mound Valley-2 | Continue Participation in the National Flood Insurance Program | Flood | City Clerk | Low | 1 | None | None | On-Going | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Oswego-1 | Flood proof Oswego Water Treatment Facility Intake | Dam Failure, Flood | City Mayor | High | 1, 2 | TBD | FEMA HMGP, Kansas Department of Commerce, Watershed Restoration and Protection Strategy, Kansas Department of Health and Environment, Rural Development | 5-10 years | On-Going |
| Oswego-2 | Protect Oswego water supply | Drought, Dam Failure, Flood, Utility/ Infrastructure Failure | City Mayor | High | 1, 2 | TBD | FEMA, KDHE, U.S. Army Corps of Engineers, WRAPS, Rural Development, Kansas Department of Commerce | 1-5 years | On-Going |
| Oswego-3 | Secondary water supply line for Oswego | Drought, Wildfire | City Mayor | High | 1, 2 | $800,000 | Kansas Department of Health and Environment, Rural Development, Kansas Department of Commerce | 5-10 years | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Oswego-4 | Install generators in critical/special needs facilities | Multi-Hazard | City Public Works Director | High | 1, 2 | $10,000 | FEMA HMGP, Kansas Department of Commerce, Rural Development | 1-5 years | On-Going |
| Oswego-5 | Provide hazard information to the public | All Hazards | City Clerk | High | 1, 2, 3, 4 | $3,000 | City budget | 1 year | On-Going |
| Oswego-6 | Utility line clearance program | Utility /Infrastructure Failure, Windstorm, Winter Storm | City Public Works Director | Medium | 1 | Unknown | Private energy providers | 1 year | On-Going |
| Oswego-7 | Evaluate existing shelter locations in schools and public buildings | Tornado, Windstorm | City Clerk | High | 1, 2 | TBD | FEMA HMGP, Kansas Department of Commerce, Rural Development | 1 year | On-Going |
| Oswego-8 | Continue Participation in the NFIP | Flood | City Clerk | Low | 1 | Low Cost | City budget | On-Going | On-Going |
| Oswego-9 | Construct emergency shelters within the community | Tornado, Windstorm | City Mayor | High | 1, 2 | Unknown | Unknown | 1 year | New |
| Parsons-1 | Floodproof Parsons wastewater treatment facility | Flood | Parsons City Manager | High | 1, 2 | $3,000,000 | FEMA HMGP | 5-10 years | On-Going |
| Parsons-2 | Floodproof Parsons water treatment facility | Flood | Parsons City Manager | High | 1, 2 | $3,000,000 | FEMA HMGP | 5-10 years | On-Going |
| Parsons-3 | Construct community tornado shelters | Tornado, Windstorm | Parsons City Manager | High | 1, 2 | $750,000 | FEMA HMGP | 2-8 years | On-Going |
| Parsons-4 | Install/expand/upgrade outdoor warning sirens in Parsons | Tornado, Windstorm | Parsons City Manager | High | 1, 2, 4 | $128,000 | FEMA HMGP | 2-6 years | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Parsons-5 | Upgrade levee system on Labette Creek | Flood | Parsons City Manager | Low | 1, 2 | $2,000,000 | FEMA | 2-4 years | On-Going |
| Parsons-6 | Buyout flood prone properties to include repetitive loss properties | Flood | Parsons City Manager | Low | 1 | $2,000,000 | FEMA HMGP | 1-3 years | On-Going |
| Parsons-7 | Continue to participate in the NFIP | Flood | Parsons City Manager | Low | 1, 2 | None | None | On-Going | On-Going |
| Parsons-8 | Review all proposed project alternatives included in the 2000 Flood Mitigation Plan to determine if they are still viable, follow up, as appropriate | Flood | Parsons City Manager | Low | 1, 2 | $3,796,000 | FEMA FMA or HMGP | 10 years | On-Going |
| Parsons-11 | Install and upgrade flood pumps | Flood | Utilities Director | High | 1, 2 | $3,000,000 | Unknown | 1 year | New |
| Parsons-12 | Purchase of back-up generator for critical city facilities | Multi-Hazard | Parsons City Manager | High | 1, 2 | $50,000 per location | Unknown | 1 year | New |
| Parsons-13 | Educate citizens on critical infrastructure | Multi-Hazard | City PIO | Medium | 3 | <$100 | Unknown | 1 year | New |
| Parsons-14 | Create buffer zones around waterways to prevent chemical migration | Multi-Hazard | Utilities Director | High | 1, 2 | $2,000,000 | NRCS and USDA | Several years | New |
| Labette County Community College-1 | Put FEMA approved shelters in place in different areas throughout campus. | Tornado | LCC's Facilities Director | High | 1, 2 | Unknown | Unknown | Unknown | New |
| USD 493 Columbus-1 | Create safe rooms in existing facilities | Tornado | District | High | 1, 2 | Unknown | Unknown | 1 year | New |
| USD 493 Columbus-2 | Create storm shelter at schools | Tornado | District | High | 1, 2 | Unknown | Unknown | 1 year | New |
| USD 493 Columbus-2 | Create storm shelter for residents | Tornado | City/District | High | 1, 2 | Unknown | Unknown | 1 year | New |
| USD503-1 | Construct saferoom at Parsons Middle School | Tornado, Windstorm | USD 503 Superintendent | High | 1, 2 | $216,000 | FEMA HMGP | 3-5 years | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| USD503-2 | Install Generators at High School and Middle School | Dam Failure, Extreme Heat, Flood, Lightning, Tornado, Utility/ Infrastructure Failure, Windstorm, Winter Storm | USD 503 Superintendent | High | 1, 2 | $60,000 | FEMA HMGP | 3-5 years | On-Going |
| USD504-1 | Construct saferoom at Oswego High School | Tornado, Windstorm | USD 504 Superintendant | High (20) | 1, 2 | $650,000 | Capital Outlay Fund, Qualified Zone Academy Bonds, FEMA HMGP | 2 years | On-Going |
| USD504-3 | Construct saferoom at Neosho Heights, Oswego High and Service Valley Charter Academy | Tornado, Windstorm | USD 504 Superintendant | High | 1, 2 | $800,000 | Unknown | 18 Months | New |
| USD505-1 | New antenna for weather signal for Chetopa School | All Hazards | USD 505 Maintenance Supervisor | High | 1, 4 | $800-$2,500 | School District, FEMA HMGP, National Weather Service, other grants | 5 years | On-Going |
| USD505-2 | Public Information | All Hazards | USD 505 Superintendant | High | 3 | $500 | School District / Chetopa City | 6 months | On-Going |
| USD505-3 | Install generators at USD 505 facilities | Multi-Hazard | USD 505 Superintendant | High | 1, 2 | Used: $27,000 to $45,000 New: $52,000 to $88,000 | School District, FEMA HMGP | 5 years | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| USD505-4 | Construct Saferooms | Tornado, Windstorm | USD 505 Superintendant | High | 1, 2 | Unknown | Unknown | Unknown | On-Going |
| USD505-5 | Lock and ventilate server rooms and install smoke and flood detectors | Utility/ Infrastructure failure | USD 505 Technology Department Supervisor | High | 1, 2 | $5,000 | District funds | 6 months - 1 year | New |
| USD506-1 | Construct saferooms in new and existing buildings in USD 506 | Tornado, Windstorm | USD 506 Superintendant | High | 12 | $1,250,000 for students and staff in all schools $2,400,000 for students, staff, and members of the communities at all school locations | FEMA HMGP | 5 years | On-Going |
| USD506-2 | Install generators in school buildings | Dam Failure, Extreme Heat, Flood, Lightning, Tornado, Utility/ Infrastructure Failure, Windstorm, Winter Storm | USD 506 Superintendant | High | 12 | $150,000 | FEMA HMGP | 1-2 years | On-Going |
| USD506-3 | Install storm siren for elementary school | Tornado, Windstorm | USD 506 Maintenance Supervisor | High | 1, 2, 4 | $25,000 | Unknown | 6 months - 1 year | New |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Great Plains Industrial Park (Formerly KSAAP)-1 | Wildfire Training | Wildfire | Redevelopment Authority Grounds Manager | Low | 1, 3 | $150,000 | Fire Departments, KSAAP-LRA, KS Forest Service, other state agencies, FEMA | 18 months | On-Going |
| Great Plains Industrial Park (Formerly KSAAP)-2 | Reduce hazardous fuels and explosives in prioritized wildfire risk areas | Wildfire | Redevelopment Authority Grounds Manager | Low | 1 | $50,000 | Various partners, Kansas Forest Service, FEMA | 2 years | On-Going |
| Great Plains Industrial Park (Formerly KSAAP)-3 | Saferoom Construction | Tornado, Windstorm | Redevelopment Authority Executive Director | High | 1, 2 | $175,000 | Contributions from tenants, FEMA HMGP | 1-5 years | On-Going |
| Labette Health-1 | Public Information | All Hazards | Labette Health Emergency Preparedness Director | High | 3 | $5,000 to $15,000 | FEMA HMGP | 1-2 years | On-Going |
| Labette Health-2 | Install Generators at Labette Health | Dam Failure, Extreme Heat, Flood, Lightning, Tornado, Utility/ Infrastructure Failure, Windstorm, Winter Storm | Labette Health Emergency Preparedness Director | High | 1, 2 | TBD | FEMA HMGP | 2 years | Completed |
| Labette Health-3 | Construct a safe room/CORE building | Tornado, Windstorm | CEO | High | 1, 2 | $40,000 | Unknown | 6 months | New |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Labette Mental Health-1 | Educate and prepare vulnerable populations for disasters | High | Director | High | 1, 3 | Unknown | SRS, Federal and State Grants | Continuous | New |
| PWWSD#4-1 | Install generators at north and south pump station | Dam Failure, Extreme Heat, Flood, Lightning, Tornado, Utility/ Infrastructure Failure, Windstorm, Winter Storm | PWWSD #4 Board Chairperson | High | 1, 2 | $40,000 each | FEMA, HMGP, district reserves | 5 years | On-Going |
| PWWSD#4-2 | Relocate Raw Water Pump House | Dam Failure, Flood | Board Chairperson | High | 1, 2 | $200,000 | FEMA, HMGP, district reserves | 5 years | On-Going |
| Rural Water Dist #7 -1 | Public Education on Water Plan | Drought | RWD#7 | High | 3 | Unknown | Unknown | 1 year | On-Going |
| Radiant-1 | Installation of lightning arrestors on distribution power line structures | Lightning | Radiant Electric Cooperative Manager | Medium | 1, 2 | $4,000 | Rural Utilities Service, U.S. Department of Agriculture; General Funds; FEMA HMGP | 1 month | On-Going |
| Radiant-2 | Replace copper weld wire and pole line spans to current codes and standards | Tornado, Utility/ Infrastructure Failure, Windstorm, Winter Storm | Radiant Electric Cooperative Manager | Medium | 1 | $50,000 per mile- | Rural Utilities Service, U.S. Department of Agriculture; FEMA HMGP | 2 months | On-Going |
| Twin Valley-1 | Replace copper weld wire and pole line spans to current codes and standards | Tornado, Utility/ Infrastructure Failure, Windstorm, Winter Storm | Twin Valley Electric Cooperative, Inc. | Medium | 1 | $17,500,000 | Rural Utilities Service, FEMA HMGP | 3 years | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Twin Valley-2 | Installation of a Tie-Line to connect two metering points together for back feeding to correct major outages | Tornado, Utility/ Infrastructure Failure, Windstorm, Winter Storm | Twin Valley Electric Cooperative Manager | Medium | 1, 2 | $60,000.00 per mile | Rural Utilities Service,; FEMA/ SEMA Mitigation | 6 months | On-Going |
| Twin Valley-3 | Installation of lightning arrestors on distribution power line structures | Tornado, Utility/ Infrastructure Failure, Windstorm, Winter Storm | Twin Valley Electric Cooperative Manager | Medium | 1, 2 | $24,000 | Rural Utilities Service,; FEMA HMGP | 1 year or more | On-Going |
| Twin Valley-4 | Repair and rebuild of electric utility infrastructure to maintain reliable electric service for Twin Valley membership | Tornado, Windstorm, Winter Storm | William Worthy, C.O.O | High | 1, 2 | $1,000,000 | Unknown | On-Going | New |

### 5.6.8 MONTGOMERY COUNTY

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| County-1 | Add telemetry to the existing NOAA Verdigris River Station at Coffeyville and Independence | Flood | Montgomery County Emergency Manager, Independence, and Coffeyville Floodplain Management Department Directors | High | 4 | Unknown | HMGP | 18 months | On-Going |
| County-2 | Promote NOAA All Hazard Radios | All Hazards | Montgomery County Emergency Manager | Medium | 3 | Unknown | HMGP | 18 months | On-Going |
| County-3 | Promote Flood Insurance | Flood | Montgomery County Emergency Manager | Medium | 1 | Unknown | HMGP | On-Going | On-Going |
| County-4 | Improve Fragmented Communications System in County | All Hazards | Montgomery County Emergency Manager | High | 3, 4 | $1,000,000 | HMGP | 18 months | On-Going |
| County-5 | Implement reverse call back system for severe weather warnings | All Hazards | Montgomery County Emergency Manager | High | 3, 4 | $30,000 per year | NOAA, local budget | 18 months | On-Going |
| County-6 | Distribute "Family Guide for Emergency Prepared Neighborhoods" | All Hazards | Montgomery County Emergency Manager | Medium | 3 | None | None | 3 months | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| County-7 | Buyout flood prone Property | Flood | Montgomery County Emergency Manager | Low | 1 | $1,900,000 | HMGP | 18 months | Completed |
| County-8 | Install back-up generators in critical/special needs facilities | Flood, Tornado, Winter Storm, Windstorm, Utility/ Infrastructure Failure, Extreme Heat | Montgomery County Emergency Manager | High | 1, 2 | Unknown | HMGP | 18 months | On-Going |
| County-9 | Prepare Debris Removal Plan for FEMA Approval | Winter Storm, Windstorm | Montgomery County Emergency Management | Medium | 1, 2 | Unknown | Staff Time and Resources | 18 months | On-Going |
| County-10 | Work with park owners to develop emergency procedures for mobile home tenants | All Hazards | Montgomery County Emergency Manager | Medium | 3 | Unknown | Unknown | On-Going | On-Going |
| County-11 | Identify and publish locations of existing shelter locations | Tornado, Flood, Extreme Heat | Montgomery County Emergency Manager | Medium | 3, 4 | Unknown | Unknown | On-Going | On-Going through GIS department |
| County-12 | Continue to participate in the National Flood Insurance Program | Flood | Montgomery County Emergency Manager | Low | 1 | None | None | On-Going | On-Going |
| County-13 | Mitigate landslide hazard on Table Mound Road | Landslide | Montgomery County Public Works Department Director | Medium | 1, 2 | $1,000,000 | HMGP | 2 years | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| County-14 | Reinforce bridge footings for scour critical bridges | Flood | Montgomery County Public Works Department Director | Medium | 1, 2 | $2,000,000 | HMGP/Local Funding | 2 years | On-Going |
| County-15 | Work with K-State Research and Extension to monitor crop disease and continue research for damage prevention | Agricultural Infestation | K-State Research and Extension – Montgomery County and Montgomery County Emergency Manager | Medium | 1 | Minimal | USDA, State, and County Governments | On-Going | On-Going |
| County-16 | Promote Availability of Crop Insurance | Agricultural Infestation, Drought, flood, Hail | K-State Research and Extension – Montgomery County and Montgomery County Emergency Manager | Medium | 1, 3 | Minimal | State, County and Crop Insurance Companies, Local Banks and Ag Lenders | On-Going | On-Going |
| County-17 | Inform public through current and new technology over all media outlets | All Hazards | Montgomery County GIS Department Director | Medium | 3 | TBD | Local agency funding | 2 years | On-Going |
| County-18 | Develop GIS Layers of Soil types | Expansive Soils | Montgomery County GIS Department Director, Montgomery County Appraiser | Medium | 1, 3 | $20,000 | Local funding | 2 years | Completed |
| County-19 | Develop GIS layers of pipeline locations | Utility/ Infrastructure Failure, Expansive Soils | Montgomery County GIS Department Director | Medium | 1, 3 | $208,000 | Local funding | 4 years | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Caney-1 | Identify and publish location of existing shelter locations | Tornado, Flood, Extreme Heat | City of Caney, City Administrator | Medium | 1, 3 | $5,000 | HMGP | 6 months | On-Going |
| Caney-2 | Continue to participate in the NFIP in good standing and manage floodplain in accordance with currently adopted Floodplain Management Ordinance | Flood | City of Caney, City Administrator | Low | 1 | $2,000 | Local Funding | 6-9 months | On-Going |
| Caney-3 | Upgrade Outdoor Warning Sirens | Tornado | City of Caney, City Administrator | High | 1, 2 | $200,000 | HMGP | 6 months | On-Going |
| Cherryvale-1 | Continue to participate in the National Flood Insurance Program in good standing and manage the floodplain in accordance with the currently adopted Floodplain Management Ordinance | Flood | City of Cherryvale, City Administrator | Low | 1 | $1,000 per year | Local Funds | On-Going | On-Going |
| Cherryvale-2 | Upgrade outdoor warning sirens in Cherryvale | Tornado | City of Cherryvale, City Administrator | High | 1, 2 | $45,000-$60,000 | City of Cherryvale Capital Improvement Fund | 6 months | Completed |
| Cherryvale-3 | Enhance Stormwater Drainage System | Flood | City of Cherryvale, City Administrator | Medium | 1, 2 | $175,000-$250,000 | City of Cherryvale Capital Improvement Fund, HMGP | 6 months | On-Going |
| Coffeyville-1 | Implement physical and electronic perimeter monitoring of critical facilities and utilities | Utility/ Infrastructure Failure | City of Coffeyville Utility Department Director, other entities | Medium | 2 | $750,000 | HMGP | 18 months | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Coffeyville-2 | Expand/Improve Emergency Communications | All Hazards | Coffeyville Police Department Chief | High | 3 | $175,000 | HMGP and other Grants, 911 monies | 1-2 years | On-Going - requesting funding |
| Coffeyville-3 | Implement reverse call back system for severe weather warnings | All Hazards | Montgomery County Emergency Manager | High | 3 | $60,000 to implement and $5,000 to $10,000 a year to maintain | Grants, Private Sectors Companies that might benefit from the system | 1-3 years | On-Going |
| Coffeyville-4 | Elevate or flood proof wastewater lift stations in Coffeyville | Flood | City of Coffeyville Wastewater Utility Director | High | 1, 2 | $400,000 | HMGP | 24 months | On-Going |
| Coffeyville-5 | Continue to participate in the National Flood Insurance Program in good standing and manage the floodplain in accordance with the currently adopted Floodplain Management Ordinance | Flood | City of Coffeyville Engineering Department Director | Low | 1 | $10,000 per year | City of Coffeyville | On-Going | On-Going |
| Coffeyville-6 | Implement flood proofing measures such as elevation of electrical components at the Coffeyville Water Treatment Plant Intake Structure | Flood | City of Coffeyville Water Utility | High | 1, 2 | $100,000 | HMGP | 18 months | On-Going |
| Coffeyville-7 | Install back-up pumps and mobile piping system at the Coffeyville Water Treatment Plant | Flood | City of Coffeyville Water Utility Director | High | 1, 2 | $125,000 | HMGP | 18 months | On-Going |
| Coffeyville-8 | Increase the height of the Coffeyville levee | Flood | City of Coffeyville Engineering Department Director | Medium | 1, 2 | $5,000,000 | Hazard Mitigation Grant Program, US Army Corps of Engineers | 24 months | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Coffeyville-9 | Flood prone property buyout in Coffeyville | Flood | City of Coffeyville Engineering Department Director | Low | 1 | $4,000,000 | FEMA-HMGP, HMA, KDEM, KDOC, City | 18 months | On-Going |
| Coffeyville-10 | Upgrade Outdoor Warning Sirens | Tornado | Coffeyville Fire Department Chief | High | 2, 3 | $175,000 | HMGP and other Grants, Private Donations, 911 money, Chemical Companies, Railroad and other companies with vested interest in public warning system | 1 year | On-Going |
| Coffeyville-11 | Relocate electric transmission and distribution lines out of the floodplain | Flood | Electric Department Director | Medium | 1 | $500,000 | HMGP | 2 years | On-Going |
| Coffeyville-12 | Purchase/Install SCADA software to help reduce peak demand outages | Extreme Heat Utility/ Infrastructure Failure | Electric Department Director | Low | 1 | $60,000 | HMGP | 1 year | On-Going |
| Coffeyville-13 | Add electric substation transformer switching devices for flexibility in controlling peak load and extreme heat outages | Extreme Heat Utility/ Infrastructure Failure | Electric Department Director | Low | 1, 2 | $350,000 | HMGP | 1-2 years | On-Going |
| Coffeyville-14 | Bury utility, phone, cable wires for new construction | Winter Storm, Windstorm Utility/ Infrastructure Failure | Electric Department Director | Low | 1 | $200,000 | HMGP | 1 year | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Coffeyville-15 | Replace overhead utility phone, cable wires with buried wires in prioritized locations | Winter Storm, Windstorm Utility/ Infrastructure Failure | Electric Department Director | Low | 1 | $350,000 | HMGP, HMA | 1 year | Completed |
| Coffeyville-16 | Geographically separate electric supply lines and substations | All Hazards | Electric Department Director | Low | 1 | $1,000,000 | HMGP | 2 years | On-Going |
| Coffeyville-17 | Elevate electric transformers above the flood elevation | Flood Utility/ Infrastructure Failure | Electric Department Director | Medium | 1, 2 | $250,000 | HMGP | 2 years | On-Going |
| Coffeyville-18 | Install self-supporting concrete electric poles | Winter Storm, Windstorm Utility/ Infrastructure Failure | Electric Department Director | Low | 1, 2 | $300,000 | HMGP | 2 years | On-Going |
| Coffeyville-19 | Add disconnect switches on primary lines to allow for isolation areas | All Hazards Utility/ Infrastructure Failure | Electric Department Director | Medium | 1 | $450,000 | HMGP | 2 years | On-Going |
| Dearing-1 | Implement physical and electronic perimeter monitoring of critical facilities and utilities-water pumping station, wastewater lift station, and city lagoons | Utility/Infrastructure Failure | City of Dearing Council | Medium | 2 | Unknown | HMGP | 2 years | On-Going |
| Dearing-2 | Install back-up generator for city hall | Winter Storm, Windstorm, Flood, Lightning, Utility/ Infrastructure Failure | City of Dearing Council | High | 1, 2 | Unknown | HMGP | 2 years | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Dearing-3 | Install back-up generator for waste water lift station | Multi-Hazard | City of Dearing Council | High | 1, 2 | Unknown | HMGP | 1 year | On-Going |
| Dearing-4 | Install back-up generator for water system pumping station | Multi-Hazard | City of Dearing Council | High | 1, 2 | Unknown | HMGP | 1 year | On-Going |
| Dearing-5 | Continue process to join National Flood Insurance Program | Flood | City of Dearing Council | Low | 1 | | | | On-Going |
| Dearing-6 | Culvert Enlargement for Storm Drainage | Flood | City of Dearing Council | Medium | 1 | Unknown | HMGP ; potential soft match from Engineer | 3 years | On-Going |
| Dearing-7 | Stream Erosion and Sediment Control Project | Flood | City of Dearing Council | Medium | 1 | Unknown | HMGP ; potential soft match from Engineer | 2 years | On-Going |
| Dearing-8 | Construct a tornado shelter, cooling center, city hall | Tornado, Extreme Heat | City of Dearing Council | High | 1, 2 | $200,000 | HMGP potential soft match from Architect | 4 years | On-Going |
| Elk City-1 | Improve dike protecting Elk City Water Plant | Flood | Elk City Council, Corps of Engineers | High | 1, 2 | TBD | HMGP, HMA | 3 years | On-Going |
| Elk City-2 | Mitigate Elk City water pumps against flood damage | Flood | Elk City Council | High | 1, 2 | $9,000 | HMGP | 1 year | On-Going |
| Elk City-3 | Construct community tornado shelter | Tornado | Elk City Council | High | 1,2,3,4 | $200,000 - $300,000 | HMGP, HMA | Unknown | On-Going |
| Elk City-4 | Install Tornado Sirens | Tornado | Elk City Council | High | 1,2,3,4 | Minimal | None | 4 months | On-Going |
| Elk City-5 | Elevate electrical equipment at water plant | Flood | Elk City Council | High | 1, 2 | $18,000 | HMGP | 1 year | Completed |
| Elk City-6 | Install Flood Gate at Elk City water plant on east side at culvert | Flood | Elk City Council | High | 1, 2 | $20,000 | HMGP | 2 years | Completed |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Elk City-7 | Purchase automatic pump and generator for water plant | Flood | Elk City Council | High | 1, 2 | $20,000 | HMGP | 1 year | On-Going |
| Elk City-8 | Elk City Dike drainage improvement and maintenance | Flood | Elk City Council | Medium | 1, 2 | Unknown | Unknown | 1 year | On-Going |
| Elk City-9 | Continue to participate in the National Flood Insurance Program | Flood | Elk City Council | Low | 1 | None | None | On-Going | On-Going |
| Havana-1 | Purchase and install outdoor warning sirens | Tornado | City of Havana Council | High | 1, 2 | TBD | HMGP | 2 years | On-Going |
| Havana-2 | Install back-up generator for shelter | Winter Storm, Windstorm, Flood, Lightning, Utility/Infrastructure Failure | City of Havana Council | High | 1, 2 | TBD | HMGP | Following shelter construction | On-Going |
| Havana-3 | Construct storm shelter | Tornado | City of Havana Council | High | 1, 2 | TBD | HMGP | 2 years | On-Going |
| Independence-1 | Replace and increase storm warning public address system | Tornado | Independence Police Department Chief | High | 1, 2,4 | $150,000 | Grants or capital out levy | 5 years | On-Going |
| Independence-2 | Construct flood gate and pumps at the end of the levee adjoining pine street | Flood | City of Independence – Street Department Director | Medium | 1, 2 | Unknown | Unknown | Unknown | On-Going |
| Independence-3 | Install emergency generator at Water Treatment Plant | Flood | City of Independence – Water and Sewer Department Director | High | 1, 2 | $750,000 | Unknown | Unknown | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Independence-4 | Develop project to mitigate flood damage of Independence high service pump station at the Water Treatment Plant--elevate high service pump building and clear wells | Flood | City of Independence – Water and Sewer Department Director | High | 1, 2 | $5,000,000 | HMGP, HMA | 3 years | On-Going |
| Independence-5 | Relocate the main electrical panel at Water Treatment Plant outside the floodplain | Flood | City of Independence – Director of Utilities | High | 1, 2 | $500,000 | HMGP | 3 years | On-Going |
| Independence-6 | Purchase and install standby pumps at lift stations for discharge of wastewater in the event lift stations are inoperable | Flood | City of Independence – Water and Sewer Department Director | High | 1, 2 | $250,000 | HMGP | 3 years | On-Going |
| Independence-7 | Replace pumps with submersible pumps, elevate electrical control panels and elevate emergency generators at Wald Ave. and Southwest Pump Stations (sanitary sewer) | Flood | City of Independence – Water and Sewer Department Director | High | 1, 2 | $10,000,000 | HMGP | 4 years | On-Going |
| Independence-8 | Construct flood levee to protect buildings, equipment and treatment facilities at the wastewater treatment plant | Flood | City of Independence – Water and Sewer Department Director | High | 1, 2 | TBD | HMGP, Army Corp of Engineers | Unknown | On-Going |
| Independence-9 | Continue to participate in the National Flood Insurance Program in good standing and manage the floodplain in accordance with the currently adopted Floodplain Management Ordinance | Flood | City of Independence Council | Low | 1 | None | None | On-Going | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Independence-10 | Purchase flood prone property in the 100-year floodplain | Flood | City of Independence Council | Medium | 1 | $3,292,020 | FEMA-HMGP KDEM | On-Going | complete |
| Liberty-1 | Provide flood protection to Liberty Wastewater Treatment Plant | Flood | City of Liberty Council | High | 1 | $320,000 | HMGP | 2 years | On-Going |
| USD 436-1 | Evaluate existing tornado shelter locations in all USD 436 schools | Tornado | USD 436 Superintendant | High | 1, 2 | $6,000 | USD 436 – Contingency Reserve Fund; USD 436 – Supplemental General Fund | 6 months | On-Going |
| USD 436-2 | Construct safe rooms in new and existing schools in USD 436 | Tornado | USD 436 Superintendant | High | 1, 2 | $2,000,000 to $5,000,000 | USD 436 – Contingency Reserve Fund; USD 436 – Supplemental General Fund; USD 436 – Capital Outlay Fund; Federal Grants; State Grants; also state aide for new facilities | 6 years | On-Going |
| USD 445-1 | Evaluate existing school shelter locations in all schools in USD 445 | Tornado | USD 445 Superintendant | High | 1, 2 | Unknown | HMGP | As funds available | On-Going |
| USD 445-2 | Construct safe rooms in new and existing schools in USD 455 | Tornado | USD 445 Superintendant | High | 1, 2 | Unknown | HMGP | As funds available | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| USD 446-1 | Evaluate existing tornado shelter locations in all USD 446 schools | Tornado | USD 446 Superintendent | High | 1, 2 | $10,000 to $20,000 | HMGP | 3 months | On-Going |
| USD446-2 | Construct safe rooms in new and existing schools in USD 446 | Tornado | USD 446 Superintendent | High | 1, 2 | $400,000 | HMGP | 6 months to 1 year | On-Going |
| USD 447-1 | Evaluate existing tornado shelter locations in all USD 447 schools | Tornado | USD 447 Superintendant | High | 1, 2 | $2,500 to $7,500 per facility | Local district funds, private donations, state/federal dollars | 18 months | On-Going |
| USD 447-2 | Construct safe rooms in new and existing schools in USD 447 | Tornado | USD 447 Superintendant | High | 1, 2 | $55,000 - $75,000 per facility | Local district funds, private donations, state/federal dollars | 3-5 years | On-Going |
| Coffeyville Community College-1 | Construct saferoom on college campus | Tornado | Planning and Operations Manager | High | 1, 2 | $450,000 | Grant funding and private donations, HMGP, HMA | 5 years | On-Going |
| Independence Community College-1 | Provide training services and resource materials for train-the-trainer training sessions to assist with implementation of area mitigation action projects | All Hazards | Office of Instruction Manager, Independence Community College | Medium | 3 | $30 to $65 dollars per hour for development and $25 to $70 dollars per hour for instruction. | FEMA | On-Going | On-Going |
| RFD #1-1 | Reduce hazardous fuels in prioritized wildfire risk areas | Wildfire | Kansas Forest Service, Local Fire Department Chiefs and Rural Fire District Chiefs | Low | 1 | $85/ac | The Kansas Forest Service will assist by pursuing federal WUI dollars for hazardous fuel reduction | On-Going | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| RFD #1-2 | Increase public and fire department training on wildland urban interface fires | Wildfire | Kansas Forest Service | Low | 3 | $30 per student per training session | The Kansas Forest Service along with its state and federal partners can assist with providing such training opportunities. | On-Going | On-Going |
| RFD #1-3 | Provide homeowner education on wildfire mitigation in wildland-urban interface | Wildfire | Kansas Forest Service and local Fire Department Chiefs | Low | 3 | $500 | Kansas Forest Service and federal grants | On-Going | On-Going |
| RFD #1-4 | Reduce hazardous fuels in prioritized wildfire risk areas | Wildfire | Kansas Forest Service, Local Fire Department Chiefs and Rural Fire District Chiefs | Low | 1 | $85/ac | The Kansas Forest Service will assist qualifying communities with pursuing federal WUI grant dollars for hazardous fuel reduction projects | On-Going | On-Going |
| PWWSD #4-1 | Install back-up generator at pump house | Winter Storm, Windstorm, Flood, Lightning, Utility/Infrastructure Failure | Public Wholesale Water Supply District #4 Director | High | 1, 2 | $25,000 | Reserves or HMGP | 5 years | On-Going |
| RWD #6-1 | Map Pipelines | Utility/Infrastructure Failure | Rural Water District Director | Medium | 1, 2, 3 | $10,000 | Unknown | On-Going | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| RWD #6-2 | Install back-up generators for pumps | Winter Storm, Windstorm, Flood, Lightning, Utility/Infrastructure Failure | Rural Water District Director | High | 1, 2 | $25,000 for each pump | Unknown | 9 months | On-Going |
| RWD #6-3 | Perimeter monitoring | Utility/Infrastructure Failure | Rural Water District Director | Medium | 1, 2 | $10,000 to $25,000 per site | Unknown | On-Going | On-Going |
| RWD #7-1 | Install back-up generators for pumps | Winter Storm, Windstorm, Flood, Lightning, Utility/Infrastructure Failure | Rural Water District Director | High | 1, 2 | $25,000 for each pump | Unknown | 9 months | On-Going |
| RWD #7-2 | Map Pipelines | Utility/Infrastructure Failure | Rural Water District Director | Medium | 1, 2, 3 | $10,000 | Unknown | On-Going | On-Going |
| RWD #7-3 | Perimeter monitoring | Utility/Infrastructure Failure | Rural Water District Director | Medium | 1, 2 | $10,000 to $25,000 per site | Unknown | On-Going | On-Going |
| RWD #8-1 | Connect water supply systems of RWD #8 and RWD #13 | Flood | Rural Water District Director | High | 1 | $50,000 | FEMA and Kansas Rural Water Association. | ASAP | On-Going |
| RWD #10-1 | Install back-up generators for pumps | Winter Storm, Windstorm, Flood, Lightning, Utility/Infrastructure Failure | Rural Water District Director | High | 1, 2 | $25,000 for each pump | Unknown | 9 months | On-Going |
| RWD #10-2 | Map Water Pipelines | Utility/Infrastructure Failure | Rural Water District Director | Medium | 1, 2, 3 | $10,000 | Unknown | On-Going | On-Going |
| RWD #10-3 | Perimeter monitoring | Utility/Infrastructure Failure | Rural Water District Director | Medium | 1, 2 | $10,000 to $25,000 per site | Unknown | On-Going | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| RWD #12-1 | Reinforce water tower to withstand high winds and peripheral winds from tornadoes | Tornado, Windstorm | Rural Water District #12 Board of Directors | Low | 1, 2 | TBD | HMGP or Kansas SRF Loan | TBD | On-Going |
| RWD #13-1 | Connect water supply systems of RWD #8 and RWD #13 | Flood | Rural Water District Director | High | 1 | $50,000 | FEMA and Kansas Rural Water Association. | ASAP | On-Going |
| Radiant Electric Cooperative-1 | Installation of lightning arrestors on distribution power line structures | Lightning | Radiant Electric Cooperative Director | Low | 1, 2 | $75,000 | Rural Utilities Service, U.S. Department of Agriculture; General Funds for maintenance; FEMA/ SEMA Mitigation | 1 year + | On-Going |
| Radiant Electric Cooperative-2 | Replace copper weld wire and pole line spans to current codes and standards | Winter Storm | Radiant Electric Cooperative Director | Low | 1 | $2,500,000 | Rural Utilities Service, U.S. Department of Agriculture; FEMA/ KDEM Mitigation | 1 year | On-Going |
| Radiant Electric Cooperative-3 | Relocation/elevation of power line and related infrastructure facilities out of floodplain | Flood | Radiant Electric Cooperative Director | Medium | 1, 2 | $500,000 | Rural Utilities Service, U.S. Department of Agriculture; FEMA/ KDEM Mitigation | 2 years | On-Going |
| Coffeyville Regional Medical Center-1 | Construct Safe room at Coffeyville Regional Medical Center | Tornado | Coffeyville Regional Medical Administration Director | High | 1, 2 | $1,600,000 | HMGP, Coffeyville Regional Medical Center | 2 years | On-Going |
| American Red Cross-1 | Promote private insurance | All Hazards | American Red Cross Disaster Services Director | Medium | 3 | None | None | 1 year | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Mercy Hospital-1 | Construct safe room at Mercy Hospital | Tornado | Mercy Hospital Director | High | 1, 2 | $4,000,000 | HMGP, Sisters of Mercy | 18 months | On-Going |
| Private Non-profit Schools-1 | Construct safe rooms in private schools | Tornado | Individual private school councils or boards | High | 1, 2 | Varies based on project location | HMGP | Varies | On-Going |
| Private Non-profit Schools-2 | Evaluate safe rooms in private schools | Tornado | Individual private school councils or boards | High | 1, 2 | Varies based on project location | HMGP | Varies | On-Going |

### 5.6.9 NEOSHO COUNTY

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Multi-1 | Wildfire public education | Wildfire | - | - | - | - | - | - | Reassigned to County |
| Multi-2 | Increase public and fire department training on wildland urban interface fires | Wildfire | - | - | - | - | - | - | Reassigned to County |
| Multi-3 | Reduce hazardous fuels in prioritized wildfire risk areas | Wildfire | - | - | - | - | - | - | Reassigned to County |
| County-1 | Continue NFIP Participation | Flood | Neosho County Emergency Manager | Low | 1, 2 | Unknown | Neosho County General Revenue | On-Going | On-Going |
| County-2 | Install Additional Severe Weather Warning Sirens Indoor/Outdoor Warning | Windstorm, Tornado | Neosho County Emergency Manager | - | - | - | - | - | Deleted |
| County-3 | Promote Neosho County Hazard Mitigation Plan to the Public Education | All Hazards | Neosho County Emergency Manager | High | 3 | None | None | On-Going | On-Going |
| County-4 | Ensure the Neosho County Hazard Mitigation Plan is reviewed and kept current | All Hazards | Neosho County Emergency Manager | Low | 1, 4 | None | None | On-Going | On-Going |
| County-5 | Obtain Dam Inundation Maps and Emergency Action Plans for the high and significant hazard dams in the County | Dam/Levee Failure | Neosho County Emergency Manager | Low | 1, 3 | None | County budget for staff time | 1 year | On-Going |
| County-6 | Update critical infrastructure | Multi-Hazard | Rural Water District Directors | Medium | 1, 2 | Unknown | Unknown | 2020 | New |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| County-7 | Promote Crop Insurance and Private Hazard Insurance | Agricultural Infestation, Dam and Levee Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flood, Hailstorm, Lightning, Soil Erosion and Dust, Utility/ Infrastructure Failure, Tornado, Wildfire, Windstorm, Winter Storm | Neosho County Emergency Manager | High | 3, 4 | None | County budget for staff time | 1 year | On-Going |
| County-8 | Wildfire public education | Wildfire | Kansas Forest Service and local Fire Department Chiefs | Low | 3, 4 | $500 | Kansas Forest Service and federal grants | On-Going | On-Going |
| County-9 | Increase public and fire department training on wildland urban interface fires | Wildfire | Kansas Forest Service Personnel | Low | 3, 4 | $30 per student | The Kansas Forest Service, along with its state and federal partners, can assist with providing such training opportunities. | On-Going | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| County-10 | Reduce hazardous fuels in prioritized wildfire risk areas | Wildfire | Kansas Forest Service and the local Fire Department Chiefs | Low | 1 | $85 per acre | The Kansas Forest will assist qualifying communities with pursuing federal WUI grant dollars for hazardous fuel reduction projects | On-Going | On-Going |
| Chanute-1 | Install additional severe weather warning sirens | Tornado, Windstorm | City of Chanute, Community Development Office Director | Medium | 1, 2, 4 | Unknown | HMGP, City funds | 3 months | Completed |
| Chanute-2 | Continue NFIP Participation | Flood | City of Chanute, Community Development Office Director | Low | 1, 2 | None | None | On-Going | On-Going |
| Chanute-3 | Buyout of Floodprone Properties | Flood | City of Chanute, Community Development Office Director | Low | 1 | $500,000 | HMGP | 1 year | Completed |
| Erie-1 | Buyout of Floodprone properties | Flood | City of Erie, City Clerk | Low | 1 | $667,772 | KDEM, FEMA, Kansas Department of Commerce CDBG Urgent Need Program | 2015 | On-Going |
| Erie-2 | Public Information on location of tornado shelters and cooling centers | Tornado, Extreme Heat | City of Erie, City Clerk | High | 1, 4 | None | None | On-Going | On-Going |
| Erie-3 | Install Additional Severe Weather Warning Sirens | Tornado, Wind Storm | Erie Police Department Chief | Medium | 1, 2, 4 | $25,000 | Homeland Security Rural Development Grant | 2015 | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Erie-4 | Bury secondary power lines in new development | Tornado, Windstorm, Utility/ Infrastructure Failure, Winter Storm, Lightning | City Superintendent | Medium | 1 | Unknown | Developers | On-Going | On-Going |
| Erie-5 | Continue NFIP Participation | Flood | City Superintendent | Low | 1, 2 | $208,000 | None | 4 years | On-Going |
| Galesburg-1 | Install one centrally located tornado siren in town | Tornado | Galesburg City Council | Medium | 1, 2 | $25,000 to $50,000 | Unknown | 1-3 years | New |
| St. Paul-1 | Cable TV severe weather warning | All Hazards | City of St. Paul Fire Department Chief | - | - | - | - | - | Deleted |
| St. Paul-2 | Continue NFIP participation | Flood | City of St. Paul City Council | Low | 1, 2 | None | City of St. Paul | On-Going | On-Going |
| St. Paul-3 | Notify residents of locations of city tornado shelters and cooling centers | Tornado, Extreme Heat | City of St. Paul City Council | High | 3, 4 | None | None | On-Going | On-Going |
| St. Paul-4 | Purchase of NOAA weather radios | Multi-Hazard | City of St. Paul Fire Department Chief | Medium | 1 | $1,000 | City of St. Paul | 6 months to 1 year | Completed |
| Stark-1 | Construct storm shelters and safe rooms | Tornados and Windstorms | Mayor | High | 1, 2 | Unknown | Federal grants | 2020 | New |
| Thayer-1 | Public Information on location of tornado shelters and cooling center | Tornado, Windstorm | City of Thayer Council | High | 1, 3 | $3,000 | TBD | 1 year | On-Going |
| Thayer-2 | Construction of a community saferoom | Tornado | City of Thayer Council | - | - | - | - | - | Deleted |
| Thayer-3 | Promote NOAA Weather Radios | All Hazards | City of Thayer Council | Medium | 1, 3, 4 | $3,500 | HMGP | 1 year | On-Going |
| Thayer-4 | Install additional severe weather warning sirens | Tornado, Windstorm | Thayer Fire and Rescue Director | Medium | 1, 2, 4 | $50,000 | HMGP | 1 year | Completed |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Thayer-5 | Utility line clearance program | Tornado, Windstorm, Winter Storm, Utility/ Infrastructure Failure | City of Thayer Council | Medium | 1, 2 | TBD | TBD | On-Going | On-Going |
| Thayer-6 | Install generator at the Thayer Community Building | Tornado, Windstorm, Winter Storm, Utility/ Infrastructure Failure, Lightning | City of Thayer Council | Medium | 1, 2 | $20,000 | HMGP | 1 year | On-Going |
| Thayer-7 | Install Generators at Thayer lift station and water treatment plant | Tornado, Windstorm, Winter Storm, Utility/ Infrastructure Failure, Lightning | City of Thayer Council | Medium | 1, 2 | $18,200 | HMGP | 1 year | On-Going |
| Thayer-8 | Wildfire fuel reduction around the Rail Road right of way leading into and through Thayer, KS | Wildfire | City of Thayer Council | Low | 1, 2 | $100,000 | The Kansas Forest Service will assist qualifying communities with pursuing federal WUI grant dollars for hazardous fuel reduction projects | 1 year | On-Going |
| Thayer-9 | Local road flood prevention | Flood | City of Thayer Council | Low | 1, 2 | $50,000 | HMGP | 1 year | On-Going |
| Thayer-10 | Continue the process to join the NFIP | Flood | City of Thayer Council | Low | 1, 2 | Staff Time | None | 1 year | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| USD 101-1 | Evaluate existing school tornado shelter locations | Tornado | USD 101 Superintendent | High | 1, 2 | TBD | None | 7/1/1905 | On-Going |
| USD 101-2 | Construct saferooms in schools | Tornado | USD 101 Superintendent | High | 1, 2 | $750,000 | Bond funds and HMGP grant | 7/2/1905 | On-Going |
| USD 413-1 | Construct saferooms in schools | Tornado | Superintendent's office | High | 1, 2 | $1,200,000 | HMGP, USD 413 | 7/3/1905 | Completed |
| USD 413-2 | Create a storm shelter | Tornado | District Office Manager | High | 1, 2 | $58,000 | Unknown | 6 months - 1 year | New |
| USD 447-1 | Evaluate existing school tornado shelter locations | Tornado | USD 447 Board of Education and Superintendent of Schools | High | 1, 2 | $2,500 to $7,500 per facility identified | Local district funds, private donations, state/federal grants | 18 months and On-Going | On-Going |
| USD 447-2 | Construct saferooms in schools | Tornado | USD 447 Board of Education and Superintendent of Schools | High | 1, 2 | TBD | Local district funds, private donations, HMGP | 3-5 years | On-Going |
| USD 505-1 | Evaluate existing school tornado shelter locations | Tornado | USD 505 Superintendant | High | 1, 2 | None | USD 505 | 6/30/1905 | On-Going |
| USD 505-2 | Construct saferooms in schools | Tornado | USD 505 Superintendant | High | 1, 2 | $190,553 | HMGP | 7/1/1905 | On-Going |
| USD 505-3 | Install Generators at USD 505 facilities | Lightning, Tornado, Utility/ Infrastructure Failure, Windstorm, Winter Storm | USD 505 Superintendant | Medium | 1, 2 | Used: $27,000 to $45,000 each New: $52,000 to $88,000 each | USD 505 | 5 years | On-Going |
| Neosho County Community College-1 | Install generators at Neosho County Community College | Multi-Hazard | Neosho County Community College, Dean of Planning & Operations | Medium | 1, 4 | $30,000-$40,000 | HMGP | 6-12 months | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Neosho County Community College-2 | Institute emergency notification system | Multi-Hazard | Neosho County Community College, VP of Planning & Operations | High | 1, 4 | $112,165 | Grants and In-kind donations | 2-3months | On-Going |
| Heartland Rural Electric Cooperative-1 | Upgrade power lines utilizing twisted pair conductors | Tornado, Utility/ Infrastructure Failure, Wind Storm, Winter Storm | Heartland REC Director | Medium | 1, 2 | $2,598,000 | HMGP | 4 years | On-Going |
| Public Wholesale Water Supply District - 23 | Move plant out of floodplain | Flood | Plant Manager | High | 1, 2 | $20,000,000 | RWA, USDA, PDM | 2020 | New |
| Radiant Electric Cooperative-1 | Installation of lightning arrestors on distribution power line structures | Lightning, Utility Infrastructure Failure | Radiant Electric Cooperative, Inc Director | Medium | 1, 2 | $50,000 | Rural Utilities Service, U.S. Department of Agriculture; General Funds for maintenance, FEMA/KDEM Mitigation (HMGP) | 1-2 years | On-Going |
| Radiant Electric Cooperative-2 | Replace copper weld wire and pole line spans to current codes and standards | Tornado, Utility/ Infrastructure Failure, Wind Storm, Winter Storm | Radiant Electric Cooperative, Inc Director | Medium | 1, 2 | $1,000,000 | Rural Utilities Service, U.S. Department of Agriculture; FEMA/KDEM Mitigation (HMGP) | 1 year | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Twin Valley Electric Cooperative-1 | Installation of Lightning Arrestors on distribution power line structures | Lightning, Utility/ Infrastructure Failure | Twin Valley Electric Cooperative Director | Medium | 1, 2 | $62,000 | Rural Utilities Service, U.S. Department of Agriculture; General Funds for maintenance, FEMA/KDEM Mitigation (HMGP) | 1-2 years | On-Going |
| Twin Valley Electric Cooperative-2 | Replace copper weld wire and pole line spans to current codes and standards | Tornado, Utility/ Infrastructure Failure, Wind Storm, Winter Storm | Twin Valley Electric Cooperative Director | Medium | 1, 2 | $3,000,000 | Rural Utilities Service, U.S. Department of Agriculture; FEMA/KDEM Mitigation (HMGP) | 1 year | On-Going |
| Twin Valley Electric Cooperative-3 | Installation of a Tie-Line to connect two meeting points together for back-feeding to correct major outages | Tornado, Utility Infrastructure Failure, Wind Storm, Winter Storm | Twin Valley Electric Cooperative Director | Medium | 1, 2 | $540,000 | Rural Utilities Service, U.S. Department of Agriculture; FEMA/KDEM Mitigation (HMGP) | 6 months | On-Going |

### 5.6.10 WILSON COUNTY

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Multi-Jurisdictional-1 | Coordinate annual reviews of the Wilson County Multi-Hazard Mitigation Plan to monitor, evaluate, and update the plan | Multi-Hazard | - | - | - | - | - | - | Reassigned to County |
| Multi-Jurisdictional-2 | Upgrade and enhance power lines | Winter Storm and Windstorm | - | - | - | - | - | - | Reassigned to Radiant Electric Coop |
| Multi-Jurisdictional-3 | Study feasibility of interconnecting County water supplies | Multi-Hazard | - | - | - | - | - | - | Reassigned to County |
| Multi-Jurisdictional-4 | Increase outreach on National Flood Insurance Program (NFIP) | Flood | - | - | - | - | - | - | Reassigned to County |
| Multi-Jurisdictional-5 | Improve public outreach activities related to risk, preparedness, and mitigation | Multi-Hazard | - | - | - | - | - | - | Reassigned to County |
| Multi-Jurisdictional-6 | Promote and assist distribution of NOAA weather radios | Multi-Hazard | - | - | - | - | - | - | Reassigned to County |
| Multi-Jurisdictional-7 | Review and update mutual aid agreements | Multi-Hazard | - | - | - | - | - | - | On-Going |
| Multi-Jurisdictional-8 | Coordinate and implement streambed stabilization projects on the Verdigris River | Soil Erosion and Dust | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-9 | Provide information on sheltering locations | Multi-Hazard | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-10 | Increase public and fire department training on wildland-urban interface fires | Wildfire | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-11 | Coordinate with FEMA in completing and adopting new flood maps | Flood | - | - | - | - | - | - | Reassigned to County |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Multi-Jurisdictional-12 | Expand information on Wilson County Emergency Management website | Multi-Hazard | - | - | - | - | - | - | Reassigned to County |
| Multi-Jurisdictional-13 | Expand information on Wilson County Emergency Management website | Wildfire | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-14 | Reduce hazardous fuels in prioritized wildfire risk areas | Wildfire | - | - | - | - | - | - | Deleted |
| Multi-Jurisdictional-15 | Improve GIS mapping and information available on the Internet | Multi-Hazard | - | - | - | - | - | - | Reassigned to County |
| County-1 | Implement flood buyout program in Wilson County | Flood | Wilson County Coordinator | High | 1 | $1,333,248 | FEMA Hazard Mitigation Grant Program, Community Development Block Grant, Kansas Division of Emergency Management, Wilson County | 6/30/2015 | Completed |
| County-2 | Obtain backup power generator for Wilson County Courthouse | Multi-Hazard | Wilson County Coordinator | Medium | 2 | $150,000-$175,000 | FEMA Hazard Mitigation Grant Program, Judicial Capital Outlay | 2-3 years | On-Going |
| County-3 | Review and enforce the County's floodplain ordinance | Flood | Wilson County Health Department - Environmental Specialist | Medium | 1 | $36,000 | Local taxes and fees | 2008 and On-Going | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| County-4 | Provide detailed damage assessment to real estate and/or personnel property for ad hoc valuation in order to assist any government agencies with reimbursement | Multi-Hazard | Wilson County Appraisers Office - County Appraiser | Low | 3 | Minimal | County funds | 3 months - 1 year | New |
| County-5 | Coordinate annual reviews of the Wilson County Multi-Hazard Mitigation Plan to monitor, evaluate, and update the plan | Multi-Hazard | Wilson County Emergency Management - Emergency Manager | High | 1, 4 | Staff Time | None | Annually | On-Going |
| County-6 | Study feasibility of interconnecting County water supplies | Multi-Hazard | Wilson County Emergency Management - Emergency Manager | High | 1, 2 | $50,000 | State of Kansas, local tax dollars | 7/2/2015 | On-Going |
| County-7 | Increase outreach on National Flood Insurance Program (NFIP) | Flood | Wilson County Health Department - Environmental Specialist | High | 3 | $500 | Local | 7/1/2015 | On-Going |
| County-8 | Improve public outreach activities related to risk, preparedness, and mitigation | Multi-Hazard | Wilson County Emergency Management - Emergency Manager | High | 3 | $500 | Local | Annually | On-Going |
| County-9 | Promote and assist distribution of NOAA weather radios | Multi-Hazard | Wilson County Emergency Management - Emergency Manager | High | 1, 3 | $4,000 to $5,000 | Hazard Mitigation Grant Program, matching funds from local business and industries | 3-4 years | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| County-10 | Review and update mutual aid agreements | Multi-Hazard | Wilson County Emergency Management - Emergency Manager | Medium | 1, 4 | $2,000 | Local | 5 years | On-Going |
| County-11 | Coordinate with FEMA in completing and adopting new flood maps | Flood | Wilson County Health Department - Environmental Specialist | Low | 1, 3 | $5,000 | Wilson County | 6/30/2015 | On-Going |
| County-12 | Expand information on Wilson County Emergency Management website | Multi-Hazard | Wilson County GIS/ Data Processing Department - Specialist | Low | 3, 4 | $500 | Local | 2009 and On-Going | On-Going |
| County-13 | Improve GIS mapping and information available on the Internet | Multi-Hazard | Wilson County GIS/ Data Processing Department - Specialist | Low | 3 | $5,000 for initial set up of Internet $60,000 for new aerial photography | Local funds, Wireless 911 Grant Program | Funding dependent | On-Going |
| Altoona-1 | Promote and assist in purchase and distribution of NOAA weather radios | Multi-Hazard | City of Altoona | High | 1, 3 | $50,000 | FEMA Hazard Mitigation Grant Program | 4 years | New |
| Benedict-1 | Promote and assist in purchase and distribution of NOAA weather radios | Multi-Hazard | City of Benedict Mayor | High | 1, 3 | $200,000 | FEMA Hazard Mitigation Grant Program | 4 years | New |
| Benedict-2 | Provide warning siren for entire town | Multi-Hazard | City of Benedict Mayor | Medium | 1 | Unknown | FEMA | 1-3 years | New |
| Buffalo-1 | Promote and assist in purchase and distribution of NOAA weather radios | Multi-Hazard | City of Buffalo Mayor | High | 1, 3 | $208,000 | FEMA Hazard Mitigation Grant Program | 4 years | Completed |
| Buffalo-2 | Provide warning siren for entire town | Multi-Hazard | City of Buffalo Mayor | Medium | 1, 2 | Unknown | FEMA | 1-3 years | Completed |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Buffalo-3 | Construct community shelter meeting safe room standards | Multi-Hazard | City of Buffalo Mayor | Low | 1, 2 | Unknown | FEMA Hazard Mitigation Grant Program or Pre-Disaster Mitigation Grant Program | 5 years | On-Going |
| Buffalo-4 | Enhance and continue housing rehabilitation program | Multi-Hazard | City of Buffalo Mayor | High | 1, 2 | $220,000 | Unknown | 2 years | New |
| Buffalo-5 | Evaluate culvert cleanouts | Flood | City of Buffalo Mayor | High | 1 | $250,000 | Unknown | 2 years | New |
| Fredonia-1 | Relocate Fredonia power plant and electrical substation to the City Industrial Park to reduce future flood damage | Multi-Hazard | Fredonia-Utilities Director | High | 1, 2 | Relocate the power plant $6 million, relocate the electric substation $1.8 million | FEMA reimbursements for flood damaged facilities, state reimbursements for flood damaged facilities, state revolving fund grants and/or loans, County revenues from countywide sales tax, FEMA Hazard Mitigation Grant Program | 2 years | Completed |
| Fredonia-2 | Relocate Fredonia water treatment plant out of the floodplain | Flood | City of Fredonia Utility Department | Medium | 1, 2 | Unknown | Unknown | 2 years | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Fredonia-3 | Mitigate potential flood damage to Fredonia wastewater treatment plant | Flood | Fredonia - Utilities Director | Medium | 1, 2 | $500,000 | State revolving fund grants and/or loans, County revenues from countywide sales tax, FEMA Hazard Mitigation Grant Program | 1 year | On-Going |
| Fredonia-4 | Obtain backup power generator for Fredonia City Hall | Multi-Hazard | Fredonia City Administrator | Low | 1, 2 | $50,000-$80,000 | FEMA Hazard Mitigation Grant Program Judicial Capital Outlay | 2-3 years | Completed |
| Fredonia-5 | Determine backup facilities for City Hall, Police Station, Fire Department, City Shop and Hospital | Tornado | Fredonia City Administrator | High | 1, 2 | Unknown | Unknown | Unknown | New |
| Fredonia-6 | Construction of levee/dike around sewer plant | Flood | Fredonia Utilities Director | Medium | 1, 2 | Unknown | Unknown | 1 year | New |
| Fredonia-7 | Install electric lines underground and replace pole-mounted transformers with ground transformers | Windstorm and Winter Storm | Fredonia Utilities Director | High | 1 | Unknown | Unknown | Multiple years | New |
| Neodesha-1 | Implement flood buyout program in Neodesha | Flood | Neodesha City Administrator | High | 1 | $610,000 | FEMA Hazard Mitigation Grant Program, State assistance, and City funds | 6/30/2015 | Completed |
| Neodesha-2 | Replace secondary power source for City of Neodesha with one outside the flood zone | Flood | Neodesha Utilities Director | High | 1, 2 | Unknown | FEMA Hazard Mitigation Grant Program, State assistance, and City funds | 2 years | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Neodesha-3 | Relocate raw water intake for City of Neodesha to prevent further damage due to flooding and erosion | Flood | Neodesha Utilities Director | High | 1, 2 | $363,000 to $2,000,000 | FEMA HMGP and PDM Program, Community Development Block Grants, and City revenue bonds | 2 years | On-Going |
| Neodesha-4 | Develop new water storage for Neodesha | Multi-Hazard | Neodesha City Administrator | Medium | 1, 2 | $3,000,000 | FEMA HMGP and PDM Program, Community Development Block Grants, and City revenue bonds | 10 years | On-Going |
| New Albany-1 | Install an outdoor warning siren | Tornado | City of New Albany Council | High | 1, 2 | $4,500 | City funds or available grant funding | 5 years | New |
| New Albany-2 | Construct a community shelter for 50 residents | Tornado | City of New Albany Council | Medium | 1, 2 | $25,000 | Grant funding | 5 years | New |
| Altoona-Midway USD 387-1 | Retrofit existing best available area for tornado refuge to meet FEMA tornado safe room standards | Tornado | Altoona-Midway USD 387 Superintendent | High | 1 | Unknown | FEMA HMGP | 7/1/2105 | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| USD 461-1 | Complete Tornado Refuge Site Assessment and prioritize and implement safe room projects | Tornado | USD 461 Neodesha Superintendent | High | 1 | TBD | The assessment will be completed using District funding. For retrofitting existing structures, the District will apply for FEMA HMGP funding. For future facilities, the District will pursue bond issues. | 6/30/2015 | On-Going |
| Fredonia USD 484-1 | Complete Tornado Refuge Site Assessment and prioritize and implement safe room projects | Tornado | Fredonia USD 484 Superintendent | High | 1 | TBD | The assessment will be completed using District funding. For retrofitting existing structures, the District will apply for FEMA Hazard Mitigation Grant Program funding. For future facilities, the District will pursue bond issues. | 6/30/2015 | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Wilson County Rural Fire District-1 | Reduce hazardous fuels in prioritized wildfire risk areas | Wildfire | Fire Department Chief and Emergency Manager | Low | 1 | $85/acre | The Kansas Forest will assist qualifying communities with pursuing federal WUI grant dollars for hazardous fuel reduction projects | On-Going | On-Going |
| Wilson RWDs #1, #2, #3, #4, #6, #8, #9, #10, #12 | Purchase generators | Utility Failure | Director | Medium | 1, 2 | $30,000 | Water district general funds | 2015 | New |
| Wilson RWDs #1, #2, #4, #6, #8, #9, #10, #12 | Upgrade and/or replace infrastructure | Utility Failure | Director | Medium | 1, 2 | $30,000 | Water district general funds | 2015 | New |
| Wilson RWD #5 | Purchase a generator | Utility Failure | RWD #5 Purchasing Director | Medium | 1, 2 | $30,000 | Water district general funds | 2015 | New |
| Wilson RWD #7 | Purchase a generator | Utility Failure | RWD #7 Purchasing Director | Medium | 1, 2 | $30,000 | Water district general funds | 2015 | New |
| Wilson RWD #11 | Bore out waterline under pond spillway | Flood | Wilson RWD #11- Operator | Low | 1 | $20,000 | Unknown | 2015 | New |
| Wilson RWD #11 | Purchase a generator | Utility Failure | Wilson RWD #11 - Operator | Medium | 1, 2 | $30,000 | Water district general funds | 2015 | New |
| Wilson RWD #13 | Purchase a generator | Flood | Wilson RWD #13 - Operator | Low | 1, 2 | $15,000 | Water district general funds | 2015 | New |
| Radiant Electrical-1 | Upgrade and enhance power lines | Winter Storm and Windstorm | Heartland Rural Electric Cooperative Director | High | 1, 2 | $494,000 | FEMA Hazard Mitigation Grant Program | 4 years | On-Going |

### 5.6.11 WOODSON COUNTY

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Multi-Jurisdictional-1 | Homeowner Education on Wildland Urban Interface | Wildfire | - | - | - | - | - | - | Reassigned to Woodson County Rural Fire |
| Multi-Jurisdictional-2 | Increase public and fire department training on wildland urban interface fires | Wildfire | - | - | - | - | - | - | Reassigned to Woodson County Rural Fire |
| Multi-Jurisdictional-3 | Reduce hazardous fuels in prioritized wildfire risk areas | Wildfire | - | - | - | - | - | - | Reassigned to Woodson County Rural Fire |
| County-1 | Drainage Improvement Study | Flood | Woodson County Public Works Department Director | High | 1 | $125,000 | FEMA-Hazard Mitigation Grant Program; County funds | 1-3 years | On-Going |
| County-2 | Community Storm Shelter | Tornado, Windstorm | Woodson County Emergency Manager | High | 1, 2 | $800,000 | FEMA Hazard Mitigation Grant Program / local funds or in-kind match | 1-5 years | On-Going |
| County-3 | Generator for 4-H and Community Building | Lightning, Tornado, Windstorm, Winter Storm, Utility/ Infrastructure Failure | Woodson County Public Works Department Director | High | 1, 2 | $30,000 | FEMA Hazard Mitigation Grant Program | 9-18 months | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| County-4 | Mark Evacuation Routes | Flooding, Winter Storms | Woodson County Emergency Manager | Medium | 1, 2, 3, 4 | $60,000 plus staff time | FEMA Hazard Mitigation Grant Program/ County staff time | 2-4 years | On-Going |
| County-5 | Enhance GIS Capabilities | All Hazards | Woodson County Appraiser and Emergency Manager | Medium | 1 | $25,000 | Emergency Management Performance Grant | 6-24 months | On-Going |
| County-6 | NFIP Continued Compliance | Flood | Woodson County Emergency Manager | High | 1 | None | None | On-Going | On-Going |
| Toronto-1 | Community Storm Shelter | Tornado, Windstorm | City of Toronto Council | High | 1, 2 | $600,000 | Hazard Mitigation Grant Program | 1-4 years | On-Going |
| Toronto-2 | NFIP Continued Compliance | Flood | City of Toronto Council | High | 1 | None | None | On-Going | On-Going |
| Yates Center-1 | Back-up Generator for Shop | Lightning, Tornado, Windstorm, Winter Storm, Utility/ Infrastructure Failure | Yates Center Road and Bridge Department Director | High | 1, 2 | $25,000 | Hazard Mitigation Grant Program | ASAP | On-Going |
| Yates Center-2 | Prevent Flooding to Low Water Bridge | Flood | Yates Center Road and Bridge Department Director | High | 1, 2 | $50,000 - $60,000 | Hazard Mitigation Grant Program | ASAP | On-Going |
| Yates Center-3 | Stream Corridor Restoration | Flood | Yates Center Street Department Director | High | 1, 2 | $100,000 | Hazard Mitigation Grant Program or other grants and local funding | 90 days from securing funds | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Yates Center-4 | Adopt Building Code | All Hazards | Yates Center Code Enforcement Officer | Medium | 1 | $40,000 per year for an inspector and the cost of adopting a building code | Each city would contribute a portion of the salary for a building inspector | 1 year | On-Going |
| Yates Center-5 | NFIP Continued Compliance | Flooding | City of Yates Center Council | High | 1 | None | None | On-Going | On-Going |
| USD-366-1 | School/Community Saferoom | Tornado, Windstorm | City of Yates Center Council | High | 1, 2 | $1,200,000 | Hazard Mitigation Grant Program | 2-5 years | On-Going |
| Lyon-Coffey REC-1 | Replace Copper Weld Wire Spans and Poles with Poles to current Standards | Tornado, Windstorm, Winter Storm | Lyon-Coffey Electric Cooperative, Inc Director | Medium | 1 | $11,000,000 | Rural Utilities Service, FEMA Hazard Mitigation Grant Program, KDEM | 12 months | On-Going |
| Heartland REC-1 | Upgrade and Enhance Power Lines | Tornado, Windstorm, Winter Storm | Heartland Rural Electric Cooperative Director | Medium | 1 | $208,000 | FEMA Hazard Mitigation Grant Program | 4 years | Modified and On-Going |
| Heartland REC-2 | Upgrade and Enhance Power Lines | Tornado, Windstorm, Winter Storm | Heartland Rural Electric Cooperative Director | Medium | 1 | $72,100 | Unknown | 4-5 years | New |
| Radiant REC-1 | Replace cooper weld wire and pole line spans to current codes and standards | Tornado, Windstorm, Winter Storm | Radiant Electric Cooperative, Inc Director | Medium | 1 | $500,000 | Rural Utilities Service, U.S. Department of Agriculture; General Funds for maintenance; FEMA/KDEM Mitigation | 6 months | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| Radiant REC-2 | Installation of Lightning Arrestors | Tornado, Windstorm, Winter Storm | Radiant Electric Cooperative, Inc Director | Low | 1, 2 | $25,000 | Rural Utilities Service, U.S. Department of Agriculture; General Funds for maintenance; FEMA/SEMA Mitigation | 1 month | On-Going |
| RWD #1-1 | Install back-up generators for pumps | Winter Storm, Windstorm, Flood, Lightning, Utility/ Infrastructure Failure | Rural Water District Director | High | 1, 2 | $25,000 for each pump | Unknown | 1 year | New |
| WC Rural Fire-1 | Homeowner Education on Wildland Urban Interface | Wildfire | Woodson County Rural Fire Department Chief and Emergency Manager | High | 3 | $500 per workshop | FEMA Hazard Mitigation Grant Program, KFS Community Wildfire Protection Program grants, Emergency Management Performance Grants | 6-18 months | On-Going |
| WC Rural Fire-2 | Increase public and fire department training on wildland urban interface fires | Wildfire | Woodson County Rural Fire Department Chief and Emergency Manager | Low | 3 | $30 per student per training session | The Kansas Forest Service, along with its state and federal partners, can assist with providing such training opportunities | On-Going | On-Going |

| Action Identification | Description | Hazard Addressed | Responsible Party | Overall Priority | Goal(s) Addressed | Estimated Cost | Potential Funding Source | Proposed Completion Timeframe | Current Status |
|---|---|---|---|---|---|---|---|---|---|
| WC Rural Fire-3 | Reduce hazardous fuels in prioritized wildfire risk areas | Wildfire | Woodson County Rural Fire Department Chief and Emergency Manager | Low | 1 | $85/acre | The Kansas Forest will assist qualifying communities with pursuing federal WUI grant dollars for hazardous fuel reduction projects | On-Going | On-Going |
| SEK Health-1 | Provide public information | All Hazards | SEK Health Director | High | 3 | $10,000 | FEMA HMGP | 1-2 years | New |

## 5.7 MITIGATION ACTIONS SUPPORTING NATIONAL FLOOD INSURANCE PROGRAM

Participating jurisdictions within the region are committed to continued participation and compliance with the NFIP. The following table identifies specific mitigation actions supporting this commitment and are provided to assist in NFIP CRS application and compliance.

**Actions in Support of NFIP**

| County | Action Identification | Description | Responsible Party | Current Status |
|---|---|---|---|---|
| Allen | County-5 | Promote National Flood Insurance Program | Allen County Flood Plain Director | On-Going |
| Allen | Elsmore-4 | Promote National Flood Insurance Program | Allen County Flood Plain Director | On-Going |
| Allen | Gas-5 | Promote National Flood Insurance Program | Allen County Flood Plain Director | On-Going |
| Allen | Humboldt-5 | Promote National Flood Insurance Program | Allen County Flood Plain Director | On-Going |
| Allen | Iola-1 | Implement buyout program for flood damaged properties | City of Iola Codes Services Department Supervisor | On-Going |
| Allen | Iola-7 | Promote National Flood Insurance Program | Allen County Flood Plain Director | On-Going |
| Allen | LaHarpe-4 | Promote National Flood Insurance Program | Allen County Flood Plain Director | On-Going |
| Allen | Moran-6 | Promote National Flood Insurance Program | Allen County Flood Plain Director | On-Going |
| Allen | Savonburg-5 | Promote National Flood Insurance Program | Allen County Flood Plain Director | On-Going |
| Bourbon | County-3 | Develop a program to acquire and preserve parcels of land subject to repetitive flooding from willing and voluntary property owners. | County Officials | On-Going |
| Bourbon | County-4 | On an annual basis, contact owners identified in high-risk flood areas and inform them of potential availability of assistance through the Federal Flood Mitigation Assistance program, in addition to other flood protection measures. | City-County Officials | On-Going |
| Bourbon | County-5 | Identify flood prone areas and recommend flood reduction measures to county planners. | County Officials | On-Going |
| Bourbon | County-27 | Continued participation and compliance with the NFIP | City / County Officials | On-Going |
| Bourbon | County-28 | Advertise and promote the availability of flood insurance to property owners by direct mail once a year. | City / County Officials | On-Going |
| Bourbon | Bronson-1 | Identify flash-flood prone areas to consider flood reduction measures to the city's floodplain manager/ planning officer. | City Officials | On-Going |
| Bourbon | Fort Scott-1 | Identify flood prone areas to consider future flood reduction measures within the City of Fort Scott. | City Officials | On-Going |
| Bourbon | Fort Scott-4 | Develop a program to acquire and preserve parcels of land subject to repetitive flooding from willing and voluntary property owners. | City Officials | On-Going |
| Bourbon | Fulton-1 | Identify flood prone areas to consider future flood reduction measures within the City of Fulton. | City Officials | On-Going |
| Bourbon | Redfield- 1 | Identify flood prone areas to consider future flood reduction measures within the City of Redfield. | City Planners | On-Going |

| County | Action Identification | Description | Responsible Party | Current Status |
|---|---|---|---|---|
| Bourbon | Uniontown-1 | Identify flood prone areas to consider future flood reduction measures within the City of Uniontown. | City Officials | On-Going |
| Chautauqua | Sedan-1 | NFIP Continued Compliance | City of Sedan | On-Going |
| Cherokee | County-10 | Continue Participation in the National Flood Insurance Program | Hazard Mitigation Committee, Emergency Managers | On-Going |
| Cherokee | County-12 | Floodplain Property Acquisition Program | Hazard Mitigation Committee, Emergency Managers | On-Going |
| Crawford | County-7 | Study and implement drainage issued throughout the county in flood prone areas, and make recommendations for flood control measures, flood management procedures, and low-water crossing improvements. | Crawford County Council | On-Going |
| Crawford | Arcadia-1 | Continue to participate in the National Flood Insurance Program. | Arcadia Council | On-Going |
| Crawford | Arcadia-3 | Update flood damage prevention ordinance to include new FEMA digital flood insurance rate maps. | Arcadia Council | On-Going |
| Crawford | Arcadia-4 | Provide additional support to the Community Rating System to raise the rating to the next level. | Arcadia Council | On-Going |
| Crawford | Arma-6 | Update flood damage prevention ordinance to include new FEMA digital flood insurance rate maps. | Arma Council | On-Going |
| Crawford | Arma-9 | Continue to participate in the National Flood Insurance Program. | Arma Council | On-Going |
| Crawford | Frontenac-1 | Update flood damage prevention ordinance to include new FEMA digital flood insurance rate maps. | Frontenac Council | On-Going |
| Crawford | Frontenac-4 | Continue to participate in the National Flood Insurance Program. | Frontenac Council | On-Going |
| Crawford | Girard-1 | Continue to participate in the National Flood Insurance Program. | Girard Council | On-Going |
| Crawford | Girard-4 | Update flood damage prevention ordinance to include new FEMA digital flood insurance rate maps. | Girard Council | On-Going |
| Crawford | Girard-5 | Provide additional support to the Community Rating System to raise the rating to the next level. | Girard Council | On-Going |
| Crawford | Pittsburg-1 | Continue to participate in the NFIP. | Pittsburg Council | On-Going |
| Crawford | Pittsburg-2 | Update flood damage prevention ordinance to include new FEMA digital flood insurance rate maps. | Pittsburg Council | On-Going |
| Crawford | Pittsburg-3 | Provide additional support to the Community Rating System to raise the rating to the next level. | Pittsburg Council | On-Going |
| Elk | County-5 | Continued Compliance with NFIP and public education | Elk County Emergency Manager, Floodplain Administrator | On-Going |
| Elk | Grenola-1 | Continue to participate in the NFIP | City of Grenola Personnel | On-Going |
| Elk | Howard-5 | Continue Participation in the NFIP | City of Howard Council | On-Going |
| Elk | Longton-6 | Continue to participate in the NFIP and remain in good standing | City of Longton Council | On-Going |
| Labette | County-6 | Continue participation in the National Flood Insurance Program | Labette County Commission Chairman | On-Going |

| County | Action Identification | Description | Responsible Party | Current Status |
|---|---|---|---|---|
| Labette | Altamont-1 | Continue participation in the National Flood Insurance Program | City Clerk | On-Going |
| Labette | Chetopa-6 | Continue Participation in the National Flood Insurance Program | City Clerk | On-Going |
| Labette | Mound Valley-2 | Continue Participation in the National Flood Insurance Program | City Clerk | On-Going |
| Labette | Oswego-8 | Continue Participation in the NFIP | City Clerk | On-Going |
| Labette | Parsons-6 | Buyout flood prone properties to include repetitive loss properties | Parsons City Manager | On-Going |
| Labette | Parsons-7 | Continue to participate in the NFIP | Parsons City Manager | On-Going |
| Montgomery | County-3 | Promote Flood Insurance | Montgomery County Emergency Manager | On-Going |
| Montgomery | County-7 | Buyout flood prone Property | Montgomery County Emergency Manager | Completed |
| Montgomery | County-12 | Continue to participate in the National Flood Insurance Program | Montgomery County Emergency Manager | On-Going |
| Montgomery | Caney-2 | Continue to participate in the NFIP in good standing and manage floodplain in accordance with currently adopted Floodplain Management Ordinance | City of Caney, City Administrator | On-Going |
| Montgomery | Cherryvale-1 | Continue to participate in the National Flood Insurance Program in good standing and manage the floodplain in accordance with the currently adopted Floodplain Management Ordinance | City of Cherryvale, City Administrator | On-Going |
| Montgomery | Coffeyville-5 | Continue to participate in the National Flood Insurance Program in good standing and manage the floodplain in accordance with the currently adopted Floodplain Management Ordinance | City of Coffeyville Engineering Department Director | On-Going |
| Montgomery | Coffeyville-6 | Implement flood proofing measures such as elevation of electrical components at the Coffeyville Water Treatment Plant Intake Structure | City of Coffeyville Water Utility | On-Going |
| Montgomery | Coffeyville-9 | Flood prone property buyout in Coffeyville | City of Coffeyville Engineering Department Director | On-Going |
| Montgomery | Dearing-5 | Continue process to join National Flood Insurance Program | City of Dearing Council | Complete |
| Montgomery | Elk City-9 | Continue to participate in the National Flood Insurance Program | Elk City Council | On-Going |
| Montgomery | Independence-9 | Continue to participate in the National Flood Insurance Program in good standing and manage the floodplain in accordance with the currently adopted Floodplain Management Ordinance | City of Independence Council | On-Going |
| Montgomery | Independence-10 | Purchase flood prone property in the 100-year floodplain | City of Independence Council | complete |
| Neosho | County-1 | Continue NFIP Participation | Neosho County Emergency Manager | On-Going |
| Neosho | Chanute-2 | Continue NFIP Participation | City of Chanute, Community Development Office Director | On-Going |

| County | Action Identification | Description | Responsible Party | Current Status |
|---|---|---|---|---|
| Neosho | Chanute-3 | Buyout of Floodprone Properties | City of Chanute, Community Development Office Director | Completed |
| Neosho | Erie-1 | Buyout of Floodprone properties | City of Erie, City Clerk | On-Going |
| Neosho | Erie-5 | Continue NFIP Participation | City Superintendent | On-Going |
| Neosho | St. Paul-2 | Continue NFIP participation | City of St. Paul City Council | On-Going |
| Neosho | Thayer-10 | Continue the process to join the NFIP | City of Thayer Council | On-Going |
| Wilson | County-1 | Implement flood buyout program in Wilson County | Wilson County Coordinator | Completed |
| Wilson | County-7 | Increase outreach on National Flood Insurance Program (NFIP) | Wilson County Health Department - Environmental Specialist | On-Going |
| Woodson | County-6 | NFIP Continued Compliance | Woodson County Emergency Manager | On-Going |
| Woodson | Toronto-2 | NFIP Continued Compliance | City of Toronto Council | On-Going |
| Woodson | Yates Center-5 | NFIP Continued Compliance | City of Yates Center Council | On-Going |

## 5.8 ACTION IMPLEMENTATION

Each participating jurisdiction is responsible for implementing their specifically identified mitigation actions. To foster accountability and increase the likelihood that actions will be implemented, every proposed action is assigned to a specific department. In general:

- A representative from the responsible department will be responsible for tracking and reporting on action status.
- The representative provide input on whether the action as implemented is successful in reducing vulnerability, if applicable.
- If the action is unsuccessful in reducing vulnerability, the responsible department will be tasked with identifying deficiencies and additional required actions.

By identifying actions by specific jurisdiction it is hoped that future plan updates will be simplified as each jurisdiction can modify their individual actions without altering the actions of other jurisdictions. Additionally, each action has been assigned an proposed completion timeframe to determine if the action is being implemented according to plan.

# 6.0 PLAN MAINTENANCE

## 6.1 INTRODUCTION

*44 CFR 201.6 (c)(4) requires "A plan maintenance process that includes: (i) A section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle. (ii) A process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate. (iii) Discussion on how the community will continue public participation in the plan maintenance process."*

This chapter details the regional strategy for plan maintenance and outlines the methodology for monitoring, updating, and evaluating the Plan. The chapter also discusses incorporating the Plan into existing planning mechanisms and how to address continued public involvement.

## 6.2 LOCAL EMERGENCY PLANNING COMMITTEE REQUIREMENTS

Regional Local Emergency Planning Committees (LEPCs) will be tasked with Plan monitoring, evaluation, and maintenance with assistance from KDEM. The LEPCs, led by county emergency management agencies and with facilitation by KDEM, will:

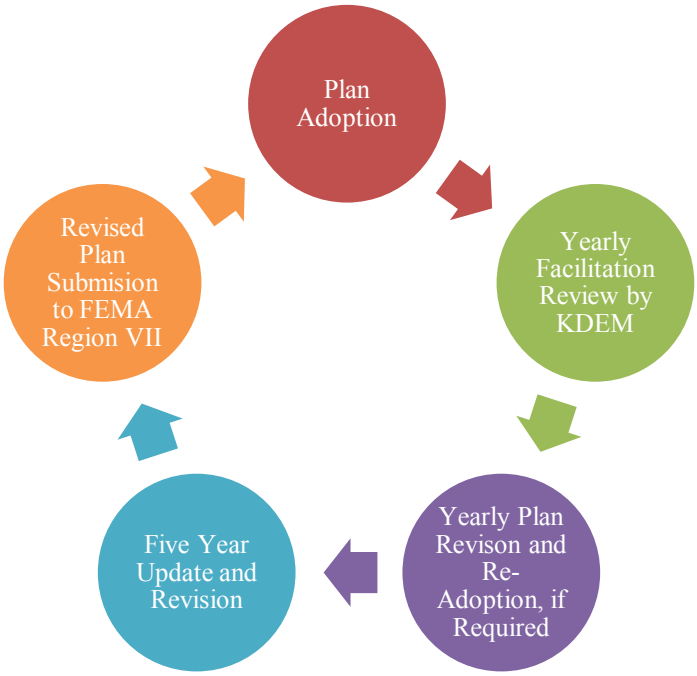
- Meet regularly to monitor and evaluate the implementation of the Plan
- When applicable, meet after a disaster event to evaluate the effectiveness of the Plan
- Act as a think tank for all issues related to hazard mitigation planning
- Act as a clearinghouse for hazard mitigation ideas and activities
- Assist with the implementation of all identified actions with available resources
- Monitor all available funding opportunities for mitigation actions
- Coordinate the cycle for the revision and update of the mitigation plan
- Report on Plan progress and recommended changes to the relevant governing bodies
- Inform and solicit input from the public

LEPC members will also be responsible for promoting the integration of the hazard mitigation plan into all relevant local and regional plans, policies, procedures and ordinances.

## 6.3 PLAN MAINTENANCE PROCESS

*44 CFR 201.6 (c)(4) requires "A plan maintenance process that includes: (i) A section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle."*

The following diagram present the process for Plan maintenance and updates. KDEM will facilitate a y early Plan review and further facilitate any revisions, if necessary, and the subsequent re-adoption process.




Prior to Plan expiration, and working with all participating jurisdictions, a five-year update of the Plan will be submitted to the KDEM and FEMA Region VII as per the above noted requirement. The Plan will be reviewed to determine whether there have been any significant changes identified during the one year KDEM facilitated Plan reviews. These changes may include:

- Increased local or regional development or populations
- Increased or decreased exposure to identified hazards
- Emergence of newly identified hazards
- Changes in local or regional capabilities
- Legislative changes
- Newly available data
- Successful or unsuccessful implementation of identified actions
- New jurisdictions who would like to participate

The on-going Plan maintenance process provides participating jurisdictions the capability of evaluating identified actions for success or failure. Additionally, the process allows for t he timely revision of t he Plan as necessary. Changes to the Plan will be made to accommodate actions that have failed, are not considered feasible, or ha ve been newly identified to address current needs. Updating of the Plan will be enacted through written changes and submissions as directed by the LEPCs and facilitated by KDEM.

Upon each successive revision the Plan will need to be re-adopted by all participating jurisdictions. Circumstances, including a major disaster or a change in regulations or laws, may modify the required five year planning cycle.

## 6.4 Post-Disaster Declaration Procedures

Following a disaster, the LEPCs may meet to review the Plan to determine if any additional actions need to be identified, additional funding has become available, or any identified actions need to be re-prioritized.

## 6.5 Incorporation of Mitigation Plan Into Other Planning Mechanisms

*(44 CFR 201.6 (c)(4)(ii) requires "A process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate."*

All participating jurisdictions will strive to implement actions that minimize loss of life and property damage from hazards as to their current capabilities. Whenever possible, participating jurisdictions will use existing plans, policies, procedures and programs to aid in the implementation of identified hazard mitigation actions. Potential avenues for implementation may include:

- Operation plans
- General or master plans
- Ordinances
- Capital improvement plans
- Budget revisions or adoptions
- Hiring of staff
- Stormwater planning
- Land use planning

The governing bodies of the jurisdictions adopting this Plan will encourage all other relevant planning mechanisms under their authority to consult this Plan to ensure minimization of risk to natural hazards as well as coordination of activities.

## 6.6 Continued Public Involvement

*44 CFR 201.6 (c)(4)(iii) requires a "Discussion on how the community will continue public participation in the plan maintenance process."*

Public participation is an important part of the continued mitigation planning process. Every effort will be made by participating jurisdictions to keep the public informed on both relevant

mitigation issues and the five year Plan revision cycle. S trategies for c ontinued public involvement may include:

- Public hearings
- Postings on electronic media, to include websites
- Notifications, when possible, in local media
- Making plans available for review in public locations

# APPENDIX A

# ADOPTION RESOLUTIONS

# APPENDIX B

# MEETING INFORMATION



# Regional Mitigation Plan Kickoff Meetings Invitation

**For Region H: Crawford, Bourbon, Cherokee, Labette, Allen, Neosho, Wilson, Montgomery, Elk, Woodson, Greenwood, Chautauqua Counties**



When:

**15 April 2013, 9—noon -** Via Christi Hospital, Pittsburgh, KS

**16 April 2013, 1—4 pm** - KDOT—1700 S. Washington, Chanute, KS

**22 April 2013**, 6:30—9:30 p.m.— Cox Building, Howard, KS

The Regional Mitigation Plan Initiative for Region H includes the 12 counties listed above. Stakeholder participation is paramount to its success. We look forward to seeing you there!

Kansas Division of Emergency Management
2800 SW Topeka Blvd
Topeka, KS 66611
785-861-3024

Kickoff Meeting will be facilitated by AMEC. Regional Mitigation Plans will be written by the State of Kansas and its contract employees.



| | |
|---|---|
| To | **Region "H" Hazard Mitigation Planning Committee** |
| Through | **Jeanne Bunting, Mitigation Planner**<br>**Kansas Division of Emergency Management (KDEM)** |
| From | **Susan Belt, MT(ASCP), AMEC Environment & Infrastructure, Inc** |
| Tel / E-mail | **785-272-6830 / susan.belt@amec.com** |
| Date | **4/19/2013** |
| Subject | **Minutes from the Region "H" Crawford, Bourbon, Labette and Cherokee Kickoff Planning Meeting held on 4/15/2013 in Pittsburg, KS.** |

This document is a record of attendance and a summary of the issues discussed during the above meeting. Topics covered during the meeting included: (1) an introduction to the purpose of hazard mitigation planning, (2) the benefits of a multi-jurisdictional approach, (3) the reasons for and benefits of the regional mitigation planning process, and (4) grant programs linked to an approved plan. The hazard mitigation planning process was reviewed to include requirements for public involvement and the use of data collection guides. The planning committee reviewed the list of hazards to be used as a part of the regional plan. The participants indicated a familiarity with the hazard ranking methodology or probability, magnitude, warning time, and duration. Mrs. Belt explained that the State Hazard Mitigation Team had decided with the current update of the State Plan to profile the hazard Civil Disorder as a separate hazard rather than including it as a part of the Terrorism hazard. The group discussed mitigation actions and the availability of grant programs during the meeting. The meeting concluded with a discussion of the next steps in the planning process. The formal presentation portion of the meeting began at 9:00 am and concluded at 11:00 am.

## Attendees

| Name | Organization |
|---|---|
| Ron Albertini | Crawford County / City of Frontenac |
| Joey Adams | Crawford County EMS |
| Jason Allison | Cherokee County Emergency Management |
| Tom Amershek | Pittsburg State University |
| Fred Andrew | USD 250 Pittsburg |
| Paul Ballou | City of Fort Scott |
| Debbi Baugher | Labette County Public Health |
| Jim Beam | Mulberry Council |
| Bill Beasley | City of Pittsburg |
| Eldon Bedene | Crawford County Emergency Management |
| J. Don Book | Salvation Army / Red Cross |
| Derek Clevenger | City of Parsons |
| Terri Coop | Bourbon County Emergency Management |
| Larry Cupit | Public Health of Labette County |
| Jolene Edwards | Crawford County RWD #7 |
| Betha Elliott | Cherokee County Health Department |
| Matt Eyer | Blue Umbrella Solutions |
| Judith Freeman | Crawford County Zoning |
| John Gagliardo | Crawford County 911 |

| | |
|---|---|
| Pam Gilchrist | American Red Cross |
| Kelly Gillette | Crawford County Mental Health |
| Janis Goedeke | Crawford County Health Department |
| Troy Graham | City of Pittsburg |
| Brandy Grassl | Labette County 911 |
| Fred Gress | City of Parsons |
| Steve Grier | Crawford County Sheriff |
| Diane Gross | USD 234 Fort Scott |
| Steve Higgs | Labette County Sheriff |
| Jason Hipfl | RWD #5 |
| Rick Hizey | City of Parsons |
| Pat Holt | Girard Medical Center |
| Randy Jones | City of Mulberry |
| Chuck Kunshek | Crawford County RWD #2 |
| Jerry Lomshek | Public Water Supply Dist #11 / Chicopee Rural Water Dist |
| Dave Martin | City of Fort Scott |
| Sherri McGuire | City of Parsons |
| Michael McLead | Arma Fire / Crawford County #2 Fire |
| Darrell Moyer | City of Parsons |
| Kyle Nelson | Crawford County GIS |
| Stacie Nelson | Labette Health |
| Paul Norris | Heartland REC |
| Timothy Pelican | Mulberry Police Department |
| Janet Pittman | Red Cross |
| Tom Ragonese | Crawford County / Sewer District #1, 2, 3, 4 |
| Michael Ryan | Crawford County Fire Dist #1 |
| Steve Samuelson | Kansas Department of Agriculture |
| Melanie Scheper | Pittsburg Police Department |
| John Sell | Sherman Township |
| Mike Simons | City of Pittsburg |
| Danny Smith | Crawford County Sheriff |
| David Smith | City of Cherokee / District #3 Fire / Cherokee City Fire |
| Larry Steeby | Labette County / City of Parsons |
| Brock Sutherland | Labette Health |
| Bill Towery | Crawford County Environmental Health |
| Tracy Trammell | City of Mulberry |
| Chris Way | Labette EMS |
| Kari West | City of Parsons |
| Martha Wilkerson | City of Parsons |
| Carl Wood | Crawford County |

# Introductions

Eldon Bedene, Crawford County Emergency Management, began the meeting by welcoming and thanking the attendees. Matt Eyer, Contract Mitigation Planner with Kansas Division of Emergency Management (KDEM), was introduced. Because of the large number of participants, in the interest of time, participants only identified themselves by jurisdiction only. Susan Belt, AMEC, provided the formal portion of the presentation.

# Introduction to Hazard Mitigation Planning

Mrs. Belt presented information on the purpose and requirements of the Disaster Mitigation Act of 2000. The attendees were reminded that this is a regional planning effort which will combine all of the current local mitigation plans in Region "H." Those plans include: Allen, Bourbon, Crawford, Cherokee, Chautauqua, Elk, Greenwood, Labette, Montgomery, Neosho, Woodson, and Wilson Counties. Once the regional plan is approved, it will supersede the previous plans. The presentation also addressed the benefits for jurisdictions participating in this mitigation plan update, including eligibility for federal hazard mitigation assistance funding programs. Historically, the region has received nearly $21 million in Hazard Mitigation Assistance grants. The group also discussed the Siren grant program that began in 2011. Region H has received more than $500,000 for 31 warning sirens in the region.

Mrs. Belt described the benefits of participating in a multi-jurisdictional plan as improving coordination and communication among local jurisdictions and that these hazards do not stop at jurisdictional boundaries thus this multi-jurisdictional plan allows for a more comprehensive approach. The group also heard information regarding the significant cost savings being realized by the regional approach to planning. There are currently insufficient funds available to provide the full cost of updates to each county plan.
The regional approach now being used allows planning services to be provided to each county for the update at no cost to the county. KDEM has hired two contractors to assist with the planning effort. Matt Eyer with Blue Umbrella will be completing the Region "H" mitigation plan for committee review.

Mrs. Belt also described the role of the Hazard Mitigation Planning Committee (HMPC).Each jurisdiction participating in development of the plan must meet the following minimum requirements:

- Designate a representative to serve on the Region "G" Hazard Mitigation Planning Committee, which will meet **twice** during the planning process,
- Provide data for and assist in the development of the updated risk assessment that describes how various hazards impact your jurisdiction,
- Provide data to describe current capabilities,
- Develop/update mitigation actions (at least one) specific to your jurisdiction,
- Provide comments on plan drafts as requested,
- Inform the public, local officials, and other interested parties about the planning process and provide opportunities for them to comment on the plan, and
- Formally adopt the mitigation plan.

# Planning for Public Involvement

The local/regional hazard mitigation plan requirements state that the public must have the opportunity to comment on the plan. The public will be given two opportunities to comment on the plan, once during the drafting stage and another when the plan is complete in the final draft stage. KDEM is planning to utilize Facebook pages to advertize the planning meetings, and to provide a vehicle for the public to make comments regarding the process and plan drafts. Jeanne Bunting with KDEM will provide additional information regarding the pages at a future meeting.

The meeting attendees discussed methods for notifying the public in the plan. The group discussed methods that are used to effectively engage the public in their Counties. Examples included using Survey Monkey to survey the public, using social media, city, county and school websites. The group felt that public meetings were not generally a successful method for engaging the public. School representatives and city officials present at the meeting agreed to place information on their websites related to surveys and plan review locations. Local Emergency Management Agencies will coordinate the appropriate links to the surveys. Participants were asked to contact their local emergency manager to assist with public participation.

## Data Collection Process

Mrs. Belt explained the process being used to collect data for vulnerability and loss for each jurisdiction for the State of Kansas plan. This data will likely be utilized during the regional plan development process. The participating jurisdictions were provided hard copies of Data Collection Guides. KDEM will follow-up after the meeting with electronic copies emailed to the attendees. Local County Emergency Management Agencies will follow-up with jurisdictions that were not in attendance at this meeting to provide an overview of the process being used and copies of data collection guides for completion. The Data Collection Guides are specific for local units of government and schools. There are two different guides, one for local governments, and one for schools and universities. The jurisdictions were requested to provide data regarding hazards that had occurred in their jurisdiction since the last plan update (2009 to 2012) for the 22 hazards that are in the Regional Plan. The Data Collection Guides were requested to be returned to Matt Eyer by May 3, 2013. Mrs. Belt reminded the group that copies of photos and newspaper articles are also helpful in putting the plan together.

## Plan Format/ Regional and Countywide Risk Assessment

Mrs. Belt, with the help of Blue Umbrella staff, reviewed the process for integrating the plans. The list of hazards in the State of Kansas plan is the list that is being used for the regional plans. Several of the hazards included in the State Plan were not included in the current plan for a few of the counties in Region H. Those counties will need to provide additional information for the risk assessment. Most of the plans in Region H utilized the same methodology for ranking hazards that is used by the State Plan and will be used for the Regional Plans. Blue Umbrella staff updated the results of a hazard ranking using the State Plan methodology for hazards in their current plan and the new Civil Disorder hazard. Planning committee members, along with other representatives from their jurisdiction were asked to review the new hazard ranking listing provided for their individual counties and for Region H and provide any comments back to Blue Umbrella by May 3, 2013. Many participants returned the hazard ranking form at the end of the meeting.

Steve Samuelson with the Kansas Department of Agriculture, provided the group with information regarding the Community Rating System (CRS). The program is available to communities that participate in the National Flood Insurance Program (NFIP). Participation in the CRS program allows communities to obtain discounts for NFIP participants on flood insurance.

## Mitigation Actions

The planning committee was provided an introduction to update and development of mitigation actions. Each jurisdiction was provided with a copy of the actions included in the current plan. Jurisdictional representatives were requested to provide updates as to: (1) action status – "completed," "pending/on-going," "deleted," or "modified"; (2) updates to the text and a description of the progress for any pending actions. The group was reminded that each participating jurisdiction must have at least one action and that all NFIP jurisdictions must have an NFIP-related action. Participants were also given a copy of sample actions and forms for adding new actions to the plan. Mrs. Belt also discussed the concept of regional actions to be included as well as actions for each local entity. The updates on the current actions and any new actions were requested to be returned to Blue Umbrella by May 3, 2013. The final planning meeting will be scheduled for October, 2013, will continue the discussion regarding mitigation actions. At that final meeting, the mitigation actions for the plan will be prioritized.

## Next Steps

The meeting concluded with a discussion of the remaining steps to complete the planning process as follows:

- **May 3, 2013 — Data Collection Guides Due to KDEM**
- **May3, 2013 —Hazard Ranking Reviews Due to KDEM**
- **May 3, 2013 — Mitigation Action Updates + New Actions Due to KDEM**
- **August 28, 2013 — Meeting #2 with Emergency Managers ONLY**
- **October, 2013 — Meeting #3 @ 1:00 pm Location to be Determined**
- **October/November 2013 — Submit Plan to FEMA**
- **December 2013 — Anticipate FEMA's Approval Pending Adoption**

# Region "H" Mitigation Plan Kickoff Meeting

Location: Pittsburg

Date: 4/15/2013 Time: 0900-1100



| | NAME (Print) | Organization | Phone / E-mail |
|---|---|---|---|
| LB | Debbi Baugher | Public Health of Labette County | 620-421-4350 dbaugher@labettecounty.com |
| | Terri Coop | BBCO emer mgmt | 620 224 8165 em@bourbon countyks.org |
| LB | FRED GRESS | Parsons, City of | 620-421-7030 fgress@parsonsks.com |
| | Rick Hizey | City of Parsons | 620-423-9539 rhizey@parsonsks.com |
| | Janis Goedeke | CR Co Health | jgoedeke@crawfordcohd.org |
| | J. Don Book | Salvation Army Red Cross | 620-875-7612 jdonbook@gmail.com |
| | Jason Allison | Cherokee Cty Em | 620-429-1857 jallison198@gmail.com |
| | Jim Beam | Mulberry Council | 620-764-3156 P.O. Box 124. 66756 |
| | John "Nick" Sell | Shennan Township Board | 620 249 0461 nicksin022001@yahoo.com 95 W Lease Rd Farlington, Ks 66734 |

# Region "H" Mitigation Plan Kickoff Meeting

Location: Pittsburg

Date: 4/15/13 Time: 0900-1100



| NAME (Print) | Organization | Phone / E-mail |
|---|---|---|
| Kelly Gillette | Crawford Co. Mental Hlth | kgillette@ ~~[illegible]~~ cmhcc.org |
| Pat Holt | Girard Med Center | PhoLT@GirardmedicalCenter.com |
| Pam Gilchrist | American Red Cross | pamgilchrist@redcross.org |
| Jerry D. Lomshek | Public Wholesale Water Supply Dist #11 Chicopee Rural Water Dt. | jdlomshek@hotmail.com |
| Paul Norris | Heartland REC | pauln@heartland-rec.com |
| LB Larry Cupit | Public Health of Labette Co. | lcupit@labettecounty.com |
| LB Derek Clevenger | City of Parsons | dclevenger@parsonsks.com |
| LB Darrell Moyer | " " | dmoyer@parsonsks.com |
| Chuck Kunshek | Cr. Co RWD #2 | c_kunshek@hotmail.com |

# Region "H" Mitigation Plan Kickoff Meeting

Location: Pittsburg

Date: 4/15/13 Time: 0900-1100 Page 3 of 7

| NAME (Print) | Organization | Phone / E-mail |
|---|---|---|
| Jason Hipfl | RWD#5 | cjlamborn@yahoo.com 620-235-3776 ~~AHipfl@msn.com~~ |
| Michael McLeod | Arma Fire Crawford Co #2 Fire | 620-230-9963 |
| Tom Ragonese | Crawford County Sewer Dist. #1, 2, 3, 4 | 620-724-6604 tomr@ckt.net |
| Eldon Bedene | Crawford Co. EM | 620-249-0104 edbedene@ckt.net |
| Paul Ballou | City of Fort Scott | 620-224-8169 pballou@fscity.org |
| Dave Martin | City of Ft Scott | 620-644-2498 dmartin@fscity.org |
| LB Brandt Grassl | Labette Co 9-1-1 | 620-795-2565 Dgrassl@labettecounty.com |
| Steve Higgins | Labette Co. Sheriff | Shiggins@labettecounty.com |
| LB Brock Sutherland | Labette Health | brock@lcmc.com |

# Region "H" Mitigation Plan Kick off Meeting

Location: Pittsburg

Date: 4/15/13 Time: 0900-1100



| NAME (Print) | Organization | Phone / E-mail |
|---|---|---|
| Martha Wilkerson | City of Parsons | 620-421-7020<br>mwilkerson@parsonsks.com |
| Tracy Trammell | City of Mulberry | 620-764-3315<br>cityofmulberryks@yahoo.com |
| RANDY L JONES | " " | "<br>randyjones@AZZ.com |
| MIKE SIMONS | City of Pittsburg | 620-230-5596<br>mike.simons@pittks.org |
| Carl R Wood | Crawford County | CR-Wood@.cox.net |
| Timothy T Pelican | Mulberry Police Dept | 620-764-3200 |
| TROY GRATHAM | CITY OF PITTSBURG | 620-231-4170<br>TROY.GRATHAM@PITTKS.ORG |
| Steve Geier | Crawford Co Sheriff | 620-724-8294<br>sgeier@crseks1.org |
| Bill Towery | Cr. Co. Env. Health | 620-724-7088<br>Btowery@ckt.net |

# Region "H" Mitigation Plan Kick off Meeting

Location: Pittsburg

Date: 4/15/13 Time: 0900-1100 Page 5 of 7

| NAME (Print) | Organization | Phone / E-mail |
|---|---|---|
| Matt Eyler | Blue Umbrella Solutions | 303 552 1181 |
| Bill Beasley | City Of Pittsburg | 620-231-4170 bills@pittks.org |
| Danny Smith | Crawford Co Sheriff | dsmith@crsoks.org |
| JANET PITTMAN | RED CROSS | janpitt@gmail.com |
| Tom Amershek | PSU | TAmershek@pittstate.edu |
| | | |
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| | | |

# Region "H" Mitigation Plan Kick off Meeting

Location: Pittsburg

Date: 4/15/13 Time: 0900-1100



| NAME (Print) | Organization | Phone / E-mail |
|---|---|---|
| Diane Gross | USD 234 Fort Scott | 620 223-0800 dgross@usd234.org |
| LB Larry Steeby | LB County City of Parsons | 620 778 3012 firechief@parsonsks.com |
| LB Stacie Nelson | Labette Health | 620-820-5154 snelson@labettehealth.com |
| LB Chris Way | Labette EMS | cway@lcmc.com 6204212401 |
| Melanie Schieper | Pittsburg Police Dept | |
| David Smith | City of Cherokee Dist #3 Fire Cherokee City Fire | sawmilldavid@hotmail.com |
| Joey Adams | Crawford County EMS | jadams@cremc.org |
| Kyle Nelson | Crawford County GIS | kylnel@gmail.com |
| Ron Albertini | Crawford Co / Frontenac | surveyor@frontenacks.net |

# Region "H" Mitigation Plan Kick off Meeting

Location: Pittsburg
Date: 4/15/13 Time: 0900-1100



| NAME (Print) | Organization | Phone / E-mail |
|---|---|---|
| Jolene Edwards | CCRWD #7 | 620-249-0223<br>edwards.jd@cktinet |
| Steve Samuelson | KDA/DWR/Floodplain | 785-296-4622<br>steve.samuelson@kda.ks.gov |
| John Gigliardo | Cr Co 9-1-1 | 620-249-0303 |
| Judith Freeman | Cr. Co. Zoning & Floodplg | 620-724-6168<br>jfreeman@ckt.net |
| 23 Kari West | City of Parsons | Kwest@parsonsks.com |
| 23 Sherri McGuire | City of Parsons | smcguire@parsonspd.com |
| Michael Ryan | Cr. Co. Fire Dist. #1 | Mryan20@Cox.net |
| Fred Andrew | USD #250 Pittsburg | fandrew@usd250.org |
| Betha Elliott | CK Co Health Dept | 620 429-3081<br>belliott@cherokeecountyks.org |

| | |
|---|---|
| To | **Region "H" Hazard Mitigation Planning Committee** |
| Through | **Jeanne Bunting, Mitigation Planner**<br>**Kansas Division of Emergency Management (KDEM)** |
| From | **Susan Belt, MT(ASCP), AMEC Environment & Infrastructure, Inc** |
| Tel / E-mail | **785-272-6830 / susan.belt@amec.com** |
| Date | **4/19/2013** |
| Subject | **Minutes from the Region "H" Allen, Montgomery, Neosho, and Wilson Counties Kickoff Planning Meeting held on 4/16/2013 in Chanute, KS.** |

This document is a record of attendance and a summary of the issues discussed during the above meeting. Topics covered during the meeting included: (1) an introduction to the purpose of hazard mitigation planning, (2) the benefits of a multi-jurisdictional approach, (3) the reasons for and benefits of the regional mitigation planning process, and (4) grant programs linked to an approved plan. The hazard mitigation planning process was reviewed to include requirements for public involvement and the use of data collection guides. The planning committee reviewed the list of hazards to be used as a part of the regional plan. The participants indicated a familiarity with the hazard ranking methodology or probability, magnitude, warning time, and duration. Mrs. Belt explained that the State Hazard Mitigation Team had decided with the current update of the State Plan to profile the hazard Civil Disorder as a separate hazard rather than including it as a part of the Terrorism hazard. The group discussed mitigation actions and the availability of grant programs during the meeting. The meeting concluded with a discussion of the next steps in the planning process. The formal presentation portion of the meeting began at 1:00 pm and concluded at 3:30 pm.

## Attendees

| Name | Organization |
|---|---|
| Ronald Baker | Allen County Hospital |
| Pam Beasley | Allen County Emergency Management |
| Julia E. Bird | RWD #7 |
| Jeff Bohrer | USD 101 |
| Rick Brown | PWWSD #23 |
| Jeanne Bunting | Kansas Division of Emergency Management |
| Carol Buzbee | City of LaHarpe |
| Terry Call | Allen County GIS |
| Donna Culver | American Red Cross |
| Leon "Butch" Cuppet | City of Savonburg |
| Todd Durham | Wilson County Health Department |
| Cassie Edson | Wilson County Health Department |
| Matt Eyer | Blue Umbrella Solutions |
| Ryan Follmer | City of Chanute |
| Sara Frederick | SEK Multi-County Health Department |
| Jacob Gray | KDEM |
| James Grimmett | Coffeyville Fire Department |
| Jim Hardy | USD 413 – Chanute |
| Jeri Heitman | City of St. Paul |

| | |
|---|---|
| Ted Hizey | City of Galesburg |
| Cynthia Jacobson | Allen County Community College |
| Ron Jenkins | City of Iola Fire Department |
| Brandon Jones | Southern Star Allen County |
| Traci Kuhn | City of Buffalo |
| Cindy Lero | City of Erie |
| Scott Lucke | Southern Star Allen County |
| Terry Lyons | Wilson County Emergency Management |
| Kris Marple | Wilson County |
| DeeDee Martin | SEK Multi-County Health Department |
| Charlie McKinney | USD 413 – Chanute |
| Kathy McMurray | Water District #2 / City of Savonburg |
| John Merrell | City of Cherryvale |
| Jim Miller | Montgomery County Emergency Management |
| Angela Murphy | Allen County 911 |
| Bryan Murphy | Allen County Sheriff's Office |
| Ginny Oliver | USD 101 |
| Jim Perdue | USD 484 Fredonia |
| Clarence Price | City of Elsmore |
| Steve Samuleson | Kansas Department of Agriculture |
| Sherry Sandlin | Allen County Hospital |
| Byron Schultz | Neosho County Emergency Management |
| Lola Shively | RWD #5 |
| Ben Smith | Neosho County Community College |
| John E. Smith | CERT – Allen County |
| Arnold Thomas | RWD #11, #13 / City of Fall River |
| Leah Tindle | Radiant Electric Cooperative |
| Scott Wiltse | Woodson County Emergency Management |
| Steve Womack | Iowa Police Department |
| William Worthy | Twin Valley Electric |

# Introductions

Byron Schultz, Neosho County Emergency Management, began the meeting by welcoming and thanking the attendees. Jake Gray, State Hazard Mitigation Officer, Jeanne Bunting, Mitigation Planner, and Matt Eyer, Contract Mitigation Planner with Kansas Division of Emergency Management (KDEM), were introduced. Participant introduced themselves and identified what jurisdiction they represented. Susan Belt, AMEC, provided the formal portion of the presentation.

# Introduction to Hazard Mitigation Planning

Mrs. Belt presented information on the purpose and requirements of the Disaster Mitigation Act of 2000. The attendees were reminded that this is a regional planning effort which will combine all of the current local mitigation plans in Region "H." Those plans include: Allen, Bourbon, Crawford, Cherokee, Chautauqua, Elk, Greenwood, Labette, Montgomery, Neosho, Woodson, and Wilson Counties. Once the regional plan is approved, it will supersede the previous plans. The presentation also addressed the benefits for jurisdictions participating in this mitigation plan update, including eligibility for federal hazard mitigation assistance funding programs.

Historically, the region has received nearly $21 million in Hazard Mitigation Assistance grants. The group also discussed the Siren grant program that began in 2011. Region H has received more than $500,000 for 31 warning sirens in the region.

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- Designate a representative to serve on the Region "G" Hazard Mitigation Planning Committee, which will meet **twice** during the planning process,
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The meeting attendees discussed methods for notifying the public in the plan. The group discussed methods that are used to effectively engage the public in their Counties. Examples included using Survey Monkey to survey the public, using social media, city, county and school websites. The group felt that public meetings were not generally a successful method for engaging the public. School representatives and city officials present at the meeting agreed to place information on their websites related to surveys and plan review locations. Local Emergency Management Agencies will coordinate the appropriate links to the surveys. Participants were asked to contact their local emergency manager to assist with public participation.

## Data Collection Process

Mrs. Belt explained the process being used to collect data for vulnerability and loss for each jurisdiction for the State of Kansas plan. This data will likely be utilized during the regional plan development process. The participating jurisdictions were provided hard copies of Data Collection Guides. KDEM will follow-up after the meeting with electronic copies emailed to the attendees. Local County Emergency Management Agencies will follow-up with jurisdictions that were not in attendance at this meeting to provide an overview of the process being used and copies of data collection guides for completion. The Data Collection Guides are specific for local units of government and schools. There are two different guides, one for local governments, and one for schools and universities. The jurisdictions were requested to provide data regarding hazards that had occurred in their jurisdiction since the last plan update (2009 to 2012) for the 22 hazards that are in the Regional Plan. The Data Collection Guides were requested to be returned to Matt Eyer by May 3, 2013. Mrs. Belt reminded the group that copies of photos and newspaper articles are also helpful in putting the plan together. The group had questions regarding conduct of individual county meetings, and Ms. Bunting explained the documentation process that is necessary to assure that jurisdictions meet the participation requirements.

## Plan Format/ Regional and Countywide Risk Assessment

Mrs. Belt, with the help of Blue Umbrella and KDEM staff, reviewed the process for integrating the plans. The list of hazards in the State of Kansas plan is the list that is being used for the regional plans. Several of the hazards included in the State Plan were not included in the current plan for a few of the counties in Region H. Those counties will need to provide additional information for the risk assessment. Most of the plans in Region H utilized the same methodology for ranking hazards that is used by the State Plan and will be used for the Regional Plans. Blue Umbrella staff updated the results of a hazard ranking using the State Plan methodology for hazards in their current plan and the new Civil Disorder hazard. Planning committee members, along with other representatives from their jurisdiction were asked to review the new hazard ranking listing provided for their individual counties and for Region H and provide any comments back to Blue Umbrella by May 3, 2013. Many participants returned the hazard ranking form at the end of the meeting.

Steve Samuelson with the Kansas Department of Agriculture, provided the group with information regarding the Community Rating System (CRS). The program is available to communities that participate in the National Flood Insurance Program (NFIP). Participation in the CRS program allows communities to obtain discounts for NFIP participants on flood insurance.

## Mitigation Actions

The planning committee was provided an introduction to update and development of mitigation actions. Each jurisdiction was provided with a copy of the actions included in the current plan. Jurisdictional representatives were requested to provide updates as to: (1) action status – "completed," "pending/on-going," "deleted," or "modified"; (2) updates to the text and a description of the progress for any pending actions. The group was reminded that each participating jurisdiction must have at least one action and that all NFIP jurisdictions must have an NFIP-related action. Participants were also given a copy of sample actions and forms for

adding new actions to the plan. Mrs. Belt also discussed the concept of regional actions to be included as well as actions for each local entity. The updates on the current actions and any new actions were requested to be returned to Blue Umbrella by May 3, 2013. The final planning meeting will be scheduled for October, 2013, will continue the discussion regarding mitigation actions. At that final meeting, the mitigation actions for the plan will be prioritized. Many participants returned the action items review from their initial mitigation plans before the end of the meeting.

## Next Steps

The meeting concluded with a discussion of the remaining steps to complete the planning process as follows:

- **May 3, 2013 — Data Collection Guides Due to KDEM**
- **May3, 2013 —Hazard Ranking Reviews Due to KDEM**
- **May 3, 2013 — Mitigation Action Updates + New Actions Due to KDEM**
- **August 28, 2013 — Meeting #2 with Emergency Managers ONLY**
- **October, 2013 — Meeting #3 @ 1:00 pm Location to be Determined**
- **October/November 2013 — Submit Plan to FEMA**
- **December 2013 — Anticipate FEMA's Approval Pending Adoption**

# Region "H" Mitigation Plan Kickoff Meeting

Location: Chanute

Date: 4/16/13 Time: 1-4 pm



| NAME (Print) | Organization | Phone / E-mail |
|---|---|---|
| Cynthia Jacobson | Allen Community College | 620-365-5116 jacobson@allencc.edu |
| Scott Lucke | Southern Star Allen County | 620 473-0033 Scott.Lucke@SSCGP.com |
| Brandon Jones | Southern Star Central Gas Pipeline Woodson County Rural Fire | 785 204 0268 Brandon.Jones@SSCGP.com |
| James Grimmett | Coffeyville Fire | 620-252-8620 jgrimmett@coffeyville.com |
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# Region "H" Mitigation Plan Kickoff Meeting

Location: Chanute
Date: 4/16/13 Time: 1-4 pm



| NAME (Print) | Organization | Phone / E-mail |
|---|---|---|
| Byron Shultz | Neosho County | 620 432 4074<br>byronoco911@hotmail.com |
| Cassie Edson | WCHD | 620-378-4455<br>PIO@twinmounds.com |
| Leon "Butch" Cuppett | City of Savonburg | 620-754-3698<br>cuppetleon@yahoo.com |
| Kris Marple | Wilson Co. | 620-378-3472<br>coordinator@twinmounds.com |
| Cyndi Heitman | City of St. Paul | 620-449-2266<br>cityofstpaul@rlrnews.com |
| Traci Kuhn | City of Buffalo | 620-537-8755<br>cityofbuffalo@yahoo.com |
| Bryan J Murphy | Allen Co SO. | 620-365-1400<br>bmurphy@allencosheriff.org |
| Terry Call | Allen Co GIS | 620 365-1432<br>tcall@allencoshcriff.org |
| Rick Brown | PWWSD #23 | rbrown@pwwsd23.net<br>620-378-3749 |

# Region "H" Mitigation Plan Kickoff Meeting

Location: Chanute

Date: 4/16/13 Time: 1-4 pm



| NAME (Print) | Organization | Phone / E-mail |
|---|---|---|
| Steve Samuelson | KDA/DWR/Floodplain | 785-296-4622<br>steve.samuelson@kda.ks.gov |
| Terry Lyons | WL Co. EM | 620-378-4455<br>WCEM@Twinmounds.com |
| SARA FREDERICK | SEK Multi County Health<br>AL/AN/BB/WO Co | #620-365-6602<br>sfrederick@aceks.com |
| DeDee Mattin | SEK Multi County Health Dpt<br>AL/BB/AN/WO Co | 620 365 2191<br>dmattin@aceks.com |
| Pam Beasley | Allen County EM | 620-363-2859<br>pbeasley@allencosheriff.org |
| Sherry Sandlin | Allen county Hospital | 620-365-1187<br>Sherry.Sandlin@hcahealthcare.com |
| Leah M. Tindle | Radiant Electric Coop., Inc. | 620-378-2161 ext. 135<br>leah@radiantec.coop |
| arnold Thomas | RWD #11, 13,<br>City of Fall River | 620-378-2390 |
| Jeanne Dunting | KDEM | 785-861-3024 |

# Region "H" Mitigation Plan Kickoff Meeting

Location: Chanute

Date: 4/16/13 Time: 1-4 pm



| NAME (Print) | Organization | Phone / E-mail |
|---|---|---|
| Cindy Lero | City of Erie | 620-244-3461 |
| Matt Eyer | Blue Umbrella Solutions | 303-552-1181 Matt@BlueUmbrella.co |
| Jim Perta | USD 4E4 Fredonia | 620-378-4177 jperta@fredoniaks.com |
| Ron Jenkins | City of Iola F.D | 620-365-4972 iolafivedept@cox.net ~~iolafivedept.@cox.net~~ |
| Lola Shively | RWD #5 | 620-698-2780 lshively@embargmail.com |
| Carol Buzbee | city of La Harpe | 620-496-2241 |
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# Region "H" Mitigation Plan Kickoff Meeting

Location: Chanute
Date: 4/16/13 Time: 1:00pm – 4:00pm



| NAME (Print) | Organization | Phone / E-mail |
|---|---|---|
| TED HIZEY | CITY OF GALESBURG | 763-2389<br>TD HIZEY @ YAHOO.COM |
| Kathy M Murray | District 2 Water board<br>City of Salubria | 754-3299 |
| John E Smith | CERT | 620-228-1086 jesmith228@yahoo.com |
| William Worthy | Twin Valley EC | 620-784-5502 wworthy@twinvalley electric.coop |
| Charlie McKinney | USD 413 | mckinneych@usd413.org |
| Jess A Bard | RWD #7 | jrbar-ranch@yahoo.com |
| STEVE WOMACK | IOLA POLICE DEPT. | 620-365-4960 |
| Todd Durham | Wilson Co. Health | 620 378-4455<br>tdurham@twinmounds.com |
| Clarence L. Price | City of Elsmore | TreeTop34@hotmail.com<br>62-754-3487 |

# Region "H" Mitigation Plan Kickoff Meeting

Location: Chanute

Date: 4/16/13 Time: 1-4pm



| NAME (Print) | Organization | Phone / E-mail |
|---|---|---|
| Scott Wiltse | Wootton COEM | 6207943870 SWILTSE07@Gmail.com |
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# Region "H" Mitigation Plan Kickoff Meeting

Location: Chanute

Date: 4/16/13 Time: 1-4pm



| NAME (Print) | Organization | Phone / E-mail |
|---|---|---|
| Jim Hardy | USD 413 Chanute Public School | hardyj@usd413.org |
| Ron Baker | Allen Co Hospital | ronald.baker@hcamidwest.com |
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| To | **Region "H" Hazard Mitigation Planning Committee** |
| Through | **Jeanne Bunting, Mitigation Planner**<br>**Kansas Division of Emergency Management (KDEM)** |
| From | **Susan Belt, MT(ASCP), AMEC Environment & Infrastructure, Inc** |
| Tel / E-mail | **785-272-6830 / susan.belt@amec.com** |
| Date | **4/23/2013** |
| Subject | **Minutes from the Region "H" Chautauqua, Elk, Greenwood, and Woodson Counties Kickoff Planning Meeting held on 4/22/2013 in Howard, KS.** |

This document is a record of attendance and a summary of the issues discussed during the above meeting. Topics covered during the meeting included: (1) an introduction to the purpose of hazard mitigation planning, (2) the benefits of a multi-jurisdictional approach, (3) the reasons for and benefits of the regional mitigation planning process, and (4) grant programs linked to an approved plan. The hazard mitigation planning process was reviewed to include requirements for public involvement and the use of data collection guides. The planning committee reviewed the list of hazards to be used as a part of the regional plan. The participants indicated a familiarity with the hazard ranking methodology or probability, magnitude, warning time, and duration. Mrs. Belt explained that the State Hazard Mitigation Team had decided with the current update of the State Plan to profile the hazard Civil Disorder as a separate hazard rather than including it as a part of the Terrorism hazard. The group discussed mitigation actions and the availability of grant programs during the meeting. The meeting concluded with a discussion of the next steps in the planning process. The formal presentation portion of the meeting began at 6:30 pm and concluded at 8:30 pm.

## Attendees

| Name | Organization |
|---|---|
| Jeanie Beason | Chautauqua County Health Department |
| Annie Blankinship | Chautauqua County Health Department |
| Kandy Dowell | Elk County Health Department |
| Kimber Dupuis | City of Longton/ USD 283 / Longton Fire Department |
| Matt Eyer | Blue Umbrella |
| Doug Hanks | Elk County Sheriff's Office |
| Matt Hartley | Chautauqua County Emergency Management |
| Gary Hebb | Elk County Commission |
| John McMillan | Caney Valley Electric |
| Jackie Miller | KDEM |
| Byrdee Miller-Marcic | Elk County Emergency Management |
| Doug Ritz | Elk County Commission |
| Steve Samuelson | Kansas Department of Agriculture |
| Danny Signer | City of Howard / Howard Fire Department |
| Vicky Wedman | Elk County Clerk's Office |

# Introductions

Byrdee Miller-Marcic, Elk County Emergency Management, began the meeting by welcoming and thanking the attendees. Matt Eyer, Contract Mitigation Planner with Kansas Division of Emergency Management (KDEM), was introduced. Participant introduced themselves and identified what jurisdiction they represented. Susan Belt, AMEC, provided the formal portion of the presentation.

# Introduction to Hazard Mitigation Planning

Mrs. Belt presented information on the purpose and requirements of the Disaster Mitigation Act of 2000. The attendees were reminded that this is a regional planning effort which will combine all of the current local mitigation plans in Region "H." Those plans include: Allen, Bourbon, Crawford, Cherokee, Chautauqua, Elk, Greenwood, Labette, Montgomery, Neosho, Woodson, and Wilson Counties. Once the regional plan is approved, it will supersede the previous plans. The presentation also addressed the benefits for jurisdictions participating in this mitigation plan update, including eligibility for federal hazard mitigation assistance funding programs. Historically, the region has received nearly $21 million in Hazard Mitigation Assistance grants. The group also discussed the Siren grant program that began in 2011. Region H has received more than $500,000 for 31 warning sirens in the region.

Mrs. Belt described the benefits of participating in a multi-jurisdictional plan as improving coordination and communication among local jurisdictions and that these hazards do not stop at jurisdictional boundaries thus this multi-jurisdictional plan allows for a more comprehensive approach. The group also heard information regarding the significant cost savings being realized by the regional approach to planning. There are currently insufficient funds available to provide the full cost of updates to each county plan. The regional approach now being used allows planning services to be provided to each county for the update at no cost to the county. KDEM has hired two contractors to assist with the planning effort. Matt Eyer with Blue Umbrella will be completing the Region "H" mitigation plan for committee review.

Mrs. Belt also described the role of the Hazard Mitigation Planning Committee (HMPC).Each jurisdiction participating in development of the plan must meet the following minimum requirements:

- Designate a representative to serve on the Region "G" Hazard Mitigation Planning Committee, which will meet **twice** during the planning process,
- Provide data for and assist in the development of the updated risk assessment that describes how various hazards impact your jurisdiction,
- Provide data to describe current capabilities,
- Develop/update mitigation actions (at least one) specific to your jurisdiction,
- Provide comments on plan drafts as requested,
- Inform the public, local officials, and other interested parties about the planning process and provide opportunities for them to comment on the plan, and
- Formally adopt the mitigation plan.

## Planning for Public Involvement

The local/regional hazard mitigation plan requirements state that the public must have the opportunity to comment on the plan. The public will be given two opportunities to comment on the plan, once during the drafting stage and another when the plan is complete in the final draft stage. KDEM is planning to utilize Facebook pages to advertize the planning meetings, and to provide a vehicle for the public to make comments regarding the process and plan drafts. Jeanne Bunting with KDEM will provide additional information regarding the pages at a future meeting.

The meeting attendees discussed methods for notifying the public in the plan. The group discussed methods that are used to effectively engage the public in their Counties. Examples included using Survey Monkey to survey the public, using social media, city, county and school websites. The group felt that public meetings were not generally a successful method for engaging the public. County and city officials present at the meeting agreed to place information on their websites related to surveys and plan review locations. Local Emergency Management Agencies will coordinate the appropriate links to the surveys. Participants were asked to contact their local emergency manager to assist with public participation. Jackie Miller, KDEM Regional Manager agreed to provide information to the emergency managers in Region H that were not present at the meeting.

## Data Collection Process

Mrs. Belt explained the process being used to collect data for vulnerability and loss for each jurisdiction for the State of Kansas plan. This data will likely be utilized during the regional plan development process. The participating jurisdictions were provided hard copies of Data Collection Guides. KDEM will follow-up after the meeting with electronic copies emailed to the attendees. Local County Emergency Management Agencies will follow-up with jurisdictions that were not in attendance at this meeting to provide an overview of the process being used and copies of data collection guides for completion. The Data Collection Guides are specific for local units of government and schools. There are two different guides, one for local governments, and one for schools and universities. The jurisdictions were requested to provide data regarding hazards that had occurred in their jurisdiction since the last plan update (2009 to 2012) for the 22 hazards that are in the Regional Plan. The Data Collection Guides were requested to be returned to Matt Eyer by May 3, 2013. Mrs. Belt reminded the group that copies of photos and newspaper articles are also helpful in putting the plan together. The group had questions regarding conduct of individual county meetings, and Mrs. Belt explained the documentation process that is necessary to assure that jurisdictions meet the participation requirements.

## Plan Format/ Regional and Countywide Risk Assessment

Mrs. Belt, with the help of Blue Umbrella staff, reviewed the process for integrating the plans. The list of hazards in the State of Kansas plan is the list that is being used for the regional plans. Several of the hazards included in the State Plan were not included in the current plan for a few of the counties in Region H. Those counties will need to provide additional information for the risk assessment. Most of the plans in Region H utilized the same methodology for ranking hazards that is used by the State Plan and will be used for the Regional Plans. Blue Umbrella staff updated the results of a hazard ranking using the State Plan methodology for hazards in their current plan and the new Civil Disorder hazard. Planning committee members,

along with other representatives from their jurisdiction were asked to review the new hazard ranking listing provided for their individual counties and for Region H and provide any comments back to Blue Umbrella by May 3, 2013. Many participants returned the hazard ranking form at the end of the meeting.

Steve Samuelson with the Kansas Department of Agriculture, provided the group with information regarding the Community Rating System (CRS). The program is available to communities that participate in the National Flood Insurance Program (NFIP). Participation in the CRS program allows communities to obtain discounts for NFIP participants on flood insurance.

## Mitigation Actions

The planning committee was provided an introduction to update and development of mitigation actions. Each jurisdiction was provided with a copy of the actions included in the current plan. Jurisdictional representatives were requested to provide updates as to: (1) action status – "completed," "pending/on-going," "deleted," or "modified"; (2) updates to the text and a description of the progress for any pending actions. The group was reminded that each participating jurisdiction must have at least one action and that all NFIP jurisdictions must have an NFIP-related action. Participants were also given a copy of sample actions and forms for adding new actions to the plan. Mrs. Belt also discussed the concept of regional actions to be included as well as actions for each local entity. The updates on the current actions and any new actions were requested to be returned to Blue Umbrella by May 3, 2013. The final planning meeting will be scheduled for October 25, 2013, will continue the discussion regarding mitigation actions. At that final meeting, the mitigation actions for the plan will be prioritized. Many participants returned the action items review from their initial mitigation plans before the end of the meeting.

## Next Steps

The meeting concluded with a discussion of the remaining steps to complete the planning process as follows:

- **May 3, 2013 — Data Collection Guides Due to KDEM**
- **May3, 2013 —Hazard Ranking Reviews Due to KDEM**
- **May 3, 2013 — Mitigation Action Updates + New Actions Due to KDEM**
- **August 28, 2013 — Meeting #2 with Emergency Managers ONLY**
- **October 25, 2013 — Meeting #3 @ 1:00 pm Location to be Determined**
- **October/November 2013 — Submit Plan to FEMA**
- **December 2013 — Anticipate FEMA's Approval Pending Adoption**

# Region "H" Mitigation Plan Kickoff Meeting

Location: Howard, Ks

Date: 4/22/2013 Time: 6:30 - 8:30 pm



| NAME (Print) | Organization | Phone / E-mail |
|---|---|---|
| Kimber Dupuis | City of Longton USD 285 Longton Fire Department | (620) 642-2117 tinksshadow69@yahoo.com |
| Randy Donnell | ECHD | echdus@sktc.net |
| Gary Dutton | ECC | 620-374-2772 |
| Doug Ritz | Elk County Com. | 378-3152 |
| Danny R. Signer | City of Howard Howard Fire Dept | 620-374-2141 dsigner@sktc.net |
| Jackie Mai | KDEM | — |
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# Region "H" Mitigation Plan Kickoff Meeting

**Location:** Howard, Ks
**Date:** 4/22/2013 **Time:** 6:30pm – 8:30pm



| NAME (Print) | Organization | Phone / E-mail |
|---|---|---|
| Byrdee Miller-Marcie | Elk Co. EM | 620-374-3597<br>elkcoem@gmail.com |
| Matt Eyer | Blue Umbrella | 303-552-1181<br>Matt@BlueUmbrellaCo |
| Steve Samuelson | KDA/DWR/Floodplain | 785-296-4622<br>steve.samuelson@kda.ks.gov |
| John McMillan | Caney Valley Electric | 620-758-2262<br>john@CaneyValley.Com |
| Matt Hartley | Chautauqua Co. EM | 620-515-4456<br>cqcountyem@Gmail.com |
| Annie Blankinship | CQ Co. Health Dept | 620-216-0492<br>anniieblankinship@sbcglobal.net |
| Jeanie Beason | CQ Co Health Dept. | cqcohd@sbcglobal.net |
| ~~Vicky~~ Wedman | Elk Co Clerk's Off. | 620-374-2480<br>~~Vwedman@~~ elkclerk@skt.net |
| Doug Hanks | Elk Co. Sheriff's office | Kmdrsh@gmail.com<br>374-2108 |

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|---|---|
| To | **Region "H" Hazard Mitigation Planning Committee** |
| Through | **Jeanne Bunting, Mitigation Planner**<br>**Kansas Division of Emergency Management (KDEM)** |
| From | **Matthew Eyer, Blue Umbrella Solutions** |
| Tel / E-mail | **303-552-1181 / Matt@blueumbrella.co** |
| Date | **8/28/2013** |
| Subject | **Minutes from the Region "H" Mid-Term Meeting held on 8.28/2013 in Sedan, KS.** |

This document is a record of attendance and a summary of the issues discussed during the above meeting. Topics covered during the meeting included: (1) a review of plan format and contents, (2) a review of mitigation goals, (3) a discussion of participating jurisdictions and continuing participation requirements, (4) a review of current input from the public and a request to facilitate further input, and (5) assignment of tasks to complete plan input for each participating jurisdiction. The meeting concluded with a discussion of the next steps in the planning process. The formal presentation portion of the meeting began at 1:00 pm and concluded at approximately 2:30 pm.

## Attendees

| Name | Organization |
|---|---|
| Larry Steeby | Labette County Emergency Management |
| Pam Beasley | Allen County Emergency Management |
| Matt Hartley | Chautauqua County Emergency Management |
| Byrdee Miller | Elk County Emergency Management |
| James Miller | Montgomery County Emergency Management |
| Ben Grover | KDEM |
| Jeanne Bunting | KDEM |
| Matt Eyer | Blue Umbrella Solutions |
| Jacob Gray | KDEM |
| Terry Lyons | Wilson County Emergency Management |
| Byron Schultz | Neosho County Emergency Management |

## Introductions

Matt Eyer, Blue Umbrella Solutions, began the meeting by welcoming and thanking the attendees. Participant introduced themselves and identified what jurisdiction they represented. Matt Eyer, Blue Umbrella Solutions, provided the formal portion of the presentation.

## Review of Plan Content and Format

Mr. Eyer presented information on the content of the draft plan. Attendees were present with a series of slides showing the data collected to date and the format a substance of the draft plan.

Attendees were given the opportunity to review specific sections of the plan related to their county and comment as to corrections and additions.

## Review of Mitigation Goals

Attendees were presented with the derived mitigation goals for the region. Attendees were asked to review each of the four goals and provide any suggestions for modification. All were in agreement that the goals presented were ideal.

## Continuing Participation Requirements

Based on the review of the plan, attendees were concerned about the complete participation of jurisdictions within their counties. Consensus was reached that many jurisdictions, either through lack of personnel or fiscal resources, were unable to attend all meetings. Attendees proposed that both telephone and email discussions on mitigation planning requirements, data submission and mitigation actions be counted as active participation. This proposal was agreed upon by all in attendance. The plan was amended to reflect this change on participation requirements.

## Planning for Public Involvement

The local/regional hazard mitigation plan requirements state that the public must have the opportunity to comment on the plan. Meeting attendees were asked to continue providing an aveniue for public feedback by making the surveymonkey.com link available over participating jurisdiction websites if possible. Additionally, attendees were reminded of the two weke open comment period when the draft plan is complete. Attendees voiced concern over the critical infrastructure listing in the plan and it was agreed that this would be filed under a secure appendix tat would be unavailable to the public.

## Assignment of Tasks to Complete Draft Plan

Each attendee was provide with a portable jump drive with the draft plan and associated spreadsheets. Attendees were asked to review each section for completeness and accuracy. Mr. Eyer requested that any changes and additions to the plan be either tracked in the documents, added to the included change list, or emailed directly to him. A closure date of September 20th was set.

## Next Steps

The meeting concluded with a discussion of the remaining steps to complete the planning process as follows:

- **September 20, 2013 — Plan additions and revisions due**
- **October 16, 2013 — Final planning meeting, Pittsburg**
- **October 24, 2013 — Final planning meeting, Chanute**
- **October 25, 2013 — Final planning meeting, Howard**
- **November 2013 — Submit Plan to KDEM**
- **December 2013 — Submit Plan to FEMA**
- **February 2014 — Plan approval and availability for adoption**

Location: CQ Law Enforcement Center, 215 N. Chautauqua, Sed
Date: August 28, 2103
Time: 1 - 4 PM

| Name | Organization | County | Phone and Email |
|---|---|---|---|
| Larry Staeby | Labette Co E.M. | Labette | 620 421-7050 |
| Terry Lyons | Wilson Co EM | Wilson | 620-378-4455 |
| Matt Hartley | Chautauqua Co. EM | Chautauqua | 620-515-4456 cqcountyem@gmail.com |
| Byron Shuler | Neosho Co EM | Neosho | 620 432 4074 byronecogh@hotmail. |
| Pam Beasley | AL Co EM | Allen | 620 363 2859 pbeasley@allencosheriff.org |
| Lyndee Miller-Marcie | Elk Co. EM | Elk | 620-374-3597 elkcoem@gmail.com |
| James E Miller | MG Co EM | | 620-330-1260 jmiller@mgcountyks.org |
| Ben Grover | KDEM GIS | | 785 274 1878 benjamin.f.grover3.nfg@mail.mil |
| Jacob Gray | KDEM SHMO | KDEM | 785 274-1973 jacob.s.gray.nfg@mail.mil |
| Jeanne Bunting | KDEM | KDEM | 785-861-3024 |
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| To | **Region "H" Hazard Mitigation Planning Committee** |
| Through | **Jeanne Bunting, Mitigation Planner**<br>**Kansas Division of Emergency Management (KDEM)** |
| From | **Matthew Eyer, Blue Umbrella Solutions** |
| Tel / E-mail | **303-552-1181 / Matt@blueumbrella.co** |
| Date | **10/27/2013** |
| Subject | **Minutes from the Region "H" Final Meeting held on 10/16/2013 in Pittsburg, KS.** |

This document is a record of attendance and a summary of the issues discussed during the above meeting. Topics covered during the meeting included: (1) a final review of plan participating jurisdictions, (2) a final review of mitigation goals, (3) a review of available grants with a mitigation plan, and (4) incorporation of final edits. The meeting concluded with a discussion of the next steps in the planning process. The formal presentation portion of the meeting began at 2:00 pm and concluded at approximately 3:00 pm.

# Attendees

A complete list of attendees may be found on the attached meeting sing-in forms.

# Introductions

Matt Eyer, Blue Umbrella Solutions, began the meeting by welcoming and thanking the attendees. Matt Eyer, Blue Umbrella Solutions, provided the formal portion of the presentation.

# Review of Plan Participating Jurisdictions

Mr. Eyer presented information on highlighting participating jurisdictions by county. Attendees were present with a series of slides showing the participating jurisdictions. Attendees were given the opportunity to review each jurisdiction to ensure all were included in the plan. In addition, attendees were provided with information concerning special districts, such as rural Water Districts or Fire Districts. They were informed that while these districts were not required to formally adopt the plan, in doing so they are given the opportunity to oversee awarded grant funding rather than have the county oversee the funding.

# Review of Mitigation Goals

Attendees were presented with the final regional mitigation goals for the region.

# Review of Available Grants

Attendees were reminded of the grant funding streams that were open and available with an approved mitigation plan.

## Incorporation of Final Edits

Attendess were given an opportunity to review the completed draft plan via a hard copy. Any changes or additions were noted to be included in the final plan edit.

## Next Steps

The meeting concluded with a discussion of the remaining steps to complete the planning process as follows:

- **October 28, 2013 — Make plan available to public for two week final review**
- **November 2013 — Submit Plan to KDEM**
- **November 2013 — Submit Plan to FEMA**
- **January 2014 — Plan approval and availability for adoption**

Location: Pittsburg, Crawford County
Date: October 16, 2103
Time: 9 - 11 AM

| Name | Organization | County | Phone and Email |
|---|---|---|---|
| David Dodge | Oswego Community Hospital | Labette | 620-795-2921 ddodge@oswegomedical.com |
| Pat Hall | Mirard Medical Center | Crawford | 620-724-0360 PHall@mirardmedicalcenter.com |
| Mike Starr | USD 506 | Labette | 620-423-9507 mstarr@usd506.org. |
| Randy Skindberg | Crawford Co EMS | Crawford | 620-249-6958 |
| Fred Andrew | USD250 Pittsburg | Crawford | 620-235-3190 office 620-235-9393 cell fandrew@usd250.org |
| Eldon D. Bedene. | Crawford Co EM. | Crawford | 1-620-249-0104. edbedene@CKT.NET |
| Jolene Edwards | RWD #7 | Crawford | 620-249-0223 edwards.jc@ckt.net |
| John Nicholson | Sheridan Township | Crawford | 620 2490661 NICKINOZ2001@yahoo.com |
| Mike McCracken | Pittsburg State University | Crawford | 620-235-4624 mmccracken@pittstate.edu |
| Gary Gugala, Captain | The Salvation Army | Crawford | 620 875-9854 gary_gugala@USC.salvationarmy.org |
| Kevin Doherty | Labette Community Col. | Labette | 620-820-1285 Kevind@labette.edu |
| Brandon Start | Parsons Police Dept | Labette | 620 421 7060 bstart@parsonspd.com |
| Karla Armstrong | Fort Scott Com. College | Bourbon | 620 223 2700 Karlaa@fortscott.edu |
| Susan Beeson | USD505 Chetopa St Paul | Labette | 620-236-7244 sbeeson@usd505.org |

Location: Pittsburg, Crawford County
Date: October 16, 2103
Time: 9 - 11 AM

| Name | Organization | County | Phone and Email |
|---|---|---|---|
| Toni A Crumrine | City of Chetopa | Labette | 620-423-2363 cell<br>620-236-7511 work chetopacity@kans.com |
| Buddy Bualle | City of Arma | Crawford | |
| Jeremy Allen | city of Arma | CRAWFORD | 620-347-4500<br>Arma350@ckt.net |
| Bill Towery | Crawford Co. Dept Environment | Crawford | BTowery@ckt.net<br>620-230-8981 |
| Jason Allison | cherokee cty Em | Cherokee | 620-674-1410<br>jallison198@gmail.com |
| Brett Trotnic | City of Oswego | Labette | 620-795-4433 |
| George Vanderpool | RR 5 | Crawford | 620-249-7439 |
| David W Winchell | USD 503 schools | Labette | 620-778-8873<br>dwinchell@vikingnet.net |
| Judy Freeman | Crawford Co Zoning + Flooding | Crawford | 620-724-6168<br>jfreeman@ckt.net. |
| Janis Goedeke | Crawford Co Health | Crawford | 620-231-5411<br>jgoedeke@crawfordcohd.org |
| John Zafuta | City of Frontenac | Crawford | 6202319210<br>johnz@frontks.com |
| Mike Simons | Pittsburg Fire Dept | Crawford | ~~620~~ |
| Bill Beasley | Pittsburg | Crawford | 620 231 4170<br>billb@pittks.org |
| Chase D. Waggoner | City of Girard | Crawford | (620) 724-6216<br>Firechief@girardkansas.gov |

Location: Pittsburg, Crawford County
Date: October 16, 2103
Time: 9 - 11 AM

| Name | Organization | County | Phone and Email |
|---|---|---|---|
| Art Mallory | Cherokee County Emerg Mgt | Cherokee | 620 210-0143<br>amallory54@gmail.com |
| Tom Ragonese | CRAWFORD COUNTY | CRAWFORD | 620-224-6664<br>tomr@ckt.net |
| Larry Staby | Labette County | Labette | 620 778 3012<br>firechief@parsonsks.com |
| Tina Peoples | Great Plains Devel Authority | LABETTE | 620-778-6448<br>tpeoples@parsonsks.com |
| Darlene Domer | LABETTE SERVICE CENTER ARC | Labette | 620-421-4150<br>LABARC@sbcglobal.net |
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Location: Pittsburg, Crawford County
Date: October 16, 2103
Time: 9 - 11 AM

| Name | Organization | County | Phone and Email |
|---|---|---|---|
| Jonathon m Tower | Labette center for mental Health services | Labette | 620-421-3770 towerajm@sbcglobal.net |
| Don Pyle | Crawford County Clerk | Crawford | 620-724-6115 countyclerk@ckt.net |
| Paul Norris | Heartland REC | Crawford | 620-724-5522 paulN@heartland-rec.com |
| Kelly Gillette | Crawford Co. Mental Hlth Ctr. | " | 620-230-8040 kgillette@comhcc.org |
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| To | **Region "H" Hazard Mitigation Planning Committee** |
| Through | **Jeanne Bunting, Mitigation Planner**<br>**Kansas Division of Emergency Management (KDEM)** |
| From | **Matthew Eyer, Blue Umbrella Solutions** |
| Tel / E-mail | **303-552-1181 / Matt@blueumbrella.co** |
| Date | **10/27/2013** |
| Subject | **Minutes from the Region "H" Final Meeting held on 10/24/2013 in Chanute, KS.** |

This document is a record of attendance and a summary of the issues discussed during the above meeting. Topics covered during the meeting included: (1) a final review of plan participating jurisdictions, (2) a final review of mitigation goals, (3) a review of available grants with a mitigation plan, and (4) incorporation of final edits. The meeting concluded with a discussion of the next steps in the planning process. The formal presentation portion of the meeting began at 2:00 pm and concluded at approximately 3:00 pm.

# Attendees

A complete list of attendees may be found on the attached meeting sing-in forms.

# Introductions

Matt Eyer, Blue Umbrella Solutions, began the meeting by welcoming and thanking the attendees. Matt Eyer, Blue Umbrella Solutions, provided the formal portion of the presentation.

# Review of Plan Participating Jurisdictions

Mr. Eyer presented information on highlighting participating jurisdictions by county. Attendees were present with a series of slides showing the participating jurisdictions. Attendees were given the opportunity to review each jurisdiction to ensure all were included in the plan. In addition, attendees were provided with information concerning special districts, such as rural Water Districts or Fire Districts. They were informed that while these districts were not required to formally adopt the plan, in doing so they are given the opportunity to oversee awarded grant funding rather than have the county oversee the funding.

# Review of Mitigation Goals

Attendees were presented with the final regional mitigation goals for the region.

# Review of Available Grants

Attendees were reminded of the grant funding streams that were open and available with an approved mitigation plan.

## Incorporation of Final Edits

Attendess were given an opportunity to review the completed draft plan via a hard copy. Any changes or additions were noted to be included in the final plan edit.

## Next Steps

The meeting concluded with a discussion of the remaining steps to complete the planning process as follows:

- **October 28, 2013 — Make plan available to public for two week final review**
- **November 2013 — Submit Plan to KDEM**
- **November 2013 — Submit Plan to FEMA**
- **January 2014 — Plan approval and availability for adoption**

Location: Chanute, Neosho County
Date: October 24, 2103
Time: 9 - 11 AM

| Name | Organization | County | Phone and Email |
|---|---|---|---|
| Jim Keath | Sheriff | Neosho | 620-244 3888 |
| Byron Shuler | E.M. | Neosho | 620 244 3874 |
| Julie A Reed | RWD #7 | Wilson | 918-941-1005 |
| Todd Durham | Health Dept. | Wilson | 620-378-4455 tdurham@twinmounds.com |
| Cindy Levo | City of Erie | Neosho | 620-244-3461 cityclerk@erieks.com |
| Ryan Follmer | City of Chanute | Neosho | 620-431-5231 rfollmer@chanute.org |
| Traci Kuhn | City of Buffalo | Wilson | 620-537-8755 cityofbuffalo@yahoo.com |
| Don Busch | " " new Athletic | " | 620-330-4519 |
| Terry Lyons | WL Co EM | Wilson | 620 378-4455 |
| Leah Tindle | Radio.t Electric | Wilson | 620-378-2161 |
| PETE FEGGINS | WL SHERIFF | WILSON | 620-378-3622 |
| Kris Marple | WL. County | WL. | 620-378-3472 |
| Jim Porter | USD 484 | Wilson | 620-375-4177 |
| BEN SMITH | NCCC | Nto | 620-433-0785 |

Location: Chanute, Neosho County
Date: October 24, 2103
Time: 9 - 11 AM

cityofstpaul@rivernews.com

| Name | Organization | County | Phone and Email |
|---|---|---|---|
| Joni Heitman | City of St. Paul | Neosho | 620-449-2266 |
| Pam Beasley | AL EM | Allen | 620-363-2859 |
| Charlie McKinney | USD 413 | Neosho | 620-432-2500 |
| Jeff Bahrenburg | USD 101 | Neosho | 620-423-5391 |
| Rick Brown | PWWSD #23 | Wilson/Woodson/Neosho Labette/Montgomery | 620-378-3749 |
| Jim Miller | Montgomery County EM | Montgomery | |
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| To | **Region "H" Hazard Mitigation Planning Committee** |
| Through | **Jeanne Bunting, Mitigation Planner**<br>**Kansas Division of Emergency Management (KDEM)** |
| From | **Matthew Eyer, Blue Umbrella Solutions** |
| Tel / E-mail | **303-552-1181 / Matt@blueumbrella.co** |
| Date | **10/27/2013** |
| Subject | **Minutes from the Region "H" Final Meeting held on 10/25/2013 in Howard, KS.** |

This document is a record of attendance and a summary of the issues discussed during the above meeting. Topics covered during the meeting included: (1) a final review of plan participating jurisdictions, (2) a final review of mitigation goals, (3) a review of available grants with a mitigation plan, and (4) incorporation of final edits. The meeting concluded with a discussion of the next steps in the planning process. The formal presentation portion of the meeting began at 2:00 pm and concluded at approximately 3:00 pm.

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# Review of Mitigation Goals

Attendees were presented with the final regional mitigation goals for the region.

# Review of Available Grants

Attendees were reminded of the grant funding streams that were open and available with an approved mitigation plan.

## Incorporation of Final Edits

Attendess were given an opportunity to review the completed draft plan via a hard copy. Any changes or additions were noted to be included in the final plan edit.

## Next Steps

The meeting concluded with a discussion of the remaining steps to complete the planning process as follows:

- **October 28, 2013 — Make plan available to public for two week final review**
- **November 2013 — Submit Plan to KDEM**
- **November 2013 — Submit Plan to FEMA**
- **January 2014 — Plan approval and availability for adoption**

Location: Howard, Elk County
Date: October 25, 2103
Time: 6 - 9 PM

| Name | Organization | County | Phone and Email |
|---|---|---|---|
| Byrdie Miller-Mann | Elk Em | Elk | elkcoem@gmail.com 620-374 3597 |
| Bill Brooks | Sedan | Chautauqua | 918-331-7553 |
| Jack Warren | Sedan | Chautauqua | 620-870-4344 |
| Larry Mitchell | Howard | Elk | 620-374-2877 |
| Kandy Dowell | Elk Public Health | Elk | 6203742277 elkcopublic health gmail |
| Connie Blankenship | CQ Co. Health | Chautauqua | 620-725-5850 cqcohd@sbcglobal.net |
| Becky Oakleaf | City of Howard | Elk | boakleaf@sktc.net |
| Matthew Hartley | Chautauqua EM | CQ | cqcountyem@gmail.com 620-515-4456 |
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## Matt Eyer

**From:** Terry Lyons [wcem@twinmounds.com]
**Sent:** Tuesday, September 24, 2013 8:54 AM
**To:** matt@blueumbrella.CO
**Subject:** Participating Facilities

I have either spoken to in person or on the phone all Wilson County facility participants about mitigation planning or mitigation information and consider all facilities fully participating in the mitigation planning process.

Terry Lyons
Wilson County Emergency Management
421 N 7th
Fredonia,KS 66736
620 378-4455
Cell 620-330-6123

## Matt Eyer

**From:** Scott Wiltse [swiltse07@gmail.com]
**Sent:** Monday, September 16, 2013 12:53 PM
**To:** Matt Eyer
**Subject:** Woodson County, KS
**Attachments:** Woodson County, KS Region H Critical Facilities (08.27.13).xlsx

Matt,

Due to budget restraints within my County, membrs of the various jurisdiction, utility providers and such were unable to attend the Mitigation Meetings. Due to the restraints, I have taken the time to contact and visit with them to discuss this Project and gather the information to submit to you. This was completed with a bare minimun of participation and to the best of my ability with the information I was provided.

Also I have attached one form, and the action Items look fine.

--
Scott Wiltse
Emergency Manager

## Matt Eyer

**From:** Firechief [firechief@parsonsks.com]
**Sent:** Friday, September 13, 2013 1:58 PM
**To:** matt@blueumbrella.co
**Subject:** All Hazard Plan attendance

Matt,

All organizations listed by you for data submission and actions in Labette County have been in contact with me and meetings have occurred to put together each organizations individual submission which in turn should qualify them for meeting the requirement of meeting attendance.

Larry Steeby, Emergency Manager
Labette County

Matt,

I have also included in this packet, the City of Thayer's paperwork to be included in the Haz-Mit plan. This information was taken via a phone conversation with the city's mayor Tony Vining, 620-212-1276. If you have any questions, please call me at my cell 620-432-4074.

I also made contact with the other participants in our county's plan in regards to the submission of their paperwork, and on the attendance roster the ones marked with a red X are the entities that I contacted via phone and they have all told me that they submitted paperwork through their county Emergency Managers. They have facilities within Neosho County, however they are based out of another county. Again please call me if there is an issue on this.

I think that I have fulfilled what needed, however, if not let me know.

Sincerely,

Byron Shultz

Neosho County Emergency Management

To Whom It May Concern:

SUBJECT: Mitigation Plan Preparation

This memo is to ascertain that the Jurisdictions in Montgomery County listed below have either sent updates to the Multi Hazard Mitigation Plan or have responded to this office with their information in order to update the Montgomery County Multi-Hazard Mitigation Plan.

1 – Montgomery County
2 – City of Cherryvale
3 – City of Caney
4 – City of Coffeyville
5 – City of Dearing
6 – City of Elk City
7 – City of Havana
8 – City of Independence
9 – City of Liberty
10 – USD 436
11 – USD 445
12 – USD 446
13 – USD 447
14 – Coffeyville Community College
15 – Independence Community College
16 – Montgomery County Rural Fire District #1
17 – PWWSD #4-1
18 – RWD -1-2-3-7-8-10-12-13
19 – Radiant Electric Cooperative
20 – Coffeyville Regional Medical Center
21 – American Red Cross
22 – Mercy Hospital
23 – Private Non-Profit School #1 - #2

Research and contact with these jurisdictions is continuous regarding mitigation issues.

Respectfully Submitted: Jim Miller – Montgomery County Emergency Manager

# APPENDIX C

# PUBLIC SURVEY

# APPENDIX D

# CRITICAL FACILITIES

# RESTRICTED

# APPENDIX E

# FEMA APPROVAL DOCUMENTATION