HAZARD MITIGATION ACTION PLAN

FOR

HOPKINS COUNTY TEXAS

AND THE JURISDICTIONS OF

COMO, CUMBY, and SULPHUR SPRINGS

Five Year Update

INCORPORATED AND UNINCORPORATED AREAS

DEVELOPED BY ARK-TEX COUNCIL OF GOVERNMENTS

Date

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FORWARD

Development of a comprehensive all-hazard Mitigation Plan was approved by the Division of Emergency Management, Texas Department of Public Safety, in a letter dated February 21, 2003. The Planning Project Number is DR-1379-3.145. This Hazard Mitigation Plan identifies the potential impact of natural and man-made hazards that threaten the nine (9) county region of the Ark-Tex Council of governments. The specific counties are as follows: Bowie, Cass, Morris, Franklin, Hopkins, Lamar, Red River, Titus, and Delta. This section is for HOPKINS COUNTY and includes the cities of Sulphur Springs, Como, and Cumby, Texas

FEDERAL AUTHORITIES

Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act)

Public Law (PL) 106-390 (Disaster Mitigation Act of 2000)

Code of Federal Regulations (CFR) 44

44 CFR Parts 78, 201, and 206

STATE AUTHORITIES

Emergency Management Plan for Hopkins County, Texas

Joint Resolution Between the County of Hopkins, Texas, and the cities of Sulphur Springs, Como, and Cumby, Texas.

Inter-local Agreements with the Ark-Tex Council of Governments

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SECTION I

HOPKINS COUNTY TEXAS

PURPOSE

The goal of all mitigation efforts is long-term risk reduction. The emphasis on sustained actions to reduce long-term risk differentiates mitigation from preparedness and response tasks that are required to survive a disaster and from recovery tasks, which are essentially the return to pre-disaster status. Mitigation actions follow a disaster focus on making the situation safer and better than before the incident occurred. Mitigation is an essential component of emergency management. Effective mitigation actions can decrease the impact, the requirements and the expense of future hazard events. None of the communities in this plan have been designated for special consideration because of minority or economically disadvantaged populations.

Hazard mitigation planning is never ending. The primary purpose of this plan is to ensure that the residents, visitors, and businesses in Hopkins County, Texas are safe and secure from natural hazards by reducing the risk and vulnerability before disasters happen, through federal, state, and local community communication, public education, research, and data analysis. This plan is intended to serve as a guide in coordinating and implementing hazard mitigation policies, programs, and projects.

The Hopkins County Emergency Management Plan has been developed, and the assessment level of planning preparedness is Intermediate. **The Hazard Mitigation Action Plan update** will only serve to enhance the County's already considerable capabilities in recognizing, planning for, responding to, and recovering from disaster. The County's history of the careful development, monitoring, and integration of emergency management and hazard mitigation planning is testament to its standing commitment to make the jurisdictions as disaster-resistant as possible.

The Plans, ordinances, maps and codes were reviewed by the Hazard Mitigation Committee and staff before mitigation action items and implementation strategies were determined. Information gathered from the Plans, ordinances, maps, permits, and codes were considered and incorporated into this Hazard Mitigation Plan. The lack of various plans and codes were considered also. This was factored in when considering the various mitigation action items and implementation strategies.

We cannot control natural phenomena such as floods, tornadoes, winter storms, wildfires and other hazardous events. Despite their destructiveness, these occurrences are part of the natural system.

While we cannot prevent natural hazards, we can reduce some of their adverse consequences. We can avoid the worst-case scenario when a hazard does occur by managing the known characteristics of the hazard.

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The following objectives will be addressed in the plan:

- What hazards could occur
- Frequency of occurrence
- Hazards impact on community and severity of impact
- Vulnerability to each hazard
- Hazards with greatest risks
- Prioritized mitigation actions

PLAN ORGANIZATIONAL STRUCTURE

Organizational Structure

Ark-Tex Council of Governments (ATCOG), is an organization comprised of city and county governments, colleges, service organizations, school districts, chambers of commerce, etc., with the goal to build strength through regional cooperation. It is through this regional cooperation that ATCOG can serve its members by working to continually improve the economic, social, educational, and safety aspects of life for citizens of Hopkins County.

ATCOG served as the coordinating agency for the development of the plan. As the coordinator, ATCOG had many responsibilities including administration, content organization, and text development. The following is a brief summary of ATCOG's responsibilities for the plan:

- Assign a lead planning staff member to provide technical assistance and necessary data to the Hopkins County Hazard Mitigation Planning Team (HMPT).
- Schedule, coordinate and facilitate community meetings with the assistance of the planning team.
- Provide any necessary materials, handouts, etc., necessary for public planning meetings.
- Work with the planning team to collect and analyze data and develop goals and implementation strategies.
- Prepare, based on community input and team direction, the first draft of the plan and provide technical writing assistance for review, editing and formatting.
- Coordinate with stakeholders within the cities and the unincorporated areas of Hopkins County during plan development.
- Submit the final plan to the State of Texas and provide follow up technical assistance to the Hopkins County Community Mitigation Planning Team to correct any noted deficiencies subsequent to the review of the plan by the State of Texas.
- Upon approval by the State of Texas, submit the updated plan to FEMA and provide follow up technical assistance to the Hopkins County Community Mitigation Planning Team to address any noted deficiencies subsequent to the review of the plan by FEMA.
- Coordinate adoption and final approval process by all City and Town Councils and the Commissioners Court of the updated and approved FEMA plan.
- Submit a final plan, with adoption documentation and approval signatures for all participating jurisdictions, to the State and FEMA and ensure plan is noted as complete and approved by both agencies.

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- Prepare for and attend City Council/Commissioners Court/public meetings during plan consideration and plan adoption process.
- Complete and acquire approval of all necessary forms associated with the application for Hopkins County's Multi-Jurisdictional Hazard Mitigation Grant.

A Multi-Jurisdictional Hazard Mitigation Planning Team (HMPT) was formed consisting of representatives appointed by local jurisdictions to work together with ATCOG in the plan development. The team's primary duties were:

- Ensure that the Hopkins County HMPT includes representatives from the neighborhood stakeholders' groups. Each participating city must provide at least one representative to the county team and provide active support and input. ATCOG will approve the final composition of the planning team.
- Assist ATCOG staff with identifying hazards and estimating potential losses from future hazard events.
- Assist ATCOG in developing and prioritizing mitigation actions to address the identified risks.
- Assist ATCOG in coordinating meetings to develop the plan.
- Identify the community resources available to support the planning effort.
- Assist with recruiting participants for planning meetings.
- Gain the support of neighborhood stakeholders for the recommendations resulting from the planning process.
- After adoption, appoint members to a committee to monitor and work toward plan implementation.
- After adoption, publicize the plan to neighborhood interests and ensure new community members are aware of the plan and its contents.
- Subsequent to State of Texas and FEMA approval of the plan, assume responsibility for bringing the plan to life by ensuring it remains relevant by monitoring progress, through regular maintenance and implementation projects. Ensure that the Hopkins County HMPT includes representatives from the neighborhood stakeholders' groups. Each participating city must provide at least one representative to the county team and provide active support and input. ATCOG will approve the final composition of the planning team.

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THE PLANNING PROCESS

BENEFITS OF MITIGATION PLANNING

1. Increases public awareness and understanding of vulnerabilities as well as support for specific actions to reduce losses from future natural disasters.

2. Builds partnerships with diverse stakeholders increasing opportunities to leverage data and resources in reducing workloads as well as achieving shared community objectives.

3. Expands understanding of potential risk reduction measures to include structural and regulatory tools, where available, such as ordinances and building codes.

4. Informs development, prioritization, and implementation of mitigation projects. Benefits accrue over the life of the project as losses are avoided from each subsequent hazard event.

The Multi-Jurisdictional Planning Process.

A multi-jurisdiction plan was chosen to best prepare the communities of Hopkins County for Hazards. The Ark Tex Council of governments worked hand in hand with the jurisdictions within the planning area of Hopkins County to develop the current plan. It is through this regional cooperation that ATCOG can serve its members by working to continually improve the economic, social, educational, and safety aspects of life for citizens

Mitigation plans need to be a living document and to ensure this the plan must be monitored, evaluated, and updated on a five-year or less cycle. This includes incorporating the mitigation plan into county and local comprehensive or capital improvement plans as they are developed.

Organize Resources:
Effective planning efforts result in practical and useful plans, but written plans are only one element in the process. The planning process is as important as the plan itself. A successful planning process organizes resources by encouraging cooperation and bringing together a cross-section of government agencies, local entities, concerned citizens and other stake holders to reach consensus on how to achieve a desired outcome or resolve a community issue. Applying a community wide approach and including multiple aspects adds validity to the plan. Those involved gain a better understanding of the problem and how solutions and actions were devised. The result is a common set of community values and widespread support for directing financial, technical, and human resources to an agreed upon action.

- ✓ A comprehensive county approach was taken in developing the plan. An open public involvement process was established for the public, neighboring communities, regional agencies, businesses, academia, etc. to provide opportunities for everyone to become involved in the planning process and to make their views known. This was done by having public meetings that were advertised with notices in public places and by media press releases.

- ✓ Each participant was given an explanation of the Hazard Mitigation Planning Process. These opportunities were also used to gather hazard information, develop mitigation strategies, and edit the plan during the writing process.

- ✓ The review and incorporation of appropriate existing plans, studies, reports, technical information, and other research was included into the plan during its drafting process

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- ✓ Support and information were obtained from other government programs and agencies such as the National Flood Insurance Program (NFIP), Natural Resources Conservation Service (NRCS), US Geological Survey (USGS), NOAA Weather, etc.

Risk and Vulnerability Assessment:
The plan must be reactive to hazards that face the community. It is not sufficient to just identify the hazards. The potential consequences of these hazards must be assessed. This phase included identifying and profiling all hazards, assessing vulnerability and risk. Research into the history of Hopkins County to document past disasters was required. Local libraries, national weather records and the life experiences from local residents were used to assess the plan.

A general assessment included using local residents, historical data, Texas State Mitigation Plan, Local or Regional Reports, Strategic Plans, Flood Studies, and other data to establish the following:

- ♦ The type, location and extent of all hazards that can affect the jurisdiction, both historically and in the future.
- ♦ Past occurrences of hazard events in or near the community and the severity, duration, and the resulting influences on the area.
- ♦ Description of the jurisdictions vulnerability to those hazards including types and numbers of existing and future buildings, infrastructure and critical facilities in identified hazard areas.
- ♦ Probability or likelihood of hazard occurrence.
- ♦ General description of land uses and development trends for future land use decisions.

The development of a Multi-Jurisdictional Hazard Mitigation Plan involves the use of many types of information including historical data on previous disasters, information on critical infrastructures, zoning and flood plains maps, records, charts, etc., from many sources.

Develop Mitigation Strategies:
Written Strategies were developed to demonstrate how Hopkins County, Texas intends to reduce losses identified in the Risk Assessment. It includes goals and objectives to guide the selection of mitigation activities and reduce potential losses. This is a blueprint for reducing the potential losses identified in the risk assessment. The Mitigation Strategy also includes:

- A description of mitigation objectives meant to reduce long-term vulnerabilities. These objectives were identified by the HMPT using hazard profiles, survey assessments, etc.
- Identification and a comprehensive analysis of a range of mitigation actions and projects.
- An Action Plan describing how the mitigation actions and projects were prioritized, and how they would be implemented and administered.

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Economic Considerations

Hopkins County and the jurisdictions of Como, Cumby, and Sulphur Springs have very limited budgets. Como, and Cumby, have volunteer fire departments. Hopkins County has a total population of 35,161. Their tax base and the annual budget are low. They will have to rely on grants and volunteerism to accomplish the bulk of the projects. Building codes are nearly non-existent and the public works department is limited to a few individuals that have multiple job responsibilities.

Resource Information

Resource information was obtained from the following government programs and agencies:

National Flood Insurance Program (NFIP), which provided information about flooding and actions needed to satisfy compliance with NFIP.

The US Geological Survey (USGS), provided information that was incorporated into the hazards of drought and flooding.

Natural Resources Conservation Service (NRCS), provided information about water management and climate change that are found in the identified hazards of drought and extreme heat.

The Texas Hazard Mitigation Plan helped to develop the common language used in the Hopkins Mitigation Plans.

The Emergency Management Plan of Hopkins County provided information regarding current emergency management preparedness. The information helped determine the most immediate needs relating to all identified mitigated hazards.

Fort Worth. Texas Mitigation Plan provided an example of action tables that was used to organize and clarify the actions.

Texas Wildfire Risk Assessment Portal (TXWRAP) provided statistical graphs and maps regarding wildfire activity in Hopkins County. This information is found in the wildfire section of the Plan.

NOAA Weather web site provided information regarding climate data and global warming.

The US Census Bureau provided statistics and population information found throughout the plan.

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Team Members were informed of the progress, discussed issues, and were notified of any changes to FEMA's guidelines for the creation of the plan. Existing plans were reviewed to determine how they might be incorporated into the HMAP. The Emergency Management Coordinator of Hopkins County and the Mayors (or their appointees) of Como, Cumby, and Sulphur Springs and will oversee the Mitigation Plan.

Adoption, Implementation and Maintenance:

This describes the system that Hopkins County and the participating jurisdictions have established to monitor the plan; provides a description of how, when, and by whom the HMPT process and mitigation actions will be evaluated; presents the criteria used to evaluate the plan; and explains how the plan will be maintained and updated.

Through citizen involvement, the plan reflects community issues, concerns, and new ideas and perspectives on mitigation opportunities. Mitigation team members consist of representatives from various county departments and representatives from private organizations, businesses, and various city government officials. Hopkins County entered into a contract with The Ark-Tex Council of Governments Council of Governments in Texarkana, Texas, to develop the plan. The Mitigation Action Team assisted in developing plan goals and action items and shared their expertise to create a more comprehensive plan.

Newspaper postings helped publicize the meeting to neighboring counties and non-profits or other interested parties. The Ark-Tex Council of Governments staff has also met numerous times, had numerous telephone conversations, and worked individually with officials and employees from the County and each of the cities in gathering the data necessary for the plan.

Upon approval by FEMA the plan will be submitted to the County by the Mitigation Planner for final signatures. The Plan will be available for public viewing at the county seat and the city hall of Como, Cumby, and Sulphur Springs.

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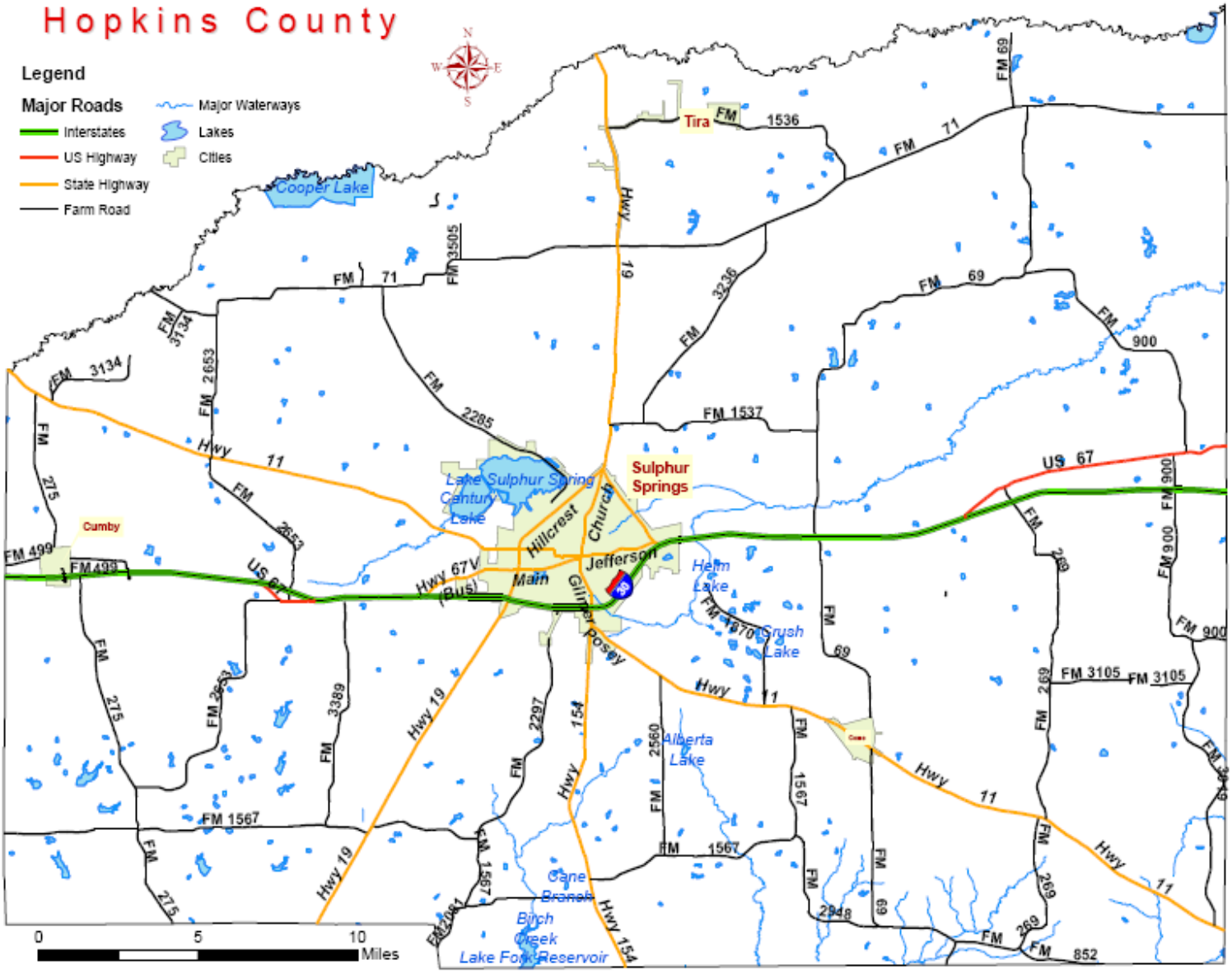
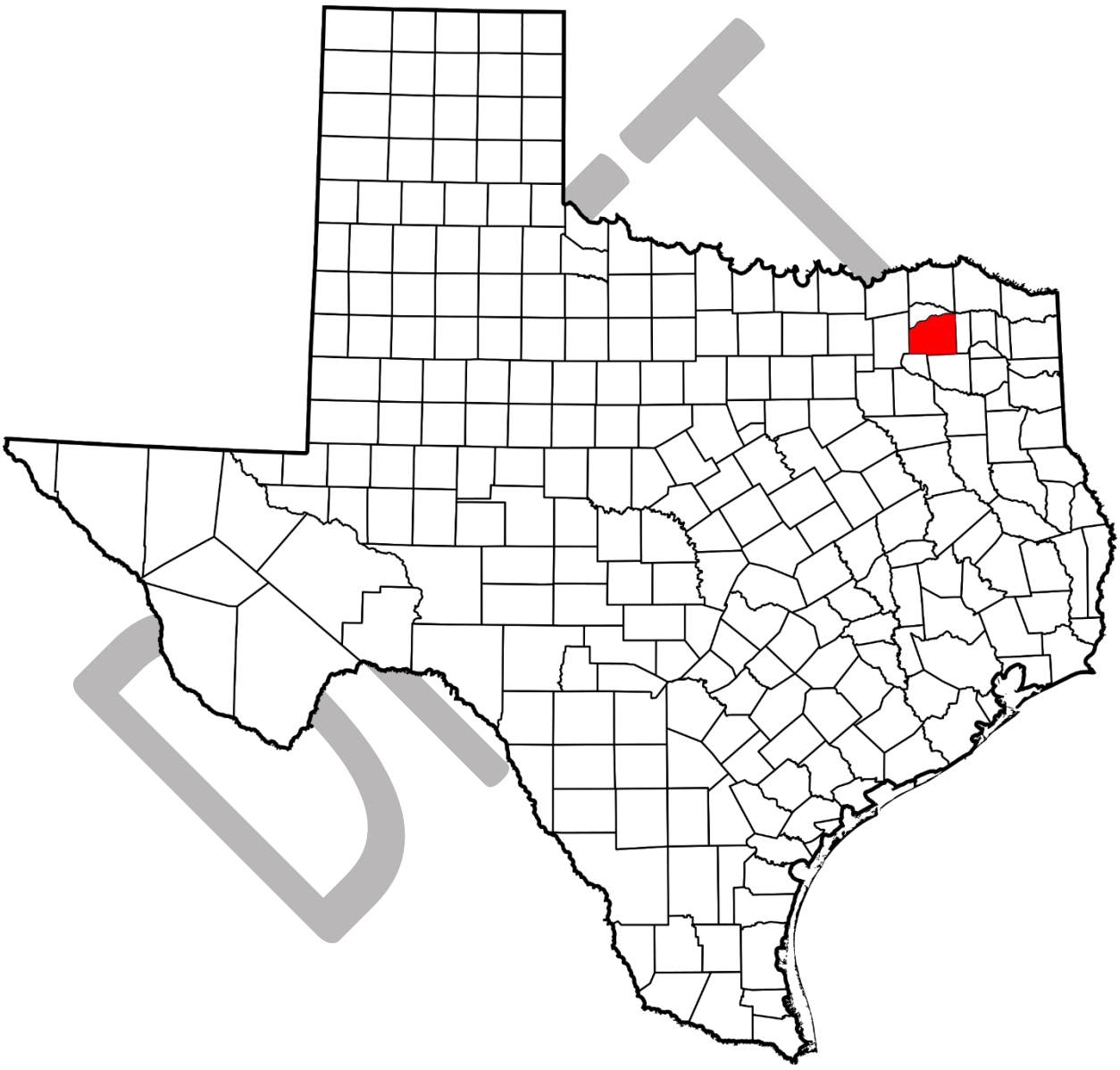


MAP OF HOPKINS COUNTY

Hopkins County Location in Texas



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County Government

County government is spelled out in the Texas Constitution, which makes counties functional agents of the state. Thus, counties, unlike cities, are limited in their actions to areas of responsibility specifically spelled out in laws passed by the legislature.

At the heart of each county is the commissioner's court. Hopkins County has four-precinct commissioners and a county judge who serve on this court. This body conducts the general business of the county and oversees financial matters. The major elective offices found include the county attorneys, county and district clerks, county treasurer, tax assessor-collector, justices of the peace, and constables. There is an auditor appointed by the district courts.

PARTICIPATING JURISDICTIONS

The plan is a result of a joint effort between Hopkins County officials, mayors, council members, and employees of the cities of Como, Cumby, Sulphur Springs. Each of these entities has participated in the formation of this plan and Update.

County Government

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Economic Considerations

Hopkins County and the jurisdictions of Como, Cumby, and Sulphur Springs have limited revenues and the population is rural, so the needs of Hopkins County remain simple. The county does not have a budget that allows for projects that can be tackled without assistance on the state or federal levels. The jurisdictions do not have elaborate local governments and the entire county is operated and maintained by a handful of dedicated workers.

Red River County Jurisdictions Ranked by Population		
Ranking	Jurisdiction	Population
1	Hopkins County Unincorporated	19,510
2	Sulphur Springs	16,014
3	Cumby	808
4	Como	752

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The Hopkins County Hazard Mitigation Plan consists of Hopkins County and the jurisdictions of Como, Cumby and Sulphur Springs

The Hazard Mitigation Action Team assisted in developing plan goals and action items by using their own skills sets and knowledge to create a more comprehensive plan. A variety of backgrounds and experience were evident in the team members, thus provided an eclectic view of mitigation needs and solutions.

Team meetings, telephone calls and e-mail communication played a role in team member contact and plan completion. Important Dates are listed below:

Hopkins County Team Members	
Andy Endsley	Emergency Management Coordinator, Hopkins Co.
Kathy Springfield	Deputy Emergency Management Coordinator, Hopkins Co.
Robert Newsom	Hopkins County Judge
Mary Doss	Como City Secretary
Jason Ricketson	Sulphur Springs Emergency Management Coordinator
Mario Villarino	Hopkins County Extension Agent
Beth Wisenbaker	Grant Coordinator
Doug Simmerman	Cumby Mayor
John Sellers	Sulphur Springs Mayor

Robert Newsom
Robert Newsom is the Hopkins County Judge. He was appointed originally to his position after his predecessor resigned to become the Executive Director of the Ark-Tex Council of Governments. Judge Newsom has since been elected to the post after serving out his appointed term. Mr. Newsom served as state district judge for 16 years. He has a law degree from Texas Tech University.
Judge Newsom has played a critical role in developing the Hopkins County Team. He has offered guidance and advice regarding hazards and providing information that helped to form action selection.

Jason Ricketson
Jason Ricketson is the Sulphur Springs Emergency Management Coordinator. Mr. Ricketson served 17 years as patrol, patrol Supervisor and K-9 officer. He has a degree in science. Jason was very helpful in finding priority actions for the city of Sulphur Springs. He offered many creative suggestions to the plan regarding appropriate actions for the city. Mr. Ricketson kept close communications with ATCOG during the planning process.

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Mario Villarino
Dr. Mario Villarino is the county extension agent. He has earned advanced degrees in veterinary medicine and microbiology. Dr. Villarino has been very helpful in offering suggestions, actions and observations regarding crop damage due to extreme weather.

Beth Wisenbaker
Beth Wisenbaker is the Hopkins County Grant Coordinator. She has been an advocate for plan update development and has shared her enthusiasm with other planning team members while stressing the importance of plan completion. Ms. Wisenbaker has provided valuable information regarding her county and her precinct. She helped to prioritize actions chosen that would enhance the safety and reduce property loss for her precinct.

Mary Doss
Mary Doss is the city secretary for Como. In that role she has information regarding most aspects of the Como administration. She has been the to-go to person for current information in the Hopkins County Hazard Mitigation Plan.

John Sellers Sulphur springs mayor

Doug Simmerman

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A list of possible stakeholders was developed, and contacts were made by phone and/or by e-mail. The list includes the neighboring county judges and members of the school system, the local hospital, the local farm agent, the local director of the Red Cross. Further information regarding participation will be entered after draft posting.

Identified Area Stakeholders				
Name	**Title**	**Company**	**Location**	**Type of Contact**
Lucy Hebron	County Judge	Wood County	Quitman	Email
Misty Batts	Director	Red Cross	Paris, TX	Email
Jason Murray	County Judge	Delta County	Cooper	Email
Bobby Stovall	County Judge	Hunt County	Greenville	Email
Paul Harvey	Administrator	Christus Mother Francis Hospital	Sulphur Springs	Email
Mike Lamb	Superintendent	SSISD	Sulphur Springs Texas	Email
Scott Lee	County Judge	Franklin County Texas	Mt. Vernon	Email
Wayne Wolfe	County Judge	Rains County	Emory	Email

Public Participation

Public participation is a key component to strategic planning processes. Citizen participation offers citizens the chance to voice their ideas, interests, and opinions. Opportunities were given to the citizens of Hopkins County to participate in planning and to review the plan.

On date a plan draft was posted on the Hopkins County website. Contact information was posted on the site. Notices were posted at the courthouse in the local newspaper and on the Hopkins Website. Further information regarding participation will be entered after draft posting.

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SECTION II

HAZARD IDENTIFICATION AND ASSESSMENT

Extreme Weather and Climate Change

Currently, there is a strong scientific consensus that the Earth is warming and that this warming is mainly caused by human activities. This consensus is supported by various studies of scientists' opinions and by position statements of scientific organizations, many of which explicitly agree with the Intergovernmental Panel on Climate Change (IPCC) synthesis reports.

Nearly all publishing climate scientists (97–98%) support the consensus on anthropogenic climate change, and the remaining 3% of contrarian studies either cannot be replicated or contain errors.

One of the most visible consequences of a warming world is an increase in the intensity and frequency of extreme weather events. The National Climate Assessment finds that the number of heat waves, heavy downpours, and major hurricanes has increased in the United States, and the strength of these events has increased, too.

There are no national or major scientific institutions anywhere in the world that dispute the theory of anthropogenic climate change ***that will increase the likelihood of unstable weather patterns.***

Climate models have previously shown that Earth will see more heavy rainstorms as the atmosphere warms, but a new climate model developed by NASA researchers is the first to show the difference in strength between storms that occur over land and those over the ocean and how storms strengths will change in general.

These conclusions are particularly bad news for the storm-prone portions of the central and eastern United States, where strong winds are a major source of weather-related casualties. Also, according to NASA, Global warming will make severe thunderstorms and tornadoes a more common feature of U.S. weather.

The western United States won't catch a break either—while it is expected to get drier, the storms that do form are likely to have more lightning, which could then trigger more wildfires.

No single weather event can be directly attributed to climate change. But as the globe warms up, Americans can expect more storms bearing down on much of the United States, scientists say.

Even increased snowfall has a climate change connection. That's not because the Feb. 1 2011 storm can be linked to rising atmospheric carbon dioxide levels or increasing global temperature – again, such a connection is impossible to make – but, according to climatologists, an increased propensity for winter storms is exactly what you'd expect in a warming world.

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"There's no inconsistency at all," Michael Mann, the director of the Penn State Earth System Science Center, told LiveScience. "If anything, this is what the models project: that we see more of these very large snowfalls."

"Drier conditions near the ground combined with higher lightning flash rates per storm may end up intensifying wildfire damage," said study leader Tony Del Genio of NASA's Goddard Institute for Space Studies in New York.

"Climate is the statistics of weather over the long term," Ken Caldeira, a senior scientist at the Carnegie Institute for Science at Stanford University, told LiveScience. "No specific weather event can by itself confirm or disprove the body of scientific knowledge associated with climate change."

Regardless of individual views regarding global warming, extreme weather patterns over the last ten years are self-evident. We can easily predict that continued extremes in weather, like those mentioned above, will occur in the foreseeable future.

All of Hopkins County including the jurisdictions of Avery, Bogata, Clarksville and Detroit are susceptible to several possible natural hazards. The Hazard Mitigation Team with the assistance of the Ark-Tex Council of Governments Hazard Mitigation Planner conducted a comprehensive Hazard Analysis beginning in May 2003. The hazard analysis will be reviewed annually, and up-dated as needed during the Formal Review Process.

The Hazard Mitigation Team identified the following hazards that had the potential to cause personal or property damage in the county:

- Flood
- Tornado
- Winter Storm
- Thunderstorm Winds
- Hailstorm
- Drought
- Wildfire
- Lightning
- Dam Failure

Hazard by Area of Risk	
Hazards with distinct area of risk	Hazards without distinct area of risk
Flood	Tornado
Dam Failure	Drought
Wildfire	Lightning
Earthquake	Winter Storm
	Thunderstorm Winds
	Hailstorm
	Extreme Heat

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Hazards Listed in the Texas Hazard Mitigation Plan Not Included in the Hopkins Plan	
Hazard	**Reason for Exclusion**
Tropical storms	Hopkins County is 300 miles from the coast. Tropical storms are not an issue for Hopkins County. The planning area has no history of Tropical Storms hazards; therefore, no impacts are expected in the future.
Coastal erosion	Hopkins County is 300 miles from the coast. Coastal Erosion is not an issue for Hopkins County. The planning area has no history of Coastal Erosion hazard; therefore, no impacts are expected in the future.
Expansive soils	There is no evidence that expansive soils are an issue for Hopkins County. The planning area has no history of Expansive soils hazard; therefore, no impacts are expected in the future.
Land subsidence	There is no evidence that land subsidence is an issue for Hopkins County. The planning area has no history of Land Subsidence hazard; therefore, no impacts are expected in the future.

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The process for identifying hazards included looking at historical data to determine which hazards seemed to occur in Hopkins County. Sources used were newspaper articles, general local knowledge of jurisdictions' staff and local residents, NOAA Satellite and Information Service National Climatic Data Center reports, and advice from FEMA Hazard Mitigation Plan reviewers and Texas Department of Emergency Management staff.

Hazards How and Why		
Hazard	**How Identified**	**Why Identified**
Floods	• Review Repetitive Flood Properties • NOAA • Newspaper accounts • Input from public • Review of FIRMS	• The County contains many creeks, streams and rivers • The County has experienced flooding in the past. • Flooding is a frequent issue
Tornado	• Public Input • National Weather Service • Past History • NCDC Data Base	• Public Concern • Past History • Frequency
Winter Storms	• Past Disasters (2000 ice storm) costliest in recent memory • Public input • NOAA • National Weather Center	• Little equipment to fight ice and snow • Heavy psychological toll on population • Population not educated about dealing with outages etc.
Thunderstorms Winds	• NOAA reports • Public Input • Newspaper Accounts	• Wind shears an ongoing problem • Severe thunderstorms with accompanying high winds occur every year
Hail	• Newspaper accounts • NOAA • Input from public	• Frequency • Past History • Public Concern
Droughts	• History • Review of NCDC database • Public Input	• Costly to agri-business • Drought common to state and county
Extreme Heat	• History • Review of NCDC database • Public Input	• Costly to agri-business • Extreme heat common to state and county
Wildfire	• Fire databases • Public Input • Texas Forestry • Newspaper Articles	• More wildfire occurrences than any other natural disaster • Can be common to drought and storms • Rural areas most vulnerable
Earthquake	• Public Input	• Concern over the oil and gas wells using fracking technique
Dam Failure	• Public Input	• Dams in Sulphur springs and in the county pose possible threats to life and property

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Determining Risk

The following tables represent the factors used to calculate overall risk in Hopkins County or in the participating jurisdictions.

Severity x .45 + Probability x .30 + Warning Time x .15 + Duration x .10 = Risk

Potential Severity of Impact: (45% of Priority Risk Index)	
SUBSTANTIAL **Index Value = 4**	• Possible fatalities • Complete shutdown of facilities for 30 days or more • More than 50 percent of property destroyed or with major damage
MAJOR **Index Value - 3**	• Possible permanent disability from Injuries and/illnesses • Complete shutdown of critical facilities for at least 2 weeks • More than 25 percent of property destroyed or with major damage
MINOR **Index Value = 2**	• Injuries and/or illnesses do not result in permanent disability • Complete shutdown of critical facilities for more than 1 week • More than 10 percent of property destroyed or with major damage
LIMITED **Index Value = 1**	• Injuries and/or illnesses are treatable with first aid • Shutdown of critical facilities and services for 24 hours or less • Less than 10 percent of property destroyed or with major damage

Probability of Future Events: (30% of Priority Risk Index)	
Highly Likely Index Value = 4	Event probable in the next year. 1/1 = 1.00 (Greater than .33)
Likely Index Value = 3	Event probable in next 3 years 1/3 = .33 (Greater than 0.20, but less than or equal to 0.33)
Occasional Index Value = 2	Event probable in next 5 years 1/5 = 0.20 (Greater than 0.10, but less than or equal to 0.20)
Unlikely Index Value = 1	Event probable in next 10 years 1/10 = 0.10 90.10 or less)

Formula for probability: # events divided by the # of years on record i.e. 10 flood events in a 20 year period would give a 10/20 = .50 Value index of 4 (Highly Likely)

Warning Time: (15% of Priority Risk Index)	
Index Value = 4	Less than 6 hours
Index Value = 3	6 to 12 hours
Index Value = 2	12 to 24 hours
Index Value = 1	More than 24 hours

Duration: (10% of Priority Risk Index)	
Index Value = 4	More than a week
Index Value = 3	Less than a week
Index Value = 2	Less than 24 hours
Index Value = 1	Less than 6 hours

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Priority Risk Index (PRI)

High Risk	PRI of 3.0 or greater
Medium Risk	PRI score 2.0 to 3.0
Low Risk	PRI score less than 2.0

PRI Value = (Impact x .45%) + Probability x 30%) + (Warning Time x 15%) + (Duration x 10%)

Vulnerability is categorized as “Low” to “High”. These terms are defined as follows:

Vulnerability of Hazards	
LOW	Limited or no history of significant impacts to property, infrastructure and/or public safety.
MODERATE	People and facilities located in areas that have low levels of historic occurrence of impacts from hazard and/or in areas where impact is possible but not probable.
HIGH	People and facilities located in areas that have previously experienced impacts from hazards and/or in areas where impacts from hazards are possible and probable. Future damage to property and infrastructure is probable and/or a documented history of threat to public safety exists.

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Property Damage Assessments

The following damage assessment tables are used to estimate monetary loss due to natural hazards in Hopkins County.

Hopkins County Damage Assessment				
Structure Type	$ Value	75%	50 %	25%
Residential	1,404,817,570	1,053,613,177.50	702,408,785	351,204,392.50
Commercial	406,064,071	304,548,053.25	203,032,035.50	101,516,017.75
Industrial	53,976,020	40,482,015	26,988,010	13,494,005
Exempt Property	253,528,394	190,146,295.50	126,764,197	63,382,098.50

Como Damage Assessment				
Structure Type	$ Value	75%	50 %	25%
Residential	12,739,250	9,554,437.50	6,369,625	3,184,812.50
Commercial	2,389,670	1,792,252.50	1,194,835	597,417.50
Industrial	749,450	562,087.50	374,725	187,362.50
Exempt Property	1,568,110.	1,176,082.50	784,055	392,027.50

Cumby Damage Assessment				
Structure Type	$ Value	75%	50 %	25%
Residential	14,685,540	11,014,155	7,342,770	3,671,385
Commercial	3,960,460	2,767,845	1,845,230	922,615
Industrial				
Exempt Property	6,031,170	4,523,377.50	3,015,585	1,507,792.50

Sulphur Springs Damage Assessment				
Structure Type	$ Value	75%	50 %	25%
Residential	500,201,470	375,151,102.50	250,100,735	125,050,367.50
Commercial	359,895,221	269,921,415.75	179,947,610.50	89,973,805.25
Industrial	50,977,100	38,232,825	25,488,550	12,744,275
Exempt Property	172,047,010	129,035,257.50	86,023,505	43,011,752.50

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Hazard Assessment Elements

The Hazard Profiles, found in following sections, were prepared for each identified natural hazard and assess the hazard per the following seven elements.

1. Description: Identification and description of hazards likely to affect the multi-jurisdictional area along with the sources used to identify these hazards.

2. **Location:** The location or geographic area affected by each natural hazard along with a map of the areas affected.

3. Impact: Impact describes the hazard's potential severity of impact that the hazard event is capable of inflicting upon the county and four jurisdictions. Classification methods such as the Fujita Scale and Richter Scales are used to illustrate extent. Due to the limited amount of county and city specific documented data, some of the analysis for determining potential severity was limited to obtaining opinion and information furnished by local residents, emergency responders, and the county and city Emergency Management Coordinators.

4. Previous Occurrences: Previous Occurrences describes the hazard in terms of what, when, and where past events have occurred and the extent of damages.

5. Probability of Future Events: Probability of Future Events describes the probability that the hazard will occur within the County and four jurisdictions.

6. Vulnerability: Vulnerability describes how exposed or susceptible to damage the county is in terms of why and where the hazard can occur within the county and/or the two jurisdictions. The vulnerability is the risk of future occurrences. HAZUS, THMP, and other local data were used to establish a base map and conduct risk assessments.

7. Overall Summary of Vulnerability and Impacts: This section summarizes the vulnerability of the entire county and the possible impacts of the natural disaster.

Hazard Analysis

Simply put, hazard analysis is an evaluation of the types of hazards (emergencies) that have occurred in the past or could occur in the future, identification of the population at risk, and an evaluation of the hazards versus the population to determine overall vulnerability.

The following steps were taken:

- Identification of the Hazards. Determination of the hazards, both natural and technical, that could affect the county.
- Profiling the Hazard Events. Determination of how bad a hazard can get.
- Inventorying Assets. Determination of where and/or to what extent the hazards can affect the assets of the county/city.
- Estimating Losses. Determining how the hazards will affect the county/city.

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HAZARD DESCRIPTIONS

FLOOD

Flood Types

Flash Flood: A flash flood generally results from a torrential rain on a relatively small drainage area. Runoff from these rainfalls results in high floodwater that can cause destruction of homes, buildings, bridges, and roads. Flash floods are a threat to public safety in areas where the terrain is steep and surface runoff rates are high.

Riverine Floods: Riverine floods are caused by precipitation over large areas and differ from flash floods in their extent and duration. Floods in large river systems may continue for periods ranging from a few hours to many days.

Floodplains

100-Year Flood: There is one chance in 100, or a 1% chance of a flood of such magnitude or greater occurring in any given year. There is no guarantee that a similar flood will not occur in the next year, or in the next month.

Floodplain: The lowland and flat areas adjoining inland and coastal waters including, at a minimum, that area subject to a one percent or greater chance of flooding in any given year.

Floodway: That portion of the floodplain, which is effective in carrying flow, within which this carrying capacity must be preserved and where water depths and velocities are the greatest. It is the area along the channel that provides for the discharge of the base flood so the cumulative increase in water surface elevation is no more than one foot.

Impact: The magnitude of observed or forecast flooding is conveyed using flood severity categories. These flood severity categories include minor flooding, moderate flooding, and major flooding. Each category has a definition based on property damage and public threat. Minor damage is defined as: minimal or no property damage, but possibly some public threat or inconvenience. Moderate damage is defined as: some inundation of structures and roads near streams. Some evacuations of people and/or transfer of property to higher elevations are necessary. Major damage is defined as: extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations. The impact of floods varies locally.

The following are floodplain maps for Como, Cumby, and Sulphur Springs.

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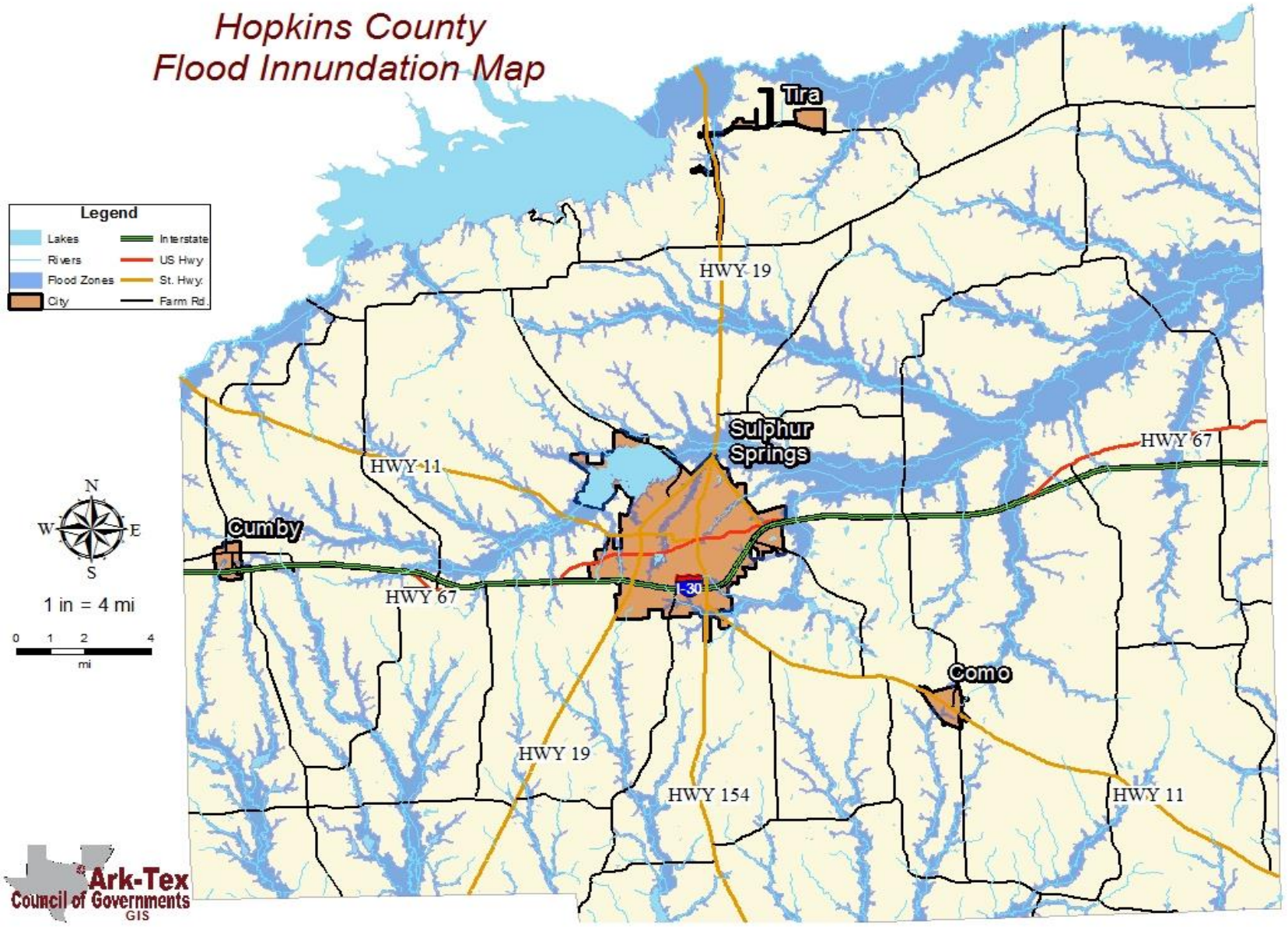
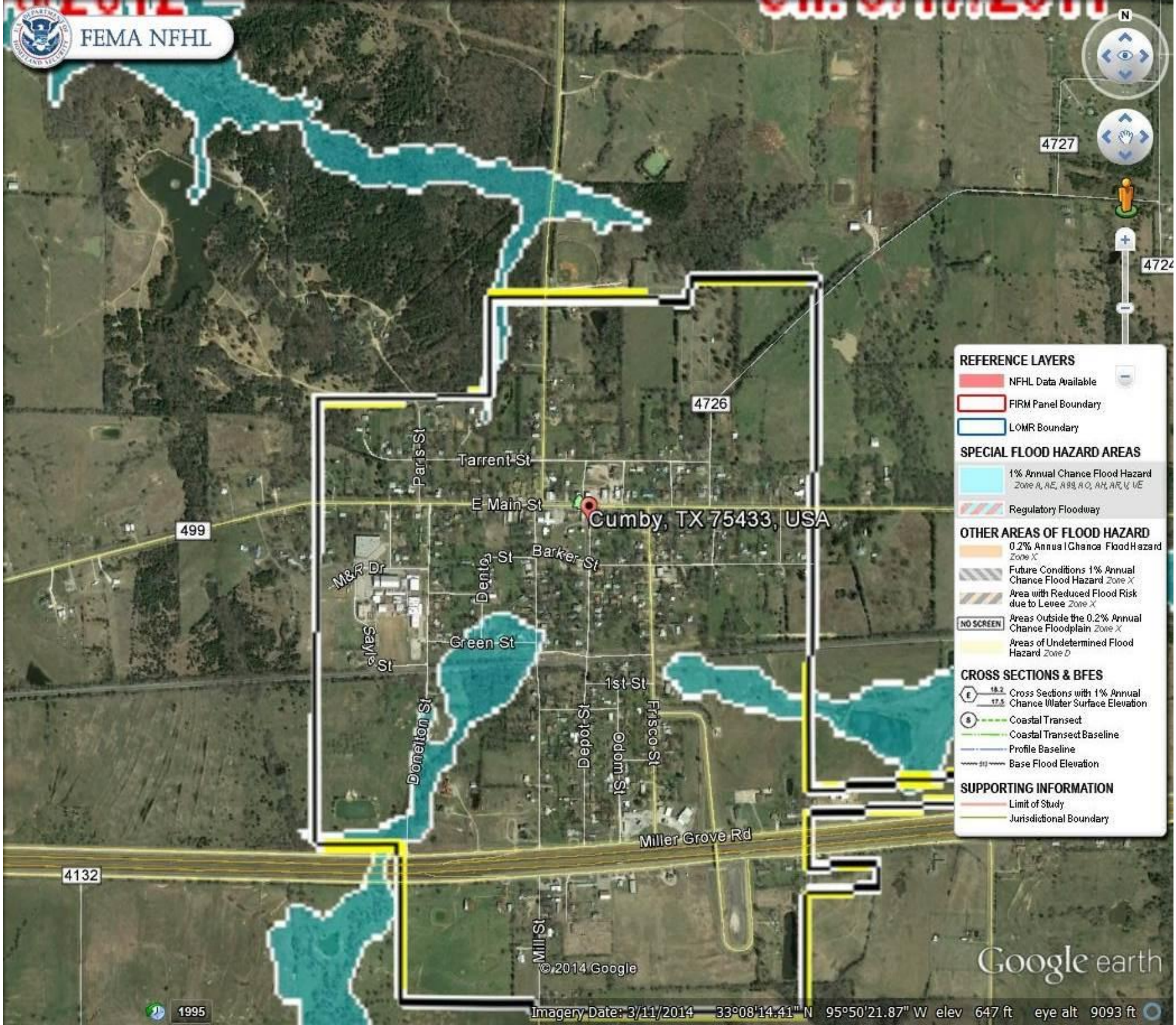
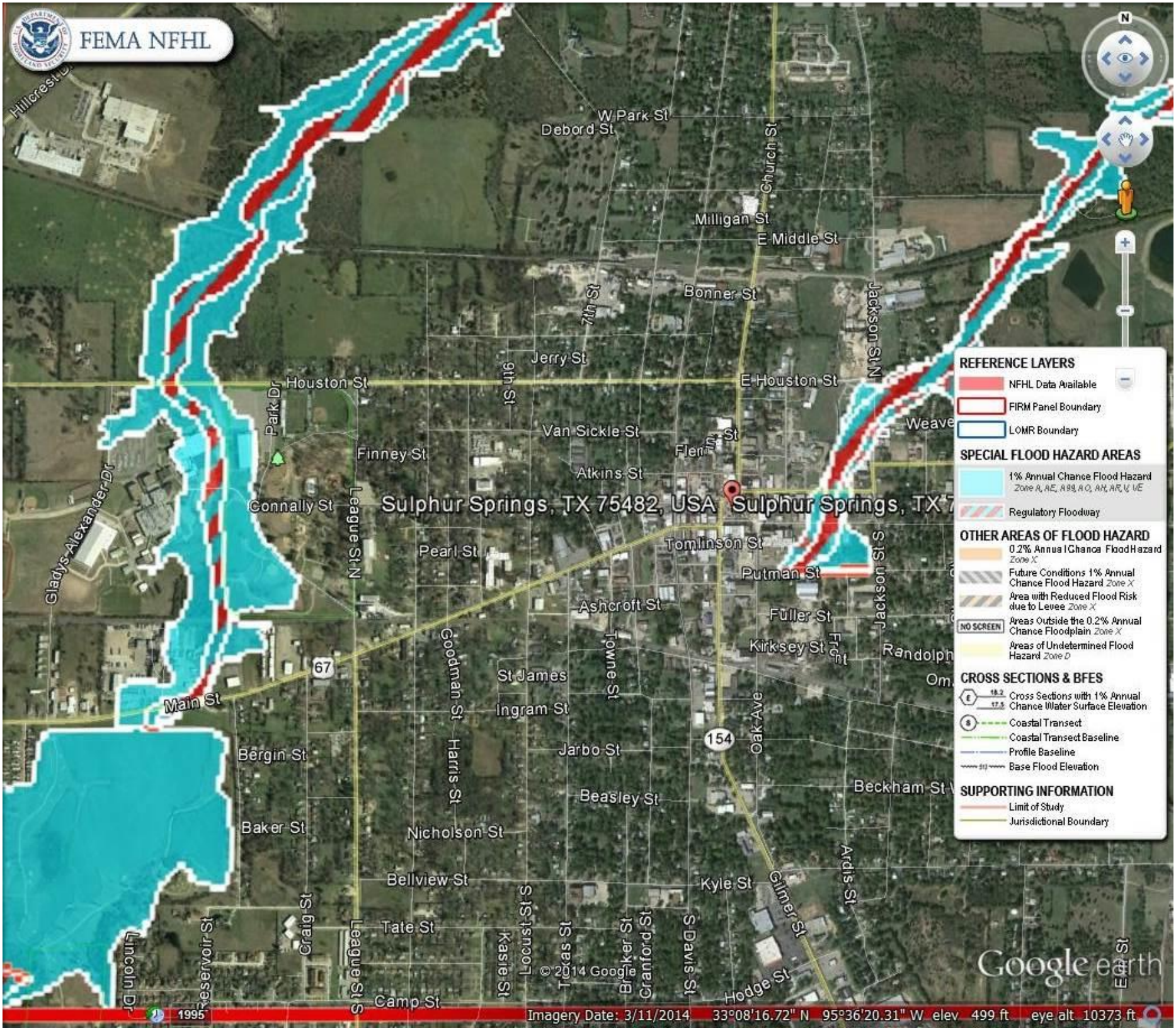

Hopkins County
Flood Innundation Map
Legend
Lakes
Rivers
Flood Zones
City
Interstate
US Hwy
St. Hwy.
Farm Rd.
N
W
E
S
1 in = 4 mi
0 1 2 4
mi
Tira
HWY 19
Sulphur Springs
HWY 67
HWY 11
Cumby
HWY 67
I-30
Como
HWY 19
HWY 154
HWY 11
Ark-Tex Council of Governments GIS


FEMA NFHL
2335
69
6th St
Carroll St
Mills St
Askins St
Como, TX 75431, USA
Smith St
Taylor St
Katy St
Lynch St
2328
11
McBride St
Haywood St
2329
© 2014 Google
Google earth
1995
Imagery Date: 10/30/2012 33°03'39.51" N 95°28'19.03" W elev 534 ft eye alt 10749 ft
REFERENCE LAYERS
NFHL Data Available
FIRM Panel Boundary
LOMR Boundary
SPECIAL FLOOD HAZARD AREAS
1% Annual Chance Flood Hazard
Zone A, AE, A99, AO, AH, AR, V, VE
Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD
0.2% Annual Chance Flood Hazard
Zone X
Future Conditions 1% Annual Chance Flood Hazard Zone X
Area with Reduced Flood Risk due to Levee Zone X
NO SCREEN
Areas Outside the 0.2% Annual Chance Floodplain Zone X
Areas of Undetermined Flood Hazard Zone D
CROSS SECTIONS & BFES
Cross Sections with 1% Annual Chance Water Surface Elevation
Coastal Transect
Coastal Transect Baseline
Profile Baseline
Base Flood Elevation
SUPPORTING INFORMATION
Limit of Study
Jurisdictional Boundary


FEMA NFHL
N
4727
4724
4726
Tarrent St
Paris St
E Main St
Cumby, TX 75433, USA
499
Barker St
Denton St
M&R Dr
Green St
1st St
Depot St
Odom St
Fisco St
Donelton St
Miller Grove Rd
4132
Mill St
© 2014 Google
Google earth
1995
Imagery Date: 3/11/2014 33°08'14.41" N 95°50'21.87" W elev 647 ft eye alt 9093 ft
REFERENCE LAYERS
NFHL Data Available
FIRM Panel Boundary
LOMR Boundary
SPECIAL FLOOD HAZARD AREAS
1% Annual Chance Flood Hazard Zone A, AE, A99, AO, AH, AR, V, VE
Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD
0.2% Annual Chance Flood Hazard Zone X
Future Conditions 1% Annual Chance Flood Hazard Zone X
Area with Reduced Flood Risk due to Levee Zone X
NO SCREEN
Areas Outside the 0.2% Annual Chance Floodplain Zone X
Areas of Undetermined Flood Hazard Zone D
CROSS SECTIONS & BFES
Cross Sections with 1% Annual Chance Water Surface Elevation
Coastal Transect
Coastal Transect Baseline
Profile Baseline
Base Flood Elevation
SUPPORTING INFORMATION
Limit of Study
Jurisdictional Boundary


FEMA NFHL
W Park St
Debord St
Church St
Milligan St
E Middle St
Bonner St
7th St
Jackson St N
Jerry St
9th St
E Houston St
Houston St
Park Dr
Van Sickle St
Finney St
Atkins St
Connally St
Sulphur Springs, TX 75482, USA
Sulphur Springs, TX
Gladys Alexander Dr
League St N
Pearl St
Tomlinson St
Putman St
S Jackson St
Ashcroft St
Fuller St
Kirksey St
Goodman St
Towne St
67
St James
Ingram St
Main St
Bergin St
Harris St
Jarbo St
154
Oak Ave
Beckham St
Beasley St
Baker St
Nicholson St
Bellview St
Kyle St
Gilmer St
Ardis St
Craig St
Tate St
Reservoir St
Lincoln Dr
League St S
Kasie St
S Locust St
Texas St
Brooker St
Cranford St
S Davis St
Hodge St
Camp St
© 2014 Google
Google earth
1995
Imagery Date: 3/11/2014 33°08'16.72" N 95°36'20.31" W elev 499 ft eye alt 10373 ft
REFERENCE LAYERS
NFHL Data Available
FIRM Panel Boundary
LOMR Boundary
SPECIAL FLOOD HAZARD AREAS
1% Annual Chance Flood Hazard
Zone A, AE, A99, AO, AH, AR, V, VE
Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD
0.2% Annual Chance Flood Hazard
Zone X
Future Conditions 1% Annual Chance Flood Hazard Zone X
Area with Reduced Flood Risk due to Levee Zone X
NO SCREEN
Areas Outside the 0.2% Annual Chance Floodplain Zone X
Areas of Undetermined Flood Hazard Zone D
CROSS SECTIONS & BFES
Cross Sections with 1% Annual Chance Water Surface Elevation
Coastal Transect
Coastal Transect Baseline
Profile Baseline
Base Flood Elevation
SUPPORTING INFORMATION
Limit of Study
Jurisdictional Boundary

Flood Plain Maps Narrative

Hopkins County and the jurisdictions of Como, Cumby, and Sulphur Springs participate in the NFIP program. They have flood plain maps and a designated representative to monitor new construction to prevent anyone from developing in low areas. Priority was given to each action by the HMPT. Each NFIP action was weighted regarding ultimate impact on buildings and infrastructure. These participating jurisdictions are taking positive steps to remain in compliance such as widening ditches and revising building codes. These jurisdictions will use NFIP community workshops to provide information and incentives for property owners to acquire flood insurance and taking action to minimize the effects of flooding on people, property, also, through measures including flood warning, emergency response, and evacuation planning.

Como Flood Plain page ??

The city of Como has a total of 704 acres inside the city limits. The 100-year flood plain covers approximately 25.9 acres or 3.7% of the total acreage. The total taxable value of all property in the city is approximately 9.9 million dollars. Due to the location of the flood plain, it is estimated that a 100-year flood event in the city would cause minimal damage. There would be minimal or no property damage, but possibly some public threat or inconvenience. There is no record of repetitive flood losses.

Cumby Flood Plain Page ??

The city of Cumby has a total of 576 acres inside the city limits. The 100-year flood plain covers approximately 14 acres or 2.4% of the total acreage. Due to the location of the flood plain, it is estimated that a 100-year flood event would cause minimal damage. There would be minimal or no property damage, but possibly some public threat or inconvenience. No record of repetitive flood losses.

Sulphur Springs Flood Plain Page??

The city of Sulphur Springs has a total of 11,200 acres inside the city limits. The 100-year flood plain covers approximately 3,136 acres or 28% of the total acreage. The total taxable value of all property in the city is approximately 585.5 million dollars. A 100-year flood event would cause moderate damage. There would be some inundation of structures and roads near streams. Some evacuations of people and/or transfer of property to higher elevations would be necessary. There are five residential repetitive flood properties found in Sulphur Springs.

Hopkins County

Unincorporated Hopkins County has one residential repetitive flood property listed

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PAST OCCURRENCE OF FLOODING IN HOPKINS COUNTY
(Data from National Climatic Data Center)
Ten Year Profile

There have been ten days of recorded events in the last ten years.

February 4, 2010
As the result of a wet winter with precipitation above normal, the soils in Hopkins County remained saturated and low lying areas remained wet. Continuous rainfall on February 4th with accumulations of 1-2 inches of rain flooded low lying areas affecting surrounding areas, affecting surrounding areas. Some roads near these low lying areas were closed. Closed roads included CR2310 at CR 3343, parts of CR 2336. CR 2408 was washed out and would likely be closed for longer. Most of these roads remained closed through the morning hours of February 5th.
A motorist got her vehicle stuck in high water on CR 4754 and the vehicle had to be removed by a wrecker.

January 25, 2012
Nearly 20 hours of continuous rain resulted in nuisance and low-lying flooding across Hopkins County. The county received between 2 to 4 inches of rainfall. The local newspaper reported several county roads were covered with water, but these roads typically flood with heavy rain. The roads include: CRs 1119,1157,1120, 1127 off FM 2653, and FM 71 west of the Sulphur River. The entrance to cooper Lake at FM 71 and FM 3595 was also covered with water. In addition, a bridge along FM 69 near the town of Dike was washed out. The bridge was located along FM 69 approximately 4 miles north of FM 1537?Mahoney Road. The bridge was under construction at the time.

October 23, 2015
Heavy rain led to flash flooding across portions of north Central Texas on the October 23-24, 2015. Highway 19 at FM 71 was barricaded due to flood waters in Hopkins County.

November 29, 2015
Multiple road closures were required in the county, mostly due to flooding along and near the Sulphur River. A few of those closings included FM 71 and M 1571 at the Sulphur River. The sheriff's department reported additional high water problems on FM 900 between Saltillo and FM 69.

December 12, 2015
Two rounds of heavy rainfall resulted in water over FM71 in the Peerless area.

December 27, 2015
A potent storm system brought deadly tornadoes and severe weather to N. Texas on the 26th followed by waves of heavy rainfall that resulted in significant flooding across parts of North and Central Texas.

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Flooding was occurring along interstate 30 near mile marker 120 west of Sulphur Springs. A low water crossing along C1174 south of Sulphur Springs were flooded. League Street from the railroad track to across Main Street in Sulphur Springs and many of the service roads south of Sulphur Springs were barricaded due to flooding . In addition, many low-lying areas were flooded in the city.

Widespread flooding was occurring across the county with many county roads covered with at least some water. Many unpaved roads were unusable due to mud and water on the roads. Also, water was collecting on small portions of Interstate 30 between Cumby and Sulphur Springs. At one point, a high water rescue was needed on FM 1567 after a car was washed into a flooded creek. One section of CR 1174 near SH 154 was closed due to the culvert being washed out.

April 29, 2016
A series of thunderstorms producing heavy rain resulted in flash flooding across Hopkins County and in Sulphur Springs. By 4 pm, it was reported that a number of main roads in Sulphur Springs were flooded and cars were already stalling in the high water in some locations. Other side streets were also impassable in the afternoon and/or evening hours. The local fire department reported swift water rescues on Buford Circle, Main Street at League Street, and MLK Drive. Outside of the city, several county roads were reported impassable with vehicles also stalled in high water. Near Como, one lady was rescued when her cared was swept off the road by rising flood waters in the evening hours. Other county roads that were reported flooded were CR 4759, FM 1567, CR 2436 near Como, FM 2653, FM 69, CR 4582, SH19 south, CR 4762, CR 3568, CR 3504 and CR 3236. Property damage estimated 200K.

April 10, 2017
Thunderstorms developed across north and Central Texas during the afternoon hours on April 10 and continued on the 11th. Thunderstorms produced a wide array of severe weather including large hail and heavy rainfall High water was reported west of State Highway 154.

August 13, 2017
A few severe storms occurred during the evening of Saturday, August 12, and then training thunderstorms with heavy rain led to flash flooding in many locations between the Red River and the Interstate 20 corridor during the morning of the 13th.

Hopkins County Sheriff's Department reported:

- Highway 71 near the Delta/Hopkins County line was closed due to high water
- FM 2653 N. just north of Interstate 30 was closed due to high water.
- Highway 11 near the intersection of CR 4707 was closed due to high water.
- FM 1537 near Hwy 69 was closed due to high water; approximately 7 miles northeast of the city of Sulphur Springs, TX.
- FM 3236 near the intersection of CR 3512 was closed due to high water and flood damage.

June 19, 2019
There was large hail, followed by damaging winds and flash flooding as storms moved southeast into the overnight hours. Local police reported that several roads were closed, and swift water rescues were being performed in the city of Sulphur Springs.

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FLOOD RISK					
COMMUNITY	**POTENTIAL IMPACT 45%**	**PROBABLITY 30%**	**Warning 15%**	**Duration 10%**	**RISK**
Hopkins Unincorporated	Major PRI=3	Highly Likely PRI=4	6 to 12 hrs. PRI=2.	< 24 hrs. PRI=2	High 3.2
Como	Limited PRI=1	Unlikely PRI=1	6 to 12 hrs. PRI=2.	< 24 hrs. PRI=2	Low 1.25
Cumby	Limited PRI=1	Unlikely PRI=1	6 to 12 hrs. PRI=2.	< 24 hrs. PRI=2	Low 1.25
Sulphur Springs	Major PRI=3	Highly Likely PRI=4	6 to 12 hrs. PRI=2.	< 24 hrs. PRI=2	High 3.2

Hopkins County Critical Facilities				
Critical Facilities	**Como**	**Cumby**	**Sulphur Springs**	**Hopkins County**
City Hall	1	1	1	
Fire Station				15
Civic Center	1	1	2	1
Govt. Facility				2
Wastewater Treatment Plant	1	1	1	
Corrections Facility			1	1
Hospital			1	1
Maintenance Barn			1	1
Post Office	1	1	1	8
Water Tower	1			
Police Station		1	1	3
Sheriff Office				1
EMS				
Public Schools	2	3		6
Water Treatment Plant				
County Seat and offices			1	1

Location: Historically, the entire County has suffered from flash flooding. If future trends occur as they have in the past, the County area will continue to have floods. Countywide, the highways and county roads will continue to flood. Como and Cumby have no record of flooding issues, but Sulphur Springs has had multiple events recorded over the last sixteen years of record.

Probability: Flash floods are highly likely county wide, however there are no historical records of Como or Cumby experiencing significant flash flood events. From the maps we see that Como and Cumby have a 1% chance of flooding in any given year. We can look for Sulphur Springs and the rural parts of Hopkins County to continue to have flooding events annually.

Estimated Property Damage from Flood at 75%	
Como	$13,084,860
Cumby	$18,305,377.50
Sulphur Springs	$812,340,600.75

Impact The magnitude of observed or forecast flooding is conveyed using flood severity categories. Each category has a definition based on property damage and public threat. These flood severity categories include substantial, major, minor, and limited flooding, Hopkins County and Sulphur Springs were rated as MAJOR because they have a history of frequent flooding with some rescues from flooded autos being necessary and/or property or infrastructure damage. Como and Cumby were rated LIMITED because they have no history of flooding in the 16 years that records have been kept by the NOAA Weather Service for Hopkins County. The impact of flash floods varies locally**.** Roads may flood in Sulphur Springs and in rural county areas after heavy rains. There are no reported deaths or injuries due to flooding and minimal financial loss. Improvements such as new culverts could help to minimize the problem, however, should it rain hard enough in a short period of time streets will flood. All the cities are responsive to the dangers of high water and know to place warning signs out for motorists when needed. The Damage Assessment Tables on page 29 address the amount of loss that can occur with flooding.

Possible Amounts of Flooding Within Jurisdictions		
Jurisdiction	**From**	**To**
Hopkins County	¼ inch	3 feet
Sulphur Springs	¼ inch	1 foot
Como	No history of flash flooding	
Cumby	No history of flash flooding	

Vulnerability: Flash flooding, and the inability to accommodate the existing drainage on some of the rural FM roads and in Sulphur Springs is a constant problem. The vulnerability for Hopkins County and Sulphur Springs is rated HIGH. The Vulnerability of Como and Cumby is LOW.

Summary: Historically, Hopkins County and Sulphur Springs have suffered from flooding. If future trends continue, Sulphur Springs and rural county roads will continue to flood during periods of heavy rains. Countywide, the FM roads and State Highway 11 have seen flooding in the past and will continue to do so. FM roads and state highways are depicted on the Hopkins County map on page ??.

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TORNADOES

A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud. It is spawned by a thunderstorm (or sometimes as a result of a hurricane) and produced when cool air overrides a layer of warm air, forcing the warm air to rise rapidly. The damage from a tornado is a result of the high wind velocity and wind-blown debris. Tornado season is generally March through August, although tornadoes can occur at any time of the year. They tend to occur in the afternoons and evenings: over 80 percent of all tornadoes strike between noon and midnight.

Compared with other States, Texas ranks number one for frequency of Tornadoes, number of deaths, number of injuries and for cost of damages. When compared to other States by the frequency per square mile, Texas ranks, number 10 for the frequency of tornadoes, number 16 for fatalities, number 21 for injuries per area and number 21 for costs per area.

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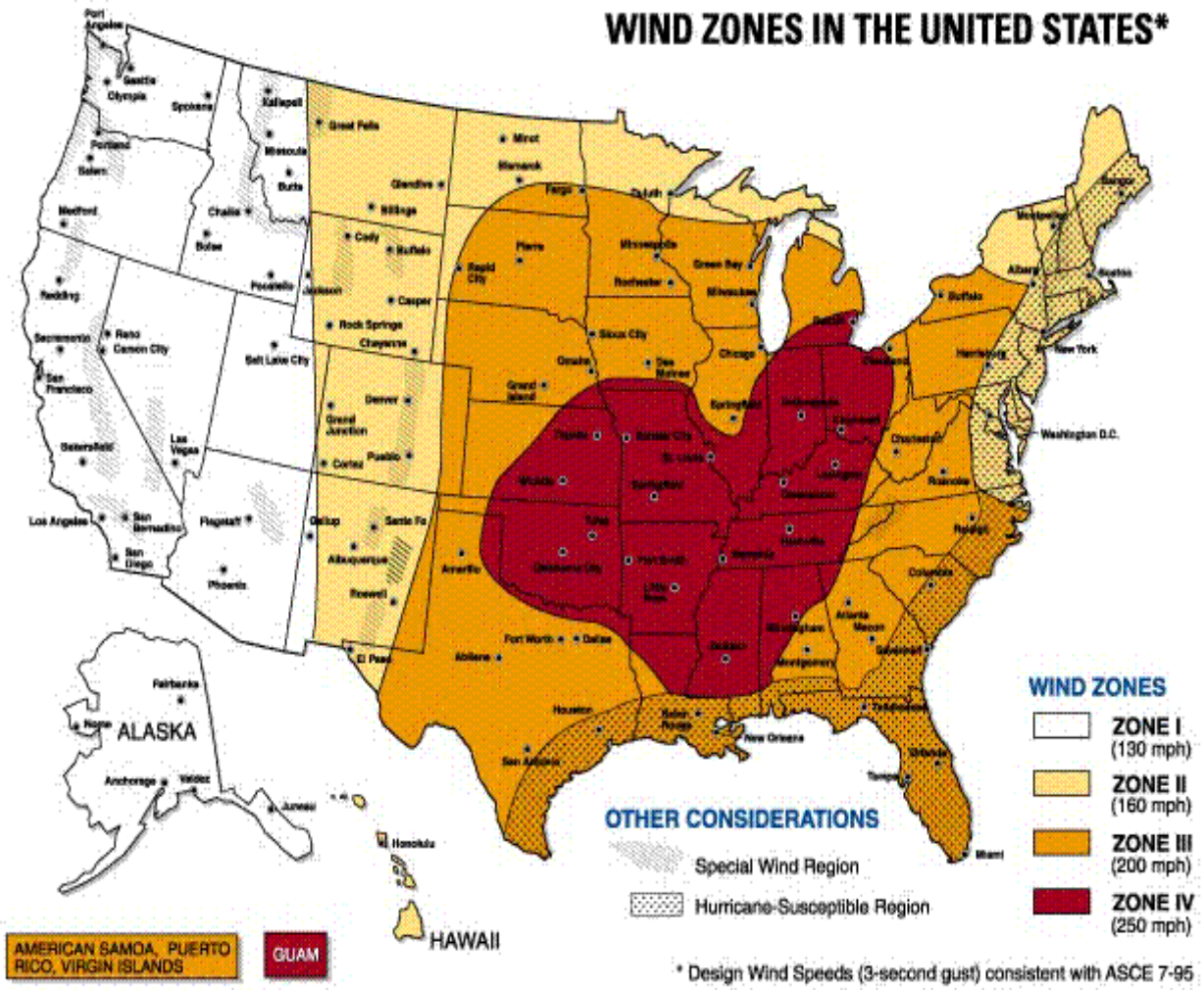

Figure I.2 Wind zones in the United States

The **Enhanced Fujita Scale**, or **EF Scale**, shown below, is the scale for rating the strength of tornadoes in the United States estimated via the damage they cause. Implemented in place of the Fujita scale, it was used starting February 1, 2007. The scale has the same basic design as the original Fujita scale, six categories from zero to five representing increasing degrees of damage. It was revised to reflect better examinations of tornado damage surveys, so as to align wind speeds more closely with associated storm damage. The new scale takes into account how most structures are designed and is thought to be a much more accurate representation of the surface wind speeds in the most violent tornadoes.

Enhanced Fujita (EF) Scale

Enhanced Fujita Category	Wind Speed (mph)	Potential Damage
EF0	65-85	**Light damage.** Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF1	86-110	**Moderate damage.** Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111-135	**Considerable damage.** Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	136-165	**Severe damage.** Entire stories 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	**Devastating damage.** Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
EF5	>200	**Incredible damage.** Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m (109 yd.); high-rise buildings have significant structural deformation; incredible phenomena will occur.

source: http://en.wikipedia.org/wiki/Enhanced_Fujita_Scale

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TORNADO PAST OCCURRENCES IN HOPKINS COUNTY

(Data from National Climatic Data Center)

Ten Year Profile

There have been six days of recorded events in the last ten years

January 20, 2010

A National Weather Service Storm Survey found evidence of a tornado touchdown approximately 4 miles southwest of Sulphur Springs and tracked approximately 5.5 miles to the northeast. One mobile home was destroyed resulting in two injuries. A pre-fabricated metal building on Highway 19 south of County Road 174 suffered considerable damage. The damage was consistent with the upper end of the **EFO** rating and wind speeds estimated near 80 mph.

Also, the survey also found evidence of a tornado in a sub-division 2 miles east of Sulphur Springs. Around 50 homes suffered some degree of roof damage, two of which sustained more severe damage after being impaled by large tree branches. This damage was consistent with the rating of an EF-) with wind speeds around 80 to 85 mph.

April 3, 2012

A historic north Texas tornado outbreak occurred on April 3rd, with 17 tornadoes developing from the DFW Metroplex east to Hopkins County. All events were estimated to be an **EF0** in strength with estimated winds of 85 mph.

- A very brief tornado touched down in an open field near FM 3389 and CR 1170, south of Brashear.

- Also, trained spotters and the Sulphur Springs Police Department reported a tornado near Highway 19 North and Loop 301 on the north side of town. This tornado touched down in open county but did damage to a few power poles, power lines, and trees. The tornado was rated an EF-0 with maximum estimated winds near 85 mph. The total path length was around 0.6 miles long with a width of approximately 50 yards.

- Trained storm spotters reported a tornado 6 miles northwest of Winnsboro which is also about 2 miles southeast of Pickton. The tornado damaged a few trees. Maximum wind spends were likely around 80 mph.

April 3, 2014

A national weather Service damage survey crew determined a tornado produced **EF1** damage in northern Hopkins County, near the city of Birthright. This tornado caused damage to several homes and businesses, including the Birthright Volunteer Fire Department building. A total of 76 houses or businesses were damaged in this tornado.

December 26, 2015

A storm chaser observed a brief tornado south of Sulphur Springs estimated to be an **EF0** in strength at 5:33 pm.

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April 29, 2917
Residents recorded video of an **EF0** tornado near FM 1567 and County Road 1137 shortly after 5:30 pm. The tornado briefly had multiple vortices but generally maintained a width of around 100 yards. The tornado traveled north along County Road 1131 with mainly tree damage observed. A metal barn was destroyed near CR 1131 and CR 1120. A home was damaged along FM 275 south of 1-co near the end of the track. The home burned after a large tree limb fell on the main powerline into the home.

January 21, 2018
Trained spotters reported a brief EF0 tornado near the intersection of Hopkins County Roads 2393 and 2399. Debris was encountered near the intersection. .

Tornadoes in Hopkins County 2000-2020
Probability/Severity

Fujita Scale	Tornadoes	Estimated Damage in $
F0	10	1,320,000
F1	1	250,000
F2		
F3		
F4		
F5		
Total		1,820,000

Hopkins County Tornado Risk					
COMMUNITY	**POTENTIAL IMPACT 45%**	**PROBABLITY 30%**	**Warning 15%**	**Duration 10%**	**RISK**
Hopkins Unincorporated	Substantial PRI=4	Highly Likely PRI=4	< 6 hrs. PRI=4	< 6 hrs. PRI=1	High 3.7
Como	Substantial PRI=4	Unlikely PRI=1	< 6 hrs. PRI=4	< 6 hrs. PRI=1	Medium 2.8
Cumby	Substantial PRI=4	Unlikely PRI=1	< 6 hrs. PRI=4.	< 6 hrs. PRI=1	Medium 2.8
Sulphur Springs	Substantial PRI=4	Unlikely PRI=1	< 6 hrs. PRI=4.	< 6 hrs. PRI=1	Medium 2.8

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Hopkins County Critical Facilities				
Critical Facilities	**Como**	**Cumby**	**Sulphur Springs**	**Hopkins County**
City Hall	1	1	1	
Fire Station				15
Civic Center	1	1	2	1
Govt. Facility				2
Wastewater Treatment Plant	1	1	1	
Corrections Facility			1	1
Hospital			1	1
Maintenance Barn			1	1
Post Office	1	1	1	8
Water Tower	1			
Police Station		1	1	3
Sheriff Office				1
EMS				
Public Schools	2	3		6
Water Treatment Plant				
County Seat and offices			1	1

Tornadoes can strike anywhere in Hopkins County. All critical facilities are vulnerable to the destructive forces of a tornado.

Location: All of Hopkins County can possibly be affected. Tornadoes have an unpredictable pattern, so the entire County is subject to being hit by a tornado. Como, Cumby, and Sulphur Springs with the unincorporated parts of Hopkins County could be affected.

Probability: Tornadoes are most frequent in the months of April, May and June. While tornadoes can occur at any time during the day or night, they tend to form during the late afternoon and into the evening. Based on a historical trending over the past 59 years there is a 41% chance that a tornado will strike Hopkins County in any given year. Strong scientific evidence predicts an increase in violent weather in Hopkins County may increase. Most tornadoes are expected to touchdown for relatively short periods of time in a bounce type pattern. The possibility of a tornado touchdown on an annual basis is considered highly likely for the County. The possibility is remains unlikely for the participating jurisdictions because they occupy a smaller portion of Hopkins County.

Vulnerability Due to the frequency and unpredictable pattern of tornadoes, all of Hopkins County is vulnerable to tornado-induced damages. The damage potential is high due to the concentrations of populated areas, number of mobile homes and manufactured housing units throughout the county. Cumby and Como consist of mostly older wood frame homes and mobile homes. Sulphur Springs has more valuable property such as the county courthouse and places of business that could be destroyed. Because of a larger population, Sulphur Springs could experience more damage and injury than the other jurisdictions.

Impact: Based on a historical trend over the past 59 years, Hopkins County will experience one or more tornadoes annually. The expected tornado size would range between 25 to 1000 yards

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wide, with a path from one to 10 miles long. Most tornadoes are expected to touchdown for relatively short periods of time in a bounce type pattern. A F1 tornado could destroy the small towns of Como and Cumby. Small towns can experience a complete loss of communications. Roads could be blocked by downed trees and building debris. There are no modern buildings in any of the jurisdictions other than Sulphur Springs. This would contribute to the possibility of injury and death. The Damage Assessment Tables on page 29 demonstrate the amount of loss that can occur from a tornado. The extent of damage can be substantial.

Estimated Property Loss at 50%	
Como	$8,723,240
Cumby	$12,203,585
Sulphur Springs	$316,469,700.5

Historically the severity has ranged from F0 to F2. The entire scale presented is used to determine ranges and severity. The expected tornado size would range between 25 to 1000 yards wide, with a path from one to several miles long. The full range of 65 (F0) to 200 mph (F5 +) are possible in Hopkins County and its jurisdictions. Should a F5 tornado hit Sulphur Springs a 50% property loss could add up to over 339 million dollars.

Summary: Hopkins County is located in tornado alley. There have been 8 tornado events in Hopkins County with no deaths and 3 injuries recorded over a 20 year history. Warning sirens, safe rooms, enforced modern building codes and generators for emergency power are needed safeguards for the small communities of Como, Cumby, and Sulphur Springs to help protect its citizens from tornadoes.

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"Global warming creates volatility. I feel it when I'm flying. The storms are more volatile. We are paying the price in more hurricanes and tornadoes."

Senator Debbie Stabenow

Thunderstorm Winds

Thunderstorm winds are typically straight-line winds and do most of the damage when accompanying a thunderstorm. Sometimes people think that a tornado has struck because the straight-line winds can be as powerful as a strong tornado, but straight-line winds do not spin. A downburst is an example of a straight line wind. A downburst is a small area of rapidly descending rain and rain-cooled air beneath a thunderstorm that produces a violent, localized downdraft covering 2.5 miles or less. Wind speeds in some of the stronger downbursts can reach 100 to 150 miles per hour.

According to research by Jeremy Pal, a professor of civil engineering and environmental science at Loyola Marymount University severe thunderstorms with accompanying high winds are predicted to increase dramatically in the United States and in some cities, like Atlanta, Ga., New York, and Dallas, storms are expected to double by the end of the century.

The Beaufort Scale below is the standard for measuring wind effects on both land and sea.

Beaufort Scale

Beaufort Number	Wind Speed	Seaman's Term	Effects on Land
0	Under 1	Calm	Calm; Smoke rises vertically
1	1-3	Light Air	Smoke drift indicates wind direction; vanes do not move
2	4-7	Light Breeze	Wind Felt on face; leaves rustle; vanes begin to move.
3	8-12	Gentle Breeze	Leaves, small twigs in constant motion; light flags extended
4	13-18	Moderate Breeze	Dust, leaves, and loose paper raised up; small branches move.
5	19-24	Fresh Breeze	Small trees begin to sway
6	25-31	Strong Breeze	Large branches of trees in motion; whistling heard in wires.
7	32-38	Moderate Gale	Whole trees in motion; resistance felt in walking against the wind.
8	39-46	Fresh Gale	Twigs and small branches broken off trees.
9	47-54	Strong Gale	Slight structural damage occurs; slate blown from roofs.
10	55-63	Whole Gale	Seldom experienced on land; trees broken; structural damage occurs
11	64-72	Storm	Very rarely experienced on land; usually with widespread damage
12	73 or higher	Hurricane	Violence and destruction.

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THUNDERSTORM WINDS PAST OCCURRENCES IN HOPKINS COUNTY
(Data from National Climatic Data Center)

Ten Year Profile

There have been 28 days of recorded events 21 days with Property Damage. in the last ten years. Property damage was estimated to be $610,000. This is a list of events with property damage.

January 20, 2010
Severe storms developed in an area of strong low-level lift ahead of an approaching upper level low pressure system:

- Power poles and large trees were damaged at the intersection of Highway 19 and Highway 154 on the north side of Sulphur Springs.
- A roof was caved in, a truck was overturned, and debris was noted on Irwin Rd. between Drexel Drive and Hines Drive in Sulphur Springs.
- Two tractor trailers were overturned on Interstate 30 at mile marker 131.

April 24, 2010
A county commissioner reported approximately 50 trees were over roads in the Precinct 2 area. Most of these trees were broken off at 30 to 40 feet up the tree trunk. It took two days to clean up the tree debris. Estimated damage was $3,000. Winds were estimated to be 52 knots.

May 20, 2010
Hopkins County local and county Emergency Management officials determined that damage and debris reported near the intersection of Interstate 30 and Highway 67 was caused by straight line winds of approximately 61 knots. Winds damaged trees, powerlines and power poles near this location. Estimated damage was $30,000.

August 6, 2010

- The automated weather station at the Sulphur Springs Municipal Airport measured a 67 mph (58 knots) wind gust. No damages were recorded.
- Trees were knocked down by thunderstorm winds on CR 4131, two miles south of Cumby.

April 4, 2011
Trees were blown down in the Greenpond area, southwest of Como. Some of these trees were blocking roads. Estimated wind was 64 mph (56 Knots). Property damage was estimated to be $3,000 dollars.

April 11, 2011
Several trees were knocked down across the county, but the hardest hit area was along Hwy 19 north of Sulphur Springs. On either side of the highway, numerous trees were knocked down and many trees blocked roads. On CR 4769, a carport was blown across the road. The roof of an unoccupied trailer on CR 4591 was ripped off. A few trees were also knocked down across the southern half of the county. Winds were estimated to have been 75 mph (65 knots). Property Damage was estimated to have been $15,000.

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A large tree was blown through power lines by thunderstorm winds on Reservoir St. in Sulphur Springs. A utility pole near Mulberry Street and Middle Street was snapped in two. Wind speeds were estimated to have been 81 mph (70 knots). Estimated property damage was $7,000.

April 25, 2011

Numerous severe thunderstorms developed along a dryline as an upper level disturbance approached north Texas. Hopkins County recorded the following:

- Several travel trailers were blown over, many trees and power poles were knocked down and a metal building was severely damaged in Sulphur Springs. A tee at the Propane Company on Loop 31 was snapped and fell on a carport which damaged the car underneath the covering. The wind speed was estimated at 70 mph or 61 knots. Property damage was assessed to have been $45,000.
- Trees were knocked down on CRs 3511 and 3504. A barn in the area was also destroyed. Wind was estimated to have been 60 mph or 52 knots. Property damage was $4,000.
- Several trees were blown down by estimated 60 mph (52 knots) winds. One tree fell on a house on CR 3504. Trees were also reported down on CR3511, and a barn in area was destroyed. There was $10,00 dollars' worth of property damage.
- Winds were estimated to be near 60 mph (52 knots) in Como. Although damaged property was not mentioned in the Event Narrative property damage was determined to be $7,000.
- A barn in Pickton-Pine Forest area lost its metal roof. Winds were estimated to have been around 63 mph (55 knots) and the property damage was estimated to have been $3,000

July 4, 2011

Medium sized trees were knocked down along FM 3236 north-northeast of Sulphur Springs. Some sheds were also displaced several yards along the same road. On residential home on FM 3236 sustained damage. The damage was the result of a microburst from a dissipating, high based thunderstorm. Winds were estimated to have been 70 mph or 61 knots. Estimated property damage was set at $25,000.

September 18, 2011

Powerlines and a large tree blocked a highway about 4 miles southwest of Sulphur Springs**.** Wind speeds were estimated to have been 60 mph or 52 knots. Property loss set at $2,000.

April 3, 2012

Approximately 10 moderate sized trees in Sulphur Springs were knocked down by thunderstorm winds. The emergency manager noted that the trees were all already dead or dying. Winds speeds were estimated at 45 mph or 39 knots. Property loss was determined to be $5,000.

August 12, 2012

Law enforcement reported large trees blown down throughout the city of Sulphur Springs. Property damage was set at $10,000.

December 19, 2012

Sulphur Springs Municipal Airport measured a 62 MPH (54 knots) thunderstorm wind gust. Property damage estimated to have been $5,000.

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June 9, 2014
Thunderstorm winds blew a tree onto a house and also took the roof off a metal barn. Wind speeds were estimated to have been 55 mph or 48 knots. Estimated damages set at $10,000.

October 13, 2014
Sulphur Springs News reported Trees blown down, one of which landed on a parked car. Power lines were also reported blown down county-wide. Several homes also reported roof damage. Wind speeds estimated to have been 49 mph (43 knots). Property damage costs were reported to be $10,000.

May 25, 2015
This date was a particularly busy day for thunderstorm winds in Hopkins County. NOAA Storm Events Database recorded the following**:**

- A social media report indicated damage toa gas station awning near the Hospital in Sulphur Springs, Texas. Estimated wind speed was 58 mph or 50 knots. Property damage was $1,000.

- Amateur radio operators estimated winds between 60 and 70 mph in Sulphur Springs Several trees were blown over, and numerous carports were damaged. Additionally, the Sulphur Springs airport had several airplanes moved or damaged as a result of the storm. Property damage was set at $325,000.

- A social media report indicated that airplanes were displaced at Sulphur Springs Municipal Airport. Winds were estimated at 55 mph or 48 knots. Expenses were set at $1,000.

- A social media report indicated large trees blown down on FM 2653 near Ridgeway, Texas. No damage estimates were available. Winds were 58mph or 50 knots.

March 29, 2017
Emergency management reported significant damage ($20,000) to very large commercial chicken coop structures. Two were completely destroyed and on partially destroyed, and a very large number of chickens were killed. Wind speeds estimated to have been 75 mph or 65 knots.

February 7, 2019
Hopkins County Sheriff's Department reported that wooden rafters were blown off of a barn, small out-buildings were flipped, and a tree with a112 inch base was uprooted . this occurred in the northwest part of Hopkins County. Wind speed 58 mph or 50 knots. Property damage was estimated at $5,000.

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May 18, 2019

- Emergency management reported a tree down and blocking the road just west of the community of Peerless along Highway 71. Additional trees were also knocked down in the area, usually isolated in nature, but did block some county roads. Wind speed: 76 mph or 50 knots. Property damage: $5,000.

- Emergency management reported a tree down, and a barn damaged on CR 2408 in the southeast part of the county. Other isolated trees were knocked down in the area, including on CR 2409 and CR 2403. Wind speed 58 mph/50 knots. Property damage $3000.

June 19, 2019

- A social media report indicated a tree being uprooted in the town of Miller Grove, Texas, but emergency management reported many trees and tree limbs being knocked down in the western portions of the county. Wind speed: 58 mph/50 knots. Property damage: $6,000.

- A homeowner near Cooper Lake reported huge trees broke off and uprooted on their property. The tops of trees were carried long distances, and shingles were blown off the roof. Wind speed 70 mph/61 knots. Property damage: $2,000.

- The Sulphur Springs Airport Automated Weather Observation System (AWOS) reported a wind gust of 61mph. Property damage $7,000.

October 20, 2019

Thunderstorm winds caused damage to 2 sheds and several trees near FM 2437 and 2428 in far southern Hopkins County. Several trees lost several 8-14 diameter tree limbs. One shed was collapsed, and another was leaning. Wind speed: 70mph/61 knots. Property damage: $5,000.

May 8, 2020

A resident sent in a picture of a very large tree branch that broke off in high thunderstorm winds, causing scattered damage around the property including a metal fence and the roof of the home. Wind speed: 58 mph/50 knots. Property damage: $6,000.

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Hopkins County Thunderstorm Winds Risk					
COMMUNITY	**POTENTIAL IMPACT 45%**	**PROBABLITY 30%**	**Warning 15%**	**Duration 10%**	**RISK**
Hopkins Unincorporated	Minor PRI=2	Highly Likely PRI=4	6-12 hrs. PRI 3	<6 hrs. PRI 1	Medium 2.65
Como	Minor PRI=2	Highly Likely PRI=4	6-12 hrs. PRI 3	<6 hrs. PRI 1	Medium 2.65
Cumby	Minor PRI=2	Highly Likely PRI=4	6-12 hrs. PRI 3	<6 hrs. PRI 1	Medium 2.65
Sulphur Springs	Minor PRI=2	Highly Likely PRI=4	6-12 hrs. PRI 3	<6 hrs. PRI 1	Medium 2.65

Hopkins County Critical Facilities				
Critical Facilities	**Como**	**Cumby**	**Sulphur Springs**	**Hopkins County**
City Hall	1	1	1	
Fire Station				15
Civic Center	1	1	2	1
Govt. Facility				2
Wastewater Treatment Plant	1	1	1	
Corrections Facility			1	1
Hospital			1	1
Maintenance Barn			1	1
Post Office	1	1	1	8
Water Tower	1			
Police Station		1	1	3
Sheriff Office				1
EMS				
Public Schools	2	3		6
Water Treatment Plant				
County Seat and offices			1	1

Critical Facilities

All critical facilities located in Hopkins County unincorporated and the jurisdictions of Como, Cumby and Sulphur Springs are vulnerable to some structural damage from high winds.

Probability: Given the climate and history, thunderstorm winds are highly likely during the storm season. Thunderstorms and their accompanying high winds are most prolific in the spring and summer months however, they may occur at any time in Hopkins County given the right conditions.

Vulnerability: Hopkins County and its' jurisdictions are susceptible to damage from thunderstorm winds. Microbursts and downburst produce winds severe enough to be mistaken for tornadoes. The entire county is vulnerable to high winds associated with thunderstorms.

Impact: According to NOAA Satellite and Information Service of the National Climatic Data Center, there were 129 thunderstorm wind events reported in Hopkins County between 1956 and 2008. The magnitudes ranged from 50 knots to 90 knots.

There have been no reported injuries or deaths from thunderstorm wind events in Hopkins County. Storms cause power outages, disruptions of transportation and property damage. Historical data indicate that the entire county is susceptible to windstorms during the thunderstorm season and, depending on the severity, costs will vary. See the Damage Assessment Tables on page ?? demonstrating possible loss for the county and each participating jurisdiction.

Estimated Property Loss at 15%		
Hopkins County	Residential	$210,722,635.50
Como	Residential	$1,910,887.5
Cumby	Residential	$594,069
Sulphur Springs	Residential	$75,030,220.5

Location: Historically, all of Hopkins County has been affected by thunderstorm winds. If this trend continues, the entire County will be subject to their damage. This would include the jurisdictions of Como, Cumby, and Sulphur Springs.

Summary: High winds in Hopkins County can be a destructive force associated with thunderstorms. Thunderstorms also spawn tornadoes. Deteriorating infrastructure, mobile homes business signage and crops are most susceptible to damage. Como, Cumby, Sulphur Springs, and Hopkins County residents share susceptibility to thunderstorm wind damage.

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Lightning

Description
Lightning is a massive electrostatic discharge between electrically charged regions within clouds, or between a cloud and the earth's surface. Lightning can strike communications equipment like radiocommunication and emergency response. Lightning strikes can also cause significant damage to buildings, critical facilities, and infrastructure, largely by igniting a fire. Lightning can strike and kill people. It can also ignite wildfire.

The National Lightning Safety Institute (http://www.lightningsafety.com) defines the following forms of lightning:

Direct Strike - This is the most dangerous hazard, wherein the person or structure is in a direct path for lightning currents. The magnitude of the current determines its effects. A typical amperage of 2OkA acting on a ground of 10 ohms creates 200,000V. A large strike can attain l5OkA levels. More than 50 volts will drive a potentially lethal current through the body.

Side Strike - This hazard results from the breakup of the direct strike when alternate parallel paths of current flow into the ground via a person or structure. When the initial current path offers some resistance to current flow, a potential above ground current develops and the person or structure's resistance to ground becomes the alternate path of conduction.

Conducted Strike - This hazard occurs when lightning strikes a conductor which in turn introduces the current into an area some distance from the ground strike point. Unprotected connected equipment can be damaged and personnel may be injured if they become an indirect path in the completion of the ground circuit.

Structure Voltage Gradient - Current passing through two or more structures create momentary voltage differential. Poor interconnect bonding may cause a completed circuit potential difference. The same hazard is created, for example, by a person touching an ungrounded object while he they are grounded. The electrical circuit is completed through the person, sometimes with fatal consequences.

Induced Effects - Lightning can induce electric field and magnetic field coupling into structures and into wiring. Magnetic coupling is transformer action, and the common laws for transformers prevail.

Streamer Conductor - The streamer hazard occurs when a lightning leader influences electric behavior of objects on the Earth. Even streamers which do not become a part of the main channel can contain significant amounts of current. Streamer current exposure can affect people and sensitive electronics.

Sequelae - These secondary effects are many. Forest and grass fires, explosive steam conditions in masonry, trees and other water-bearing objects, and consequences of the thunderclap startling a person into inadvertently throw a switch are examples.

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Step Voltage/Touch Voltage - This hazard occurs as a result of a lightning strike dissipating its energy through the ground. The ground current creates a voltage drop across the surface of the Earth. A person standing within several hundred feet from the lightning strike point can have several hundred volts generated between their feet. This hazard is identical to a person being grounded while touching two live wires, one with each hand.

Lightning Activity Level (LAL)	
Is a scale which describes lightning activity. Values are labeled 1-6:	
LAL 1	No thunderstorms
LAL 2	Isolated thunderstorms. Light rain will occasionally reach the ground. Lightning is very infrequent, 1 to 5 cloud to ground strikes in a five minute period.
LAL 3	Widely scattered thunderstorms. Light to moderate rain will reach the ground. Lightning is infrequent, 6 to 10 cloud to ground strikes in a 5-minute period.
LAL 4	Scattered thunderstorms. Moderate rain is commonly produced Lightning is frequent, 11 to 15 cloud to ground strikes in a 5-minute period.
LAL 5	Numerous thunderstorms. Rainfall is moderate to heavy. Lightning is frequent and intense, greater than 15 cloud to ground strikes in a 5-minute period.
LAL 6	Dry lightning (same as LAL 3 but without rain). This type of lightning has the potential for extreme fire activity and is normally highlighted in fire weather forecasts with a Red

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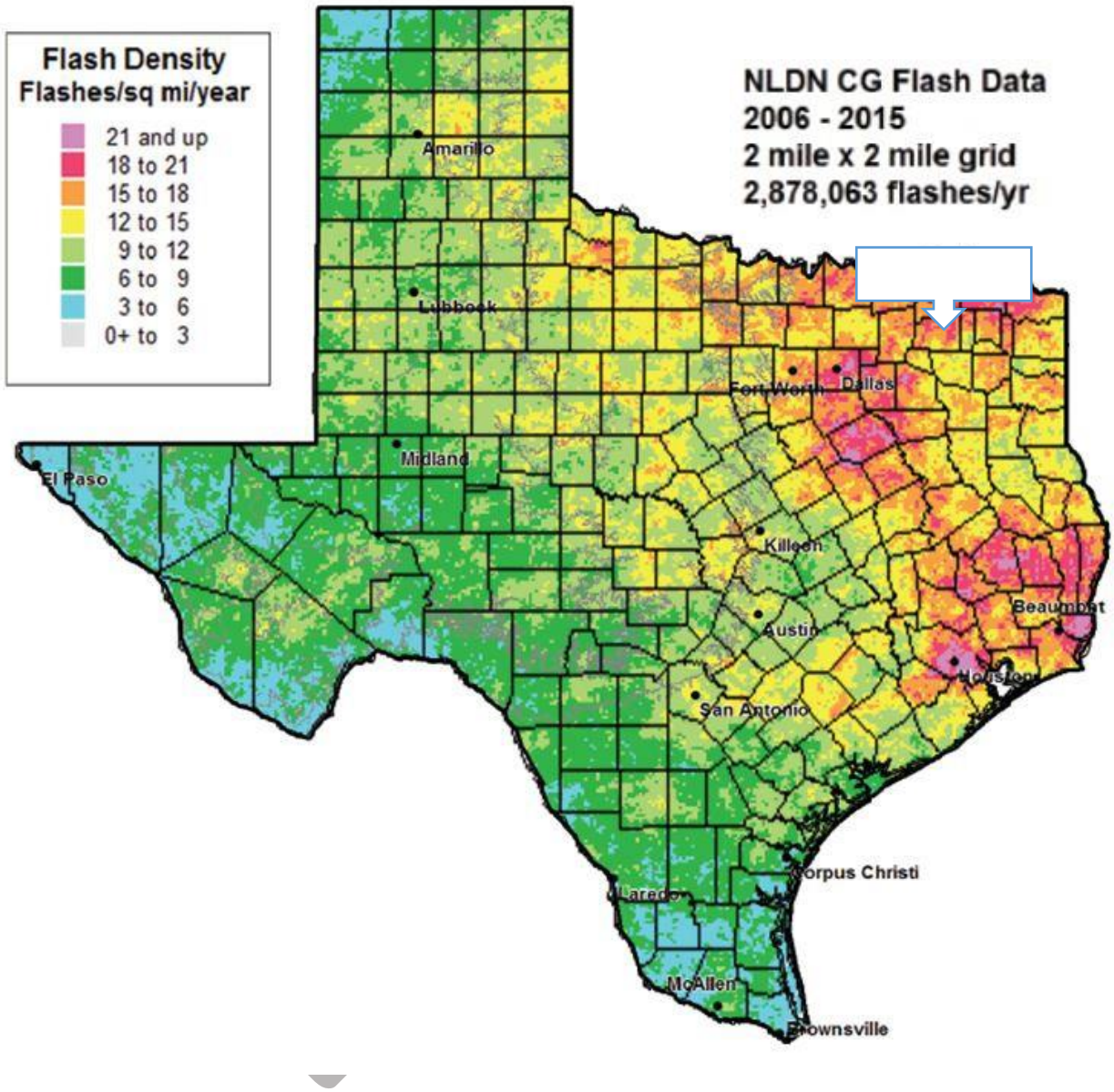
Lightning can happen anywhere in the state of Texas. Hopkins County can expect a flash density of more than 21cloud to ground strikes per square mile per year.

Lightning Incidences in Texas (2006-2015)



Hopkins County Lightning Risk					
COMMUNITY	**POTENTIAL IMPACT 45%**	**PROBABLITY 30%**	**Warning 15%**	**Duration 10%**	**RISK**
Hopkins Unincorporated	Major PRI=3	Unlikely PRI=1	<6 hrs. PRI 4	<6 hrs. PRI 1	Medium 2.35
Como	Major PRI=3	Unlikely PRI=1	<6 hrs. PRI 4	<6 hrs. PRI 1	Medium 2.35
Cumby	Major PRI=3	Unlikely PRI=1	<6 hrs. PRI 4	<6 hrs. PRI 1	Medium 2.35
Sulphur Springs	Major PRI=3	Unlikely PRI=1	<6 hrs. PRI 4	<6 hrs. PRI 1	Medium 2.35

Hopkins County Critical Facilities				
Critical Facilities	**Como**	**Cumby**	**Sulphur Springs**	**Hopkins County**
City Hall	1	1	1	
Fire Station				15
Civic Center	1	1	2	1
Govt. Facility				2
Wastewater Treatment Plant	1	1	1	
Corrections Facility			1	1
Hospital			1	1
Maintenance Barn			1	1
Post Office	1	1	1	8
Water Tower	1			
Police Station		1	1	3
Sheriff Office				1
EMS				
Public Schools	2	3		6
Water Treatment Plant				
County Seat and offices			1	1

Critical Facilities

All critical facilities located in unincorporated Hopkins County and the jurisdictions of Como, Cumby and Sulphur Springs are subject to some damage from intense lightning.

Estimated Property Loss at 15%		
Hopkins County	Residential	$210,722,635.50
Como	Residential	$1,910,887.5
Cumby	Residential	$594,069
Sulphur Springs	Residential	$75,030,220.5

Historical Occurrences: In the past ten years there have been one recorded lightning event reported in Hopkins County based on the NCEI records which includes the NOAA storm events data base. It is highly likely multiple lightning occurrences have gone unreported before and during the recording period. The flash density for the planning area along with input from local team members indicates regular lightning occurrences that simply have not been reported to the weather service.

Location: Lightning can strike in any geographic location and is considered a common occurrence in Texas. The Hopkins County planning area, and the jurisdictions of Como, Cumby and Sulphur Springs are susceptible to lightning strike. Therefore, lightning could occur at any location within the entire planning area. It is assumed that the Hopkins County planning area is uniformly exposed to the threat of lightning.

Extent: According to the NOAA, the average number of cloud-to-ground flashes for the State of Texas between 2007 and 2016 was 11.3 flashes per square mile. The National Lightning Detection Network lightning flash density map (shows a range of eighteen to twenty-one cloud-to-ground lightning flashes per square mile per year for the entire Hopkins planning area. The power of lightning can run the full extent of the Lightning Activity Level (LAL 1-LAL 6). See page for review of the Lightning Activity Level (LAL) table.

Probability: Based on historical records and input from the planning team the probability of occurrence for future lightning events in Hopkins County, including the jurisdiction of Como, Cumby and Sulphur Springs are considered highly likely, however, the likely hood of it damaging a building or a critical facility is unlikely. The planning team stated that lightning occurs regularly in the area.

Vulnerability: Texas leads the nation in the number of annual lightning strikes. During a thunderstorm lightning may strike anywhere in Hopkins County.

Impact: Although there are no recorded deaths or monetary losses due to lightning in Hopkins County the probability and potential of death and property loss remain palpable.

Summary: Lightning can strike anywhere in Hopkins County **When** damage occurs it is important to report the incident to NOAA to establish credible data. Actions in this plan reflect sensible measures to take to lower the risks of lightning strikes in Hopkins County.

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WINTER STORMS

Winter Storms are hazards that poses a threat to the entirety of the planning area. Winter Storms in the context of this document refers to Freezing Rain, Ice Storms, Blizzards, and Heavy Snow events that may occur during the winter months in Hopkins County. The National Weather Service (NWS) glossary defines Ice Storms, Blizzards, and Heavy Snow events as:

Freezing Rain is "rain that falls as a liquid but freezes into glaze upon contact with the ground."

"An **ice storm** is an occasion when damaging accumulations of ice are expected during freezing rain situations. Significant accumulations of ice pull down trees and utility lines resulting in loss of power and communication. These accumulations of ice make walking and driving extremely dangerous. Significant ice accumulations are usually accumulations of ¼" or greater."

"A **blizzard** means that the following conditions are expected to prevail for a period of 3 hours or longer:

- Sustained wind or frequent gusts to 35 miles an hour or greater; and
- Considerable falling and/or blowing snow (i.e., reducing visibility frequently to less than ¼ mile)."

"A **heavy snow** generally means...

- snowfall accumulating to 4" or more in depth in 12 hours or less; or
- snowfall accumulating to 6" or more in depth in 24 hours or less

In forecasts, snowfall amounts are expressed as a range of values, e.g., "8 to 12 inches." However, in heavy snow situations where there is considerable uncertainty concerning the range of values, more appropriate phrases are used, such as "...up to 12 inches..." or alternatively "...8 inches or more..."

The following National Weather Service warnings detail the potential extent of a storm.

National Weather Service WATCH: A message indicating that conditions favor the occurrence of a certain type of hazardous weather. For example, a severe winter weather watch means that a severe winter weather event is expected in the next six hours or so within an area approximately 120 to 150 miles wide and 300 to 400 miles long (36,000 to 60,000 square miles). The NWS Storm Prediction Center issues such watches. Local NWS forecast offices issue other watches 12 to 36 hours in advance of a possible hazardous- weather or flooding event. Each local forecast office usually covers a state or a portion of a state.

NWS WARNING: Indicates that a hazardous event is occurring or is imminent in about 30 minutes to an hour. Local NWS forecast offices issue warnings on a county-by-county basis.

Winter Storm WATCH: A winter storm is occurring, or will soon occur, in your area.

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Winter Storm WARNING: Means sustained winds or frequent gusts to 35 miles per hour or greater and considerable falling or blowing snow (reducing visibility to less than a quarter mile) are expected to prevail for a period of three hours or longer, and dangerous wind chills are expected in the warning area.

The *Wind Chill* temperature is simply a measure of how cold the wind makes real air temperature feel to the human body. Since wind can dramatically accelerate heat loss from the body, a blustery 30° day would feel just as cold as a calm day with 0° temperatures. The index was created in 1870, and on November 1, 2001, the National Weather Service released a more scientifically accurate equation, which is used today. Below is a chart for calculating wind chill. (Please note that it is not applicable in calm winds or when the temperature is over 50°.)

Wind Chill Chart

Wind (mph) \ Temperature (°F)	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	26	29	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times: 30 minutes | 10 minutes | 5 minutes

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T= Air Temperature (°F) V= Wind Speed (mph)

Effective 11/01/01

Source: National Weather Service and NOAA

Ice storms most commonly develop along a line stretching from northern Texas to Newfoundland in slow-moving low-pressure systems where there is a large temperature difference between the warm Gulf air and cold Arctic air. Local accumulations of ice may be heavy if the storm stalls over a region for an extended time. Ice storms lasting 12 hours or more generally produce ice accumulations several centimeters thick. The typical ice storm swath is 30 miles wide and 300 miles long. Ice storms generally warrant major headlines only one year in three.

Ice storms typically begin with snow and strong easterly winds conditions well ahead of an approaching warm front. The snow, however, changes briefly to sleet and then to rain that freezes on impact, coating all exposed surfaces with a growing layer of ice.

For drivers, the consequences of icing can be serious, for stopping distances on glaze ice are ten times greater than on dry pavement, and double that on packed snow.

Power and communication systems using overhead lines are perhaps hardest hit by ice storms. Hanging wire cables collect ice until the cable breaks or the rain stops. Animal and plants may be killed or injured by ice accumulation. Damage to trees rivals disease and insects as destructive agents.

The Christmas Day storm of 2000 clobbered counties along a 260-mile stretch of the Red River. Hopkins County was one of several counties declared a disaster area.

Back-to-back December weather fronts slammed North Texas with ice that produced the perfect ice storm. Many electric cooperatives were sent to their knees by the fury of the storms.

Potential Damage/Loss Due To Ice Storms

Life and Property

Slick roads and other surfaces cause traffic accidents resulting in death and injury. People shoveling snow have heart attacks. Property is at risk from flooding. Trees, power lines, telephone lines and subject to damage from accumulation of ice and snow. Trees fall on utility lines and houses.

Roads and Bridges

Fallen trees across roads can block access to emergency services. The ability to travel after an ice storm is a priority issue for hospitals, utilities and emergency service vehicles.

Power Lines

Falling trees are a major cause of power outages resulting in interruption of services and damaged property. Downed power lines also create the danger of electrical shock.

Water Lines

Cast iron mainlines frequently break during severe freezes. Also, residential water lines often fail. The potential for severe winter storms is high and records indicate that the cost can be in the millions of dollars, depending on the severity of the storm.

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PAST OCCURRENCES OF WINTER STORMS IN HOPKINS COUNTY

(Data from National Climatic Data Center)

Eight Winter events in the last ten years. Total Property damage loss for the ten year period were $5,575,125

February 11, 2010

Reports of 8-12 inches of snow were reported across the county. The heaviest snowfall totals were reported in the southwest corner of the county. A total of 8.5-9 inches of snow was reported in Sulphur Springs, and a total of 12 inches of snow was estimated in Brashear. According to the local newspaper, only a few minor vehicle accidents and a few power outages were reported. The roads that were impacted the most were SH 11 east from Como to the county line, westboune1-30 from Franklin County to Sulphur Springs and SH 154 South. Total estimated property damage costs were $40,000.

January 9, 2011

Five to seven inches of snow fell across the county. Numerous vehicle accidents occurred across the county, especially along Interstate 30. Property damage costs were estimated to be $200,000.

February 1, 2011

Heavy rain fell across the county followed by heavy sleet and then light snow. As temperatures fell behind the cold front, the water began to freeze on the roads. A few reports of a .25-.30 inch of ice and sleet were reported in the Cumby area. The sleet and ice made travel treacherous around the county. Most of the vehicle incidents reported were due to stuck vehicles or vehicles that had slid off the roadway. The prolonged cold that settled in after the ice storm kept roads treacherous for the next four days and many schools and business were closed for just as long. One person died in a car accident at State Highway 11 and FM 1567 west of Como, but no other details were available. Estimated property damage was set at $150,000.

February 4, 2011

Snowfall totals of 5-9 inches were reported around the county. The heaviest totals were in the southeast portions of the county. In Sulphur Springs, the reports varied from 6-9 inches. The COOP Observer in Sulphur Springs reported 8’75 inches of snow. In Cumby, a total of 5.5 inches was reported. The snow caused many motorists to get stuck on the roadways. Property Damage was estimated to have been $25,000.

December 5, 2013

Up to 2 inches of freezing rain and sleet fell across the county causing significant damage to trees, tree branches, utility poles and lines due to the heavy collection of ice. A trained spotter reported 0.50 inches of freezing rain in Cumby. The newspaper in Sulphur Springs reported over 1.75 inches of sleet. Hundreds of trees, tree branches, and power lines were knocked down. Falling tree branches and ice damaged cars and roofs. Bridges, overpasses, and elevated surfaces became icy but other roads were largely not impacted by the ice. One railroad employee was injured when a tree fell on him as he was working to remove tree debris from the railroad tracks. Property damage was estimated to have been 2 million dollars.

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March 2, 2014
Sleet and freezing rain affected Hopkins County resulting in slick roads. The freezing rain total averaged 0.10 inches, but sleet total between 1.5 and 2 inches was reported in Cumby with another 1.5 inches reported northwest of Sulphur springs and around 0.50 inches in Sulphur Springs. Over 3 inches of sleet and ice was reported in Tira. Property damage was estimated to have been $200,000.

March 5, 2015
The sheriff's department reported 4 inches of snow in Sulphur Springs.

February 13-February 17, 2021
A historic winter storm impacted the region from February 13-19 with a combination of extreme cold/windchills, freezing drizzle and then 2 rounds of snow, ice and sleet. In Hopkins County, the first round of winter weather (February 16-17) resulted in an additional 1-5 inches of snow. While the winter precipitation did have an impact on the county and transportation, the bigger impacts were from the extreme cold and wind chills.

The maximum temperature on the 15th was only in the lower teens. Wind chill values during the 14-16 were between 10 to -10 degrees Fahrenheit most of the time. The cold temperatures resulted in an extreme amount of damage to pipes, infrastructure and power. The state listed 1 fatality in Hopkins County due to the winter storm, but no additional information could be obtained. Property damage was estimated to have been 2.96 million dollars.

Hopkins County Winter Storms Risk					
COMMUNITY	**POTENTIAL IMPACT 45%**	**PROBABLITY 30%**	**Warning 15%**	**Duration 10%**	**RISK**
Hopkins Unincorporated	Minor PRI=2	Highly Likely PRI=4	6 to 12 hrs. PRI 3	< 1 week PRI 3	Medium 2.85
Como	Minor PRI=2	Highly Likely PRI=4	6 to 12 hrs. PRI 3	< 1 week PRI 3	Medium 2.85
Cumby	Minor PRI=2	Highly Likely PRI=4	6 to 12 hrs. PRI 3	< 1 week PRI 3	Medium 2.85
Sulphur Springs	Minor PRI=2	Highly Likely PRI=4	6 to 12 hrs. PRI 3	<1 week. PRI 3	Medium 2.85

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Hopkins County Critical Facilities				
Critical Facilities	**Como**	**Cumby**	**Sulphur Springs**	**Hopkins County**
City Hall	1	1	1	
Fire Station				15
Civic Center	1	1	2	1
Govt. Facility				2
Wastewater Treatment Plant	1	1	1	
Corrections Facility			1	1
Hospital			1	1
Maintenance Barn			1	1
Post Office	1	1	1	8
Water Tower	1			
Police Station		1	1	3
Sheriff Office				1
EMS				
Public Schools	2	3		6
Water Treatment Plant				
County Seat and offices			1	1

Critical Facilities
All critical facilities located in unincorporated Hopkins County and the jurisdictions of Como, Cumby and Sulphur Springs are subject to some damage from winter storms

Location:
Winter Storms have no distinct geographic boundary. They can occur in every area of the county including the Northeast Texas region.

Impact
Although East Texas does not have severe winters it is not immune from some of the hazards of cold weather. Every year, winter weather indirectly kills hundreds of people in the U.S, primarily from automobile accidents but from overexertion, and hypothermia as well.

Heavy accumulations of ice can bring down trees and power lines, disabling electric power and communications for days. Heavy snow or ice can immobilize communities by shutting down transportation into, out of, and within the county. In rural areas and smaller communities, homes and farms may be isolated for days. Livestock and other animals can die from exposure. When the event happens in the early spring, crops such as fruit can be destroyed. Hopkins County and its jurisdictions can expect ice accumulations on streets, power lines and trees that will range from ¼ to ¾ of an inch.

Residents of **Como, Cumby and Sulphur Springs** could lose power to their sewage and water plant. They could lose power to homes and experience damage to city infrastructure. The elderly could suffer from lack of heat and lighting during a winter storm. The small businesses in the jurisdictions could experience lost revenue due to reduced traffic during winter storm events.

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Falling trees and tree limbs could damage property and block roadways in both jurisdictions. Auto accidents related to travel on the icy roads increase.

Estimated Property Loss at 15%		
Hopkins County	Residential	75,030,220.5
Como	Residential	1,910,887.5
Cumby	Residential	2,202,831
Sulphur Springs	Residential	75,030,220.5

The Damage Assessment Tables found on page ?? demonstrate the amount of damage that can be possible. A temperature range between 32 degrees f. and 10 degrees f. is the range of temperature anticipated county wide that would create conditions for winter storms. (see the wind chill chart on page ??).

Probability: The probability of the occurrence of a freeze is high, given historical weather patterns. Fifteen winter storms have occurred between 1994 and 2010. It is highly likely that a winter storm will occur in any given year. Hopkins County and the participating jurisdictions share the same likelihood of experiencing a winter storm.

Vulnerability Hopkins County has a significant amount of acreage designated as conservation, public lands and agricultural land uses. The small towns of Como, Cumby, and Sulphur Springs are vulnerable to power outages, icy roads and delayed emergency services.

Summary: In rural east Texas, when moist gulf air meets arctic temperatures winter storms can occur. The storms usually take their toll from heavy accumulations of ice that form, often overnight, on trees, power lines and structures. In the more remote areas of the county homes may be without electrical power for days but critical facilities in more urban areas are operating within a few days. Como, Cumby, Sulphur Springs, rural Hopkins County may have power outages lasting one to two weeks.

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HAILSTORM

Hail is a form of precipitation that occurs at the beginning of thunderstorms. It is in the form of balls or lumps of ice, usually called hailstones. Hail is formed when raindrops pass through a belt of cold air on their way to earth. This belt of cold air causes the raindrops to freeze into small blocks of ice. The formation of hail requires the presence of cumulonimbus or other convective clouds with strong updrafts. The air turbulence that accompanies thunderstorms aids the formation of hailstones. The water that goes into the formation of hailstones is super-cooled water, that is to say, it is at a temperature below freezing point but still in the form of a liquid. Hailstones start falling when they become too heavy to be supported by air currents.

Hailstones are not formed of single raindrops. However the process of formation of a hailstone does start with the freezing of a single raindrop. This may be carried by a strong current to the level where rain is still falling as drops. And as this again passes through the cold air belt, new raindrops may cling to the frozen hailstone, thus increasing its size. Hailstones grow in size by repeated collisions with super-cooled water. This water is suspended in the cloud through which the particle is traveling. Those single frozen raindrops that do not get carried back to the raindrop level remain as smaller hailstones.

Hailstorms are very common in middle latitudes and a heavy shower generally lasts around 15 minutes. Hailstorms generally occur during mid to late afternoon. Big hailstones falling with force are known to have caused fatal harm to human and animal life.

The following chart shows the Combined NOAA/TORRO Hailstorm Intensity Scales:

Combined NOAA/TORRO Hailstorm Intensity Scales

Size Code	Intensity Category	Typical Hail Diameter (inches)	Approximate Size	Typical Damage Impacts
H0	Hard Hail	up to 0.33	Pea	No damage
H1	Potentially Damaging	0.33-0.60	Marble or Mothball	Slight damage to plants, crops
H2	Potentially Damaging	0.60-0.80	Dime or grape	Significant damage to fruit, crops, vegetation
H3	Severe	0.80-1.20	Nickel to Quarter	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	1.2-1.6	Half Dollar to Ping Pong Ball	Widespread glass damage, vehicle bodywork damage

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Size Code	Intensity Category	Typical Hail Diameter (inches)	Approximate Size	Typical Damage Impacts
H5	Destructive	1.6-2.0	Silver dollar to Golf Ball	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	2.0-2.4	Lime or Egg	Aircraft bodywork dented, brick walls pitted
H7	Very destructive	2.4-3.0	Tennis ball	Severe roof damage, risk of serious injuries
H8	Very destructive	3.0-3.5	Baseball to Orange	Severe damage to aircraft bodywork
H9	Super Hailstorms	3.5-4.0	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	4+	Softball and up	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

Sources: www.noaa.gov and www.torro.org

The largest hailstone ever reported was September 3, 1970, in Coffeyville, Kansas. It was approximately the size of a softball—758 grams, 45 centimeters in circumference, and 14.2 centimeters in diameter.

HISTORY OF HAILSTORMS IN HOPKINS COUNTY

The NOAA Satellite and Information Service, National Climatic Data Center, reports that there have been 149 hail events reported between 1950 and 2012 in Hopkins County. Eight (8) of those events reported the largest magnitude of 2.75 inches, and forty one (41) of those events reported the smallest magnitude of .75 inches. A hailstorm caused approximately $116 million in damages on March 29, 2000, in the Sulphur Springs area. This storm was widespread with thunderstorms and tornadoes in Ft. Worth, Arlington, Grand Prairie, and Navarro County. Another storm on April 5, 2003, caused three (3) injuries by baseball size hail. The storm developed in Kent County and moved eastward into western Young County in North Central Texas. The damage path across North Texas extended from Padgett, in western Young County, to west of Sulphur Springs, a distance of approximately 192 miles. This was one of the costliest storms on record to hit North Texas, with damage estimates approximately 885 million dollars.

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Past Occurrence of Hailstorm in Hopkins County

There were seventeen recorded days of hailstorms in Hopkins County between 2010 and 2020. Property damages were estimated to be $194,000. On June 19, 2019 hail estimated to be the size of a tennis ball (2,75 in.) was recorded**.**

Hopkins County Hailstorms Risk					
COMMUNITY	**POTENTIAL IMPACT 45%**	**PROBABLITY 30%**	**Warning 15%**	**Duration 10%**	**RISK**
Hopkins Unincorporated	Limited PRI=1	Highly Likely PRI=4	<6 hrs. PRI 4	<6 hrs. PRI 1	Medium 2.35
Como	Limited PRI=1	Highly Likely PRI=4	<6 hrs. PRI 4	<6 hrs. PRI 1	Medium 2.35
Cumby	Limited PRI=1	Highly Likely PRI=4	<6 hrs. PRI 4	<6 hrs. PRI 1	Medium 2.35
Sulphur Springs	Limited PRI=1	Highly Likely PRI=4	<6 hrs. PRI 4	<6 hrs. PRI 1	Medium 2.35

Hopkins County Critical Facilities				
Critical Facilities	**Como**	**Cumby**	**Sulphur Springs**	**Hopkins County**
City Hall	1	1	1	
Fire Station				15
Civic Center	1	1	2	1
Govt. Facility				2
Wastewater Treatment Plant	1	1	1	
Corrections Facility			1	1
Hospital			1	1
Maintenance Barn			1	1
Post Office	1	1	1	8
Water Tower	1			
Police Station		1	1	3
Sheriff Office				1
EMS				
Public Schools	2	3		6
Water Treatment Plant				
County Seat and offices			1	1

Critical Facilities

All critical facilities located in unincorporated Hopkins County and the jurisdictions of Como, Cumby and Sulphur Springs are subject to some damage from and intense hailstorm. It is hard to imagine a hailstorm severe enough to render a critical facility damaged to the point of not being able to provide the needed services or functions.

Location: Hailstorms can strike anywhere in Hopkins County including the jurisdictions of Como, Cumby and Sulphur Springs.

Probability: The probability of a hailstorm strike in Hopkins County is highly likely. The jurisdictions of Como, Cumby, and Sulphur Springs are at risk.

Impact: The impact of a hailstorm has historically been limited, however, the baseball size hail recorded on April 4, 2003 caused three injuries. Hail can damage autos, roofs, siding and crops. A 2% loss to residential property in the county could result in a monetary value of $19,358,809. See the tables on page 29 for a more comprehensive look at possible damage values.

Estimated Property Loss at 25%		
Hopkins County	Residential	$351,204,392.50
Como	Residential	$3,184,812.50
Cumby	Residential	$3,671,385
Sulphur Springs	Residential	$125,050,367.50

Vulnerability: Buildings, autos, crops, can be damaged by hail. Hail is often part of thunderstorm activity. In some rare cases hail can cause physical injury. The overall vulnerability level in Hopkins County and the jurisdictions of Como, Cumby, and Sulphur Springs is high.

Summary: Hailstorms are unpredictable and often associated with thunderstorm activity. Thunderstorms have historically occurred throughout the county, and if the trend continues, all of Hopkins County and its jurisdictions could be affected by hailstorms.

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DROUGHT

Description
A drought is a period of abnormally dry weather that persists long enough to produce a serious hydrologic imbalance (crop damage, water supply shortage, etc.) The severity of the drought depends upon the degree of moisture deficiency, the duration, and the size of the affected area.

There are four different ways that drought can be defined:

- **Meteorological** – a measure of departure of precipitation from normal. Due to climatic differences what is considered a drought in one location may not be a drought in another location.
- **Agricultural** – refers to a situation when the amount of moisture in the soil no longer meets the needs of a crop.
- **Hydrological** – occurs when surface and subsurface water supplies are below normal.
- **Socioeconomic** – refers to the situation that occurs when physical water begins to affect people.

Drought is a period when precipitation falls below normal levels.

Defining the beginning or the end of a drought can be difficult. Some droughts may be short in duration, but more severe in their intensity. Low humidity and high temperatures usually accompany droughts, which mean that any additional moisture evaporates quickly before it has the chance to improve conditions.

Droughts not only lead to water shortages, but they also produce widespread crop failure and environmental stress, and in recent years have caused more than 300 Texas cities and utilities to resort to ordinances or other measures to limit water use. The extreme heat associated with some droughts has led to heat related deaths, job losses among agricultural workers, and significant acreage and property destroyed by wildfires.

Drought ends when it rains. When enough precipitation has fallen, a region's soil moisture profile will improve enough to sustain plants and crops. Once recovery continues to the extent that the water levels of lakes, rivers, wells, and reservoirs have returned to normal, then a drought is considered over.

Types of Drought Impacts
Drought impacts are often grouped as economic, environmental, and social. The economic impact of droughts in East Texas includes:

- Farmers may lose money if a drought destroys their crops or stunts the crops' growth, causing lower yields and poor crop quality. If a farmer's water supply is too low, the farmer may have to spend more money on irrigation or to find new water sources, like wells.
- Ranchers may lose livestock, or they might have to spend more money on feed and water for their animals.

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- People who work in the timber industry may be affected when trees, especially young trees, die, or wildfires destroy stands of timber.
- Businesses that manufacture and sell recreational equipment, like boats and fishing equipment, may not be able to sell some of their goods because drought has dried up lakes and other water sources.
- Businesses that depend on agricultural production, like tractor manufacturers and companies that process food, may lose business when drought damages crop or livestock.
- Power companies that normally rely on hydroelectric power (electricity that is created from the energy of running water) may have to spend more money on other fuel sources if drought dries up too much of the water supply. The power companies' customers would also have to pay more.
- Water companies may have to spend money on new or additional water supplies.
- Barges and ships may have difficulty navigating streams, rivers, and canals because of low water levels, which would also affect businesses that depend on water transportation for receiving or sending goods and materials.
- People may have to pay more for food.

Drought also causes *environmental* losses because of forest fires; soil erosion; damage to plants, animals, and their habitat; and air and water quality decline. Sometimes the damage is only temporary, and conditions return to normal when the drought is over. But sometimes drought's impact on the environment can last a long time, or may even become permanent if, for example, an endangered species was lost because of low stream flows. Examples of environmental impacts include:

- Losses or destruction of fish and wildlife habitat
- Lack of food and drinking water for wild animals
- Increase in disease in wild animals because of reduced food and water supplies
- Migration of wild animals, leading to a loss of wildlife in some (drought-stricken) areas and too much wildlife in areas not affected by drought
- Increased stress on endangered species
- Lower water levels in reservoirs, lakes, and ponds
- Loss of wetlands
- More fires
- Wind and water erosion of soils, reduced soil quality

Social impacts of drought include public safety, health, conflicts that arise between people when there is not enough water to go around, and changes in lifestyle. Many of the impacts that we consider economic and environmental also have social impacts. Examples of social impacts include:

- Mental and physical stress on people (for example, people may experience anxiety or depression about economic losses caused by drought)
- Health problems related to low water flows (for example, low water supplies and water pressure make fire-fighting more difficult)
- Loss of human life (from heat stress and suicides, for example)
- Threat to public safety from an increased number of forest and range fires

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- Reduced incomes
- Population migrations (from rural to urban areas)
- Fewer recreational activities

All these impacts were considered in planning for and responding to drought conditions.

According to the National Climatic Data Center

The wide variety of disciplines affected by drought, its diverse geographical and temporal distribution, and the many scales drought operates on make it difficult to develop both a definition to describe drought and an index to measure it. Many quantitative measures of drought have been developed in the United States, depending on the discipline affected, the region being considered, and the particular application. Several indices developed by Wayne Palmer, as well as the Standardized Precipitation Index, are useful for describing the many scales of drought.

Common to all types of drought is the fact that they originate from a deficiency of precipitation resulting from an unusual weather pattern. If the weather pattern lasts a short time (say, a few weeks or a couple months), the drought is considered *short-term*. But if the weather or atmospheric circulation pattern becomes entrenched and the precipitation deficits last for several months to several years, the drought is considered to be a *long-term* drought. It is possible for a region to experience a long-term circulation pattern that produces drought, and to have short-term changes in this long-term pattern that result in short-term wet spells. Likewise, it is possible for a long-term wet circulation pattern to be interrupted by short-term weather spells that result in short-term drought.

Any party which takes credit for the rain must not be surprised if its opponents blame it for the drought.

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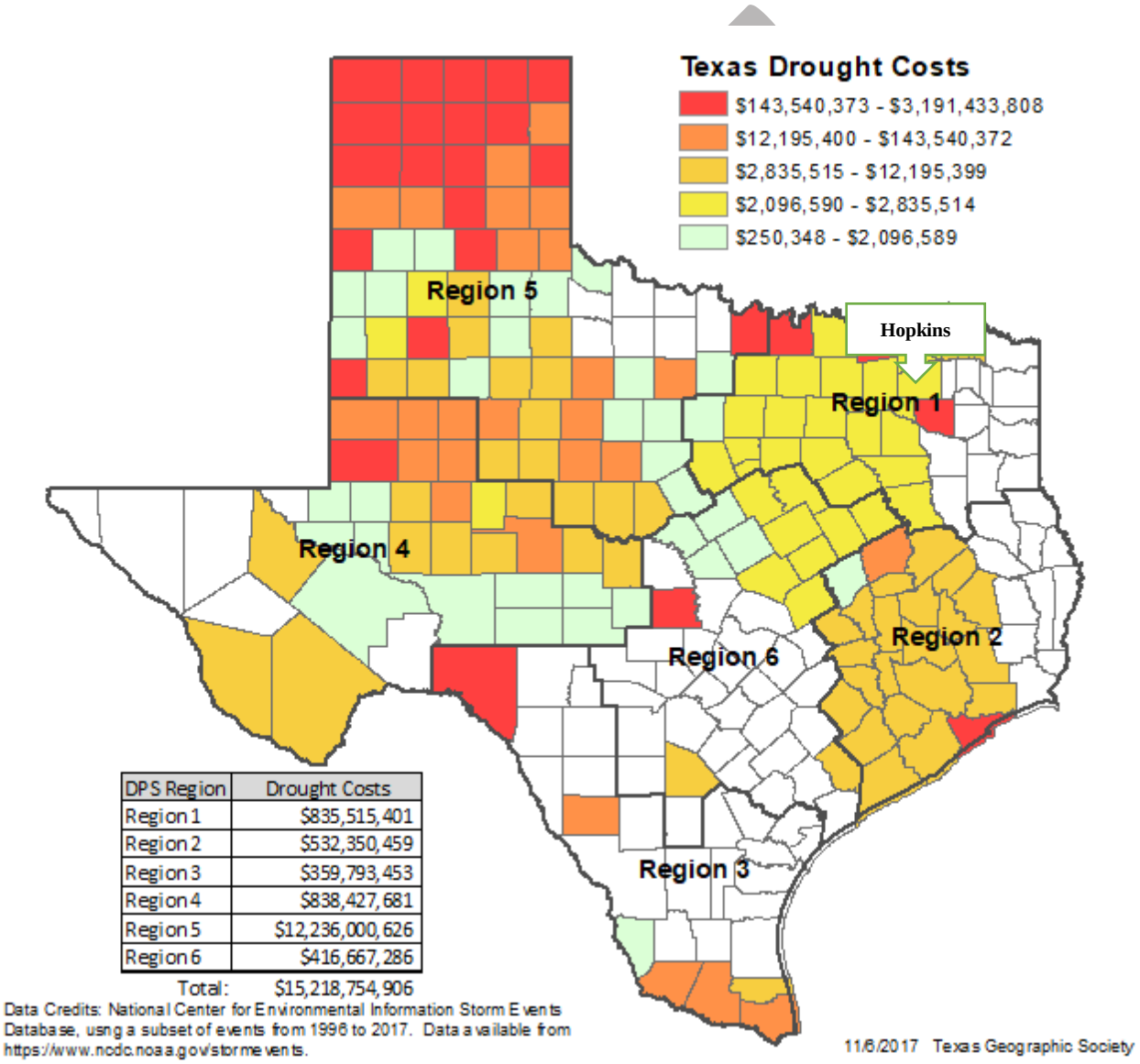
Historical Dollar Losses

The following map illustrates the total county losses (property plus crop losses) from drought or abnormal dryness over the period (1996-2016). The different colors on the map represent the relative losses between counties within the state; white signifies zero dollars lost. The inset table reports total dollar losses for each region over the 21-year base period.

Historical Dollar Losses



DPS Region	Drought Costs
Region 1	$835,515,401
Region 2	$532,350,459
Region 3	$359,793,453
Region 4	$838,427,681
Region 5	$12,236,000,626
Region 6	$416,667,286
Total:	$15,218,754,906

Data Credits: National Center for Environmental Information Storm Events Database, usng a subset of events from 1996 to 2017. Data available from https://www.ncdc.noaa.gov/stormevents.

Future Risks

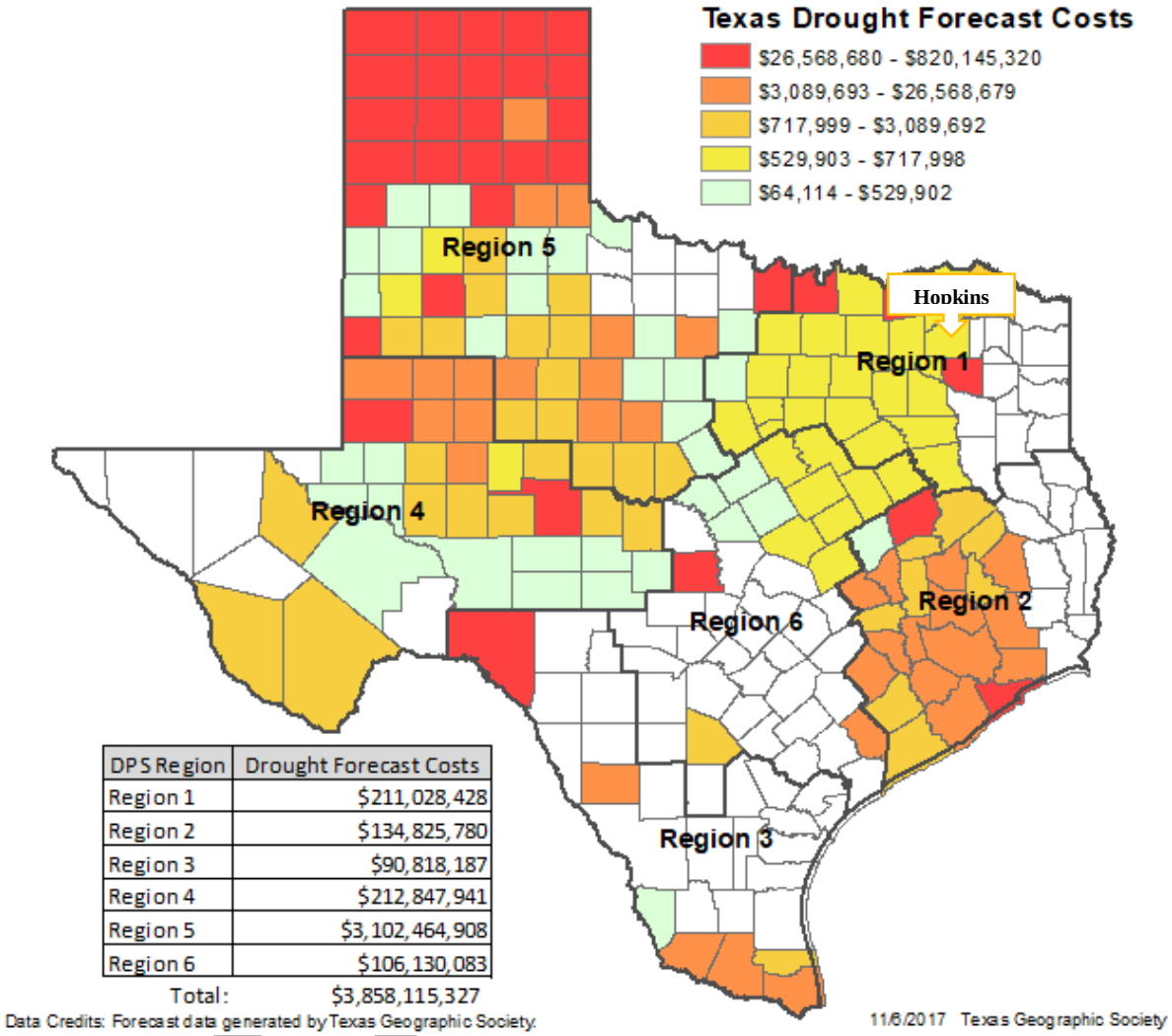
Results of the hazard impact forecast for drought or abnormal dryness are presented below along with a local assessment of those risks. Following this is a discussion and summary of risk statewide.

County Dollar Loss Forecast

This map shows the results of the forecast model for 2019-2023 for drought and abnormal dryness dollar losses at the county level. These are based on the locations of impacts in the base period and the likely locations of future losses.

Drought/Abnormal Dryness Dollar Loss Forecast

The forecast is an estimate of damages that are likely to occur if similar weather events re-occur in or near previously impacted areas during the base period. Future drought or abnormal dryness dollar losses will not necessarily be in the same places that they were in the past, but a strong correlation is likely.



DPS Region	Drought Forecast Costs
Region 1	$211,028,428
Region 2	$134,825,780
Region 3	$90,818,187
Region 4	$212,847,941
Region 5	$3,102,464,908
Region 6	$106,130,083
Total:	$3,858,115,327

Data Credits: Forecast data generated by Texas Geographic Society.

Hopkins County Drought Risk					
COMMUNITY	**POTENTIAL IMPACT 45%**	**PROBABLITY 30%**	**Warning 15%**	**Duration 10%**	**RISK**
Hopkins Unincorporated	Substantial PRI 4	Highly Likely PRI 4	> than 24 hours PRI 1	>Week PRI 4	High 3.55
Como	Substantial PRI 4	Highly Likely PRI 4	> than 24 hours PRI 1	>Week PRI 4	High 3.55
Cumby	Substantial PRI 4	Highly Likely PRI 4	> than 24 hours PRI 1	>Week PRI 4	High 3.55
Sulphur Springs	Substantial PRI 4	Highly Likely PRI 4	> than 24 hours PRI 1	>Week PRI 4	High 3.55

Hopkins County Critical Facilities				
Critical Facilities	**Como**	**Cumby**	**Sulphur Springs**	**Hopkins County**
City Hall	1	1	1	
Fire Station				15
Civic Center	1	1	2	1
Govt. Facility				2
Wastewater Treatment Plant	1	1	1	
Corrections Facility			1	1
Hospital			1	1
Maintenance Barn			1	1
Post Office	1	1	1	8
Water Tower	1			
Police Station		1	1	3
Sheriff Office				1
EMS				
Public Schools	2	3		6
Water Treatment Plant				
County Seat and offices			1	1

Critical Facilities

Drought can impact the availability of water to citizens. Wastewater treatment plants and potable water sources may be impacted by lingering drought. Como, Cumby Sulphur Springs and the unincorporated portions of Hopkins County are equally susceptible to drought.

Probability: Droughts will continue to occur in the Hopkins County and the participating jurisdictions when the conditions are right. It is a normal, recurrent feature of climate. A drought will affect Hopkins County and its participating jurisdictions. Historically a drought can last from a few days to several months.

Vulnerability The region is vulnerable when there is a deficiency of precipitation over an extended period of time. All of Hopkins County and its jurisdictions are vulnerable to drought. For Como, Cumby, and Sulphur Springs droughts have a social dynamic that includes affecting the elderly and young, causing depression, creating job loss, requiring residents to relocate due to economic impact and rising costs for food**.**

Impact: Hopkins County drought defined: Drought is determined by using the Palmer Drought Index which is illustrated on page 79. It is based on precipitation and temperature data for the area. The scale ranges from 3.99, which is very wet to -4.00 or less, which is considered extreme drought. The scale is most accurate when used to determine drought over a period of months. Since 1996 the NOAA weather data base indicates that Hopkins County has lost $532,000 in property loss and $1,516,000 in crop damage. See the Damage Assessment Tables on page 29. The extent of drought experienced in Hopkins County and its jurisdictions will range from ***0 Abundantly Dry to 4 Exceptional Drought***

The impact of a drought on the jurisdictions of Hopkins County include economic problems due to high food prices, the water from municipal works can drop in quality causing illness, lawns and other plants are impacted. Public safety can be threatened by the increased likelihood of wildfires. If the water levels of Cooper Lake become low there would be a decrease in recreational activities such as fishing and swimming for the residents of both jurisdictions.

Location: Historically, drought has affected all of Hopkins County including the jurisdictions of Como, Cumby, and Sulphur Springs. The agricultural areas, which include the rural parts of the County, would be affected more so than the urban areas.

Summary: Drought is seen as an issue for Hopkins County, Como, Cumby, and Sulphur Springs however the county has never experienced shortages of potable water. Water rationing has never been necessary in any of the jurisdictions, but this remains a real possibility due to climate change. New precautions should be considered to mitigate changing weather patterns.

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Extreme Heat

Heat kills by taxing the human body beyond its abilities. In a normal year, about 175 Americans succumb to the demands of summer heat. Among the large continental family of natural hazards, only the cold of winter-not lighting, hurricanes, tornadoes, floods, or earthquakes-takes a greater toll. In the 40 year period from 1936 through 1975, nearly 20,000 people were killed in the United States by the effects of heat and solar radiation. In the disastrous heat wave of 1980, more than 1,250 people died. These are the direct casualties. No one can know how many more deaths are advanced by heat wave weather-how many diseased or aging hearts surrender that under better conditions would have continued functioning.

North American summers are hot; most summers see heat waves in one section or another of the United States. East of the Rockies, they tend to combine both high temperature and high humidity although some of the worst have been catastrophically dry.

The stagnant atmospheric conditions of the heat wave trap pollutants in urban areas and add the stresses of severe pollution to the already dangerous stresses of hot weather, creating a health problem of undiscovered dimensions. The high inner-city death rates also can be read as poor access to air-conditioned rooms. While air conditioning may be a luxury in normal times, it can be a lifesaver during heat wave conditions. The cost of cool air moves steadily higher, adding what appears to be a cruel economic side to heat wave fatalities. Indications from the 1978 Texas heat wave suggest that some elderly people on fixed incomes, many of them in buildings that could not be ventilated without air conditioning, found the cost too high, turned off their units, and ultimately succumbed to the stresses of heat. Elderly persons, small children, chronic invalids, those on certain medications or drugs (especially tranquilizers and anticholinergics), and persons with weight and alcohol problems are particularly susceptible to heat reactions, especially during heat waves in areas where a moderate climate usually prevails.

Based on the latest research findings, the National Weather Service has devised the Heat Index (HI). The HI, given in degrees F, is an accurate measure of how hot it really feels when relative humidity (RH) is added to the actual air temperature. Exposure to full sunshine can increase HI values by up to 15 degrees Fahrenheit. Also, strong winds, particularly with very hot, dry air, can be extremely hazardous.

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Hopkins County Extreme Heat

All of Hopkins County including the jurisdictions of Como, Cumby, and Sulphur Springs will suffer from the impact of heat. Extreme heat is often categorized in terms of weather events with drought.

In Hopkins County those at greatest risk of death due to excessive heat are the urban-dwelling elderly without access to an air-conditioned environment for at least part of the day. Thus, the issues of prevention and mitigation combine issues of the aging and of public health.

Infrastructure is often affected in urban areas such as county roads soften and concrete roads have been known to "explode" lifting 3 - 4 foot pieces of concrete. During the 1980 heat wave hundreds of miles of highways buckled (NOAA, 1980)

Further economic impact occurs when stress is placed on automobile cooling systems, diesel trucks and railroad locomotives. This leads to an increase in mechanical failures. Train rails develop sun kinks and distort. Refrigerated goods experience a significant greater rate of spoilage due to extreme heat. Additional impact will be felt as food prices rise due to crop loss.

The demand for electric power during heat waves is well documented. According to the Institute for Research in the Atmosphere at Colorado State University, "In 1980, consumers paid $1.3 billion more for electric power during the summer than the previous year. The demand for electricity, 5.5% above normal, outstripped the supply, causing electric companies to have rolling black outs."

Extreme Heat Past Occurrences
NOAA Weather Service

Month/year	Highest Temperature	Days Over 90
June 2010	97	23
July 2010	99	26
August 2010	103	30
September 2010	97	19
2011 The Hottest Summer in Recorded History		
June 2011	**100**	**29**
July 2011	**103**	**31**
August 2011	**110**	**30**
September 2011	**106**	**18**
June 2012	101	17
July 2012	105	29
August 2012	105	27
September 2012	102	18
June 2013	101	17
July 2013	100	21
August 2013	102	26

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Month/year	Highest Temperature	Days Over 90
September 2013	102	24
June 2014	95	15
July 2014	100 on 13th 14th	21
August 2014	99 on 16th 22nd.	24
September 2014	96 on 5th, 10th.	13
June 2015	95 on 9th, 10th	16
July 2015	102	29
August 2015	104	28
September 2015	100	23
June 2016	96 on 18th, 27th	22
July 2016	100 on 22nd, 23rd	30
August 2016	103	20
September 2016	97	13
June 2017	94	11
July 2017	100	27
August 2017	95 on 19th, 20th	15
September 2017	94 on 21st, 23rd	18
June 2018	98 on 28th, 30th	28
July 2018	106	30
August 2018	99 on 29th, 31st	28
September 2018	97	15
June 2019	95 on 20th, 21st	21
July 2019	100	28
August 2019	104	28
September 2019	100	29
June 2020	99 on 9th, 15th	26
July 2020	101 on 3rd, 12th	30
August 2020	103	30
September 2020	92	5

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The NOAA Satellite and Information Service, National Climatic Data Center shows that the following 2 temperature extreme events (excessive heat) were reported in Hopkins County between 2010 and 2020:

Type of Temperature Extreme	High Temperature	Location	Date
Excessive Heat	110 degrees	In Hopkins County daytime high temperatures ranges approximately from 103-110	08/01/2011
Excessive Heat	110 degrees	Hopkins county reached Excessive Heat criteria as heat index values reached around 110 degrees	08/28/2020

Based on the latest research findings, the National Weather Service has devised the Heat Index (HI). The HI, given in degrees F, is an accurate measure of how hot it really feels when relative humidity (RH) is added to the actual air temperature. Exposure to full sunshine can increase HI values by up to 15 degrees Fahrenheit. Also, strong winds, particularly with very hot, dry air, can be extremely hazardous. The following shows heat index/heat disorders.

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NOAA national weather service: heat index

Relative Humidity (%) \ temperature (°F)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	130	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Caution
Extreme Caution
Danger
Extreme Danger

To find the Heat Index temperature, look at the Heat Index chart above. For example, if the air temperature is 96°F and the relative humidity is 65%, the heat index—how hot it feels—is 121°F.

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Hopkins County Extreme Heat Risk

COMMUNITY	POTENTIAL IMPACT 45%	PROBABLITY 30%	Warning 15%	Duration 10%	RISK
Hopkins Unincorporated	Limited PRI 1	Highly Likely PRI 4	> 24 hrs. PRI 1	< a week PRI 3	Medium 2.1
Como	Limited PRI 1	Highly Likely PRI 4	> 24 hrs. PRI 1	< a week PRI 3	Medium 2.1
Cumby	Limited PRI 1	Highly Likely PRI 4	> 24 hrs. PRI 1	< a week PRI 3	Medium 2.1
Sulphur Springs	Limited PRI 1	Highly Likely PRI 4	> 24 hrs. PRI 1	< a week PRI 3	Medium 2.1

Hopkins County Critical Facilities				
Critical Facilities	**Como**	**Cumby**	**Sulphur Springs**	**Hopkins County**
City Hall	1	1	1	
Fire Station				15
Civic Center	1	1	2	1
Govt. Facility				2
Wastewater Treatment Plant	1	1	1	
Corrections Facility			1	1
Hospital			1	1
Maintenance Barn			1	1
Post Office	1	1	1	8
Water Tower	1			
Police Station		1	1	3
Sheriff Office				1
EMS				
Public Schools	2	3		6
Water Treatment Plant				
County Seat and offices			1	1

Critical Facilities

Extreme heat can impact the overall well-being of citizens. Wastewater treatment plants and potable water sources may be impacted by lingering drought. Como, Cumby Sulphur Springs and the unincorporated portions of Hopkins County are equally susceptible to extreme heat.

Probability: It is likely that extreme heat waves will continue to occur in the region when the conditions are right. It is a normal, recurrent feature of climate. Hopkins County typically has three or four heat occurrences every summer. It is highly likely that Hopkins County and its jurisdictions will experience extreme heat.

Vulnerability: The region is vulnerable when there is a deficiency of precipitation over an extended period of time and high temperatures. The extent of damage or injury increases with the temperature and relative humidity levels. All of Hopkins County and the jurisdictions of Como, Cumby, and Sulphur Springs are vulnerable. The elderly, young and ill are most vulnerable to

extreme heat. Crops and livestock are stressed during extended periods of extreme heat suffer,. Extreme heat causes heat stroke, time lost on the job and psychological stress

Impact:
According to the NOAA weather service in Shreveport, Louisiana, extreme heat by definition exists when over a two day period the heat index high reaches 105-109 with a minimum evening index temperature of 75 degrees or better. The heat index is calculated by combining air temperature and humidity levels. The full range of the heat index on the preceding page is applicable for Hopkins County and its jurisdictions. There is no specific history regarding property or crop damage due to excessive heat available. For a better idea of the possible property losses see Damage Assessment Tables on page 29 for examples of loss in dollars. The Heat Index will be mitigated to any combination of temperature and humidity that ranges from 100 degrees F to 114 degrees F

Location: The entire county would be affected by extreme heat. All the jurisdictions suffer from the impact of extreme heat.

Summary: Hot temperatures are part of the East Texas landscape. During the months of June, July and August we can expect temperatures of over 100 degrees. The citizens who live in Hopkins County and the participating jurisdictions of Como, Cumby, and Sulphur Springs are aware of extreme heat's lethal potential and take precautions to prevent overheating and heat related strokes. Models produced by the environmental sciences project increase incidents of extreme temperature climate change due to global warming. Mitigation actions should take place now to prepare for rising temperatures

What dreadful hot weather we have. It keeps one in a continual state of inelegance.
Jane Austen

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EARTHQUAKES

An earthquake is a motion or trembling that occurs when there is a sudden breaking or shifting of rock material beneath the earth's surface. This breaking or shifting produces elastic waves which travel at the speed of sound in rock. These waves may be felt or produce damage far away from the epicenter-the point on the earth's surface above where the breaking or shifting actually occurred.

Earthquakes do occur in Texas. Within the 20th century, there have been more than 100 earthquakes large enough to be felt; their epicenters occur in 40 of Texas's 257 counties. Four of these earthquakes have had magnitudes between 5 and 6, making the large enough to be felt over a wide area and produce significant damage near their epicenters. There have been historical earthquakes in four regions within Texas which indicate potential earthquake hazard. The greatest hazard in Northeastern Texas is from very large earthquakes (magnitude 7 or above) which might occur outside of Texas, particularly in Oklahoma or Missouri-Tennessee.

Earthquakes are measured by scales that have been developed throughout the years. The most common scales are known as the Richter scale and the Mercalli scale. In order to understand the severity of earthquakes, the following information will shed light on the different levels of damage that may occur during a specific earthquake.

Modified Mercalli Intensity Scale

Mercalli Intensity **(at epicenter)**	**Magnitude**	**Witness Observations**
I	1 to 2	Felt by very few people; barely noticeable.
II	2 to 3	Felt by a few people, especially on upper floors.
III	3 to 4	Noticeable indoors, especially on upper floors, but may not be recognized as an earthquake.
IV	4	Felt by many indoors, few outdoors. May feel like heavy truck passing by.
V	4 to 5	Felt by almost everyone, some people awakened. Small objects moved. Trees and poles may shake.
VI	5 to 6	Felt by everyone. Difficult to stand. Some heavy furniture moved, some plaster falls. Chimneys may be slightly damaged.
VII	6	Slight to moderate damage in well built, ordinary structures. Considerable damage to poorly built structures. Some walls may fall.
VIII	6 to 7	Little damage in specially built structures. Considerable damage to ordinary buildings, severe damage to poorly built structures. Some walls collapse.
IX	7	Considerable damage to specially built structures, buildings shifted off foundations. Ground cracked noticeably. Wholesale destruction. Landslides.
X	7 to 8	Most masonry and frame structures and their foundations destroyed. Ground badly cracked. Landslides. Wholesale destruction.
XI	8	Total damage. Few, if any, structures standing. Bridges destroyed. Wide cracks in ground. Waves seen on ground.
XII	8 or greater	Total damage. Waves seen on ground. Objects thrown up into air.

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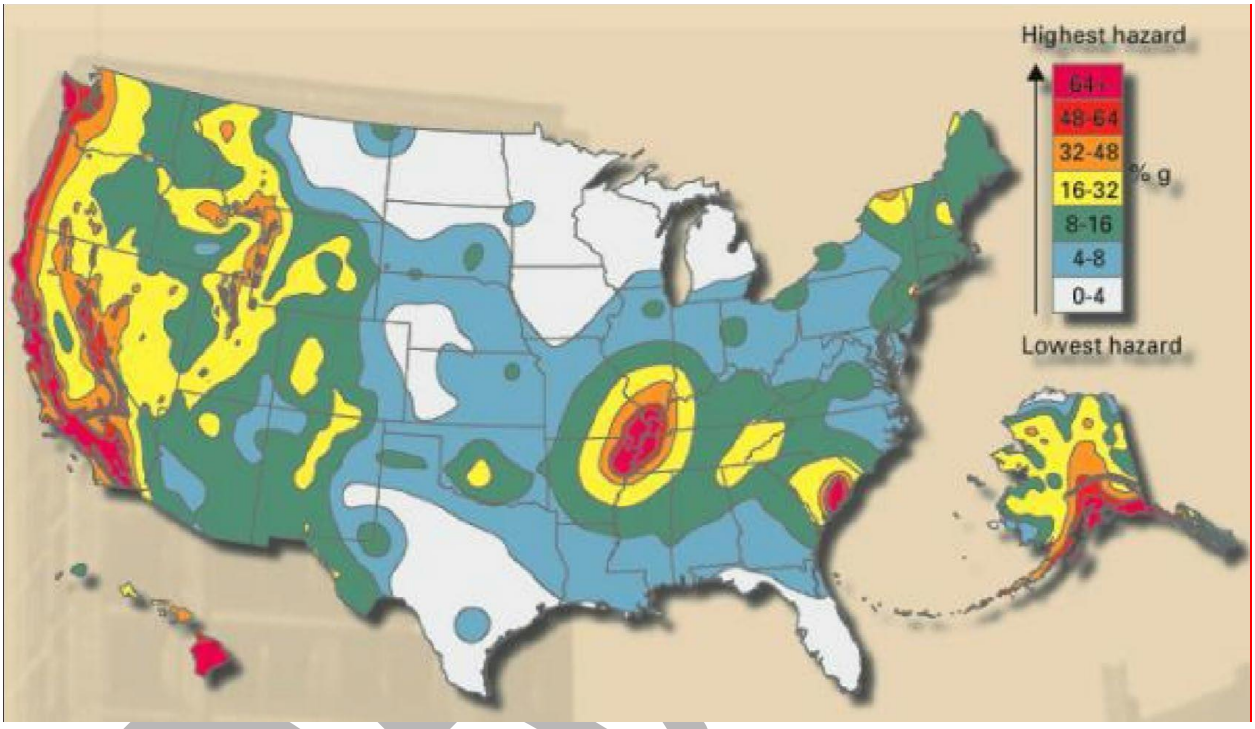
Earthquake Magnitude

Magnitude is measure of the strength of an earthquake or strain energy released by it, as determined by seismographic observations. This is a logarithmic value originally defined by Charles Richter (1935). An increase of one unit of magnitude (for example, from 4.6 to 5.6) represents a 10-fold increase in wave amplitude on a seismogram or approximately a 30-fold increase in the energy released. In other words, a magnitude 6.7 earthquake releases over 900 times (30 times 30) the energy of a 4.7 earthquake - or it takes about 900 magnitude 4.7 earthquakes to equal the energy released in a single 6.7 earthquake! There is no beginning nor end to this scale. However, rock mechanics seems to preclude earthquakes smaller than about -1 or larger than about 9.5. A magnitude -1.0 event release about 900 times less energy than a magnitude 1.0 quake. Except in special circumstances, earthquakes below magnitude 2.5 are not generally felt by humans.

Magnitude (Richter Scale)	Effects	Number per year
less than 2	Not felt by humans. Recorded by instruments only.	Numerous
2-3	Felt only by the most sensitive. Suspended objects swing	300,000
3-4	Felt by some people. Vibration like a passing heavy vehicle	49,000
4-5	Felt by most people. Hanging objects swing. Dishes and windows rattle and may break	6,200
5-6	Felt by all; people frightened. Chimneys topple; furniture moves	800
6-7	Some panic. Buildings may suffer substantial damage	120
7-8	Widespread panic. Few buildings remain standing. Large landslides; fissures in ground	18
8-9	Complete devastation. Ground waves	1 every few years

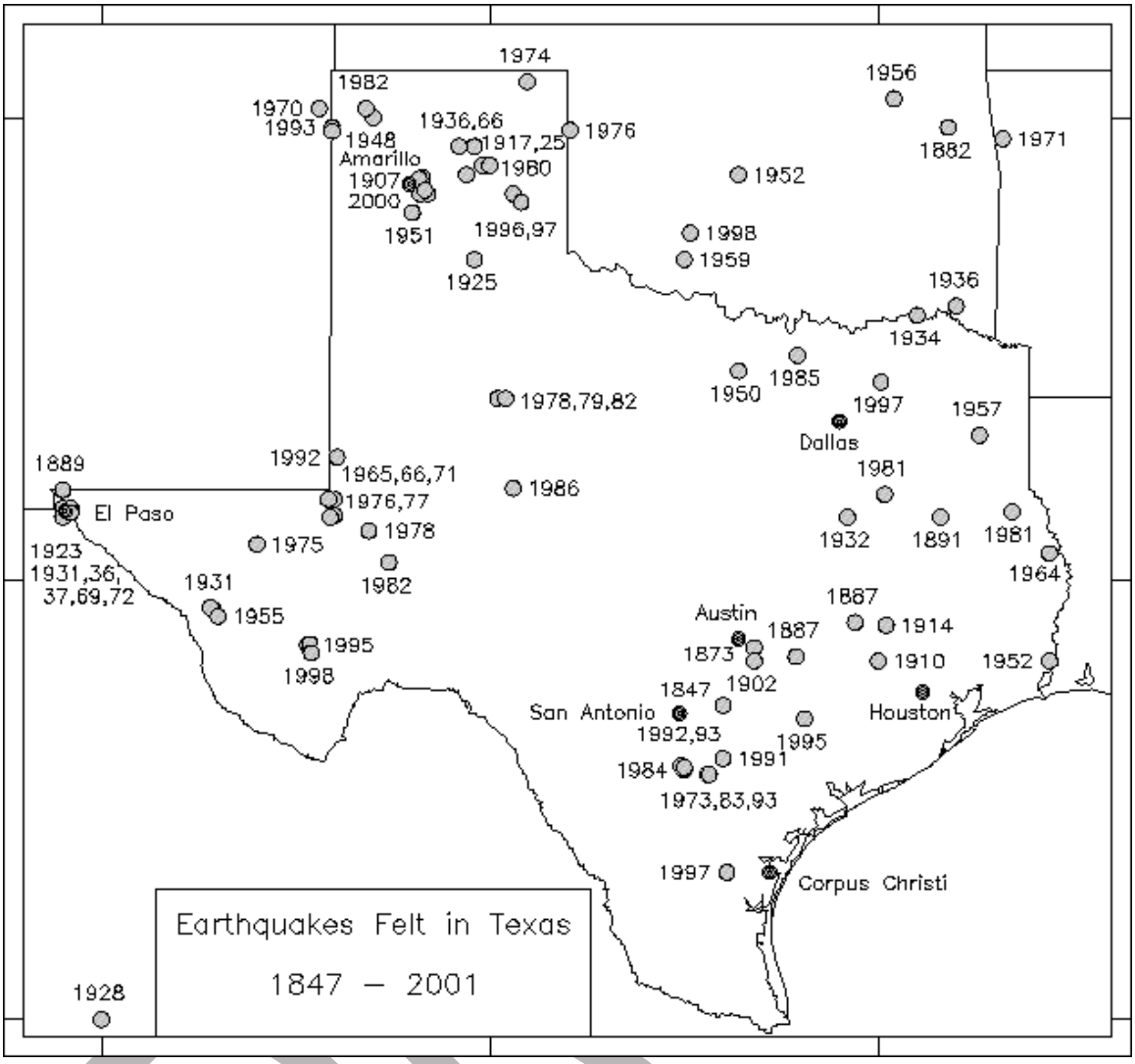
Earthquake Risk

Earthquake risk is the probable building damage, and number of people that are expected to be hurt or killed if a likely earthquake on a particular fault occurs. Earthquake risk and earthquake hazard are occasionally incorrectly used interchangeably.



As indicated on Table 2.18, earthquakes in the past have occurred in and around the Northeast Texas area. The information listed in this table covers a Magnitude of 3.0 or greater.

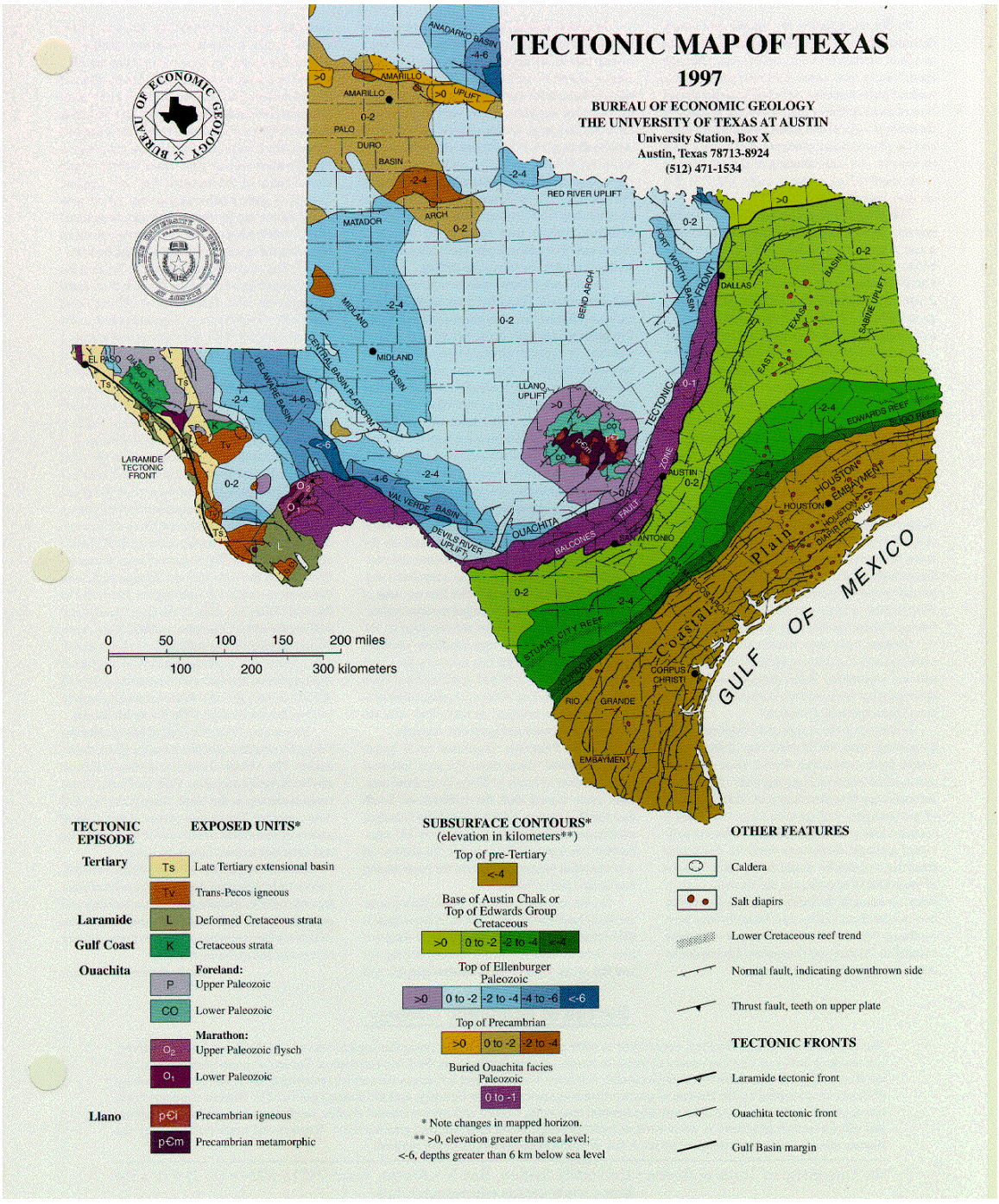
The map above indicates that the Northeast Texas area poses more of an increased threat than some areas in the United States due to the fact that it is bordered by three states that are ranked the same as our area. You will notice that these states have had activity in the past. Also, due to the fact that aftershocks can occur, the threat lingers.



Various ongoing natural processes produce stress that occasionally cause the underlying rock material to break or shift in an earthquake. Rock material is most likely to break where it is highly stressed or where it has broken before, as along a preexisting fault. Earthquakes are most common along very large, well-developed faults (such as the San Andreas Fault in California) which divide the earth into huge, country-sized relatively stable regions, called tectonic plates. The majority of the world's earthquakes, such as most reported in Mexico, California, Alaska, and Japan, occur along plate boundaries.

However, not all earthquakes occur at plate boundaries; in regions like Texas many also occur far away from plate boundary faults. Sometimes these "plate interior" earthquakes are quite large; for example, in 1811-1812 three earthquakes with magnitude above 8 occurred near the Missouri-Tennessee boundary. These quakes were as large as any historic earthquakes that have occurred in California, or anywhere else in the U.S. outside of Alaska. While Texans haven't experienced such large quakes in historic times, smaller quakes do occur naturally along faults in several regions of Texas.

While all earthquakes occur on faults, not all faults have earthquakes. A fault is simply a fracture in rock material accompanied by displacement along the two sides of the fracture. If the displacement occurs slowly enough, no earthquake waves are generated. And, often the displacement may have occurred millions of years ago, so that the fault remains but there is no present earthquake threat. Finally, many faults go undiscovered because they lie far beneath the surface, covered by soil. It is not accident that fault maps show the most faults in regions where bedrock is exposed at the surface. .



In the central U.S., the USGS assesses the greatest hazard in the Missouri-Tennessee area, where three earthquakes with magnitude of 8 or greater occurred in 1811 and 1812. In the 20th century, the largest earthquake in the Missouri-Tennessee area only had a magnitude of about 5.5. The very rarity of large earthquakes makes hazard analysis an inexact science. In the 20th century, hundreds of man-made lakes and reservoirs have been constructed in Texas; in some cases these pose a special hazard, particularly if there are population centers downstream. Large very distant earthquakes sometimes have surprisingly low-frequency effects. Earthen or earth-filled dams are of special concern since intense shaking or sloshing could cause dam failure.

Historical Earthquakes in North East Texas

The Northeast Texas region is at risk from very large, distant earthquakes which might occur in Missouri-Tennessee or Oklahoma; the earthquakes that pose such a hazard are rare, probably occurring only once per 500 years or less. Such distant earthquakes would be most likely to damage large buildings or poorly reinforced masonry structures. Earthquakes with epicenters within this region are rare and small. Several earthquakes with magnitudes 3 to 4.5 will probably occur each century. These pose little or no risk unless their epicenters are extremely close to poorly built or very sensitive structures.

Throughout most of this region, the most intense shaking experienced over the past two centuries originated from several earthquakes with magnitude about 8 which occurred in Missouri-Tennessee in 1811-1812, or an earthquake with magnitude 5.6 which occurred in eastern Oklahoma in 1882. Although such distant earthquakes are unlikely to produce severe damage, they can cause failure in very large structures, or structures which are designed with absolutely no earthquake-resistant features. Figure 2.8 shows Earthquakes in the Central United States from 1699 through 2002.

Small earthquakes with epicenters in this region occasionally do occur, some of natural origin and some apparently induced by petroleum production. These include:

- A magnitude 4.0 earthquake with an epicenter near Mexia, probably induced by oil production, that occurred on April 9, 1932.
- A magnitude 4.2 earthquake centered in Lamar County north of Paris that occurred on April 12, 1934.
- A magnitude 3.0 earthquake that occurred in Gregg County near Gladewater on March 19, 1957. This quake may have been induced by petroleum production in the East Texas Field.
- A series of earthquakes in 1964 with magnitudes of 4.0 and higher near Hemphill-Pineland in Sabine County.
- A magnitude 3.3 earthquake centered near Jacksonville in Cherokee County, which occurred on November 7, 1981.

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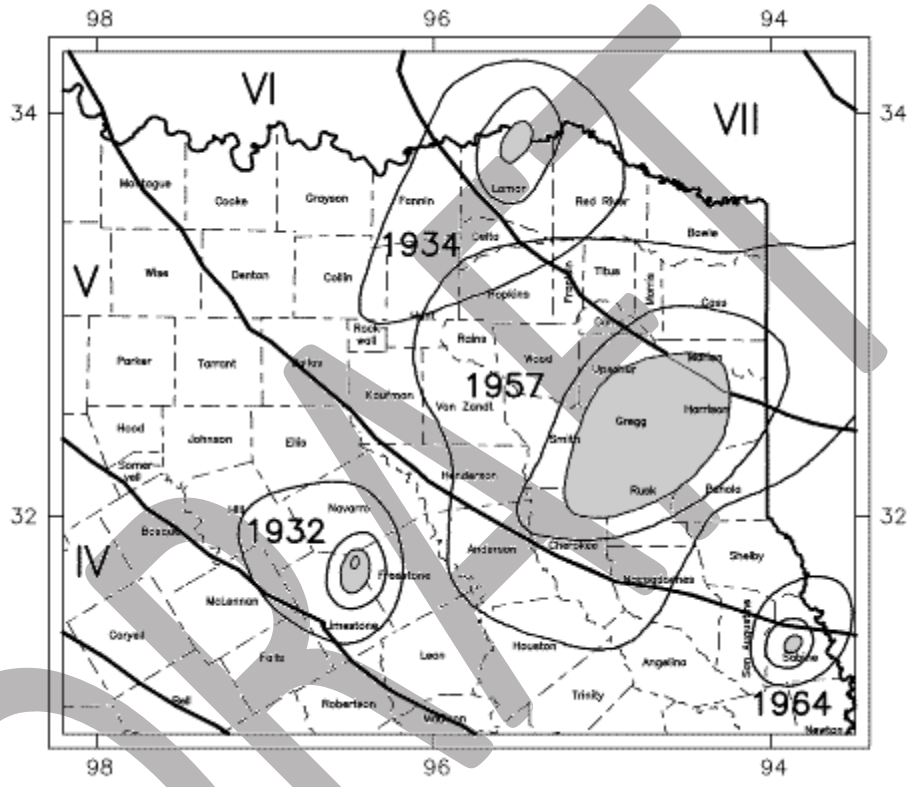
- A magnitude 3.3 earthquake in Cooke and Denton County near Pilot Point and Valley View, which occurred on September 18, 1985.

- A magnitude 3.4 earthquake centered near Commerce in Hunt County; this occurred on May 27, 1997.

Events of these magnitudes seldom produce damage further than about a few miles from the epicenter. Below shows the felt areas of representative historical earthquakes in Northeast Texas.



Felt areas of representative historical earthquakes in northeastern Texas. Shaded regions indicate areas of intensity V and above for earthquakes of 1932 (Limestone County), 1934 (northern Lamar County), 1957 (Gregg County), and 1964 (Sabine County). Thick lines indicate estimated boundaries of Modified Mercalli Intensities for the 1811-1812 Missouri-Tennessee earthquakes.

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While Texas does face some earthquake hazard, this hazard is very small in comparison to that in many other states, including California, Missouri, Montana, South Carolina, and Washington. In most parts of Texas, earthquake hazard is also small compared to the hazard attributable from other natural phenomena, such as hurricanes, tornadoes, and floods. There is no need for Texas to enact sweeping changes in construction practices or take other drastic measures to mitigate earthquake hazard.

Northeast Texas Earthquakes of Magnitude 3 or Greater

The University of Texas at Austin, Jackson School of Geosciences, Institute for Geophysics, Texas Division of Emergency Management.

*Imax = Maximum Modified Mercalli intensity reported in Texas.
**Cause: T = probably tectonic in origin. M = probably man-made (induced). ? = poorly constrained event, insufficient or conflicting evidence.

Date	Origin time (UTC)	Lat. °N	Long. °W	Magnitude	Imax *	Felt area (km2)	Cause**	Location	County
16 Dec. 1811	08:15	90.0	8.1	VII	5,000,000	T	New Madrid, MO		
23 Jan. 1812		89.6	7.8	VII	5,000,000	T	New Madrid, MO		
07 Feb. 1812		89.6	8.0	VII	5,000,000	T	New Madrid, MO		
				Comments: Probably felt in Texas, but no verifiable accounts known. The formation of Caddo Lake in northeast Texas has been attributed to these earthquakes, but accounts of the lake exist prior to 1811.					
22 Oct. 1882		95.1	5.6	V	740,000	T	Ft. Gibson, OK		
				Comments: Previously listed as occurring near Paris, TX. Bricks were shaken loose from walls and chimneys at Bonham, TX.					
08 Jan. 1891		95.2	4.0	VI	—	T	Rusk	Cherokee	
				Comments: Several chimneys thrown to the ground.					
09 Apr.1932		96.4	4.0	VI	6,400	M	Wortham-Mexia	Limestone	

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Comments: In Wortham, bricks from several chimneys were shaken loose. The mortar of one building was cracked.

12 Apr.1934	95.5	4.2	V	13,000	T	Trout Switch	Lamar

Comments: One house needed releveling after the shock.

20 Mar.1950	97.8	3.3	IV	—	?	Chico	Wise
09 Apr.1952	97.8	5.5	V	640,000	T	El Reno, OK	

Comments: Intensities III-V noted in much of north Texas. Felt as far south as Austin, TX.

19 Mar. 1957	94.7	4.7	V	45,000	M	Gladewater	Gregg
19 Mar. 1957	94.7	3.0	III	3,000	M	Gladewater	Gregg
19 Mar. 1957	94.7	3.0	III	3,000	M	Gladewater	Gregg
19 Mar. 1957	94.7	3.0	III	3,000	M	Gladewater	Gregg
24 Apr. 1964	93.9	3.7	V	—	T	Hemphill	Sabine
24 Apr. 1964	93.9	3.7	IV	—	T	Hemphill	Sabine
24 Apr. 1964	93.8	3.2	IV	—	T	Hemphill	Sabine
27 Apr. 1964	93.8	3.2	IV	—	T	Hemphill	Sabine
28 Apr. 1964	93.8	4.4	VI	2,700	T	Hemphill	Sabine

Comments: A small fissure opened up in the yard of a Plainview resident on April 27. Wallpaper and plaster cracked during the April 23 shock.

30 Apr. 1964	93.8	3.0	III	—	T	Hemphill	Sabine

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07 May 1964		94.0	3.2	V		—	T	Hemphill	Sabine	
02 June 1964		94.0	4.2	V		—	T	Hemphill	Sabine	
03 June 1964		94.0	4.2	V		—	T	Hemphill	Sabine	
03 June 1964		93.9	3.1	III		—	T	Hamphill	Sabine	
03 June 1964		94.0	3.6	IV		—	T	Hemphill	Sabine	
09 June 1981		94.28	3.2	III		—	T	Center	Shelby	
06 Nov. 1981		95.92	3.3	V		800	T	Jacksonville	Anderson	
Comments: Reports of minor damage include cracks in concrete patios and windows and a broken water pipe.										
18 Sept. 1985	15:54:04	33.47	97.04	3.3		V	700	T	Valley View	Cooke
31 May 1997	03:26:41	33.2	96.1	3.4		IV	1,100	T	Commerce	Hunt
Comments: Slight damage reported.										
31 Oct. 2008		97.03	3.0	IV		—	M	DFW airport	Tarrant	
16 May 2009		97.02	3.3	IV		—	M	DFW airport	Tarrant	
16 May 2009		97.10	3.0	-		—	M	DFW airport	Tarrant	
17 Jul. 2011		97.08	3.0	IV		—	M	Cleburne	Johnson	
18 Jan. 2012		97.49	3.3	IV		—	M	Cleburne	Johnson	
15 Jun. 2012		97.27	3.3	IV		—	M	NW of Cleburne	Johnson	

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24 Jun. 2012	97.29	3.5	IV	—	M	NW of Cleburne	Johnson
30 Sep. 2012	96.98	3.4	IV	—	M	DFW airport	Tarrant
30 Sep. 2012	96.96	3.1	-	—	M	DFW airport	Tarrant

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Past Occurrence of Earthquake in Hopkins County

Hopkins County will continue to monitor earthquake activity. There is no record of earthquake in Hopkins County. However, there has been an increase in fracking in the area. Fracking has been connected to increased earthquake activity in some areas.

The website FracFocus.org, a chemical disclosure registry, provided information regarding the location of fracking wells in Hopkins and neighboring counties. The following is a list of Hopkins and adjoining counties with fracking activity. Neighboring Wood county reports no seismic activity as a result of fracking. In the past wood county has had the most fracking activity with 15 fracking wells occurring in the last 15 years.

- Delta 0
- Fannin 0
- Franklin 0
- Hopkins 0
- Hunt 0
- Lamar 0
- Rains 0
- Wood 0

Hopkins County Earthquake Risk					
COMMUNITY	**POTENTIAL IMPACT 45%**	**PROBABLITY 30%**	**Warning 15%**	**Duration 10%**	**RISK**
Hopkins Unincorporated	Limited PRI 1	Unlikely PRI=1	< 6 hrs. PRI = 4	< 6 hrs. PRI = 1	Low 1.45
Como	Limited PRI 1	Unlikely PRI=1	<6 hrs. PRI = 4	< 6 hrs. PRI = 1	Low 1.45
Cumby	Limited PRI 1	Unlikely PRI=1	< 6 hrs. PRI = 4	< 6 hrs. PRI = 1	Low 1.45
Sulphur Springs	Limited PRI=1	Unlikely PRI=1	< 6 hrs. PRI = 4	< 6 hrs. PRI = 1	Low 1.45

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Hopkins County Critical Facilities				
Critical Facilities	**Como**	**Cumby**	**Sulphur Springs**	**Hopkins County**
City Hall	1	1	1	
Fire Station				15
Civic Center	1	1	2	1
Govt. Facility				2
Wastewater Treatment Plant	1	1	1	
Corrections Facility			1	1
Hospital			1	1
Maintenance Barn			1	1
Post Office	1	1	1	8
Water Tower	1			
Police Station		1	1	3
Sheriff Office				1
EMS				
Public Schools	2	3		6
Water Treatment Plant				
County Seat and offices			1	1

Probability: The Northeast Texas region is at risk from very large, distant earthquakes which might occur in Missouri-Tennessee or Oklahoma; the earthquakes that pose such a hazard are rare, probably occurring only once per 500 years or less. Such distant earthquakes would be most likely to damage large buildings or poorly reinforced masonry structures. Earthquakes with epicenters within this region are rare and small. Several earthquakes with magnitudes 3 to 4.5 will probably occur each century. These pose little or no risk unless their epicenters are extremely close to poorly built or very sensitive structures. The increased oil and gas fracking activity could increase the likelihood of an earthquake. Damage from this type of earthquake is minimal.

Location: All of Hopkins County including the participating jurisdictions of Como, Cumby, and Sulphur Springs could experience earthquake activity.

Vulnerability: The principal hazard is from rare, distant, but very large earthquakes occurring outside of Texas and there is mounting scientific evidence that the process for fracking for gas and oil wells may increase the likelihood of mild quakes. Hopkins County and its participating jurisdictions share a vulnerability rating of low. There is no history of significant impacts to property, infrastructure or public safety.

Impact: There has never been an earthquake in Hopkins County, and the County would probably receive minimal damage from distant earthquakes. The process of fracking has also begun in Hopkins County. **Como** population 695 has gas stations, convenience stores and a K-12 public school that could be damaged from an earthquake. Merchandise could fall off the shelves in the small stores and shops. In the school children could be injured by wall mounted equipment falling. **Cumby** population 780 has a K-12 school on a single campus. Wall mounted technology and educational displays could cause injury. There are also two restaurants and a convenience store that could suffer have their businesses disrupted due to broken gas line or in extreme circumstance

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downed power lines. **Sulphur Springs** population 15,868 is the largest city in Hopkins County and it would be the most likely jurisdiction to suffer damage due to building and population density. Items could be thrown to the floor in grocery stores and shops. Interstate 30 runs through Sulphur Springs and there are many eateries and shops on or close to the exits. The historic Hopkins County Courthouse could be damaged from shifting foundations or cracks in mortar and water lines could crack and the K-12 public school falling debris could injure teachers and children.

Estimated Structure loss at 25%	
Como	$4,361,620
Cumby	$6,101,792.5
Sulphur Springs	$270,780,200.25

Summary: Architects and planners should be informed about oil and gas fracking activity in the areas and the possibility of distant earthquakes that could affect large and sensitive structures in Northeast Texas. Sensitive structure, including dams, towers, very tall buildings, bridges, and highway overpasses, should be constructed with the possibility of earthquakes in mind. Residents should understand that small earthquakes occasionally do occur in this region, including some induced by petroleum production. They should be informed that the principal hazard is from rare, distant, but very large earthquakes occurring outside of Texas in neighboring states.

You can no more win a war than you can win an earthquake.

Jeannette Rankin: 1st woman in US congress

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DAM FAILURE

A dam is "any barrier, including one for flood detention, designed to impound liquid volumes and which has a height of dam greater than six feet. This does not include highway, railroad or other roadway embankments, including low water crossing that may temporarily detain floodwater, levees designed to prevent inundation by floodwater, closed dikes designed to temporarily impound liquids in the event of emergencies, or off-channel impoundments authorized by the commission in accordance with Texas Water Code, Chapter 26, or the Texas Solid Waste Disposal Act, Texas Civil Statutes Article 4477-7". (Regulations section 299.1).

The FEMA states that there are 75,900 dams in the United States, according to the 2005 update to the National Inventory of Dams. Approximately one third of these pose a "high" or "significant" hazard to life and property if failure occurs. Dam failure or levee breeches can occur with little warning. Intense storms may produce a flood in a few hours or even minutes for upstream locations. Flash floods occur within six (6) hours of the beginning of heavy rainfall, and dam failure may occur within hours of the first signs of breaching. Other failures and breeches can take much longer to occur, from days to weeks, as a result of debris jams or the accumulation of melting snow.

There have been no recorded dam failures in Hopkins County. However, dam failure is being profiled as a hazard at the suggestion of Mr. Van Meredith, Mitigation Plan Reviewer for FEMA, since dam failure was mentioned under the profiled hazard "Earthquakes". The statement was made that "Earthen or earth-filled dams are of special concern since intense shaking or sloshing could cause dam failure."

Each dam in the *National Inventory of Dams* is assigned a downstream hazard classification based on the potential for loss of life and damage to property should the dam fail. The classification has nothing to do with the condition or structure of the dam or whether the dam is about to collapse. Dams are classified by size and hazard potential:

Size Classification		
Category	**Storage (ac-ft)**	**Height (ft)**
Small	Less than 1000	Less than 40
Intermediate	1000-49,999	40-99
Large	50,000+	100+

Height of dam is "the vertical distance from the effective crest of the dam to the lowest elevation on the centerline or downstream toe of the dam including the natural stream channel. Texas Water Code, Chapter 26, or the Texas Solid Waste Disposal Act, Texas Civil Statutes Article 4477-7. Regulations section 299.1).

Hazard Classification (Severity)		
Category	**Loss of Life**	**Economic Loss**
Low (L)	None Expected	Minimal
Significant (S)	Possible, but none expected	Appreciable
High (H)	Expected	Excessive

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Texas has more dams listed in the National Inventory of Dams than any other state. Currently, there are 7,069 dams listed in the National Inventory of Dams, and 42 of those dams are located within Hopkins County.

The following table lists the dams in Hopkins County.

HOPKINS COUNTY DAMS

NID ID	DAM NAME	STORAGE (AC-FT)	HEIGHT (FT)	HAZARD CLASSIFICATION CATEGORY
TX00645	GAMBLIN LAKE DAM	264	22	L
TX00646	WHOLECATTLE FEEDERS DAM B	198	16	L
TX00647	ELBERTA LAKE DAM	243	19	L
TX00648	STEWART LAKE DAM	250	20	L
TX00649	BERRY LAKE DAM	202	18	L
TX00650	CRUSH LAKE DAM	397	16	L
TX00651	UPPER LAKE FORK CREEK WS SCS SITE 21 DAM	1786	30	L
TX00652	UPPER LAKE FORK CREEK WS SCS SITE 19 DAM	1056	33	L
TX00663	UPPER LAKE FORK CREEK WS SCS SITE 23 DAM	5056	35	L
TX00664	UPPER LAKE FORK CREEK WS SCS SITE 22 DAM	1502	33	L
TX00665	UPPER LAKE FORK CREEK WS SCS SITE 13 DAM	4288	32	L
TX00666	UPPER LAKE FORK CREEK WS SCS SITE 14 DAM	768	26	L
TX00667	WHOLECATTLE FEEDERS DAM A	174	15	L
TX00668	DA JORDAN ESTATE LAKE DAM	132	10	L
TX00669	RAILROAD POOL DAM	346	18	L
TX00670	PATTERSON LAKE DAM	619	18	L
TX00653	UPPER LAKE FORK CREEK WS SCS SITE 18 DAM	1730	30	L
TX00654	UPPER LAKE FORK CREEK WS SCS SITE 17 DAM	1600	27	L
TX00656	JAMES R BECK LAKE DAM	109	13	L
TX00657	GOODING LAKE DAM	90	16	L
TX00658	HELM LAKE NO 1 DAM	314	28	L
TX00659	HELM LAKE NO 2 DAM	184	23	L
TX00660	SULPHUR SPRINGS COUNTRY CLUB DAM	145	19	L
TX00661	LAKE COLEMAN DAM	733	18	H

TX00662	UPPER LAKE FORK CREEK WS SCS SITE 12 DAM	1301	27	L
TX04249	UPPER LAKE FORK CREEK WS SCS SITE 15A DAM	1869	30	L
TX04356	LAKE SULPHUR SPRINGS DAM	34700	34	H
TX04474	UPPER LAKE FORK CREEK WS SCS SITE 16B DAM	1131	27	L
TX04475	UPPER LAKE FORK CREEK WS SCS SITE 16C DAM	669	21	L
TX05412	TX NO NAME NO 37 DAM	140	18	L
TX05414	TX NO NAME NO 38 DAM	119	16	L
TX05415	HELM LAKE NO 3 DAM	155	26	L
TX05416	JENNINGS LAKE DAM	117	17	L
TX05417	TX NO NAME NO 39 DAM	200	25	L
TX05418	TX NO NAME NO 40 DAM	51	16	L
TX06354	JOHNSON KNIGHT LAKE DAM	318	22	L
TX06359	CAMPS LAKE DAM	51	21	L
TX06447	CROSS TIMBER RANCH LAKE NO 1 DAM	846	23	L
TX06719	UPPER LAKE FORK CREEK WS SCS SITE 20C DAM	1441	31	L
TX06888	DE VRIES LAKE DAM	255	19	L
TX06911	DEREK LAMBERT DAM	88	15	L
TX08012	JIM CHAPMAN LAKE	797300	95	L

There is no past occurrence on record of dam failure in Hopkins County.

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Hopkins County Dam Failure Risk					
COMMUNITY	**POTENTIAL IMPACT 45%**	**PROBABLITY 30%**	**Warning 15%**	**Duration 10%**	**RISK**
Hopkins Unincorporated	Limited PRI = 1	Unlikely PRI = 1	< 6 hrs. PRI = 4	< 6 hrs. PRI =1	Low PRI = 1.45
Sulphur Springs	Major PRI =3	Unlikely PRI = 1	< 6 hrs. PRI = 4	< 6 hrs. PRI =1	Medium PRI= 2.35

Hopkins County Critical Facilities				
Critical Facilities	**Como**	**Cumby**	**Sulphur Springs**	**Hopkins County**
City Hall	1	1	1	
Fire Station				15
Civic Center	1	1	2	1
Govt. Facility				2
Wastewater Treatment Plant	1	1	1	
Corrections Facility			1	1
Hospital			1	1
Maintenance Barn			1	1
Post Office	1	1	1	8
Water Tower	1			
Police Station		1	1	3
Sheriff Office				1
EMS				
Public Schools	2	3		6
Water Treatment Plant				
County Seat and offices			1	1

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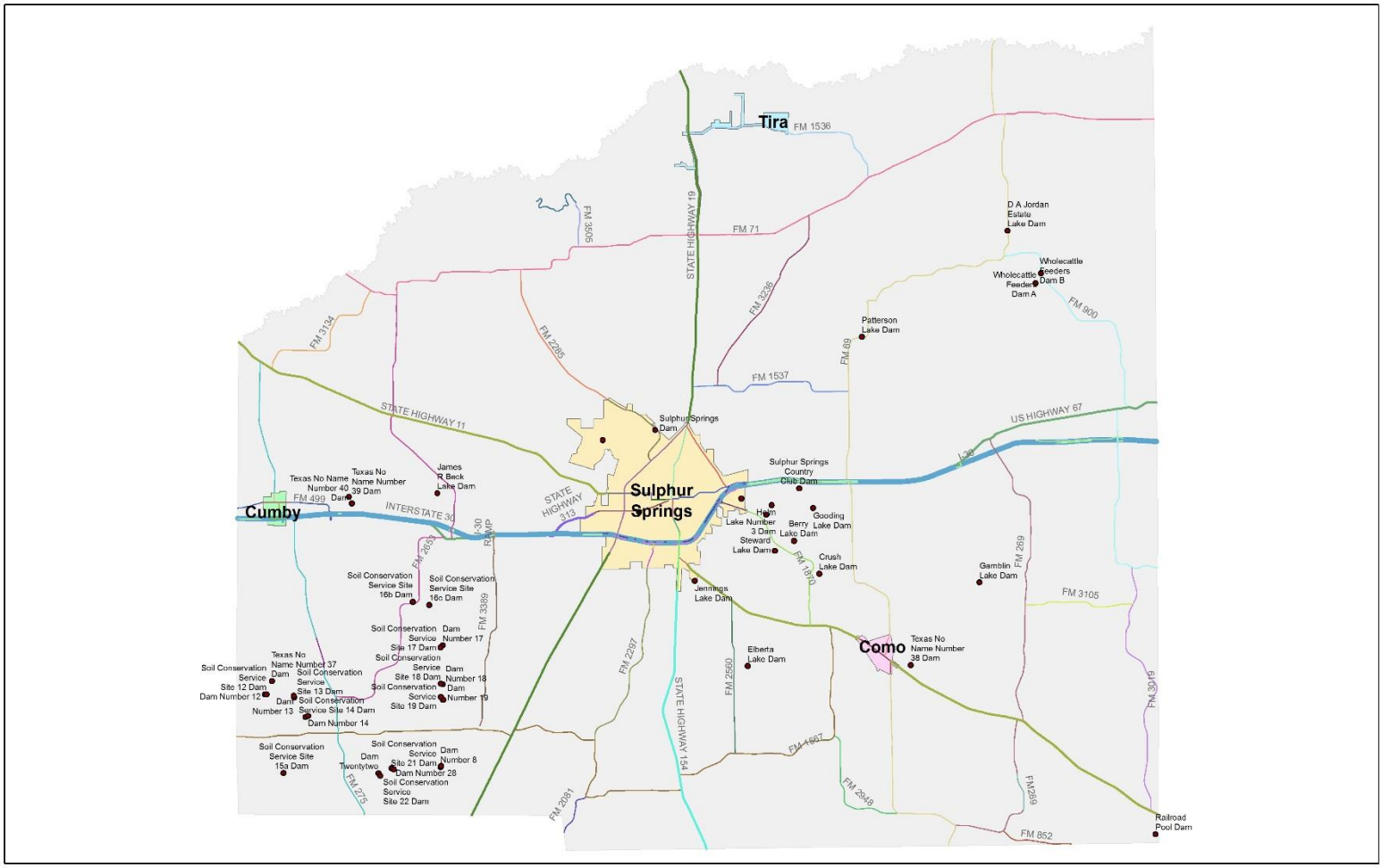
Hopkins County Dams



Location: Dams are located in the rural areas of Hopkins County, including the participating jurisdictions of Como, Cumby, and Sulphur Springs. There is a total of 42 dams listed in Hopkins County, most of which are small and having a hazard rating of low. Most of the dams are in rural Hopkins County, in the Southwest part of the County south of Interstate 30, and the Southeast section of the County in the Helm Lake and Crush Lake areas along FM 1870 between Interstate 30 and Highway 11. These rural areas would experience limited impact if there was a dam failure. The two Sulphur Springs dams of Lake Sulphur Springs and Coleman Lake will be the main focus because they have a High risk rating. (See map on preceding page.)

Probability: There is no local history of a dam breaking in Hopkins County and it is unlikely that a dam will break anywhere in the county. Sulphur Springs could experience the most damage should a dam break. The region is at risk of dam failure if there is ever a large, distant earthquake which might occur in Missouri-Tennessee or Oklahoma. The hazard is rare and poses little or no risk. Historically, since there have been no dam failures in Hopkins County, the probability is unlikely.

Vulnerability: Sulphur Springs is the most vulnerable of all the jurisdictions in Hopkins County. According to the Texas Dam Safety Program, heavy rains after a severe drought leave earthen dams vulnerable. Lake Sulphur Springs and Lake Coleman have hazard ratings of high. S*hould one of the dams collapse major property damage and death could occur.*

Impact: A breach of the Lake Sulphur Springs Dam embankment would have a width of 90.9 feet and would result in a maximum peak flow from the reservoir of 114,092 cfs. The flood wave resulting from such a breach would travel downstream through the floodplain of White oak Creek, attenuating approximately 17 miles downstream of Lake Sulphur Springs Dam. As time is not a factor in any of the calculations, it is not possible to determine warning time for locations downstream of the dam using the simplified breach methodology.
According to the results of the PMF analysis, Lake Coleman Dam is hydraulically adequate in its current condition. It passes 90 percent of the PMF, which meets state criteria. Alternatively, the top of the dam could be raised to a constant 519 ft.-msl. To allow the dam to pass 100 percent of the PMF.

According to the results of the simplified breach analysis described in the new TCEQ hydrologic and hydraulic guideline, a breach of the Lake Coleman Dam embankment would have a width of 44.1 feet and would result in a maximum peak flow from the reservoir of 9,073 ofs. The flood wave resulting from such a breach would travel downstream through the floodplain of Coleman Creek, attenuating approximately 3.5 miles downstream of Lake Coleman Dam at the confluence with White Oak Creek. As time is not a factor in any of the calculations, it is not possible to determine warning times for locations downstream of the dam using the simplified breach methodology.

The National Inventory of Dams shows the Cooper Dam, located at Jim Chapman Lake, aka, Copper Lake, as having a hazard classification level of high, but according to the Army Corp of Engineers, they have little concern regarding the possibility of the dam failing. The dam has a high hazard classification because of what *could* happen *should* it be breached, The Corp

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representative also explained that because of the dam's good condition there are no descriptions regarding inundation. Maps are available through the Corp, for in-office use only and cannot be placed in a plan. There are no other known sources of inundation maps available. The Corp representative did share that their maps indicated dam failure could impact Hopkins, Delta and Red River Counties. Hopkins County recognizes this a **data deficiency**. As a corrective action to this **data deficiency**, Hopkins County is proposing a mitigation action to conduct an inundation study for the portion of the inundation area that lies within its boundary.

Estimated Property Loss at 25%		
Hopkins County	Residential	$351,204,392.50
Sulphur Springs	Residential	$125,050,367.50

Summary: It is unlikely that a dam break will occur that would have more than a limited effect on most of the County. Sulphur Springs would possibly experience major damage should Lake Sulphur Springs Dam, or Lake Coleman Dam, break. Both have a hazard rating of high. Lake Jim Chapman lies in the rural area of Hopkins County and Delta County. More damage would occur in neighboring counties should the dam break. In accordance with **Title 30 Texas Administrative Code (TAC) Chapter 299, Dams and Reservoirs, §299.61(b)**, owners of significant and high hazard dams were required to submit an Emergency Action Plan, which may be a draft version, to the executive director for review by January 1, 2011. The High Hazard Dams of Sulphur Springs Lake and Coleman Lake have an EAP Plan in accordance with this code. The jurisdictions of Como and Cumby do not have actions related to dams.

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An Ant may well destroy a whole dam. **Chinese Proverb**

WILDFIRE

Wildfires typically start in woodland or prairie areas. They can occur naturally though they are often exacerbated by human activities. Wildfires can be hard to control as they threaten homes and communities located nearby. Wildfires happen in every state, and they do not respect county or state lines. The impact of fire reaches well beyond the initial flames and smoke. Even if firefighters are able to protect homes and business, the aftermath of wildfire can be just as devastating as floods.

In Texas, the greatest high-danger fire threats are forest, brush and grass fires. The East Texas Piney Woods belt of commercial timber is most susceptible to forest fires. In East Texas, the most monetary damage was caused by arson. Arsonists were responsible for 1 of every 4 fires. Debris burning is and continues to be the major cause of fires. Other causes such as control burns, construction fires and other miscellaneous fires rank second.

A HISTORY OF WILDFIRES IN TEXAS

Texas has had some significant fires in the urban wild land interface areas, where combustible homes meet combustible fuels. In 1996, the Poolville, Texas Fire burned 141structures and 16,000 acres in Parker and Wise counties west of Fort Worth. During the 2000 fire season, 48 homes were lost to wildfires in Texas that burned more than a quarter of a million acres.

In 1996, a historical record number of fires and losses in terms of acreage lost due to fires that burned across the state during a four-month period of the traditional fire season in the state. A total of 113 homes and 170,000 acres were lost due to fire in what is undoubtedly the worst siege of fire in the history of Texas. Over three hundred- trained fire fighters were brought in from across the nation to assist and supplement the Texas Forest Service personnel in control of these fires. The Southern States Forest Fire Compact was invoked in order for Texas to receive help in terms of personnel and equipment from neighboring states.

"The Bastrop County Complex fire was a major wildfire that struck Bastrop County, Texas**,** between September and October 2011. Three separate fires started on September 4, 2011, during Labor Day weekend, and merged into one large blaze that burned east of the city of Bastrop. 1,691 homes were destroyed by the fire, making it the most destructive single wildfire in Texas history. After being largely contained in late September, the fire was finally declared controlled on October 10, and declared extinguished on October 29, having killed two people and inflicted an estimated $325 million of insured property damage.

On September 20, 2011, fire officials reported that the likely cause of the blaze was sparks from electric power lines. 30-mile-per-hour gusts of wind on September 4 apparently toppled trees which tumbled into electrical lines at two locations, creating sparks that fell onto and ignited the dry grass and leaf litter below." **Wikipedia**

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Major Fire Causes – East Texas Commercial Forest Regions - 1966

Rank	Cause	Percentage
1	Debris burning	55.5
2	Arson	10
3	Miscellaneous	21.5
4	Equipment/railroads	5
5	Lightning	3.5
6	Smoking	2
7	Campfires	1.5

Should any part of the State of Texas experience extended periods of fair, windy weather, implementation of countywide bans on outdoor burning may be advised as a Wildfire prevention tool in that area. The Texas Forest Service recommends that local governments consider a KBDI of 600 and above for imposition of burn bans. Other indicators that dictate the need for a burn ban include: 1000 HR fuel moisture, Energy Release Component and run occurrence of local fire departments.

The Keetch-Byram Drought Index (KBDI) is basically a mathematical system for relating current and recent weather conditions to potential or expected fire behavior. The KBDI is the most widely used drought index system by fire managers in the south. It is also one of the only drought index systems specifically developed to equate the effects of drought with potential fire activities. The result of this system is a drought index number ranging from 0 to 800 that accurately describes the amount of moisture that is missing. A rating of zero defines the point where there is no moisture deficiency and 800 is the maximum drought possible. These numbers correlate with potential fire behavior as follows in Table 2.20:

ISO FIRE PROTECTION CLASSES FOR HOPKINS COUNTY

Fire Protection Area	Protection Class	Primary Fire Response
Como	9/10*	Cumby FD
Cumby	7/9	Cumby FD
Sulphur Springs	5	Sulphur Springs FD

*Split class means that all properties within 1,000 feet of a water supply (fire hydrant) and within 5 road miles of a fire station are eligible for the first class (Class 1 through 8). Properties more than 1,000 feet from a water supply from a water supply but within 5 road miles of a fire station are eligible for Class 9. All properties more than 5 road miles from a fire station are Class 10.

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Expected Fire Conditions with Varying KBDI Levels	
0 – 200 Low Fire Danger	Soil and fuel moisture is high. Most fuels will not readily ignite or burn. However, with sufficient sunlight and wind, cured grasses and some light surface fuels will burn in spots and patches.
200 – 400 Moderate Fire Danger	Fires more readily burn and will carry across an area with no "gaps". Heavier fuels will still not readily ignite and burn. Also, expect smoldering and the resulting smokes to carry into and possibly through the night.
400 – 600 High Fire Danger	Fire intensity begins to significantly increase. Fires will readily burn in all directions exposing mineral soils in some locations. Larger fuels may burn or smolder for several days creating possible smoke and control problems.
600 – 800 Extreme Fire Danger (600 – 800 continued)	Surface litter and most organic layers are consumed. 1000-hour fuels contribute to intensity. Stumps will burn to the end of roots underground. Any dead snag will ignite. Spotting from snags is a major problem if close to line. Expect dead limbs on trees to ignite from sparks. Expect extreme intensity on all fires that makes control efforts difficult. With winds above 10 miles per hour, spotting is the rule. Expect increased need for resources for fire suppression. Direct initial attack is almost impossible. Only rapid response time to wildfire with complete mop-up and patrol will prevent a major fire situation from developing.

Potential Wildfire Damages and Losses In Hopkins County

The "urban wildfire interface" is the geographical area where combustible homes are mixed with combustible vegetation. The determination of specific wildfire hazard sites depends on several factors.

- Topographic location and fuels
- Site/building construction and design
- Defensible space
- Accessibility
- Fire protection response
- Water availability.

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PAST OCCURRENCES OF WILDFIRES IN HOPKINS COUNTY

Hopkins County Wildfires 2013-2020								
Type of Fire	2013	2014	2015	2016	2017	2018	2019	2020
Natural Vegetation, other	7	0	9	9	11	10	1	1
Forest, woods or wildland	6	4	4	1	2	3	1	2
Brush or brush-and-grass mixture fire	18	8	33	27	11	23	15	18
Grass Fire	218	208	185	198	112	129	95	102
Total	249	220	231	235	136	165	112	123

Keetch-Byram Drought Index (KBDI) is an index used to determining forest fire potential. The drought index is based on a daily water balance, where a drought factor is balanced with precipitation and soil moisture (assumed to have a maximum storage capacity of 8-inches) and is expressed in hundredths of an inch of soil moisture depletion.

The drought index ranges from 0 to 800, where a drought index of 0 represents no moisture depletion, and an index of 800 represents absolutely dry conditions. Presently, this index is derived from ground based estimates of temperature and precipitation derived from weather stations and interpolated manually by experts at the Texas Forest Service (TFS) for counties across the state. Researchers at Texas A&M University are working with the TFS to derive this index from AVHRR satellite data and NEXRAD radar rainfall within a GIS.

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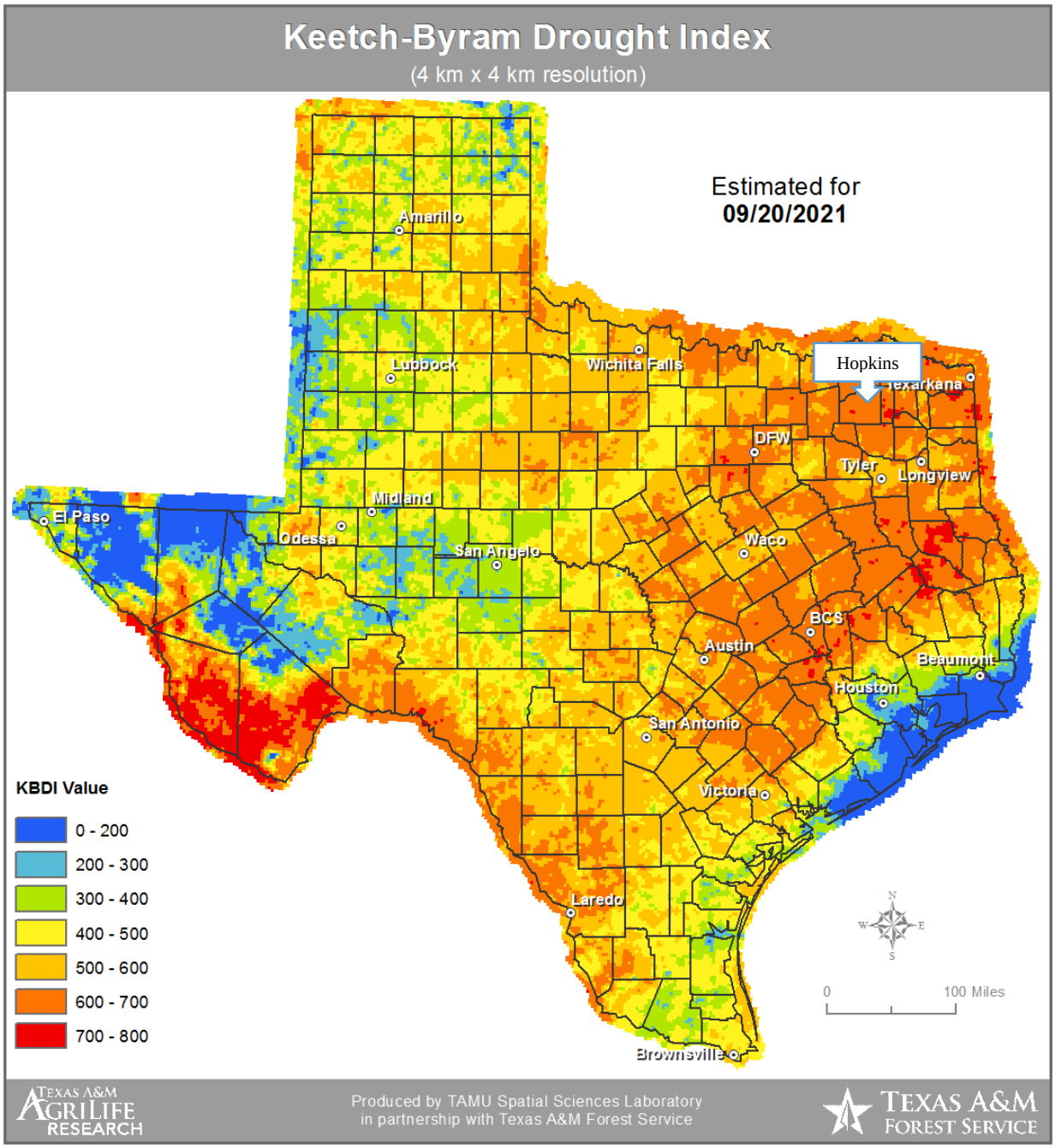
The map below shows the current (September 20, 2014) KBDI for Hopkins County at 600-700.



OUTDOOR BURN BANS

August 25, 2021

TEXAS A&M FOREST SERVICE

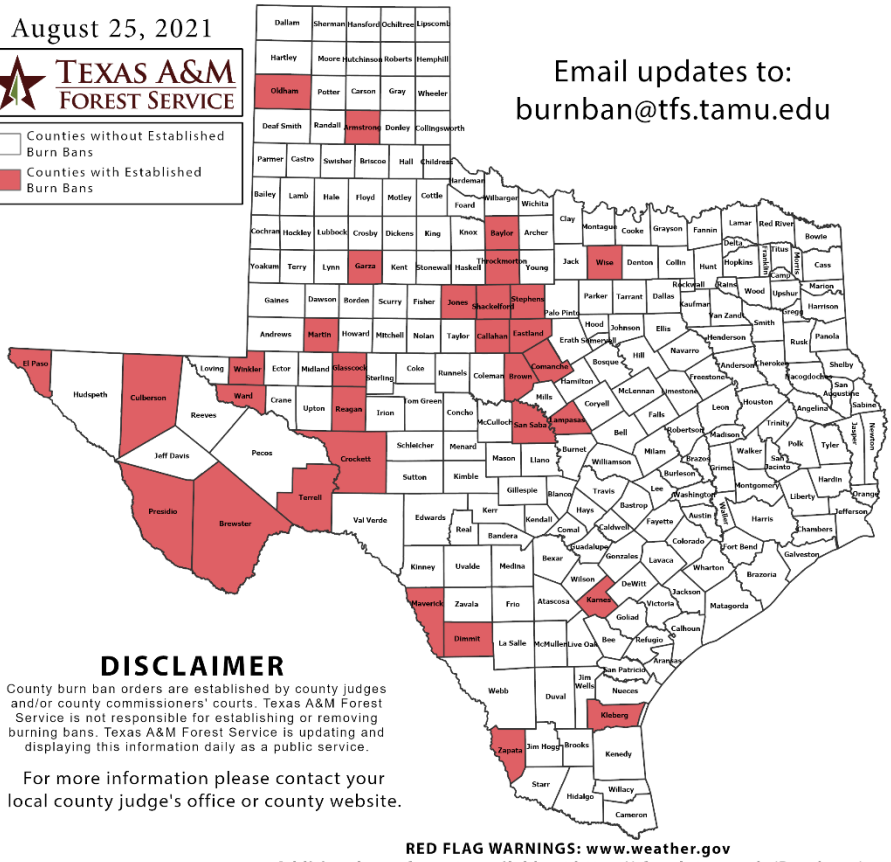
Counties without Established Burn Bans

Counties with Established Burn Bans

Email updates to:
burnban@tfs.tamu.edu

Counties with Burn Bans: 31

Armstrong
Baylor
Brewster
Brown
Callahan
Comanche
Crockett
Culberson
Dimmit
Eastland
El Paso
Garza
Glasscock
Jones
Karnes
Kleberg
Lampasas
Martin
Maverick
Oldham
Presidio
Reagan
San Saba
Shackelford
Stephens
Terrell
Throckmorton
Ward
Winkler
Wise
Zapata



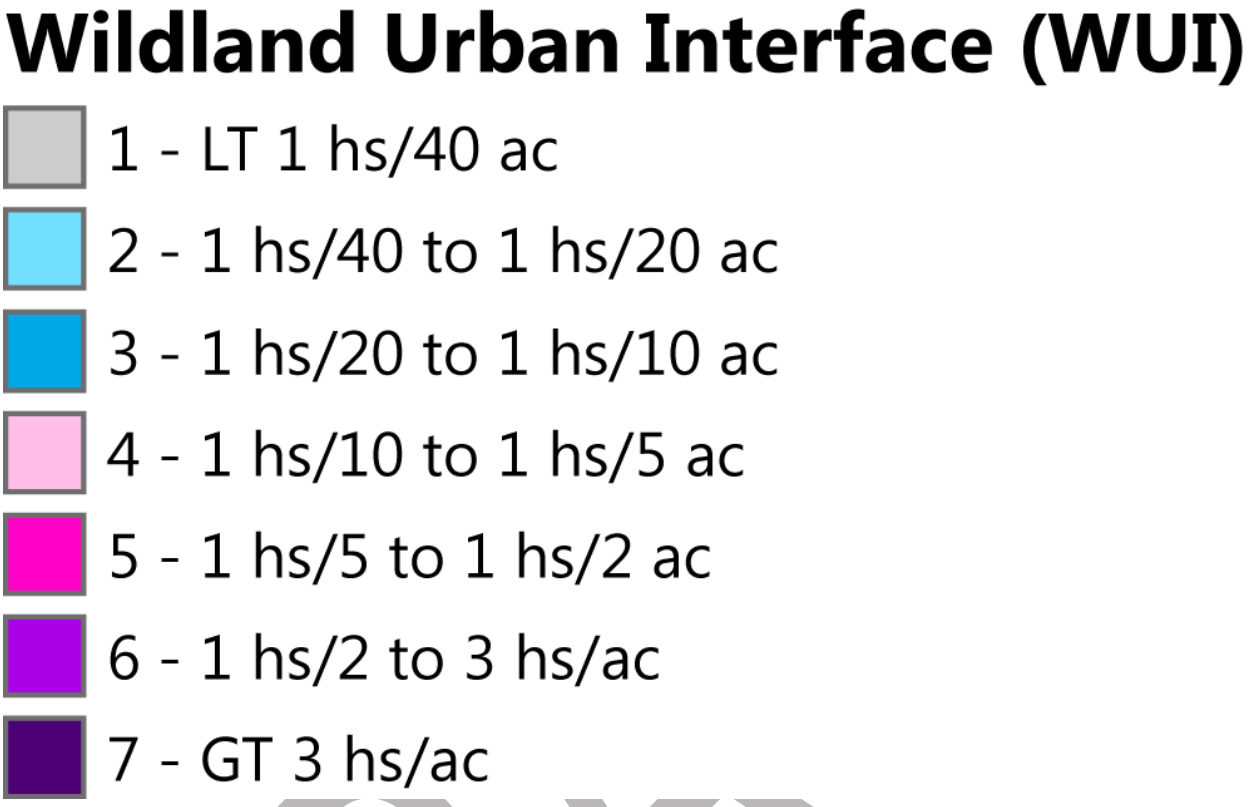
DISCLAIMER

County burn ban orders are established by county judges and/or county commissioners' courts. Texas A&M Forest Service is not responsible for establishing or removing burning bans. Texas A&M Forest Service is updating and displaying this information daily as a public service.

For more information please contact your local county judge's office or county website.

RED FLAG WARNINGS: www.weather.gov
Additional map formats available at https://tfsweb.tamu.edu/Burnbans/

Legend for the following Wildland Urban Interface maps



Legend:

LT=less than
hs=house
ac=acre
GT=greater than

No major land development has taken place in Hopkins County that would impact the need for updated Wildfire Urban Interface (WUI) maps.

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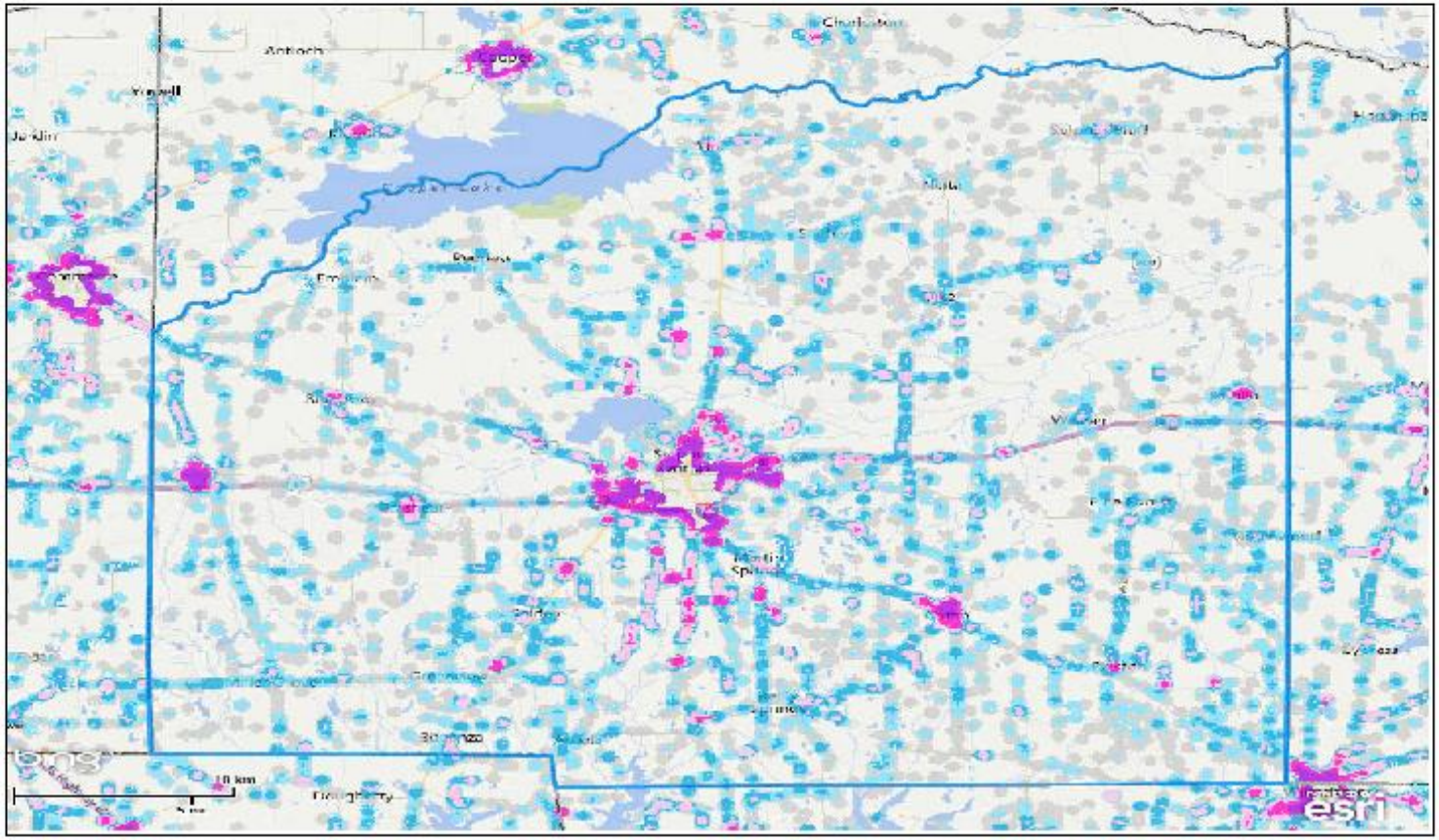
Hopkins County WUI

Depicts where humans and their structures meet or intermix with wildland fuels



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09/15/2015 2:00 PM

Texas Wildfire Risk Assessment 2010

www.texaswildfirerisk.com

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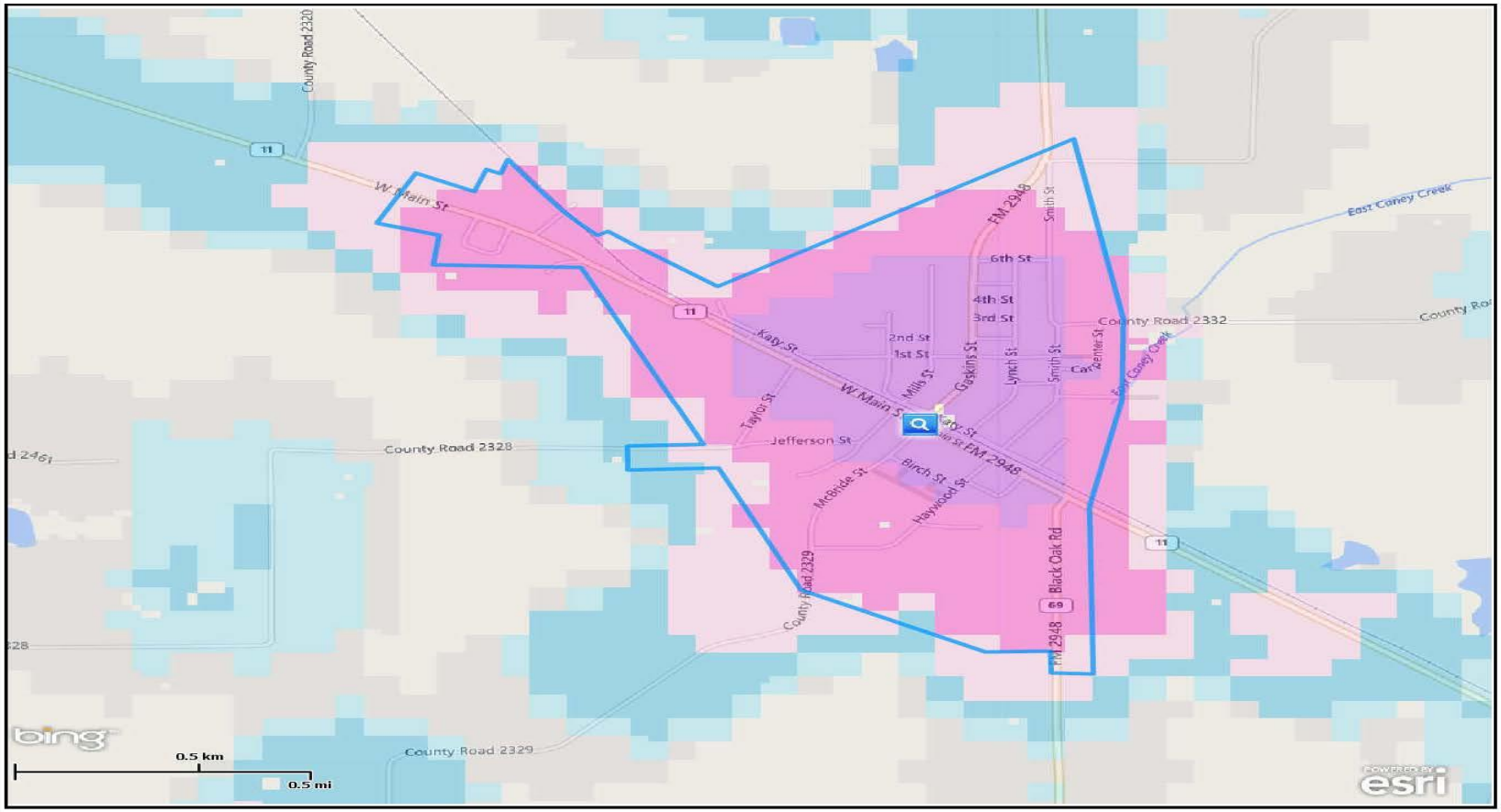
Como WUI



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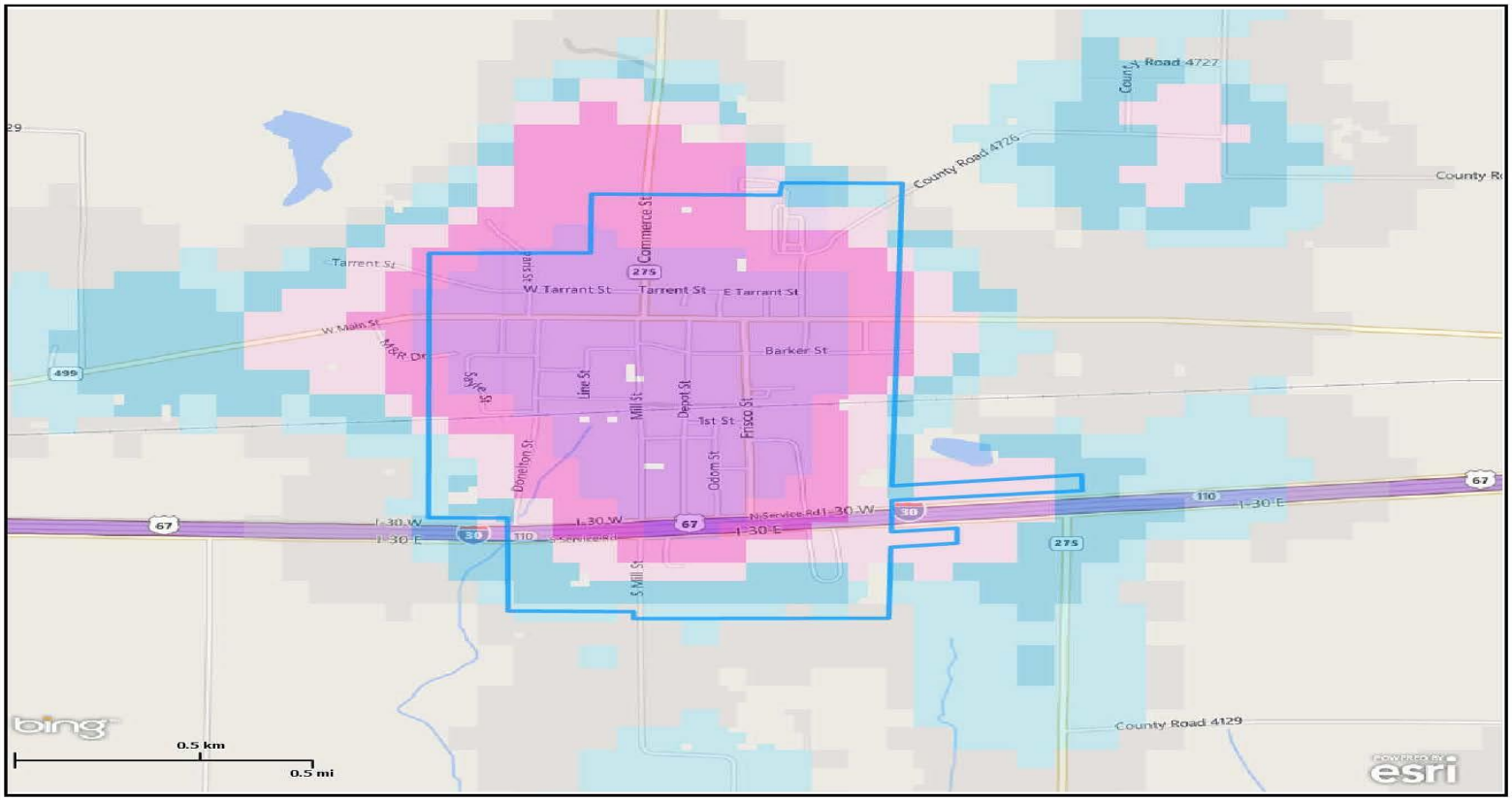
Cumby WUI



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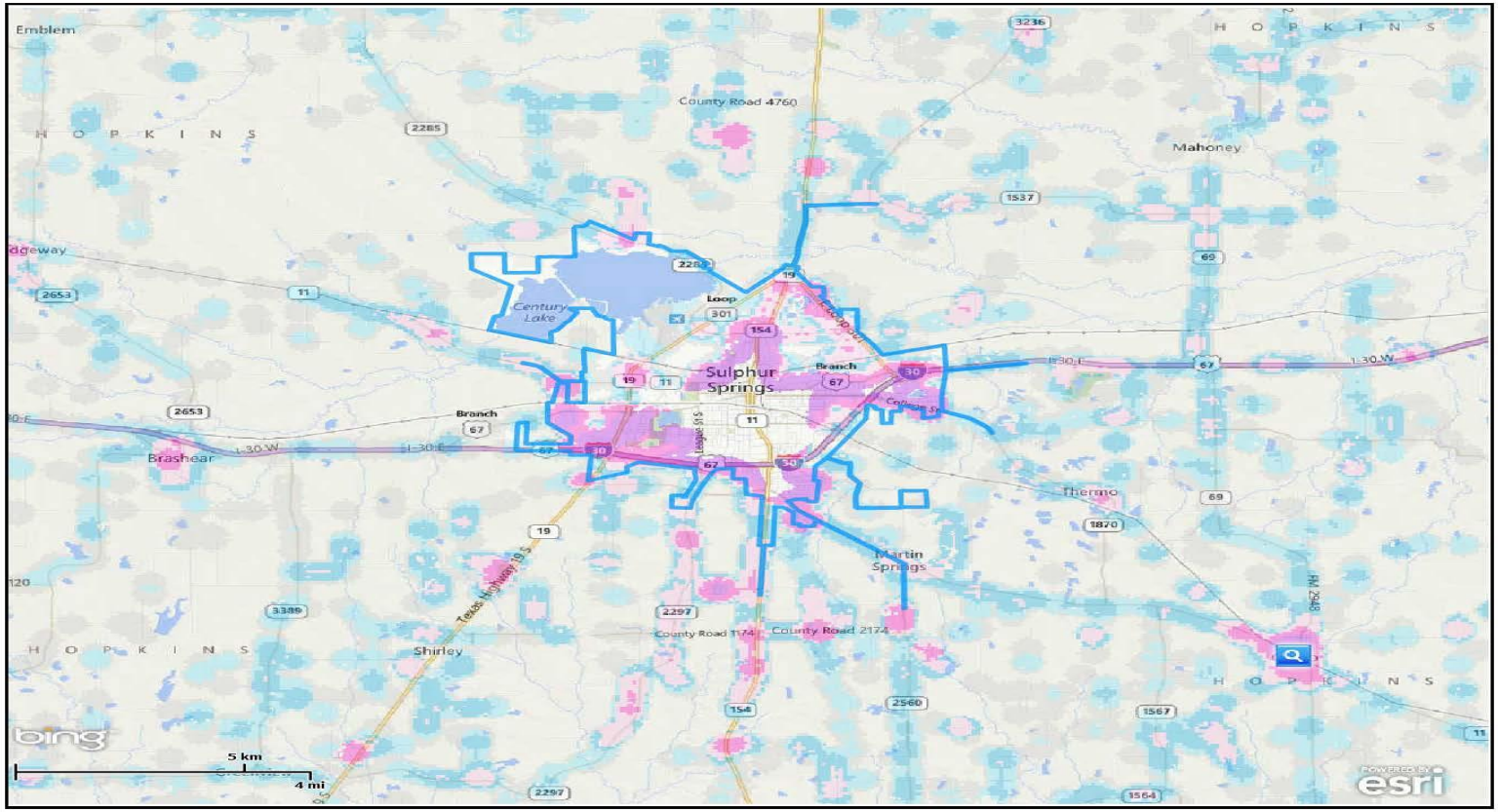
Sulphhur Springs WUI



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Texas Wildfire Risk Assessment 2010
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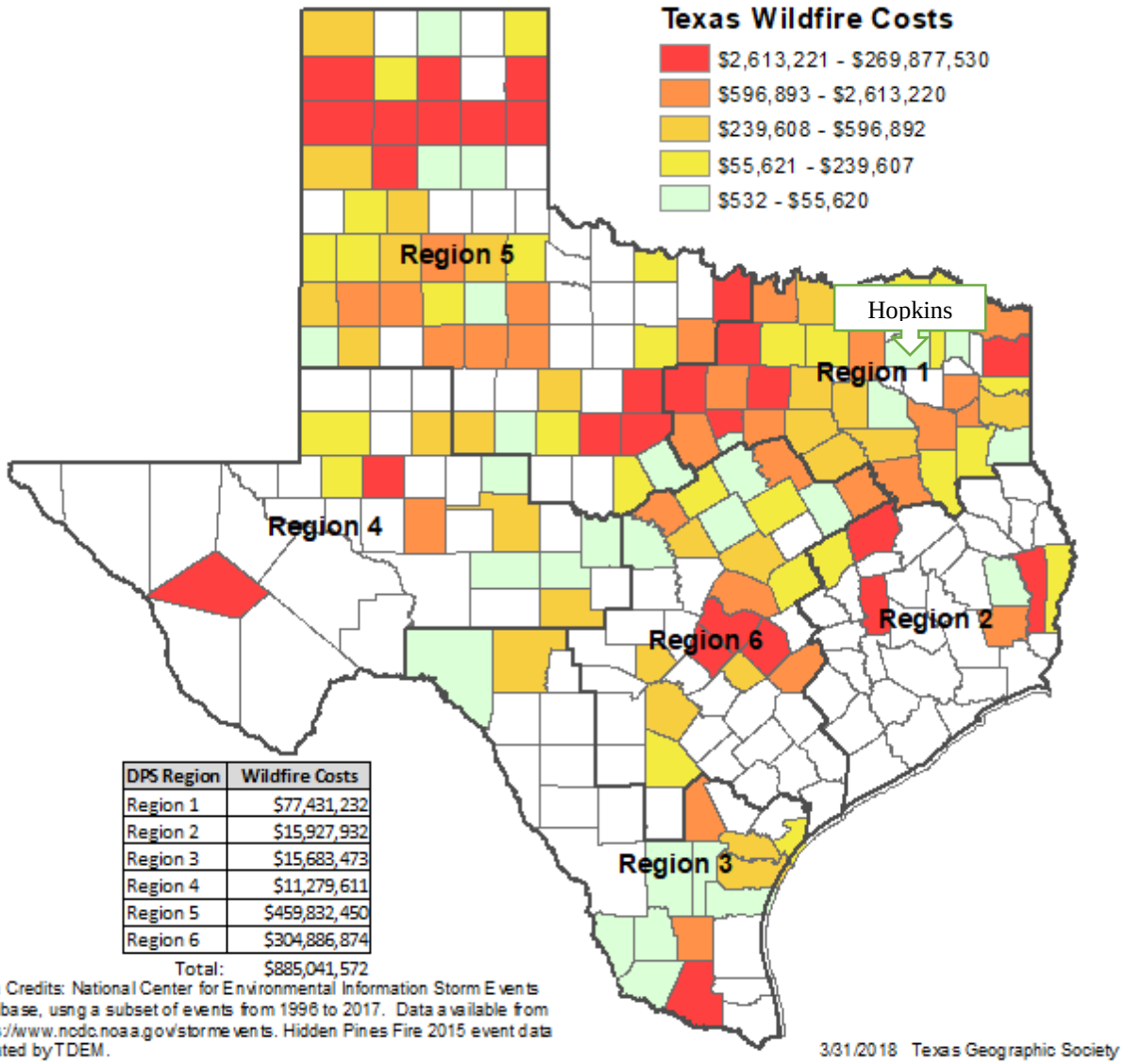
Historical Dollar Losses

illustrates the total county losses (property plus crop losses) from wildfires over the 21-year base period (1996 thru 2016). The different colors on the map represent the relative losses between counties within the state; white signifies zero dollars lost. The inset table reports total dollar losses for each region over the 21-year base period.



DPS Region	Wildfire Costs
Region 1	$77,431,232
Region 2	$15,927,932
Region 3	$15,683,473
Region 4	$11,279,611
Region 5	$459,832,450
Region 6	$304,886,874
Total:	$885,041,572

Data Credits: National Center for Environmental Information Storm Events Database, using a subset of events from 1996 to 2017. Data available from https://www.ncdc.noaa.gov/stormevents. Hidden Pines Fire 2015 event data updated by TDEM.

3/31/2018 Texas Geographic Society

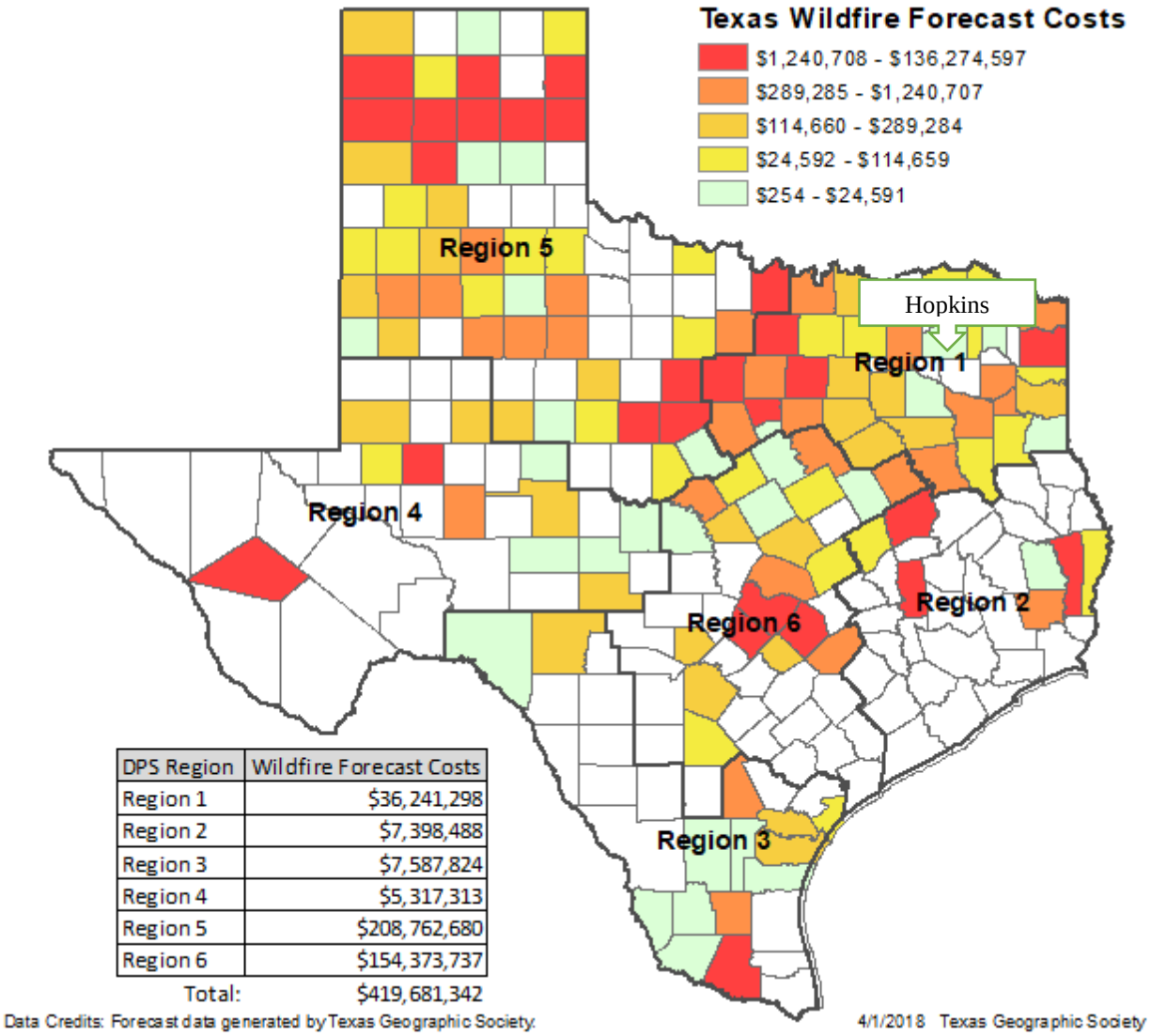
Future Risks

Results of the hazard impact forecast for wildfire are presented. Following this is a discussion and summary of risk statewide.

County Dollar Loss Forecast

This map shows the results of the forecast model for 2019-2023 for wildfire dollar losses at the county level. These are based on the locations of impacts in the base period and the likely locations of future losses.

Wildfire Dollar Loss Forecast



DPS Region	Wildfire Forecast Costs
Region 1	$36,241,298
Region 2	$7,398,488
Region 3	$7,587,824
Region 4	$5,317,313
Region 5	$208,762,680
Region 6	$154,373,737
Total:	$419,681,342

The forecast is an estimate of damages that are likely to occur if similar weather events re-occur in or near previously impacted areas during the base period. Future wildfires losses will not necessarily be in the same places they were in the past, but a strong correlation is likely.

WILDFIRES IN HOPKINS COUNTY

Hopkins County Wildfire Risk					
COMMUNITY	**POTENTIAL IMPACT 45%**	**PROBABLITY 30%**	**Warning 15%**	**Duration 10%**	**RISK**
Hopkins Unincorporated	Substantial PRI 4	Highly Likely PRI 4	< 6 hrs. PRI 4	< Week PRI 3	High 3.9
Como	Substantial PRI 4	Unlikely PRI 1	< 6 hrs. PRI 4	< Week PRI 3	Medium 2.85
Cumby	Substantial PRI 4	Unlikely PRI 1	< 6 hrs. PRI 4	< Week PRI 3	Medium 2.85
Sulphur Springs	Substantial PRI 4	Unlikely PRI 4	< 6 hrs. PRI 4	< Week PRI 3	Medium 3.9

Hopkins County Critical Facilities				
Critical Facilities	**Como**	**Cumby**	**Sulphur Springs**	**Hopkins County**
City Hall	1	1	1	
Fire Station				15
Civic Center	1	1	2	1
Govt. Facility				2
Wastewater Treatment Plant	1	1	1	
Corrections Facility			1	1
Hospital			1	1
Maintenance Barn			1	1
Post Office	1	1	1	8
Water Tower	1			
Police Station		1	1	3
Sheriff Office				1
EMS				
Public Schools	2	3		6
Water Treatment Plant				
County Seat and offices			1	1

Probability*:* Historical weather conditions indicate that the probability of occurrence is highly likely. The threat of fires cannot be eliminated but public education and the use of prescribed burns can be used to better manage this hazard in Hopkins County and participating jurisdictions. The Probability in unincorporated Hopkins County is greater because of the prevalence of dense vegetation and pasture.

Vulnerability: The most vulnerable month for wildfires is July. However, Como, Cumby, and Sulphur Springs have never been threatened by wildfires.

Historically, the danger lies in the rural areas of Hopkins County. Should a fire occur in Como, Cumby, or Sulphur Springs, framed homes and mobile homes would be very susceptible. The only acreage that is rated at even a moderate level (661 acres) is found in the rural parts of the county.

Hopkins County Wildfire Threat by Acreage						
			Como	Cumby	Sulphur Springs	Hopkins County
		Non-Burnable	1	1	4036	24,192
	1	Low	530		9185	280,486
	2			526		202,467
	3	Moderate				661
	4					
	5	High				
	6					
	7	Very High				

Impact: Data is not available to determine the extent that each fire must reach before it runs out of control. There were 318 fires reported to the Texas Forestry Service between 2006 and 2009.. The KDBI Levels of 200 (moderate) to 800 (extreme) are considered when mitigating wildfires. The county and participating jurisdictions will consider the full range of the KDBI scale when mitigating wildfires. See Damage Assessment tables on page ?? for estimates of financial impacts.

Estimated Structure loss at 25%	
Como	$3,093,668
Cumby	$2,885,605
Sulphur Springs	$169,558,441

Location: Due to heavy vegetation and dry conditions wildfire events in Hopkins County are possible any time during the year. All of Hopkins County and the jurisdictions of Como, Cumby, and Sulphur Springs could possibly be affected, depending on where the wildfire started.

Summary: There are no Hopkins County "Communities at Risk" listed in the Federal Register. The Texas register of "Communities at Risk." However, fires can destroy property, and homes causing injury and death. Fortunately, no lives were lost in any of the fires listed. It is important

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that communities have up to date emergency warning, reporting, and response systems in place. Well trained cohesive VFD's play a critical role in protecting people and property. The rural areas of Hopkins County are particularly at risk. However, most of the fires have been small and easily contained.

"The government is us; WE are the government, you and I" – **Theodore Roosevelt**

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SECTION IV
MITIGATION GOALS AND LONG TERM STRATEGY

GOALS

Mitigation Plan Goals

The Hopkins County Mitigation Action Plan goals describe the direction that Hopkins County agencies, organizations, and citizenry can take to minimize the impacts of natural hazards. Specific recommendations are outlined in the action items. These goals help guide direction of future activities aimed at reducing risk and preventing loss from natural hazards.

Goal #1: Protect Life and Property

- Implement activities that assist in protecting lives by making homes, businesses, infrastructure, critical facilities, and other property more resistant to natural hazards.
- Improve hazard assessment information to make recommendations for discouraging new development in areas vulnerable to natural hazards.

Goal #2: Public Awareness

- Develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards.
- Provide information on tools, and funding resources to assist in implementing mitigation activities.

Goal #3: Natural Systems

- Preserve, rehabilitate, and enhance natural systems to serve natural hazard mitigation functions.

Goal #4: Partnerships and Implementation

- Encourage leadership within public and private sector organizations to prioritize and implement local, county, and regional hazard mitigation activities.

Goal #5: Emergency Services

- Establish policy to ensure mitigation projects for critical facilities, services and infrastructure.
- Strengthen emergency operations by increasing collaboration and coordination among public agencies, non-profit organizations and business.
- Integrate natural hazard mitigation activities with emergency operation plans and procedures.

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Plan update mitigation strategy:

The previous goals and actions were never acted on and many of the old actions are no longer valid. This updated plan represents the most current data available regarding actions needed to reduce loss of life and property through mitigation. The five year update is seen as an opportunity to set actions in place that are current, valid and obtainable.

- A new way to measure risk has been introduced in the 5 year update. There are no changes noted that would impact the development of the plan.
- Added language reflects a desire to see that the Plan is acted upon in a measured fashion with at least annual meetings being held to monitor overall action priorities and progress.
- No natural event has occurred since the original plan that would alter the current plan's prioritization.
- There have been no new developments in the county or jurisdiction that would alter vulnerability. Hopkins County has experienced a 1.1% variation in population since 2010.
- There have been no changes politically or financially that would impact the plan's development.

Hopkins County recognizes the importance of dedicated involvement regarding the integration of the plan into existing county and participating jurisdiction plans and budgets and codes. Hopkins County has initiated a proactive course of action that includes annual reviews and reports to the Hopkins County Commissioners Court and the city councils of Como, Cumby and Sulphur Springs.

The presiding Hopkins County Judge or his/her appointed representative will maintain a schedule to ensure that the plan is addressed and updated in a timely manner.

The annual meetings will involve the gathering of hazard related data from the previous year and discussion of progress made toward action item implementation.
The HMAP Steering Committee will evaluate the plan to assess if significant changes have occurred in the premises upon which the plan was developed such as the following:

- Changes in data sources and/or methodology used to determine vulnerabilities and loss estimates, in terms of quality and availability
- changes in federal or state plans that could affect the continued implementation of any of the mitigation actions
- the identification of new hazards requiring new mitigation actions
- changes in community perception relative to specific hazards

In addition to these functions, the HMAP Steering Committee will work to educate and involve the public in hazard mitigation activities and to oversee the incorporation of this plan into future planning and public policy documents as these are updated or developed. The incorporation of this plan into other planning instruments will serve as an additional metric for success. This plan will ultimately be evaluated based on implementation of action items, the incorporation of

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mitigation principles into future public policy, improved public safety, and the overall reduction of losses for Hopkins County and the jurisdictions of Como, Cumby, and Sulphur Springs.

Method of Prioritization: Actions were prioritized using the **STAPLE+E** criteria. The actions do not adversely affect a particular segment of the population or cause relocation of lower income people. They provide long-term reduction of losses and have minimal secondary adverse impacts. They do not have adverse effects on the environment, and are consistent with the community's environmental goals, and have mitigation benefits while they are environmentally sound.

S – Social	Mitigation actions are acceptable to the community if they do not adversely affect a particular segment of the population, do not cause relocation of lower income people, and if they are compatible with the community's social and cultural values.
T – Technical	Mitigation actions are technically most effective if they provide long-term reduction of losses and have minimal secondary adverse impacts.
A – Administrative	Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.
P – Political	Mitigation actions can truly be successful if all stakeholders have been offered an opportunity to participate in the planning process and if there is public support for the action.
L – Legal	It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.
E – Economic	Budget constraints can significantly deter the implementation of mitigation actions. Hence, it is important to evaluate whether an action is cost-effective, as determined by a cost benefit review, and possible to fund.
E - Environmental	Sustainable mitigation actions that do not have an adverse effect on the environment, that comply with Federal, State, and local environmental regulations, and that are consistent with the community's environmental goals, have mitigation benefits while being environmentally sound.

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Hopkins County Actions
Hopkins County and Jurisdiction Hazards
Five Year Update

Como Mitigation Actions 2016				
HAZARD	**Location**	**ACTION**	**DISPOSITION**	**EXPLANATION**
Como				
Flood	Como	Construct waste-water overflow tank to contain overflow issues that currently exist during flash flooding.	Deferred	Will be addressed in current plan update
Flood	**Como**	Disseminate PSA's, Newspaper Articles through local media about dangers of flooded county roads and to "Turn Around; Don't Drown."	Completed and ongoing	
Tornado	**Como**	Construct a FEMA approved Safe Room for Citizens	Deferred	Wil be addressed in current plan update
Tornado	**Como**	Establish building codes for new buildings to meet minimum wind speed resistance standards.	Deferred	
Winter Storms	**Como**	Install backup generators at water and waste stations to protect water supply from contamination during power outages	Deferred	Will be addressed in current plan update.
Winter Storms	**Como**	Mitigate protecting power lines from the impacts of winter storms by establishing standards for all utilities regarding tree pruning around lines.	No longer a viable action	
Thunderstorm Winds	**Como**	Require tie-downs with anchors and ground anchors for manufactured homes	Deferred	Will be addressed in current plan update.
Thunderstorm Winds	**Como**	Install backup generators at water and waste stations to protect water supply from contamination during power outages	Deferred	Will be addressed in current plan update.
Hail	**Como**	Install hail resistant film on the windows of critical facilities	Deferred	
Hail	**Como**	Conduct a workshop and develop brochures educating residents on the likelihood of hailstorms and how protect their home and property from hail damage.	Will be reworded and Deferred	.

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Drought	**Como**	Conduct public workshops on conserving water, xeriscaping and managing drought impact.	Deferred	Will be addressed in current plan update
Drought	**Como**	Replace municipal appliances or equipment with water-saving models or parts.	Deferred	Will be addressed in current plan update
Extreme Heat	**Como**	Provide a cooling center for citizen in extreme heat events	Deferred	Will be reworded addressed in current plan update
Extreme Heat	**Como**	Conduct fan drives for low-income and elderly who cannot afford air conditioning	**Deferred**	
Wildfire	**Como**	Conduct a fire prevention campaign targeting defensible space around your home.	**Deferred**	
Wildfire	**Como**	Clear dense vegetation away from areas that are close to buildings or dwellings		
Earthquake	**Como**	Reduce potential damage to critical facilities and infrastructure from future seismic events by using flexible piping when extending water, sewer, or natural gas service.	**Deferred**	
Earthquake	**Como**	Develop an outreach program about earthquake risk and mitigation activities in homes, schools, and businesses such as securing filing cabinets and heavy appliances**.**	**Deferred**	
Dam Failure	**Como**	Dam Failure is not an identified Hazard for Como. There are no high risk dams located near Como.		

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Comprehensive Range of Specific Mitigation Actions Tables

The comprehensive range of specific mitigation actions being considered are listed below. A cost benefit review was performed to help decide which action items are feasible. The cost estimate and funding source are listed below. A cost benefit analysis will be performed prior to submission of any application to FEMA. Priorities listed below are defined as:

- High 1-3 Years
- Medium 4-7 Years
- Low 8+ Years.

Estimated Cost of Actions	
Low	0-$10,000
Medium	$10,000-$25,000
High	$25,000 +

COMO

NOTE: ***All Como projects are subject to availability of federal and local funding as well as availability of local staff to administer the project.***

Como Flood Mitigation Action #1	Construct waste-water overflow tank to contain overflow issues that currently exist during flash flooding
Mitigation Goal/Objective	Goal #1: Protect Life and Property
Priority	High
Funding Source(s)	FEMA and other grant sources
Estimated Cost	High (25k +)
Responsible Agency	Como
Estimated Completion Time	2 years
Effect on New Buildings	Could help protect new buildings from contaminated water overflow
Effect on Existing Buildings	Could help protect existing building from contaminated water overflow.
Comments:	

Como Flood Mitigation Action #2	Bi-Annual storm drainage cleaning program to be implemented to keep debris from hampering drainage
Mitigation Goal/Objective	**Goal #1** Protect Life and Property
Priority	High
Funding Source(s)	Como Annual Budget
Estimated Cost	Medium (10k-25k)
Responsible Agency	Como Public Works Department
Estimated Completion Time	3 years
Effect on New Buildings	This could protect new buildings from flash flooding
Effect on Existing Buildings	This could protect existing buildings from flash flooding
Comments:	

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Como Tornado Mitigation Action #1	Construct a FEMA approved Safe Room for Citizens
Mitigation Goal/Objective	Goal #1: Protect Life and Property
Priority	High
Funding Source(s)	FEMA Grant
Estimated Cost	High (25k+)
Responsible Agency	Como/
Estimated Completion Time	High 3 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

Como Tornado Mitigation Action #2	Establish building codes for new buildings to meet minimum wind speed resistance standards.
Mitigation Goal/Objective	Goal #4: Partnerships and Implementation
Priority	Low
Funding Source(s)	Como
Estimated Cost	Low (0-10K)
Responsible Agency	Como
Estimated Completion Time	8 years
Effect on New Buildings	Provides additional protection for high winds.
Effect on Existing Buildings	NA
Comments:	Como currently has no building codes

Como Winter Storm Mitigation Action #1	Install backup generators at water and waste stations to protect water supply from contamination during power outages.
Mitigation Goal/Objective	Goal #1: Protect Life and Property
Priority	Medium
Funding Source(s)	FEMA & other grants
Estimated Cost	Medium (25K +)
Responsible Agency	City of Como
Estimated Completion Time	6 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

Como Winter Storm Mitigation Action #2	Remove dead or rotting trees and branches that could fall and cause injury or damage during an ice storm. New
Mitigation Goal/Objective	Goal #: Protect Life and Property
Priority	High
Funding Source(s)	City of Como/ Hopkins County
Estimated Cost	Low (0-10K)
Responsible Agency	City
Estimated Completion Time	2 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

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Como Thunderstorm Winds Mitigation Action #1	Require tie-downs with anchors and ground anchors for manufactured homes.
Mitigation Goal/Objective	Goal #1: Protect Life and Property
Priority	High
Funding Source(s)	City of Como/Hopkins County
Estimated Cost	Medium (10-25k)
Responsible Agency	Hopkins County
Estimated Completion Time	1 year
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

Como Thunderstorm Winds Mitigation Action # 2	Install Backup generators at water and water stations to protect water supply from contamination during power outages.
Mitigation Goal/Objective	Goal #1: Protect Life and Property
Priority	High
Funding Source(s)	Como, FEMA Grant
Estimated Cost	High (25 k +)
Responsible Agency	City
Estimated Completion Time	3 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

Como Hail Mitigation Action #1	Install hail resistant film on the windows of critical facilities
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #2: Public Awareness Goal #4: Partnerships and Implementation
Priority	High
Funding Source(s)	City of Como
Estimated Cost	Low (0-10K)
Responsible Agency	Como
Estimated Completion Time	2 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	By monitoring local weather patterns we can better predict the likelihood of storms

Como Hail Mitigation Action # 2	Conduct a workshop for residents about the prevalence of hailstorms and how to protect your home and property form hail damage
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #2: Public Awareness
Priority	High
Funding Source(s)	City of Como
Estimated Cost	Low (0-10k)
Responsible Agency	City
Estimated Completion Time	2 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	Being properly insured can help with rebuilding.

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Como Drought Mitigation Action #1	Conduct public workshops on conserving water, xeriscaping and managing drought impact.
Mitigation Goal/Objective	Goal #2: Public Awareness
Priority	Medium
Funding Source(s)	City of Como
Estimated Cost	Low (0-10K)
Responsible Agency	City
Estimated Completion Time	4 years
Effect on New Buildings	By managing landscape could prevent foundation problems.
Effect on Existing Buildings	By managing landscape could prevent foundation problems.
Comments:	

Como Drought Mitigation Action # 2	Replace municipal appliances or equipment with water-saving models or parts.
Mitigation Goal/Objective	Goal #3: Natural Systems Goal #4: Partnerships and Implementation
Priority	High
Funding Source(s)	Como
Estimated Cost	Low (1-10K)
Responsible Agency	City
Estimated Completion Time	On-going
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	This could save money by cutting water usage

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Como Extreme Heat Mitigation Action #1	Provide a cooling center for citizen in extreme heat events.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #5: Emergency Services
Priority	Medium
Funding Source(s)	NA
Estimated Cost	Low (1-10k)
Responsible Agency	Como
Estimated Completion Time	4 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	Working together with churches and business groups

Como Extreme Heat Mitigation Action #2	Conduct a fan drives for low-income and elderly who cannot afford air conditioning
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #4: Partnerships and Implementation
Priority	High
Funding Source(s)	NA
Estimated Cost	Low (0-10K)
Responsible Agency	Como
Estimated Completion Time	2 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	Working with churches and business to fund project.

Como Wildfire Mitigation Action #1	Conduct a fire prevention campaign targeting defensible space around your home.
Mitigation Goal/Objective	Goal #2: Public Awareness
Priority	High
Funding Source(s)	City/Texas Forest Service
Estimated Cost	Low (0-10k)
Responsible Agency	Como
Estimated Completion Time	2 years
Effect on New Buildings	Raises awareness of wildfire/urban interface
Effect on Existing Buildings	Raises awareness of wildfire/urban interface
Comments:	

Como Wildfire Mitigation Action # 2	Clear dense vegetation away from areas that are close to buildings or dwellings.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #3: Natural Systems Goal #5: Emergency Services
Priority	Medium
Funding Source(s)	City/ County/State
Estimated Cost	Medium (10-25K)
Responsible Agency	Como
Estimated Completion Time	5 years
Effect on New Buildings	Protects new structures from wildfire dangers
Effect on Existing Buildings	Protects existing structures from wildfire dangers
Comments:	

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Como Earthquake Mitigation Action #1	Reduce potential damage to critical facilities and infrastructure from future seismic events by using flexible piping when extending water, sewer, or natural gas service.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #4: Partnerships and Implementation
Priority	Medium
Funding Source(s)	Hopkins County/Como
Estimated Cost	Medium (10-25K)
Responsible Agency	County/Como
Estimated Completion Time	6 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

Como Earthquake Mitigation Action #2	Develop an outreach program about earthquake risk and mitigation activities in homes, schools, and businesses such as securing filing cabinets and heavy appliances.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #2: Public Awareness
Priority	High
Funding Source(s)	Hopkins County/Como
Estimated Cost	Low (0-10k)
Responsible Agency	Como/County
Estimated Completion Time	3 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

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Cumby Mitigation Actions 2016				
HAZARD	**Location**	**ACTION**	**DISPOSITION**	**EXPLANATION**
Flood	**Cumby**	Participate in the "Turn Around Don't Drown Program"	Deferred	
Flood	**Cumby**	Place Permanent "***Caution Road May Flood"*** road signs in areas that are prone to flood.	Deferred	
Tornado	**Cumby**	Construct FEMA standard community safe room	Deferred	
Tornado	**Cumby**	Install backup generators at water and waste stations to protect water supply from contamination during power outages	Deferred	
Winter Storms	**Cumby**	Remove dead or rotting trees and branches that could fall and cause injury or damage during an ice storm	Deferred	
Winter Storms	**Cumby**	Install backup generators at water and waste stations to protect water supply from contamination during power outages	Deferred	
Thunderstorm Winds	**Cumby**	Require tie-downs with anchors and ground anchors for manufactured homes	Deferred	
Thunderstorm Winds	**Cumby**	Provide public workshops and information regarding mitigating homes against thunderstorm winds.	Deferred	
Hail	**Cumby**	Install hail resistant film on the windows of critical facilities	Deferred	
Hail	**Cumby**	Conduct a workshop for residents about the prevalence of hailstorms and how to protect your home and property from hail damage.	Deferred	
Drought	**Cumby**	Conduct public workshops on conserving water, xeriscaping and managing drought impacts..	Deferred	
Drought	**Cumby**	Establish water rationing protocol for times of intense drought.	Deferred	
Extreme Heat	**Cumby**	Develop and Implement Radio/TV/Newspapers PSA's advising public of heat advisories and mitigate extreme heat	Deferred	
Extreme Heat	**Cumby**	Provide cooling centers to assist the elderly and young	Deferred	

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CUMBY

NOTE: ***All Cumby projects are subject to availability of federal and local funding as well as availability of local staff to administer the project.***

Cumby Flood Mitigation Action #1	Participate in the "Turn Around Don't Drown Program"
Mitigation Goal/Objective	Goal #1: Protect Life and Property
Priority	Medium
Funding Source(s)	NA
Estimated Cost	NA
Responsible Agency	City of Cumby
Estimated Completion Time	4 years
Effect on New Buildings	Protects structures from flood damage
Effect on Existing Buildings	Protects structures from flood damage
Comments:	

Cumby Flooding Mitigation Action # 2	Place Permanent "***Caution Road May Flood"*** road signs in areas that are prone to flood.
Mitigation Goal/Objective	Goal #1: Protect Life and Property
Priority	High
Funding Source(s)	NA
Estimated Cost	Low (0-10k)
Responsible Agency	City of Cumby
Estimated Completion Time	2 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

Cumby Tornado Mitigation Action #1	Construct FEMA standard community safe room
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #5: Emergency Services
Priority	High
Funding Source(s)	NA
Estimated Cost	Low (0-10k)
Responsible Agency	City of Cumby
Estimated Completion Time	1 year
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

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Cumby Tornado Mitigation Action #2	Install backup generators at water and waste stations to protect water supply from contamination during power outages.
Mitigation Goal/Objective	Goal #1: Protect Life and Property
Priority	Medium
Funding Source(s)	FEMA Grant, ,City of Cumby
Estimated Cost	High (25K+)
Responsible Agency	NA
Estimated Completion Time	6 years
Effect on New Buildings	Protect new buildings from waste water contamination
Effect on Existing Buildings	Protect new buildings from waste water contamination
Comments:	

Cumby Winter Storm Mitigation Action #1	Install backup generators at water and waste stations to protect water supply from contamination during power outages.
Mitigation Goal/Objective	**Goal #1: Protect Life and Property**
Priority	Medium
Funding Source(s)	FEMA Grant, City of Cumby
Estimated Cost	High (25k +)
Responsible Agency	City of Cumby
Estimated Completion Time	6 years
Effect on New Buildings	Protect new buildings from waste-water contamination.
Effect on Existing Buildings	Protect existing buildings from waste-water contamination.
Comments:	

Cumby Winter Storm Mitigation Action #2	Remove dead or rotting trees and branches that could fall and cause injury or damage during an ice storm.
Mitigation Goal/Objective	Goal #1: Protect Life and Property
Priority	High
Funding Source(s)	City of Cumby
Estimated Cost	Low (0-10k)
Responsible Agency	City of Cumby
Estimated Completion Time	2 years
Effect on New Buildings	Raise awareness of damage from falling limbs/trees.
Effect on Existing Buildings	Raise awareness of damage from falling limbs/trees.
Comments:	

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Cumby Thunderstorm Winds Mitigation Action #1	Require tie-downs with anchors and ground anchors for manufactured homes.
Mitigation Goal/Objective	Goal #1: Protect Life and Property
Priority	High
Funding Source(s)	City of Cumby
Estimated Cost	Low (0-10k)
Responsible Agency	City
Estimated Completion Time	2 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

Cumby Thunderstorm Winds Mitigation Action #2	Provide public workshops and information regarding mitigating homes against thunderstorm winds.
Mitigation Goal/Objective	Goal#2 Public Awareness
Priority	Medium
Funding Source(s)	FEMA and other grant money
Estimated Cost	Low (0-10K)
Responsible Agency	FEMA and City
Estimated Completion Time	7 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

Cumby Hail Mitigation Action #1	Install hail resistant film on the windows of critical facilities
Mitigation Goal/Objective	Goal #1: Protect Life and Property
Priority	High
Funding Source(s)	City of Cumby
Estimated Cost	Low (0-10K)
Responsible Agency	City of Cumby
Estimated Completion Time	2 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	By monitoring local weather patterns we can better predict the likelihood of storms

Cumby Hail Mitigation Action # 2	Conduct a workshop for residents about the prevalence of hailstorms and how to protect your home and property from hail damage.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #2: Public Awareness
Priority	High
Funding Source(s)	City of Cumby
Estimated Cost	Low (0-10k)
Responsible Agency	City of Cumby
Estimated Completion Time	2 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA

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Comments:	Being properly insured can help with rebuilding.

Cumby Drought Mitigation Action #1	Conduct public workshops on conserving water, xeriscaping and managing drought impacts.
Mitigation Goal/Objective	Goal #2: Public Awareness Goal #3: Natural Systems
Priority	High
Funding Source(s)	City/County/State
Estimated Cost	Low (0-10k)
Responsible Agency	City of Cumby
Estimated Completion Time	1 year
Effect on New Buildings	Could help protect foundations from cracking
Effect on Existing Buildings	Could help protect foundations from cracking
Comments:	

Cumby Drought Mitigation Action #2	Establish water rationing protocol for times of intense drought.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #4: Partnerships and Implementation
Priority	High
Funding Source(s)	City of Cumby
Estimated Cost	Low (0-10k)
Responsible Agency	City of Cumby
Estimated Completion Time	2 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

Cumby Extreme Heat Mitigation Action #1	Develop and Implement Radio/TV/Newspapers PSA's advising public of heat advisories and mitigate extreme heat.
Mitigation Goal/Objective	Goal #2: Public Awareness
Priority	High
Funding Source(s)	City of Cumby
Estimated Cost	Low (0-10k)
Responsible Agency	City
Estimated Completion Time	1 year
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

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Cumby Extreme Heat Mitigation Action #2	Provide cooling centers to assist the elderly and young.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #4: Partnerships and Implementation Goal #5: Emergency Services
Priority	High
Funding Source(s)	City of Cumby
Estimated Cost	Low (0-10k)
Responsible Agency	City
Estimated Completion Time	3 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

Cumby Wildfire Mitigation Action #1	Implement a vegetation management program to reduce the danger of wildfire reaching dwellings.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #4: Partnerships and Implementation Goal #5: Emergency Services
Priority	Medium
Funding Source(s)	City of Cumby, Hopkins County/Texas Forest Service? Grants
Estimated Cost	Medium (10-25k)
Responsible Agency	City of Cumby
Estimated Completion Time	5 years
Effect on New Buildings	Protect from Urban/Wildfire interface
Effect on Existing Buildings	P:rotect from Urban/Wildfire interface
Comments:	This will require a joint effort of local and state funding and manpower.

Cumby Wildfire Mitigation Action #2	Conduct a wildfire education program stressing the dangers of trash burning in Cumby.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #2: Public Awareness Goal #5: Emergency Services
Priority	High
Funding Source(s)	City of Cumby/Hopkins County
Estimated Cost	Low (0-10k)
Responsible Agency	City of Cumby
Estimated Completion Time	2 years
Effect on New Buildings	Preventing fires that could spread to homes and businesses
Effect on Existing Buildings	Preventing fires that could spread to homes and businesses
Comments:	

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Cumby Earthquake Mitigation Action #1	Collect geologic information on seismic sources, soil conditions, and related potential hazards and use the information to better prepare properties from earthquake damage.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #2: Public Awareness Goal #4: Partnerships and Implementation
Priority	Medium
Funding Source(s)	Cumby/Hopkins County
Estimated Cost	Low (0-10k)
Responsible Agency	City of Cumby/ Hopkins County
Estimated Completion Time	6 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

Cumby Earthquake Mitigation Action #2	Develop an outreach program about earthquake risk and mitigation activities in homes, schools, and businesses such as securing filing cabinets and heavy appliances.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #2: Public Awareness
Priority	High
Funding Source(s)	Hopkins County/Cumby
Estimated Cost	Low (0-10k)
Responsible Agency	City of Cumby/Hopkins County
Estimated Completion Time	3 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

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Sulphur Springs Mitigation Actions 2016				
HAZARD	**Location**	**ACTION**	**DISPOSITION**	**EXPLANATION**
Flood	**Sulphur Springs**	Increase the size of ditches to accommodate flash flood waters in flood prone areas	**Deferred**	
Flood	**Sulphur Springs**	Catalog, evaluate, and update any floodplain regulations within the City to comply with the latest FEMA regulations.	**Deferred**	
Tornado	**Sulphur Springs**	Participate in the Texas Tornado Rebate Program	**No longer a viable action.**	**Program ended December 2020**
Tornado	**Sulphur Springs**	Disseminate information at public events and in local newspaper regarding tornado safety. Install backup generators at water and waste stations to protect water supply from contamination during power outages	**Completed**	**Added new action**
Winter Storms	**Sulphur Springs**	Develop a pre-emptive strategy for removing dead limbs and overhangs that might fall during winter storms	**Completed**	**Added new action**
Winter Storms	**Sulphur Springs**	Purchase emergency mobile generators to use with emergency equipment during power outages for critical facilities	**Completed**	**. Added new action**
Thunderstorm Winds	**Sulphur Springs**	Require tie-downs with anchors and ground anchors for manufactured homes.	**Deferred**	
Thunderstorm Winds	**Sulphur Springs**	Provide public workshops and information regarding mitigating homes against thunderstorm winds	**Completed**	**Added new action**
Hail	**Sulphur Springs**	Install hail resistant film on the windows of critical facilities	**Deferred**	
Hail	**Sulphur Springs**	Educate residents on the likelihood of hailstorms and how to mitigate their home and property from hail damage.	**Completed**	**. Added new action**
Drought	**Sulphur Springs**	Conduct public workshops on conserving water, xeriscaping and managing drought impacts.	**Deferred**	
Drought	**Sulphur Springs**	Establish water rationing protocol for times of intense drought	**Deferred**	
Extreme Heat	**Sulphur Springs**	Radio/TV/Newspapers PSA's advising public of hazards of heat and how to mitigate extreme heat.	**Deferred**	

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Extreme Heat	**Sulphur Springs**	Conduct fan drives for low-income and elderly who cannot afford air conditioning. Install backup generators at water and waste stations to protect water supply from contamination during power outages	**Completed**	**Added new action**
Wildfire	**Sulphur Springs**	Implement a vegetation management program to reduce the danger of wildfire reaching dwellings.	**Completed**	**Added new action**
Wildfire	**Sulphur Springs**	Conduct a wildfire education program stressing the dangers of trash burning in Sulphur Springs.	**Deferred**	
Earthquake	**Sulphur Springs**	Develop an outreach program about earthquake risk and mitigation activities in homes, schools, and businesses such as securing filing cabinets and heavy appliances.	**Deferred**	
Earthquake	**Sulphur Springs**	Collect geologic information on seismic sources, soil conditions, and related potential hazards and use the information to better prepare properties from earthquake damage.	**Deferred**	
Dam Failure	**Sulphur Springs**	Increase the ability of residents and businesses to receive early warning from the National Weather Service. This would be accomplished by using grant funding to help purchase and distribute NOAA weather radios to vulnerable populations and businesses.	**Delete**	**No longer viable action** **Added new action**
Dam Failure	**Sulphur Springs**	Install backup generators at water and waste stations to protect water supply from contamination during power outages.	**Completed**	**Added new action**

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SULPHUR SPRINGS

NOTE: ***All Sulphur Springs projects are subject to availability of federal and local funding as well as availability of local staff to administer the project.***

Sulphur Springs Flooding Mitigation Action #1	Increase the size of ditches to accommodate flash flood waters in flood prone areas
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #3: Natural Systems Goal #5: Emergency Services
Priority	Medium
Funding Source(s)	City of Sulphur Springs
Estimated Cost	Medium (10-25k)
Responsible Agency	City
Estimated Completion Time	4 years
Effect on New Buildings	Protection from flood damage
Effect on Existing Buildings	Protection from flood damage
Comments:	

Sulphur Springs Flooding Mitigation Action #2	Catalog, evaluate, and update any floodplain regulations within the City to comply with the latest FEMA regulations.
Mitigation Goal/Objective	Goal #1: Protect Life and Property
Priority	Medium
Funding Source(s)	NA
Estimated Cost	Low (0-10k)
Responsible Agency	City of Sulphur Springs
Estimated Completion Time	6 years
Effect on New Buildings	Protection from flood damage
Effect on Existing Buildings	Protection from flood damage
Comments:	

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Sulphur Springs Tornado Mitigation Action #1	Provide weather training through NWS Storm Ready Program.
Mitigation Goal/Objective	Goal #1: Protect Life and Property
Priority	High
Funding Source(s)	FEMA/other grant money/city
Estimated Cost	Low (0-10K)
Responsible Agency	City of Sulphur Springs/Hopkins County
Estimated Completion Time	3 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	Contributes 50% of cost for individual shelters

Sulphur Springs Tornado Mitigation Action #2	Require anchors for manufactured homes.
Mitigation Goal/Objective	Protect Life and Property
Priority	Medium
Funding Source(s)	City of Sulphur Springs
Estimated Cost	Low
Responsible Agency	City of Sulphur Springs
Estimated Completion Time	6 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	Manufactured mobile homes are susceptible to tornado winds. Homes anchored securely to the ground could save homes from damage and personal injury.

Sulphur Springs Winter Storm mitigation Action #1	Mitigate protecting power lines from the impacts of winter storms by establishing standards for all utilities regarding tree pruning around lines.
Mitigation Goal/Objective	**Goal # 1** Protect Life and Property **Goal # 3 Natural Systems**
Priority	Medium
Funding Source(s)	Sulphur Springs County Annual Budget
Estimated Cost	Medium (10-25k)
Responsible Agency	Sulphur Springs EMC
Estimated Completion Time	5 years
Effect on New Buildings	No effect
Effect on Existing Buildings	No effect
Comments:	Keeping power on for businesses and homes is critical during winter storms.

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Sulphur **Springs Winter Storm Mitigation Action #2**	Identify locations for heating centers or shelters for vulnerable populations and stranded motorists
Mitigation Goal/Objective	Goal #1: Protect Life and Property
Priority	Medium
Funding Source(s)	FEMA and other grant money
Estimated Cost	Medium (25k+)
Responsible Agency	City of Sulphur Springs
Estimated Completion Time	5 years
Effect on New Buildings	Protection from water overflow or contamination.
Effect on Existing Buildings	Protection from water overflow or contamination.
Comments:	

Sulphur Springs Thunderstorm Winds Mitigation Action # 1	Require tie-downs with anchors and ground anchors for manufactured homes.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #4: Partnerships and Implementation
Priority	High
Funding Source(s)	Sulphur Springs
Estimated Cost	Low (0-10k)
Responsible Agency	City of Sulphur Springs
Estimated Completion Time	On going
Effect on New Buildings	Protect new structure from falling limbs and trees.
Effect on Existing Buildings	Protect existing building from falling limbs and trees.
Comments:	

Sulphur Springs Thunderstorm Winds Mitigation Action # 2	Provide weather training through NWS Storm Ready Program.
Mitigation Goal/Objective	Goal #1: Protect Life and Property
Priority	High
Funding Source(s)	City of Sulphur Springs
Estimated Cost	Low (0-10k)
Responsible Agency	City
Estimated Completion Time	2 years
Effect on New Buildings	
Effect on Existing Buildings	
Comments:	

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Sulphur Springs Hail Mitigation Action #1	Install hail resistant film on the windows of critical facilities.
Mitigation Goal/Objective	Goal #1: Protect Life and Property
Priority	High
Funding Source(s)	City of Sulphur Springs
Estimated Cost	Low (0-10K)
Responsible Agency	City of Sulphur Springs
Estimated Completion Time	2 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	By monitoring local weather patterns we can better predict the likelihood of storms

Sulphur Springs Hail Mitigation Action # 2	Provide weather training through NWS Storm Ready Program.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #2: Public Awareness
Priority	High
Funding Source(s)	City of Sulphur Springs
Estimated Cost	Low (0-10k)
Responsible Agency	City of Sulphur Springs
Estimated Completion Time	2 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	Being properly insured can help with rebuilding.

Sulphur Springs Drought Mitigation Action #1	Conduct public workshops on conserving water, xeriscaping and managing drought impacts.
Mitigation Goal/Objective	Goal #2: Public Awareness Goal #3: Natural Systems
Priority	High
Funding Source(s)	Sulphur Springs
Estimated Cost	Low (0-10k)
Responsible Agency	City of Sulphur Springs
Estimated Completion Time	3 years
Effect on New Buildings	Possibly protect foundations from cracking,
Effect on Existing Buildings	Possibly protect foundations from cracking,
Comments:	

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Sulphur Springs Drought Mitigation Action #2	Establish water rationing protocol for times of intense drought.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #3: Natural Systems Goal #4: Partnerships and Implementation
Priority	Medium
Funding Source(s)	City of Sulphur Springs
Estimated Cost	Low (0-10k)
Responsible Agency	City of Sulphur Springs
Estimated Completion Time	5 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

Sulphur Springs Extreme Heat Mitigation Action #1	Radio/TV/Newspapers PSA's advising public of hazards of heat and how to mitigate.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #2: Public Awareness
Priority	High
Funding Source(s)	City of Sulphur Springs
Estimated Cost	Low (0-10k)
Responsible Agency	City Sulphur Springs
Estimated Completion Time	3 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

Sulphur Springs Extreme Mitigation Action #2	Conduct fan drives for low-income and elderly who cannot afford air conditioning. Install backup generators at water and waste stations to protect water supply from contamination during power outages
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #4: Partnerships and Implementation
Priority	Medium
Funding Source(s)	City Sulphur Springs / donations
Estimated Cost	High (25k+)
Responsible Agency	City Sulphur Springs
Estimated Completion Time	6 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

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Sulphur Springs Wildfire Mitigation Action #1	Conduct a fire prevention campaign targeting defensible space around your home.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #3: Natural Systems Goal #4: Partnerships and Implementation
Priority	Medium
Funding Source(s)	City of Sulphur Springs
Estimated Cost	Medium (10-25k)
Responsible Agency	City Sulphur Springs
Estimated Completion Time	6 years
Effect on New Buildings	Reduces fire risk
Effect on Existing Buildings	Reduces fire risk
Comments:	

Sulphur Springs Wildfire Mitigation Action #2	Conduct a wildfire education program stressing the dangers of trash burning in Sulphur Springs.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #2: Public Awareness Goal #3: Natural Systems
Priority	High
Funding Source(s)	City of Sulphur Springs
Estimated Cost	Low (0-10k)
Responsible Agency	City of Sulphur Springs
Estimated Completion Time	3 years
Effect on New Buildings	Reduces Fire Risk
Effect on Existing Buildings	Reduces Fire Risk
Comments:	

Sulphur Springs Earthquake Mitigation Action #1	Develop an outreach program about earthquake risk and mitigation activities in homes, schools, and businesses such as securing filing cabinets and heavy appliances.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #2: Public Awareness Goal #4: Partnerships and Implementation Goal #5: Emergency Services
Priority	Medium
Funding Source(s)	Hopkins County/Sulphur Springs
Estimated Cost	Low (0-10k)
Responsible Agency	City of Sulphur Springs/Hopkins County
Estimated Completion Time	6 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

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Sulphur Springs Earthquake Mitigation Action #2	Collect geologic information on seismic sources, soil conditions, and related potential hazards and use the information to better prepare properties from earthquake damage.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #2: Public Awareness
Priority	High
Funding Source(s)	Hopkins County/Sulphur Springs
Estimated Cost	Low (0-29k)
Responsible Agency	City of Sulphur Springs/Hopkins county
Estimated Completion Time	3 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

Sulphur Springs Dam Failure Action #1	Prepare updated high resolution, digitalized maps of dam failure inundation areas.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #2: Public Awareness Goal #4: Partnerships and Implementation
Priority	High
Funding Source(s)	FEMA/City of Sulphur Springs
Estimated Cost	Low (0-10K)
Responsible Agency	City of Sulphur Springs
Estimated Completion Time	3 years
Effect on New Buildings	
Effect on Existing Buildings	
Comments:	This would give both citizens and employees of Sulphur Springs more information regarding the need for further mitigation.

Sulphur Springs Dam Failure #2	Reinforce earthen dams to replace shifting or eroding dam material.
Mitigation Goal/Objective	Goal #1: Protect Life and Property
Priority	Medium
Funding Source(s)	FEMA/Sulphur Springs
Estimated Cost	High (25K+)
Responsible Agency	City of Sulphur Springs
Estimated Completion Time	6 years
Effect on New Buildings	Would help protect vulnerable property from flooding due to dam break.
Effect on Existing Buildings	Would help protect vulnerable property from flooding due to dam break
Comments:	

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Hopkins County Mitigation Actions 2016				
HAZARD	**Location**	**ACTION**	**DISPOSITION**	**EXPLANATION**
Flood	**Hopkins County**	Increase the size of ditches to accommodate flash flood water in flood prone areas.	Reword and expand	
Flood	**Hopkins County**	Participate in the Turn Around, Don't Drown Program (NFIP)	Deferred	
Tornado	**Hopkins County**	Design and Implement a safe shelter plan	Deferred	
Tornado	**Hopkins County**	Distribute NOAA weather radios to limited-income residents that live in high risk areas such as mobile home parks.	No longer a viable goal	Added new action
Winter Storms	**Hopkins County**	Develop a preemptive strategy for removing dead limbs and overhands that might fall during winter storms.	Completed	Added new actin
Winter Storms	**Hopkins County**	Purchase emergency mobile generators to use with emergency equipment during power outages for critical facilities such as water pumps, sewage pumps, and fire stations.	Deferred	
Thunderstorm Winds	**Hopkins County**	Provide public workshops and information regarding mitigating homes against thunderstorm winds.	Deferred	
Thunderstorm Winds	**Hopkins County**	Require structures on temporary foundations to be securely anchored to permanent foundation	Deferred	
Hail	**Hopkins County**	Educate residents on the likelihood of hailstorms and how to mitigate their homes and property against hail damage.	Deferred	
Hail	**Hopkins County**	Install hail resistant film on the windows of critical facilities.	Deferred	
Drought	**Hopkins County**	Conduct public workshops on conserving water, xeriscaping and managing drought impacts.	Deferred	
Drought	**Hopkins County**	Replace appliances or equipment wear with water-saving models.	Completed	Added new action
Extreme Heat	**Hopkins County**	Conduct a local fan drive as community service project	Deferred	Added new action
Extreme Heat	**Hopkins County**	Radio/TV/newspapers PSA's advising public of hazards of heat and to mitigate extreme heat.	Deferred	Added new action

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Wildfire	**Hopkins County**	Implement a vegetation management program to reduce the danger of wildfire reaching dwellings.	Expand and reword	
Wildfire	**Hopkins County**	Conduct a wildfire education program stressing the dangers of trash burning in Hopkins County.	Ongoing and deferred	
Earthquake	**Hopkins County**	Collect geologic information on seismic sources, soil conditions, and related potential hazards and use the information to better prepare properties from earthquake damage.	Deferred	
Earthquake	**Hopkins County**	Reduce potential damage to critical facilities and infrastructure from future seismic events by using flexible piping when extending water, sewer, or natural gas service.	Deferred	
Dam Failure	**Hopkins County**	Hire a consultant to complete a dam inundation study, safety study, and inventory of mitigation activities to implement for the county dams.	Completed	Added new action
Dam Failure	**Hopkins County**	Claim a data deficiency to gather information on dam vulnerabilities to be addressed once study is completed.	Completed	Added new action

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HOPKINS COUNTY

NOTE: ***All Hopkins County projects are subject to availability of federal and local funding as well as availability of local staff to administer the project.***

Hopkins County Flood Mitigation Action #1	Increase size of culverts and resize roads.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #2: Public Awareness
Priority	Medium (4-7 years)
Funding Source(s)	State of Texas
Estimated Cost	High ($25K +)
Responsible Agency	Hopkins County
Estimated Completion Time	4 years
Effect on New Buildings	Adds additional protection from flash floods
Effect on Existing Buildings	Adds additional protection from flash floods
Comments:	

Hopkins County Flood Mitigation Action #2	Participate in the Turn Around, Don't Drown Program
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #2: Public Awareness
Priority	High
Funding Source(s)	Hopkins County, FEMA, State
Estimated Cost	Low (0-10k)
Responsible Agency	Hopkins County
Estimated Completion Time	2 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

Hopkins County Tornado Mitigation Action #1	Design and Implement a safe shelter plan
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #4: Partnerships and Implementation Goal #5: Emergency Service
Priority	Medium
Funding Source(s)	Hopkins County
Estimated Cost	Medium (10-25k)
Responsible Agency	Hopkins County
Estimated Completion Time	5 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	Identify and publicize the locations of public safe shelters well before a tornado event occurs.

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Hopkins County Tornado Mitigation Action #2	Participate in the NWS Storm Ready Program
Mitigation Goal/Objective	Goal #1: Protect Life and Property
Priority	Medium
Funding Source(s)	Hopkins County/FEMA Grant
Estimated Cost	Low (0-10K)
Responsible Agency	Hopkins County
Estimated Completion Time	5 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

Hopkins County Winter Storm Mitigation Action #1	Mitigate protecting power lines from the impacts of winter storms by establishing standards for all utilities regarding tree pruning around lines
Mitigation Goal/Objective	**Goal # 1** Protect Life and Property **Goal # 3 Natural Systems**
Priority	Medium
Funding Source(s)	Hopkins County Annual Budget
Estimated Cost	Medium (10-25k)
Responsible Agency	Hopkins County EMC
Estimated Completion Time	5 years
Effect on New Buildings	No effect
Effect on Existing Buildings	No effect
Comments:	It is critical to keep power to homes and businesses during winter storm activity.

Hopkins County Winter Storm Mitigation Action #2	Purchase emergency mobile generators to use with emergency equipment during power outages for critical facilities such as water pumps, sewage pumps, and fire stations.
Mitigation Goal/Objective	Goal #1: Protect Life and Property
Priority	Medium
Funding Source(s)	FEMA Publications
Estimated Cost	Low (25K+)
Responsible Agency	Hopkins County VFD's and EMC
Estimated Completion Time	6 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

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Hopkins County Thunderstorm Winds Mitigation Action #1	Provide public workshops and information regarding mitigating homes against thunderstorm winds.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #2 Public Awareness
Priority	High
Funding Source(s)	Hopkins County and State
Estimated Cost	High (25K+)
Responsible Agency	Hopkins County
Estimated Completion Time	6 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

Hopkins County Thunderstorm Winds Mitigation Action #2	Require structures on temporary foundations to be securely anchored to permanent foundations.
Mitigation Goal/Objective	Goal #1: Protect Life and Property
Priority	Medium
Funding Source(s)	Hopkins County
Estimated Cost	Low (0-10k)
Responsible Agency	Hopkins County
Estimated Completion Time	5 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

Hopkins County Hail Mitigation Action # 1	Educate residents on the likelihood of hailstorms and how to mitigate their homes and property against hail damage.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #2: Public Awareness Goal #4: Partnerships and Implementation Goal #5: Emergency Services
Priority	Medium
Funding Source(s)	Hopkins County/jurisdictions
Estimated Cost	Medium (10-25k)
Responsible Agency	Hopkins County
Estimated Completion Time	6 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	The county might use citizen volunteers to implement such a program.

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Hopkins County Hail Mitigation Action # 2	Install hail resistant film on the windows of critical facilities.
Mitigation Goal/Objective	Goal #1: Protect Life and Property
Priority	Medium
Funding Source(s)	Hopkins County
Estimated Cost	Low (0-10K)
Responsible Agency	Hopkins County
Estimated Completion Time	6 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

Hopkins County Drought Mitigation Action #1	Conduct public workshops on conserving water, xeriscaping and managing drought impacts.
Mitigation Goal/Objective	Goal #2: Public Awareness Goal #3: Natural Systems
Priority	Medium
Funding Source(s)	Hopkins County/State of Texas
Estimated Cost	Low (0-10k)
Responsible Agency	Hopkins County
Estimated Completion Time	4 years
Effect on New Buildings	Could help protect foundations from shifting soil
Effect on Existing Buildings	Could help protect foundations from shifting soil
Comments:	

Hopkins County Drought Mitigation Action #2	Implement a water conservation program and enforce it during drought periods enforcing restrictions on watering lawns.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #3: Natural Systems
Priority	Low
Funding Source(s)	Hopkins County
Estimated Cost	Medium
Responsible Agency	County
Estimated Completion Time	On-going
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

Hopkins County Extreme Heat Mitigation Action #1	Conduct a local fan drive as community service project.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #4: Partnerships and Implementation
Priority	High
Funding Source(s)	Hopkins County/Fund Raisers
Estimated Cost	Low (0-10k)
Responsible Agency	Hopkins County
Estimated Completion Time	3 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

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Hopkins County Extreme Heat Mitigation Action #2	Radio/TV/newspapers PSA's advising public of hazards of heat and how to mitigate extreme heat.
Mitigation Goal/Objective	Goal #2: Public Awareness
Priority	High
Funding Source(s)	Hopkins County
Estimated Cost	Low (0-10k)
Responsible Agency	County
Estimated Completion Time	2 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

Hopkins County Wildfire Mitigation Action #1	Implement a Health and Safety Code for high grasses close to residences.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #3: Natural Systems
Priority	Medium
Funding Source(s)	FEMA and other Grant money
Estimated Cost	High (25k+)
Responsible Agency	Hopkins County
Estimated Completion Time	5 years
Effect on New Buildings	Would help protect new building from wildfire.
Effect on Existing Buildings	Would help protect existing buildings from wildfire.
Comments:	

Hopkins County Wildfire Mitigation Action #2	Conduct a wildfire education program stressing the dangers of trash burning in Hopkins County.
Mitigation Goal/Objective	Goal #2: Public Awareness
Priority	Medium
Funding Source(s)	Hopkins County
Estimated Cost	Low (0-10k)
Responsible Agency	County
Estimated Completion Time	6 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

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Hopkins County Earthquake Mitigation Action # 1	Collect geologic information on seismic sources, soil conditions, and related potential hazards and use the information to better prepare properties from earthquake damage.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #2: Public Awareness Goal #4: Partnerships and Implementation Goal #5: Emergency Services
Priority	Medium
Funding Source(s)	Hopkins County/jurisdictions
Estimated Cost	Medium (10-25k)
Responsible Agency	Hopkins County
Estimated Completion Time	6 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

Hopkins County Earthquake Mitigation Action #2	Reduce potential damage to critical facilities and infrastructure from future seismic events by using flexible piping when extending water, sewer, or natural gas service.
Mitigation Goal/Objective	Goal #1: Protect Life and Property
Priority	Medium
Funding Source(s)	Hopkins County/ Jurisdictions
Estimated Cost	Medium (10K-25K)
Responsible Agency	County
Estimated Completion Time	7 years
Effect on New Buildings	NA
Effect on Existing Buildings	NA
Comments:	

DRAFT

Hopkins County Dam Mitigation Action #1	Adopt Ordinances that limit development in areas that could be affected by flooding caused by a dam failure.
Mitigation Goal/Objective	Goal #1: Protect Life and Property
Priority	High
Funding Source(s)	Hopkins County
Estimated Cost	Low (0-10k)
Responsible Agency	City
Estimated Completion Time	3 years
Effect on New Buildings	Would help protect vulnerable property from flooding due to dam break.
Effect on Existing Buildings	Would help protect vulnerable property from flooding due to dam break
Comments:	

Hopkins County Dam Mitigation Action #2	Reinforce earthen dams to replace shifting or eroding dam material.
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #2: Public Awareness
Priority	High
Funding Source(s)	Hopkins County
Estimated Cost	Low (0-10k)
Responsible Agency	City
Estimated Completion Time	3 years
Effect on New Buildings	Would help protect people and vulnerable property from flooding due to dam break.
Effect on Existing Buildings	Would help protect people and vulnerable property from flooding due to dam break
Comments:	

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SECTION V
Implementation, Monitoring, Evaluating, Updating and Integration

Hopkins County and each participating jurisdiction will be responsible for implementing its own mitigation actions contained in Section IV. Each action has been assigned to a specific person or local government office that is responsible for implementing it. Hopkins County and its jurisdictions have very lean budgets and staff. They rely on grants and federal funding for many of the improvements that are made within their borders. State law requires that the city council and the Commissioners' Court of Hopkins County approve changes to budgets, improvement plans and mitigation plans. The governing bodies of each participating jurisdiction have adopted the mitigation action plan for their jurisdictions.

The Hopkins County Commissioners will be responsible for adopting the Hopkins County Mitigation Action Plan. (All jurisdictions must officially adopt and commit to implementation of the plan to be covered by the plan. This includes all participating cities/towns). This governing body has the authority to make public policy regarding natural hazards. The Hopkins Mitigation Plan will be submitted to the Texas Department of Emergency Management for review and upon their approval, TDEM will then submit the plan to the Federal Emergency Management Agency (FEMA) for review and final approval. The review will address the federal criteria outlined in FEMA Interim Final Rule 44 CFR Part 201. Once accepted by FEMA, Hopkins County/City will formally adopt it and gain eligibility for Hazard Mitigation Grant Program funds.

Monitoring

To prevent issues regarding meeting the goals of The Hopkins County Hazard Mitigation Action Plan it is agreed that the county and participating jurisdictions will evaluate the plan on an annual basis to determine the effectiveness of programs, and to reflect changes in land development or programs that may affect mitigation priorities. The evaluation process will include a definite schedule and timeline, and will identify the local agencies and organizations participating in plan evaluation

Annually near the anniversary of the plan's approval, the Hazard Mitigation Committee Members will meet to monitor the progress of the mitigation actions for their respective communities. The County Judge or his/her designated appointee will organize the meeting. The public will be invited to attend and will be encouraged to provide feedback.

The meeting will review the progress of each action for each community to assess if the action is being completing in a timely fashion and if additional resources need to be directed to complete the actions. Monitoring the plan's actions is important to keep accountability for all team members.

They will also review the risk assessment portion of the Plan to determine if this information should be updated or modified, given any new available data. This plan can and will pave the way for other plans, codes and programs. A written record of the annual meeting, along with any project reports, will be accomplished and kept on file in the county office. Every five years the updated plan will be submitted to the State Hazard Mitigation Officer.

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The Status of the Hazard Mitigation Actions will be monitored by the designated emergency management coordinator for each jurisdiction on a quarterly basis. Preparation for the Five Year Plan Update will begin no later than 1 year prior to the plan expirations date.

Implementation

The Hopkins County Hazard Mitigation Committee will be responsible for coordinating implementation of the five year plan action items and undertaking the formal review process. The county formed a Hazard Mitigation Committee that consists of members from local agencies, organizations, and citizens.

Upon formal adoption of the plan, hazard mitigation team members from each participating jurisdiction will review all comprehensive land use plans, capital improvement plans, Annual Budget Reviews, Emergency Operations or Management Plans, transportation plans, and any building codes to guide and control development. The hazard mitigation team members will work to integrate the hazard mitigation strategies into these other plans and codes. Each jurisdiction will conduct annual reviews of their comprehensive and land use plans and policies and analyze the need for any amendments in light of the approved hazard mitigation plan. Participating jurisdictions will ensure that capital improvement planning in the future will also contribute to the goals of this hazard mitigation plan to reduce the long-term risk to like and property from all hazards. Within one year of formal adoption of the hazard mitigation plan, existing planning mechanisms will be reviewed by each jurisdiction.

The Hopkins County HMAP will be incorporated into a variety of new and existing planning mechanisms for Como, Cumby, Sulphur Springs and the County government including: grant applications, human resource manuals, ordinances, building codes and budgets. Each team member will communicate new ideas and issues found within the plan to the city boards. The county and its participating jurisdictions will consider how to best incorporate the plans together. This includes incorporating the mitigation plan into county and local comprehensive or capital improvement plans as they are developed.

The Status of the Hazard Mitigation Actions will be monitored by the designated emergency management coordinator for each jurisdiction on a quarterly basis. Preparation for the Five Year Plan Update will begin no later than 1 year prior to the plan expirations date.

Updating

Preparation for the Five Year Plan Update will begin no later than 1 year prior to the plan expirations date. The County Judge or his/her designated appointee will organize a meeting with the Hazard Mitigation Committee Members to begin the update process. The committee member will organize all data gathered during the monitoring and evaluation meetings to assist will the plan update. The committee members will also assess the need for additional participating jurisdictions for the plans update. The public will be invited to attend and will be encouraged to provide feedback.

Copies of the Plan will be kept at the county courthouse and all city halls. The existence and location of these copies will be publicized in the appropriate local papers. The plan includes the address and the phone number of the county department responsible for keeping track of public comments on the Plan.

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Hopkins County is committed to supporting the cities, communities and other jurisdictions in the planning area as they implement their mitigation plans. Hopkins County will review and revise as needed, the long-range goals and objectives in its strategic plan and budgets to ensure that they are consistent with this mitigation action plan Hopkins County will work with participating jurisdictions to advance the goals of the is hazard mitigation plan through its routine, ongoing, long-range planning, budgeting and work processes.

Integration

Como Maintenance Program: The jurisdiction of Como will integrate data and action recommendations into the existing maintenance program. A city council member or the mayor will propose it to the city council who will vote on it at the monthly city council meeting. The mayor will sign this into action after a majority vote. To improve and expand capabilities, the City of Como should establish a Hazard Mitigation Team to address their Hazard Mitigation Plan recommendations.

Cumby Master Plan: The jurisdiction of Cumby will integrate action recommendations into their master plan. A city council member or the mayor will propose this to the monthly city council meeting. The mayor will sign this into action after a majority vote. To improve and expand capabilities, the City of Cumby should establish a Hazard Mitigation Team to address their Hazard Mitigation Plan recommendations

Sulphur Springs Master Plan: The jurisdiction of Sulphur Springs will integrate action recommendations into their master plan. A city council member or the mayor will propose this to the monthly city council meeting. The mayor will sign this into action after majority vote. To improve and expand capabilities, the City of Sulphur springs should establish a Hazard Mitigation Team to address their Hazard Mitigation Plan recommendations.

Hopkins County Maintenance Program: Unincorporated Hopkins County will integrate data and action recommendations into the existing maintenance program. The county judge or county commissioner will propose the integration to the County which will vote on it at the monthly city council meeting. The county judge will sign this into action after a majority vote. To improve and expand capabilities, Hopkins County should establish a team to develop public-private initiatives addressing disaster related issues.

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R E S O L U T I O N

Como

WHEREAS the County of Hopkins and the Cities of Como, Cumby, and Sulphur Springs recognize their vulnerability and the many potential hazards shared by all residents; and

WHEREAS, the County of Hopkins and the Cities of Como, Cumby, and Sulphur Springs have each have recognized the need to prepare a Five-year Updated Mitigation Action Plan; and

WHEREAS, the County of Hopkins and the Cities of Como, Cumby, and Sulphur Springs have decided to jointly prepare one Five-year Updated Mitigation Action Plan.

THEREFORE, BE IT RESOLVED that the County of Hopkins and the Cities of Como, Cumby and Sulphur Springs hereby jointly adopt and approve said Five-year Updated Mitigation Action Plan; and

BE IT FURTHER RESOLVED that the Hopkins County Judge and the Mayors of Hopkins and the Cities of Como, Cumby, and Sulphur Springs shall mutually appoint a Hazard Mitigation Coordinator to coordinate all aspects of the Updated and Revised Mitigation Action Plan including its review and maintenance, for the County of Hopkins and the Cities of Como, Cumby and Sulphur Springs in accordance with this resolution.

RESOLVED THIS _____ DAY OF_____, 2021

_____

Mayor, Como, Texas

ATTEST_____

City Secretary

DRAFT

R E S O L U T I O N

Cumby

WHEREAS the County of Hopkins and the Cities of Como, Cumby, and Sulphur Springs recognize their vulnerability and the many potential hazards shared by all residents; and

WHEREAS, the County of Hopkins and the Cities of Como, Cumby, and Sulphur Springs have each have recognized the need to prepare a Five-year Updated Mitigation Action Plan; and

WHEREAS, the County of Hopkins and the Cities of Como, Cumby, and Sulphur Springs have decided to jointly prepare one Five-year Updated Mitigation Action Plan.

THEREFORE, BE IT RESOLVED that the County of Hopkins and the Cities of Como, Cumby and Sulphur Springs hereby jointly adopt and approve said Five-year Updated Mitigation Action Plan; and

BE IT FURTHER RESOLVED that the Hopkins County Judge and the Mayors of Hopkins and the Cities of Como, Cumby, and Sulphur Springs shall mutually appoint a Hazard Mitigation Coordinator to coordinate all aspects of the Updated and Revised Mitigation Action Plan including its review and maintenance, for the County of Hopkins and the Cities of Como, Cumby and Sulphur Springs in accordance with this resolution.

RESOLVED THIS _____ DAY OF_____, 2021

_____

Mayor, Cumby, Texas

ATTEST_____

City Secretary

DRAFT

R E S O L U T I O N

Sulphur Springs

WHEREAS the County of Hopkins and the Cities of Como, Cumby, and Sulphur Springs recognize their vulnerability and the many potential hazards shared by all residents; and

WHEREAS, the County of Hopkins and the Cities of Como, Cumby, and Sulphur Springs have each have recognized the need to prepare a Five-year Updated Mitigation Action Plan; and

WHEREAS, the County of Hopkins and the Cities of Como, Cumby, and Sulphur Springs have decided to jointly prepare one Five-year Updated Mitigation Action Plan.

THEREFORE, BE IT RESOLVED that the County of Hopkins and the Cities of Como, Cumby and Sulphur Springs hereby jointly adopt and approve said Five-year Updated Mitigation Action Plan; and

BE IT FURTHER RESOLVED that the Hopkins County Judge and the Mayors of Hopkins and the Cities of Como, Cumby, and Sulphur Springs shall mutually appoint a Hazard Mitigation Coordinator to coordinate all aspects of the Updated and Revised Mitigation Action Plan including its review and maintenance, for the County of Hopkins and the Cities of Como, Cumby and Sulphur Springs in accordance with this resolution.

RESOLVED THIS _____ DAY OF_____, 2021

_____

Mayor, Sulphur Springs, Texas

ATTEST_____

City Secretary

DRAFT

R E S O L U T I O N

Hopkins County

WHEREAS the County of Hopkins and the Cities of Como, Cumby, and Sulphur Springs recognize their vulnerability and the many potential hazards shared by all residents; and

WHEREAS, the County of Hopkins and the Cities of Como, Cumby, and Sulphur Springs have each have recognized the need to prepare a Five-year Updated Mitigation Action Plan; and

WHEREAS, the County of Hopkins and the Cities of Como, Cumby, and Sulphur Springs have decided to jointly prepare one Five-year Updated Mitigation Action Plan.

THEREFORE, BE IT RESOLVED that the County of Hopkins and the Cities of Como, Cumby and Sulphur Springs hereby jointly adopt and approve said Five-year Updated Mitigation Action Plan; and

BE IT FURTHER RESOLVED that the Hopkins County Judge and the Mayors of Hopkins and the Cities of Como, Cumby, and Sulphur Springs shall mutually appoint a Hazard Mitigation Coordinator to coordinate all aspects of the Updated and Revised Mitigation Action Plan including its review and maintenance, for the County of Hopkins and the Cities of Como, Cumby and Sulphur Springs in accordance with this resolution.

RESOLVED THIS _____ DAY OF_____, 2021

_____

County Judge, Hopkins County, Texas

ATTEST_____

County Clerk

DRAFT

APPENDIX

Information from previous plan prior to update

Data

Statistics

Maps

DRAFT

Worksheet #3a Inventory Assets step 3

Date: June, 2004 *What will be affected by the hazard event?*

Task A. Determine the proportion of buildings, the value of buildings, and the population in your community or state that are located in hazard areas.

Hazard Flood Plains, Hopkins County, Census Tract Sector 3

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community Or State	# in Hazard Area	% in Hazard Area	$ in Community Or State	$ in Hazard Area	% in Hazard Area	# in Community Or State	# in Hazard Area	% in Hazard Area
Residential	11,169	374	3.35	965,961,000	22,533,933	2.33	31,960	913	2.85
Commercial	185	141	76	197,467,000	21,619,720	11	31,960	*N/A	*N/A
Industrial	41	17	41.5	48,418,000	71,493,460	147	31,960	*N/A	*N/A
Agricultural	14	0	0	2,109,000	0	0	31,960	0	0
Religious/ Non-profit	16	7	43.7	17,772,000	1,050,170	6	31,960	*NA	*N/A
Government	1	6	600	3,247,000	4,979,930	152	31,960	*N/A	*N/A
Education	1	0	0	11,926,000	0	0	31,960	0	0
Utilities	10,058.85 kms	*N/A	*N/A	957,432,000	*N/A	*N/A	31,960	0	0
Total	**11,436	**545	**764.55	**1,216,900,000	**121,677,213	**318.33	**31,960**	**913**	**2.85**

*NA – Not Available Source: (1990) HAZUS, Census 2000

**-Excluding Utilities 2003 County Tax Appraisal Dist.

Task B. Determine whether (and where) you want to collect additional inventory data.

	Y	N
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	

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5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards? X____
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence? X____

7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives? X_____

DRAFT

Worksheet #3a Inventory Assets step 3

Date: June, 2004 *What will be affected by the hazard event?*

Task A. Determine the proportion of buildings, the value of buildings, and the population in your community or state that are located in hazard areas.

Hazard Flood Plains, Hopkins County, Census Tract Sector 7

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community Or State	# in Hazard Area	% in Hazard Area	$ in Community Or State	$ in Hazard Area	% in Hazard Area	# in Community Or State	# in Hazard Area	% in Hazard Area
Residential	11,169	0	0	965,961,000	0	0	31,960	0	0
Commercial	185	0	0	197,467,000	0	0	31,960	0	0
Industrial	41	0	0	48,418,000	0	0	31,960	0	0
Agricultural	14	0	0	2,109,000	0	0	31,960	0	0
Religious/ Non-profit	16	0	0	17,772,000	0	0	31,960	0	0
Government	1	0	0	3,247,000	0	0	31,960	0	0
Education	1	0	0	11,926,000	0	0	31,960	0	0
Utilities	10,058.85 kms	*N/A	*N/A	957,432,000	*N/A	*N/A	31,960	0	0
Total	****11,436**	***0**	***0**	****1,216,900,000**	***0**	***0**	**31,960**	**0**	**0**

*NA – Not Available Source: (1990) HAZUS, Census 2000

**-Excluding Utilities 2003 County Tax Appraisal Dist.

Task B. Determine whether (and where) you want to collect additional inventory data.

	Y	N
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

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Worksheet #3a Inventory Assets step 3

Date: June, 2004 *What will be affected by the hazard event?*

Task A. Determine the proportion of buildings, the value of buildings, and the population in your community or state that are located in hazard areas.

Hazard Flood Plains, Hopkins County, Census Tract Sector 2

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community Or State	# in Hazard Area	% in Hazard Area	$ in Community Or State	$ in Hazard Area	% in Hazard Area	# in Community Or State	# in Hazard Area	% in Hazard Area
Residential	11,169	0	0	965,961,000	0	0	31,960	0	0
Commercial	185	0	0	197,467,000	0	0	31,960	0	0
Industrial	41	0	0	48,418,000	0	0	31,960	0	0
Agricultural	14	0	0	2,109,000	0	0	31,960	0	0
Religious/ Non-profit	16	0	0	17,772,000	0	0	31,960	0	0
Government	1	0	0	3,247,000	0	0	31,960	0	0
Education	1	0	0	11,926,000	0	0	31,960	0	0
Utilities	10,058.85 kms	*N/A	*N/A	957,432,000	*N/A	*N/A	31,960	0	0
Total	**11,436	**0	**0	**1,216,900,000	**0	**0	31,960	0	0

*NA – Not Available Source: (1990) HAZUS, Census 2000

**-Excluding Utilities 2003 County Tax Appraisal Dist.

Task B. Determine whether (and where) you want to collect additional inventory data.

	Y	N
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?		X
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

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Worksheet #3a Inventory Assets step 3

Date: *What will be affected by the hazard event?*

Task A. Determine the proportion of buildings, the value of buildings, and the population in your community or state that are located in hazard areas.

Hazard Flood Plains, Hopkins County, Census Tract Sector 1

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community Or State	# in Hazard Area	% in Hazard Area	$ in Community Or State	$ in Hazard Area	% in Hazard Area	# in Community Or State	# in Hazard Area	% in Hazard Area
Residential	11,169	0	0	965,961,000	0	0	31,960	0	0
Commercial	185	0	0	197,467,000	0	0	31,960	0	0
Industrial	41	0	0	48,418,000	0	0	31,960	0	0
Agricultural	14	0	0	2,109,000	0	0	31,960	0	0
Religious/ Non-profit	16	0	0	17,772,000	0	0	31,960	0	0
Government	1	0	0	3,247,000	0	0	31,960	0	0
Education	1	0	0	11,926,000	0	0	31,960	0	0
Utilities	10,058.85 kms	*N/A	*N/A	957,432,000	*N/A	*N/A	31,960	0	0
Total	**11,436	**0	**0	**1,216,900,000	**0	**0	31,960	0	0

*NA – Not Available Source: (1990) HAZUS, Census 2000

**-Excluding Utilities 2003 County Tax Appraisal Dist.

Task B. Determine whether (and where) you want to collect additional inventory data.

	Y	N
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?		X
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

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Worksheet #3a Inventory Assets step 3

Date: June, 2004 *What will be affected by the hazard event?*

Task A. Determine the proportion of buildings, the value of buildings, and the population in your community or state that are located in hazard areas.

Hazard Flood Plains, Hopkins County, Census Tract Sector 3

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community Or State	# in Hazard Area	% in Hazard Area	$ in Community Or State	$ in Hazard Area	% in Hazard Area	# in Community Or State	# in Hazard Area	% in Hazard Area
Residential	11,169	374	3.35	965,961,000	22,533,933	2.33	31,960	913	2.85
Commercial	185	141	76	197,467,000	21,619,720	11	31,960	*N/A	*N/A
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Agricultural	14	0	0	2,109,000	0	0	31,960	0	0
Religious/ Non-profit	16	7	43.7	17,772,000	1,050,170	6	31,960	*NA	*N/A
Government	1	6	600	3,247,000	4,979,930	152	31,960	*N/A	*N/A
Education	1	0	0	11,926,000	0	0	31,960	0	0
Utilities	10,058.85 kms	*N/A	*N/A	957,432,000	*N/A	*N/A	31,960	0	0
Total	**11,436	**545	**764.55	**1,216,900,000	**121,677,213	**318.33	**31,960**	**913**	**2.85**

*NA – Not Available
**-Excluding Utilities

Source: (1990) HAZUS, Census 2000
2003 County Tax Appraisal Dist.

Task B. Determine whether (and where) you want to collect additional inventory data.

	Y	N
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or	X	

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likelihood of occurrence?

7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives? X_____

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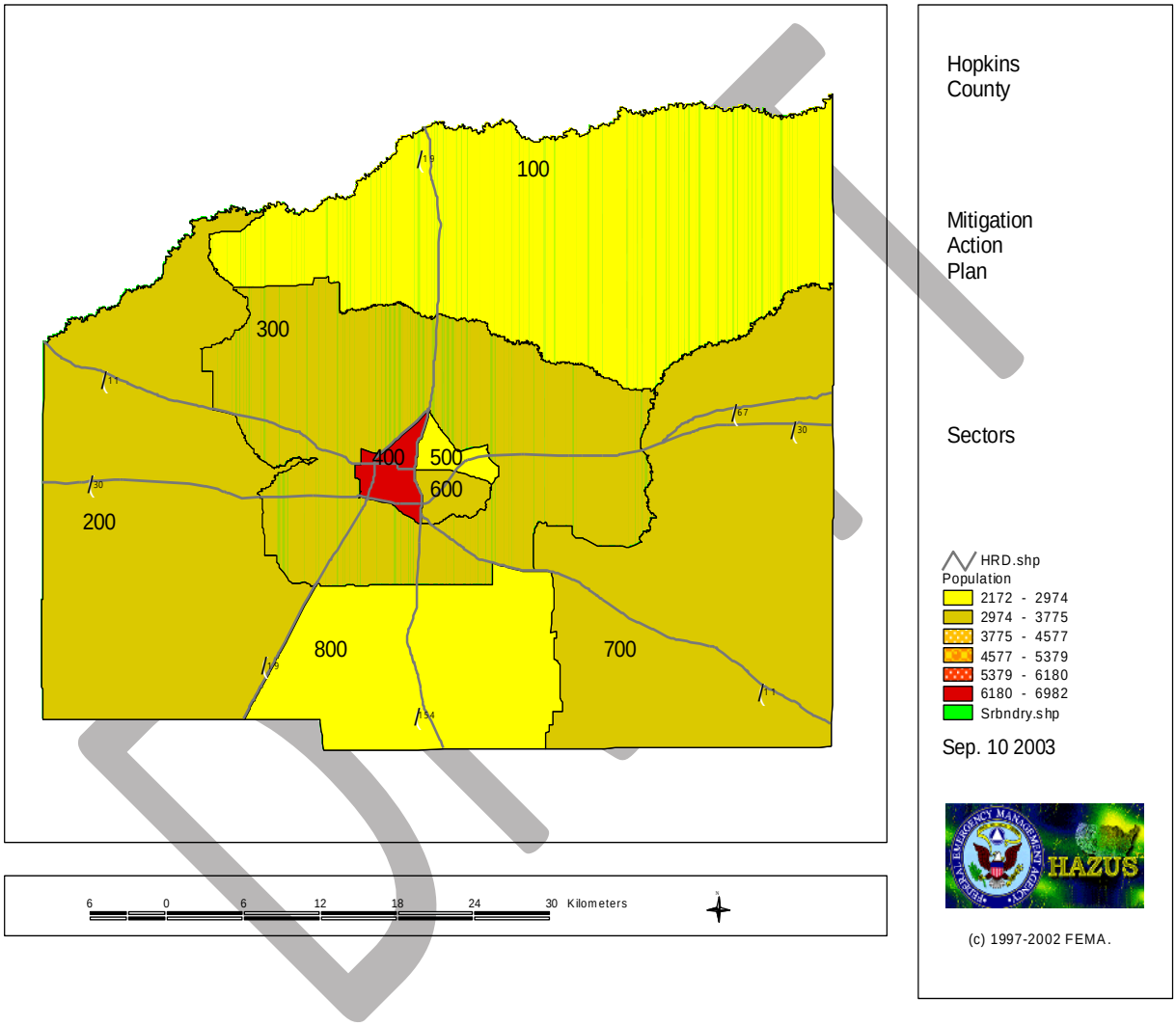
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19
11
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N
Hopkins County
Mitigation Action Plan
Sectors
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Population
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2974 - 3775
3775 - 4577
4577 - 5379
5379 - 6180
6180 - 6982
Srbndry.shp
Sep. 10 2003
HAZUS
(c) 1997-2002 FEMA.

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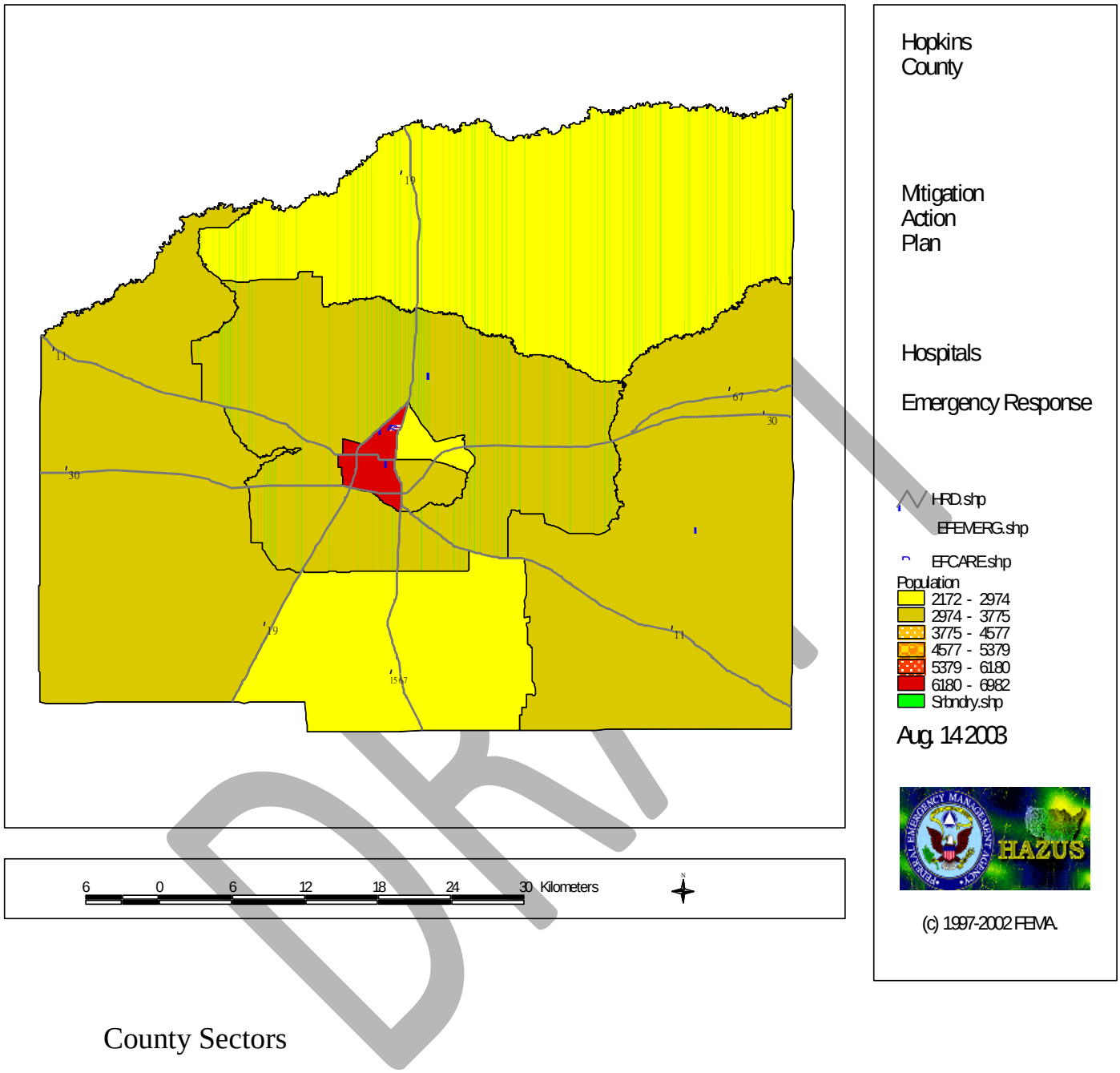

Figure 1.2

Hopkins County Medical Facilities/Emergency Response

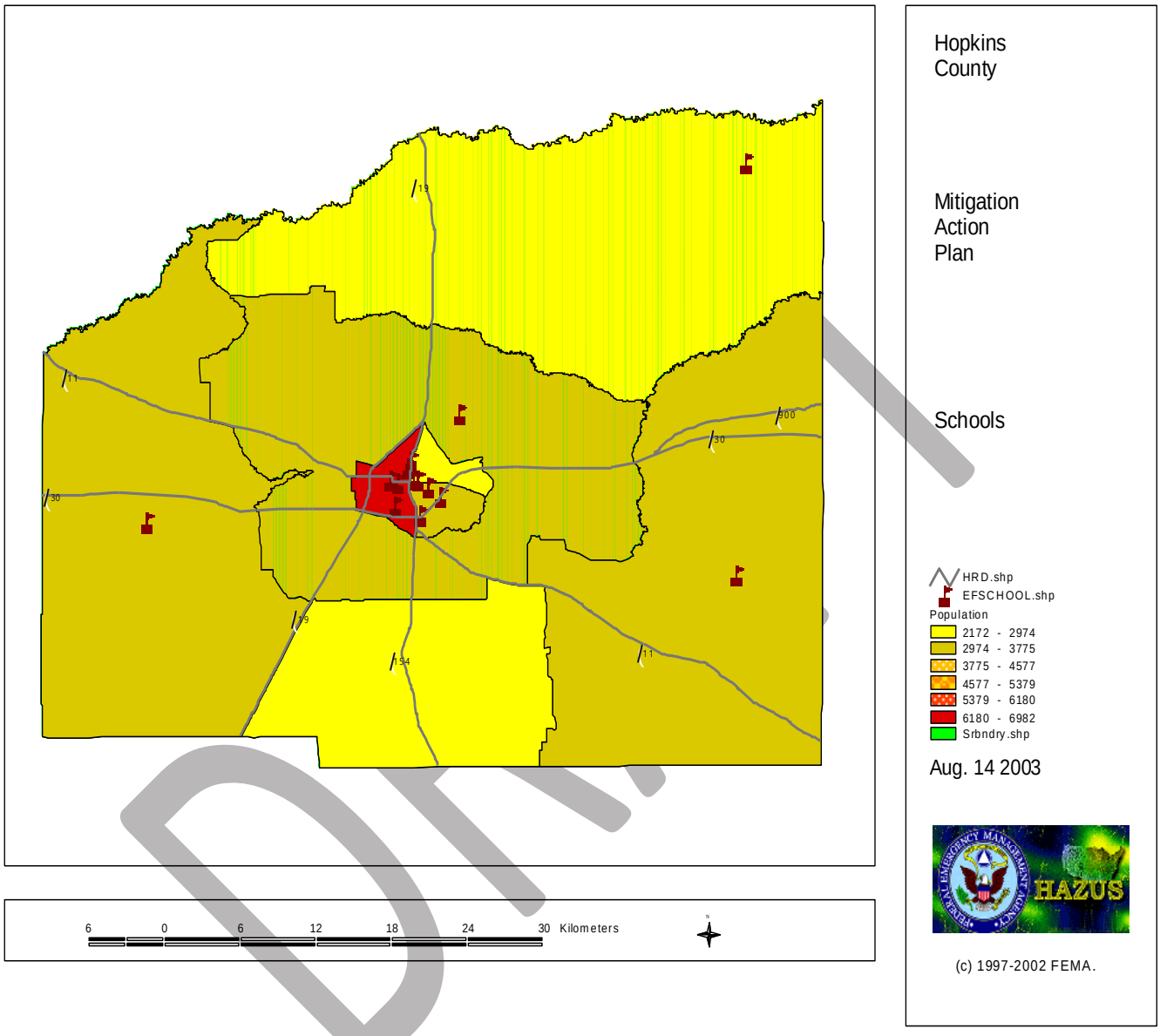

Figure 1.3
County Schools

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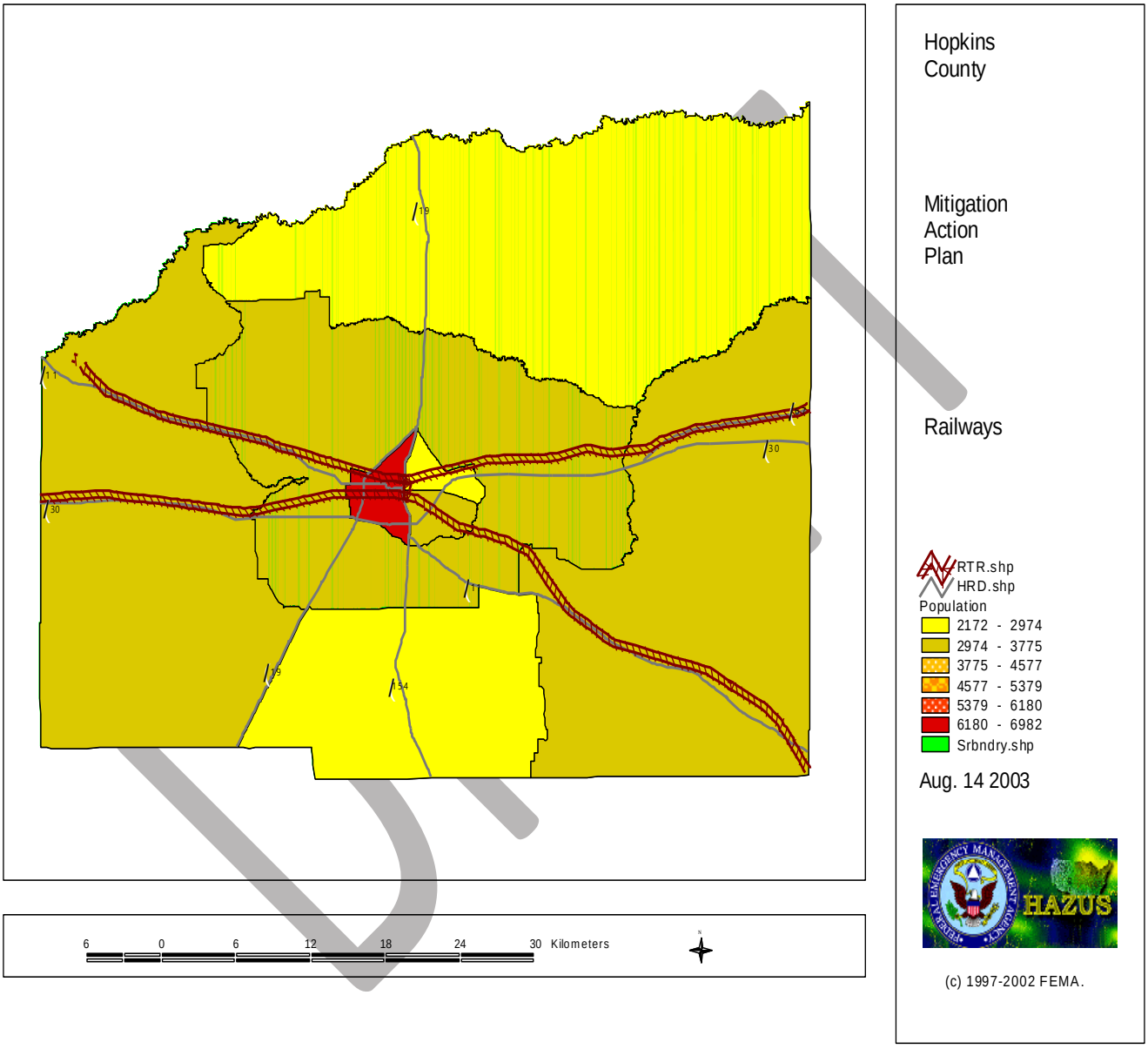

Figure 1.5
County Railways

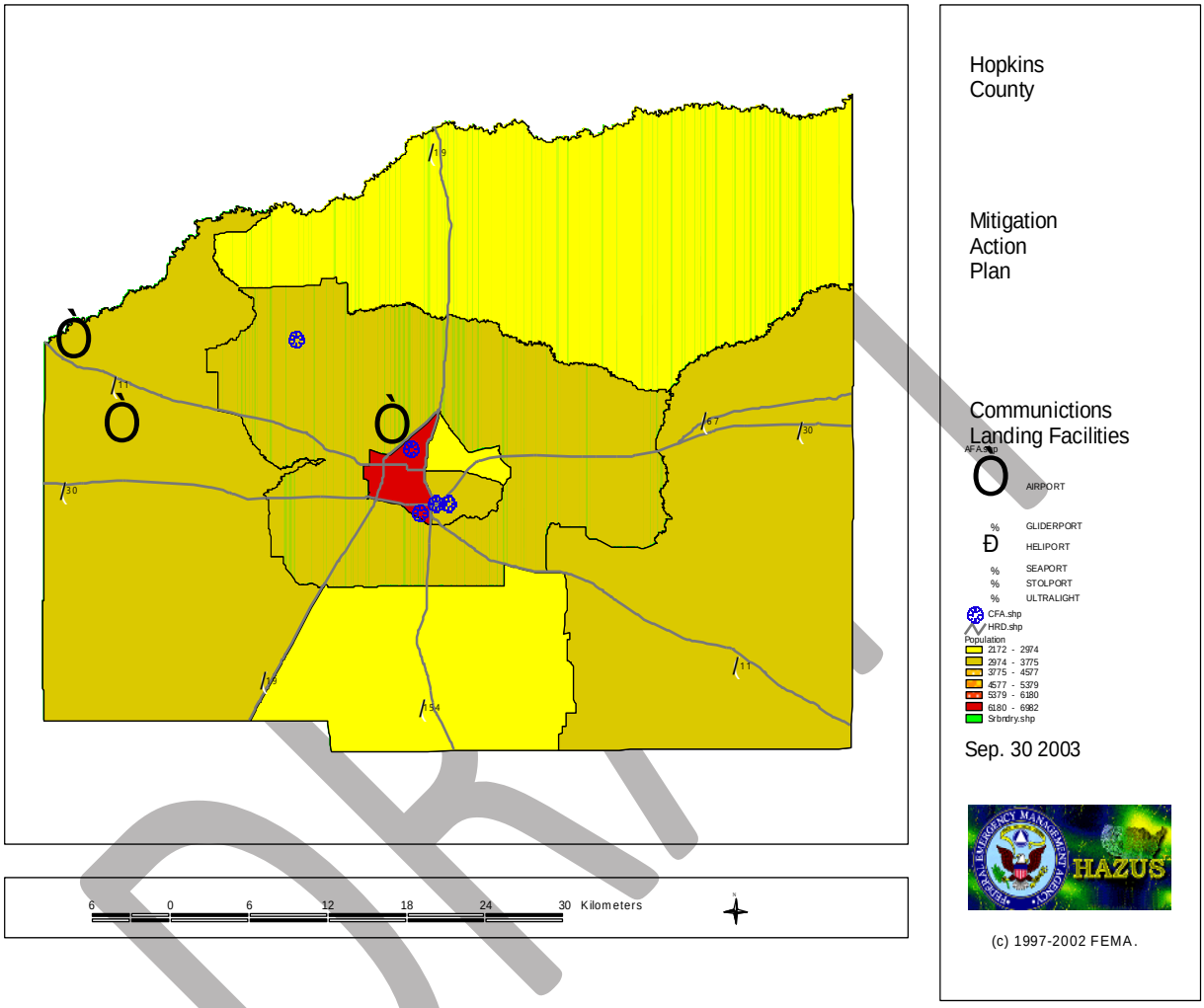

Figure 1.6
County Landing Facilities
Communications

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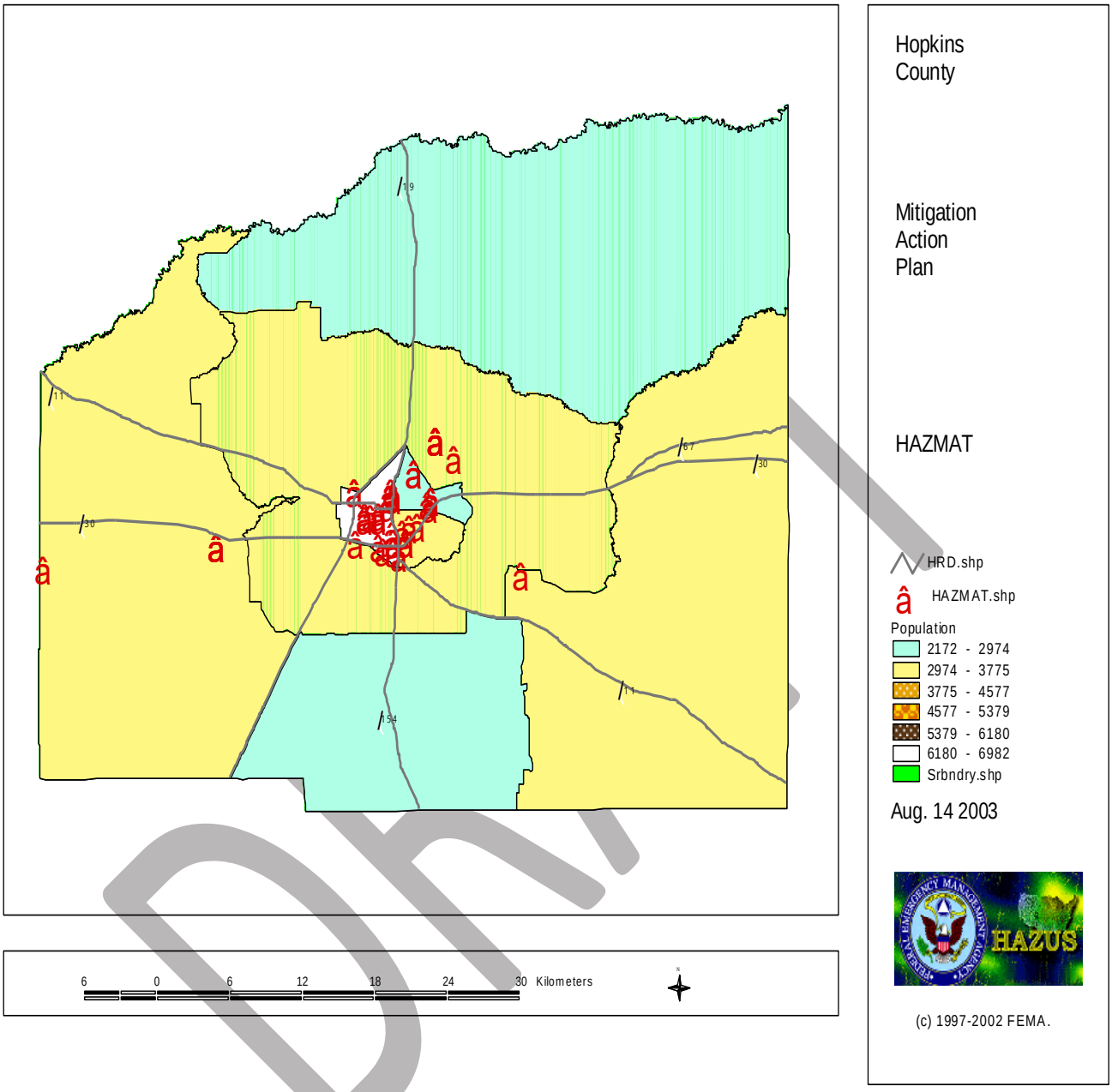

Figure 1.7
HAZMAT Facilities

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Figure 1.8

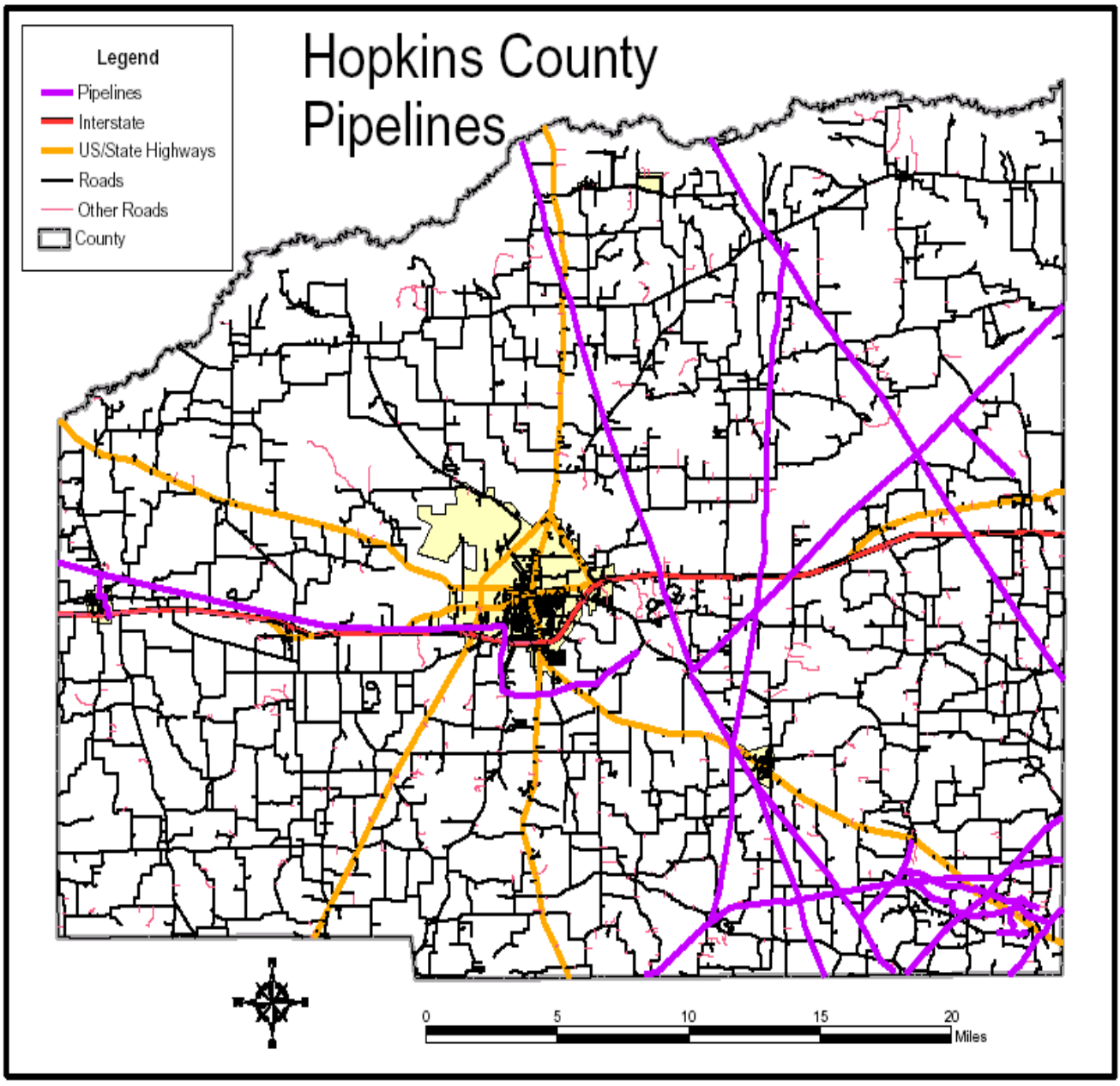
Hopkins County
Pipelines
Legend
Pipelines
Interstate
US/State Highways
Roads
Other Roads
County
0
5
10
15
20
Miles

Figure 1.9
Sulphur Springs Flood Plain

The city of Sulphur Springs has a total of 11,200 acres inside the city limits. The 100-year flood plain covers approximately 3,136 acres or 28% of the total acreage. The total taxable value of all property in the city is approximately 585.5 million dollars. A 100-year flood event would cause moderate damage. There would be some inundation of structures and roads near streams. Some evacuations of people and/or transfer of property to higher elevations would be necessary. No record of repetitive flood losses in Sulphur Springs.