MITIGATION ACTION PLAN
Five-Year Update

FOR

DELTA COUNTY TEXAS

INCORPORATED AND UNINCORPORATED AREAS

DEVELOPED BY THE ARK-TEX COUNCIL OF GOVERNMENTS

June 14, 2021

DELTA COUNTY TEXAS

FORWARD

This Hazard Mitigation Plan identifies the potential impact of natural hazards that threaten Delta County and the participating jurisdiction of Cooper which are part of the of the Ark-Tex Council of Governments (ATCOG).

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 Delta County, Texas

Joint Resolution between the **County of Delta, Texas**, and the jurisdiction of Cooper

Don Shipp, Ark-Tex Council of Governments, Texarkana, Texas submitted this plan for approval in December 2014. Area Code 903 832-8636. Fax: 903 832-2627. dshipp@atcog.org

SECTION I2

DELTA COUNTY TEXAS
Five-Year Update

PURPOSE

The goal of all mitigation efforts is long-term reduction in loss of life and property from natural hazards. 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 Five-year Update is to ensure that the residents, visitors, and businesses in Delta County, Texas including the participating jurisdiction of Cooper 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, as well as research, and data analysis. This plan is intended to serve as a guide in coordinating and implementing hazard mitigation policies, programs, and projects.

The Delta County Emergency Management Plan has been developed, and the assessment level of planning preparedness is Intermediate. The Hazard Mitigation Plan 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.

The following objectives will be addressed in the updated 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 Delta 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 summary of ATCOG's responsibilities for the plan:

- Assign a lead planning staff member to provide technical assistance and necessary data to the Delta 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 Delta County during plan development.
- Submit the final plan to the State of Texas and provide follow up technical assistance to the Delta 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 Delta 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.
- 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 Delta 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 Delta 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.

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 Delta County for Hazards. The Ark-Tex Council of governments worked hand in hand with the jurisdictions within the planning area of Delta 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 studies, reports, technical information, and other research was included into the plan during its drafting process

- ✓ 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 enough 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 Delta County to document past disasters was required. Local libraries, national weather records and the life experiences from residents were used to assess the plan.

A general assessment included using 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.

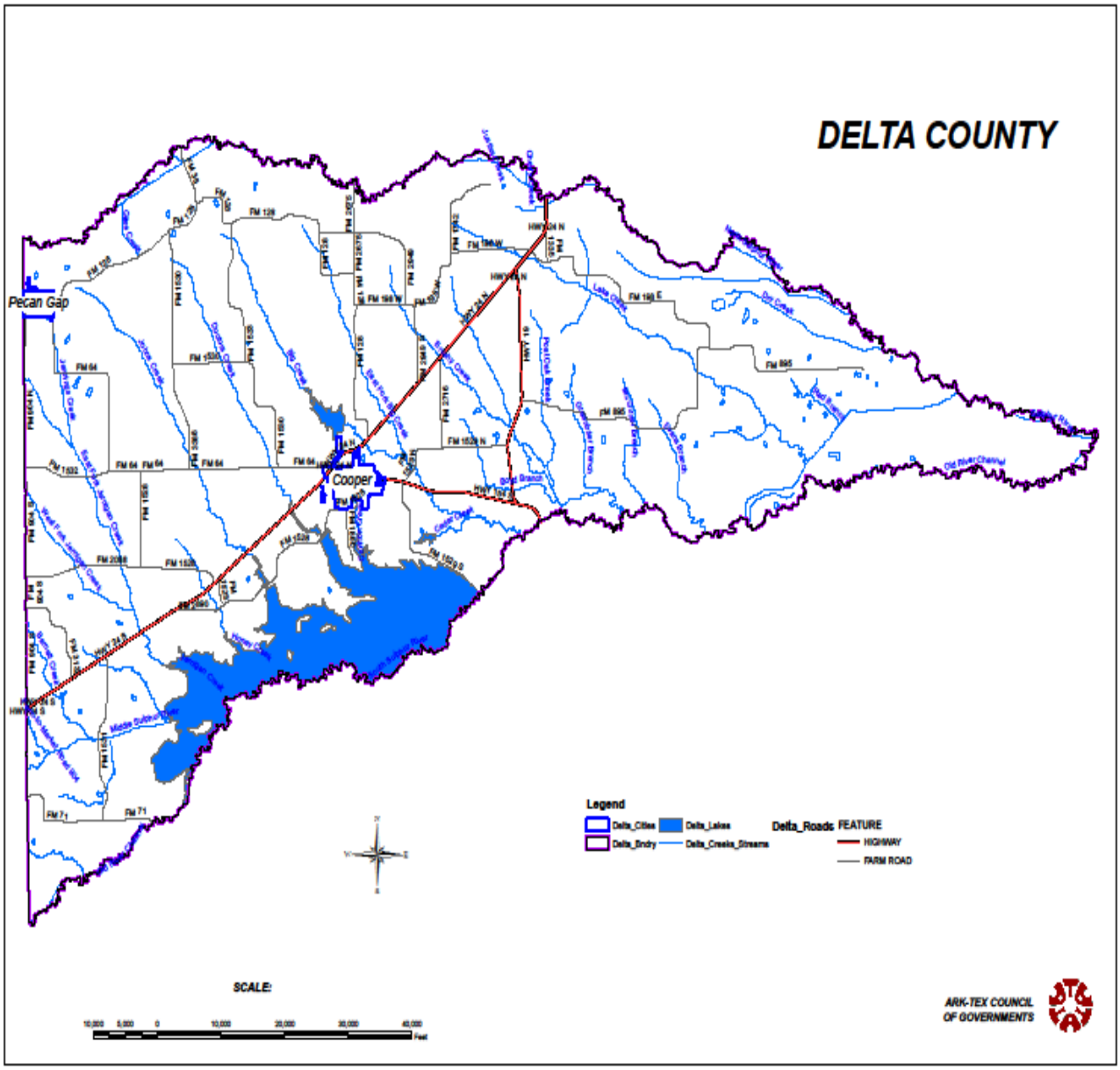
The development of a Multi-Jurisdictional Hazard Mitigation Plan involves the use of many types of information including historical data on previous disasters, information on critical infrastructures, zoning and flood plains maps, records, charts, etc., from many sources.

Develop Mitigation Strategies:
Written Strategies were developed to demonstrate how Delta 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.

By Failing to prepare, you are preparing to fail."
Benjamin Franklin

Delta County, Texas


DELTA COUNTY
Pecan Gap
Cooper
Legend
Delta_Cities
Delta_Lakes
Delta_Bndry
Delta_Creeks_Streams
Delta_Roads FEATURE
HIGHWAY
FARM ROAD
SCALE:
ARK-TEX COUNCIL
OF GOVERNMENTS

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 commissioners' court. Delta 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 judge and 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.

Economic Considerations

Delta County and the jurisdiction of Cooper have very limited budgets. Delta County has a total population of 5,349. Their tax base and the annual budget is 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. The median household income for Delta County is $46,138. The per capita income is $25,004. There are only six Texas counties smaller than Delta in land area.

Delta County Population		
Ranking	Jurisdiction	Population
1	Delta County Unincorporated	3,356
2	Cooper	1,993

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 Delta Mitigation Plans.

The Emergency Management Plan of Delta 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 Delta 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.

The Delta County Hazard Mitigation Plan consists of unincorporated Delta County and the jurisdiction of Cooper.

The Hazard Mitigation Action Team assisted in developing plan goals and action items by using their own skill 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 in the Planning Process		
Date	**Purpose**	**Location**
Jan. 28, 2019	Discussed mitigation process with appointed team chair. Began selection of team members.	Telephone conversation and e-mails
September 3, 2020	Kick-off meeting	Zoom meeting
November 20, 2020	Notice of plan availability was posted in the Delta County Courthouse. A draft of the plan was posted on the Delta County website.	Delta Courthouse
December 3, 2020	A public notice appeared in the Cooper newspaper	Cooper, Texas
December 10, 2020	Stakeholder e-mails sent regarding availability of plan draft on the Delta County website.	
Ongoing	Many telephone conversations and e-mail were sent to team members and others who could provide information regarding the plan development.	Delta County and Cooper

DELTA COUNTY TEAM MEMBERS		
Name	**Title**	**Agency**
Tanner Crutcher	Delta County EMC	Delta County
Charla Singleton	Chief Deputy	Delta County
Emily Howse	City Secretary	Cooper, Texas

Team Member Background and Contributions

Emily Howse: Emily has been with the city of Cooper Texas for 15 years. She has worked as city secretary for the last eight years. Emily was very helpful in providing a variety of details regarding the city of Copper operations and policies. We had several telephone conferences and exchanged e-mails regarding the hazard mitigation plan.

Charla Singleton: Charla is the newly elected sheriff of Delta County. Prior to her appointment as sheriff she was the Delta County Chief Deputy. Charla attended police training school in Sulphur Springs, Texas Charla provided a great deal of information regarding dams and dam safety in Delta County. She also contributed to overall input regarding hazards and community preparation.

Tanner Crutcher: Tanner is the Emergency Management Coordinator for Delta County, Texas, including the cities of Cooper and Pecan Gap, and has served in that capacity since November 2018. Tanner is also employed as a full-time firefighter with the City of Frisco, Texas. Tanner has previously served in other capacities in Delta County, including as an Assistant to the County Judge in which he was responsible for preparing the County's annual operating budget, overseeing facilities, capital projects, and economic development negotiations. Tanner earned his Bachelor of Science degree in May 2015 from Texas A&M University – Commerce and will soon graduate with his Master of Science degree from Texas A&M University - Commerce, pending a thesis defense. Mr. Crutcher functioned as the chairman of the Delta County Mitigation Team. He provided information or suggestions throughout the planning process. The plan could not have been written without his expertise and advice.

Stakeholders

Selected stakeholders consisting of neighboring county governments, non-profit organizations and educational institutions were contacted by e-mail inviting comment and review on December 10, 2020. A DRAFT of the mitigation plan and contact information were placed on the Delta County Website for review on November 20, 2020. A public notice was posted in the Cooper, Texas paper on December 3, 2020. There were no requests from Stakeholders for additional information or participation.

The following people were identified as possible stakeholders and contacted by e-mail or in person to inquire about their interest and participation in the Delta Plan.

Area Stakeholder Contacts				
Name	**Title**	**Company**	**Location**	**Type of Contact**
L. D Williamson	County Judge	Red River County	Clarksville, TX	e-mail
Scott Lee	County Judge	Franklin County	Mt. Vernon, TX	e-mail
Brandon Bell	County Judge	Lamar County	Paris, TX	e-mail
Randy Moore	County Judge	Fannin County	Bonham, TX	e-mail
Bobby W. Stovall,	County Judge	Hunt County	Greenville, TX	e-mail
Robert Newsom	County Judge	Hopkins County	Sulphur Springs	e-mail
Marcia Lair	Director	House of Hope	Cooper, TX	e-mail

Public Participation

Public participation is a key component to strategic planning processes. Citizen participation offers residents the chance to voice their ideas, interests, and opinions. Opportunities were given to the citizens of Delta County to participate in planning and to review the plan.
A draft of the hazard mitigation plan and contact information were posted on the Delta County Website and posted in the courthouse on November 20, 2020. Notices regarding the mitigation plan availability were also placed in the Cooper newspapers and posted at the courthouse. on December 3, 2020. There were no requests from the public for additional information or participation.

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.

"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 Delta County and the jurisdiction of Cooper 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 September of 2020. The hazard analysis will be reviewed annually, and up-dated as needed during the Formal Review Process.

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/cities
- Estimating Losses. Determining how the hazards will affect the county/cities.

Negative extreme weather impacts driven by climate change represent a risk to current and future Texans, according to John Nielsen-Gammon, Texas State Climatologist and Texas A&M University Regents Professor in the Department of Atmospheric Sciences.

In a new report published today, (March 5, 2020) Nielsen-Gammon and Texas A&M researchers analyze what Texas' climate and weather conditions will be like when the state turns 200 in

2036. Using observed and analyzed historical meteorological and climate data, the report describes future extreme weather risks facing the state.

“Anyone who is impacted by weather and climate and anybody who cares about the future of Texas should read this report,” Nielsen-Gammon said.

The report’s data and analysis show that:

- The number of 100-degree days will double by 2036, compared to the 2000-2018 average.
- The expected average temperature in 2036 will be about 3 degrees warmer than the average over the last half of the last century.
- By 2036, extreme rainfall is expected to be 30-50 percent more frequent than the 1950-1999 average, causing more flooding — especially in Houston and other Texas cities where impervious surfaces increase rainwater runoff intensity.
- Higher temperatures and increased rainfall variability will cause more intense droughts.
- For some parts of the Texas coast, the storm surge risk may double by 2050 due to sea level rise and more intense hurricanes.

Texas needed an updated, state-specific climate assessment, Nielsen-Gammon said; the last such assessment was published in 2011. In 2018, Nielsen-Gammon contributed to a regional climate assessment as a regional co-author of the Fourth National Climate Assessment. (taken from Texas A&M Today https://today.tamu.edu/2020/03/05/extreme-weather-risks-rising-in-texas-warns-new-report/

Areas of Risk: Hazards Identified	
Hazards with Distinct Area of Risk	Hazards without Distinct Area of Risk
Flood	Drought
Wildfire	Winter Storm
	Tornado
	Hailstorm
	Thunderstorm Winds
	Lightning

The process for identifying hazards included looking at historical data to determine which hazards seemed to occur in Delta 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, the Texas Division of Emergency Management staff, the Texas Hazard Mitigation Plan.

Natural Hazards Most Likely to Occur in Delta County.			
Hazard	**Type of Disaster**	**How Identified**	**Why Identified**
Floods	Natural	• 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	Natural	• Public Input • National Weather Service • History • NCDC Data Base	• Public Concern • History • Frequency
Winter Storms	Natural	• 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.
Thunderstorm Winds	Natural	• NOAA reports • Public Input • Newspaper Accounts	• Wind shears an ongoing problem • Severe Windstorms occur every year
Hailstorm	Natural	• Newspaper accounts • NOAA • Input from public	• Frequency • History • Public Concern
Drought	Natural	• History • Review of NCDC database • Public Input	• Costly to agri-business • Drought common to state and county
Hail	Natural	• NOAA reports • Public Input	• Damage to autos and homes • Frequency
Lightning	Natural	• Public Input • Lightning Monitors	• Damage to property and possible deaths • Frequency
Wildfire	Natural	• 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

Hazards Listed in the Texas Hazard Mitigation Plan Not Included in the Delta County Plan	
Hazard	**Reason for Exclusion**
Tropical storms	Delta County is 300 miles from the coast. Tropical storms are not an issue for Delta County. The planning area has no history of Tropical Storms hazards; therefore, no impacts are expected in the future.
Coastal erosion	Delta County is 300 miles from the coast. Coastal Erosion is not an issue for Delta 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 Delta 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 Delta County. The planning area has no history of Land Subsidence hazard; therefore, no impacts are expected in the future.
Extreme Heat	There are no state records for Delta County regarding past extreme heat loss or projected loss listed in the current Texas Hazard Mitigation Plan. The planning area has no history of extreme heat hazard; therefore, no impacts are expected in the future.
Earthquake	The planning area has no history of Erosion earthquakes; therefore, no impacts are expected in the future.
Dams	Cooper Dam was assessed by the Fort Worth District for the Periodic Assessment (PA) in April 2019 and was presented to the USACE Dam Senior Oversight Group who recommended and Dam Safety Action Classification (DSAC) of 5, considered Low Urgency. The Deputy Dam Safety Officer for Headquarters USACE approved the DSAC recommendation in May 2020. This classification was assigned based on the risks and consequences associated with project performance under a series of loading conditions. There are no historical occurrences of problems with the dam.

Hazard Assessment

Delta County and the jurisdiction of Cooper are susceptible to several possible natural hazards. The Hazard Mitigation Team, with the assistance of the Ark-Tex Council of Governments Hazard Mitigation Planners, conducted a comprehensive Hazard Analysis. The hazard analysis will be reviewed annually, and up-dated as needed during the Formal Review Process.

Identifying Hazards

It is critical to identify and describe all the natural hazards capable of occurring within the County and the vulnerabilities to each one. Each community in the county is unique in location, topography, location of critical facilities, commercial and residential development, etc. Some municipalities are more susceptible to certain hazards because of these and other unique circumstances. These hazards are identified so that appropriate action can be taken to mitigate the impact, minimize loss, and recover as quickly as possible. It is recognized that all the demands of a disaster situation cannot be anticipated, but by being aware of the areas, major facilities and persons that may be vulnerable to each type of hazard, preventive measures, as well as emergency response, can be planned

QUANTIFYING RISK

The following tables are designed to quantify risk. Severity of Impact, Probability of Future Events, Warning Time, and Duration are the elements considered for each hazard.

Potential Severity of Impact: (45% of Priority Risk Index)	
SUBSTANTIAL **Index Value = 4**	• Complete shutdown of facilities for 30 days or more • More than 50 percent of property destroyed or with major damage
MAJOR **Index Value - 3**	• 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**	• 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**	• 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 is categorized as Unlikely to Highly Likely. These terms are defined as follows:

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

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:

Hazard Vulnerability	
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.

Life is inherently risky. There is only one big risk you should avoid at all costs, and that is the risk of doing nothing. Denis Waitley

DELTA COUNTY DAMAGE ASSESSMENT

Delta County Damage Assessment				
Structure Type	**Value**	**75%**	**50%**	**25%**
Residential	$82,380,412	61,785,309	41,190,206	20,595,103
Industrial	$14,474,766	108,560,745	7,237,383	3,618,692
Roads and Bridges	$532,600,000	399,450,000	266,300,000	133,150,000
Agriculture	$82,843,281	62,132,460	414,216,405	20,710,820
total	$712,298,459	631,928,514	728,943,994	178,074,615

Cooper Damage Assessment				
Structure Type	**Value**	**75%**	**50%**	**25%**
Residential	$28,820,938	21,615,704	14,410,469	7,205,235
Commercial	$6,014,340	4,510,755	3,007,170	1,503,585
Industrial	$10,122,891	7,592,168	5,061,445	2,530,723
Government	$281,000	210,750	140,500	70,250
Educational	$6,846,967	5,135,225	3,423,484	1,711,742
total	$51,805,136	39,064,602	26,043,068	13,021,535

FLOOD

Descriptions

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.

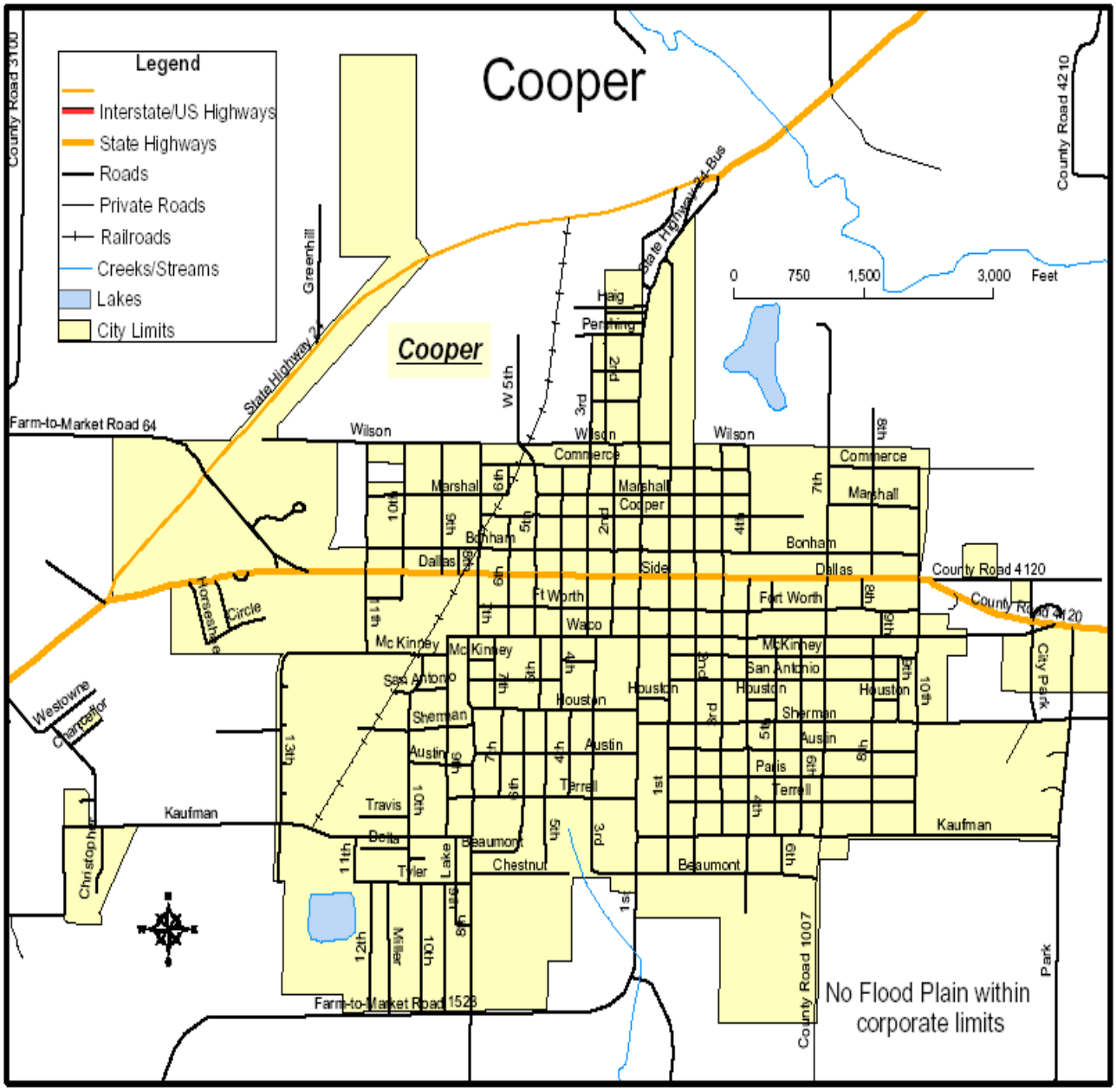
Floodplains
100-Year Flood: There is one chance in 100, or a 1% chance of a flood of such magnitude or greater occurring in any given year. There is no guarantee that a similar flood will not occur in the next year.

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.

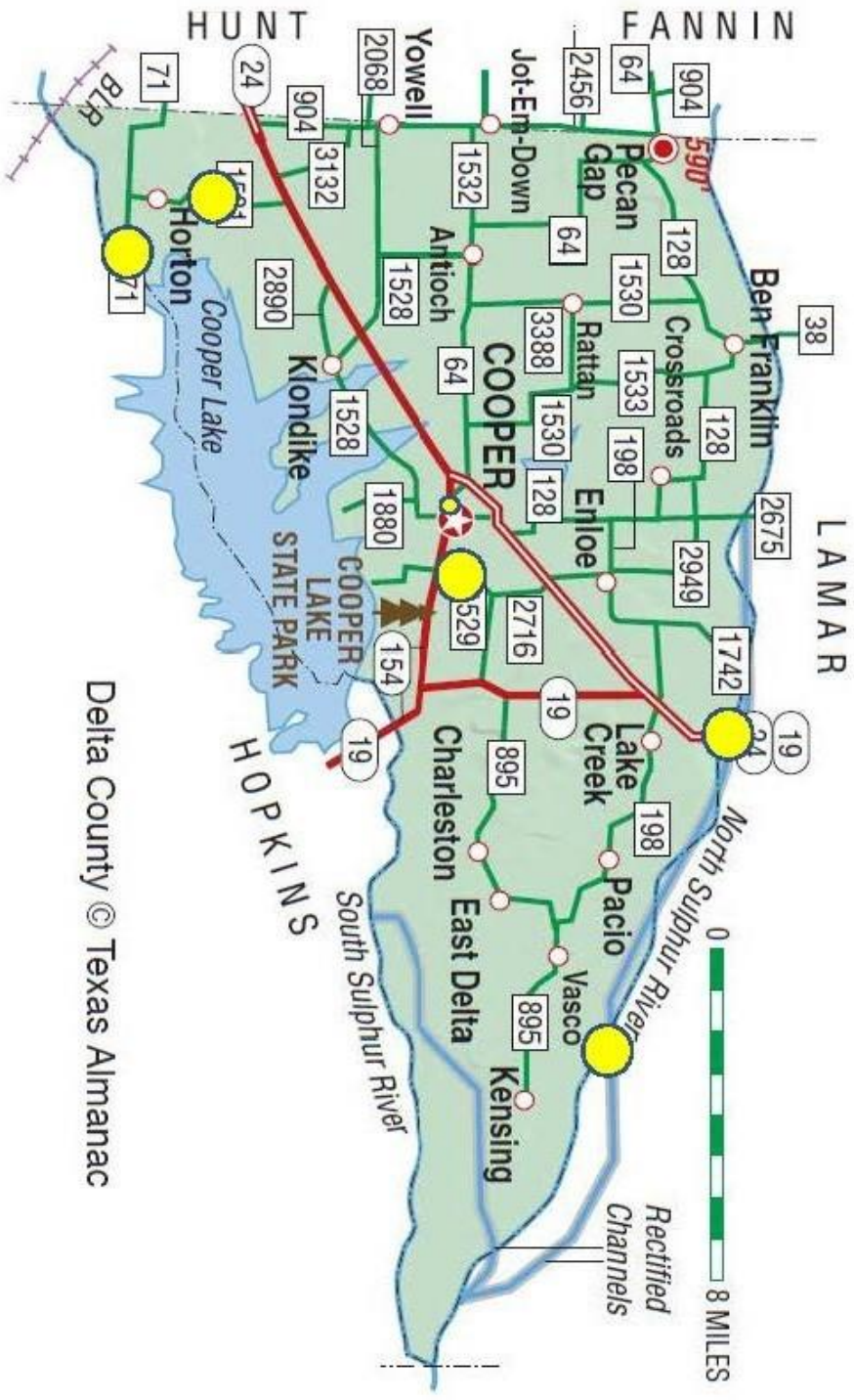
Floodway: That portion of the floodplain, which is effective in carrying flow, within which this carrying capacity must be preserved and where water depths and velocities are the greatest. It is the area along the channel that provides for the discharge of the base flood so the cumulative increase in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

Delta County and the jurisdiction of **Cooper** do not participate in the National Flood Insurance Program. Each will set an action of full participation as part of this plan.

According to FEMA, Delta County has not been mapped. Therefore, there are no available FEMA flood maps for Delta County. The following mapping was generated by the Ark-Tex Council of Governments.



The city of Cooper has a total of 940.8 acres inside the city limits. There are no floodplains in Cooper. There is no record of repetitive flood losses.



This Delta County map depicts problem road areas that may flood during heavy rainfall. The problem areas are marked by yellow circles.

Delta County Flood Risk					
Jurisdiction	**Impact**	**Probability**	**Warning Time**	**Duration**	**PRI Score**
Delta County	Limited PRI = .45	Highly Likely PRI = 1.20	6 to 12 hrs. PRI = .45	< 24 hrs. PRI =.20	Medium 2.6
Cooper	Limited PRI = .45	Occasional PRI = .6	6 to 12 hrs. PRI = .45	< 24 hrs. PRI =.20	Low 1.7

Estimated Property Loss at 50%	
Delta County	$728,943,994
Cooper	$26,043,068

Critical Facilities

There are no critical facilities identified as located in flood zones in Cooper or Delta County.

HISTORY OF FLASH FLOODING IN Delta COUNTY

(Data from NOAA Satellite and Information Service, National Climatic Data Center)
November 25, 1996 to August 13, 2017.

Delta County Flash Flood History			
Date	**Location**	**Description**	**Cost**
11/25/96	Delta County	Several roads were flooded throughout the county and Farm to Market Road 439 was closed.	
02/20/97	Delta County	Numerous roads were flooded and subsequently closed throughout the county	
06/13/97	Delta County	Highway 198 was reported flooded near Enloe along with numerous unidentified roads throughout the county.	
10/12/97	Delta County	Water was reported over Highway 24 at FM 1528.	
10/17/98	Cooper	Water covered several roads in Cooper	
11/13/98	Delta County	Highway 71 was closed due to flash flooding from heavy thunderstorms 12 miles SW of Cooper	
12/04/98	Cooper	City streets in Cooper and in the western part of Delta County were flooded.02/27/	
02/27/2001	Delta Count	Several roads flooded across the county	0.00K
12/16/2001	Delta County	County roads 1529 and 71 were closed due to high water. F 224 remains closed from Cooper to the Hunt County line.	0.00K
10/19/2002	Delta County	County Roads flooded southwest of Cooper	25K
01/03/2005	Cooper	Flooding was reported on FM 71 at the South Sulphur River Bridge	
01/12/2005	Cooper	Two streets in town have several inches of water over them and are closed.	
06/27/2007	Delta County	FM 1531 and FM 3388 were closed due to flooding near Rattan.	

07/10/2007	Delta County	FM 38 was flooded and closed near Rowdy Creek and several secondary roads were closed.	
03/18/2008	Delta County	A couple of roads were closed near Klondike due to flooding.	
03/20/2015	Delta County	Cooper Police reported high water over the roadway on Texas State Highway 24. Highway 24 was closed near Cooper due to the high water	
12/27/2015	Delta County	Several county and farm-to market roads remained flooded across the county after several inches of heavy rain	
08/13/2017	Delta County	Delta County Sheriff's Department reported that part of FM 1531, FM 2068, and FM 3388 were closed due to high water.	
		Total	25K

According to the National Weather Service there, is no record of flood found in Delta County after 2017.

Location: Historically, the entire County has suffered from flash flooding. If future trends continue as they have in the past, the County area will continue to have floods. Countywide, the highways and county roads will continue to flood. Cooper can expect some roadway flooding after extended periods of heavy rain. In Cooper, the intersection of Southwest 6 and Beaumont Street and the 1000 block of Southwest 9 can have standing water for short periods of time. It must rain 3 to four inches in 1.5 hours for the streets to be covered with water, but it is extremely rare for a street in Cooper to become impassable. There appears to be no repetitive pattern in road and highway flooding.

Extent: 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 a transfer of property to higher elevations are necessary. Major damage is defined as extensive inundation of structures and roads with significant evacuations of people and/or transfer of property to higher elevations. The impact of floods varies locally**.** Roads may flood in Cooper and in rural county areas after heavy rains. Damage will be minor. It would be the exception in East Texas to find a town or city that does not. The flooding is minor. There are no repetitive loss properties, and 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 Assessment Damage Tables on page 26 addresses the amount of loss that can occur with flooding.

Possible Amounts of Flooding Within Jurisdictions		
Jurisdiction	**From**	**To**
Cooper	¼ inch	1 foot
Delta County	¼ inch	3 feet

Probability: We must prepare for the increase potential of heavy rain. Flash floods are possible at any time during the storm season. These types of floods occur often during that period. Current data suggests that as the earth warms, precipitation extremes will become more intense, winter and

summer, simply because warmer air can carry more water vapor. Weather statistics confirm that this has begun to happen. The probability is highly likely. Historically the probability of flooding is greater in the rural areas than in the jurisdictions.

Vulnerability/Impact: The probability of a flash flood and the inability to accommodate the existing drainage on some of the FM roads can be a problem. Should Cooper flood, many businesses would be in jeopardy. Citizens might have to relocate temporarily. Some dwellings would be totally lost. Clearly a major flood in Cooper could threaten lives and income. The elderly shut-ins would have to be evacuated from their homes.

Summary: The jurisdiction of Cooper experiences flooded streets due to flash flooding. Cooper has emergency procedures in place to warn citizens about flooded streets. Barricades and cones are on hand to warn drivers of flooded areas. There are no repetitive flood properties in the jurisdictions. In Delta County identified sections of rural roads and highways frequently flood after heavy rains. In these places roads are well marked to warn drivers of impending danger. Educational programs like *Turn Around, Don't Drown* will help citizens become more informed about the dangers of flooded roadways. Alternate routes for emergency vehicles should be identified before flooding happens. The county and participating jurisdictions will have action goals to participate in the National Flood Insurance Program.

TORNADOES

Description
A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud. It is spawned by a thunderstorm (or sometimes because 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 1 for the frequency of tornadoes, number 16 for fatalities, number 21 for injuries per area and number 21 for costs per area

Tornadoes come from mainly two types of thunderstorms: supercell and non-supercell.*

Supercell Tornadoes

Tornadoes that come from a **supercell** thunderstorm are the most common, and often the most dangerous. A rotating updraft is a key to the development of a supercell, and eventually a tornado. There are many ideas about how this rotation begins. One way a column of air can begin to rotate is from wind shear – when winds at two different levels above the ground blow at different speeds or in different directions.

An example of wind shear that can eventually create a tornado is when winds at ground level, often slowed down by friction with the earth's surface, come from the southwest at 5 mph. But higher up, at 5000 feet above the same location, the winds are blowing from the southeast at 25 mph! An invisible “tube” of air begins to rotate horizontally. Rising air within the thunderstorm tilts the rotating air from horizontal to vertical – now the area of rotation extends through much of the storm.

Once the updraft is rotating and being fed by warm, moist air flowing in at ground level, a tornado can form. There are many ideas about this too.

Scientists still have many questions. As few as 20 percent of all supercell thunderstorms actually produce tornadoes. Why does one supercell thunderstorm produce a tornado and another nearby storm does not? What are some of the causes of winds moving at different speeds or directions that create the rotation? What are other circulation sources for tornadoes? What is the role of downdrafts (a sinking current of air) and the distribution of temperature and moisture (both horizontally and vertically) in tornadogenesis?

Non-Supercell Tornadoes

And, since not all tornadoes come from supercells, what about tornadogenesis in non-supercell thunderstorms?

Nearly 20% of all tornadoes are associated with lines of strong thunderstorms called “quasi-linear convective systems” (QLCS). *QLCS tornadoes* frequently occur during the late night and early morning hours. These tornadoes, however, tend to be weaker and shorter-lived on average than those associated with supercell thunderstorms. NSSL researchers are looking for ways to detect QLCS tornadoes more effectively.

Another type of non-supercell tornado is a *landspout*. A landspout is a tornado with a narrow, rope-like condensation funnel that forms while the thunderstorm cloud is still growing and there is no rotating updraft - the spinning motion originates near the ground.*

***National Severe Storms Lavatory (NSSL)**

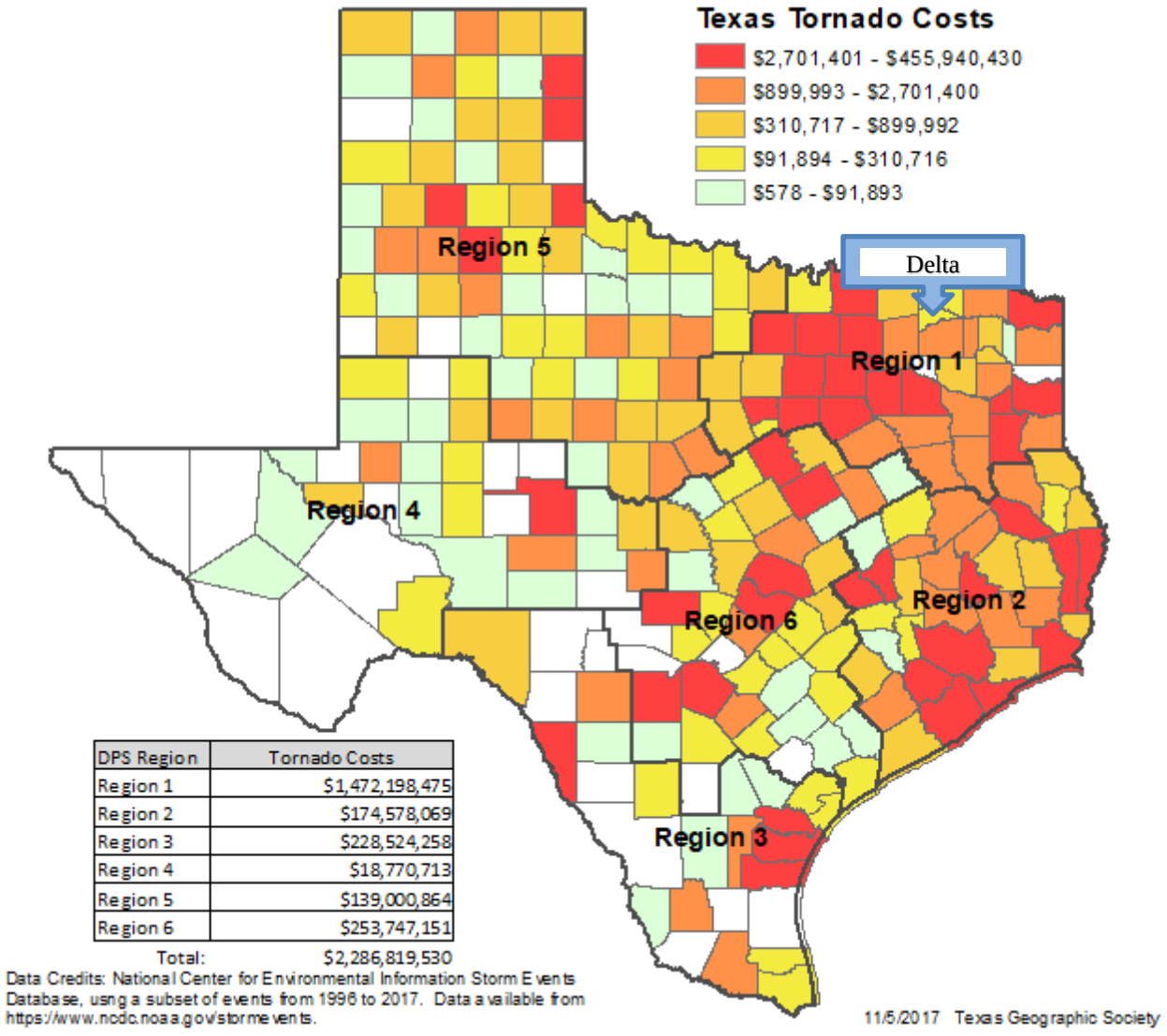
We understand tornadoes scientifically, but it still feels supernatural. The randomness makes it feel supernatural.

Michael Koryta

Historical Dollar Losses

illustrates the total county losses (property plus crop losses) from tornadoes 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.

Historical Tornado Dollar Losses

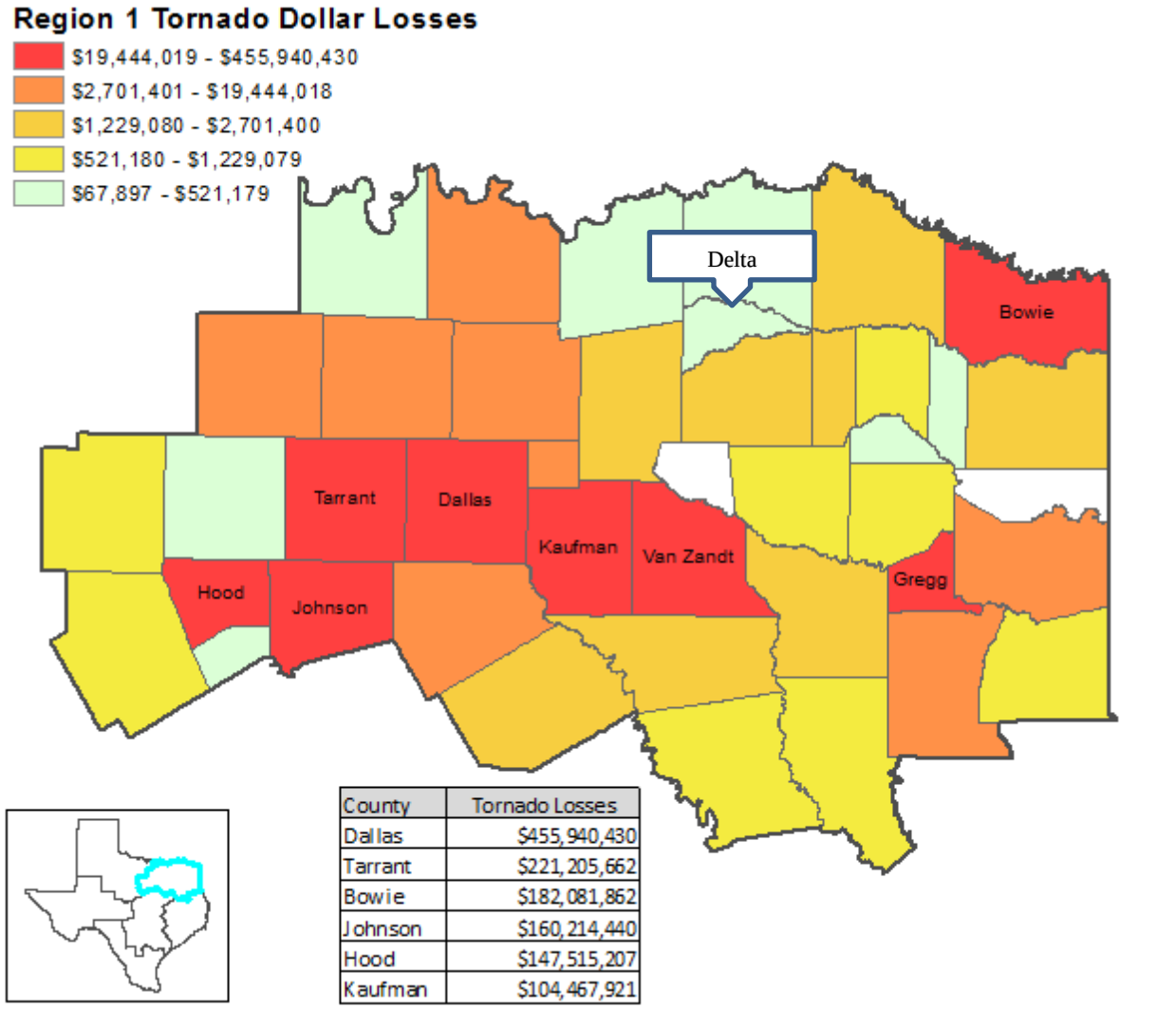


DPS Region	Tornado Costs
Region 1	$1,472,198,475
Region 2	$174,578,069
Region 3	$228,524,258
Region 4	$18,770,713
Region 5	$139,000,864
Region 6	$253,747,151
Total:	$2,286,819,530

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.

This map shows Region 1's total county losses (property plus crop losses) from tornadoes. County colors indicate their losses relative to other counties within the region. The inset table in this map reports the total dollar losses for the highest-loss counties. These counties are also labeled.

Historical Tornado Dollar Losses in Region 1



County	Tornado Losses
Dallas	$455,940,430
Tarrant	$221,205,662
Bowie	$182,081,862
Johnson	$160,214,440
Hood	$147,515,207
Kaufman	$104,467,921

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.

6/26/2017 Texas Geographic Society

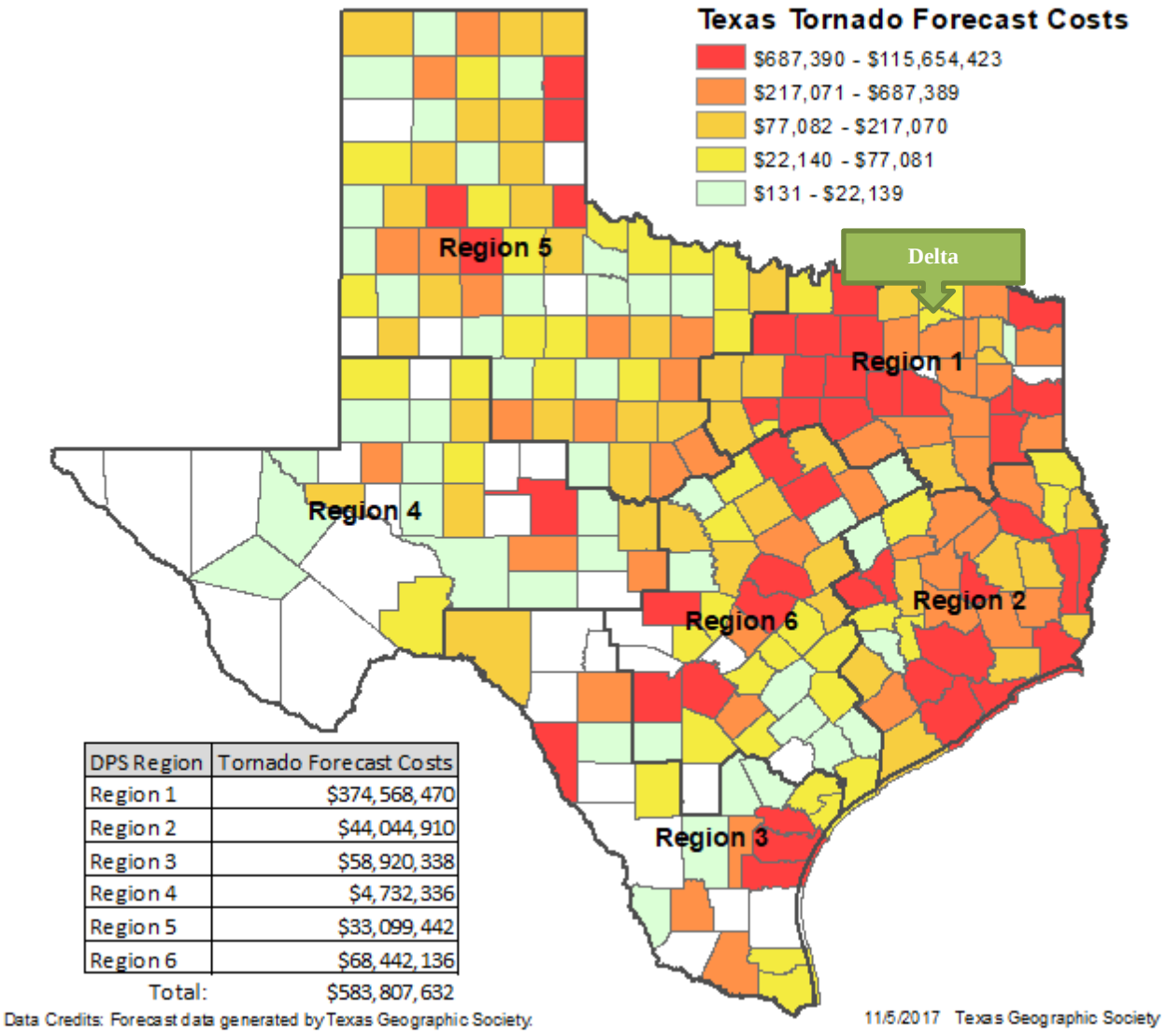
Future Risks

Results of the hazard impact forecast for tornadoes are presented below along with a local assessment of those risks. Following this is a discussion and summary of tornado risks statewide.

County Dollar Loss Forecast

This map shows the results of the forecast model for 2019-2023 for tornado 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.

Tornado Dollar Losses Forecast



DPS Region	Tornado Forecast Costs
Region 1	$374,568,470
Region 2	$44,044,910
Region 3	$58,920,338
Region 4	$4,732,336
Region 5	$33,099,442
Region 6	$68,442,136
Total:	$583,807,632

This forecast is an estimate of damages that are likely to occur if comparable weather events re-occur in locations in or near those that were impacted during the base period. Future tornado dollar losses will not necessarily be in the same places they were in the past, but a strong correlation is likely. The local risk assessment information on tornadoes is from Dallas County.

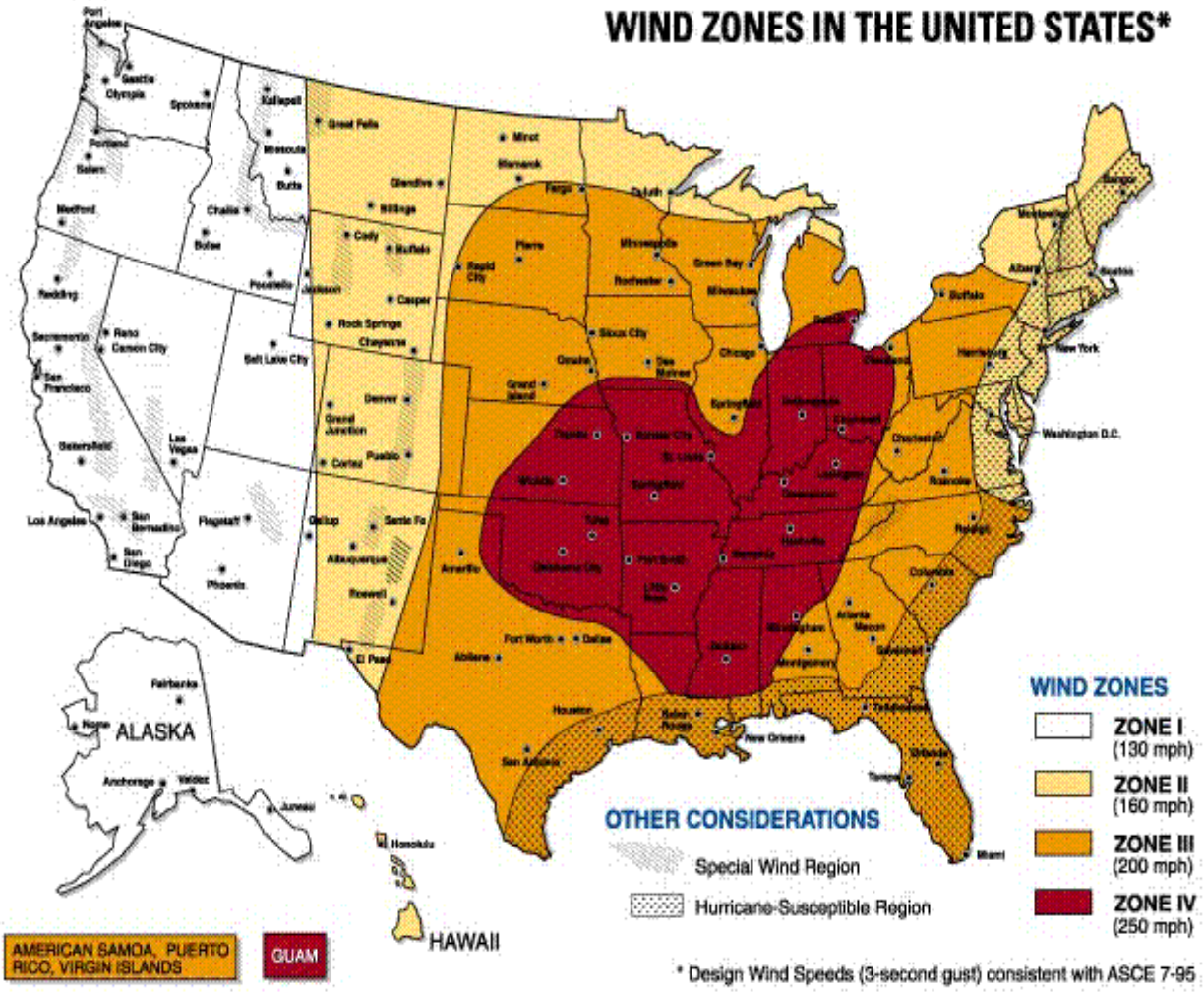


Figure I.2 Wind zones in the United States

Delta County Tornado Risk					
Jurisdiction	**Impact 45%**	**Probability 30%**	**Warning Time 15%**	**Duration 10%**	**PRI Score**
Delta County	Substantial PRI = 1.8	Unlikely PRI = 0.10	>6 hrs. PRI = .6	>6 hrs. PRI =.10	Medium 2.6
Cooper	Substantial PRI = 1.8	Unlikely PRI = 0.10	>6 hrs. PRI = .6	>6 hrs. PRI =.10	Medium 2.6

Estimated Property Loss at 25%	
Delta County	$178,074,615
Cooper	$13,021,535

Delta County Critical Facilities		
Critical Facilities	**Cooper**	**Delta Co.**
City Hall	1	
Fire Station	1	5
Govt. Facility	1	4
Wastewater Treatment Plant	1	
Corrections Facility		1
Maintenance Barn		
Post Office	1	2
Water Tower	2	2
Police Station		
Sheriff Office	1	
EMS		
Water Treatment Plant	1	
County Seat and offices	1	

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

Past Occurrences of Tornadoes					
Begin Date	Location	F SCALE	Fatalities Injuries	Description	$PrD
06/02/54	Delta County	F2	1/F 8/I	Six Miles Long 1000 Yds. Wide	25K
04/02/57	Delta County	F2	1/F	None Reported	25K
04/22/64	Delta County	F3	2/I	Six Miles Long 50 Yds. Wide	25K
04/18/77	Delta County	F2	0	None Reported	0
05/24/03	Delta County	F1	0	Tornado touchdown between Klondike and Horton on FM 1520. The Fisherman's Motel and Marina in the Klondike area received major roof damage. Several homes had structural damage including roof damage from fallen trees. Residents of the area had no power, telephone service, or water for much of Sunday	75K
				Total	**150K**

The EF Scale was revised from the original Fujita Scale to reflect better examinations of tornado damage surveys to align wind speeds more closely with associated storm damage. The new scale has to do with how most structures are designed.

While the F-scale goes from F0 to F12 in theory, the EF-scale is capped at EF5, which is defined as "winds ≥200 mph (320 km/h)". In the United States, the Enhanced Fujita scale went into effect on February 2, 2007 for tornado damage assessments and the Fujita scale is no longer used.

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 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 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		

Location: Tornado Alley is a term often used by the media to denote a zone in the Great Plains region of the central United States, often a north-south oriented region centered on north Texas, Oklahoma, Kansas, and Nebraska, where tornadoes are most frequent. Most maps show Delta County located on the eastern edge of tornado alley.

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 50 years, Delta County can expect to receive a tornado touchdown every five to ten years. Should the predictions of increased violent weather be valid the incidence of tornadoes in Delta County may increase. The expected tornado size would range between 25 to 1000 yards wide, with a path from one to several miles long. 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 unlikely for the County. The possibility is less for the participating jurisdictions because they occupy a small portion of Delta County.

Vulnerability/Impact: Due to the frequency and unpredictable pattern of tornadoes, all of Delta 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. Cooper has more valuable property such as the county courthouse and places of business that could be destroyed. The Delta County Courthouse is the largest structure in the county. A F3 or F4 tornado could destroy the small town of Cooper. Small towns can experience complete loss of communication. Roads could be blocked by downed trees and building debris. There are no modern buildings in either town and this would contribute to the possibility of injury and death. The Damage Assessment Tables on page 26 demonstrates the amount of loss that can occur from a tornado. The extent of damage can be substantial.

Extent: The **Enhanced Fujita Scale**, or **EF Scale** 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, 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. A strategically placed EF2or EF3 Tornado could destroy Cooper. Fortunately, a storm of that magnitude had never occurred in the city limits.

Historically the severity of tornadoes in Delta County has ranged from F1 to F3 on the Fujita Scale. There is no record of a tornado using the new EF scale. The entire scale presented is used to determine ranges and severity. The full range of 65 (F0) to 200 mph (F5 +) are possible in Delta County and Cooper. The full range of this scale is used to determine ***extent.*** ***(See page40)***

Summary: Delta County is on the edge of tornado alley. Its small rural size and population have limited the number of events to five. There was one fatality recorded in1954 and again in 1957 there were fatalities. Local County data is limited but tornadoes remain a number one concern for its citizenry. Warning systems, safe rooms, and generators for emergency power are needed safeguards for the jurisdiction of Cooper.

Thunderstorm Winds

Description

Damaging winds are often called “straight-line” winds to differentiate the damage they cause from tornado damage. Strong thunderstorm winds can come from a number of different processes. Most thunderstorm winds that cause damage at the ground are a result of outflow generated by a thunderstorm downdraft. Damaging winds are classified as those exceeding 50-60 mph.

Damage from severe thunderstorm winds account for half of all severe reports in the lower 48 states and is more common than damage from tornadoes. Wind speeds can reach up to 100 mph and can produce a damage path extending for hundreds of miles. Since most thunderstorms produce some straight-line winds as a result of outflow generated by the thunderstorm downdraft, anyone living in thunderstorm-prone areas of the world is at risk for experiencing this hazard.

People living in mobile homes are especially at risk for injury and death. Even anchored mobile homes can be seriously damaged when winds gust over 80 mph.

Types of Damaging Winds

Straight-line wind is a term used to define any thunderstorm wind that is not associated with rotation and is used mainly to differentiate from tornadic winds.

A **downdraft** is a small-scale column of air that rapidly sinks toward the ground.

A macroburst is an outward burst of strong winds at or near the surface with horizontal dimensions larger than 4 km (2.5 mi) and occurs when a strong downdraft reaches the surface. To visualize this process, imagine the way water comes out of a faucet and hits the bottom of a sink. The column of water is the downdraft and the outward spray at the bottom of the sink is the macroburst. Macroburst winds may begin over a smaller area and then spread out over a wider area, sometimes producing damage similar to a tornado. Although usually associated with thunderstorms, macrobursts can occur with showers too weak to produce thunder.

A **microburst** is a small concentrated downburst that produces an outward burst of strong winds at or near the surface. Microbursts are small — less than 4 km across — and short-lived, lasting only five to 10 minutes, with maximum windspeeds sometimes exceeding 100 mph. There are two kinds of microbursts: wet and dry. A wet microburst is accompanied by heavy precipitation at the surface. Dry microbursts, common in places like the high plains and the intermountain west, occur with little or no precipitation reaching the ground.

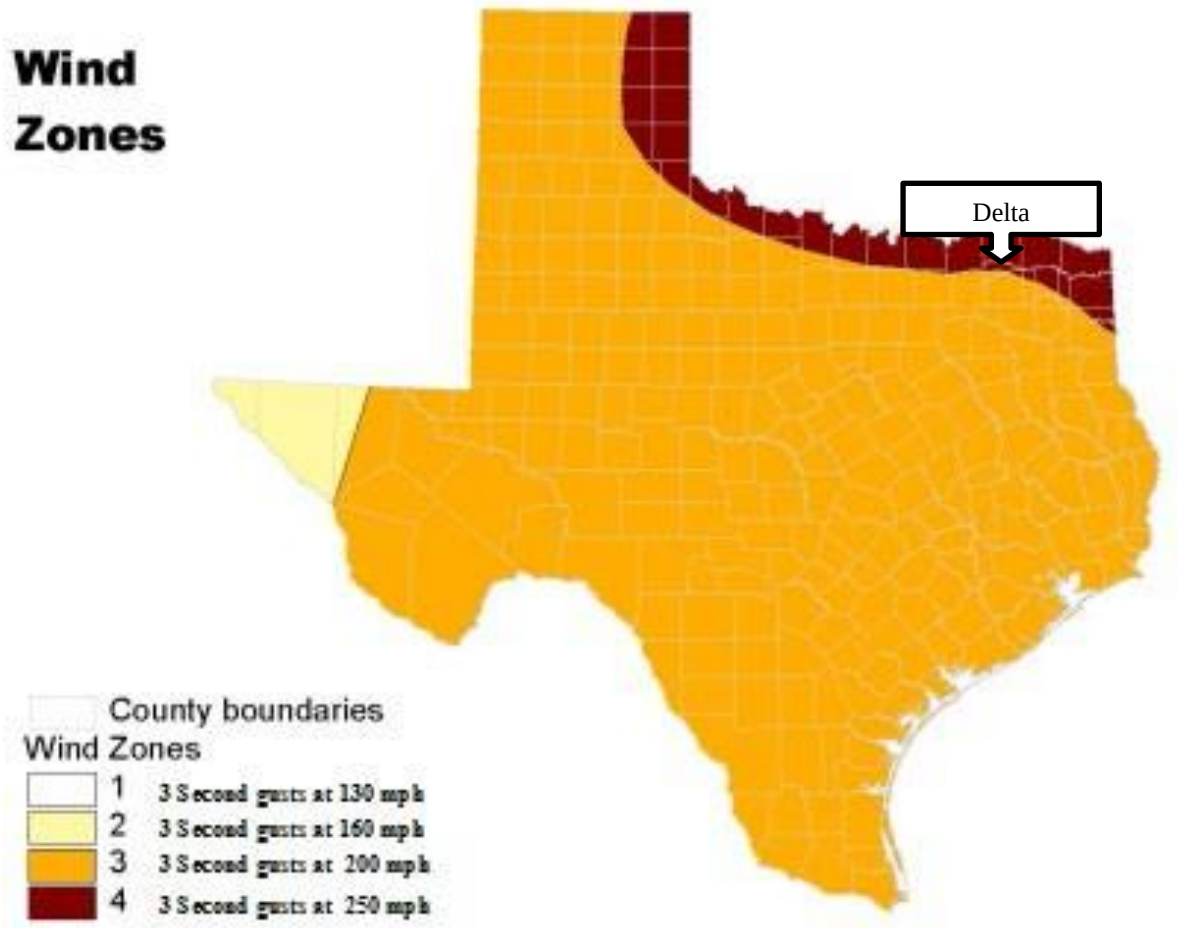
A **downburst** is the general term used to broadly describe macro and microbursts. Downburst is the general term for all localized strong wind events that are caused by a strong downdraft within a thunderstorm, while microburst simply refers to an especially small downburst that is less than 4 km across.

A **gust front** is the leading edge of rain-cooled air that clashes with warmer thunderstorm inflow. Gust fronts are characterized by a wind shift, temperature drop, and gusty winds out ahead of a thunderstorm. Sometimes the winds push up air above them, forming a shelf cloud or detached roll cloud.

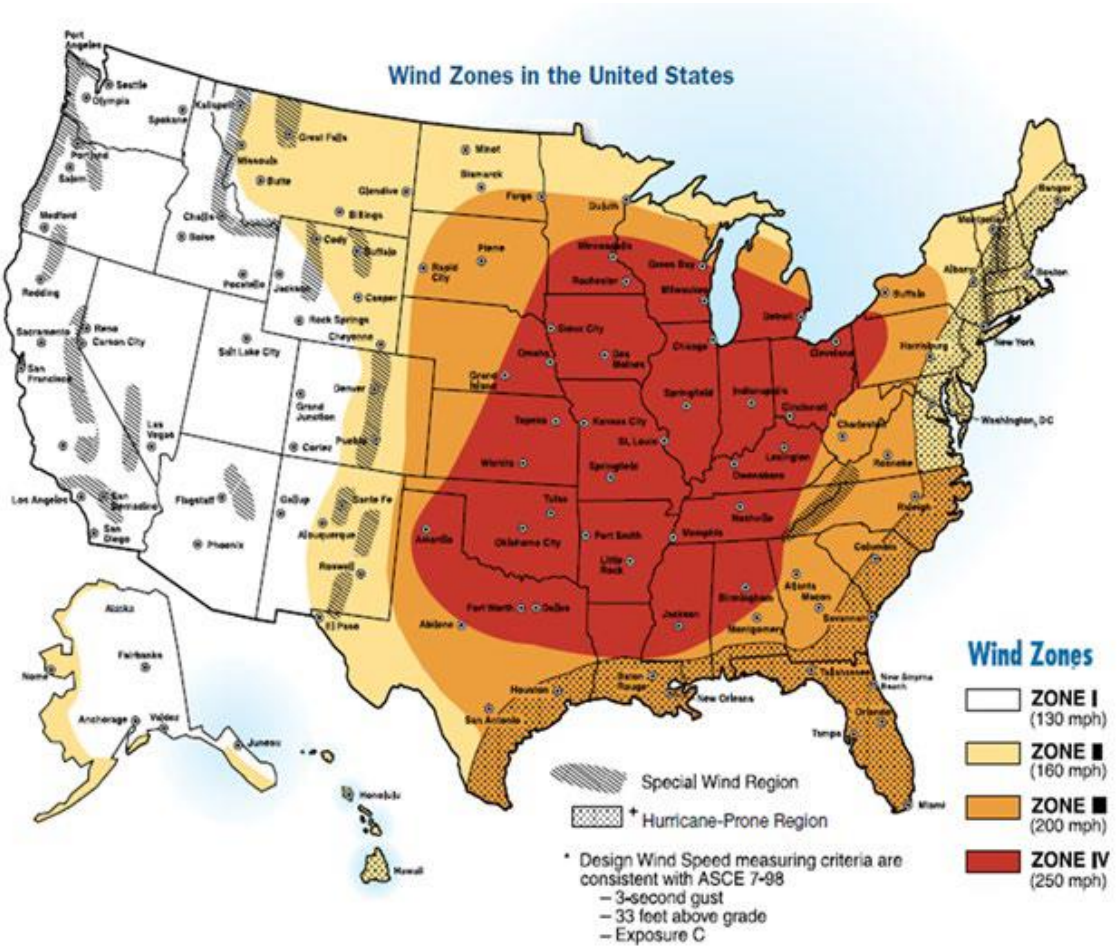
A **derecho** is a widespread, long-lived windstorm that is associated with a band of rapidly moving showers or thunderstorms. A typical derecho consists of numerous microbursts, downbursts, and downburst clusters. By definition, if the wind damage swath extends more than 240 miles (about 400 kilometers) and includes wind gusts of at least 58 mph (93 km/h) or greater along most of its length, then the event may be classified as a derecho.

A **haboob** is a wall of dust that is pushed out along the ground from a thunderstorm downdraft at high speeds.*

*The National Severe Storms Laboratory



The following map illustrates the wind risk zones of the entire U.S. based on the highest expected wind speeds with the following criteria: 1) three-second gusts, and 2) thirty-three-feet above grade. The data on the map considers all wind hazards including severe thunderstorms, tornadoes, and hurricanes. Zones are associated with the highest wind speed for that region. The map also displays special wind hazard-prone areas. Wind speeds draw a parallel to design specifications of a shelter or safe room. Typically, Texans require a shelter/safe room to withstand 160-200 mph wind with a maximum expectance of 250 mph.



The Beaufort Scale depicted in the chart shows wind speeds and the effects of winds on land. The entire range of the scale is used to determine EXTENT in Delta County.

Beaufort Scale

Beaufort number	Wind Speed (mph)	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 Force		Violence and destruction.

HISTORY OF SEVERE WINDS IN DELTA COUNTY

(A total of 76 Thunderstorm related High Wind events were reported in Delta County, between 1960 and 2019. Only those storms listing property damage are show in the following table.)

Location	Begin Date	Description	$PD
Ben Franklin	05/29/94	Threes were blown down by thunderstorm winds.	5K
Cooper Lake	05/29/94	Trees blown down by thunderstorm winds.	5K
Cooper	11/03/94	A utility pole blown down by high winds.	0.5K
Horton	11/03/94	Utility pole blown down by high winds southwest corner of county.	0.5K
11 miles SW of Cooper	11/04/94	Tree blown down across Hwy 24 on Hunt/Delta line.	0.5K
7 miles W of Cooper	11/04/94	High winds blew the roofs off two outbuildings.	5K
4 miles SW of Cooper	11/04/94	Roofs damaged and trees blown down by high winds.	5K
Cooper	06/02/95	Power lines blown down by high winds.	2K
4 Miles NW of Klondike	04/19/96	Strong winds blew down power lines and trees.	2K
Cooper	04/19/96	Power lines blown down.	2K
Cooper	04/22/97	Numerous trees and power lines blown down.	2K
Lake Creek	06/13/97	Strong winds blew roof and porch off home.	30K
Lake Creek	06/13/97	Strong winds flipped mobile home and blew down trees.	25K
3 miles East of Cooper	07/15/97	A barn was blown over by winds.	2K
Cooper	07/12/98	A portable sign blown down onto road.	0.5K
Cooper	12/10/98	Two cars destroyed when winds blew trees down on them.	25K
Cooper	03/02/00	Trees blown down and 4 businesses damaged. Flooding reported along low-lying roads eastern part of county.	50K
Cooper	05/27/00	Trees and power lines blown down.	2K
Klondike	03/27/00	Trees and power lines blown down.	2K
Cooper	09/01/00	Two mobile homes damaged by thunderstorm winds.	10K
Ben Franklin	10/12/01	Storage shed unroofed by winds.	2K
Klondike	08/11/03	Numerous power lines torn down, 4-inch limbs broken.	3K
Cooper	04/10/08	Several trees and large limbs torn down across county	5K
Cooper	05/10/08	Wide-spread damage, roofs torn off, trees knocked down, radio tower destroyed	150K
Cooper	06/28/08	Large limbs, broken, fences torn down.	3K
Cooper	05/02/09	The roof of a building on the west side of the square in Cooper collapsed. The incoming water broke the windows and	20K

		doors, scattering debris onto Dallas Avenue.	
Cooper	04/24/2011	Large trees were knocked down at the intersection of 4th Street and Terrell Ave. Power lines were also knocked down in the city of Cooper	10.K
1-mile West of Lake Creek	03/08/2012	Damaging downburst winds caused damage near the intersection of State Highway 24 and FM 198. A small barn lost most of its roof, the roof was tossed about a hundred yards from the building. A Large metal storage building also lost most of its roof. Part of the walls of the storage building collapsed as well.	50K
Klondike	04/03/2014	A trained spotter recorded a wind gust to the south of Cooper on Highway 24. Several trees were damaged in the vicinity.	5K

There are no Thunderstorm wind records from April 2014 to 2020

Estimated Property Loss at 15 %	
Delta County	$106,844,768
Cooper	$7,770,770

Delta County Critical Facilities		
Critical Facilities	**Cooper**	**Delta Co.**
City Hall	1	
Fire Station	1	5
Govt. Facility	1	4
Wastewater Treatment Plant	1	
Corrections Facility		1
Maintenance Barn		
Post Office	1	2
Water Tower	2	2
Police Station		
Sheriff Office	1	
EMS		
Water Treatment Plant	1	
County Seat and offices	1	

Critical Facilities

All critical facilities located in Delta County unincorporated and the jurisdiction of Cooper, are vulnerable to some structural damage from high winds.

Delta County Thunderstorm Winds Storm Risk					
Jurisdiction	**Impact 45%**	**Probability 30%**	**Warning Time 15%**	**Duration 10%**	**PRI Score**
Delta County	Minor PRI=. 9	Highly Likely PRI=.1.2	12 to 24 hrs. PRI= .3	> Less than 6 hrs. PRI = .1	Medium 2.5
Cooper	Minor PRI= .9	Highly Likely PRI= 1.2	12 to 24 hrs. PRI = .3	> Less than 6 hrs. PRI = .1	Medium 2.5

Location: Historically, all of Delta County has been affected by high winds. If this trend continues, the entire County will be subject to high wind thunderstorms. This would include the jurisdictions of Cooper.

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

Vulnerability/Impact: The County is susceptible to flash flooding and wind damage from severe thunderstorms. Vulnerability depends on the magnitude of the storm. Damage potential is high in populated areas. There have been no reported injuries and no deaths from thunderstorm wind events. There are many issues related to what is in danger in the communities. Storms cause power outages, disruptions of transportation and property damage. There is insufficient data to conduct a complete risk analysis. Historical data indicate that the entire county is susceptible to windstorms during the storm season and, depending on the severity, costs will vary. The average damage cost is a little over four thousand dollars a year.

Extent: A worst case scenario involving thunderstorms winds would be a solid or redeveloping line of severe thunderstorms that moves through the entire county. These storms can result in heavy rains causing widespread flooding and road closures. Large economic loss to agriculture and/or major damage to buildings and other property can result if such storms are accompanied by hail and high winds. High winds can also down trees and highline poles and result in power outages capable of affecting large areas of the county. Extreme winds can cause several kinds of damage to a building. Wind speeds, even in these extreme wind events, rapidly increase and decrease. An obstruction such as a house in the path of the wind causes the wind to change direction. This change in wind direction increases pressure on parts of the house. The combination of increased pressures and fluctuating wind speeds creates stress on the house that frequently causes connections between building components to fail. The wind speeds from a Thunderstorm can reach the full extent of the Beaufort Scale. See page 47 for a review of the Beaufort Scale.

Summary: The jurisdiction of Cooper and Delta County can fall prey to the high winds, that often accompany thunderstorms. Although these storms are typically not as deadly as tornadoes, they can inflict serious structural damage to buildings, personal injury, and death. Fires sometimes develop from the lightening, tall trees which are plentiful and their limbs, can fall on autos, homes, and people. As a rule, protected populations such as schools and nursing homes are not at risk. Power outages are common during thunderstorms. All the jurisdictions could benefit from emergency backup generators for wastewater disposal and emergency equipment. **See tables on page 26 that estimate costs due to damages.**

Hailstorms

Description

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 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.

Combined NOAA/TORRO Hailstorm Intensity Scales

Size Code	Intensity Category	Typical Hail Diameter (in.)	Approximate Size	Damage Impacts
H0	Hard Hail	Up to 0.33	Pea	No damage
H1	Potentially Damaging	0.33-0.60	Marble	Slight damage to plants, crops
H2	Potentially Damaging	0.60-0.80	Dime	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	Ping Pong Ball	Widespread glass damage, vehicle bodywork damage
H5	Destructive	1.6-2.0	Golf Ball	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	2.0-2.4	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	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

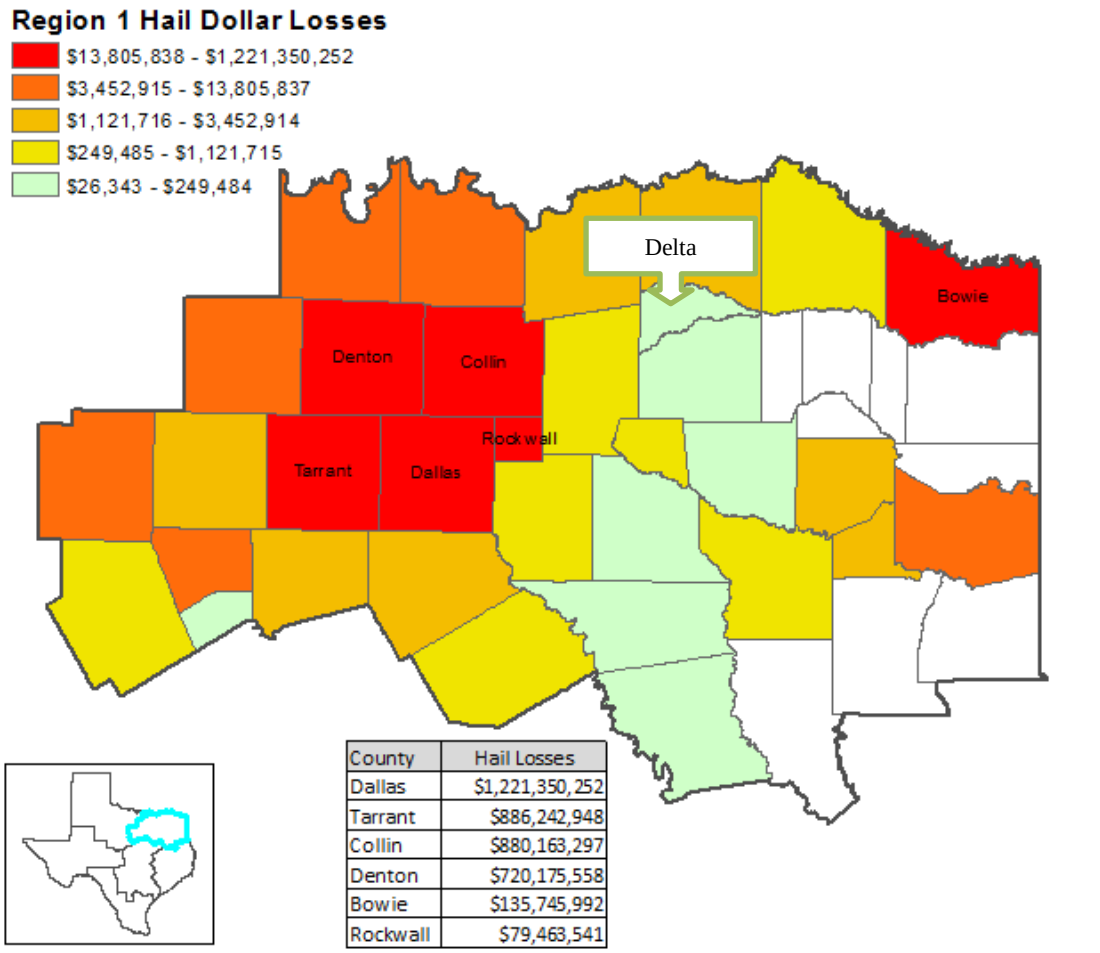
History of Hailstorms in Delta County

The NOAA Satellite and Information Service, National Climatic Data Center, reports that there have been 16 days with hail events reported between 1999 and 2021 in Delta County. In a few situations multiple hailstorms occurred on the same day. For this reports' purposes these were recorded as $125,000 in damage. Cooper has recorded multiple hail events over the last 49 years of record keeping. Two hailstorms have occurred in the last five years in Delta County. Since record keeping began in 1968, five events recorded a magnitude of 2.75 inches which is an H7 on the hailstorm intensity scale. Hail this size can damage automobiles, destroy roofs, and break windows. The possibility of hailstorms is the same over the entire Delta County planning area. Each year hailstorms cause millions of dollars of damage to crops like corn and soybeans. It can rip the leaves off trees and in extreme cases, kill small animals. Business signage can be destroyed by large hail. In Delta County, Texas the probability of a hailstorm occurring is likely being probable in the next 3 years.

In Cooper and rural Delta County, there are many older, wood framed, houses that are more likely to experience structural damage from hailstorms. The roofs of homes and businesses are very susceptible to hail damage, resulting in repairs costing hundreds or even thousands of dollars to a single-family dwelling. Some newer homes may have roof-top skylights that can break or crack during periods of large hail. Water damage as well as roof repair becomes a factor when skylights break. Also, cars that are open to the elements are susceptible to hail damage, including broken windshields and dented car bodies.

Delta County Hailstorm Risk					
COMMUNITY	**POTENTIAL IMPACT 45%**	**PROBABLITY 30%**	**Warning 15%**	**Duration 10%**	**RISK**
Delta Unincorporated	Limited PRI=1	Likely PRI=3	<6 hrs. PRI 4	<6 hrs. PRI 1	Medium 2.05
Cooper	Limited PRI=1	Likely PRI=3	<6 hrs. PRI 4	<6 hrs. PRI 1	Medium 2.05

Estimated Property Loss at 2 %	
Delta County	$14,245,969
Cooper	$1,036,102

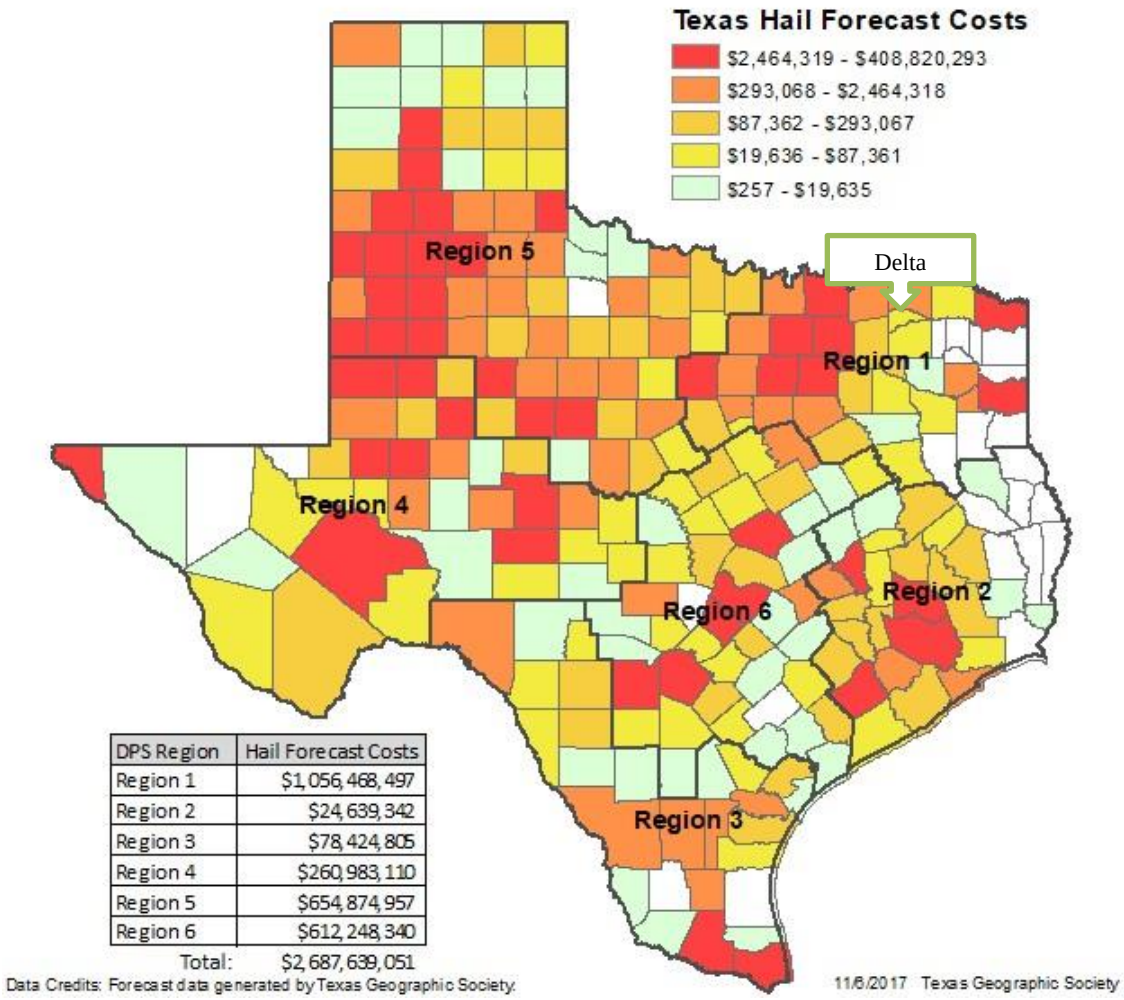


County	Hail Losses
Dallas	$1,221,350,252
Tarrant	$886,242,948
Collin	$880,163,297
Denton	$720,175,558
Bowie	$135,745,992
Rockwall	$79,463,541

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.

6/26/2017 Texas Geographic Society

This map shows the results of the forecast model for 2019-2023 for hailstorm 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.



Delta County Critical Facilities		
Critical Facilities	**Cooper**	**Delta Co.**
City Hall	1	
Fire Station	1	5
Govt. Facility	1	4
Wastewater Treatment Plant	1	
Corrections Facility		1
Maintenance Barn		
Post Office	1	2
Water Tower	2	2
Police Station		
Sheriff Office	1	
EMS		
Water Treatment Plant	1	
County Seat and offices	1	

Critical Facilities

All critical facilities located in unincorporated Delta County and the jurisdiction of Cooper, 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 are unpredictable, but since they occur before thunderstorms, and thunderstorms have historically occurred throughout the County. If the trend continues, all of Delta County and the entire planning area could be affected by hailstorms.

Probability: The probability of a hailstorm occurring in Delta County is highly likely. The jurisdiction of Cooper shares the same probability and risk.

Vulnerability: Buildings, autos, and crops, can be damaged by hail. Hail is often part of thunderstorm activity. In rare cases hail can cause physical injury. The vulnerability rating of Delta County and the jurisdiction of Cooper is high. Wooden Structures exist in all the jurisdictions in Delta County. Repainting and even replacing lumber may be necessary if the storms are severe enough. Anyone who has an uncovered automobile could experience expensive repair costs. Also, all the buildings in the jurisdictions have glass windows and many dwelling in all the jurisdictions have roofs that will be susceptible to hail damage. Public facilities like schools have open parking lots that both faculty and staff use. Windshield and auto body damage can easily occur when large hail strikes. The parking area around the Delta County Courthouse is also susceptible to hailstorms.

Extent: Hail measured at 2.75 inches has been recorded on multiple occasions in Delta County since record keeping began in 1955, but the pea size and smaller are the most common, causing no damage. All jurisdictions are affected equally. See the table on pages 25 for a more comprehensive look at possible damage values. Delta County can expect hail size up to H7 on the Hailstorm Intensity Scale. See the Combined NOAA/TORRO Hailstorm Intensity Scales Table on page 49.

Impact: The impact of a hailstorm has historically been limited; however, large size hail can cause injuries. Hail can damage autos, roofs, siding, and crops. See the tables on page 26 for a more comprehensive look at possible damage values

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

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.

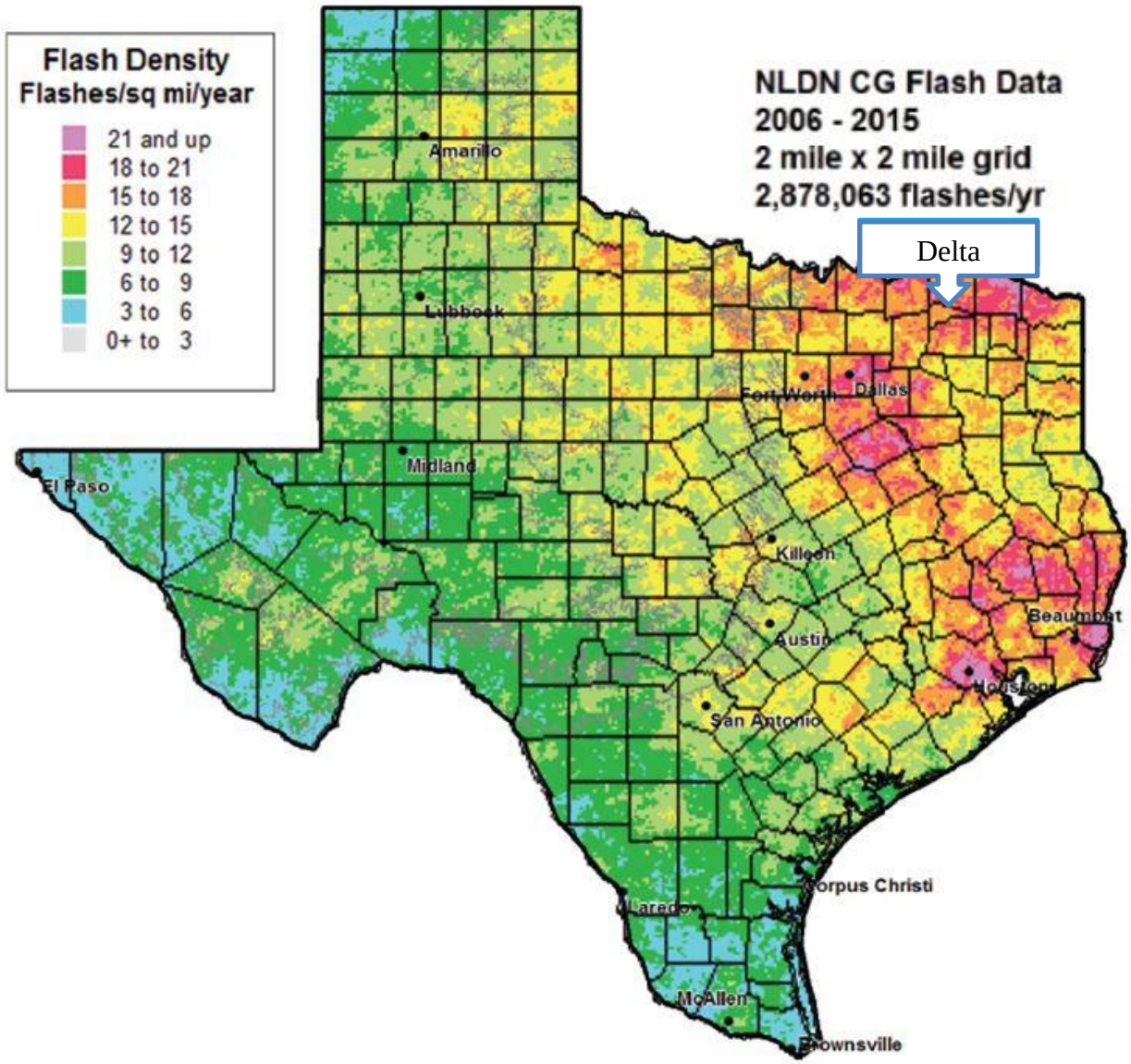
Sequelae - These secondary effects are many. Forest and grass fires, explosive steam conditions in masonry, trees and other water-bearing objects, and consequences of the thunderclap startling a person into inadvertently throw a switch are examples.

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

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

Lightning Incidences in Texas (2006-2015)



Critical Facilities

All critical facilities located in unincorporated Delta County and in the jurisdiction of Cooper are subject to damage from lightning. The major threat to a building hit by lightning is fire.

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

Delta County Critical Facilities		
Critical Facilities	**Cooper**	**Delta Co.**
City Hall	1	
Fire Station	1	5
Govt. Facility	1	4
Wastewater Treatment Plant	1	
Corrections Facility		1
Maintenance Barn		
Post Office	1	2
Water Tower	2	2
Police Station		
Sheriff Office	1	
EMS		
Water Treatment Plant	1	
County Seat and offices	1	

Critical Facilities

All critical facilities located in unincorporated Delta County and the jurisdiction of Cooper, are subject to some damage from intense lightning.

Historical Occurrences: Since January 1996, there have been no recorded lightning events reported in Delta 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. However, 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 Delta County planning area, and the jurisdiction of Cooper are susceptible to lightning strike. Therefore, lightning could occur at any location within the entire planning area. It is assumed that the Delta 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 Delta planning area. The power of lightning can run the full extent of the Lightning Activity Level (LAL 1-LAL 6). See page 58 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 Delta County, including the jurisdiction of Cooper 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 Delta County.

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

Summary: Lightning can strike anywhere in Delta 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 Delta County.

WINTER STORMS

Description
Winter 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 rival disease and insects as destructive agents.

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, and telephone lines are subject to damage from accumulation of ice and snow. Trees fall on utility lines and houses.

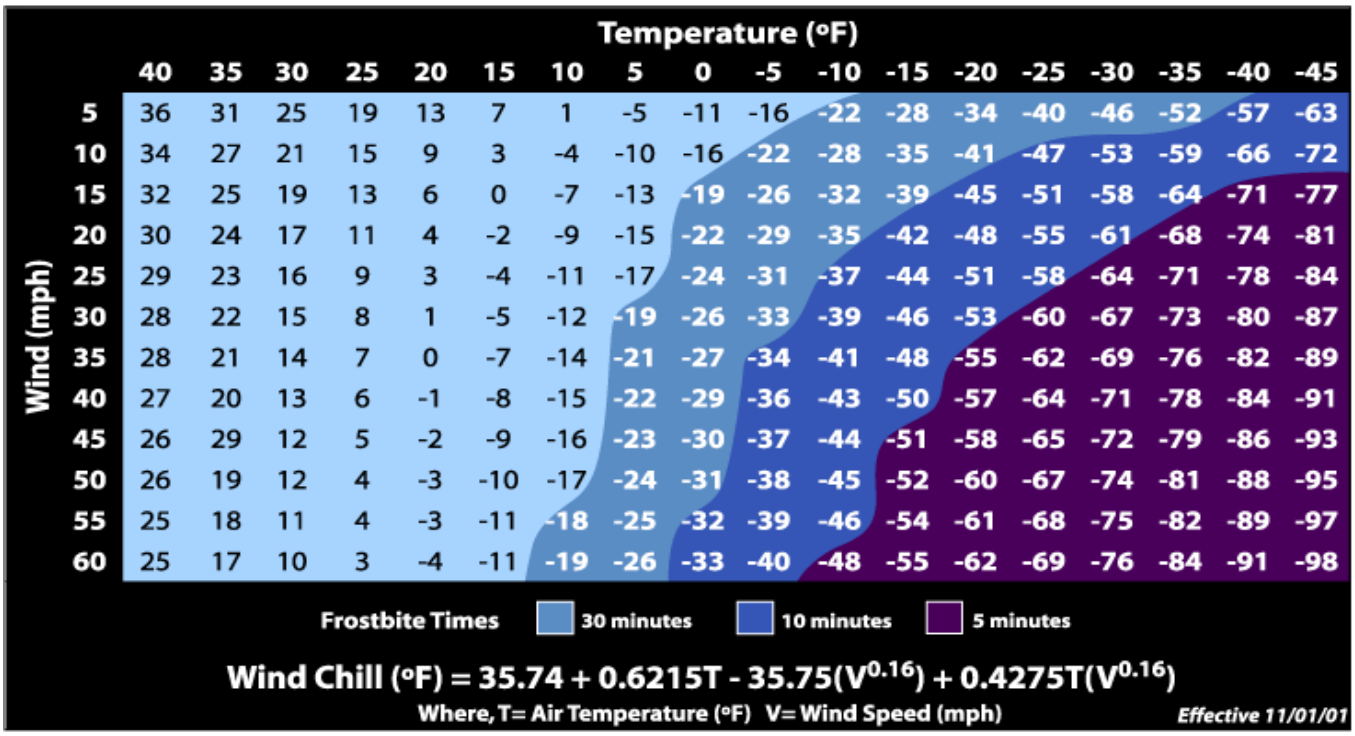
Roads and Bridges
Fallen trees across roads can block access to emergency services. The ability to travel after an ice storm is a priority issue for hospitals, utilities, and emergency service vehicles.

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.

Potential Damage/Loss Due to Ice Storms

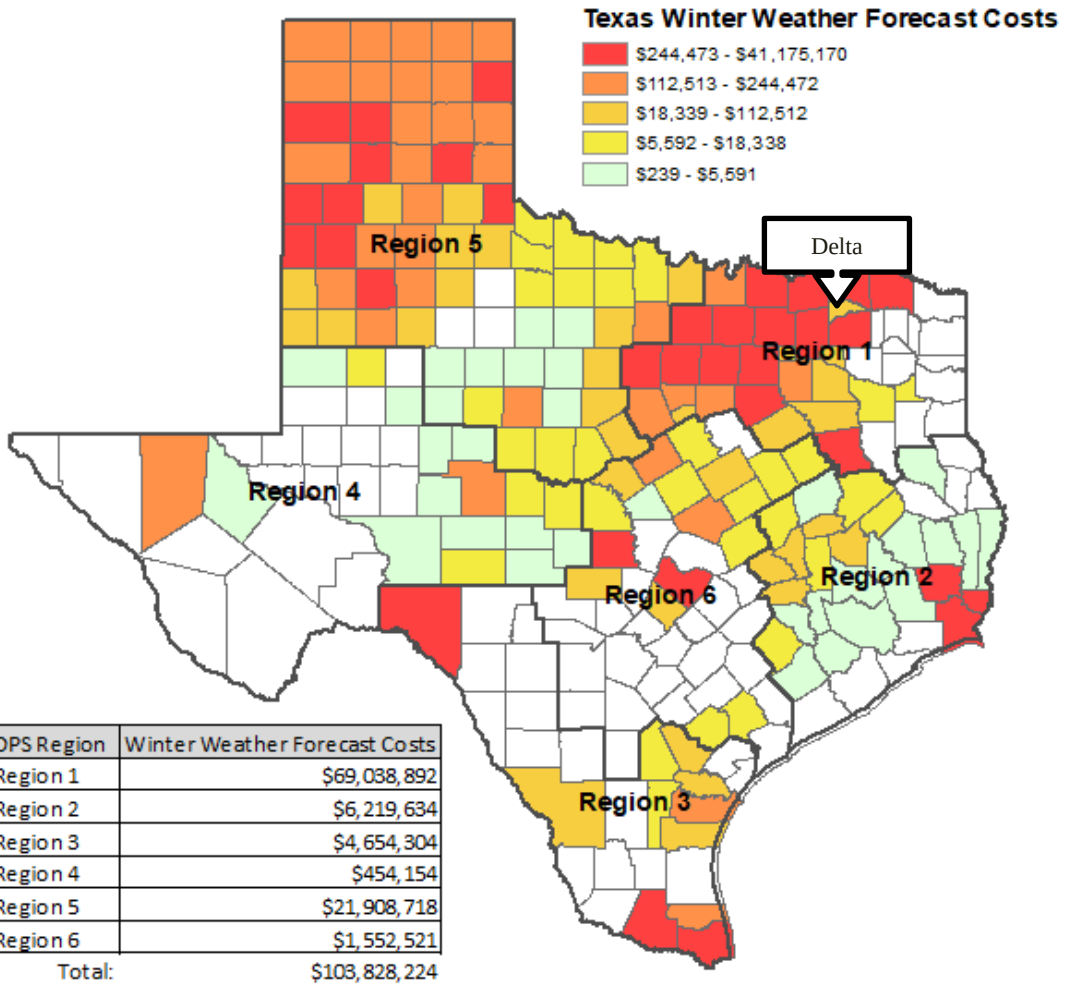
The Christmas Day storm struck counties along a 260-mile stretch that included Delta County. Delta was one of several counties declared a disaster area. Back-to-back December weather fronts slammed North Texas with ice that produced the perfect ice storm. Many electric cooperatives were sent to their knees by the fury of the storms.



Future Risks
Results of the hazard impact forecast for winter weather are presented. Following this is a discussion and summary of risk statewide.

County Dollar Loss Forecast
Map shows the results of the forecast model for 2019-2023 for winter weather 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.

Winter Weather Dollar Losses Forecast



DPS Region	Winter Weather Forecast Costs
Region 1	$69,038,892
Region 2	$6,219,634
Region 3	$4,654,304
Region 4	$454,154
Region 5	$21,908,718
Region 6	$1,552,521
Total:	$103,828,224

Data Credits: Forecast data generated by Texas Geographic Society

10/10/2017 Texas Geographic Society

The National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information categorizes winter activity as winter weather, winter storm and ice storm. The three reports from their organization were combined and presented as one table below.

History of Winter Weather in Delta County January 25, 2000-February 4, 2011			
Date	Event	Description	Cost
01/25/2000	Winter Storm	A mixture of rain, freezing rain, sleet and snow fell over the county. Ice and sleet accumulations of about 3 inches Numerous schools and businesses were closed at various time periods due to the ice and snow.	0.0K
12/12/2000	Winter Storm	A mixture of sleet and freezing rain, with sleet accumulations up to one inch, affected to area. Some state highways and interstate highways were closed due to ice or accidents. Power outages and school closings occurred over the area including Delta County	
12/25/2000	Winter Storm	Freezing rain downed trees and power lines and caused power outages generally along and north of I 20. Thousands of people were without power along the Red River. Up to 4 inches of ice-covered trees and power lines. This was described by some as the worst ice storm in 51 years.	
01/01/2001	Heavy Snow	Heavy snow fell on December 31st and lingered for several days	0.0K
02/05/2002	Winter Storm	Snow and minor icing occurred in Delta county with 5-6 inches of snow recorded.	
03/02/2002	Winter Storm	One inch of snow fell in Delta County. Temperatures dropped to the upper teens	
02/24/2003	Winter Storm	Three to five inches of snow and sleet were reported. Schools and businesses closed.	
02/14/2004	Heavy Snow	Heavy snow of 4 to 5.5 inches fell in Delta County	0.0K
03/05/2005	Heavy Snow	The sheriff's department reported 3.5 inches of snow in Cooper, TX. Sleet and freezing rain reported prior to the rain.	
02/11/2010	Heavy Snow	An estimated 7-9 inches of snow fell around the county.	50.0K
01/09/2011	Heavy Snow	Five to six inches of snow fell across Delta County. Numerous traffic accidents occurred. Damage to roads reported.	20.K
02/04/2011	Heavy Snow	About 5-6 inches of snow fell across the county.	5.0K
		Total	**75K**

NOTE: The costs represented above are for a region, not one specific county. Based on available data any winter storm impacts the entire county and the participating jurisdiction Cooper.

There were no Winter Storms recorded between February 2011 and February 2021. However, in February of 2021 Winter Storm Uri dropped over 1 foot of snow with temperatures falling as low as -2 degrees Fahrenheit in Northeast Texas was hit harder than any other state in the nation. Billions of dollars were lost.

Delta County Winter Storm Risk					
Jurisdiction	**Impact 45%**	**Probability 30%**	**Warning Time 15%**	**Duration 10%**	**PRI Score**
Delta County	Minor PRI=. 9	Occasional PRI=.6	12 to 24 hrs. PRI= .3	> Less than 1 week PRI = .30	Medium 2.1
Cooper	Minor PRI= .9	Occasional PRI= .6	12 to 24 hrs. PRI = .3	> Less than 1 week PRI = .30	Medium 2.1

Estimated Property Loss at 25 %	
Delta County	$178,074,615
Cooper	$13,021,535

Delta County Critical Facilities		
Critical Facilities	**Cooper**	**Delta Co.**
City Hall	1	
Fire Station	1	5
Govt. Facility	1	4
Wastewater Treatment Plant	1	
Corrections Facility		1
Maintenance Barn		
Post Office	1	2
Water Tower	2	2
Police Station		
Sheriff Office	1	
EMS		
Water Treatment Plant	1	
County Seat and offices	1	

Critical Facilities

All critical facilities located in unincorporated Delta County and the jurisdiction of Cooper, 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.

Extent

Although Northeast 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. The Delta County and its jurisdictions can expect ice accumulations on streets, power lines and trees that will range from ¼ to ¾ of an inch. The Damage Assessment Tables found on page 26 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 in Delta that would create conditions for winter storms. (see the wind chill chart on page 61).

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. Delta County and the participating jurisdictions share the same likelihood of experiencing a winter storm.

Vulnerability/Impact: Delta County has a significant amount of acreage designated as conservation, public lands, and agricultural land uses. The small towns and communities are always vulnerable. Cooper could lose power to its sewage and water plant, power to homes and damage to city infrastructure. The elderly in Cooper could suffer from lack of heat and lights during a winter storm. The small businesses in Cooper could experience lost revenue due to reduced traffic during winter storm events. Falling trees and tree limbs could damage property and block roadways in both jurisdictions. Auto accidents related to travel on the icy roads increase.

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. Cooper, and rural Delta County may have power outages lasting one to two weeks.

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.

- 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

- 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.

Dwight Morrow

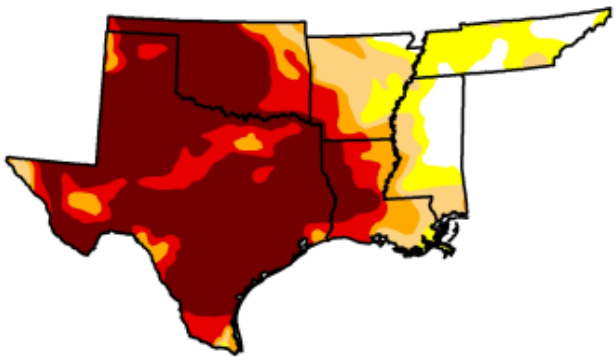
U.S. Drought Monitor

August 23, 2011
Valid 7 a.m. EST

South

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	6.38	93.62	83.57	74.13	65.66	50.93
Last Week (08/16/2011 map)	7.07	92.93	83.11	73.73	64.82	49.27
3 Months Ago (05/24/2011 map)	24.18	75.82	68.41	61.94	49.55	24.50
Start of Calendar Year (12/28/2010 map)	8.86	91.14	67.65	35.21	10.17	0.00
Start of Water Year (09/28/2010 map)	54.23	45.77	20.04	6.79	0.83	0.00
One Year Ago (08/17/2010 map)	66.20	33.80	11.53	3.45	0.83	0.00



Intensity:

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

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

http://drought.unl.edu/dm

Released Thursday, August 25, 2011
Eric Luebehusen / Laura Edwards, USDA / Western Regional Climate Center

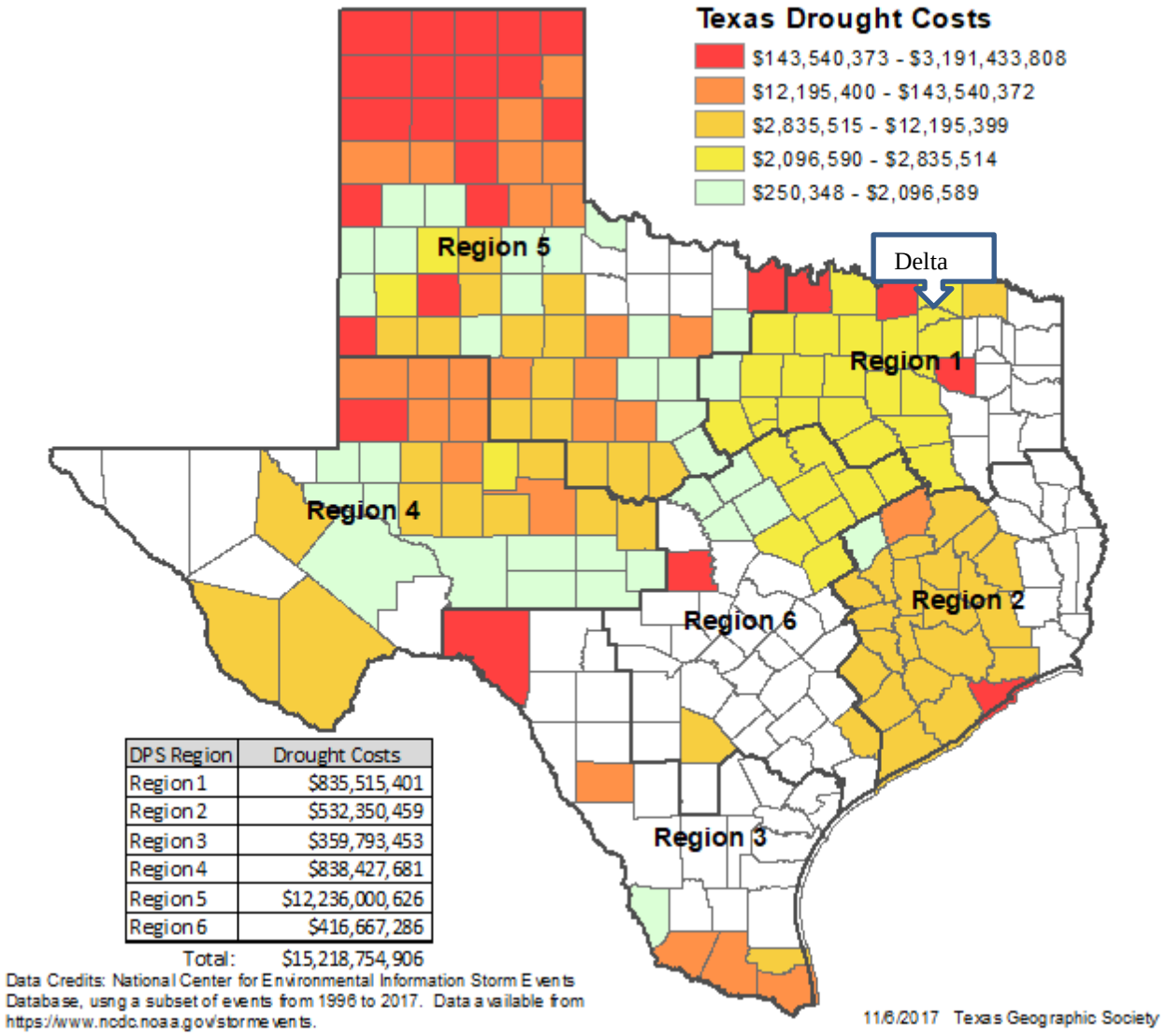
In 2011 Texas was amid one of the most severe one-year droughts on record, according to John Nielsen-Gammon, the Texas State Climatologist and professor of atmospheric sciences at Texas A&M University.

Rainfall totals were unusually light across the state. The July monthly total of 0.72 inches ranks third driest, surpassed by the 0.69 inches recorded in both 1980 and 2000. (Texas A&M News & Information Services.)

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.

Map: Historical Drought/Abnormal Dryness 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, using a subset of events from 1996 to 2017. Data available from https://www.ncdc.noaa.gov/stormevents.

11/6/2017 Texas Geographic Society

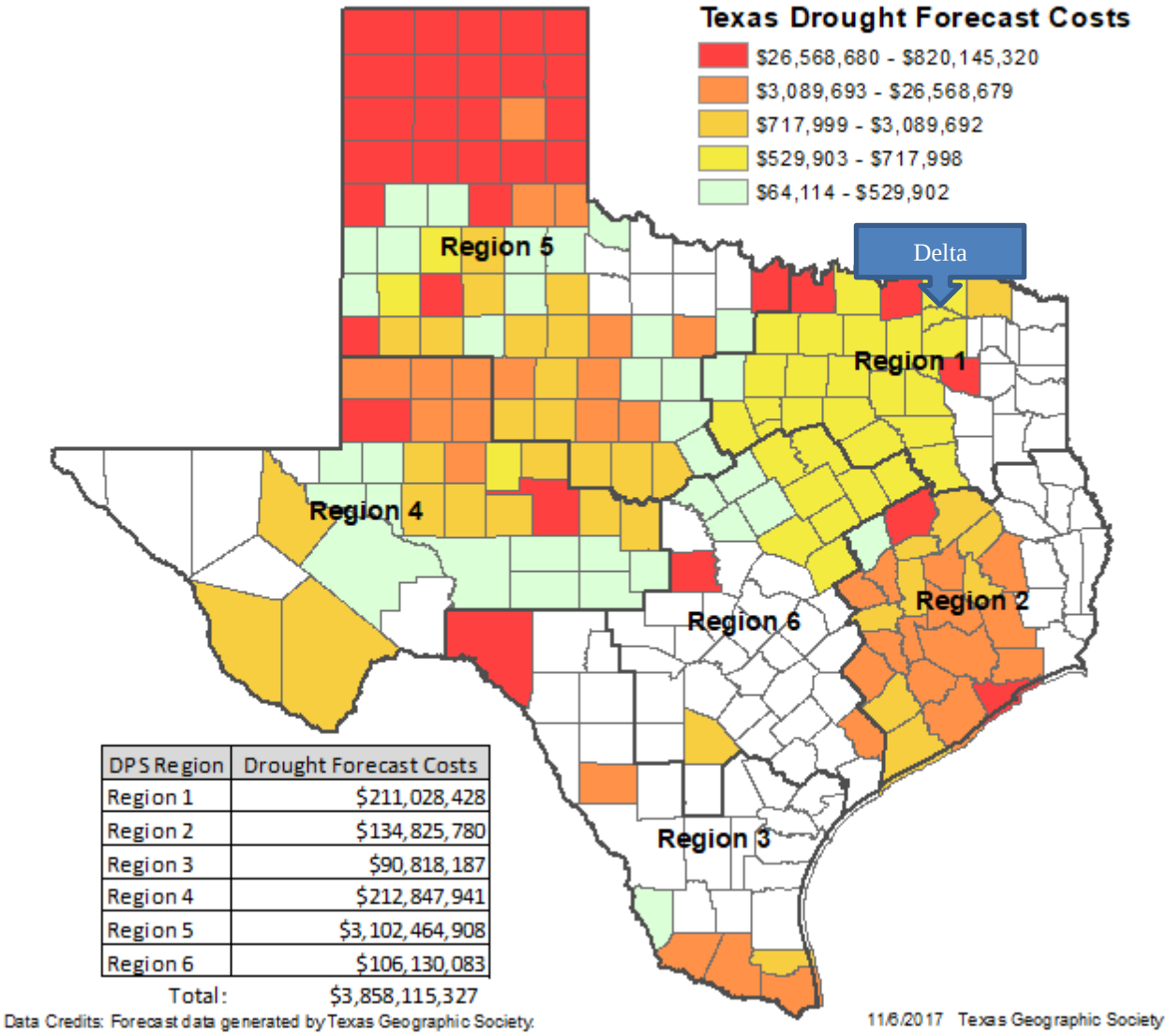
Future Risks

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



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

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.

Delta County Drought Risk					
COMMUNITY	**POTENTIAL IMPACT 45%**	**PROBABLITY 30%**	**Warning 15%**	**Duration 10%**	**RISK**
Delta County	Substantial PRI 4	Highly Likely PRI 4	> than 24 hours PRI 1	>Week PRI 4	High 3.55
Cooper	Substantial PRI 4	Highly Likely PRI 4	> than 24 hours PRI 1	>Week PRI 4	High 3.55

Estimated Property Loss at 25%	
Delta County (Agriculture)	20,710,820

Delta County Critical Facilities		
Critical Facilities	**Cooper**	**Delta Co.**
City Hall	1	
Fire Station	1	5
Govt. Facility	1	4
Wastewater Treatment Plant	1	
Corrections Facility		1
Maintenance Barn		
Post Office	1	2
Water Tower	2	2
Police Station		
Sheriff Office	1	
EMS		
Water Treatment Plant	1	
County Seat and offices	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. Cooper and the unincorporated portions of Delta County are equally susceptible to drought.

NOAA Storm Events Database
Delta Drought Previous Occurrences

Many short droughts lasting one to three months are listed in the NOAA Storm Events Database. There are several other drought events that have persisted for many months and recording large regional losses. One recent drought rain from June 1, 2005 to November 0f 2006. In the drought of 2005-2006 a half a million dollars were recorded lost in both property and crop damage in the region. Another long running drought ran from January of 2011 to December of 2011. Again, a drought was recorded from November 2012 through October of 2013. According to this database property damage to the region were $507,000 in property damage and $1.442 million dollars in crop damage. The last recorded drought was recorded for one month in 2017.

Probability: Droughts will continue to occur in the region when the conditions are right. It is a normal, recurrent feature of climate. A drought will affect Delta County and its participating jurisdictions. There were 15 recorded droughts between 1892 and 2011. Historically a drought can last from a few days to several months.

Vulnerability/Impact: The region is vulnerable when there is a deficiency of precipitation over an extended period. All of Delta County and its jurisdictions are vulnerable to drought. For Cooper 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**.** The impact of a drought on Cooper and Delta 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.

Extent: Delta County Drought Defined: Drought is determined by using the Palmer Drought Index which is illustrated on the following page. 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. (See the Damage Assessment Tables on page 26). The extent of drought experienced in Delta County and its jurisdictions will range from ***0 Abundantly Dry to 4 Exceptional Drought*** (see drought monitor on page 50 for further detail).

Location: Historically, drought has affected all of Delta County including the jurisdictions of Cooper. 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 Delta County and Cooper. The county and participating jurisdictions have never experienced water shortages due to drought. Water rationing has never been necessary in the city of Cooper, but this remains a real possibility due to climate change due to global warming.

WILDFIRE

Description

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 can 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 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**

Major Fire Causes – East Texas Commercial Forest Regions - 2009

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.

Potential Wildfire Damages and Losses in Delta County

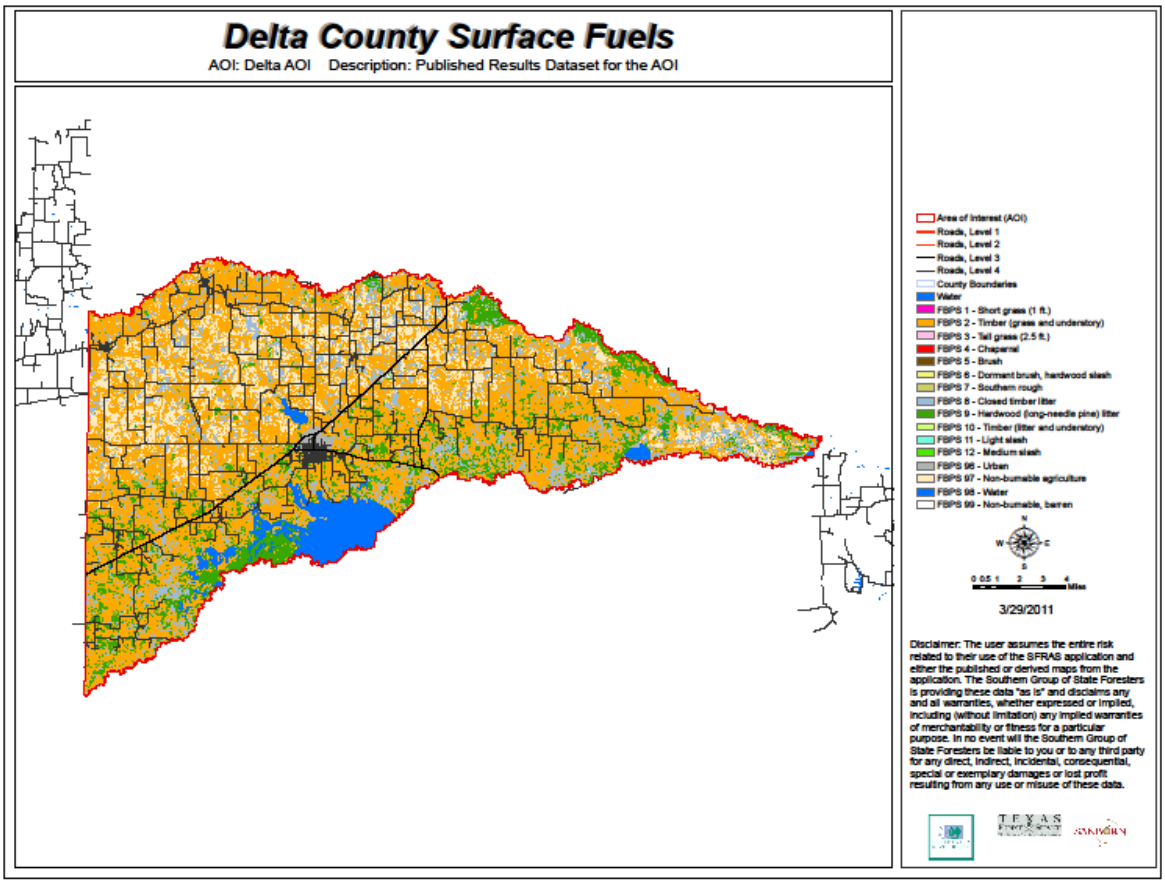
The "urban wildfire interface" is the geographical area where combustible homes are mixed with combustible vegetation. The determination of specific wildfire hazard sites depends on several factors.

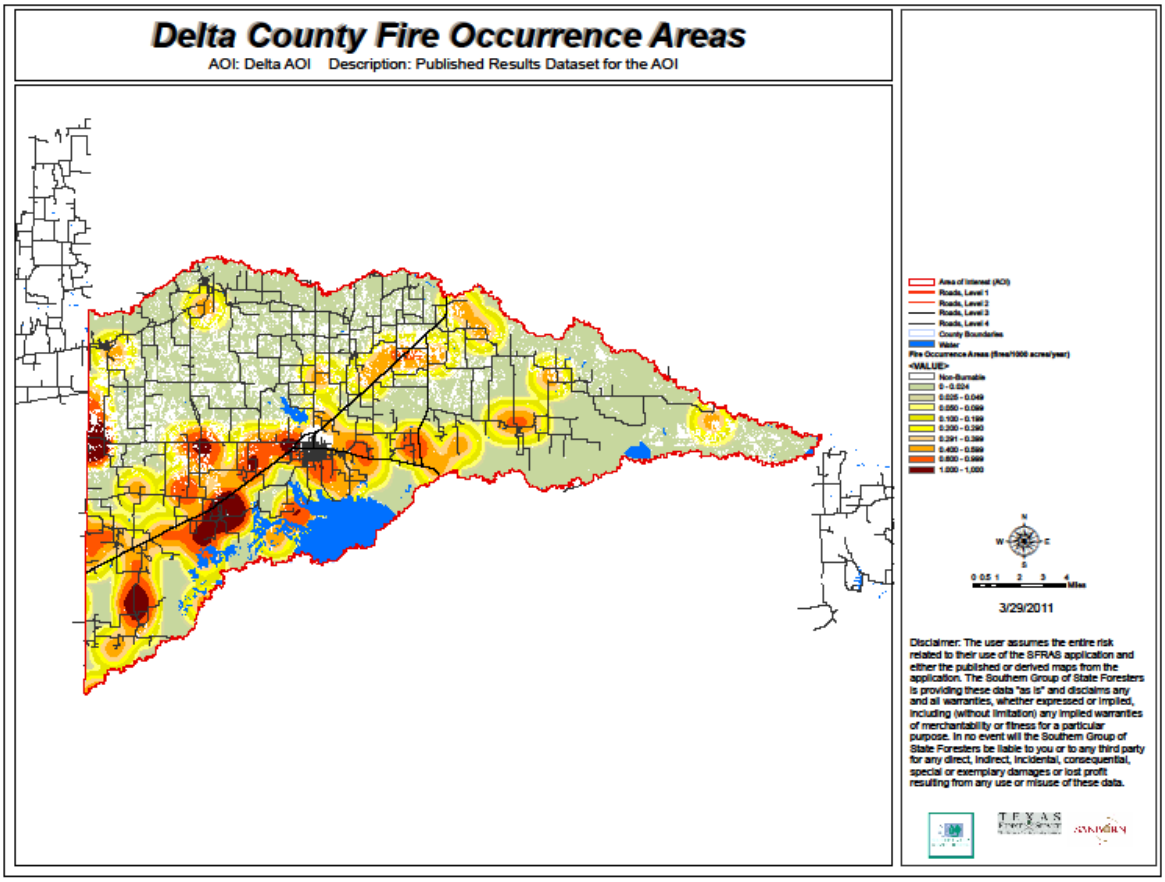
- Topographic location and fuels
- Site/building construction and design
- Defensible space
- Accessibility
- Fire protection response; and
- Water availability.

Delta County residents are served by a variety of local fire departments. One hundred and eleven wild/forest fire events were reported in Delta County between 2005 and 2009 according to the Texas Forest Service.

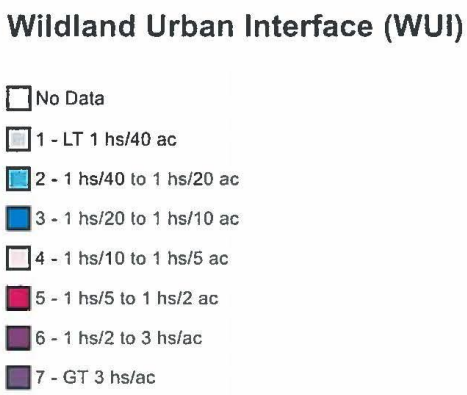
Expected Fire Conditions with Varying KBDI Levels

0 – 200 Low Fire Danger	Soil and fuel moisture are 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) 600-800 contd.	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.


Delta County Surface Fuels
AOI: Delta AOI Description: Published Results Dataset for the AOI
Area of Interest (AOI)
Roads, Level 1
Roads, Level 2
Roads, Level 3
Roads, Level 4
County Boundaries
Water
FBPS 1 - Short grass (1 ft.)
FBPS 2 - Timber (grass and understory)
FBPS 3 - Tall grass (2.5 ft.)
FBPS 4 - Chaparral
FBPS 5 - Brush
FBPS 6 - Dormant brush, hardwood slash
FBPS 7 - Southern rough
FBPS 8 - Closed timber litter
FBPS 9 - Hardwood (long-needle pine) litter
FBPS 10 - Timber (litter and understory)
FBPS 11 - Light slash
FBPS 12 - Medium slash
FBPS 98 - Urban
FBPS 97 - Non-burnable agriculture
FBPS 98 - Water
FBPS 99 - Non-burnable, barren
N
W
E
S
0 0.5 1 2 3 4
Miles
3/29/2011
Disclaimer: The user assumes the entire risk related to their use of the SFRAS application and either the published or derived maps from the application. The Southern Group of State Foresters is providing these data "as is" and disclaims any and all warranties, whether expressed or implied, including (without limitation) any implied warranties of merchantability or fitness for a particular purpose. In no event will the Southern Group of State Foresters be liable to you or to any third party for any direct, indirect, incidental, consequential, special or exemplary damages or lost profit resulting from any use or misuse of these data.
TEXAS

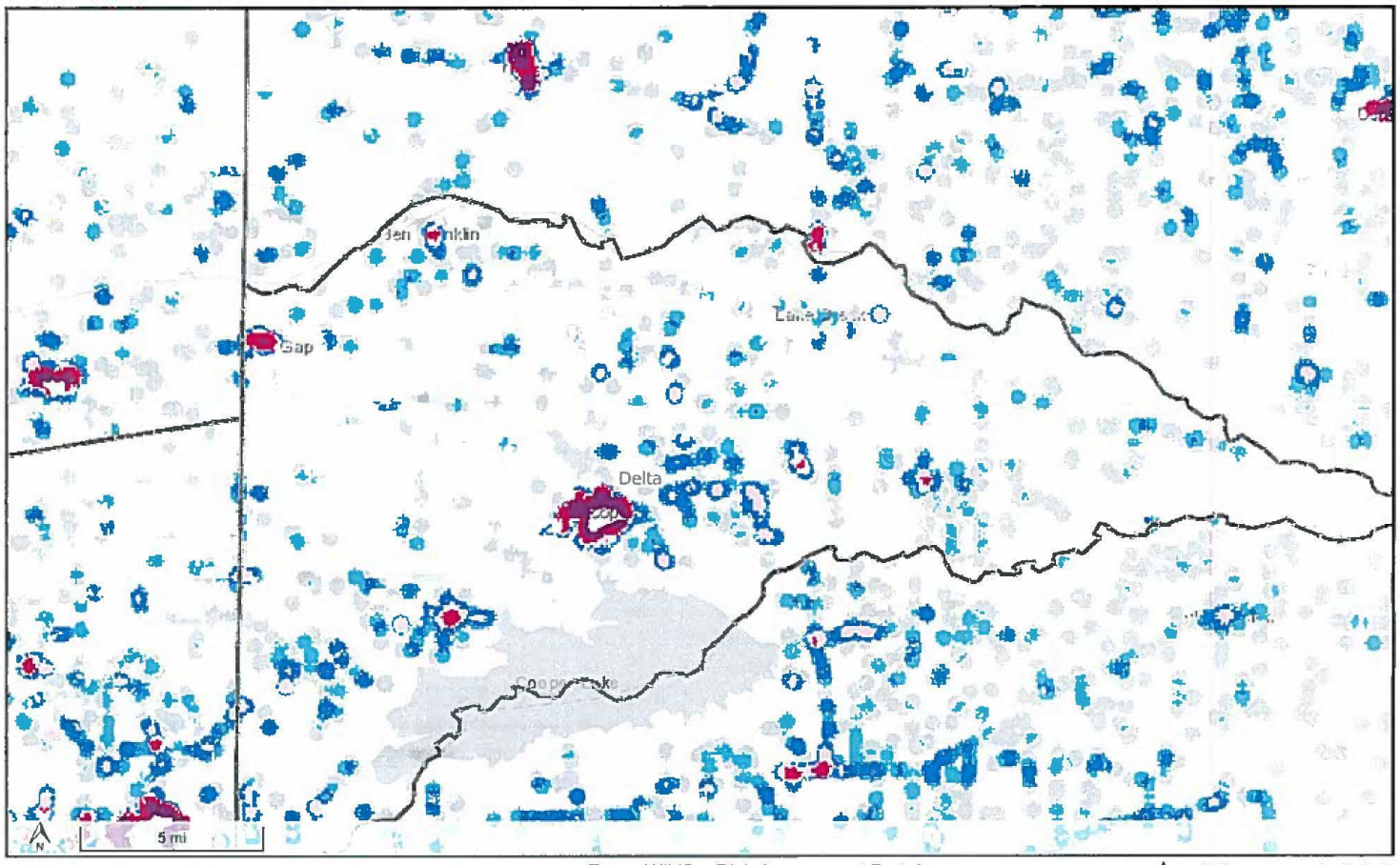

Delta County Fire Occurrence Areas
AOI: Delta AOI Description: Published Results Dataset for the AOI
Area of Interest (AOI)
Roads, Level 1
Roads, Level 2
Roads, Level 3
Roads, Level 4
County Boundaries
Water
Fire Occurrence Areas (fires/1000 acres/year)
<VALUE>
Non-Burnable
0 - 0.024
0.025 - 0.049
0.050 - 0.099
0.100 - 0.199
0.200 - 0.290
0.291 - 0.399
0.400 - 0.599
0.600 - 0.999
1.000 - 1.000
N
W
E
S
0 0.5 1 2 3 4
Miles
3/29/2011
Disclaimer: The user assumes the entire risk related to their use of the SFRAS application and either the published or derived maps from the application. The Southern Group of State Foresters is providing these data "as is" and disclaims any and all warranties, whether expressed or implied, including (without limitation) any implied warranties of merchantability or fitness for a particular purpose. In no event will the Southern Group of State Foresters be liable to you or to any third party for any direct, indirect, incidental, consequential, special or exemplary damages or lost profit resulting from any use or misuse of these data.
TEXAS
FORESTSERVICE

WUI Legend


Wildland Urban Interface (WUI)
No Data
1 - LT 1 hs/40 ac
2 - 1 hs/40 to 1 hs/20 ac
3 - 1 hs/20 to 1 hs/10 ac
4 - 1 hs/10 to 1 hs/5 ac
5 - 1 hs/5 to 1 hs/2 ac
6 - 1 hs/2 to 3 hs/ac
7 - GT 3 hs/ac

Delta County

WUI



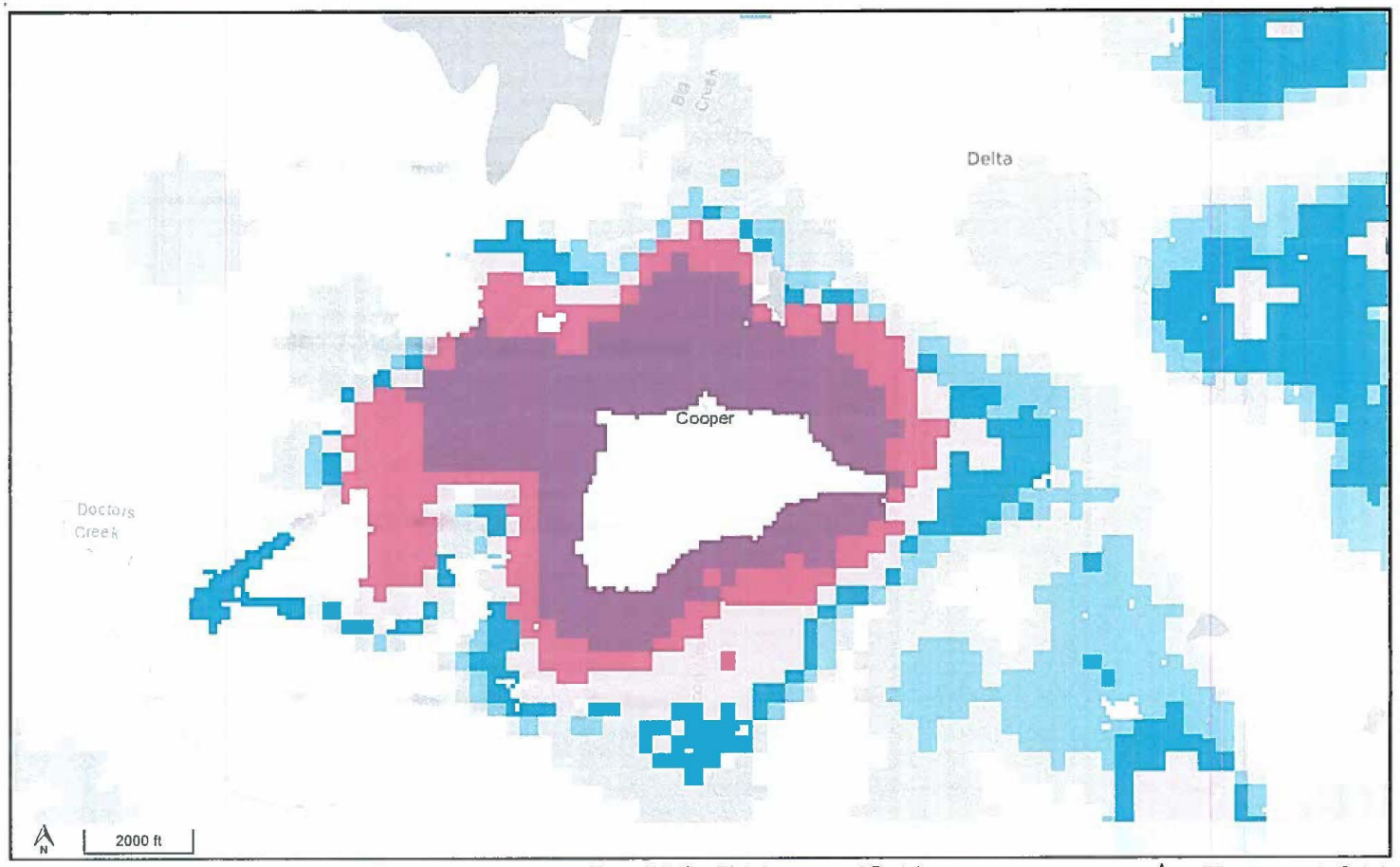
Report Created:
10/13/2020 - 7:33:05 PM

Texas Wildfire Risk Assessment Portal
http://texaswildfirerisk.com

TEXAS A&M FOREST SERVICE

Cooper , Texas (Delta County)

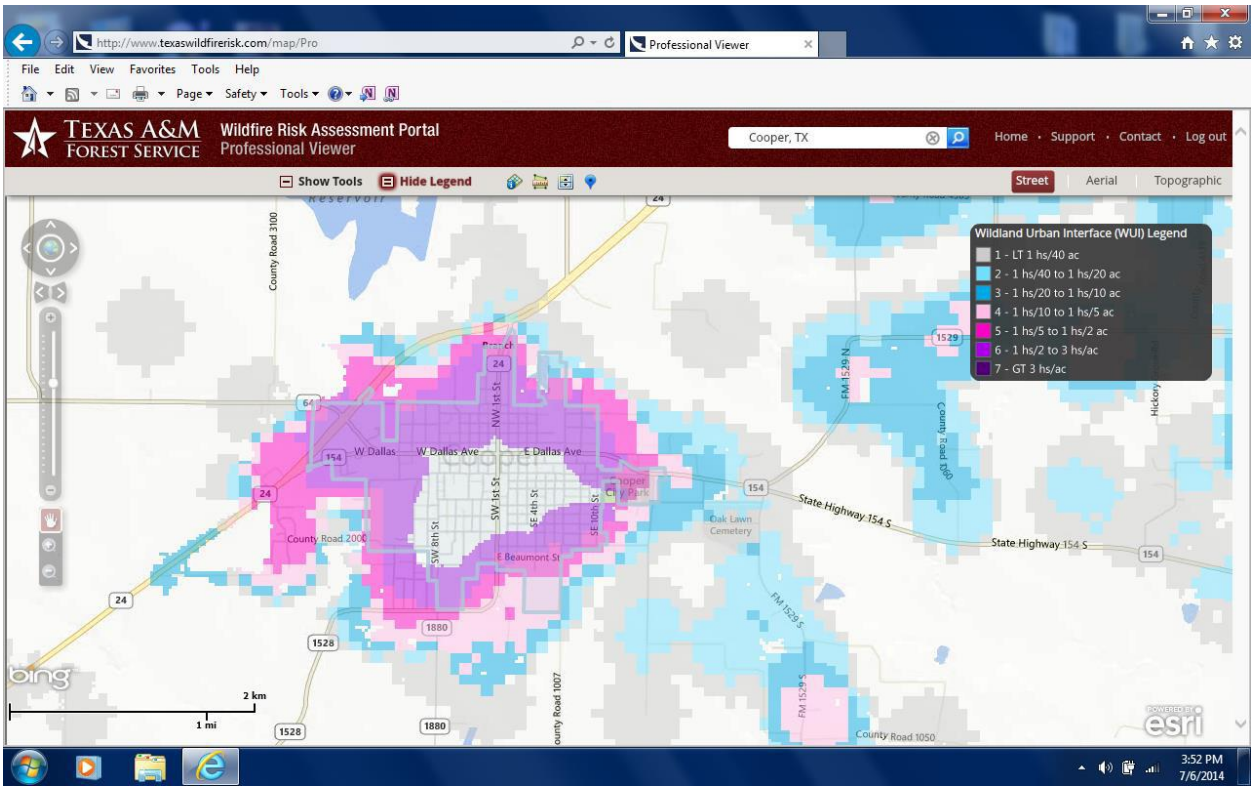
WUI



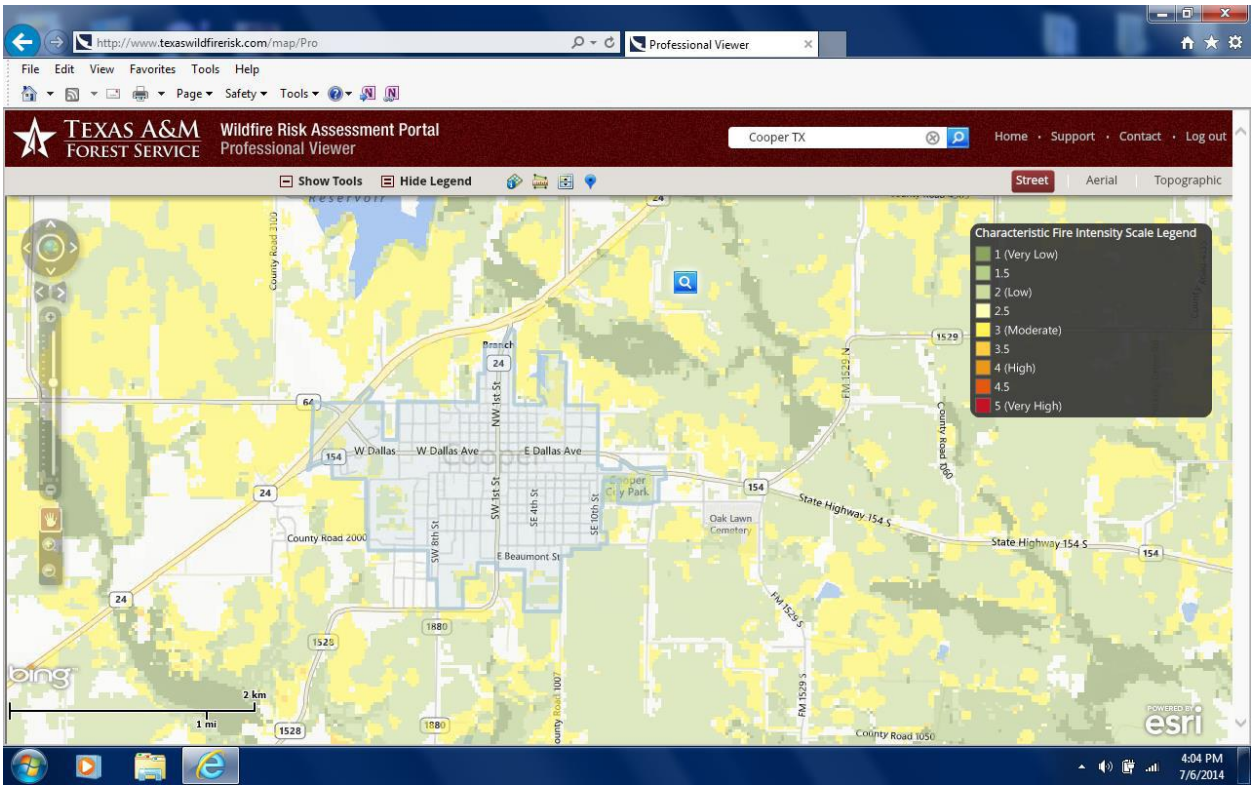
Report Created:
10/13/2020 - 8:00:58 PM

Texas Wildfire Risk Assessment Portal
http://texaswildfirerisk.com

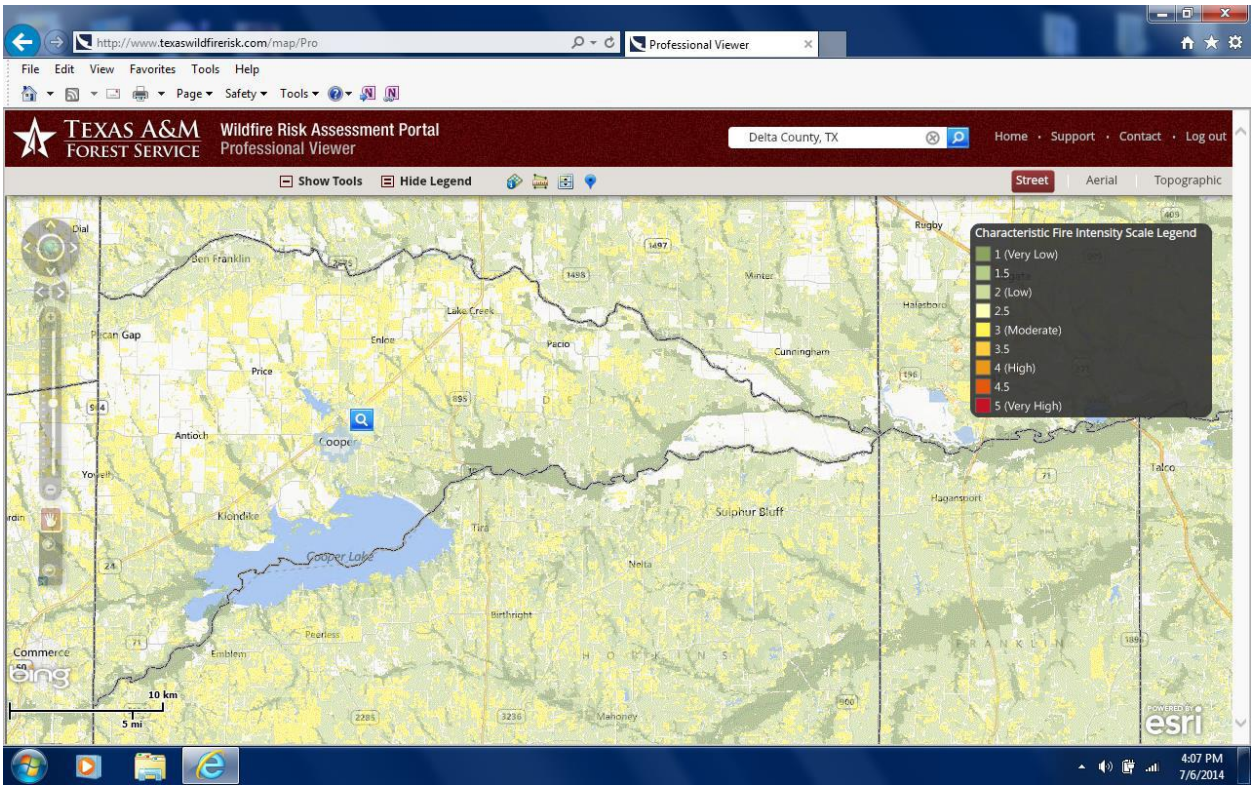
TEXAS A&M FOREST SERVICE



Cooper Urban/Wildland Interface



Cooper Fire Intensity Scale



Delta Fire Intensity Scale

IDENTIFYING ASSETS
ESTIMATING POTENTIAL LOSSES

U.S. Census data shows that there has been practically no increase in population from 2000 to 2019 and practically no new construction from has occurred. The population of Delta County decreased by 4 residents from 2000 to 2019 and little new construction has occurred. With this stagnant trend in development in Delta County, there is very little change in the vulnerability for each jurisdiction. There is no recorded history for fires from 2015-present.

Cooper has an abandoned structure ordinance. The property owner is contacted and has 20 days to present a planning of getting the property back to within code regulations. If no action is taken by the owner, the city goes through the municipal court to have the property torn down. The city takes a lien on the property.

ISO FIRE PROTECTION CLASSES FOR DELTA COUNTY

Fire Protection Area	Protection Class	Primary Fire Response
Cooper	5	Cooper FD

There are no communities in Delta County participating in the Community Rating System (CRS).

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

Estimated Property Loss at 25%	
Delta County	$178,074,615
Cooper	$13,021,535

Delta County Critical Facilities		
Critical Facilities	**Cooper**	**Delta Co.**
City Hall	1	
Fire Station	1	5
Govt. Facility	1	4
Wastewater Treatment Plant	1	
Corrections Facility		1
Maintenance Barn		
Post Office	1	2
Water Tower	2	2
Police Station		
Sheriff Office	1	
EMS		
Water Treatment Plant	1	
County Seat and offices	1	

Critical Facilities

Critical Facilities located near underbrush or unkept property are vulnerable to fires generated by wildfires. Critical facilities located in Cooper are a less of a risk than buildings located in the unincorporated areas of Delta County due to the proximity of wildfire fuels.

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 Delta County and participating jurisdictions.

Vulnerability/Impact: The most vulnerable month for wildfires is July. However, Cooper has never been threatened by wildfires. The urban/wild land interface is greater in Cooper and a wildfire would cause great damage in a short period of time. Old wooden structures in Cooper provide what could be a wildfire perfect storm. Homes would be destroyed; incomes would be impacted due to loss of property and businesses. City and County Government could be disrupted.

Extent: Data is not available to determine the extent that each fire must reach before it runs out of control. There were 38 fires reported to the Texas Forestry Service between January 1 and August 6, 2009. The largest fire wildfire occurred on January 23, 2009 covering 40 acres in rural Delta County. This was also the most expensive fires costing an estimated $375.00. The KBDI was at 300-400 which indicates moderate fire danger. 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 the Damage Assessment Tables on page 26).

Wildland Urban Interface	
Jurisdiction	**High Risk Acres**
Cooper	240

Location: Due to heavy vegetation and dry conditions wildfire events in Delta County are possible any time during the year. All of Delta County and the jurisdiction of Cooper could possibly be affected, depending on where the wildfire started.

Summary: There are no Delta County "Communities at Risk" listed in the Federal Register. The Texas register of "Communities at Risk" listed Enloe, The Southern Fire Risk Assessment System (SFRAS) designates the following communities as "Communities at Risk": Cooper and West Delta are rated moderate, Ben Franklin, Enloe and Charleston communities are rated low.

Fires can destroy property, and homes causing injury and death. Fortunately, no lives were lost in any of the fires listed in 2009. It is important 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. Because of the urban/wild land interface**, t**he city of Cooper may experience wildfire damage. The rural areas of Delta County are particularly at risk. However, most of the fires have been small and easily contained.

SECTION III

Mitigation Plan Update Strategy for Delta County

The many of the previous goals and actions for Delta County and Cooper were never acted on and many of the old actions are no longer valid. The plan was never incorporated into other planning mechanisms as intended. Measures have been taken to ensure annual reviews. 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. Delta County has experienced a -5.4% variation in population from April 2010-July 2018 representing a loss of 689 residents. It is ranked 233 in the state for median household income.
- There have been no changes politically or financially that would impact the plan's development.
- The prioritization of our goals and objectives have not changed in our hazard mitigation plan as compared to the last approved plan.

Delta County recognizes the importance of dedicated involvement regarding the integration of the plan into existing county and participating jurisdiction plans and budgets and codes. Delta County has initiated a proactive course of action that includes annual reviews and reports to the Delta County Commissioners Court and the city council of Cooper.

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

Method of Prioritization

Delta County, the City staffs, and Hazard Mitigation Team members were involved in the selection of the above priority actions. Actions were prioritized using the STAPLE+E criteria, planning tool used to evaluate alternative actions. 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. **The following table explains the STAPLE+E criteria.**

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.**

MITIGATION GOALS AND LONG-TERM STRATEGY

GOALS

Mitigation Plan Goals

The Delta County Mitigation Action Plan goals describe the direction that Delta 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.

Delta Hazard Mitigation Actions 2011 Update

No mitigation planning occurred after initial plan adoption. This is the first 5-year update since 2011.

HAZARD	ACTION	DISPOSITION	EXPLANATION
Flash Floods Delta County	Participate in the National Flood Insurance Program	Delete	No longer viable mitigation action
	Participate in the "Turn Around, Don't Drown" program.		This continues to be a viable goal.
Tornado Delta County	Adopt new and current building code standards for tying down mobile homes and adopt new building codes to increase building resistant to high winds.	Continued for current update	This continues to be a viable goal
	Provide NOAA weather radios to limited-income residents who live-in high-risk areas such as mobile home parks.	Continued for current update	This continues to be a viable goal.
Winter Storm Delta County	Purchase mobile generators for critical facilities county wide.	Continued for current update	
	Retro-fit existing public building and implement designs and construction for a safe public storm facility.	Continued for current update	
Thunderstorm Delta County	Install lightning warning devices in public parks	Change wording	This will appear under the lightning hazard n.
	Educate the public about the dangers of lightning and high winds found in thunderstorms	Change wording	This will appear under the lightning hazard
Drought Delta County	Conduct workshops for the public regarding conserving water, xeriscaping and managing drought impacts	Continued for current update	This continues to be a viable goal.
	Replace municipal appliances or equipment with water-saving models or parts.	Continued for current update.	This continues to be a viable goal.
Wildfire Delta County	Provide smoke alarms to county residents with limited incomes.	Delete	No longer viable mitigation action

Cooper Hazard Mitigation Actions 2011 Update

No mitigation planning occurred after initial plan adoption. This is the first 5-year update since 2011**.**

HAZARD	ACTION	DISPOSITION	EXPLANATION
Flood Cooper	Participate in the National Flood Insurance Program	Delete	No longer a viable mitigation action
	Increase the size of ditches to accommodate flash flood waters (NFIP)	Continued for current update	
Tornado Cooper	Construct FEMA standard community safe room		No longer a viable mitigation action
	Increase tornado public awareness by disseminating information at public events and newspapers.	Continued for current update	
Winter Storm Cooper	Purchase generators for water and sewage facilities	Continued for current update	
	Remove dead or rotting trees and branches that could fall and cause injury or damage during an ice storm.	Continued current update	
Thunderstorms Cooper	Install lightning warning devices in public parks.	Change wording.	This will appear under the lightning hazard
	Educate the public about the dangers of lightning and high winds found in thunderstorms	Change wording	This will appear under the lightning hazard.
Drought Cooper	Conduct workshops on conserving water, xeriscaping and managing drought impacts	Continued for current update	
	Implement a water conservation program and enforce it during drought periods .	Continued for current update.	
Wildfire Cooper	Provide smoke alarms free of charge to area residents with limited incomes	May not work. Check it out.	No longer viable mitigation action
	Implement a vegetation management program to reduce the danger of wildfire reaching dwellings.	Continued for current update	

MITIGATION ACTIONS AND IMPLEMENTATION PLAN

In order to determine the following mitigation actions, zoom meetings were held, emails sent, and telephone calls were made to Delta County team members for contributions. Mitigation Ideas: Possible Mitigation Measures by Hazard Type, A Mitigation Planning Tool for Communities, FEMA-R5, 9/02, was used as a guide in compiling the mitigation actions to be considered. Mitigation action items were presented to the team. Those individuals reviewed the items presented and made the decision to select the mitigation actions.

Priority was given to each action by the HMPT. Costs, Citizens served, and community impact were considered when prioritizing the actions.

The comprehensive range of specific mitigation actions and projects 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.

The comprehensive range of specific mitigation actions and projects 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 3-7 Years; Low 8+ Years.

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

Delta County Actions and Goals

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

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

Delta County Flood Actions

Delta County Flood Mitigation Action #1	Participate in the National Flood Insurance Program
Mitigation Goal/Objective	***Goal #2: Public Awareness*** ***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.
Priority	High
Funding Source(s)	County
Estimated Cost	Low (0-$10,000)
Responsible Agency	County
Estimated Completion Time	1 year
Effect on New Buildings	Not Applicable
Effect on Existing Buildings	Not Applicable
Comments:	

Delta County Flood Mitigation Action #2	Participate in the "Turn Around, Don't Drown" program.
Mitigation Goal/Objective	***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
Priority	High
Funding Source(s)	State and County
Estimated Cost	Low (0-$10,000)
Responsible Agency	TXDOT
Estimated Completion Time	2 years
Effect on New Buildings	Not Applicable
Effect on Existing Buildings	Not Applicable
Comments:	County road flooding a problem for all of N.E. Texas

Delta County Tornado Actions

Delta County Tornado Mitigation Action #1	Adopt new and current building code standards for tying down mobile homes and adopt new building codes to increase building resistant to high winds.
Mitigation Goal/Objective	***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.
Priority	Medium
Funding Source(s)	PDM Grant
Estimated Cost	Low (0-$10,000)
Responsible Agency	Delta County and individual jurisdictions
Estimated Completion Time	3 years
Effect on New Buildings	Not Applicable
Effect on Existing Buildings	Not Applicable
Comments:	

Delta County Tornado Mitigation Action #1	Develop and implement a public education program that will provide the public with understanding of their risk to Tornado events and the mitigation methods to protect themselves, their family and their property.
Mitigation Goal/Objective	**Goal 1** Protect Life and Property **Goal 2** Public Awareness
Priority	High
Funding Source(s)	Delta County Annual Budget
Estimated Cost	Low (0k-10k)
Responsible Agency	Delta County EMC
Estimated Completion Time	2 years
Effect on New Buildings	This could help reduce damage by implementing ideas about home and business protection from tornadic winds.
Effect on Existing Buildings	This could help reduce damage by implementing ideas about home and business protection from tornadic winds
Comments:	Educating the public is an integral part of mitigation.

Delta County Thunderstorm Winds

Delta County Thunderstorm Winds Mitigation Action #1	Provide a community awareness campaign concerning the risks and consequences of windstorms. By educating the public about High winds loss of life and property may be mitigated as they take steps to secure their property and respond to warning.
Mitigation Goal/Objective	**Goal #2** Public Awareness
Priority	High
Funding Source(s)	Delta County Annual Budget
Estimated Cost	Low (0-10k)
Responsible Agency	Delta County EMC
Estimated Completion Time	3 years
Effect on New Buildings	Knowledge gained from workshops can translate into actions that improve structures and their design.
Effect on Existing Buildings	Knowledge gained from workshops can translate into actions that improve structures and their design.
Comments:	Educating the Public will help protect life and property

Delta County Thunderstorm Winds Mitigation Action #2	Purchase Emergency mobile generators to use with emergency equipment during power outages for critical facilities.
Mitigation Goal/Objective	**Goal # 1** Protect Life and Property **Goal# 2** Public Awareness
Priority	High
Funding Source(s)	Delta County Annual Budget
Estimated Cost	Low (0k-10k)
Responsible Agency	Delta County EMC
Estimated Completion Time	2 years
Effect on New Buildings	This could protect new buildings from sewage flooding and water contamination.
Effect on Existing Buildings	This could protect existing buildings from sewage flooding and water contamination
Comments:	It is important during times of stress and outages that critical facilities such as waste treatment plants and water supplies remain operational.

Delta County Lightning Actions

Delta County Lightning Mitigation Action #1	Install lightning warning devices in public parks
Mitigation Goal/Objective	***Goal #4: Partnerships and Implementation*** Develop leadership within public and private sector organizations to prioritize and implement local, county, and regional hazard mitigation activities. **Goal #5: Emergency Services** Strengthen emergency operations by increasing collaboration and coordination among public agencies, non-profit organizations and business.
Priority	High
Funding Source(s)	County and State
Estimated Cost	Unknown
Responsible Agency	County will do an analysis of feasibility
Estimated Completion Time	3 years
Effect on New Buildings	Storm readiness program could lessen storm impact on new and existing buildings
Effect on Existing Buildings	Storm readiness program could lessen storm impact on new and existing buildings
Comments:	Delta county officials are interested in any practical activity that will protect property and lives.

Delta County Lightning Mitigation Action #2	Educate the public about the dangers of lightning and high winds found in thunderstorms.
Mitigation Goal/Objective	***Goal #2: Public Awareness*** Develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards.
Priority	Moderate
Funding Source(s)	None
Estimated Cost	Low (0-$10,000)
Responsible Agency	County Staff/VFD
Estimated Completion Time	2 years
Effect on New Buildings	Not Applicable
Effect on Existing Buildings	Not Applicable
Comments:	

Delta County Hailstorm Actions

Delta County Hail Mitigation Action #1	Install hail resistant film on the windows of critical facilities.
Mitigation Goal/Objective	**Goal #1** Protect Life and Property
Priority	Medium
Funding Source(s)	Delta County Annual Budget
Estimated Cost	Low (0-10k)
Responsible Agency	Delta County Public Works
Estimated Completion Time	5 years
Effect on New Buildings	Can protect new buildings from window damage from hail
Effect on Existing Buildings	Can protect existing buildings from window damage from hail
Comments:	

Delta County 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)	Delta County Annual Budget
Estimated Cost	Low (0-10k)
Responsible Agency	Delta County EMC
Estimated Completion Time	3 years
Effect on New Buildings	Knowledge gained from workshops can translate into actions that improve structures and their design.
Effect on Existing Buildings	Knowledge gained from workshops can translate into actions that improve structures and their design.
Comments:	Public awareness and education can minimize loss and protect lives by giving citizens the tools needed to take action.

Delta County Winter Storms Actions

Delta County Winter Storms Mitigation Action #1	Purchase mobile generators for critical facilities county wide.
Mitigation Goal/Objective	***Goal #5: Emergency Services*** a. Establish policy to ensure mitigation projects for critical facilities, services and infrastructure. b. Strengthen emergency operations by increasing collaboration and coordination among public agencies, non-profit organizations and business.
Priority	High
Funding Source(s)	PDM Grant
Estimated Cost	Medium ($10,000-$25,00)
Responsible Agency	Delta County working with grant writers
Estimated Completion Time	Four years
Effect on New Buildings	The availability of power during storm created outage is critical for timely response
Effect on Existing Buildings	The availability of power during storm created outage is critical for timely response

Delta County Winter Storms Mitigation Action #2	Retro-fit existing public building and implement designs and construction for a safe public storm facility.
Mitigation Goal/Objective	***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.
Priority	Low
Funding Source(s)	Local
Estimated Cost	Medium ($10,000-$25,000)
Responsible Agency	Delta County VFD's and EMC's
Estimated Completion Time	3 years
Effect on New Buildings	Not Applicable
Effect on Existing Buildings	Not Applicable
Comments:	

Delta County Drought Mitigation Action #1	Conduct workshops for the public regarding conserving water, xeriscaping and managing drought impacts.
Mitigation Goal/Objective	***Goal #2: Public Awareness*** 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
Priority	Low
Funding Source(s)	Delta County Extension Office
Estimated Cost	Low (0-$10,000)
Responsible Agency	Delta County and the County Extension Office
Estimated Completion Time	2 years and ongoing
Effect on New Buildings	Not applicable
Effect on Existing Buildings	Not applicable
Comments:	

Delta County Drought Mitigation Action #2	Replace municipal appliances or equipment with water-saving models or parts.
Mitigation Goal/Objective	***Goal #3: Natural Systems*** Preserve, rehabilitate, and enhance natural systems to serve natural hazard mitigation functions ***Goal #4: Partnerships and Implementation*** a) Develop leadership within public and private sector organizations to prioritize and implement local, county, and regional hazard mitigation activities.
Priority	Low
Funding Source(s)	County
Estimated Cost	Low (0-$10,000)
Responsible Agency	County
Estimated Completion Time	3 years
Effect on New Buildings	Not Applicable
Effect on Existing Buildings	Not Applicable
Comments:	Water shortage has not been a major problem in NE Texas

Delta County Wildfire Actions

Delta County Wildfire Mitigation Action #1	Conduct a wildfire education program stressing the dangers of trash burning in order to help prevent wildfires.
Mitigation Goal/Objective	**Goal #2** Public Awareness
Priority	High
Funding Source(s)	Delta County Annual Budget
Estimated Cost	Low (0-10k)
Responsible Agency	Delta County EMC
Estimated Completion Time	3 years
Effect on New Buildings	Out of control trash burning can destroy a new building
Effect on Existing Buildings	Out of control trash burning can destroy an existing building.
Comments:	Programs such as this can empower citizens to take precautionary action.

Delta County Wildfire Mitigation Action #2	Purchase Emergency mobile generators to use with emergency equipment during power outages.
Mitigation Goal/Objective	**Goal #1** Protect Life and Property
Priority	Medium
Funding Source(s)	Delta County Annual Budget, FEMA Grant
Estimated Cost	Medium (10-25k)
Responsible Agency	Delta County EMC
Estimated Completion Time	5 years
Effect on New Buildings	Generators can provide power to equipment utilized in fighting fires.
Effect on Existing Buildings	Generators can provide power to equipment utilized in fighting fires.
Comments:	

The Jurisdiction of Cooper Actions and Goals

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

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

Cooper Flood Actions

Cooper Flood Mitigation Action #1	Participate in the National Flood Insurance Program
Mitigation Goal/Objective	***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.
Priority	High
Funding Source(s)	Not Applicable
Estimated Cost	Low (0-$10,000)
Responsible Agency	City of Cooper and the Texas Water Board
Estimated Completion Time	3 years
Effect on New Buildings	Protect New Structure from flooding by raising base elevation
Effect on Existing Buildings	Not Applicable
Comments:	

Cooper Flood Mitigation Action #2	Increase the size of ditches to accommodate flash flood waters (NFIP)
Mitigation Goal/Objective	Goal #1 Protect Life and Property Implement activities that assist in protecting lives by making homes, business, infrastructure critical facilities and other property more resistant to natural hazards
Priority	Medium ($10,000-$25,000)
Funding Source(s)	City
Estimated Cost	Low (employee time)
Responsible Agency	City of Cooper
Estimated Completion Time	2.5 years
Effect on New Buildings	Protect from seepage from poor drainage
Effect on Existing Buildings	Protect from seepage from poor drainage
Comments:	

Cooper Tornado Actions

Cooper Tornado Mitigation Action # 1	Construct FEMA standard community safe room
Mitigation Goal/Objective	***Goal # 1 Protect Life and Property*** Implement activities that assist in protecting lives by making homes, business, infrastructure critical facilities and other property more resistant to natural hazards
Priority	High
Funding Source(s)	GRANT
Estimated Cost	High ($25,000 +)
Responsible Agency	City of Cooper /ATCOG
Estimated Completion Time	3 Years
Effect on New Buildings	Not applicable
Effect on Existing Buildings	Not applicable
Comments:	Safe Room are needed in every jurisdiction

Cooper Tornado Mitigation Action # 2	Increase tornado public awareness by disseminating information at public events and newspapers.
Mitigation Goal/Objective	***Goal #2: Public Awareness*** Develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards.
Priority	High
Funding Source(s)	FEMA, City Staff
Estimated Cost	Low (0-$10,000) FEMA brochures, PSA's
Responsible Agency	City of Cooper
Estimated Completion Time	1 year
Effect on New Buildings	Not Applicable
Effect on Existing Buildings	Not Applicable
Comments:	

Cooper Thunderstorm Winds Actions

Cooper Thunderstorm Winds Mitigation Action #1	Provide public workshops and information regarding mitigating homes against windstorms
Mitigation Goal/Objective	**Goal #1** Protect Life and Property **Goal # 2** Public Awareness
Priority	Medium
Funding Source(s)	Cooper Annual Budget
Estimated Cost	Low (0-10k)
Responsible Agency	City Fire Department/EMC
Estimated Completion Time	5 years
Effect on New Buildings	Actions learned and implements could help protect new buildings from high winds
Effect on Existing Buildings	Actions learned and implements could help protect new buildings from high winds
Comments:	Public awareness and education can minimize loss and protect lives by giving citizens the tools needed to take action.

Cooper 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)	Cooper Annual Budget
Estimated Cost	Low (0-10k)
Responsible Agency	Mayor of Cooper
Estimated Completion Time	5 years
Effect on New Buildings	This would help protects new mobile homes from damage during high winds.
Effect on Existing Buildings	This would help protects existing mobile homes from damage during high winds
Comments:	

Cooper Lightning Actions

Cooper Lightning Mitigation Action #1	Install lightning warning devices in public parks.
Mitigation Goal/Objective	***Goal #5: Emergency Services*** Establish policy to ensure mitigation projects for critical facilities, services, and infrastructure
Priority	High
Funding Source(s)	Grant
Estimated Cost	Medium ($10,000-$25,000)
Responsible Agency	VFD
Estimated Completion Time	3 years
Effect on New Buildings	Faster response to emergency situations
Effect on Existing Buildings	Faster response to emergency situations
Comments:	

Cooper Lightning Mitigation Action # 2	Educate the public about the dangers of lightning and high winds found in thunderstorms.
Mitigation Goal/Objective	***Goal #2: Public Awareness*** Provide information on tools, and funding resources to assist in implementing mitigation activities.
Priority	High
Funding Source(s)	City
Estimated Cost	Low (0-$10,000)
Responsible Agency	VFD
Estimated Completion Time	4 years
Effect on New Buildings	Help prepare New buildings for thunderstorm activity
Effect on Existing Buildings	Help prepare Existing building for thunderstorm bursts
Comments:	

Cooper Hailstorm Actions

Cooper Hail Mitigation Action #1	Install hail resistant film on the windows of critical facilities
Mitigation Goal/Objective	**Goal #1** Protect Life and Property
Priority	Medium
Funding Source(s)	Cooper Annual Budget
Estimated Cost	Low (0-10k)
Responsible Agency	Cooper Public Works
Estimated Completion Time	5 years
Effect on New Buildings	No effect
Effect on Existing Buildings	This will strengthen existing buildings resiliency to this hazard.
Comments:	

Cooper 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)	Cooper Annual Budget
Estimated Cost	Low (0-10k)
Responsible Agency	City Fire Dept./ EMC
Estimated Completion Time	3 years
Effect on New Buildings	Knowledge gained from workshops can translate into actions that improve structures and their design.
Effect on Existing Buildings	Knowledge gained from workshops can translate into actions that improve structures and their design.
Comments:	Public awareness and education can minimize loss and protect lives by giving citizens the tools needed to take action.

Cooper Winter Storm Action

Cooper Winter Storm Mitigation Action #1	Purchase generators for water and sewage facilities
Mitigation Goal/Objective	***Goal # 1 Protect Life and Property*** Implement activities that assist in protecting lives by making homes, business, infrastructure critical facilities and other property more resistant to natural hazards.
Priority	Medium
Funding Source(s)	FEMA
Estimated Cost	Medium ($10000-$25000)
Responsible Agency	City of Cooper
Estimated Completion Time	Two years
Effect on New Buildings	Water and sewage problems could be averted protecting business from closing or costly repairs.
Effect on Existing Buildings	Water and sewage problems could be averted protecting business from closing or costly repairs.
Comments:	FEMA grant funding would be necessary to complete this much needed action.

Cooper 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*** Implement activities that assist in protecting lives by making homes, businesses, infrastructure, critical facilities, and other property more resistant to natural hazards.
Priority	Moderate
Funding Source(s)	City
Estimated Cost	Low (0-$10000)
Responsible Agency	City of Cooper
Estimated Completion Time	3 years
Effect on New Buildings	Could protect buildings from falling trees or limbs
Effect on Existing Buildings	Could protect buildings from falling trees or limbs.
Comments:	

Cooper Drought Actions

Cooper Drought Mitigation Action #1	Conduct workshops on conserving water, xeriscaping and managing drought impacts
Mitigation Goal/Objective	***Goal #2: Public Awareness*** 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
Priority	Low
Funding Source(s)	County
Estimated Cost	Low (0-$10,000)
Responsible Agency	City and County Extension
Estimated Completion Time	3 years
Effect on New Buildings	This could help with possible foundation issues and
Effect on Existing Buildings	
Comments:	

Cooper Drought Mitigation Action # 2	Implement a water conservation program and enforce it during drought periods enforcing restrictions on watering lawns and replacing municipal appliances or equipment with water-saving models or parts
Mitigation Goal/Objective	**Goal #3: Natural Systems** Preserve, rehabilitate, and enhance natural systems to serve natural hazard mitigation functions ***Goal #4: Partnerships and Implementation*** Develop leadership within public and private sector organizations to prioritize and implement local, county, and regional hazard mitigation activities.
Priority	Low
Funding Source(s)	City of Cooper
Estimated Cost	Low (0-$10,000)
Responsible Agency	City of Cooper
Estimated Completion Time	3 years
Effect on New Buildings	Not Applicable
Effect on Existing Buildings	Not Applicable
Comments:	Water shortage has not been a major problem in NE Texas

Cooper Wildfire Mitigation Actions

Cooper Wildfire Mitigation Action #1	Conduct a wildfire education program stressing the dangers of trash burning in order to help prevent wildfires.
Mitigation Goal/Objective	**Goal #2** Public Awareness
Priority	High
Funding Source(s)	Cooper Annual Budget
Estimated Cost	Low (0-10k)
Responsible Agency	Cooper Fire Chief
Estimated Completion Time	3 years
Effect on New Buildings	Out of control trash burning can destroy a new building
Effect on Existing Buildings	Out of control trash burning can destroy an existing building.
Comments:	Programs such as this can empower citizens to take precautionary action.

Cooper Wildfire Mitigation Action #2	Develop and implement a building vegetation clearance program.
Mitigation Goal/Objective	**Goal #1** Protect Life and Property **Goal #4** Partnerships and Implementation
Priority	Medium
Funding Source(s)	Cooper Annual Budget
Estimated Cost	Medium (10-25k)
Responsible Agency	Cooper Public Works
Estimated Completion Time	5 years
Effect on New Buildings	This would protect new buildings from Wildfire/Urban Interface
Effect on Existing Buildings	This would protect existing buildings from Wildfire/Urban Interface
Comments:	Much can be accomplished when the private and public sector joins hands

SECTION IV

Monitoring, Implementation, Evaluating, Updating and Integration

Delta County and the participating jurisdiction of Cooper will be responsible for implementing its own mitigation actions contained in Section III. Each action has been assigned to a specific person or local government office that is responsible for implementing it. Delta 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 Delta 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. For implementation, monitoring and evaluating the public will be invited to participate as they have been in this current process.

The Delta County Commissioners will be responsible for adopting the Delta 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 Delta County 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, Delta County/City will formally adopt it and gain eligibility for Hazard Mitigation Grant Program funds.

Evaluation

To prevent issues regarding meeting the goals of The Delta 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. Agencies participating in the plan review will include public works, emergency management or fire department, representatives for the city councils or commissioners' court, and mayors or city managers.

Also, at this meeting time the Hazard Mitigation Committee Members will monitor the progress of the plan implementation and 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. Monitoring and evaluation will occur at this meeting. This will be done as it has been done previously for all participating jurisdictions.

The meeting will review the progress of the plan and each action for each community to assess if the plan and 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.

Evaluating Criteria will be as follows: what action was implemented, what was the projected cost versus the actual cost, was the timeline followed, where the applicable agencies involved in the implementation, where these the appropriate agencies, were other agencies not involved that should be considered in the future; if so, what agencies and what would their role be and why. Other criteria would be determining after a hazard occurs was the action that was implemented beneficial? This can be measured is several different ways from comparing historical occurrences listed in this plan to the current event. Criteria for evaluating after an incident includes cost of property damage previous incidents and current; was there less injury and loss of life. Also, comparing response dollars and resources allocated will also be factored. A successful mitigation action will be one that has saved lives, kept more citizens safe, lessened the impact of property damage as well as crop damage. Feedback from individual citizens will also be critical in order to determine if the impact was lessened on an individual level basis. As it has done before, outreach will continue and soliciting of information concerning resilience to an event will be solicited in the future via these means.

Monitoring

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. Monitoring is defined as tracking the implementation of the plan over time. The plan will be monitored in the following ways:

1. Step One: Review any past occurrences of hazards that have impacted the participating jurisdictions since the last plan maintenance review meeting occurred.

2. Step Two: Review the proposed implementation.

3. Step Three: Determine if any of these recent hazard occurrences resulted in significant enough damages to require a reprioritization of the implementation timeline. If so, the following questions should be asked:
    a. Do goals/actions need revision?
    b. Should actions be added or deleted?
    c. What is the status of recommended actions?

4. Step Four: The planning team shall, at its discretion, direct participating jurisdiction staff to perform site visits and/or prepare progress statements on individual plan components to assist in the plan evaluation process.

5. Step Five: If certain components of the implementation plan that were scheduled for completion since the last plan maintenance review were not accomplished, the committee shall

review what steps need to be taken to bring the specific aspects of the mitigation plan into compliance.

6. Step Six: The committee shall update and validate the implementation plan timeline shown in the actions and establish milestones for implementation and review during the forthcoming year.

Again, the public will be invited to attend and will be encouraged to provide feedback.

The plan in its entirety, including but not limited to planning process, public participation, risk assessment, mitigation strategy and actions will be monitored and evaluated.

Implementation

The Delta 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 considering 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 Delta County HMAP will be incorporated into a variety of new and existing planning mechanisms for **Cooper and Delta 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 Placed on the Delta County website and a copy will be placed in the county judge's office. 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.

Delta County is committed to supporting the cities, communities, and other jurisdictions in the planning area as they implement their mitigation plans. Delta 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 Delta 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

Cooper, Delta County Seat, population is 1,993. The following are the city of Cooper's authorities, policies, programs, and resources available to accomplish hazard mitigation actions and strategies. The city of Cooper has a mayor, a fire chief, a police department, and maintenance department. Cooper has building codes, and zoning ordinances. Cooper will integrate data and action recommendations into the local emergency operations plan and will consider information in the Hazard Mitigation Plan for planning and zoning. A city council member or the mayor will propose the plans integration at a city council meeting. The mayor will sign this into action after a majority vote. To improve and expand capabilities, the City of Cooper will establish a Hazard Mitigation Team to address their Hazard Mitigation Plan. Cooper could benefit from additional training and staff to support mitigation plan activities.

Unincorporated Delta County population of 3,356. The following are Delta County's authorities, policies, programs, and resources available to accomplish hazard mitigation action and strategies. Delta County has a county judge and four commissioners. It has volunteer fire departments and a public works department. There is a county emergency management coordinator. Unincorporated Delta 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 Delta County should establish a team to develop public-private initiatives addressing disaster related issues

Copies of the Plan will be kept at the county courthouse and city hall as well as one the Delta County website. The existence and location of these copies will be publicized in the county's newspapers. The County Judge's Office will be responsible for keeping track of public comments on the Plan.

If you don't know where you are going, you will wind up somewhere else. Yogi Berra

STATE OF TEXAS
COUNTY OF DELTA

COMMISSIONERS COURT

FILED FOR RECORD
AT 9:15A M
JUN 14 2021
Jane Jones, County Clerk
DELTA COUNTY, TEXAS

RESOLUTION OF THE COURT

#06142021-01

WHEREAS, the County of Delta and the City of Cooper, recognize their vulnerability and the many potential hazards shared by all residents; and

WHEREAS, the County of Delta and the City of Cooper have each have recognized the need to prepare a Five-year Updated Mitigation Action Plan; and

WHEREAS, the County of Delta and the City of Cooper have decided to jointly prepare one Five-year Updated Mitigation Action Plan.

THEREFORE BE IT RESOLVED, that the County of Delta and the City of Cooper hereby jointly adopt and approve said Five-year Updated Mitigation Action Plan; and

BE IT FURTHER RESOLVED, that the Delta County Judge and the Mayor of Cooper 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 Delta and the City of Cooper in accordance with this resolution.

RESOLVED THIS 14 **DAY OF** June, **2021.**

CITY OF COOPER

Darren Braddy, Mayor

ATTEST:

Emily Howse, City Secretary

Council:

David Phillips, Councilman

Allen Foster, Councilman

Amanda L'Esperance, Councilwoman

Diane Stegall, Councilwoman

Elmo Robinson, Councilman

DELTA COUNTY

Jason Murray, County Judge

ATTEST:

Jane Jones, County Clerk

Commissioners:

Morgan Baker, Commissioner, Precinct 1

Jimmy Sweat, Commissioner, Precinct 2

Bobby Asbill, Commissioner, Precinct 3

Mark Brantley, Commissioner, Precinct 4

RESOLUTION
#01-06-21

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RESOLVED THIS 14 **DAY OF** June **, 2021.**

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Diane Stegall, Councilwoman

Elmo Robinson, Councilman

DELTA COUNTY

Jason Murray, County Judge

APPROVED:

Jane Jones, County Clerk

Commissioners:

Morgan Baker, Commissioner, Precinct 1

Jimmy Sweat, Commissioner Precinct 2

Bobby Asbill, Commissioner Precinct 3

Mark Brantley, Commissioner Precinct 4

APPENDIX

STATE OF TEXAS

COUNTY OF DELTA

PUBLIC NOTICE

Draft Proposal of the Five-Year Update of the Delta County Hazard Mitigation Plan

A draft copy of the Delta County Hazard Mitigation Plan Five-Year Update is posted on the Delta County Website (www.deltacountytx.com) under the Public Notices section as well as on the Emergency Management webpage. The plan *DRAFT* has been posted to allow the citizens of the county to review and comment prior to official plan approval. The posted draft is designed to give viewers an idea of what the completed approved plan will look like. Contact information is posted with the plan draft.

Hazard Mitigation is defined as any sustained action taken to reduce or eliminate the long-term risk to life and property from hazard events. It is an on-going process that occurs before, during, and after disasters and serves to break the cycle of damage and repair in hazardous areas.

Acronyms

Table 6.1

ATCOG	Arkansas-Texas Council of Governments
BEA	Bureau of Economic Analysis
CFR	Code of Federal Regulations
EDAP	Economically Distressed Areas Program
FEMA	Federal Emergency Management Agency
HAZMAT	Hazardous Materials
HAZUS	Hazards, U. S.
HMIS	Hazardous Material Information System
HMPG	Hazard Mitigation Program Grant
HMT	Hazard Mitigation Team
MAP	Mitigation Action Plan
PA	Public Assistance
PDM	Pre-Disaster Mitigation
PI	Project Impact
PL	Public Law
PP-M	Property-Project Mitigation Program
TWDB	Texas Water Development Board

RESOLUTION

WHEREAS, the County of Delta and the Cities of Cooper and Pecan Gap recognize their vulnerability and the many potential hazards shared by all residents; and

WHEREAS; the County of Delta and the Cities of Cooper and Pecan Gap each have recognized the need to prepare a Mitigation Action Plan; and

WHEREAS, the County of Delta and the Cities of Cooper and Pecan Gap have decided to jointly prepare one Mitigation Action Plan.

THEREFORE BE IT RESOLVED that the County of Delta and the Cities of Cooper and Pecan Gap hereby jointly adopt and approve said Mitigation Action Plan; and

BE IT FURTHER RESOLVED that the Delta County Judge and the Mayors of Cooper and Pecan Gap shall mutually appoint a Hazard Mitigation Coordinator to coordinate all aspects of the Mitigation Action Plan including its review and maintenance, for the County of Delta and the Cities of Cooper and Pecan Gap in accordance with this resolution.

RESOLVED THIS 8th **DAY OF** SEPTEMBER**, 2014.**

[signature]
County Judge, Delta County

ATTEST [signature]
County Clerk

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RESOLUTION

01-09-2014

WHEREAS, the County of Delta and the Cities of Cooper and Pecan Gap recognize their vulnerability and the many potential hazards shared by all residents; and

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BE IT FURTHER RESOLVED that the Delta County Judge and the Mayors of Cooper and Pecan Gap shall mutually appoint a Hazard Mitigation Coordinator to coordinate all aspects of the Mitigation Action Plan including its review and maintenance, for the County of Delta and the Cities of Cooper and Pecan Gap in accordance with this resolution.

RESOLVED THIS 8 **DAY OF** September**, 2014.**

Mayor, City of Cooper

ATTEST

City Secretary

RESOLUTION

WHEREAS, the County of Delta and the Cities of Cooper and Pecan Gap recognize their vulnerability and the many potential hazards shared by all residents; and

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RESOLVED THIS 21 **DAY OF** October **, 2014.**

Warren Cheney
Mayor, City of Pecan Gap

ATTEST Nelda Campbell
City Secretary

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