# Tyler County Multi-Jurisdictional Hazard Mitigation Plan




LANGFORD COMMUNITY MANAGEMENT SERVICES EST. 1983

2026 Update

U.S. Department of Homeland Security FEMA Region 6
800 N. Loop 288
Denton, TX 76209

FEMA

August 31, 2026

Jennifer Charlton-Faia, Deputy State Hazard Mitigation Officer
Texas Division of Emergency Management
P.O. Box 285
Del Valle, TX 78617-9998

RE: Approval of the Tyler County, Texas Multi-Jurisdiction Hazard Mitigation Plan

Dear Ms. Charlton-Faia:

This office has concluded its review of the referenced plan, and we are pleased to provide our approval of this plan in meeting the criteria set forth by 44 CFR § 201.6. FEMA approval does not include the review or approval of content that exceeds the applicable FEMA mitigation planning requirements. By receiving this approval, eligibility for the Hazard Mitigation Assistance Grants will be ensured for five years from the date of this letter, expiring on August 30, 2031.

This approval does not demonstrate approval of projects contained in the plan. This office has provided the enclosed Local Hazard Mitigation Planning Tool with reviewer's comments, to further assist the community in refining the plan going forward. Please advise the referenced community of this approval.

If you have any questions, please contact David Freeborn, HM Community Planner, at (940) 268-7602.

Sincerely,

FOR Ryan A Carey

Digitally signed by Ryan A Carey
Date: 2026.09.03 10:12:11 -05'00'

Roberto E. Ramirez Chief,
Risk Analysis Branch

Enclosures: Approved Participants
cc: Anne Lehnick

Approved Participants

Attached is the list of approved participating governments included in the August 31, 2026 review of the referenced Hazard Mitigation plan.

| | Community Name |
|---|---|
| 1) | Chester Independent School District |
| 2) | Chester town |
| 3) | Chester WSC |
| 4) | Colmesneil city |
| 5) | Colmesneil Independent School District |
| 6) | Ivanhoe city |
| 7) | Spurger Independent School District |
| 8) | Tyler County |
| 9) | Warren Independent School District |
| 10) | Woodville Independent School District |
| 11) | Woodville town |

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# SECTION 1: INTRODUCTION



Figure 1-1: Location of Tyler County Relative to the State of Texas

Tyler County is in the Piney Woods Region of Texas, with its easternmost border only 20 miles away from the Louisiana border, and from the center of the county, it is 56 miles north of Beaumont, part of the Beaumont–Port Arthur metropolitan statistical area. Tyler County has four incorporated cities: the county seat, Woodville, the city of Chester, the city of Colmesneil, and the city of Ivanhoe. It also has three unincorporated communities: Fred, Warren, and Spurger. There are five Independent School Districts serving the children of Tyler County: Spurger ISD, Warren ISD, Colmesneil ISD, Chester ISD, and Woodville ISD.

The county has a hazard profile similar to many other Southeast Texas communities. It deals with hurricanes, flash flooding, and tornadoes. With climate change affecting weather patterns on the Texas coast, these and other hazards are forecast by national weather monitors to become more frequent and greater in magnitude.

These hazards can be life-threatening, destroy property, disrupt the economy, and lower the overall quality of life. Hazard mitigation is defined by the Federal Emergency Management Agency (FEMA) as sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects. FEMA is the federal agency responsible for preparing for, responding to, and recovering from disasters in the United States. Hazard mitigation planning is an investment in a community's safety and sustainability. It is widely accepted that the most effective hazard mitigation measures are implemented at the local government level, where decisions on the regulation and control of development are ultimately made.

This hazard mitigation plan is a framework for Tyler County, including participating jurisdictions, to address hazard vulnerabilities by reducing the future impact of various hazards on people and property that exist today and in the foreseeable future.

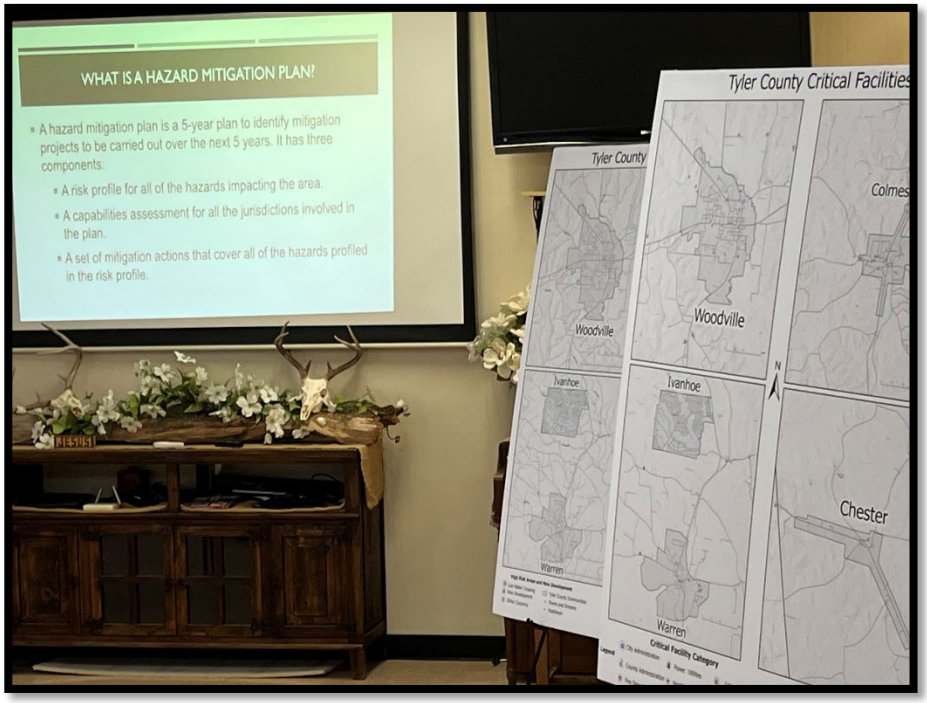
## Participation and Scope

The Tyler County Hazard Mitigation Plan is a multi-jurisdictional Plan covering 11 jurisdictions: Tyler County, the cities of Woodville, Ivanhoe, Chester, and Colmesneil; five school districts: Spurger ISD, Warren ISD, Colmesneil ISD, Chester ISD, and Woodville ISD; and one special district, Chester Water Supply Corp. The prior Hazard Mitigation Plan for the area was the Tyler County Multi-jurisdictional Hazard Mitigation Plan. This 2021 Plan Update only covered the county and two cities, Woodville and Ivanhoe. The Core Team was expanded following a need to better collaborate across all communities in Tyler County, especially the smaller cities and school districts.

Additional entities were invited to participate but chose to do so as stakeholders, rather than jurisdictions. These are listed in Section Two under Public and Stakeholder Involvement.

Below is an example of outreach efforts to inform the public about the upcoming Hazard Mitigation Action Plan (HMAP).

Figure 1-2: Tyler County HMP Engagement Example




The updated Plan builds on the 2020 version, incorporating new capabilities, updated risk assessments, and collaboratively developed mitigation actions between the Tyler County Office of Emergency Management and the other participants in the Plan. The 2026 Plan update included a dramatic increase in participation from cities and special districts.

The 2026 Plan's scope includes a detailed understanding of the planning area regarding existing capabilities, historical data, and future development patterns. Next, the area's vulnerability to different natural hazards has been studied thoroughly, resulting in a detailed assessment of hazard risk. The assessment was used to assist the planning team in identifying and ranking mitigation activities based on their likelihood of reducing risk.

## Purpose

The Mission Statement of the Plan is…
**"*Tyler County and participating jurisdictions will work to reduce or eliminate the long-term risk to loss of life and property from the full range of natural disasters that affect the area.*"**

The Plan was prepared by Langford Community Management Services on behalf of and with extensive input from representatives of Tyler County and participating jurisdictions. The purpose of the Plan is to minimize or eliminate long-term risks to human life and property from known hazards and to break the cycle of high-cost disaster response and recovery throughout Tyler County.

To accomplish this, cost-effective hazard mitigation actions within the planning area are identified along with information critical to successful implementation, such as estimated cost, responsible departments, funding sources, and timelines. In addition, an updated FEMA-approved Hazard Mitigation Plan is a condition of eligibility for certain types of non-emergency disaster assistance, including funding for mitigation programs and projects.

A successful Hazard Mitigation Plan will:

1) Align risk reduction with other Federal, State, or community objectives;
2) Build or encourage partnerships for risk reduction involving government, organizations, businesses, and the public;
3) Communicate priorities to potential sources of funding;
4) Identify long-term, broadly supported strategies for risk reduction;
5) Review the Plan with Core Team participants annually;
6) Identify implementation approaches that focus resources on the greatest risks and vulnerabilities; and
7) Increase education and awareness around threats, hazards, and vulnerabilities.

The Core Planning Team has identified 11 natural hazards to be addressed in the 2026 plan. Detailed information about these hazards and risks can be found in Section 4, while detailed risk assessments for each hazard are discussed in Sections 5-15. The Plan's specific goals are identified in Section 16, with mitigation actions outlined in Section 17. Section 18 discusses the ongoing maintenance of the Plan, how information will be incorporated into existing plans (such as land use and ordinances), funding mechanisms, monitoring, and evaluation, annual and 5-year updates, and a commitment to involve the public continuously.

# SECTION 2: PLANNING PROCESS




1. **Organize the Planning Process and Resources** – At the start, the participating jurisdictions focus on assembling the resources needed for a successful mitigation planning process. This includes securing technical expertise, defining the planning area, and identifying key individuals, agencies, neighboring jurisdictions, businesses, and/or other stakeholders to participate in the process. The planning process for local and tribal governments must include opportunities for the public to comment on the Plan.
2. **Assess Risks** – Next, the local government needs to identify the characteristics and potential consequences of hazards. It is important to understand what geographic areas each hazard might impact and what people, property, or other assets might be vulnerable.
3. **Develop a Mitigation Strategy** – The local government then sets priorities and develops long-term strategies for avoiding or minimizing the undesired effects of disasters. The mitigation strategy addresses how the mitigation actions will be implemented and administered.
4. **Adopt and Implement the Plan** – Once FEMA has received notification of the adoption from the governing body and approved the Plan, the county, local governments, and school districts will work to the best of their ability to implement the projects included in the plan and track their progress through annual meetings.

## Planning Team

Tyler County, including participating jurisdictions, hired Langford Community Management Services to provide technical support and oversee the Plan's development. The Tyler County Plan update was created using a direct representative model, where each participating jurisdiction chooses and sends a representative to represent its interests.

A local planning team was also established at the jurisdictional level, which was responsible for assembling representatives to participate in the meetings and complete relevant tasks. This group was primarily responsible for developing and eventually implementing the mitigation actions at the local level.

Figure 2-1: Tyler County Hazard Mitigation Plan Team

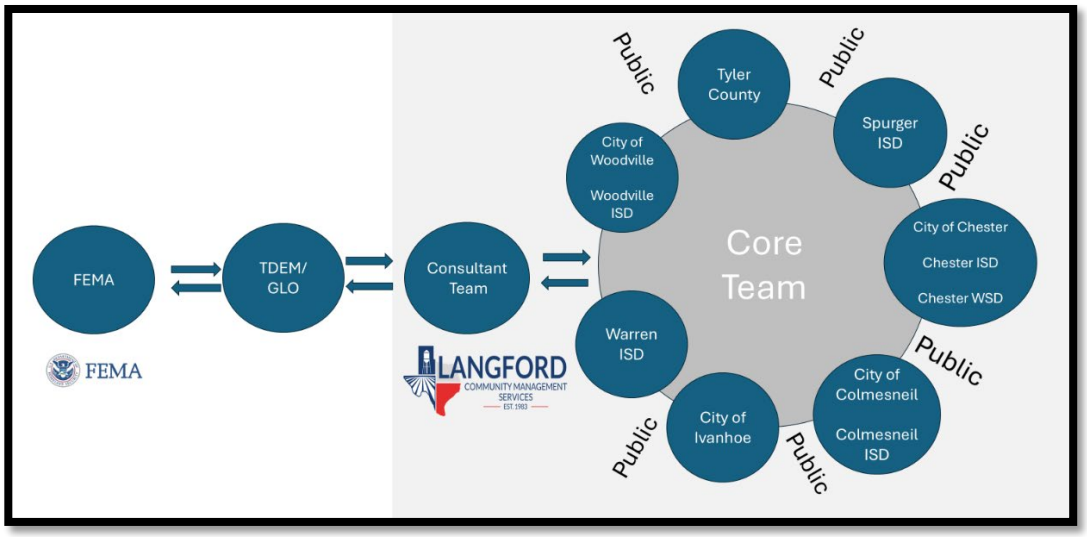
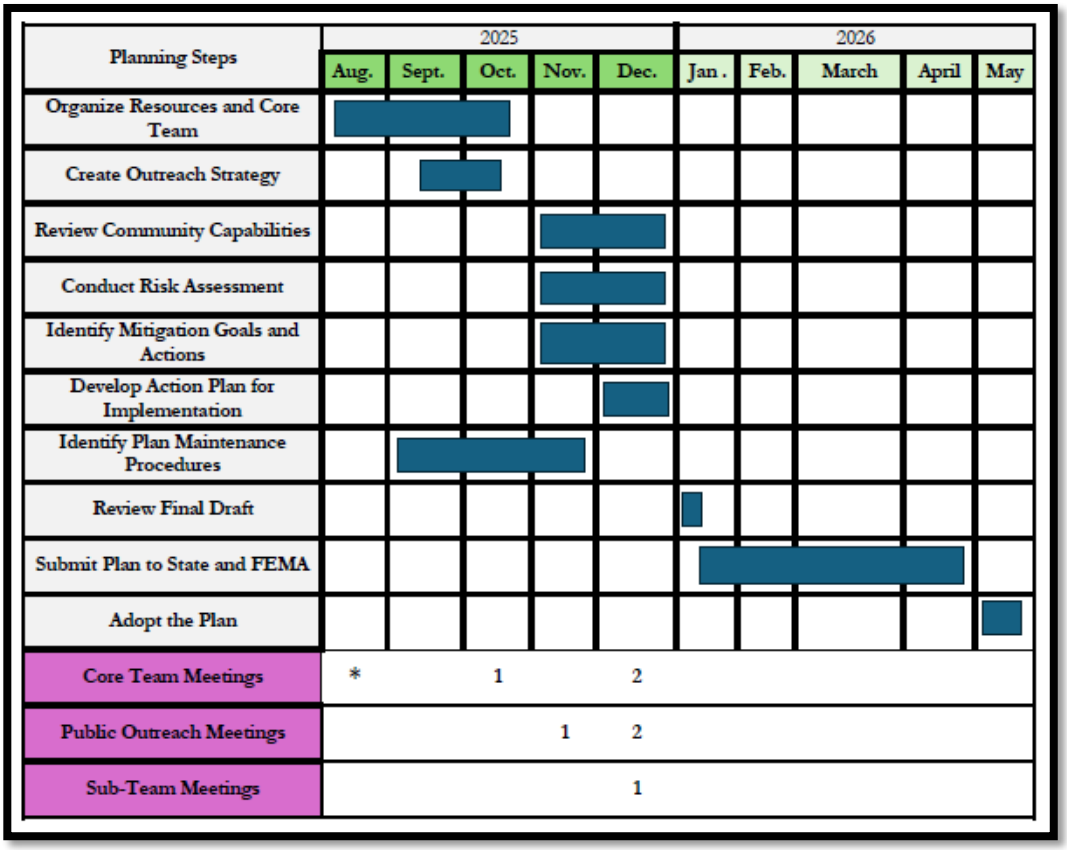



Table 2-1. Core Planning Team – Plan Participants

| Organization | Title | Department |
|---|---|---|
| Tyler County | Emergency Management Coordinator<br>Assistant Emergency Manager | Office of Emergency Management |
| Tyler County | County Judge<br>County Commissioners | County Administration |
| City of Woodville | Mayor, City Administrator | City Administration |
| City of Chester | Mayor, City Council | City Administration |
| City of Colmesneil | Mayor, City Secretary | City Administration |
| City of Ivanhoe | Mayor, City Secretary | City Administration |
| Chester ISD | Superintendent | District Administration |
| Spurger ISD | Superintendent | District Administration |
| Warren ISD | Superintendent | District Administration |

| | | |
|---|---|---|
| Chester WSC | District Board Members | |
| Woodville ISD | Superintendent | District Administration |
| Colmesneil ISD | Superintendent | District Administration |

Figure 2-2: Plan Schedule




As the schedule described, there were 2 Core Team Meetings: the Kickoff Meeting, where all core team members and invited stakeholders learned about the plan, and data collection via the Plan Engagement Website was initiated, on October 2nd, and the Hazard Mitigation Workshop, on December 8th. At the Hazard Mitigation Workshop, all core team members met with LCMS planners throughout the day to develop a set of hazard mitigation actions that can be found in Section 17. Follow-up meetings throughout January were scheduled to collect any outstanding information and make edits to the plan.

# Resources and Existing Plans

## Resources

Various resources were used to gather and analyze data on past hazard events and their impact on the planning area to conduct hazard risk assessments. As a component of the risk assessment, existing capabilities were discussed and reviewed. The preliminary findings of the hazard risk assessments were presented at the Mitigation Action Workshop and then shared in their entirety with the participants to develop mitigation actions. The information obtained from these assessments facilitated discussions that helped participants develop actions for their respective communities.

Resources used for the assessments include the National Oceanic and Atmospheric Administration (NOAA), Texas Geographic Society, U.S. Geographic Society (USGS), U.S. Department of Health and Human Services, U.S. Departments of Agriculture, FEMA, U.S. Army Corp of Engineers (USACE), Texas Water Development Board (TWDB), Texas A & M Forest Service, Texas Division of Emergency Management (TDEM), local reporting, and other sources.

## Existing Plans and Regulations

### *Tyler County Subdivision and Development Regulations*

The Tyler County Subdivision Regulations, updated by the Tyler County Commissioners' Court on July 20, 2021, set minimum standards for subdivisions to protect public health and safety. They require adequate streets and roads, storm drainage, water, and sewage facilities, and establish the process for subdivision application, review, and approval.

The regulations are organized into chapters covering: general and administrative provisions (authority, when plats and applications are required, exemptions, development tiers, conflicts of laws, and definitions); minimum standards for water and sewage service (public and non-public water systems, wastewater disposal including OSSFs, utility easements, and fire-fighting/public utility expectations); and minimum standards for roads and streets (right-of-way, intersection and street layout, subgrade and base, surfacing, minimum elevation and cross-slope, and requirements for dedication, signage, and setbacks).

Later sections establish minimum drainage standards (lot grading, defined drainage courses, restrictions on blocking natural flow, drainage ditches and structures, and drainage easements) and include a dedicated chapter on recreational vehicle parks (definitions, application requirements, infrastructure, road design, service buildings, and operating standards). The final chapters outline the application and approval process, including pre-application meetings, submittal requirements, plat and survey standards, approval procedures and timelines, financial guarantees, revisions/cancellations/amendments, variance criteria, and enforcement and disclosure requirements—followed by appendices with forms and checklists.

### *2020 Tyler County Hazard Mitigation Plan*

The 2020 Tyler County Hazard Mitigation Plan provides a countywide framework to reduce risks to life, property, and infrastructure from natural hazards such as flooding, extreme heat, and severe weather. Ivanhoe participated in the plan's development and aligns local planning and floodplain management ordinances with FEMA and Disaster Mitigation Act requirements, supporting public safety, sustainable development, and eligibility for mitigation funding

### *Ivanhoe Comprehensive Plan (2001)*

The Ivanhoe Comprehensive Plan establishes a long-term vision to guide land use, housing, economic development, infrastructure, and historic preservation. While advisory in nature, the plan emphasizes directing growth away from hazard-prone areas, encouraging infill development and downtown revitalization, and balancing future development with environmental constraints and community quality of life

### *Ivanhoe Zoning Ordinances*

Ivanhoe's zoning ordinances implement the goals of the comprehensive plan by establishing zoning districts, permitted uses, and development standards for residential, commercial, and industrial areas. The ordinances regulate site design, setbacks, safety features, and building practices, and adopt recognized international building and safety codes to promote orderly growth, public health, and general welfare in compliance with Texas law

### *Woodville Code of Ordinances and Flood Damage Prevention Ordinance*

The City of Woodville has adopted the 2006 editions of the International Building Code, International Plumbing Code, International Mechanical Code, International Residential Code, and International Fuel Gas Code, and it has adopted the 2008 edition of the National Electrical Code (NFPA 70).

The chapter designates the City Administrator as the Floodplain Administrator, responsible for administering and implementing the flood damage prevention regulations (including relevant NFIP/44 CFR requirements), reviewing floodplain development permits, and maintaining required records. For mapping and regulatory flood hazard boundaries, the city adopts FEMA's Flood Insurance Rate Map (FIRM) for Community Number 481035, dated April 4, 2011 (including any later revisions).

As for elevation and construction standards, the ordinance sets general requirements in all special flood hazard areas for new construction and substantial improvements, including anchoring to resist flotation/collapse, flood-damage-resistant materials, and protection of utilities to prevent floodwater intrusion. Where Base Flood Elevation (BFE) data is available, residential buildings must have the lowest floor (including basement) elevated to 1 foot above BFE. Nonresidential buildings must either be elevated 1 foot above BFE or be floodproofed (watertight below BFE, structurally resistant to flood forces and buoyancy) with professional certification and a recorded floodproofing elevation.

The aforementioned plans and ordinances were reviewed with the relevant jurisdictions, and suggestions for mitigation actions were developed according to the identified gaps in plans and ordinances.

## Public and Stakeholder Involvement

The process of hazard mitigation planning presents an opportunity for Tyler County, along with the participating jurisdictions, water utilities, stakeholders, and the general public, to assess and develop effective actions to mitigate the risk of loss of life and property damage that may result from a disaster occurring within or around the planning area. Public participation and stakeholder involvement in the Plan are critical to ensure that the components of the Plan are accurate and relevant to the needs of the community. The Planning Team develops a greater understanding of local concerns and legacy knowledge with input from individual citizens and the community as a whole. If citizens and stakeholders are involved, it also imparts more credibility to the final Plan and increases the likelihood of successfully implemented mitigation actions.

The following plan stakeholders were invited and actively participated during multiple points in the planning process. The Lions Club, Rotary Club, and Community Watch Organization were actively distributing community surveys and sharing plan information with their members and the public. The Volunteer Fire Departments of Tyler County were involved with reviewing critical facility information and contributed to the list of hazard mitigation projects seen in the plan. All stakeholders listed were sent an invitation to attend the Tyler County Hazard Mitigation Plan kickoff meeting, and sent the link to the Plan Engagement Website.

Table 2-2. Plan Stakeholders

| Community Organizations and Stakeholders | | |
|---|---|---|
| City of Woodville Lions Club | Tyler County Hospital | Spurger VFD |
| City of Woodville Rotary Club | Woodville VFD | Warren VFD |
| Dam B Community Watch (NP) | Chester VFD | Colmesneil VFD |
| Fred VFD | Shady Grove VFD | Dam B VFD |
| Ivanhoe VFD | Wildwood VFD | White Tail Ridge VFD |
| Seneca Water Supply Corporation | Entergy Texas | Tyler County LEPC |

## Public Engagement

A public engagement strategy was developed as part of the pre-planning process. A public and stakeholder engagement platform was developed to capture community input on known hazards and risks faced by the community. On the website, community members could identify critical facilities, low water crossings, and other risks faced by community members.

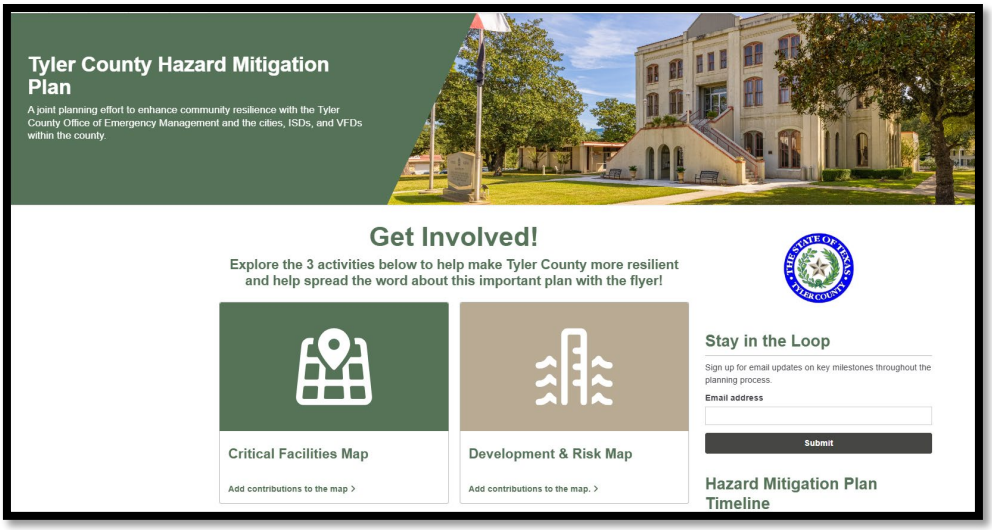



Figure 2-3: Tyler County HMP Plan Engagement Website

The plan engagement website also hosted a survey, which asked community members about their experiences with natural disasters and what actions they had taken to prepare their families and homes. The survey was also distributed in paper format at multiple locations across the county, including the Tyler County Nutrition Center, Dam B Community Watch, Woodville Lions Club, Woodville Rotary Club, Ivanhoe City Hall, Tyler County Tax Assessment Office, and the Warren ISD Office.

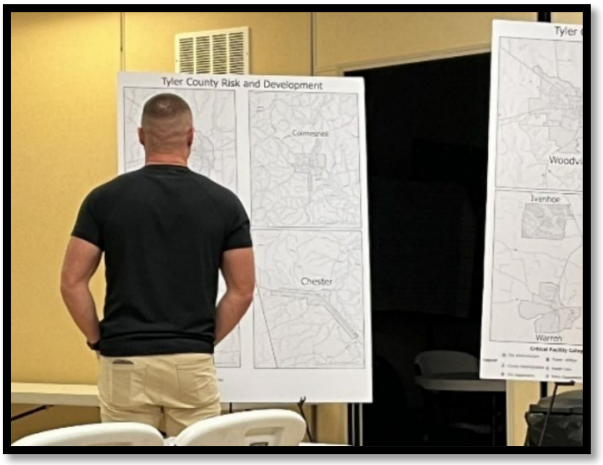
There were two public engagement opportunities for the public to learn about the plan. The first was at the Tyler County Small Town Christmas event, on November 22, 2025, where a booth was set up to talk to community members about their experiences with disasters in Tyler County.

Figure 2-4 : Tyler County Small Town Christmas Community Engagement



The second opportunity was at the Community Resilience Meeting on December 8, 2025, where community members were asked to review the data collected on the plan engagement hub and told about the plan's purpose and contents. This meeting was held in the evening after the Core Participants' Mitigation Action Workshops.

Figure 2-5: Community Resilience Meeting – Dec 8th, 2025




## Survey Results

1. Summary of Findings from the Survey: 61 total survey responses, with 40 paper surveys and 21 digitally entered surveys.
2. 18% of survey respondents were from the City of Woodville, 16.4% were from the City of Colmesneil, 16.5% were from the were from the City of Colmesneil, 3.5% were from the City of Chester, 1.7% were from Warren CDP, 1.7% from Spurger CDP, and 52.5% were residents of Tyler County that did not provide a specific place of residence within Tyler County.
3. Hurricanes and tropical storms were identified as the highest threat by survey respondents, followed by floods and drought.
4. 78.8% respondents reported experiencing flooding while living in the county. Extreme heat and hurricanes were the next most common events, reported by 65.6% of respondents.
5. While 78.7% of respondents indicated that they do not live in a floodplain, 16.7% were uncertain about their floodplain status, and 4.9% reported living in a floodplain.
6. 93.3% of respondents identified as not having flood insurance, with around 55% indicating they don't need it because their structure was elevated, 18% said no because it was too expensive and 20% saying they had never considered it.
7. The mitigation activities favored by residents to be enacted by their governments from highest to lowest priority were: Strengthening Critical Facilities, Replacing Vulnerable or Inadequate Bridges or Roads, Improving Resilience of Utilities, Educating Community Members to Retrofit their Properties, Constructing Community Shelters and Flood Infrastructure, and lowest priority of Buying Out Flood-prone Properties and Preserving Open Space.

# SECTION 3: PLANNING AREA PROFILE

This section provides a profile of the hazard mitigation planning area.

## Tyler County

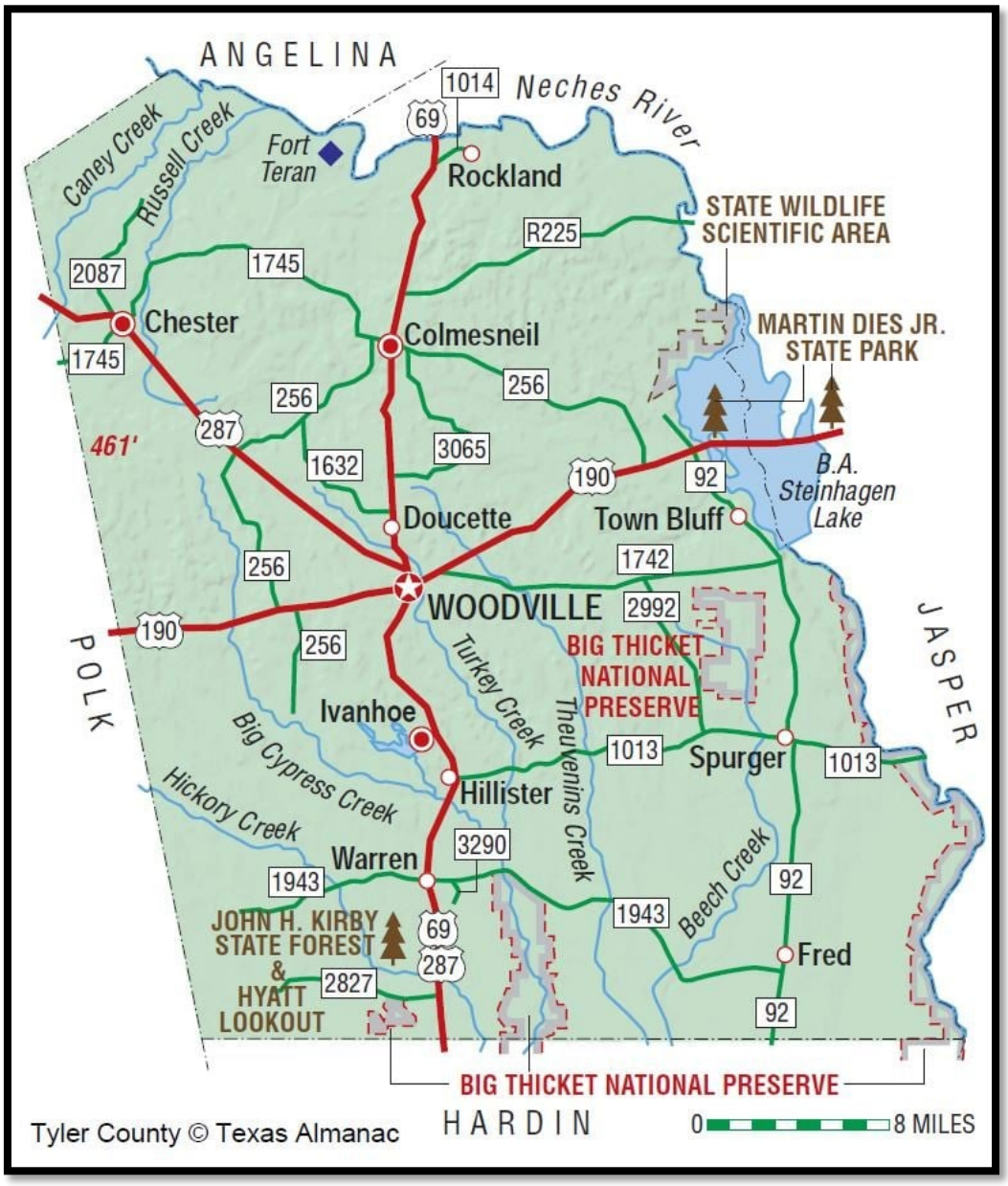



Figure 3-1: Map of Tyler County Major Routes and Landmarks

Tyler County was originally inhabited by Caddoan and Atakapan Native Americans. As westward colonization by European and American settlers continued, natives belonging to the Alabama and Coushatta tribes migrated westward into the Tyler County area. Today, the Alabama-Coushatta Reservation is located just beyond the western Tyler County boundary along Highway 190.

In the 1830s, Tyler County was settled by Americans with land grants from Mexico, and by 1845, the City of Woodville was founded and chosen as the future county seat. Tyler County was officially incorporated in 1864 and named after President John Tyler. Subsistence farming of corn, sweet potatoes, and other crops was the primary use of land, as the soil would not support industrial plantations for cotton. The local economy shifted with the construction of the Sabine and East Texas Railroad in the 1880s, as a quickly growing rail network allowed for the harvesting of local timber.

Tyler County has three major highways running through the county. Highway 190, which spans from New Orleans, LA, to the western end of Pecos County, TX; U.S. Route 69, which begins in Port Arthur and extends north-northwest to Denison on the Texas-Oklahoma border, and U.S. Route 287, which also begins in Port Arthur and routes south of Dallas, then northwest to the Texas Panhandle and continues Northwest through Oklahoma, Colorado, and ending in Northern Montana.

## Incorporated Communities of Tyler County

### *Woodville*

Woodville, Texas, is located in southeastern Tyler County in East Texas, within the Pineywoods region, at the intersection of U.S. Highways 69, 190, and 287, approximately 60 miles northeast of Beaumont and 130 miles northeast of Houston. The community was founded in 1846 and later incorporated in 1957 as a General Law Type A city, serving as the county seat of Tyler County. Woodville's economy has historically been driven by timber and forestry, reflecting the surrounding forested landscape, and today is supported by local government, education, healthcare, agriculture, and small businesses that serve the broader rural area.

### *Chester*

Chester, Texas, is a city located in Tyler County in East Texas, along U.S. Highway 287. The community was formed in 1883 and named for Chester A. Arthur, who was a United States senator from New York at the time. Chester was incorporated in 1968 and operates as a General Law Type A municipality. Historically, the town's primary industries have been lumber and ranching.

### *Ivanhoe*

Ivanhoe was initially developed in the 1960s as a private subdivision marketed for recreational use. With five man-made lakes and thousands of wooded acres, the area quickly became popular among vacationers from Houston and Southeast Texas. Boating, fishing, and camping defined its identity, and many families purchased lots for weekend use. Over the decades, however, a growing number of property owners became full-time residents. With this shift came the desire for more formal infrastructure and local governance. In November 2009, Ivanhoe officially incorporated as a city. In 2010, it expanded further by merging with the adjacent Ivanhoe North subdivision, forming one unified municipality. Ivanhoe was incorporated as a General Law Type C City, meaning it is governed by a mayor and 5 city council members.

### *Colmesneil*

The City of Colmesneil is approximately 10 miles north of Woodville on U.S. Route 69. The City of Colmesneil was first settled with the construction of the Texas and New Orleans Railroad, as it was the only spot in Tyler County with a railroad turntable, making it a crucial hub for the developing timber industry and the more successful agricultural industries surrounding Tyler County. The population has historically fluctuated quite dramatically, ranging from around 1,000 residents when the city was first settled to less than 400 residents during the Great Depression. Over the past 35 years, the population fluctuation has been less extreme, with the city averaging around 600 residents since 1990. Colmesneil was incorporated in 1970 as a General Law Type B City, meaning it is governed by a mayor and five aldermen.

## Unincorporated Communities of Tyler County

### *Fred*

Fred is an unincorporated community in southeastern Tyler County, located about seven miles south of Spurger and approximately 40 miles north of Beaumont within the Big Thicket region. Established in the late 1800s, the Fred post office opened in 1881, and by 1883, the community included churches, a school, and a general store. Fred grew steadily through the early twentieth century, reaching a population of 75 by 1913 and 349 by the late 1960s. From the 1970s through 2000, the population was reported at 239. Local schools operated in the area for decades before consolidating, and by the 1980s, Fred Elementary was part of the Warren Independent School District. The post office has long been a central community fixture, with the current brick facility opening in 1976. Today, Fred remains a small rural community with historic roots and a close connection to the natural environment of the Big Thicket.

### *Spurger*

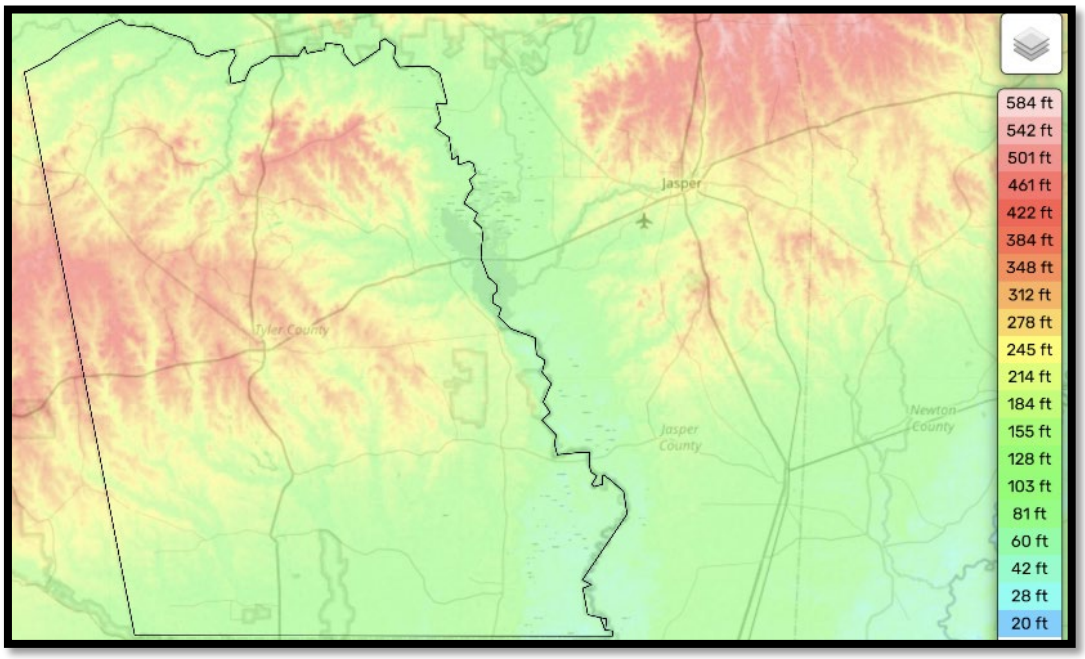
Spurger is an unincorporated rural community in southeastern Tyler County, Texas, located near the Neches River at the intersection of FM 92 and FM 1013. Settlement in the area dates back to the early 1800s, and a post office was established in 1881. Historically, Spurger developed around timber, agriculture, and small-scale rural commerce. Population levels fluctuated throughout the twentieth century, reflecting broader rural trends, but the community has remained a local center for the surrounding area. Today, Spurger retains a strong rural character and is anchored by the Spurger Independent School District, which serves as a key community institution.

### *Warren*

Warren is a census-designated place and unincorporated community in south-central Tyler County, Texas, located along U.S. Highway 287 about 13 miles south of Woodville. It was first listed as a CDP in the 2010 U.S. Census with a population of 757; the community's population was 677 as of the 2020 Census. Warren covers about 4.2 square miles of land and uses ZIP Code 77664. The community's origins date to the early 1880s when sawmills and the arrival of the Texas & New Orleans Railroad spurred settlement. The Warren Independent School District serves local students and remains a central institution in the area.

## Environmental Conditions in Tyler County

Figure 3-2: Tyler County Elevation Map




Tyler County has an average elevation of 203 feet above sea level, with a maximum elevation of 495 feet above sea level and a minimum elevation of 36 feet above sea level.

Soils in Tyler County, Texas reflect two dominant landscape settings. The northern and central portions of the county consist primarily of gently rolling uplands formed in clayey to sandy marine and continental deposits. These areas are characterized by loamy or sandy surface layers over clayey or loamy subsoils and are mapped mainly as upland soil associations such as Shankler–Hillister–Doucette, Pinetucky–Doucette–Stringtown, Rayburn–Colita–Corrigan, Kenefick–Belrose–Votaw, Lulus–Bleakwood, and Ozias–Estes–Koury. These well-to-moderately-well-drained soils support extensive pine and mixed hardwood forests and have low flood risk. In contrast, the southern portion of the county is flatter and dominated by recent noncalcareous and calcareous alluvial and floodplain soils, including the Otanya–Kirbyville–Waller and Dallardsville–Otanya–Kountze associations, along with wetter flat soils such as Burkeville–Woodville–Redco and Sawlit–Woodville–Mollville. These soils are more variable in drainage, are subject to seasonal wetness or flooding, and support bottomland hardwoods, grasses, pasture, and limited cropland. Overall, approximately one-quarter of the county consists of soils considered excellent farmland.

Figure 3-3: Tyler County Soil Map

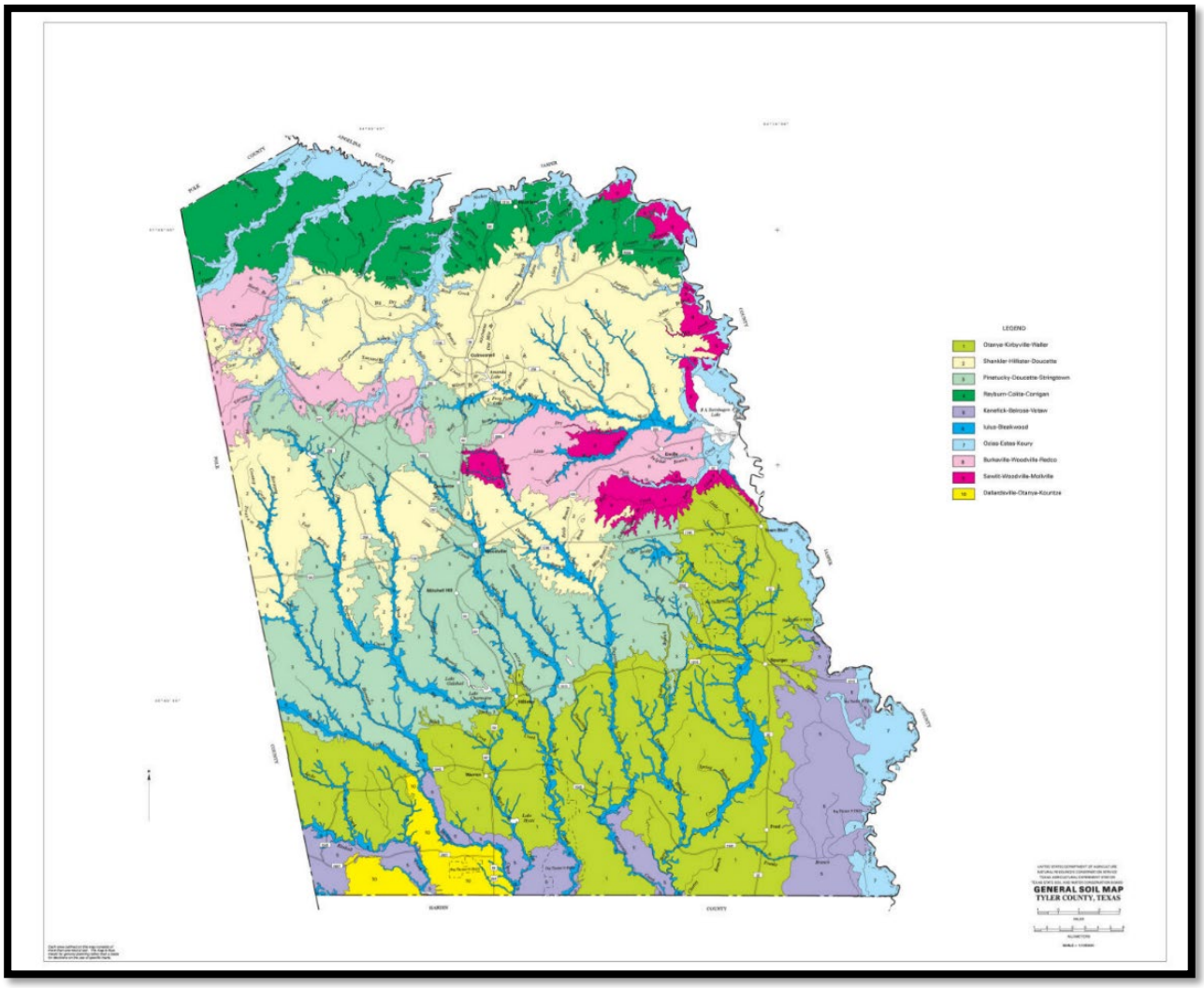
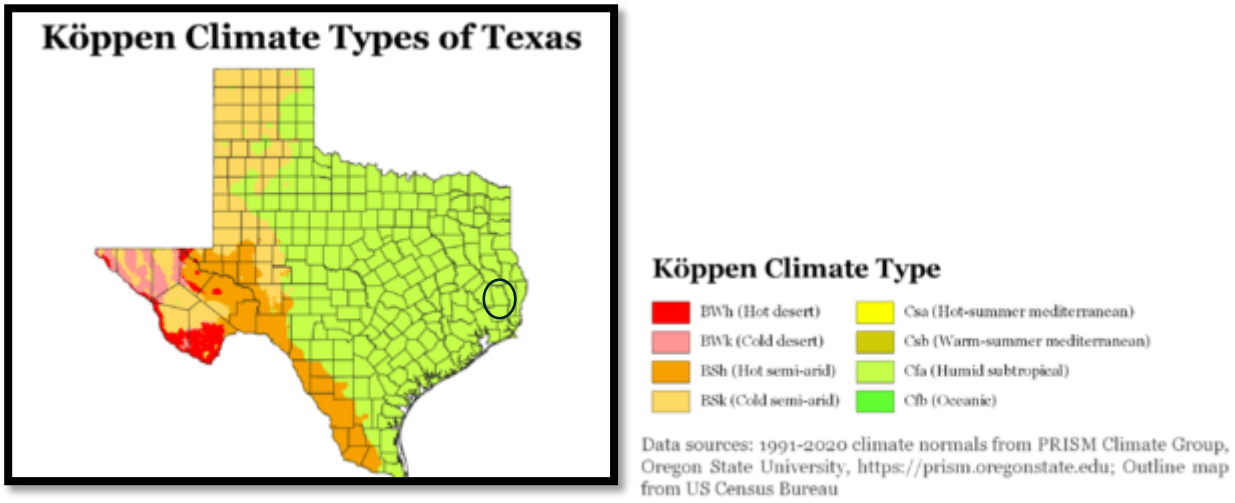



Figure 3-4: Koppen Climate Types of Texas



Tyler County is in the Humid subtropical climate region, characterized by hot, humid summers and mild winters with most precipitation falling in the spring months.

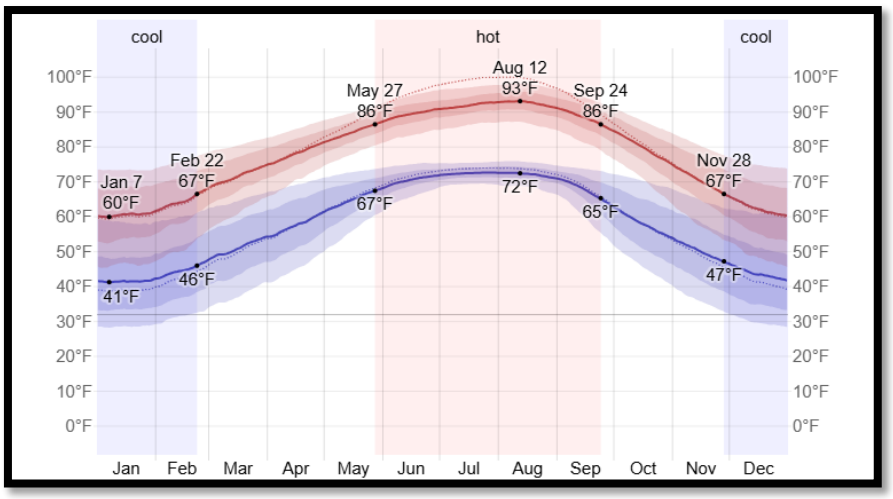


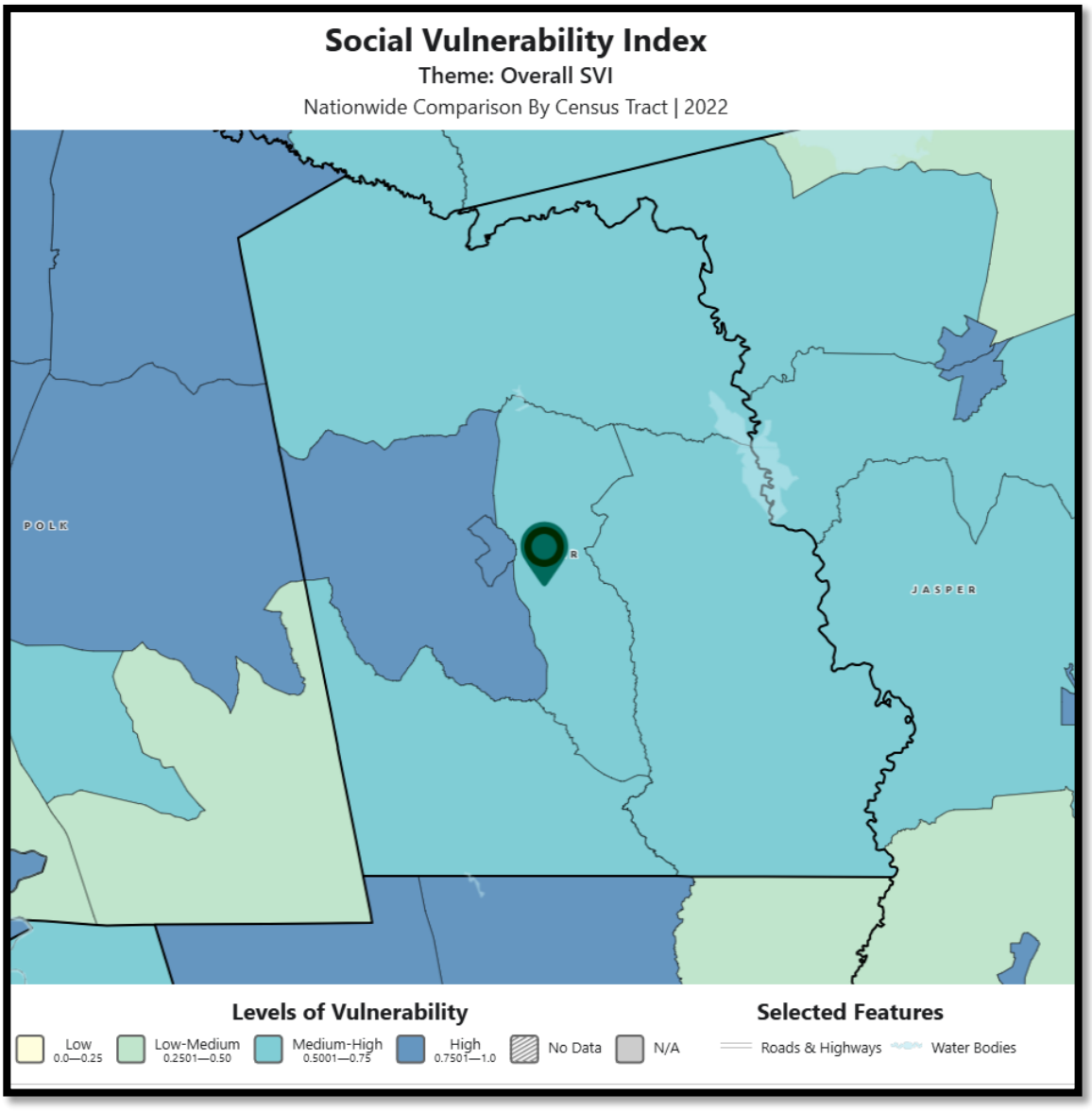

Figure 3-5: Average High and Low Temperature in Woodville, TX (Weatherspark.com)

Tyler County experiences summer for around four months out of the year, from mid-to-late May to mid-to-late September, and winter for around three months, from late November to late February. The average daily high temperature is above 86 F in the summer months and below 67 F in the winter months.

## Social and Physical Vulnerability Across Tyler County

The Centers for Disease Control use census data and other reliable sources to create a Social Vulnerability Index. Social Vulnerability is defined as the characteristics of a person or group in terms of their capacity to cope with and recover from the impacts of a disaster. Social Vulnerability Indices are tools that government officials use to identify areas that may be more socially vulnerable, i.e., areas that have higher proportions of people with characteristics that might make preparing for and recovering from a disaster more difficult. Examples of these groups include those who have physical or mental disabilities, those who do not speak English as a first language, and those who do not own a vehicle with which they could evacuate.

Figure 3-6: Tyler County Social Vulnerability Index By Social Tract




Tyler County exhibits an overall high level of vulnerability when considering U.S. County rankings, falling in the top 25% of most vulnerable counties in the U.S., with a majority of the census tracts being between the 50th and 75th percentiles for census tracts in the U.S., and the census tracts containing Ivanhoe and Woodville being between the 75th and 100th percentiles. Across the four components of the vulnerability score, Tyler County scores the highest when looking at "Housing Type & Transportation", indicating a high presence of vulnerable housing types such as mobile homes, and a population lacking a means of transportation. The second most contributing parameter for the vulnerability score is constructed through looking at "Household Characteristics", consisting of factors like a greater percentage of people age 65+ or a high percentage of residents with a disability.

Table 3-1: Vulnerable Populations Across County

| Jurisdiction | 2020 | 2023 | Estimated Vulnerable or Sensitive Populations | | | |
|---|---|---|---|---|---|---|
| | Census Population | Population Estimate | Youth (Under 5) | Elderly (Over 65) | Below Poverty Level (2023) | Percentage of Low to Moderate Income (2020) |
| Tyler County | 19,798 | 20,560* | 1407* | 3,592* | 3,495 | |
| Woodville | 2,403 | 2884 | 95 | 651 | 440 | 33.5% |
| Ivanhoe | 1,327 | 1619 | 37 | 414 | 469 | 42.7% |
| Chester | 270 | 200 | 5 | 55 | 16 | 36.4% |
| Colmesneil | 542 | 697 | 47 | 137 | 150 | 37.4% |

*Initial 2024 estimates were available for Tyler County; all other jurisdictions used 2023 data

## School Districts

### *Woodville ISD*

Woodville ISD, headquartered in the county seat of Woodville, serves about 1,300 students from Pre-K through 12th grade across three schools: Woodville Elementary, Woodville Middle, and Woodville High. The mission of Woodville ISD is to provide exceptional educational opportunities to maximize each student's potential. The district provides a full academic curriculum along with athletics, arts, and community programs. Woodville's schools are a central part of the community, and the district also extends slightly into neighboring Polk County.

### *Chester ISD*

Chester ISD is a small, community-centered public district based in Chester, TX, serving Pre-K through 12th grade on one campus with both elementary and secondary schools. Known for its close-knit environment and small class sizes, the district emphasizes individual attention and involvement in academics and athletics. Enrollment is under 200 students, giving Chester a low student-to-teacher ratio and a strong sense of school identity.

### *Colmesneil ISD*

Colmesneil ISD, located in the town of Colmesneil, serves students from Pre-K through high school across two campuses: an elementary school (PK–6) and a combined junior high/high school (7–12). With a district population of around 400 students, CISD offers a personalized learning environment and extracurricular opportunities while fostering community engagement. The district has historically earned solid state accountability ratings. The vision of Colmesneil Independent School District is to produce students who are progressive, independent, collaborative, open, determined, and well-rounded.

### *Spurger ISD*

Spurger ISD serves the community of Spurger and surrounding rural areas, educating students in grades PK–12 across its elementary and secondary schools. The district focuses on a well-rounded education with academics, athletics, and student activities. With an enrollment of roughly 390 students, Spurger provides a small-town learning atmosphere where teachers and staff can build close relationships with students. The mission statement of Spurger ISD is to empower its students to become competent, productive citizens who are able to succeed at their next level of endeavor and who pursue lifelong learning in a global society.

### *Warren ISD*

Warren ISD, based in Warren, is one of the larger districts in Tyler County with over 1,100 students across multiple campuses: Fred Elementary, Warren Elementary, Warren Junior High, and Warren High. Serving grades PK–12, the district offers a comprehensive academic program, athletics, and extracurricular options, including strong career and technical education pathways. Warren ISD's mission is to cultivate each child's full potential, ultimately developing future-ready young graduates.

## Population Growth

Table 3-2: Population Growth from 2010-2023

| Jurisdiction | 2010 Census | 2020 Census | 2023 Estimate | Pop. Change 2010-2020 | % Change 2010-2020 | Pop. Change 2010 - 2023 | % Change 2010-2023 | Pop. Change 2020 - 2023 | % Change 2020-2023 |
|---|---|---|---|---|---|---|---|---|---|
| Tyler County* | 21,766 | 19,798 | 20,084 | -1968 | -9% | -1,682 | -8% | 286 | 1.4% |
| Woodville | 2,584 | 2406 | 2,884 | -178 | -7% | 300 | 12% | 478 | 20% |
| Ivanhoe | 1,423 | 1331 | 1,619 | -92 | -6.5% | 196 | 14% | 288 | 22% |
| Colmesneil | 597 | 538 | 697 | -59 | -10% | 100 | 17% | 159 | 30% |
| Chester | 315 | 271 | 200 | -44 | -14% | -115 | -37% | -71 | -26% |

*Initial 2024 population estimates were available for Tyler County; all other jurisdictions used 2023 data.

Tyler County experienced an overall population decrease from 2010 to 2020, but recent population estimates indicate that the population across most of Tyler County, especially the cities of Colmesneil, Ivanhoe, and Woodville is growing. Early 2024 population estimates for Tyler County, estimating a population of 20,560 indicates faster growth than shown in the table above, with a population increase closer to 4% from 2020 to 2024. Texas Water Development Board Projections seen in Table 3- below are slightly higher, but predict an overall stable population for Tyler County for the next 45 years.

Table 3-3: Population Projects from 2020-2060

| Projection Year | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 |
|---|---|---|---|---|---|---|
| Tyler County | 22,288 | 22,396 | 22,396 | 22,396 | 22,396 | 22,396 |
| Chester WSC | 1,096 | 1,129 | 1,152 | 1,171 | 1,186 | 1,199 |
| Colmesneil | 1,045 | 1,045 | 1,045 | 1,045 | 1,045 | 1,045 |
| Woodville | 5,809 | 5,825 | 5,825 | 5,825 | 5,825 | 5,825 |

# SECTION 4: HAZARDS AND RISKS

Based upon a full review of the range of hazards suggested under FEMA planning guidance and input from Tyler County Core Team members, 11 hazards have been identified as important to be addressed in the Tyler County Hazard Mitigation Plan Update. These were chosen based upon a review of the State Hazard Mitigation Plan, a review of the historical record of disaster declarations for the Tyler County planning area, historical incidents contained in the National Centers for Environmental Information (NCEI), and local records and accounts of magnitude and damages from different and distinct hazard events.

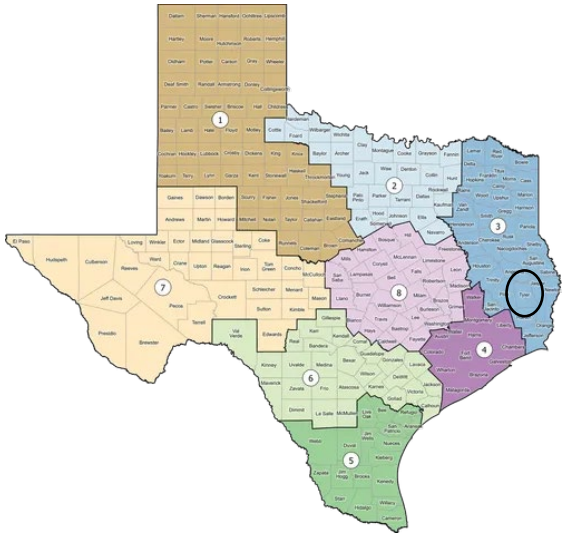
According to the State Hazard Mitigation Plan, Tyler County is located within the South-central portion of the Texas Division of Emergency Management Region 3, where hurricanes, floods, and coastal flooding can be expected to dominate the hazard profile.

Figure 4-1: 2023 State Hazard Mitigation Plan Region 3 Hazard Ranking & Damages

***Region 3 Hazard Rankings by Total Damages***

| Hazard | Hazard Ranking | Total Damages |
|---|---|---|
| Hurricane | 1 | $2,986,087,598 |
| Flood | 2 | $2,388,163,079 |
| Severe Coastal Flood | 3 | $1,338,949,948 |
| Severe Winter Weather | 4 | $352,766,264 |
| Tornado | 5 | $252,740,775 |
| Hailstorm | 6 | $187,715,624 |
| Severe Wind | 7 | $63,407,050 |
| Wildfire | 8 | $25,004,384 |
| Drought | 9 | $20,109,053 |
| Lightning | 10 | $6,092,284 |
| Extreme Heat | 11 | $256,279 |
| **Grand Total** | | **$7,621,292,338** |

Figure 4-1: Texas Division of Emergency Management Regions



Source: Texas Division of Emergency Management

The increased risk for these specific hazards in the planning area is confirmed in the table below. Disaster declarations are made at the county level and are not specific to any one city or sub-area, however, it is illustrative for local emergency planners to understand the type and frequency of the hazards impacting the larger region. Keep in mind that the incidents listed are only those that had a level of impact sufficient to necessitate a disaster declaration, and that hazards have affected the area more frequently than the table may initially suggest. For more specific disaster impacts, see sections 5 through 15. Statewide disaster declarations are not included in this list.

Table 4-1: Disaster Declarations in Tyler County (Source: www.FEMA.gov)

| FEMA Declaration Number | Year | Incident Type |
|---|---|---|
| DR-398-TX | 1973 | Flood |
| DR-580-TX | 1979 | Severe Storm |
| DR-836-TX | 1989 | Flood |
| DR-828-TX | 1989 | Severe Storm |
| DR-937-TX | 1992 | Flood |
| DR-1041-TX | 1995 | Flood |
| DR-1239-TX | 1998 | Severe Storm |
| FM-2332-TX | 2000 | Fire |
| DR-1379-TX | 2001 | Coastal Storm |
| DR-1606-TX | 2005 | Hurricane |
| DR-1624-TX | 2006 | Fire |
| DR-1791-TX | 2008 | Hurricane |
| DR-4029-TX | 2011 | Fire |
| DR-1999-TX | 2011 | Fire |
| DR-4223-TX | 2015 | Severe Storm |
| DR-4272-TX | 2016 | Flood |
| DR-4266-TX | 2016 | Flood |
| DR-4332-TX | 2017 | Hurricane |
| DR-4485-TX | 2020 | Biological |
| DR-4586-TX | 2021 | Severe Ice Storm |
| DR-4798-TX | 2024 | Hurricane |
| DR-4781-TX | 2024 | Flood |

Since the U.S. Federal Government began issuing disaster declarations in 1953, Tyler County has had 22 major disaster declarations where Individual and/or Public Assistance has been approved. Based on Table 4-1 above, 15 of the 22 disaster declarations have been issued in the past 25 years. The infographics below provide a summary of the type of hazard, year, and time of year in which it occurred.

The types of hazards that have had disaster declarations for the Tyler County planning area since 1953 are shown in Figure 4-2 below.

Figure 4-2: Tyler County Disaster Declarations Since 1953 by Type

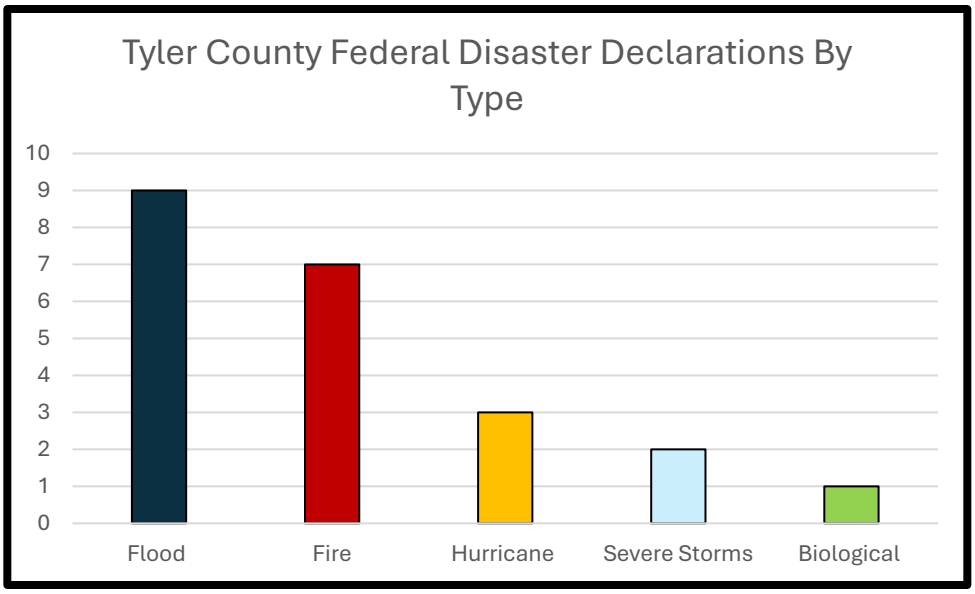
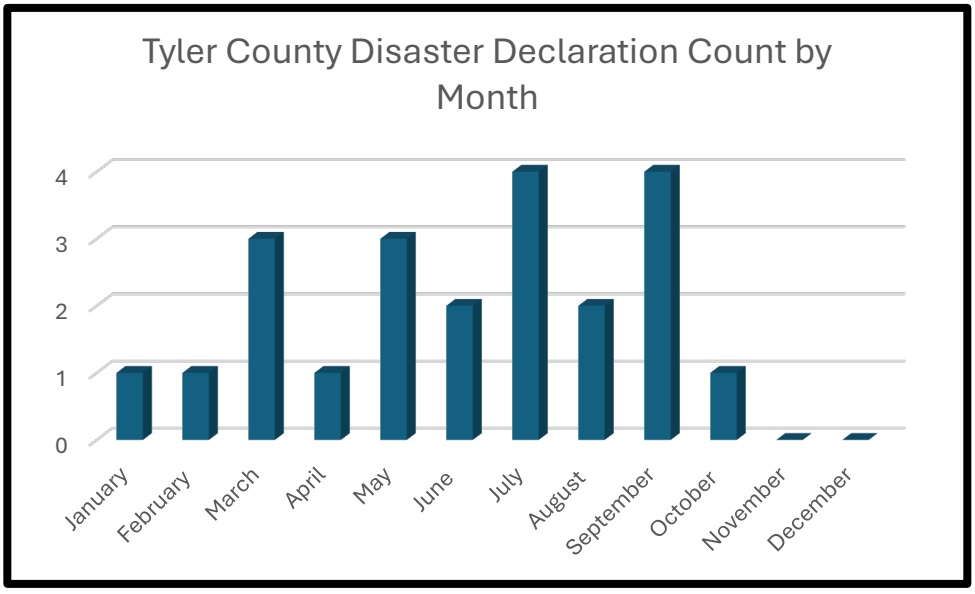
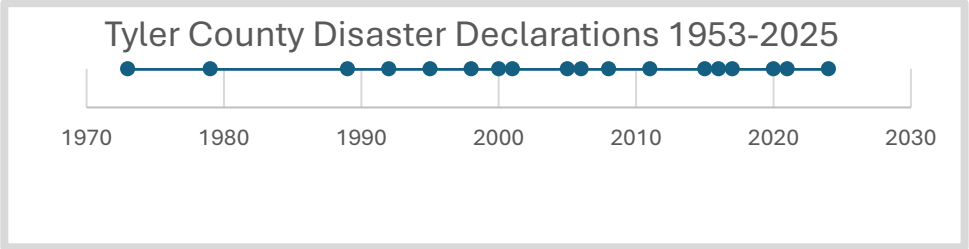



Figure 4-3: Tyler County Disaster Declarations Since 1953 by Month of Occurrence




The years in which disasters have been declared in the planning area are shown in Figure 4-4 below. Table 4-1 on the previous page can be used as a reference for more details.

Figure 4-4: Disaster Declaration Timeline




## Hazard Descriptions

The following 11 hazards are included in the State of Texas Hazard Mitigation Plan and are determined to be a risk to the planning area. Compared to the regional hazards, coastal flooding was left off this list due to the subject area not being on the Texas Gulf Coast, with no history of impact. Earthquakes also have no history of impacting the plan participants and were not profiled due to negligible risk,

Table 4-2: Hazards Impactful to Tyler County

| HAZARD | DESCRIPTION |
|---|---|
| **HYDROLOGIC** | |
| Drought | A deficiency in precipitation over an extended period, usually a season or more, which results in a water shortage, causing adverse impacts on vegetation, animals, and/or people. |
| Floods | Flooding is a general or temporary condition of partial or complete inundation of water, usually in floodplains. A floodplain is an area of land susceptible to being inundated by floodwater from any source. |
| **ATMOSPHERIC** | |
| Extreme Heat | Extreme Heat is a condition when temperatures hover above local excessive heat criteria combined with high humidity levels. |
| Hailstorm | Hail is showery precipitation in the form of irregular pellets or balls of ice more than 5 mm (about 0.2 in) in diameter. |
| Hurricanes, Tropical Storms, and Depressions | A hurricane is a large rotating storm with high-speed winds that form over warm waters in tropical areas. Hurricanes have sustained winds of at least 74 miles per hour and an area of low air pressure in the center called the eye. Hurricanes, tropical storms, and depressions are associated with heavy rainfall and inland flooding, storm surges, and high winds. |
| Lightning | Lightning is a sudden charge of electricity that develops from storms or excessive heat. |
| Severe Winter Storms | A condition when temperatures hover below freezing and can include ice, snow, and sleet. |

| | |
|---|---|
| Tornado | A tornado is a narrow, violently rotating column of air that extends from the base of a thunderstorm to the ground. |
| Windstorms or Thunderstorm Winds | Severe windstorms can occur alone or when accompanied by severe thunderstorms. Flying debris can cause major damage to utilities, infrastructure, and property. |
| **OTHER** | |
| Wildfire | Wildfires are unplanned, unwanted fires burning in a natural area, like a forest, grassland, or prairie. Buildings and human development that are susceptible to wildfires are considered the Wildland-Urban Interface (WUI). |
| Dam Failure | A structural failure of a dam that results in the sudden, rapid, and often uncontrolled release of impounded water |

Compared to the previous plan version, man-made hazards such as hazardous materials were removed from this update, given that it is outside of the scope of a conversation around natural disasters.

| Hazard | Deaths | Injuries | Property Damage | Crop Damage | Frequency |
|---|---|---|---|---|---|
| **Drought** | 0 | 0 | 0 | $0 | Occasional |
| **Floods** | 0 | 0 | $15,204,000 | $0 | Highly Likely |
| **Extreme Heat** | 0 | 0 | $0 | $0 | Highly Likely |
| **Hailstorm** | 0 | 0 | $5,000 | $0 | Highly Likely |
| **Hurricanes, Tropical Storms, and Depressions** | 1 | 0 | $160,900,000 | $0 | Highly Likely |
| **Lightning** | 0 | 0 | $50,000 | $0 | Highly Likely |
| **Severe Winter Storms** | 0 | 0 | $55,000 | $0 | Highly Likely |
| **Tornado** | 0 | 1 | $422,000 | $0 | Highly Likely |
| **Thunderstorm Winds** | 0 | 0 | $356,000 | $0 | Highly Likely |
| **Wildfire** | 0 | 0 | $0 | $15,000 | Highly Likely |
| **Dam Failure** | 0 | 0 | $0 | $0 | Occasional |

Table 4-3: County Hazard Impact Summary (2000-2025)

## Natural Hazards and Climate Change

Climate change describes the rapid and relatively recent increase in global average temperatures that has helped drive a fivefold increase in the number of weather-related disasters in the last 50 years. Climate change means disasters are happening simultaneously, too.

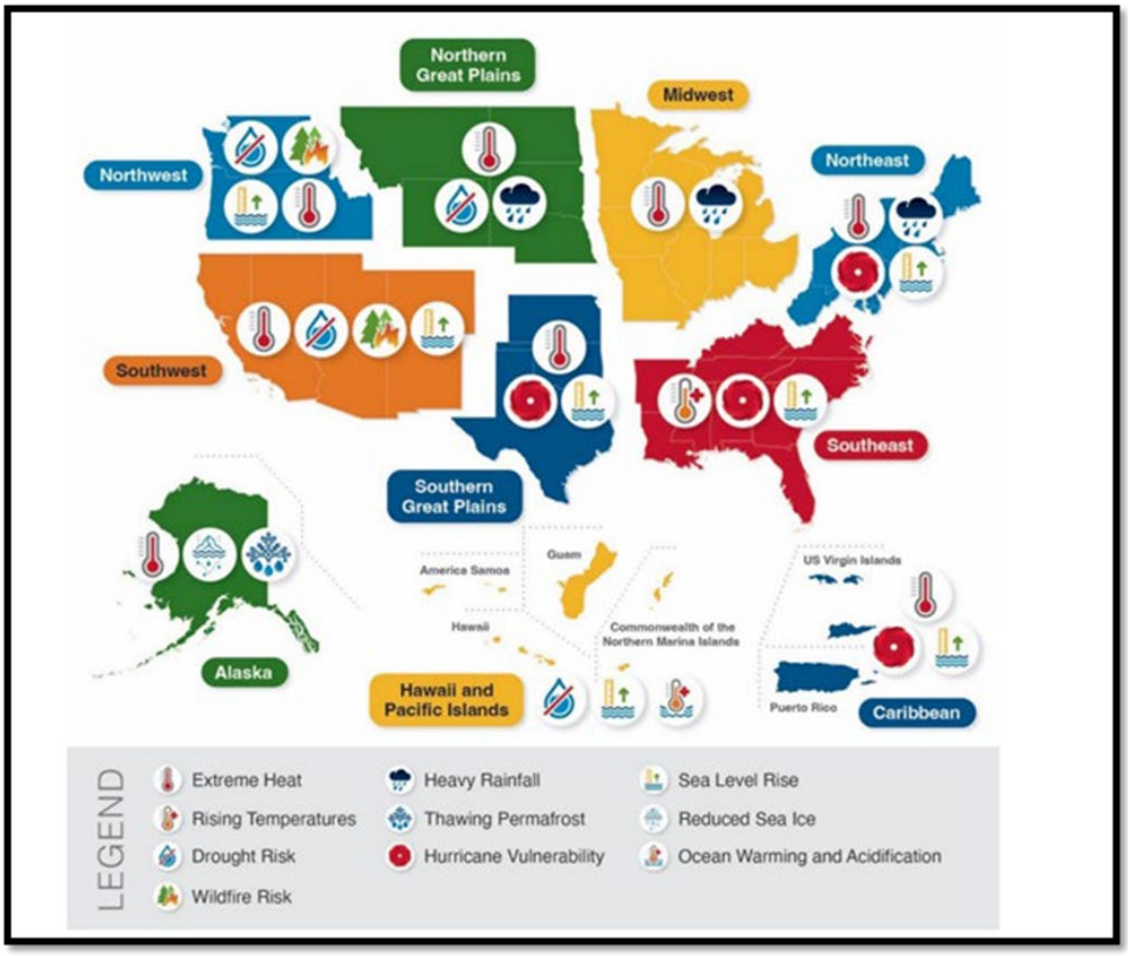



Figure 4-5 Climate-Related Hazards by Region

Source: Climate Adaptation Planning: Guidance for Emergency Managers (fema.gov)

With increasing global surface temperatures, the possibility of more droughts and increased intensity of storms will likely occur. As more water vapor evaporates into the atmosphere, it becomes fuel for more powerful storms to develop. More heat in the atmosphere and warmer ocean surface temperatures can lead to increased wind speeds in tropical storms. Rising sea levels expose higher locations not usually subjected to the power of the sea and to the erosive forces of waves and currents.

Texas is considered one of the more vulnerable states in the U.S. to abrupt climate changes and to the impact of gradual climate changes to the natural and built environments. Texas is one of the highest-ranked states in the U.S. concerning the frequency in which they experience natural and climate-driven disasters. Extreme heatwaves and hurricanes will become more frequent and coastal Texas will face significant sea-level rise. Megadroughts can trigger abrupt changes to regional ecosystems and the water cycle, drastically increase extreme summer temperature and fire risk, and reduce the availability of water resources, as Texas experienced during 2011-2012.

Adapting to climate change through efforts like flood control measures or drought-resistant crops partially reduces climate change risks, although some limits to adaptation have already been reached.

## Overview of Hazard Analysis

The hazard risk analysis methodology involves reviewing historical data and conducting statistical analysis on the impact of hazards in the planning area. To gather this information, we retrieved records from the National Centers for Environmental Information (NCEI) and the National Oceanic and Atmospheric Administration (NOAA) that were reported for Tyler County. We also evaluated other local and state records whenever they were available.

Additionally, we used geographic information system (GIS) mapping software to identify and assess the risks for Tyler County and other participating jurisdictions by evaluating community critical facilities and their vulnerability to hazards.

The Risk Assessment includes general parameters for each hazard, such as the location in the planning area, the expected extent or magnitude of the hazard, the frequency of its occurrence based on the number of historical events over the study period, the approximate annualized losses, a description of the general vulnerability, and a statement of the hazard's impact.

The Priority Risk Index definitions are defined in Table 4-3 and were adapted from Brazos County OEM and the North Carolina Emergency Management Division. Three major factors contribute to community risk: population growth, changes in development, and a shifting global and local climate. It is essential for communities to consider how their growth and broad climate phenomena will impact them in the future, to avoid putting current and future community members at risk.

| | Degree of Risk | | | Assigned Weighting Factor |
|---|---|---|---|---|
| | Level | Criteria | Index Value | |
| Probability | Unlikely | Event Possible in next 10 Years | 1 | 30% |
| | Possible | Event possible in next 5 years | 2 | |
| | Likely | Event probable in next 3 years | 3 | |
| | Highly Likely | Event nearly certain to occur in the next year | 4 | |
| Impact (Impact is subdivided into 3 categories: social impact, property impact, and CIKR impact) | Minor | Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of critical facilities. | 1 | 30% |
| | Limited | Minor injuries only. More than 10% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one day. | 2 | |
| | Critical | Multiple deaths/injuries possible. More than 25% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one week. | 3 | |
| | Catastrophic | High number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more | 4 | |
| Spatial extent | Negligible | Less than 1% of area affected | 1 | 20% |
| | Small | Between 1 and 10% of area affected | 2 | |
| | Moderate | Between 10 and 50% of area affected | 3 | |
| | Large | Between 50 and 100% of area affected | 4 | |
| Warning Time | More than 24 hours | Self-explanatory | 1 | 10% |
| | 12 to 24 hours | Self-explanatory | 2 | |
| | 6 to 24 hours | Self-explanatory | 3 | |
| | Less than 6 hours | Self-explanatory | 4 | |
| Duration | Less than 6 hours | Self-explanatory | 1 | 10% |
| | Less than 24 hours | Self-explanatory | 2 | |
| | Less than one week | Self-explanatory | 3 | |
| | More than one week | Self-explanatory | 4 | |

Source: adapted from North Caroline Emergency Management Division

The Priority Risk Index aligns strongly with the priority disasters established by the 2023 State of Texas Hazard Mitigation Plan for Southeast Texas. Hurricanes, severe winter weather, and floods are the highest-ranked natural hazards as ranked by the Tyler County emergency management staff and administrators. While the historical impact of some of these lower-ranked disasters may not be severe, most still have the potential to produce unprecedented destruction and damage and severely impact critical infrastructure.

| | PROBABILITY | EXTENT | IMPACT | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Social Impact | | Property Impact | Critical Infrastructure Impact | | Incident Exposure | | |
| | *Probability* | *Spatial Extent* | *Historical Human* | *Possible Human* | *Extent of Damage* | *Duration of Shutdown* | *Average Impact* | *Duration of Exposure* | *Warning Time* | ***Priority Risk Index*** |
| **Weights** | **0.3** | **0.2** | | | | | **0.3** | **0.1** | **0.1** | |
| ***Tyler County Planning Area*** | | | | | | | | | | |
| Hurricanes | 4 | 4 | 2 | 4 | 4 | 3 | 3.25 | 4 | 1 | 3.475 |
| Severe Winter Weather | 4 | 2 | 2 | 4 | 3 | 3 | 3 | 4 | 2 | 3.1 |
| Flood | 4 | 2 | 2 | 4 | 3 | 3 | 3 | 4 | 2 | 3.1 |
| Wildfire | 4 | 2 | 2 | 3 | 2 | 2 | 2.25 | 4 | 2 | 2.875 |
| Extreme Heat | 4 | 2 | 2 | 3 | 2 | 2 | 2.25 | 4 | 1 | 2.775 |
| Tornado | 4 | 1 | 1 | 4 | 2 | 2 | 2.25 | 1 | 3 | 2.475 |
| Lightning | 4 | 2 | 1 | 3 | 1 | 1 | 1.5 | 1 | 2 | 2.35 |
| Drought | 2 | 3 | **1** | **2** | **3** | **2** | 2 | 4 | 1 | 2.3 |
| Windstorms | 4 | 1 | 1 | 2 | 2 | 1 | 1.5 | 1 | 2 | 2.15 |
| Hailstorm | 4 | 1 | 1 | 2 | 1 | 1 | 1.25 | 1 | 2 | 2.075 |
| Dam Failure | 2 | 2 | 1 | 4 | 1 | 2 | 2 | 2 | 2 | 2 |

Figure 4- : Tyler County Priority Risk Index

## Future Impacts of Climate Change on Natural Hazards in Tyler County

### *Drought*

**Climate Change**: Climate change is expected to cause decreased precipitation and increased temperatures over a broad time scale, leading to water sources such as lakes and underground aquifers drying up, which will increase the frequency and intensity of droughts.

### *Floods*

**Climate Change**: With climate change leading to more intense and frequent rainfall events, riverine flooding and flash flood events are expected to increase in frequency and intensity.

### *Extreme Heat*

**Climate Change**: As mean annual temperatures continue to increase due to climate change, extreme heat events will be more intense and frequent.

### *Hailstorm*

**Climate Change**: Evidence shows that warming temperatures may make hail events less frequent, as hail formation requires sufficiently cold temperatures, but will likely lead to far more intense hailstorms with larger hail sizes, given increased atmospheric moisture.

### *Hurricanes, Tropical Storms, and Depressions*

**Climate Change**: Climate science research suggests that the frequency of hurricanes and tropical storms or depressions overall will not increase, but the frequency of intense storms will likely increase due to the rise in ocean temperatures, leading to quicker storm development and intensification. This is based on data that shows that while hurricane formation in the North Atlantic Ocean has increased, the number of hurricanes that make landfall in the United States has not increased since 1900.

### *Lightning*

**Climate Change:** While research on the topic is still evolving, as average temperatures rise and atmospheric moisture increases, lightning strikes will likely increase in frequency and result in more cloud-to-ground strikes, increasing the intensity of lightning events.

### *Severe Winter Storms*

**Climate Change**: The impacts of climate change on the frequency and severe winter storms in Texas are complex and hard to clearly predict, as they depend on interactions between the stratospheric and tropospheric polar vortices. Dry La Niña or wet El Niño conditions also increase the frequency and severity of winter storms. Overall, there are likely to be fewer but more intense winter storms.

### *Tornado*

**Climate Change**: Changes in the frequency and severity of tornadoes due to climate change are uncertain for Texas, according to the 2022 State Climate Summary for the State of Texas provided by the NOAA National Centers for Environmental Information.

### *Thunderstorm Winds*

**Climate Change**: As stated for tropical storms, depressions, and hurricanes, the frequency of thunderstorm wind events is not likely to increase, but the intensity of the winds will increase, leading to more damage.

### *Wildfire*

**Climate Change**: Tyler County may experience more frequent droughts caused by climate change combined with higher overall temperatures, which will likely lead to more frequent wildfires as fuel levels increase. The intensity of wildfires is also likely to increase with increased fuel levels.

### *Dam Failure*

**Climate Change:** As rainfall events become more extreme from climate change, dam infrastructure that is built for a certain capacity of water is likely to fail more often. Therefore, dam failures are more likely to occur and become more frequent given the increased frequency of intense hurricanes that weaken dam infrastructure.

## Population and Development Changes in Tyler County

There has not been any significant development reported across unincorporated Tyler County or any of the cities: Chester, Colmesneil, Woodville, or Ivanhoe. Given that permitting data is difficult to access, especially for smaller communities, part of the plan engagement website asked community members to identify new or recent developments. Only one subdivision was identified on the Risk and Development Map, and real estate websites only reveal one property labeled new construction. The population of Tyler County is growing slightly but is still 1,000 people fewer than the 2010 population count, indicating a relatively stable population, fluctuating around 20,000-21,000 residents. Given the very few records of new development and the stable population, there has been no change in community vulnerability for Tyler County, the City of Woodville, or the City of Ivanhoe, the three prior plan participants in the 2020 Tyler County Hazard Mitigation Plan update. Community vulnerability for the new participants, the City of Colmesneil, the City of Chester, Chester WSC, and the five ISDs has not increased since 2020.

# SECTION 5: DROUGHT

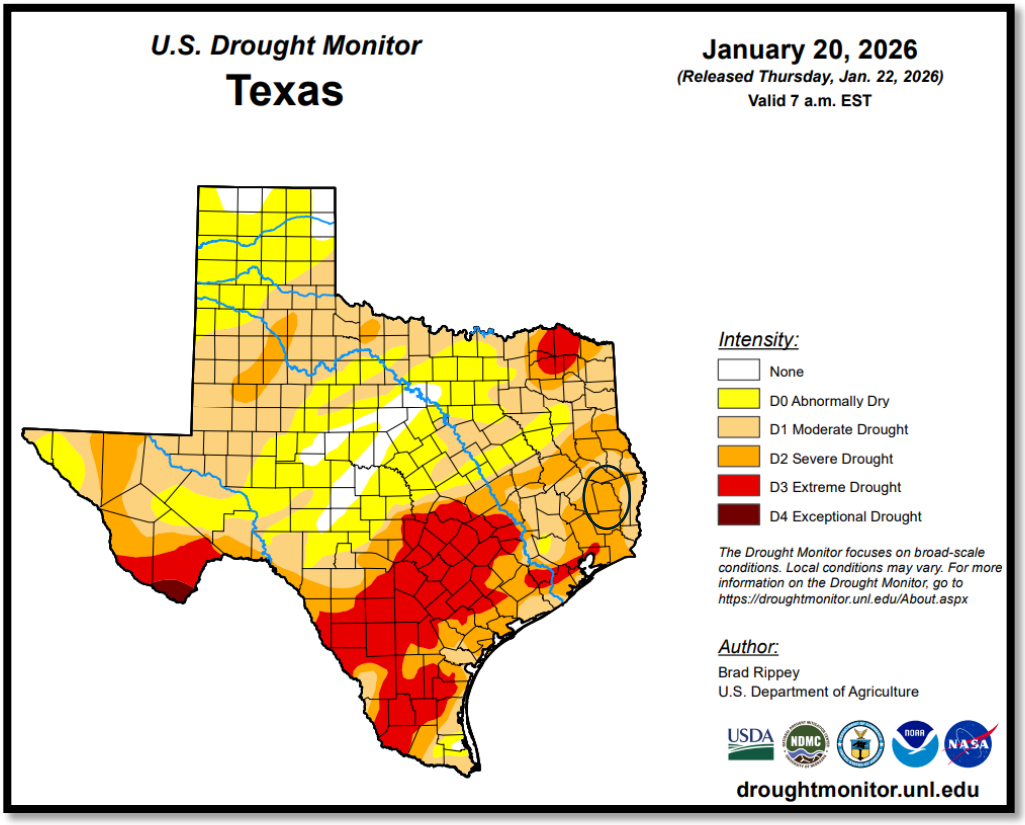
## Description

Drought is a deficiency in precipitation over an extended period, usually a season or more, resulting in a water shortage, causing adverse impacts on vegetation, animals, and/or people. Droughts are defined as a moisture deficit at a magnitude high enough to have social, environmental, or economic effects, and can become very prolonged and persist from one year to the next. Common effects of drought include crop failure, water supply shortages, and fish and wildlife mortality. The Texas Hazard Mitigation Plan describes the climate of 2/3 of Texas counties as arid or semi-arid, with these counties almost always in varying stages of drought.

## Location

Droughts vary greatly in their intensity and duration and can occur regularly throughout Tyler County, including all participating jurisdictions, equally. Drought is monitored nationwide by the National Drought Mitigation Center (NDMC), which provides the Drought Monitor map in Figure 5-1 showing the entirety of the planning area currently experiencing moderate drought (D1) conditions or abnormally dry conditions (D0). The planning area has experienced exceptional drought conditions within the last fifteen years, particularly during the drought of summer 2011, when the entire state of Texas was at some level of drought (Figure 5-2).

Figure 5-1: US Drought Monitor, January 20th, 2026



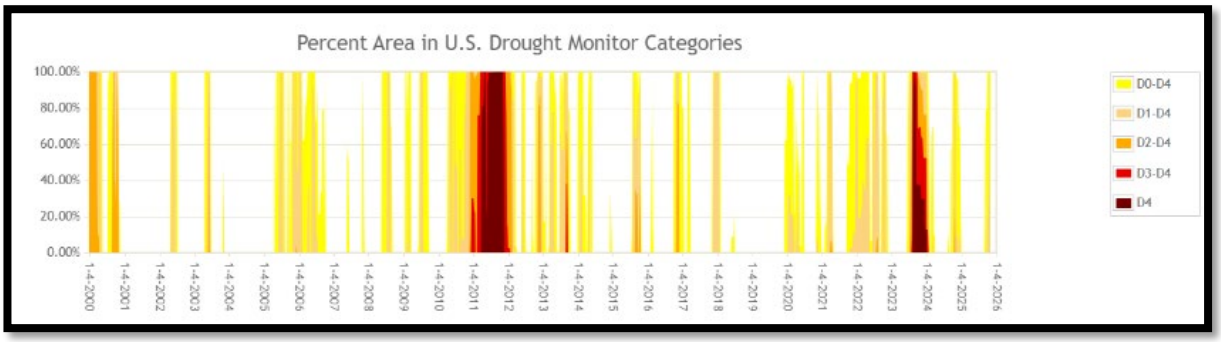
## Extent

The Palmer Drought Severity Index (PDSI) is based on precipitation and temperature and is used to measure the extent of drought. The index measures the moisture supply of the environment. The PDSI classifications vary roughly between -4.0 and +4.0, ranging from extremely dry to extremely wet periods. NOAA's United States Drought Monitor (USDM) Categories range from D0 to D4 according to the intensity of drought, and are based on several indicators, including the PDSI, and are used to describe broad-scale drought conditions across the United States. Table 5- 1 describes the basic PDSI classification descriptions and depicts the magnitude of drought with descriptions of possible impacts.

Table 5-1: Drought Index Categories and Impacts

| Category | Description | Possible Impacts | Palmer Drought Severity Index (PDSI) | CPC Soil Moisture Model Percentiles | USGS Weekly Streamflow (Percentiles) | Standardized Precipitation Index (SPI) | Objective Drought Indicator Blends |
|---|---|---|---|---|---|---|---|
| 0 | Abnormally Dry | Going into drought: short-term dryness slows planting, growth of crops, or pastures. Coming out of drought: some lingering water deficits in pastures or crops not fully recovered. | -1.0 to -1.9 | 21 to 30 | 21 to 30 | -0.5 to -0.7 | 21 to 30 |
| 1 | Moderate Drought | Some damage to crops. Pastures, streams, reservoirs, or wells are low. Some water shortages are developing, or imminent. Voluntary water- use restrictions requested. | -2.0 to -2.9 | 11 to 20 | 11 to 20 | -0.8 to -1.2 | 11 to 20 |
| 2 | Severe Drought | Crop or pasture losses are likely. Water shortages are common. | -3.0 to -3.9 | 6 to 10 | 6 to 10 | -1.3 to -1.5 | 6 to 10 |
| 3 | Extreme Drought | Water restrictions imposed. Major crop/pasture losses, widespread water shortages or restrictions. | -4.0 to -4.9 | 3 to 5 | 3 to 5 | -1.6 to -1.9 | 3 to 5 |
| 4 | Exceptional Drought | Exceptional and widespread crop/pasture losses. Shortages of water in reservoirs, streams, and wells create water emergencies. | -5.0 or less | 0 to 2 | 0 to 2 | -2.0 or less | 0 to 2 |

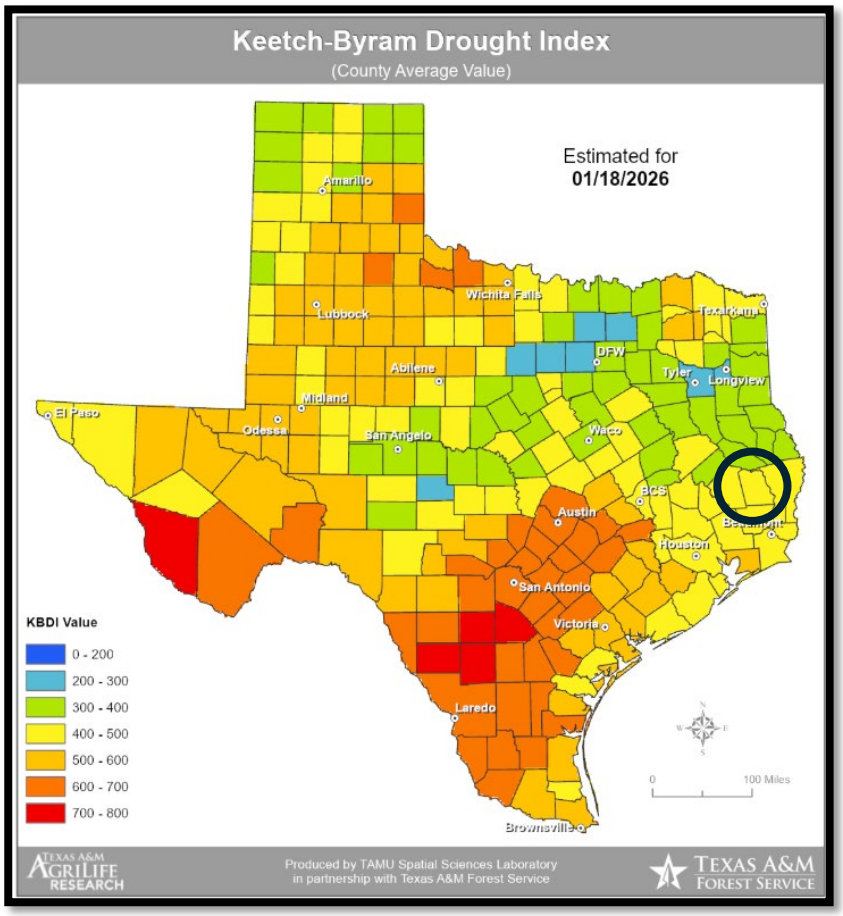
Figure 5-2: Drought Index Timeline from 2000-2026




Based on the extent and location of historic and current drought conditions, the Tyler County planning area can anticipate a range of drought conditions from abnormally dry conditions to exceptional drought, or D0 to D4, based on the USDM Drought Intensity Category.

The Keetch-Byram Drought Index is used by the Texas Forest Service to determine the fire potential based on daily water balance, precipitation, and soil moisture. Figure 5-3 shows the Keetch-Byram Drought Index rating classification for all of Texas and color-coded by county with a scale of 0 to 800 (low risk to high risk). Tyler County is in the 400-500 category of medium-high risk, with some smaller areas at higher and lower risk at the time this report was written. The Keetch- Byram Drought Index is also discussed in relation to wildfires in section 6.

Figure 5-3: Keetch-Byram Drought Index Average by County



## Historical Occurrences

Overview of historical occurrences of drought

## Significant Events

### *Drought of February 2000*

Tyler County experienced one of its five driest Februarys on record, with less than one inch of rainfall. Total precipitation for January and February 2000 was under 2.5 inches, making it the second driest two-month period on record for the Beaumont/Port Arthur area.

### *2011-2012 Drought*

The 2011-2012 drought severely impacted Tyler County, dramatically elevating wildfire risk, leading to multiple fires, as seen in Section 6. The USDA included Tyler County as one of 39 counties in drought-related disaster declarations, making low-interest loans available to farmers. The cost of livestock surged dramatically, as the cost to raise them increased significantly during the drought, and livestock theft was a widespread problem.

The data used to assess historical experience with drought for the planning area came from NOAA's NCEI National Storms Database. This database contains extensive and authoritative information for weather-related events in the country from 2000 through 2025 (25 years). Agricultural producers such as farmers and ranchers purchase crop insurance to protect their yield in a natural disaster such as drought, hail, or flood. Historical crop damages are typically not found in the public record and are likely much higher than quantified by NCEI data due to agricultural losses being a transaction between the agricultural landowner and insurance policyholder. Furthermore, the extent of crop loss due to drought is difficult to quantify because a drought during a growing season can impact the next two years of crop production. Table 5-2 lists historical events that have occurred in Tyler County as reported in the NCEI.

There have not been any events recorded past the listed dates.

Table 5-2: Historical Occurrences of Drought in Tyler County (2000-2025)

| Date Range | Direct Injuries | Direct Fatalities | Property Damage | Crop Damage |
|---|---|---|---|---|
| 2/1/2000 – 2/29/2000 | $0 | $0 | $0 | $0 |
| 11/1/2023 – 11/10/2023 | $0 | $0 | $0 | $0 |

Table 5-3: Historical Drought Magnitude for Tyler County

| Drought Category | Description | Tyler County | |
|---|---|---|---|
| **None** | Normal to Wet Conditions | 836 | 61.7% |
| **D0** | Abnormally Dry | 242 | 17.9% |
| **D1** | Moderate Drought | 157 | 11.6% |
| **D2** | Severe Drought | 53 | 3.9% |
| **D3** | Extreme Drought | 22 | 1.6% |
| **D4** | Exceptional Drought | 45 | 3.3% |
| **Total** | | 1355 | 100% |

Data provided by the NOAA drought monitor also provides a perspective of historical occurrences of drought in the planning area by summarizing the percentage of area in each drought category weekly. The table below provides a summary of the number of weeks in each drought category or the magnitude of the drought that describes the drought condition for the majority of the county for each weekly period from January 4, 2000, to November 19, 2024. This nearly 25-year window of drought provides a clear picture as to how often the occurrence of different drought categories can be expected in the future.

## Probability of Future Events

Based on available records of historic events from NCEI, there has been an approximate cumulative five years of drought within the past 25-year reporting period. This is based on the percentages seen in Table 5-3, where a majority of Tyler County is in a Drought Condition of D1 or Higher, on average one out of every five weeks over the past 25 years. This frequency supports an **Occasional** probability of future events occurring within the Tyler County planning area, which means that an event is probable in the next five years.

| Frequency of Occurrence |
|---|
| Highly likely: Event probable in the next year. |
| Likely: Event probable in the next three years. |
| Occasional: Event possible in the next five years. |
| Unlikely: Event possible in the next 10 years. |

## Vulnerability and Impacts

Drought affects large areas, creating vulnerability for people, animals, property, agriculture, and the environment. Over the entirety of the planning area, the biggest impacts of drought are dead crops and grazing land, edible plants for animals, and even trees. This primarily affects farming and wildlife, but people can be directly impacted as well due to shortages of potable water supply. Communities will also ration the use of water during prolonged drought, particularly for lawn care, swimming pools, and irrigation. Drought is related to, and can exacerbate, the natural hazards of wildfires and extreme heat. Drought can contribute to the cause of wildfires due to dying vegetation serving as ignition fuel, and can be intensified by extreme heat. The impacts of drought mostly affect water shortages and crop/livestock losses and do not typically extend to buildings and critical facilities.

The entire population of Tyler County, including all plan participants, is vulnerable to water supply shortages, which present widespread health risks as people can only survive a few days without water. Potable water is used for many essential functions such as drinking, bathing, heating and cooling systems, and some electricity production. This affects vulnerable populations more acutely, such as children, older adults, and people with illnesses or fragile health conditions. Also, vulnerable populations that do not have adequate air conditioning units in their homes are more at risk for injury or death.

The planning area has a total population of 20,560 according to the 2023 ACS population estimate. Those over the age of 65 represent 17.5% (3,592) of the total population, and children under the age of 5 represent 6.8% (1407) of the total population. The total population of the county that is estimated to be below the poverty level is 17% (3,495). Table 5-4 presents the 2023 American Community Survey population and age cohort estimates below.

Table 5-4: Populations at Greater Risk by Jurisdiction

| Jurisdiction | Population Estimate | Youth | Elderly | Below Poverty Level |
|---|---|---|---|---|
| Tyler County | 20,560 | 1,407 (6.8%) | 3,592 (17.5%) | 3,495 (17.0%) |
| Woodville | 2,884 | 95 (3.3%) | 651 (22.6%) | 440 (15.3%) |
| Ivanhoe | 1,619 | 37 (2.3%) | 414 (25.6%) | 469 (29.0%) |
| Chester | 200 | 5 (2.5%) | 55 (27.5%) | 16 (8.0%) |
| Colmesneil | 697 | 47 (6.7%) | 137 (19.7%) | 150 (21.5%) |

*Based On 2023 5-Year ACS Estimates *ISD populations are captured in City and County estimates

## Historic Drought Impacts

The environment of the Tyler County planning area is also vulnerable to damage during drought. Through lack of food and water and habitat degradation, aquatic and terrestrial species can experience significant reductions due to death and lower reproduction rates.

Water is central to the ability of people to inhabit and transact commerce in a region, and the economic impacts of drought can be significant, especially during prolonged drought. The ability to produce goods and provide services is dependent on direct and indirect access to clean water. Due to the interconnected nature of supply and production chains, the negative effects of droughts can have ripple effects on many industries and sectors of the economy. The overall impact of damage caused by periods of drought is dependent on its extent and duration. It is rare that drought alone leads to a direct risk to the health and safety of people in the Tyler County planning area, severe water shortages could lead to a direct risk to the health and safety of the population. The severity of the impact of a drought can be mitigated by preparedness and planning by the community, comprised of government, businesses, and citizens.

The National Drought Mitigation Center (NDMC) at the University of Nebraska-Lincoln developed the Drought Impact Reporter to provide a national database of drought impacts by county. The number of impacts in eight distinct impact categories from 2000-2025 is provided in Figure 5-5 below. Table 5-5 lists the drought impacts in Tyler County based on reports received by the Drought Impact Reporter. These reports are predominantly provided by the media, but can also come from NWS, other agencies, CoCoRaHS, legacy reports, and user reports.

Figure 5-5: Drought Impacts, 2000-2026

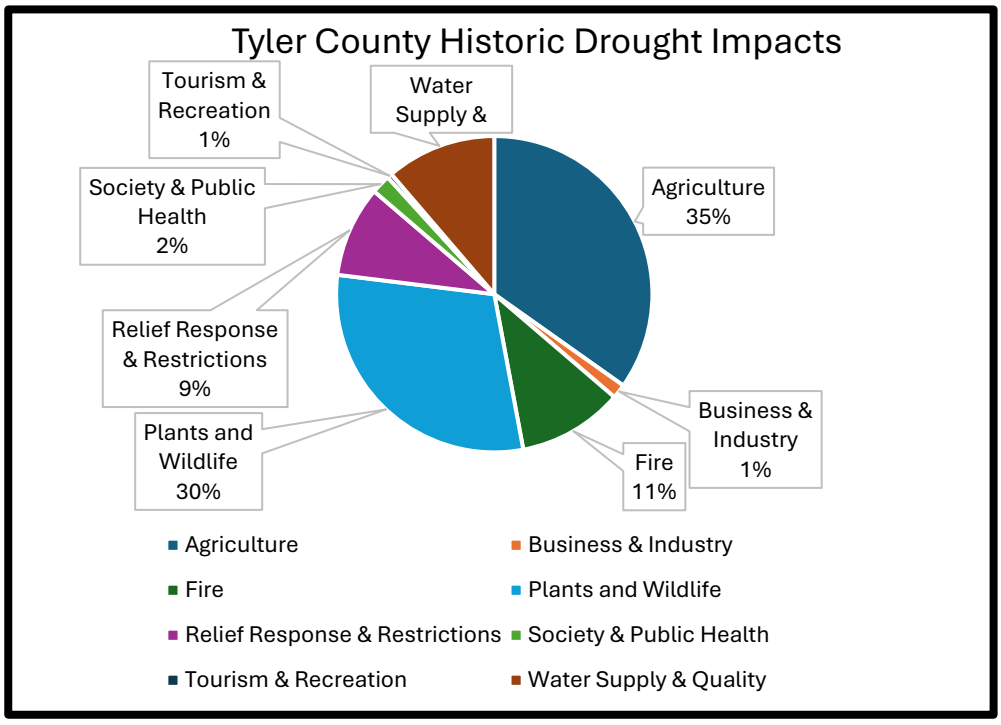


Table 5-5: Drought Impacts, January 2000- January 2026

| Tyler County Drought Impacts | |
|---|---|
| Total | 204 |
| Agriculture | 71 |
| Business & Industry | 3 |
| Fire | 22 |
| Plants & Wildlife | 61 |
| Relief, Response & Restrictions | 19 |
| Society & Public Health | 4 |
| Tourism & Recreation | 1 |
| Water Supply & Quality | 23 |

Based on 25 years of data from the NCEI, the direct impacts of droughts in the Tyler County planning area have resulted in no reported property or crop losses and no known injuries or fatalities. Drought impact reports like those presented above, however, come from several different sources and provide a different perspective of the impact that drought can have on communities beyond direct monetary property or crop damages that typically are not reported publicly. It is important to consider that crop damage information is rarely publicly reported, and water availability issues are not easily quantified, so the impact is likely much more pronounced than the direct losses attributed to this hazard.

## Drought Impacts Forecast

No injuries, fatalities, property, or crop damage were reported in the 25-year period of analysis. However, given 71 reports of drought impacting agriculture, 22 reports of drought contributing to fire risk, and 61 reports of drought impacting plants and wildlife, drought is likely to pose a significant but under-documented natural hazard for Tyler County.

# SECTION 6: WILDFIRE

## Description

Wildfires are unplanned, unwanted fires burning uncontrolled in a natural area rich with vegetative fuels, like a forest, grassland, or prairie. Meteorological conditions such as high temperatures, low humidity, droughts, and high winds increase wildfire risk. Sparks from agricultural, industrial, or automobile activity are often the cause of wildfires, with humans the most common source of initial ignition. Wildfires can also be naturally ignited by lightning strikes as a part of the natural management of forest ecosystems. While wildfires can occur any time of year, they are especially likely over the spring and summer months, when fuel is often dry so flames can move unchecked through a highly vegetative area. **Source:** http://texasforestservice.tamu.edu

## Location

In Tyler County, wildfire spread is most likely in upland pine and pine–hardwood forests where continuous pine litter and unmanaged understory fuels support rapid fire growth. Ignitions are often more common near roads and dispersed rural development (the WUI), and fires can move quickly through grass and brush in openings before entering adjacent timber. Bottomland hardwoods and wetter drainages generally limit spread, but during prolonged drought, they may dry enough to carry fire and lose their buffering effect. The more rural and sparsely populated unincorporated areas of Tyler County are more vulnerable to large sweeping wildfire events, especially given the percentage of wildfire ignitions caused by debris burnings usually outside of city limits. The threat to people and property is greatest in the Wildland-Urban Interface/Intermix; however, the entire planning area of Tyler County is at risk for wildfires.

## Extent

The likelihood that a wildfire event will occur in the planning area is measured using the Keetch-Byram Drought Index (KBDI) and the Texas Forest Service's Fire Intensity Scale (FIS). The KBDI describes the potential for wildfire based upon weather conditions such as daily water balance, precipitation, and soil moisture (Table 6-1). The index ranges from 0-800 with a score of 0 indicating no moisture depletion and a score of 800 representing completely dry conditions.

Table 6-1: Keetch Byram Drought Index Descriptions

| KBDI Score Range | Description |
|---|---|
| 0-200 | Soil moisture and large-class fuel moisture are high and do not contribute much to fire intensity. Typically, observed in early spring following winter precipitation. |
| 200-400 | Fuels are beginning to dry and contribute to wildfire intensity. Heavier fuels will still not readily ignite and burn. This is often seen in late spring or early summer. |
| 400-600 | Lower litter and duff layers contribute to fire intensity and will burn actively. Wildfire intensity begins to increase significantly. Larger fuels could burn or smolder for several days. This is often seen in late summer and early fall. |
| 600-800 | Often associated with more severe drought with increased wildfire occurrences. Intense, deep-burning fires with extreme intensities can be expected. Live fuels can also be expected to burn actively at these levels. |

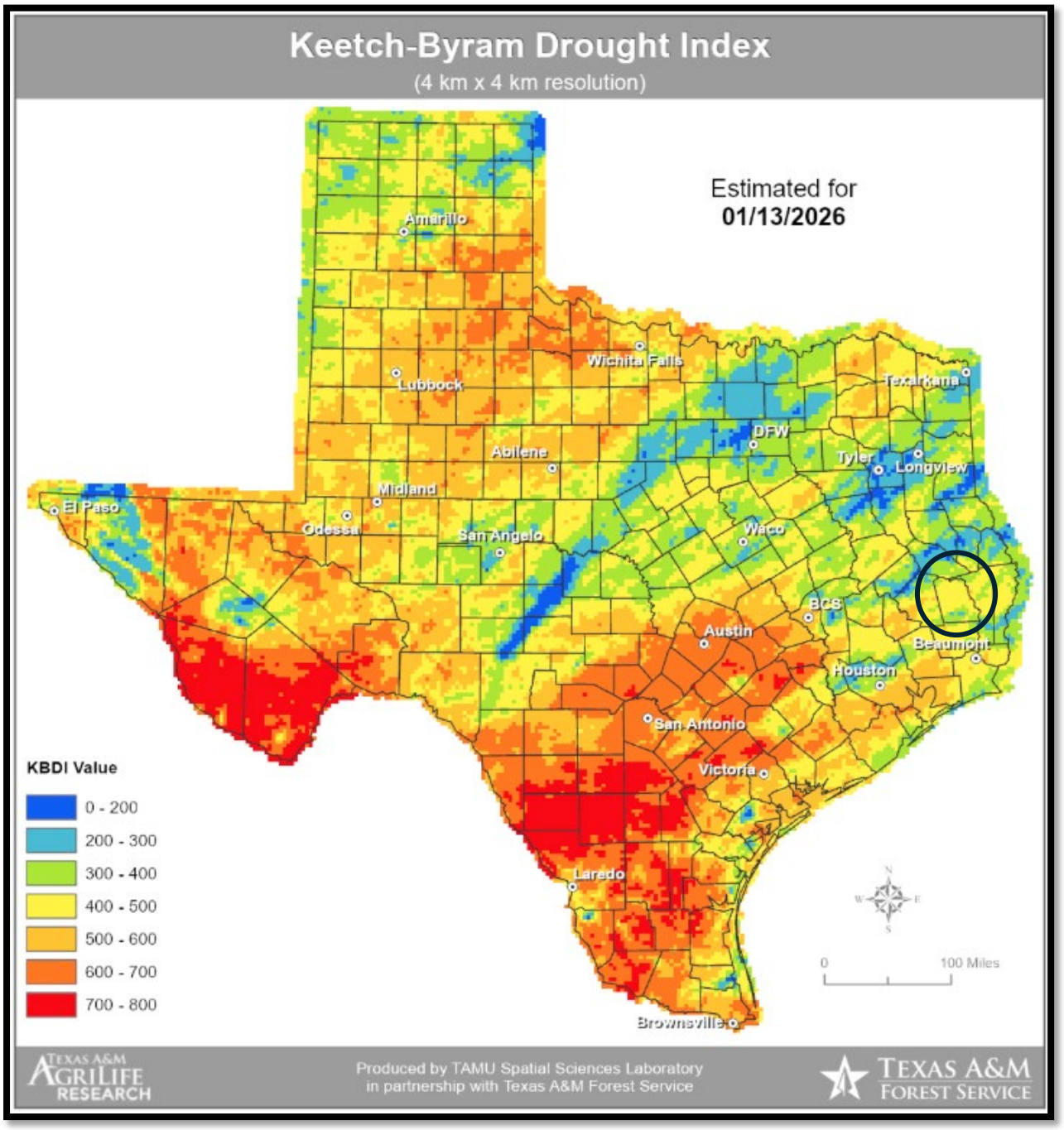



Figure 6-1: Keetch-Byram Drought Index – January 2026

The KDBI for an area is frequently updated based on environmental conditions. Based on the drought analysis, the majority of Tyler County has been in drought for over 20% of the past 25 years. Short-term drought measurements can show significant conditions that contribute to wildfire ignition. Based on Figure 6-1 above, the Tyler County planning area exhibits average values in the 400-500 range. At these levels, often associated with moderate to severe drought, fire intensity and occurrence begin to increase significantly, and fires could burn for significant durations. The KBDI is a good measure of the readiness of fuels to ignite in the event of a wildfire. Drought or extreme weather conditions can greatly influence the KDBI in a short period of time so the current KBDI should always be monitored to more accurately assess risk.

The Texas Wildfire Risk Assessment Portal (TXWRAP) is the primary mechanism for the Texas A&M Forest Service to deploy risk information and create awareness about wildfire issues across the state (www.TexasWildfireRisk.com). The tool uses the Fire Intensity Scale (FIS) layer to determine the potential fire intensity for the specified location. FIS quantifies potential fire intensity based on high to extreme weather conditions, fuels, and topography. It is similar to the Richter scale for earthquakes, providing a standard scale to measure potential wildfire intensity by magnitude. FIS consists of five classes where the order of magnitude between classes is ten-fold. The minimum class, Class 1, represents very low wildfire intensities and the maximum class, Class 5, represents very high wildfire intensities.

**Class 1, Very Low:** Very small, discontinuous flames, usually less than one foot in length; very low rate of spread; no spotting. Fires are typically easy to suppress by firefighters with basic training and nonspecialized equipment.

**Class 2, Low:** Small flames, usually less than two feet long; small amount of very short-range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.

**Class 3, Moderate:** Flames up to eight feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozers and plows are generally effective. Increasing potential for harm or damage to life and property.

**Class 4, High:** Large flames, up to 30 feet in length; short-range spotting common; medium-range spotting is possible. Direct attack by trained firefighters, engines, and dozers is generally ineffective, while indirect attack may be effective. Significant potential for harm or damage to life and property.

**Class 5, Very High:** Very large flames up to 150 feet in length; profuse short-range spotting, frequent long-range spotting; strong fire-induced winds. Indirect attack is marginally effective at the head of the fire. Great potential for harm or damage to life and property.

The Fire Intensity Scale evaluates the potential fire behavior for an area, regardless of whether any fires have occurred there in the past. This additional information allows local officials and mitigation planners to quickly identify areas where dangerous fire behavior potential exists in relation to nearby homes or other valued assets. **The wildfire risk for the Tyler County planning area is moderate to moderate-high based on the characteristic wildfire intensity scale for 51% of the county, with 44% of the county being below Class 3, Moderate.**

Table and Figure 6-2: Fire Intensity Scale Mapping and Percent of Area for Tyler County

| | Characteristic Fire Intensity Scale Category | Acres | Percent |
|---|---|---|---|
| | 0 | 18,435 | 3 % |
| | 1 - Very Low | 57,323 | 10 % |
| | 1.5 | 39,890 | 7 % |
| | 2 - Low | 92,248 | 15 % |
| | 2.5 | 51,752 | 9 % |
| | 3 - Moderate | 159,431 | 27 % |
| | 3.5 | 146,352 | 24 % |
| | 4 - High | 33,370 | 6 % |
| | 4.5 | 1 | 0 % |
| | 5 - Very High | 0 | 0 % |
| | > 5 | 0 | 0 % |
| | **Total** | **598,802** | **100 %** |

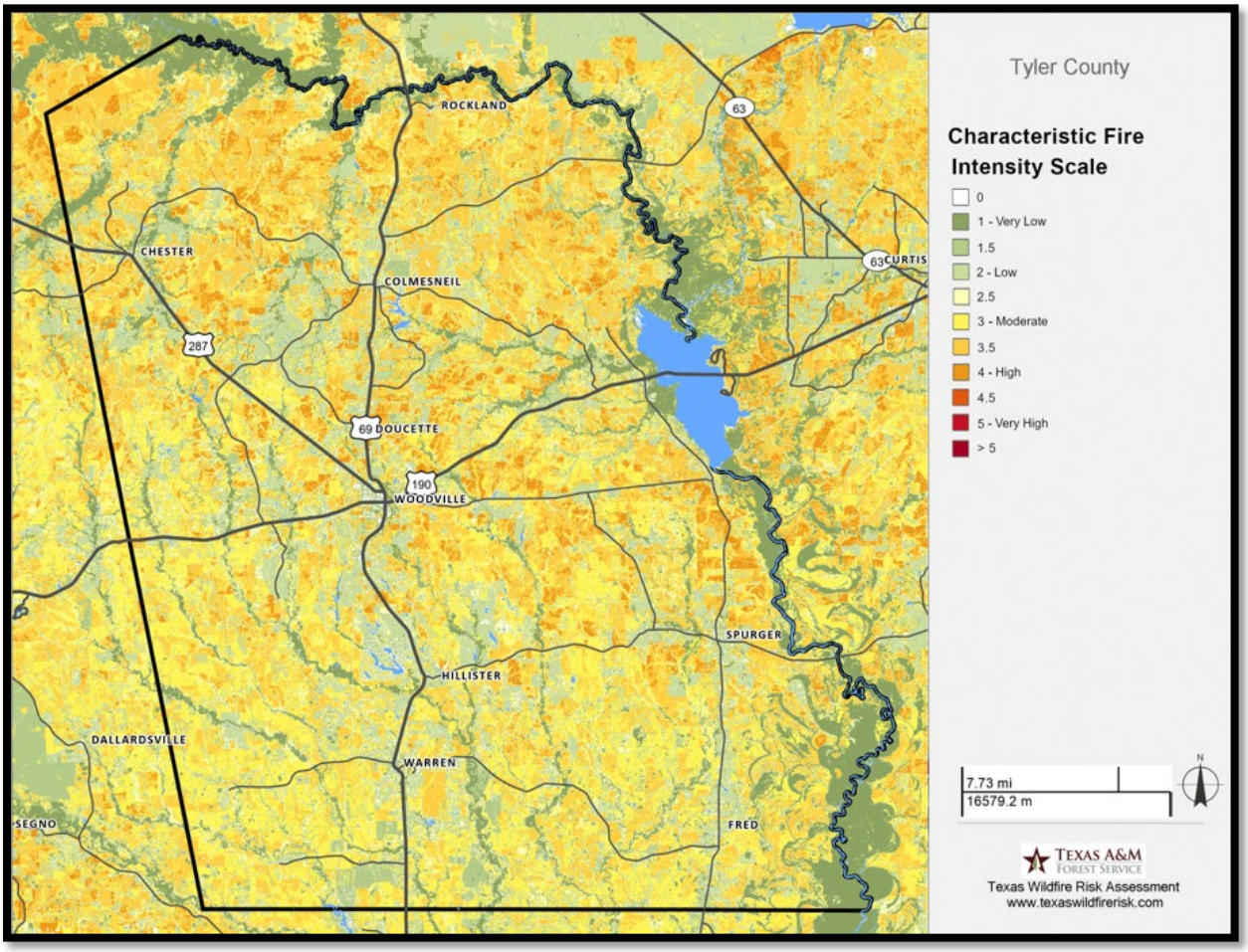


Table and Figure 6-3: Fire Intensity Scale Mapping and Percent of Area for City of Colmesneil

| | Characteristic Fire Intensity Scale Category | Acres | Percent |
|---|---|---|---|
| | 0 | 463 | 10 % |
| | 1 - Very Low | 33 | 1 % |
| | 1.5 | 587 | 13 % |
| | 2 - Low | 1,344 | 30 % |
| | 2.5 | 264 | 6 % |
| | 3 - Moderate | 649 | 14 % |
| | 3.5 | 923 | 20 % |
| | 4 - High | 282 | 6 % |
| | 4.5 | 0 | 0 % |
| | 5 - Very High | 0 | 0 % |
| | > 5 | 0 | 0 % |
| | **Total** | **4,545** | **100 %** |

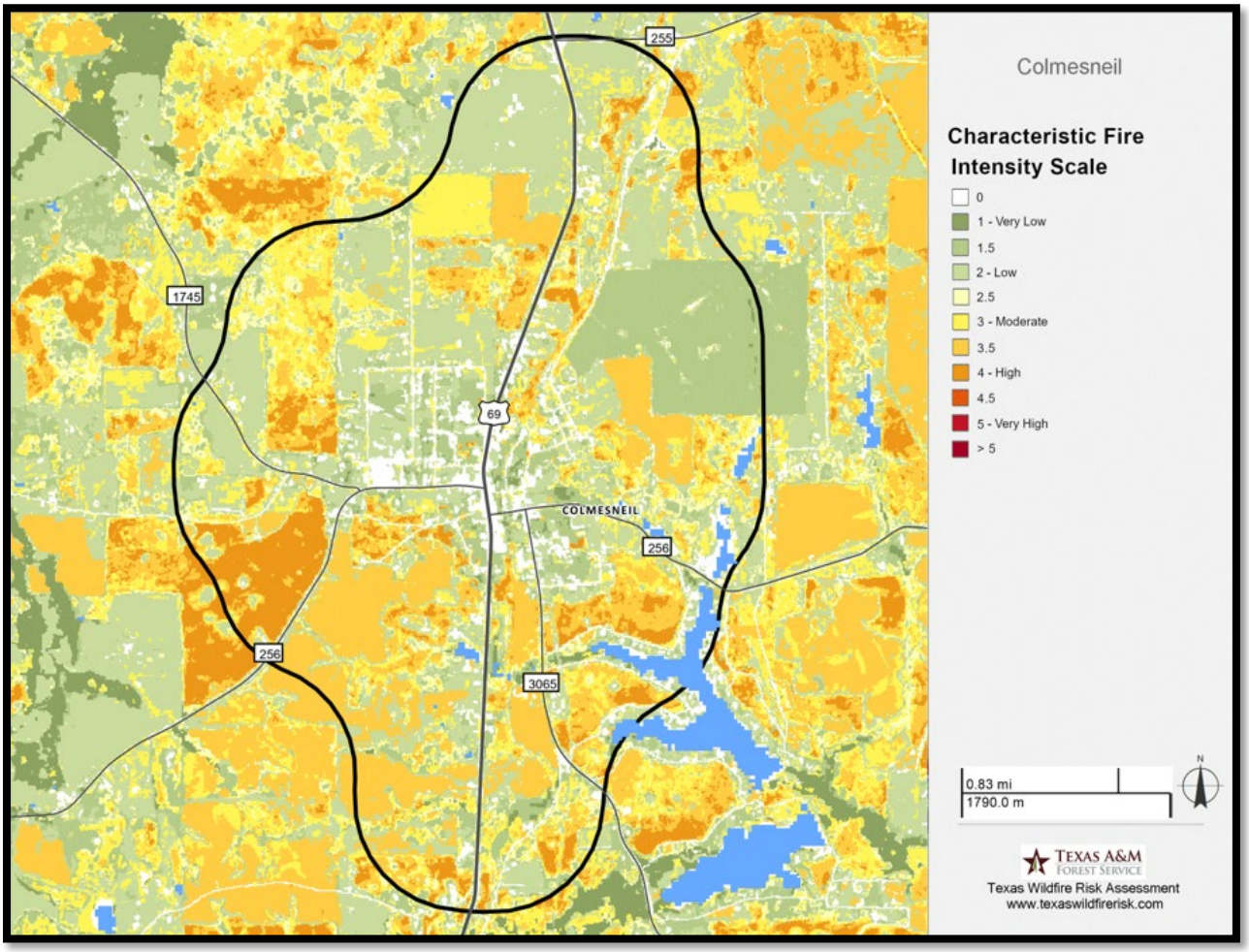


Table and Figure 6-4: Fire Intensity Scale Mapping and Percent of Area for the City of Ivanhoe

| | Characteristic Fire Intensity Scale Category | Acres | Percent |
|---|---|---|---|
| | 0 | 819 | 15 % |
| | 1 - Very Low | 510 | 9 % |
| | 1.5 | 655 | 12 % |
| | 2 - Low | 1,445 | 27 % |
| | 2.5 | 644 | 12 % |
| | 3 - Moderate | 749 | 14 % |
| | 3.5 | 609 | 11 % |
| | 4 - High | 22 | 0 % |
| | 4.5 | 0 | 0 % |
| | 5 - Very High | 0 | 0 % |
| | > 5 | 0 | 0 % |
| | **Total** | **5,452** | **100 %** |

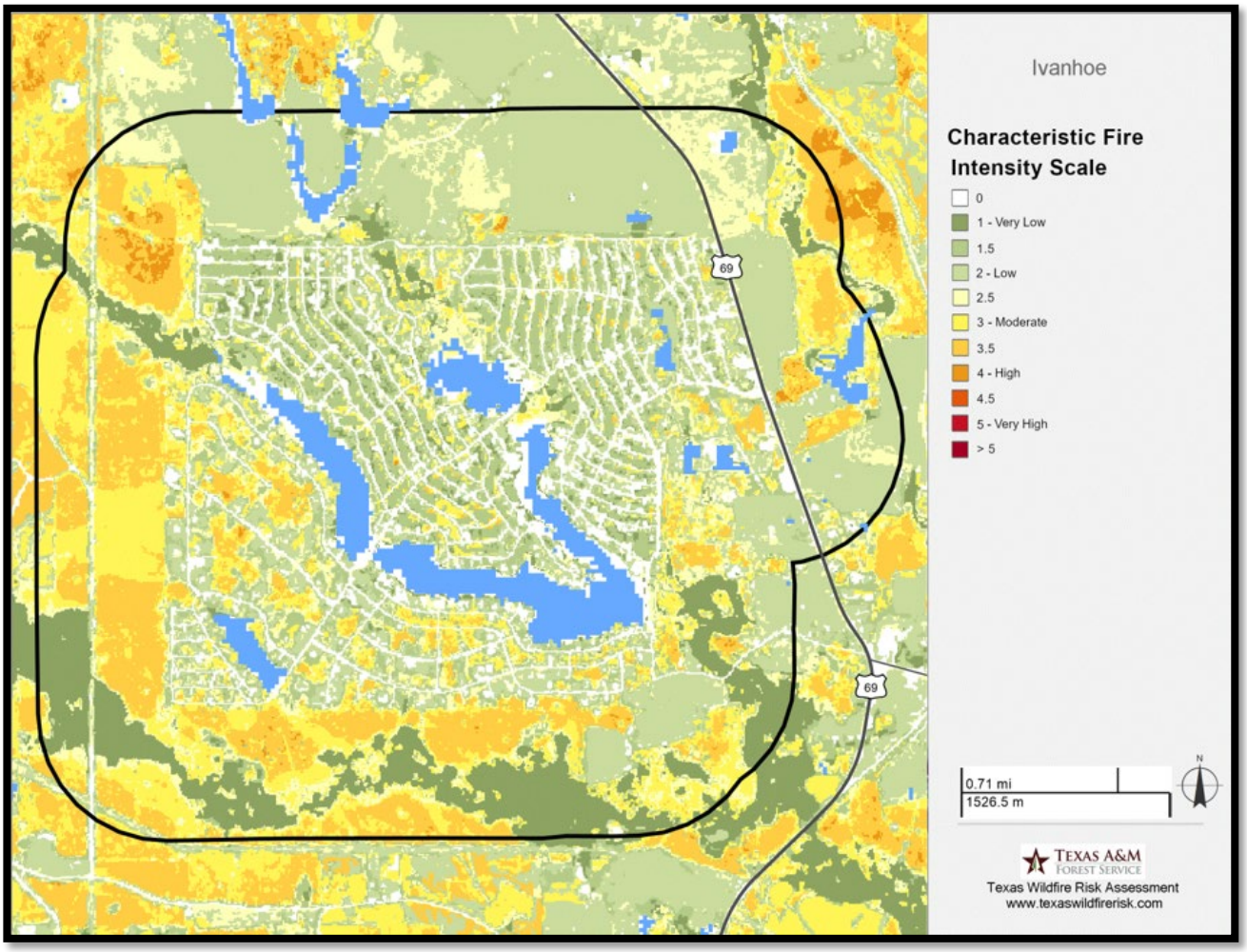


Table and Figure 6-5: Fire Intensity Scale Mapping and Percent of Area for the City of Woodville

| | Characteristic Fire Intensity Scale Category | Acres | Percent |
|---|---|---|---|
| | 0 | 802 | 15 % |
| | 1 - Very Low | 452 | 8 % |
| | 1.5 | 883 | 17 % |
| | 2 - Low | 1,100 | 21 % |
| | 2.5 | 202 | 4 % |
| | 3 - Moderate | 851 | 16 % |
| | 3.5 | 712 | 13 % |
| | 4 - High | 324 | 6 % |
| | 4.5 | 0 | 0 % |
| | 5 - Very High | 0 | 0 % |
| | > 5 | 0 | 0 % |
| | **Total** | **5,326** | **100 %** |

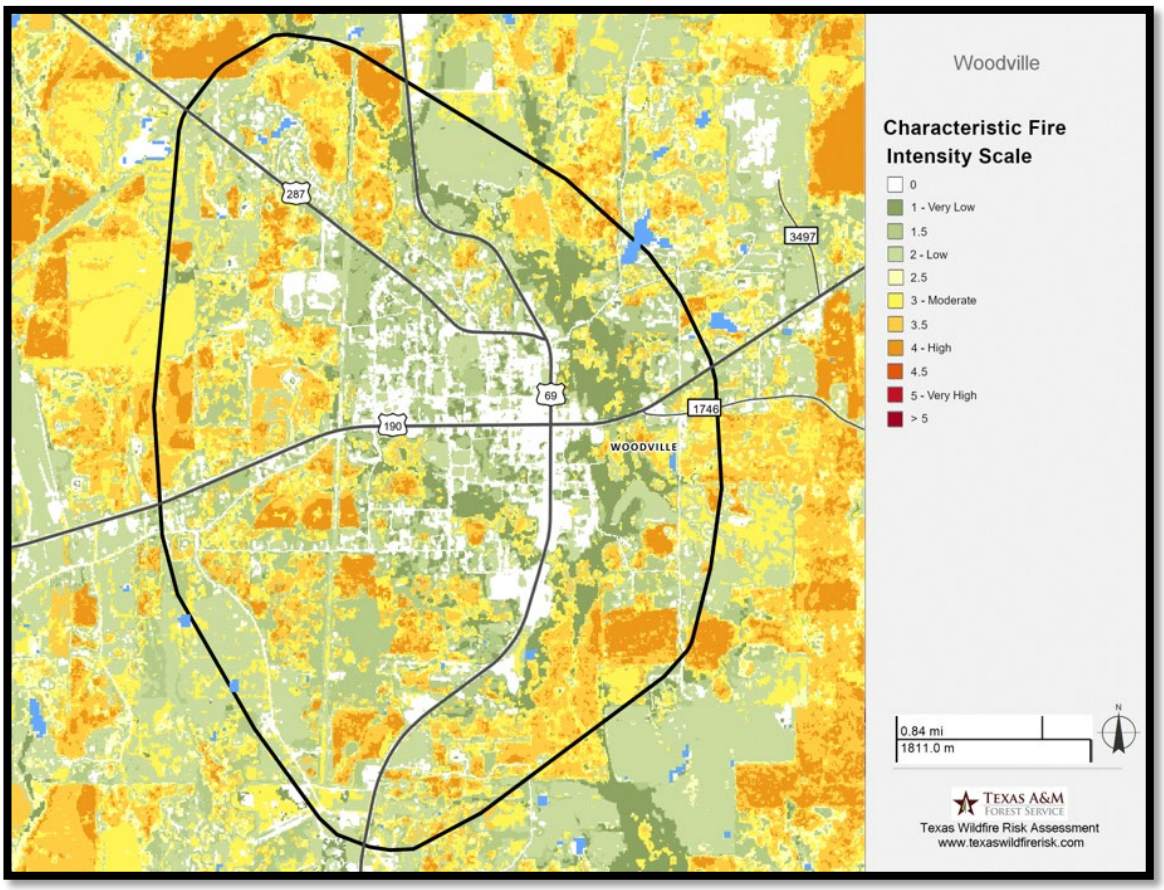
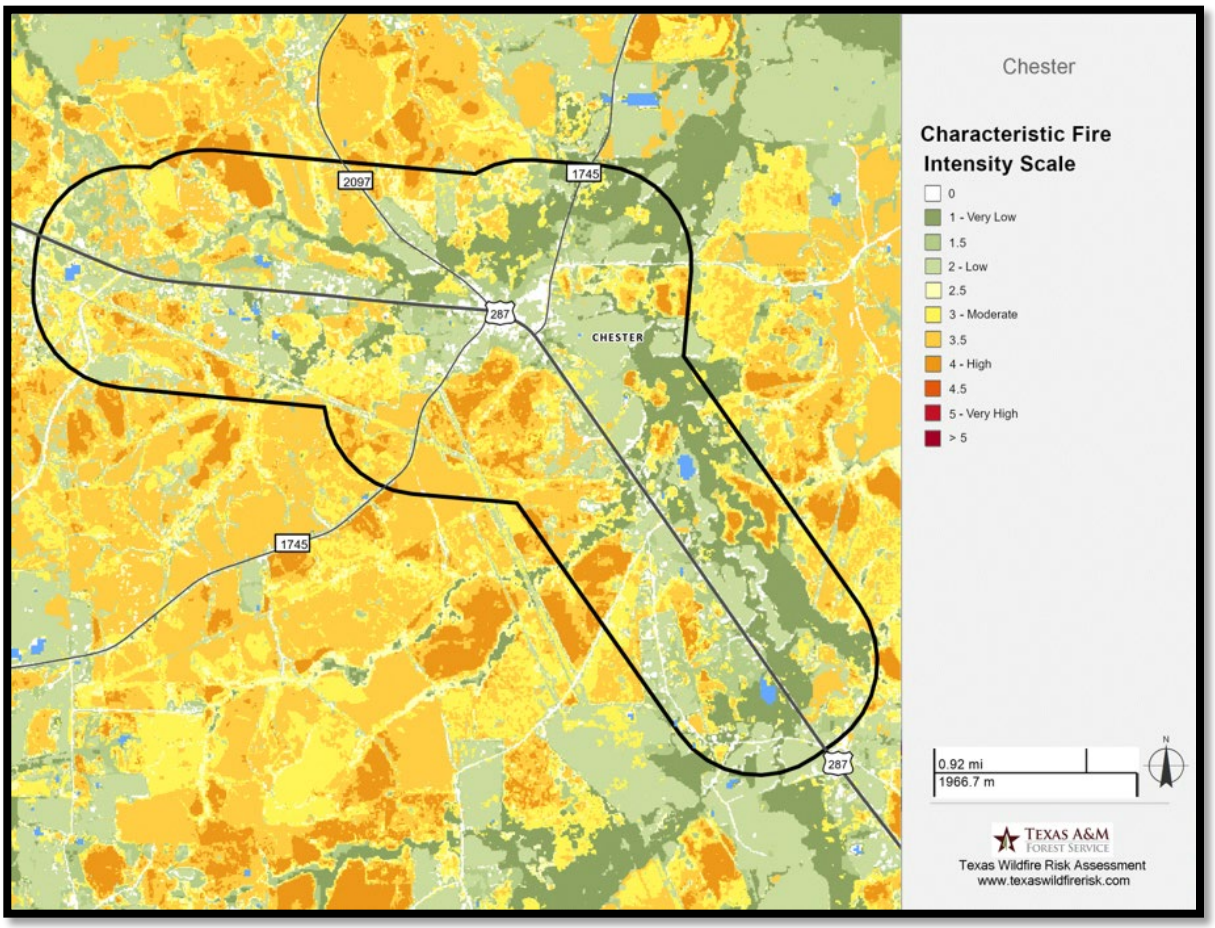


Table and Figure 6-6: Fire Intensity Scale Mapping and Percent of Area for the City of Chester

| | Characteristic Fire Intensity Scale Category | Acres | Percent |
|---|---|---|---|
| | 0 | 292 | 7 % |
| | 1 - Very Low | 645 | 15 % |
| | 1.5 | 386 | 9 % |
| | 2 - Low | 921 | 22 % |
| | 2.5 | 290 | 7 % |
| | 3 - Moderate | 682 | 16 % |
| | 3.5 | 806 | 19 % |
| | 4 - High | 237 | 6 % |
| | 4.5 | 0 | 0 % |
| | 5 - Very High | 0 | 0 % |
| | > 5 | 0 | 0 % |
| | **Total** | **4,259** | **100 %** |



## Historical Occurrences

Table 6-7: Historical Wildfire Events 2000-2025 (Reported to NCEI)

| Date | Deaths | Injuries | Property Damage | Crop Damage |
|---|---|---|---|---|
| 4/18/2011 | 0 | 0 | $0 | $15,000 |
| 6/20/2011 | 0 | 0 | $0 | $0 |
| 8/17/2011 | 0 | 0 | $0 | $0 |

The NCEI storm events database carries limited information on wildfire occurrence with damage estimates of impacts, injuries, or fatalities in the planning area from 2000 to 2025. Figure 6-6 below lists the wildfires reported in Tyler County by agency from 2005 to 2021. Figure 7-7 and Table 6-6 show the ignition causes for all wildfires in the planning area between 2005 and 2021, the number of times of each unique ignition cause, and the percentage of total ignitions.



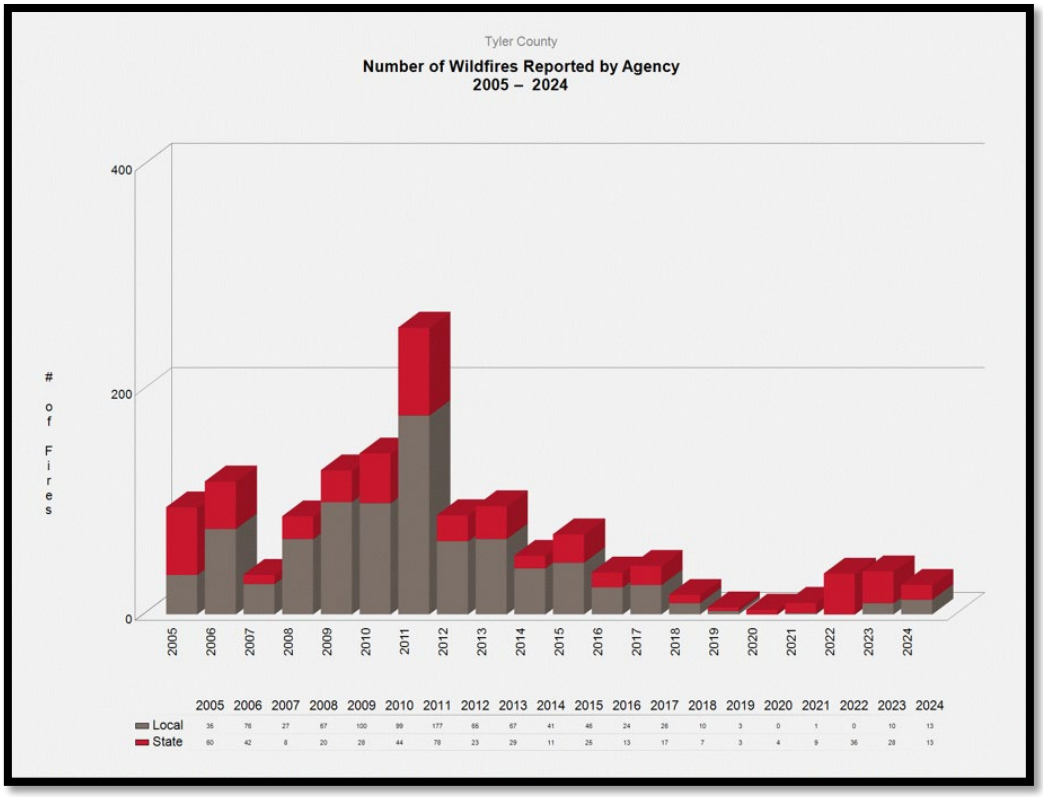



Figure 6-7: Number of Wildfires Reported by Agency from 2005-2024 in Tyler County

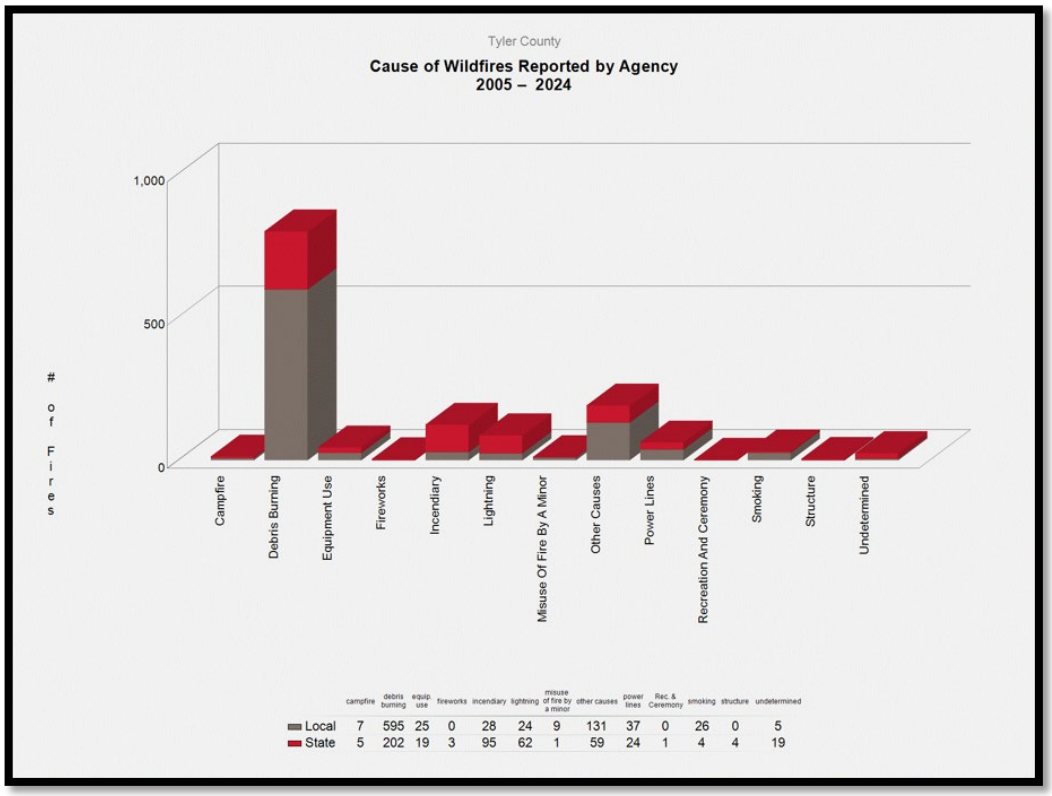



Figure 6-8: Wildfire Ignition Causes from 2005-2024 in Tyler County

Table 6-8, Wildfire Ignition Causes from 2005-2024

| Ignition Cause | Count | % of Total |
|---|---|---|
| Campfire | 12 | 0.9 % |
| Children | 10 | 0.7 % |
| Debris Burning | 797 | 57.5 % |
| Equipment Use | 44 | 3.2 % |
| Fireworks | 3 | 0.2 % |
| Incendiary | 123 | 8.9 % |
| Lightning | 86 | 6.2 % |
| Miscellaneous | 190 | 13.7 % |
| Power Lines | 61 | 4.4 % |
| Recreation and Ceremony | 1 | 0.1 % |
| Smoking | 30 | 2.2 % |
| Structure | 4 | 0.3 % |
| Unknown | 24 | 1.7 % |
| **Grand Total** | 1,385 | 100% |

Source: Texas Wildfire Risk Assessment Portal (TxWRAP)

## Significant Events

### *Pipeline Road Fire – April 16th, 2011*

Starting on private land just north of the southern Tyler County line, the Pipeline Road fire burned approximately 7,100 acres, including 652 acres in the Big Thicket National Preserve, destroying some trail infrastructure and closing some paths for months.

### *2023 Neches River Wildfire*

In late August 2023, the Neches River Wildfire burned roughly 200 acres in Tyler County, Texas, near Recreational Road 255. The fire prompted evacuations, road closures, and a multi-agency response including Texas A&M Forest Service aerial support. It was contained within days with no reported injuries or structural losses.

### *2025 Woodville Tire Fire*

In August 2025, a lightning-sparked fire broke out at a tire recycling facility near Woodville in Tyler County, Texas, sending heavy black smoke into the area. Multiple fire departments responded, and the blaze was about 80% extinguished within hours, with crews remaining on scene for monitoring. No injuries or major off-site impacts were reported.

## Probability of Future Events

Based on reported historical occurrences of wildfire, 1,385 wildfire events occurred in a 19-year reporting period for Tyler County. This data establishes an approximate probability of occurrence of about 73 events per year. This frequency supports a yearly probability of future events, meaning a wildfire event is highly likely within the next year. The risk of future wildfires with greater impact on people and property will increase if existing development patterns continue into the wildlands.

| Frequency of Occurrence |
| --- |
| Highly Likely: Event probable in next year. |
| Likely: Event probable in the next three years. |
| Occasional: Event possible in the next five years. |
| Unlikely: Event possible in next 10 years. |

## Vulnerability and Impact

Populations and structures that are most susceptible to wildfire risk are located in the Wildland-Urban Interface and/or Intermix (WUI). WUI fires occur in areas where the built environment meets undeveloped wildland or vegetative fuels. Natural vegetation provides the fuel for wildfires in natural uninhabited areas, while WUI fires consume both vegetation and materials from the built environment.

The severity of the impact of major wildfire events can be substantial. Such events have caused deaths and injuries, damaged or destroyed property and critical facilities, and disrupted infrastructure and services. The severity of impact is gauged by homes and structures lost, acreage burned, and the number of resulting injuries and fatalities. The vulnerability of the jurisdictions in the planning area to wildfire events is increased where critical facilities are in the WUI as they are more likely to sustain damage from the hazard event.

Functional WUI represents a classification of the land near buildings into zones that describe the wildfire risk mitigation activities appropriate for each zone.

**Direct Exposure**—The Direct Exposure zone is burnable land cover within 75 m of a structure. Reducing fire intensity and ember production in this zone would reduce the exposure of nearby buildings to heat and embers. Buildings in this zone also require hardening of the structure to resist ignition.

**Indirect or Secondary Exposure**—The Indirect Exposure zone is non-burnable land cover within 1500 m of burnable land cover that is within 75 m of a structure, meaning that embers and home-to-home spread could reach within this zone. Indirectly exposed structures would benefit from the hardening of the structure to resist ignition from embers and nearby structures, but defensible space is usually not required due to the heavily developed nature of the zone.

**Critical Fireshed**—The Critical Fireshed zone is the unpopulated land within about 2.4 km of a group of structures. Fires that originate within or spread to the Critical Fireshed have an immediate threat of reaching the nearby structures; fuel treatments that slow fire spread in this zone can reduce risk to these structures.

**Sources of Ember Load to Buildings**—These are areas of burnable land cover that produce embers capable of reaching nearby buildings. Ember production is a function of fire type and intensity, and ember travel is a function of wind speed and direction. Fuel treatment in this zone is a priority for reducing ember load to the nearby buildings.

**Little-to-no Exposure**—The Little-to-no Exposure zone is non-burnable land that is within 75 m of a structure but greater than 1500 m from a large (500 ha) contiguous block of burnable land cover. Flames—even from home-to-home spread—and embers are unlikely to reach the Little-to-no-Exposure zone, but smoke and evacuations could still impact this area.

*Buildings used in producing Functional WUI are defined as greater than 40 sq meters.

Six percent of Tyler County is under threat of direct exposure from wildfires, with a significant portion of the county belonging to the Critical Fireshed classification (16%) and Sources of Ember Load to Buildings classification (17%). Indicating a prioritization of fuel treatments to reduce wildfire risk should be considered to reduce the risk of vulnerable communities and structures nearby.

Table and Figure 6-9: Functional Wildland Urban Interface Mapping and Percent of Area for Tyler County

| | Functional Wildland Urban Interface (WUI) Category | Acres | Percent |
|---|---|---|---|
| | Direct Exposure | 35,840 | 6 % |
| | Indirect Exposure | 653 | 0 % |
| | Critical Fireshed | 95,496 | 16 % |
| | Sources of Ember Load to Buildings | 460,198 | 17 % |
| | Little to No Exposure | 0 | 0 % |
| | Water | 6,617 | 1 % |
| | **Total** | **598,803** | **100 %** |

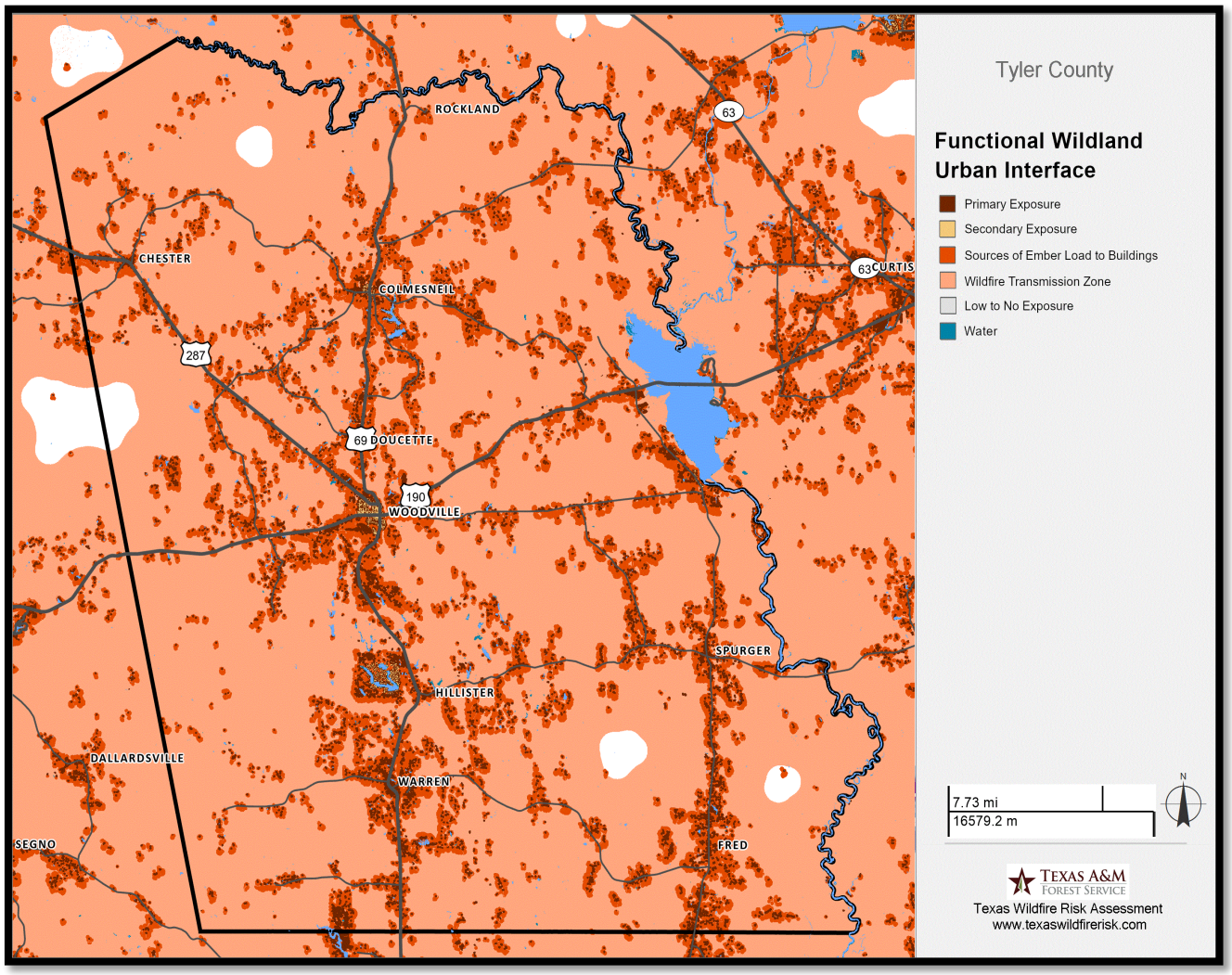


Table and Figure 6-10: Functional Wildland Urban Interface Mapping and Percent of Area for the City of Woodville

| | Functional Wildland Urban Interface (WUI) Category | Acres | Percent |
|---|---|---|---|
| | Direct Exposure | 1,653 | 31 % |
| | Indirect Exposure | 342 | 6 % |
| | Critical Fireshed | 2,186 | 41 % |
| | Sources of Ember Load to Buildings | 1,134 | 21 % |
| | Little to No Exposure | 0 | 0 % |
| | Water | 12 | 0 % |
| | **Total** | **5,326** | **100 %** |

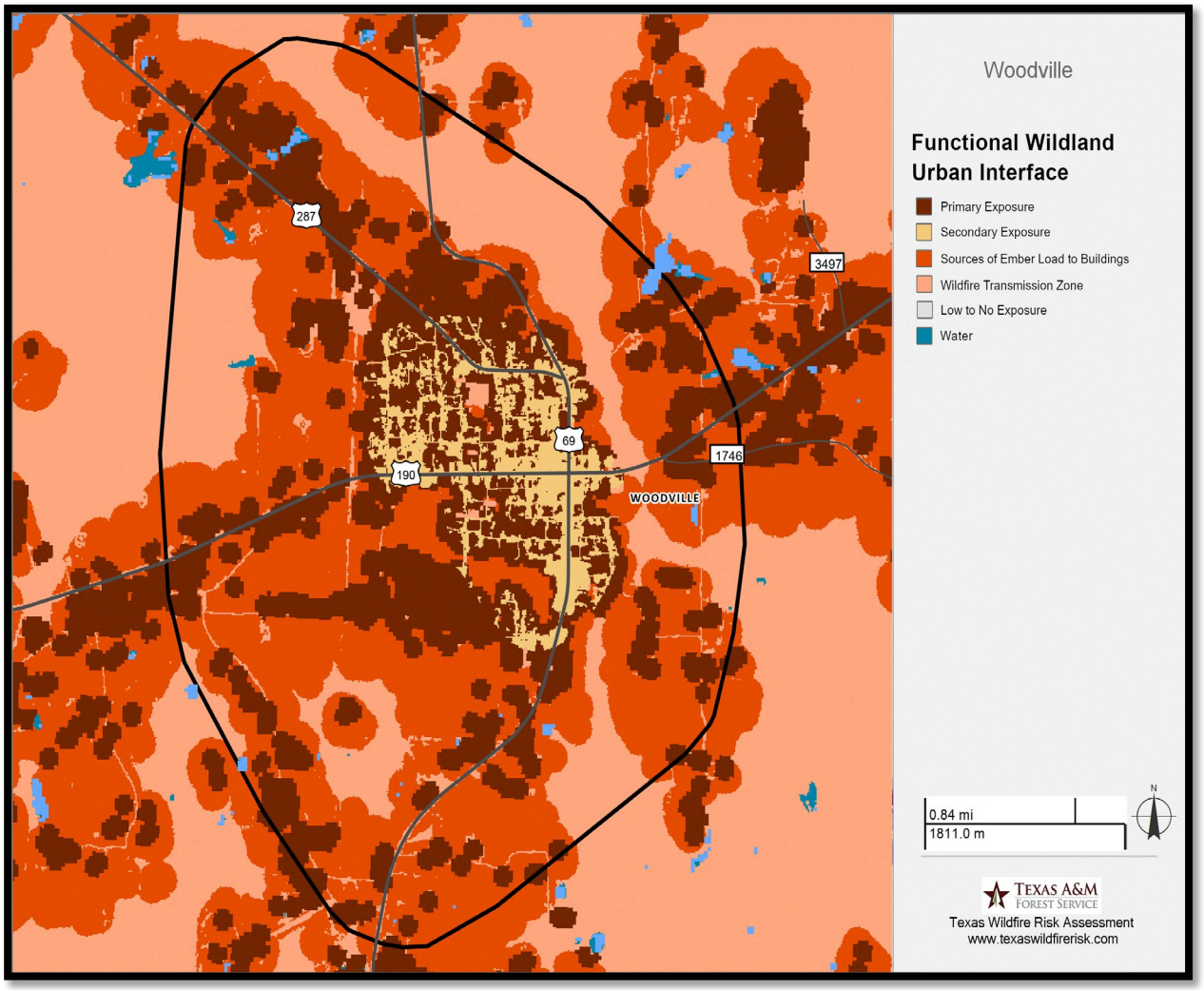


Table and Figure 6-11: Functional Wildland Urban Interface Mapping and Percent of Area for the City of Chester

| | Functional Wildland Urban Interface (WUI) Category | Acres | Percent |
|---|---|---|---|
| | Direct Exposure | 650 | 15 % |
| | Indirect Exposure | 0 | 0 % |
| | Critical Fireshed | 1,369 | 32 % |
| | Sources of Ember Load to Buildings | 2,233 | 52 % |
| | Little to No Exposure | 0 | 0 % |
| | Water | 6 | 0 % |
| | **Total** | **4,258** | **100 %** |

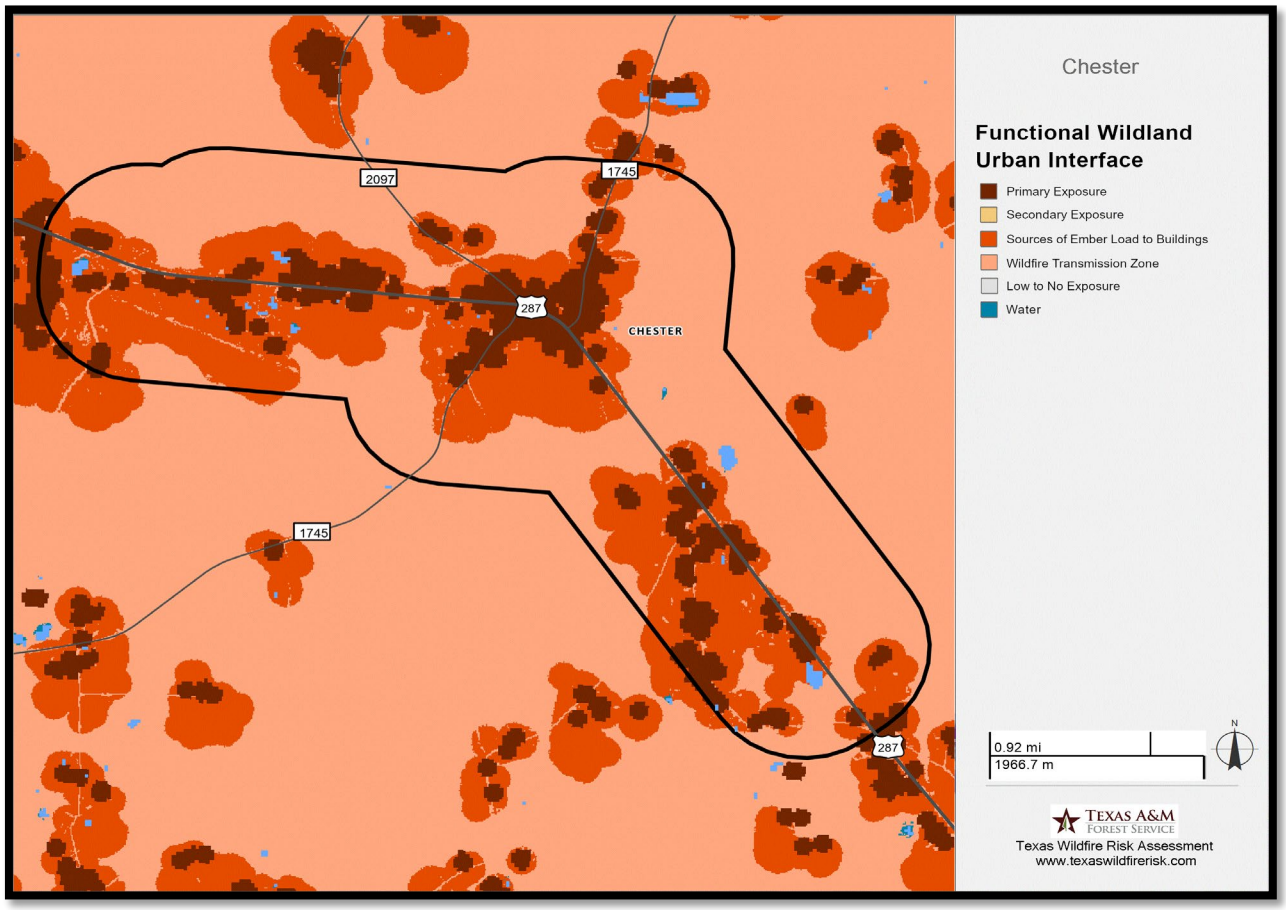


Table and Figure 6-12: Functional Wildland Urban Interface Mapping and Percent of Area for the City of Ivanhoe

| | Functional Wildland Urban Interface (WUI) Category | Acres | Percent |
|---|---|---|---|
| | Direct Exposure | 1,504 | 28 % |
| | Indirect Exposure | 181 | 3 % |
| | Critical Fireshed | 1,496 | 27 % |
| | Sources of Ember Load to Buildings | 1,947 | 36 % |
| | Little to No Exposure | 0 | 0 % |
| | Water | 324 | 6 % |
| | **Total** | **5,452** | **100 %** |

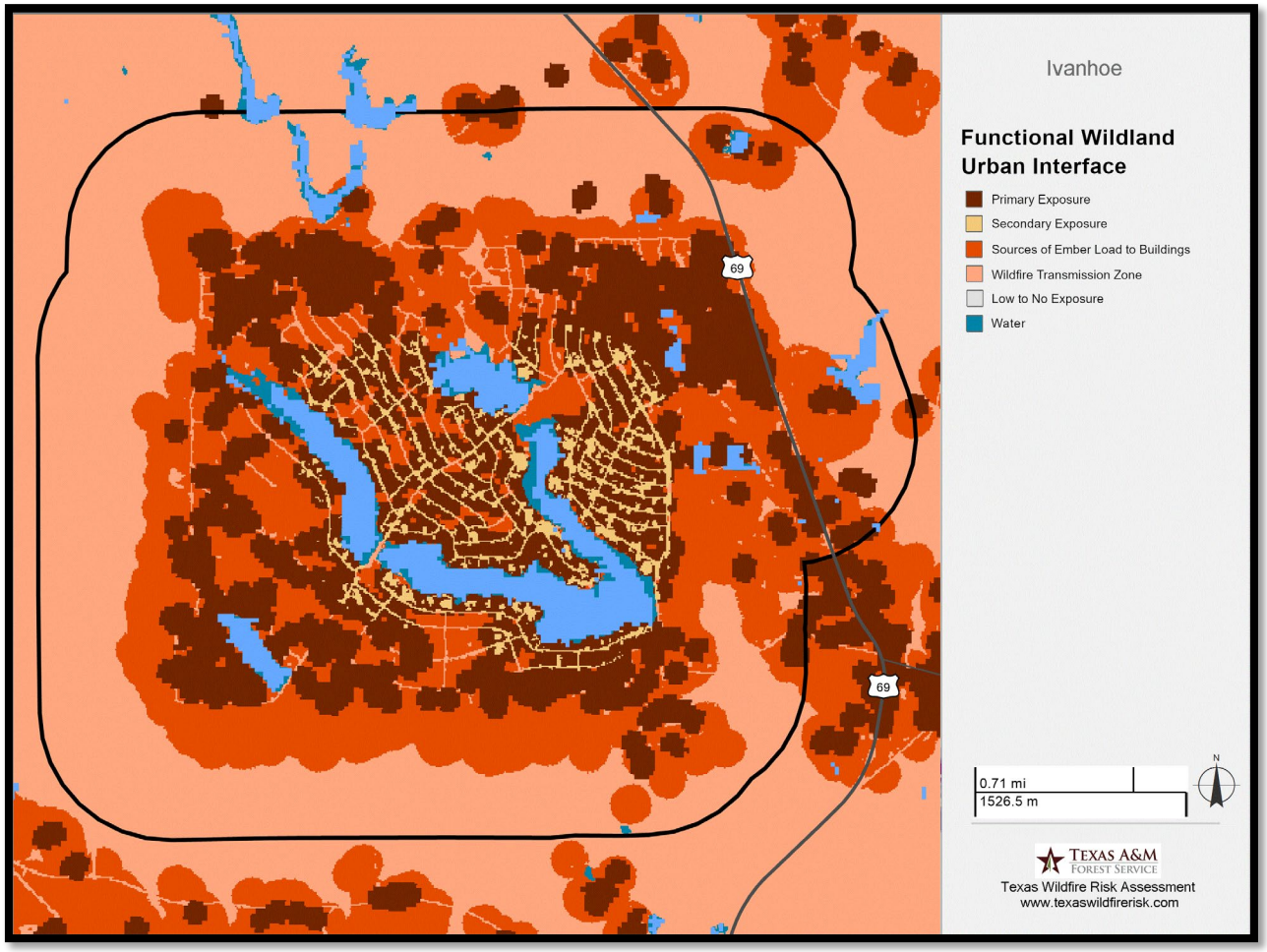


Table and Figure 6-13: Functional Wildland Urban Interface Mapping and Percent of Area for the City of Colmesneil

| | Functional Wildland Urban Interface (WUI) Category | Acres | Percent |
|---|---|---|---|
| | Direct Exposure | 1,504 | 28 % |
| | Indirect Exposure | 181 | 3 % |
| | Critical Fireshed | 1,496 | 27 % |
| | Sources of Ember Load to Buildings | 1,947 | 36 % |
| | Little to No Exposure | 0 | 0 % |
| | Water | 324 | 6 % |
| | **Total** | **5,452** | **100 %** |

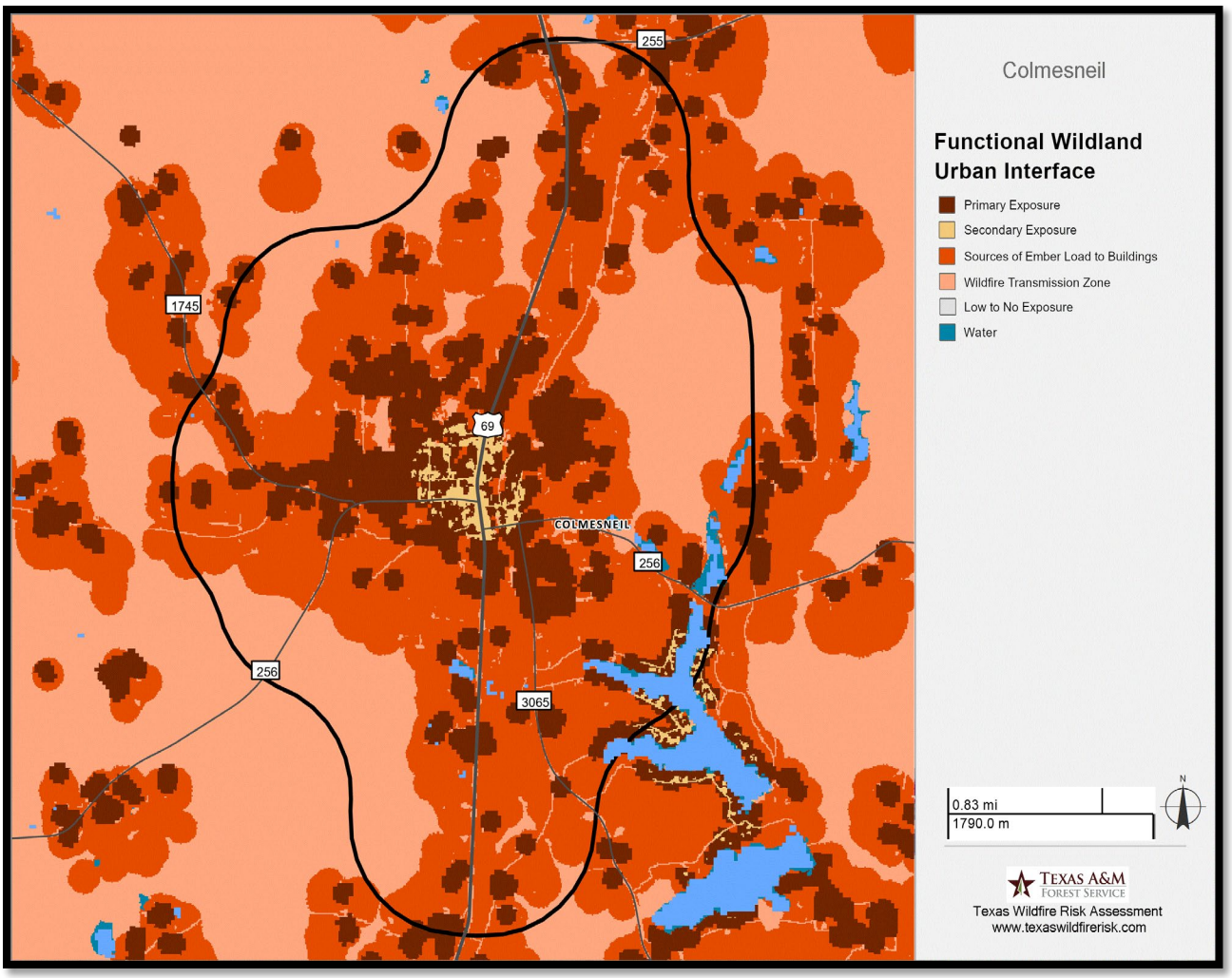


Table 6-14: WUI Risk Across Tyler County Critical Facilities and Private Critical Facilities

| Tyler County and Private Critical Facilities | WUI Risk |
|---|---|
| Dam B VFD | Direct Exposure |
| Dedicated Medical Center and Urgent Care | Secondary Exposure |
| Dogwood Entergy Power Station | Direct Exposure |
| Entergy/Sheco Substation | Source of Ember Loading |
| Fred Fire Department | Critical Fireshed |
| Fred VFD | Direct Exposure |
| Gib Lewis Water Plant | Direct Exposure |
| Lakeside and Doucette Water Supply | Direct Exposure |
| Precinct 1 Road and Bridge Maintenance Barn | Direct Exposure |
| Sam Houston Electrical Co-op - substation | Direct Exposure |
| Seneca Water | Direct Exposure |
| Seneca Water Supply Corporation - Well 2 | Direct Exposure |
| Shady Grove VFD | Direct Exposure |
| Spurger Fire Department | Direct Exposure |
| Spurger VFD | Direct Exposure |
| TCH Family Medical Clinic | Secondary Exposure |
| TCH Family Medical Clinic | Secondary Exposure |
| TDCJ Gib Lewis Prison Unit | Direct Exposure |
| TDCJ Gib Lewis unit | Direct Exposure |
| Texas Department of Human Services | Direct Exposure |
| Texas Department of Public Safety | Secondary Exposure |
| Tyler County Annex Building | Secondary Exposure |
| Tyler County Collection Center | Direct Exposure |
| Tyler County Courthouse | Secondary Exposure |
| Tyler County Hospital | Secondary Exposure |
| Tyler County Jail | Direct Exposure |
| Tyler County Precinct 3 | Secondary Exposure |
| Tyler County Precinct 4 | Direct Exposure |
| Tyler County Rodeo and Fairgrounds | Direct Exposure |
| Tyler County Sheriff's Office | Secondary Exposure |
| Tyler County Special Utility District | Direct Exposure |
| Tyler County Water | Critical Fireshed |
| Tyler County Water Department | Direct Exposure |
| Undine Water Supply | Direct Exposure |
| US Army Corp of Engineer | Secondary Exposure |
| Warren Entergy Power Station | Direct Exposure |
| Warren Volunteer Fire Department | Direct Exposure |
| Warren Water | Direct Exposure |
| Wildwood VFD | Direct Exposure |
| White Tail Ridge VFD | Direct Exposure |
| Woodville Pellet | Direct Exposure |

Table 6-15: WUI Risk Across Ivanhoe Critical Facilities

| City of Ivanhoe Facility | WUI Risk |
|---|---|
| Ivanhoe Volunteer Fire Department | Direct Exposure |
| Ivanhoe Police Substation | Direct Exposure |
| Ivanhoe City Hall | Secondary Exposure |
| Ivanhoe Police Department | Secondary Exposure |
| Ivanhoe VFD (Station Two) | Secondary Exposure |
| Lake Ivanhoe Dam | Direct Exposure |
| Lake Camelot Dam | Direct Exposure |
| Lake Galahad Dam | Direct Exposure |
| Lake Tristan Dam | Direct Exposure |
| Lake Charmaine Dam | Direct Exposure |

Table 6-16: WUI Risk Across Woodville Critical Facilities

| City of Woodville | WUI Risk |
|---|---|
| Sims Street Water Plant | Direct Exposure |
| Industrial Park Well | Direct Exposure |
| Carlow Hill Water Plant | Direct Exposure |
| Woodville Volunteer Fire Department | Secondary Exposure |
| Woodville Police Dept | Secondary Exposure |
| Woodville Transportation | Secondary Exposure |
| City Hall | Secondary Exposure |
| City Warehouse & WWTP | Secondary Exposure |
| 190 W. Elevated | Source of Ember Loading |
| 190 W. Booster Pump | Critical Fireshed |
| Pine Street Water Plant | Secondary Exposure |

Table 6-17: WUI Risk Across Colmesneil Critical Facilities

| City of Colmesneil | WUI Risk |
|---|---|
| Colmesneil City Hall | Secondary Exposure |
| Colmesneil Community Center | Secondary Exposure |
| Colmesneil VFD/ESD #7 | Secondary Exposure |
| Well #2 | Direct Exposure |
| Well #4 | Direct Exposure |
| Plant #1 | Direct Exposure |
| North Booster Station | Direct Exposure |
| Power substation | Critical Fireshed |

Table 6-18: WUI Risk Across Chester Critical Facilities

| City of Chester | WUI Risk |
|---|---|
| Chester VFD | Direct Exposure |
| Chester City Hall | Direct Exposure |

Table 6-19: WUI Risk Across Chester WSC Critical Facilities

| Chester WSC | WUI Risk |
|---|---|
| Chester Water Supply Corp. | Direct Exposure |
| Chester Water Well | Direct Exposure |
| Chester Water Supply | Direct Exposure |
| Chester Water Supply - Pump | Direct Exposure |
| Barnum Plant | Direct Exposure |

Table 6-20: WUI Risk Across Chester ISD Critical Facilities

| Chester ISD | WUI Risk |
|---|---|
| Chester Transportation | Direct Exposure |
| Chester ISD | Direct Exposure |

Table 6-21: WUI Risk Across Woodville ISD Critical Facilities

| Woodville ISD | WUI Risk |
|---|---|
| Woodville Elementary School | Source of Ember Loading |
| WISD Eagle Summit | Direct Exposure |
| Woodville High School | Direct Exposure |
| Woodville Middle School | Direct Exposure |
| Woodville ISD Administration | Secondary Exposure |

Table 6-22: WUI Risk Across Colmesneil ISD Critical Facilities

| Colmesneil ISD | WUI Risk |
|---|---|
| Moffett Gym | Direct Exposure |
| Colmesneil Middle/High School | Direct Exposure |
| Lake Tejas | Direct Exposure |
| Colmesneil Elementary School | Direct Exposure |

Table 6-23: WUI Risk Across Spurger ISD Critical Facilities

| Spurger ISD | WUI Risk |
|---|---|
| Spurger ISD | Direct Exposure |
| Spurger Gym | Direct Exposure |
| Spurger Elementary | Direct Exposure |
| Spurger Middle/High School | Direct Exposure |
| Spurger Transportation | Direct Exposure |

Table 6-24: WUI Risk Across Warren ISD Critical Facilities

| Warren ISD Facility | WUI Risk |
|---|---|
| Warren ISD Admin Building | Direct Exposure |
| Warren ISD Police Department | Direct Exposure |
| Warren ISD Police | Direct Exposure |
| Warren Elementary | Direct Exposure |
| Fred Elementary School | Direct Exposure |
| Warren High School | Direct Exposure |
| Warren Middle School | Direct Exposure |
| Warren Transportation Building | Direct Exposure |

The impacts of wildfire on the Tyler County planning area would be severe based on the overall moderate to high-risk rating. Impacts would include air quality degradation due to the wildfire producing large amounts of smoke and other pollutants. This situation can cause health problems for residents, especially those with respiratory issues. If the wildfire is severe enough or close enough to populated areas, it can result in the need for evacuations.

Evacuation can be a traumatic experience for many people, especially if they must leave their homes and possessions behind, including pets. Wildfire often harms or destroy homes, businesses, and other buildings, leading to significant property damage. They can cause power outages, which can disrupt normal life and can cause economic impacts, especially to places that depend on tourism or agriculture. The loss of power and disruption to normal life can result in financial losses for businesses and individuals.

To reduce these vulnerabilities and impacts, cities can take steps to prepare for wildfires, such as creating evacuation plans, conducting regular fire drills, implementing building codes and other regulations to reduce fire risk, and working with fire departments to improve fire suppression and response capabilities.

# SECTION 7: LIGHTNING

## Description

Lightning is sudden charges of electricity that develop from storms or excessive heat. This massive electrostatic discharge can occur between electrically charged regions within clouds, or between a cloud and the Earth's surface. A bolt of lightning, or the visible sparks, can cause air temperatures surrounding the bolt to approach 50,000°F causing rapid air expansion leading to thunder, which often accompanies lightning strikes. Lightning is most often affiliated with severe thunderstorms, and often strikes outside of heavy rain and can occur as far as ten miles away from any rainfall.

## Location

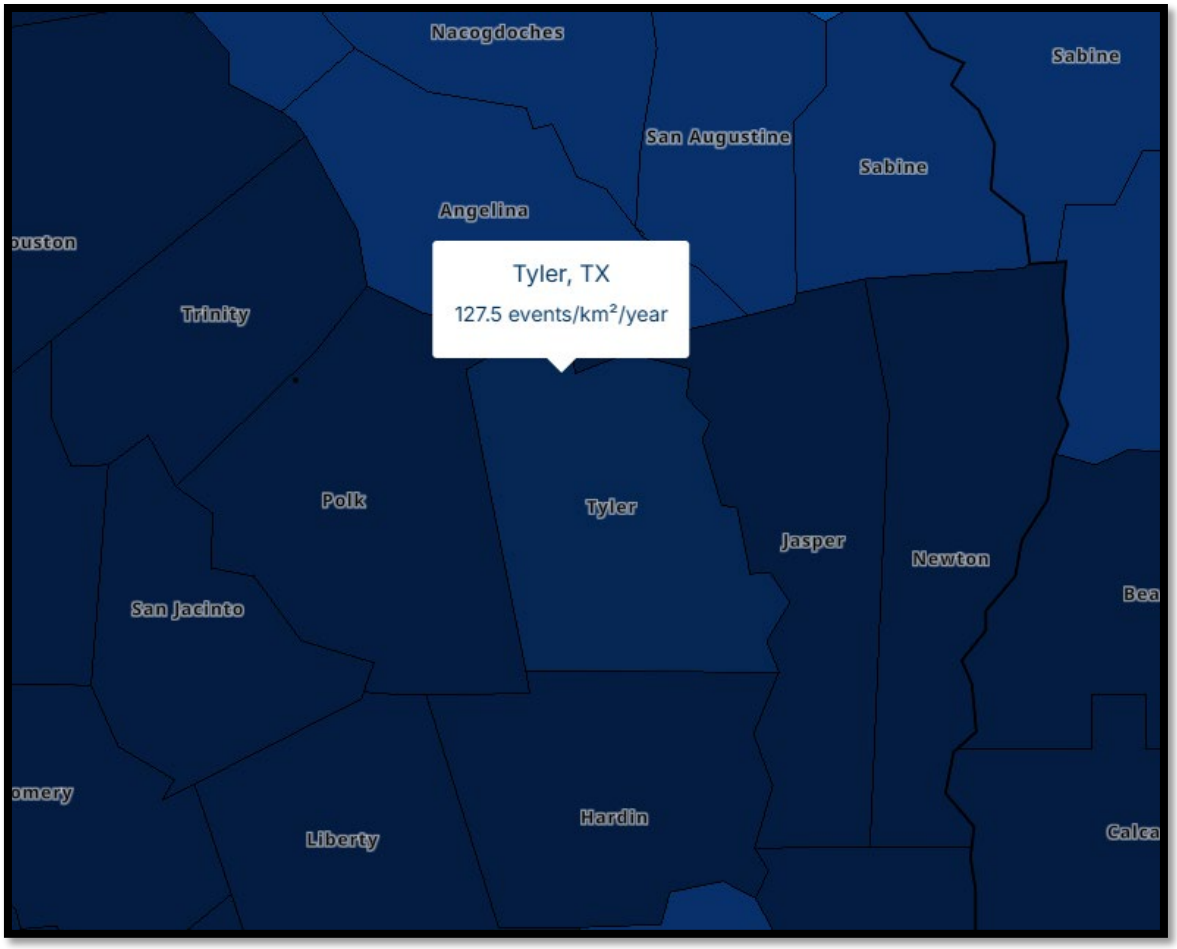
The Tyler County planning area is located in a region of the country that is very susceptible to lightning strikes. Lightning can occur at any location within the entire planning area, and it is assumed that all areas within Tyler County are uniformly exposed to the threat of lightning due to the consistent geography and terrain found throughout.

## Extent

Lightning's extent is defined in terms of the frequency of lightning strikes within a defined geographic area and a set time period. The Vaisala's U.S. National Lightning Detection Network lightning flash density map, Figure 7-1, shows the average number of lightning events per km2 per year. According to the map below, the Tyler County planning area has a total lightning density of 127.5 events/km2/year for the planning area from 2016-2024.

Figure 7-1: Lightning Density Map From 2016-2024






Source: https://interactive-lightning-map.vaisala.com/

A total lightning density of more than 64 events/km2/year in an area is considered to be a major severity and a total lightning density of more than 96 events/km2/year in an area is considered to be an extreme severity. Any lightning strike that causes death or property damage is likewise considered an extreme severity. The lightning hazard is considered to be an extreme severity for the planning area, given the density of 127.5 events/km2/year.

The magnitude of lightning hazard events can also be measured in terms of the number of strikes in a smaller interval of time. The Lightning Activity Levels (LAL) scale is used by NOAA to express the extent of lightning events and is on a scale of 1 to 6 along with descriptions of corresponding cloud and thunderstorm development. The LAL rankings scale reflects the frequency of lightning strikes from cloud to ground within a 15-minute interval. Lightning activity levels are described in more detail in Table 7-1 below.

Table 7-1: Lightning Activity Level

| LAL | Cloud and Storm Development | Lightning Strikes Per 15 Min |
|---|---|---|
| 1 | No thunderstorms. | 0 |
| 2 | Cumulus clouds are common, but only a few reach the towering cumulus stage. A single thunderstorm must be confirmed in the observation area. The clouds produce mainly virga, but light rain will occasionally reach the ground. Lightning is very infrequent. | 1-8 |
| 3 | Towering cumulus covers less than two-tenths of the sky. Thunderstorms are few, but two to three must occur within the observation area. Light to moderate rain will reach the ground, and lightning is infrequent. | 9-15 |
| 4 | Towering cumulus covers two to three-tenths of the sky. Thunderstorms are scattered and more than three must occur within the observation area. Moderate rain is common, and lightning is frequent. | 16-25 |
| 5 | Towering cumulus and thunderstorms are numerous. They cover more than three-tenths and occasionally obscure the sky. Rain is moderate to heavy, and lightning is frequent and intense. | >25 |
| 6 | Similar to LAL 3 except thunderstorms are dry. | 9-15 |

The Tyler County planning area can generally experience all lightning activity levels based on the extent and location of thunderstorm and hurricane conditions, and all areas are vulnerable to a LAL of 5, the most severe threat of lightning, with LAL 6 having fewer strikes, but being significantly more likely to ignite vegetation, given dry thunderstorm conditions. LAL 6 conditions have a well-documented history of igniting wildfires in the Tyler County planning area.

## Historical Occurrences

While lightning occurs quite frequently in the planning area, the only lightning data contained within NOAA Storm Data are lightning events that result in fatality, injury, and/or property and crop damage. This data has been supplemented with additional events found through local news stories. There are no known events past the listed dates.

## Significant Events

Two significant lightning events have been recorded for the Tyler County planning area, with damages only reported for one event from the NCEI, totaling $50,000 in damages.

### *August 27, 2009 - $50,000*

Scattered thunderstorms developed during the evening of August 27, 2009, and lightning struck a house on FM 1746, east of Woodville, destroying the home.

### *August 30th, 2025 – Woodville Tire Fire*



On August 30, 2025, lightning struck the Local Tire Disposal Center in Woodville, igniting a hazardous industrial fire requiring over 40 agencies from across East Texas to contribute to containing the fire.

## Texas A&M Forest Service (Wildfires Caused by Lightning)

Lightning occurrences and damage are not well documented in the NCEI data but other sources and accounts from the Core Planning Team members indicate that lightning strikes occur frequently in the planning area. The Texas A&M Forest Service maintains a wildfire occurrence database based on state and local reports. The local reports are based on a voluntary online fire department reporting system that is used by both paid and volunteer fire departments. Table 7-3 lists wildfires caused by lightning strikes recorded by the Texas Forest Service from 2005 to 2024 within the planning area.

Table 7-3: Wildfire Ignitions Caused by Lightning

| Location | Ignitions Caused By Lightning | Percentage of Fires |
|---|---|---|
| **Tyler County** | 86 | 6.2% |
| **Woodville*** | 1 | — |
| **Chester** | 1 | .07% |
| **Colmesneil** | 3 | .21% |
| **Ivanhoe** | 0 | 0% |

Source: Texas Wildfire Risk Assessment Portal (TWRAP) *Woodville Ignition Occurred in 2025, Outside Scope of TXWRAP Data

Lightning is believed to be responsible for 86 of the 1,385 (6.2%) of the recorded wildfire ignitions from 2005 through 2024, indicating that lightning is a substantial hazard for the planning area that has posed a significant source of compounding hazard events.

## Probability of Future Events

With limited reported incidents in the planning area, the team utilized the most current lightning flash density estimate developed by Vaisala for risk assessment. The most current lightning flash density estimate indicates a probability of occurrence of approximately 127.5 lightning events per square kilometer per year. Tyler County is 924.4 square miles or 23,94.2 square kilometers. The Vaisala flash density estimate combined with the total area produces an estimate of approximately 305,260 flashes per year. A Highly Likely probability of occurrence for future lightning events in the Tyler County planning area is supported by this frequency. This means that an event is probable in the next year.

| Frequency of Occurrence |
| --- |
| Highly likely: Event probable in next year. |
| Likely: Event probable in the next three years. |
| Occasional: Event possible in the next five years. |
| Unlikely: Event possible in next 10 years. |

## Vulnerability and Impacts

Lightning strikes are random, making all property and people within the Tyler County planning area vulnerable to the impact of lightning. Lightning can also be responsible for damage to buildings, electrical systems, forests, and/or wildfires, and damage to infrastructure such as power transmission lines and communication towers. Lightning is attracted to tall metal structures making water towers, electric power stations, and power poles particularly vulnerable to strikes. Lightning strikes can disrupt communication systems, including telephone and internet services, which can impact emergency response times and communication between businesses and customers. Lightning strikes can cause power outages that can affect large areas and cause disruption to businesses, transportation, and other essential services. The damage caused by lightning strikes can have a significant economic impact on cities, particularly in areas where businesses and tourism are major industries. Damage to buildings and electrical equipment can result in costly repairs and downtime. Lightning strikes can cause fires that can spread quickly and cause extensive damage to buildings and surrounding areas and are a cause of wildfires making agricultural land vulnerable as well. Agricultural losses from this hazard can be extensive.

Lightning strikes can also pose a risk to public safety, particularly in outdoor areas such as parks, sports fields, and other public spaces. The peak lightning season in the State of Texas is from June to August; however, the most fatalities occur in July as fatalities occur most often when people are outdoors, working, or participating in some form of recreation. Moving inside will decrease a person's vulnerability to injury or death due to lightning strikes.

Communities, especially school districts during outdoor sports seasons, can take steps to mitigate the impact of lightning strikes by implementing lightning protection systems, maintaining electrical infrastructure, and educating the public on lightning safety measures. Doing so can minimize the risks associated with lightning strikes and ensure the safety and well-being of their residents and visitors.

# SECTION 8: FLOODS

## Description

Floods are defined as the accumulation of water within a water body and the overflow of excess water into adjacent floodplain lands. When surface water runoff enters streams, rivers, or dry creek beds, riverine flooding conditions occur whenever the water carrying capacity of the water channel is compromised by excess runoff. Types of flooding include riverine flooding, coastal flooding, and shallow flooding. If the local basin drainage area is relatively flat, then slow-moving floodwater can last for days. In drainage areas with substantial slopes, or when the channel is narrow and confined, rapidly moving and extremely high-water conditions, called a flash flood, can occur.

Common impacts of flooding include damage to personal property, buildings, and infrastructure; bridge and road closures; service disruptions; and injuries and fatalities. In this report, historical damage from flooding is reported here and in Section 11 (along with other hurricane-related damages).

## Location

Flooding occurs in the studied and described floodplain, seen in the maps in this section, and also can occur in developed areas where stormwater management infrastructure is inadequate, resulting in surface water flooding often associated with tropical storms. The Tyler County Flood Damage Prevention Ordinance addresses fluvial or riverine flooding. The Flood Damage Prevention Ordinance was originally adopted on February 11th, 2008. Tyler County's Flood Damage Prevention Ordinance is a floodplain management regulation adopted under state authority to reduce loss of life and property from flooding. It applies to all mapped areas of special flood hazard in the county, using FEMA flood maps and studies (FIRM/FHBM and related Flood Insurance Studies) to define where the rules apply. The ordinance's purpose is to protect public health and welfare by limiting unsafe development in flood-prone areas, reducing public costs tied to flooding, and preventing development practices that increase flood heights, velocities, or floodplain obstruction.

Operationally, the ordinance requires a Floodplain Development Permit for development in regulated flood hazard areas and assigns a Floodplain Administrator to review permits, interpret map boundaries, coordinate watercourse changes, and maintain public records. For construction, it sets minimum standards for new construction, substantial improvements, and substantially damaged structures: buildings must be anchored, built with flood damage-resistant materials and methods, and designed to protect utilities and service equipment. Residential structures must elevate the lowest floor to or above the Base Flood Elevation (BFE); nonresidential structures must elevate or be professionally floodproofed and certified. Enclosures below elevated floors are limited in use and must include flood openings; additional requirements apply to manufactured homes (elevation/anchoring) and subdivisions/manufactured home parks (drainage and utilities standards). The Flood Insurance Rate Maps that are enforced by this ordinance are dated 4/04/2011 and only identify Zone A flood areas, without base flood elevation provided.

Table 8-1: Percentage of Tyler County Community in the 100 and 500 Year Floodplain

| Community | Floodplain Type | Percent of Community Area |
|---|---|---|
| Tyler County | 1% Annual | 19.9% |
| | .02% Annual | 21.3% |
| City of Woodville | 1% Annual | 18.35% |
| | .02% Annual | 19.9% |
| City of Ivanhoe | 1% Annual | 18.6% |
| | .02% Annual | 19.4% |
| City of Colmesneil | 1% Annual | 5.9% |
| | .02% Annual | 6.41% |
| City of Chester | 1% Annual | 12.9% |
| | .02% Annual | 13.8% |

We can see that the 100-year floodplain covers a significant portion of Tyler County as a whole. Just under 1/5 of the cities of Ivanhoe and Woodville are in the 100-year floodplain. Just over 1/8th of the City of Chester is within the 100-year floodplain, with Colmesneil having the lowest percentage at 5.9% of the city in the floodplain, or less than 1/116$^{th}$ of the total area. There are no existing critical facilities within the 100-year floodplain across any of the core participants of this plan, with the city of Ivanhoe having their City Hall and Police Department vulnerable to a 500-year flood.

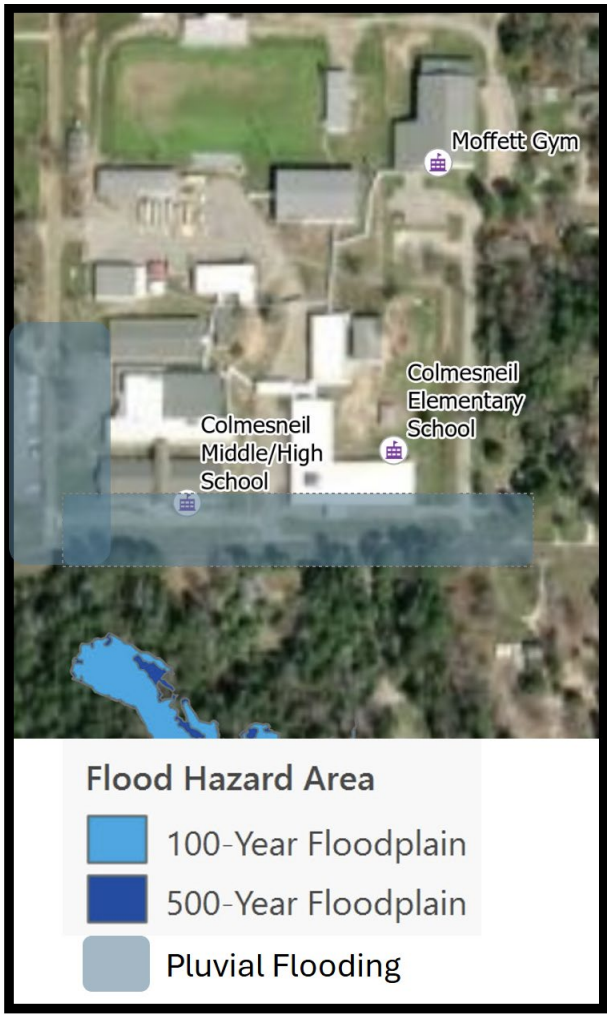
Table 8-2: Critical Facilities within the 100- and 500-Year Floodplain by Jurisdiction

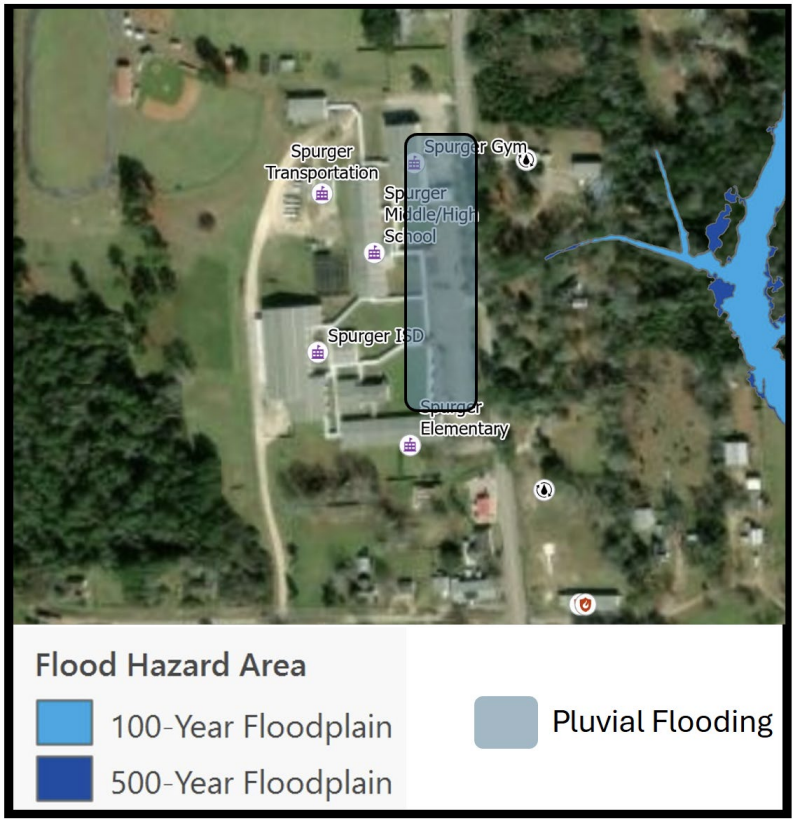
| Critical Facilities Within the Floodplain | | |
|---|---|---|
| **Community** | **1% Annual** | **.02% Annual** |
| Tyler County | None | None |
| City of Woodville | None | None |
| City of Ivanhoe | None | Ivanhoe City Hall Ivanhoe Police Department |
| City of Chester | None | None |
| City of Colmesneil | None | None |
| Woodville ISD | None | None |
| Chester ISD | None | None |
| Colmesneil ISD | None | None |
| Spurger ISD | None | None |
| Warren ISD | None | None |
| Chester WSC | None | None |

The incorporated cities of Woodville, Ivanhoe, Chester, and Colmesneil, as well as Tyler County, all have floodplains within their jurisdictional limits and can all experience the impacts of flooding. Chester WSC,, Chester ISD, Woodville ISD, and Warren ISD have no facilities within the floodplain and have no documented impacts of flooding across their campuses so flooding is not a hazard to be addressed for them in this plan.

While Colmesneil ISD and Spurger ISD facilities fall outside of the traditional floodplain, they experienced pluvial or surface water flooding caused by intense rainfall that overwhelms their existing drainage infrastructure, which creates problems with accessing the campus and disrupts school operations.

Figure 8-1: Colmesneil ISD Pluvial Flooding and Figure 8-2: Spurger ISD Pluvial Flooding



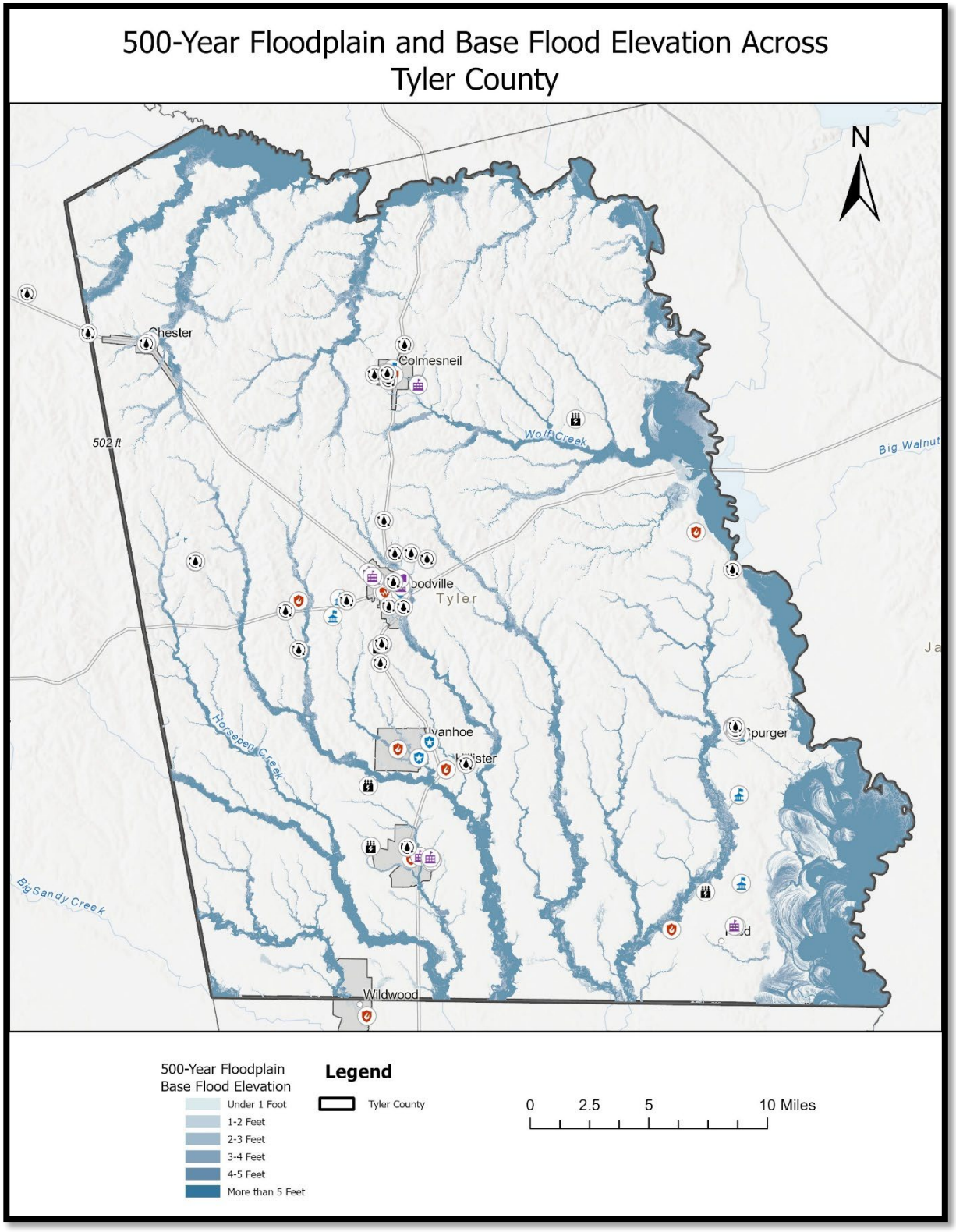



Figure 8-3: 500-year Floodplain and Base Flood Elevation Across Tyler County

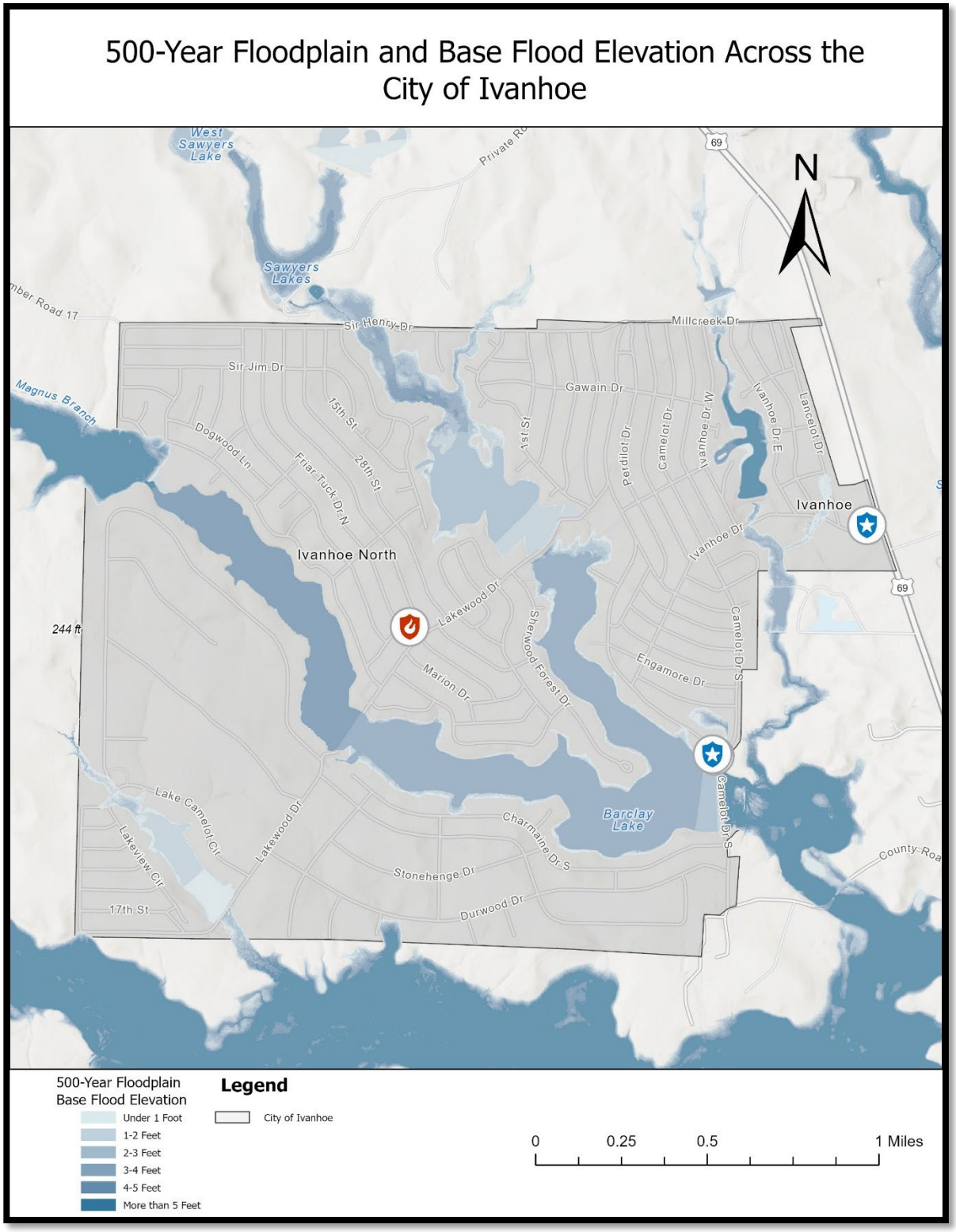



Figure 8-4: 500-year Floodplain and Base Flood Elevation Across the City of Ivanhoe with Critical Facilities

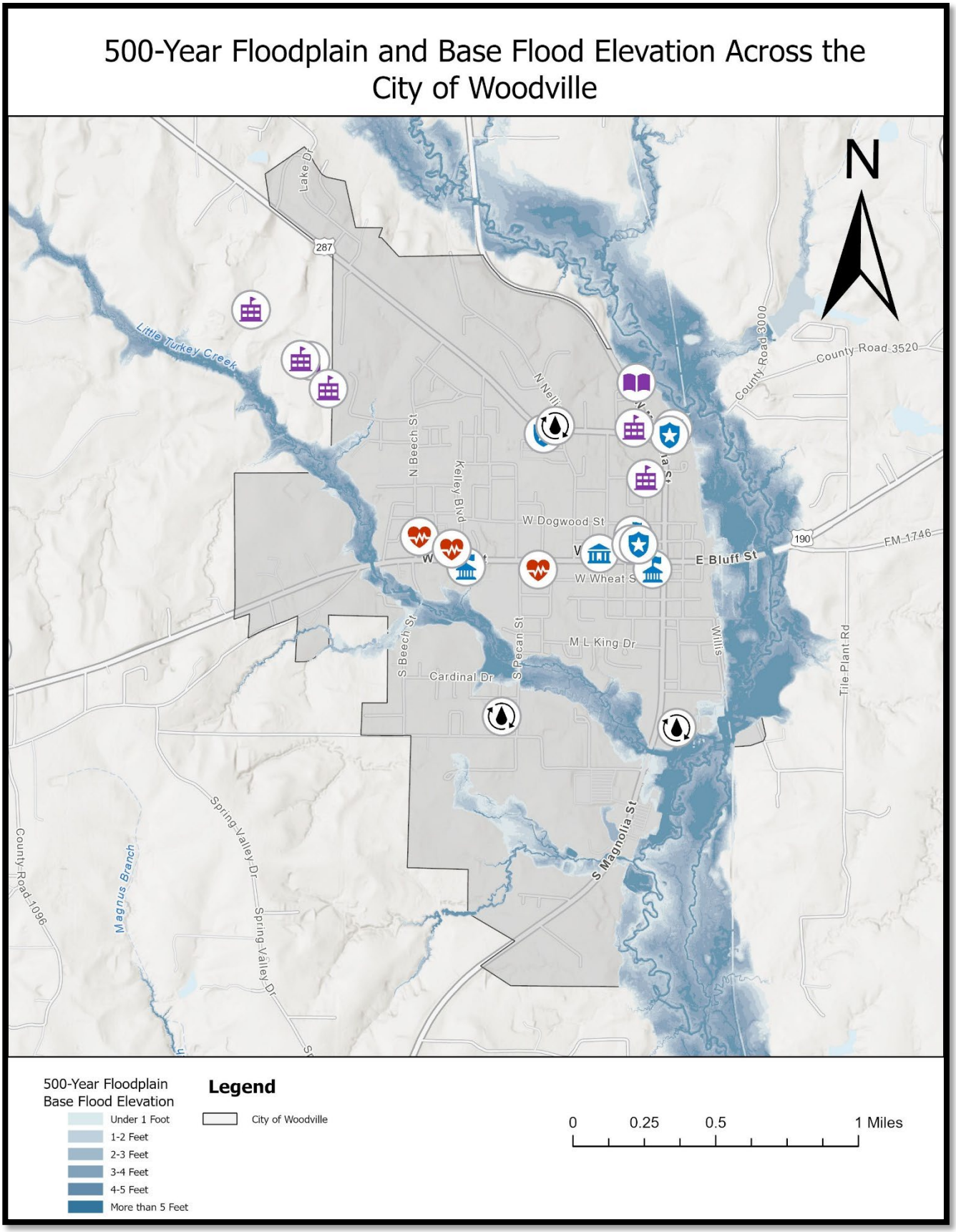



Figure 8-5: 500-year Floodplain and Base Flood Elevation Across the City of Woodville with Critical Facilities

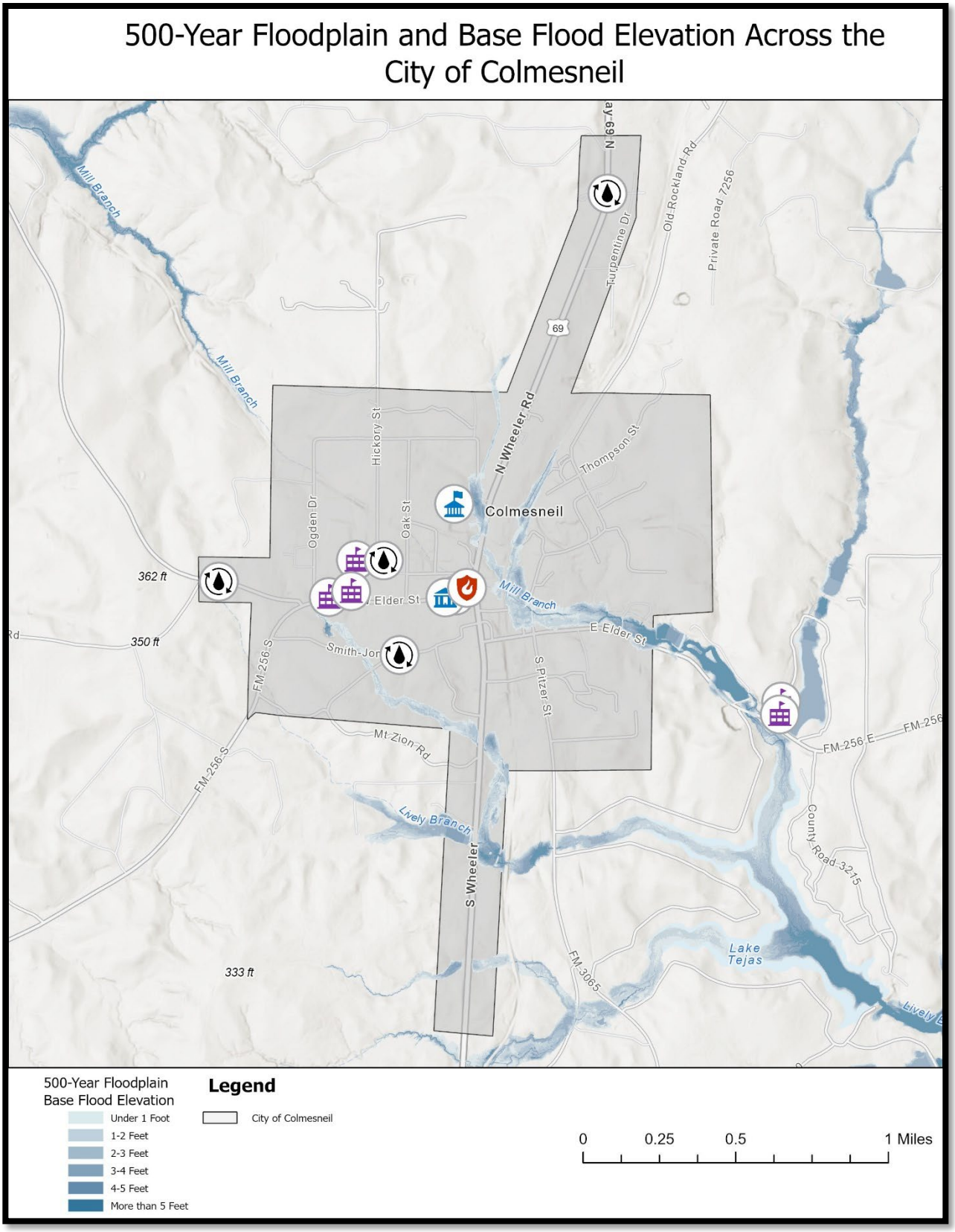



Figure 8-6: 500-year Floodplain and Base Flood Elevation Across the City of Colmesneil with Critical Facilities

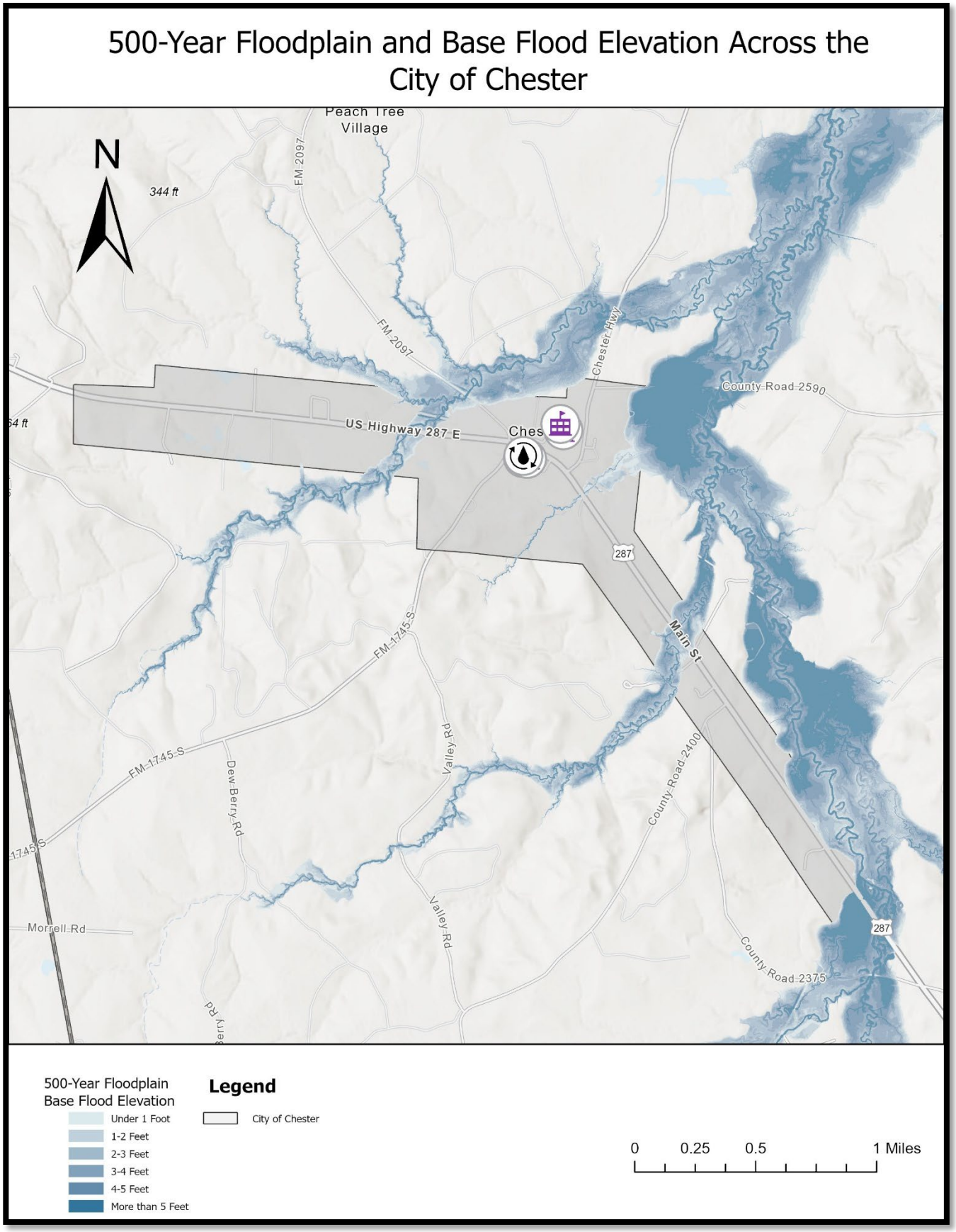



Figure 8-7: 500-year Floodplain and Base Flood Elevation Across the City of Chester with Critical Facilities

## Extent

Flood event severity is a complex science studied by hydrologists and engineers. The severity of a flood event is established by a combination of several factors, including stream and river basin topography and physiography, precipitation, weather patterns, recent soil moisture conditions, and degree of vegetative clearing and impervious surface. Urbanization, due to its relationship to increased impervious cover, contributes to flood severity. Based on historical occurrences, flood events can last anywhere from a couple of hours to several days. A flood zone provides a measure of a flood's intensity and magnitude. A base flood is defined by FEMA as a flood having a one percent chance of being equaled or exceeded in any given year. It is also known as the "100- year flood" or the "1% annual chance event". The base flood is the national standard used by the National Flood Insurance Program. Flood zones are delineated on Flood Insurance Rate Maps, and the depths of flooding can be interpreted from the summary data and profiles in the Flood Insurance Study. Flood depths may range from less than one foot to more than five feet in places, depending on the severity of the event (as measured in annual chance exceedance). Table 8-6 provides a description of FEMA flood zones and the flood impact in terms of severity or potential harm.

Table 8-6: FEMA Flood Zone Categories

| | |
|---|---|
| Floodway | A "Regulatory Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. Communities must regulate development in these floodways to ensure that there are no increases in upstream flood elevations. For streams and other watercourses where FEMA has provided Base Flood elevations (BFEs), but no floodway has been designated, the community must review floodplain development on a case-by-case basis to ensure that increases in water surface elevations do not occur or identify the need to adopt a floodway if adequate information is available. |
| Zone A | Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas, no depths or base flood elevations are shown within these zones. |
| Zone AE | Areas subject to inundation by the 1-percent-annual-chance flood event are determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply. |
| Zone AO | Areas subject to inundation by 1-percent-annual-chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between one and three feet. Average flood depths derived from detailed hydraulic analyses are shown in this zone. Mandatory flood insurance purchase requirements and floodplain management standards apply. |
| 0.2 SFHA | These are the areas that have a 0.2 percent chance of being equaled or exceeded in any given year. |
| Zone X | The areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 0.2-percent-annual-chance flood, are Zone X. |

As previously mentioned, Tyler County currently only enforces the 2011 FIRMs, which only identify Zone A flood areas. Data with the 500-year floodplain and base flood elevation is available, as seen in Figures 8-1 through 8-7, revealing the potential scale and magnitude of flooding in Tyler County.

## Historical Occurrences

Table 8-7: Historical Flood Events Across Tyler County

| Location | Date | Flood Type | Deaths | Injuries | Property Damage | Crop Damage |
|---|---|---|---|---|---|---|
| Woodville | 6/27/2004 | Flash Flood | 0 | 0 | $0 | $0 |
| Countywide | 9/24/2005 | Flash Flood | 0 | 0 | $10,000 | $0 |
| Hillister | 10/16/2006 | Flash Flood | 0 | 0 | $3,000 | $0 |
| Rockland | 10/16/2006 | Flash Flood | 0 | 0 | $3,000 | $0 |
| Fred | 10/16/2006 | Flood | 0 | 0 | $50,000 | $0 |
| Fred | 10/18/2006 | Flash Flood | 0 | 0 | $3,000 | $0 |
| Chester | 4/27/2009 | Flash Flood | 0 | 0 | $0 | $0 |
| Chester | 5/3/2009 | Flash Flood | 0 | 0 | $0 | $0 |
| Chester | 10/22/2009 | Flash Flood | 0 | 0 | $10,000 | $0 |
| Doucette | 10/30/2013 | Flash Flood | 0 | 0 | $40,000 | $0 |
| Woodville | 5/27/2015 | Flash Flood | 0 | 0 | $0 | $0 |
| Colmesneil | 5/27/2015 | Flash Flood | 0 | 0 | $5,000 | $0 |
| Dam Res | 3/10/2016 | Flash Flood | 0 | 0 | $14,000,000 | $0 |
| Dam Res | 3/10/2016 | Flood | 0 | 0 | $700,000 | $0 |
| Rockland | 5/27/2016 | Flash Flood | 0 | 0 | $25,000 | $0 |
| Dam Res | 5/27/2016 | Flood | 0 | 0 | $150,000 | $0 |
| Town Bluff | 6/1/2016 | Flood | 0 | 0 | $100,000 | $0 |
| Warren | 3/29/2018 | Flash Flood | 0 | 0 | $0 | $0 |
| Dam Res | 5/8/2019 | Flash Flood | 0 | 0 | $0 | $0 |
| Doucette | 10/14/2019 | Flash Flood | 0 | 0 | $100,000 | $0 |
| Warren | 4/10/2024 | Flash Flood | 0 | 0 | $0 | $0 |
| Warren | 4/29/2024 | Flash Flood | 0 | 0 | $5,000 | $0 |
| Chester | 5/2/2024 | Flash Flood | 0 | 0 | $0 | $0 |
| Fred | 5/2/2024 | Flash Flood | 0 | 0 | $0 | $0 |
| Warren | 5/2/2024 | Flash Flood | 0 | 0 | $0 | $0 |
| Warren | 5/5/2024 | Flash Flood | 0 | 0 | $0 | $0 |
| Spurger | 5/13/2024 | Flash Flood | 0 | 0 | $0 | $0 |
| Spurger | 5/16/2024 | Flash Flood | 0 | 0 | $0 | $0 |
| Warren | 4/21/2025 | Flash Flood | 0 | 0 | $0 | $0 |

Historical evidence indicates that areas within the planning area are susceptible to flooding, especially in the form of flash flooding. It is important to note that only reported flood events have been factored into this risk assessment; therefore, it is likely that additional flood occurrences have gone unreported before and during the recording period. Table 8-7 identifies historical flood events that resulted in damage, injuries, or fatalities within the planning area. Historical Data is provided by the Storm Prediction Center (NOAA), the NCEI database for Tyler County. There are no known events recorded past the listed dates.

## Significant Events

Communities across Tyler County have experienced severe flooding events throughout the period of analysis for this plan.

### *October 16th, 2006 – Flood - $50,000*

An abundance of atmospheric moisture and strong wind shear led to multiple tornadoes and widespread flash flooding across Southeast Texas. Over a two-day period, 12 to 16 inches of rainfall caused long-duration flooding in portions of Tyler County. The most significant impact occurred near the community of Fred, where several roadways were flooded and became impassable.

### *March 10th, 2016 - Flash Floods - $14,000,000*

A prolonged heavy rainfall event caused widespread flash flooding across Southeast Texas. Rainfall totals ranged from 5 to 20 inches, with the heaviest amounts occurring near Toledo Bend Reservoir. The excessive rainfall pushed lake levels to a record high of 174.36 feet, exceeding the previous record set in 1989. Flooding intensified on the morning of the 10th when 4 to 8 inches of rain fell in a short period, resulting in flooded roadways and damage to approximately 33 homes in Tyler County.

### *October 14th, 2019 – Flash Floods - $100,000*

Heavy rain totaling 5.28 inches caused isolated flash flooding in Tyler County, covering roads between Chester and Colmesneil.

## Probability of Future Events

FEMA states that flooding is the most common natural disaster in the United States, affecting every region and every state. Based on recorded historical occurrences and extent within the Tyler County planning area, 30 recorded flooding events in the 25-year reporting period provide a probability of at least one flood event per year. This frequency supports a **Highly Likely** probability of future events, meaning that an event is probable in the next year.

| Frequency of Occurrence |
|---|
| Highly likely: Event probable in next year. |
| Likely: Event probable in the next three years. |
| Occasional: Event possible in the next five years. |
| Unlikely: Event possible in next 10 years. |

## Vulnerability and Impacts

The flood hazard areas throughout Tyler County are subject to periodic inundation, which may result in loss of life and property, disruption of commerce and governmental services, and extraordinary public expenditures for flood protection and relief, all of which adversely affect public safety. Riverine Flooding has killed and injured more people than any other weather-related hazard and the greatest number of deaths is due to people driving into water going over roads. For this study, the location and proximity to the floodplain or SFHA determines a property's vulnerability to a flood. Structures that lie along the banks of a waterway are the most vulnerable and are often repetitive loss structures. Future development outside of a floodplain is encouraged, although there are some critical facilities, homes, and businesses already located in the floodplain due to their development before current floodplain regulations.

Flood losses are exacerbated by the cumulative effect of obstructions in floodplains. Occupancy of flood hazard areas is especially hazardous when development is inadequately elevated, flood-proofed, or otherwise protected from flood damage. Moreover, increased development in floodplains can increase flood heights and velocities making flooding more intense and widespread than predicted. Mitigation actions are included to address flood maintenance issues as well (Section 15), such as routinely clearing debris from roadside ditches and bridges. Expanding drainage culverts and stormwater structures to convey flood waters more adequately is critical to flood mitigation as well. Table 8-8 below shows Tyler County dollar losses from January 2000 through October 2025.

Table 8-8: Loss Summary

| Time Period | Fatalities | Injuries | Property Damage | Crop Damage |
|---|---|---|---|---|
| Loss Summary, Tyler County | | | | |
| 25-year Total | 0 | 0 | $15,204,000 | $0 |
| Per Year | 0 | 0 | $608,160 | $0 |
| Per Capita Dollar Losses (2024 ACS Pop) | | | | |
| 25-year Total | 0 | 0 | $739.49 | $0 |
| Per Year | 0 | 0 | $29.57 | $0 |

While the cities of Tyler County have almost certainly experienced flood damage, the only documented flood damage occurred in unincorporated Tyler County.

## National Flood Insurance Program (NFIP) Participation

Tyler County, in addition to all the municipal governments (Woodville, Ivanhoe, Chester, and Colmesneil), are participants in the National Flood Insurance Program. The NFIP protects businesses and homeowners from devastating losses in the event of a flood hazard. As an additional indicator of floodplain management responsibility, communities may choose to participate in FEMA's Community Rating System (CRS). This is an incentive-based program that allows communities to undertake flood mitigation activities that go beyond NFIP requirements. Currently, none of the communities in Tyler County participates in CRS. It is the purpose of all NFIP jurisdictions participating in the Hazard Mitigation Plan to continue to promote public health, safety, and general welfare by minimizing public and private losses due to flood conditions in specific areas. According to the NFIP Community Status Book and confirmed by the jurisdictions, all jurisdictions in this plan have adopted a Flood Damage Ordinance. They will continue to comply with NFIP requirements through their local permitting, inspection, and record-keeping requirements for new and substantially improved or damaged construction. Per the 2023 NFIP changes, the Substantial Damage Estimator and Repetitive Damage forms have been incorporated into the Subdivision Rules and Regulations. The Floodplain Administrator for unincorporated Tyler County and the City of Colmesneil is the Emergency Management Coordinator of Tyler County, in Woodville, the City Administrator is the Floodplain Administrator, and in Ivanhoe, it is the City Secretary. The City of Chester does not currently have a Floodplain Administrator, and this deficiency has been addressed through the city's mitigation actions. The City of Colmesneil's flood damage prevention ordinance names the Tyler County Emergency Management Coordinator as their Floodplain Administrator and both Tyler County and the City of Colmesneil have signed an interlocal agreement authorizing the transfer of floodplain administration responsibility from the City of Colmesneil to Tyler County OEM. Both documents can be found in Appendix H.

## Floodplain Management

The Flood Damage Prevention Ordinances for the County, and three municipalities Colmesneil, Woodville, and Ivanhoe, fully define and address bringing substantial improvement/ damage properties up to the most recent flood mitigation standards through the floodplain ordinance permitting process by requiring substantially improved or damaged properties to be elevated or mitigated according to the most recent flood map data. The Tyler County Commissioners' Court will also review building codes for flood resilience in the future and examine strategies to meet the most recent NFIP requirements for structural resilience in flood hazard areas. The city of Chester does not currently have an adopted Flood Damage Prevention Ordinance, and this deficiency has been addressed through the mitigation actions in Section 17.

Table 8-9 summarizes NFIP flood losses by NFIP community and reported (mailing) city within Tyler County, Texas. In unincorporated areas governed by Tyler County, 20 structures account for 47 flood losses across the reported cities of Colmesneil, Spurger, and Woodville. An additional 3 structures located within the City of Woodville account for 10 flood losses. County-wide, the total is 23 structures with 57 documented NFIP flood losses.

Table 8-9: Total Number of Repeat Structure Damages and Losses

| NFIP Community | Reported City | Number of Structures | Number of Losses |
|---|---|---|---|
| Tyler County | Colmesneil | 2 | 6 |
| Tyler County | Spurger | 5 | 10 |
| Tyler County | Woodville | 13 | 31 |
| Woodville | Woodville | 3 | 10 |
| County-Wide Total | | 23 | 57 |

Table 8-10 summarizes NFIP flood losses by reported city, NFIP community, and property type in Tyler County, Texas. Flood losses are concentrated primarily in single-family residential structures located in unincorporated areas governed by Tyler County, particularly in the city of Woodville. Fewer losses occur within the City of Woodville, with limited impacts to non-residential properties.

Table 8-10: List of Repeat Property Losses By Community

| City | NFIP Community Name | Property Type | Total Losses |
|---|---|---|---|
| Colmesneil | Tyler County | Single-family Residence | 3 |
| Colmesneil | Tyler County | Residential Mobile Home | 3 |
| Spurger | Tyler County | Single-family Residence | 2 |
| Spurger | Tyler County | Single-family Residence | 2 |
| Spurger | Tyler County | Single-family Residence | 2 |
| Spurger | Tyler County | Single-family Residence | 2 |
| Spurger | Tyler County | Non-residential Building | 2 |
| Woodville | Tyler County | Single-family Residence | 2 |
| Woodville | Tyler County | Single-family Residence | 4 |
| Woodville | Tyler County | Single-family Residence | 2 |
| Woodville | Tyler County | Single-family Residence | 2 |
| Woodville | Tyler County | Single-family Residence | 3 |
| Woodville | Tyler County | Single-family Residence | 2 |
| Woodville | Tyler County | Single-family Residence | 2 |
| Woodville | Tyler County | Single-family Residence | 2 |
| Woodville | Tyler County | Single-family Residence | 3 |
| Woodville | Tyler County | Single-family Residence | 3 |
| Woodville | Tyler County | Single-family Residence | 2 |
| Woodville | Tyler County | Single-family Residence | 2 |
| Woodville | Tyler County | Single-family Residence | 2 |
| Woodville | City of Woodville | Single-family Residence | 6 |
| Woodville | City of Woodville | Single-family Residence | 2 |
| Woodville | City of Woodville | Non-residential Building | 2 |

# SECTION 9: THUNDERSTORM WIND

## Description

Severe wind can occur as straight-line events (derechos), or with other natural hazards, including hurricanes and severe thunderstorms. According to the National Weather Service (NWS), a thunderstorm occurs when thunder accompanies rainfall. Thunderstorms create extreme wind events and are created when heat and moisture near the Earth's surface are transported to the upper levels of the atmosphere. The clouds, precipitation, and severe wind that become thunderstorms are the result of this process. Straight-line winds can have gusts of 87 knots (100 mph) or more and are responsible for most thunderstorm wind damages. One type of straight-line wind, the downburst, is a small area of rapidly descending air beneath a thunderstorm. A downburst can cause damage equivalent to a strong tornado and make air travel extremely hazardous.

## Location

Thunderstorms are unpredictable and can occur anywhere in the planning area. Tyler County, along with all participating jurisdictions, is equally at risk of thunderstorm winds. According to FEMA's Wind Zones map of the United States (Figure 9-1), the planning area falls under Wind Zone 3, which is associated with winds that can reach up to 200 mph. This area is also situated near the coast, making it vulnerable to hurricanes.

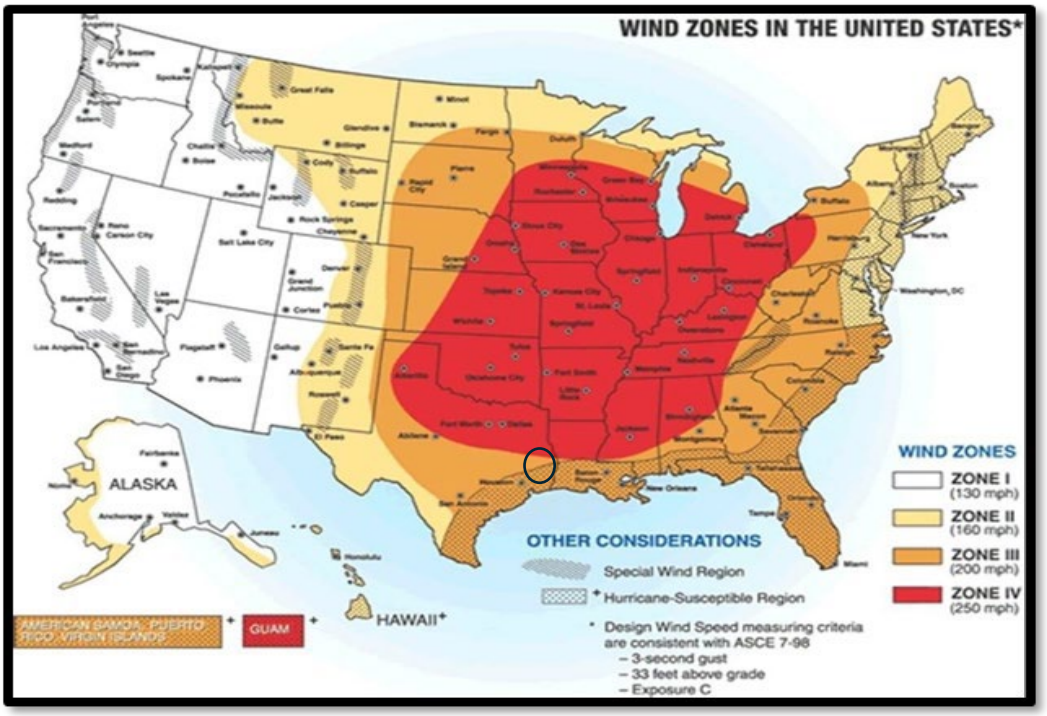



Figure 9-1: Wind Zones in the United States

## Extent

The extent or magnitude of a specific thunderstorm wind event is measured by the Beaufort Wind Scale, developed in 1805. Table 9-2 describes the Beaufort Wind Scale, with different intensities of wind events in terms of speed and effect, from calm to violent and destructive. Based on historical occurrences, the planning area is expected to experience a windstorm with a maximum magnitude of Beaufort Scale 12.

Table 9-2: Beaufort Wind Scale

**BEAUFORT WIND SCALE**

| Beaufort Number | Description | Wind speed | Wave height | Sea conditions | Land conditions | |
|---|---|---|---|---|---|---|
| 0 | Calm | < 1 knot<br>< 1 mph<br>< 2 km/h | 0 ft<br>0 m | Sea like a mirror | Smoke rises vertically |  |
| 1 | Light air | 1–3 knots<br>1–3 mph<br>2–5 km/h | 0–1 ft<br>0–0.3 m | Ripples | Direction shown by smoke drift |  |
| 2 | Light breeze | 4–6 knots<br>4–7 mph<br>6–11 km/h | 1–2 ft<br>0.3–0.6 m | Small wavelets | Wind felt on face |  |
| 3 | Gentle breeze | 7–10 knots<br>8–12 mph<br>12–19 km/h | 2–4 ft<br>0.6–1.2 m | Large wavelets | Leaves and small twigs in constant motion |  |
| 4 | Moderate breeze | 11–16 knots<br>13–18 mph<br>20–28 km/h | 3.5–6 ft<br>1–2 m | Small waves | Raises dust and loose paper |  |
| 5 | Fresh breeze | 17–21 knots<br>19–24 mph<br>29–38 km/h | 6–10 ft<br>2–3 m | Moderate waves | Small trees and leafs begin to sway |  |
| 6 | Strong breeze | 22–27 knots<br>25–31 mph<br>39–49 km/h | 9–13 ft<br>3–4 m | Large waves | Large branches in motion |  |
| 7 | High wind, moderate gale, near gale | 28–33 knots<br>32–38 mph<br>50–61 km/h | 13–19 ft<br>4–5.5 m | Sea heaps up | Whole trees in motion |  |
| 8 | Gale, fresh gale | 34–40 knots<br>39–46 mph<br>62–74 km/h | 18–25 ft<br>5.5–7.5 m | Moderately high waves | Twigs break off trees |  |
| 9 | Strong/severe gale | 41–47 knots<br>47–54 mph<br>75–88 km/h | 23–32 ft<br>7–10 m | High waves | Slight structural damage |  |
| 10 | Storm, whole gale | 48–55 knots<br>55–63 mph<br>89–102 km/h | 29–41 ft<br>9–12.5 m | Very high waves | Trees uprooted, considerable structural damage |  |
| 11 | Violent storm | 56–63 knots<br>64–72 mph<br>103–117 km/h | 37–52 ft<br>11.5–16 m | Exceptionally high waves | Widespread damage |  |
| 12 | Hurricane force | ≥ 64 knots<br>≥ 73 mph<br>≥ 118 km/h | ≥ 46 ft<br>≥ 14 m | Exceptionally high waves, sea is completely white | Devastation |  |

## Historical Occurrences

Historical occurrences of thunderstorm wind events with resulting damages that have impacted the Tyler County planning area are shown in Table 9-3 below. Only high wind events associated with thunderstorm winds are considered in this section. Wind damage associated with other hazards, such as tornadoes or hurricanes, is accounted for in other sections. From 2000-2025, there have been 77 thunderstorm wind events recorded in the NCEI storm events database that have impacted the Tyler County planning area. The NCEI, organized under the National Oceanic and Atmospheric Administration, is the largest archive available for climate data; however, it is important to note that only incidents and damages reported to the NCEI have been factored into this risk assessment. Some occurrences appear multiple times due to reports from various locations throughout the planning area. There have not been any events recorded past the listed dates.

Table 9-3: Historical Thunderstorm-Wind Events, 2000-2025

| Jurisdiction | Date | Magnitude | Deaths | Injuries | Property Damage | Crop Damage |
|---|---|---|---|---|---|---|
| Chester | 3/10/2000 | | 0 | 0 | $5,000 | $- |
| Colmesneil | 3/26/2000 | | 0 | 0 | $5,000 | $- |
| Spurger | 4/2/2000 | | 0 | 0 | $2,000 | $- |
| Colmesneil | 5/10/2000 | | 0 | 0 | $2,000 | $- |
| Woodville | 8/3/2000 | | 0 | 0 | $2,000 | $- |
| Colmesneil | 8/21/2000 | | 0 | 0 | $2,000 | $- |
| Spurger | 3/14/2001 | | 0 | 0 | $5,000 | $- |
| Woodville | 6/29/2001 | | 0 | 0 | $5,000 | $- |
| Colmesneil | 10/13/2001 | 50 | 0 | 0 | $5,000 | $- |
| Spurger | 11/26/2001 | | 0 | 0 | $5,000 | $- |
| Spurger | 12/16/2001 | | 0 | 0 | $20,000 | $- |
| Countywide | 4/8/2002 | | 0 | 0 | $10,000 | $- |
| Spurger | 7/7/2002 | | 0 | 0 | $5,000 | $- |
| Colmesneil | 8/27/2002 | | 0 | 0 | $2,000 | $- |
| Spurger | 8/27/2002 | | 0 | 0 | $2,000 | $- |
| Woodville | 3/18/2003 | 50 | 0 | 0 | $10,000 | $- |
| Woodville | 4/10/2004 | 50 | 0 | 0 | $2,000 | $- |
| Town Bluff | 6/2/2004 | 50 | 0 | 0 | $2,000 | $- |
| Colmesneil | 6/2/2004 | 50 | 0 | 0 | $2,000 | $- |
| Chester | 6/27/2004 | 50 | 0 | 0 | $2,000 | $- |
| Town Bluff | 8/28/2004 | 50 | 0 | 0 | $2,000 | $- |
| Woodville | 11/23/2004 | 50 | 0 | 0 | $50,000 | $- |
| Woodville | 4/29/2006 | 50 | 0 | 0 | $2,000 | $- |
| Woodville | 8/5/2006 | 50 | 0 | 0 | $5,000 | $- |
| Woodville | 11/10/2006 | 60 | 0 | 0 | $2,000 | $- |
| Hillister | 5/30/2007 | 50 | 0 | 0 | $2,000 | $- |

| | | | | | | |
|---|---|---|---|---|---|---|
| Woodville | 6/3/2007 | 50 | 0 | 0 | $2,000 | $- |
| Spurger | 6/4/2007 | 50 | 0 | 0 | $10,000 | $- |
| Town Bluff | 2/16/2008 | 50 | 0 | 0 | $2,000 | $- |
| Chester | 5/15/2008 | 50 | 0 | 0 | $5,000 | $- |
| Colmesneil | 8/3/2008 | 50 | 0 | 0 | $50,000 | $- |
| Hillister | 3/25/2009 | 50 | 0 | 0 | $3,000 | $- |
| Woodville | 6/3/2009 | 52 | 0 | 0 | $1,000 | $- |
| Woodville | 8/25/2009 | 52 | 0 | 0 | $1,000 | $- |
| Woodville | 5/17/2010 | 52 | 0 | 0 | $1,000 | $- |
| Woodville | 5/17/2010 | 52 | 0 | 0 | $1,000 | $- |
| Fred | 5/17/2010 | 52 | 0 | 0 | $1,000 | $- |
| Colmesneil | 10/11/2010 | 52 | 0 | 0 | $1,000 | $- |
| Colmesneil | 10/11/2010 | 52 | 0 | 0 | $5,000 | $- |
| Doucette | 6/12/2012 | 50 | 0 | 0 | $4,000 | $- |
| Doucette | 2/21/2013 | 52 | 0 | 0 | $- | $- |
| Colmesneil | 6/6/2013 | 50 | 0 | 0 | $3,000 | $- |
| Woodville | 3/28/2014 | 50 | 0 | 0 | $5,000 | $- |
| Milton | 3/28/2014 | 50 | 0 | 0 | $1,000 | $- |
| Hillister | 4/4/2014 | 50 | 0 | 0 | $15,000 | $- |
| Spurger | 4/24/2015 | 50 | 0 | 0 | $3,000 | $- |
| Woodville | 4/27/2015 | 50 | 0 | 0 | $3,000 | $- |
| Spurger | 5/25/2015 | 50 | 0 | 0 | $1,000 | $- |
| Hicksbaugh | 5/25/2015 | 50 | 0 | 0 | $1,000 | $- |
| Fred | 5/25/2015 | 50 | 0 | 0 | $- | $- |
| Colmesneil | 5/27/2015 | 50 | 0 | 0 | $5,000 | $- |
| Woodville | 5/27/2015 | 50 | 0 | 0 | $3,000 | $- |
| Woodville | 4/27/2016 | 60 | 0 | 1 | $20,000 | $- |
| Woodville Area | 5/27/2016 | 50 | 0 | 0 | $- | $- |
| Doucette | 3/29/2017 | 50 | 0 | 0 | $5,000 | $- |
| Woodville Area | 5/26/2018 | 50 | 0 | 0 | $10,000 | $- |
| Chester | 1/11/2020 | 50 | 0 | 0 | $1,000 | $- |
| Woodville | 5/11/2021 | 50 | 0 | 0 | $- | $- |
| Chester | 4/26/2023 | 50 | 0 | 0 | $2,000 | $- |
| Dam Res | 4/26/2023 | 65 | 0 | 0 | $4,000 | $- |
| Dam Res | 4/26/2023 | 50 | 0 | 0 | $- | $- |
| Town Bluff | 4/26/2023 | 50 | 0 | 0 | $2,000 | $- |
| Woodville | 8/27/2023 | 74 | 0 | 0 | $10,000 | $- |
| Colmesneil | 1/8/2024 | 50 | 0 | 0 | $3,000 | $- |
| Rockland | 4/28/2024 | 50 | 0 | 0 | $1,000 | $- |
| Dam Res | 4/28/2024 | 50 | 0 | 0 | $2,000 | $- |

| | | | | | | |
|---|---|---|---|---|---|---|
| Warren | 4/29/2024 | 50 | 0 | 0 | $1,000 | $- |
| Woodville | 5/16/2024 | 50 | 0 | 0 | $- | $- |
| Colmesneil | 5/30/2024 | 50 | 0 | 0 | $1,000 | $- |
| Hillister | 5/30/2024 | 50 | 0 | 0 | $- | $- |
| Colmesneil | 7/7/2024 | 50 | 0 | 0 | $4,000 | $- |
| Hillister | 7/17/2024 | 50 | 0 | 0 | $1,000 | $- |
| Warren | 12/28/2024 | 50 | 0 | 0 | $2,000 | $- |
| Colmesneil | 3/4/2025 | 69 | 0 | 0 | $- | $- |
| Colmesneil | 3/4/2025 | 50 | 0 | 0 | $1,000 | $- |
| Town Bluff | 3/4/2025 | 50 | 0 | 0 | $- | $- |
| Rockland | 5/26/2025 | 50 | 0 | 0 | $1,000 | $- |

## Significant Events

There have been four thunderstorm wind events that have each caused $20,000 or more in damage to Tyler County, but there have been an additional 73 thunderstorm wind events that have caused a total of $216,000 in damage to property in Tyler County from 2000 to 2025. Thankfully, recorded data indicate that there have been no deaths or injuries related to thunderstorm wind events in Tyler County.

### *Thunderstorm Winds – December 2001*

In mid-December of 2001, thunderstorm winds struck the unincorporated community of Spurger, destroying a barn, damaging the roof of a house, and destroying trees.

### *Thunderstorm Winds – November 2004*

In late November of 2004, thunderstorm winds struck Woodville, downing trees and damaging power lines across the city, resulting in $50,000 in damage.

### *Thunderstorm Winds – April 2016*

In late April of 2016, thunderstorm winds caused widespread tree and power line damage. One mobile home was significantly damaged, injuring one of the residents, and one building had its roof severely damaged and its windows blown out.

## Probability of Future Events

Thunderstorm season and the winds they bring are commonly associated with the rainy season of late spring and early summer. The months with the highest number of thunderstorm wind incidents are May with 18 incidents, April with 15 incidents, and March with 11 incidents. Wind events categorized as Forces 10-12 on the Beaufort Scale with hurricane-force winds have routinely impacted the area and is the level of windstorm hazard the area should mitigate for in the future. The Tyler County planning area has experienced, on average, three thunderstorm wind events every year, meaning that an event is **Highly Likely** within the next year for the planning area.

| Frequency of Occurrence |
|---|
| Highly likely: Event probable in the next year. |
| Likely: Event probable in the next three years. |
| Occasional: Event possible in the next five years. |
| Unlikely: Event possible in the next 10 years. |

## Vulnerability and Impacts

Thunderstorm winds exist at different strength levels and occur randomly throughout the planning area with the potential to cause injury and property damage. All people, animals, existing and future structures, and facilities in the Tyler County planning area could potentially be impacted and remain vulnerable to strong winds. A thunderstorm wind event can impact human health, including injuries from windblown debris, direct injuries, traffic accidents, and in rare cases, fatalities. Debris from damaged structures can also cause damage to other buildings not directly impacted by the event. Infrastructure, such as power lines, poles, radio towers, water towers, and streetlights are vulnerable to the impacts of severe thunderstorm winds. In addition, street signs, garbage cans, outdoor furniture, storage sheds, roofs, vehicles, trees, and other objects commonly found outdoors are at risk. While these vulnerabilities do exist, the overall impacts of thunderstorm wind are limited in scope and have not yet resulted in any reported injuries or fatalities.

Considering the percentage of mobile housing, based on the ACS 2023 data, unincorporated Tyler County is the most vulnerable, with 25% of all housing units classified as mobile homes. Regarding incorporated communities, Colmesneil and Ivanhoe are the most vulnerable, at 16.1% mobile homes in Colmesneil and 11.4% in Ivanhoe. Considering housing age, Chester is the most vulnerable, with 76.7% of all housing units built before 1980, with Colmesneil and Ivanhoe close in 2nd and 3rd with just under 50% of their housing stock built before 1980. These structures are likely to have been built to less stringent construction standards than newer construction and could be more susceptible to damage during significant events.

Table 9-4: Structures at Greatest Risk by Jurisdiction

| Jurisdiction | Total Housing Units | Mobile Housing Units | Housing Built Before 1980 |
|---|---|---|---|
| Tyler County | 9,499 | 1,862 | 3856 |
| Woodville | 1433 | 32 | 687 |
| Ivanhoe | 999 | 114 | 376 |
| Chester | 120 | 7 | 92 |
| Colmesneil | 317 | 51 | 156 |

*County totals include all jurisdictions, ISDs, and unincorporated areas. Source: 2023 ACS 5-year estimate

## Historic Thunderstorm Winds Impacts

Below is the Tyler County Loss Summary Table, 9-5, which shows the 25-year column totals and the average annual (Per Year) losses in these categories. The bottom half of each table shows per capita dollar loss rates for the total and average annual losses. These rates are important measures for comparing losses between different areas. The average annual loss estimate of property and crops is $14,240 in Tyler County.

Table 9-5: Tyler County Loss Summary

| Time Period | Fatalities | Injuries | Property Damage | Crop Damage |
|---|---|---|---|---|
| Loss Summary, Tyler County | | | | |
| 25-year Total | 0 | 0 | $356,000 | $0 |
| Per Year | 0 | 0 | $14,240 | $0 |
| Per Capita Dollar Losses (2024 ACS Pop) | | | | |
| 25-year Total | 0 | 0 | $17.31 | $0 |
| Per Year | 0 | 0 | $0.69 | $0 |

# SECTION 10: TORNADOS

## Description

A tornado is a narrow, violently rotating column of air that extends from the base of a cumulonimbus cloud to the ground. Tornadoes, among the most violent storms on the planet, are capable of tremendous destruction with wind speeds that can reach as high as 250-300 mph. Typically, the vortex of air will remain suspended in the atmosphere and be visible as a funnel cloud. If the lower tip of the vortex touches the ground, however, the path of the tornado will often leave destruction in its wake and can be more than one mile wide and 50 miles long. Supercell thunderstorms, created when horizontal wind shears (winds moving in different directions at different altitudes) begin to rotate the storm, can produce the most extreme and powerful tornadoes. The economic and financial impacts of a tornado event on a community can be devastating, depending on the scale of the event and the population density of the area that is hit. The damage caused in the aftermath of a tornado event can be minimized with collaborative preparedness and pre-event planning by the government, businesses, and citizens.

## Location

Tornadoes do not have any specific geographic boundary and can occur uniformly throughout the planning area. Tyler County is located in Wind Zone 3, where tornado winds can be as high as 200 mph.

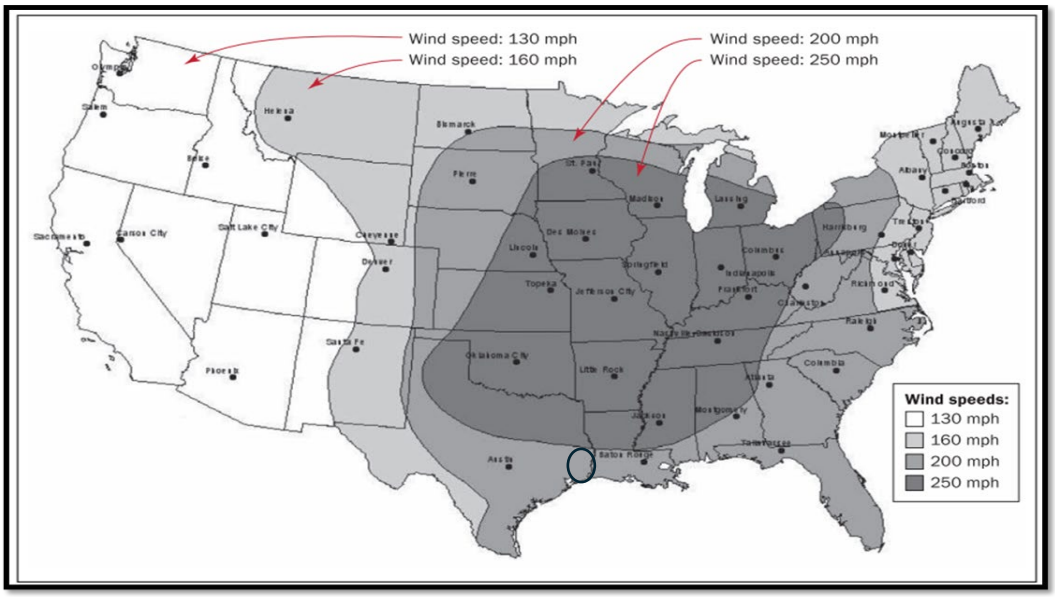



Figure 10-1: Wind Zones Across the Continental United States

Tornado Alley refers to an area in the southern plains of the central United States that experiences a higher-than-normal frequency of tornadoes each year due to weather patterns and geography. This area extends from central Texas to northern Iowa, and from central Kansas and Nebraska east to Western Ohio (Figure 10-2). Tornadoes in this region typically occur in late spring and occasionally in early fall. The Tyler County planning area is outside of the area known as tornado alley, but it is still prone to frequent tornado events.

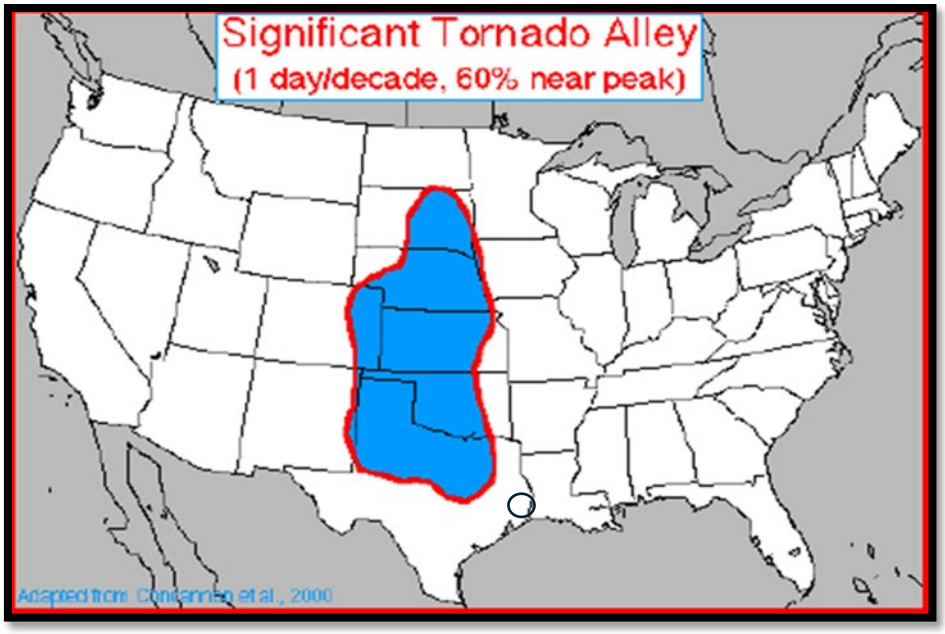
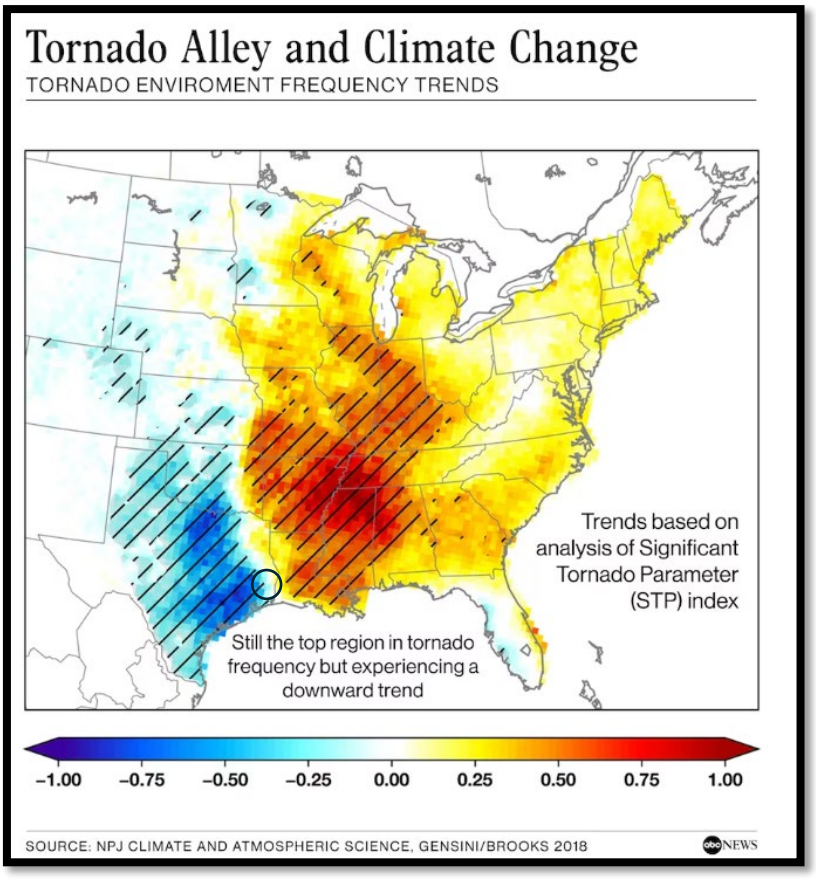



Figure 10-2: Historic Tornado Alley

Recent research indicates that with climate change, Tornado Alley is shifting away from the Midwestern United States and moving towards the Southern and Central East Coast slightly. Climate change will likely also lead to a shift when the peak of tornado season occurs in Southeast Texas. Tornados may be less likely to strike in the late Spring and Summer months, spanning from March through August ('Tornado Alley' Has Shifted, Study Says, Weather.com).

Figure 10-3: Tornado Alley Shifting with Climate Change



Tyler County is right on the edge of the areas of decreasing tornado frequency, indicating that tornadoes may become slightly less frequent in the future.

## Extent

Tornado events prior to 2007 follow the original Fujita Scale, Table 10-1. The current measure of the extent of tornado damage is the enhanced Fujita Scale and it took effect on February 1, 2007. The scale ranges from EF0, generally weak tornadoes with the ability to do minor damage, to EF5, tornadoes with winds in excess of 200 mph and the ability to do devastating damage to areas they come in contact with. Tornadoes can range from weak to violent and typically cause the greatest damage to structures of light construction, such as single-family, manufactured, and mobile homes.

Table 10-1 The Fujita Tornado Scale

| Scale | Wind speed estimate (mph) | Potential damage | Example of damage |
|---|---|---|---|
| **F0** | 40-72 | Light damage | Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged. |
| **F1** | 73-112 | Moderate damage | The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving vehicles pushed off the roads; attached garages may be destroyed. |
| **F2** | 113-157 | Significant damage | Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; high-rise windows broken and blown in; light-object missiles generated. |
| **F3** | 158-206 | Severe damage | Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forests uprooted; heavy cars lifted off the ground and thrown. |
| **F4** | 207-260 | Devastating damage | Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown, and large missiles generated. |
| **F5** | 261-318 | Incredible damage | Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile-sized missiles fly through the air farther than 100 meters (110 yards); trees debarked; steel-reinforced concrete structures badly damaged and skyscrapers toppled. |

Table 10-2: The Enhanced Fujita Tornado Scale Source: https://www.spc.noaa.gov/efscale/ef-scale.html

| Scale | Wind speed estimate (mph) | Potential Damage | Example of damage |
|---|---|---|---|
| **EF0** | 65–85 | Minor damage | Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over. Confirmed tornadoes with no reported damage (i.e., those that remain in open fields) are always rated EF0. |
| **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 | Considerable damage. Roofs torn off from well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off the 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 are badly damaged. |
| **EF4** | 166–200 | Devastating damage | Well-constructed and whole-frame houses are completely leveled; cars and other large objects are thrown, and small missiles are generated. |
| **EF5** | >200 | Incredible damage | Strong-framed, well-built houses leveled off foundations are swept away; steel-reinforced concrete structures are critically damaged; tall buildings collapse or have severe structural deformations; some cars, trucks, and train cars can be thrown approximately one mile (1.6 km). |

The Enhanced Fujita Scale has 28 Damage Indicators (DI), or types of structures and vegetation, each with a varying number of Degrees of Damage (DoD). Larger degrees of damage done to the damage indicators correspond to higher wind speeds. Each damage indicator has a unique Degree of Damage scale, summarized in Table 10-3. For example, the Degree of Damage scale for Damage Indicator 2, One and Two-family Residences, is depicted in Figure 10-3. For specific information for all of the Degree of Damages for the remaining Damage Indicators, refer to the National Oceanic and Atmospheric Administration website (http://www.spc.noaa.gov/faq/tornado/ef-scale.html).

Table 10-3: Degrees of Damage Scale

| DI No. | Damage Indicator (DI | Degree of Damage (DOD) |
|---|---|---|
| 1 | Small barns or farm outbuildings (SBO) | 8 |
| 2 | One- or two-family residences (FR12) | 10 |
| 3 | Manufactured home – single-wide (MHSW) | 9 |
| 4 | Manufactured home – double wide (MHDW) | 12 |
| 5 | Apartments, condominiums, townhouses [three stories or less] (ACT) | 6 |
| 6 | Motel (M) | 10 |
| 7 | Masonry apartment or motel building (MAM) | 7 |
| 8 | Small retail building [fast-food restaurants] (SRB) | 8 |
| 9 | Small professional buildings [doctor's office, branch banks] (SPB) | 9 |
| 10 | Strip mall (SM) | 9 |
| 11 | Large shopping mall (LSM) | 9 |
| 12 | Large, isolated retail building [K-Mart, Wal-Mart] (LIRB) | 7 |
| 13 | Automobile showroom (ASR) | 8 |
| 14 | Automobile service building (ASB) | 8 |
| 15 | Elementary school [single-story; interior or exterior hallways] (ES) | 10 |
| 16 | Junior or senior high school (JHSH) | 11 |
| 17 | Low-rise building [1–4 stories] (LRB) | 7 |
| 18 | Mid-rise building [5–20 stories] (MRB) | 10 |
| 19 | High-rise building [more than 20 stories] (HRB) | 10 |
| 20 | Institutional building [hospital, government, or university building] (IB) | 11 |
| 21 | Metal building system (MBS) | 8 |
| 22 | Service station canopy (SSC) | 6 |
| 23 | Warehouse building [tilt-up walls or heavy-timber construction (WHB) | 7 |

| | | |
|---|---|---|
| **24** | Electrical transmission lines (ETL) | 6 |
| **25** | Free-standing towers (FST) | 3 |
| **26** | Free-standing light poles, luminary poles, flag poles (FSP) | 3 |
| **27** | Trees: hardwood (TH) | 5 |
| **28** | Trees: softwood (TS) | 5 |

Typical Construction

- Asphalt shingles, tile, slate or metal roof covering
- Flat, gable, hip, mansard or mono-sloped roof or combinations thereof
- Plywood/OSB or wood plank roof deck
- Prefabricated wood trusses or wood joist and rafter construction
- Brick veneer, wood panels, stucco, EIFS, vinyl or metal siding
- Wood or metal stud walls, concrete blocks or insulating-concrete panels
- Attached single or double garage

| DOD* | Damage description | Exp** | LB | UB |
|---|---|---|---|---|
| 1 | Threshold of visible damage | 65 | 53 | 80 |
| 2 | Loss of roof covering material (<20%), gutters and/or awning; loss of vinyl or metal siding | 79 | 63 | 97 |
| 3 | Broken glass in doors and windows | 96 | 79 | 114 |
| 4 | Uplift of roof deck and loss of significant roof covering material (>20%); collapse of chimney; garage doors collapse inward or outward; failure of porch or carport | 97 | 81 | 116 |
| 5 | Entire house shifts off foundation | 121 | 103 | 141 |
| 6 | Large sections of roof structure removed; most walls remain standing | 122 | 104 | 142 |
| 7 | Exterior walls collapsed | 132 | 113 | 153 |
| 8 | Most walls collapsed in bottom floor, except small interior rooms | 152 | 127 | 178 |
| 9 | All walls collapsed | 170 | 142 | 198 |
| 10 | Destruction of engineered and/or well constructed residence: slab swept clean | 200 | 165 | 220 |

* DOD is degree of damage **Wind Speed values are in mph

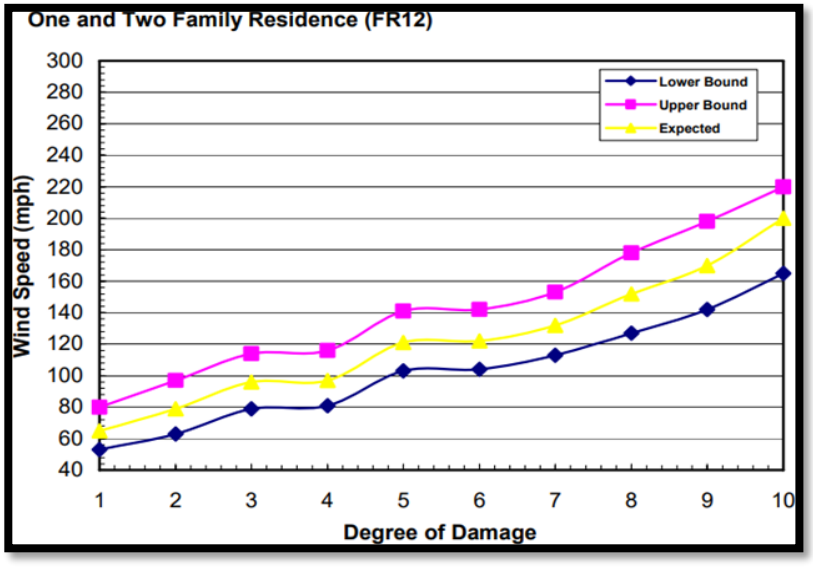



Figure 10-4: Degrees of Damage Scale

LB and UB are the lower bound and upper bound for wind speeds. The graph above (Figure 10-4) indicates the wind speeds of a tornado by the expected Degree of Damage.

The tornadic events in the Tyler County planning area have been between F0 and F1 pre-2007, and a maximum magnitude of EF1 post-2006 (Table 10-5, 10-6). However, because Tyler County is in Wind Zone III, the planning area could experience anywhere from an EF0 to an EF4. Therefore, the range of extent that the planning area would be expected to mitigate is a tornado that could cause minor to devastating damage, an EF0 to EF4.

## Significant Events

Table 10-4 lists historical tornado events in the planning area from 2000-2025 that were reported to the NCEI or NOAA. The impact of each tornado event in Tyler County is listed by date with additional impact information related to the specific jurisdiction of touchdown, the magnitude of the event, total dollar losses related to crop and property damage, injuries, and fatalities. There have not been any events recorded past the listed dates.

Table 10-4: Historical Tornado Events by Jurisdiction, 2000 – 2025

| Location | Date | Magnitude | Death | Injuries | Property Damage | Crop Damage |
|---|---|---|---|---|---|---|
| Fred | 11/23/2004 | F1 | 0 | 0 | $100,000 | $0 |
| Warren | 12/15/2007 | EF0 | 0 | 0 | $12,000 | $0 |
| Fred | 1/25/2012 | EF0 | 0 | 0 | $20,000 | $0 |
| Woodville Area | 12/21/2013 | EF1 | 0 | 0 | $20,000 | $0 |
| Town Bluff | 12/21/2013 | EF1 | 0 | 0 | $75,000 | $0 |
| Spurger | 12/27/2014 | EF1 | 0 | 0 | $15,000 | $0 |
| Woodville | 4/27/2016 | EF1 | 0 | 0 | $10,000 | $0 |
| Hillister | 3/29/2017 | EF1 | 0 | 0 | $60,000 | $0 |
| Hillister | 3/29/2017 | EF1 | 0 | 0 | $20,000 | $0 |
| Town Bluff | 5/19/2019 | EF1 | 0 | 0 | $50,000 | $0 |
| Hicksbaugh | 12/29/2022 | EF1 | 0 | 0 | $15,000 | $0 |
| Doucette | 3/4/2025 | EF1 | 0 | 1 | $25,000 | $0 |

Source: NCEI Storm Events Database and Local News Stories

Table 10-5: Historical Tornado Events Magnitude Summary, 2000 - 2006

| Number of Events | Magnitude (Fujita Scale) | | | | | | |
|---|---|---|---|---|---|---|---|
| | N/A | F0 | F1 | F2 | F3 | F4 | F5 |
| 1 | | | 1 | | | | |

Table 10-6: Historical Tornado Events Magnitude Summary, 2007-2024

| Number of Events | Magnitude (Fujita Scale) | | | | | | |
|---|---|---|---|---|---|---|---|
| | N/A | EF0 | EF1 | EF2 | EF3 | EF4 | EF5 |
| 11 | | 2 | 9 | | | | |

The locations of previous occurrences from 1967 through 2022 in the planning area are shown in Figure 10-5. This map displays historic tornado tracks, the distance traveled, and the direction they traveled. Only reported tornadoes were plotted and factored into the risk assessment; however, several occurrences have likely gone unreported over the past 67 years. Not all tornado paths were available in GIS form.

## Significant Events

### *F1 Tornado – 2004 - $100,000*

A tornado traveled from Hardin County through the southeastern corner of Tyler County, damaging trees, power lines, and a couple of homes.

### *EF1 Tornado – 2013 - $75,000*

A tornado touched down in Town Bluff, destroying trees, damaging a grocery store, and tearing off roof sheeting from the Corps of Engineers building, damaging some park amenities.

### *EF1 Tornado – 2017 - $60,000*

A tornado touched down in southern Ivanhoe and moved eastward, downing trees, significantly damaging a home, crushing an SUV, and doing minor damage to the siding of a handful of other homes.

Table 10-7: Tornado Categories and Associated Impacts

| Weak Tornadoes | Strong Tornadoes | Violent Tornadoes |
|---|---|---|
| 69% of all tornadoes | 29% of all tornadoes | 2% of all tornadoes |
| Less than 5% of tornado deaths | Nearly 30% of all tornado deaths | 70% of all tornado deaths |
| Lifetime 1-10+ minutes | May last 20 minutes or longer | Lifetime can exceed one hour |
| Winds less than 110 mph | Winds 110 – 205 mph | Winds greater than 205 mph |

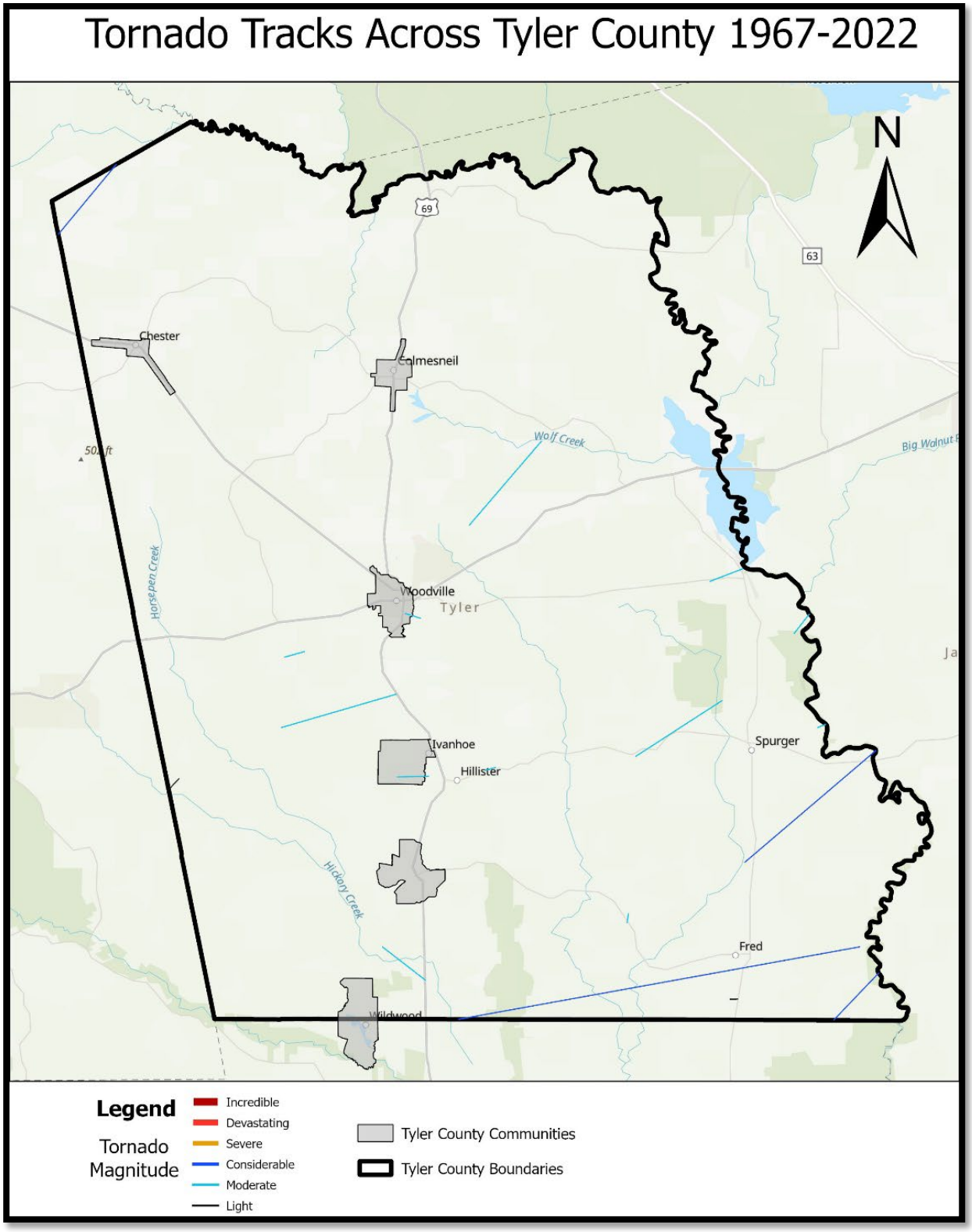



Fig 10-5: Tornado Tracks 1967-2022, Distance Travelled, Magnitude, and Direction

## Probability of Future Events

According to historical records, there were 12 events in a 25-year reporting period in the planning area. This provides a probability of occurrence of approximately once every two years for the Tyler County planning area. This frequency supports a **Highly Likely** probability of future events for the planning area, including all participating jurisdictions, meaning that an event is probable in the next year.

| Frequency of Occurrence |
|---|
| Highly likely: Event probable in next year. |
| Likely: Event probable in the next three years. |
| Occasional: Event possible in the next five years. |
| Unlikely: Event possible in next 10 years. |

## Vulnerability and Impacts

All existing and future buildings, facilities, and populations in the Tyler County planning area are considered to be vulnerable to tornadoes and could potentially be impacted. High wind velocity, wind-blown debris, lightning, and large hail are typically the cause of damage done by a tornado. The high winds and flying debris can cause roofs to collapse, windows to shatter, and walls to crumble. Tornadoes can also cause significant damage to buildings, roads, bridges, and other infrastructure in cities. First responders and those needing to evacuate an area may encounter blocked roads as a result of the debris, rendering some areas inaccessible or inescapable. Tornadoes can have a significant impact on the local economy as well, causing damage to businesses and homes, as well as disrupting transportation and causing productivity losses. The psychological trauma of experiencing a tornado, losing property or loved ones, or being displaced from one's home can have lasting effects on mental health.

Tornadoes pose a severe threat to communities as they often result in power outages, which could cause health and safety risks to vulnerable populations who rely on electricity for medical necessities, as well as patients in hospitals. Power outages can also disrupt electricity supply to neighborhoods and even entire cities, causing problems with heating, cooling, lighting, and communication. Anyone in the path of a tornado can incur serious injuries or even fatalities. Falling trees, branches, utility lines, poles, and flying debris pose safety risks, and people caught in the open or unable to take adequate cover are at the highest risk of injury or death. Certain buildings and structures are more prone to damage than others from the high wind velocity associated with tornado events. The three most susceptible types of structures to tornado damage are:

1. Manufactured Homes
2. Homes on crawlspaces (more susceptible to lift)
3. Buildings with large spans, such as shopping malls, gymnasiums, and factories

The Tyler County planning area features mobile and manufactured home parks. Because manufactured and temporary housing is located sporadically throughout rural portions of the planning area, they are not only vulnerable to tornado hazards but also more prone to being isolated from essential needs and emergency services in the event of a disaster. Additionally, any structures built prior to 1980 are likely to have been built to lower or less stringent construction standards than newer construction and may be more susceptible to damage during significant events.

Considering the percentage of mobile housing, based on the ACS 2023 data, unincorporated Tyler County is the most vulnerable, with 25% of all housing units classified as mobile homes. Regarding incorporated communities, Colmesneil and Ivanhoe are the most vulnerable, at 16.1% mobile homes in Colmesneil and 11.4% in Ivanhoe. Considering housing age, Chester is the most vulnerable, with 76.7% of all housing units built before 1980, with Colmesneil and Ivanhoe close in 2nd and 3rd with just under 50% of their housing stock built before 1980.

Table 10-8: Structures at Greater Risk by Jurisdiction

| Jurisdiction | Total Housing Units | Mobile Housing Units | Housing Built Before 1980 |
|---|---|---|---|
| Unincorporated Tyler County | 6,630 | 1,658 (25%) | 2545 (38.4%) |
| Woodville | 1433 | 32 (2.2%) | 687 (47.9%) |
| Ivanhoe | 999 | 114 (11.4%) | 376 (37.6%) |
| Chester | 120 | 7 (5.8%) | 92 (76.7%) |
| Colmesneil | 317 | 51 (16.1%) | 156 (49.2%) |

Source: 2023 ACS 5-year estimate

## Historic Tornado Impacts

The summary table, 10-9, shows the 25-year property and crop damage totals as well as the average annual (Per Year) losses summarizing historic tornado impacts. The bottom half of the table shows per capita dollar loss rates for the total and average annual losses. These rates are important measures for comparing losses between different hazards and areas. The average annual loss estimate of property and crops is $20.53 for Tyler County.

Table 10-9: Tyler County Loss Summary for Tornados

| Time Period | Fatalities | Injuries | Property Damage | Crop Damage |
|---|---|---|---|---|
| **Loss Summary, Tyler County** | | | | |
| 25-year Total | 0 | 1 | $422,000 | $0 |
| Per Year | 0 | < 1 | $16,880 | $0 |
| **Per Capita Dollar Losses** | | | | |
| 25-year Total | 0 | <1 | $20.53 | $0 |
| Per Year | 0 | <1 | $0.82 | $0 |

Since weather varies from year to year, forecasts of specific years are less likely to be true (less reliable) than these totals and averages for the period. The second summary table shows per capita dollar loss rates based on 2020 Census population counts. This is an important measure for comparing historical losses between different hazards and areas. Table 10-10 below displays the tornado losses by jurisdictions within the planning area.

Table 10-10: Tornado Losses by Jurisdiction 2000-2025

| Jurisdiction | Est. Prop. Losses | Est. Crop Losses | Total Est. Losses |
|---|---|---|---|
| Tyler County | $392,000 | $0 | $392,000 |
| Woodville | $30,000 | $0 | $30,000 |

*Unincorporated Areas, ISD, and other district losses are included in County Totals.

# SECTION 11: HURRICANES

## Description

A hurricane is an intense tropical weather system of strong thunderstorms with a well-defined surface circulation and maximum sustained winds of 74 mph or higher. Hurricanes, along with tropical storms and depressions, produce a variety of potential hazards, including damaging winds, coastal flooding due to storm surge, severe storms with heavy rainfall and high winds, and even tornadoes.

The information in this section covers historical damage within Tyler County associated with hurricanes, tropical storms, and depressions associated with severe winds. Tornadoes and flooding associated with tropical storms are in Chapters 10 and 8, respectively. Severe winds threaten the lives of community members, their property, and the vital utilities that mainly fail due to flying debris or downed trees and power lines. Severe winds typically cause the greatest damage to structures of light construction, particularly manufactured homes.

## Location

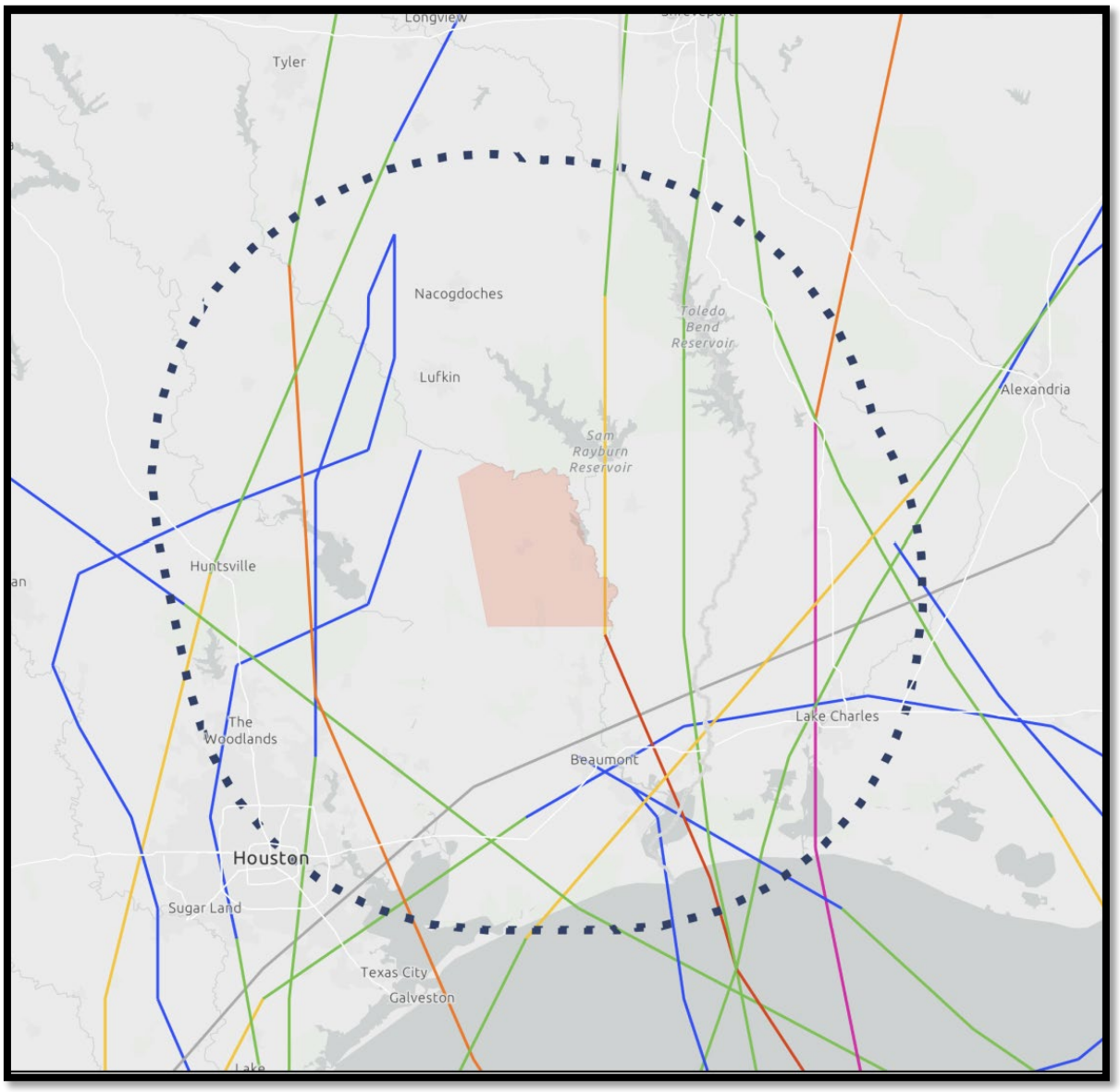
Hurricanes and tropical storms can occur throughout the planning area and are not confined to any geographic area; however, the likelihood of impact decreases the further a location is from the Texas coast. The southern edge of Tyler County is approximately 70 miles away from the Gulf of Mexico at its closest point and has experienced dozens of storms going back to the 1800s, although the hurricanes are often weakened compared to landfall strength. The table below lists hurricanes or tropical storm events with a storm track (center of the storm) that crossed the planning area, listed in order of the reported event date. Storm tracks are categorized according to the Saffir-Simpson wind intensity scale, with the category assigned as the magnitude of the storm when the storm track crossed within 60 NM of the planning area, given the wide area of impact of hurricanes.

Table 11-1: Hurricane/TS/TD Storm Track Events Table

| Storm Name | Date | Category |
|---|---|---|
| Unnamed | 8 Sep - 9 Sep, 2000 | Tropical Depression |
| Allison | 5 Jun - 19 Jun, 2001 | Tropical Depression |
| Ivan | 2 Sep - 24 Sep, 2004 | Tropical Depression |
| Rita | 18 Sep - 26 Sep, 2005 | Category 1 Hurricane |
| Humberto | 12 Sep - 14 Sep, 2007 | Category 1 Hurricane |
| Edouard | 3 Aug - 6 Aug, 2008 | Tropical Storm |
| Ike | 1 Sep - 15 Sep, 2008 | Tropical Storm |
| Cindy | 19 Jun - 24 Jun, 2017 | Tropical Storm |
| Harvey | 16 Aug - 2 Sep, 2017 | Tropical Storm |
| Barry | 10 Jul - 16 Jul, 2019 | Tropical Storm |
| Imelda | 17 Sep - 19 Sep, 2019 | Tropical Depression |
| Laura | 20 Aug - 29 Aug, 2020 | Category 4 to Category 2 Hurricane |
| Unnamed* | 9th Oct, 2020 | Tropical Storm |
| Beta | 17 Sep - 25 Sep, 2020 | Extratropical Storm |
| Nicholas | 12 Sep - 17 Sep, 2021 | Tropical Storm |
| Beryl | 28 Jun - 11 Jul, 2024 | Category 1 Hurricane |

The map below shows the historical tracks of hurricanes through the planning area from 2000 to 2025. The category assigned to each storm on the map is its magnitude at the time it crossed into Tyler County. Based on data provided by NOAA's National Climatic Data Center (NCDC) and the FEMA National Risk Index, Tyler County's hurricane risk is significant given the proximity to the Gulf and Atlantic coasts of the United States.

Figure 11-1: Historical Storm Tracks from 2000-2025



## Extent

For hurricanes, the extent can be expressed separately for flood, wind, and surge. Flooding is examined in Section 8, but storm surge is not an issue for Tyler County since it is located too far from the coast. For hurricane wind extent, the Saffir-Simpson Hurricane Wind Scale (SSHWS) is the scientific scale most often used to measure hurricane winds. The Saffir- Simpson Hurricane Wind Scale is a 1 to 5 rating based on a hurricane's sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage. Category 1 and 2 storms are still dangerous, however, and require preventative measures. Wind speeds range from 39-73 mph for Tropical Storms, and Tropical Depressions have wind speeds equal to or less than 38 mph.

Table 11-2: Saffir Simpson Wind Scale

| Category | Sustained Winds | Types of Damage Due to Hurricane Winds |
|---|---|---|
| 1 | 74-95 mph | Very dangerous winds will produce some damage. Well-constructed frame homes could have damage to roofs, shingles, vinyl siding, and gutters. Large branches of trees will snap, and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days. |
| 2 | 96-110 mph | Extremely dangerous winds will cause extensive damage. Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near to total power loss is expected with outages that could last from several days to weeks. |
| 3 (Major) | 111-129 mph | Devastating damage will occur. Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes. |
| 4 (Major) | 130-156 mph | Catastrophic damage will occur. Well-built framed homes can sustain severe damage with the loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted, and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months. |
| 5 (Severe) | 157 mph or higher | Catastrophic damage will occur. A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months. |

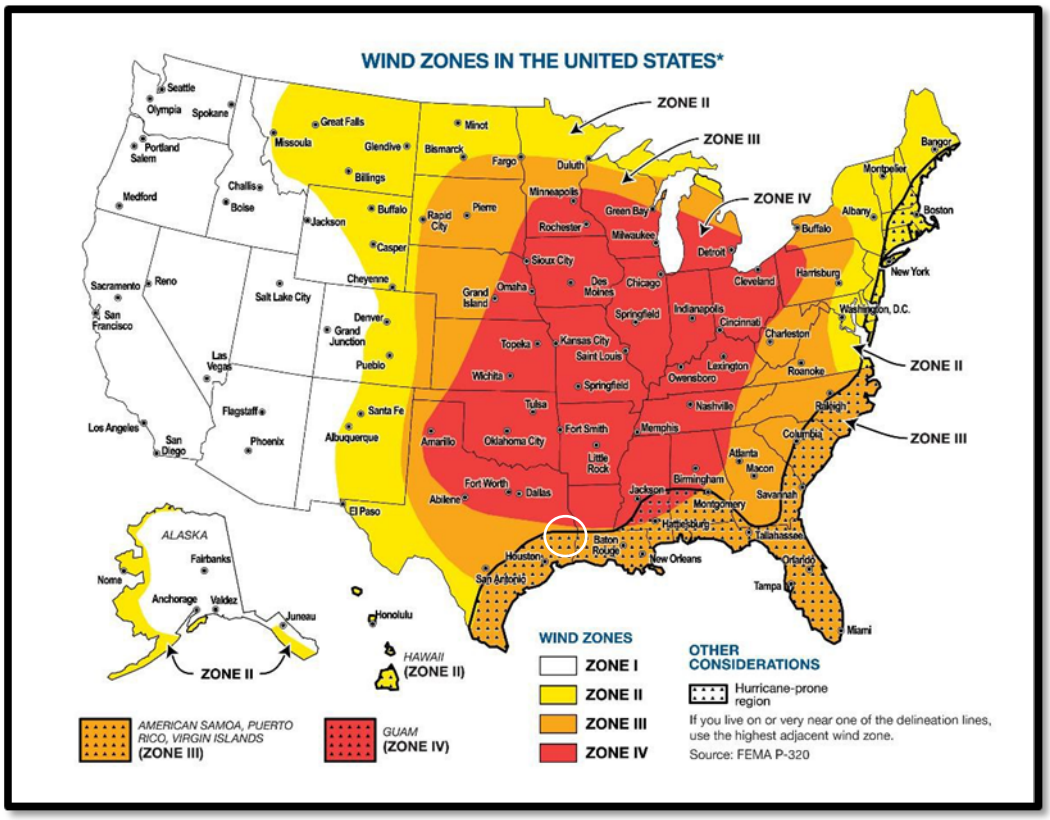



Figure 11-2: Wind Zones in the United States

According to the FEMA Wind Zones Map used to determine building standards, Tyler County is in a hurricane-prone region. Based on the past 25 years of hurricanes that impacted the Tyler County planning area, Hurricanes up to Category 4 are the extent of the hazard to be mitigated.

## Historical Occurrences

Hurricanes and Tropical Storms that had a direct path through the County planning area, as well as tracks that went through adjacent counties yet still impacted the County planning area, are identified in this section. Based on historical storm data provided by NOAA's National Climatic Data Center (NCDC), 65 tropical storms and hurricanes have occurred in the planning area since 1842. Table 11-3 below summarizes the storms and reported damages in the planning area. There have been other historically significant storms that will be discussed below.

Table 11-3: Hurricane and Tropical Storm Impacts

| Event Counts | Magnitude | Injuries | Fatalities | Property Damage | Crop Damage |
|---|---|---|---|---|---|
| 5 | Hurricane | 0 | 0 | $159,900,000 | $0 |
| 8 | Tropical Storm | 0 | 0 | $1,000,000 | $0 |
| 4 | Tropical Depression | 0 | 0 | $0 | $0 |
| | **Total** | 0 | 0 | $160,900,000 | $0 |

## Vulnerability and Impact

The proximity of Tyler County to the Texas Coast makes this area vulnerable to flooding from hurricane-brought rain and hurricane-force winds that cause damage across large areas. This exposes all buildings, facilities, and populations in the planning area equally to the impact of a hurricane or tropical storm. Damage to towers, trees, and underground utility lines from uprooted trees and fallen poles can cause damage to utility infrastructure, resulting in considerable disruption. Debris such as small items left outside, signs, roofing materials, and trees can become extremely hazardous in hurricanes and tropical storms, and fierce winds can easily destroy poorly constructed buildings, barns, and mobile homes. Hurricanes and tropical storms also produce copious amounts of rain increasing the risk of flooding. This rain can overwhelm drainage systems as hurricanes and tropical storms that have weakened after making landfall can continue to drop significant quantities of water. The impacts on communities from a Category 5 storm can result in the complete destruction of houses, commercial property, and cropland. This would result in large-scale economic impacts and population displacement. Warning time for hurricanes, however, has lengthened due to modern early warning technology allowing the community time to reduce the impact of tropical storms and hurricanes.

## Significant Events

There have been multiple historically significant events impacting Tyler County from 2000 through 2025: most notably Hurricane Rita (2005), Hurricane Ike (2008), Hurricane Harvey (2017), Hurricane Laura (2020), and Hurricane Beryl (2024), which are discussed further below.

## Historic Hurricane Impacts

### *Hurricane Rita – September 24th, 2005*

The Tyler County Historical Commission has Hurricane Rita as a pivotal point in county history. Tyler County was absolutely devastated, with countless trees downed and houses severely damaged, and power out for some parts of Tyler County for weeks. Through local determination and national support, Tyler County recovered with a stronger sense of community.

### *Hurricane Ike – September 13th, 2008*

As reported by the TEEX Hurricane Ike Impact Report, Hurricane Ike decimated Tyler County, with up to 80 MPH winds doing $47 million in property damage, destroying 21,000 acres of timberlands and costing the combined industries of Tyler County an approximate $33 million in economic damages.

### *Hurricane Harvey – August 28th, 2017*

Harvey produced 20 to 30 inches of rain, which flooded 1,730 homes. Major flooding occurred in Warren, Fred, and along the Neches River, where it had the 4th highest crest at Town Bluff. One death was a result of the flooding.

### *Hurricane Laura – August 26th, 2020*

Hurricane Laura was downgraded from a Category 4 to a Category 2 hurricane as it moved past Tyler County, resulting in over 40% of Tyler County losing power, with downed trees and power lines damaging countless homes and businesses, resulting in over $10 million in reported property damage.

### *Hurricane Beryl – July 8th, 2024*

Making landfall as a Category 1, Hurricane, Beryl was significantly less damaging to Tyler County than any of the previous storms discussed in depth. Northwest Tyler County experienced strong winds and rain, knocking down trees and power lines, resulting in over 1,000 residents losing power.

## Vulnerability

The Tyler County planning area features mobile and manufactured home parks, which are more vulnerable to hurricane winds than site-built structures. In addition, manufactured and temporary housing is located sporadically throughout rural portions of the planning area, which are more prone to being isolated from essential needs and emergency services in the event of a disaster.

Based on 2023 American Community Survey (ACS) estimates, there are 6,630 housing units in Tyler County of which 25%, or 1,658 units, are mobile or manufactured homes. In addition, 2,545 units or 38.4% of the housing units in the overall planning area were built before 1980. These structures are likely to have been built to less stringent standards than newer construction; therefore, they may be more susceptible to damage during significant events.

Table 11-4. Structures at Greater Risk by Jurisdiction

| Jurisdiction | Total Housing Units | Mobile Housing Units | Housing Built Before 1980 |
|---|---|---|---|
| Unincorporated Tyler County | 6,630 | 1,658 (25%) | 2545 (38.4%) |
| Woodville | 1433 | 32 (2.2%) | 687 (47.9%) |
| Ivanhoe | 999 | 114 (11.4%) | 376 (37.6%) |
| Chester | 120 | 7 (5.8%) | 92 (76.7%) |
| Colmesneil | 317 | 51 (16.1%) | 156 (49.2%) |

Source: 2023 ACS 5-year estimate

## Probability of Future Events

The probability of future events relies on measuring the number of previous occurrences of a hurricane or tropical storm event over the relevant time period. There have been 65 occurrences over the past 183 years, an average of one every two to three years, but 16 hurricane or storm events over the past 25 years, or an average of one every one to two years. This frequency provides a Highly Likely probability that a hurricane or tropical storm will impact some portion of the planning area in the next year.

| **Frequency of Occurrence** |
|---|
| Highly likely: Event probable in next year. |
| Likely: Event probable in next three years. |
| Occasional: Event possible in the next five years. |
| Unlikely: Event possible in next 10 years. |

# SECTION 12: SEVERE WINTER STORMS

## Description

A severe winter storm event is when temperatures hover below freezing, and precipitation includes freezing ice, snow, and sleet. Strong winds often accompany severe winter storms and combine with freezing precipitation to produce a low wind chill. Severe winter storms may include snowstorms, blizzards, cold waves, and ice storms. Snowstorms include four or more inches of snow in a 12-hour period. Blizzards are characterized by low temperatures and strong winds in excess of 35 mph with large amounts of drifting snow. A cold wave is a winter cold front with a drastic drop in temperature. An ice storm occurs when rain falls out of the warm and moist upper layers of the atmosphere into a cold and dry layer near the ground. The rain freezes on contact with the cold ground and accumulates on exposed surfaces. If a half inch of rain freezes on trees and utility wires, damage can occur, especially if accompanied by high winds. Half an inch is used as the criterion before an icing event is categorized as an "ice storm".

## Location

Severe winter storm events are not confined to specific geographic boundaries and vary in intensity and duration. All existing and future buildings, facilities, and populations in the Tyler County planning area are uniformly exposed to a winter storm hazard and could potentially be impacted.

Table 12-1: Winter Weather Alert Definitions

| | |
|---|---|
| Winter Weather Advisory | This alert may be issued for a variety of severe conditions. Weather advisories may be announced for snow, blowing or drifting snow, freezing drizzle, freezing rain, or a combination of weather events. |
| Winter Storm Watch | Severe winter weather is expected to affect the area. Freezing rain, sleet, or heavy snow may occur separately or in combination. |
| Winter Storm Warning | Severe winter weather conditions are extremely likely to occur within the next 12 hours. |
| Freezing Rain or Freezing Drizzle | Rain or drizzle is likely to freeze upon impact, resulting in a coating of ice glaze on roads and all other exposed objects. |
| Sleet | Small particles of ice are usually mixed with rain. If enough sleet accumulates on the ground, travel is hazardous. |
| Blizzard Warning | Sustained wind speeds of at least 35 mph are accompanied by considerable falling or blowing snow. This alert is the most perilous winter storm with visibility dangerously restricted. |
| Frost/Freeze warning | Below-freezing temperatures are expected and may cause significant damage to plants, crops, and fruit trees. |
| Wind Chill Warning | A strong wind combined with a temperature slightly below freezing can have the same chilling effect as a temperature nearly 50 degrees lower in a calm atmosphere. The combined effect is called the wind chill factor. Warnings are issued when the wind chill can pose a serious threat to life with very little outdoor exposure. |

## Extent

The extent or magnitude of a severe winter storm is measured on an intensity scale from "Mild" to "Severe" based on temperature ranges and snow accumulation levels. Table 12-2, Magnitude of Severe Winter Storms, is an index developed by the National Weather Service (NWS).

This table should be referenced with the wind chill factor, Table 12-1, to better determine the intensity of a winter storm. Based on past events, the planning area can expect to experience severe winter storms with extreme intensity in the future.

Table 12-2: Magnitude of Severe Winter Storms

| Intensity | Temperature Range F ˚ | Extent Description |
|---|---|---|
| **Mild** | - | Winds less than 10 mph and freezing rain or light snow falling for short durations with little or no accumulations. |
| **Moderate** | - | Winds 10 to15 mph and sleet and/or snow up to four inches. |
| **Significant** | - | Intense snow showers accompanied by strong gusty winds, between 15 and 20 mph, with significant accumulation. |
| **Extreme** | - | Wind-driven snow that reduces visibility, heavy winds (between 20 to 30 mph), and sleet or ice up to five millimeters in diameter. |
| **Severe** | Below | Winds of 35 mph or more and snow and sleet greater than four inches. |

Wind chill temperature is a measure of how cold the wind makes real air temperature feel to the human body. Since wind can dramatically accelerate heat loss from the body, a 30° day would feel just as cold as a calm day with 0° temperatures. Given the documented severe winter storms, with snow accumulation and below freezing temperatures, the extent to mitigate is Severe.

Figure 12-1 is a chart for calculating wind chill using the wind speed and air temperature. Please note that it is not applicable to calm winds or when the temperature is over 50°F.

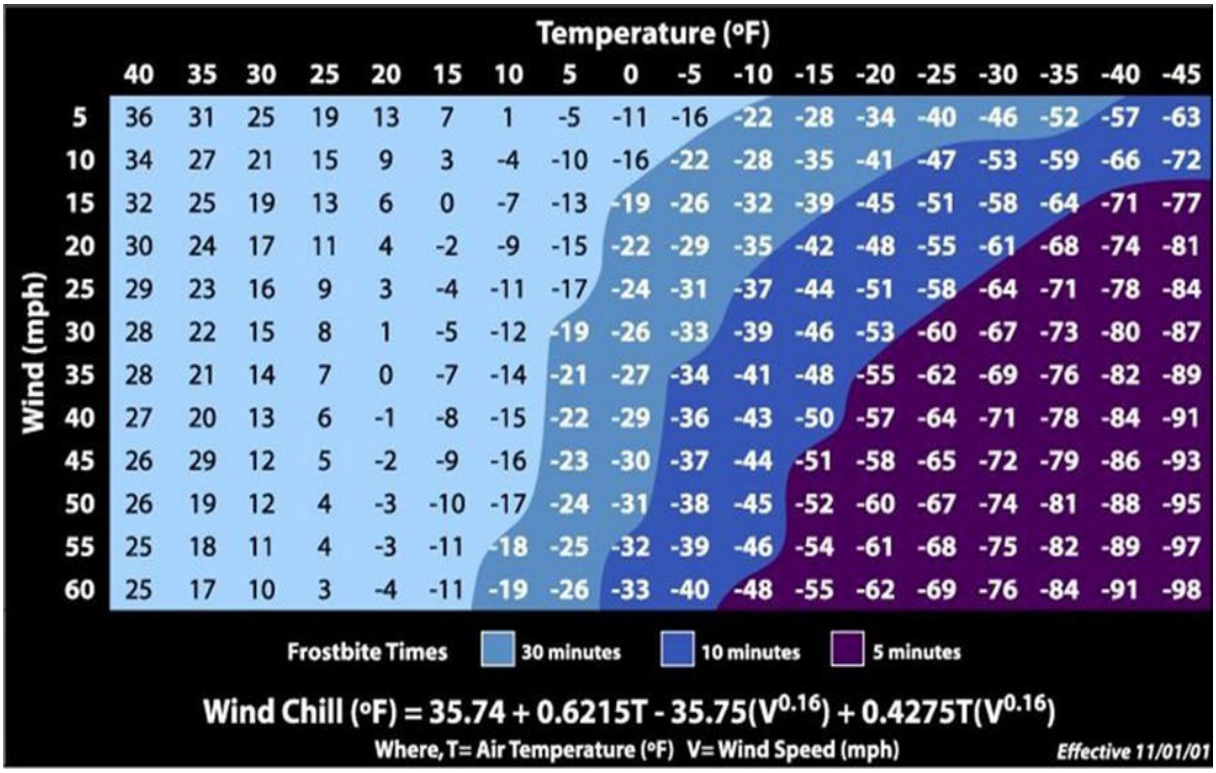



Figure 12-1: Wind Chill Index Considering Wind Speed and Temperature

## Significant Events

Based on NCEI data, from 2000 through October 2025, the Tyler County planning area experienced 14 severe winter events in the form of winter storms, winter weather, ice storms, and cold/wind chill events. No injuries or fatalities were reported for the following severe winter events.

### *Cold/Wind Chill – January 2010*

An Arctic cold front impacted Tyler County from January 7 to 9, 2010, producing the coldest temperatures since 1996. Prolonged freezing conditions caused school closures, plumbing failures, weather-related fires in the SETX area, and there were specific reports of sporadic power outages in Tyler County.

### *Winter Storm Uri – February 2021*

An arctic front brought Winter Storm Uri to Southeast Texas in mid-February, covering Tyler County in sleet, ice, and snow. With one to two inches of frozen rain, ice, and snow, most roads were hazardous and bridges and overpasses were closed. No fatalities were reported due to Uri.

Table 12–3: Historical Severe Winter Storms

| Date | Event Type | Fatalities | Injuries | Property Damage | Crop Damage |
|---|---|---|---|---|---|
| 12/11/2008 | Winter Weather | 0 | 0 | $0 | $0 |
| 12/4/2009 | Winter Storm | 0 | 0 | $0 | $0 |
| 1/8/2010 | Cold/Wind Chill | 0 | 0 | $50,000 | $0 |
| 2/11/2010 | Winter Weather | 0 | 0 | $0 | $0 |
| 2/23/2010 | Winter Storm | 0 | 0 | $0 | $0 |
| 2/3/2011 | Winter Weather | 0 | 0 | $5,000 | $0 |
| 1/23/2014 | Winter Storm | 0 | 0 | $0 | $0 |
| 1/28/2014 | Winter Weather | 0 | 0 | $0 | $0 |
| 3/4/2014 | Ice Storm | 0 | 0 | $0 | $0 |
| 12/7/2017 | Winter Weather | 0 | 0 | $0 | $0 |
| 1/16/2018 | Winter Weather | 0 | 0 | $0 | $0 |
| 2/14/2021 | Winter Storm | 0 | 0 | $0 | $0 |
| 2/17/2021 | Ice Storm | 0 | 0 | $0 | $0 |
| 1/21/2025 | Winter Storm | 0 | 0 | $0 | $0 |
| Total | | 0 | 0 | $55,000 | $0 |

## Probability of Future Events

According to historical records, the Tyler County planning area experiences approximately one extreme winter weather event every 1-2 years. The probability of a future winter storm event occurring in the planning area is **Highly Likely**, with a winter storm likely to occur within the next year.

| Frequency of Occurrence |
|---|
| Highly likely: Event probable in next year. |
| Likely: Event probable in next three years. |
| Occasional: Event possible in the next five years. |
| Unlikely: Event possible in next 10 years. |

## Vulnerability and Impacts

All infrastructure, critical facilities, populations, and buildings in the Tyler County planning area are vulnerable to severe winter events. Winter weather, such as ice hazards and extremely cold temperatures, as well as snow, presents a risk to the planning area.

Populations of people and animals are subject to direct health risks from extended exposure to cold air and precipitation. Animals, such as pets and livestock, typically cannot survive the effects of direct exposure to severe winter weather and should be provided with shelter. In addition, house fires can occur more frequently during winter storm events due to increased and improper use of alternative heating sources, which can cause injury or death. Moreover, house fires during winter storms present a greater danger because some areas may not be easily accessible due to icy roads, and water supplies may freeze and impede firefighting efforts. The people most at risk of the effects of severe winter storms are children younger than five and older adults over 65. Vulnerable populations are at greater risk of death from hypothermia during these events, especially in the rural areas of the county where populations are sparse, icy roads may impede travel, and there are fewer neighbors to check in on the elderly.

The planning area has a total population of 20,560 according to the 2023 ACS population estimate. Those over the age of 65 represent 6.8% (1,407) of the total population, and children under the age of 5 represent 6.8% (1,407) of the total population. The total population of the county that is estimated to be below the poverty level is 17% (3,495). Table 12-4 presents the 2023 American Community Survey population and age cohort estimates below.

Table 12-4: Populations at Greater Risk by Jurisdiction

| Jurisdiction | Population Estimate | Youth | Elderly | Below Poverty Level |
|---|---|---|---|---|
| Tyler County | 20,560 | 1,407 (6.8%) | 3,592 (17.5%) | 3,495 (17.0%) |
| Woodville | 2,884 | 95 (3.3%) | 651 (22.6%) | 440 (15.3%) |
| Ivanhoe | 1,619 | 37 (2.3%) | 414 (25.6%) | 469 (29.0%) |
| Chester | 200 | 5 (2.5%) | 55 (27.5%) | 16 (8.0%) |
| Colmesneil | 697 | 47 (6.7%) | 137 (19.7%) | 150 (21.5%) |

*Based On 2023 5-Year ACS Estimates

Public and private infrastructure is also vulnerable to severe winter storms. These events can disrupt electric service for long periods of time. In addition, extended periods of freezing temperatures can cause water pipes to freeze and crack. The buildup of ice can cause power lines and tree limbs to break under weight, potentially causing damage to property or the electric grid. During these times of ice and snow accumulation, response times will increase until public works road crews are able to clear roads of ice, snow, and other obstructions.

## Historic Severe Winter Storm Impacts

A total of $55,000 of property damage was reported over the 25-year period of analysis, but the true financial impact is likely higher due to unreported property damage.

# SECTION 13: HAIL

## Description

Hail is showery precipitation in the form of irregular pellets or balls of ice that typically measure 0.2 inches and six inches in diameter. It is a particularly damaging form of frozen precipitation resulting from thunderstorms, with the size of the hail being a direct result of the size and severity of the storms. Hail is produced when warm air rapidly rises into the upper atmosphere and the air mass is cooled. Frozen droplets within the cooled air mass accumulate to form ice crystals that then fall to the Earth as precipitation. The strength of the updraft is dependent on heating on the surface of the Earth with larger temperature gradients between the upper atmosphere and the surface responsible for increased suspension time and, therefore, increased hailstone size.

## Location

Hailstorms are not confined to any specific geographic location and can vary greatly in size, location, intensity, and duration. As a result, all areas within the Tyler County planning area are equally at risk of hail.

## Extent

The NCEI Intensity Scale, depicted in Table 13-1, shows how the intensity category of a hailstorm depends on hail size and the potential damage it could cause. The intensity scale ranges from H0 to H10, with increments of intensity or damage potential in relation to hail size (distribution and maximum), texture, fall speed, speed of storm translation, and strength of the accompanying wind. The National Weather Service (NWS) classifies a storm as "severe" if there is hail one inch in diameter (approximately the size of a quarter) or greater, based on radar intensity or as seen by observers. Based on historical data, hail of up to 2.5 inches can be expected in the planning area.

Table 13-1: Hail Intensity and Magnitude

| Size Code | Intensity Category | Size (Diameter Inches) | Descriptive Term | Typical Damage |
|---|---|---|---|---|
| H0 | Hard Hail | Up to 0.33 | Pea | No damage |
| H1 | Potentially Damaging | 0.33 - 0.60 | Marble | Slight damage to plants and crops |
| H2 | Potentially Damaging | 0.60 - 0.80 | Dime | Significant damage to plants and crops |
| H3 | Severe | 0.80 - 1.2 | Nickel | Severe damage to plants and crops |
| H4 | Severe | 1.2 - 1.6 | Quarter | Widespread glass and auto damage |
| H5 | Destructive | 1.6 - 2.0 | Half Dollar | Widespread destruction of glass, roofs, and risk of injuries |
| H6 | Destructive | 2.0 - 2.4 | Ping Pong Ball | Aircraft bodywork dented and brick walls pitted |

| | | | | |
|---|---|---|---|---|
| H7 | Very Destructive | 2.4 - 3.0 | Golf Ball | Severe roof damage and risk of serious injuries |
| H8 | Very Destructive | 3.0 - 3.5 | Hen Egg | Severe damage to all structures |
| H9 | Super Hailstorms | 3.5 - 4.0 | Tennis Ball | Extensive structural damage could cause fatal injuries |
| H10 | Super Hailstorms | 4.0 + | Baseball | Extensive structural damage could cause fatal injuries |

The Tyler County area may experience hailstorms ranging from an H0 to an H7 based on previous occurrences for the area discussed further below. The Core Team can plan to mitigate storms ranging from hard hail (low risk) to very destructive hailstorms (high risk), the latter potentially leading to widespread destruction of glass and roofs, and the potential risk of injuries. Given that climate change is likely to make hailstorms more intense in the future, and the largest hailstone size documented is 2.5 inches, preparing for an H7-magnitude hailstorm, with hail up to three inches is recommended.

## Historical Occurrence

Historical evidence for Tyler County suggests that the entire planning area is vulnerable to hail events. Historical events with reported damage, injuries, or fatalities are shown in Table 13-2 below. A total of 64 reported historical hail events impacted Tyler County during the 25-year period from 2000 through 2025. These reported events may not represent all hail events that have occurred during this time since they were only the events reported to the NCEI and NOAA databases. There have not been any events recorded past the listed dates.

Table 13-2: Historical Hail Events in Tyler County (2000-2025)

| Community | Date | Hail Size | Injuries | Deaths | Property Damage | Crop Damage |
|---|---|---|---|---|---|---|
| Colmesneil | 3/10/2000 | 0.75 | 0 | 0 | 0 | 0 |
| Woodville | 3/18/2000 | 1.75 | 0 | 0 | 0 | 0 |
| Woodville | 3/21/2000 | 1 | 0 | 0 | 0 | 0 |
| Woodville | 8/3/2000 | 0.75 | 0 | 0 | 0 | 0 |
| Spurger | 6/27/2001 | 1.75 | 0 | 0 | 0 | 0 |
| Spurger | 11/26/2001 | 0.75 | 0 | 0 | 0 | 0 |
| Warren | 11/28/2001 | 1.75 | 0 | 0 | 0 | 0 |
| Chester | 11/28/2001 | 1 | 0 | 0 | 0 | 0 |
| Woodville | 12/30/2002 | 0.75 | 0 | 0 | 0 | 0 |
| Chester | 2/21/2003 | 0.75 | 0 | 0 | 0 | 0 |
| Rockland | 2/4/2004 | 0.75 | 0 | 0 | 0 | 0 |
| Fred | 4/10/2004 | 1.75 | 0 | 0 | 0 | 0 |
| Warren | 5/1/2004 | 0.88 | 0 | 0 | 0 | 0 |
| Woodville | 10/4/2004 | 1 | 0 | 0 | 0 | 0 |
| Fred | 10/4/2004 | 0.75 | 0 | 0 | 0 | 0 |
| Colmesneil | 11/21/2004 | 0.88 | 0 | 0 | 0 | 0 |
| Woodville | 11/23/2004 | 1 | 0 | 0 | 0 | 0 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Colmesneil | 3/19/2005 | 0.75 | 0 | 0 | 0 | 0 |
| Rockland | 3/22/2005 | 0.75 | 0 | 0 | 0 | 0 |
| Chester | 5/25/2005 | 0.88 | 0 | 0 | 0 | 0 |
| Woodville | 5/2/2006 | 0.88 | 0 | 0 | 0 | 0 |
| Colmesneil | 5/14/2006 | 1 | 0 | 0 | 0 | 0 |
| Fred | 5/14/2006 | 1.75 | 0 | 0 | 0 | 0 |
| Warren | 11/10/2006 | 1 | 0 | 0 | 0 | 0 |
| Colmesneil | 5/3/2007 | 0.88 | 0 | 0 | 0 | 0 |
| Colmesneil | 6/4/2007 | 0.75 | 0 | 0 | 0 | 0 |
| Doucette | 6/4/2007 | 1 | 0 | 0 | 0 | 0 |
| Spurger | 6/4/2007 | 0.75 | 0 | 0 | 0 | 0 |
| Doucette | 4/12/2009 | 0.75 | 0 | 0 | 0 | 0 |
| Warren | 5/26/2009 | 0.75 | 0 | 0 | 0 | 0 |
| Woodville | 8/25/2009 | 1 | 0 | 0 | 0 | 0 |
| Woodville | 8/25/2009 | 1.75 | 0 | 0 | 0 | 0 |
| Fred | 8/25/2009 | 0.88 | 0 | 0 | 0 | 0 |
| Hillister | 10/11/2010 | 1 | 0 | 0 | 0 | 0 |
| Fred | 4/26/2011 | 1 | 0 | 0 | 0 | 0 |
| Warren | 2/11/2013 | 1 | 0 | 0 | 0 | 0 |
| Hillister | 2/11/2013 | 1 | 0 | 0 | 0 | 0 |
| Spurger | 6/13/2014 | 1 | 0 | 0 | 0 | 0 |
| Chester | 10/12/2014 | 1.75 | 0 | 0 | 0 | 0 |
| Fred | 4/27/2015 | 1 | 0 | 0 | 0 | 0 |
| Chester | 7/4/2015 | 1 | 0 | 0 | 0 | 0 |
| Chester | 4/26/2017 | 1.75 | 0 | 0 | 0 | 0 |
| Town Bluff | 4/26/2017 | 1 | 0 | 0 | 0 | 0 |
| Warren | 5/3/2017 | 1.75 | 0 | 0 | 0 | 0 |
| Warren | 5/3/2017 | 1.75 | 0 | 0 | 0 | 0 |
| Spurger | 5/3/2017 | 1 | 0 | 0 | 0 | 0 |
| Rockland | 3/18/2018 | 1 | 0 | 0 | 0 | 0 |
| Woodville | 5/26/2018 | 1.75 | 0 | 0 | 0 | 0 |
| Spurger | 2/26/2019 | 1.75 | 0 | 0 | 0 | 0 |
| Fred | 5/9/2019 | 0.88 | 0 | 0 | 0 | 0 |
| Woodville Area | 4/19/2020 | 1.5 | 0 | 0 | 0 | 0 |
| Hicksbaugh | 5/11/2021 | 1 | 0 | 0 | 0 | 0 |
| Warren | 4/15/2023 | 2.5 | 0 | 0 | 0 | 0 |
| Rockland | 4/15/2023 | 1.5 | 0 | 0 | 0 | 0 |
| Chester | 4/26/2023 | 1 | 0 | 0 | 0 | 0 |
| Chester | 4/26/2023 | 1.25 | 0 | 0 | $5,000 | 0 |
| Woodville Area | 2/11/2024 | 1 | 0 | 0 | 0 | 0 |
| Warren | 2/11/2024 | 1 | 0 | 0 | 0 | 0 |
| Spurger | 2/11/2024 | 1 | 0 | 0 | 0 | 0 |
| Spurger | 2/11/2024 | 1.75 | 0 | 0 | 0 | 0 |
| Doucette | 4/9/2024 | 1.75 | 0 | 0 | 0 | 0 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Chester | 5/9/2024 | 2.5 | 0 | 0 | 0 | 0 |
| Colmesneil | 5/9/2024 | 1 | 0 | 0 | 0 | 0 |
| Colmesneil | 5/9/2024 | 2 | 0 | 0 | 0 | 0 |

Figure 13-1: Historical Hailstorms Across Tyler County

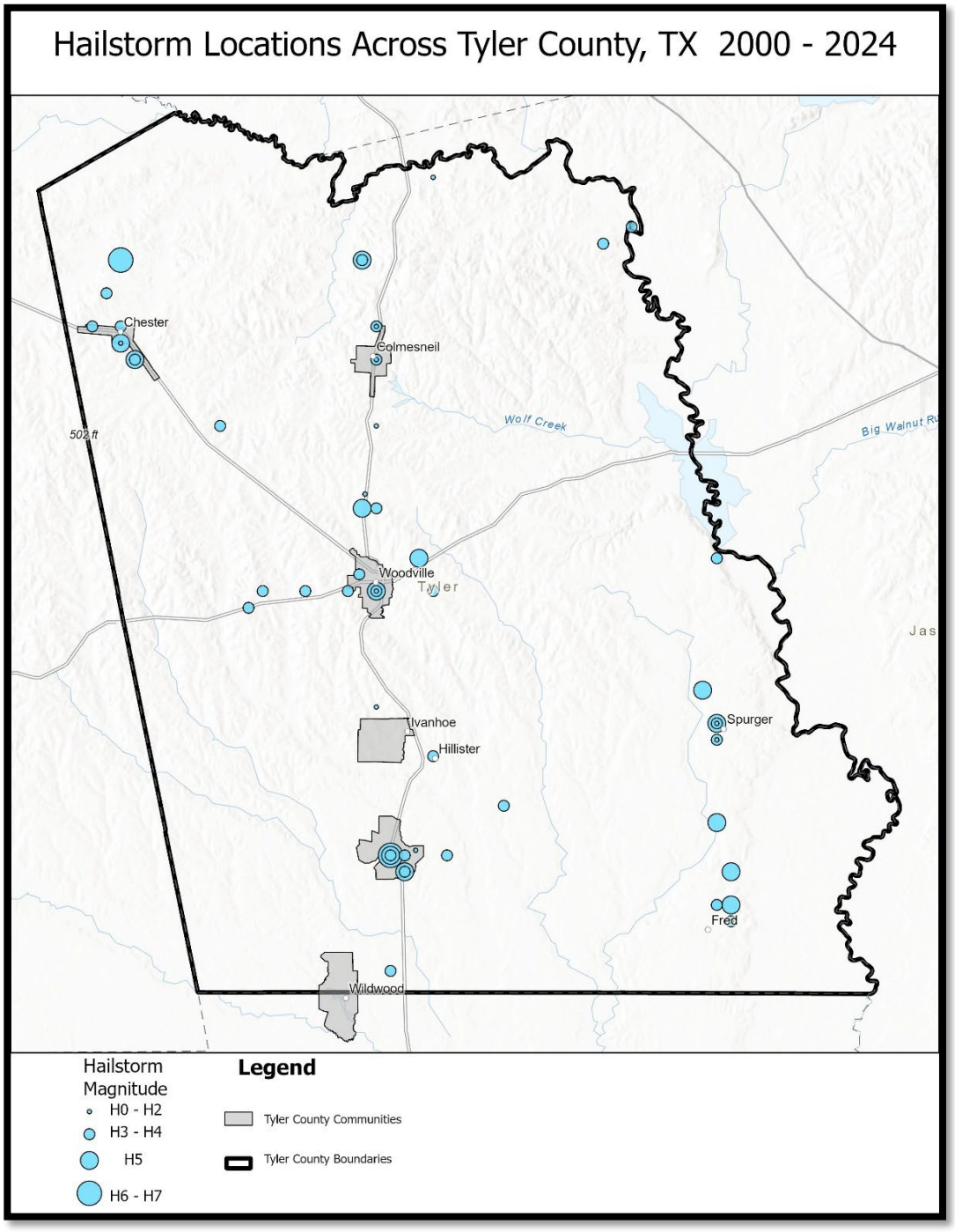


Figure 13-1 above plots this historical evidence by locating past hail events in the Tyler County planning area, where latitude and longitude were available.

## Significant Events

While there have been no documented deaths or injuries related to hailstorms in Tyler County, hailstorms over the past 25 years have caused $5,000 in damage. Given that it is just damage reported that reached the NCEI, the true financial impact of hailstorms is likely significantly greater. All reported hailstorms have been at H7 magnitude or lower.

## Probability of Future Events

Based on available records of historic events, there were 64 events in a 25-year reporting period for the Tyler County planning area. This provides a probability of, on average, 2-3 storms per year. This frequency supports a **Highly Likely** probability of future events, meaning that an event is probable somewhere in the planning area in the next year.

| Frequency of Occurrence |
|---|
| Highly likely: Event probable in next year. |
| Likely: Event probable in next three years. |
| Occasional: Event possible in the next five years. |
| Unlikely: Event possible in next 10 years. |

## Vulnerability and Impacts

Hail can cause significant injury to humans and has been fatal in some circumstances. People could be struck by hail, falling trees, and branches. Also, hail could cause power outages, which could cause health and safety risks to more vulnerable populations in the planning area. The most common impacts of hailstorms are on crops, trees, and landscaping, since even small hail can tear plants apart in a short amount of time. Vehicles, roofs of buildings, and homes are also commonly damaged by hail. Older structures not built to current codes may be more susceptible to hail damage than newer structures. HVAC and electrical service systems, particularly those on roofs, at schools, and critical facilities would be vulnerable and could also be damaged.

The Tyler County planning area features mobile and manufactured home parks, which are more vulnerable to hailstorms than site-built structures. In addition, manufactured and temporary housing is located sporadically throughout rural portions of the planning area, which are also vulnerable to the hailstorm hazard and more prone to being isolated from essential needs and emergency services in the event of a disaster. Also, structures built prior to 1980 are likely to have been built to lower or less stringent construction standards than newer construction and may be more susceptible to damage during significant events.

Table 13-3: Structures at Greater Risk by Jurisdiction

| Jurisdiction | Total Housing Units | Mobile Housing Units | Housing Built Before 1980 |
|---|---|---|---|
| Unincorporated Tyler County | 6,630 | 1,658 (25%) | 2545 (38.4%) |
| Woodville | 1433 | 32 (2.2%) | 687 (47.9%) |
| Ivanhoe | 999 | 114 (11.4%) | 376 (37.6%) |
| Chester | 120 | 7 (5.8%) | 92 (76.7%) |
| Colmesneil | 317 | 51 (16.1%) | 156 (49.2%) |

*County totals include all jurisdictions, ISDs, and unincorporated areas. Source: 2023 ACS 5-year estimate

Considering the percentage of mobile housing, based on the ACS 2023 data, unincorporated Tyler County is the most vulnerable, with 25% of all housing units classified as mobile homes. Regarding incorporated communities, Colmesneil and Ivanhoe are the most vulnerable, at 16.1% mobile homes in Colmesneil and 11.4% in Ivanhoe. Considering housing age, Chester is the most vulnerable, with 76.7% of all housing units built before 1980, with Colmesneil and Ivanhoe close in 2nd and 3rd with just under 50% of their housing stock built before 1980. To mitigate the risks associated with the impacts of hailstorms, it is important to have early warning systems in place, build structures that can withstand high-velocity impacts from hail, and establish emergency response plans to quickly respond to disasters.

## Historic Hailstorm Impacts

The summary below, Table 13-4, shows the 25-year property and crop damage totals as well as the average annual (Per Year) losses summarizing historic hailstorm impacts. The bottom half of the table shows per capita dollar loss rates for the total and average annual losses. These rates are important measures for comparing losses between different hazards and areas. The average annual loss estimate of property and crops is $200 for Tyler County.

Table 13-4, Tyler County Loss Summary

| Time Period | Fatalities | Injuries | Property Damage | Crop Damage |
|---|---|---|---|---|
| **Loss Summary, Tyler County** | | | | |
| 25-year Total | 0 | 0 | $5,000 | $0 |
| Per Year | 0 | 0 | $200 | $0 |
| **Per Capita Dollar Losses** | | | | |
| 25-year Total | 0 | 0 | $0.24 | $0 |
| Per Year | 0 | 0 | $0.01 | $0 |

Since weather varies from year to year, forecasts for specific years are less likely to be true (less reliable) than these totals and averages for the period. The second summary table shows per

capita dollar loss rates based on 2020 Census population counts. This is an important measure for comparing historical losses between different hazards and areas. Table 13-5 below displays the hailstorm losses by jurisdictions within the planning area.

Table 13-5: Hailstorm Losses by Jurisdiction 2000-2025

| Jurisdiction | Est. Prop. Losses | Est. Crop Losses | Total Est. Losses |
|---|---|---|---|
| Tyler County* | $0 | $0 | $0 |
| Woodville | $0 | $0 | $0 |
| Chester | $5,000 | $0 | $5,000 |
| Ivanhoe | $0 | $0 | $0 |
| Colmesneil | $0 | $0 | $0 |

*Unincorporated communities are included in County Totals. No Damages to ISD facilities within the county were reported.

# SECTION 14: EXTREME HEAT

## Description

Extreme heat is a condition where temperatures exceed local average high temperatures by ten degrees or more for an extended period of time and is also characterized by high humidity levels. Extreme heat is a common occurrence in Texas during the summer months. Extended periods of extreme heat are called heat waves and can lead to illness and death, particularly among vulnerable populations. In fact, heat waves have been the top cause of U.S. weather fatalities, on average, over the past 30 years. Texas had a particularly deadly year in 2011 when 203 heat-related deaths were reported. The major human risks associated with severe summer heat include heat cramps, sunburn, dehydration, fatigue, heat exhaustion, and heat stroke. Extreme heat can lead to power outages as heavy demands for air conditioning strain the power grid and prolonged exposure to excessive temperatures can damage crops and injure or kill livestock. As the Earth's climate warms overall heat waves are expected to become more frequent, longer, and more intense.

## Location

Extreme heat is not confined to any specific geographic area and can occur anywhere within the planning area. City residents can face a heightened risk of extreme heat because of warmer temperatures in cities from the urban heat island effect. The urban heat island effect is caused by large amounts of paved surfaces that absorb and re-radiate heat. The lack of green spaces and tree cover in these areas adds to the issue. Since Tyler County does not have any large major metropolitan areas, the urban heat island effect is not as pronounced. This results in a negligible variance in extreme temperatures from heat waves in the unincorporated areas of the counties versus the incorporated areas.

## Extent

The "Heat Index" is the relationship between temperature and relative humidity established by the National Oceanic and Atmospheric Administration (NOAA) to measure the magnitude or intensity of an extreme heat event. This index combines the effect of high temperatures with high humidity to determine how hot it feels outside. Figure 14-1 below describes the heat index as it relates to the likelihood of heat disorders due to prolonged exposure or strenuous activity. As an example, if the air temperature is 98°F and the relative humidity is 65%, the heat index is 128°F. The red area indicates extreme danger, and the example below would fall into this category. Also, exposure to full sunshine can increase heat index values by up to 15°F since the heat index values in the chart below were devised for shady light wind conditions.

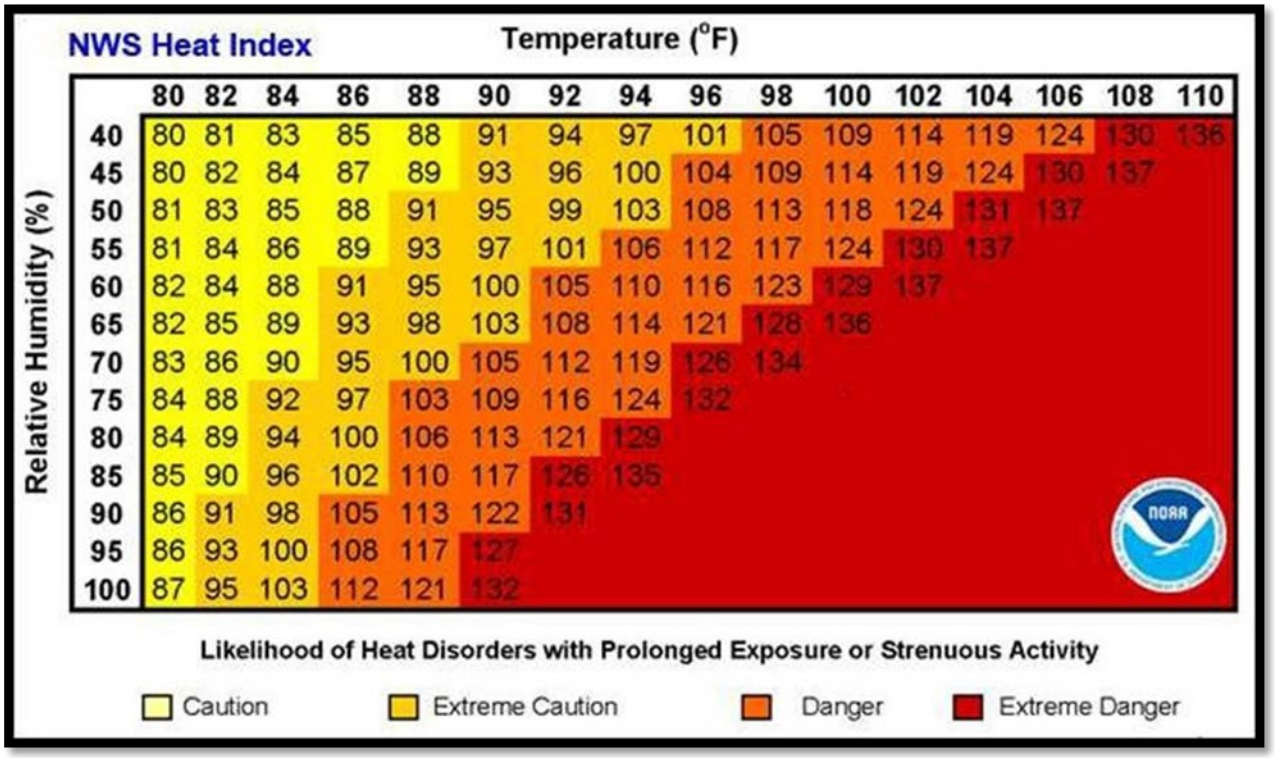



Figure 14-1: National Weather Service Heat Index

The likelihood of health disorders associated with ranges of heat index values are displayed below. The classifications of Caution, Extreme Caution, Danger, and Extreme Danger are associated with increasingly harmful effects on the body. Effects on the body depend on the magnitude or intensity of the event with the shaded rows in the table below (Table 14-1) corresponding to the colors in the chart above (Figure 14-1). The National Weather Service will initiate alert procedures when the Heat Index is expected to exceed 105° to 110°F, depending on local climate, for at least two consecutive days.

Table 14-1: Heat Index and Warnings

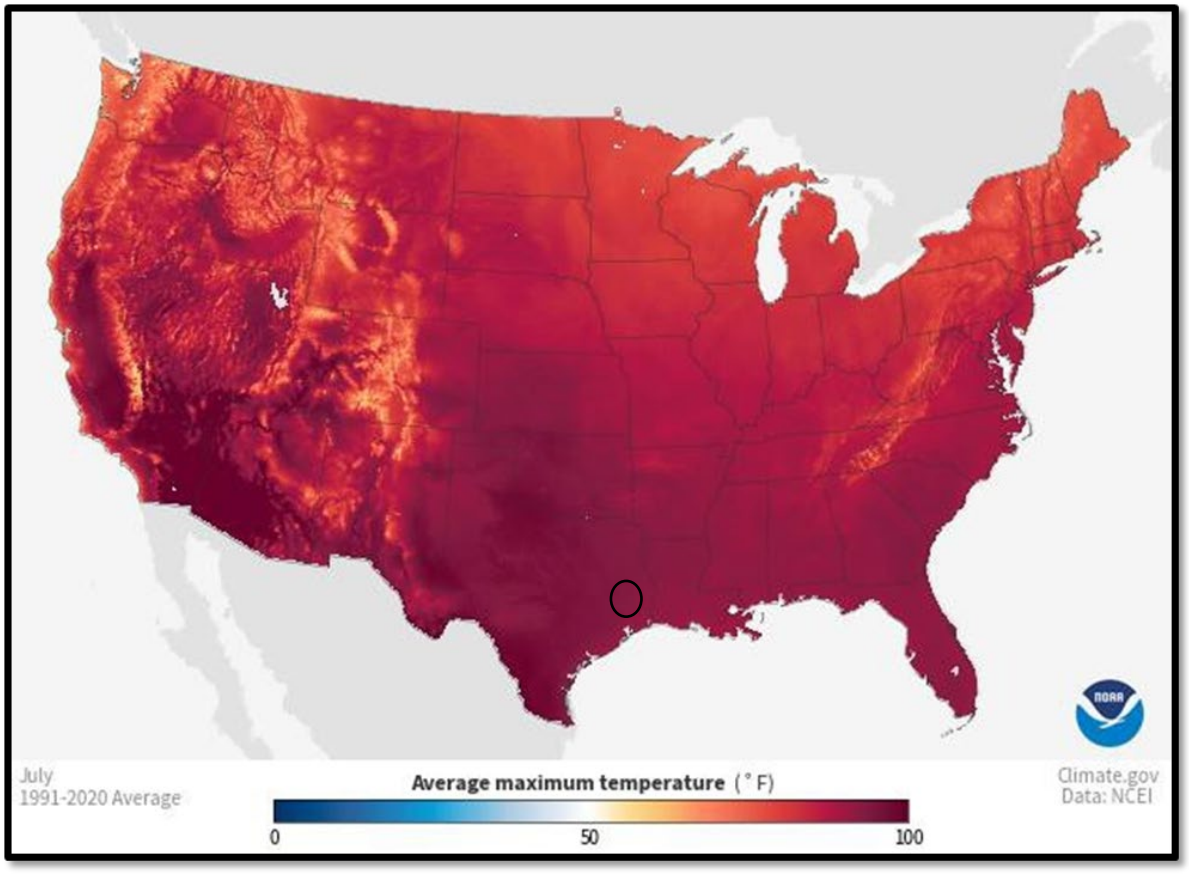
| Classification | Heat Index | Effect on the body |
|---|---|---|
| Caution | 80°F - 90°F | Fatigue possible with prolonged exposure and/or physical activity |
| Extreme Caution | 90°F - 103°F | Heat stroke, heat cramps, or heat exhaustion possible with prolonged exposure and/or physical activity |
| Danger | 103°F - 124°F | Heat cramps or heat exhaustion likely, and heat stroke possible with prolonged exposure and/or physical activity |
| Extreme Danger | 125°F or higher | Heat stroke highly likely |

Based on the past 10 years of climate data, the hottest month of the year for the Tyler County planning area is typically August, with an average high temperature of 95°F and an average relative humidity of 72%.

According to the Heat Index Calculator provided by the National Weather Service's Weather Prediction Center, this would put the average Heat Index score at around 126°F, on the higher end of the Danger Classification. In sunlight, this would expose community members to extremely dangerous levels of heat. The National Oceanic and Atmospheric Administration (NOAA) provides the map below that shows the long-term average maximum temperature in each climate division across the contiguous United States for August.

This data (Figure 14-2) is based on daily observations from 1981 to 2010. The planning area exhibits an average maximum temperature of 90 to 100°F or above based on historical data and has the potential to reach "dangerous" heat index levels at just 92°F and "extremely dangerous" heat index levels at 98°F.

Figure 14-2: Average Maximum Temperature, Contiguous United States, August 1981-2010




Based on the average maximum temperature (90 to 100°F) and the average relative humidity of 74% from May through September in the County planning area, extreme heat events to the extent of Danger and Extreme Danger should be mitigated to reduce threats to humans, livestock, and pets. When the heat index reaches a Danger classification, effects can include

sunstroke, muscle cramps, heat exhaustion, and prolonged exposure can cause heatstroke. When the Heat Index reaches an Extreme Danger classification, effects on the body can include all of the above in addition to increasing the risk of heat stroke and even death.

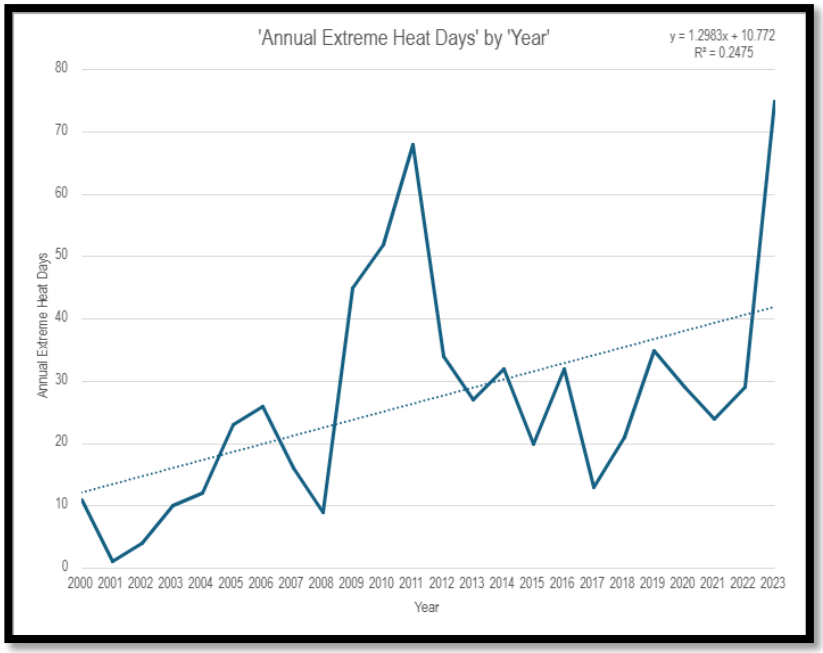
## Significant Events

Table 14-2: Tyler County Extreme Heat Events

| Start Date | End Date | Event Type | Deaths | Injuries | Property Damage | Crop Damage |
|---|---|---|---|---|---|---|
| 8/29/2000 | 8/31/2000 | Heat | 0 | 0 | $0 | $0 |
| 9/01/2000 | 9/05/2000 | Heat | 0 | 0 | $0 | $0 |
| 8/01/2023 | 8/31/2023 | Heat | 0 | 0 | $0 | $0 |

Tyler County experiences frequent excessive heat events, especially in the summer months, with the annual number of extreme heat days increasing by one event per year since 2000.

Figure 14-3: Tyler County Annual Extreme Heat Days from 2000-2024



## Probability of Future Events

The planning area can expect between 15 and 20 extreme heat days and at least one extreme heat event, or heat wave, each summer due to the warm, sunny, and humid subtropical climate in the Tyler County planning area. The probability of the area experiencing at least one extreme heat event in the next year is **Highly Likely.**

| Frequency of Occurrence |
|---|
| Highly likely: Event probable in next year. |
| Likely: Event probable in next three years. |
| Occasional: Event possible in the next five years. |
| Unlikely: Event possible in next 10 years. |

The probability that the number of extreme heat days will continue to increase in the future is also highly likely. According to NOAA, the top 10 warmest years on record (1850-2025) across the globe have all occurred within the past 12 years. The table below ranks the warmest years on record with land and ocean annually averaged measurements compiled from 1850-2025.

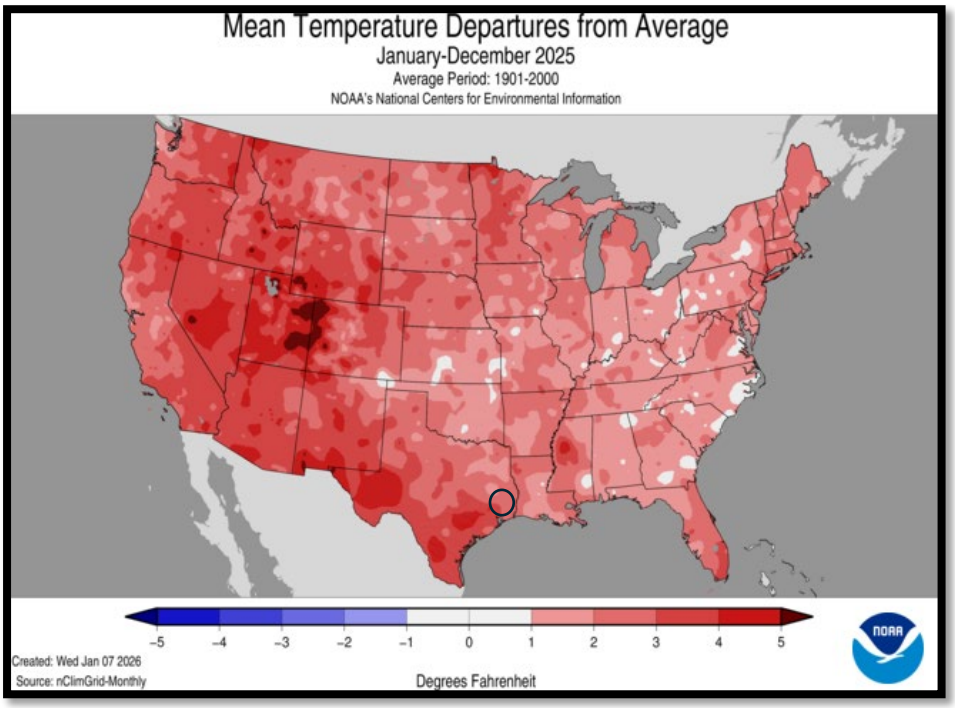
Table 14-3: Top Ten Warmest Years, Globally (NOAA, 1850-2025)

| Rank: 1 = Warmest Period of Record: 1880–2022 | Year | Anomaly °C | Anomaly °F |
|---|---|---|---|
| 1 | 2024 | 1.29 | 2.32 |
| 2 | 2023 | 1.19 | 2.14 |
| 3 | 2025 | 1.17 | 2.11 |
| 4 | 2016 | 1.03 | 1.85 |
| 5 | 2020 | 1.02 | 1.84 |
| 6 | 2019 | 0.99 | 1.78 |
| 7 | 2017 | 0.94 | 1.69 |
| 8 | 2015 | 0.92 | 1.66 |
| 9 | 2022 | 0.9 | 1.62 |
| 10 | 2018 | 0.88 | 1.58 |

Source: "Global Climate Report – Annual 2025". NOAA.

The average maximum temperature maps in Figure 14-4 are produced by the NCEI and depict trends for 2025, compared to the average temperature period from 1901 to 2000. The Tyler County planning area experienced a 2°F to 3°F departure from the average temperature of the previous century, indicating a significant increase in average temperature.

Figure 14-4: Mean Temperature Departure from Average Across the United States




National Climate Report | Annual 2025 | NCEI

## Vulnerability and Impacts

Table 14-4: Vulnerable Populations Across Tyler County

| Jurisdiction | Population Estimate | Youth | Elderly | Below Poverty Level |
|---|---|---|---|---|
| Tyler County | 20,560 | 1,407 (6.8%) | 3,592 (17.5%) | 3,495 (17.0%) |
| Woodville | 2,884 | 95 (3.3%) | 651 (22.6%) | 440 (15.3%) |
| Ivanhoe | 1,619 | 37 (2.3%) | 414 (25.6%) | 469 (29.0%) |
| Chester | 200 | 5 (2.5%) | 55 (27.5%) | 16 (8.0%) |
| Colmesneil | 697 | 47 (6.7%) | 137 (19.7%) | 150 (21.5%) |

Residents of the area, especially vulnerable populations such as children under five and those over 65, should exercise caution by staying out of the heat for prolonged periods when a heat advisory or excessive heat warning is in effect. In addition to children and the elderly, the most vulnerable population to heat illnesses and casualties is the infirm, who frequently live on low fixed incomes and cannot afford to run air conditioning on a regular basis. Those working or remaining outdoors for extended periods of time and overweight individuals are also at higher risk. It is never safe to leave a baby, child, disabled person, or pet in a locked car. Cars heat up quickly in the sun. This is true even in the winter; the first toddler death due to being left in a

locked car in the U.S. in 2018 occurred in February. The graphic in Figure 14-5 below is produced by NOAA with tips on how to practice heat safety in different situations.

Figure 14-5: Heat Safety Best Practices




In most locations, scientists expect daily minimum temperatures—which typically occur at night—to become warmer at a faster rate than daily maximum temperatures. As the region continues to warm overall, it will be important to educate the public about strategies to stay cool during extreme heat events and how to recognize and respond to heat-related illnesses.

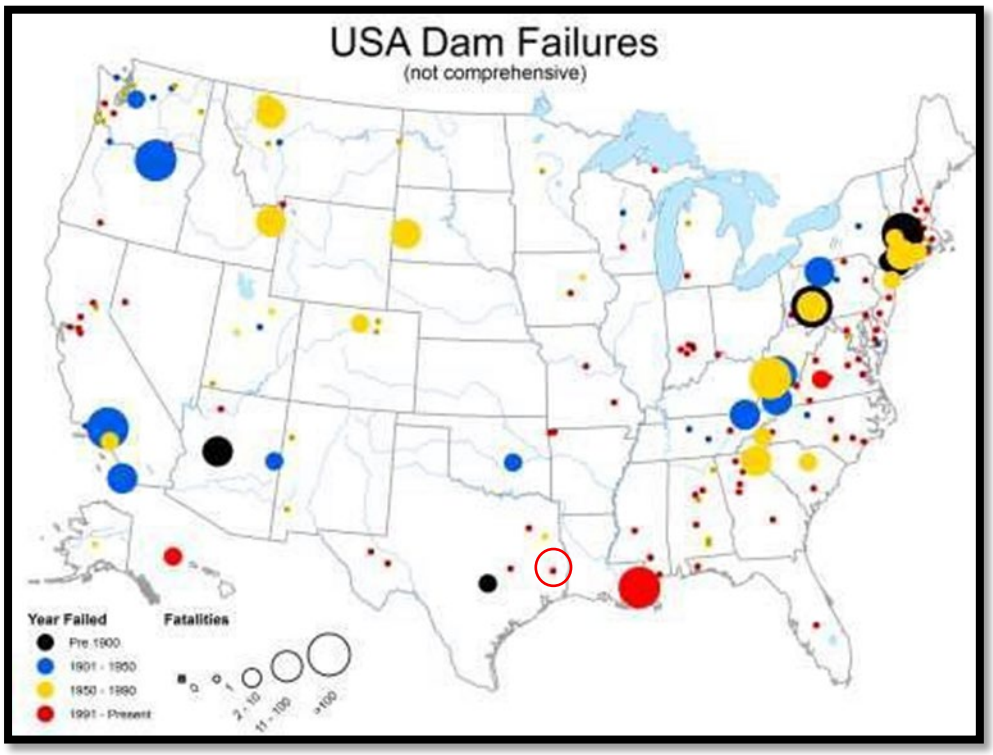
# SECTION 15: DAM FAILURE

## Description

Dams are water storage, control, or diversion structures that impound water upstream in reservoirs. Benefits provided by dams include water supplies for drinking, irrigation, and industrial uses. Dams also provide flood control, hydroelectric power, recreation, and navigation. At the same time, dams also represent a risk to public safety. Dams require ongoing maintenance, monitoring, safety inspections, and occasionally rehabilitation to continue providing safe service.

Dam failure can take several forms, including a collapse of or breach in the structure. Hundreds of dam failures have occurred throughout U.S. history. These failures have caused immense property and environmental damage and have taken thousands of lives. As the nation's dams age and the population increases, the potential for deadly dam failures grows. No one knows precisely how many dam failures have occurred in the U.S., but they have been documented in every state. From January 2005 through June 2013, state dam safety programs reported 173 dam failures and 587 "incidents", episodes that, without intervention, would likely have resulted in dam failure. The graphic below depicts the history of dam failures throughout the US.

Figure 15-1: Historic Dam Failures Across the United States




In the event of a dam failure, the energy of the water stored behind the dam can cause rapid and unexpected flooding downstream, resulting in loss of life and substantial property damage. A devastating effect on the water supply and power generation could be expected as well. The causes of dam failures are many, but they are most likely to happen for one of five reasons.

1. **Overtopping is** caused by water spilling over the top of a dam. Overtopping of a dam is often a precursor of dam failure. National statistics show that overtopping due to inadequate spillway design, debris blockage of spillways, or settlement of the dam crest accounts for approximately 34% of all U.S. dam failures. Overtopping can happen after periods of prolonged rainfall and flooding for which the dam was not designed or failure of upstream dams in the same drainage basin.
2. **Foundation Defects**, including settlement and slope instability, cause about 30% of all dam failures.
3. **Cracking** is caused by movements like the natural settling of a dam.
4. **Inadequate maintenance and upkeep**.
5. **Piping** is when seepage through a dam is not properly filtered, and soil particles continue to progress and form sinkholes in the dam. [See an animation of a piping failure.] Another 20% of U.S. dam failures have been caused by piping. Seepage often occurs around hydraulic structures, such as pipes and spillways; through animal burrows; around roots of woody vegetation; and through cracks in dams, dam appurtenances, and dam foundations.

## Location

Figure 15-3 and Table 15-1 provide a summary and illustrate general locations for each dam in the

planning area. Currently, there are 33 dams located and relevant to the Tyler County planning area:

Six are classified as "high-hazard", thirteen as "significant-hazard", fourteen as "low-hazard" dams, zero as "undetermined," and zero as "not available." The Town Bluff Dam is located in Jasper County, but still poses a risk to unincorporated Tyler County.

Figure 15-2: Dams of Tyler County, Texas

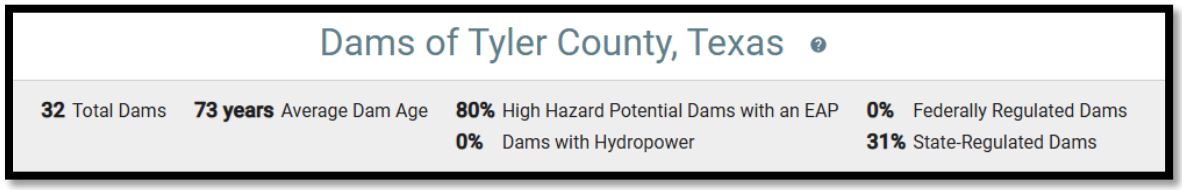


Figure 15-3: Tyler County Dam Hazard Classifications

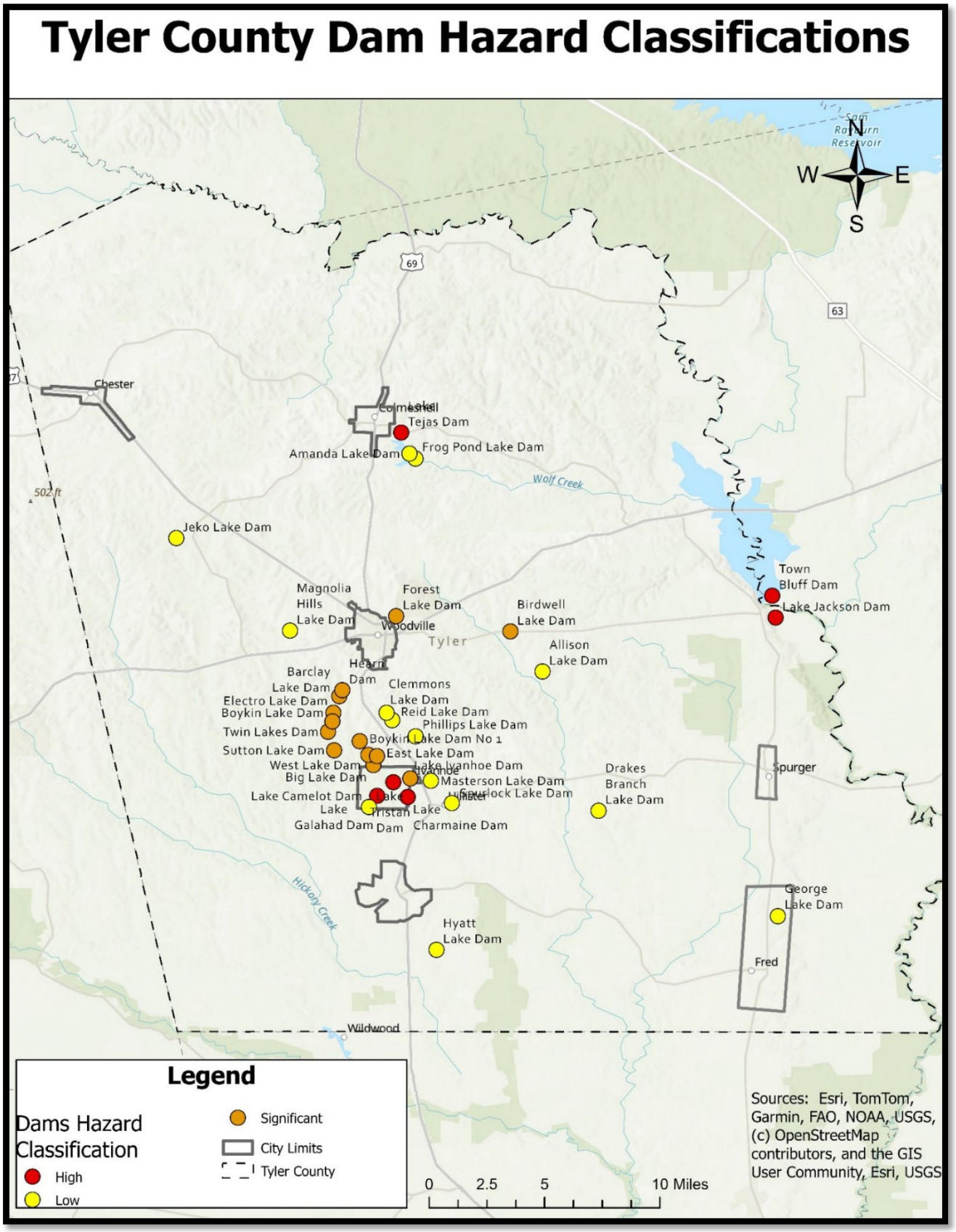


Table 15-1: Tyler County Dam Hazard Classifications

| Dam Name | NID ID | State Regulated Dam | Federally Regulated Dam | Dam Height (Ft) | Year Built | Normal Storage (Acre-Ft) | Hazard Classification | EAP Prepared |
|---|---|---|---|---|---|---|---|---|
| Lake Tejas Dam | TX03773 | Yes | No | 18 | 1935 | 100 | High | Yes |
| Lake Jackson Dam | TX09065 | Yes | No | 8 | | 25 | High | No |
| Lake Tristan Dam | TX03756 | Yes | No | 19 | 1958 | 185 | High | Yes |
| Lake Galahad Dam | TX03757 | Yes | No | 11 | 1958 | 268 | High | Yes |
| Lake Charmaine Dam | TX03755 | Yes | No | 24 | 1965 | 608 | High | Yes |
| Town Bluff Dam | TX00015 | No | Yes | 43 | 1951 | 67000 | High | Yes |

| Dam Name | NID ID | State Regulated Dam | Federally Regulated Dam | Dam Height (Ft) | Year Built | Normal Storage (Acre-Ft) | Hazard Classification | EAP Prepared |
|---|---|---|---|---|---|---|---|---|
| Barclay Lake Dam | TX03761 | No | No | 17 | 1932 | 45 | Significant | Not Required |
| Electro Lake Dam | TX03762 | No | No | 12 | 1927 | 30 | Significant | Yes |
| Twin Lakes Dam | TX03766 | No | No | 10 | 1915 | 75 | Significant | Not Required |
| Boykin Lake Dam | TX03751 | No | No | 15 | 1976 | 80 | Significant | Not Required |
| Boykin Lake Dam No 1 | TX03750 | No | No | 19 | 1943 | 3 | Significant | Not Required |
| Sutton Lake Dam | TX03763 | No | No | 13 | 1915 | 164 | Significant | Not Required |
| Forest Lake Dam | TX03770 | No | No | 16 | 1940 | 103 | Significant | Yes |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Birdwell Lake Dam | TX03772 | No | No | 15 | 1945 | 55 | Significant | Yes |
| Hearn Dam | TX09407 | No | No | 17 | | 28 | Significant | Yes |
| Big Lake Dam | TX03753 | No | No | 21 | 1949 | 161 | Significant | Yes |
| West Lake Dam | TX03752 | No | No | 24 | 1949 | 140 | Significant | Yes |
| East Lake Dam | TX03754 | No | No | 22 | 1949 | 129 | Significant | Yes |
| Lake Ivanhoe Dam | TX04492 | Yes | No | 19 | 1958 | 105 | Significant | Yes |

| Dam Name | NID ID | State Regulated Dam | Federally Regulated Dam | Dam Height (Ft) | Year Built | Normal Storage (Acre-Ft) | Hazard Classification | EAP Prepared |
|---|---|---|---|---|---|---|---|---|
| Hyatt Lake Dam | TX03749 | Yes | No | 7 | 1963 | 90 | Low | Not Required |
| Spurlock Lake Dam | TX03765 | No | No | 11 | 1958 | 80 | Low | Not Required |
| Reid Lake Dam | TX03758 | No | No | 13 | 1958 | 69 | Low | Not Required |
| Masterson Lake Dam | TX03759 | No | No | 13 | 1940 | 52 | Low | Not Required |
| Allison Lake Dam | TX03771 | No | No | 11 | 1965 | 100 | Low | Not Required |
| Phillips Lake Dam | TX03760 | No | No | 11 | 1938 | 36 | Low | Not Required |
| Jeko Lake Dam | TX03767 | No | No | 8 | 1958 | 126 | Low | Not Required |
| Clemmons Lake Dam | TX04248 | No | No | 12 | 1952 | 30 | Low | Not Required |
| George Lake Dam | TX05816 | No | No | 15 | 1981 | 64 | Low | Not Required |
| Magnolia Hills Lake Dam | TX03769 | No | No | 11 | 1950 | 45 | Low | Not Required |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Drakes Branch Lake Dam | TX03764 | No | No | 11 | 1965 | 44 | Low | Not Required |
| Frog Pond Lake Dam | TX03775 | Yes | No | 19 | 1957 | 410 | Low | Not Required |
| Amanda Lake Dam | TX03774 | Yes | No | 29 | 1959 | 971 | Low | Not Required |
| Lake Camelot Dam | TX04491 | Yes | No | 14 | 1958 | 74 | Low | Yes |

All census blocks within five miles of a dam with a maximum storage capacity of 100,000 acre-feet or more are considered at risk of potential dam failure hazards. For dams with a maximum storage capacity between 10,000 and 100,000 acre-feet, all census blocks within three miles are deemed to be at risk of potential dam failure hazards. For dams with a maximum storage capacity of less than 10,000 acre-feet, all census blocks within one mile are considered to be at risk from potential dam failure hazards.

The six high-hazard dams in the planning area represent max storage capacities of 100, 25, 185, 268, 600, and 67,000 acre-feet. All except Town Bluff Dam have a storage capacity that is far less than the 10,000-acre-feet maximum threshold for the one-mile distance stated above, suggesting that the downstream census blocks at risk would be much less than a mile. With residential, agricultural, and commercial developments located downstream of many dams, all populations are at risk in the event of a dam failure. Of the six high-hazard dams, four (Lake Tejas Dam, Lake Tristian Dam, Lake Charmine Dam, and Lake Galahad Dam) serve as crossing points for vehicles over their respective lakes.

## Significant Events

There are multiple incidents of dam failure documented in the planning area, many of which are directly related to the flooding events that occurred during Hurricane Harvey in 2017. According to the Association of State Dam Safety Officials (ASDSO) Dam Incident Database, three dams failed on August 29, 2017, in relation to Hurricane Harvey. All three, Electro Lake Dam, Forest Lake Dam, and Hearne Dam, are classified as significant hazard dams, and all have EAPs prepared. Amanda Lake Dam experienced a dam failure on May 27, 2016, where a flood event led to overtopping and breach. The dam is classified as low hazard and not required to have an EAP prepared; it is important to take precautions should a dam failure occur.

The number of census blocks at risk as they relate to dam size is to be used only as a rough guide. Inundation maps based on hydraulic and hydrologic modeling can be used to provide precise risk from dam failure. The owners of the high-hazard dams in Tyler County all have the mandated Emergency Action Plans prepared.

## Extent

The extent or magnitude of a dam failure event is described in terms of the classification of damage that could result from a dam's failure, not the probability of failure. The National Interagency Committee on Dam Safety defines high-hazard dams as those where failure or maloperation would cause loss of human life. Low-hazard potential dams are those at which failure or mis-operation probably would not result in loss of human life but would cause limited economic and/or environmental losses. Losses would be limited mainly to the owner's property.

The six High and 13 Significant hazard dams located within the Tyler County planning area were profiled to examine the risk they pose to the economy, environment, and loss of human life. The six high-hazard and one significant hazard dam that are in or within 1 mile of the jurisdiction limits were mapped, and a preliminary inundation analysis was conducted, as up-to-date official inundation maps are unavailable. Low-hazard dams are classified as not posing a risk to life, with minimal economic loss. Additionally, the 14 low-hazard dams within the planning area are relatively small with low normal storage, so it is not necessary to individually profile them.

Classifications for dam failure extent are found in Table 15-2 below.

Table 15-2: Dam Hazard Classification Criteria

| Hazard Potential Classification | Loss of Human Life | Economic, Environmental, Lifeline Loss |
|---|---|---|
| Low | No loss of life | Minimal Economic Loss |
| Significant | Loss of Life Possible (1-6 deaths) | Appreciable Economic Loss |
| High | Significant Loss of Life (7+ deaths) | Excessive Economic Loss |

Source: TAC Ch. 299

### *Risk of Dam Inundation by Tyler County Jurisdictions*

**Jurisdiction:** Tyler County

**Dams and Classification:** 33 Total: Six High Hazard, 13 Significant Hazard, 14 Low Hazard

**Extent Classification:** High

**Level of Intensity to Mitigate:** There are six High Hazard Dams in the Tyler County Planning area that pose a threat to human life.

**1) Lake Tejas Dam**

The Lake Tejas Dam is owned by Colmesneil ISD. It was completed in 1935 for primarily recreational purposes. The dam's height is 18 feet and has a normal storage of 100 acre-feet. The maximum discharge is 461 cubic feet per second, with the drainage area being 1.95 square miles.

In the event of a failure at Lake Tejas Dam, the flood waters would flow south, impacting roads and houses downstream. The dam structure doubles as part of FM 256, so the road would be severely impacted during a failure. There are several houses located along Lake Amanda, which is directly downstream of Lake Tejas Dam, that could be potentially impacted by flood waters.

There are two low-hazard dams located downstream (Amanda Lake Dam and Frog Pond Lake Dam) that can be impacted by a failure of Lake Tejas Dam.

Updated inundation maps are not available, so a preliminary analysis of inundation was made using a cone spanning one mile from the dam site in ArcGIS Pro. Using this in combination with FEMA's BLE, a dam failure could result in flood waters rising to over two or more feet above base level. Roads, homes, and other structures are at risk of damage one mile downstream. No critical facilities listed are located downstream; many roads may be impacted, which will impede evacuation or emergency services.

Given its High Hazard classification, this dam requires regular, thorough inspections and stringent maintenance protocols to ensure its safety and structural integrity. The consequences of dam failure would likely include considerable flooding, which may endanger lives, damage homes, and disrupt vital services.

**2) Lake Jackson Dam**

Lake Jackson Dam is controlled and maintained by an unlisted owner. The exact date of completion is not listed on the National Inventory of Dams, but its most recent inspection was in 2023. The dam's purpose is also not listed. The dam's height is 8 feet and has a normal storage of 25 acre-feet. The max discharge is not listed, and the drainage area is 95 square miles.

In the event of failure at Lake Jackson Dam, the flood waters would flow south, impacting roads and houses downstream. There are several houses located directly downstream that could be potentially impacted by flood waters.

Updated inundation maps are not available, so a preliminary analysis of inundation was made using a cone spanning one mile from the dam site in ArcGIS Pro. Using this in combination with FEMA's BLE, a dam failure could result in flood waters rising to over four or more feet above base level. Roads, homes, and other structures are at risk of damage one mile downstream. No critical facilities listed are located downstream; many roads may be impacted, which will impede evacuation or emergency services.

This dam requires regular, thorough inspections and stringent maintenance protocols to ensure its safety and structural integrity. The consequences of dam failure would likely include considerable flooding, which may endanger lives, damage homes and businesses, and disrupt vital services.

### 3) Lake Tristan Dam

Lake Tristian Dam is owned by the City of Ivanhoe. The dam was completed in 1958 for recreational purposes. Its normal storage is 185-acre feet, with a height of 19 feet. The maximum discharge is 3,726 cubic feet per second and has a drainage area of 4.23 square miles.

In the event of failure at Lake Tristian Dam, the flood waters would flow south, impacting roads and houses downstream. The dam doubles as a bridge, so a dam failure would lead to Lakewood Dr facing flooding. This would make it nearly impossible for citizens located on the northwest side of Ivanhoe to evacuate. A failure would also impact a High Hazard dam located downstream, the Lake Charmine Dam, increasing the possibility of damage and risk to life.

Updated inundation maps are not available, so a preliminary analysis of inundation was made using a cone spanning one mile from the dam site in ArcGIS Pro. Using this in combination with FEMA's BLE, a dam failure could result in flood waters rising to over three or more feet above base level. Roads, homes, and other structures are at risk of damage one mile downstream. The city of Ivanhoe's city hall and police station are located within the one-mile cone, indicating that in the event of a failure, these two critical facilities may be impacted, leading to a delay in emergency response and communication.

This dam requires regular, thorough inspections and stringent maintenance protocols to ensure its safety and structural integrity. Dam failure can pose a threat to human life, as well as impact economic or environmental assets.

### 4) Lake Galahad Dam

Lake Galahad Dam is owned by the City of Ivanhoe. The dam was completed in 1958 for recreational purposes. Its normal storage is 268-acre feet, with a height of 11 feet. The maximum discharge is 17,287 cubic feet per second and has a drainage area of 10.47 square miles.

In the event of failure at Lake Galahad Dam, the flood waters would flow south, impacting roads and houses downstream. The dam doubles as a bridge, so a dam failure would lead to flooding on Lakewood Dr. This would make it nearly impossible for citizens located on the west side of Ivanhoe to evacuate. Failure would also affect a high-hazard dam located downstream, Lake Charmine Dam, increasing the risk of damage and loss of life.

Updated inundation maps are not available, so a preliminary analysis of inundation was made using a cone spanning one mile from the dam site in ArcGIS Pro. Using this in combination with FEMA's BLE, a dam failure could result in flood waters rising to over three or more feet above base level. Roads, homes, and other structures are at risk of damage one mile downstream. The city of Ivanhoe's city hall and police station are located downstream, indicating that in the event of a failure, these two critical facilities may be impacted, leading to a delay in emergency response and communication.

This dam requires regular, thorough inspections and stringent maintenance protocols to ensure its safety and structural integrity. Dam failure can pose a threat to human life, as well as impact economic or environmental assets.

**5) Lake Charmine Dam**

Lake Charmine Dam is owned by the City of Ivanhoe. The dam was completed in 1965 for recreational purposes. Its normal storage is 608-acre feet, with a height of 24 feet. The maximum discharge is 18,500 cubic feet per second and has a drainage area of 15.47 square miles.

In the event of failure at Lake Galahad Dam, the flood waters would flow south, impacting roads and houses downstream. The dam doubles as a bridge, so dam failure would lead to flooding on Camelot Dr. This would make it difficult for citizens located on the southwest and west side of Ivanhoe to evacuate.

Updated inundation maps are not available, so a preliminary analysis of inundation was made using a cone spanning one mile from the dam site in ArcGIS Pro. Using this in combination with FEMA's BLE, a dam failure could result in flood waters rising to over five or more feet above base level. Roads, homes, and other structures are at risk of damage one mile downstream. No critical facilities are located directly downstream; however, impacted roads could make it difficult for emergency services to function properly.

This dam requires regular, thorough inspections and stringent maintenance protocols to ensure its safety and structural integrity. Dam failure can pose a threat to human life, as well as impact economic or environmental assets.

**6) Town Bluff Dam**

Town Bluff Dam is owned by the U.S. Army Corps of Engineers. The dam was completed in 1951 for recreational purposes. Its normal storage is 67,000-acre feet, with a height of 43 feet. The maximum discharge is 80,000 cubic feet per second and has a drainage area of 7,573 square miles.

In the event of failure at Town Bluff Dam, the flood waters would flow south, impacting roads and houses downstream. The dam doubles as a bridge, so dam failure would lead to flooding on Camelot Dr. S. This would make it difficult for citizens located on the southwest and west side of Ivanhoe to evacuate.

Updated inundation maps are not available, so a preliminary analysis of inundation was made using a cone spanning five miles from the dam site in ArcGIS Pro. Using this in combination with FEMA's BLE, a dam failure could result in flood waters rising to over five or more feet above base level. Roads, homes, and other structures are at risk of damage five miles downstream. No critical facilities are located directly downstream; however, impacted roads could make it difficult for emergency services to function properly.

This dam requires regular, thorough inspections and stringent maintenance protocols to ensure its safety and structural integrity. Dam failure can pose a threat to human life, as well as impact economic or environmental assets.

**There are 13 Significant Hazard Dams in the Tyler County Planning area.**

**1) Barclay Lake Dam**

Barclay Lake Dam is privately owned by Allen Bell. It was completed in 1932 to be used for recreational purposes. The dam's height is 17 feet and has a normal storage of 45 acre-feet. It has a maximum discharge rate of 355 cubic feet per second. This dam is not required to have an EAP prepared.

This dam could impact economic or environmental assets, as there is a large area of agricultural land near the dam site. Future reassessments will be conducted to better understand the specific downstream impacts of this dam should developments increase.

**2) Electro Lake Dam**

Electro Lake Dam is privately owned by Charles Dodd. It was completed in 1927 to be used for recreational purposes. The dam's height is 12 feet, and its normal storage is 30 acre-feet. It has a maximum discharge rate of 2,000 cubic feet per second, with a drainage area of 2.5 square miles. This dam has an EAP prepared.

This dam could impact economic or environmental assets, as there is a large area of agricultural land near the dam site. Future reassessments will be conducted to better understand the specific downstream impacts of this dam should developments increase.

**3) Twin Lakes Dam**

Twin Lakes Dam is privately owned by Bailey Four Canyon Ranch. It was completed in 1915 to be used for water supply purposes. The dam's height is 10 feet and has a normal storage of 75 acre-feet. There is no listed data about max discharge rate or drainage area. This dam is not required to have an EAP prepared.

This dam could impact economic or environmental assets, as there is a large area of agricultural land near the dam site. Future reassessments will be conducted to better understand the specific downstream impacts of this dam should developments increase.

**4) Boykin Lake Dam**

Boykin Lake Dam is privately owned by Frank Boykin. It was completed in 1976 to be used for irrigation purposes. The dam's height is 15 feet and has a normal storage of 80 acre-feet. There is no listed data about maximum discharge rate or drainage area. This dam is not required to have an EAP prepared.

This dam could impact economic or environmental assets, as there is a large area of agricultural land near the dam site. Future reassessments will be conducted to better understand the specific downstream impacts of this dam should developments increase.

**5) Boykin Lake Dam No. 1**

Boykin Lake Dam No. 1 is privately owned by Kenneth Baily. It was completed in 1932 to be used for irrigation purposes. The dam's height is 19 feet and has a normal storage of 3 acre-feet. There is no listed data about maximum discharge rate or drainage area. This dam is not required to have an EAP prepared.

This dam could impact economic or environmental assets, as there is a large area of agricultural land near the dam site. Future reassessments will be conducted to better understand the specific downstream impacts of this dam should developments increase.

**6) Sutton Lake Dam**

Sutton Lake Dam is privately owned by Allen Bell. It was completed in 1915 to be used for recreational purposes. The dam's height is 13 feet and has a normal storage of 164 acre-feet. There is no listed data about maximum discharge rate or drainage area. This dam is not required to have an EAP prepared.

This dam could impact economic or environmental assets, as there is a large area of agricultural land near the dam site. Future reassessments will be conducted to better understand the specific downstream impacts of this dam should developments increase.

**7) Forest Lake Dam**

Forest Lake Dam is privately owned by Gwendolyn Nichols. It was completed in 1940 to be used for recreational purposes. The dam's height is 16 feet and has a normal storage of 103 acre-feet. It has a maximum discharge rate of 1,957 cubic feet per second and a drainage area of 0.9 square miles. This dam has an EAP prepared. The Forest Lake dam failed due to Hurricane Harvey in August 2017 and has yet to be repaired. Given the complete failure of the dam, no water is being retained, and Forest Lake is dry. There is no current downstream inundation risk for Forest Lake Dam.

**8) Birdwell Lake Dam**

Birdwell Lake Dam is privately owned by Lois and Robert Stanton. It was completed in 1945 to be used for irrigation purposes. The dam's height is 15 feet and has a normal storage of 55 acre-feet. It has a maximum discharge rate of 1,225 cubic feet per second. This dam has an EAP prepared.

This dam could impact economic or environmental assets, as there is a large area of agricultural land near the dam site. Future reassessments will be conducted to better understand the specific downstream impacts of this dam should development increase.

**9) Hearn Dam**

Hearn Dam is privately owned by Three Rivers Council Boy Scouts of America. It was completed in 1945 to be used for recreational purposes. The dam's height is 17 feet and has a normal storage of 28 acre-feet. It has a maximum discharge rate of 3,768 cubic feet per second. This dam has an EAP prepared.

This dam could impact economic or environmental assets, as there is a large area of agricultural land near the dam site. Future reassessments will be conducted to better understand the specific downstream impacts of this dam should development increase.

**10) Big Lake Dam**

Big Lake Dam is privately owned by William Baggett. It was completed in 1949 to be used for irrigation purposes. The dam's height is 21 feet and has a normal storage of 161 acre-feet. It has a max discharge rate of 530 cubic feet per second, and a drainage area of 3.24 square miles. This dam has an EAP prepared.

This dam could impact economic or environmental assets, as there is a large area of agricultural land near the dam site. Future reassessments will be conducted to better understand the specific downstream impacts of this dam should development increase.

**11) West Lake Dam**

West Lake Dam is privately owned by William Baggett. It was completed in 1949 to be used for irrigation purposes. The dam's height is 24 feet and has a normal storage of 140 acre-feet. It has a maximum discharge rate of 3,185 cubic feet per second and a drainage area of 1.76 square miles. This dam has an EAP prepared.

This dam could impact economic or environmental assets, as there is a large area of agricultural land near the dam site. Future reassessments will be conducted to better understand the specific downstream impacts of this dam should development increase.

**12) East Lake Dam**

East Lake Dam is privately owned by William Baggett. It was completed in 1949 to be used for irrigation purposes. The dam's height is 22 feet and has a normal storage of 129 acre-feet. It has a maximum discharge rate of 3,885 cubic feet per second, and a drainage area of 3.01 square miles. This dam has an EAP prepared.

This dam could impact economic or environmental assets, as there is a large area of agricultural land near the dam site. Future reassessments will be conducted to better understand the specific downstream impacts of this dam should development increase.

**13) Lake Ivanhoe Dam**

Lake Ivanhoe Dam is owned by the City of Ivanhoe. It was completed in 1958 to be used for recreational purposes. The dam's height is 19 feet and has a normal storage of 105 acre-feet. It has a maximum discharge rate of 2 cubic feet per second and a drainage area of 0.63 square miles. This dam has an EAP prepared.

This dam could impact economic or environmental assets, as there is a large area of agricultural land near the dam site. Future reassessments will be conducted to better understand the specific downstream impacts of this dam should development increase.

There are 14 Low Hazard Dams in the Tyler County Planning area.

The 14 Low Hazard Dams within the planning area are isolated from populated areas (at least one mile from city limits), and/or have a relatively low volume of water. Until development patterns change, there is no need to profile the dams in future hazard mitigation plans.

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**Jurisdiction:** City of Woodville

**Dams and Classification:** No dams within city limits. One Significant Hazard dam within one mile of city limits.

**Extent Classification:** No Hazard

**Level of Intensity to Mitigate:** There is one Significant Hazard dam, Forest Lake Dam, within one mile of the city limits. As stated earlier, the Forest Lake Dam has failed and has not been repaired within the past 9 years. It poses no risk of dam failure to unincorporated Tyler County, the City of Woodville, or Woodville ISD.

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**Jurisdiction:** City of Chester

**Dams and Classification:** No dams in city limits. Zero dam withins one mile of city limits.

**Extent Classification:** No Hazard

**Level of Intensity to Mitigate:** N/A

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**Jurisdiction:** City of Colmesneil

**Dams and Classification:** No dams in city limits. One High Hazard dam is within one mile of the city limits.

**Extent Classification:** No Hazard

**Level of Intensity to Mitigate: N/A.** There is one High Hazard dam, the Lake Tejas Dam, that is within a mile of the City of Colmesneil. The Lake Tejas Dam is half a mile east of the City of Colmesneil, and the flow of inundation water would be completely outside of Colmesneil city limits, flowing south-southeast into Lake Amanda and Wilson Branch.

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**Jurisdiction:** City of Ivanhoe

**Dams and Classification:** Three High Hazard Dams; four Significant Hazard (one in city limits, and three within one mile upstream of city limits; one Low Hazard Dam

**Extent Classification:** High

**Level of Intensity to Mitigate:** There are Three High Hazard Dams within the City of Ivanhoe: Lake Galahad, Lake Charmaine, and Lake Tristan; four significant hazards: Lake Ivanhoe in the city limits, Big Lake, East Lake, and West Lake outside of city limits upstream; and one Low Hazard Dam that poses no risk to the City of Ivanhoe.

**1) Lake Tristan Dam**

Lake Tristian Dam is owned by the City of Ivanhoe. The dam was completed in 1958 for recreational purposes. Its normal storage is 185-acre feet, with a height of 19 feet. The maximum discharge is 3,726 cubic feet per second and has a drainage area of 4.23 square miles.

In the event of failure at Lake Tristian Dam, the flood waters would flow south, impacting roads and houses downstream. The dam doubles as a bridge, so a dam failure would lead to Lakewood Dr. facing flooding. This would make it nearly impossible for citizens located on the northwest side of Ivanhoe to evacuate. A failure would also impact a High Hazard dam located downstream, the Lake Charmine dam, increasing the possibility of damage and risk to life.

Updated inundation maps are not available, so a preliminary analysis of inundation was made using a cone spanning one mile from the dam site in ArcGIS Pro. Using this in combination with FEMA's BLE, a dam failure could result in flood waters rising to over three or more feet above base level. Roads, homes, and other structures are at risk of damage one mile downstream. The City of Ivanhoe's city hall and police station are located within the one-mile cone, indicating that in the event of a failure, these two critical facilities may be impacted, leading to a delay in emergency response and communication.

This dam requires regular, thorough inspections and stringent maintenance protocols to ensure its safety and structural integrity. Dam failure can pose a threat to human life, as well as impact economic or environmental assets.

**2) Lake Galahad Dam**

Lake Galahad Dam is owned by the City of Ivanhoe. The dam was completed in 1958 for recreational purposes. Its normal storage is 268-acre feet, with a height of 11 feet. The maximum discharge is 17,287 cubic feet per second and has a drainage area of 10.47 square miles.

In the event of failure at Lake Galahad Dam, the flood waters would flow south, impacting roads and houses downstream. The dam doubles as a bridge, so a dam failure would lead to flooding on Lakewood Dr. This would make it nearly impossible for citizens located on the west side of Ivanhoe to evacuate. Failure would also affect a high-hazard dam located downstream, Lake Charmine dam, increasing the risk of damage and loss of life.

Updated inundation maps are not available, so a preliminary analysis of inundation was made using a cone spanning one mile from the dam site in ArcGIS Pro. Using this in combination with FEMA's BLE, a dam failure could result in flood waters rising to over three or more feet above base level. Roads, homes, and other structures are at risk of damage one mile downstream.

The city of Ivanhoe's city hall and police station are located downstream, indicating that in the event of a failure, these two critical facilities may be impacted, leading to a delay in emergency response and communication.

This dam requires regular, thorough inspections and stringent maintenance protocols to ensure its safety and structural integrity. Dam failure can pose a threat to human life, as well as impact economic or environmental assets.

**3) Lake Charmaine Dam**

Lake Charmaine Dam is owned by the City of Ivanhoe. The dam was completed in 1965 for recreational purposes. Its normal storage is 608-acre feet, with a height of 24 feet. The maximum discharge is 18,500 cubic feet per second and has a drainage area of 15.47 square miles.

In the event of failure at Lake Galahad Dam, the flood waters would flow south, impacting roads and houses downstream. The dam doubles as a bridge, so dam failure would lead to flooding on Camelot Dr. S. This would make it difficult for citizens located on the southwest and west side of Ivanhoe to evacuate.

Updated inundation maps are not available, so a preliminary analysis of inundation was made using a cone spanning one mile from the dam site in ArcGIS Pro. Using this in combination with FEMA's BLE, a dam failure could result in flood waters rising to over five or more feet above base level. Roads, homes, and other structures are at risk of damage one mile downstream. No critical facilities are located directly downstream; however, impacted roads could make it difficult for emergency services to function properly.

This dam requires regular, thorough inspections and stringent maintenance protocols to ensure its safety and structural integrity. Dam failure can pose a threat to human life, as well as impact economic or environmental assets.

**4) Big Lake Dam**

Big Lake Dam is privately owned by William Baggett. It was completed in 1949 to be used for irrigation purposes. The dam's height is 21 feet and has a normal storage of 161 acre-feet. It has a max discharge rate of 530 cubic feet per second, and a drainage area of 3.24 square miles. This dam has an EAP prepared.

This dam could impact economic or environmental assets, as there is a large area of agricultural land near the dam site. Future reassessments will be conducted to better understand the specific downstream impacts of this dam should development increase.

**5) West Lake Dam**

West Lake Dam is privately owned by William Baggett. It was completed in 1949 to be used for irrigation purposes. The dam's height is 24 feet and has a normal storage of 140 acre-feet. It has a maximum discharge rate of 3,185 cubic feet per second and a drainage area of 1.76 square miles. This dam has an EAP prepared.

This dam could impact economic or environmental assets, as there is a large area of agricultural land near the dam site. Future reassessments will be conducted to better understand the specific downstream impacts of this dam should development increase.

**6) East Lake Dam**

East Lake Dam is privately owned by William Baggett. It was completed in 1949 to be used for irrigation purposes. The dam's height is 22 feet and has a normal storage of 129 acre-feet. It has a maximum discharge rate of 3,885 cubic feet per second, and a drainage area of 3.01 square miles. This dam has an EAP prepared.

This dam could impact economic or environmental assets, as there is a large area of agricultural land near the dam site. Future reassessments will be conducted to better understand the specific downstream impacts of this dam should development increase.

**7) Lake Ivanhoe Dam**

Lake Ivanhoe Dam is owned by the City of Ivanhoe. It was completed in 1958 to be used for recreational purposes. The dam's height is 19 feet and has a normal storage of 105 acre-feet. It has a maximum discharge rate of 2 cubic feet per second and a drainage area of 0.63 square miles. This dam has an EAP prepared.

This dam could impact economic or environmental assets, as there is a large area of agricultural land near the dam site. Future reassessments will be conducted to better understand the specific downstream impacts of this dam should development increase.

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**Jurisdiction:** Chester WSC

**Dams and Classification:** No dams.

**Extent Classification:** None **Level**

**of Intensity of Mitigate:** None

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**Jurisdictions:** Chester ISD and Spurger ISD

**Dams and Classification:** No dams.

**Extent Classification:** None

**Level of Intensity to Mitigate:** None

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**Jurisdictions:** Warren ISD

**Dams and Classification:** No Dams

**Extent Classification:** None

**Level of Intensity to Mitigate:** None

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**Jurisdiction:** Woodville ISD

**Dams and Classification:** One Significant Hazard dam within one mile of ISD facilities.

**Extent Classification:** No Hazard

**Level of Intensity to Mitigate:** There is one Significant Hazard dam, Forest Lake Dam, within one mile of WISD facilities. As stated earlier, the Forest Lake Dam has failed and has not been repaired within the past 9 years. It poses no risk of dam failure to unincorporated Tyler County, the City of Woodville, or Woodville ISD.

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**Jurisdiction:** Colmesneil ISD

**Dams and Classification:** One High Hazard Dam

**Extent Classification:** Significant

**Level of Intensity to Mitigate:** One High Hazard Dam

1) Lake Tejas Dam

Lake Tejas Dam is owned by Colmesneil ISD. It was completed in 1935 for primarily recreational purposes. The dam's height is 18 feet high and has a normal storage of 100 acre-feet. The maximum discharge is 461 cubic feet per second, with the drainage area being 1.95 square miles.

The Lake Tejas Dam failing would impact the Colmesneil ISD facilities surrounding Lake Tejas, including cabins, trails, and the surrounding nature. Lake Tejas and recreational tourism are a source of income for CISD so in addition to property destruction from a Lake Tejas failure, it would have lasting economic impacts on Colmesneil ISD.

Figure 15-4: Preliminary Dam Inundation Analysis for Lake Tejas Dam

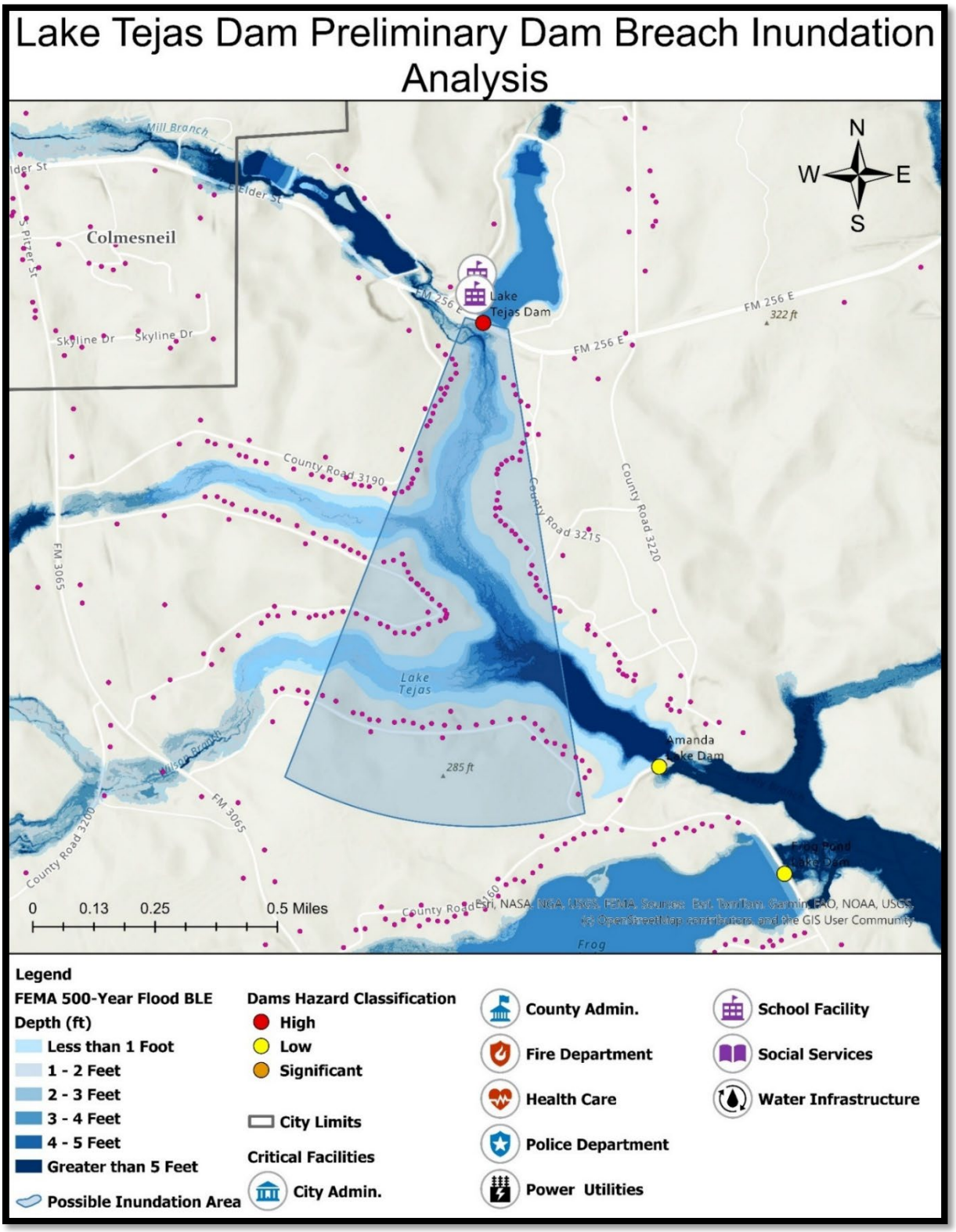


Figure 15-5: Preliminary Dam Inundation Analysis for Forest Lake Dam (*If Repaired and retaining water)

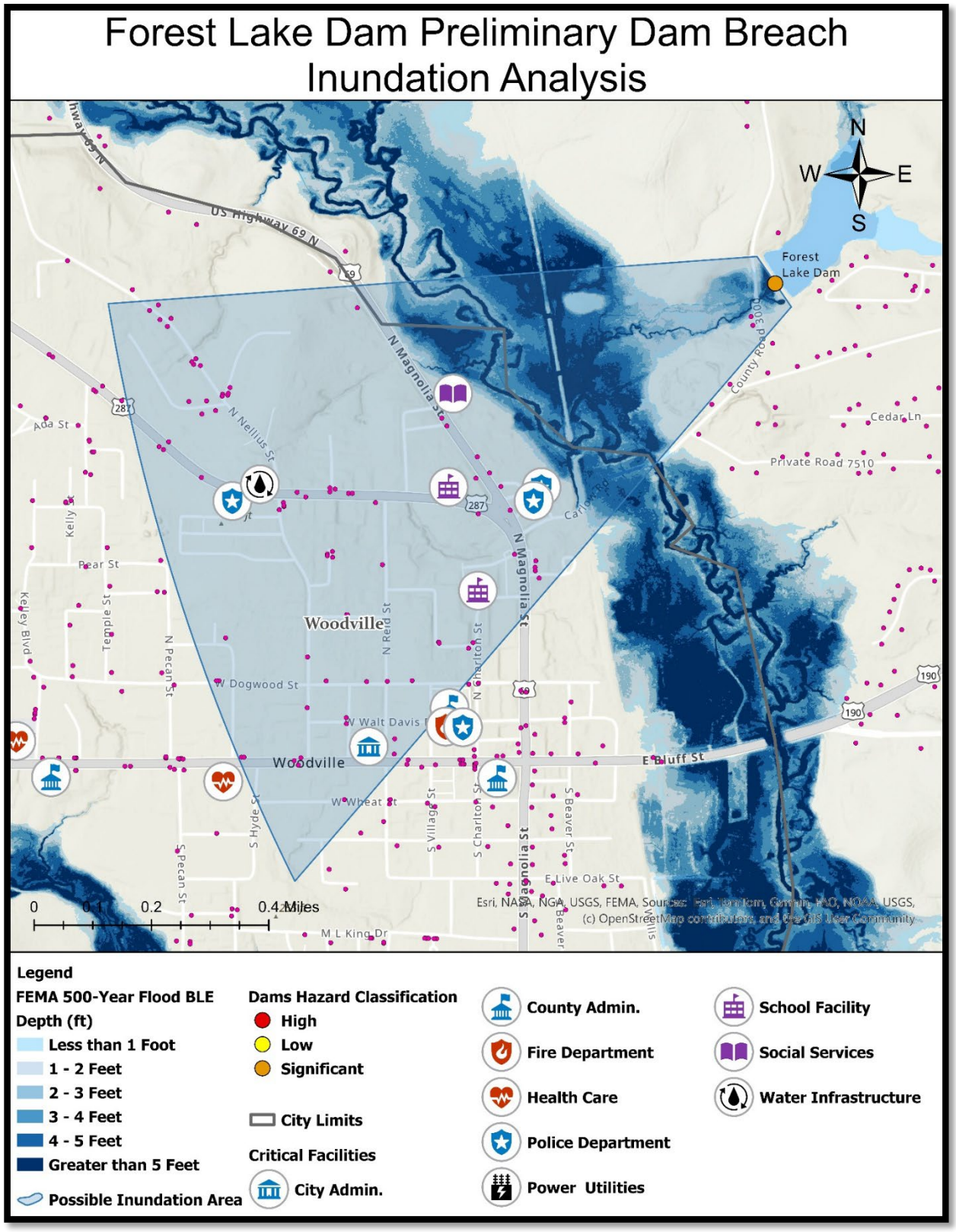


Figure 15-6: Preliminary Dam Inundation Analysis for Lake Tristian Dam

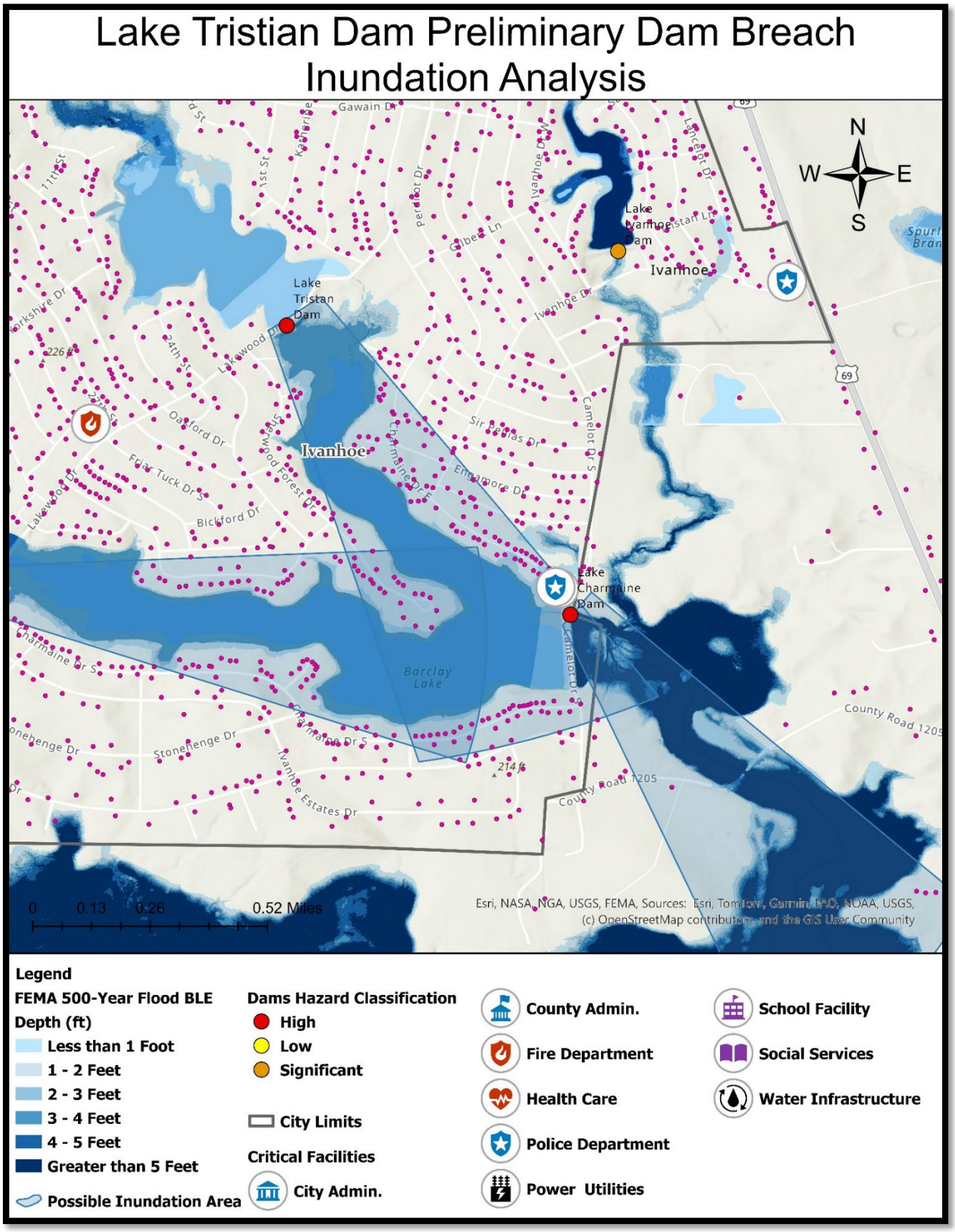


Figure 15-7: Preliminary Dam Inundation Analysis for Lake Galahad

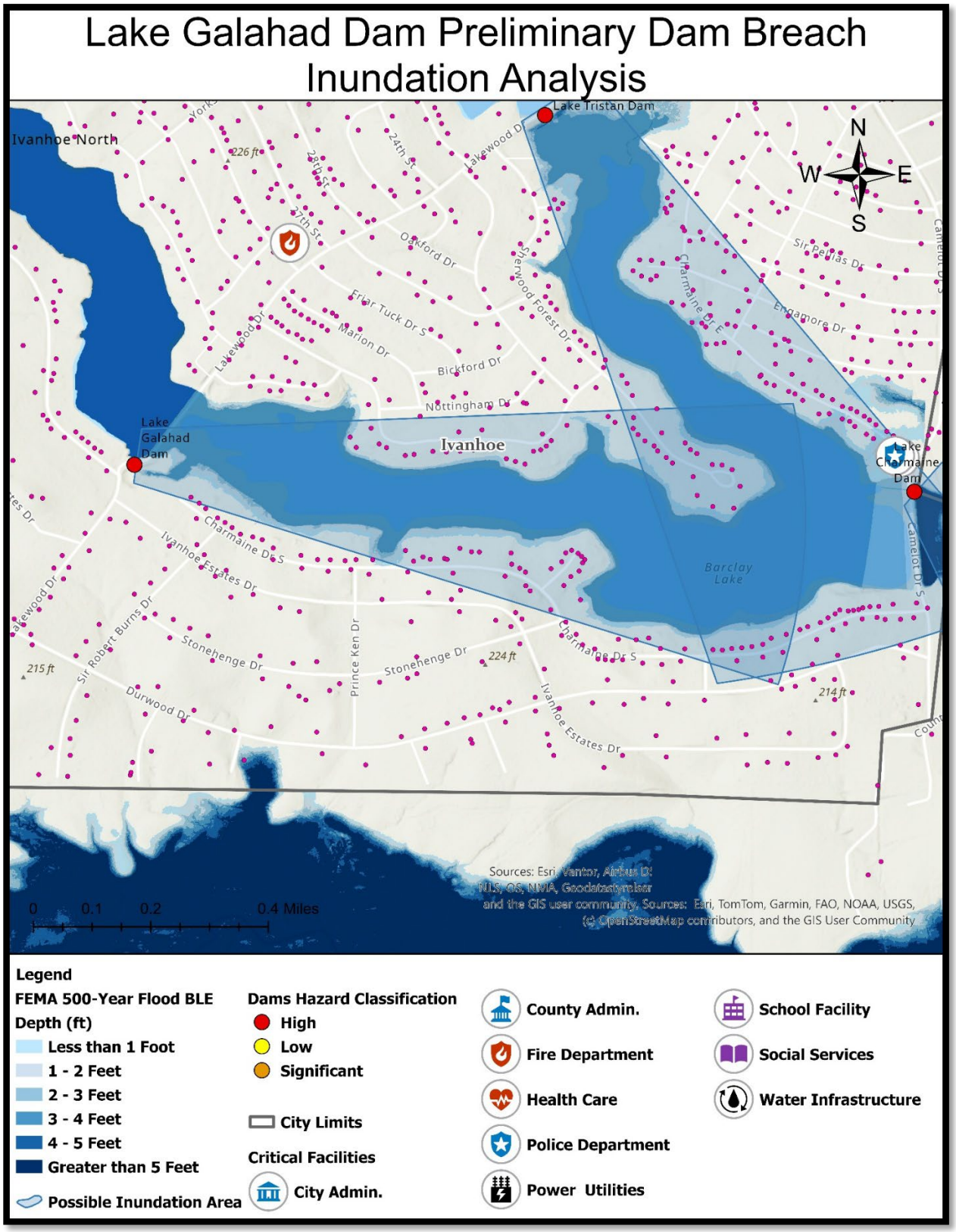


Figure 15-8: Preliminary Dam Inundation Analysis for Lake Charmaine Dam

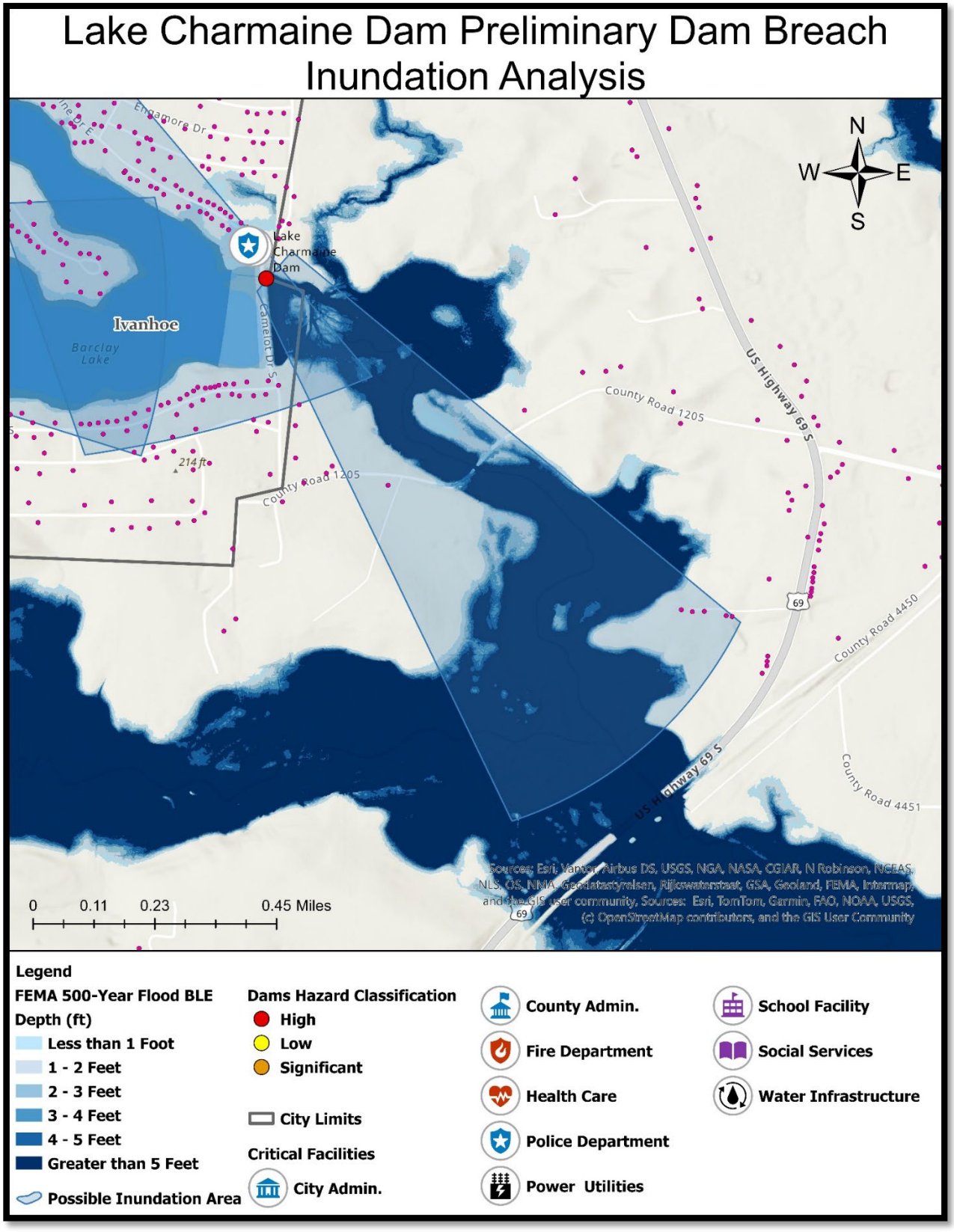


Figure 15-9: Preliminary Dam Inundation Analysis for Lake Jackson

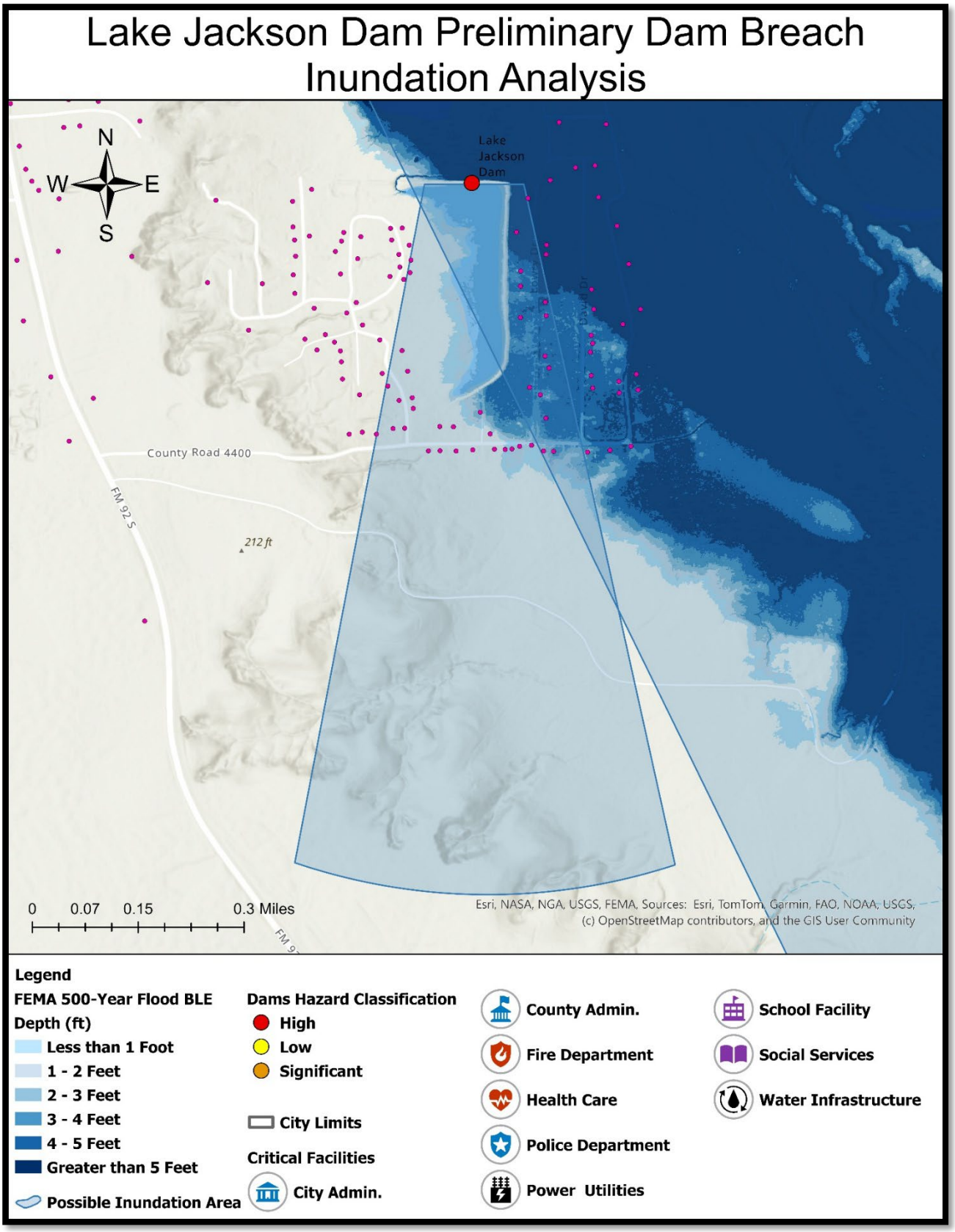
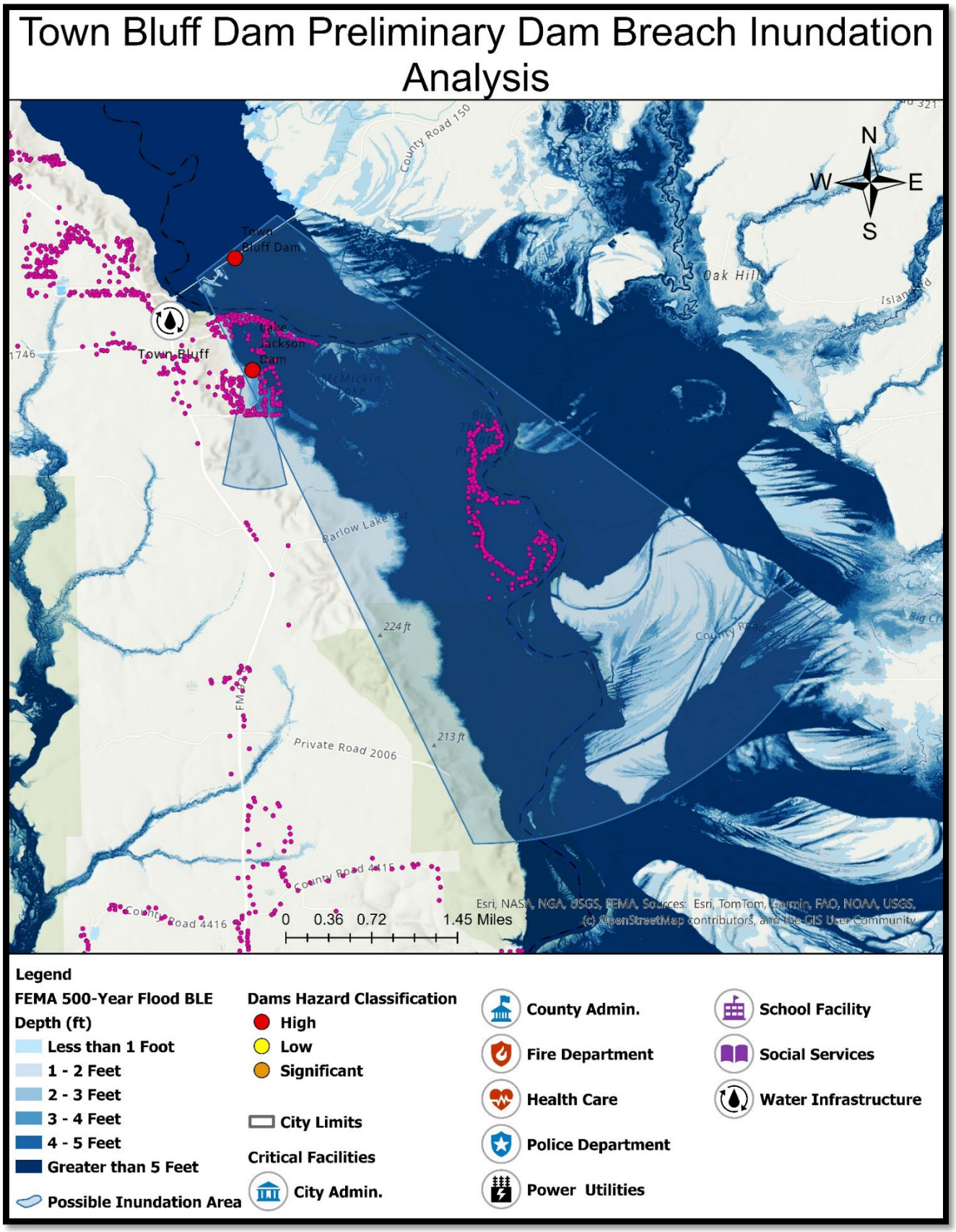


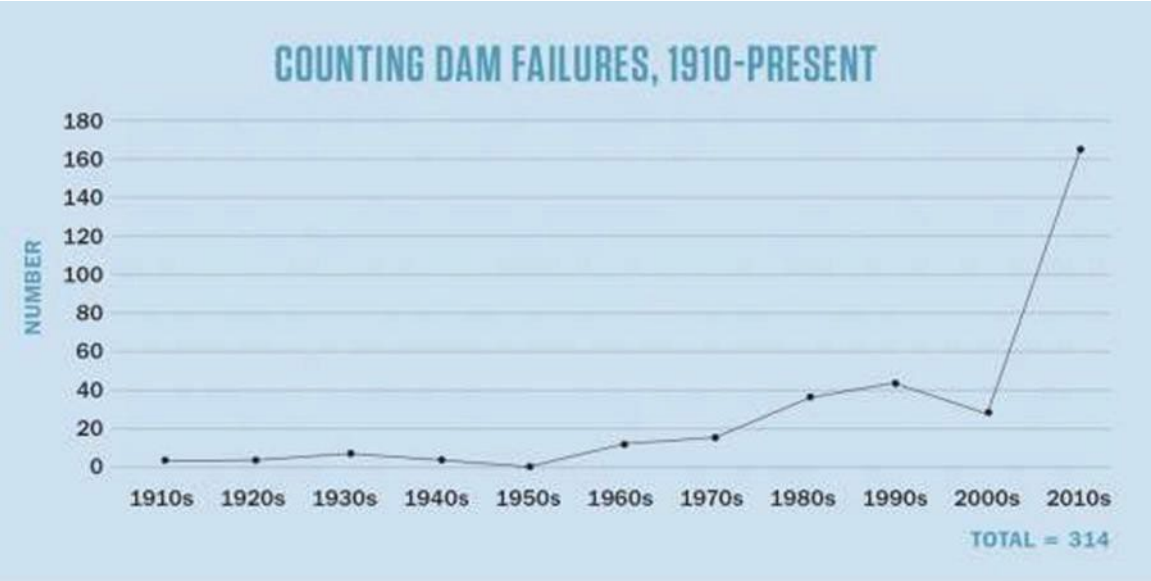
Figure 15-9: Preliminary Dam Inundation Analysis for Town Bluff Dam



## Historical Occurrences

Texas dams earn a "D" grade from the American Society of Civil Engineers. Of the approximately 300 dam failures in Texas since 1910, half have occurred in the last nine years.

Figure 15-10: Texas Dam Failures, 1910-2019




Source: Texas Observer

Many of the dams in the planning area are classified as small dams, and their failure has the capacity to cause physical and economic harm. A federal study found that from 1960 to 1998, dam failures accounted for 300 fatalities that occurred nationally, and more than 85% were caused by dams less than 50 feet in height. In Texas, almost half of all dams are considered too small to regulate, and they are exempt from inspections and oversight. Based on an investigation by the Texas Observer, "This investigation found that the vast majority of failures in Texas involve dams that impound less than 1,000 acre-feet. Despite their size, many small dams are ticking time bombs, according to safety experts. Big dams are usually owned by government agencies such as river authorities, which have money for upgrades and are regulated by TCEQ. Small dams are typically owned by individuals, homeowners' associations, and cash-strapped counties that can't afford expensive improvements." This article makes the point not to conflate dam size ith do nstream hazard potential, an important reminder that government priorities have to balance risk reduction and political viability and sometimes favor reduced regulatory oversight and property rights, even hen lives could be at risk.

## Significant Events

There have been four dam failure events in the Tyler County planning area between the years 2000-2025. The failures were all related to flood and heavy rain events, three of which were directly related to the severe weather from Hurricane Harvey in August, 2017. The impacts of heavy rain can weaken dam infrastructure overtime, so it is important to monitor and maintain the condition of the dams, especially those that pose high hazard.

## Probability of Future Events

According to historical records, from 2000-2025, the Tyler County planning area has experienced four dam failures. The probability of a dam failure event occurring in the planning area is **Occasional**, with a dam failure event probable in the next 5 years.

| Frequency of Occurrence |
|---|
| Highly likely: Event probable in next year. |
| Likely: Event probable in next three years. |
| Occasional: Event possible in next five years. |
| Unlikely: Event possible in next 10 years. |

## Vulnerability and Impact

All areas that are directly downstream of one of the six high hazard dams in the planning area are vulnerable to a breach. The average lifespan of dams is approximately 50 years. The average age of all dams within the planning area is approximately 75 years, which may be a concern for future dam failures. The two largest dams were built in 1951 (Town Bluff Dam) and 1959 (Amanda Lake Dam), making them 75 and 70 years old, respectively. In Table 15-3 , the High and Significant Hazard Classifications are listed with their most recent inspection date, and if they have an EAP.

Table 15-3 : High Hazard Dams of Tyler County

| Dam Name | Last Inspection Date | Condition Assessment | Condition Assessment Date | Date of last EAP Revision |
|---|---|---|---|---|
| **Lake Tejas Dam** | 4/20/2023 | Fair | 11/21/2023 | 1/31/2024 |
| **Lake Jackson Dam** | 4/26/2023 | Poor | 3/21/2024 | Not Available |
| **Lake Tristan Dam** | 10/3/2023 | Fair | 4/16/2024 | 2/8/2024 |
| **Lake Galahad Dam** | 10/3/2023 | Fair | 4/16/2024 | 2/8/2024 |
| **Lake Charmaine Dam** | 10/3/2023 | Poor | 4/16/2024 | 2/8/2024 |
| **Town Bluff Dam** | 5/25/2021 | Not Available | Not Available | 7/25/2023 |

Dam failure is categorized from lesser degree to catastrophic failure. Catastrophic type of failure is characterized by the sudden, rapid, and uncontrolled release of impounded water or the likelihood of such an uncontrolled release. Lesser degrees of failure include any malfunction or abnormality outside the design assumptions and parameters that adversely affect a dam's primary function of impounding water. These lesser degrees of failure can often lead to an increased risk of catastrophic failure; however, lesser degrees are easier to remedy to prevent further complications. If a dam failure is extensive, a large amount of water would enter the downstream waterways forcing them out of their banks. There may be significant environmental effects, resulting in flooding that could disperse debris and hazardous materials downstream that can damage local ecosystems. If the event is severe, debris carried downstream can block traffic flow, cause power outages, disrupt local utilities, such as water and wastewater, and could result in school closures.

The dams in Tyler County are susceptible to the impacts of cascading or compounding hazard events, where upstream dam failure, hurricanes, flash floods, tornadoes, and wildfires could significantly damage a dam and lead to its failure. Additionally, dam failure leads to downstream flooding with vegetation and soil disturbances. This debris accumulation can increase the potential for wildfires if fuel is not managed properly, especially if drought conditions follow an inundation event.

## Extent

Given the coverage of high and significant hazard dams across Tyler County, the extent to mitigate for dam inundation is **"High".** Given the density of housing and city facilities in Ivanhoe, directly downstream of significant and high-hazard dams, the extent to mitigate for dam inundation is **"High".** Given that Colmesneil ISD owns the Lake Tejas Dam and has recreational facilities surrounding the lake that contribute to the financial well-being of the district, the extent of damage to mitigate for Colmesneil ISD is **"Significant".**

Given a lack of dams upstream and within 1 mile of City Limits, the extent to mitigate for dam inundation for the Cities of Woodville, Chester, and Colmesneil is **"None"**; Dam inundation poses no threat to residents or city facilities. Dam inundation also poses no risk to any facilities for Chester ISD, Woodville ISD, Spurger ISD, Warren ISD, and Chester WSC, meaning the extent to mitigate for dam inundation for these jurisdictions is also **"None"**.

## High Hazard Potential Dam Eligibility

Currently, only Lake Charmaine Dam is eligible for High Hazard Potential Dam Grant funding. While there are other dams classified as high hazard, indicating that their failure could cause a significant loss of life and property damage, according to Chapter 299 of the Texas Administrative Code, FEMA has a distinct definition for determining High Hazard Potential Dam funding eligibility. Funding eligibility is based on three criteria: if the dam is in poor or unsatisfactory condition, if the dam is classified as High Hazard, and if the dam has a recently updated Emergency Action Plan (EAP). Based on that set of criteria seen in Table 15-3 above, only Lake Charmaine Dam is eligible for that funding source.

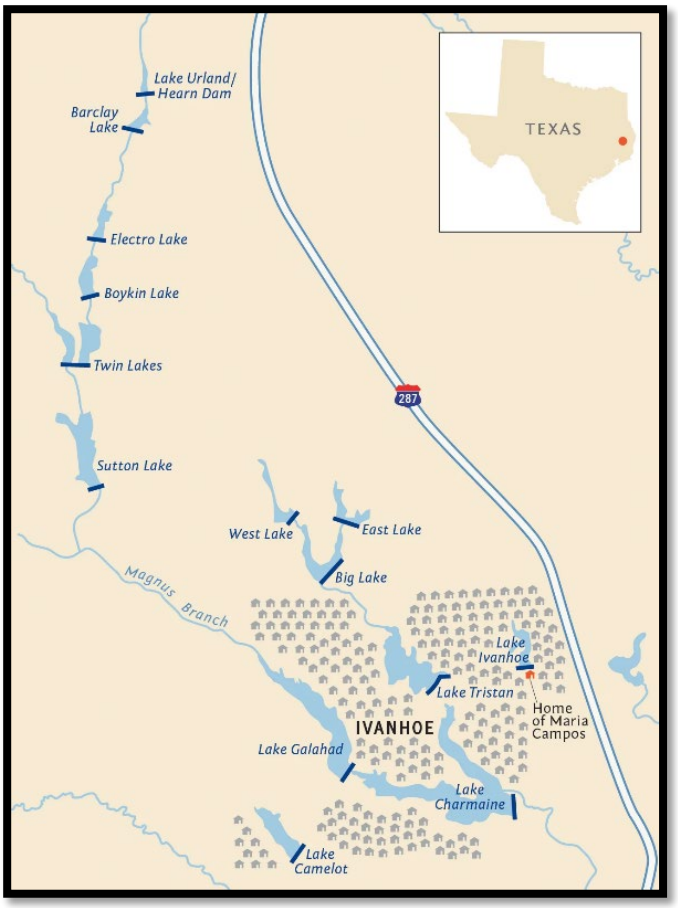
## Collaboration With Local Dam Owners and TCEQ

To ensure eligibility for HHPD funding for the Lake Charmaine Dam, the City of Ivanhoe, the owner of the Lake Charmaine Dam, collaborated extensively with the Tyler County Office of Emergency Management and the planning staff of Langford Community Management Services. In addition to attending all planning meetings, consisting of the kick-off meeting, the mitigation action workshop on December 8, 2025 an additional meeting with the City of Ivanhoe was held on January 6, 2026to review their dam information. Dam condition assessments, provided through collaboration with TCEQ, and the Emergency Action Plan for the Lake Charmaine Dam from the City of Ivanhoe were examined, and data deficiencies were revealed.

Currently, there is no official inundation study performed for the Lake Charmaine Dam, meaning there is no map with the area of inundation and the depth of water if the dam were to fail. A mitigation action to remedy this data deficiency has been added to the plan. To begin to address this data deficiency, the 500-year floodplain has been mapped, and a one-mile cone extending downstream from the dam with potential properties at risk can be seen in Figure 15-11.

Lake Charmaine Dam is highly vulnerable to cascading hazard events driven by (1) upstream dam failures, (2) hurricanes, (3) flash flooding, and (4) post-wildfire watershed impacts, and less likely 5) Tornados. Extreme rainfall from hurricanes and localized flash-flood events can rapidly increase inflows and water surface elevations across the upstream drainage network and can also trigger sequential ("domino") dam incidents upstream that compound peak flows into Lake Charmaine. In addition, wildfire in the upstream watershed could destroy vegetation and increase runoff, debris, and sediment delivery to Magnus Branch, reducing storage capacity and increasing stress on dam conveyance and structural components during subsequent storms. The result is elevated potential for non-breach emergency releases/overtopping and incremental (breach) flooding risk at Lake Charmaine, with significant consequences for both upstream access and downstream inundation.

Figure 15-11: Ivanhoe Dam Map (Source: Dammed to Fail -Texas Observer)




**Upstream Cascade Setting:** There are 11 dams upstream of Lake Charmaine Dam, seven along Magnus Branch and four dams northeast of Lake Charmaine. Three of the four northeast dams are on private property outside city limits, creating added coordination and situational awareness challenges during fast-moving storm events. During intense rainfall, these upstream impoundments can contribute to rapidly rising water levels and, if compromised, can send additional flood waves downstream that converge at Lake Charmaine.

**Cascading Impacts Upstream Flooding and Life Safety:** Upstream flash flooding and torrential rain can create significant flooding upstream of Lake Charmaine Dam, which can limit emergency access and evacuation for the City of Ivanhoe. Key constrained routes include Lakewood Drive (just south of Lake Tristan and Lake Galahad) and Camelot Drive, which is located on the Lake Charmaine dam embankment. Flooded approaches and embankment-adjacent road impacts can reduce evacuation time, complicate emergency response, and isolate lakefront neighborhoods.

**Downstream Consequences of Upstream Dam Failure:** When upstream dams fail, there is a substantial increase in flooding affecting lakefront properties in Ivanhoe, and this escalation has historically contributed to the failure of Lake Charmaine Dam. The combined inflow surge

and elevated reservoir levels—potentially compounded by reduced storage and obstructed conveyance from post-wildfire debris and sediment—increase the likelihood of overtopping/erosion and potential breach, which would significantly expand downstream inundation affecting residences and critical transportation routes south of the dam.

**Historical Incident Demonstrating the Cascade Mechanism:** The City of Ivanhoe has documented that upstream flooding and dam inundation during Hurricane Harvey resulted in a ~100-foot gash in Lake Charmaine Dam, which flooded homes and roads south of the dam. There have been no documented effects of upstream wildfires on dam conditions.

Tornadoes, while typically localized compared to hurricane flooding, could still contribute to dam incident risk by damaging the embankment, blocking access routes, and introducing debris that impairs conveyance during subsequent rainfall events. No other hazards profiled in this plan pose a threat to Lake Charmaine Dam, and its upstream or downstream flood potential.
Appendix contains additional Confidential information about the hazard potential for the ake Charmaine Dam. Contact the Tyler County Office of Emergency Management or the City of Ivanhoe for access to this information.

# SECTION 16: MITIGATION STRATEGY

The Tyler County Office of Emergency Management updated its goals to reflect its current objectives for hazard mitigation across Tyler County.

**1.** Build the capability for carrying out hazard mitigation activities.

I. Objective 1.1 - Encourage education and training for personnel involved in hazard mitigation to develop high levels of expertise.

II. Objective 1.2 - Ensure, to the extent feasible, adequate levels of staffing for hazard mitigation activities.

III. Objective 1.3 - Create and foster partnerships to help communities reduce their exposure to hazards.

IV. Objective 1.4 - Focus on identifying and obtaining federal, state, and private-sector funds available for hazard mitigation.

V. Objective 1.5 - Upgrade operational systems and facilities that support hazard mitigation.

**2.** Heighten public awareness and support for hazard mitigation.

I. Objective 2.1 - Ensure that communication between disaster personnel and the public in advance of and during hazard events is adequate in content and coverage.

II. Objective 2.2 - Inform Tyler County and participating jurisdiction citizens about the full range of natural hazards they face, and the need for guarding against injury and loss of life caused by those hazards.

III. Objective 2.3 - Devise programs to educate the public about how to prevent or reduce the loss of life or property from all hazards, including specific actions that can be taken.

**3.** Increase awareness of public officials, community and business leaders of the need for hazard mitigation, and support actions to protect public health and safety.

I. Objective 3.1 - Encourage the adoption of appropriate hazard mitigation measures by local governments, businesses, institutions, and individuals, and communicate information about specific, effective actions they can take.

II. Objective 3.2 - Ensure that communication among disaster personnel and public officials in advance of and during hazard events is adequate in content and coverage.

III. Objective 3.3 - Focus on protecting particularly vulnerable areas during hazard events (e.g., hospitals, areas crossed by fuel transmission lines).

4. Promote resource-sharing and increase coordination and cooperation among governmental entities in conducting hazard mitigation activities.
    I. Objective 4.1 - Improve and expand communication and coordination within and among federal, state, and local governments in mitigating hazards.
    II. Objective 4.2 - Identify and map critical facilities and take action to ensure that critical facilities and services can continue to operate in disaster situations.
    III. Objective 4.3 - Create hazard-specific and general hazard mitigation partnerships among Tyler County, its participating jurisdictions, and other Stakeholders.
5. Mitigate damage to and losses of new and existing real property.
    I. Objective 5.1 - Protect public infrastructure and private buildings from known hazards.
    II. Objective 5.2 - Support methods, codes, and ordinances that reduce threats to existing and new development and ensure that citizens are not unnecessarily exposed to potential hazards.
    III. Objective 5.3 - Reduce repetitive losses to the NFIP.
    IV. Objective 5.4 - Protect against financial losses caused by hazard events through liberal application of insurance coverage.
    V. Objective 5.5 – Identify High Hazard Potential Dams in Tyler County and work to improve their condition, and reduce downstream and upstream risk caused by dams.
6. Promote sustainable growth.
    I. Objective 6.1 - Promote beneficial uses of hazardous areas while expanding open space and recreational opportunities.
    II. Objective 6.2 - Incorporate hazard mitigation into long-range planning, budgeting, and development activities.
    III. Objective 6.3 - Prevent creation of future hazards to life and property.

# SECTION 17: MITIGATION ACTIONS

The mitigation actions developed by the Core Team, Jurisdictional sub-teams, and community stakeholders are presented in this section for the Tyler County planning area jurisdictions. Core Team members and Jurisdictional sub-team members met for one primary mitigation workshop in December 2025 with follow up meeting in January 2026, to develop mitigation actions for each of the natural hazards described in the Plan, Sections 5-15.

This began with a review of mitigation actions from the prior Tyler County Hazard Mitigation Plan to assess whether they had been completed and, if not, whether they were still relevant. The Action items with an "Ongoing" label in the New Action column are those that have been carried over from the previous plan. New actions were developed with unique insight from planning team members, community and regional plans, capital improvement plans, and mitigation ideas developed by FEMA and the Texas Division of Emergency Management (TDEM).

Based on input from the three jurisdictions: Tyler County, Woodville, and Ivanhoe, the following action items from the previous Plan were completed or have been cancelled as they are no longer relevant, cost-effective, or otherwise feasible. Action items previously listed but still ongoing are included in the current mitigation actions in the tables below.

Table 17-1: List of Completed or Removed Actions for Tyler County

| Mitigation Action | Hazard(s) Addressed | Status |
|---|---|---|
| Countywide Debris Management Strategy: Develop coordinated strategies for clearing roads of fallen trees and debris. Re-adopt solid waste codes and standards for disaster resistance. | Hurricane, Flood, Drought, Excessive Heat, Wildfires, Hail, Windstorm, Tornado, Severe Winter Storm, Dam Failure, | Completed |

Table 17-2: List of Completed or Removed Actions for the City of Woodville

| Mitigation Action | Hazard(s) Addressed | Status |
|---|---|---|
| Review and Update Evacuation Plan: Update evacuation plan and implement recommendations from plan. (Do not have a city-specific evacuation plan - included in the county basic plan) TXDOT/DPS in control | Wildfire, Extreme Heat | Cancelled |
| Address and improve drainage at the following low water crossings: S. Beech & Holly; S. Pecan & Cardinal; Railroad & Veterans Way to Bridge; Carlow Hill Road to Bridge; and S. Magnolia @ Dewberry Clinic. | Hurricane, Floods, Windstorms | Completed |
| Map the risk of Dam Failure for Babin Lake and Chesswood Lake. Map culverts and problem areas that have a history of flooding. | Hurricane, Flood, Drought, Tornado, Lightning | Cancelled – Dams pose no threat, and are not registered as dams in the state of Texas |

Table 17-1: List of Completed or Removed Actions for the City of Ivanhoe

| Mitigation Action | Hazard(s) Addressed | Status |
|---|---|---|
| Protect Critical Facilities and Equipment: Move equipment and vehicles to higher ground where necessary. Install lightning protection devices and methods on communications infrastructure and other critical facilities. Install and maintain surge protection on critical electronic equipment. | Hurricane, Flood, Drought, Windstorm, Hailstorms, Lightning, Severe Winter Weather | Completed |
| Prepare for and Reduce the Impacts of Power Outages: Install and maintain auxiliary power at critical facilities to ensure continuity of government, emergency response, and public safety during extended power outages. | Hurricane, Floods, Tornado, Lightning, Windstorms, Hailstorms, Severe Winter Storms, Dam Failure | Completed |
| Fire Equipment: Equipment for improved response by Fire Dept. as first responders for home/business as well as brush fires. | Wildfire, Extreme Heat, Drought, Lightning | Completed |
| Protect Infrastructure: Address and Improve drainage at the following low water crossings: Ivanhoe Drive. | Hurricane, Flood, Windstorm, Extreme Heat, Lightning, Tornado, Hailstorms, Wildfire, Severe Winter Storms, Dam Failure | Completed |
| Property Buyout on Lake Ivanhoe and Lake Ivanhoe Dam: Buyout properties that are at the most risk of repetitive flooding. | Hurricane, Floods, Severe Winter Weather, Dam Failure | Completed |

| | | |
|---|---|---|
| Require Water Conservation During Drought Conditions: Implement programs that require water users to conserve based on the severity of the drought. | Drought, Extreme Heat | Completed |
| Break-away Fencing at Spillways: Install breakaway fencing at dam spillways to allow emergency access. | Hurricane, Flood, Windstorm, Severe Winter Storm | Cancelled |
| Protect Infrastructure: Protect power lines and the functioning of other critical facilities through promoting ROW maintenance with clearing and trimming. | Hurricane, Flood, Windstorm, Extreme Heat, Lightning, Tornado, Hailstorms, Wildfire, Severe Winter Storms, Dam Failure | Cancelled |
| Protect Infrastructure: Identify infiltration/inflow (I&I) issues with methods such as smoke testing. Replace sewer lines to reduce I&I. | Hurricane, Flood, Windstorm, Extreme Heat, Lightning, Tornado, Hailstorms, Wildfire, Severe Winter Storms, Dam Failure | Cancelled |
| Monitor Water Supply: Regularly check for leaks to minimize water supply losses. Improve and maintain water supply monitoring systems to include SCADA, automated meters, and leak detection software. | Drought, Extreme Heat | Cancelled |
| French drains around Civic Center: Install French drains around civic center to address drainage problems at Civic Center. | Hurricane, Flood, Windstorm, Severe Winter Storm | Cancelled |
| City Wide Hazardous Fuel Reduction Project: Reduce the available vegetative fuels in areas prone to wildland fire to reduce the risk to urban interfaces. | Wildfires, Lightning, Extreme Heat, Drought | Cancelled |
| Protect critical infrastructure, homes, and businesses that would be most impacted by a catastrophic dam failure: identify and voluntarily move, remove, or elevate structures in the dam failure inundation zone. Relocate critical infrastructure or critical functions outside the failure inundation zone, elevate above anticipated flood levels, or protect infrastructure that cannot be relocated or elevated (e.g., pipelines, water, sewage, natural gas, pump systems). | Dam Failure | Cancelled |
| Remove existing structures from flood hazard areas: citywide acquisition program would prioritize buyouts/acquisitions of homes. | Hurricane, Flood, Severe Winter Weathers | Cancelled |

The Core Planning team reviewed the remaining actions, presenting them to their respective departments and stakeholders to get feedback and develop them further. The goals listed in the Hazard Mitigation Plan in Section 16 were used as guidance while considering factors such as existing and future growth, hazard risk assessments, individual community priorities, critical facilities, and unique community vulnerabilities.

## Mitigation Action Plan

The Mitigation Action Plan is a method to prioritize mitigation actions and assign departmental responsibility, ensuring a higher rate of successful action implementation and administration. Each jurisdiction has multiple authorities to implement the mitigation strategy, including, but also limited to, local planning and zoning, public works efforts, emergency management, tax authority, building codes and ordinances, and legislative and managerial departments.

All of the new and old mitigation actions in this section were prioritized primarily based on FEMA's Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLE-E) criteria. These criteria are considered necessary for each action's successful and enduring implementation. Each participating jurisdiction in the Plan had an opportunity to discuss and consider each of the criteria as they related to each action and rate them from one to five. The total scores from the STAPLE-E exercises were then used to assign overall priority to each mitigation action for each of the participating jurisdictions. In addition to the STAPLE-E exercise, jurisdictions analyzed each action in terms of which department or agency would be responsible for the administration of the action, action timeline, and potential funding sources, measuring whether the potential benefit to be gained from the action outweighs the costs associated with it. The same STAPLE-E criteria were used to rank the HHPD Dam Mitigation Actions.

An action that is ranked as "High" indicates that it scored among the top actions in the STAPLE-E Prioritization exercise. A "Medium" action may not be implemented right away, depending on the cost and how many barriers there are for effective implementation. A "Low" action is one whose benefit is hard to quantify in relation to the cost and the significant barriers for implementation, but it is still considered of value to the community and is to be implemented when funds and resources are available.

## Tyler County Mitigation Actions

| Mitigation Action #1<br>Status: Ongoing<br>$15,000 | Storm Ready Designation |
|---|---|
| **Description and Objective** | Prepare/submit an application for Storm Ready Designation to the National Weather Service that attests to the community's level of preparedness for severe weather. |
| **Hazards Addressed** | Hurricane, Flood, Lightning, Windstorm, Severe Winter Storm |
| **Priority** | Medium |
| **Possible Funding Sources** | Local, NWS |
| **Responsible Department** | Tyler County Office of Emergency Management; County Commissioners; Private Contractors |
| **Time to Complete** | 24 Months |

| Mitigation Action #2<br>Status: Ongoing<br>$25,000 | Hazardous Materials Training |
|---|---|
| **Description and Objective** | Provide hazardous materials training and establish a County Hazardous Materials Response Team. Conduct tabletop exercises to strengthen response capability and communications. |
| **Hazards Addressed** | Hazardous Materials, Wildfires |
| **Priority** | High |
| **Possible Funding Sources** | Local, TDEM |
| **Responsible Department** | Tyler County Office of Emergency Management; County Commissioners; Private Contractors |
| **Time to Complete** | Annual Training |

| Mitigation Action #3<br>Status: Ongoing<br>$30,000 | Wilderness Area Response Plan |
|---|---|
| **Description and Objective** | Develop partnerships between local VFDs, neighboring VFDs, and the Forest Service. Draft a response plan with roles and responsibilities for wildfire events. |
| **Hazards Addressed** | Wildfire, Lightning, Extreme Heat, Drought |
| **Priority** | High |
| **Possible Funding Sources** | Local, TAMUFS |
| **Responsible Department** | Office of Emergency Management, VFDs |
| **Time to Complete** | 36 Months |

| Mitigation Action #4<br>Status: Ongoing<br>$75,000 | Identifying Surface Water Drainage Obstructions |
|---|---|
| **Description and Objective** | Map culverts in all areas of the County. Develop a beaver control plan. Prepare an inventory of culverts that historically create flooding problems and target them for retrofitting. Implement a program to inventory culverts where obstructions often lead to flooding conditions, so that signage is provided to inform motorists of the potential hazard when measurable rainfall has occurred. |
| **Hazards Addressed** | Hurricane, Flood, Severe Winter Storm, Dam Failure, Windstorm |
| **Priority** | Medium |
| **Possible Funding Sources** | Local |
| **Responsible Department** | Tyler County Office of Emergency Management; County Commissioners; GIS |
| **Time to Complete** | 36 Months |

| Mitigation Action #5<br>Status: Ongoing<br>$75,000 | **Identify Citizens, Properties, and Structures at Risk** |
|---|---|
| **Description and Objective** | Identify all properties and assets within the County that might be in the floodplain but were not identified by the hazard mitigation team, utilizing FIRMs, testimonials, etc. Map out flood-prone assets on GIS. |
| **Hazards Addressed** | Hurricane, Flood, Severe Winter Storm, Dam Failure |
| **Priority** | Medium |
| **Possible Funding Sources** | Local |
| **Responsible Department** | Tyler County Office of Emergency Management; County Commissioner |
| **Time to Complete** | 24 Months |

| Mitigation Action #6<br>Status: Ongoing<br>$1,500,000 | **Floodplain/Floodway Property Buyouts and/or Elevation** |
|---|---|
| **Description and Objective** | Establish a voluntary "acquisition and demolition program", "acquisition and structure relocation program", and "structure elevation program" to address repetitive loss, flood-prone properties. Conduct floodplain/floodway voluntary buyout or structure relocation of flooded structures to remove them from the SFHA and restrict future structures from development on the site. Conduct voluntary elevations for properties in the floodplain/floodway. A database will be developed and maintained by the floodplain manager of all flood-prone properties, particularly RL and SRL properties, throughout the county, with all pertinent data for each property. |
| **Hazards Addressed** | Flood, Hurricane |
| **Priority** | Medium |
| **Possible Funding Sources** | FEMA HMGP, FMA |
| **Responsible Department** | Tyler County Office of Emergency Management; County Commissioner |
| **Time to Complete** | 48 Months |

| Mitigation Action #7<br>Status: Ongoing<br>$45,000 | Inventory of Alternative Firefighting Water Sources |
|---|---|
| Description and Objective | Advocate for water storage facilities with fire-resistant electrical pump systems in development outside of the fire protection district that are not connected to a community water or hydrant system. Develop a protocol for fire jurisdictions and water districts to communicate all hydrant outages and water shortage information. Coordinate the usage of existing water company flush valves for filling tankers. Evaluate existing water sources/systems, identify substandard systems, and generate cost estimates for upgrading these systems so they meet fire department standards. Create a GIS of available water sources for fighting wildfires. |
| Hazards Addressed | Wildfire, Lightning, Extreme Heat, Drought |
| Priority | Medium |
| Possible Funding Sources | Local, TAMFS |
| Responsible Department | Office of Emergency Management |
| Time to Complete | 36 Months |

| Mitigation Action #8<br>Status: New (No Prior Progress)<br>$20,000 | Water Preservation Programs |
|---|---|
| Description and Objective | Encourage the development of low-use water systems on a general basis through educational programming that shows the benefit of using water more precisely, both from a production and a cost standpoint. Put together a practical how-to user's manual that outlines the various methods of water conservation and irrigation system design, and includes conservation information over traditional methods. |
| Hazards Addressed | Extreme Heat, Drought |
| Priority | Low |
| Possible Funding Sources | EPA, TWDB, Local |
| Responsible Department | TCOEM; TC Commissioner; TCEQ; TA&M Agri-Life Extension Service; DETCOG, SETX Groundwater Conservation |
| Time to Complete | 24 Months |

| Mitigation Action #9<br>Status: Ongoing<br>$20,000 | Improve Public/Private Collaborative Programs |
|---|---|
| **Description and Objective** | Distribute information about floods, fire, windstorms, and other types of natural hazards to property owners in areas identified to be at risk through hazard mapping. Develop a one-page handout on types of insurance and deliver it through county utility or service agencies. Educated individuals and businesses on the benefits of engaging in mitigation activities such as developing impact analyses. Pinpoint areas of high risk and transfer the cost of risk to property owners through insurance (rather than to the public). Encourage the development of unifying organizations to ensure communications and dissemination of natural hazard mitigation information. Identify activities for private sector and citizen involvement, such as strategies for building safely in flood zones. |
| **Hazards Addressed** | Hurricane, Flood, Drought, Extreme Heat, Lightning, Wildfires, Hail, Windstorm, Tornado, Severe Winter Storm, Dam Failure |
| **Priority** | Medium |
| **Possible Funding Sources** | Private Funding, Local |
| **Responsible Department** | Tyler County Office of Emergency Management |
| **Time to Complete** | 36 Months |

| **Mitigation Action #10**<br>**Status: Ongoing**<br>**$600,000** | **Link Infrastructure Providers** |
|---|---|
| **Description and Objective** | Educate private property owners on the limitations of infrastructure during hazard events. Develop a process to encourage private property owners to upgrade their private infrastructure to withstand emergency vehicles and hazard events. Encourage individual and family preparedness through public education projects such as safety fairs. Coordinate the maintenance of emergency transportation routes through communication among the County Commissioners, neighboring jurisdictions, and TxDOT. Identify opportunities for partnering with citizens, private contractors, and other jurisdictions to increase the availability of equipment and manpower for the efficiency of responders' efforts. Work with community groups to establish community response teams. Familiarize public officials with requirements regarding public assistance for disaster response |
| **Hazards Addressed** | Hurricane, Flood |
| **Priority** | High |
| **Possible Funding Sources** | TXDOT, Local, DECOG |
| **Responsible Department** | Office of Emergency Management |
| **Time to Complete** | 36 Months |

| Mitigation Action #11<br>Status: Ongoing<br>$25,000 | Pursue Funding Opportunities |
|---|---|
| Description and Objective | Develop incentives for the County, citizens, and businesses to pursue hazard mitigation projects. Allocate county and regional resources and assistance to mitigation projects when possible. Partner with other organizations, counties and agencies to identify grant programs and foundations that may support mitigation activities. |
| Hazards Addressed | Hurricane, Flood, Drought, Extreme Heat, Lightning, Wildfires, Hail, Windstorm, Tornado, Severe Winter Storm, Dam Failure |
| Priority | Medium |
| Possible Funding Sources | TX-PACE, |
| Responsible Department | Tyler County Office of Emergency Management |
| Time to Complete | 48 Months |

| Mitigation Action #12<br>Status: Ongoing<br>$100,0000 | Fire Hazard Maps |
|---|---|
| Description and Objective | Update wildland/urban interface/city maps as more updated and/or advanced data is available (i.e., satellite imagery, updated GIS systems, better GPS info, etc.). Conduct risk analysis incorporating data and the created hazard maps using GIS technology to identify risk sites and further assist in prioritizing mitigation activities. Encourage coordination between fire jurisdictions to ensure that the most accurate elevation data and other GIS datasets are being used. |
| Hazards Addressed | Wildfire, Lightning, Extreme Heat, Drought |
| Priority | Medium |
| Possible Funding Sources | CWPP |
| Responsible Department | Tyler County Office of Emergency Management; County Commissioner; Cities of Woodville, Ivanhoe; GIS; DETCOG |
| Time to Complete | 24 Months |

| Mitigation Action #13<br>Status: Ongoing<br>$150,000 | Inventory At-Risk Buildings and Infrastructure |
|---|---|
| Description and Objective | Further identify people, critical facilities, special facilities, housing units, commercial facilities, infrastructure, lifelines, and hazmat facilities at risk from natural hazard events. Further developing strategies to mitigate risk to these facilities, or to utilize alternative facilities, should natural hazard events cause damage to the facilities in question. Further identify bridges, roads, and utilities at risk from flood hazards, identify enhancements, and implement projects needed to reduce the risks. |
| Hazards Addressed | Hurricane, Flood |
| Priority | Medium |
| Possible Funding Sources | FEMA HMGP, CDBG, Local |
| Responsible Department | Office of Emergency Management |
| Time to Complete | 24 Months |

| Mitigation Action #14<br>Status: New<br>$8,000,000 | County-Wide Hazardous Fuels Reduction Project |
|---|---|
| Description and Objective | Reduce the available vegetative fuels in areas prone to wildland fire to reduce the risk in the Wildland-Urban Interfaces. Implement a hazardous fuels reduction program with priority on clearing and maintaining right-of-way to create fire breaks throughout the County and properties with the highest wildfire risks. |
| Hazards Addressed | Wildfire |
| Priority | High |
| Possible Funding Sources | CWDG |
| Responsible Department | Tyler County VFDs, Office of Emergency Management |
| Time to Complete | 48 Months |

| Mitigation Action #15<br>Status: Ongoing<br>$100,000 | Implement wildfire Outreach, Education & Inspection Program |
|---|---|
| Description and Objective | Implement a wildfire outreach, education, and inspection program with the intent to gain rights of entry to properties surrounding areas with the highest wildfire risks. |
| Hazards Addressed | Wildfire |
| Priority | Medium |
| Possible Funding Sources | Local, TAMUFS |
| Responsible Department | Tyler County Commissioners<br>Tyler County Precincts |
| Time to Complete | 48 Months |

| Mitigation Action #16<br>Status: Ongoing<br>$1,500,000 | Fire Repression Study and Implementation |
|---|---|
| Description and Objective | Study water resources available and document any special permission, restrictions, access requirements, etc. Work to develop additional resources through collaboration with private water entities and investigate joint strategies for the development of new sources. The purpose is to have an organized Point of Distribution (POD) with back-up generator to help mitigate against certain hazards. Implement the recommendations from the study. |
| Hazards Addressed | Wildfires |
| Priority | Low |
| Possible Funding Sources | TAMUFS, HMGP |
| Responsible Department | Office of Emergency Management |
| Time to Complete | 48 Months |

| Mitigation Action #17<br>Status: Ongoing<br>$8,000,000 | Storm Water Drainage and Road Improvements |
|---|---|
| Description and Objective | City road drainage/road improvement project - This project reduces repetitive loss to roads in the area by increasing storm water drainage capacity and investigating soil characteristics to mitigate cracking around the drain. Upgrade roads/box culverts/ bridges/ dams in the City of Ivanhoe. Upgrade roads to oil top or pavement throughout the city and add culverts as necessary, as roads are upgraded and elevated. Improve dams as necessary to prevent overtopping and erosion, as this is the only ingress-egress for sections of the city. |
| Hazards Addressed | Flood, Hurricane |
| Priority | Medium |
| Possible Funding Sources | FEMA HMGP, TxDOT, Private, Local |
| Responsible Department | Tyler County Office of Emergency Management; County Commissioner; Cities of Woodville, Ivanhoe; Private Contractors |
| Time to Complete | 60 Months |

| Mitigation Action #18<br>Status: New<br>(No Previous Progress)<br>$1,500,000 | Community Safe Room Creation |
|---|---|
| Description and Objective | Participate in the Safe Room Rebate Program / Construct a safe room/building for the public to go to for shelter. Allow this building to serve as a Warming/Cooling Center. |
| Hazards Addressed | Wildfire, Lightning, Extreme Heat, Hurricanes, Tornadoes, Severe Winter Storms, Hazardous Materials, Thunderstorm Winds, Flood, Dam Failure |
| Priority | Medium |
| Possible Funding Sources | FEMA HMGP, CDBG, Local |
| Responsible Department | Tyler County Office of Emergency Management; County Commissioner; Private Contractors |
| Time to Complete | 60 Months |

| **Mitigation Action #19**<br>**Status: New**<br>**(No Prior Progress)**<br>**$250,000** | **Develop CWPP** |
|---|---|
| **Description and Objective** | Develop and implement an effective mitigation, response, and recovery plan for wildfire in the urban wildland interface areas by building local capacity, enlisting support from the development community and citizen groups, and identifying the more hazardous areas of the "fireplain". |
| **Hazards Addressed** | Wildfire |
| **Priority** | High |
| **Possible Funding Sources** | USFS CWPP |
| **Responsible Department** | Tyler County Office of Emergency Management; County Commissioner |
| **Time to Complete** | 30 Months |

| **Mitigation Action #20**<br>**Status: Ongoing**<br>**$100,000** | Hazard Mitigation Action Plan Integration |
|---|---|
| **Description and Objective** | Integrate the County's mitigation plan into current capital improvement plans to ensure that development does not encroach on known hazard areas. Partner with other organizations and agencies with similar goals to promote building codes that are more disaster-resistant at the state level. |
| **Hazards Addressed** | Hurricane, Flood, Drought, Extreme Heat, Lightning, Wildfires, Hail, Windstorm, Tornado, Severe Winter Storm, Dam Failure |
| **Priority** | High |
| **Possible Funding Sources** | FEMA HMGP, CDBG, Local |
| **Responsible Department** | Office of Emergency Management |
| **Time to Complete** | 24 Months |

| | |
|---|---|
| **Mitigation Action #21**<br><br>**Status: New (No Prior Progress)**<br><br>**$2,500,000** | Master Drainage Plan-Stormwater Management Plan |
| **Description and Objective** | Develop flood hazard information by collecting information, high water marks, and conducting engineering studies to develop the 100-year and 500-year flood elevation levels and establish BFE data. |
| **Hazards Addressed** | Hurricane, Flood |
| **Priority** | Medium |
| **Possible Funding Sources** | FEMA FMA, TWDB, NOAA, Local |
| **Responsible Department** | Tyler County Office of Emergency Management; County Commissioner; Private Contractors |
| **Time to Complete** | 36 Months |

| | |
|---|---|
| **Mitigation Action #22**<br>**Status: Ongoing**<br>$2,000,000 | Address Storm Water Drainage Issues Countywide - Phase 1 |
| **Description and Objective** | This project reduces repetitive loss to structures in the area by increasing stormwater drainage capacity through investigating and mitigating cracking around the drain. Upgrade bridges to box culverts at County Roads: 1910, 4470, 1920, 2780, 2150, 2810, 3725, 4780. The bridges are deficient and need to be replaced, and this installation upgrade would improve stormwater drainage capacity. Upgrade low water crossings to include raising the road or header walls at County Roads: 1520, 4250, 1125, 2080, 2175, 2580, 2575, 3750, 3630, 3660, 3665, 3667, 3650, 3251, 3625, 4700, 4890, 4800, 4375, 4700, 4850, and 4600. Flooding overtops the road at these low water crossings, and this upgrade would improve stormwater drainage capacity. |
| **Hazards Addressed** | Hurricane, Flood, Dam Failure |
| **Priority** | High |
| **Possible Funding Sources** | FEMA HMGP, TxDOT |
| **Responsible Department** | Tyler County Office of Emergency Management; County Commissioner; Private Contractors |
| **Time to Complete** | 30 Months |

| | |
|---|---|
| **Mitigation Action #23**<br>**Status: New**<br>$1,000,000 | Address Storm Water Drainage Issues Countywide - Phase 2 |
| **Description and Objective** | This project reduces repetitive loss to structures in the area by increasing stormwater drainage capacity through investigating and mitigating cracking around the drain. The next phase of project locations to focus on include: 4755, 1550, 10325 US Highway 69 S. Warren, TX, 92 Extension, FM 256, CR 2590, Behind Justice Center - CR 3000, HW 69, and Cobb Mill |
| **Hazards Addressed** | Hurricane, Flood, and Dam Failure |
| **Priority** | High |
| **Possible Funding Sources** | FEMA HMGP, TxDOT |
| **Responsible Department** | Tyler County Office of Emergency Management; County Commissioner; Private Contractors |
| **Time to Complete** | 60 Months |

| | |
|---|---|
| **Mitigation Action #24**<br>**Status: Ongoing**<br>**$3,500,0000** | Roadside Ditch and Drainage Channel Improvements |
| **Description and Objective** | Russell & Billums Creek Watershed Drainage Improvements |
| **Hazards Addressed** | Hurricane, Flood |
| **Priority** | Medium |
| **Possible Funding Sources** | HMGP, TWDB |
| **Responsible Department** | County Commissioners, Public Works |
| **Time to Complete** | 36 Months |

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|---|---|
| **Mitigation Action #25**<br>**Status: Ongoing**<br>**$5,200,000** | Roadside Ditch and Drainage Channel Improvements: |
| **Description and Objective** | Hickory & Turkey Creek Watershed Drainage Improvements |
| **Hazards Addressed** | Hurricane, Flood |
| **Priority** | Medium |
| **Possible Funding Sources** | HMGP, TWDB |
| **Responsible Department** | County Commissioners, Public Works |
| **Time to Complete** | 36 Months |

| | |
|---|---|
| **Mitigation Action #26**<br>**Status: Ongoing**<br>**$4,300,000** | Roadside Ditch and Drainage Channel Improvements: |
| **Description and Objective** | Wolf Creek and Neches R. Watershed Drainage Improvements |
| **Hazards Addressed** | Hurricane, Flood |
| **Priority** | Medium |
| **Possible Funding Sources** | HMGP, TWDB |
| **Responsible Department** | County Commissioners, Public Works |
| **Time to Complete** | 36 Months |

| | |
|---|---|
| **Mitigation Action #27**<br>**Status: Ongoing**<br>**$5,000,000** | Roadside Ditch and Drainage Channel Improvements |
| **Description and Objective** | Beech Creek Watershed Drainage Improvements |
| **Hazards Addressed** | Hurricane, Flood |
| **Priority** | Medium |
| **Possible Funding Sources** | HMGP, TWDB |
| **Responsible Department** | County Commissioners, Public Works |
| **Time to Complete** | 36 Months |

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|---|---|
| **Mitigation Action #28**<br>**Status: New (No Prior Progress)**<br>**$2,500,000** | Assess and Map Community Risk |
| **Description and Objective** | Work with public and private local dam owners to map the risk of Dam Failure throughout Tyler County to better inform evacuation planning, siren placement, and risk communication. |
| **Hazards Addressed** | Dam Failure |
| **Priority** | High |
| **Possible Funding Sources** | FEMA HMGP, TWDB, TCEQ |
| **Responsible Department** | Office of Emergency Management, Local Dam Owners |
| **Time to Complete** | 60 Months |

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|---|---|
| **Mitigation Action #29**<br>**Status: New**<br>**$1,000,000** | Emergency Warning System |
| **Description and Objective** | Phase 1: Conduct a study to identify the best location/most effective locations for warning sirens. Phase 2: Implement the recommendations of that study. Locations to be prioritized: Rockland, Fox Landing, Corps of Engineers, Sheffield Ferry, Barlow Lake Estates, Mt. Neches |
| **Hazards Addressed** | Hurricane, Dam Failure, Wildfire, Flood, Tornado, Hail |
| **Priority** | High |
| **Possible Funding Sources** | HMGP, Local Funds, TxCDBG |
| **Responsible Department** | Office of Emergency Management |
| **Time to Complete** | 48 Months |

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|---|---|
| **Mitigation Action #30**<br>**Status: New** | Vulnerability Assessments for Water Supply Systems and Infrastructure Improvement |
| **Description and Objective** | Assess Water Supply Systems to identify needed upgrades to reduce water loss, and ensure adequate water supply for fire suppression. Systems to assess include: Southwest (Ivanhoe), Warren Water Supply, Tyler County Water (Office in Spurger), Doucette, Lakeside, Cypress Creek, Udine, and Seneca Water. Phase 2: Work with water supply corporations to implement needed improvements. |
| **Hazards Addressed** | Drought, Flood, Wildfire |
| **Priority** | High |
| **Possible Funding Sources** | TWDB, Local Funds |
| **Responsible Department** | Office of Emergency Management |
| **Time to Complete** | 48 Months |

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|---|---|
| **Mitigation Action #31**<br>**Status: New**<br>**$750,000** | Solar Powered Lighting Across Emergency Response Facilities |
| **Description and Objective** | Solar-powered lighting around Woodville City Park, Tyler County offices (Behind County Clerk's Office specifically), Ivanhoe, Chester City Park, and Colmesneil City Park. Helipads in Chester City Park, Colmesneil ISD, Spurger FD, Ivanhoe at Galahad Loop, Warren ISD, Wildwood, Tyler County Fairgrounds (POD), Tyler County Airport, Baseball Field (next to airport), Ball Field in Fred. This will improve safety for facilities that serve as PODs and evacuation areas across the county. |
| **Hazards Addressed** | Hurricane, Flood, Wildfire, |
| **Priority** | Low |
| **Possible Funding Sources** | TxCDBG, EECBG |
| **Responsible Department** | Tyler County Commissioners, Tyler County Cities |
| **Time to Complete** | 48 Months |

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|---|---|
| **Mitigation Action #32**<br>**Status: New**<br>**$50,000** | Resilient Emergency Warning System for Hazard Conditions |
| **Description and Objective** | Design and install a Weather Warning System in the Tyler County EOC to interface with RAWS at the Airport, with a UPS, and a standby generator to ensure there is a continuously functioning emergency alert system that can quickly inform community members of the best protective actions to take. |
| **Hazards Addressed** | Hurricane, Flood, Wildfire, Tornadoes, Extreme Heat, Severe Winter Storms, Hail |
| **Priority** | High |
| **Possible Funding Sources** | FEMA HMGP, TXCDBG |
| **Responsible Department** | Office of Emergency Management, County Commissioners |
| **Time to Complete** | 36 Months |

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|---|---|
| **Mitigation Action #33**<br>**Status: New**<br>**$40,000** | UTV with a Patient Tray and Water Tank - Skid Unit/Water Pump System and associated trailer |
| **Description and Objective** | Procure and deploy a complete 100-gallon mobile fire-suppression unit by purchasing a suitable UTV and towing trailer and installing a 100-gallon skid unit (tank + pump + hose/nozzle) to provide on-demand water application where needed. |
| **Hazards Addressed** | Wildfire, Floods, Thunderstorm Winds, Tornadoes |
| **Priority** | Low |
| **Possible Funding Sources** | AFG, Local |
| **Responsible Department** | Office of Emergency Management, VFDs |
| **Time to Complete** | 36 Months |

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|---|---|
| **Mitigation Action #34**<br>**Status: New**<br>**$80,000** | Emergency Response and Monitoring Drones |
| **Description and Objective** | Purchase 2 Drones for Emergency Management and Law Enforcement purposes, one for the Sheriff's Department and one at the EOC. |
| **Hazards Addressed** | Hurricanes, Floods, Tornadoes, Wildfires, Severe Winter Storms |
| **Priority** | Low |
| **Possible Funding Sources** | FEMA, AFG, Local |
| **Responsible Department** | Office of Emergency Management, Sheriff's Office |
| **Time to Complete** | 48 Months |

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|---|---|
| **Mitigation Action #35**<br>**Status: New**<br>**$20,000** | Swift Water Rescue Equipment and Training |
| **Description and Objective** | A swift-water rescue boat, motor, and trailer for search and rescue and during flood events in the county. Also include equipment for the boat and personnel that would be in the boat and picked up in the situation, such as life jackets. Please include training for personnel for swift water training. |
| **Hazards Addressed** | Floods, Dam Failure, Hurricane |
| **Priority** | Medium |
| **Possible Funding Sources** | AFG, TEEX, Local |
| **Responsible Department** | Tyler County OEM, VFDs |
| **Time to Complete** | 48 Months |

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|---|---|
| **Mitigation Action #36**<br>**Status: New**<br>**$60,000** | Foam Trailer and Equipment |
| **Description and Objective** | A 1000-gallon resupply foam trailer that would be used for emergency fire situations such as structure fires, spills, fires at the Tyler County airport, and tire fires/hazardous material fires. This would include the trailer, tank, foam, and needed equipment for the trailer. |
| **Hazards Addressed** | Wildfire, Hazardous Material Incidents |
| **Priority** | Low |
| **Possible Funding Sources** | AFG, Local |
| **Responsible Department** | Office of Emergency Management, VFDs |
| **Time to Complete** | 48 Months |

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|---|---|
| **Mitigation Action #37**<br>**Status: New**<br>**$1,000,000** | Tri-Band Radios for Emergency Response |
| **Description and Objective** | Ensure that VFDs and county emergency management have Tri-band radios to ensure effective emergency response and communication. In total, 325 tri-band radios are needed for the county. 115 Mobile Radios, 210 Portable radios |
| **Hazards Addressed** | Wildfires, Hurricanes, Tornadoes, Thunderstorm Winds |
| **Priority** | High |
| **Possible Funding Sources** | AFG, DECOG, Local |
| **Responsible Department** | Office of Emergency Management, VFDs |
| **Time to Complete** | 24 Months |

## City of Woodville Mitigation Actions

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|---|---|
| **Mitigation Action #1**<br>**Status: New**<br>**$25,000** | Community Education and Awareness |
| **Description and Objective** | Participate in community education and disaster readiness campaigns such as Ready, Set, Go! and the FireWise community program. Educate the public on all hazards by conducting outreach activities, distributing mailouts, and posting signage. This could also include school drills. |
| **Hazards Addressed** | Hurricane, Lightning, Flood, Windstorm, Severe Winter Storms, Wildfire, Tornadoes, Hail, Drought |
| **Priority** | Low |
| **Possible Funding Sources** | Local, CWPP |
| **Responsible Department** | City Manager and Administration |
| **Time to Complete** | 24 Months |

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|---|---|
| **Mitigation Action #2**<br>**Status: New (No Prior Progress)**<br>$25,000 | Partnership for Floodplain Management |
| **Description and Objective** | Tyler County Emergency Management will act as a facilitator to develop and form partnerships with cities and communities to support floodplain management. This support includes the City of Woodville and Tyler County partnering together to develop BFE data and update the City's Flood Damage Prevention Ordinance. |
| **Hazards Addressed** | Flooding, Severe Winter Storm, Hurricanes |
| **Priority** | Medium |
| **Possible Funding Sources** | Local |
| **Responsible Department** | City Administrator, TCOEM |
| **Time to Complete** | 36 Months |

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|---|---|
| **Mitigation Action #3**<br>**Status: New**<br>**$15,000** | Protect Critical Facilities & Equipment: |
| **Description and Objective** | Install lightning protection devices and methods on communications infrastructure and other critical facilities. The priority is installing lightning arrestors on the water tower. Install hail guards on outdoor electric units and HVAC components. |
| **Hazards Addressed** | Lightning, Hurricane, Flooding, Hail |
| **Priority** | Medium |
| **Possible Funding Sources** | FEMA HMGP, Local |
| **Responsible Department** | Public Works |
| **Time to Complete** | 36 Months |

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|---|---|
| **Mitigation Action #4**<br>**Status: New**<br>**$15,000** | Monitor Drought and Heat Conditions |
| **Description and Objective** | Identify drought indicators and regularly monitor and report conditions to decision makers and stakeholders as necessary. |
| **Hazards Addressed** | Wildfire, Drought, Extreme Heat |
| **Priority** | Medium |
| **Possible Funding Sources** | Local |
| **Responsible Department** | City Administrator, Tyler County Office of Emergency Management |
| **Time to Complete** | Monthly |

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|---|---|
| **Mitigation Action #5**<br>**Status: Ongoing**<br>**$600,000** | Monitor Water Supply |
| **Description and Objective** | Regularly check for leaks to minimize water supply losses. Improve and maintain water supply monitoring systems to include SCADA, automated meters, and leak detection software. |
| **Hazards Addressed** | Drought, Extreme Heat |
| **Priority** | Medium |
| **Possible Funding Sources** | Local |
| **Responsible Department** | Public Works |
| **Time to Complete** | Monthly |

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|---|---|
| **Mitigation Action #7**<br>**Status: Ongoing**<br>**$50,000** | Plan For Drought |
| **Description and Objective** | Update and maintain the drought contingency plan. Develop criteria or triggers for drought-related actions. Develop agreements for secondary water sources that may be used during drought conditions. |
| **Hazards Addressed** | Drought, Extreme Heat |
| **Priority** | Medium |
| **Possible Funding Sources** | TCEQ, Local |
| **Responsible Department** | City Administrator, Public Works |
| **Time to Complete** | 24 Months |

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|---|---|
| **Mitigation Action #8**<br>**Status: Ongoing**<br>**$100,000** | Update and Enforce Building Codes & Development Standards |
| **Description and Objective** | Adopt higher floodplain standards for new development and enforce existing building codes. This includes limiting or restricting development in areas identified as floodplains. Update and Enforce Fire Codes to encourage and, in some cases, require Fire-Resistant Construction Techniques. Promote building and design standards to minimize wind and projectile damage and wind-resistant building techniques. |
| **Hazards Addressed** | Hurricane, Flooding, Windstorms, Wildfire, Hailstorm, Tornado, Severe Winter Storms |
| **Priority** | Medium |
| **Possible Funding Sources** | Local, FEMA |
| **Responsible Department** | City Council, Code Enforcement, City Administrator |
| **Time to Complete** | |

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|---|---|
| **Mitigation Action #9**<br>**Status: Ongoing**<br>$1,5000,000 | Protect Infrastructure – Electric |
| **Description and Objective** | Protect power lines, emergency facilities, and other critical infrastructure from hazards. Promote ROW maintenance with clearing and trimming. |
| **Hazards Addressed** | Hurricanes, Floods, Windstorms, Wildfires, Hail |
| **Priority** | Medium |
| **Possible Funding Sources** | Local, Private, CWDG |
| **Responsible Department** | City Council, City Manager, Public Works, Engineer |
| **Time to Complete** | 18 Months |

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|---|---|
| **Mitigation Action #10**<br>**Status: Ongoing**<br>$1,5000,000 | Protect Infrastructure - Wastewater |
| **Description and Objective** | Identify infiltration/inflow (I&I) issues with methods such as smoke testing. Replace sewer lines to reduce I&I. Ensure all above line portions are properly insulated. |
| **Hazards Addressed** | Hurricanes, Floods, Windstorms |
| **Priority** | Medium |
| **Possible Funding Sources** | Local, CDBG |
| **Responsible Department** | City Council, City Manager, Public Works, Engineer |
| **Time to Complete** | 24 Months |

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|---|---|
| **Mitigation Action #11**<br>**Status: Ongoing**<br>**$75,000** | Reduce Impacts to Roadways |
| **Description and Objective** | Plan for and maintain adequate road and debris clearing capabilities. |
| **Hazards Addressed** | Hurricanes, Floods, Tornados, Windstorms, Severe Winter Storms |
| **Priority** | Medium |
| **Possible Funding Sources** | Local |
| **Responsible Department** | City Administrator/Public Works |
| **Time to Complete** | 24 Months |

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|---|---|
| **Mitigation Action #13**<br>**Status: Ongoing** | Prepare for and reduce the Impacts of Power Outages – Phase 1 |
| **Description and Objective** | Install auxiliary power sources at critical facilities and infrastructure, beginning with a 190W pump station at the Industrial Park Water Well. |
| **Hazards Addressed** | Hurricane, Flooding, Tornado, Lightning, Windstorms, Hailstorms, Severe Winter Storms, |
| **Priority** | Medium |
| **Possible Funding Sources** | FEMA HMGP, |
| **Responsible Department** | City Manager, Public Works, Police Department, Volunteer Fire Department |
| **Time to Complete** | 24 Months |

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|---|---|
| **Mitigation Action #13a**<br>**Status: New** | Prepare for and reduce the Impacts of Power Outages- Phase 2 |
| **Description and Objective** | Install auxiliary power sources at critical facilities and infrastructure. The second set of critical facilities for Phase 2 includes the Police Department first, and as funds allow, the 5 Sewer Lift Stations after. |
| **Hazards Addressed** | Hurricane, Flooding, Tornado, Lightning, Windstorms, Hailstorms, Severe Winter Storms, Wildfire, Extreme Heat |
| **Priority** | Medium |
| **Possible Funding Sources** | FEMA HMGP, Local |
| **Responsible Department** | City Manager, Public Works, Police Department, Volunteer Fire Department |
| **Time to Complete** | 48 Months |

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|---|---|
| **Mitigation Action #14**<br>**Status: Ongoing**<br>**$30,000** | Improve Compliance with NFIP |
| **Description and Objective** | Designate a local floodplain manager and provide education materials online to real estate and insurance agencies to increase community understanding of flood insurance. Hold a town hall meeting with NFIP representatives to discuss the insurance purchase process. Enter the Community Rating System (CRS) program to enable reduced insurance premiums within the community. The first priority is to establish a program for public information (PPI) with a PPI committee as suggested by activity 332 of the CRS coordinator's manual. |
| **Hazards Addressed** | NFIP Compliance |
| **Priority** | Low |
| **Possible Funding Sources** | Local, FEMA FMA |
| **Responsible Department** | City Administrator, Code Enforcement/Permitting |
| **Time to Complete** | 24 Months |

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|---|---|
| **Mitigation Action #15**<br>**Status: Ongoing**<br>**$1,000,000** | Remove Existing Structures from Flood Hazard Areas |
| **Description and Objective** | Citywide acquisition program would prioritize buyouts/acquisitions of homes along Railroad Street and the structure and S. Beech and Holly. |
| **Hazards Addressed** | Hurricane, Flood |
| **Priority** | Medium |
| **Possible Funding Sources** | FEMA HMGP, FMA |
| **Responsible Department** | City Council, City Administrator/Floodplain Manager |
| **Time to Complete** | 48 Months |

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|---|---|
| **Mitigation Action #16**<br>**Status: New**<br>**$300,000** | Conduct Regular Maintenance of Drainage Systems |
| **Description and Objective** | Address/Improve drainage along Turkey Creek |
| **Hazards Addressed** | Hurricanes, Floods |
| **Priority** | Low |
| **Possible Funding Sources** | Local |
| **Responsible Department** | Public Works, TCEQ |
| **Time to Complete** | Annual |

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| **Mitigation Action #17**<br>**Status: Ongoing**<br>**$150,000** | City-Wide Hazardous Fuels Reduction Project |
| **Description and Objective** | Reduce the available vegetative fuels in areas prone to wildland fire to reduce the risk to urban interfaces. |
| **Hazards Addressed** | Wildfire, Extreme Heat, Drought, Lightning |
| **Priority** | High |
| **Possible Funding Sources** | CWDG, Local, Private |
| **Responsible Department** | City Manager, Public Works |
| **Time to Complete** | 24 Months |

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|---|---|
| **Mitigation Action #18**<br>**Status: Ongoing**<br>$100,000 | Rehab and Replace Water Pipes |
| **Description and Objective** | Upgrade and maintain existing water delivery systems to eliminate breaks and leaks. |
| **Hazards Addressed** | Drought, Extreme Heat, Floods |
| **Priority** | Low |
| **Possible Funding Sources** | Local, CDBG, TWDB |
| **Responsible Department** | Public Works, City Administrator |
| **Time to Complete** | 36 Months |

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|---|---|
| **Mitigation Action #19**<br>**Status: New (No Prior Progress)**<br>**$40,000** | Plant Drought-Tolerant Trees along Public Sidewalks and Parking Lots |
| **Description and Objective** | Trees along sidewalks and parking lots provide shade from the heat and sun while preserving potable water supplies for drinking and fire suppression. Xeriscaping is a type of landscaping that uses little water by only using plants that are native to the area. |
| **Hazards Addressed** | Extreme Heat, Drought |
| **Priority** | Low |
| **Possible Funding Sources** | Local |
| **Responsible Department** | Public Works |
| **Time to Complete** | 48 Months |

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|---|---|
| **Mitigation Action #20**<br>**Status: New**<br>**$150,000** | Secondary Water Supply for the Prison |
| **Description and Objective** | Currently, their existing well is a vertical well with a submersible pump, which is very prone to lightning outages. Surge protection to protect the pump and controls, on-site water storage with an above-ground pump for backup water during outages. |
| **Hazards Addressed** | Lightning, Flooding, Hurricane, Wildfire, Severe Winter Storm |
| **Priority** | Medium |
| **Possible Funding Sources** | HMGP, TDCJ |
| **Responsible Department** | Prison, Public Works |
| **Time to Complete** | 48 Months |

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|---|---|
| **Mitigation Action #21**<br>**Status: New**<br>$200,000 | Tri-Band Radios for Emergency Communications |
| **Description and Objective** | The City of Woodville and Woodville VFD are communicating on the same frequency/channel, and it is causing communication issues. Tri-band radios are needed to help address this - 20 Handhelds for the city employees. For Woodville VFD - 6 in-truck radios, 35 handhelds. |
| **Hazards Addressed** | Floods, Wildfires, Tornadoes, Hurricanes |
| **Priority** | Medium |
| **Possible Funding Sources** | Local, DECOG |
| **Responsible Department** | City Administrator, Woodville VFD, Woodville Police |
| **Time to Complete** | 24 Months |

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|---|---|
| **Mitigation Action #22**<br>**Status: New**<br>**$10,000,000** | Water Treatment Plant Rehabilitation |
| **Description and Objective** | The water treatment plant needs significant repair. I & I overwhelm the plant. A new centrifuge, clarifiers, and an oxidation ditch are needed to increase treatment plant resilience for better handling of peak flow events. |
| **Hazards Addressed** | Flood, Hurricane |
| **Priority** | High |
| **Possible Funding Sources** | CDBG, HMGP |
| **Responsible Department** | Public Works |
| **Time to Complete** | 60 Months |

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|---|---|
| **Mitigation Action #23**<br>**Status: New**<br>**$200,000** | Warning System Modernization |
| **Description and Objective** | Update the Warning Siren and connect to the Genasys ALERT system. |
| **Hazards Addressed** | Floods, Tornadoes, Hurricanes, Wildfires, Thunderstorm Wind, Severe Winter Storms, Hail |
| **Priority** | High |
| **Possible Funding Sources** | HMGP, Local |
| **Responsible Department** | City Administrator, Tyler County Office of Emergency Management |
| **Time to Complete** | 36 Months |

## City of Ivanhoe Mitigation Actions

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|---|---|
| **Mitigation Action #1**<br>**Status: Ongoing**<br>**$250,000** | Implement and Maintain Emergency Notification System |
| **Description and Objective** | Implement a community warning system to alert citizens in the event of an emergency. Work with providers and Tyler County to coordinate and assist with outreach and education of warning system. This would be a system such as IRIS or Siren. |
| **Hazards Addressed** | Hurricane, Floods, Drought, Tornado, Lightning |
| **Priority** | Medium |
| **Possible Funding Sources** | FEMA HMGP, |
| **Responsible Department** | City Manager, Tyler County EMC |
| **Time to Complete** | 36 Months |

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|---|---|
| **Mitigation Action #2**<br>**Status: Ongoing**<br>**$250,000** | Conduct Regular Dam Inspections, Evaluations, and Training |
| **Description and Objective** | Review the latest inspection report and conduct thorough and routine inspections to assess their operation and condition. Check for damage and undermining of structural components such as spillways. Diligent inspection and monitoring can help identify minor issues before they become emergencies. Evaluate conformance to current engineering standards and dam safety requirements and upgrade the dam as appropriate. Train personnel and staff in monitoring and inspection procedures for the dam, including instrumentation used at the dam and typical seasonal trends. |
| **Hazards Addressed** | Dam Failure |
| **Priority** | Medium |
| **Possible Funding Sources** | FEMA HMGP, HHPD |
| **Responsible Department** | City Manager, Tyler County EMC, TCEQ |
| **Time to Complete** | Annual |

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|---|---|
| **Mitigation Action #3**<br>**Status: Ongoing**<br>**$2,500,000** | Community Safe Room Program |
| **Description and Objective** | Participate in the Residential Safe Room Rebate Program/Construct a safe room/ building for the public to go to for shelter. |
| **Hazards Addressed** | Hurricane, Flood, Windstorm, Extreme Heat, Lightning, Tornado, Hailstorms, Wildfire, Severe Winter Storms, Dam Failure |
| **Priority** | Medium |
| **Possible Funding Sources** | FEMA HMGP, TDEM, Local |
| **Responsible Department** | City Manager |
| **Time to Complete** | 36 Months |

| | |
|---|---|
| **Mitigation Action #4**<br>**Status: Ongoing**<br>**$65,000** | Strengthen State Dam Regulatory Standards |
| **Description and Objective** | Many of the dams that have the ability to impact Ivanhoe residents and businesses are currently unregulated by TCEQ. Work with the State to increase the number of inspections, regulations, and funding for upgrades to dams that are structurally deficient or do not meet standards. The city, county, non-governmental organizations, state, and private landowners will work together to find solutions to mitigate the risk that this hazard poses. |
| **Hazards Addressed** | Dam Failure |
| **Priority** | High |
| **Possible Funding Sources** | Local |
| **Responsible Department** | City Manager, TCEQ |
| **Time to Complete** | 36 Months |

| | |
|---|---|
| **Mitigation Action #5**<br>**Status: Ongoing (Updated Scope)**<br>**$313,000** | Assess and Map Community Risk |
| **Description and Objective** | Map risk of Dam Failure for Lake Charmaine (HHPD), Lake Ivanhoe, Lake Camelot, Lake Galahad, Lake Tristan, West Lake, East Lake Dam, Boykin Lake Dam, Big Lake Dam, Sutton Lake, Twin Lake, and Electro Lake. Risk mapping consists of contracting with engineers to perform inundation modeling to provide exact areas of inundation as well as flood depths. Map culverts and problem areas that have a history of flooding. |
| **Hazards Addressed** | Dam Failure, HHPD Data Deficiency, Flood |
| **Priority** | Medium |
| **Possible Funding Sources** | Local, TCEQ, FEMA HMGP |
| **Responsible Department** | City Manager, Dam Owner/Operator, Tyler County OEM |
| **Time to Complete** | 36 Months |

| | |
|---|---|
| **Mitigation Action #6**<br>**Status: Ongoing**<br>**$20,000** | Form Partnerships to Support Floodplain Management |
| **Description and Objective** | Tyler County emergency management will act as a facilitator to develop and form partnerships with cities and communities to support and implement regional floodplain management strategies. |
| **Hazards Addressed** | Hurricane, Floods, Severe Winter Storm |
| **Priority** | High |
| **Possible Funding Sources** | Local |
| **Responsible Department** | Tyler County OEM, City Council, County Commissioners |
| **Time to Complete** | 24 Months |

| | |
|---|---|
| **Mitigation Action #7**<br>**Status: New**<br>**$75,000** | Emergency Communications Systems |
| **Description and Objective** | Develop a communication system to link first responders, city officials, and key infrastructure personnel such as law enforcement, fire departments, public works and city hall. |
| **Hazards Addressed** | Hurricane, Flood, Windstorm, Tornado, Lightning, Hailstorm, Severe Winter Weather, Wildfire, Drought, Extreme Heat, Dam Failure |
| **Priority** | Medium |
| **Possible Funding Sources** | FEMA, TDEM, Local, DECOG |
| **Responsible Department** | City Manager |
| **Time to Complete** | 24 Months |

| | |
|---|---|
| **Mitigation Action #8**<br>**Status: Ongoing**<br>**$7,000** | Monitor Drought and Heat Conditions |
| **Description and Objective** | Identify drought Indicators and regularly monitor and report conditions to decision makers and stakeholders as necessary. |
| **Hazards Addressed** | Drought, Extreme Heat |
| **Priority** | High |
| **Possible Funding Sources** | Local |
| **Responsible Department** | City Manager, Tyler County EMC |
| **Time to Complete** | 24 Months |

| | |
|---|---|
| **Mitigation Action #9**<br>**Status: Ongoing**<br>**$7,000** | Portable Emergency Signage with Generator |
| **Description and Objective** | Public works department needs a portable emergency sign with a generator to keep people informed during emergencies and to mitigate secondary problems from people responding to hazards when uninformed. |
| **Hazards Addressed** | Hurricane, Flood, Windstorm, Extreme Heat, Lightning, Tornado, Hailstorms, Wildfire, Severe Winter Storms, Dam Failure |
| **Priority** | Medium |
| **Possible Funding Sources** | FEMA HMGP |
| **Responsible Department** | Public Works |
| **Time to Complete** | 24 Months |

| | |
|---|---|
| **Mitigation Action #10**<br>**Status: Ongoing**<br>**$4,000,000** | Rehab and Replace Aging Culverts and Roads |
| **Description and Objective** | Raise Ivanhoe Dr. and increase drainage capacity at the crossing below Ivanhoe Dam. All aging culverts and crossings need to be assessed citywide to ensure that they comply with heightened drainage standards to reduce risk. |
| **Hazards Addressed** | Hurricane, Flood, Windstorm, Severe Winter Storm |
| **Priority** | Medium |
| **Possible Funding Sources** | TXCDBG, Local |
| **Responsible Department** | City Manager, Public Works |
| **Time to Complete** | 48 Months |

| | |
|---|---|
| **Mitigation Action #11**<br>**Status: Ongoing**<br>**$35,000** | NFIP Compliance |
| **Description and Objective** | Designate a local floodplain manager and provide education materials online and to real estate and insurance agencies to increase community understanding of flood insurance. Hold a town hall meeting with NFIP representatives to discuss the insurance purchase process. Enter the Community Rating System (CRS) program to enable reduced insurance premiums within the community. |
| **Hazards Addressed** | Hurricane, Floods |
| **Priority** | High |
| **Possible Funding Sources** | Local, FEMA FMA |
| **Responsible Department** | City Council, City Manager, Planning Director |
| **Time to Complete** | 36 Months |

| | |
|---|---|
| **Mitigation Action #12**<br>**Status: Ongoing**<br>**$2,600,000** | Dam Reconstruction |
| **Description and Objective** | Reconstruct the Dam that impounds Camelot Lake to reduce the risk of dam failure. |
| **Hazards Addressed** | Hurricane, Flood, Severe Winter Storm, Dam Failure |
| **Priority** | Medium |
| **Possible Funding Sources** | FEMA HMGP, Local |
| **Responsible Department** | City Council, City Manager, Planning Director |
| **Time to Complete** | 36 Months |

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|---|---|
| **Mitigation Action #13**<br>**Status: New, No Prior Progress**<br>**$70,000** | Siren Warning System - One at City Hall, one at Fire Station |
| **Description and Objective** | Strategically install a siren warning system to reach the general population in the event of an emergency. |
| **Hazards Addressed** | Hurricane, Flood, Windstorm, Extreme Heat, Lightning, Tornado, Hailstorms, Wildfire, Severe Winter Storms, Dam Failure |
| **Priority** | High |
| **Possible Funding Sources** | FEMA HMGP, TDEM, |
| **Responsible Department** | City Manager |
| **Time to Complete** | 36 Months |

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|---|---|
| **Mitigation Action #14**<br>**Status: Ongoing**<br>$120,000 | Reduce Impacts to Roadways |
| **Description and Objective** | Plan for and maintain adequate road and debris clearing capabilities. |
| **Hazards Addressed** | Hurricane, Flood, Tornado, Dam Failure, Windstorms, Severe Winter Storms |
| **Priority** | High |
| **Possible Funding Sources** | Local |
| **Responsible Department** | City Manager, Public Works |
| **Time to Complete** | 24 Months |

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|---|---|
| **Mitigation Action #15**<br>**Status: New, No Prior Progress**<br>**$30,000** | Education and Awareness |
| **Description and Objective** | Participate in FireWise program and increase public awareness of all hazards by conducting outreach activities, mailouts, and signage. This could include school drills and distribution materials. |
| **Hazards Addressed** | Wildfire, Tornado, Extreme Heat, Drought, Dam Failure, Hailstorm, Windstorms, Lightning |
| **Priority** | Medium |
| **Possible Funding Sources** | CWPP, Local, TAMUFS |
| **Responsible Department** | City Manager, Tyler County EMC |
| **Time to Complete** | 48 Months |

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|---|---|
| **Mitigation Action #16**<br>**Status: New, No Prior Progress**<br>**$90,000** | Public Works Dept. Truck |
| **Description and Objective** | The public works department needs a new 3/4-or-1-ton truck to better perform day-to-day operations and maintenance that mitigate the damage from hazard events. |
| **Hazards Addressed** | Hurricane, Flood, Windstorm, Severe Winter Storm |
| **Priority** | Medium |
| **Possible Funding Sources** | Local |
| **Responsible Department** | Public Works |
| **Time to Complete** | 48 Months |

| | |
|---|---|
| **Mitigation Action #17**<br>**Status: New, No Prior Progress**<br>**$125,000** | Increase Spillway Capacity |
| **Description and Objective** | Increase spillway capacity at 4 dams that would impact Ivanhoe residents to reduce the risk of dam failure. This includes the Lake Charmaine, HHPD-eligible dam. |
| **Hazards Addressed** | Dam Failure, Hurricane, Flood, Windstorm, Severe Winter Storm |
| **Priority** | Medium |
| **Possible Funding Sources** | FEMA HMGP, HHPD |
| **Responsible Department** | Public Works |
| **Time to Complete** | 60 Months |

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|---|---|
| **Mitigation Action #18**<br>**Status: Ongoing**<br>**$118,000** | Update and Enforce Building Codes and Development Standards |
| **Description and Objective** | Adopt higher floodplain standards for new development and enforce existing building codes. This includes limiting or restricting development in areas identified as floodplains. Update and enforce Fire Codes to Encourage, and in Some Cases Require, Fire-Resistant Construction Techniques. Promote wind-resistant building techniques. |
| **Hazards Addressed** | Hurricane, Floods, Windstorms, Wildfire, Hailstorm, Tornado, Severe Winter Storms |
| **Priority** | Medium |
| **Possible Funding Sources** | Local, GLO |
| **Responsible Department** | City Council, Planning Director, Code Enforcement |
| **Time to Complete** | 24 Months |

| | |
|---|---|
| **Mitigation Action #19**<br>**Status: New, No Prior Progress**<br>**$160,000** | Conduct Regular Maintenance of Drainage Systems |
| **Description and Objective** | Improve the local drainage system through ditch and culvert maintenance, small-scale regrading, and sediment removal. |
| **Hazards Addressed** | Hurricane, Floods |
| **Priority** | High |
| **Possible Funding Sources** | Local |
| **Responsible Department** | Public Works |
| **Time to Complete** | 24 Months |

| | |
|---|---|
| **Mitigation Action #20**<br>**Status: New, No Prior Progress**<br>**$1,600,000** | Bridge Replacement/Expansion at Charmaine Dam |
| **Description and Objective** | Replace Charmaine Dam Road and expand its width. This will allow for better access and evacuation potential from the Lake Charmaine Dam. |
| **Hazards Addressed** | Hurricane, Floods, Severe Winter Weather, and Dam Failure (HHPD) |
| **Priority** | Medium |
| **Possible Funding Sources** | CDBG, Local |
| **Responsible Department** | City Manager, Public Works, TCEQ |
| **Time to Complete** | 60 Months |

| | |
|---|---|
| **Mitigation Action #21**<br>**Status: Ongoing**<br>**$75,000** | Update Drought Contingency Plan |
| **Description and Objective** | Update and maintain the drought contingency plan. Development criteria or triggers for drought-related actions. Develop agreements for secondary water sources that may be used during drought conditions. |
| **Hazards Addressed** | Drought, Extreme Heat |
| **Priority** | High |
| **Possible Funding Sources** | TCEQ, Local |
| **Responsible Department** | City Manager, Public Works |
| **Time to Complete** | 24 Months |

| | |
|---|---|
| **Mitigation Action #22**<br>**Status: New, No Prior Progress**<br>**$53,000** | Require Water Conservation During Drought Conditions |
| **Description and Objective** | Implement programs that require water users to conserve based on the severity of the drought. |
| **Hazards Addressed** | Drought, Extreme Heat |
| **Priority** | Low |
| **Possible Funding Sources** | Local, TCEQ |
| **Responsible Department** | City Manager |
| **Time to Complete** | 36 Months |

| | |
|---|---|
| **Mitigation Action #23**<br>**Status: Ongoing**<br>**$400,000** | Fire Break around City Boundaries |
| **Description and Objective** | Arrange fire break area around southern and western boundaries abutting forested timberlands. |
| **Hazards Addressed** | Wildfire, Extreme Heat, Drought, Lightning |
| **Priority** | Medium |
| **Possible Funding Sources** | USFS CWDG |
| **Responsible Department** | City Council, VFD |
| **Time to Complete** | 48 Months |

| | |
|---|---|
| **Mitigation Action #24**<br>**Status: Ongoing**<br>**$75,000** | Review and Update Evacuation Plan |
| **Description and Objective** | Update the evacuation plan and implement recommendations from the plan. |
| **Hazards Addressed** | Wildfire, Extreme Heat |
| **Priority** | High |
| **Possible Funding Sources** | Local |
| **Responsible Department** | City Manager, Tyler County EMC |
| **Time to Complete** | 36 Months |

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|---|---|
| **Mitigation Action #25**<br>**Status: New**<br>**$405,000** | Rehabilitate Lake Charmaine Dam |
| **Description and Objective** | Lake Charmaine Dam has been experiencing seepage and piping, forming voids in the dam. This action sets out to perform a geotechnical investigation for identifying needed reconstruction and mitigation and then conduct all required construction to rehabilitate Lake Charmaine Dam. |
| **Hazards Addressed** | Dam Failure, FEMA HHPD |
| **Priority** | High |
| **Possible Funding Sources** | FEMA HHPD, Local |
| **Responsible Department** | City of Ivanhoe, Contracted Engineers |
| **Time to Complete** | 36 Months |

## City of Chester Mitigation Actions

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|---|---|
| **Mitigation Action #1**<br>**Status: New**<br>**$250,000** | Generator for City Hall and Fire Station |
| **Description and Objective** | Install and wire a generator to provide continuous power to Chester City Hall and the Chester VFD fire station. |
| **Hazards Addressed** | Flood, Wildfire, Hurricane, Thunderstorm Wind, Tornadoes, Extreme Heat, Lightning, Severe Winter Storm |
| **Priority** | High |
| **Possible Funding Sources** | HMGP |
| **Responsible Department** | City Administration |
| **Time to Complete** | 48 Months |

| | |
|---|---|
| **Mitigation Action #2**<br>**Status: New**<br>**$100,000** | Warning Siren for City of Chester |
| **Description and Objective** | Install a Warning Siren for the City of Chester to provide emergency warnings to community residents. One siren is adequate to cover the City of Chester's limits. |
| **Hazards Addressed** | Flood, Wildfire, Hurricane, Thunderstorm Winds, Tornadoes, Hailstorms |
| **Priority** | High |
| **Possible Funding Sources** | HMGP |
| **Responsible Department** | City Council, Chester VFD |
| **Time to Complete** | 36 Months |

| | |
|---|---|
| **Mitigation Action #3**<br>**Status: New**<br>**$150,000** | Fire Station POD Reinforcement |
| **Description and Objective** | The fire station has an area that is unshielded and exposed to all weather conditions. The construction needs to be completed to ensure that emergency vehicles and supplies are not damaged by extreme weather events. This will allow the Fire Station to serve as a Point of Distribution during disasters. |
| **Hazards Addressed** | Tornado, Hail, Hurricane, Thunderstorm Winds |
| **Priority** | High |
| **Possible Funding Sources** | TXCDBG, Local |
| **Responsible Department** | City Council, Chester VFD |
| **Time to Complete** | 30 Months |

| | |
|---|---|
| **Mitigation Action #4**<br>**Status: New**<br>**$35,000** | UTV With Patient Tray |
| **Description and Objective** | Purchase a UTV with a patient tray for emergency response, including a trailer and necessary add-ons for all-weather response. |
| **Hazards Addressed** | Wildfire, Floods, Hurricane |
| **Priority** | Medium |
| **Possible Funding Sources** | Local, |
| **Responsible Department** | Chester VFD |
| **Time to Complete** | 48 Months |

| | |
|---|---|
| **Mitigation Action #5**<br>**Status: New**<br>**$225,000** | Firefighting Equipment Modernization |
| **Description and Objective** | Purchase SCBAs and turnout gear for Chester VFD firefighters. |
| **Hazards Addressed** | Wildfires |
| **Priority** | High |
| **Possible Funding Sources** | FEMA AFG, TAMU FS, USDA CFDLG |
| **Responsible Department** | Chester VFD |
| **Time to Complete** | 36 Months |

| | |
|---|---|
| **Mitigation Action #6**<br>**Status: New**<br>**$75,000** | Tri-Band Radios |
| **Description and Objective** | Chester VFD needs Tri-band radios - 9 vehicle radios and 12 handheld radios. $5,000 for each truck radio, $2,500 for the smaller mobile units |
| **Hazards Addressed** | All Hazards |
| **Priority** | Medium |
| **Possible Funding Sources** | FEMA AFG, TAMU FS |
| **Responsible Department** | City Council, Chester VFD |
| **Time to Complete** | 24 Months |

| | |
|---|---|
| **Mitigation Action #7**<br>**Status: New**<br>**$75,000** | Solar Lighting At Chester Helipad |
| **Description and Objective** | Install Solar Lighting at the Chester Helipad to ensure that the helipad can remain functional during power outages caused by natural hazards. |
| **Hazards Addressed** | Wildfire, Severe Winter Storms, Hurricanes, Windstorms, Tornado |
| **Priority** | Low |
| **Possible Funding Sources** | HMGP |
| **Responsible Department** | Chester VFD |
| **Time to Complete** | 36 Months |

| | |
|---|---|
| **Mitigation Action #8**<br>**Status: New**<br>**$200,000** | Radio Tower Repeater |
| **Description and Objective** | Install a radio tower repeater to enhance emergency response communications. |
| **Hazards Addressed** | All Hazards |
| **Priority** | Medium |
| **Possible Funding Sources** | TX SHSP, TX SERI |
| **Responsible Department** | Chester VFD, City Council, Tyler County OEM |
| **Time to Complete** | 30 Months |

| | |
|---|---|
| **Mitigation Action #9**<br><br>**Status: New** | Drought-Resistant Landscaping and Plumbing |
| **Description and Objective** | At City Facilities, plant drought-resistant landscaping and install low-flow water fixtures to reduce water waste. |
| **Hazards Addressed** | Drought |
| **Priority** | Medium |
| **Possible Funding Sources** | Local |
| **Responsible Department** | City Council |
| **Time to Complete** | 30 Months |

| | |
|---|---|
| **Mitigation Action #10**<br><br>**Status: New**<br><br>**$20,000** | NFIP Compliance |
| **Description and Objective** | To meet the requirements of the National Flood Insurance Program, the City of Chester will adopt a Flood Damage Prevention Ordinance and identify a staff member who can serve as its Floodplain Administrator. |
| **Hazards Addressed** | Flood, NFIP |
| **Priority** | Medium |
| **Possible Funding Sources** | Local |
| **Responsible Department** | City Council |
| **Time to Complete** | 30 Months |

## City of Colmesneil Mitigation Actions

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|---|---|
| **Mitigation Action #1**<br>**Status: New**<br>$300,000 | Generators for Water Wells and Electrical Elevation |
| **Description and Objective** | Replacement of old generators on three wells. Elevate electrical panels to keep flood waters out to prevent damage. |
| **Hazards Addressed** | Hurricanes, Floods, Hurricanes, Tornadoes, Wildfires, Windstorms |
| **Priority** | High |
| **Possible Funding Sources** | FEMA HMGP, USDA ECWAG |
| **Responsible Department** | Director of Utilities, Mayor |
| **Time to Complete** | 36 Months |

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|---|---|
| **Mitigation Action #2**<br>**Status: New**<br>**$500,000** | City-Wide Drainage Improvements |
| **Description and Objective** | Improve drainage on Railroad Street. Improve drainage on Mathis Street. Add downspout and gutter drainage for all city-owned buildings. Add low water crossing markers. Add portable barriers that automatically deploy based on water elevation |
| **Hazards Addressed** | Floods, Hurricanes |
| **Priority** | Medium |
| **Possible Funding Sources** | FEMA HMGP, CDBG |
| **Responsible Department** | Director of Utilities, Mayor |
| **Time to Complete** | 60 Months |

| | |
|---|---|
| **Mitigation Action #3**<br>**Status: New**<br>**$175,000** | High Wind and Hurricane Retrofits |
| **Description and Objective** | Hardening of municipal facilities and water system assets to reduce damage and service interruptions during flooding and extreme wind events. |
| **Hazards Addressed** | Hurricane, Flood, Thunderstorm Wind |
| **Priority** | Medium |
| **Possible Funding Sources** | FEMA HMGP, Local |
| **Responsible Department** | Director of Utilities, Mayor |
| **Time to Complete** | 48 Months |

| | |
|---|---|
| **Mitigation Action #4**<br>**Status: New**<br>**$150,000** | Extreme Heat Resilience Project |
| **Description and Objective** | Develop urban cooling strategies such as planting trees and creating green roofs. Establish cooling centers for vulnerable populations. |
| **Hazards Addressed** | Extreme Heat, Drought |
| **Priority** | Low |
| **Possible Funding Sources** | FEMA HMGP, Local, TPWD |
| **Responsible Department** | Director of Utilities, Mayor |
| **Time to Complete** | 60 Months |

| | |
|---|---|
| **Mitigation Action #5**<br>**Status: New**<br>**$20,000** | Drought Contingency Plan |
| **Description and Objective** | Create an emergency plan for water usage during a drought. |
| **Hazards Addressed** | Drought |
| **Priority** | Medium |
| **Possible Funding Sources** | TCEQ, Local |
| **Responsible Department** | Director of Utilities, Mayor |
| **Time to Complete** | 24 Months |

| | |
|---|---|
| **Mitigation Action #6**<br>**Status: New**<br>**$60,000** | Lightning Protection Across City Facilities |
| **Description and Objective** | Place power surge protectors on water wells in City Hall. Install early warning lightning detectors at city hall, parks, and outdoor facilities |
| **Hazards Addressed** | Lightning |
| **Priority** | Medium |
| **Possible Funding Sources** | FEMA HMGP |
| **Responsible Department** | Director of Utilities, Mayor |
| **Time to Complete** | 48 Months |

| | |
|---|---|
| **Mitigation Action #7**<br>**Status: New**<br>**$200,000** | Emergency Warning Siren |
| **Description and Objective** | Install outdoor warning sirens with central electronic controls based on the type of hazard. |
| **Hazards Addressed** | Wildfire, Hail, Severe Winter Storms, Hurricanes, Floods, Windstorms, Tornado, Lightning |
| **Priority** | High |
| **Possible Funding Sources** | FEMA HMGP, TDEM |
| **Responsible Department** | Director of Utilities, Mayor, Police Department |
| **Time to Complete** | 30 Months |

| | |
|---|---|
| **Mitigation Action #8**<br>**Status: New**<br>**$200,000** | Hail-Resistant Retrofits for City Facilities |
| **Description and Objective** | Replace all roofs with metal roofing. Place storm shutters on windows to protect from hail. Install utility shielding for HVAC, generators, and electrical boxes. |
| **Hazards Addressed** | Hail |
| **Priority** | Medium |
| **Possible Funding Sources** | FEMA HMGP, Local |
| **Responsible Department** | Director of Utilities, Mayor |
| **Time to Complete** | 30 Months |

| | |
|---|---|
| **Mitigation Action #9**<br>**Status: New**<br>**$30,000** | Defensible Space Across City Facilities |
| **Description and Objective** | Establish defensible space around city facilities by clearing vegetation. |
| **Hazards Addressed** | Wildfire |
| **Priority** | Medium |
| **Possible Funding Sources** | TAMU FS, CWDG |
| **Responsible Department** | Director of Utilities, Mayor |
| **Time to Complete** | 24 Months |

| | |
|---|---|
| **Mitigation Action #10**<br>**Status: New**<br>**$40,000** | Severe Winter Storm Infrastructure Retrofits and City Facility Preparation |
| **Description and Objective** | Install pipe covers and faucet covers for public buildings. Test gas pipes. Add carbon monoxide detectors. Install heating lamps for all water wells. Purchase portable heating devices. |
| **Hazards Addressed** | Severe Winter Storms |
| **Priority** | Medium |
| **Possible Funding Sources** | FEMA HMGP, Local |
| **Responsible Department** | Director of Utilities, Mayor |
| **Time to Complete** | 36 Months |

## Colmesneil ISD Mitigation Actions

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|---|---|
| **Mitigation Action #1**<br>**Status: New**<br>**$300,000** | Generators for Colmesneil ISD Facilities |
| **Description and Objective** | 3 Generators: 1 fixed generator for the school cafeteria, 1 Generator for the CISD bus barn, 1 larger generator for the Gym to serve as a heating/cooling and disaster shelter. |
| **Hazards Addressed** | Severe Winter Storms, Hurricanes/TS, Wildfires, Extreme Heat |
| **Priority** | High |
| **Possible Funding Sources** | FEMA HMGP |
| **Responsible Department** | District Administration |
| **Time to Complete** | 48 Months |

| | |
|---|---|
| **Mitigation Action #2**<br>**Status: New**<br>**$650,000** | School Building Retrofits for Extreme Weather Events |
| **Description and Objective** | Retrofit school buildings to withstand flooding and high winds. Install storm windows with shatterproof film. Winterize facilities, including insulation of pipes. During weatherization, install low-flow toilets and faucets to reduce water use. |
| **Hazards Addressed** | Floods, Thunderstorm Winds, Hail, Severe Winter Storms, Drought |
| **Priority** | Medium |
| **Possible Funding Sources** | FEMA HMGP, Local |
| **Responsible Department** | District Administration |
| **Time to Complete** | 36 Months |

| | |
|---|---|
| **Mitigation Action #3**<br><br>**Status: New** | Lightning Detection and Alert System for Athletic Facilities |
| **Description and Objective** | Install lightning detection alerts and sirens for athletic facilities. |
| **Hazards Addressed** | Lightning |
| **Priority** | Medium |
| **Possible Funding Sources** | FEMA HMGP, Local |
| **Responsible Department** | District Administration |
| **Time to Complete** | 36 Months |

| | |
|---|---|
| **Mitigation Action #4**<br><br>**Status: New** | Campus Technology Surge Protection and Data Backup |
| **Description and Objective** | Install surge protection for CISD technology rooms and have a UPS for data backup. |
| **Hazards Addressed** | Lightning |
| **Priority** | Low |
| **Possible Funding Sources** | Local, TEA, FEMA HMGP |
| **Responsible Department** | District Administration |
| **Time to Complete** | 24 Months |

| | |
|---|---|
| **Mitigation Action #5**<br>**Status: New**<br>**$100,000** | Warning Siren |
| **Description and Objective** | Install a Warning Siren at Colmesneil ISD Facilities to alert students of extreme weather events. Install a Dam Failure Sensor and Warning Siren at Lake Tejas Dam |
| **Hazards Addressed** | Tornado, Dam Failure, Wildfire, Hurricane |
| **Priority** | High |
| **Possible Funding Sources** | FEMA HMGP, TDEM, Local |
| **Responsible Department** | District Administration |
| **Time to Complete** | 36 Months |

| | |
|---|---|
| **Mitigation Action #6**<br>**Status: New**<br>**$150,000** | Stormwater Drainage |
| **Description and Objective** | Improve stormwater drainage at the Colmesneil ISD campus. Nuisance flooding causes access issues to the front of the school. |
| **Hazards Addressed** | Medium |
| **Priority** | High |
| **Possible Funding Sources** | FEMA HMGP, TDEM, Local |
| **Responsible Department** | District Administration |
| **Time to Complete** | 36 Months |

## Chester ISD Mitigation Actions

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|---|---|
| **Mitigation Action #1**<br>**Status: New**<br>**$500,000** | Backup Generators for CISD |
| **Description and Objective** | Backup generator for school cafeteria - prevent food spoilage, also a generator for the administration building, same campus, different building (for heating/cooling center), Generator for the gym. |
| **Hazards Addressed** | Hurricane, Wildfire, Extreme Heat, Severe Winter Storms, Lightning |
| **Priority** | Medium |
| **Possible Funding Sources** | FEMA HMGP |
| **Responsible Department** | CISD Administration |
| **Time to Complete** | 48 Months |

| | |
|---|---|
| **Mitigation Action #2**<br>**Status: New**<br>**$100,000** | Solar Lighting |
| **Description and Objective** | Install Solar Lighting across the Chester ISD campus. Lighting improves school safety, and solar lighting allows for campus operations to continue during power outages associated with storms and extreme weather events. This is especially important for safe evacuation. |
| **Hazards Addressed** | Hurricanes, Tornados, Thunderstorm Winds, Wildfire |
| **Priority** | Low |
| **Possible Funding Sources** | Local |
| **Responsible Department** | CISD Administration |
| **Time to Complete** | 60 Months |

| | |
|---|---|
| **Mitigation Action #3**<br><br>**Status: New**<br><br>**$350,000** | CISD Roof Replacement |
| **Description and Objective** | The Elementary and Tech Building needs a roof replacement, with sloped metal stand in-seam Roofs (cap above the flat roof). The current roof condition and design are causing leakage inside the building. Water is not being moved to the existing drainage system because of pooling on the roof. This action reduces hazard impacts by preventing water accumulation on the roof, limiting interior water intrusion, and controlling stormwater discharge pathways. |
| **Hazards Addressed** | Hurricane, Tornado, Thunderstorm Winds, Hail |
| **Priority** | High |
| **Possible Funding Sources** | FEMA HMGP |
| **Responsible Department** | CISD Administration |
| **Time to Complete** | 48 Months |

| | |
|---|---|
| **Mitigation Action #4**<br>**Status: New**<br>**$10,000** | Utility and HVAC Shielding |
| **Description and Objective** | Purchase Shielding/Hail Guards for AC units on the elementary school building. |
| **Hazards Addressed** | Hail, Severe Winter Storms |
| **Priority** | Low |
| **Possible Funding Sources** | FEMA HMGP, Local |
| **Responsible Department** | CISD Administration |
| **Time to Complete** | 24 Months |

| | |
|---|---|
| **Mitigation Action #5**<br>**Status: New**<br>**$20,000** | Defensible Space and Fuel Reduction |
| **Description and Objective** | Vegetation maintenance surrounding the campus (AG shop in direct path of tree -storm concerns), Creation of defensible space focusing on protecting the maintenance building. Incorporate drought-resistant vegetation to help address drought conditions that increase wildfire risk. |
| **Hazards Addressed** | Wildfire, Tornado, Thunderstorm Winds, Hurricane, Drought |
| **Priority** | High |
| **Possible Funding Sources** | Local, CWDG |
| **Responsible Department** | CISD Administration |
| **Time to Complete** | 30 Months |

| | |
|---|---|
| **Mitigation Action #6**<br>**Status: New**<br>**$200,000** | All-Weather Bus Shelter |
| **Description and Objective** | Construct a protective shelter for buses and maintenance vehicles to prevent damage and ensure that buses remain functional and can serve as a means of evacuation. |
| **Hazards Addressed** | Wildfire, Tornado, Thunderstorm Winds, Hurricane, Hail |
| **Priority** | High |
| **Possible Funding Sources** | FEMA HMPG, TDEM, Local |
| **Responsible Department** | CISD Administration |
| **Time to Complete** | 48 Months |

## Warren ISD Mitigation Actions

| | |
|---|---|
| **Mitigation Action #1**<br>**Status: New**<br>**$600,000** | Mobile Generators for WISD Facilities |
| **Description and Objective** | Purchase and set up 3 mobile generators and wiring for their Middle + high school campus and their two elementary school campuses. |
| **Hazards Addressed** | Hurricanes, Windstorm, Tornado, Severe Winter Storm, Lightning |
| **Priority** | High |
| **Possible Funding Sources** | FEMA HMGP |
| **Responsible Department** | WISD Maintenance |
| **Time to Complete** | 48 Months |

| | |
|---|---|
| **Mitigation Action #2**<br>**Status: New**<br>**$500,000** | Shatterproof Windows |
| **Description and Objective** | Across Fred Elementary, Warren HS, Middle School, and Elementary install shatter-resistant windows |
| **Hazards Addressed** | Tornado, Hail, Thunderstorm Winds |
| **Priority** | Low |
| **Possible Funding Sources** | FEMA HMGP |
| **Responsible Department** | WISD Maintenance |
| **Time to Complete** | 36 Months |

| | |
|---|---|
| **Mitigation Action #3**<br>**Status: New**<br>**$200,000** | Cooling and Heating Center |
| **Description and Objective** | At the Warren Elementary school, convert the gym into a cooling and heating center through the purchase of a fixed location generator, and purchase any additional HVAC equipment needed. Phase out this action to include the other campuses as funds are available. |
| **Hazards Addressed** | Extreme Heat, Severe Winter Storms |
| **Priority** | Medium |
| **Possible Funding Sources** | FEMA HMGP |
| **Responsible Department** | WISD Admin, WISD Maintenance |
| **Time to Complete** | 48 Months |

| | |
|---|---|
| **Mitigation Action #4**<br>**Status: New**<br>**$75,000** | Defensible Space at Warren Elementary |
| **Description and Objective** | Conduct fuel reduction activities and create defensible space on the Warren Elementary campus, focusing first on the Agriculture Education portion of the campus. As part of vegetation management, plant drought-resistant and ignition-resistant vegetation on campus. |
| **Hazards Addressed** | Wildfire, Tornado, Thunderstorm Winds, Drought, Lightning |
| **Priority** | Low |
| **Possible Funding Sources** | FEMA HMGP, CWDG |
| **Responsible Department** | WISD Maintenance |
| **Time to Complete** | 24 Months |

| | |
|---|---|
| **Mitigation Action #5**<br>**Status: New**<br>**$300,000** | Emergency Communication Modernization |
| **Description and Objective** | Explore options for centralized communication across WISD by getting radio and cell communication through more reliable networks for emergency response and law enforcement. |
| **Hazards Addressed** | Wildfire, Hail, Severe Winter Storms, Hurricanes, Windstorms, Drought, Extreme Heat, Tornado, Lightning |
| **Priority** | High |
| **Possible Funding Sources** | FEMA HMGP, Local |
| **Responsible Department** | Warren ISD Police |
| **Time to Complete** | 36 Months |

| | |
|---|---|
| **Mitigation Action #6**<br>**Status: New**<br>**$200,000** | Intercom Alert System for Emergency Preparedness and Protective Actions |
| **Description and Objective** | Currently, gaps exist across Warren Jr. High and Elementary. Fully document these gaps district-wide as phase 1 of this project. Prioritize the installation of the emergency warning system at Warren Jr. High and Elementary first and make other improvements as funding is available. |
| **Hazards Addressed** | Wildfire, Hail, Severe Winter Storms, Hurricanes, Windstorms, Drought, Extreme Heat, Tornado, Lightning |
| **Priority** | High |
| **Possible Funding Sources** | FEMA HMGP, TEA |
| **Responsible Department** | WISD IT Director |
| **Time to Complete** | 48 Months |

## Spurger ISD Mitigation Actions

| | |
|---|---|
| **Mitigation Action #1**<br>**Status: New**<br>**$100,000** | Resilient Electric Infrastructure |
| **Description and Objective** | Retrofit existing overhead electric lines to underground insulated lines. |
| **Hazards Addressed** | Wildfires, Tornadoes, Hurricanes, Windstorms |
| **Priority** | High |
| **Possible Funding Sources** | FEMA HMGP |
| **Responsible Department** | SISD Administration |
| **Time to Complete** | 36 Months |

| | |
|---|---|
| **Mitigation Action #2**<br>**Status: New**<br>**$150,000** | SISD Generator |
| **Description and Objective** | Spurger ISD needs one stationary generator to supply power to the campus. A mobile generator is needed for the fuel site for their bus barn and to ensure their Cafeteria has power for their food to prevent spoilage. |
| **Hazards Addressed** | Wildfire, Hail, Severe Winter Storms, Hurricanes, Windstorms, Extreme Heat, Tornado, Lightning, Flood |
| **Priority** | Medium |
| **Possible Funding Sources** | FEMA HMGP |
| **Responsible Department** | SISD Administration |
| **Time to Complete** | 36 Months |

| | |
|---|---|
| **Mitigation Action #3**<br>**Status: New**<br>**$150,000** | Increase Access to Water Supply for Fire Suppression |
| **Description and Objective** | Relocate and provide additional fire hydrants and enhance water lines on campus property for fire protection. Existing fire hydrant coverage is insufficient to provide rapid fire suppression, and improvements are needed for |
| **Hazards Addressed** | Wildfire |
| **Priority** | High |
| **Possible Funding Sources** | FEMA HMGP, TXCDBG, TXA&MFS |
| **Responsible Department** | SISD Administration |
| **Time to Complete** | 48 Months |

| | |
|---|---|
| **Mitigation Action #4**<br>**Status: New** | Old Gym Retrofit for School Shelter |
| **Description and Objective** | Retrofit the Old Gym Facility to House Administrative Staff and Provide an Emergency Shelter for Students and Faculty. Spurger ISD admin works in a temporary building that is not strong enough to serve as a shelter in an extreme weather event, and there is currently no building on campus to serve as a shelter. |
| **Hazards Addressed** | All Hazards |
| **Priority** | Medium |
| **Possible Funding Sources** | FEMA HMGP, Local |
| **Responsible Department** | SISD Administration |
| **Time to Complete** | 60 Months |

| | |
|---|---|
| **Mitigation Action #5**<br>**Status: New**<br>$20,000 | Update Emergency Operations Plan |
| **Description and Objective** | Expand the Emergency Operations Plan to address all potential hazards |
| **Hazards Addressed** | All Hazards |
| **Priority** | High |
| **Possible Funding Sources** | Local |
| **Responsible Department** | SISD Administration |
| **Time to Complete** | 24 Months |

| | |
|---|---|
| **Mitigation Action #6**<br>**Status: New**<br>**$200,000** | Drainage Improvement Projects |
| **Description and Objective** | Increase Volume of Existing Detention Facility and Correct Outfall Structure Elevation to Reduce Localized Flooding Occurrence Between Campus Facilities (all of campus flows into one area - dug out to make deeper, flow line is deeper than drainage pipe) |
| **Hazards Addressed** | Pluvial Flooding |
| **Priority** | Low |
| **Possible Funding Sources** | CDBG |
| **Responsible Department** | SISD Administration |
| **Time to Complete** | 48 Months |

| | |
|---|---|
| **Mitigation Action #7**<br><br>**Status: New**<br><br>$50,000 | Campus-wide Fuel Reduction and<br><br>Defensible Space |
| **Description and Objective** | Reduce Fuel Loading Along all Property Edges to Reduce Risk of Flame Spread and Ember Exposure. This also helps reduce potential wind-blown projectiles around the SISD campus. As a component of fuel management, incorporate drought-resistant vegetation into campus landscaping. |
| **Hazards Addressed** | Wildfire, Thunderstorm Winds, Tornadoes, Drought |
| **Priority** | Medium |
| **Possible Funding Sources** | TAMU FS |
| **Responsible Department** | SISD Administration |
| **Time to Complete** | 24 Months |

## Woodville ISD Mitigation Actions

| | |
|---|---|
| **Mitigation Action #1**<br>**Status: New**<br>**$500,000** | Hardened Hallways for Sheltering |
| **Description and Objective** | In the main buildings of Woodville High School and Woodville Middle School, create hardened hallways that are reinforced to serve as shelters during extreme weather events. |
| **Hazards Addressed** | Hurricane, Thunderstorm Winds, Tornadoes, Hail, Severe Winter Storms |
| **Priority** | Medium |
| **Possible Funding Sources** | FEMA HMGP |
| **Responsible Department** | Maintenance and Operations Department |
| **Time to Complete** | 48 Months |

| | |
|---|---|
| **Mitigation Action #2**<br>**Status: New**<br>**$350,000** | Generators for WISD Elementary Campus |
| **Description and Objective** | Purchase two stationary generators, one for the Summit to allow large gathering spaces such as the Gym and theatre to remain functional, and one for the Elementary school central campus. |
| **Hazards Addressed** | Wildfire, Lightning, Extreme Heat, Hurricane |
| **Priority** | High |
| **Possible Funding Sources** | FEMA HMGP |
| **Responsible Department** | Maintenance and Operations Department |
| **Time to Complete** | 48 Months |

| | |
|---|---|
| **Mitigation Action #3**<br>**Status: New**<br>**$100,000** | Drought-Resistant Landscaping |
| **Description and Objective** | Ensure drought-resistant landscaping and xeriscaping across all Woodville ISD school campuses. |
| **Hazards Addressed** | Drought |
| **Priority** | Low |
| **Possible Funding Sources** | FEMA HMGP, Local |
| **Responsible Department** | Maintenance and Operations Department |
| **Time to Complete** | 36 Months |

## Chester WSC Mitigation Actions

| | |
|---|---|
| **Mitigation Action #1**<br>**Status: New**<br>**$ 500,000** | Generators for Chester WSC |
| **Description and Objective** | Purchase three generators and electric transfers for the Chester WSC infrastructure. |
| **Hazards Addressed** | Hurricane, Severe Winter Storms, Wildfire, Tornado, Extreme Heat, Lightning, Windstorms |
| **Priority** | High |
| **Possible Funding Sources** | FEMA HMGP |
| **Responsible Department** | Chester Water Supply Board |
| **Time to Complete** | 60 Months |

| | |
|---|---|
| **Mitigation Action #2**<br>**Status: New**<br>**$8,000,000** | Water Wells Resilience |
| **Description and Objective** | Water wells are currently vulnerable to drought, hail, and winter storms and are in bad condition. Purchase 4 new water wells and ensure they are fully winterized and grounded with surge protection. Ensure all electrical units are shielded from hail and winterized. |
| **Hazards Addressed** | Drought, Hail, Severe Winter Storms |
| **Priority** | Low |
| **Possible Funding Sources** | CDBG, TWDB |
| **Responsible Department** | Chester Water Supply Board |
| **Time to Complete** | 60 Months |

| | |
|---|---|
| **Mitigation Action #3**<br>**Status: New**<br>**$15,000,000** | Water Line Replacements |
| **Description and Objective** | Existing water lines are in poor condition, and all 37 miles of the water system needs to be reworked. This consists of replacing pipes, installing shut-off valves and water meters, and insulating above-ground pipes. These improvements will dramatically reduce water loss and ensure that access to water is maintained during extreme weather events. This will also address access to water for wildfire suppression. |
| **Hazards Addressed** | Drought, Wildfire, Severe Winter Storms |
| **Priority** | Medium |
| **Possible Funding Sources** | CDBG, TWDB |
| **Responsible Department** | Chester Water Supply Board |
| **Time to Complete** | 60 Months |

# SECTION 18: PLAN MAINTENANCE

This section describes how the Tyler County planning area and its jurisdictions will implement the Plan and continue to evaluate and enhance it over time. As indicated in the previous section, each action has been assigned to a specific department within the jurisdiction. To ensure that the Plan remains current and relevant, the following Plan maintenance procedures will be addressed:

- Ensure the mitigation strategy remains current and that actions are implemented according to the timeline.
- Develop an ongoing mitigation program throughout the community for each participating jurisdiction and work together at the county level to update and review the Plan. Integrate short and long-term mitigation objectives into community officials' daily roles and responsibilities.
- Continue public involvement and maintain momentum with education programs and materials, routine publication of accomplishments, and briefings to decision-makers on the Plan's progress.

Table 18-1: Team Members Responsible for Plan Maintenance.

| Jurisdiction/Entity | Title |
|---|---|
| Tyler County | Emergency Management Coordinator |
| City of Woodville | Mayor |
| City of Chester | Mayor |
| City of Colmesneil | Mayor |
| City of Ivanhoe | Mayor |
| Woodville ISD | Superintendent |
| Chester ISD | Superintendent |
| Colmesneil ISD | Superintendent |
| Spurger ISD | Superintendent |
| Warren ISD | Superintendent |
| Chester WSC | District Board |

## Incorporation

Following approval and adoption of the Plan, all participating jurisdictions will implement actions they have developed and prioritized in the Plan based on funding availability and continuing public input. A timeline is provided with each action and is used to assess whether actions are being completed on time based on the date of Plan adoption. Potential funding sources are also listed for each action below in this Section. Additional funding sources can include federal disaster declarations and other non-federal grant sources.

**Local funding**: This is funding that the community can allocate in the budget process, and with other local funding mechanisms such as impact fees and drainage utility fees. This funding can be used entirely for specific hazard mitigation activities and projects or can be used as a match to leverage federal and state funding.

**CWDG**: The Community Wildfire Defense Grant Program, or CWDG, is intended to help at-risk local communities and tribes plan for and reduce the risk of wildfire. This program, which the Bipartisan Infrastructure Law authorized, prioritizes at-risk communities in an area identified as having high or very high wildfire hazard potential, are low-income, or have been impacted by a severe disaster that affects the risk of wildfire. More details on these three priorities are in the Notices of Funding Opportunity (NOFOs) below. The program provides funding for communities for two primary purposes:

- Develop and revise Community Wildfire Protection Plans (CWPP).
- Implement projects described in a Community Wildfire Protection Plan less than ten years old.

The CWDG Grant Program also helps communities in the wildland-urban interface (WUI) implement the three goals of the National Cohesive Wildland Fire Management Strategy.

**HMGP**: The purpose of Hazard Mitigation Grant Programs is to help communities implement hazard mitigation measures following a Presidential Major Disaster Declaration in the areas of the state, tribe, or territory requested by the Governor or Tribal Executive. The key purpose of this grant program is to enact mitigation measures that reduce the risk of loss of life and property from future disasters.

**CDBG**: The Community Development Block Grant (CDBG) focuses on developing livable communities by providing affordable housing and suitable living environments for principally low-to-moderate income residents. The program helps communities fund infrastructure projects that help with water, sewer, generators, or key road improvements. These funds may supplement utility development that helps mitigate hazards.

## Methods of Incorporating the Plan

| | |
|---|---|
| Grant Applications | Hazard mitigation grant funding will be sought to fund eligible action items as the funding is awarded. If a need for additional action items is presented, an amendment will be necessary to include the action in the plan. This is relevant to all Core Team jurisdictions. |
| Capital Improvement Plans<br>District Improvement Plans | The Plan and mitigation actions will be reviewed annually to determine any funding needs to be included during the budget process for the County, Cities, and Special Districts included in this plan. Local funds that match requirements for grants will be considered by the appropriate departments, such as engineering, planning, code enforcement, Campus Maintenance, and others, to achieve the mitigation action based on the timeline. |
| Floodplain Management Plans and Watershed Studies | These types of plans include preventative and corrective actions to address the flood hazard. This plan contains a clear set of actions to guide the future adoption and updating of Flood Damage Prevention Ordinances for Tyler County and the cities within it. The plan will also guide the process of updating the factual basis for those Flood Damage Ordinances |
| Regulatory Plans and<br>Future Growth Plans | This Plan will be consulted when City departments review or revise their current regulatory planning mechanisms and growth plans, such as land development and building codes, comprehensive plans, and capital improvement plans. This plan will also be considered as districts plan for any future campus and facility expansions for best practices for resilience. |
| Community Wildfire Protection Plans | Tyler County will be collaborating with many of the same Core Planning Team Members to develop a Community Wildfire Protection Plan to assess wildfire risk and identify appropriate fuel reduction projects and this plan update can serve as a strong starting point for a factual basis and inventory of community assets at risk for that plan. |

The Core Team members will conduct a review of the plans and policies in place at least annually. This will occur at a Commissioners' Court Meeting for the County, a City Council Meeting for the cities, a District Board Meeting for Chester WSC and a School Board Meeting for the ISDs of Tyler County. The review and analysis will guide any updates and incorporate new actions into the plan as appropriate. The plans and policies that require review include emergency operations or management plans, capital improvement plans, comprehensive land use and future growth plans, transportation plans, annual budgeting, and any building codes that guide and control development in a way that will contribute to the goals of this Plan to reduce long-term risk to life and property from all hazards. For the ISDs, this will include looking at district budgets, campus improvement plans, and maintenance and construction guidelines when improving district facilities.

In the past five years, the hazard mitigation plan was consulted when developing the City of Ivanhoe's Resilient Comprehensive Plan. It was also used by Tyler County to develop an application for a CWPP and a CWDG grant. There are no known previous incorporations into projects and plans by the City of Woodville.

Periodic annual tracking of the Plan is required to ensure that the mitigation actions are implemented over the 5-year cycle and that the Plan is kept current based on the latest information about hazards and their impacts. The team members designated by department and jurisdiction in Table 18-1 are responsible for monitoring, evaluating, and updating the Plan for their participating jurisdiction. The Core Team will meet on an annual basis or when other plans are being developed, reviewed, or updated. In addition to annual monitoring, the Plan will be similarly reviewed immediately after extreme weather events, including, but not limited to, state and federally declared disasters.

## Tracking Plan Progress

The designated Core Planning Team members from each community evaluating the Plan will prepare annual reports that will be used to keep the Plan updated and keep them on file, using the mitigation action implementation tracking tables found in Appendix E. Major changes to mitigation actions, the overall direction of the Plan, or the policies contained within the Plan are subject to formal adoption by each city, and the amendment will be submitted to TDEM. To determine whether to recommend approval or denial of a Plan amendment request, each City or Special District will consider the following factors:

- Changes in information, data, or assumptions from those on which the Plan was based.
- New issues or needs that were not adequately addressed in the Plan.
- Errors or omissions made in the identification of issues or needs during the preparation of the Plan.

This annual Plan Maintenance process enables all participating jurisdictions to keep their Hazard Mitigation Plan relevant based on the latest information, capabilities, needs, and community input. The process also provides an opportunity to ensure that mitigation actions meet the goals in this Plan and that they are implemented in the manner they were intended. This is a valuable opportunity to identify mitigation actions in the annual report that were not successful and to recommend the removal of those that are no longer needed.

## Monitoring

The Plan will be monitored in its entirety, using multiple methods, including but not limited to:

- Public participation
- Plan evaluation methods

Update methods:

- Action prioritization
- Administration of identified mitigation actions

- Risk assessment

## Incorporating Planning Mechanisms

The parties responsible for the monitoring vary based on the city and district departments involved. This ensures that all identified new changes are integrated into the updated Plan, existing policies and procedures, and that mitigation actions funded by City Councils are implemented in the projected timeline.

All planning team meetings for monitoring the Plan will include a sign-in sheet to record attendance and a brief report that identifies policies and actions in the Plan that have been successfully implemented since its adoption. The report will also document the steps to be followed to develop action items into a policy or project that has not yet been completed, and how the Plan has been incorporated into other planning mechanisms.

## Evaluation For Effectiveness

As part of the annual tracking of the Plan, Core Planning Team members will evaluate changes in risk and hazard data associated with the planning area to determine if there are any needed changes to mitigation action timelines, prioritization, or if any action needs to be amended, added, or deleted. To evaluate plan effectiveness, Core Team members will assess their overall success at implementing their set of actions, with 1 point for total implementation, and a half point for partial. This will allow each jurisdiction to receive a score. This will also be done by tracking projects that the plan has been referenced in, outside of the scope of the mitigation actions.

The Plan evaluation is also an opportunity to review the effectiveness of public participation and outreach efforts and to update or expand upon those efforts. The effectiveness of public participation can be measured by surveys, the number of website hits, the number of people in attendance, and the number of materials printed. The annual evaluation process is necessary to make any necessary amendments to the Plan to keep the Plan relevant and most effective in mitigating the identified hazards in the Plan. Team meetings for evaluating the Plan will include a sign-in sheet to record attendance and a brief report that identifies any changes to the Plan or to the local jurisdiction's implementation process needed for continued success. The main Plan Evaluation Meeting will include all Core Team planning members and occur three years after the final approval letter is issued for this plan update, so set up the plan Update process for success.

## Five-Year Review and Update

The Plan will be thoroughly reviewed by Planning Team members, led by the Tyler County Office of Emergency Management, at the end of three years from the approval date to determine whether there have been any significant changes in the planning area that may require updating, amending, or deleting parts of the Plan. It is wise to begin considering Plan updates in advance of the five-year deadline due to the timelines for grant funding, Plan reviews,

and to ensure eligibility. Oftentimes, the timelines for grant and planning cycles can take more than a year to apply and receive funding.

The 5-year Plan review allows for evaluating successful and unsuccessful mitigation actions, documenting avoided losses, and considering factors affecting the Plan. Necessary revisions will be summarized and integrated into the existing Plan or reserved for the 5-year Plan update. The revised or new Plan will be submitted to TDEM and FEMA for final review and approval.

## Continued Public Involvement

Input from the stakeholders and public was an integral part of the preparation of this Plan and will remain integral while the Plan is reviewed, revised, and updated. This Plan will be posted on the county, cities' and special districts' websites, and made available at key locations where the public will be invited to review and provide feedback via e-mail. All public participation will be available for a minimum of two weeks, or as outlined by FEMA requirements. Core Planning Team members (Table 18-1) are tasked with notifying stakeholders and community members when the annual review of the Plan is undertaken.

The Core Team may also develop a voluntary citizen/stakeholder advisory group comprised of members from throughout the planning area to provide feedback on an annual basis, for Tyler County, this may involve the LEPC. The public and stakeholders must maintain a vested interest in the Plan to keep the Plan relevant as it relates to the broader community's sustained health, safety, and welfare. Media such as websites, social media, local newspapers, and radio stations will be used to notify the public of any maintenance or periodic review activities taking place.

Public participation is critical to creating a Plan that is enduring and one that has meaning to the community. The direct involvement of local officials and the public has been and will continue to be sought during the implementation and maintenance phases of this Tyler County Multi-Jurisdictional Hazard Mitigation Plan Update.

# APPENDIX A – Community Capabilities and Improvements

| Capability | Chester | Colmesneil ISD | Colmesneil | Woodville ISD | Woodville | Tyler County | Ivanhoe | Chester ISD | Spurger ISD | Warren ISD | Chester WSD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Emergency Operations Plan | X | X | X | X | X | X | X | X | X | X | X |
| Comprehensive Plan | | | | X | X | X | X | | | | |
| Economic Development Plan | | | | | X | X | | | | | |
| Transportation Plan | | X | | X | | X | | | X | X | |
| Continuity of Operations Plan | | | | X | | X | X | X | | | |
| Stormwater Management Plan | | | | | | X | X | | | | |
| Zoning Ordinances | | | | | X | | X | | | | |
| Building Codes | | | | | X | X | X | | | | |
| Subdivision Ordinances | | | | | X | X | X | | | | |
| Flood Damage Prevention Ordinance | | | X | | X | X | X | | | | |
| Floodplain Administrator | | | X | | X | X | X | | | | |
| Engineers | | | | X | X | X | | | | | X |
| Planners | | | | X | X | X | | | | | |
| GIS Analysts | | | | X | X | X | | | | | |
| Building Inspectors | | | | X | X | X | | | | | |
| Emergency Managers | X | X | X | X | X | X | X | | X | X | |
| Grant Writers | | | | X | X | X | | | | | |
| Chief Building Official | | | | X | | | | | | | |
| CDBG | X | | X | | | X | X | | | | |
| Capital Improvement Program | | | | | | | | X | | | X |
| Tax Levying Authority | | X | X | | | X | X | X | | | |
| Utility Fees | X | X | X | | X | X | | | | | X |
| School Programs | X | X | | X | X | X | | X | | | |
| Public Information Officer | | X | | X | | X | | | | | |
| Community Newsletters | | X | | | X | X | | | | | |
| Firewise Communities | | | | | | X | | | | | |

As part of the plan engagement platform, a survey was sent out to all core team plan participants to understand their existing capabilities and identify gaps that could lead to identifying new mitigation projects. Tyler County has the fewest gaps in capabilities that impact community resilience, and a review of their current needs highlighted gaps concerning plans, such as a Community Wildfire Protection Plan and a need for additional studies, such as an updated BFE hydraulics and hydrologic (H&H) study to support updating their current Flood Damage Prevention Ordinance. The City of Woodville has the second fewest gaps in terms of their capabilities, but tasks such as ensuring their City Administrator is fully trained as a Floodplain Administrator were identified. Discussions around building codes and zoning occurred with all municipalities across Tyler County, but capacity issues were identified through these conversations. Hiring and training staff to oversee ordinance and building code enforcement is significantly cost-prohibitive to the City of Chester. The City of Woodville currently contracts out its permitting and inspections and mentioned updating building codes past IBC 2006 would impose a significant burden for new construction regarding requirements for fire suppression systems that they felt would discourage new developers in the area. The City of Ivanhoe is currently developing a Resilient Comprehensive Plan, with an updated Zoning Ordinance, so they are actively addressing some gaps in terms of comprehensive land use guidance and regulations. Increasing access to existing regulations was a recommendation for the cities of Chester and Colmesneil, as they are currently inaccessible via the internet. Chester Water Supply Corporation's biggest gap is access to a professional engineer to support the implementation of some of the identified infrastructure improvements in this plan. They are currently addressing this gap through developing a connection to engineering and surveying provided by Texas A&M to identify existing water infrastructure and working on contracting out with engineering firms to ensure all upgrades are made according to best practices and industry standards. The five independent school districts in Tyler County had their biggest gaps in terms of financing the identified improvements due to a lack of local funding and a lack of staff to navigate the FEMA grant process. Strict curriculum requirements served as a barrier in some cases for collaboration with local emergency management resources to implement a comprehensive natural hazard and emergency preparedness curriculum. The school districts are working to address these issues through a more intentional incorporation of mitigation projects with their capital improvements and financing processes.

# APPENDIX B – STAPLEE Action Prioritization Worksheets

All mitigation actions were evaluated using the STAPLE+E criteria. Due to technological and logistical constraints, a limited number of completed STAPLE+E worksheets are still being collected from Core Planning Team members. During the Mitigation Action Workshop, the Plan Consultant recorded the action priority designations ("High," "Medium," and "Low") based on the summed STAPLE+E scores generated in-session. As a result, actions have documented priority rankings even where individual jurisdictions retained their original scoring worksheets and the raw score sheets were not immediately consolidated into the project file. Outstanding worksheets will be compiled and retained with the plan records as they are received.

## Tyler County STAPLEE

## Ivanhoe STAPLEE

| Mitigation Action | Socially Acceptable | Technically Feasible | Administratively Possible | Politically Acceptable | Legal | Economically Sound | Environmentally Sound | BONUS: Addresses Multiple Hazards (5pts) | BONUS: Complements another entity's efforts (5pts) | Total Score |
|---|---|---|---|---|---|---|---|---|---|---|
| Protect Critical Facilities and Equipment: Move equipment and vehicles to higher ground where necessary. Install lightning protection devices and methods on communications infrastructure and other critical facilities. Install and maintain surge protection on critical electronic equipment. | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 45 |
| Form Partnerships to Support Floodplain Management: Tyler County emergency management will act as a facilitator to develop and form partnerships with cities and communities to support and implement regional floodplain management strategies. | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 45 |
| Protect Infrastructure: Address and Improve drainage at the following low water crossings: Ivanhoe Drive. | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 45 |
| Property Buyout on Lake Ivanhoe and Lake Ivanhoe Dam: Buyout properties that are at the most risk of repetitive flooding. | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 45 |
| Prepare for and Reduce the Impacts of Power Outages: Install and maintain auxiliary power at critical facilities to ensure continuity of government, emergency response, and public safety during extended power outages. | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 44 |
| Fire Equpment: Equipment for improved response by Fire Dept. as first responders for home/business as well as brush fires. | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 44 |
| Conduct Regular Maintenance of Drainage Systems: Address/Improve local drainage. | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 44 |
| Review and Update Evacuation Plan: Update evacuation plan and implement recommendations from plan. | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 5 | 43 |
| Strengthen State Dam Regulatory Standards: Many of the dams that have the ability to impact Ivanhoe residents and businesses are currently unregulated by TCEQ. Work with the State to increase the number of inspections, regulation, and funding for upgrades to dams that are structurally deficient or do not meet standards. The city, county, non-governmental organizations, state, and private landowners will work together to find solutions to mitigate the risk that this hazard poses. | 5 | 4 | 4 | 5 | 5 | 4 | 5 | 5 | 5 | 42 |
| Monitor Drought and Heat Conditions: Identify drought indicators and regularly monitor and report conditions to decision makers and stakeholders as necessary. | 5 | 4 | 4 | 5 | 5 | 4 | 5 | 5 | 5 | 42 |
| NFIP Compliance: Designate a local floodplain manager and provide education materials online and to real estate and insurance agencies to increase community understanding of flood insurance. Hold a town hall meeting with NFIP representatives to discuss the insurance purchase process. Enter the Community Rating System (CRS) program to enable reduced insurance premiums within the community. The first priority is to establish a program for public information (PPI) with a PPI committee as suggested by activity 332 of the CRS coordinators manual. | 5 | 4 | 4 | 5 | 5 | 4 | 5 | 5 | 5 | 42 |
| Siren Warning System - One at City Hall, one at Fire Station: Strategically install a siren warning system to reach the general population in the event of an emergency. | 5 | 5 | 4 | 5 | 5 | 3 | 5 | 5 | 5 | 42 |
| Reduce Impacts to Roadways: plan for and maintain adequate road and debris clearing capabilities. | 5 | 4 | 4 | 5 | 5 | 3 | 5 | 5 | 5 | 41 |
| Plan for Drought: Update and maintain drought contingency plan. Development criteria or triggers for drought-related actions. Develop agreements for secondary water sources that may be used during drought conditions. | 5 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 5 | 41 |
| Community Safe Room Program: Participate in the Residential Safe Room Rebate Program/Construct a safe room/ building for the public to go to for shelter. | 5 | 4 | 3 | 4 | 5 | 4 | 5 | 5 | 5 | 40 |
| Assess and Map Community Risk: Map risk of Dam Failure for Lake Charmaine, Lake Ivanhoe, South Sawyers Lake, East Sawyers Lake, Boykin Lake #1, Sutton Lake, Twin Lake, Electro Lake, and Urland Lake. Map culverts and problem areas that have a history of flooding. | 5 | 3 | 3 | 5 | 5 | 4 | 5 | 5 | 5 | 40 |
| Rehab and Replace Aging Culverts and Roads: Raise Ivanhoe Dr. and increase drainage capacity at crossing below Ivanhoe Dam. All aging culverts and crossings need to be assessed citywide to ensure that they comply with heightened drainage standards to reduce risk. | 5 | 4 | 4 | 5 | 5 | 3 | 4 | 5 | 5 | 40 |
| Dam Reconstruction: Reconstruct the Dam that impounds Camelot Lake to reduce the risk of dam failure. | 5 | 4 | 4 | 5 | 5 | 3 | 4 | 5 | 5 | 40 |
| Public Works Dept. Truck: Public works department needs a new 3/4-or-1-ton truck to better perform day to day operations and maintenance that mitigate the damages from hazard events. - Continue: No Progress, Plan for Future Implementation | 4 | 4 | 5 | 4 | 5 | 3 | 5 | 5 | 5 | 40 |
| Bridge Replacement/Expansion at Charmaine Dam: Replace Charmaine Dam Road and expand width. | 5 | 4 | 4 | 4 | 5 | 4 | 4 | 5 | 5 | 40 |
| Maintain and Implement Emergency Notification System: Implement a community warning system to alert citizens in the event of an emergency. Work with providers and Tyler County to coordinate and assist with outreach and education of warning sytem. This would be a system such as IRIS or Siren. | 3 | 3 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 39 |
| Conduct Regular Dam Inspections, Evaluations, and Training: Review latest inspection report and conduct thorough and routine inspections to assess their operation and condition. Check for damage and undermining of structural components such as spillways. Diligent inspection and monitoring can help identify minor issues before they become emergencies. Evaluate conformance to current engineering standards and dam safety requirements and upgrade the dam as appropriate. Train personnel and staff in monitoring and inspection procedures for the dam including instrumentation used at the dam and typical seasonal trends. | 5 | 3 | 3 | 4 | 5 | 4 | 5 | 5 | 5 | 39 |
| Emergency Communications Systems: Develop a communication system to link first responders, city officials, and key infrastructure personnel such as law enforcement, fire departments, public works and city hall. | 5 | 3 | 4 | 5 | 5 | 2 | 5 | 5 | 5 | 39 |
| Education and Awareness: Participate in FireWise program and increase public awareness of all hazards by conducting outreach activities, mailouts, and signage. This could include school drills and distribution materials. | 5 | 3 | 3 | 5 | 5 | 3 | 5 | 5 | 5 | 39 |
| Increase Spillway Capacity: Increase spillway capacity at 4 dams that would impact Ivanhoe residents to reduce the risk to dam failure. | 4 | 4 | 4 | 4 | 5 | 3 | 5 | 5 | 5 | 39 |
| Update and Enforce Building Codes and Development Standards: Adopt higher floodplain standards for new development and enforce existing building codes. This includes limiting or restricting development in areas identified as floodplains. Update and enforce Fire Codes to Encourage, and in Some Cases Require , Fire-Resistant Construction Techniques. Promote Building and Design Standards to Minimize Wind Damage and wind resistant building techniques. | 5 | 4 | 4 | 4 | 5 | 3 | 4 | 5 | 5 | 39 |
| Portable Emergency Signage with Generator: Public works department needs a portable emergency sign with a generator to keep people informed during emergencies and to mitigate secondary problems from people responding to hazards when uninformed. | 5 | 3 | 3 | 4 | 5 | 2 | 5 | 5 | 5 | 37 |
| Fire Break around City Boundaries: Arrange fire break area around southern and western boundaries abutting forested timberlands. | 4 | 3 | 4 | 3 | 5 | 3 | 4 | 5 | 5 | 36 |
| Require Water Conservation During Drought Conditions: Implement programs that require water users to conserve based on the severity of the drought. | 3 | 3 | 3 | 2 | 5 | 3 | 4 | 5 | 5 | 33 |

## Woodville STAPLEE

| Mitigation Action | Action Status | Socially Acceptable | Technically Feasible | Administratively Possible | Politically Acceptable | Legal | Economically Sound | Environmentally Sound | BONUS: Addresses Multiple Hazards (5pts) | BONUS: Complements another entity's efforts (5pts) | Total Score |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Plant Drought Tolerant Trees along Public Sidewalks and Parking Lots: Trees along sidewalks and parking lots provide shade from the heat and sun while preserving potable water supplies for drinking and fire suppression. Xeriscaping is a type of landscaping that uses little water by only using plants that are native to the area. | Ongoing | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | | 26 |
| Remove Existing Structures from Flood Hazard Areas: Citywide acquisition program would prioritize buyouts/acquisitions of homes along railroad Street and the structure and S. Beech and Holly. | Some buyouts have been completed, but FEMA houses have returned to the area- Ongoing - Backside of railroad street (might be part of highway construction buyout) | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 5 | | 28 |
| Rehab and Replace Water Pipes: Upgrade and maintain existing water delivery systems to eliminate breaks and leaks. | Ongoing: Some Progress, Plan on Finishing Implementation | 5 | 5 | 5 | 5 | 5 | 5 | | 5 | | 35 |
| Education and Awareness: Participate in FireWise community program and educate public on all hazards by conducting outreach activities, mailouts, and signage. This could include school drills and distribution materials. | Continue: No Progress, Plan for Future Implementation | 5 | 5 | 5 | 5 | 5 | 3 | 3 | 5 | | 36 |
| Assess and Map Community Risk: Map risk of Dam Failure for Babin Lake, Forrest Lake (dam broke and not built back), and Chesswood Lake. Map culverts and problem areas that have a history of flooding. | Ongoing: Some Progress, Plan on Finishing Implementation | 5 | 5 | 4 | 4 | 5 | 5 | 5 | 5 | | 38 |
| Improve Compliance with NFIP: Designate a local floodplain manager and provide education materials online, and to real estate and insurance agencies to increase community understanding of flood insurance. Hold a town hall meeting with NFIP representatives to discuss the insurance purchase process. Enter the Community Rating System (CRS) program to enable reduced insurance premiums within the community. The first priority is to establish a program for public information (PPI) with a PPI committee as suggested by activity 332 of the CRS coordinator's manual. | Ongoing: Some Progress, Plan on Finishing Implementation | 5 | 5 | 3 | 5 | 5 | 4 | 5 | 5 | | 39 |
| Conduct Regular Maintenance of Drainage Systems: Address/Improve drainage along Turkey Creek. | Continue: No Progress, Plan for Future Implementation | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | | 39 |
| Protect Critical Facilities & Equipment: Install lightning protection devices and methods on communications infrastructure and other critical facilities. Install and maintain surge protection on critical electronic equipment. | No lightning arrestors on water tower. Equipment is currently adequately shielded | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | 40 |
| Monitor Drought and Heat Conditions: Identify drought indicators and regularly monitor and report conditions to decision makers and stakeholders as necessary. | Continue: No Progress, Plan for Future Implementation | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | 40 |
| Monitor Water Supply: Regularly check for leaks to minimize water supply losses. Improve and maintain water supply monitoring systems to include SCADA , automated meters and leak detection software. | Ongoing: Some Progress, Plan on Finishing Implementation | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | 40 |
| Plan For Drought: Update and maintain drought contingency plan. Develop criteria or triggers for drought-related actions. Develop agreements for secondary water sources that may be used during drought conditions. | Ongoing: City has a drought contingency plan, updated in accordance with state regulations | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | 40 |
| Update and Enforce Building Codes & Development Standards: Adopt higher floodplain standards for new development and enforce existing building codes. This includes limiting or restricting development in areas identified as floodplains. Update and Enforce Fire Codes to encourage and in some cases require Fire-Resistant Construction Techniques. Promote building and design standards to minimize wind damage and wind resistant building techniques. (2006 IRC - lowest standards - sprinkler systems/fire suppression). Subcontractor does inspections and plan review | Ongoing: Some Progress, Plan on Finishing Implementation | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | 40 |
| Protect Infrastructure: Protect power lines, emergency facilities and other critical infrastructure from hazards. Promote ROW maintenance with clearing and trimming. (Primarily Entergy responsibility) | Ongoing: Some Progress, Plan on Finishing Implementation | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | 40 |
| Protect Infrastructure: Identify infiltration/inflow (I&I) issues with methods such as smoke testing. Replace sewer lines to reduce I&I. | In Progress - Some sewer lines have been replaced. Cobb Mill needs work | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | 40 |
| Reduce Impacts to Roadways: Plan for and maintain adequate road and debris clearing capabilities. | Ongoing: Some Progress, Plan on Finishing Implementation | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | 40 |
| Prepare for and reduce the Impacts of Power Outages: Install auxiliary power sources at critical facilities and infrastructure beginning with a 190W pump station at the Industrial Park Water Well. Conduct regular maintenance and checks of auxiliary power sources and resources necessary to provide auxiliary power. Phase 2: Police Department, 5 Sewer Lift Stations next | Ongoing: Some Progress, Plan on Finishing Implementation | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | 40 |
| Secondary Water Supply for the prison (vertical well) - currently submersible and very prone to lightning, if struck, then there will be no water | New | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | 40 |
| tri-band radios for the city of Woodville and Woodville VFD - communicating on the same frequency/channel (20 Handhelds for the city employees). For Woodville VFD - 6 in-truck radios, 35 handhelds. | New | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | 40 |
| Water Treatment Plant needs significant repair. I& I overwhelms the plant. Last renovated 25+ years ago. Need a new centrifuge, clarifiers, oxidation ditch (racetrack) | New | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | 40 |
| Partnership for Floodplain Management: Tyler County Emergency Management will act as a facilitator to develop and form partnerships with cities and communities to support and implement regional floodplain management strategies. (city performs permitting, county will focus on the emergency management and provide additional support). (Pursue training for CFM/floodplain management training) | Continue: No Progress, Plan for Future Implementation | 5 | 5 | 5 | 5 | 5 | 5 | 3 | 5 | 5 | 43 |
| City-Wide Hazardous Fuels Reduction Project: Reduce the available vegetative fuels in areas prone to wildland fire to reduce the risk to urban interfaces. | Ongoing: Some Progress, Plan on Finishing Implementation | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 45 |
| Update Warning Siren and connect to GENESYS and the weather warning system. | New | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 45 |

## Spurger ISD STAPLEE

| Spurger ISD | | | Socially Acceptable | Technically Feasible | Administratively Possible | Politically Acceptable | Legal | Economically Sound | Environmentally Sound | BONUS: Addresses Multiple Hazards (5pts) | BONUS: Complements another entity's efforts (5pts) | Total Score |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mitigation Action | Hazards Addressed | Responsible Departments | | | | | | | | | | |
| Retrofit existing overhead electric lines to underground insulated lines. | Wildfires, Tornadoes, Hurricanes, Windstorms | SISD Administration | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | 40 |
| Generators: Stationary generator, fixed site, to supply fuel the campus | All Hazards | SISD Administration | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | 40 |
| Mobile Generator for fuel site for bus barn, food storage for cafeteria (Old generator needs to be replaced) | All Hazards | SISD Administration | 5 | 4 | 5 | 5 | 5 | 4 | 5 | 5 | | 38 |
| Relocate and Provide Additional Fire Hydrants to Campus Property to Increase Area-wide Fire Protection | Wildfire | SISD Administration | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | 40 |
| Retrofit Old Gym Facility to House Administrative Staff and Provide Emergency Point of Refuge for Students and Facility during Emergencies - could also be used for school activities - move staff at temporary building - convert portion of facility into admin offices and provide shelter - strongest building) | All Hazards | SISD Administration | 5 | 4 | 5 | 5 | 5 | 4 | 4 | 5 | | 37 |
| Expand Emergency Operations Plan (EOP) to Address all Potential Hazards | All Hazards | SISD Administration | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | 40 |
| Increase Volume of Existing Detention Facility and Correct Out Fall Structure Elevation to Reduce Localized Flooding Occurance Between Campus Facilities (all of campus flows into one area - dug out to make deeper, flow line is deeper than drainage pipe) | Flooding | SISD Administration | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | 40 |
| Reduce Fuel Loading Along all Property Edges to Reduce Risk of Flame Spread and Ember Exposure | Wildfire | SISD Administration | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | 40 |

## Woodville ISD STAPLEE

| Woodville ISD | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mitigation Action | Hazards Addressed | Responsible Departments | Estimated Cost | Socially Acceptable | Technically Feasible | Administratively Possible | Politically Acceptable | Legal | Economically Sound | Environmentally Sound | BONUS: Addresses Multiple Hazards (5pts) | BONUS: Complements another entity's efforts (5pts) | Total Score | |
| Hardened Hallway for the other two jurisdictions ( Main Building Highschool and Main Building Middle School) | Hurricane, High Winds, Tornadoes, Severe Winter Storm | Maintenance and Operations Department | $800,000 | 5 | 4 | 1 | 5 | 5 | 2 | 3 | 5 | | 30 | Medium Priority |
| Generator for the Elementary school campus. One generator for the Summit (gym, fine arts, theatre) both would be stationary | Wildfire, Flood, Lightning, Extreme Heat | Maintenance and Operations Department | $800,000 | 5 | 5 | 1 | 5 | 5 | 2 | 3 | 5 | | 31 | Highest Priority |
| Ensure drought resistant landscaping and hardscaping across all school campuses | Drought | Maintenance and Operations Department | $150,000 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | | | 34 | Low Priority |

## Chester STAPLEE

## City of Colmesneil STAPLEE

| Mitigation Action | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| City of Colmesneil | Mitigation Action | Socially Acceptable | Technically Feasible | Administratively Possible | Politically Acceptable | Legal | Economically Sound | Environmentally Sound | BONUS: Addresses Multiple | BONUS: Complements another | Total Score |
| Replacement of old generators on three wells. Elevate electrical panels to keep flood waters out to prevent damage. | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 45 |
| Improve drainage on Railroad Street. Improve drainage on Mathis Street. Add down spout and gutter drainage for all city-owned buildings. Add low water crossing markers. Add portable barriers that are active. | | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 44 |
| Create an emergency plan for water usage during a drought. | | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 44 |
| Retrofit city facilities to withstand floods and high winds. | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 45 |
| Develop urban cooling strategies such as planting trees and creating green roofs. Establish cooling centers for vulnerable populations. | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 45 |
| Place power surge protectors on water wells. In City Hall. Install early warning lightning detectors. | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 45 |
| Install outdoor warning sirens with central electronic controls based on the type of hazard. | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 45 |
| Replace all roofs with metal roofing. Place storm shutters on windows to protect from hail. Install utility shielding for HVAC, generators, and electrical boxes. | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 45 |
| Establish defensible space around city facilities by clearing vegetation. | | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 44 |
| Install pipe covers, faucette covers for public buildings. Test gas pipes. Add carbonmonoxide detectors. Install heating lamps for all water wells. Purchase portable heating devices. | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 44 |
| Protect water and sewer pipes to reduce flooding during a dam failure. | | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 44 |

## Chester ISD STAPLEE

| Chester ISD | Socially Acceptable | Technically Feasible | Administratively Possible | Politically Acceptable | Legal | Economically Sound | Environmentally Sound | BONUS: Addresses Multiple Hazards (5pts) | BONUS: Complements another entity's efforts (5pts) | Total Score |
|---|---|---|---|---|---|---|---|---|---|---|
| Mitigation Action | | | | | | | | | | |
| Backup generator for school cafeteria - prevent food spoilage, also a genearator for the administration building, same campus, different building (for heating/cooling center), Generator for the gym. (High Priority) | 4 | 5 | 5 | 5 | 5 | 5 | 5 | | | 34 |
| Solar Lighting across the campus | 5 | 5 | 5 | 5 | 5 | 3 | 5 | | | 33 |
| Elementary and Tech Building roof replacement- sloped metal( stand in seam Roofs (cap above the flat roof) ) lead to leakage inside the building and flooding surrounding the campus. (follow up on roof type) (Drainage is in place, but moving water to it efficiently is the issue) (High Priority) | 5 | 5 | 5 | 5 | 5 | 3 | 5 | | | 33 |
| Shielding for AC units on the elementary school building | 5 | 5 | 5 | 5 | 5 | 3 | 5 | | | 33 |
| Vegetation maintenance surrounding the campus (AG shop in direct path of tree -storm concerns), Creation of defensible space focusing on protecting the maintenance building. | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | | 35 |
| Protective shelter for bus and maintenance vehicles (ensure that bus(es) remain functional and can serve as evacuation shelters) (High Priority) | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | | 35 |
| Cinderblock hallways reinforced - roofs are the concern | 5 | 5 | 5 | 5 | 5 | 3 | 5 | | | 33 |
| Septic system for sprinklers - water reuse, low-flow water faucets etc in place | 5 | 5 | 5 | 5 | 5 | 3 | 5 | | | 33 |
| Surge protection and backup batteries in place for data hub on campus | 5 | 5 | 5 | 5 | 5 | 3 | 5 | | | 33 |

Hurricane, Flood, Lightning, Windstorm, Severe Winter Storm, Wildfire, Hail, Tornado, Dam Failure, Extreme Heat, Drought

## Chester WSC STAPLEE

## Warren ISD STAPLEE

## Colmesneil ISD STAPLEE

# APPENDIX C – Critical Facilities

**Tyler County Critical Facilities and Private Critical Infrastructure:** Dam B VFD, Dedicated Medical Center and Urgent Care, Dogwood Energy Power Station, Energy/SHECO Substation, Fred Fire Department, Fred VFD, Gib Lewis Water Plant, Lakeside and Doucette Water Supply, Precinct 4 Maintenance Barn, Precinct 1 Road and Bridge Maintenance Barn, Sam Houston Electrical Coop-Substation, Seneca Water, Seneca Water Supply Corporation-Well 2, Shady Grove VFD, Spurger Fire Department, Spurger VFD, TCH Family Medical Clinic, TDCJ Gib Lewis Prison Unit, TDCJ Gib Lewis Unit, Texas Department of Human Services, Texas Department of Public Safety, Tyler County Annex Building, Tyler County Annex Building #2, Tyler County Collection Center, Tyler County Courthouse, Tyler County Hospital, Tyler County Jail, Tyler County Precinct #3, Wildwood VFD, Tyler County Rodeo and Fairgrounds, Tyler County Sheriff's Office, Tyler County Special Utility District, Tyler County Water, Tyler County Water Department, Undine Water Supply, US Army Corp of Engineers, Warren Energy Power Station, Warren VFD, Warren Water, White Tail Ridge VFD, Woodville Pellet.

**City of Chester Critical Facilities:** Chester VFD, Chester City Hall.

**Chester ISD Critical Facilities:** Chester Transportation, Chester ISD (all schools and the district office located on one campus).

**Chester WSC Critical Facilities:** Chester Water Supply Corp Office, Chester Water Well in Chester, Chester Water Supply in Woodville, Chester Water Supply-Well Pump, Barnum Plant.

**City of Woodville Critical Facilities:** Sims Street Water Plant, Industrial Park Well, Carlow Hill Water Plant, Woodville VFD, Woodville Police Department, Woodville Transportation, Woodville City Hall, City Warehouse & WWTP, 190 W. Elevated, 190 W. Booster Pump, Pine Street Water Plant.

**City of Colmesneil Critical Facilities:** Colmesneil City Hall, Colmesneil Community Center, Colmesneil VFD/ESD #7, Well #2, Well #4, Plant #1, North Booster Station, Power Substation.

**City of Ivanhoe Critical Facilities:** Ivanhoe VFD, Ivanhoe Police Substation, Ivanhoe City Hall, Ivanhoe Police Department, Ivanhoe VFD- Station Two, Lake Ivanhoe Dam, Lake Camelot Dam, Lake Galahad Dam, Lake Tristan Dam, Lake Charmaine Dam.

**Woodville ISD Critical Facilities:** Woodville Elementary, WISD Eagle Summit, Woodville High School, Woodville Middle School, Woodville ISD Administration.

**Colmesneil ISD Critical Facilities:** Moffett Gym, Colmesneil Middle/High School, Colmesneil Elementary School, Lake Tejas, and Lake Tejas Dam.

**Spurger ISD Critical Facilities:**

Spurger ISD, Spurger Gym, Spurger Elementary, Spurger Middle/High School, Spurger Transportation.

**Warren ISD Critical Facilities:**

Warren ISD Administration Building, Warren ISD Police Department, Warren ISD Police, Warren Elementary, Fred Elementary School, Warren High School, Warren Middle School, Warren Transportation Building.

# APPENDIX D – Community Survey Results

Langford Community Management Services, Inc.

## Form Results Summary

Oct 16, 2025 - Dec 11, 2025

**Project:** Tyler County Natural Hazard Mitigation Plan

**Form:** Take the Community Resilience Survey!

**Tool Type:** Form

**Activity ID:** 133

**Exported:** Feb 01, 2026, 07:50 PM

**Exported By:** JConrado

**Filter By:** No filters applied.

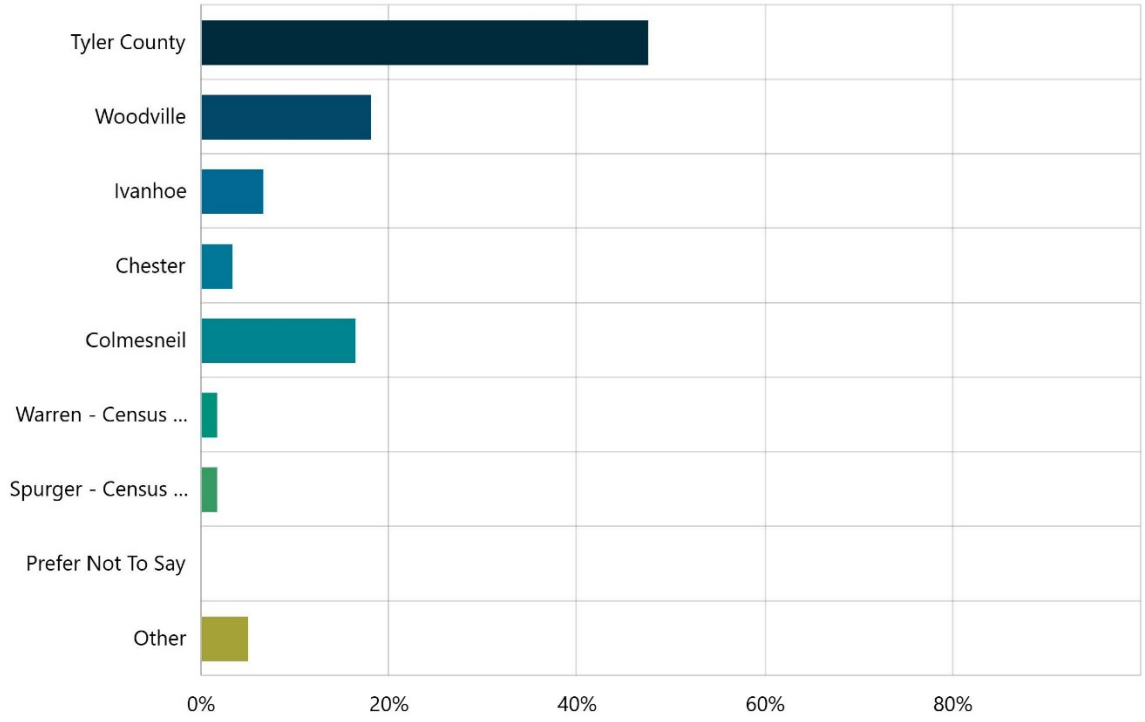
Open

**Take the Community Resilience Survey!**
Tyler County Natural Hazard Mitigation Plan

| 13 Contributors | 61 Contributions |
|---|---|

## Contribution Summary

**1. Please share with us which community you live in...** Required
Select Box | Skipped: 0 | Answered: 61 (100%)

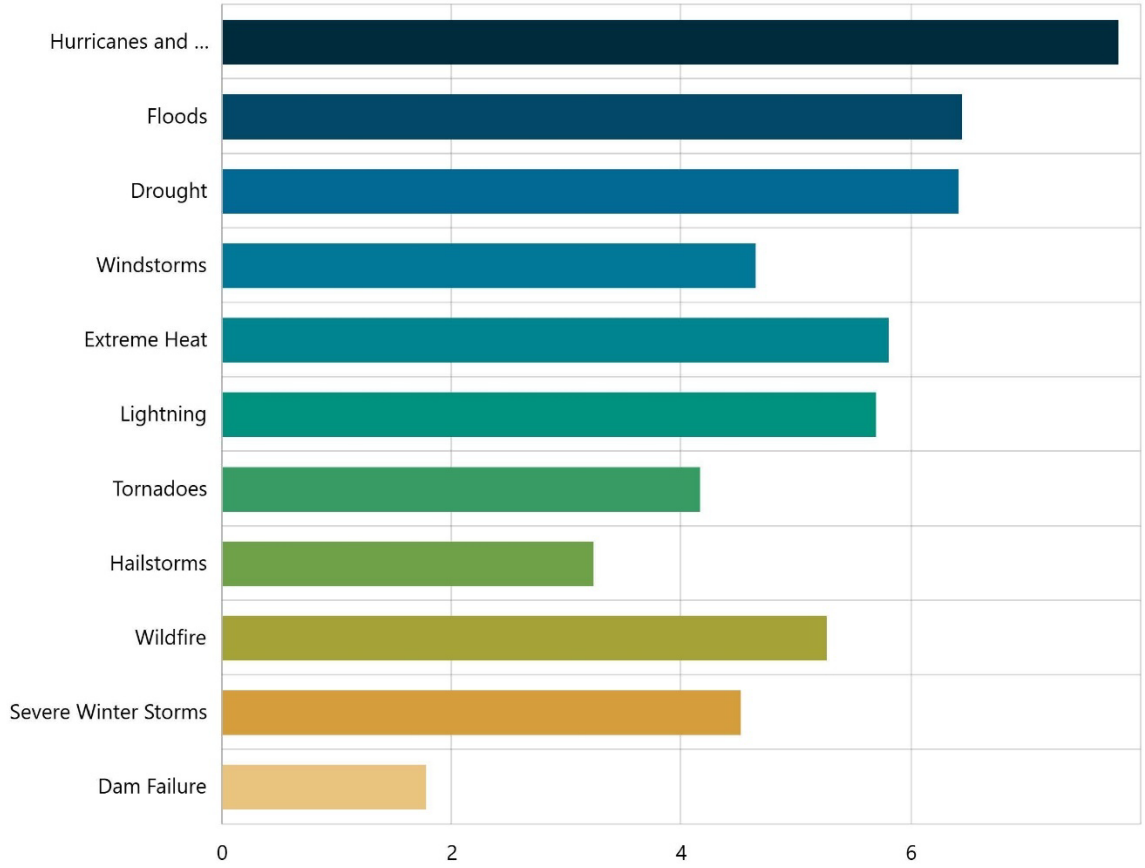



| Answer choices | Percent | Count |
|---|---|---|
| Tyler County | 47.54% | 29 |
| Woodville | 18.03% | 11 |
| Ivanhoe | 6.56% | 4 |
| Chester | 3.28% | 2 |
| Colmesneil | 16.39% | 10 |
| Warren - Census Designated Place | 1.64% | 1 |
| Spurger - Census Designated Place | 1.64% | 1 |

| | | |
|---|---|---|
| Prefer Not To Say | 0% | 0 |
| Other | 4.92% | 3 |
| **Total** | **100.00%** | **61** |

**2. From greatest at the top, to lowest at the bottom, rank the hazards based on the impact they've had on Tyler County.** Required

Ranking | Skipped: 0 | Answered: 61 (100%)




| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | Count | Score | Avg Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hurricanes and Tropical Storms | 42.86% 24 | 10.71% 6 | 7.14% 4 | 8.93% 5 | 1.79% 1 | 5.36% 3 | 8.93% 5 | 5.36% 3 | 7.14% 4 | 1.79% 1 | 0% 0 | 56 | 7.80 | 3.50 |
| Floods | 19.23% 10 | 23.08% 12 | 15.38% 8 | 3.85% 2 | 3.85% 2 | 5.77% 3 | 3.85% 2 | 3.85% 2 | 5.77% 3 | 15.38% 8 | 0% 0 | 52 | 6.44 | 4.44 |
| Drought | 1.92% 1 | 25.00% 13 | 13.46% 7 | 15.38% 8 | 11.54% 6 | 13.46% 7 | 7.69% 4 | 5.77% 3 | 1.92% 1 | 3.85% 2 | 0% 0 | 52 | 6.41 | 4.48 |
| Win | 6.12 | 4.08 | 8.16 | 12.2 | 12.2 | 10.2 | 10.2 | 8.16 | 16.3 | 6.12 | 6.12 | 49 | 4.64 | 6.22 |

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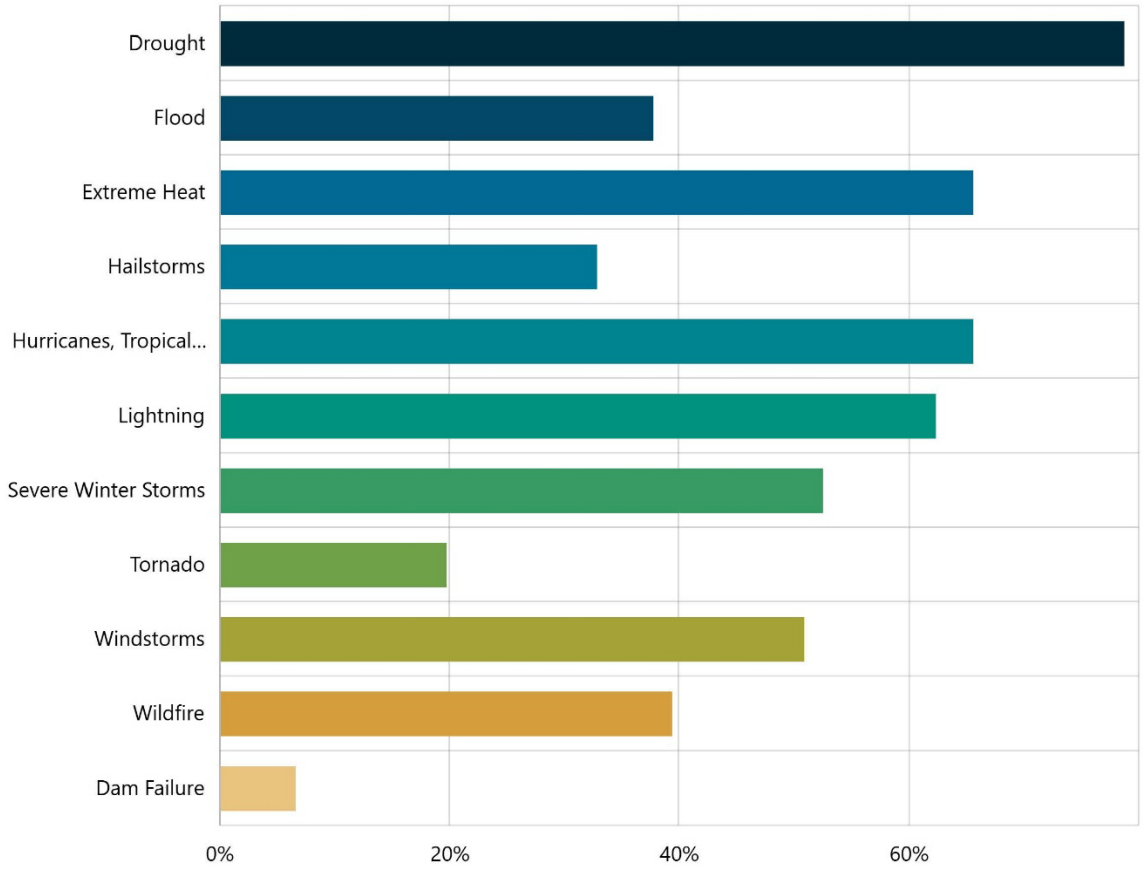
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| dstorms | 3% | 2% | 4% | 6% | 6% | 5% | 5% | 4% | 8% | 3% | 3% | | | |
| Extreme Heat | 22.00% 11 | 12.00% 6 | 14.00% 7 | 10.00% 5 | 6.00% 3 | 0% 0 | 0% 0 | 10.00% 5 | 12.00% 6 | 8.00% 4 | 6.00% 3 | 50 | 5.80 | 4.92 |
| Lightning | 0% 0 | 12.50% 6 | 16.67% 8 | 25.00% 12 | 16.67% 8 | 8.33% 4 | 10.42% 5 | 2.08% 1 | 4.17% 2 | 4.17% 2 | 0% 0 | 48 | 5.69 | 4.77 |
| Tornadoes | 6.98% 3 | 0% 0 | 6.98% 3 | 9.30% 4 | 9.30% 4 | 27.91% 12 | 11.63% 5 | 16.28% 7 | 0% 0 | 9.30% 4 | 2.33% 1 | 43 | 4.16 | 6.09 |
| Hailstorms | 0% 0 | 4.65% 2 | 0% 0 | 4.65% 2 | 6.98% 3 | 9.30% 4 | 23.26% 10 | 18.60% 8 | 18.60% 8 | 9.30% 4 | 4.65% 2 | 43 | 3.23 | 7.42 |
| Wildfire | 11.11% 5 | 11.11% 5 | 22.22% 10 | 8.89% 4 | 13.33% 6 | 2.22% 1 | 4.44% 2 | 11.11% 5 | 8.89% 4 | 2.22% 1 | 4.44% 2 | 45 | 5.26 | 4.87 |
| Severe Winter Storms | 4.08% 2 | 8.16% 4 | 8.16% 4 | 8.16% 4 | 16.33% 8 | 6.12% 3 | 10.20% 5 | 6.12% 3 | 10.20% 5 | 16.33% 8 | 6.12% 3 | 49 | 4.51 | 6.39 |
| Dam Failure | 4.65% 2 | 0% 0 | 2.33% 1 | 2.33% 1 | 2.33% 1 | 4.65% 2 | 2.33% 1 | 2.33% 1 | 2.33% 1 | 11.63% 5 | 65.12% 28 | 43 | 1.77 | 9.49 |

**Score** - Sum of the weight of each ranked position, multiplied by the response count for the position choice, divided by the total contributions. Weights are inverse to ranked positions.
**Avg Rank** - Sum of the ranked position of the choice, multiplied by the response count for the position choice, divided by the total 'Count' of the choice.

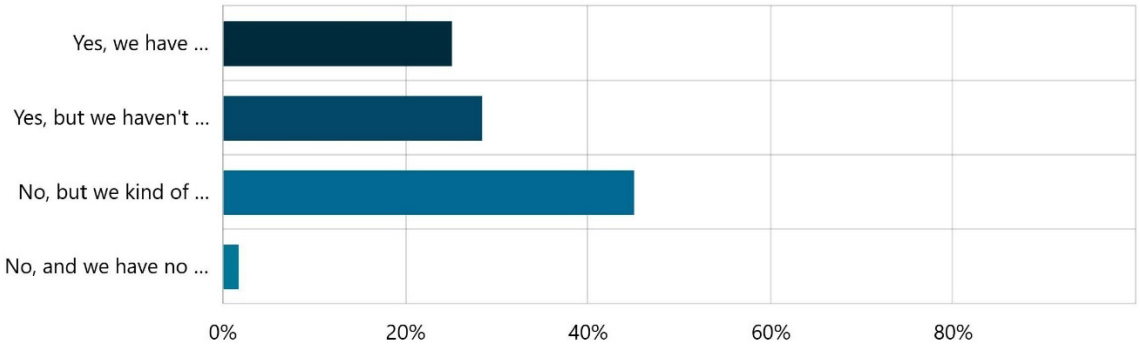
**3. What hazards have you experienced while living in Tyler County? Select All that Apply** Required
Multi Choice | Skipped: 0 | Answered: 61 (100%)




| Answer choices | Percent | Count |
|---|---|---|
| Drought | 78.69% | 48 |
| Flood | 37.70% | 23 |
| Extreme Heat | 65.57% | 40 |
| Hailstorms | 32.79% | 20 |
| Hurricanes, Tropical Storms & Depressions | 65.57% | 40 |
| Lightning | 62.30% | 38 |
| Severe Winter Storms | 52.46% | 32 |
| Tornado | 19.67% | 12 |
| Windstorms | 50.82% | 31 |

| | | |
|---|---|---|
| Wildfire | 39.34% | 24 |
| Dam Failure | 6.56% | 4 |

**4. Does your household have a plan in the event of a disaster?**
Select Box | Skipped: 1 | Answered: 60 (98.4%)




| Answer choices | Percent | Count |
|---|---|---|
| Yes, we have practiced the plan. | 25.00% | 15 |
| Yes, but we haven't practiced the plan. | 28.33% | 17 |
| No, but we kind of know what to do | 45.00% | 27 |
| No, and we have no idea what to do | 1.67% | 1 |
| **Total** | **100.00%** | **60** |

**5. What actions have you taken to prepare yourself, your family and/or, your home for a disaster?**
Long Text | Skipped: 11 | Answered: 50 (82%)

**Sentiment**

No sentiment data

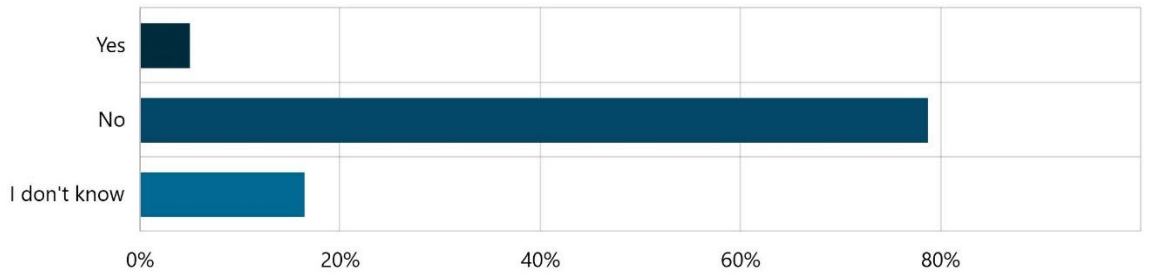
**Tags**

No tag data

**Featured Contributions**

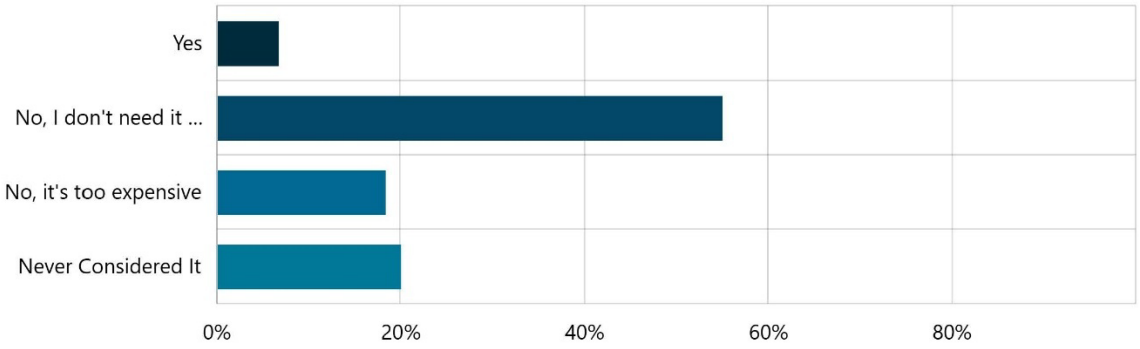
No featured contributions

**6. Is your home located in a floodplain?**
Select Box | Skipped: 0 | Answered: 61 (100%)




| Answer choices | Percent | Count |
|---|---|---|
| Yes | 4.92% | 3 |
| No | 78.69% | 48 |
| I don't know | 16.39% | 10 |
| **Total** | **100.00%** | **61** |

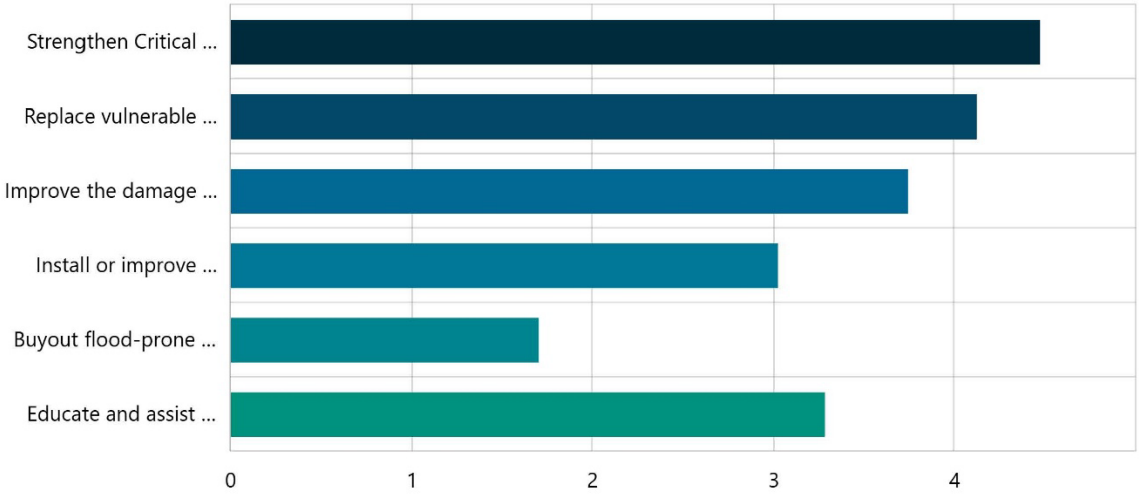
**7. Do you have flood insurance?**
Select Box | Skipped: 1 | Answered: 60 (98.4%)




| Answer choices | Percent | Count |
|---|---|---|
| Yes | 6.67% | 4 |
| No, I don't need it because my structure is elevated | 55.00% | 33 |
| No, it's too expensive | 18.33% | 11 |
| Never Considered It | 20.00% | 12 |
| **Total** | **100.00%** | **60** |

**8. From the top being the highest priority, to bottom being the lowest, rank the following mitigation actions based on what you believe should be prioritized**

Ranking | Skipped: 4 | Answered: 57 (93.4%)




| | 1 | 2 | 3 | 4 | 5 | 6 | Count | Score | Avg Rank |
|---|---|---|---|---|---|---|---|---|---|
| Strengthen Critical Facilities such as police stations, fire departments, and hospitals | 48.21% 27 | 10.71% 6 | 10.71% 6 | 16.07% 9 | 7.14% 4 | 7.14% 4 | 56 | 4.47 | 2.45 |
| Replace vulnerable or inadequate bridges and roads | 21.82% 12 | 36.36% 20 | 10.91% 6 | 14.55% 8 | 10.91% 6 | 5.45% 3 | 55 | 4.12 | 2.73 |
| Improve the damage resistance of utilities through actions like burying powerlines and replaces pipes | 11.11% 6 | 24.07% 13 | 33.33% 18 | 14.81% 8 | 12.96% 7 | 3.70% 2 | 54 | 3.74 | 3.06 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Install or improve protective structures like flood barriers, dams, or community shelters | 5.66%<br>3 | 15.09%<br>8 | 20.75%<br>11 | 26.42%<br>14 | 20.75%<br>11 | 11.32%<br>6 | 53 | 3.02 | 3.75 |
| Buyout flood-prone properties and preserve the land as open space | 1.85%<br>1 | 1.85%<br>1 | 9.26%<br>5 | 7.41%<br>4 | 20.37%<br>11 | 59.26%<br>32 | 54 | 1.70 | 5.20 |
| Educate and assist property owners in making their homes more resilient | 14.81%<br>8 | 14.81%<br>8 | 16.67%<br>9 | 18.52%<br>10 | 25.93%<br>14 | 9.26%<br>5 | 54 | 3.28 | 3.54 |

**Score** - Sum of the weight of each ranked position, multiplied by the response count for the position choice, divided by the total contributions. Weights are inverse to ranked positions.
**Avg Rank** - Sum of the ranked position of the choice, multiplied by the response count for the position choice, divided by the total 'Count' of the choice.

# Appendix E – Annual Plan Update Worksheets

| Mitigation Worksheet Project Tracking | | | | | |
|---|---|---|---|---|---|
| Jurisdiction: | | | | | |
| Action Number/Title | Mitigation Action Progress | Current Priority (L, M, H) | Action Status (Cancelled, Ongoing, Finished) | Next Steps | Date |
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# Appendix F – Adoption Resolutions:

# TYLER COUNTY COMMISSIONERS COURT

County Courthouse, Room 101 / Woodville, Texas

| JOE BLACKSHER | DOUG HUGHES | MILTON POWERS | MIKE MARSHALL | BUCK HUDSON |
|---|---|---|---|---|
| Commissioner, Pct. 1 | Commissioner, Pct. 2 | County Judge | Commissioner, Pct. 3 | Commissioner, Pct. 4 |

**WHEREAS,** the Federal Disaster Mitigation Act of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), creating the framework for state, local, tribal, and territorial governments to engage in hazard mitigation planning to receive certain types of non-emergency disaster assistance; and,

**WHEREAS,** the Disaster Mitigation Act of 2000 was amended in May 2023 to require an Active Hazard Mitigation Plan for federal grant funding eligibility; and,

**WHEREAS**, a Core Team comprised of members of Tyler County, participating sub-jurisdictions, and school districts took part in the identification of Critical Facilities, Community Capabilities, Identification and Prioritization of Natural Hazard Risks, and the identification of new Hazard Mitigation Actions; and,

**WHEREAS**, Stakeholders and Participants also provided input; and,

**WHEREAS**, Tyler County and the Tyler County Commissioners' Court commit to comply with the annual Plan review as described by FEMA; and,

**WHEREAS**, the Plan incorporates the comments, ideas, and concerns of the communities, which this updated Plan is designed to protect, ascertained through a series of Public Outreach Meetings, newspaper coverage, and other activities.

**WHEREAS**, the Plan is currently under review by FEMA, and additional edits to the Plan's contents may be required to ensure compliance with 44 CFR § 201.6.

**NOW THEREFORE, BE IT RESOLVED** by the Commissioners' Court of Tyler County that the 2026 Tyler County Hazard Mitigation Plan update, and any edits required for plan approval, are hereby approved and adopted by the Court on February 9th, 2026, and the Court resolves to execute the Actions in the Plan.

Milton Powers, County Judge

Joseph Blacksher, Commissioner Pct. #1

Doug Hughes, Commissioner Pct. #2

Mike Marshall, Commissioner Pct. #3

Buck Hudson, Commissioner Pct. #4

ATTEST: County Clerk, Janet Brown

## Resolution for Tyler County Hazard Mitigation Plan

**WHEREAS,** the Federal Disaster Mitigation Act of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), creating the framework for state, local, tribal, and territorial governments to engage in hazard mitigation planning to receive certain types of non-emergency disaster assistance; and,

**WHEREAS,** the Disaster Mitigation Act of 2000 was amended in May 2023 to require an Active Hazard Mitigation Plan for federal grant funding eligibility; and,

**WHEREAS,** a Core Team comprised of members of Tyler County, participating sub-jurisdictions, and school districts took part in the identification of Critical Facilities, Community Capabilities, Identification and Prioritization of Natural Hazard Risks, and the identification of new Hazard Mitigation Actions; and,

**WHEREAS,** Stakeholders and Participants also provided input; and,

**WHEREAS,** Woodville ISD in Tyler County, Texas, and its Board of Trustees commit to comply with the annual Plan review as described by FEMA; and,

**WHEREAS,** the Plan incorporates the comments, ideas, and concerns of the communities that this updated Plan is designed to protect, ascertained through a series of Public Outreach Meetings, community tabling, surveys, and a website for public review and comments.

**WHEREAS,** the Plan is being reviewed by TDEM and FEMA and may require edits for compliance with 44 CFR § 201.6; and,

**NOW THEREFORE, BE IT RESOLVED** by the Board of Trustees of Woodville ISD, Tyler County, Texas, that the 2026 Hazard Mitigation Plan update, and any required edits for meeting standards set by 44 CFR § 201.6, is hereby approved and adopted by the Board of Trustees and resolves to execute the Actions in the Plan to the best of its ability.

Ayes: 7 Nays: 0 Abstentions 0

President, Woodville ISD Board of Trustees

Secretary, Woodville ISD Board of Trustee

**WARREN INDEPENDENT SCHOOL DISTRICT**
**HAZARD MITIGATION RESOLUTION**

**WHEREAS,** the Federal Disaster Mitigation Act of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), creating the framework for state, local, tribal, and territorial governments to engage in hazard mitigation planning to receive certain types of non-emergency disaster assistance; and,

**WHEREAS,** the Disaster Mitigation Act of 2000 was amended in May 2023 to require an Active Hazard Mitigation Plan for federal grant funding eligibility; and,

**WHEREAS,** a Core Team comprised of members of Tyler County, participating sub-jurisdictions, and school districts took part in the identification of Critical Facilities, Community Capabilities, Identification and Prioritization of Natural Hazard Risks, and the identification of new Hazard Mitigation Actions; and,

**WHEREAS,** Stakeholders and Participants also provided input; and,

**WHEREAS,** Warren ISD in Tyler County, Texas, and its Board of Trustees commit to comply with the annual Plan review as described by FEMA; and,

**WHEREAS,** the Plan incorporates the comments, ideas, and concerns of the communities that this updated Plan is designed to protect, ascertained through a series of Public Outreach Meetings, community tabling, surveys, and a website for public review and comments.

**WHEREAS,** the Plan is being reviewed by TDEM and FEMA and may require edits for compliance with 44 CFR § 201.6; and,

**NOW THEREFORE, BE IT RESOLVED** by the Board of Trustees of Warren ISD, Tyler County, Texas, that the 2026 Hazard Mitigation Plan update, and any required edits for meeting standards set by 44 CFR § 201.6, is hereby approved and adopted by the Board of Trustees and resolves to execute the Actions in the Plan to the best of its ability.

Adopted this 23 (date) day of February (month), 2026 (year), by the Board.

Board President Printed Name: Billie Read

Board President Signature: Billie Read

Board Secretary Printed Name: Jordan Johnston

Board Secretary Signature:

## Tyler County Hazard Mitigation Plan Adoption Resolution

**WHEREAS,** the Federal Disaster Mitigation Act of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), creating the framework for state, local, tribal, and territorial governments to engage in hazard mitigation planning to receive certain types of non-emergency disaster assistance; and,

**WHEREAS,** the Disaster Mitigation Act of 2000 was amended in May 2023 to require an Active Hazard Mitigation Plan for federal grant funding eligibility; and,

**WHEREAS,** a Core Team comprised of members of Tyler County, participating sub-jurisdictions, and school districts took part in the identification of Critical Facilities, Community Capabilities, Identification and Prioritization of Natural Hazard Risks, and the identification of new Hazard Mitigation Actions; and,

**WHEREAS,** Stakeholders and Participants also provided input; and,

**WHEREAS,** the City of Colmesneil in Tyler County, Texas, and its City Council commit to comply with the annual Plan review as described by FEMA; and,

**WHEREAS,** the Plan incorporates the comments, ideas, and concerns of the communities that this updated Plan is designed to protect, ascertained through a series of Public Outreach Meetings, community tabling, surveys, and a website for public review and comments.

**WHEREAS,** the Plan is being reviewed by TDEM and FEMA and may require edits for compliance with 44 CFR § 201.6; and,

**NOW THEREFORE, BE IT RESOLVED** by the City Council of Colmesneil, Texas, that the 2026 Hazard Mitigation Plan update, and any required edits for meeting standards set by 44 CFR § 201.6, is hereby approved and adopted by the City Council and resolves to execute the Actions in the Plan to the best of its ability.

Elbert Sheffield, Mayor

## Resolution 2026-6R

**WHEREAS,** the Federal Disaster Mitigation Act of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), creating the framework for state, local, tribal, and territorial governments to engage in hazard mitigation planning to receive certain types of non-emergency disaster assistance; and,

**WHEREAS,** the Disaster Mitigation Act of 2000 was amended in May 2023 to require an Active Hazard Mitigation Plan for federal grant funding eligibility; and,

**WHEREAS,** a Core Team comprised of members of Tyler County, participating sub-jurisdictions, and school districts took part in the identification of Critical Facilities, Community Capabilities, Identification and Prioritization of Natural Hazard Risks, and the identification of new Hazard Mitigation Actions; and,

**WHEREAS,** Stakeholders and Participants also provided input; and,

**WHEREAS,** the City of Ivanhoe in Tyler County, Texas, and its City Council commit to comply with the annual Plan review as described by FEMA; and,

**WHEREAS,** the Plan incorporates the comments, ideas, and concerns of the communities that this updated Plan is designed to protect, ascertained through a series of Public Outreach Meetings, community tabling, surveys, and a website for public review and comments; and

**WHEREAS,** the Plan is being reviewed by TDEM and FEMA and may require edits for compliance with 44 CFR § 201.6.

**NOW THEREFORE, BE IT RESOLVED** by the City Council of Ivanhoe, Texas, that the 2026 Hazard Mitigation Plan update, and any required edits for meeting standards set by 44 CFR § 201.6, is hereby approved and adopted by the City Council and resolves to execute the Actions in the Plan to the best of its ability.

PASSED AND APPROVED ON February 19th, 2026

**APPROVED:**

Skip Blackstone, Mayor

**ATTEST:**

Hailey Williams, City Secretary

**CHESTER INDEPENDENT SCHOOL DISTRICT**
273 Yellow Jacket Dr.
Chester, Texas 75936
Admin Phone 936-969-2371
Fax 936-969-2080

Superintendent
Cory Hines

# Tyler County Hazard Mitigation Plan Resolution

WHEREAS, the Federal Disaster Mitigation Act of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), creating the framework for state, local, tribal, and territorial governments to engage in hazard mitigation planning to receive certain types of non-emergency disaster assistance; and,

WHEREAS, the Disaster Mitigation Act of 2000 was amended in May 2023 to require an Active Hazard Mitigation Plan for federal grant funding eligibility; and,

WHEREAS, a Core Team comprised of members of Tyler County, participating sub- jurisdictions, and school districts took part in the identification of Critical Facilities, Community Capabilities, Identification and Prioritization of Natural Hazard Risks, and the identification of new Hazard Mitigation Actions; and,

WHEREAS, Stakeholders and Participants also provided input; and,

WHEREAS, Chester ISD in Tyler County, Texas, and its Board of Trustees commit to comply with the annual Plan review as described by FEMA; and,

WHEREAS, the Plan incorporates the comments, ideas, and concerns of the communities that this updated Plan is designed to protect, ascertained through a series of Public Outreach Meetings, community tabling, surveys, and a website for public review and comments.

WHEREAS, the Plan is being reviewed by TDEM and FEMA and may require edits for compliance with 44 CFR § 201.6; and,

NOW THEREFORE, BE IT RESOLVED by the Board of Trustees of Chester ISD, Tyler County, Texas, that the 2026 Hazard Mitigation Plan update, and any required edits for meeting standards set by 44 CFR § 201.6, is hereby approved and adopted by the Board of Trustees and resolves to execute the Actions in the Plan to the best of its ability.

Wade Read, President

Shawna Neal, Secretary

2/25/26
Date Approved

# *Chester Water Supply*

Phone Number: (936) 969-2360
Fax: (936) 969-3058
Hours: M – F: 8:00 am – 12:00 pm

141 Cade ST.
P.O. Box 87
Chester, Texas 75936

**WHEREAS,** the Federal Disaster Mitigation Act of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), creating the framework for state, local, tribal, and territorial governments to engage in hazard mitigation planning to receive certain types of non-emergency disaster assistance; and,

**WHEREAS,** the Disaster Mitigation Act of 2000 was amended in May 2023 to require an Active Hazard Mitigation Plan for federal grant funding eligibility; and,

**WHEREAS,** a Core Team comprised of members of Tyler County, participating sub-jurisdictions, and school districts took part in the identification of Critical Facilities, Community Capabilities, Identification and Prioritization of Natural Hazard Risks, and the identification of new Hazard Mitigation Actions; and,

**WHEREAS,** Stakeholders and Participants also provided input; and,

**WHEREAS,** the Chester Water Supply Corporation in Tyler County, Texas, and its Board commit to comply with the annual Plan review as described by FEMA; and,

**WHEREAS,** the Plan incorporates the comments, ideas, and concerns of the communities that this updated Plan is designed to protect, ascertained through a series of Public Outreach Meetings, community tabling, surveys, and a website for public review and comments; and

**WHEREAS,** the Plan is being reviewed by TDEM and FEMA and may require edits for compliance with 44 CFR § 201.6.

**NOW THEREFORE, BE IT RESOLVED** by the Board of the Chester Water Supply Corporation, Texas, that the 2026 Hazard Mitigation Plan update, and any required edits for meeting standards set by 44 CFR § 201.6, is hereby approved and adopted by the Board and resolves to execute the Actions in the Plan to the best of its ability.

Ray McKnight, President

Chester Water Supply Corporation

141 Cade St
P.O. Box 87
Chester, Texas 75936

Phone: (936) 969-2087
Fax: (936) 969-3058
Hours: M-F 8AM-12PM

# City of Chester

**WHEREAS,** the Federal Disaster Mitigation Act of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), creating the framework for state, local, tribal, and territorial governments to engage in hazard mitigation planning to receive certain types of non-emergency disaster assistance; and,

**WHEREAS,** the Disaster Mitigation Act of 2000 was amended in May 2023 to require an Active Hazard Mitigation Plan for federal grant funding eligibility; and,

**WHEREAS,** a Core Team comprised of members of Tyler County, participating sub-jurisdictions, and school districts took part in the identification of Critical Facilities, Community Capabilities, Identification and Prioritization of Natural Hazard Risks, and the identification of new Hazard Mitigation Actions; and,

**WHEREAS,** Stakeholders and Participants also provided input; and,

**WHEREAS,** the City of Chester in Tyler County, Texas, and its City Council commit to comply with the annual Plan review as described by FEMA; and,

**WHEREAS,** the Plan incorporates the comments, ideas, and concerns of the communities that this updated Plan is designed to protect, ascertained through a series of Public Outreach Meetings, community tabling, surveys, and a website for public review and comments.

**WHEREAS,** the Plan is being reviewed by TDEM and FEMA and may require edits for compliance with 44 CFR § 201.6; and,

**NOW THEREFORE, BE IT RESOLVED** by the City Council of Chester, Texas, that the 2026 Hazard Mitigation Plan update, and any required edits for meeting standards set by 44 CFR § 201.6, is hereby approved and adopted by the City Council and resolves to execute the Actions in the Plan to the best of its ability.

Mayor Robert Poynter

**COLMESNEIL INDEPENDENT SCHOOL DISTRICT**
610 W. Elder St.
P.O. Box 37
Colmesneil, TX 75938
Phone: 409.837.5757
Fax: 409.837.9107
www.colmesneilisd.net

**WHEREAS,** the Federal Disaster Mitigation Act of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), creating the framework for state, local, tribal, and territorial governments to engage in hazard mitigation planning to receive certain types of non-emergency disaster assistance; and,

**WHEREAS,** the Disaster Mitigation Act of 2000 was amended in May, 2023 to require an Active hazard Mitigation Plan for federal grant funding eligibility; and,

**WHEREAS,** a Core Team comprised of members of Tyler County, participating sub-jurisdictions, and school districts took part in the identification of Critical Facilities, Community Capabilities, Identification and Prioritization of Natural Hazard Risks, and the identification of new Hazard Mitigation Actions; and,

**WHEREAS,** Stakeholders and Participants also provided input; and,

**WHEREAS,** Colmesneil ISD in Tyler County, Texas, and its Board of Trustees commit to comply with the annual Plan review as described by FEMA; and

**WHEREAS,** the Plan incorporates the comments, ideas, and concerns of the communities that this updated Plan is designed to protect, ascertained through a series of Public Outreach Meetings, community tabling, surveys, and a website for public review and comments.

**WHEREAS,** the Plan is being reviewed by TDEM and FEMA and may require edits for compliance with 44 CFR 201.6; and

**NOW THEREFORE, BE IT RESOLVED** by the Board of Trustees of Colmesneil ISD, Tyler County, Texas, that the 2026 Hazard Mitigation Plan update, and any required edits for meeting standards set by 44 CFR 201.6 is hereby approved and adopted by the Board of Trustees and resolves to execute the Actions in the Plan to the best of its ability.

Signatures:

Board President
Eric Lee

Board Secretary
Twyla Darder



**SPURGER INDEPENDENT SCHOOL DISTRICT**
**RESOLUTION REGARDING THE TYLER COUNTY**
**2026 HAZARD MITIGATION PLAN**

WHEREAS, the Federal Disaster Mitigation Act of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), creating the framework for state, local, tribal, and territorial governments to engage in hazard mitigation planning to receive certain types of non-emergency disaster assistance; and,

WHEREAS, the Disaster Mitigation Act of 2000 was amended in May 2023 to require an Active Hazard Mitigation Plan for federal grant funding eligibility; and,

WHEREAS, a Core Team comprised of members of Tyler County, participating sub-jurisdictions, and school districts took part in the identification of Critical Facilities, Community Capabilities, Identification and Prioritization of Natural Hazard Risks, and the identification of new Hazard Mitigation Actions; and,

WHEREAS, Stakeholders and Participants also provided input; and,

WHEREAS, Spurger ISD in Tyler County, Texas, and its Board of Trustees commit to comply with the annual Plan review as described by FEMA; and,

WHEREAS, the Plan incorporates the comments, ideas, and concerns of the communities that this updated Plan is designed to protect, ascertained through a series of Public Outreach Meetings, community tabling, surveys, and a website for public review and comments.

WHEREAS, the Plan is being reviewed by TDEM and FEMA and may require edits for compliance with 44 CFR § 201.6; and,

NOW THEREFORE, BE IT RESOLVED by the Board of Trustees of Spurger ISD, Tyler County, Texas, that the 2026 Hazard Mitigation Plan update, and any required edits for meeting standards set by 44 CFR § 201.6, is hereby approved and adopted by the Board of Trustees and resolves to execute the Actions in the Plan to the best of its ability.

Presiding Officer

Secretary

## RESOLUTION 20260309

**WHEREAS,** the Federal Disaster Mitigation Act of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), creating the framework for state, local, tribal, and territorial governments to engage in hazard mitigation planning to receive certain types of non-emergency disaster assistance; and,

**WHEREAS,** the Disaster Mitigation Act of 2000 was amended in May 2023 to require an Active Hazard Mitigation Plan for federal grant funding eligibility; and,

**WHEREAS,** a Core Team comprised of members of Tyler County, participating sub-jurisdictions, and school districts took part in the identification of Critical Facilities, Community Capabilities, Identification and Prioritization of Natural Hazard Risks, and the identification of new Hazard Mitigation Actions; and,

**WHEREAS,** Stakeholders and Participants also provided input; and,

**WHEREAS,** the City of Woodville in Tyler County, Texas, and its City Council commit to comply with the annual Plan review as described by FEMA; and,

**WHEREAS,** the Plan incorporates the comments, ideas, and concerns of the communities that this updated Plan is designed to protect, ascertained through a series of Public Outreach Meetings, community tabling, surveys, and a website for public review and comments.

**WHEREAS,** the Plan is being reviewed by TDEM and FEMA and may require edits for compliance with 44 CFR § 201.6; and,

**NOW THEREFORE, BE IT RESOLVED** by the City Council of Woodville, Texas, that the 2026 Hazard Mitigation Plan update, and any required edits for meeting standards set by 44 CFR § 201.6, is hereby approved and adopted by the City Council and resolves to execute the Actions in the Plan to the best of its ability.

Amy Bythewood, Mayor
City of Woodville

Attest

Danita Skinner, City Secretary
City of Woodville