

2021

Erath County Hazard Mitigation Action Plan



North Central Texas
Council of Governments

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Executive Summary

We cannot control when or where a tornado or other natural hazard will strike, but we can save lives and reduce property damage by understanding the risks and taking action to address those risks. In the process, we can increase resilience in our community, environment, and economy. Participating jurisdictions in the Erath County Hazard Mitigation Action Plan (HazMAP) are dedicated to the protection of local citizens and their property, and to the improvement of the quality of life for all residents.

Mitigation has been defined as “sustained action to reduce or eliminate long-term risk to human life and property from natural, human-caused, and technological hazards.”¹ It is fundamentally a loss-prevention function characterized by planned, long-term alteration of the built environment to ensure resilience against natural and human-caused hazards. This loss-prevention function has been illustrated by the Multi-Hazard Mitigation Council study of the Federal Emergency Management Agency (FEMA) mitigation projects, which shows that for every dollar invested in mitigation, six dollars of disaster losses were avoided.²

Mitigation should form the foundation of every emergency management agency’s plans and procedures. Emergency management agencies should adopt mitigation practices to reduce, minimize, or eliminate hazards in their community. The Erath County Hazard Mitigation Action Plan identifies the hazards faced by participating jurisdictions, vulnerabilities to these hazards, and mitigation strategies for the future. The plan fulfills the requirements of the Federal Disaster Mitigation Act as administered by the Texas Division of Emergency Management (TDEM) and the Federal Emergency Management Agency (FEMA).

This plan is not legally binding but instead is a tool for the jurisdiction to use to become more resilient to natural hazards. Mitigation actions will be implemented as capabilities and funding allow.

¹ State of Texas Mitigation Handbook, page 1-1.

² Natural Hazard Mitigation Saves: 2017 Interim Report, page 1.

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Acronyms

EMC- Emergency Management Coordinator

EOC- Emergency Operations Center

FEMA- Federal Emergency Management Agency

HazMAP- Hazard Mitigation Action Plan

HMPT- Hazard Mitigation Planning Team

LPT- Local Planning Team

N/A- Not Applicable

NCEI- National Centers for Environmental Information

NCTCOG- North Central Texas Council of Governments

NFIP- National Flood Insurance Program

NFPA- National Fire Protection Association

NWS- National Weather Service

OWS- Outdoor Warning Siren

RLP- Repetitive Loss Properties

SRLP- Severe Repetitive Loss Properties

TDEM- Texas Division of Emergency Management

TFS- Texas A&M Forest Service

TPW- Texas Parks & Wildlife Department

TxDOT- Texas Department of Transportation

UTA- University of Texas at Arlington

WUI- Wildland-Urban Interface

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Chapter 1: Introduction

1.1 Overview

The Erath County Hazard Mitigation Action Plan (HazMAP) as written fulfills the requirements of the Disaster Mitigation Act of 2000 (DMA 2000), which is administered by the Federal Emergency Management Agency (FEMA). The Disaster Mitigation Act provides federal assistance to state and local emergency management entities to mitigate the effects of disasters. The HazMAP also encourages cooperation among various organizations across political subdivisions.

This HazMAP is an update of the 2015 FEMA-approved HazMAP. The title was changed from the Local Mitigation Action Plan to Hazard Mitigation Action Plan to clearly specify the intent of the document. With each update, new challenges are identified, new strategies proposed, and when incorporated, the updated plan grows in complexity, but not necessarily in utility.

This HazMAP is the result of two years of study, data collection, analysis, and community feedback. Representatives and citizens from participating jurisdictions attended public meetings to discuss the hazards their communities face and the vulnerabilities those hazards present.

All participants involved in this plan understand the benefits of developing and implementing mitigation plans and strategies. Elected officials, public safety organizations, planners, and many others have worked together to develop and implement this HazMAP, displaying that they have the vision to implement mitigation practices and therefore reduce the loss of life and property in their communities.

Information was collected up to 2018.

1.2 Authority

The [Robert T. Stafford Disaster Relief and Emergency Assistance Act](#) (Stafford Act), as amended by the Disaster Mitigation Act of 2000, provides the legal basis for state, tribal, and local governments to undertake risk-based approaches to reducing natural hazard risks through mitigation planning. Specifically, the Stafford Act requires state, tribal, and local governments to develop and adopt FEMA-approved hazard mitigation plans as a condition for receiving certain types of non-emergency disaster assistance.

The Stafford Act authorizes the following grant programs:

- [Hazard Mitigation Grant Program](#) (HMGP), which helps communities implement hazard mitigation measures following a Presidential major disaster declaration. This program also funds development and update of hazard mitigation plans.
- [Pre-Disaster Mitigation Grant Program](#) (PDM), which awards planning and project grants to assist states, territories, federally-recognized tribes, and local communities in implementing sustained pre-disaster natural hazard mitigation programs. Such efforts may include development or update of hazard mitigation plans.
- [Public Assistance Grant Program](#) (PA), which provides assistance to state, tribal, and local governments, and certain types of private nonprofit organizations so that communities can quickly respond to and recover from major disasters or emergencies declared by the President.

- [Fire Management Assistance Grant Program](#) (FMAG), which provides assistance to state, tribal, and local governments for the mitigation, management, and control of fires on publicly or privately-owned forests or grasslands that threaten such destruction as would constitute a major disaster.

Title 44, Chapter 1, Part 201 ([44 CFR Part 201](#)) of the Code of Federal Regulations (CFR) contains requirements and procedures to implement the hazard mitigation planning provisions of the Stafford Act.

The purpose of the Stafford Act, as amended by the Disaster Mitigation Act of 2000, is “to reduce the loss of life and property, human suffering, economic disruption, and disaster assistance costs resulting from natural disasters.” Chapter 322 of the act specifically addresses mitigation planning and requires state and local governments to prepare multi-hazard mitigation plans as a precondition for receiving FEMA mitigation grants.

This Erath County Hazard Mitigation Action Plan was developed by the Erath County Hazard Mitigation Planning Team (HMPT) under the direction and guidance of the North Central Texas Council of Governments (NCTCOG) Emergency Preparedness Department. The plan represents collective efforts of citizens, elected and appointed government officials, business leaders, non-profit organizations, and other stakeholders. This plan, and updating the plan, and timely future updates of this plan, will allow Erath County and participating jurisdictions to comply with the Disaster Mitigation Act of 2000 and its implementation regulations, 44 CFR Part 201.6, thus resulting in eligibility to apply for federal aid for technical assistance and post-disaster hazard mitigation project funding. The update will also prioritize potential risks and vulnerabilities in an effort to minimize the effects of disasters in the participating communities.

1.3 Scope

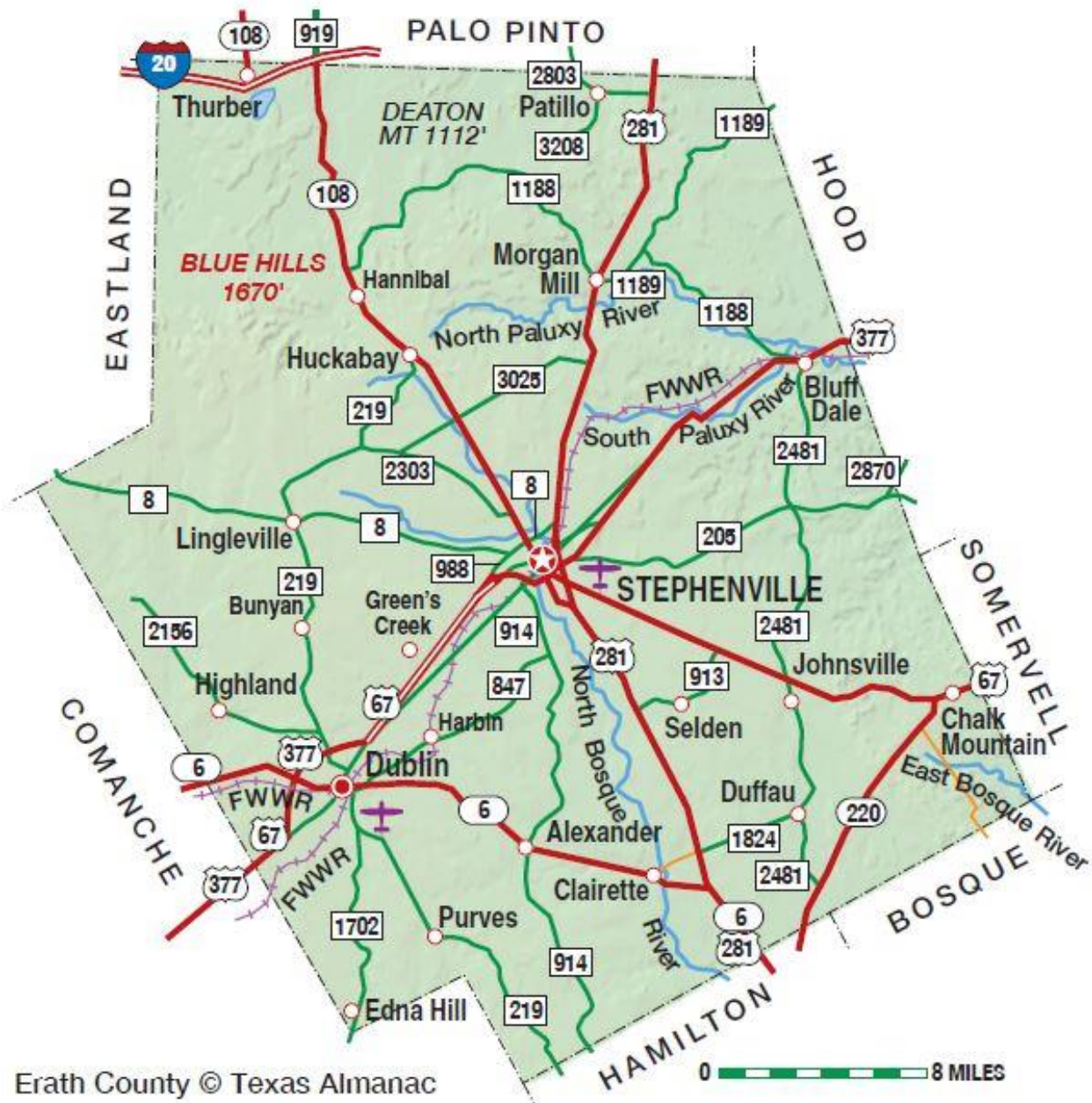
The scope of the Erath County HazMAP encompasses all participating entities in Erath County. This plan identifies natural and, for some jurisdictions, technological hazards that could threaten life and property in the communities. Assessing technological hazards is not a requirement for this hazard mitigation action plan but select jurisdictions have included these hazards in this plan. The scope of this plan includes both short and long-term mitigation strategies, implementation, strategies, and possible sources of project funding to mitigate identified hazards.

The planning area for this plan is for Erath County, Texas (marked in red on the Texas map) and includes the following jurisdictions:

- City of Dublin*
- City of Stephenville
- Erath County Unincorporated

**Jurisdictions that did not participate in the 2015 Erath County HazMAP.*





Source: [Texas State Historical Association](http://www.texasstatehistoricalassociation.org)

1.4 Purpose

This HazMAP is intended to enhance and complement federal and state recommendations for the mitigation of natural and technological hazards in the following ways:

- Substantially reduce the risk of loss of life, injuries, and hardship from the destruction of natural and technological disasters.
- Improve public awareness of the need for individual preparedness and building safer, more disaster resilient communities.
- Develop strategies for long-term community sustainability during community disasters.
- Develop governmental and business continuity plans that will continue essential private sector and governmental operations during disasters.

Erath County is susceptible to a number of different natural hazards that have potential to cause property loss, loss of life, economic hardship, and threats to public health and safety. Occurrence of natural disasters cannot be prevented; however, their impact on people and property can be lessened through hazard mitigation measures.

Mitigation planning is imperative to lessen the impact of disasters in Erath County. This plan is an excellent method by which to organize Erath County's mitigation strategies. The implementation of the plan and its components is vital to preparing a community that is resilient to the effects of a disaster. The implementation of this HazMAP can reduce loss of life and property and allow the participating communities to operate with minimal disruption of vital services to citizens. This HazMAP provides a risk assessment of the hazards Erath County is exposed to and puts forth several mitigation goals and objectives that are based on that risk assessment.

1.5 Mitigation Goals

The goals of the participants' mitigation strategy are to protect life and reduce bodily harm from natural hazards, and to lessen the impacts of natural hazards on property and the community through hazard mitigation. These goals are the basis of this plan and summarize what the Erath County Hazard Mitigation Planning Team will accomplish by implementing this plan.

1.6 Plan Organization

This Erath County HazMAP is organized into five chapters which satisfy the mitigation requirements in 44 CFR Part 201.6, with four appendices providing the required supporting documentation.

Chapter 1: Introduction

Describes the purpose of the Erath County Hazard Mitigation Action Plan and introduces the mitigation planning process.

Chapter 2: Planning Process

Describes the planning process and organization for each participating jurisdiction, satisfying requirements 201.6(c)(1), 201.6(b)(2), 201.6(b)(1), 201.6(b)(3), 201.6(c)(4)(i), 201.6(c)(4)(ii), and 201.6(c)(4)(iii).

Chapter 3: Hazard Identification and Risk Assessment

Describes the hazards identified, location of hazards, previous events, and jurisdictional profiles, satisfying requirements 201.6(c)(2)(i) and 201.6(c)(2)(ii).

Chapter 4: Mitigation Strategy

Reflects on the mitigation actions previously identified and examines the ability of Erath County and participating jurisdictions to implement and manage a comprehensive mitigation strategy, satisfying requirements 201.6(c)(1), 201.6(c)(3)(i), 201.6(c)(3)(ii), 201.6(c)(3)(iii), 201.6(c)(3)(iv), 201.6(c)(4)(ii), and 201.6(b)(3).

Chapter 5: Conclusion

Appendix A: Maps & Tables

Appendix B: Capabilities Assessment

Appendix C: NCTCOG Programs

Appendix D: Public Documents

Appendix E: Local Planning Teams

1.7 Erath County Hazard Mitigation Strategy Maintenance Process

The Erath County Hazard Mitigation Planning Team, consisting of a representative from each participating jurisdiction, will continue to collaborate as a planning group in coordination with Erath County Office of Emergency Management. Primary contact will be through emails and conference calls, with strategy meetings to occur at least annually. The points of contact for the county and jurisdictions will jointly lead the plan maintenance and update process by:

- Assisting jurisdictional Local Planning Teams in updating their individual contributions to the county Hazard Mitigation Action Plan.
- Assisting interested Local Planning Teams that would like to begin their mitigation planning process.
- Facilitating Erath County HazMAP meetings and disseminating information.
- Collaborating on data collections and record keeping.
- Requesting updates and status reports on planning mechanisms.
- Requesting updates and status reports on mitigation action projects.
- Assisting jurisdictions with mitigation grants.
- Assisting jurisdictions with implementing mitigation goals and action projects.
- Providing mitigation training opportunities.
- Maintaining documentation of local adoption resolutions for the Erath County Hazard Mitigation Action Plan.

1.8 Erath County Hazard Mitigation Action Plan Adoption

Once the Erath County Hazard Mitigation Action Plan has received FEMA “Approved Pending Local Adoption” each participating jurisdiction will take the Erath County HazMAP to their Commissioners Court or city councils for final public comment and local adoption. A copy of the resolution will be inserted into the Erath County HazMAP and held on file at the North Central Texas Council of Governments.

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Chapter 2: Planning Process

Requirement	
§201.6(b)	An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:
§201.6(b)(1)	An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
§201.6(b)(2)	An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and
§201.6(b)(3)	Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.
§201.6(c)(1)	[The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.
§201.6(c)(4)(i)	[The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle
§201.6(c)(4)(iii)	[The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

2.1 Collaborative Process

A comprehensive county approach was taken in developing the plan. An open public involvement process was established for the public, neighboring communities, regional agencies, businesses, academia, etc. to provide opportunities for everyone to become involved in the planning process and to make their views known. The meetings were advertised with notices in public places and city websites and social media pages.

Each participating jurisdiction gathered their information using a Local Planning Team (LTP), comprised of local staff that could contribute to development of this mitigation plan. The leaders of each of these LPT’s comprised the Erath County Hazard Mitigation Planning Team (HMPT) and other relevant agencies. The HMPT met regularly with the North Central Texas Council of Governments in order to submit individual assessments and data into one multi-jurisdictional mitigation plan.

Stakeholders were invited to participate, via email, by participating jurisdictions.

The North Central Texas Council of Governments was responsible for plan facilitation and coordination with Erath County HMPT members and stakeholders throughout the process.

2.1.1 Points of Contacts

The following are members of the Erath County Hazard Mitigation Planning Team (HMPT). These HMPT members were also the point(s) of contact for their respective jurisdiction during this plan update.

Erath County HMPT Members

Jurisdiction	Job Title	Role in the HMPT
City of Dublin	City Manager/Emergency Management Coordinator	Jurisdictional information and LPT Lead
City of Stephenville	Fire Captain/Emergency Management Coordinator	Jurisdictional information and LPT Lead
Erath County Unincorporated	Emergency Management Coordinator	Jurisdictional information and LPT Lead

Each HMPT member led a Local Planning Team (LPT) in their respective jurisdictions. The LPT members are listed in Appendix E.

2.1.2 Stakeholders

Stakeholders were invited to participate in the planning process, via email, and included local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development, and neighboring communities.

Stakeholders

Organization Represented	Position
Somervell County	Emergency Management Coordinator
Palo Pinto County	Emergency Management Coordinator
Parker County	Emergency Management Coordinator
Hood County	Emergency Management Coordinator
U.S. Army Corps of Engineers	Director – Civil Works
Dams in Participating Jurisdictions	Owners
Independent School Districts of Participating Jurisdictions	Superintendents
Texas Department of Transportation	Emergency Operations
Utility Providers	Emergency Operations
Local Emergency Planning Committee	Emergency Management Coordinator
Texas Division of Emergency Management	District Coordinator, Field Response
Texas Division of Emergency Management	Hazard Mitigation Planner
State Fire Marshal’s Office	District 6, Inspector
National Weather Service – Fort Worth	Warning & Coordination Meteorologist
NCTCOG’s Emergency Preparedness Planning Council	Chair
NCTCOG’s Regional Emergency Preparedness Advisory Council	Chair
Local City Councils	Local elected officials
Brazos River Authority	Project Manager

2.1.3 Public Involvement

NCTCOG hosted a public meeting on behalf of jurisdictions on July 25, 2019 at Erath County’s Texas Health Resources Hospital. The jurisdictions who used this opportunity to reach the public were in attendance and advertised the meeting within their jurisdiction.

The supporting documentation, advertisements, and details of this meeting and other meetings or outreach strategies are documented within Appendix D of this HazMAP. There were no public comments made during the meeting.

Public participation will remain an active component of this plan, even after adoption, to ensure citizens understand what the community is doing on their behalf, and to provide a chance for input on community vulnerabilities and mitigation activities that will inform the plan’s content. Public involvement is also an opportunity to educate the public about hazards and risks in the community, types of activities to mitigate those risks, and how these activities impact them. Involvement will be sought in a multitude of ways, including but not limited to periodic presentations on the plan’s progress to elected officials, schools, or other community groups; annual questionnaires or surveys; public meetings; and postings on social media and interactive websites.

2.2 Existing Data and Plans

Existing hazard mitigation information and other relevant Hazard Mitigation Action Plans were reviewed during the development of this plan. Data was gathered through numerous sources, including Geographic Information Systems (GIS). The intent of reviewing existing material was to identify existing data and information, shared objectives, and past and ongoing activities that can help inform the mitigation plan. It also helps identify the existing capabilities and planning mechanisms to implement the mitigation strategy. The table below outlines the sources used to collect data for the plan:

Data Source	Data Incorporation	Purpose
County appraisal data, census data, city land use data	Population and demographics	Population counts, parcel data, and land use data
National Centers for Environmental Information (NCEI)	Hazard occurrences	Previous event occurrences and mapping for hazards
Texas Forest Service/Texas Wildfire Risk Assessment Summary Report	Wildfire threat and urban interface	Mapping and wildfire vulnerability
U.S. Army Corps of Engineers National Dam Inventory	Dam information	Dam list
Federal Emergency Management Agency (FEMA) Digital Flood Insurance Rate Map (DFIRM) Flood Zones, National Flood Insurance Program (NFIP) studies	Flood zone maps and NFIP information	GIS mapping of flood zones and NFIP data

Data Source	Data Incorporation	Purpose
October 2017 NFIP Flood Insurance Manual Change Package	NFIP Information	Repetitive Loss Properties and Community Rating System (CRS) ratings
State of Texas Hazard Mitigation Plan, 2013 and 2018 editions	Hazards and mitigation strategy	Support the goals of the state
2015 Erath County HazMAP	All Chapters	This is an update of that plan
Hazard Mitigation: Integrating Best Practices into Planning	Planning process	Use proven techniques in developing the HazMAP
Environmental Protection Agency (EPA) Superfund National Priority List	Protected sites	Risk assessment- identify critical areas
National Register of Historic Places	Historic districts	Risk assessment
Texas Parks & Wildlife List of Rare Species	Endangered or protected species	Risk assessment
Texas Water Development Board	Lake information	Vulnerabilities
U.S. Department of Agriculture	Soil type	Expansive Soils description

2.3 Timeframe

The planning process for the update of the Erath County Hazard Mitigation Action Plan was approximately two years. The table below is the timeline followed.

Activity	Time Period
Kickoff meeting	November, 2018
Created planning teams	November-December, 2018
Capabilities assessment	January-March 2019
Hazard identification & risk assessment	January-March 2019
Public outreach	July-August 2019
Mitigation strategy (goals & action items)	July-August 2019
Review HazMAP draft	January, 2020
Update plan as needed	February, 2020
Final draft review	March, 2020
Send HazMAP to TDEM/make revisions as needed	March, 2020
Send to FEMA/ make revisions as needed	To be determined
Adoption & signatures	Once "Approved Pending Adoption" designated received.

Activities were either led or monitored by the North Central Texas Council of Governments (NCTCOG) and public outreach strategies were conducted by the participating jurisdictions. The details of these activities are provided in the individual annexes of the jurisdictions.

2.4 Planning Meetings

During the planning process, the Hazard Mitigation Planning Team met to discuss relevant information from the jurisdiction and to review objectives and progress of the plan. The goals of these meetings were to gather information and to provide guidance for the jurisdictions throughout the planning stages.

The following meetings were hosted by the North Central Texas Council of Governments for the HazMAP participants and do not represent all the meetings that were conducted throughout the process by the Local Planning Teams.

Date	Meeting
November 1, 2018	HazMAP Kickoff Meeting
January 23, 2019	Hazard Identification, Risk Assessment, and Capabilities Assessment Meeting
June 10, 2019	Hazard Identification, Risk Assessment, and Capabilities Assessment Meeting
July 25, 2019	Public Meeting and Mitigation Workshop

2.5 Plan Implementation

The Erath County Hazard Mitigation Action Planning process was overseen by the North Central Texas Council of Governments (NCTCOG). The plan was submitted to the Texas Division of Emergency Management (TDEM) and the Federal Emergency Management Agency (FEMA) for approval. It is expected that all participating jurisdictions will formally adopt the plan by resolution once the “Approved Pending Adoption” designation is received by FEMA, in accordance with the Disaster Mitigation Act of 2000.

Each jurisdiction participating in this plan is responsible for implementing specific mitigation actions as prescribed in the mitigation strategies. In each mitigation strategy, every proposed action is assigned to a specific local department or agency in order to assign responsibility and accountability and increase the likelihood of subsequent implementation. This approach enables individual jurisdictions to update their unique mitigation strategy as needed without altering the broader focus of the county-wide plan. The separate adoption of locally-specific actions also ensures that each jurisdiction is not held responsible for monitoring and implementing the actions of other jurisdictions involved in the planning process.

The Erath County Emergency Management Coordinator or their designee is the lead position for plan implementation and will work with the Erath County Hazard Mitigation Planning Team (HMPT) to ensure mitigation actions are implemented into jurisdictional planning procedures. Each participating jurisdiction will implement the plan and their individual mitigation actions in the timeframe appropriate for their planning processes. As necessary, the HMPT will seek outside funding sources to implement mitigation projects in both the pre-disaster and post-disaster environments. When applicable, potential funding sources have been identified for proposed actions listed in the mitigation strategies.

2.6 Multijurisdictional Strategy and Considerations

The Erath County Office of Emergency Management will lead activities for mitigation planning county-wide. Although The Erath County Office of Emergency Management will be responsible for maintaining

this plan, including the documentation of in-progress and completed action items, each participating jurisdiction is responsible for reporting hazards, their costs, and a status report on mitigation actions to the North Central Texas Council of Governments (NCTCOG) for recording in the plan.

Each jurisdiction is responsible for completing mitigation activities by providing the capabilities and authorities needed to carry out activities. Participating jurisdictions completed an analysis of their current legal, staffing, and fiscal capabilities as they relate to hazard mitigation planning. Jurisdictional capabilities and authorities identified to ensure successful mitigation planning are located within the jurisdictional annexes.

2.7 Plan Evaluation

All members of the Erath County Hazard Mitigation Planning Team (HMPT) will be responsible for ensuring that the Erath County Hazard Mitigation Action Plan (HazMAP) is evaluated as required. Specifically, the Erath County Emergency Management Coordinator, or their designee, will convene the HMPT and ensure an evaluation is conducted in a thorough manner. This evaluation will include analysis of current mitigation projects, evaluation of success, reevaluation of future mitigation needs, and prioritization based upon changes in needs and/or capabilities of Erath County.

The HMPT will reconvene annually to ensure that projects are on track and to reevaluate the mitigation goals, objectives, and action items. The mitigation plan shall be viewed as an evolving, dynamic document.

2.8 Plan Update

The Disaster Mitigation Act of 2000 requires that the Erath County Hazard Mitigation Action Plan be updated at least once every five years. During this process, all chapters of the plan will be updated with current information, and analyses and new and/or modified mitigation actions will be developed. The revised plan will be submitted for state and federal review and approval and presented for approval to the Erath County Commissioners Court and the respective councils of incorporated cities included in this HazMAP. Likewise, each participating jurisdiction will undergo the same process for reviewing, revising and updating their respective plans and submitting them for approval by state, federal, and the local jurisdiction's governing body. The plan will be updated every five years in accordance with federal requirements. Erath County's Emergency Management Coordinator or their designee will be responsible for ensuring that this requirement is met. Erath County and the Hazard Mitigation Planning Team will review the HazMAP annually for needed updates. The HMPT will be involved in this process to ensure all jurisdictions provide input into the planning process. The public will be invited to participate in this process through public hearings.

2.9 Plan Maintenance

It is the intention of all documented plan participants to formally adopt the Erath County Hazard Mitigation Action Plan after each maintenance revision. Once all participants adopt the changes, the revised HazMAP and proof of adoption will be submitted by the North Central Texas Council of Governments (NCTCOG) to the Texas Division of Emergency Management and the Federal Emergency

Management Agency. The plan will be revised and maintained as required under the guidance of the HazMAP and formally adopted by Erath County and jurisdiction elected officials after each revision.

Following formal adoption by the Erath County’s Commissioners Court and formal adoption of the plan by the governing council of each participating jurisdiction, the actions outlined in the HazMAP will be implemented by the county and participating jurisdictions as described throughout this document.

The Erath County Emergency Management Coordinator (EMC), or their designee, is responsible for ensuring the HazMAP and its components are monitored, evaluated, and reviewed semiannually by the responsible personnel. The EMC will use email to request the monitoring activities noted below be implemented and changes documented. The progress of action items will be tracked electronically as “in progress,” “deferred,” or “completed.”

These and other changes affecting the plan will be documented within the Erath County HazMAP file and identified as updates. Updates will be shared between participants by email or in a meeting (if deemed appropriate) twice a year, and included in annual evaluations and reviews, and the five-year update of the plan.

Members of the Hazard Mitigation Planning Team (HMPT) are responsible for ensuring their mitigation strategy is monitored, evaluated, and reviewed on an annual basis. This will be accomplished by the Erath County EMC calling an annual meeting of the HMPT, whose members will assist in plan review, evaluation, updates, and monitoring. This meeting will be open to the public and public notices will encourage community participation.

During this annual meeting, the members will provide information and updates on the implementation status of each action item included in the plan. As part of the evaluation, the HMPT will assess whether goals address current and expected conditions, whether the nature and/or magnitude of the risks have changed, if current resources are appropriate for implementing the HazMAP, whether outcomes have occurred as expected, and if agencies and other partners participated as originally proposed. These activities will take place according to the following timetable:

Responsible Personnel	Activity	Update Schedule
Local Planning Team Point of Contact	Monitoring Plan: track implementation and action items, changes to risk assessment, changes to Local Planning Team (LPT), changes to capabilities, and plan integrations.	Twice a year
	Evaluate Plan: assess effectiveness by evaluating completed actions, implementation processes, responsible personnel, and lessons learned.	Annually
	Update Plan	Once every five years

At least once every five years, or more frequently if such a need is determined by the participants, the HazMAP will undergo a major update with NCTCOG. During this process, all chapters of the plan will be updated with current information and analyses and new and/or modified mitigation action plans will be developed. The revised plan will be submitted for review and approval to the Texas Division of Emergency Management and the Federal Emergency Management Agency and presented to the governing council for approval and adoption. The plan will be updated every five years in accordance with regulations.

2.10 Incorporation into Existing Planning Mechanisms

The primary means for integrating mitigation strategies into other local planning mechanisms will be through the revision, update, and implementation of each participating jurisdiction's individual plans that require specific planning and administrative tasks (for example, plan amendments, ordinance revisions, and capital improvement projects).

The members of the HMPT will remain charged with ensuring that the goals and strategies of new and updated local planning documents for their jurisdictions are consistent with the goals and actions of the Erath County HazMAP and will not contribute to increased hazard vulnerability in Erath County or its participating jurisdictions.

During the planning process for new and updated local planning documents, such as a comprehensive plan, capital improvement plan, or emergency management plan, Erath County and its participating jurisdictions will provide a copy of the Erath County HazMAP to the appropriate parties and recommend that all goals and strategies of new and updated local planning documents are consistent with and support the goals of the Erath County HazMAP and will not contribute to increased hazards in the affected jurisdiction(s).

Chapter 3: Hazard Identification and Risk Assessment

Requirement	
§201.6(c)(2)(i)	[The risk assessment shall include a] description of the type, location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.
§201.6(c)(2)(ii)	[The risk assessment shall include a] description of the jurisdiction’s vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community. All plans approved after October 1, 2008 must also address NFIP [National Flood Insurance Program] insured structures that have been repetitively damaged by floods. The plan should describe vulnerability in terms of:
§201.6(c)(2)(ii)(A)	The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas;
§201.6(c)(2)(ii)(B)	An estimate of the potential dollar losses to vulnerable structures identified in this section and a description of the methodology used to prepare the estimate.
§201.6(c)(2)(ii)(C)	Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.
§201.6(c)(2)(iii)	For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction’s risks where they vary from the risks facing the entire planning area.

3.1 Hazard Overview

Through an assessment of previous federally declared disasters in Texas, the State of Texas Hazard Mitigation Plan, historical and potential events in Erath County, and a review of available local mitigation action plans, it was determined that this Hazard Mitigation Action Plan (HazMAP) will address the risks associated with the following nine natural hazards:

- Drought
- Earthquakes
- Expansive Soils
- Extreme Heat
- Flooding (including dam failure)
- Thunderstorms (including hail, wind, and lightning)
- Tornadoes

- Wildfires
- Winter Storms

3.2 Major Disaster Declarations since the 2015 HazMAP

The following table lists the recent major disaster declarations that have occurred in Texas since the approval of Erath County’s 2015 HazMAP until 2018:

Disaster	Event	Incident Period	Declared
DR-4485	Texas Covid-19 Pandemic	January 20, 2020 and continuing	March 25, 2020
DR-4377	Severe Storms and Flooding	June 19,2018- July 13,2018	July 06, 2018
DR-4332	Hurricane Harvey	August 23, 2017- September 15, 2017	August 25, 2017
DR-4272	Severe Storms and Flooding	May 22, 2016- June 24, 2016	June 11, 2016
DR-4269	Severe Storms and Flooding	April 17, 2016- April 30, 2016	April 25, 2016
DR-4266	Severe Storms, Tornadoes, and Flooding	March 07, 2016- March 29, 2016	March 19, 2016
DR-4255	Severe Winter Storms, Tornadoes, Straight-line Winds, and Flooding	December 26, 2016- January 21, 2016	February 09, 2016
DR-4245	Severe Storms, Tornadoes, Straight-line Winds, and Flooding	October 22, 2015- October 31, 2015	November 25, 2015
DR-4223	Severe Storms, Tornadoes, Straight-line Winds, and Flooding	May 04, 2015- June 22, 2015	May 29, 2015
DR-4159	Severe Storms and Flooding	October 30, 2013- October 31, 2013	December 20, 2013
DR-4136	Explosion (West, TX Fertilizer)	April 17, 2013- April 20, 2013	August 02, 2013

Source: [FEMA](#)

Physical impacts of these declared disasters experienced by HazMAP participants in Erath County are listed below:

- **Dublin-** no physical impacts.
- **Stephenville-** DR-4272, 4266, and 4223 created property damage due to winds, flooding, and hail.
- **Erath County Unincorporated-** DR-4272 and 4223 created property damage due to winds and flooding.

3.3 Natural Hazard Profiles

Through an assessment of previous federally declared disasters in Texas, the State of Texas Hazard Mitigation Plan, historical and potential events in Erath County, and a review of available local mitigation action plans, it was determined that this Hazard Mitigation Action Plan (HazMAP) will address the risks associated with the following nine natural hazards:

- Drought
- Earthquakes
- Expansive Soils
- Extreme Heat
- Flooding (including dam failure)
- Thunderstorms (including hail, wind, and lightning)
- Tornadoes
- Wildfires
- Winter Storms

Due to the low probability and history of occurrence of coastal erosion, land subsidence, and hurricane/tropical storm, they will not be profiled in this plan.

Since the adoption of the 2015 HazMAP, the definition of a thunderstorm now includes hail, high winds, and lightning. These individual hazards within a thunderstorm will not be listed nor categorized separately.

Around 2013, areas of North Central Texas began experiencing earthquakes. It is suspected that dormant fault lines have been disturbed. Earthquakes have been added to the list of natural hazards profiled in this update for jurisdictions that feel they could be potentially impacted by them.

For this HazMAP, dam failure is considered a technological hazard and will be addressed in the flooding portion of this HazMAP when applicable. Dam failure is an accidental or unintentional collapse, breach, or other failure of an impoundment structure that results in downstream flooding and is considered both a natural hazard and technological hazard.

The following natural hazard profiles are listed in alphabetical order.

3.3.1 Drought

Drought can be defined as a water shortage caused by the natural reduction in the amount of precipitation expected over an extended period of time, usually a season or more in length. It can be aggravated by other factors such as high temperatures, high winds, and low relative humidity. Drought can impact the economy, environment, and society by limiting food and drinking water, destroying habitat, and triggering health and safety problems due to poor water quality and increased wildfires.

The following chart describes the drought monitoring indices along with drought severity, return period, and a description of the possible impacts of the severity of drought.

Drought Severity	Return Period (years)	Description of Possible Impacts	Drought Monitoring Indices		
			Standardized Precipitation Index (SPI)	NDMC* Drought Category	Palmer Drought Index
Minor Drought	3 to 4	Going into drought; short-term dryness slowing growth of crops or pastures; fire risk above average. Coming out of drought; some lingering water deficits; pastures or crops not fully recovered.	-0.5 to -0.7	D0	-1.0 to -1.9
Moderate Drought	5 to 9	Some damage to crops or pastures; fire risk high; streams, reservoirs, or wells low, some water shortages developing or imminent, voluntary water use restrictions requested.	-0.8 to -1.2	D1	-2.0 to -2.9
Severe Drought	10 to 17	Crop or pasture losses likely; fire risk very high; water shortages common; water restrictions imposed.	-1.3 to -1.5	D2	-3.0 to -3.9
Extreme Drought	18 to 43	Major crop and pasture losses; extreme fire danger; widespread water shortages or restrictions.	-1.6 to -1.9	D3	-4.0 to -4.9
Exceptional Drought	44 +	Exceptional and widespread crop and pasture losses; exceptional fire risk; shortages of water in reservoirs, streams, and wells creating water emergencies.	less than -2	D4	-5.0 or less

*NDMC - National Drought Mitigation Center

In Texas, local governments are empowered to take action on the behalf of those they serve. When drought conditions exist, a burn ban can be put in place by a county judge or county Commissioners Court prohibiting or restricting outdoor burning for public safety.³

3.3.2 Earthquake

An earthquake is a sudden motion or trembling of the earth, either caused by an abrupt release of accumulated strain on the tectonic plates that comprise the earth's crust or from human activities. Scientific studies have tied the quakes in North Central Texas to the disposal of wastewater from oil and gas production.

Magnitude and intensity measure different characteristics of earthquakes. Magnitude measures the energy released at the source of the earthquake and is determined from measurements on seismographs. Intensity measures the strength of shaking produced by the earthquake at a certain location and is determined from effects on people, human structures, and the natural environment.

The Modified Mercalli Intensity Scale classifies earthquakes by the amount of damage inflicted. It quantifies a quake's effects on the land's surface, people, and structures involved. The following is an abbreviated description of the levels of Modified Mercalli intensity.

³ Fire Danger: Texas Burn Bans. Texas A&M Forest Service. 2018. <<http://texasforestservice.tamu.edu/TexasBurnBans/>>

Intensity	Shaking	Description/Damage
I	Not felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

Source: [USGS Earthquake Hazards Program](#).

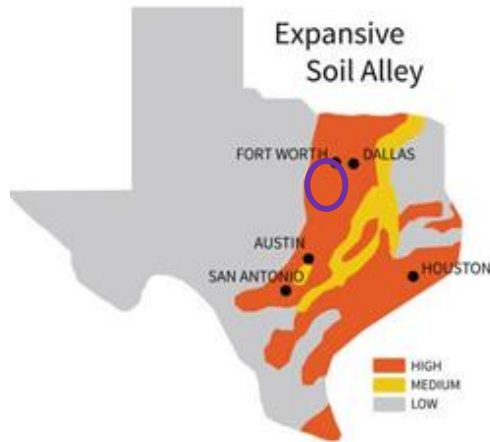
The following table gives intensities that are typically observed at locations near the epicenter of earthquakes of different magnitudes.

Magnitude	Typical Maximum Modified Mercalli Intensity
1.0 - 3.0	I
3.0 - 3.9	II - III
4.0 - 4.9	IV - V
5.0 - 5.9	VI - VII
6.0 - 6.9	VII - IX
7.0 and higher	VIII or higher

Source: [USGS Earthquake Hazards Program](#).

3.3.3 Expansive Soils

Expansive soils are soils that contain large percentages of swelling clays that may experience volume changes of up to 40% in the absence or presence of water. Homes built on expanding smectite clays without due precautions will likely be structurally damaged as the clay takes up water. Cracks will appear in walls and floors. Damage can be minor, but it also can be severe enough for the home to be structurally unsafe. Expansive soil is considered one of the most common causes of pavement distresses in roadways. Depending upon the moisture level, expansive soils will experience changes in volume due to moisture fluctuations from seasonal variations.



Expansive soils is a condition that is native to Texas soil characteristics, and cannot be documented as a time-specific event, except when it leads to structural and infrastructure damage. The great increase in damages in Texas caused by problems with expansive soils can be traced to the rise in residential slab-on-grade construction which began to accelerate in the 1960s. Prior to that time, most residential construction in Texas was pier and beam, with wood siding or other non-masonry covering. Affected homes will be heavily influenced by their proximity to a large body of water, whereas older pier and beam foundations will behave in an entirely different manner.

Geographically, Erath County is located in the Western Cross Timbers land resource area. Some areas are sandy, some are clay, some are shallow and rocky, and others are pure caliche. Caliche is calcium carbonate that binds with gravel, sand, clay and silt to form a particularly difficult soil to penetrate. There are very few areas in the County that are considered fertile. The Weatherford series consists of deep, well drained, moderately permeable soils that formed in sandy and loamy residuum weathered from weakly cemented sandstone of the Cretaceous age. These very gently sloping to strongly sloping soils occur mainly on convex ridges on hills. Slope ranges from 1 to 12 percent. Mean annual precipitation is about 34 inches and the mean annual temperature is about 65 °F. ⁴

A common procedure for evaluating and rating soil expansion potential is the Expansion Index (EI) test. The Expansion Index, EI, is used to measure a basic index property of soil and therefore, the EI is comparable to other indices such as the liquid limit, plastic limit, and plasticity index of soils.

Expansion Index (EI)	EI Potential Expansion
0-20	Very Low
21-50	Low
51-90	Medium
91-130	High
>130	Very High

Source: [Expansion Index](#)

⁴ Weatherford Series. CRC: BJW: GLL. 2016.
 < https://soilseries.sc.egov.usda.gov/OSD_Docs/W/WEATHERFORD.html >

3.3.4 Extreme Heat

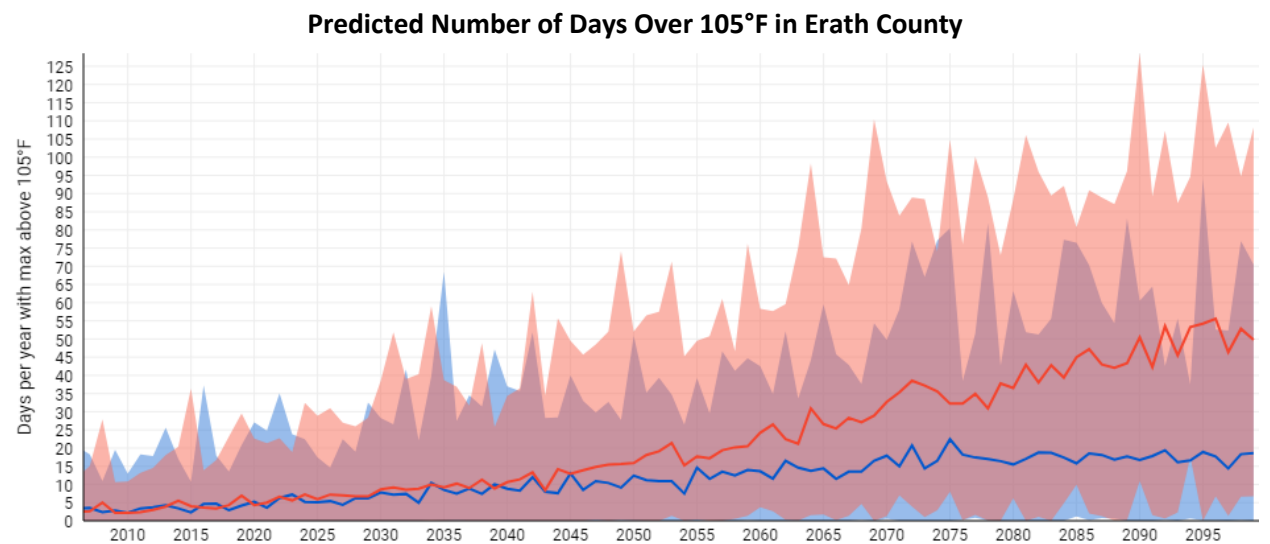
Extreme heat is characterized by a combination of very high temperatures and exceptionally humid conditions. When persisting over a period of time, it is called a heat wave.

Extreme heat can be a factor that drastically impacts drought conditions, as high temperatures lead to an increased rate of evaporation. The total number of days per year with maximum temperature above various thresholds is an indicator of how often very hot conditions occur. Depending upon humidity, wind, and physical workload, people who work outdoors or don't have access to air conditioning may feel very uncomfortable or experience heat stress or illness on very hot days. Hot days also stress plants, animals, and human infrastructure such as roads, railroads, and electric lines. Increased demand for electricity to cool homes and buildings can place additional stress on energy infrastructure.

Below is a visual representation of the expected amount of days per year that are over 105°F in Erath County.

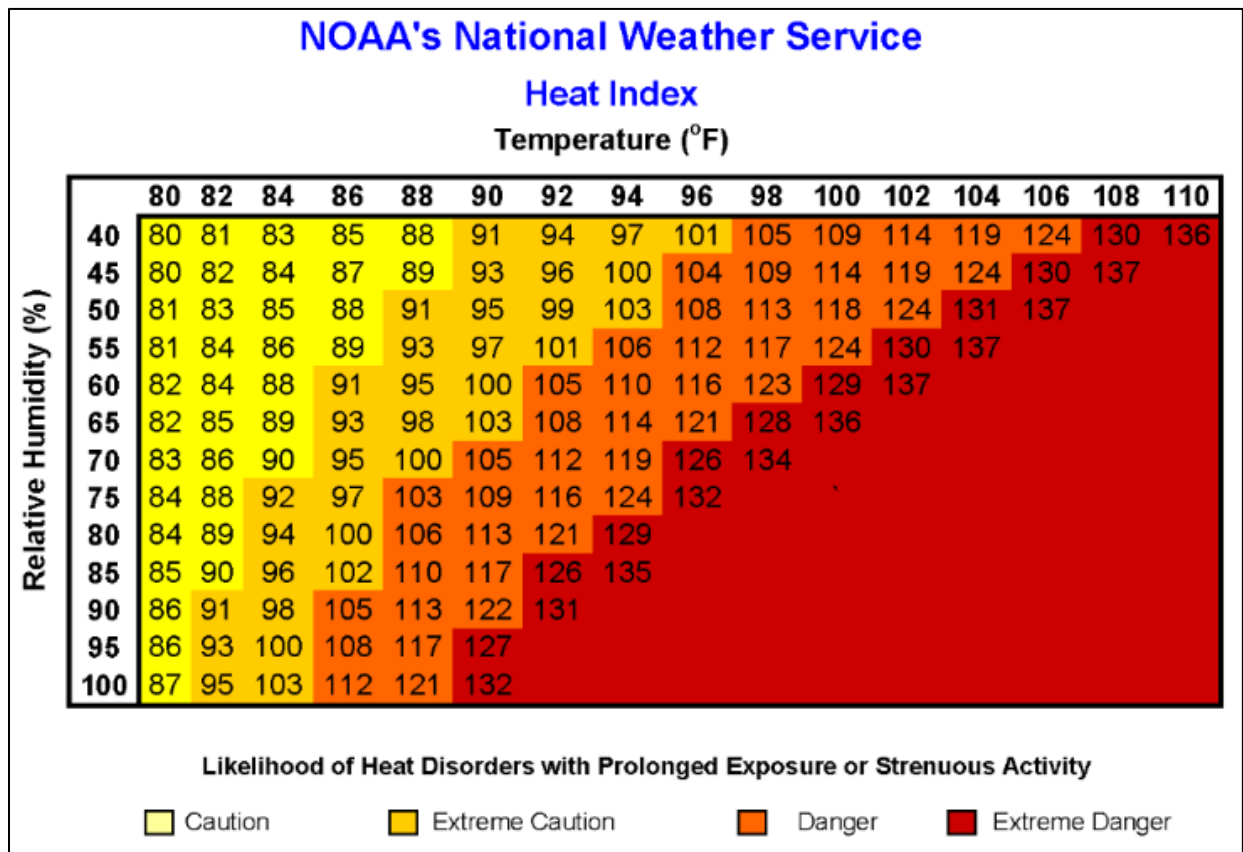
- The **blue area** shows the range of projections for a possible future in which global emissions of heat-trapping gases peak around 2040 and then decline.
- The **red area** shows the range of projections for a possible future in which global emissions of heat-trapping gases continue to increase through the 21st century. This scenario is called Representative Concentration Pathway (RCP) 8.5. For planning purposes, people who have a low tolerance for risk often focus on this scenario.
- Average lines, represented by the solid blue and red lines, show the weighted mean of all projections at each time step (projections are weighted based on model independence and skill). The lines aren't predictions of actual values; they merely highlight trends in the projections.

The trend shows how global emissions have a major role in climate variance and has an impact on extreme heat.



Source: [U.S. Climate Resilience Toolkit](#)

The following scale was used to determine the extent of extreme heat in Erath County and participating jurisdictions. The Heat Index is a measure of how hot it really feels when relative humidity is factored in with the actual air temperature. To find the Heat Index temperature, look at the Heat Index Chart below. As an example, if the air temperature is 96°F and the relative humidity is 65%, the heat index-how hot it feels-is 121°F. The red area without numbers indicates extreme danger. The National Weather Service (NWS) will initiate alert procedures when the Heat Index is expected to exceed 105°-110°F (depending on local climate) for at least 2 consecutive days.



NWS also offers a Heat Index chart, below, for areas with high heat but low relative humidity. Since heat index values were devised for shady, light wind conditions, exposure to full sunshine can increase heat index values by up to 15°F. Also, strong winds, particularly with very hot, dry air, can be extremely hazardous.

		Relative Humidity (%)																			
		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
80		77	78	78	79	79	79	80	80	80	81	81	82	82	83	84	84	85	86	86	87
81		78	79	79	79	79	80	80	81	81	82	82	83	84	85	86	86	87	88	90	91
82		79	79	80	80	80	80	81	81	82	83	84	85	86	87	88	89	90	91	93	95
83		79	80	80	81	81	81	82	82	83	84	85	86	87	88	90	91	93	95	97	99
84		80	81	81	81	82	82	83	83	84	85	86	88	89	90	92	94	96	98	100	103
85		81	81	82	82	82	83	84	84	85	86	88	89	91	93	95	97	99	102	104	107
86		81	82	83	83	83	84	85	85	87	88	89	91	93	95	97	100	102	105	108	112
87		82	83	83	84	84	85	86	87	88	89	91	93	95	98	100	103	106	109	113	116
88		83	84	84	85	85	86	87	88	89	91	93	95	98	100	103	106	110	113	117	121
89		84	84	85	85	86	87	88	89	91	93	95	97	100	103	106	110	113	117	122	
90		84	85	86	86	87	88	89	91	92	95	97	100	103	106	109	113	117	122	127	
91		85	86	87	87	88	89	90	92	94	97	99	102	105	109	113	117	122	126	132	
92		86	87	88	88	89	90	92	94	96	99	101	105	108	112	116	121	126	131		
93		87	88	89	89	90	92	93	95	98	101	104	107	111	116	120	125	130	136		
94		87	89	90	90	91	93	95	97	100	103	106	110	114	119	124	129	135	141		
95		88	89	91	91	93	94	96	99	102	105	109	113	118	123	128	134	140			
96		89	90	92	93	94	96	98	101	104	108	112	116	121	126	132	138	145			
97		90	91	93	94	95	97	100	103	106	110	114	119	125	130	136	143	150			
98		91	92	94	95	97	99	102	105	109	113	117	123	128	134	141	148				
99		92	93	95	96	98	101	104	107	111	115	120	126	132	138	145	153				
100		93	94	96	97	100	102	106	109	114	118	124	129	136	143	150	158				
101		93	95	97	99	101	104	108	112	116	121	127	133	140	147	155					
102		94	96	98	100	103	106	110	114	119	124	130	137	144	152	160					
103		95	97	99	101	104	108	112	116	122	127	134	141	148	157	165					
104		96	98	100	103	106	110	114	119	124	131	137	145	153	161						
105		97	99	102	104	108	112	116	121	127	134	141	149	157	166						
106		98	100	103	106	109	114	119	124	130	137	145	153	162	172						
107		99	101	104	107	111	116	121	127	134	141	149	157	167							
108		100	102	105	109	113	118	123	130	137	144	153	162	172							
109		100	103	107	110	115	120	126	133	140	148	157	167	177							
110		101	104	108	112	117	122	129	136	143	152	161	171								
111		102	106	109	114	119	125	131	139	147	156	166	176								
112		104	107	111	115	121	127	134	142	150	160	170	181								
113		104	108	112	117	123	129	137	145	154	164	175									
114		105	109	113	119	125	132	140	148	158	168	179									
115		106	110	115	121	127	134	143	152	162	173	184									
116		107	111	116	122	129	137	146	155	166	177										
117		108	112	118	124	132	140	149	159	170	181										
118		108	113	119	126	134	142	152	162	174	186										
119		109	114	121	128	136	145	155	166	178											
120		110	116	122	130	138	148	158	170	182											
121		111	117	124	132	141	151	162	174	187											
122		111	118	125	134	143	154	165	178												
123		112	119	127	136	146	157	169	182												
124		113	120	129	138	148	160	172													
125		114	121	130	140	151	163	176													

Heat Index



Extreme Danger	Heat stroke likely.
Danger	Sunstroke, muscle cramps, and/or heat exhaustion likely. Heatstroke possible with prolonged exposure and/or physical activity.
Extreme Caution	Sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.
Caution	Fatigue possible with prolonged exposure and/or physical activity.

3.3.5 Flooding

Flooding is defined as the accumulation of water within a water body and the overflow of excess water onto adjacent floodplain lands. The floodplain (or flood zone) is the land adjoining the channel of a river, stream, ocean, lake, or other watercourse or water body that is susceptible to flooding. The statistical meaning of terms like “100-year flood” can be confusing. Simply stated, a floodplain can be located anywhere; it just depends on how large and how often a flood event occurs. Floodplains are those areas that are subject to inundation from flooding. Floods and the floodplains associated with them are often described in terms of the percent chance of a flood event happening in any given year. As a community management or planning term, “floodplain” or “flood zone” most often refers to an area that is subject to inundation by a flood that has a 1% chance of occurring in any given year (commonly referred to as the 100-year floodplain).

Flood Insurance Risk Zones means zone designations on Flood Hazard Boundary Map (FHBM) and Flood Insurance Rate Map (FIRM) that indicate the magnitude of the flood hazard in specific areas of a community. The zone categories are below:

High Risk Area	Description
In communities that participate in the NFIP, mandatory flood insurance purchase requirements apply to all of these zones.	
Zone A	Special flood hazard areas inundated by the 100-year flood; base flood elevations are not determined. 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	Special flood hazard areas inundated by the 100-year flood; base flood elevations are determined. The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.
Zone A1-30	Special flood hazard areas inundated by the 100-year flood; base flood elevations are determined. These are known as numbered A Zones (e.g., A7 or A14). This is the base floodplain where the FIRM shows a BFE (old format).
Zone AO	Special flood hazard areas inundated by the 100-year flood; with flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. River or stream flood hazard areas, and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.
Zone AH	Special flood hazard areas inundated by the 100-year flood; flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations are determined. Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance

	of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
Zone A99	Special flood hazard areas inundated by the 100-year flood to be protected from the 100-year flood by a Federal flood protection system under construction; no base flood elevations are determined. Areas with a 1% annual chance of flooding that will be protected by a Federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones.
Moderate to Low Risk Area	Description
In communities that participate in the NFIP, flood insurance is available to all property owners and renters in these zones.	
Zone B and Zone X (shaded)	Areas of 500-year flood; areas subject to the 100-year flood with average depths of less than 1 foot or with contributing drainage area less than 1 square mile; and areas protected by levees from the base flood. Area of moderate flood hazard, usually the area between the limits of the 100-year and 500-year floods. B Zones are also used to designate base floodplains of lesser hazards, such as areas protected by levees from 100-year flood, or shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile.
Zone C and Zone X (un-shaded)	Areas determined to be outside the 500-year floodplain. Area of minimal flood hazard usually depicted on FIRMs as above the 500-year flood level. Zone C may have ponding and local drainage problems that don't warrant a detailed study or designation as base floodplain. Zone X is the area determined to be outside the 500-year flood and protected by levee from 100-year flood.
Undetermined Risk Area	Description
Zone D	Areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted. Flood insurance rates are commensurate with the uncertainty of the flood risk.

Flash Flooding

A flash flood is a rapid flood that inundates low-lying areas in less than six hours. This is caused by intense rainfall from a thunderstorm or several thunderstorms. Flash floods can also occur from the collapse of a man-made structure or ice dam. Construction and development can change the natural drainage and create brand new flood risks as the concrete that comes with new buildings, parking lots, and roads create less land that can absorb excess precipitation from heavy rains. Flash floods are a high-risk hazard since they can tear out trees and destroy buildings and bridges.

Flooding from Dam Failure

Besides rains and river or lake overflow, dam breaks can also cause flooding. A dam is defined as a barrier constructed across a watercourse for the purpose of storage, control, or diversion of water. Dams typically are constructed of earth, rock, concrete, or mine tailings. A dam failure is an accidental or unintentional collapse, breach, or other failure of an impoundment structure that results in downstream flooding.

Dam failure will be profiled in this plan within the flooding hazard.

3.3.6 Thunderstorms

A thunderstorm is a storm that consists of rain-bearing clouds and has the potential to produce hail, high winds, and lightning.

Hail

Hail occurs when, at the outgrowth of a severe thunderstorm, balls or irregularly shaped lumps of ice greater than 19.05 mm (0.75 inches) in diameter fall with rain. Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to warm air rising rapidly into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until, having developed sufficient weight, they fall as precipitation.

The Tornado and Storm Research Organization (TORRO) scale for hail extends from H0 to H10 with its increments of intensity or damage potential related to hail size (distribution and maximum), texture, fall speed, speed of storm translation, and strength of the accompanying wind.

An indication of equivalent hail kinetic energy ranges (in joules per square meter) has now been added to the first six increments on the scale, and this may be derived from radar reflectivity or from hail pads. The International Hailstorm Intensity Scale recognizes that hail size alone is insufficient to accurately categorize the intensity and damage potential of a hailstorm, especially towards the lower end of the scale. For example, without additional information, an event in which hail of up to walnut size is reported (hail size code 3: hail diameter of 21-30 mm) would be graded as a hailstorm with a minimum intensity of H2-H3. Additional information, such as the ground wind speed or the nature of the damage the hail caused, would help to clarify the intensity of the event. For instance, a fall of walnut-sized hail with little or no wind may scar fruit and sever the stems of crops but would not break vertical glass and so would be ranked H2-H3. However, if accompanied by strong winds, the same hail may smash many windows in a house and dent the bodywork of a car, and so be graded an intensity as high as H5.

However, evidence indicates maximum hailstone size is the most important parameter relating to structural damage, especially towards the more severe end of the scale. It must be noted that hailstone shapes are also an important feature, especially as the "effective" diameter of non-spheroidal specimens should ideally be an average of the coordinates. Spiked or jagged hail can also increase some aspects of damage. Below is the TORRO Hailstorm Intensity Scale (H0 to H10) in relation to typical damage and hail size codes.

TORRO Hailstorm Intensity Scale				
Size Code	Intensity Category	Typical Hail Diameter (mm)*	Probable Kinetic Energy, J-m ²	Typical Damage Impacts
H0	Hard Hail	5	0-20	No damage
H1	Potentially Damaging	5- 15	>20	Slight general damage to plants, crops
H2	Significant	10- 20	>100	Significant damage to fruit, crops, vegetation
H3	Severe	20- 30	>300	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	25- 40	>500	Widespread glass damage, vehicle bodywork damage
H5	Destructive	30- 50	>800	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	40- 60		Bodywork of grounded aircraft dented, brick walls pitted
H7	Destructive	50- 75		Severe roof damage, risk of serious injuries
H8	Destructive	60- 90		Severe damage to aircraft bodywork
H9	Super Hailstorms	75- 100		Extensive structural damage, risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	>100		Extensive structural damage, risk of severe or even fatal injuries to persons caught in the open

* Approximate range (typical maximum size in bold), since other factors (e.g. number and density of hailstones, hail fall speed, and surface wind speeds) affect severity.

Wind

Straight-line winds are often responsible for the wind damage associated with a thunderstorm. Downbursts or micro-bursts are examples of damaging straight-line winds. A downburst is a small area of rapidly descending rain and rain-cooled air beneath a thunderstorm that produces a violent, localized downdraft covering 2.5 miles or less. Wind speeds in some of the stronger downbursts can reach 100 to 150 miles per hour, which is similar to that of a strong tornado. The winds produced from a downburst often occur in one direction and the worst damage is usually on the forward side of the downburst.

The following Beaufort Wind Chart shows the description and scale used to classify the wind intensity in a thunderstorm. The scale is now rarely used by professional meteorologists, having been largely replaced by more objective methods of determining wind speeds—such as using anemometers, tracking wind echoes with Doppler radar, and monitoring the deflection of rising weather balloons and radiosondes from their points of release. Nevertheless, it is still useful in estimating the wind characteristics over a large area, and it may be used to estimate the wind where there are no wind instruments. The Beaufort scale also can be used to measure and describe the effects of different wind velocities on objects on land or at sea.

The Beaufort Scale of Wind (Nautical)			
Beaufort Number	Name of Wind	Wind Speed	
		knots	knots per hour
0	Calm	<1	<1
1	Light air	1–3	1–5
2	Light breeze	4–6	6–11
3	Gentle breeze	7–10	12–19
4	Moderate breeze	11–16	20–28
5	Fresh breeze	17–21	29–38
6	Strong breeze	22–27	39–49
7	Moderate gale (or near gale)	28–33	50–61
8	Fresh gale (or gale)	34–40	62–74
9	Strong gale	41–47	75–88
10	Whole gale (or storm)	48–55	89–102
11	Storm (or violent storm)	56–63	103–114
12–17	Hurricane	64 and above	117 and above

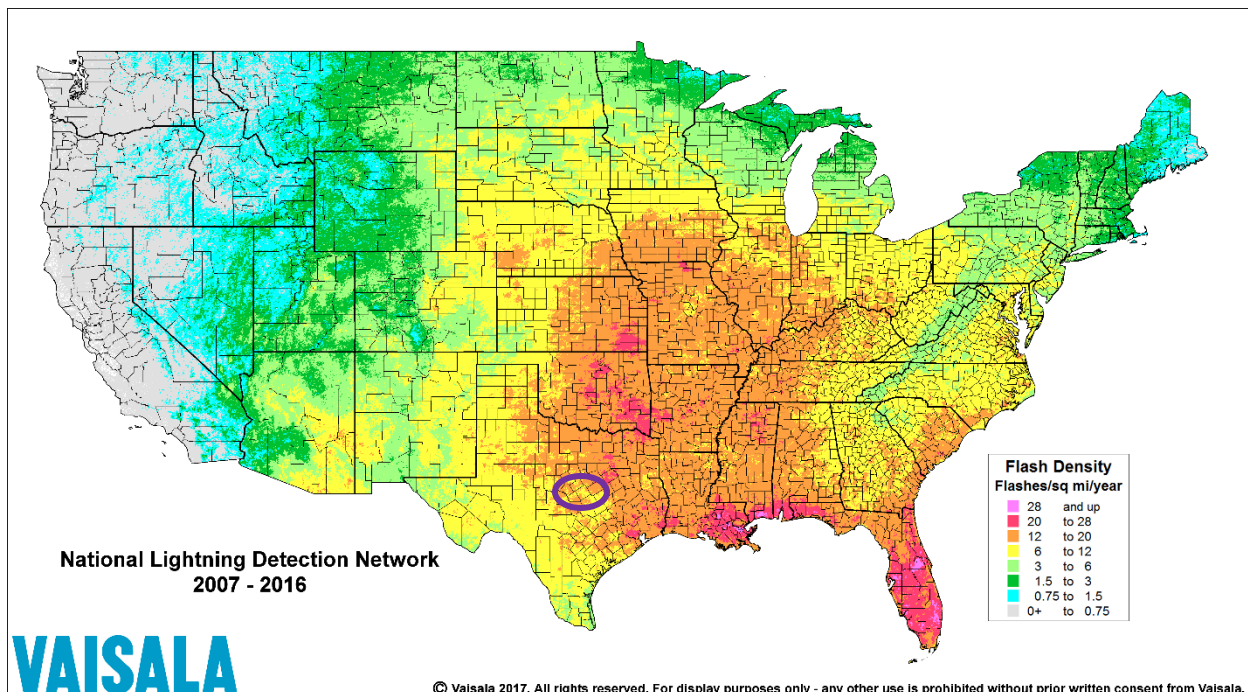
Lightning

Lightning results from the buildup and discharge of electrical energy between positively and negatively charged areas within thunderstorms. A “bolt” or brilliant flash of light is created when the buildup becomes strong enough. These bolts of lightning can be seen in cloud-to-cloud or cloud-to-ground strikes. Bolts of lightning can reach temperatures approaching 50,000°F. While lightning is mostly affiliated with thunderstorms, lightning often strikes outside of these storms, as far as 10 miles away from any rainfall. FEMA states that an average of 300 people are injured and 80 people are killed in the United States each year by lightning. Direct strikes have the power to cause significant damage to buildings, critical facilities, infrastructure, and the ignition of wildfires which can result in widespread damages to property and persons. Lightning is the most significant natural contributor to fires affecting the built environment.









The lightning activity level (LAL) is a common parameter that is part of fire weather forecasts nationwide. LAL is a measure of the amount of lightning activity using values 1 to 6 where:

LAL	Cloud and Storm Development	Lightning Strikes Per 15 Minutes
1	No thunderstorms	-
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	

According to the following map from the National Lightning Detection Network, jurisdictions in Erath County experience a flash density of 12-20 flashes per square mile, per year.



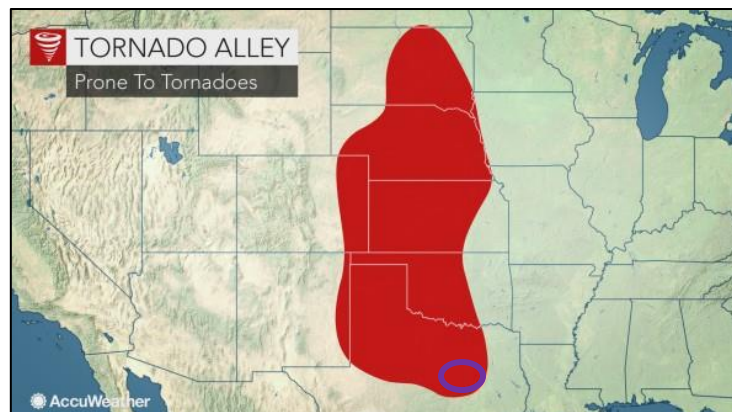
The National Weather Service uses the following Storm Prediction Center (SPC) activity levels to represent severe weather outlooks.

Understanding Severe Thunderstorm Risk Categories					
THUNDERSTORMS (no label)	1 - MARGINAL (MRGL)	2 - SLIGHT (SLGT)	3 - ENHANCED (ENH)	4 - MODERATE (MDT)	5 - HIGH (HIGH)
No severe* thunderstorms expected	Isolated severe thunderstorms possible	Scattered severe storms possible	Numerous severe storms possible	Widespread severe storms likely	Widespread severe storms expected
Lightning/flooding threats exist with <u>all</u> thunderstorms	Limited in duration and/or coverage and/or intensity	Short-lived and/or not widespread, isolated intense storms possible	More persistent and/or widespread, a few intense	Long-lived, widespread and intense	Long-lived, very widespread and particularly intense
					
<small>* NWS defines a severe thunderstorm as measured wind gusts to at least 58 mph, and/or hail to at least one inch in diameter, and/or a tornado. All thunderstorm categories imply lightning and the potential for flooding. Categories are also tied to the probability of a severe weather event within 25 miles of your location.</small>					
		National Weather Service www.spc.noaa.gov			

3.3.7 Tornadoes

A tornado is a violently rotating column of air that comes in contact with the ground. A tornado can either be suspended from, or occur underneath, a cumuliform cloud. It is often, but not always, visible as a condensation funnel.

Residents in Erath County are no strangers to tornadic events, as this area of Texas is a part of “Tornado Alley.” Tornado Alley is an area of the U.S. where there is a high potential for tornado development. This area encompasses much of northern Texas northward through Oklahoma, Kansas, Nebraska and parts of New Mexico, South Dakota, Iowa, and eastern Colorado, as seen in this picture.



The Enhanced Fujita Scale, or EF Scale, is the scale for rating the strength of tornadoes during the observed time period via the damage they cause. Six categories from EF0 to EF5 represent increasing degrees of damage. The scale takes into account how most structures are designed and is thought to be an accurate representation of the surface wind speeds in the most violent tornadoes.

Enhanced Fujita Scale		
Enhanced Fujita Category	Wind Speed in Miles Per Hour (MPH)	Potential Damage
EF0	65-85	Light damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF1	86-110	Moderate damage. Roofs severely stripped; manufactured homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111-135	Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; manufactured homes completely destroyed; large trees snapped or uprooted; light object become projectiles; cars lifted off ground.
EF3	136-165	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	166-200	Devastating damage. Well-constructed houses and whole frame houses completely leveled; cars thrown, and small projectiles generated.
EF5	>200	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized projectiles fly through the air in excess of 300 feet.

3.3.8 Wildfire

Wildfire, or wildland fire, is any fire occurring on grassland, forest, or prairie, regardless of ignition source, damages, or benefits. Wildfires are fueled almost exclusively by natural vegetation. Interface or intermix fires are urban/wildland fires in which vegetation and the built environment provide fuel.

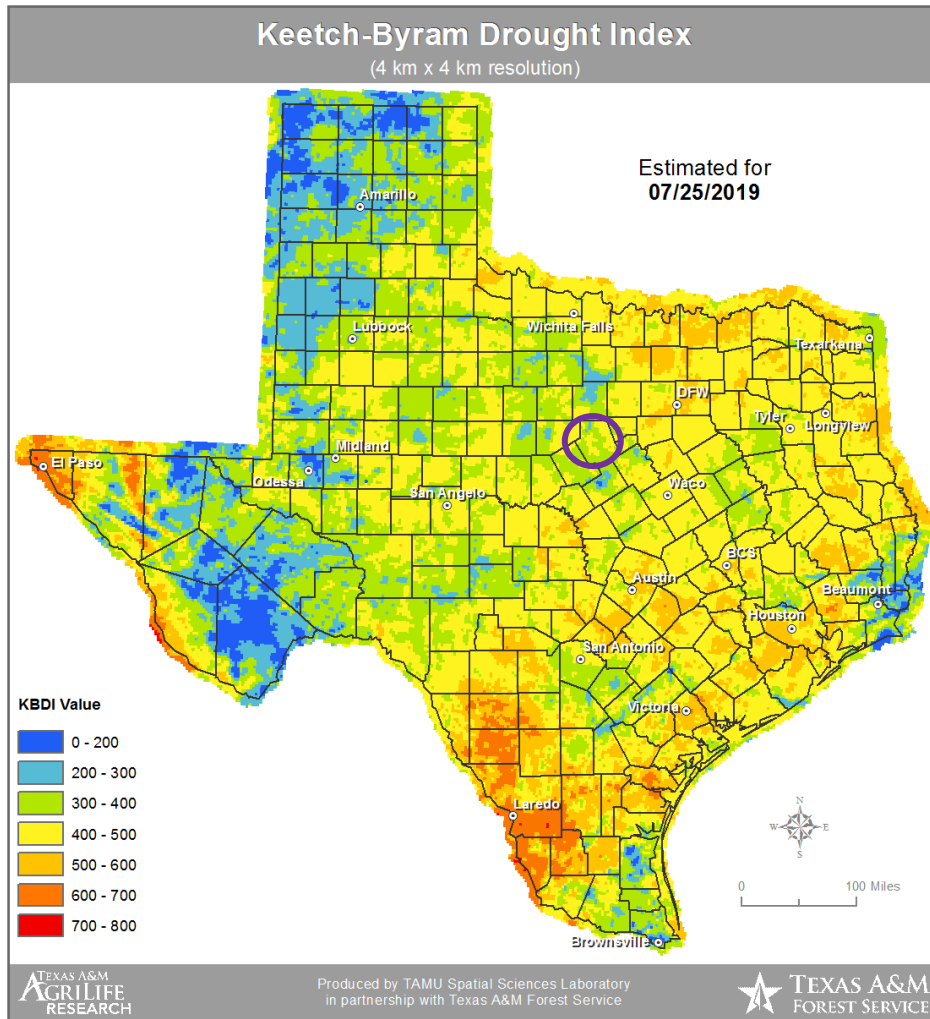
Texas A&M Forest Service (TFS) uses Keetch-Byram Drought Index (KBDI) for determination of drought conditions within the State of Texas. The KBDI is based on a daily water balance, where a drought factor is balanced with precipitation and soil moisture (assumed to have a maximum storage capacity of 8-inches) and is expressed in hundredths of an inch of soil moisture depletion.

The KBDI attempts to measure the amount of precipitation necessary to return the soil to full field capacity. It is a closed system ranging from 0 to 800, where 0 represents a saturated soil, and 800 an absolutely dry soil. At any point along the scale, the KBDI value indicates the amount of precipitation it would take to bring the moisture level back to zero, or saturation.

KBDI was developed to correlate the effects of drought on wildfire potential. This relationship is reflected in the following table:

Index Value (inches)	Color Label	Implications
0 – 200	Blue	Soil moisture and large class fuel moistures are high and do not contribute much to fire intensity. Typical of early spring following winter precipitation.
200 – 400	Blue -> Green	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	Yellow -> Orange	Lower litter and duff layers contribute to fire intensity and will burn actively. Wildfire intensity begins to increase significantly. Larger fuels could burn or smoulder for several days. This is often seen in late summer and early fall.
600 – 800	Reds	Often associated with more severe drought with increased wildfire occurrence. Intense, deep-burning fires with extreme intensities can be expected. Live fuels can also be expected to burn actively at these levels.

Below is an example of the KBDI in Texas:



For the purposes of this hazard analysis, wildfires are assessed under what is known as the wildland-urban interface (WUI). The WUI is an area of development that is susceptible to wildfires due to the amount of structures located in an area with vegetation that can act as fuel for a wildfire. The WUI creates an environment in which fire can move readily between structural and vegetation fuels. The expansion of these areas has increased the likelihood that wildfires will threaten structures and people.

Prioritized Fuel Reduction and Treatment of Structural Ignitability

The following chart shows the vegetation, and thus the amount of fuel sources, in Erath County. Grassland is the majority of vegetation in the county and can be used for grazing.

	Class	Description	Acres	Percent
	Open Water	All areas of open water, generally with < 25% cover of vegetation or soil	2,904	0.4 %

	Class	Description	Acres	Percent
	Developed Open Space	Impervious surfaces account for < 20% of total cover (i.e. golf courses, parks, etc...)	12,211	1.8 %
	Developed Low Intensity	Impervious surfaces account for 20-49% of total cover	16,712	2.4 %
	Developed Medium Intensity	Impervious surfaces account for 50-79% of total cover	868	0.1 %
	Developed High Intensity	Impervious surfaces account for 80-100% of total cover	494	0.1 %
	Barren Land (Rock/Sand/Clay)	Vegetation generally accounts for <15% of total cover	110	0.0 %
	Cultivated Crops	Areas used for the production of annual crops, includes land being actively tilled	27,764	4.0 %
	Pasture/Hay	Areas of grasses and/or legumes planted for livestock grazing or hay production	37,343	5.4 %
	Grassland/Herbaceous	Areas dominated (> 80%) by grammanoid or herbaceous vegetation, can be grazed	292,020	42.2 %
	Marsh	Low wet areas dominated (>80%) by herbaceous vegetation	0	0.0 %
	Shrub/Scrub	Areas dominated by shrubs/trees < 5 meters tall, shrub canopy > than 20% of total vegetation	125,521	18.1 %
	Floodplain Forest	> 20% tree cover, the soil is periodically covered or saturated with water	7,464	1.1 %
	Deciduous Forest	> 20% tree cover, >75% of tree species shed leaves in response to seasonal change	58,091	8.4 %
	Live Oak Forest	> 20% tree cover, live oak species represent >75% of the total tree cover	9,930	1.4 %
	Live Oak/Deciduous Forest	> 20% tree cover, neither live oak or deciduous species represent >75% of the total tree cover	0	0.0 %
	Juniper or Juniper/Live Oak Forest	> 20% tree cover, juniper or juniper/live oak species represent > 75% of the total tree cover	42,228	6.1 %
	Juniper/Deciduous Forest	> 20% tree cover, neither juniper or deciduous species represent > 75% of the total tree cover	58,395	8.4 %
	Pinyon/Juniper Forest	> 20% tree cover, pinyon or juniper species represent > 75% of the total tree cover	0	0.0 %
	Eastern Redcedar Forest	> 20% tree cover, eastern redcedar represents > 75% of the total tree cover	0	0.0 %
	Eastern Redcedar/Deciduous Forest	> 20% tree cover, neither eastern redcedar or deciduous species represent > 75% of the total tree cover	0	0.0 %
	Pine Forest	> 20% tree cover, pine species represent > 75% of the total tree cover	0	0.0 %
	Pine Regeneration	Areas of pine forest in an early successional or transitional stage	0	0.0 %
	Pine/Deciduous Forest	> 20% tree cover, neither pine or deciduous species represent > 75% of the total tree cover	0	0.0 %
	Pine/Deciduous Regeneration	Areas of pine or pine/deciduous forest in an early successional or transitional stage	0	0.0 %
	Total		692,055	100.0 %

Source: Texas Wildfire Risk Assessment Portal Professional Viewer.

Common practices to minimize the spread of wildfire are fuel breaks and fire breaks. A **fuel break** is the thinning of vegetation, or fuels, over a specific area of land. They are most commonly used to surround a

community and slow the spread of a wildfire. By decreasing the amount of vegetation that the fire has to travel through, the risk of extreme fire behavior greatly depreciates.

Types of fuel breaks include:

- **Mechanical Treatments**- A mechanical treatment removes fuels by cutting shrubs, small trees and ladder fuels that make up the understory of a forested area. Materials are either taken from the site or chipped into smaller pieces. Fuels are selected for removal based on how they would contribute to a wildfire. For example, a thick patch of cedar could readily ignite and release significant heat and embers. This fuel type contributes to the rapid spread of a wildfire and would need to be removed.

The objective of mechanical treatment is to reduce the intensity of wildfire. If there is less fuel to burn the fire stays low to the ground giving firefighters a safer condition in which to work.

- **Mulching**- A mulching operation is intended to break fuels into smaller pieces and spread them within the fuel break. While the smaller pieces will still carry fire, they will significantly reduce the intensity of it. The goal is to reduce ladder fuels like tall brush that could carry a ground fire into the top of a tree.

Mulching equipment is classified as either traditional mowers or mulchers that grind the material. Heavy duty mowers are useful when fuels are small enough to be pushed over. However, for sites with an established woody mid-story, or ladder fuels, other equipment may be needed.

- **Herbicide Treatment**- Herbicides are used to control invasive species of plants that will “take over” an area. Invasive plant species can also be reduced with mechanical thinning.

The effectiveness of herbicide treatments depends on existing vegetation, topography, and other local restrictions. Thick underbrush may require mechanical treatments prior to the use of herbicides.

- **Grazing**- Removing fuels by grazing relies on the consumption of plants by animals. Various types of livestock are used in this way across the state, including Erath County.
- **Prescribed Burning**- Prescribed or controlled, burning is the most commonly used tool for managing hazardous fuel buildups because of its relatively low cost per acre. Prescribed fire improves natural habitats and reduces heavy fuels. It is important to use a certified prescribe burn manager to improve fire safety and reduce smoke management issues.

Fuel breaks are most effective when placed along a natural fire break like a road. Choosing a site along a road also allows easy access for equipment. Regular maintenance of breaks increases their effectiveness in preventing wildfires. To maintain a fuel break, the use of herbicides as a follow up treatment to mulching will help reduce the amount of weed sprouts. Grazing is also an option to maintain a fuel break.

When creating a fuel break, these tips should be used:

- Follow a natural fire break or contour lines.
- Prune large trees to 10 feet from ground.
- Remove ladder fuels such as tall brush and small trees.
- Thin trees to create a crown spacing of 25 to 30 feet.
- Break up thick areas of brush.
- Maintain a minimum width of 60 feet on flat land and 100 feet on slopes.

A **fire break** is a break in vegetation. In some cases, it may be a gravel road, a river, or a clearing made by a bulldozer. A 'green' fire break uses grasses with high moisture content, such as winter rye or winter wheat to provide a break in the continuity of the fuel. If wide enough, a fire break will stop the spread of direct flame. However, embers can still be lofted into the air and travel across the line.

Considering the various types of fuel and fire breaks, the participating jurisdictions who have identified wildfires as a threat have listed wildfire mitigation actions in Chapter 4, along with actions for all the other identified hazards.

3.3.9 Winter Storms

Winter storms originate as mid-latitude depressions or cyclonic weather systems, sometimes following the path of the jet stream. A winter storm or blizzard combines heavy snowfall, high winds, extreme cold, and ice storms. Many winter depressions give rise to exceptionally heavy rain and widespread flooding and conditions worsen if the precipitation falls in the form of snow. The winter storm season varies widely, depending on latitude, altitude, and proximity to moderating influences. The time period of most winter weather is expected to be during the winter season, between November and March. Winter storms affect the entire planning area equally.

During periods of extreme cold and freezing temperatures, water pipes can freeze and crack, and ice can build up on power lines, causing them to break under the weight or causing tree limbs to fall on the lines. These events can disrupt electric service for long periods of time.

An economic impact may occur due to increased consumption of heating fuel, which can lead to energy shortages and higher prices. Schools often close when severe winter weather is forecasted, and it becomes a logistical burden for parents who then have to miss work or find alternative childcare. House fires and resulting deaths tend to occur more frequently from increased and improper use of alternate heating sources. Fires during winter storms also present a greater danger because water supplies may freeze and impede firefighting efforts.

The following Sperry-Piltz Ice Accumulation Index was used to determine the extent of winter conditions:

Weather Conditions and SPIA Index Levels at a Glance:

Ice and Wind: Radial Ice in Inches; Wind in Miles per Hour.	< 15 mph	15-25 mph	25-35 mph	> = 35 mph
0.10 – 0.25 inches	0	1	2	3
0.25 – 0.50 inches	1	2	3	4
0.50 – 0.75 inches	2	3	4	5
0.75 – 1.00 inches	3	4	5	5
1.00 – 1.50 inches	4	5	5	5
> 1.50 inches	5	5	5	5

3.4 Vulnerabilities and Changes in Development since 2015 HazMAP

Vulnerabilities can be social, environmental, economic, or political in nature. These vulnerabilities in turn have various impacts.

We know that, by definition, disasters can cause death and injury. We also know that housing and schools may be destroyed. These particular losses may be considered to be social impacts, as they affect the ability of individuals and families to function.

With regard to negative environmental impacts, if a community contains important ecological sites (e.g., the site of a unique flora or fauna habitat), then these areas may be extremely vulnerable to almost any sort of disaster.

There is monetary loss, or negative economic impact, whenever buildings, non-structural property, or infrastructure is damaged or destroyed. These losses can also result in loss of jobs, loss of economic stability, and loss of services (e.g., power). The more vulnerable the community is to these types of losses, the greater the economic vulnerability to a disaster.

The ability of the community to influence policy makers to reduce vulnerabilities is critical. A disaster entails political impacts. After a disaster has struck, a community often turns to its politicians when looking for guidance. Vulnerabilities may be considered in terms of the individual, the location, the capacity to respond, and the time of day, week, or year.

According to FEMA, the definition of vulnerability is “the susceptibility of people, property, industry, resources, ecosystems, or historic buildings and artifacts to the negative impact of a disaster.” The Erath

County Hazard Mitigation Planning Team (HMPT) conducted a risk assessment to determine vulnerabilities in their jurisdictions. The following information is an overview of vulnerabilities within Erath County, including data about critical facilities/infrastructure, historic buildings, lakes, and natural environment.

Overall, the vulnerability level and priorities of the participants have remained the same since the last mitigation plan.

3.4.1 Critical Facilities and Infrastructure

Critical facilities and infrastructure provide services and functions essential to a community, especially during and after a disaster. For a critical facility to function, building systems and equipment must remain operational. Furthermore, it must be supplied with essential utilities (typically power, water, waste disposal, and communications, but occasionally natural gas and steam). An inventory of critical facilities in each participating jurisdiction is located in the Appendix A, though a list of examples is provided below.

Critical Facility Examples

- Ambulance Services (Private)
- Banks
- Detention Centers- federal
- Detention Centers- county
- Detention Centers- local
- Fire Stations
- Fueling Stations
- Government Offices-federal
- Government Offices-county
- Government Offices-local
- Grocery Stores
- Historical Sites
- Hospitals
- Landfills
- Major Employers
- Medical Clinics
- Pharmacies
- Physicians
- Police Stations
- Radio Stations
- Research Labs/Facilities
- Sheriff's Office
- Veterinarian Offices
- Water Towers

Vulnerable Facility Examples

- Amusement Parks
- Apartment Complexes
- Childcare Facilities
- Churches
- Hotels/Motels
- Mobile Home/RV Parks
- Nursing Homes
- Properties Within the 100-year Floodplain
- Recreation Centers
- Retirement Communities
- Schools (Elementary/Middle School/High School)
- Sporting Arenas
- Colleges
- Montessori's/Nursery Schools/Kindergartens

This hazard mitigation action plan (HazMAP) provides enough information regarding critical facilities to enable the jurisdiction to identify and prioritize appropriate mitigation actions; however, some information may be deemed highly sensitive and should not be made available to the public. Information jurisdictions consider sensitive should be treated as an addendum to this mitigation plan so that it is still a part of the plan, but access can be controlled.

According to the Department of Homeland Security, there are 16 critical infrastructure sectors whose assets, systems, and networks, whether physical or virtual, are considered so vital to the United States that their incapacitation or destruction would have a debilitating effect on security, national economic security, national public health or safety, or any combination thereof. The following list identifies the 16 critical infrastructure sectors.

Critical Infrastructure Sectors

- Chemical Sector
- Commercial Facilities Sector
- Communication Sector
- Critical Manufacturing Sector
- Dams Sector
- Defense Industrial Base Sector
- Emergency Services Sector
- Energy Sector
- Financial Services Sector
- Food and Agriculture Sector
- Government Facilities Sector
- Healthcare and Public Health Sector
- Information Technology Sector
- Nuclear Reactors, Materials, and Waste Sector
- Transportation Sector
- Water and Wastewater Systems Sector

The age of this infrastructure ties into its level of vulnerability. The older the infrastructure, the more likely it is to fail due to the impacting hazards. Collapsed bridges, unsafe power grids, interrupted water supply-weak infrastructure can turn natural hazards into disasters. When critical infrastructure fails, it becomes nearly impossible to aid those who lack the means of evacuating on their own. This results in rescue operations that take longer to plan and execute and pose increased risks to first responders and residents due to the lack of information on the number of affected residents or the location of those who need additional assistance. Below is a list of examples for critical infrastructure.

Critical Infrastructure Examples

- Airports
- Bridges and Overpasses
- Cell Towers
- Dams/ Levees
- Wastewater Pump & Lift Stations
- Major Roadways
- Power Plant
- Railways
- Sewer Lines
- Solar Farms
- Superfund Sites
- Utility Lines
- Wastewater Treatment Facilities
- Water Lines
- Water Treatment Facilities
- Wind Farms

The following sections go into detail about some of these critical infrastructures.

Bridges

Bridges are *immensely* important to everyday travel. Bridges allow safe passage where previously it was not possible or much more difficult. Bridges allow people go to school, seek medical help, and go to work without having to negotiate a busy road, a dangerous railway line, or a fast-flowing river. Bridges are also extremely vulnerable to the impacts of natural hazards, specially earthquakes, flooding, and winter storms.

Below is a detailed list of the historic and notable bridges within the county. Of these 33 bridges, only 17 are open to vehicular traffic. These bridges are extremely vulnerable to severe weather.

Name	Location	Status	Design	Year Built	Year Lost	Span Length (ft.)	Total Length (ft.)
<u>Armstrong Creek Bridge</u>	CR 352 over Armstrong Creek	No longer exists	Pony truss	1909	2002	15.1	61.0
<u>Barton Creek Bridge</u>	CR 114 over Barton Creek	No longer exists	Pony truss	1927	2003	79.1	92.9
<u>Barton Creek Bridge</u>	CR 117 over Barton Creek	No longer exists	Pony truss	1922	2000	68.9	167.0
<u>Barton Creek Bridge</u>	CR 119 over Barton Creek	No longer exists	Truss	1924	2004	95.1	95.1
<u>Barton Creek Bridge</u>	Old Stephenville and Gordon Road over Barton Creek	Abandoned and severely deteriorated	Cable-stayed	1890	1924	100.0	120.0
<u>Bluff Dale Suspension Bridge</u>	CR 149 (Berry's Creek Road) over Puluxy River	Open to pedestrians only	Cable-stayed	1890	--	201.1	268.1
<u>Branch Armstrong Creek Bridge</u>	CR 355 over Branch Armstrong Creek	Replaced by new bridge	Pony truss	ca. 1910	1996	65.0	66.9
<u>Branch Barton Creek Bridge</u>	CR 120 over Branch of Barton Creek	Replaced by new bridge	Pony truss	1938	2000	42.0	109.9
<u>Branch Daffau Creek Bridge</u>	CR 230 over Branch of Daffau Creek	No longer exists	Pony truss	ca. 1910	2000	48.9	66.9

Name	Location	Status	Design	Year Built	Year Lost	Span Length (ft.)	Total Length (ft.)
<u>Branch North Bosque River Bridge</u>	CR 266 over Branch of North Bosque River	Replaced by new bridge	Pony truss	1939	2000	59.1	90.9
<u>Branch North Paluxy River Bridge</u>	CR 163 over Branch of North Paluxy River	Replaced by new bridge	Pony truss	1937	1992	40.0	66.9
<u>Branch of North Bosque River Bridge</u>	CR 270 over Branch of North Bosque River	Open to traffic	Steel stringer	1942	--	29.9	60.0
<u>Bypassed Green Creek Bridge</u>	Old CR 270 over Green Creek	Intact but closed to all traffic	Steel stringer	1947	--	62.0	84.0
<u>Bypassed North Bosque River Bridge</u>	Old CR 270 over North Bosque River	Abandoned	Warren pony truss with alternating verticals	--	--	--	--
<u>CR 392 Bridge</u>	CR 392 over Branch of South Fork of North Bosque River	Replaced by new bridge	Pony truss	1926	2000	19.0	38.1
<u>Cow Creek Bridge</u>	CR 344 over Cow Creek	Replaced by new bridge	Pony truss	1924	1995	39.0	40.0
<u>Daffau Creek Bridge</u>	CR 218 over Daffau Creek	Open to traffic	Warren pony truss	1938	--	68.9	107.9
<u>East Fork Armstrong Creek Bridge</u>	CR 396 over East Fork Armstrong Creek	Replaced by a new bridge	Pony truss	1926	2007	48.9	49.9
<u>FWWR - North Bosque River Bridge</u>	Railroad over North Bosque River	Open to traffic	Pratt through truss	--	--	90.0	445.0
<u>Gilmore Creek Bridge</u>	CR 293 over Gilmore Creek	No longer exists	Deck truss	1910	2004	60.0	60.0
<u>Green Creek Bridge</u>	CR 270 over Green Creek	Open to traffic	Pratt through truss	1906	--	149.9	149.9

Name	Location	Status	Design	Year Built	Year Lost	Span Length (ft.)	Total Length (ft.)
<u>North Bosque River Bridge</u>	CR 246 over North Bosque River	Closed to all traffic	Pony truss	1925	--	69.9	70.9
<u>North Bosque River Bridge</u>	East Collins Street over North Bosque River	No longer exists	Pony truss	1912	2000	42.0	106.0
<u>North Bosque River Bridge</u>	Bridge over North Bosque River	No longer exists	Truss	1920	2004	74.2	74.2
<u>North Bosque River Bridge</u>	CR 270 over North Bosque River	Open to traffic	Pratt through truss	1921	--	158.1	158.1
<u>North Paluxy River Bridge</u>	CR 153 over North Paluxy River	Replaced by new bridge	Pony truss	1939	1997	79.1	89.9
<u>Ranch Road Cottonwood Creek Bridge</u>	Ranch Road over Cottonwood Creek	Open to private traffic	Pratt pony truss	--	--	--	65.0
<u>Ranch Road Green Creek Bridge</u>	Ranch Road over Green Creek	Open to private traffic	Pratt through truss	--	--	--	105.0
<u>South Fork North Bosque River Bridge</u>	CR 392 over South Fork North Bosque River	Replaced by new bridge	Pony truss	1909	1993	40.0	63.0
<u>South Fork West Bosque River Bridge</u>	CR 417 over South Fork West Bosque River	No longer exists	Pony truss	1927	2000	60.0	60.0
<u>South Paluxy River Bridge</u>	CR 159 (formerly FM 1188) over South Paluxy River	Removed but not replaced	Through truss	1921	--	100.1	166.0
<u>South Paluxy River Railroad Bridge</u>	Railroad over South Paluxy River	Open to traffic	Through truss	--	--	--	--

Name	Location	Status	Design	Year Built	Year Lost	Span Length (ft.)	Total Length (ft.)
TX6 North Bosque River Bridge	TX 6 over North Bosque River	Unknown status - appears to be intact on Google satellite view	Steel stringer	1933	--	51.8	1105.0
Abbreviations:							
CR: County Road							
FM: Farm-to-Market							
Trib: Tributary							

Source: Bridgehunter.com

The [Texas Department of Transportation](#) (TxDOT) manages 124 on-system bridges and 77 off-system bridges within the county.

On-system bridges are located on the designated state highway system, are maintained by TxDOT, and are typically funded with a combination of federal and state or state-only funds.

Off-system bridges are not part of the designated state highway system and are under the direct jurisdiction of the local government such as a county, city, other political subdivision of the state, or special district with authority to finance a highway improvement project.

Low Water Crossings on Roads

Below is a list of low water crossings in Erath County as of 2012. A low water crossing provides a bridge or overpass for vehicles to cross bodies of water when water flow is low. Under high-flow conditions, water runs over the roadway and impedes vehicular traffic. Texas leads the nation in flash flood deaths, and most are due to people crossing these low areas in times of flooding.

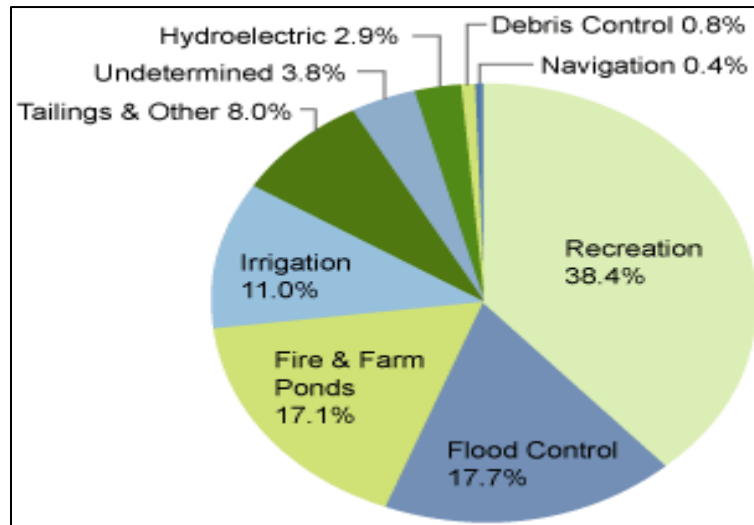
Road	Flooding Source	Low Water Crossing Type	Owner
Unnamed City Park Road	North Bosque River	Vented Ford	City of Stephenville
Unnamed Road	North Bosque River	Vented Ford	City of Stephenville
Definitions			
Low Water Crossing Types Defined:			
<p>Vented fords have a driving surface elevated some distance above the streambed with culverts (vents) that enable low flows to pass beneath the roadbed. The vents can be one or more pipes, box culverts, or open-bottom arches. In streams carrying large amounts of debris, the driving surface over the vent may be removable, permitting debris to be cleared after a large flow event.</p>			

Source: [Texas Low Water Crossing Inventory 032312](#)

Dams

Dams provide a range of economic, environmental, and social benefits, including recreation, flood control, water supply, hydroelectric power, waste management, river navigation, and wildlife habitat.

The graph to the right reflects the benefits of dams in the United States.



Source: [FEMA- Benefits of Dams](#)

The following is a list of the dams in Erath County provided by the United States Army Corps of Engineers. Those without a city name can be presumed to be located in the unincorporated Erath County. The list reflects the most current 2018 National Inventory of Dams (NID) database. State and federal dam regulators provided their data from May to November 2018 for inclusion in the 2018 database.

Please contact the respective state or federal regulatory authority for the most up-to-date information. The NID consists of dams meeting at least one of the following criteria, though to protect the sensitivity of the dams the criteria will not be identified for each dam:

1. High hazard potential classification - loss of human life is likely if the dam fails.
2. Significant hazard potential classification - no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns.
3. Height is equal to or exceeds 25 feet and storage exceeds 15 acre-feet.
4. Height exceeds 6 feet and storage is equal to or exceeds 50 acre-feet.

	Dam Name	Jurisdiction	Owner	EAP
1	NE TRIB LEON RIVER WS SCS SITE 18 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	NR
2	NE TRIB LEON RIVER WS SCS SITE 19 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	NR
3	UPPER BOSQUE RIVER WS SCS SITE 25 DAM	HICO	ERATH COUNTY; CROSS TIMBERS SWCD	Y

	Dam Name	Jurisdiction	Owner	EAP
4	UPPER BOSQUE RIVER WS SCS SITE 27 DAM	HICO	ERATH COUNTY; CROSS TIMBERS SWCD	Y
5	HOUSE LAKE DAM		WF LONG CARE OF A HOLLOMAN	NR
6	UPPER HOUSE LAKE DAM		WF LONG CARE OF A HOLLOMAN	NR
7	EL COLINA LAKE DAM		VERNON SMITH	NR
8	LESLEY LAKE DAM		KENNETH LESLEY	NR
9	HORSESHOE LAKE DAM		RT LIETZ	NR
10	LESLEY LAKE NO 2 DAM		KENNETH LESLEY	NR
11	UPPER BOSQUE RIVER WS SCS SITE 26 DAM	HICO	ERATH COUNTY; CROSS TIMBERS SWCD	Y
12	UPPER BOSQUE RIVER WS SCS SITE 24 DAM	NONE	ERATH COUNTY; CROSS TIMBERS SWCD	N
13	UPPER BOSQUE RIVER WS SCS SITE 21 DAM	NONE	ERATH COUNTY; CROSS TIMBERS SWCD	NR
14	UPPER BOSQUE RIVER WS SCS SITE 20 DAM	NONE	ERATH COUNTY; CROSS TIMBERS SWCD	NR
15	UPPER BOSQUE RIVER WS SCS SITE 22 DAM	CLAIRETTE	ERATH COUNTY; CROSS TIMBERS SWCD	NR
16	UPPER BOSQUE RIVER WS SCS SITE 23 DAM	CLAIRETTE	ERATH COUNTY; CROSS TIMBERS SWCD	NR
17	UPPER BOSQUE RIVER WS SCS SITE 19 DAM	NONE	ERATH COUNTY; CROSS TIMBERS SWCD	NR
18	GREEN CREEK WS SCS SITE 12 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	NR
19	GREEN CREEK WS SCS SITE 13 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	NR
20	GREEN CREEK WS SCS SITE 10 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	NR

	Dam Name	Jurisdiction	Owner	EAP
21	UPPER BOSQUE RIVER WS SCS SITE 18 DAM	NONE	ERATH COUNTY; CROSS TIMBERS SWCD	NR
22	UPPER BOSQUE RIVER WS SCS SITE 17 DAM	NONE	ERATH COUNTY; CROSS TIMBERS SWCD	N
23	UPPER BOSQUE RIVER WS SCS SITE 15 DAM	NONE	ERATH COUNTY; CROSS TIMBERS SWCD	N
24	UPPER BOSQUE RIVER WS SCS SITE 7 DAM	STEPHENVILLE	ERATH COUNTY; CROSS TIMBERS SWCD	N
25	KYLE DAM		CHARLES S EVERETT TRUSTEE	NR
26	PITTMAN LAKE DAM		LE PITTMAN	NR
27	GROSS LAKE DAM		WILL C MILLER III TRUSTEE	NR
28	HOPSON DAM NO 1		CAROLUS VOLLEMAN; ENGELINE VOLLEMAN	NR
29	GREEN CREEK WS SCS SITE 6 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	N
30	GREEN CREEK WS SCS SITE 7 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	N
31	GREEN CREEK WS SCS SITE 8 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	NR
32	GREEN CREEK WS SCS SITE 9 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	N
33	GREEN CREEK WS SCS SITE 11 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	NR
34	NE TRIB LEON RIVER WS SCS SITE 13 DAM	DUBLIN	UPPER LEON SWCD; ERATH COUNTY	N
35	NE TRIB LEON RIVER WS SCS SITE 14 DAM	DUBLIN	UPPER LEON SWCD; ERATH COUNTY	N
36	NE TRIB LEON RIVER WS SCS SITE 15 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	N
37	NE TRIB LEON RIVER WS SCS SITE 16-1 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	NR

	Dam Name	Jurisdiction	Owner	EAP
38	NE TRIB LEON RIVER WS SCS SITE 16-2 DAM		UPPER LEON SWCD; ERATH COUNTY	NR
39	NE TRIB LEON RIVER WS SCS SITE 17 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	NR
40	NE TRIB LEON RIVER WS SCS SITE 25 DAM	PROCTOR	UPPER LEON SWCD; ERATH COUNTY	N
41	NE TRIB LEON RIVER WS SCS SITE 12 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	NR
42	NE TRIB LEON RIVER WS SCS SITE 4 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	NR
43	NE TRIB LEON RIVER WS SCS SITE 5 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	N
44	NE TRIB LEON RIVER WS SCS SITE 6 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	NR
45	NE TRIB LEON RIVER WS SCS SITE 7 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	NR
46	NE TRIB LEON RIVER WS SCS SITE 8 DAM	HIGHLAND	UPPER LEON SWCD; ERATH COUNTY	N
47	NE TRIB LEON RIVER WS SCS SITE 9 DAM	HIGHLAND	UPPER LEON SWCD; ERATH COUNTY	N
48	NE TRIB LEON RIVER WS SCS SITE 10 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	NR
49	NE TRIB LEON RIVER WS SCS SITE 11 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	NR
50	GREEN CREEK WS SCS SITE 1 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	N
51	GREEN CREEK WS SCS SITE 2 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	N
52	GREEN CREEK WS SCS SITE 3 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	N

	Dam Name	Jurisdiction	Owner	EAP
53	GREEN CREEK WS SCS SITE 4 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	N
54	GREEN CREEK WS SCS SITE 5 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	N
55	UPPER BOSQUE RIVER WS SCS SITE 10 DAM	NONE	ERATH COUNTY; CROSS TIMBERS SWCD	NR
56	UPPER BOSQUE RIVER WS SCS SITE 11 DAM	NONE	ERATH COUNTY; CROSS TIMBERS SWCD	NR
57	UPPER BOSQUE RIVER WS SCS SITE 12 DAM	STEPHENVILLE	ERATH COUNTY; CROSS TIMBERS SWCD	N
58	UPPER BOSQUE RIVER WS SCS SITE 13 DAM	STEPHENVILLE	ERATH COUNTY; CROSS TIMBERS SWCD	N
59	UPPER BOSQUE RIVER WS SCS SITE 14 DAM	STEPHENVILLE	ERATH COUNTY; CROSS TIMBERS SWCD	N
60	UPPER BOSQUE RIVER WS SCS SITE 1 DAM	NONE	ERATH COUNTY; CROSS TIMBERS SWCD	NR
61	UPPER BOSQUE RIVER WS SCS SITE 2 DAM	NONE	ERATH COUNTY; CROSS TIMBERS SWCD	N
62	UPPER BOSQUE RIVER WS SCS SITE 3 DAM	NONE	ERATH COUNTY; CROSS TIMBERS SWCD	N
63	UPPER BOSQUE RIVER WS SCS SITE 4 DAM	NONE	ERATH COUNTY; CROSS TIMBERS SWCD	N
64	UPPER BOSQUE RIVER WS SCS SITE 8 DAM	NONE	ERATH COUNTY; CROSS TIMBERS SWCD	NR
65	UPPER BOSQUE RIVER WS SCS SITE 9 DAM	STEPHENVILLE	ERATH COUNTY; CROSS TIMBERS SWCD	N
66	NE TRIB LEON RIVER WS SCS SITE 1 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	N
67	NE TRIB LEON RIVER WS SCS SITE 2 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	NR

	Dam Name	Jurisdiction	Owner	EAP
68	NE TRIB LEON RIVER WS SCS SITE 3 DAM	NONE	UPPER LEON SWCD; ERATH COUNTY	NR
69	STEPHENVILLE COUNTRY CLUB LAKE DAM		JOHN COLLIER	NR
70	UPPER BOSQUE RIVER WS SCS SITE 5 DAM	NONE	ERATH COUNTY; CROSS TIMBERS SWCD	N
71	UPPER BOSQUE RIVER WS SCS SITE 6 DAM	STEPHENVILLE	ERATH COUNTY; CROSS TIMBERS SWCD	N
72	RL ANDERSON DAM	NONE	ETHRIDGE JA AND CALHOUN LH	NR
73	BAILEYS LAKE DAM		H HOWARD	NR
74	THURBER LAKE DAM	MINGUS	QUAIL VALLEY ASSOCIATES LLC	Y
75	HOPSON DAM NO 2		CAROLUS VOLLEMAN; ENGELINE VOLLEMAN	NR
76	J AND J BEYERS DAIRY DAM NO 2		JG BEYER DBA J AND J BEYER DAIRY	NR
77	MT PLEASANT DAIRY HOLDING POND DAM	NONE	JG BEYER DBA J AND J BEYER DAIRY	NR
78	PALUXY RIVER WS SCS SITE 6 DAM	NONE	CROSS TIMBERS SWCD; ERATH COUNTY	NR
79	PALUXY RIVER WS SCS SITE 14 DAM	NONE	CROSS TIMBERS SWCD; ERATH COUNTY	NR
80	PALUXY RIVER WS SCS SITE 20 DAM	NONE	CROSS TIMBERS SWCD; ERATH COUNTY	N
81	PALUXY RIVER WS SCS SITE 4 DAM	MORGAN HILL	CROSS TIMBERS SWCD; ERATH COUNTY	NR
82	PALUXY RIVER WS SCS SITE 11 DAM	BLUFF DALE	CROSS TIMBERS SWCD; ERATH COUNTY	N
83	THURBER LAKE NO 3 DAM		CARROLL BENNETT	NR
84	THURBER LAKE NO 2 DAM	MINGUS	JOHN PORTER	NR

	Dam Name	Jurisdiction	Owner	EAP
85	THURBER LAKE NO 4 DAM		CARROLL BENNETT	NR
86	THURBER LAKE NO 5 DAM		CARROLL BENNETT	NR
87	STEWART LAKE DAM		CH STEWART	NR
88	CLAPP LAKE DAM		BUDDY CLAPP	NR
89	MIZE LAKE DAM		ROGER MIZE ESTATE	NR
90	BENHAM LAKE NO 1 DAM		JIM BENHAM	NR
91	BENHAM LAKE NO 2 DAM		JIM BENHAM	NR
92	TERRELL LAKE DAM		JC TERRELL	NR
93	COLLIER LAKE DAM		COLLIER DIAMOND C RANCH	NR
94	SPINDOR LAKE DAM		JOE SPINDOR	NR
95	FOSTER LAKE NO 1 DAM		SUE FOSTER	NR
96	FOSTER LAKE NO 2 DAM		HS FOSTER ET AL	NR
97	BROOKS LAKE DAM		MARGRETT C BROOKS ESTATE OF	NR
98	HUCKABEE LAKE DAM		EJ HUCKABEE	NR
99	WARREN LAKE NO 1 DAM		CECIL WARREN	NR
100	WARREN LAKE NO 2 DAM		CECIL WARREN	NR
101	PASS LAKE DAM		RANDY PACK	NR
102	MITCHELL DAM		CHRISTINA BRONSON	NR
103	BROCK LAKE NO 1 DAM		BILL MCDAVID	NR
104	FARROW LAKE DAM		J FARROW	NR
105	BROCK LAKE NO 2 DAM		BILL MCDAVID	NR
106	PALUXY RIVER WS SCS SITE 19 DAM	NONE	CROSS TIMBERS SWCD; ERATH COUNTY	NR
107	PALUXY RIVER WS SCS SITE 21 DAM	NONE	CROSS TIMBERS SWCD; ERATH COUNTY	N

	Dam Name	Jurisdiction	Owner	EAP
108	PALUXY RIVER WS SCS SITE 2 DAM	NONE	CROSS TIMBERS SWCD; ERATH COUNTY	N
109	LAKE BEDROCK DAM		SUPER SIX INC	NR
110	RICHARDSON CREEK DAM		JAY MILLS	NR
111	CROCKETT CREEK LAKE DAM		DEBRA MILLS; JAY MILLS	NR
112	VISS DAM	DUBLIN	ERATH COUNTY DAIRY SALES; JEFF BEYERS GRAND CANYON DAIRY	Y
113	PALUXY RIVER WS SCS SITE 1 DAM	NONE	CROSS TIMBERS SWCD; ERATH COUNTY	NR
114	PALUXY RIVER WS SCS SITE 3 DAM	MORGAN MILL	CROSS TIMBERS SWCD; ERATH COUNTY	NR
115	PALUXY RIVER WS SCS SITE 5 DAM	LEWISVILLE	CROSS TIMBERS SWCD; ERATH COUNTY	NR
116	PALUXY RIVER WS SCS SITE 8 DAM	NONE	CROSS TIMBERS SWCD; ERATH COUNTY	NR
117	PALUXY RIVER WS SCS SITE 9 DAM	NONE	CROSS TIMBERS SWCD; ERATH COUNTY	NR
118	PALUKY RIVER WS SCS SITE 10 DAM	NONE	ERATH COUNTY; CROSS TIMBERS SWCD	NR
119	PALUXY RIVER WS SCS SITE 12 DAM	NONE	CROSS TIMBERS SWCD; ERATH COUNTY	NR
120	PALUXY RIVER WS SCS SITE 15 DAM	NONE	CROSS TIMBERS SWCD; ERATH COUNTY	NR
121	ANGLERS COVE DAM		MOUNTAIN LAKES RANCH POA	NR
122	BEACON LAKE DAM		MOUNTAIN LAKES RANCH POA	NR

Source: National Inventory of Dams, <https://nid-test.sec.usace.army.mil/ords/f?p=105:1>

* An Emergency Action Plan (EAP) is a formal document that identifies potential emergency conditions at a dam and specifies actions to be followed to minimize loss of life and property damage. Under the EAP category, the following acronyms are used Y (Yes), N (No), or NR (Not Required)

Environmental Protection Agency National Priorities List of Superfund Sites

Besides local critical facilities, some jurisdictions have national critical facilities that are monitored by the federal government, such as superfund sites. The Environmental Protection Agency's (EPA's) Superfund program is responsible for cleaning up some of the nation's most contaminated land and responding to environmental emergencies, oil spills, and natural disasters. To protect public health and the environment, the Superfund program focuses on making a visible and lasting difference in communities, ensuring that people can live and work in healthy, vibrant places. The [EPA National Priorities List](#) (NPL) is the list of sites of national priority among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL is intended primarily to guide the EPA in determining which sites warrant further investigation.⁵

According to the list, there are no superfund sites in Erath County.

3.4.2 Historic Buildings and Districts

Historic landmarks and districts are important to consider when evaluating vulnerabilities to hazards. What is historic, and worth saving, varies with the beholder. "Historic" applies to a building that is part of a community's tangible past. Due to the advanced of these structures, they are highly susceptible to cracking, leaning, and total destruction caused by any of the hazards.

Historic buildings and structures, artwork, monuments, family heirlooms, and historic documents are often irreplaceable, and may be lost forever in a disaster if not considered in the mitigation planning process. The loss of these resources is all the more painful because of how often residents rely on their presence after a disaster, to reinforce connections with neighbors and the larger community, and to seek comfort in the aftermath of a disaster.

According to the Texas Historic Sites Atlas, there are 100 cemeteries, 5 museums, and 97 historical markers throughout Erath County. There are also 8 national register properties and 3 courthouses on the list.⁶

The Erath County Historical Commission is responsible for keeping the county's history alive.

3.4.3 Bodies of Water

The level of local water sources has a dramatic effect on the impact of drought and flooding in the participating jurisdictions.

The following list identifies all the lakes and reservoirs in the participating jurisdictions.

Name	United States Geological Survey Topographic Map
Hopson Lake	Dublin
Soil Conservation Service Site 10 Reservoir	Dublin
Soil Conservation Service Site 11 Reservoir	Dublin

⁵ Superfund: National Priority List (NPL). United States Environmental Protection Agency. <<https://www.epa.gov/superfund/superfund-national-priorities-list-npl>>

⁶ Texas Historical Sites Atlas. 2015. Texas Historical Commission. <<https://atlas.thc.state.tx.us/>>

Name	United States Geological Survey Topographic Map
Soil Conservation Service Site 13 Reservoir	Dublin
Soil Conservation Service Site 14 Reservoir	Dublin
Soil Conservation Service Site 15 Reservoir	Dublin
Soil Conservation Service Site 16-1 Reservoir	Dublin
Soil Conservation Service Site 16-2 Reservoir	Dublin
Soil Conservation Service Site 17 Reservoir	Dublin
Soil Conservation Service Site 6 Reservoir	Dublin
Soil Conservation Service Site 7 Reservoir	Dublin
Soil Conservation Service Site 8 Reservoir	Dublin
Soil Conservation Service Site 9 Reservoir	Dublin
Kyle Lake	Stephenville
Pittman Lake	Stephenville
Soil Conservation Service Site 15 Reservoir	Stephenville
Soil Conservation Service Site 17 Reservoir	Stephenville
Soil Conservation Service Site 18 Reservoir	Stephenville
Soil Conservation Service Site 7 Reservoir	Stephenville

Source: [TX HomeTownLocator](#)

3.4.4 Natural Environment and Federally Protected Species

The Texas Parks and Wildlife Department established a [list](#) of rare, threatened, and endangered species within Erath County. All species on the county list are tracked in the Texas Natural Diversity Database (TXNDD). Species include birds, fishes, mammals, mollusks, and reptiles.⁷ The following species are listed as rare species living in Erath County:

- Amphibians- Woodhouse's toad
- Amphibians- Strecker's chorus frog
- Birds- white-faced ibis
- Birds- bald eagle
- Birds- black rail
- Birds- whooping crane
- Birds- mountain plover
- Birds- Franklin's gull
- Birds- interior least tern
- Birds- western burrowing owl
- Birds- black-capped vireo
- Birds- golden-cheeked warbler
- Mammals- southeastern myotis bat
- Mammals- tricolored bat
- Mammals- big brown bat
- Mammals- eastern red bat
- Mammals- hoary bat
- Mammals- Mexican free-tailed bat
- Mammals- swamp rabbit
- Mammals- black-tailed prairie dog
- Mammals- woodland vole
- Mammals- long-tailed weasel
- Mammals- mink
- Mammals- American badger

⁷ Texas Parks and Wildlife Department, Wildlife Division, Diversity and Habitat Assessment Programs. TPWD County Lists of Protected Species and Species of Greatest Conservation Need. Erath County. 30 December 2016.

- Mammals- eastern spotted skunk
- Mammals- plains spotted skunk
- Mammals- western hog-nosed skunk
- Mammals- mountain lion
- Reptiles- western box turtle
- Reptiles- slender glass lizard
- Reptiles- Texas horned lizard
- Reptiles- Brazos water snake
- Reptiles- Texas garter snake
- Reptiles- massasauga
- Insects- American bumblebee
- Mollusks- Texas fawnsfoot
- Plants- Engelmann's bladderpod
- Plants- Hall's prairie clover
- Plants- prairie butterfly-weed

Currently, there are no regional plans related to the future of North Texas' natural assets of habitat, plants, animals, open space areas and corridors, tree canopy, or carbon footprint. There are studies of particular topics that have been conducted for other purposes. For example, the Environmental Impact Statement of an individual project considers the project's impact on endangered species. Also, there are studies underway on particular topics but for smaller areas within the North Texas region.⁸

Under Chapter 12.0011 of the Texas Parks and Wildlife Code, Texas Parks and Wildlife Department (TPWD) is charged with "providing recommendations that will protect fish and wildlife resources to local, state, and federal agencies that approve, permit, license, or construct developmental projects" and "providing information on fish and wildlife resources to any local, state, and federal agencies or private organizations that make decisions affecting those resources." Project types reviewed by TPWD include reservoirs, highway projects, pipelines, urban infrastructure, utility construction, renewable energy, and residential and commercial construction, as well as many others.

Each state in the U.S. has completed a Wildlife Action Plan or Comprehensive Wildlife Conservation Strategy to improve the stability and recovery of species which are in decline, already listed as threatened or endangered, and/or are representative of the diversity and health of the state's wildlife. To date, these plans have become important guides for natural resource management programs, conservation funding, partnership building, project development, and problem-solving at local and regional levels. TPWD is the steward of the Texas Conservation Action Plan, formerly called the Texas Comprehensive Wildlife Conservation Strategy 2005 - 2010 or [Texas Wildlife Action Plan](#). This revised Texas plan (approved by the U.S. Fish and Wildlife Service in 2013) is a series of 11 regionally-specific Ecoregion handbooks, a Statewide/Multi-region handbook, and this Overview document. Collectively, they are now called the Texas Conservation Action Plan.

While the Texas Conservation Action Plan is a conservation plan for species at most at risk, its primary purpose is to bring people together to realize conservation benefits, prevent species listings, and preserve our natural heritage for future generations. [Handbooks](#) contain information on Species of Greatest Conservation Need, regionally important habitats, local conservation goals and projects, regional and statewide activities, contact information for conservation partners, and maps. The activities in each

⁸ North Texas to 2030: Extending the Trends. Vision North Texas.

handbook are starting points to engage landowners, land-use planners, natural resources professionals, and the public in regional and local community-based conservation.⁹

3.4.5 Factors that Increase Vulnerability

Climate Variability

A key factor to an increase in vulnerability is climate variability, also known as climate change. According to the United States Environmental Protection Agency (EPA),

Texas's climate is changing. Most of the state has warmed between one-half and one-degree Fahrenheit (°F) in the past century. In the eastern two-thirds of the state, average annual rainfall is increasing, yet the soil is becoming drier. Rainstorms are becoming more intense, and floods are becoming more severe... In the coming decades, storms are likely to become more severe, deserts may expand, and summers are likely to become increasingly hot and dry, creating problems for agriculture and possibly human health. Our climate is changing because the earth is warming. People have increased the amount of carbon dioxide in the air by 40% since the late 1700s. Other heat-trapping greenhouse gases are also increasing. These gases have warmed the surface and lower atmosphere of our planet about one degree during the last 50 years. Evaporation increases as the atmosphere warms, which increases humidity, average rainfall, and the frequency of heavy rainstorms in many places—but contributes to drought in others...¹⁰

The following is an article from the Dallas Morning News that describes the effects of climate change specifically in North Central Texas:

The United States has just come off a record year for weather and climate disasters and, by most accounts, it's only going to get worse.

Last year hurricanes Harvey, Irma, and Maria; the wildfires and floods in California; and tornado outbreaks in the Midwest and the South delivered \$306.2 billion in damages, more than any year in history when adjusted for inflation.

Texas is particularly vulnerable to a changing climate. It has had more costly weather-related disasters than any other state, and those events will happen more often as air and ocean temperatures climb, scientists say.

"Climate change is not just about polar bears," said Katharine Hayhoe, a climate scientist at Texas Tech University with an impressive YouTube following. "It will affect North Texas profoundly."

Between 2041 and 2050, Dallas-Fort Worth may see August temperatures rise from a mean of 86 °F at the end of the 20th century to 94 °F, with extremes rising above 120, reports one study by scientists at the University of Texas at Arlington.

⁹ Texas Conservation Action Plan. Texas Parks & Wildlife.

< https://tpwd.texas.gov/huntwild/wild/wildlife_diversity/nongame/tcap/>

¹⁰ What Climate Change Means for Texas. August 2016. EPA 430-F-16-045. United States Environmental Protection Agency.< <https://archive.epa.gov/epa/sites/production/files/2016-09/documents/climate-change-tx.pdf>>

Longer droughts and more extreme rainstorms will pose a challenge for those who manage drinking water supplies, those who raise cattle, and those who oversee our roads and railways.

The changes may also have unexpected effects on people's daily lives, including jobs. Intense heat can imperil cars and airplanes, evaporate drinking water supplies, and halt outdoor labor such as farm work and construction.

Adam Smith, a scientist with the federal government's main climate agency, the National Oceanic and Atmospheric Administration, calls Texas "the disaster capital of the United States."

As Smith explains, Texas is susceptible to almost every kind of weather and climate hazard, from extreme cold to extreme heat, from severe drought and wildfires to torrential floods. Texas is also home to a booming population and critical infrastructure, including the petrochemical plants that were damaged in Hurricane Harvey.

"Texas is a hot-spot for a wide range of extreme natural events due to its geography," said Smith. "We expect many of these extremes to become more frequent and intense as time moves forward."

While uncertainty is built into climate models, scientists have a high degree of confidence in many of the changes they observe and predict.

The bigger, longer and more common an event is, the greater the accuracy with which scientists can project how climate change will impact it, said Hayhoe, a lead author of a November 2017 climate change report overseen by scientists at 13 federal agencies. Larger events have more data associated with them and can be easier to model.

Researchers are very confident that climate change will increase both average and extreme temperatures. They are also confident that climate change is likely to increase the risk of heavy precipitation in many areas and may bring stronger droughts to the south-central and southwestern parts of the U.S.

Projected impacts on smaller-scale events like tornadoes and hailstorms are less well understood.

One area of consensus is the cause of climate change. "It is extremely likely that human activities, especially emissions of greenhouse gases, are the dominant cause of the observed warming since the mid-20th century," note the authors of the Fourth National Climate Assessment, a Congressionally mandated review that scientists conduct every four years. They add that there are no convincing alternative explanations.

Below is how these changes will affect our area, the evidence behind the projections, and how confident scientists are in each of these findings.

Heat

More record-setting heat in North Texas is a virtual certainty. Already, we are living through the warmest period in the history of modern civilization, the federal report found, and that warming will accelerate.

Climate science contrarians often attack the models on which climate projections are based. Myron Ebell, who led President Donald Trump's transition team at the Environmental Protection Agency, accepts that humans are most likely responsible for warming, but he says models have exaggerated the outcome. Ebell is director of the Center for Energy and Environment at the Competitive Enterprise Institute, a libertarian advocacy group based in Washington, D.C. He acknowledges that he is not a scientist.

In fact, researchers have used models to predict global temperature changes for more than 50 years, and the models' projections have been fairly accurate over the long term. In the early 21st century, a discrepancy appeared between observed and modeled temperatures—a period dubbed the "global warming slowdown" or "hiatus."

Scientists have published scores of studies on the mismatch and tied it to several factors that contributed to lower-than-expected observed temperatures. Those factors include a series of small volcanic eruptions, the cooling effects of which scientists had underestimated, and lower than expected solar output.

Findings from those studies are helping to improve climate model simulations and helping scientists better understand why there are differences between simulations and observations in the early 21st century, said Ben Santer, a climate scientist at the Lawrence Livermore National Laboratory.

Global average temperatures increased about 1.8 degrees Fahrenheit in the last 115 years. In Dallas, they climbed from about 65 °F during the early part of the 20th century to 68 °F during the most recent decade. If nothing is done to reduce emissions of carbon dioxide and other greenhouse gases, average temperatures in the city may reach the low 70s by 2050 and surpass 75°F by the end of the century.

Earlier this year, Amir Jina and colleagues published a study in the journal *Science* that estimated economic damage from climate change in each county of the United States.

Once temperatures reach the high 90s, equal to or above body temperature, fatality rates go up.

Besides people, heat also affects roads. A 2015 study by the University of Texas at Arlington (UTA) that focused on the impact of climate change on transportation predicted "an increase in wildfires along paved highways, heat-induced stress on bridges and railroads, air-conditioning problems in public transport vehicles and heat-related accidents by failure of individual vehicles and heat-related stress."

The study concluded, "These impacts can be translated into substantial mobility and economic loss."

Drought

Along with heat will come stronger drought, which "has profound economic impacts," said Hayhoe.

The prediction that North Texas will have longer and more severe droughts is based on multiple factors, including the relationship between high temperatures and soil dryness and the presence

of more frequent and longer lasting high-pressure systems in summer that suppress rainfall and deflect storms away from our area.

Hayhoe points to Texas' 2010-2013 drought as a probable sign of things to come. Although this drought occurred naturally, as a result of a strong La Niña event that typically brings dry conditions to our area, it was exacerbated by extreme heat. That event created severe hay shortages for cattle farmers and led some ranchers to prematurely slaughter their herds or export them out of state.

"Cotton can be drought-resistant, but not cattle," said Hayhoe.

The 2015 UTA study predicts a reduction in soil moisture of 10% to 15% in all seasons by 2050, which can also lead to cracked pavement and the premature loss of roads, railways, and other infrastructure.

Heat and drought also pose a problem for drinking water supplies, which North Texas sources from surface reservoirs that will be increasingly prone to evaporation. Hayhoe says some water managers are considering pumping the reservoirs underground during exceptionally hot and dry conditions, or covering them with polymer "blankets."

The blankets are an invisible layer of organic molecules that can help reduce evaporation.

Floods

While it's not likely that annual precipitation totals will change in North Texas, rainfall patterns likely will. Hayhoe and Nielsen-Gammon both say we will likely see enhanced "feast or famine" cycles with torrential rainstorms in the spring followed by longer than usual dry periods.

These predictions carry a high degree of certainty, because climatologists have already recorded this trend playing out.

"Rainfall becoming more extreme is something we expect because we've observed this not just in North Texas but throughout the United States, and models consistently predict it will continue to happen," said Nielsen-Gammon.

Severe rainstorms, the UTA scientists predict, will have the capacity to flood highway exit and service roads in the Federal Emergency Management Agency (FEMA) 100-year floodplain.

"While the state highway system was built above flooding levels, the connector roads may be easily flooded," said Arne Winguth, a climate scientist at UTA who co-authored the report.

Tornadoes and hail

Two events climate scientists cannot reliably project are hailstorms and tornadoes. "A lot of the things we care about are too small-scale to predict with more confidence," said Nielsen-Gammon. "The historical record is not large enough for longer-term forecasts."

There is some evidence that tornadoes, like rainstorms, are becoming more concentrated on fewer days and that their season has become less predictable.

The same is true with hail. "One thing we expect to happen with a warming climate is that the average humidity in the lower atmosphere may decrease, and if that happens it's easier for hail to stay frozen," said Nielsen-Gammon. "That factor might increase hailstorms, but that's just one of many factors that do affect hail."

Economy

Jina of the University of Chicago predicted in his study that climate change would decrease Dallas County's annual income by 10% to 20% in the coming decades unless emissions are reduced. "North Texas is one of the worst-affected places in the country," he said. Much of the loss comes from higher mortality rates, soaring air-conditioning costs, and reduced labor productivity.

To track labor productivity, Jina and his colleagues examined national time-use surveys, diaries kept by thousands of volunteers across the country, and compared them with local weather data. He found that on extremely hot days, people tended to stop working about 30 minutes early.

"There's direct evidence that people concentrate less well, make more mistakes and their brain just functions less efficiently if it's too hot," he said. Heat also disrupts sleep. "The general lack of productivity leads to them saying, 'No more work today.'"

The good news is that many climate-change effects are manageable. They do require local and federal authorities to plan ahead and take action, said Smith of the National Oceanic and Atmospheric Administration.

"It is important," he said, "to address where we build, how we build and also to build protections for populations already exposed in vulnerable areas."¹¹

All participating jurisdictions are experiencing the effects of climate variability.

Population Increase and Demographics

The entire planning areas of the participating jurisdictions, including their populations, are vulnerable to the damaging effects of most of the natural hazards identified. The 2030 population projections produced by the North Central Texas Council of Governments (NCTCOG) use the year 2000 as a base year and project population and employment in five-year increments to 2030. Over the 30-year horizon, the 16-county North Texas region is anticipated to add 1.6 million households with a corresponding 4.1 million people and 2.3 million non-construction jobs. This represents an average annual population growth rate of 2.6% for these 30 years, a magnitude of growth never before experienced in the North Central Texas region. NCTCOG forecasts reflect only one set of growth assumptions. If circumstances change, real growth outcomes might be considerably different.¹²

¹¹ Climate change to bring North Texas longer droughts, heavy rains, 120-degree temps within 25 years. Kuchment, Anna. 2018, February 15. <<https://www.dallasnews.com/news/climate-change-1/2018/02/15/climate-change-to-bring-texas-longer-droughts-heavy-rains-120-temps-august-within-25-years>>

¹² North Texas to 2030: Extending the Trends. Vision North Texas.

Population growth and distribution, especially increased population density and urbanization, increases vulnerability to disasters.¹³ The elderly, very young, those without air conditioning or heating, and outdoor laborers are most at risk to the effects of extreme heat and winter storms. Residents living in a floodplain are most at risk to flooding and residents living in the Wildland-Urban Interface (WUI) are most at risk to wildfires. Those living in poverty and in homes not built using enhanced building codes are most susceptible to the damages of these hazards.

The following table reflects the **estimated** changes in participating jurisdictions’ demographics, gathered by the North Central Texas Council of Governments, since the adoption of the 2015 HazMAP. Population estimates for Erath County refers to the entire county, not just the unincorporated portion.

Jurisdiction	2012 Population Estimate	2015 Population Estimate	2018 Population Estimate
Dublin	3,700	3,770	3,790
Stephenville	18,290	19,560	22,280
Erath County	39,380	41,460	44,420

Source: North Central Texas Regional Data Center.

In the context of emergencies, vulnerable groups may include individuals with disabilities, pregnant women, children, elderly persons, prisoners, certain members of ethnic minorities, people with language barriers, and the impoverished. For these populations, emergency response failures can have catastrophic consequences, including loss of the ability to work or live independently, permanent injury, and death. Without appropriate preparation, vulnerable individuals may not be able to evacuate as instructed, reach points of distribution for medical countermeasures, understand written or verbal communications during an emergency, or find suitable housing if their residences are destroyed during a disaster.

The community profiles of the participating jurisdictions are identified in the following table. Note that the US Census did not have data for every topic for every jurisdiction. The Erath County column of numbers includes all jurisdictions (not just participating jurisdictions) and the unincorporated portion of the county.

Community Profile			
Topic	Dublin	Stephenville	Erath County
Persons under 5 years (%)	Unavailable	Unavailable	5.7%
Persons 65 years and over (%)	Unavailable	Unavailable	14%
Language other than English spoken at home (%)	Unavailable	Unavailable	18.4%
With a disability, under age 65 (%)	Unavailable	Unavailable	7.4%
Persons without health insurance, under age 65 (%)	25%	17.9%	23.4%
Persons in poverty (%)	30.2%	26.2%	15.8%
Median household income	\$41,074	\$44,204	\$47,013
Total housing units	1,499	8,032	17,696
Median housing value	\$76,500	\$116,100	\$128,300

¹³ Ben Wisner et al., *At Risk: Natural Hazards, People’s Vulnerability, and Disasters*, 2d ed. (London: Routledge, 2004).

Community Profile			
Topic	Dublin	Stephenville	Erath County
Percent of households with a broadband Internet subscription	65.6%	74.3%	72.1%

Source: US Census Bureau Quick Facts, www.census.gov.

New technologies that provide 9-1-1 and public safety officials with the ability to proactively engage the community have had a dramatic effect on mortality rates during these increasing amounts and strength of natural disasters. Identifying at risk populations and providing them with information and assistance when they most need it can make a significant difference, especially in the event of an evacuation or seeking shelter. One measure of the strength of a community's response and recovery system is its attentiveness to its most vulnerable citizens. It is a cruel fact: disasters discriminate.

Repetitive Loss Properties

Among the National Flood Insurance Policy (NFIP) policyholders are thousands whose properties have flooded multiple times. Called "repetitive loss properties," these are buildings and/or contents for which the NFIP has paid at least two claims of more than \$1,000 in any 10-year period since 1978. "Severe repetitive loss properties" are those for which the program has either made at least four payments for buildings and/or contents of more than \$5,000 or at least two building-only payments that exceeded the value of the property.

These two kinds of properties are the biggest draw on the NFIP Fund. They not only increase the NFIP's annual losses and the need for borrowing; but they drain funds needed to prepare for catastrophic events. Community leaders and residents should also be concerned with the Repetitive Loss problem because residents' lives are disrupted and may be threatened by the continual flooding.

The primary objective of identifying these properties is to eliminate or reduce the damage to property and the disruption to life caused by repeated flooding of the same properties.

The following table reflects the loss statistics for repetitive loss properties in participating jurisdictions.

Loss Statistics: from January 1, 1978 through report as of September 30, 2018					
Jurisdiction	Total Losses	Closed Losses	Open Losses	Closed Without Payment (CWOP) Losses	Total Payments
Dublin	1	1	0	0	\$1,308.10
Stephenville	10	7	0	3	\$126,035.42
Erath County Unincorporated	8	7	0	1	\$459,678.10
Total losses: All losses submitted regardless of the status.					
Closed losses: Losses that have been paid.					
Open losses: Losses that have not been paid in full.					
CWOP losses: Losses that have been closed without payment.					
Total Payments: Total amount paid on losses.					

Source: Claim Information by State, <https://bsa.nfipstat.fema.gov/reports/1040.htm#48>.

The tables below provide information about the repetitive loss and severe repetitive loss properties within the participating jurisdictions as of March 2019, as provided by the Federal Emergency Management Agency. More details about the properties are not available to the public.

Property Details									
Community Number	Mitigated?	Insured?	City	Occupancy	Flood Zone	Total Building Payment	Total Contents Payment	Losses	Total Paid
480218	No	No	Stephenville	Single Family	X	\$134,088.10	\$21,320.61	3	\$155,408.71

New Development

Unsustainable development is one of the major factors in the rising costs of natural disasters. Many mitigation design strategies and technologies serve double duty, by not only preventing or reducing disaster losses but serving the broader goal of long-term community sustainability. For example, land use regulations prohibiting development in flood-prone areas may also help preserve the natural and beneficial functions of floodplains. New development in hazard-prone areas increases the risk of damage and injury from that hazard. The following are new developments in hazard-prone areas of the participating jurisdictions.

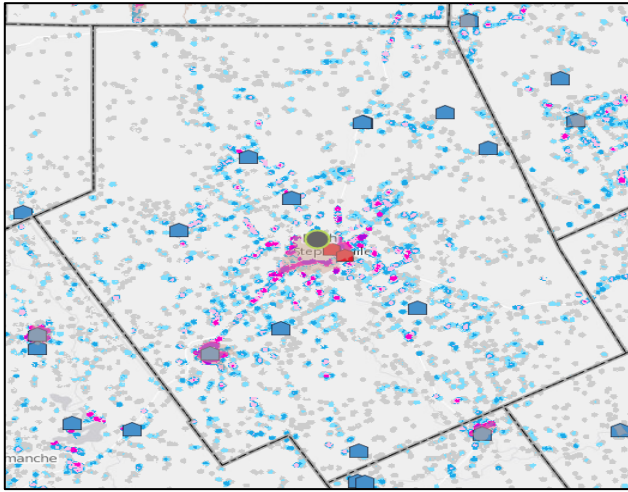
- **Dublin-** No new development.
- **Stephenville-** Building is permitted in floodplains and WUI, to include apartments, Elk Ridge, and subdivisions.
- **Erath County Unincorporated-** Three Way High School, Bluff Dale High School, a wind farm, Equibrand manufacturing facility, and Timber Creek Subdivision have been developed.

Wildland-Urban Interface

The Wildland-Urban Interface (WUI) layer of a map reflects housing density depicting where humans and their structures meet or intermix with wildland fuels. Wildfires can cause significant damage to property and threatens the lives of people who are unable to evacuate WUI areas. All improved property, critical facilities, and critical structures and infrastructure located in these wildfire-prone areas are considered vulnerable and can be exposed to this hazard.

The following map reflects the WUI areas in Erath County, with the locations of fire stations. The paid fire departments are marked in red and volunteer fire departments are marked in blue.

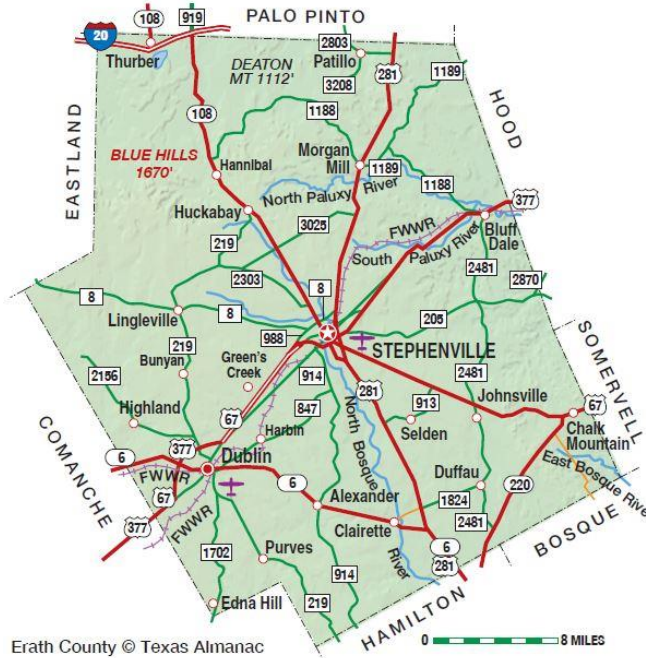
Erath County WUI Density Map



	No Data
	1-LT 1 hs/40 ac
	2-1 hs/40 to 1 hs/20 ac
	3-1 hs/20 to 1 hs/10 ac
	4-1 hs/10 to 1 hs/5 ac
	5-1 hs/5 to 1 hs/2 ac
	6-1 hs/2 to 3 hs/ac
	7-GT 3 hs/ac
	*hs- house
	*ac- acre

Source: Texas Wildfire Risk Assessment Portal Professional Viewer.

Map of Reference

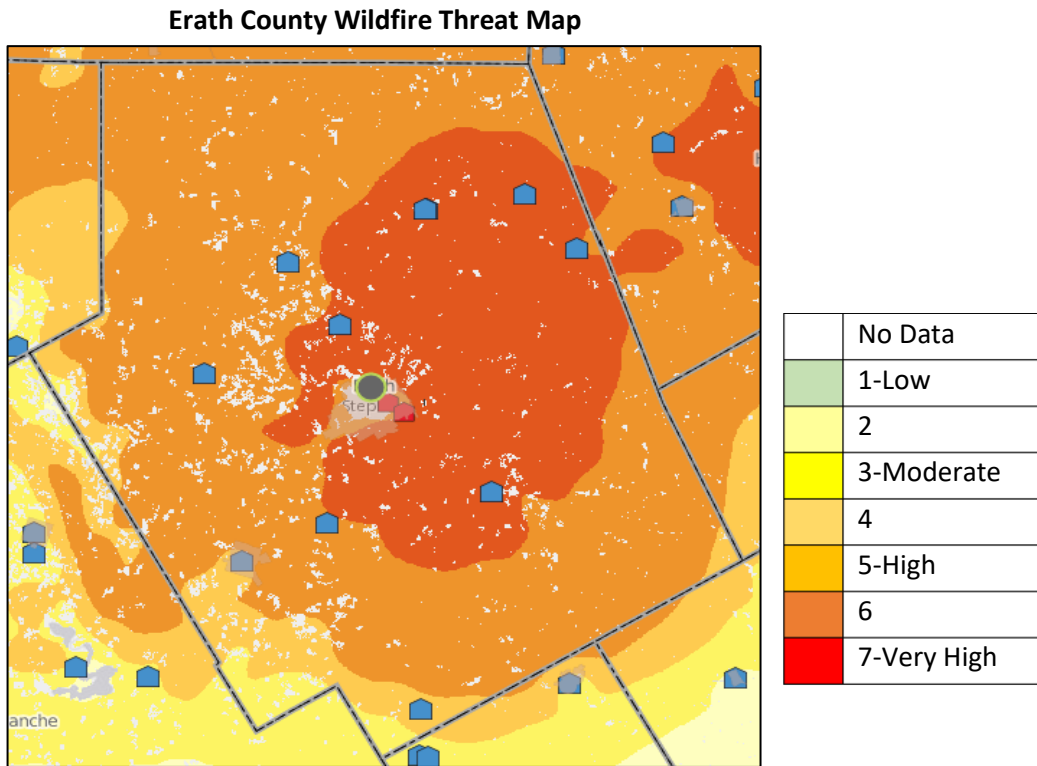


WUI housing density is categorized based on the standard Federal Register and United States Forest Service (USFS) Silvics data set categories. The number of housing density categories is extended to provide a better gradation of housing distribution to meet specific requirements of the states for their fire protection planning activities. While units of the data set are in houses per square kilometer, which is consistent with other data such as USFS SILVIS, the data is presented as the number of houses per acre to aid with interpretation and use in Texas.

Wildfire Threat is the likelihood of a wildfire occurring or burning into an area. Threat is derived by combining a number of landscape characteristics including surface and canopy fuels, resultant fire behavior, historical fire occurrence, percentile weather derived from historical weather observations, and terrain conditions. These inputs are combined using analysis techniques based on established fire science.

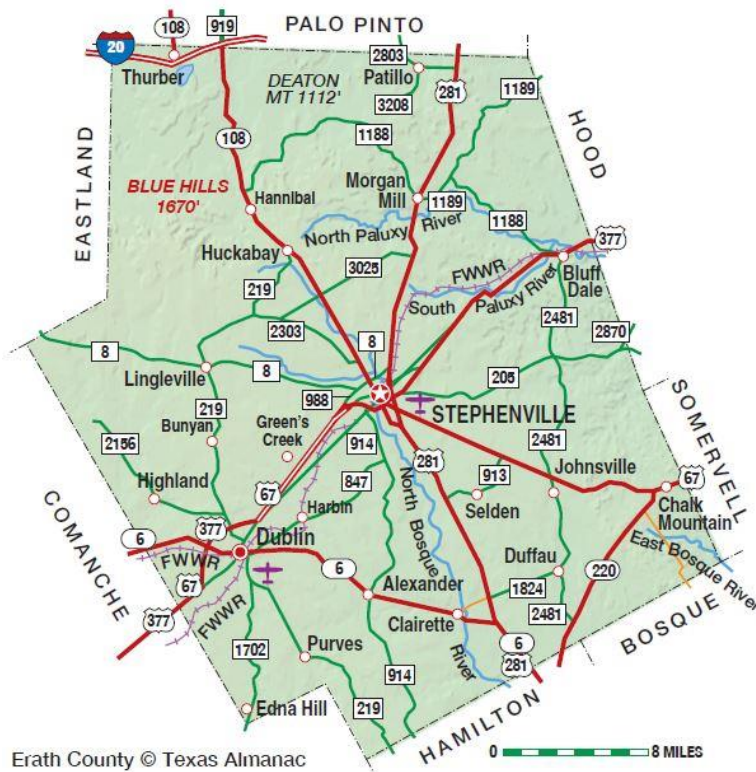
The measure of wildfire threat used in the Texas Wildfire Risk Assessment (TWRA) is based on the Wildland Fire Susceptibility Index (WFSI). WFSI combines the probability of an acre igniting (Wildfire Ignition Density), and the expected final fire size based on rate of spread in four percentile weather categories. WFSI is defined as the likelihood of an acre burning.

The following map shows the threat level of wildfires in Erath County, with the locations of fire stations. The paid fire departments are marked in red and volunteer fire departments are marked in blue.



Source: Texas Wildfire Risk Assessment Portal Professional Viewer.

Map of Reference



3.4.6 Factors that Decrease Vulnerability

Factors that decrease vulnerability to hazards include the mitigation actions that have previously been implemented, the adoption of new codes and policies, and the participation in regional projects sponsored by the North Central Texas Council of Governments (NCTCOG) and other governing agencies.

Local Mitigation Activities

The participating jurisdictions have implemented a variety of mitigation actions to protect their communities from damaging disasters. These previous mitigation actions are described in detail in Chapter 4.

National Policy

On October 5, 2018, President Trump signed the [Disaster Recovery Reform Act of 2018](#) (DRRA) into law as part of the [Federal Aviation Administration Reauthorization Act of 2018](#). These reforms acknowledge the shared responsibility of disaster response and recovery, aim to reduce the complexity of FEMA and build the nation's capacity for the next catastrophic event. The law contains more than 50 provisions that require FEMA policy or regulation changes for full implementation, as they amend the [Robert T. Stafford Disaster Relief and Emergency Assistance Act](#). It has yet to be seen how the DRRA will be implemented and how it will impact state and local agencies, but highlights from the DRRA include:

Highlights from the DRRA include:

- **Greater investment in mitigation, before a disaster:** Authorizing the National Public Infrastructure Pre-Disaster Hazard Mitigation Grant Program, which will be funded through the Disaster Relief Fund as a six percent set aside from disaster expenses.
 - This program will focus on funding public infrastructure projects that increase community resilience before a disaster occurs.
 - Previously, funding for pre-disaster mitigation grants relied on congressional appropriations which varied from year to year. Now, with a reliable stream of sufficient funding, communities will be able to plan and execute mitigation programs to reduce disaster risk nationwide.
 - According to a 2017 National Institute of Building Sciences report, the nation saves six dollars in future disaster costs for every one dollar invested in mitigation activities.
- **Reducing risk from future disasters after fire:** Providing hazard mitigation grant funding in areas that received Fire Management Assistance Grants as a result of wildfire. Adding fourteen new mitigation project types associated with wildfires and windstorms.
- **Increasing state capacity to manage disaster recovery:** Allowing for higher rates of reimbursement to state, local and tribal partners for their administrative costs when implementing public assistance (12 percent) and hazard mitigation projects (15 percent). Additionally, the legislation provides flexibility for states and tribes to administer their own post-disaster housing missions, while encouraging the development of disaster housing strategies.
 - States, tribes, territories and local governments bear significant administrative costs implementing disaster recovery programs. Often these costs can be high and substantially burdensome for the impacted entity to meet. Increasing the funding for administrative costs will enable faster, more effective delivery of vital recovery programs to communities.
 - State and tribal officials have the best understanding of the temporary housing needs for survivors in their communities. This provision incentivizes innovation, cost containment and prudent management by providing general eligibility requirements while allowing them the flexibility to design their own programs.
- **Providing greater flexibility to survivors with disabilities:** Increasing the amount of assistance available to individuals and households affected by disasters, including allowing accessibility repairs for people with disabilities, without counting those repairs against their maximum disaster assistance grant award.
- **Retaining skilled response and recovery personnel:** Authorizing FEMA to appoint certain types of temporary employees who have been with the agency for three continuous years to full time positions in the same manner as federal employees with competitive status. This allows the agency to retain and promote talented, experienced emergency managers.

National Flood Insurance Program



The National Flood Insurance Program (NFIP) aims to reduce the impact of flooding on private and public structures. It does so by providing affordable insurance to property owners, renters and businesses and by encouraging communities to adopt and enforce floodplain management regulations. These efforts help mitigate the effects of flooding on new and improved structures. Overall, the program reduces the socio-economic impact of disasters by promoting the purchase and retention of general risk insurance, but also of flood insurance, specifically. When a community participates in the NFIP, it participates in one of two phases: the Emergency Program or the Regular Program.

Emergency Program: Entry-level participation phase.

- Limited coverage
- Flat rates
- Basic Flood Hazard Boundary Map (FHBM)*

**Initial flood hazard identification*

Regular Program: Most participating communities are in this phase.

- Full participation
- Detailed Flood Insurance Rate Map (FIRM)
- NFIP's full limits of insurance

The following table includes the NFIP status of the participating jurisdictions.

Community Name	CID	County	Initial FHBM Identified	Initial FIRM Identified	Current Effective Map Date	Reg-Emer Date	Tribal
Dublin	480963B	Erath	08/30/74	08/08/78	11/16/11(M)	08/08/78	No
Stephenville	480517B	Erath	06/28/74	07/05/77	11/16/11	07/05/77	No
Erath County Unincorporated	480218	Erath	2/27/77	04/01/04	04/05/19	04/01/04	No
CID: A different community identification number is assigned for the incorporated city versus the unincorporated county.							
Community Name: The incorporated city or unincorporated county, parish, or borough.							
County: This column should match the relative incorporated city, township, village, or other entity.							
Init FHBM Identified: This date tells when the Flood Hazard Boundary Map was created. This map is only a factor in communities that do not have a Flood Insurance Rate Map.							
Init FIRM Identified: This date represents the community's first Flood Insurance Rate Map, and it is important because it represents the dividing line between two building categories called Pre-FIRM and Post-FIRM.							
Current Effective Map Date: This is the date of the map currently in effect.							

Reg-Emer Date: The date the community first joined the NFIP. An “E” next to the date indicates that the community is in the Emergency Program and subject to limited coverage. If there is no “E” next to the date, then the community participates in the Regular Program.

Tribal: A “yes” in this column indicates that the participating community is a tribal nation.

NSFHA: A ‘Non-Special Flood Hazard Area’ is an area that is in a moderate-to-low risk flood zone (Zones B, C, X Pre- and Post-FIRM)

Source: FEMA Community Status Book Report, <http://www.fema.gov/cis/TX.html>.

Jurisdictions participating in the NFIP are required to regulate any development in designated flood prone areas. In Erath County, all work within a Federal Emergency Management Agency (FEMA) designated floodplain requires a floodplain permit.

The NFIP offers three Standard Flood Insurance Policy forms: Dwelling, General Property, and Residential Condominium Building Association. These forms provide policyholders with a description of their coverage and other important coverage information. Below is a table of the local policy statistics.

Policy Statistics as of 09/30/2018			
Jurisdiction	Policies In-force	Insurance In-force (whole \$)	Written Premium In-force
Dublin	2	\$175,000	\$618
Stephenville	37	\$8,366,100	\$27,652
Erath County Unincorporated	44	\$10,659,500	\$30,008

Source: FEMA Policy Statistics Country-Wide, <https://bsa.nfipstat.fema.gov/reports/1011.htm>.

Community Rating System

The Community Rating System (CRS) is a voluntary program for communities that participate in the National Flood Insurance Program (NFIP). The goals of the CRS are to reduce flood damages to insurable property, strengthen and support the insurance aspects of the NFIP, and encourage a comprehensive approach to floodplain management. The CRS has been developed to provide incentives in the form of premium discounts for communities to go beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding. For a community to be eligible, it must be in full compliance with the NFIP.

All communities start out with a Class 10 rating, which provides no discount. There are 10 CRS classes: Class 1 requires the most credit points and gives the greatest premium discount; Class 10 identifies a community that does not apply for the CRS or does not obtain a minimum number of credit points and receives no discount. There are 18 activities recognized as measures for eliminating exposure to floods. Credit points are assigned to each activity. The activities are organized under 4 main categories:

- Public Information
- Mapping and Regulation
- Flood Damage Reduction
- Flood Preparedness

Premium discounts ranging from 5% to a maximum of 45% are applied to eligible policies written in a community as recognition of the floodplain management activities instituted.

All CRS communities must maintain completed FEMA elevation and floodproofing certificates for all new and substantially improved construction in the Special Flood Hazard Area (SFHA) after the date of application for CRS classification. These certificates must be available upon request. Therefore, in writing a policy, an agent/producer should be able to get these certificates from any CRS community. In addition, some CRS communities receive credit for having completed certificates for Post-Flood Insurance Rate Map (FIRM) buildings constructed prior to the CRS application date. If they do receive this credit, these certificates should also be available to agents/producers writing flood insurance.

According to the [April 2018 NFIP Flood Insurance Manual](#), there are no CRS communities amongst the participating jurisdictions in this hazard mitigation action plan.

The following table describes NFIP compliance within the participating jurisdictions.

NFIP Topic	Source of Information
How many structures are exposed to flood risk within the community?	Community Floodplain Administrator (FPA)
Dublin- 24	
Stephenville- unknown	
Erath County Unincorporated- unknown	
Describe any areas of flood risk with limited NFIP policy coverage	Community FPA and FEMA Insurance Specialist
Dublin- unknown	
Stephenville- unknown	
Erath County Unincorporated- unknown	
Is the Community FPA or NFIP Coordinator certified?	Community FPA
Dublin- No	
Stephenville- Yes	
Erath County Unincorporated- No	
Is floodplain management an auxiliary function?	Community FPA
Dublin- Yes	
Stephenville- Yes	
Erath County Unincorporated- Yes	
Provide an explanation of NFIP administration services (e.g. permit review, GIS, education or outreach, inspections, engineering capability)	Community FPA
Dublin- GIS	
Stephenville- Permit review, GIS, inspections, engineering capability	
Erath County Unincorporated- GIS	
What are the barriers to running an effective NFIP program in the community, if any?	Community FPA

Dublin- none	
Stephenville- none	
Erath County Unincorporated- none	
Is the community in good standing with the NFIP?	State NFIP Coordinator, FEMA NFIP Specialist, community records
Dublin- Yes	
Stephenville- Yes	
Erath County Unincorporated- Yes	
Are there any outstanding compliance issues (i.e. current violations)?	State NFIP Coordinator, FEMA NFIP Specialist, community records
Dublin- No	
Stephenville- No	
Erath County Unincorporated- No	
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	State NFIP Coordinator, FEMA NFIP Specialist, community records
Dublin- 2015	
Stephenville- unknown	
Erath County Unincorporated- 2011	
Is a CAV or CAC scheduled or needed?	State NFIP Coordinator, FEMA NFIP Specialist, community records
Dublin- No	
Stephenville- No	
Erath County Unincorporated- No	
Are the FIRMs digital or paper?	Community FPA
Dublin- Paper	
Stephenville- Digital	
Erath County Unincorporated- Digital	
Do floodplain development regulations meet or exceed FEMA or state minimum requirements? If so, in what ways?	Community FPA
Dublin- Yes	
Stephenville- Yes	
Erath County Unincorporated- unknown	
Provide an explanation of the permitting process.	Community FPA, State, FEMA NFIP
Dublin- Currently working on a process.	
Stephenville- 1. No work of any kind may begin in a floodplain area designated as A, A1-30, AE, AO, AH, or B until a floodplain development permit is issued. 2. The permit may be revoked if any false statements are made in this application. 3. If revoked, all work must cease until a permit is re-issued. 4. The development may not be used or occupied until a Certificate of Compliance is issued. 5. The permit will expire if no work is commenced within 6 months of the date of issue.	

6. The permit will not be issued until any other necessary local, state or federal permits have been obtained.

7. By signing and submitting this application, the Applicant gives consent to the local Floodplain Administrator or his/her representative to make reasonable inspections prior to the issuance of a Certificate of Compliance.

8. By signing and submitting this application, the Applicant certifies that all statements contained in SECTION I of the application, and in any additional attachments submitted by the Applicant, are true and accurate.

Erath County Unincorporated- Currently working on a process.

3.4.7 Greatest Vulnerabilities

Below is a list of the participating jurisdictions greatest vulnerabilities in relation to natural hazards.

Dublin	<ul style="list-style-type: none"> Any substantial event would be devastating to the financial capabilities of the city There is no building strong enough to withstand tornadoes or strong winds
Stephenville	<ul style="list-style-type: none"> Tarleton University is vulnerable to all hazards There are 5-6 mobile home parks Oxford House, Courthouse, Historical Museum, and historic district are vulnerable to all hazards Power failures occur due to weather At least City Hall and multiple nursing homes/assisted living will need backup generators
Erath County Unincorporated	<ul style="list-style-type: none"> Any major event would overwhelm the local resources

3.5 Historical Events

This section shows historical events and damage for the following natural hazards in Erath County since the 2015 HazMAP:

- Drought
- Earthquakes
- Expansive Soils
- Extreme Heat
- Flooding (including dam failure)
- Thunderstorms (including hail, wind, and lightning)
- Tornadoes
- Wildfires
- Winter Storms

Weather Events

The following tables identify the weather events (drought, extreme heat, flooding, thunderstorms, tornadoes, and winter storms), captured by the National Weather Service (NWS), that have occurred from 2012-2018 in the participating jurisdictions or the Erath County Zone. Damages are recorded in \$US.

The National Centers for Environmental Information (NCEI) receives storm data from the NWS. The NWS receives their information from a variety of sources, which include but are not limited to: county, state and federal emergency management officials, local law enforcement officials, SkyWarn spotters, NWS damage surveys, newspaper clipping services, the insurance industry, and the general public, among others. NWS Storm Data are geographically categorized by county or by NWS Forecast Zone. Localized events such as a tornado, thunderstorm winds, flash floods, and hail are categorized using the *Erath Co.* (County) designation. More widespread events that can impact the entire county equally, such as heat, cold, drought, floods, and winter weather, are categorized using the *Erath (Zone)*.

There have been no NWS reports of extreme heat within the participating jurisdictions.

Due to the climate variability and increasing populations, it is expected that the same level of damage experienced in the past will occur in the future, if not more, for each event.

The following abbreviations from the column headings for all weather tables are explained below:

‘Mag’: Magnitude, **‘Dth’**: Deaths, **‘Inj’**: Injuries, **‘PrD’**: Property Damage (\$), **‘CrD’**: Crop Damage (\$)

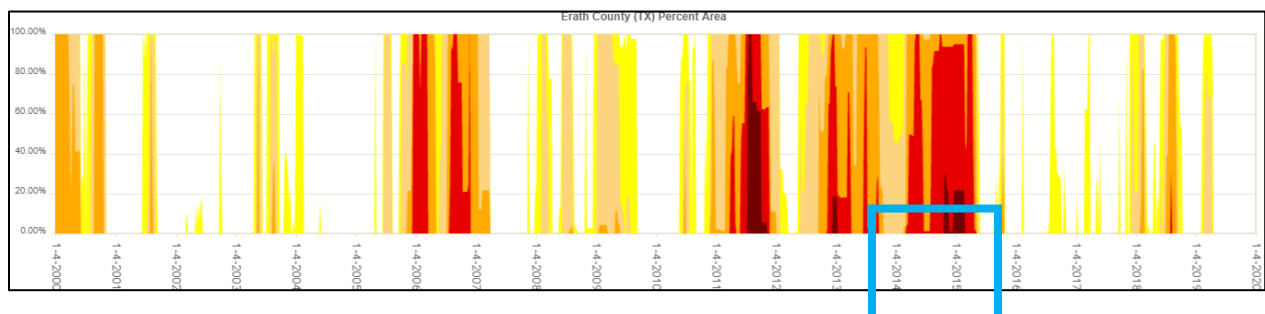
The following weather events are listed in alphabetical order.

Drought									
Location	County/Zone	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
ERATH (ZONE)	ERATH (ZONE)	09/25/2012	00:00	Drought		0	0	0.00K	2.00K
ERATH (ZONE)	ERATH (ZONE)	10/01/2012	00:00	Drought		0	0	0.00K	5.00K
ERATH (ZONE)	ERATH (ZONE)	11/01/2012	00:00	Drought		0	0	0.00K	5.00K
ERATH (ZONE)	ERATH (ZONE)	12/01/2012	00:00	Drought		0	0	0.00K	2.00K
ERATH (ZONE)	ERATH (ZONE)	01/01/2013	00:00	Drought		0	0	0.00K	3.00K
ERATH (ZONE)	ERATH (ZONE)	02/01/2013	00:00	Drought		0	0	0.00K	2.00K
ERATH (ZONE)	ERATH (ZONE)	03/01/2013	00:00	Drought		0	0	3.00K	0.00K
ERATH (ZONE)	ERATH (ZONE)	04/01/2013	00:00	Drought		0	0	0.00K	3.00K
ERATH (ZONE)	ERATH (ZONE)	05/01/2013	00:00	Drought		0	0	0.00K	3.00K
ERATH (ZONE)	ERATH (ZONE)	06/01/2013	00:00	Drought		0	0	0.00K	5.00K
ERATH (ZONE)	ERATH (ZONE)	07/01/2013	00:00	Drought		0	0	0.00K	3.00K
ERATH (ZONE)	ERATH (ZONE)	08/01/2013	00:00	Drought		0	0	0.00K	3.00K
ERATH (ZONE)	ERATH (ZONE)	09/01/2013	00:00	Drought		0	0	0.00K	3.00K
ERATH (ZONE)	ERATH (ZONE)	10/01/2013	00:00	Drought		0	0	0.00K	1.00K
ERATH (ZONE)	ERATH (ZONE)	03/11/2014	00:00	Drought		0	0	0.00K	3.00K
ERATH (ZONE)	ERATH (ZONE)	04/01/2014	00:00	Drought		0	0	0.00K	4.00K

Drought									
Location	County/Zone	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
ERATH (ZONE)	ERATH (ZONE)	05/01/2014	00:00	Drought		0	0	0.00K	3.00K
ERATH (ZONE)	ERATH (ZONE)	06/01/2014	00:00	Drought		0	0	0.00K	2.00K
ERATH (ZONE)	ERATH (ZONE)	07/01/2014	00:00	Drought		0	0	0.00K	3.00K
ERATH (ZONE)	ERATH (ZONE)	08/01/2014	00:00	Drought		0	0	0.00K	5.00K
ERATH (ZONE)	ERATH (ZONE)	09/01/2014	00:00	Drought		0	0	5.00K	0.00K
ERATH (ZONE)	ERATH (ZONE)	10/01/2014	00:00	Drought		0	0	0.00K	5.00K
ERATH (ZONE)	ERATH (ZONE)	11/01/2014	00:00	Drought		0	0	0.00K	3.00K
ERATH (ZONE)	ERATH (ZONE)	12/01/2014	00:00	Drought		0	0	0.00K	10.00K
ERATH (ZONE)	ERATH (ZONE)	01/01/2015	00:00	Drought		0	0	0.00K	2.00K
ERATH (ZONE)	ERATH (ZONE)	02/01/2015	00:00	Drought		0	0	0.00K	2.00K
ERATH (ZONE)	ERATH (ZONE)	03/01/2015	00:00	Drought		0	0	0.00K	2.00K
ERATH (ZONE)	ERATH (ZONE)	04/01/2015	00:00	Drought		0	0	0.00K	3.00K
ERATH (ZONE)	ERATH (ZONE)	10/13/2015	00:00	Drought		0	0	1.00K	0.00K
ERATH (ZONE)	ERATH (ZONE)	02/01/2018	00:00	Drought		0	0	0.00K	0.00K
ERATH (ZONE)	ERATH (ZONE)	07/24/2018	00:00	Drought		0	0	0.00K	0.00K
ERATH (ZONE)	ERATH (ZONE)	08/01/2018	00:00	Drought		0	0	0.00K	1.00K
ERATH (ZONE)	ERATH (ZONE)	09/01/2018	00:00	Drought		0	0	0.00K	0.00K
ERATH (ZONE)	ERATH (ZONE)	10/01/2019	00:00	Drought		0	0	0.00K	0.00K
Totals:						0	0	9.00K	88.00K

Source: [NOAA National Centers for Environmental Information](#)

During these times the value of cattle decreased dramatically due to low cattle weight caused by drought impact on feed lots. Cattle had to be shipped to Oklahoma and farmers had to buy hay to feed cattle instead of growing it themselves. Water levels are a critical concern during this time. The following chart reflects the annual changes in drought conditions.



D0	D1	D2	D3	D4
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Source: United States Drought Monitor.

As shown in the Percent Area graph above, the time period from 2014-2015 had the greatest severity and longest time period of D3-D4 drought conditions. Besides major crop damage, these extreme drought conditions have the potential to put Erath County in extreme fire danger and could cause widespread water shortage and restrictions, creating a water emergency.

Flood									
Location	County/Zone	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
STEPHENVILLE	ERATH CO.	05/13/2015	15:58	Flood		0	0	0.00K	0.00K
Totals:						0	0	0.00K	0.00K

Source: [NOAA National Centers for Environmental Information](#)

Flooding led to major road closures. The flood reports at the National Weather Service involved roads and vehicles.

Thunderstorm									
Location	County/Zone	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
DUBLIN	ERATH CO.	04/02/2013	00:10	Hail	1.75 in.	0	0	15.00K	0.00K
DUBLIN	ERATH CO.	04/13/2014	17:35	Hail	1.75 in.	0	0	60.00K	0.00K
DUBLIN	ERATH CO.	04/26/2015	15:41	Hail	2.75 in.	0	0	20.00K	0.00K
DUBLIN	ERATH CO.	04/26/2015	18:25	Hail	2.75 in.	0	0	50.00K	0.00K
DUBLIN	ERATH CO.	04/26/2015	18:42	Hail	3.00 in.	0	0	20.00K	0.00K
DUBLIN	ERATH CO.	04/21/2017	20:34	Hail	0.88 in.	0	0	0.00K	0.00K
DUBLIN	ERATH CO.	10/14/2018	18:00	Hail	1.00 in.	0	0	0.00K	0.00K
DUBLIN	ERATH CO.	04/17/2019	20:12	Hail	0.75 in.	0	0	0.00K	0.00K
DUBLIN CAMPBELL ARPT	ERATH CO.	04/26/2015	15:24	Hail	1.75 in.	0	0	7.00K	0.00K
DUBLIN MUNI ARPT	ERATH CO.	04/26/2015	15:44	Hail	1.75 in.	0	0	10.00K	0.00K
STEPHENVILLE	ERATH CO.	03/10/2012	10:47	Hail	1.00 in.	0	0	0.00K	0.00K
STEPHENVILLE	ERATH CO.	04/03/2014	15:53	Hail	1.00 in.	0	0	0.00K	0.00K
STEPHENVILLE	ERATH CO.	04/03/2014	16:10	Hail	1.00 in.	0	0	0.00K	0.00K
STEPHENVILLE	ERATH CO.	04/24/2015	16:34	Hail	1.75 in.	0	0	15.00K	0.00K
STEPHENVILLE	ERATH CO.	04/26/2015	17:36	Hail	4.25 in.	0	0	100.00K	0.00K
STEPHENVILLE	ERATH CO.	04/26/2015	17:47	Hail	4.25 in.	0	0	10.00K	0.00K
STEPHENVILLE	ERATH CO.	04/26/2015	19:04	Hail	2.75 in.	0	0	15.00K	0.00K
STEPHENVILLE	ERATH CO.	05/09/2015	20:18	Hail	2.50 in.	0	0	100.00K	0.00K

Thunderstorm									
Location	County/Zone	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
STEPHENVILLE	ERATH CO.	05/09/2015	20:23	Hail	1.50 in.	0	0	0.00K	0.00K
STEPHENVILLE	ERATH CO.	05/09/2015	20:24	Hail	2.00 in.	0	0	0.00K	0.00K
STEPHENVILLE	ERATH CO.	05/26/2015	20:10	Hail	0.88 in.	0	0	0.00K	0.00K
STEPHENVILLE	ERATH CO.	04/21/2017	19:57	Hail	1.00 in.	0	0	4.00K	0.00K
STEPHENVILLE	ERATH CO.	08/16/2013	06:10	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
DUBLIN	ERATH CO.	10/10/2014	20:30	Thunderstorm Wind	56 kts. EG	0	0	10.00K	0.00K
STEPHENVILLE	ERATH CO.	04/24/2015	16:29	Thunderstorm Wind	57 kts. MG	0	0	8.00K	0.00K
STEPHENVILLE	ERATH CO.	04/24/2015	16:30	Thunderstorm Wind	70 kts. EG	0	0	50.00K	0.00K
STEPHENVILLE	ERATH CO.	05/26/2015	20:07	Thunderstorm Wind	50 kts. MG	0	0	0.00K	0.00K
STEPHENVILLE	ERATH CO.	03/08/2016	06:55	Thunderstorm Wind	70 kts. EG	0	0	50.00K	0.00K
STEPHENVILLE MUNI AR	ERATH CO.	03/08/2016	07:04	Thunderstorm Wind	52 kts. MG	0	0	2.00K	0.00K
STEPHENVILLE	ERATH CO.	10/20/2019	23:15	Thunderstorm Wind	70 kts. MG	0	0	100.00K	00.0K
Totals:						0	0	651.00K	0.00K
In.: Inch									
Kts.: knots									
EG: Estimated Gusts									

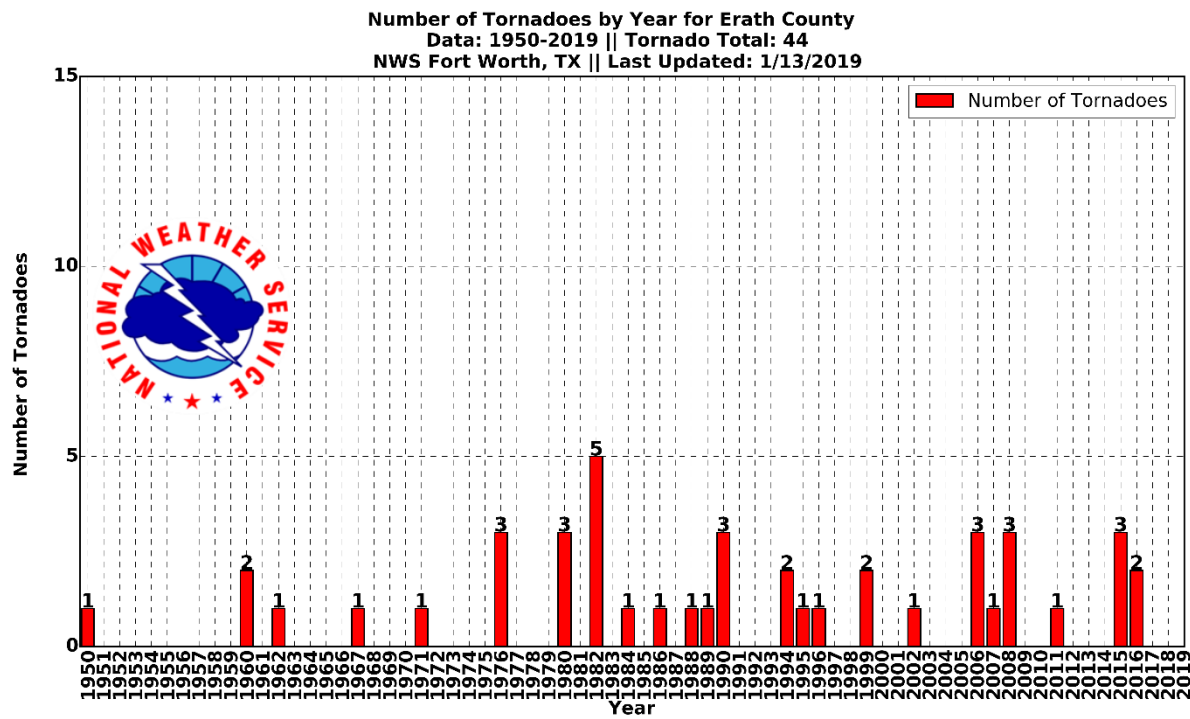
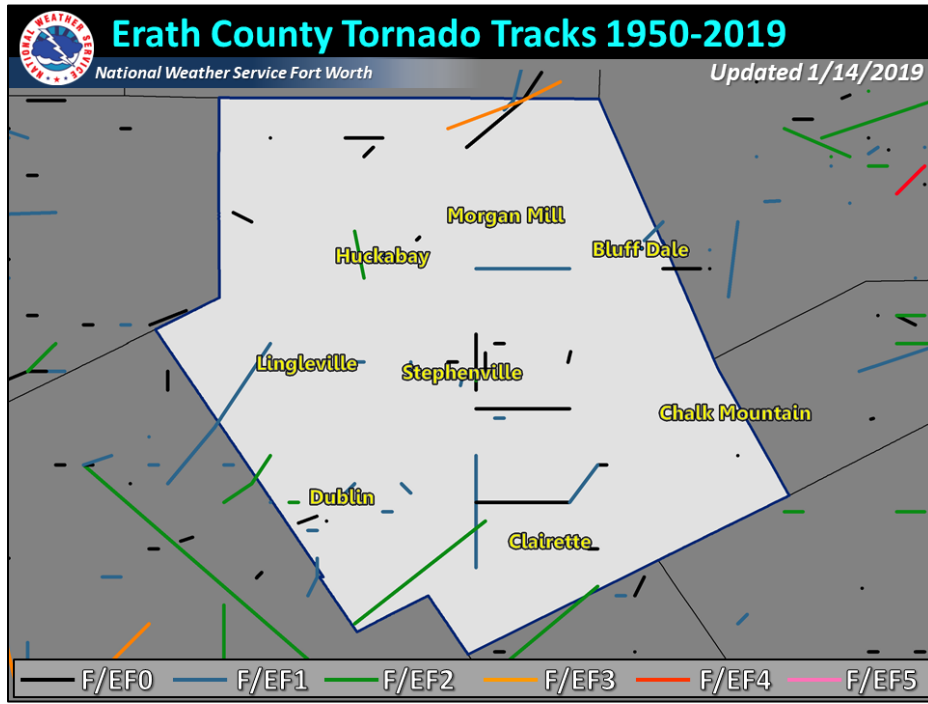
Source: [NOAA National Centers for Environmental Information](#)

Property was damaged by wind and hail.

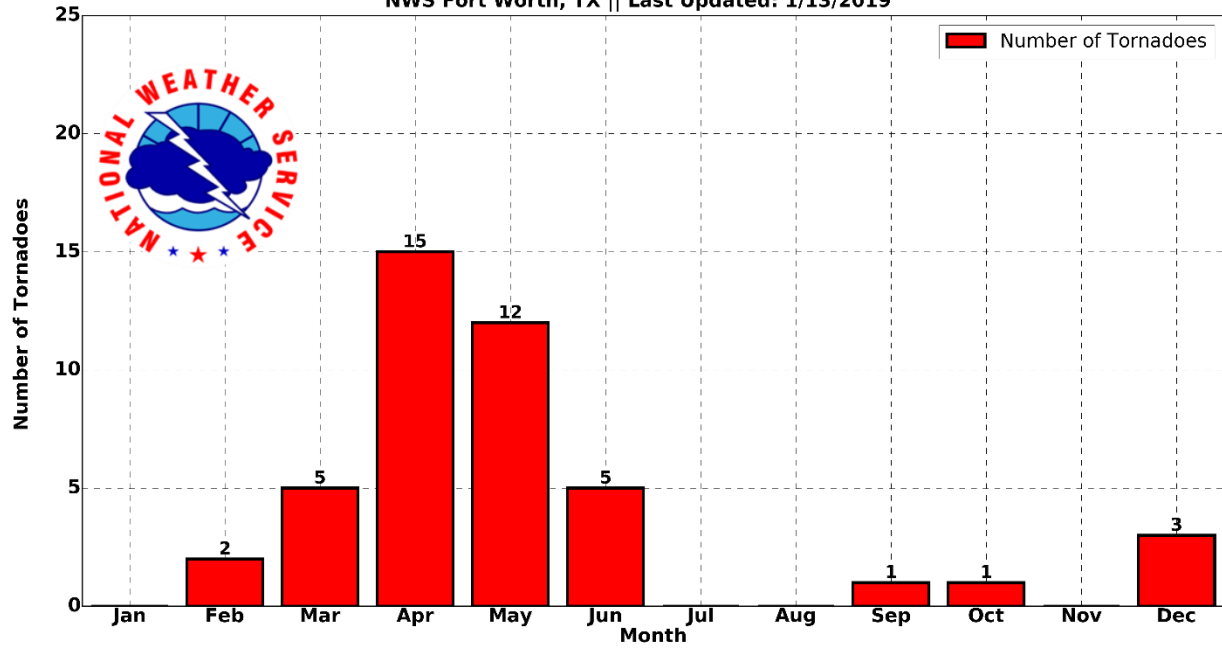
Tornado									
Location	County/Zone	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
DUBLIN	ERATH CO.	03/08/2016	06:30	Tornado	EF0	0	0	130.00K	0.00K
STEPHENVILLE	ERATH CO.	03/08/2016	06:55	Tornado	EF1	0	0	500.00K	0.00K
Totals:						0	0	630.00K	0.00K

Source: [NOAA National Centers for Environmental Information](#)

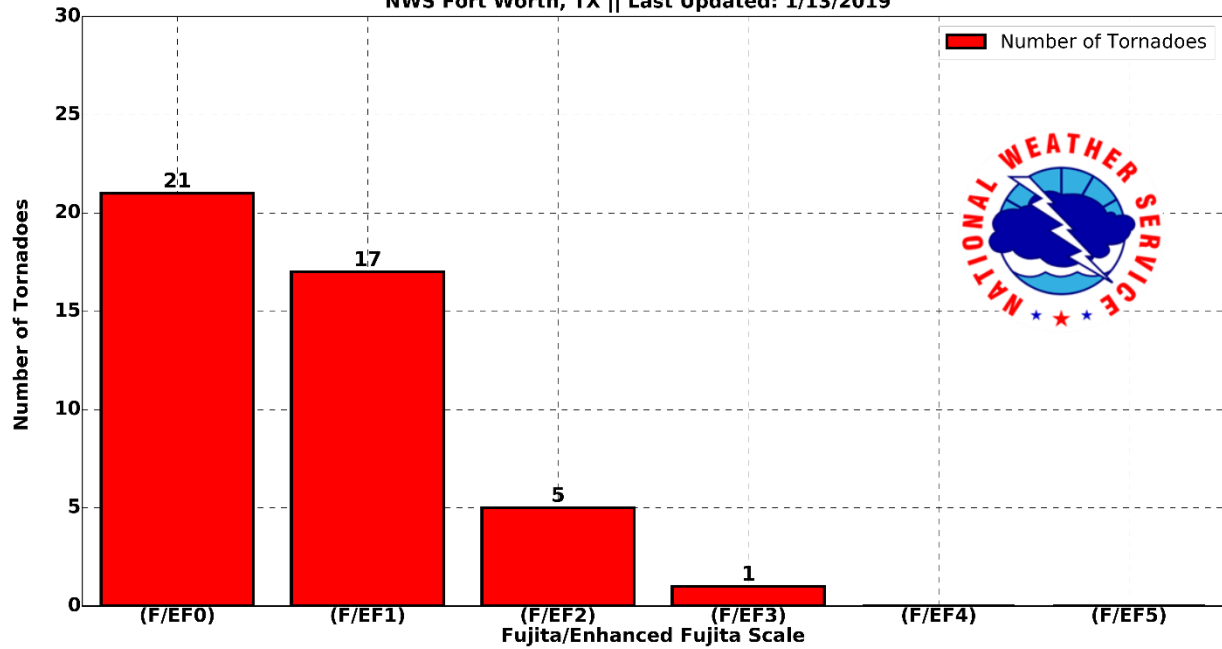
Property damage included damage to trees, power lines, and homes. The following map and charts are from the National Weather Service (NWS) Fort Worth [Erath County Climatology Page, 1950-2019](#). They reflect historical data related to tornadoes in Erath County.



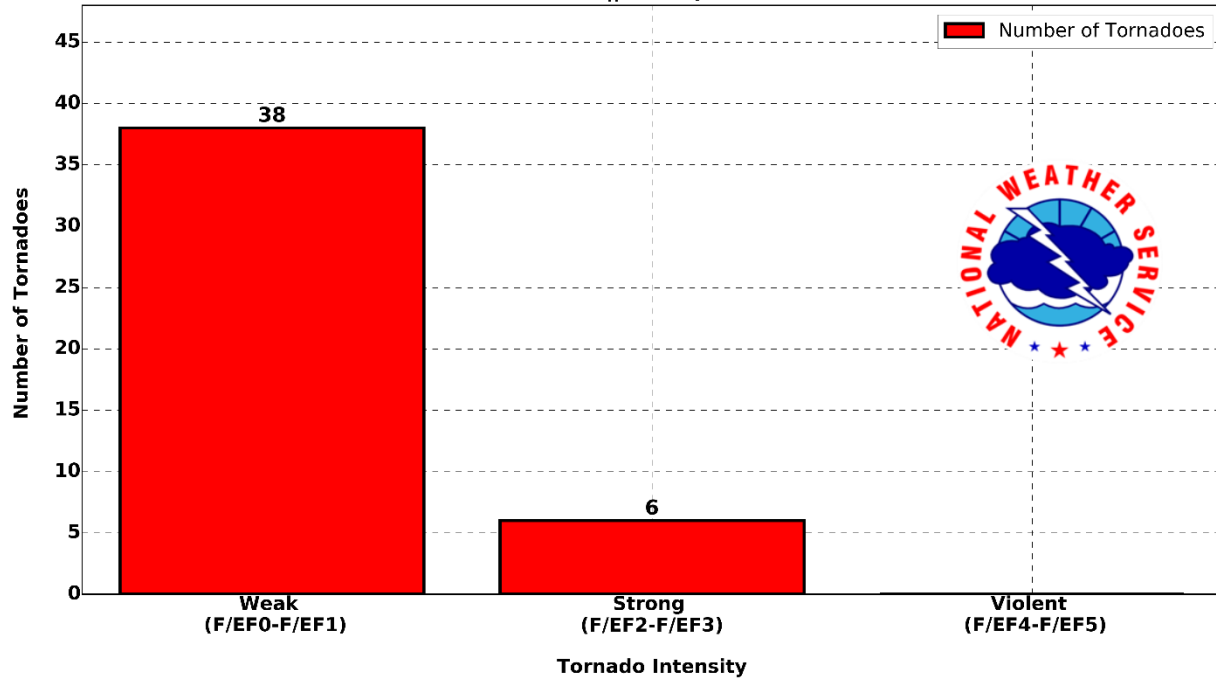
Number of Tornadoes by Month for Erath County
 Data: 1950-2019 || Tornado Total: 44
 NWS Fort Worth, TX || Last Updated: 1/13/2019



Number of Tornadoes by Rating for Erath County
 Data: 1950-2019 || Tornado Total: 44
 NWS Fort Worth, TX || Last Updated: 1/13/2019



Number of Tornadoes by Intensity for Erath County
 Data: 1950-2019 || Tornado Total: 44
 NWS Fort Worth, TX || Last Updated: 1/13/2019



Winter Storm									
Location	County/Zone	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
ERATH (ZONE)	ERATH (ZONE)	02/21/2018	12:00	Ice Storm		0	0	5.00K	0.00K
ERATH (ZONE)	ERATH (ZONE)	12/05/2013	19:15	Winter Storm		0	0	0.00K	0.00K
ERATH (ZONE)	ERATH (ZONE)	02/23/2015	02:15	Winter Storm		0	0	6.00K	0.00K
ERATH (ZONE)	ERATH (ZONE)	12/06/2017	06:30	Winter Weather		0	0	0.00K	0.00K
ERATH (ZONE)	ERATH (ZONE)	12/07/2017	10:30	Winter Weather		0	0	0.00K	0.00K
ERATH (ZONE)	ERATH (ZONE)	12/31/2017	06:00	Winter Weather		0	0	0.00K	0.00K
ERATH (ZONE)	ERATH (ZONE)	12/31/2017	10:00	Winter Weather		0	0	20.00K	0.00K
ERATH (ZONE)	ERATH (ZONE)	02/11/2018	08:00	Winter Weather		0	0	0.00K	0.00K
ERATH (ZONE)	ERATH (ZONE)	02/11/2018	08:00	Winter Weather		0	0	0.00K	0.00K
ERATH (ZONE)	ERATH (ZONE)	02/22/2018	06:00	Winter Weather		0	0	0.00K	0.00K
Totals:						0	0	31.00K	0.00K

Source: [NOAA National Centers for Environmental Information](#)

The following article highlights the severe impacts of winter weather in North Central Texas and Erath County. Although this article describes a 2013 storm, it also describes what Erath County could experience again.

National Weather Service: North Texas Snowfall Events

December 5-6, 2013

A winter storm affected much of North and Central Texas for an extended period from December 5th through the 10th. A combination of freezing rain, sleet, and a little snow began falling during the day on the 5th and continued through the morning hours of the 6th. As the ice and sleet settled on the 6th, a thick layer of ice paralyzed most of the area north of a line from Goldthwaite to Cleburne to Ennis to Sulphur Springs. In this area, accumulations of sleet and ice measured up to 5" with the highest amounts from Denton to Sherman to Bonham.



NBC 5 News captured "cobblestone ice" on North Texas roads

Temperatures remained below freezing until the 9th and 10th resulting in a prolonged winter event. Most residents were forced to remain at home for several days. A new term, coined "cobblestone ice," was used to describe the condition of the ice on the interstates and highways due to the compaction of ice and sleet.

South of this area, lighter amounts of icing occurred producing mainly icy bridges, overpasses, and elevated surfaces. As a result of the ice storm, significant tree damage occurred with thousands of tree branches falling under the weight of the ice. Power lines were also brought down, and at the peak of the storm, 275,000 customers were without power in the North Texas region. Most schools, especially in the hardest hit areas, were closed for several days. Some businesses were forced to close for a day or two also. Hundreds of injuries were reported due to falls on the ice but exact numbers were not available. Seven fatalities occurred during this event; 4 in vehicles, 2 from exposure, and 1 from a fall on the ice. Early estimates from the insurance council estimated \$30 million in residential insured losses. The estimate did not include damage to vehicles or roads. Many roads and bridges were damaged from the ice and/or from attempts by Texas Department of Transportation to remove the ice using plows and graders. Hundreds of people and semi-trucks were stranded for long periods on many of the main highways and interstates including I-35 from Fort Worth to the Oklahoma border and Interstate 20 from Fort Worth going west. The clean-up from this event took weeks and even a few months in some places.¹⁴

¹⁴ North Texas Snowfall Events 2013-1879, National Weather Service.
<<https://www.weather.gov/fwd/snowevents>>

Though there has not been a major winter event recorded since this 2013 example, a severe winter storm happening in the next five years cannot be ruled out, as weather patterns have been evolving along with the change in climate, as mentioned earlier.

Not all events have been reported to NWS, as some participants have experienced damage from various hazard events not listed above. Based on the information in the chart above, participating jurisdictions in Erath County can expect a similar occurrence of events and level of damage over the next five years.

Geographic Events

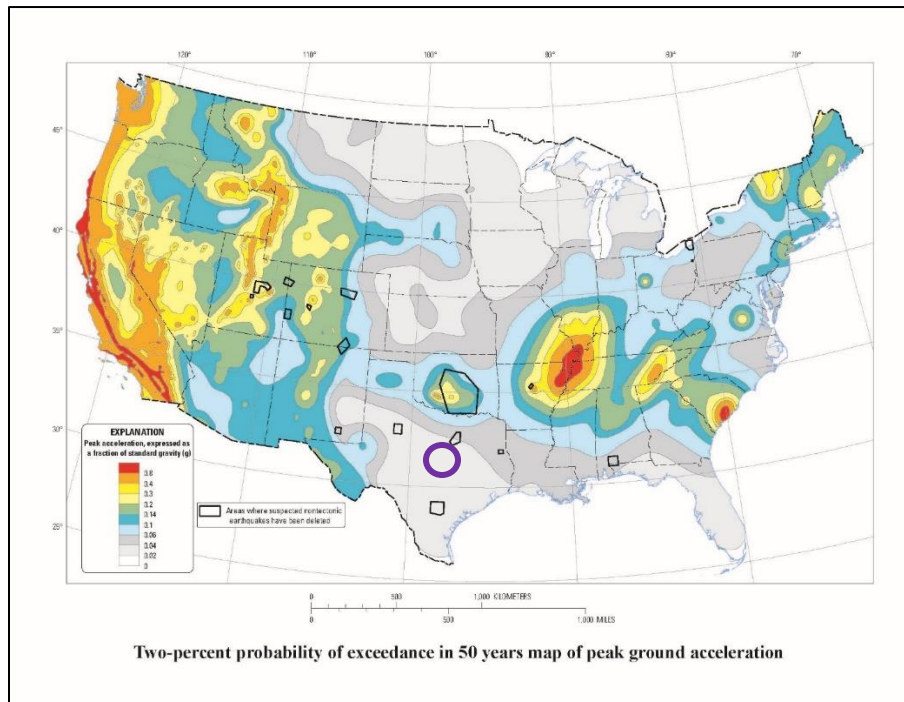
The following data reflects past geographic events that have occurred within the participating jurisdictions. **According to the best information available, there is no history of dam failure in Palo Pinto County and the participating jurisdictions. Expansive soils damage has not been formally documented, though damage has slowly occurred over time.**

Earthquake Events

The number of earthquake events in Erath County varies by source of information. The [TexNet Earthquake Catalog](#) website developed and run in 2017 by the University of Texas at Austin's Bureau of Economic Geology provides the most precise near real-time information available about earthquakes across Texas. According to their data, no earthquakes have been reported in Erath County since 2017. Based on this information, the chances of a future earthquake are low.

Along with TexNet, the [United States Geological Survey \(USGS\)](#) confirmed that no earthquakes have occurred in Erath County since 2012.

Erath County has a very low risk to future earthquakes, as shown in the following map.



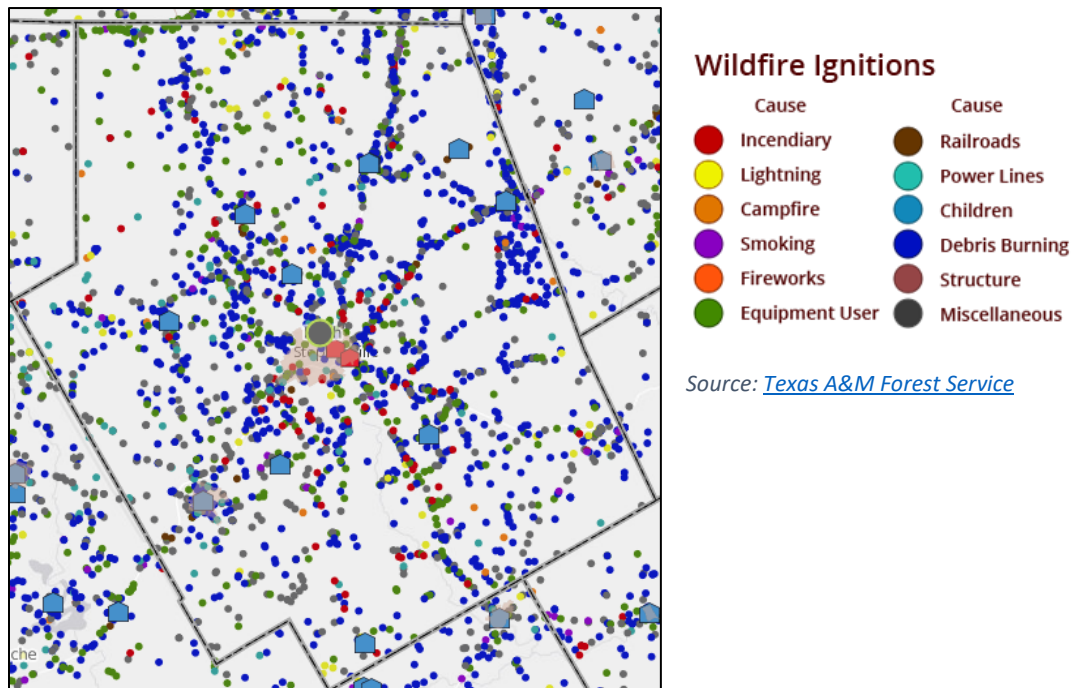
Source: [USGS](#)

Wildfire Events

Below is a list of wildfire damage across Erath County, according to Texas A&M Forest Service records.

Year	County	Agency	Fires	Acres
2012	Erath	Fire Departments	144	347
2013	Erath	Fire Departments	127	602
2014	Erath	Fire Departments	121	544
2015	Erath	Fire Departments	109	550
2016	Erath	Fire Departments	146	533
2017	Erath	TX A&M Forest Service	3	1,144
2017	Erath	Fire Departments	164	1,484
2018	Erath	TX A&M Forest Service	2	147
2018	Erath	Fire Departments	182	2,864
2019	Erath	Fire Departments	3	13

The following Wildfire Ignitions dataset from the Texas A&M Forest Service (TFS) shows the point location of all fires in Erath County from 2005 – 2015. The date range is set by TFS. The fires are symbolized by the cause of the fire. The wildfire occurrence database was obtained from state and local fire department report data sources for the years 2005 to 2015. The local category includes fires reported via Texas A&M Forest Service online fire department reporting system. It is a voluntary reporting system that includes fires reported by both paid and volunteer fire departments since 2005. The compiled fire occurrence database was cleaned to remove duplicate records and to correct inaccurate locations. More detailed maps, per jurisdiction, are located in Appendix A.



3.6 Hazard Summary

Each participating jurisdiction described the location, probability of a future event, and the maximum probable extent of each hazard. The following terms were used to describe the categories:

Location: Location is the geographic area within the planning area that is affected by the hazard, such as a floodplain. The entire planning area may be uniformly affected by some hazards, such as drought or winter storm, while only portions of the planning area may be affected by others, like wildfires. The planning area refers to individual jurisdictions. Planning area refers to the size of the participating jurisdiction providing the description.

- **Negligible-** Less than 10% of planning area would be impacted by a single event.
- **Limited-** 10 to 25% of planning area would be impacted by a single event.
- **Significant-** 26 to 99% of planning area would be impacted by a single event.
- **Extensive-** 100% of planning area would be impacted by a single event, or the event has no boundary and could occur anywhere within the planning area.

Probability of Future Events: This information was based on historic events and changing climate.

- **Unlikely-** Less than 1% annual probability.
- **Possible-** Between 1 and 10% annual probability.
- **Likely-** Between 10 and 100% annual probability.
- **Highly Likely-** 100% annual probability.

Level of Possible Damage: Based on historic events and future probability.

- **Minor-** Only minor property damage and minimal disruption of life. Temporary shutdown of critical facilities. Very few injuries, if any.
- **Limited-** More than 10% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one day. Minor injuries possible.
- **Critical-** More than 25% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one week. Multiple deaths/injuries.
- **Catastrophic-** More than 50% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for 30 days or more. High number of deaths/injuries possible.

Maximum Probable Extent: Based on historic events and future probability.

- **Minor-** Minor classification on the scientific scale.
- **Medium-** Medium classification on the scientific scale.
- **Major-** Major classification on the scientific scale.

Extent Scale			
Hazard	Classification		
	Minor	Medium	Major
Drought	PDSI -1.99 to +1.99 D0	PDSI -2.00 to -2.99 D1	PDSI -3.00 to -5.00 D2-D4
Earthquake	Magnitude < 4.9	Magnitude 5.0-6.9	Magnitude > 7.0

Extent Scale			
Hazard	Classification		
	Minor	Medium	Major
Expansive Soils	EI Expansion Potential: 21-50 (Low) EI Expansion Potential: 0-21 (Very Low)	EI Expansion Potential: 51-90 (Medium)	EI Expansion Potential: 91-130 (High) EI Expansion Potential: >130 (Very High)
Extreme Heat	Heat Index 80F°-96F° with 40% humidity	Heat Index 97F°-104F° with 40% humidity	Heat Index >105F° with 40% humidity
Flooding	Within 100yr Flood Zone, Zone AE, A < 10 feet of water	Within 500yr Flood Zone, Zone X 10-25 feet of water	Extending Beyond 100yr and 500yr Flood Zones, Zone A, AE, X > 25 feet of water
Flooding from Dam Failure	< 20% of critical facilities in the inundation zone; Dam Storage capacity less than 10,000 acre-feet	20-50% of critical facilities in the inundation zone; Dam Storage capacity between 10,000 and 100,000 acre- feet	> 50% of critical facilities in the inundation zone; Dam Storage capacity 100,000 acre-feet or more
Thunderstorm	Hail 0"-1.6" Wind Knots <1-10 LAL: 1-2	Hail 1.6"-2.4" Wind Knots 11-27 LAL: 3-4	Hail 2.4"->4" Wind Knots 28-64+ LAL: 5-6
Tornado	EF0	EF1-EF2	EF3-EF5
Wildfire	KBDI 0-300	KBDI 300-500	KBDI 500-800
Winter Storms	Temperatures 40F° to 35F° Wind Speed <25 MPH Ice Accumulation <.50 inches	Temperatures 30F° to 20F° Wind Speed 25-35 MPH Ice Accumulation .10-1.00 inches	Temperatures 15F° to -45F° Wind Speed >35 MPH Ice Accumulation >.25 inches
Abbreviations:			
PDSI: Palmer Drought (Severity) Index			
EI: Expansion Index test			
LAL: Lightning Activity Level			
EF: Enhanced Fujita scale			
KBDI: Keetch-Byram Drought Index			

Below are the hazard summaries, in alphabetical order, for each participating jurisdiction.

Drought				
Jurisdiction	Location	Probability of Future Events	Level of Possible Damage	Maximum Probable Extent/Strength
Dublin	Extensive	Possible	Limited	Medium
Stephenville	Extensive	Highly Likely	Minor	Minor
Erath County Unincorporated	Extensive	Highly Likely	Critical	Medium

Potential impacts from drought include:

- Property damage
- Loss of water supply
- Increases grassfire potential and intensity
- Negative impact on citizens, to include water restrictions and lack of drinkable water supply
- Impact on car washes, parks, and pools
- Impact on crops, livestock, and natural vegetation
- Increase in food prices
- Dust storms, leading to transportation accidents
- Natural environments damage, to include protected species and critical habitats
- Pipeline damage

Source of groundwater or surface-supply:
Dublin- Proctor Lake
Stephenville- Lower Trinity, 23 wells, upcoming groundwater project, Upper Leon River Municipal Water District
Erath County Unincorporated- Well water
Describe the type of water restrictions the jurisdiction enforces, either year-round or during a drought:
Dublin- The Drought Contingency Plan limits irrigation depending on the stage of the plan.
Stephenville- Limited water sprinkler for lawns.
Erath County Unincorporated- There are no water restrictions.

Earthquake				
Jurisdiction	Location	Probability of Future Events	Level of Possible Damage	Maximum Probable Extent/Strength
Dublin	Extensive	Unlikely	Minor	Minor
Stephenville	Extensive	Unlikely	Minor	Minor
Erath County Unincorporated	Extensive	Unlikely	Minor	Minor

Potential impacts from earthquakes include:

- Injury or death
- Property and infrastructure damage

- Water contamination or loss via broken pipes
- Transportation and communication disruption or damage
- Increase in traffic accidents
- Building collapse
- Natural gas leak
- Misplaced residents
- Power outages
- Natural environments damage, to include protected species and critical habitats

Does your jurisdiction require a permit for foundation repairs? Reviewing permits can help a jurisdiction determine the amount of damage in the community.

Dublin- No

Stephenville- Yes

Erath County Unincorporated- No

Expansive Soils

Jurisdiction	Location	Probability of Future Events	Level of Possible Damage	Maximum Probable Extent/Strength
Dublin	Extensive	Unlikely	Minor	Minor
Stephenville	Extensive	Likely	Minor	Minor
Erath County Unincorporated	Extensive	Likely	Critical	Medium

Potential impacts from expansive soils include:

- Property damage due to foundation damage
- Water contamination or loss via broken pipes
- Building and infrastructure damage
- Road damage
- Transportation delays due to road condition
- Damage to utility lines
- Damage to crops and livestock

Extreme Heat

Jurisdiction	Location	Probability of Future Events	Level of Possible Damage	Maximum Probable Extent/Strength
Dublin	Extensive	Possible	Limited	Medium
Stephenville	Extensive	Highly Likely	Limited	Medium
Erath County Unincorporated	Extensive	Highly Likely	Limited	Medium

Potential impacts from extreme heat include:

- Heatstroke or death. Elderly people who cannot afford air conditioning are at greatest risk

- Property damage
- Loss of water supply
- Increases grassfire potential and intensity
- Impact on logistics
- Power outages
- Road and train track buckling
- Disruption in critical infrastructure operations
- Vehicle engine failure
- Damage to crops

What special events or sporting events are held outside during the summer?

Dublin- Baseball games and rodeos are scheduled in the summer.

Stephenville- 4th of July, Moo-la Fest, Bygone Days, concerts & sporting events, and Splashville Water Park

Erath County Unincorporated- Various running and biking events occur in the summer.

How many extreme heat exposures have been reported since 2012 at these events?

Dublin- None

Stephenville- Numerous reports every summer, possibly 10-30 people.

Erath County Unincorporated- Data is unavailable.

Flooding

Jurisdiction	Location	Probability of Future Events	Level of Possible Damage	Maximum Probable Extent/Strength
Dublin	Extensive	Possible	Limited	Medium
Stephenville	Extensive	Highly Likely	Limited	Major
Erath County Unincorporated	Extensive	Likely	Critical	Medium

Flood location map provided on p.134. Flooding can occur anywhere with low-lying areas, clogged drains, and/or intense rain. Potential impacts from flooding include:

- Loss of electricity
- Loss of, or contamination of, water supply
- Loss of property
- Structure and infrastructure damage – flooded structures and eroded roads
- Misplaced residents
- Snakes migrate and number of mosquitoes increase
- Fire – as a result of loss of water supply
- Debris in transportation paths
- Emergency response delays
- Disruption of traffic can lead to impacts to the economy
- Natural environment damage, to include protected species and critical habitats

Common flooding hazards within the planning area include flood hazards from flash flooding and new development. Flooding from dam failure have never occurred nor is it predicted to occur in the next 5 years. Floodwater can disguise many dangerous obstacles, like uncovered manholes or debris that can cause someone to fall over. Standing water, or water that isn't flowing, can also become a breeding ground for insects that can make people very ill. Another risk can be downed power lines which may still be live.

<p>Considering population, economy, existing and future structures, improved property, critical facilities, critical infrastructure, and protected species, what is specifically vulnerable to flooding in your jurisdiction?</p>
<p>Dublin- Low-lying areas, sewer system, lagoon, and some roadways are susceptible to flooding. Stephenville- Various areas of the city flood. Erath County Unincorporated- Dairies can be impacted by flood events, along with any properties within the floodplains. Many county roads are affected by flash flooding.</p>
<p>Describe future development that may be at risk to flooding based on current zoning maps.</p>
<p>Dublin- N/A Stephenville- N/A Erath County Unincorporated- N/A</p>
<p>What rivers, creeks, and/or lakes are in your jurisdiction?</p>
<p>Dublin- Resley Creek Stephenville- Bosque River and conservation lake dam Erath County Unincorporated- Paluxy and Bosque River</p>
<p>Which of these water sources have a history of flooding?</p>
<p>Dublin- Resley Creek Stephenville- Bosque River Erath County Unincorporated- Paluxy and Bosque River</p>
<p>Name any streets or intersections that experience flooding or flash flooding:</p>
<p>Dublin- Patrick St. Obrien @ Resley Stephenville- Multiple (view map in Appendix A) Erath County Unincorporated- Various streets flood throughout the county.</p>
<p>Identify low water crossings and whether they are bridges or vented/unvented fords:</p>
<p>Dublin- West Elm (vented ford) Stephenville- Long Street (bridge), Prairie Wind Erath County Unincorporated- There are unofficial low water crossings throughout the county.</p> <p><i>A map of low water crossings is provided in Appendix A. Flood locations hazard map provided on p.134.</i></p>
<p>What critical facilities or infrastructure (airports, dams, water treatment facilities, wastewater treatment facilities, schools, hospitals, fire stations, and police stations) are located in the 100-year floodplain?</p>
<p>Dublin- None Stephenville- dam Erath County Unincorporated- Data unavailable</p>

In the event of a wildfire, will flooding and erosion be an issue in restoring destroyed forested slopes?
Dublin- N/A
Stephenville- N/A
Erath County Unincorporated- No

Only the City of Dublin had existing data for the following table:

Jurisdiction	Source	Residential Parcels Located in 100-year Floodplain	Percentage of Total Residential Parcels Located in 100-year Floodplain	Commercial and Industrial Parcels in 100- year Floodplain	Percentage of Commercial and Industrial Parcels in 100- year Floodplain
Dublin	Code Enforcement Department	19	.015%	4	.04%

<i>Flooding from Dam Failure</i>				
Jurisdiction	Location	Probability of Future Events	Level of Possible Damage	Maximum Probable Extent/Strength
Dublin	Negligible	Unlikely	Minor	Minor
Stephenville	Negligible	Unlikely	Minor	Minor
Erath County Unincorporated	Negligible	Unlikely	Minor	Minor

Potential impacts from dam failure include:

- Property and crop damage
- Transportation delays
- Injury or death
- Train derailment

The hazard extent rating scale for dam failure is based on the amount of potential damage that can be caused by a failure. For the purposes of this hazard analysis, damage from dam failure only takes into account areas where developed property is affected.

Although dam failures have the potential to cause extensive damage, there has been no recorded failures in Erath County, as a wide array of measures, including maintenance, are taken to ensure structural integrity. The United States Corps of Engineers (USACE) and the Texas Commission on Environmental Quality (TCEQ) have conducted extensive dam failure training for jurisdictional staff, reducing the impact of flooding from a dam failure to the jurisdictions. Jurisdictions have also worked with the private owners to ensure maintenance is enforced and regulated.

What dams are in your jurisdiction and what would be negatively affected if they failed (both within and outside your jurisdiction)?

Dublin- NE TRIB Leon River WS SCS Site 14 Dam flooding would affect city park.

Stephenville- Upper Bosque River WS SCS Site 15 Dam could affect airport traffic.

Erath County Unincorporated- There are a number of dams throughout the county, but the one that poses a threat is Thurber Lake Dam, impacting an interstate.

The hazard classification of dams is not available to the public, per Homeland Security regulations. If specific information is needed, please contact the dam owner or the Dam Safety Section of the TCEQ.

According to USACE, there are 120 total dams within Erath County: 69% of the dams are regulated by a state agency and 0% are regulated by a federal agency. The average age of the dams is 50 years old.

The following chart identifies the recorded discharge of the dams that were identified by the participants as a potential threat to their communities. Despite other dams being in the area, their failures would have no severe impact on people or property.

DAM_NAME	DAM_LENGTH	DAM_HEIGHT	MAX_DISCHARGE	MAX_STORAGE	DRAINAGE_AREA
NE TRIB LEON RIVER WS SCS SITE 14 DAM	1466	23	1739	320	0.37
UPPER BOSQUE RIVER WS SCS SITE 15 DAM	2900	38	15141	2906	4.3
THURBER LAKE DAM	2590	29	2	1590	4.18

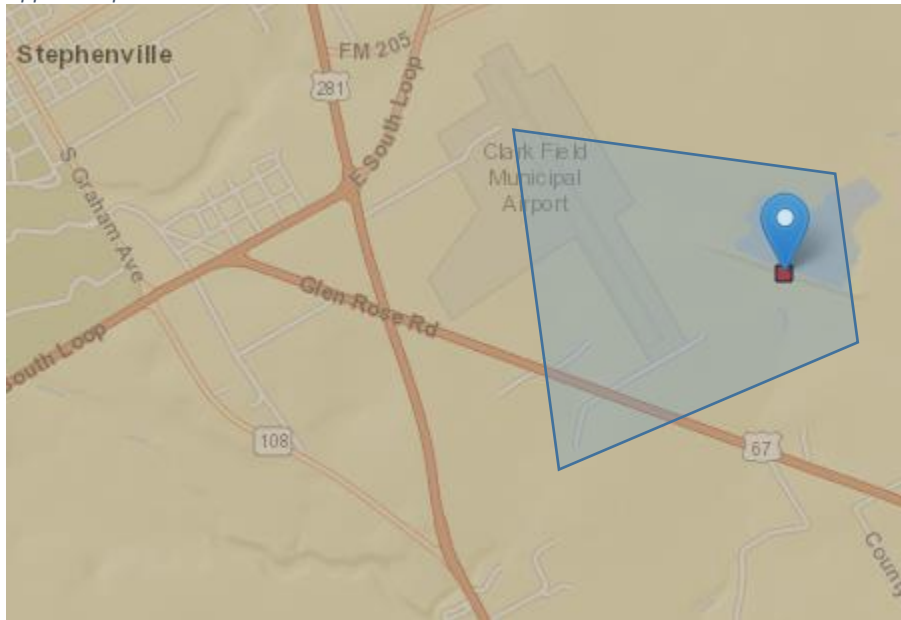
For dams with a maximum storage capacity of 100,000 acre-feet or more, all census blocks within five miles were considered to be at risk to potential dam failure hazards. For dams with a maximum storage capacity between 10,000 and 100,000 acre-feet, all census blocks within three miles were considered at risk to potential dam failure hazards. For dams with a maximum storage capacity of less than 10,000 acre-feet, all census blocks within one mile were considered to be at risk to potential dam failure hazards. Exact dam inundation maps are not available to the public- thus the following information is merely as estimation. For specific information, please contact the dam owners.

The following map shows the **estimated** inundation zones for the three (3) dams the jurisdictions identified as the most impactful to their communities.

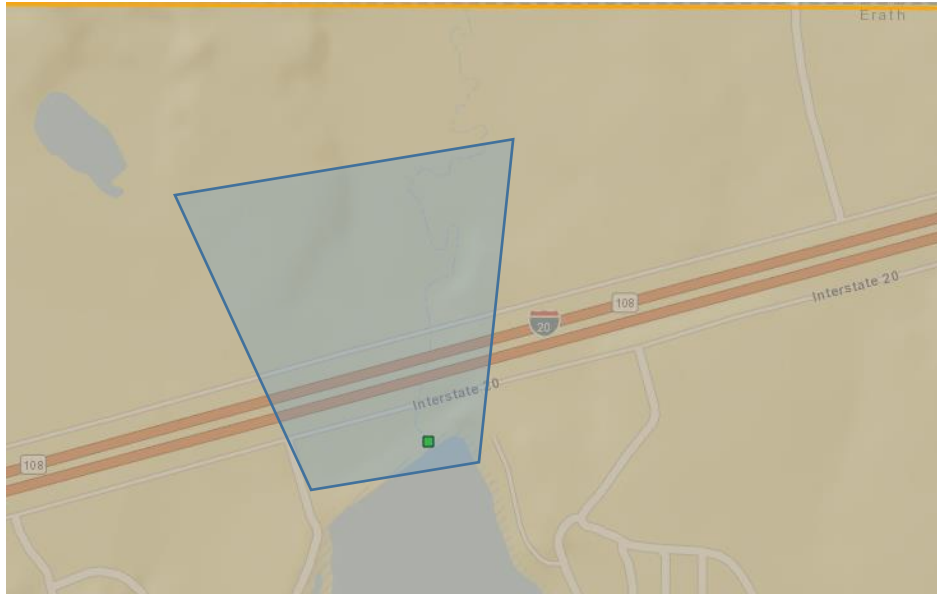
NE TRIB Leon River WS SCS Site 14 Dam



Upper Bosque River WS SCS Site 15 Dam



Thurber Lake Dam



It is each dam owner’s responsibility to ensure that their dam is in compliance with the Texas Commission on Environmental Quality’s ¹⁵(TCEQ) regulations regarding emergency action plans. Additionally, each dam owner required to have an emergency action plan must know and be prepared to take the actions outlined in their emergency action plan, should their dam begin to fail.

Local emergency management is only responsible for the impact of flooding from dam failure on surrounding areas. The responsibility for maintaining a safe dam rests with its owner. Dam owners are also responsible for maintaining safety *at* and *around* their dam. Dam owners are the only ones who can directly maintain the dams and implement mitigation and safety measures on the structures.¹⁶

Responsible Parties	Dam Related Safety Activities
Dam Owners/Operators	<ul style="list-style-type: none"> • Identification of emergency at dam • Initial notifications • Implementation of repairs • Security and technical assistance on site
Local Emergency Management and Local Responders	<ul style="list-style-type: none"> • Public warning • Possible evacuation • Shelter plan activated • Rescue and recovery • State of Emergency declaration • Termination of emergency status
State Emergency Management	<ul style="list-style-type: none"> • Aid affected area when requested • Coordinate specialized assistance

¹⁵ <https://www.tceq.texas.gov/compliance/investigation/damsafetyprog.html> For the most up-to-date information, contact TCEQ directly.

¹⁶ <https://damsafety-prod.s3.amazonaws.com/s3fs-public/files/All%20-%20Dam%20Owner%20Fact%20Sheets%202019.pdf> Dam Ownership Fact Sheet. 2018.

Responsible Parties	Dam Related Safety Activities
	<ul style="list-style-type: none"> • Notify appropriate state agencies • Determine who does what in an emergency

Thunderstorm				
Jurisdiction	Location	Probability of Future Events	Level of Possible Damage	Maximum Probable Extent/Strength
Dublin	Extensive	Possible	Limited	Medium
Stephenville	Extensive	Highly Likely	Critical	Major
Erath County Unincorporated	Extensive	Likely	Critical	Medium

Potential impacts from thunderstorms include:

- Property damage to fences, vehicles, equipment, and roofs
- Transportation delays
- Injury or death
- Electrical grid problems
- Power outage
- Communication problems – phone and internet lines down
- Natural environment damage, to include protected species and critical habitats
- Property damage
- Crop damage
- Fire- caused by lightning
- Blocked roadways from trees and damaged property

Although most new homes and buildings in the participating jurisdictions are built to resist the effects of all but the strongest thunderstorms, several mobile and manufactured home parks and vehicles remain vulnerable. Thousands of homes and vehicles can be damaged by high winds, hail, and lightning in a single storm, causing millions of dollars in damages.¹⁷

Tornado				
Jurisdiction	Location	Probability of Future Events	Level of Possible Damage	Maximum Probable Extent/Strength
Dublin	Extensive	Unlikely	Minor	Medium
Stephenville	Extensive	Likely	Critical	Medium
Erath County Unincorporated	Extensive	Likely	Critical	Medium

Potential impacts from tornadoes include:

- Injury or death
- Power outage

¹⁷ State of Texas Mitigation Plan. 2013, page 72.

- Blocked roadways from trees and damaged property
- Natural gas pipeline breaks – fire injuries, possible deaths
- Transportation disruption
- Rerouting traffic
- Loss of property
- Structure and infrastructure damage
- Misplaced residents
- Natural environment damage, to include protected species and critical habitats

Are there any community safe rooms in your jurisdiction?

Dublin- No

Stephenville- There are safe rooms at the library, City Hall, Tarleton State University, Henderson Junior High and High School.

Erath County Unincorporated- No

Wildfire

Jurisdiction	Location	Probability of Future Events	Level of Possible Damage	Maximum Probable Extent/Strength
Dublin	Negligible	Unlikely	Minor	Minor
Stephenville	Limited	Possible	Minor	Minor
Erath County Unincorporated	Significant	Likely	Critical	Medium

Potential impacts from wildfires include:

- Injury or death
- Property and fence damage
- Road closure
- Loss of power – burning utility poles
- Loss of property
- Loss of crops and livestock
- Structure and infrastructure damage
- Misplaced residents
- Loss of resources
- Natural environments damage, to include protected species and critical habitats

Considering population, economy, existing and future structures, improved property, critical facilities, critical infrastructure, and protected species, what is specifically vulnerable to wildfires in your jurisdiction?

Dublin- Barns and crops

Stephenville- It is estimated that 5,482 people or 33.7 % percent of the total project area population (16,289) live within the WUI.

Erath County Unincorporated- The large ranches are susceptible to fires.

Please view WUI maps provided in this plan for details.

Where are sources of open space, greater than 25 acres, in your jurisdiction?

Dublin- None

Stephenville- There is a large city park and the city is surrounded by open space.

Erath County Unincorporated- The county is filled with farms and ranches.

Does your jurisdiction participate in prescribed burns? *A controlled or prescribed burn, also known as hazard reduction burning, backfire, swailing, or a burn-off, is a wildfire set intentionally for purposes of forest management, farming, prairie restoration or greenhouse gas abatement.*

Dublin- No

Stephenville- No

Erath County Unincorporated- No

Winter Storm

	Location	Probability of Future Events	Level of Possible Damage	Maximum Probable Extent/Strength
Dublin	Extensive	Unlikely	Minor	Minor
Stephenville	Extensive	Likely	Critical	Major
Erath County Unincorporated	Extensive	Likely	Critical	Medium

Potential impacts from winter storms include:

- Structure and infrastructure damage
- Injury or death
- Power outages
- Loss of ability to use roads for driving
- Increased traffic accidents
- Loss of heat
- Stranded travelers / motels at full capacity
- Tree debris create fuel load for fire hazard
- Delayed emergency response time
- Frozen/ busted pipes leading to loss of water
- Disruption of traffic
- Impacts to the economy
- Communication capabilities decrease

List bridges and overpasses within the jurisdiction that could be impacted by a winter storm:

Dublin- Wild Street, Grafton Street, and loop overpasses.

Stephenville- View bridges in Appendix A.

Erath County Unincorporated- Numerous bridges are located throughout the county.

3.7 Hazard Ranking

Due to the frequency of occurrence and high impact of hazards during this planning period, the ranking order of these hazards has changed since the 2015 plan. After assessing the vulnerabilities, capabilities, and risks, the participating jurisdictions considered the possible effects on population, economy, existing and future structures, improved property, critical facilities and infrastructure, and the natural environment when ranking each hazard.

The following table reflects the rankings of each hazard, per jurisdiction.

Jurisdiction	Drought	Earthquake	Expansive Soils	Extreme Heat	Flooding	Dam Failure Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms
Dublin	5	10	8	3	4	9	2	6	1	7
Stephenville	7	9	6	3	4	10	1	5	8	2
Erath County Unincorporated	6	9	8	7	1	10	3	5	4	2

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Chapter 4: Mitigation Strategy

Requirement	
§201.6(c)(3)	[The plan shall include the following:] A mitigation strategy that provides the jurisdiction’s blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs, and resources, and its ability to expand on and improve these existing tools.
§201.6(c)(3)(i)	[The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.
§201.6(c)(3)(iii)	[The hazard mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. All plans approved by FEMA [Federal Emergency Management Agency] after October 1, 2008, must also address the jurisdiction’s participation in the NFIP [National Flood Insurance Program], and continued compliance with NFIP requirements, as appropriate.
§201.6(c)(3)(iv)	[The hazard mitigation strategy shall include an] action plan, describing how the action identified in paragraph (c)(3)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.
§201.6(c)(4)(ii)	<p>For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.</p> <p>[The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvements, when appropriate.</p>

4.1 Mitigation Goals

The Erath County Hazard Mitigation Planning Team reviewed the previous Erath County mitigation goals and unanimously agreed to forego these goals and adopt the following hazard mitigation goals:

“Our goals are to protect life and reduce bodily harm from natural hazards, and to lessen the impacts of natural hazards on property and the community through hazard mitigation.”

4.2 Mitigation Strategy

The mitigation strategy serves as the long-term blueprint for reducing the potential losses identified in the risk assessment. The Stafford Act directs hazard mitigation plans to describe hazard mitigation actions and establish a strategy to implement those actions. Therefore, all other requirements for a hazard mitigation plan lead to and support the mitigation strategy.

Each participating jurisdiction recommended strategies and actions that would support the mitigation goals, then went through a ranking process to determine which actions they would prioritize for completion. The jurisdictions conducted a cost benefit analysis to determine which strategies would most benefit their community. All project cost estimations are based on agency expertise by those submitting mitigation actions as well as previous project costs; however, many projects provided have not yet undergone the official benefit-cost analysis provided by FEMA. In these cases, jurisdictions derived the benefit cost per project based on a study conducted by the National Institute of Building Science. This study estimates that past 23 years of federally funded natural hazard mitigation has prevented approximately one million nonfatal injuries, 600 deaths, and 4,000 cases of post-traumatic stress disorder (PTSD), a total cost savings of \$68 billion. The key findings of the report included that \$1 spent on mitigation saves society an average of \$6, with positive benefit-cost ratios for all hazard types studied.¹⁸ Therefore, to reflect the benefits of future projects, each estimated project was multiplied by 6 to represent the benefit of each mitigation strategy. Utilizing this information, in addition to their jurisdiction's priorities, jurisdictions ranked their mitigation strategies and submitted them to the HMPT.

4.3 Funding Priorities

As necessary, Erath County and participating jurisdictions will seek outside funding sources to implement mitigation projects in both the pre-disaster and post-disaster environments. When applicable, potential funding sources have been identified for proposed actions listed in the mitigation strategies.

Priority will go towards projects will the highest positive impact on community resilience.

4.4 Status of Previous Mitigation Action Items

The action items in the 2015 Erath County HazMAP were determined by the 2015 Local Planning Team (LPT) in each jurisdiction. Below are the action items from each participating jurisdiction from the 2015 plan and the status of each action. Actions deleted are no longer a priority and actions deferred are deferred to this HazMAP. The City of Dublin is a new participant; thus, they do not have previous action to identify.

City of Stephenville	
Status	2015 Mitigation Actions
Deferred	Adapt existing city structure to serve as city emergency operations center.
In-progress	Develop a comprehensive public education program for distribution to Stephenville residents.

¹⁸ Multihazard Mitigation Council (2017) Natural Hazard Mitigation Saves 2017 Interim Report: An Independent Study. Principal Investigator Porter, K.; Co-Principal Investigators Scawthorn, C.; Dash, N.; Santos, J.; Investigators: Eguchi, M., Ghosh, S., Huyck, C., Isteita, M., Mickey, K., Rashed, T.; P. Schneider, Director, MMC. National Institute of Building Sciences, Washington.

City of Stephenville	
Status	2015 Mitigation Actions
Deferred	Install covered parking areas as needed to protect city vehicles against hail.
Completed	Implement the Texas Individual Tornado Safe Room Rebate Program
Deferred	Develop a Community Wildfire Protections Plan (CWPP)
Deleted	Purchase and install a CASA WX weather radar.
Deferred	Create cooling and warming centers to allow citizens, especially vulnerable populations, to seek refuge from extreme hot and cold temperatures.
In-progress	Develop and implement stormwater drainage master plan.
Deferred	Develop a contingency plan for use in the event of mandatory water rationing.
Deferred	Purchase generators to ensure continues operation of critical infrastructure during and after severe weather events and other disasters.
Deleted	Develop and implement a tree-trimming program to minimize potential effects on power lines.
Deleted	Hire a consultant to complete a dam inundation study, safety study, and inventory of mitigation activities to implement for the city dams.
Deleted	Conduct a seismology study to determine scope, impact, and extent of potential earthquakes.

Erath County Unincorporated	
Status	2015 Mitigation Actions
In-progress	Develop and implement a comprehensive public education program.
Completed	Purchase and implement a phone-based emergency mass notification program for county citizens to receive information
In-progress	Installation and maintenance of a CASA Weather Radar system
In-progress	Implement the Texas Individual Tornado Safe Room Rebate Program
In-progress	Dig a well and install a pumping station to provide an additional water source for the Unincorporated County
In-progress	Construct a 30,000-gallon water storage tank to store emergency water reserves for the County VFD.
In-progress	Purchase and distribute NOAA weather radios to Erath County residents
In-progress	Retrofit critical facilities with hail resistant roofing and hail resistant window coverings.
In-progress	Develop and implement a tree-trimming program to minimize amount of debris generated during severe weather events
In-progress	Develop a drought contingency plan
In-progress	Initiate a targeted fuel load reduction campaign to reduce the potential for wildland-urban interface fires.
In-progress	Develop a Community Wildfire Plan
In-progress	Create a Storm Water Management Program to analyze historical and current conditions contributing to flooding.
Deleted	Develop a buyout program for repetitive flood loss areas within the county
In-progress	Fix drainage issues and culvert replacement on areas that continue to flood.
In-progress	Complete a detailed structural/engineering survey of County facilities to ensure their soundness with respect to resisting the effects of high winds and hail. Forms basis for decisions about any additional actions required to mitigate risk.

Erath County Unincorporated	
Status	2015 Mitigation Actions
In-progress	Conduct a review of the county's current plans and resources to address the risks posed by ice and snow hazards during winter storms. Focus on the county's ability to respond to snow and ice emergencies, and on potentially at-risk populations in the county.
In-progress	Identify sites where stream, rain, and low water crossing gauges are needed in order to study the flow patterns of the various rivers and streams within Erath County.
In-progress	Public information/education releases to remind citizens to be aware of potential loss of life to wildfires and the impact that early warning/recognition will bring them.
In-progress	Seek grant funding to assist with education of water conservation measures during periods of extreme temperature and limited rainfall.
In-progress	Hire a consultant to complete a dam inundation study, safety study, and inventory of mitigation activities to implement for the county dams.
Deferred	Conduct a seismology study to determine scope, impact, and extent of potential earthquakes.

4.5 New Mitigation Action Items

New action items were determined by each participating jurisdiction's Local Planning Team for the 2020 Hazard Mitigation Action Plan (HazMAP). These actions include mitigation actions that qualify for mitigation funding as well as enforcement, maintenance, and response actions that the jurisdictions have identified as opportunities to increase their resiliency to hazards.

During the capabilities assessment and hazard analysis, previously impacted assets and populations were analyzed to determine the highest probability of damage and potential of loss of life per hazard. To determine the estimated benefit of each action item, data from the 2017 Interim Report was used to develop a cost-benefit analysis [*Estimated Cost x 6 = Estimated Benefit*], as it reports that \$1 spent in mitigation saves a community an average of \$6 in recovery¹⁹.

Remaining consistent with previous plans, **Priority** will go towards projects with the highest positive impact on community resilience, including life safety and property protection.

Below are the action items for this HazMAP.

¹⁹ Natural Hazard Mitigation Saves: 2017 Interim Report. National Institute of Building Science. < <https://www.nibs.org/page/mitigationsaves> >

City of Dublin Mitigation Action Items

Hazard(s) Addressed	Flooding
Action: Improve water drainage issues on Resley Creek to include replacing/improving existing culverts.	
Participating Jurisdiction	City of Dublin
Priority:	1
Estimated Cost:	\$500,000
Estimated Benefit:	\$3,000,000
Potential Funding Source(s):	City General Fund, grants
Lead Agency/Department Responsible:	Public Works Department
Implementation Schedule:	24 months
Hazard(s) Addressed	Earthquakes, Extreme Heat, Flooding, Dam Failure Flooding, Thunderstorms, Tornadoes, Wildfires, Winter Storms
Action: Utilize a mass notification system to provide mass alerts/warnings to residents.	
Participating Jurisdiction	City of Dublin
Priority:	2
Estimated Cost:	\$25,000
Estimated Benefit:	\$150,000
Potential Funding Source(s):	City General Fund, grants
Lead Agency/Department Responsible:	Police Department
Implementation Schedule:	24 months
Hazard(s) Addressed	Drought
Action: Create a public campaign to encourage citizens to utilize water saving measures during times of drought.	
Participating Jurisdiction	City of Dublin
Priority:	3
Estimated Cost:	\$3,500
Estimated Benefit:	\$21,000
Potential Funding Source(s):	City General Fund, grants
Lead Agency/Department Responsible:	Code Enforcement
Implementation Schedule:	24 months

Hazard(s) Addressed	Earthquakes, Flooding, Thunderstorms, Tornadoes
Action: Distribute tornado/storm shelter location information.	
Participating Jurisdiction	City of Dublin
Priority:	4
Estimated Cost:	\$5,500
Estimated Benefit:	\$33,000
Potential Funding Source(s):	City General Fund, grants
Lead Agency/Department Responsible:	Office of the City Manager, Office of Emergency Management
Implementation Schedule:	24 months
Hazard(s) Addressed	Wildfires
Action: Begin the process of becoming a Firewise Community.	
Participating Jurisdiction	City of Dublin
Priority:	5
Estimated Cost:	\$5,000
Estimated Benefit:	\$30,000
Potential Funding Source(s):	City General Fund, grants
Lead Agency/Department Responsible:	Office of the City Manager, Office of Emergency Management
Implementation Schedule:	24 months
Hazard(s) Addressed	Drought, Earthquakes, Expansive Soils, Extreme Heat, Flooding, Dam Failure Flooding, Thunderstorms, Tornadoes, Wildfires, Winter Storms
Action: Create a database to track areas of vulnerable populations who are at higher risks to natural hazards, such as the elderly, homeless, etc.	
Participating Jurisdiction	City of Dublin
Priority:	6
Estimated Cost:	\$10,000
Estimated Benefit:	\$60,000
Potential Funding Source(s):	City General Fund, grants
Lead Agency/Department Responsible:	Office of the City Manager, Office of Emergency Management
Implementation Schedule:	24 months

Hazard(s) Addressed	Flooding
Action: Become a NFIP CRS participant.	
Participating Jurisdiction	City of Dublin
Priority:	7
Estimated Cost:	\$1,000
Estimated Benefit:	\$6,000
Potential Funding Source(s):	City General Fund, grants
Lead Agency/Department Responsible:	Office of the City Manager
Implementation Schedule:	24 months
Hazard(s) Addressed	Drought, Earthquakes, Expansive Soils, Extreme Heat, Flooding, Dam Failure Flooding, Thunderstorms, Tornadoes, Wildfires, Winter Storms
Action: Purchase backup generators for existing and future critical facilities.	
Participating Jurisdiction	City of Dublin
Priority:	8
Estimated Cost:	\$300,000
Estimated Benefit:	\$1,800,000
Potential Funding Source(s):	City General Fund, grants
Lead Agency/Department Responsible:	Office of the City Manager, Office of Emergency Management
Implementation Schedule:	24 months
Hazard(s) Addressed	Earthquakes, Expansive Soils, Flooding, Dam Failure Flooding
Action: Establish a regular schedule to monitor dams on a quarterly basis.	
Participating Jurisdiction	City of Dublin
Priority:	9
Estimated Cost:	\$1,000
Estimated Benefit:	\$6,000
Potential Funding Source(s):	General Fund, grants
Lead Agency/Department Responsible:	Public Works Department
Implementation Schedule:	24 months

Hazard(s) Addressed	Drought, Earthquakes, Expansive Soils, Extreme Heat, Flooding, Dam Failure Flooding, Thunderstorms, Tornadoes, Wildfires, Winter Storms
Action: Update and/or adopt the most current building code, residential code, mechanical code, plumbing code, and electrical code.	
Participating Jurisdiction	Dublin
Priority:	10
Estimated Cost:	\$5,000.00
Estimated Benefit:	\$30,000.00
Potential Funding Source(s):	City Budget
Lead Agency/Department Responsible:	Code Enforcement Office
Implementation Schedule:	24 months

City of Stephenville Mitigation Action Items

Hazard(s) Addressed	Thunderstorms, Tornadoes
Action: Install multiple above- and/or below-ground commercial storm shelters throughout the city, including at least one at each of the city parks. Each would hold 80 people.	
Participating Jurisdiction	Stephenville
Priority:	1
Estimated Cost:	\$2,370,000.00
Estimated Benefit:	\$14,220,000.00
Potential Funding Source(s):	City Budget, Capital Improvement Budget, Grants
Lead Agency/Department Responsible:	Public Works Department
Implementation Schedule:	24 months
Hazard(s) Addressed	Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Dam Failure Flooding, Thunderstorms, Tornadoes, Wildfires, Winter Storms
Action: Update and/or adopt the most current building code, residential code, mechanical code, plumbing code, and electrical code.	
Participating Jurisdiction	Stephenville
Priority:	2
Estimated Cost:	\$5,000.00
Estimated Benefit:	\$30,000.00
Potential Funding Source(s):	City Budget
Lead Agency/Department Responsible:	Building Official
Implementation Schedule:	24 months

Hazard(s) Addressed	Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Dam Failure Flooding, Thunderstorms, Tornadoes, Wildfires, Winter Storms
Action: Enhance the current public education program to address the risks and mitigation actions for the identified hazards using social media, city website, local newspaper, and public outreach.	
Participating Jurisdiction	Stephenville
Priority:	3
Estimated Cost:	\$100.00
Estimated Benefit:	\$600.00
Potential Funding Source(s):	City Budget, Grants
Lead Agency/Department Responsible:	Fire Department
Implementation Schedule:	24 months
Hazard(s) Addressed	Drought, Extreme Heat, Thunderstorms, Wildfires
Action: Develop a Wildland-Urban Interface Code. This code can also assist with promoting drought resistant vegetation and tree/brush pruning for severe weather.	
Participating Jurisdiction	Stephenville
Priority:	4
Estimated Cost:	\$5,000.00
Estimated Benefit:	\$30,000.00
Potential Funding Source(s):	City Budget, Capital Improvement Budget, Grants, Firewise Program
Lead Agency/Department Responsible:	Fire Department
Implementation Schedule:	24 months
Hazard(s) Addressed	Flooding
Action: Participate in the NFIP Community Rating System program.	
Participating Jurisdiction	City of Stephenville
Priority:	5
Estimated Cost:	\$1,000.00
Estimated Benefit:	\$6,000.00
Potential Funding Source(s):	City Budget, Grants
Lead Agency/Department Responsible:	Public Works Department
Implementation Schedule:	24 months

Hazard(s) Addressed	Earthquakes, Expansive Soils, Flooding, Dam Failure Flooding
Action: Establish a regular schedule to monitor dams on a quarterly basis.	
Participating Jurisdiction	City of Stephenville
Priority:	6
Estimated Cost:	\$1,000
Estimated Benefit:	\$6,000
Potential Funding Source(s):	General Fund, grants
Lead Agency/Department Responsible:	Public Works Department
Implementation Schedule:	24 months

Erath County Unincorporated Mitigation Action Items

Hazard(s) Addressed	Earthquakes, Thunderstorms, Tornadoes
Action: Implement the construction and use of safe rooms in homes, mobile home parks, fairgrounds, campgrounds, shopping malls, or other vulnerable public structures.	
Participating Jurisdiction	Erath County Unincorporated
Priority:	1
Estimated Cost:	\$100
Estimated Benefit:	\$600
Potential Funding Source(s):	County Budget, Grants
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	24 months
Hazard(s) Addressed	Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Dam Failure Flooding, Thunderstorms, Tornadoes, Wildfires, Winter Storms
Action: Enhance the current public education program to address the risks and mitigation actions for the identified hazards using social media, city website, local newspaper, and public outreach.	
Participating Jurisdiction	Erath County Unincorporated
Priority:	2
Estimated Cost:	\$100
Estimated Benefit:	\$600
Potential Funding Source(s):	County Budget, Grants
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	24 months

Hazard(s) Addressed	Flooding, Dam Failure Flooding
Action: Develop and maintain a database to track community exposure to flood risk and repetitive loss properties; utilize data collected to provide GIS mapping for public usage	
Participating Jurisdiction	Erath County Unincorporated
Priority:	3
Estimated Cost:	\$1,500
Estimated Benefit:	\$9,000
Potential Funding Source(s):	County Budget, Grants
Lead Agency/Department Responsible:	Emergency Services
Implementation Schedule:	24 months
Hazard(s) Addressed	Drought
Action: Establish a regular schedule to monitor and report drought conditions on a monthly basis.	
Participating Jurisdiction	Erath County Unincorporated
Priority:	4
Estimated Cost:	\$100
Estimated Benefit:	\$600
Potential Funding Source(s):	County Budget, Grants
Lead Agency/Department Responsible:	Emergency Services
Implementation Schedule:	24 months
Hazard(s) Addressed	Drought, Expansive Soils, Extreme Heat, Flooding, Dam Failure Flooding
Action: Develop a vegetation maintenance schedule on dams to optimize stormwater runoff and prevent clogging of drainage infrastructure.	
Participating Jurisdiction	Erath County Unincorporated
Priority:	5
Estimated Cost:	\$2,000
Estimated Benefit:	\$12,000
Potential Funding Source(s):	County Budget, Grants
Lead Agency/Department Responsible:	County Commissioners
Implementation Schedule:	24 months
Hazard(s) Addressed	Flooding, Dam Failure Flooding, Wildfires
Action: Purchase and use drone or UAS technology for reconnaissance to detect fire hot spots, inspect dams, view flood hazards, and the find potential threats to critical facilities and personnel.	
Participating Jurisdiction	Erath County Unincorporated
Priority:	6
Estimated Cost:	\$5,000
Estimated Benefit:	\$30,000
Potential Funding Source(s):	County Budget, Grants
Lead Agency/Department Responsible:	Emergency Services

Implementation Schedule:	24 months
Hazard(s) Addressed	Earthquakes, Flooding, Dam Failure Flooding
Action: Replace bridges with ones that are stronger and at a higher elevation across bodies of water.	
Participating Jurisdiction	Erath County Unincorporated
Priority:	7
Estimated Cost:	\$1,500,000
Estimated Benefit:	\$9,000,000
Potential Funding Source(s):	County Budget, Grants
Lead Agency/Department Responsible:	County Commissioners
Implementation Schedule:	24 months
Hazard(s) Addressed	Thunderstorms, Tornadoes, Winter Storms
Action: Establish and implement tree trimming program to clear hazards near electrical lines.	
Participating Jurisdiction	Erath County Unincorporated
Priority:	8
Estimated Cost:	\$5,000
Estimated Benefit:	\$30,000
Potential Funding Source(s):	County Budget, Grants
Lead Agency/Department Responsible:	County Commissioners
Implementation Schedule:	24 months
Hazard(s) Addressed	Wildfires
Action: Enact an ordinance aimed at conservation of open space or wildland-urban interface boundary zones to separate developed areas from high-hazard areas.	
Participating Jurisdiction	Erath County Unincorporated
Priority:	9
Estimated Cost:	\$2,000
Estimated Benefit:	12,000
Potential Funding Source(s):	County Budget, Grants
Lead Agency/Department Responsible:	Emergency Services
Implementation Schedule:	24 months
Hazard(s) Addressed	Flooding
Action: Develop an educational flyer targeting NFIP policyholders on increased cost of compliance during post-flood damage.	
Participating Jurisdiction	Erath County Unincorporated
Priority:	10
Estimated Cost:	\$100
Estimated Benefit:	\$600
Potential Funding Source(s):	County Budget, Grants
Lead Agency/Department Responsible:	Emergency Management

Implementation Schedule:	24 months
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Hazard(s) Addressed	Extreme Heat
Action: Implement a tree planting program to increase the amount of natural shade for residents and visitors.	
Participating Jurisdiction	Erath County Unincorporated
Priority:	11
Estimated Cost:	\$200,000
Estimated Benefit:	\$1,200,000
Potential Funding Source(s):	County Budget, Grants
Lead Agency/Department Responsible:	County Commissioners
Implementation Schedule:	24 months
Hazard(s) Addressed	Drought, Expansive Soils, Extreme Heat, Flooding
Action: Use Smartscape in existing and new developments landscapes	
Participating Jurisdiction	Erath County Unincorporated
Priority:	12
Estimated Cost:	\$100,000
Estimated Benefit:	\$600,000
Potential Funding Source(s):	County Budget, Grants, Property Owners
Lead Agency/Department Responsible:	County Commissioners
Implementation Schedule:	24 months

4.6 Incorporation into Existing Planning Mechanisms

Based on Requirement 201.6(c)(4)(ii) and the State of Texas Mitigation Plan, the vulnerability and capabilities assessment for the town were carefully reviewed and considered when developing the mitigation actions for this plan. The Local Planning Team (LPT) will establish a process in which the mitigation strategy, goals, objectives, and actions outlined in this plan will be incorporated into the existing local planning strategies. At this time, the HazMAP has not been formally integrated into existing planning mechanisms.

Once the plan is adopted, the LPT will coordinate implementation with the responsible parties in the town, as well as external stakeholders as needed.

The following steps will be taken in implementing this HazMAP into local plans:

1. Change is proposed by an elected official or other interested party.
2. Proposal is placed on the local agenda of the governing body.
3. Agenda is published at least 10 days in advance of the meeting at which it will be discussed, so members of the public have an opportunity to attend the discussion meeting. Publication may be

made by posting the agenda on the city’s website, in the city newsletter, or on a public bulletin board.

4. Proposal is discussed at the planning meeting, including any comments by members of the public attendance.
5. Proposal is voted on by the governing body.
6. If the proposal is passed, the change is implemented by the appropriate party.

Planning mechanisms in which the HazMAP will be integrated are listed below.

Jurisdiction	Type of Plan or Activity	Department Responsible	Update Schedule	Actions to be Integrated
Dublin	Stormwater Management Plan	Public Works Departments	Every 5 years	Reference this HazMAP when developing the plan.
Dublin	Comprehensive Plan	City Administration	Every 5 years	Reference HazMAP when being stages of plan.
Stephenville	Capital Improvement Plan	City Administration	Annually	Reference this HazMAP when developing the plan.
Stephenville	Comprehensive Plan	Planning, Zoning, and Public Works Departments	Annually	Reference this HazMAP when developing the plans for critical infrastructure and resources.
Erath County Unincorporated	Emergency Action Plan	Emergency Management	Every 5 years	Reference this HazMAP when updating the ordinance.

Although it is recognized that there are many possible benefits to integrating components of this Hazard Mitigation Action Plan (HazMAP) into other planning mechanisms, the participating jurisdictions consider this HazMAP, including development and maintenance, to be the primary vehicle to ensure implementation of local hazard mitigation actions.

Chapter 5: Conclusion

Through the development of this plan, Erath County has developed a thorough hazard history, an inventory of critical facilities, and an assessment of their current capabilities. This data, when used in conjunction with the updated information about hazard threats and vulnerabilities, will prove to be invaluable to Erath County and its participating jurisdictions.

Natural hazards have been identified county-wide and technological hazards have been listed for selected jurisdictions that opted to include these hazards. Mitigation projects that could reduce the risk of lives and property due to the identified threats have been compiled and prioritized.

The creation of the Erath County Hazard Mitigation Planning Team (HMPT) brought together stakeholders from communities and organizations onto one planning team. This group has been able to work together effectively and efficiently to produce this document and establish a greater awareness of risks and mitigation strategies.

In addition to the HMPT, the creation of the Local Planning Team (LPT) in each jurisdiction brought together stakeholders and departments within the jurisdiction onto one planning team. This group was able to work together effectively and efficiently to produce jurisdictional data for this document and establish a greater awareness of risks and mitigation strategies.

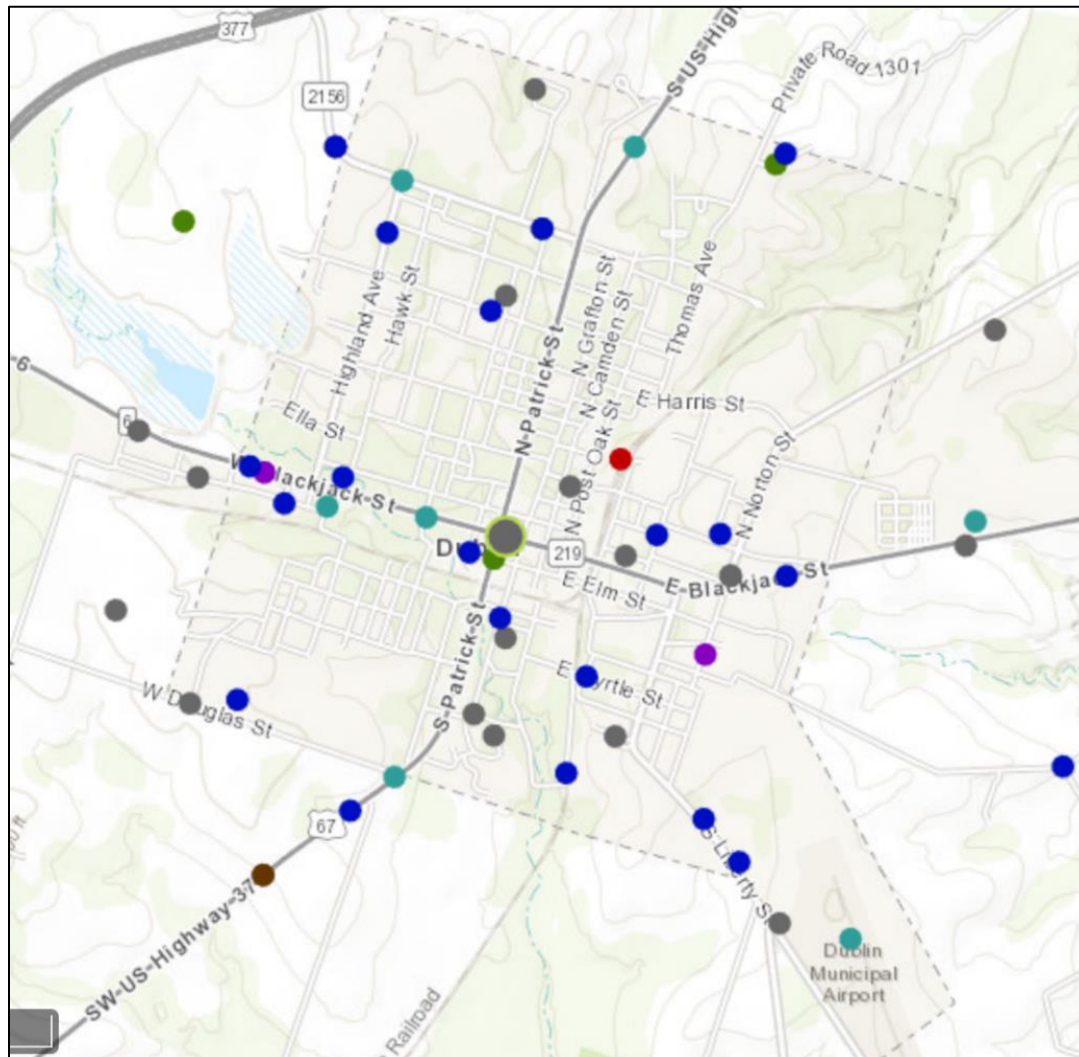
This plan will continue to evolve as necessary to properly represent the threats and vulnerabilities affecting Erath County. Continued public participation is encouraged and will continue through the ongoing multijurisdictional hazard mitigation process. The plan, in its entirety (not limited to but including development, public participation, hazard identification, and mitigation actions), will continue to be monitored and evaluated.

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Appendix A: Maps & Tables

City of Dublin

Wildfire Ignitions, 2005-2015



Wildfire Ignitions

Cause	Cause
Incendiary	Railroads
Lightning	Power Lines
Campfire	Children
Smoking	Debris Burning
Fireworks	Structure
Equipment User	Miscellaneous

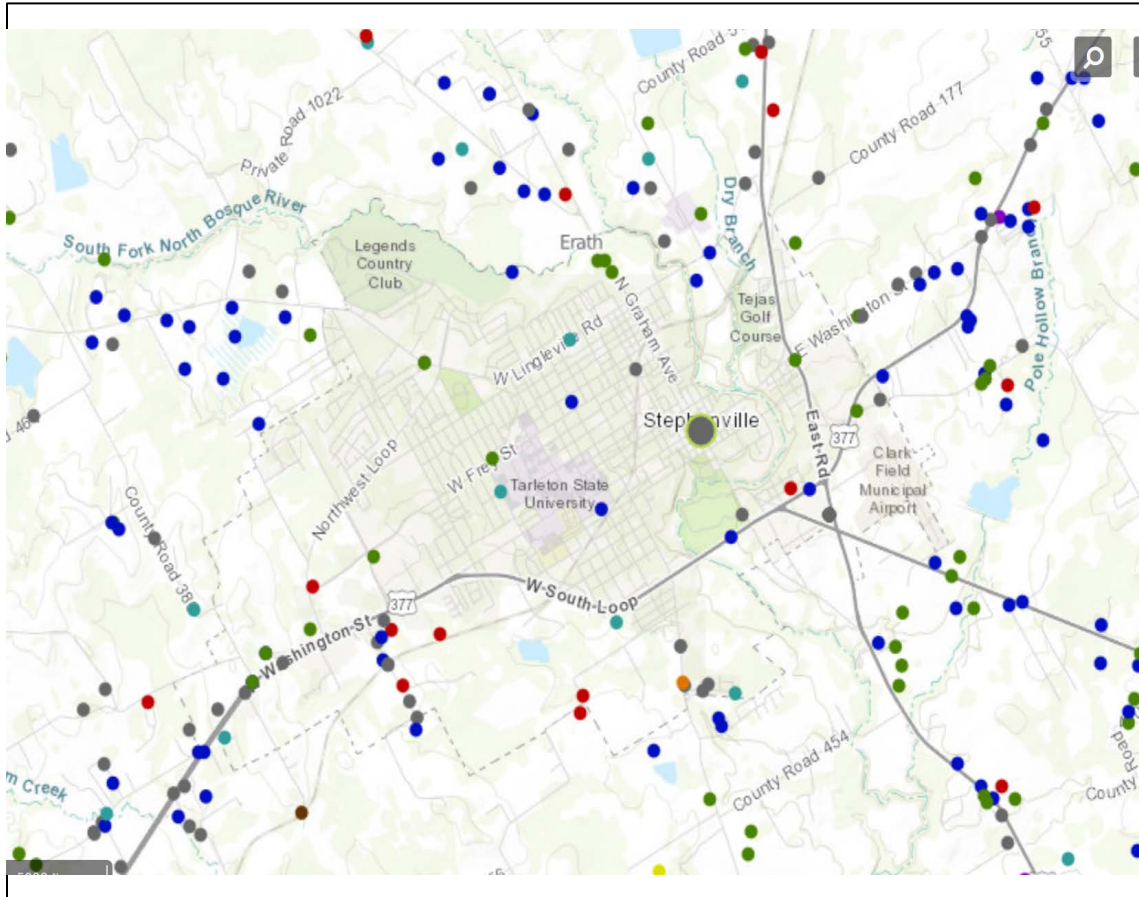
Source: [Texas A&M Forest Service](#)

Dublin Critical and Vulnerable Facility & Infrastructure Table

At Risk To: (Yes (Y) or No (N))								Dublin Critical and Vulnerable Facility and Infrastructure Inventory	
Drought	Expansive Soils	Extreme Heat	Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms	Facility Name or Description	Address
Y	Y	Y		Y	Y		Y	City Hall	213 East Blackjack
Y	Y	Y		Y	Y		Y	EMS	213 East Blackjack
Y	Y	Y		Y	Y		Y	1 st National Bank	825 North Patrick
Y	Y	Y		Y	Y		Y	Dublin National Bank	128 S. Patrick
Y	Y	Y		Y	Y		Y	Dublin Fire Department	213 E. Blackjack
Y	Y	Y		Y	Y		Y	Dublin ISD	420 North Camden
Y	Y	Y		Y	Y		Y	Brookshires Grocery	300 North Patrick
Y	Y	Y		Y	Y		Y	Dublin Dentistry	117 North Grafton
Y	Y	Y		Y	Y		Y	Jeff Hutchins Dr.	305 North Patrick
Y	Y	Y		Y	Y		Y	Best Value Pharmacy	604 North Patrick
Y	Y	Y		Y	Y		Y	Central Inn	723 North Patrick
Y	Y	Y		Y	Y		Y	3 Oaks Retirement	118 Live Oak
Y	Y	Y		Y	Y		Y	Golden Age Senior Home	
Y	Y	Y		Y	Y		Y	1 st United Methodist Church	
Y	Y	Y		Y	Y		Y	Dublin First Baptist Church	
Y	Y	Y		Y	Y		Y	Dublin Church of Christ	
Y	Y	Y		Y	Y		Y	Deluxe Inn	

City of Stephenville

Wildfire Ignitions, 2005-2015




Wildfire Ignitions

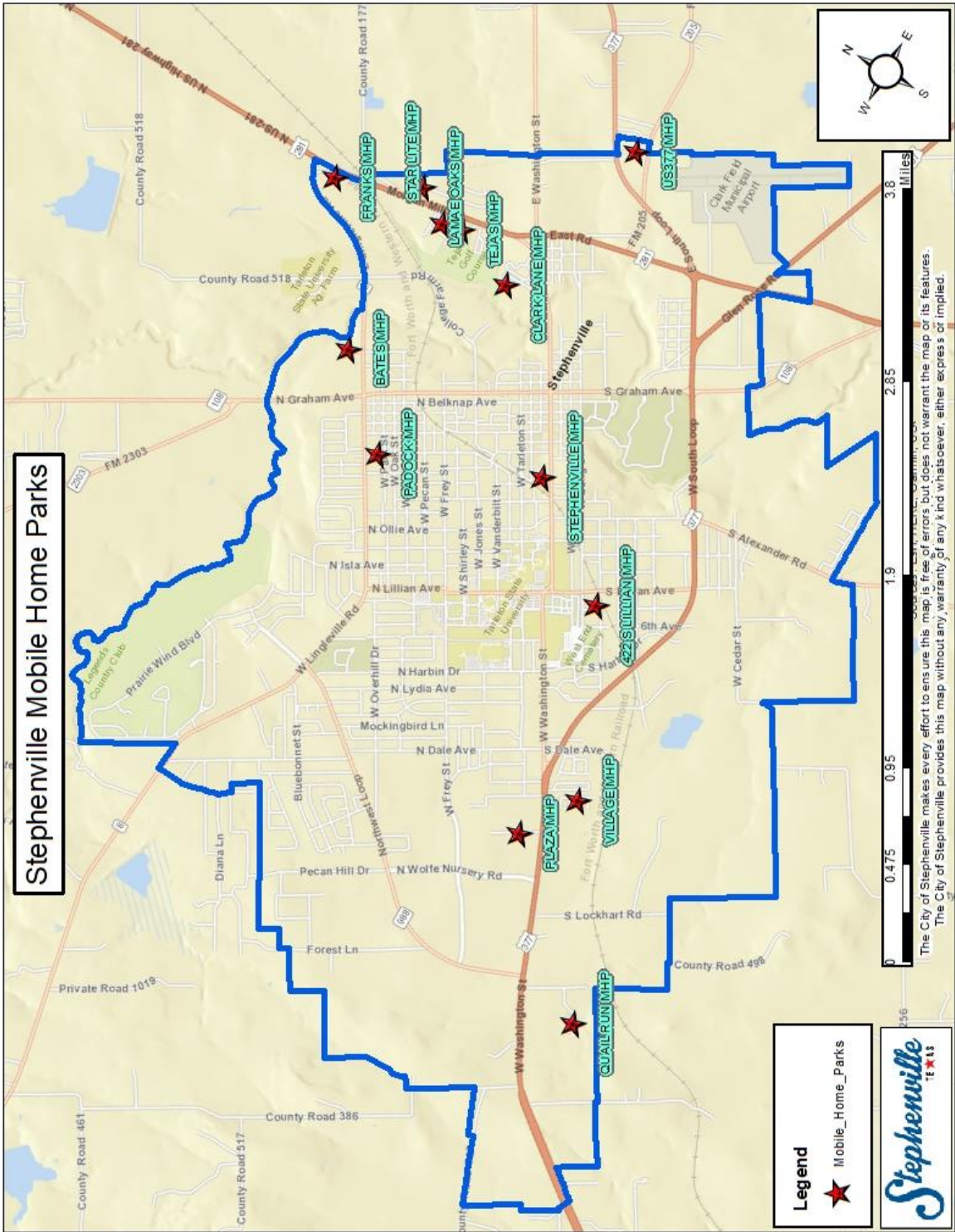
Cause	Cause
Incendiary	Railroads
Lightning	Power Lines
Campfire	Children
Smoking	Debris Burning
Fireworks	Structure
Equipment User	Miscellaneous

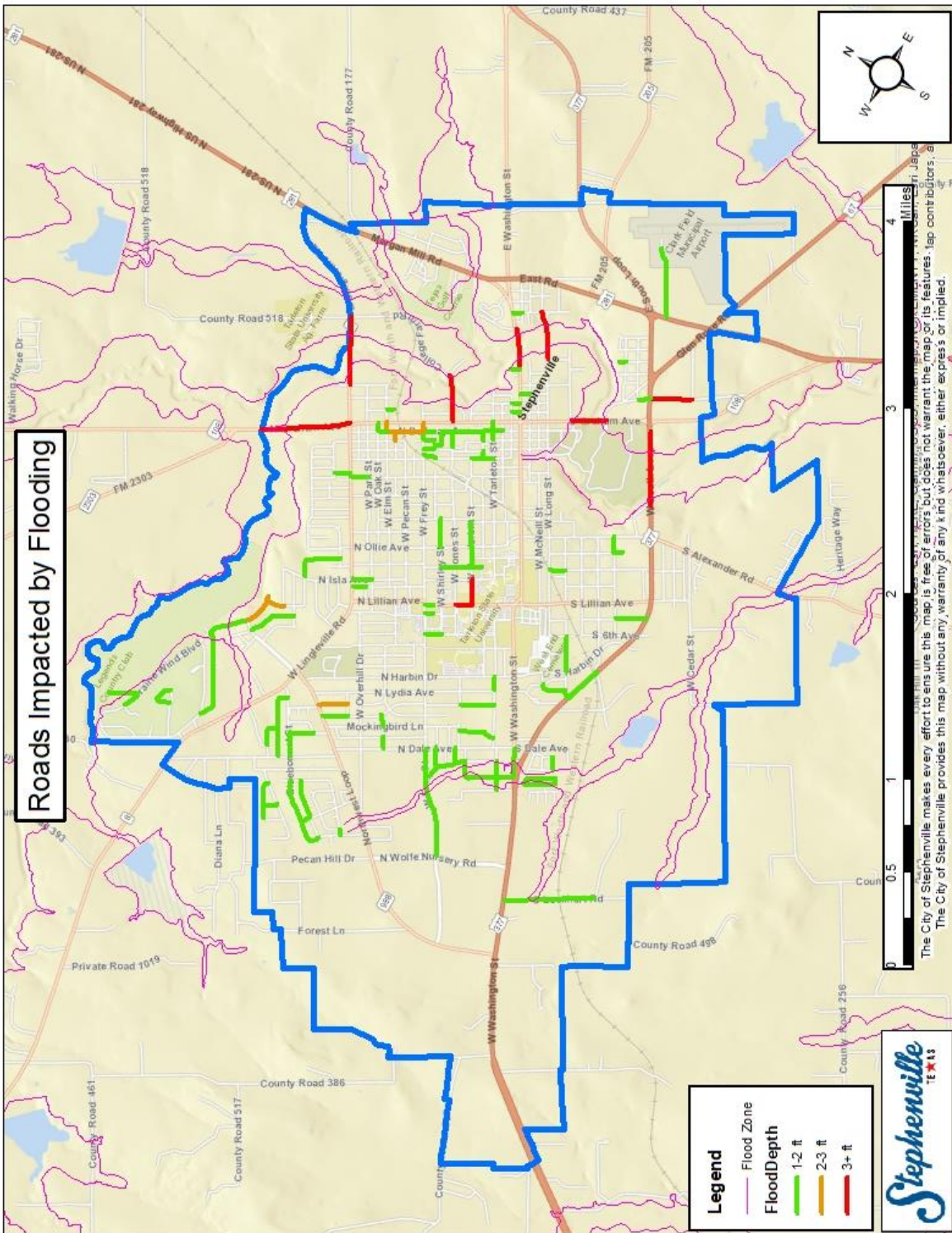
Source: [Texas A&M Forest Service](#)

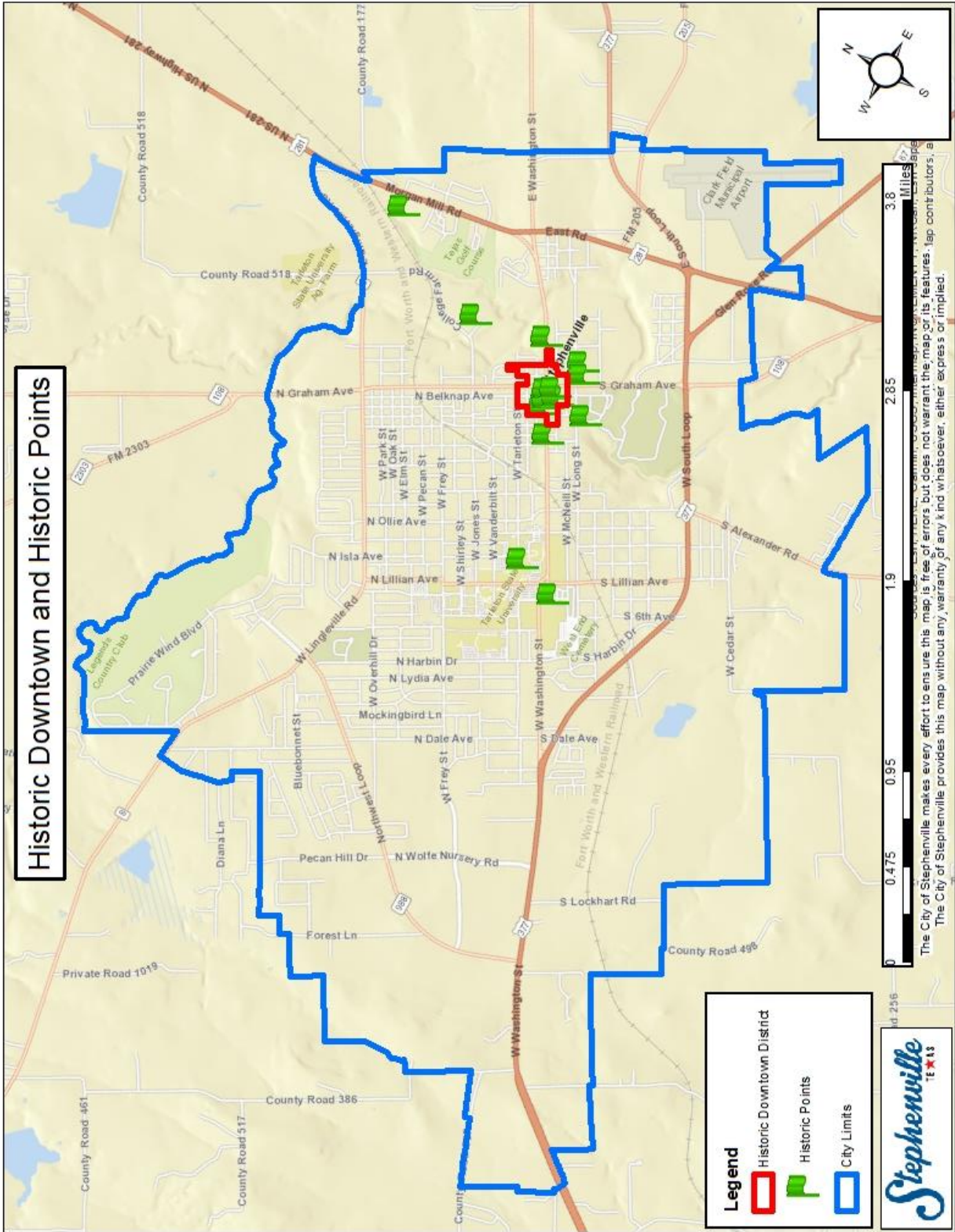
Low Water Crossings

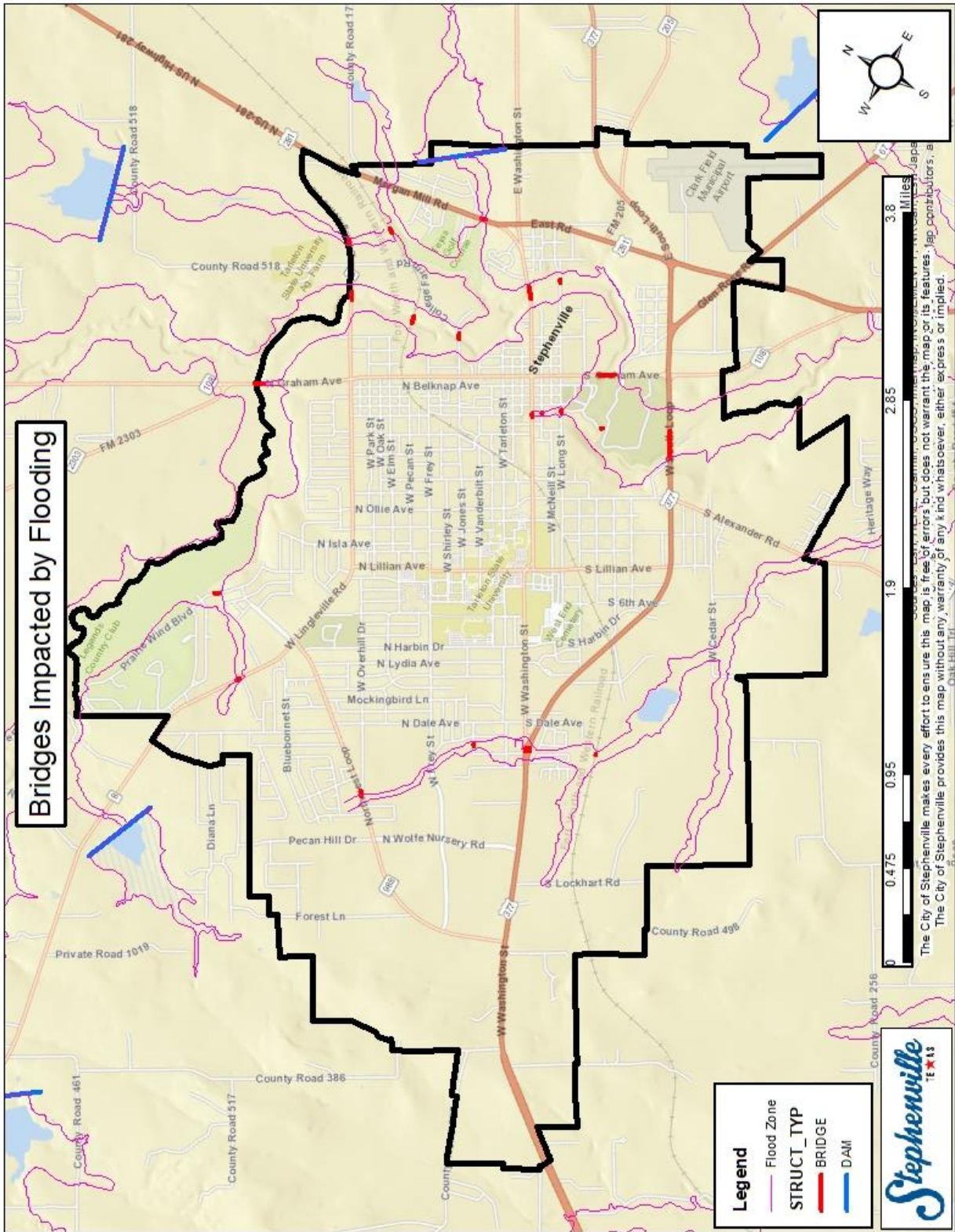


 = low water crossing









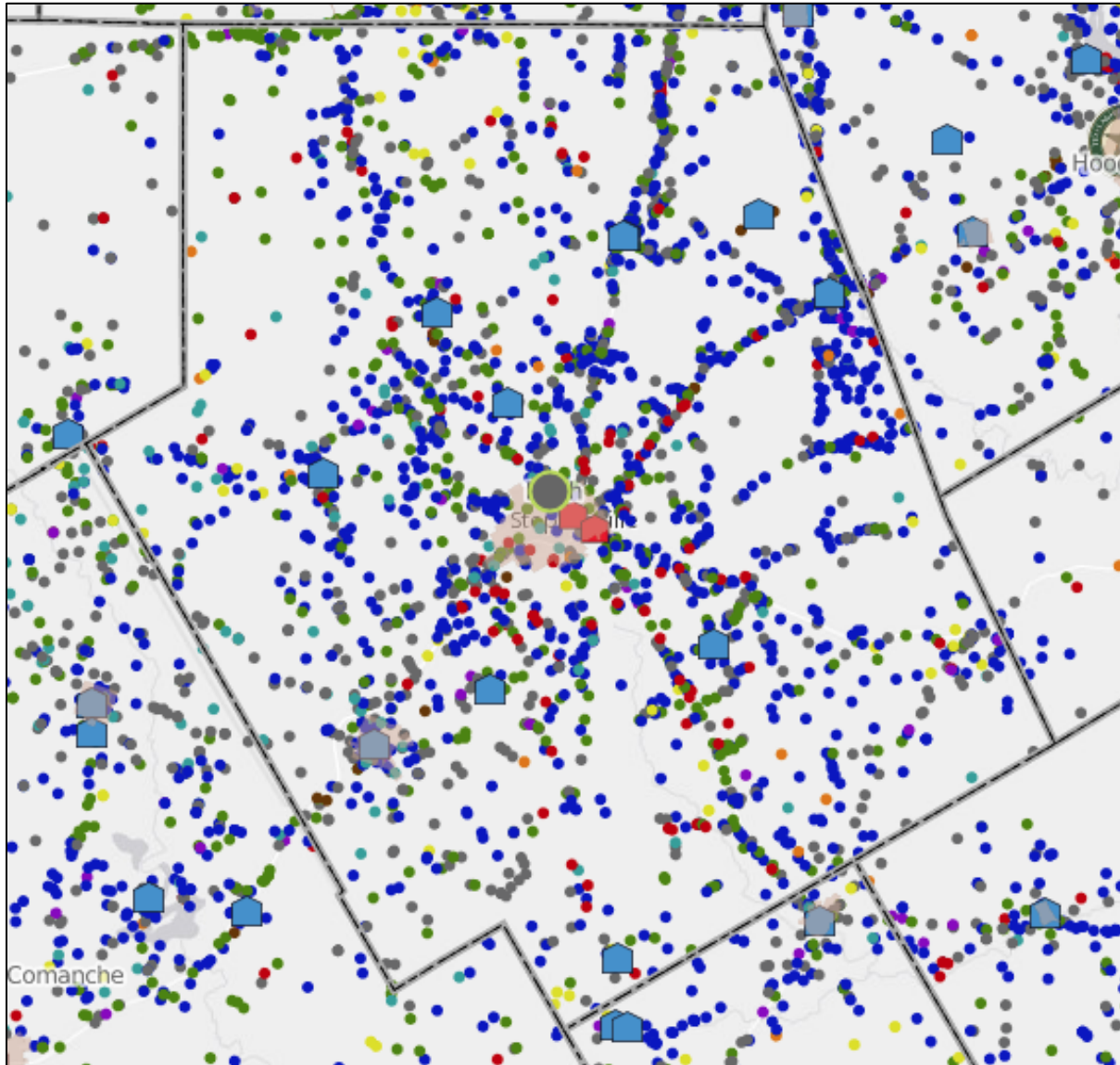
Stephenville Critical and Vulnerable Facility & Infrastructure Table

At Risk To: (Yes (Y) or No (N))								Stephenville Critical and Vulnerable Facility Inventory					
Drought	Expansive Soils	Extreme Heat	Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms	Facility Name or Description	Address	Capacity	Square Feet	Structure Value	Content Value
	Y	Y		Y	Y		Y	Texas Health Resources Hospital	411 North Belknap	454	109,066	\$16,617,390.00	Unknown
	Y	Y		Y	Y		Y	City of Stephenville City Hall	298 West Washington	116	11,606	\$538,580	Unknown
	Y	Y		Y	Y		Y	Stephenville Police Department/Fire Station 1	356 North Belknap	140	17,728	\$778,360.00	Unknown
	Y	Y		Y	Y	Y	Y	Stephenville Fire Station 2	1301 Pecan Hill Drive	90	13,064	\$3,301,970.00	Unknown
	Y	Y		Y	Y	Y	Y	City of Stephenville Municipal Services Center	1201 Glen Rose Road	50	24,050	\$5,547,480.00	Unknown
Y	Y			Y	Y		Y	Pump Station	801 Airport Road	N/A	1,788	\$63,000.00	Unknown
Y	Y			Y	Y		Y	Pump Station	839 N Garfield	N/A	Storage tank	\$49,140	Unknown
Y	Y			Y	Y		Y	Pump Station	CR 386	N/A	104	\$8,350.00	\$174,240 (Storage tank)
Y	Y			Y	Y		Y	Pump Station	CR 257	N/A	200	\$16,070 (shed)	\$227,210 (storage tank)

At Risk To: (Yes (Y) or No (N))								Stephenville Critical and Vulnerable Facility Inventory					
Drought	Expansive Soils	Extreme Heat	Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms	Facility Name or Description	Address	Capacity	Square Feet	Structure Value	Content Value
Y	Y			Y	Y		Y	Pump Station	1251 Cedar Street	N/A	532 (shop)	\$1,220,170 (shop and storage tank value)	Unknown
Y	Y			Y	Y		Y	Pump Station	501 North Paddock	N/A	Storage tank	\$28,990	Unknown
Y	Y	Y	Y	Y	Y	Y	Y	City Sewer Plant	900 CR 454	10	1,200	\$433,020	Unknown
	Y	Y	Y	Y	Y		Y	Senior Care Center	2601 Northwest Loop	91	21,737	\$4,953,900	Unknown
	Y	Y		Y	Y		Y	Mulberry Manor Nursing Home	1670 West Lingleville Road	98	23,613	\$1,019,870	Unknown
	Y	Y	Y	Y	Y		Y	Stephenville Nursing & Rehab	2311 West Washington	51	12,309	\$654,030	Unknown
	Y	Y		Y	Y		Y	Oakwood Assisted Living	2305 West Lingleville Road	114	27,294	\$2,888,450	Unknown
	Y	Y		Y	Y		Y	Goodtree Retirement Facility	2010 Good Tree	112	26,850	\$2,331,220	Unknown
	Y	Y	Y	Y	Y		Y	CVS Pharmacy	2565 West Washington			\$1,042,140	Unknown
	Y	Y	Y	Y	Y		Y	Walgreens Pharmacy	2315 West Washington			\$1,145,090	Unknown

Erath County Unincorporated

Wildfire Ignitions, 2005-2015



Wildfire Ignitions

Cause		Cause	
● Incendiary	● Railroads	● Power Lines	● Children
● Lightning	● Power Lines	● Children	● Debris Burning
● Campfire	● Children	● Debris Burning	● Structure
● Smoking	● Structure	● Structure	● Miscellaneous
● Fireworks	● Miscellaneous		
● Equipment User			

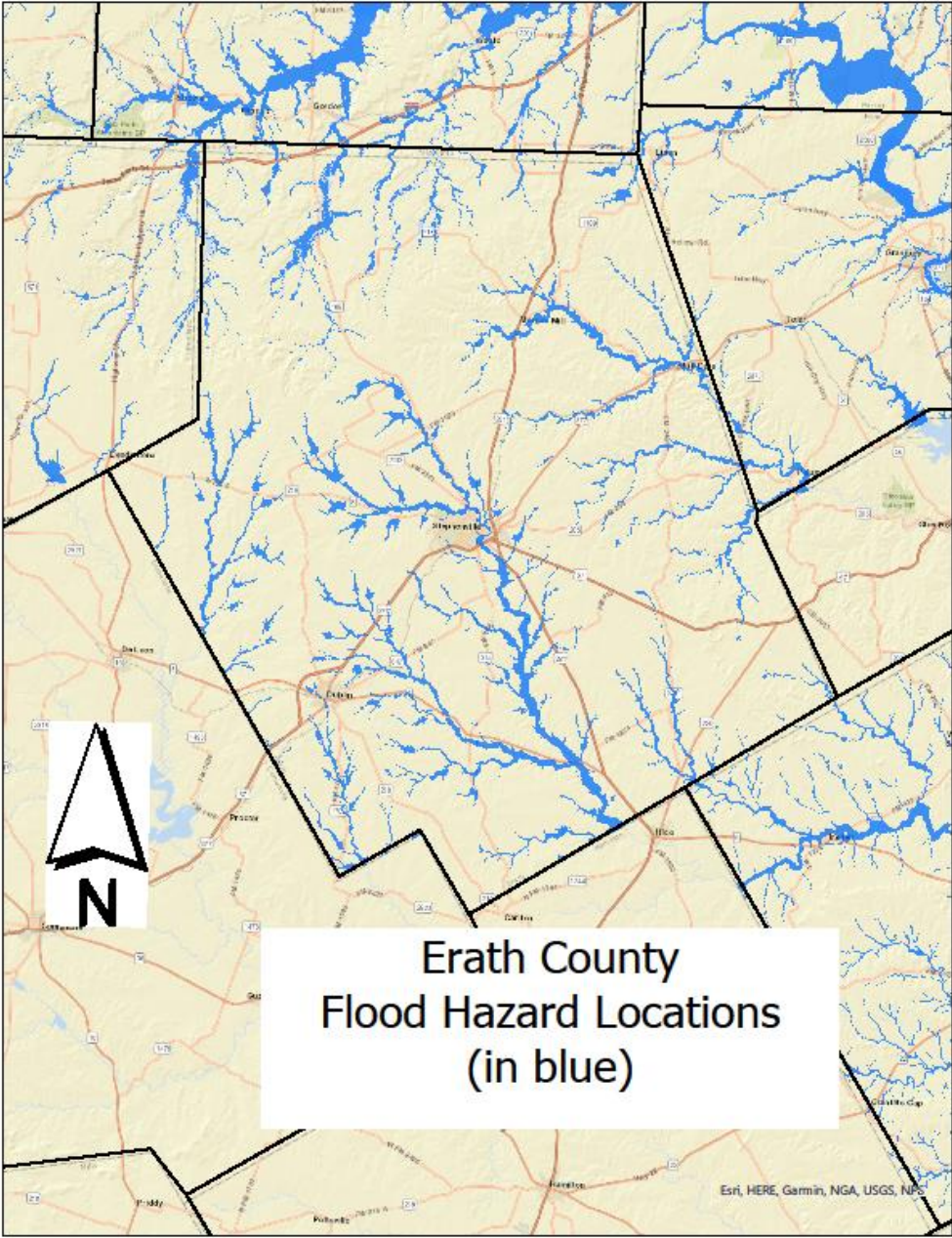
Source: [Texas A&M Forest Service](#)

Erath County Unincorporated Critical and Vulnerable Facility & Infrastructure Table

At Risk To: (Yes (Y) or No (N))								Erath County Unincorporated Critical and Vulnerable Facility Inventory				
Drought	Expansive Soils	Extreme Heat	Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms	Facility Name or Description	Address	Capacity	Square Feet	Structure Value
Y	Y	Y	Y	Y	Y	Y	Y	Selden Fire Dept	4200 FM 913, Stephenville			
Y	Y	Y	Y	Y	Y	Y	Y	Lingleville Fire Dept	19010 FM 8, Lingleville		5,000	\$78,000
Y	Y	Y	Y	Y	Y	Y	Y	Harbin Fire Dept	1215 CR 277, Dublin		3,200	\$67,000
Y	Y	Y	Y	Y	Y	Y	Y	Huckabay Fire Dept	19909 North SH 108, Stephenville		2,250	\$48,970
Y	Y	Y	Y	Y	Y	Y	Y	Morgan Mill Fire Dept	677 CR 173, Morgan Mill		3,045	\$196,810
Y	Y	Y	Y	Y	Y	Y	Y	Bluff Dale Fire Dept	175 Holt, Bluff Dale		5,040	\$131,950
Y	Y	Y	Y	Y	Y	Y	Y	Three Way ISD	247 CR 207, Stephenville	225	38,555	\$1,223,470
Y	Y	Y	Y	Y	Y	Y	Y	Lingleville ISD	21261 North FM 219, Lingleville	400	75,375	\$1,964,700
Y	Y	Y	Y	Y	Y	Y	Y	Huckabay ISD	200 CR 421, Stephenville	225	48,650	\$1,408,610
Y	Y	Y	Y	Y	Y	Y	Y	Morgan Mill ISD	295 FM 1188, Morgan Mill	200	31,038	\$1,264,430
Y	Y	Y	Y	Y	Y	Y	Y	Bluff Dale ISD	710 Church Street, Bluff Dale	300	27,201	\$1,359,450
Y	Y	Y	Y	Y	Y	Y	Y	Erath Excels	680 Peach Orchard, Stephenville		12,000	\$917,490
Y	Y	Y	Y	Y	Y	Y	Y	Pal Con	12425 North US377, Stephenville		122,210	\$4,809,330
Y	Y	Y	Y	Y	Y	Y	Y	Stephenville Christian School	1120 CR351, Stephenville		18,559	\$723,810
Y	Y	Y	Y	Y	Y	Y	Y	EquaBrand	610 CR 437, Stephenville		96,204	\$4,862,040

At Risk To: (Yes (Y) or No (N))							Erath County Unincorporated Critical and Vulnerable Facility Inventory					
Drought	Expansive Soils	Extreme Heat	Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms	Facility Name or Description	Address	Capacity	Square Feet	Structure Value
	Y	Y	Y	Y	Y	Y	Y	Wind Farm	Off of North SH 108			
	Y	Y	Y	Y	Y		Y	Major Roadways	US 281, US 377/67, SH 108			

Erath County Flood Hazard Map



Appendix B: Capabilities Assessment

The following capability assessments examine the ability of the jurisdictions to implement and manage a comprehensive mitigation strategy. Strengths, weaknesses, and resources of the jurisdictions are identified as a means to develop an effective Hazard Mitigation Action Plan (HazMAP). The capabilities identified in these assessments were evaluated collectively to develop feasible recommendations, which support the implementation of effective mitigation activities.

The assessments include questions regarding existing plans, policies, and regulations that contribute to or hinder the ability to implement hazard mitigation activities, including legal and regulatory capabilities; administrative and technical capabilities; and fiscal capabilities.

City of Dublin

Planning and Regulatory Assessment

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of natural hazards.

Type of Plans	Have capability?	Level	If Yes...		
Comprehensive or Master Plan	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Local <input type="checkbox"/> County <input type="checkbox"/> Region	Does the plan address natural hazards?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
			Does the plan identify projects to include in the mitigation strategy?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
			Can the plan be used to implement mitigation actions?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
Capital Improvement Plan (CIP)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Local <input type="checkbox"/> County <input type="checkbox"/> Region	Does the plan address natural hazards?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
			Does the plan identify projects to include in the mitigation strategy?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):

Type of Plans	Have capability?	Level	If Yes...		
			Can the plan be used to implement mitigation actions?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
Economic Development Plan	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Local <input type="checkbox"/> County <input type="checkbox"/> Region	Does the plan address natural hazards?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
			Does the plan identify projects to include in the mitigation strategy?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
			Can the plan be used to implement mitigation actions?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
Local Emergency Operations Plan	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Local <input type="checkbox"/> County <input type="checkbox"/> Region	Does the plan address natural hazards?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional): The plan is in progress
			Does the plan identify projects to include in the mitigation strategy?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Comments (optional):
			Can the plan be used to implement mitigation actions?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
Continuity of Operations Plan	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Local <input type="checkbox"/> County <input type="checkbox"/> Region	Does the plan address natural hazards?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
			Does the plan identify projects to include in the mitigation strategy?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):

Type of Plans	Have capability?	Level	If Yes...		
			Can the plan be used to implement mitigation actions?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
Transportation Plan	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Local <input type="checkbox"/> County <input type="checkbox"/> Region	Does the plan address natural hazards?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
			Does the plan identify projects to include in the mitigation strategy?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
			Can the plan be used to implement mitigation actions?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
Stormwater Management Plan	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Local <input type="checkbox"/> County <input type="checkbox"/> Region	Does the plan address natural hazards?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
			Does the plan identify projects to include in the mitigation strategy?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
			Can the plan be used to implement mitigation actions?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
Community Wildfire Protection Plan	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Local <input type="checkbox"/> County <input type="checkbox"/> Region	Does the plan address natural hazards?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
			Does the plan identify projects to include in the mitigation strategy?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):

Type of Plans	Have capability?	Level	If Yes...		
			Can the plan be used to implement mitigation actions?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
Green Infrastructure Plan	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Local <input type="checkbox"/> County <input type="checkbox"/> Region	Does the plan address natural hazards?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
			Does the plan identify projects to include in the mitigation strategy?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
			Can the plan be used to implement mitigation actions?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
Parks or Open Space Plan	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Local <input type="checkbox"/> County <input type="checkbox"/> Region	Does the plan address natural hazards?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
			Does the plan identify projects to include in the mitigation strategy?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
			Can the plan be used to implement mitigation actions?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
Hazard Mitigation Plan	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Local <input type="checkbox"/> County <input type="checkbox"/> Region	Does the plan address natural hazards?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional): This edition is the first mitigation plan for the city.
			Does the plan identify projects to include in the	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):

Type of Plans	Have capability?	Level	If Yes...		
			mitigation strategy?		
			Can the plan be used to implement mitigation actions?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):

Land Use Planning and Ordinances	Have capability?	If Yes...		
Zoning Ordinance	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Is the ordinance an effective measure for reducing hazard impacts?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Comments (optional):
		Is the ordinance adequately administered and enforced?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
Subdivision Ordinance	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Is the ordinance an effective measure for reducing hazard impacts?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Comments (optional):
		Is the ordinance adequately administered and enforced?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
Floodplain Ordinance	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Is the ordinance an effective measure for reducing hazard impacts?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
		Is the ordinance adequately administered and enforced?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
Flood Insurance Rate Maps (FIRM)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Is the FIRM an effective measure for reducing hazard impacts?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):

Land Use Planning and Ordinances	Have capability?	If Yes...		
		Is the FIRM adequately administered and enforced?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
Natural Hazard Specific Ordinance (e.g., stormwater, wildfire)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Is the ordinance an effective measure for reducing hazard impacts?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
		Is the ordinance adequately administered and enforced?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
Acquisition of land for open space and public recreation uses	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Is the ordinance an effective measure for reducing hazard impacts?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
		Is the ordinance adequately administered and enforced?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):

Building Code, Permitting, and Inspections	Have capability?	
Building Code	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Version/Year: 2006 International Building Code
Building Code Effectiveness Grading Schedule (BGEGS) Score	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Score: 10
Fire Department ISO Rating	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Rating: 6
Site Plan Review Requirements	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review method: Digital and onsite reviews

Administrative and Technical Assessment

Administrative and technical capabilities include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions.

Administration	Have capability?	If Yes...
Planning Commission	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Describe capability:
Mitigation Planning Committee	<input checked="" type="checkbox"/> Yes	Describe capability: Identifies hazards, conducts a risk and vulnerability assessment, and creates and monitors mitigation actions.
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Describe capability: Public Works have a regular schedule for maintenance.
Mutual Aid Agreements	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Describe capability: Agreements with City of Stephenville and surrounding counties.

Staff	Have capability? FT/PT*	If Yes...	
*Full-time (FT) or part-time (PT) position			
Chief Building Official	<input type="checkbox"/> Yes-FT <input type="checkbox"/> Yes- PT <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Is staffing adequate to enforce regulations?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Is staff trained on natural hazards and mitigation?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Floodplain Administrator	<input type="checkbox"/> Yes-FT <input checked="" type="checkbox"/> Yes- PT <input type="checkbox"/> No <input type="checkbox"/> N/A	Is staffing adequate to enforce regulations?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		Is staff trained on natural hazards and mitigation?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Emergency Manager	<input type="checkbox"/> Yes-FT <input checked="" type="checkbox"/> Yes- PT <input type="checkbox"/> No <input type="checkbox"/> N/A	Is staffing adequate to enforce regulations?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		Is staff trained on natural hazards and mitigation?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Community Planner	<input type="checkbox"/> Yes-FT <input type="checkbox"/> Yes- PT <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Is staffing adequate to enforce regulations?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Is staff trained on natural hazards and mitigation?	<input type="checkbox"/> Yes <input type="checkbox"/> No

Staff	Have capability? FT/PT*	If Yes...	
*Full-time (FT) or part-time (PT) position			
Civil Engineer	<input type="checkbox"/> Yes-FT <input type="checkbox"/> Yes- PT <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Is staffing adequate to enforce regulations?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Is staff trained on natural hazards and mitigation?	<input type="checkbox"/> Yes <input type="checkbox"/> No
GIS Coordinator	<input type="checkbox"/> Yes-FT <input checked="" type="checkbox"/> Yes- PT <input type="checkbox"/> No <input type="checkbox"/> N/A	Is staffing adequate to enforce regulations?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		Is staff trained on natural hazards and mitigation?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Public Works Director	<input checked="" type="checkbox"/> Yes-FT <input type="checkbox"/> Yes- PT <input type="checkbox"/> No <input type="checkbox"/> N/A	Is staffing adequate to enforce regulations?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		Is staff trained on natural hazards and mitigation?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Fire Chief	<input checked="" type="checkbox"/> Yes-FT <input type="checkbox"/> Yes- PT <input type="checkbox"/> No <input type="checkbox"/> N/A	Is staffing adequate to enforce regulations?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		Is staff trained on natural hazards and mitigation?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Staff	Have capability? FT/PT*	If Yes...	
*Full-time (FT) or part-time (PT) position			
Environmental Director	<input type="checkbox"/> Yes-FT <input type="checkbox"/> Yes- PT <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Is staffing adequate to enforce regulations?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Is staff trained on natural hazards and mitigation?	<input type="checkbox"/> Yes <input type="checkbox"/> No

Technical	Have capability?	If Yes...	
Warning Systems/Services (e.g., Reverse 911, outdoor warning signals)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Describe capability: 3 sirens	
		Has capability been used to assess or mitigate risk in the past?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		If yes, for what type of hazard event? Tornado	
Hazard data and information	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Describe capability:	
		Has capability been used to assess or mitigate risk in the past?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		If yes, for what type of hazard event?	
Grant writing	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Describe capability:	
		Has capability been used to assess or mitigate risk in the past?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		If yes, for what type of hazard event?	
HaZUS analysis or GIS software	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Describe capability:	
		Has capability been used to assess or mitigate risk in the past?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		If yes, for what type of hazard event?	

Education and Outreach Assessment

Education and outreach programs and methods can be used to implement mitigation activities and communicate hazard-related information.

Program or Organization	Have capability?	If Yes...	
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Could the program or organization help implement future mitigation activities?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Describe program or organization and how it relates to disaster resilience and mitigation:	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Could the program or organization help implement future mitigation activities?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Describe program or organization and how it relates to disaster resilience and mitigation:	
Natural disaster or safety related school programs	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Could the program or organization help implement future mitigation activities?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		Describe program or organization and how it relates to disaster resilience and mitigation: Dublin ISD protocol	
Public/private partnership initiatives addressing disaster-related issues	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Could the program or organization help implement future mitigation activities?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Describe program or organization and how it relates to disaster resilience and mitigation:	
StormReady certification	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		
Firewise Communities Certification	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		

Financial Assessment

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resources	Have capability?	If Yes...	
Capital Improvements Project funding	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Could the resource be used to fund future mitigation activities?	<input checked="" type="checkbox"/> Yes

Funding Resources	Have capability?	If Yes...	
	<input type="checkbox"/> N/A		<input type="checkbox"/> No
		Has the funding resource been used in past for mitigation activities?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		If yes, for what type of mitigation activities?	
Authority to levy taxes for specific purposes	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Could the resource be used to fund future mitigation activities?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Has the funding resource been used in past for mitigation activities?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		If yes, for what type of mitigation activities?	
Fees for water, sewer, gas, and/or electric services	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Could the resource be used to fund future mitigation activities?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		Has the funding resource been used in past for mitigation activities for mitigation activities?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		If yes, for what type of mitigation activities?	
Impact fees for new development	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Could the resource be used to fund future mitigation activities?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		Has the funding resource been used in past for mitigation activities?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		If yes, for what type of mitigation activities?	
Stormwater utility fee	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Could the resource be used to fund future mitigation activities?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Has the funding resource been used in past for mitigation activities?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		If yes, for what type of mitigation activities?	

Funding Resources	Have capability?	If Yes...	
Incurrence of debt through general obligation bonds and/or special tax bonds	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Could the resource be used to fund future mitigation activities?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		Has the funding resource been used in past for mitigation activities?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		If yes, for what type of mitigation activities?	

How can these capabilities be expanded and improved to reduce risk?

Actions that can expand and improve existing authorities, plans, policies, and resources for mitigation include budgeting and passing policies and procedures for mitigation actions, adopting and implementing stricter mitigation regulations, approving the hiring and training of staff for mitigation activities, and approving mitigation updates to existing plans as new needs are recognized.

City of Stephenville

Planning and Regulatory Assessment

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of natural hazards.

Type of Plans	Have capability?	Level	If Yes...		
Comprehensive or Master Plan	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Local <input type="checkbox"/> County <input type="checkbox"/> Region	Does the plan address natural hazards?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
			Does the plan identify projects to include in the mitigation strategy?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
			Can the plan be used to implement mitigation actions?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
Capital Improvement Plan (CIP)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Local	Does the plan address natural hazards?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):

Type of Plans	Have capability?	Level	If Yes...		
		<input type="checkbox"/> County <input type="checkbox"/> Region	Does the plan identify projects to include in the mitigation strategy? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):	
			Can the plan be used to implement mitigation actions? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Comments (optional):
Economic Development Plan	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Local <input type="checkbox"/> County <input type="checkbox"/> Region	Does the plan address natural hazards? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Comments (optional):	
			Does the plan identify projects to include in the mitigation strategy? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Comments (optional):	
			Can the plan be used to implement mitigation actions? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):	
Local Emergency Operations Plan	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Local <input type="checkbox"/> County <input type="checkbox"/> Region	Does the plan address natural hazards? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):	
			Does the plan identify projects to include in the mitigation strategy? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Comments (optional):	
			Can the plan be used to implement mitigation actions? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Comments (optional):	
Continuity of Operations Plan	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Local	Does the plan address natural hazards? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Comments (optional): Covered in Emergency Management Plan	

Type of Plans	Have capability?	Level	If Yes...		
		<input type="checkbox"/> County <input type="checkbox"/> Region	Does the plan identify projects to include in the mitigation strategy?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Comments (optional):
			Can the plan be used to implement mitigation actions?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Comments (optional):
Transportation Plan	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Local <input type="checkbox"/> County <input type="checkbox"/> Region	Does the plan address natural hazards?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Comments (optional): Future Thoroughfare Plan
			Does the plan identify projects to include in the mitigation strategy?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Comments (optional):
			Can the plan be used to implement mitigation actions?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Comments (optional):
Stormwater Management Plan	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Local <input type="checkbox"/> County <input type="checkbox"/> Region	Does the plan address natural hazards?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
			Does the plan identify projects to include in the mitigation strategy?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
			Can the plan be used to implement mitigation actions?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
Community Wildfire Protection Plan	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Local	Does the plan address natural hazards?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):

Type of Plans	Have capability?	Level	If Yes...		
		<input type="checkbox"/> County <input type="checkbox"/> Region	Does the plan identify projects to include in the mitigation strategy?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
			Can the plan be used to implement mitigation actions?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
Green Infrastructure Plan	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Local <input type="checkbox"/> County <input type="checkbox"/> Region	Does the plan address natural hazards?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
			Does the plan identify projects to include in the mitigation strategy?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
			Can the plan be used to implement mitigation actions?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
Parks or Open Space Plan	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Local <input type="checkbox"/> County <input type="checkbox"/> Region	Does the plan address natural hazards?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Comments (optional):
			Does the plan identify projects to include in the mitigation strategy?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
			Can the plan be used to implement mitigation actions?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
Hazard Mitigation Plan	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Local	Does the plan address natural hazards?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):

Type of Plans	Have capability?	Level	If Yes...		
		<input checked="" type="checkbox"/> County <input type="checkbox"/> Region	Does the plan identify projects to include in the mitigation strategy?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
			Can the plan be used to implement mitigation actions?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):

Land Use Planning and Ordinances	Have capability?	If Yes...		
Zoning Ordinance	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Is the ordinance an effective measure for reducing hazard impacts?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
		Is the ordinance adequately administered and enforced?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
Subdivision Ordinance	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Is the ordinance an effective measure for reducing hazard impacts?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
		Is the ordinance adequately administered and enforced?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
Floodplain Ordinance	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Is the ordinance an effective measure for reducing hazard impacts?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
		Is the ordinance adequately administered and enforced?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):

Land Use Planning and Ordinances	Have capability?	If Yes...		
Flood Insurance Rate Maps (FIRM)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Is the FIRM an effective measure for reducing hazard impacts?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
		Is the FIRM adequately administered and enforced?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
Natural Hazard Specific Ordinance (e.g., stormwater, wildfire)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Is the ordinance an effective measure for reducing hazard impacts?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional): Stormwater
		Is the ordinance adequately administered and enforced?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
Acquisition of land for open space and public recreation uses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Is the ordinance an effective measure for reducing hazard impacts?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):
		Is the ordinance adequately administered and enforced?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments (optional):

Building Code, Permitting, and Inspections	Have capability?	
Building Code	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Version/Year: 2015 IBC
Building Code Effectiveness Grading Schedule (BGEES) Score	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Score: 5 Residential/ 5 commercial
Fire Department ISO Rating	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Rating: 3

	<input type="checkbox"/> N/A	
Site Plan Review Requirements	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review method: Staff review

Administrative and Technical Assessment

Administrative and technical capabilities include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions.

Administration	Have capability?	If Yes...
Planning Commission	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Describe capability: Makes recommendations to city council regarding zoning amendments, etc.
Mitigation Planning Committee	<input checked="" type="checkbox"/> Yes	Describe capability: Identifies hazards, conducts a risk and vulnerability assessment, and creates and monitors mitigation actions.
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Describe capability: On as-needed basis
Mutual Aid Agreements	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Describe capability: County emergency MOU

Staff	Have capability? FT/PT*	If Yes...	
*Full-time (FT) or part-time (PT) position			
Chief Building Official	<input checked="" type="checkbox"/> Yes-FT <input type="checkbox"/> Yes- PT <input type="checkbox"/> No <input type="checkbox"/> N/A	Is staffing adequate to enforce regulations?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		Is staff trained on natural hazards and mitigation?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Floodplain Administrator	<input type="checkbox"/> Yes-FT <input checked="" type="checkbox"/> Yes- PT <input type="checkbox"/> No <input type="checkbox"/> N/A	Is staffing adequate to enforce regulations?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		Is staff trained on natural hazards and mitigation?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Emergency Manager	<input type="checkbox"/> Yes-FT <input checked="" type="checkbox"/> Yes- PT	Is staffing adequate to enforce regulations?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Staff	Have capability? FT/PT*	If Yes...	
*Full-time (FT) or part-time (PT) position			
	<input type="checkbox"/> No <input type="checkbox"/> N/A	Is staff trained on natural hazards and mitigation?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Community Planner	<input type="checkbox"/> Yes-FT <input checked="" type="checkbox"/> Yes- PT <input type="checkbox"/> No <input type="checkbox"/> N/A	Is staffing adequate to enforce regulations?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		Is staff trained on natural hazards and mitigation?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Civil Engineer	<input checked="" type="checkbox"/> Yes-FT <input type="checkbox"/> Yes- PT <input type="checkbox"/> No <input type="checkbox"/> N/A	Is staffing adequate to enforce regulations?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		Is staff trained on natural hazards and mitigation?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
GIS Coordinator	<input checked="" type="checkbox"/> Yes-FT <input type="checkbox"/> Yes- PT <input type="checkbox"/> No <input type="checkbox"/> N/A	Is staffing adequate to enforce regulations?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		Is staff trained on natural hazards and mitigation?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Public Works Director	<input checked="" type="checkbox"/> Yes-FT <input type="checkbox"/> Yes- PT <input type="checkbox"/> No <input type="checkbox"/> N/A	Is staffing adequate to enforce regulations?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		Is staff trained on natural hazards and mitigation?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Fire Chief	<input checked="" type="checkbox"/> Yes-FT <input type="checkbox"/> Yes- PT <input type="checkbox"/> No <input type="checkbox"/> N/A	Is staffing adequate to enforce regulations?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		Is staff trained on natural hazards and mitigation?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Environmental Director	<input type="checkbox"/> Yes-FT <input type="checkbox"/> Yes- PT <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Is staffing adequate to enforce regulations?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Is staff trained on natural hazards and mitigation?	<input type="checkbox"/> Yes <input type="checkbox"/> No

Technical	Have capability?	If Yes...	
Warning Systems/Services (e.g., Reverse 911, outdoor warning signals)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Describe capability: CodeRed, Nixel, CodePurple, Reverse911, 8 sirens	
		Has capability been used to assess or mitigate risk in the past?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Technical	Have capability?	If Yes...
		If yes, for what type of hazard event? Severe weather
Hazard data and information	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Describe capability: Records of severe weather events and damages
		Has capability been used to assess or mitigate risk in the past? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		If yes, for what type of hazard event? Response district
Grant writing	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Describe capability: TDA Grant Writer
		Has capability been used to assess or mitigate risk in the past? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		If yes, for what type of hazard event? Water & stormwater repairs
HaZUS analysis or GIS software	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Describe capability: Provide data for all departments
		Has capability been used to assess or mitigate risk in the past? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		If yes, for what type of hazard event? Update floodplain data and other hazards

Education and Outreach Assessment

Education and outreach programs and methods can be used to implement mitigation activities and communicate hazard-related information.

Program or Organization	Have capability?	If Yes...
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Could the program or organization help implement future mitigation activities? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		Describe program or organization and how it relates to disaster resilience and mitigation: CERT Team, Cross Timbers First Responders, First Methodist Church and other churches who have responder

Program or Organization	Have capability?	If Yes...	
		groups prepare citizens to respond to and educate the community about natural disasters.	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Could the program or organization help implement future mitigation activities?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		Describe program or organization and how it relates to disaster resilience and mitigation: Stop the Bleed, Hands Only CPR, Fire Prevention at schools & stations, Household Hazard Material Collections, Fire Home Inspections, Notices with Water Bills all focus on preparing the public for disasters.	
Natural disaster or safety related school programs	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Could the program or organization help implement future mitigation activities?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		Describe program or organization and how it relates to disaster resilience and mitigation: Stop the Bleed, Annual fire & weather drills, CPR certification all focus on preparing the public for disasters.	
Public/private partnership initiatives addressing disaster-related issues	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Could the program or organization help implement future mitigation activities?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Describe program or organization and how it relates to disaster resilience and mitigation: The Local Emergency Planning Committee (LEPC) is a community-based organization that assists in preparing for emergencies, particularly those concerning hazardous materials.	
StormReady certification	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		
Firewise Communities Certification	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		

Financial Assessment

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resources	Have capability?	If Yes...	
Capital Improvements Project funding	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Could the resource be used to fund future mitigation activities?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Has the funding resource been used in past for mitigation activities?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		If yes, for what type of mitigation activities?	
Authority to levy taxes for specific purposes	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Could the resource be used to fund future mitigation activities?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		Has the funding resource been used in past for mitigation activities?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		If yes, for what type of mitigation activities?	
Fees for water, sewer, gas, and/or electric services	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Could the resource be used to fund future mitigation activities?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		Has the funding resource been used in past for mitigation activities for mitigation activities?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		If yes, for what type of mitigation activities? Stormwater system, sewer, water	
Impact fees for new development	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Could the resource be used to fund future mitigation activities?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Has the funding resource been used in past for mitigation activities?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		If yes, for what type of mitigation activities?	
Stormwater utility fee	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Could the resource be used to fund future mitigation activities?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		Has the funding resource been used in past for mitigation activities?	<input checked="" type="checkbox"/> Yes

Funding Resources	Have capability?	If Yes...	
			<input type="checkbox"/> No
		If yes, for what type of mitigation activities? Stormwater system fee	
Incurrence of debt through general obligation bonds and/or special tax bonds	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Could the resource be used to fund future mitigation activities?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		Has the funding resource been used in past for mitigation activities?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		If yes, for what type of mitigation activities? Road repair, drainage infrastructure, bridge repair	
Incur debt through private activities	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Could the resource be used to fund future mitigation activities?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Has the funding resource been used in past for mitigation activities?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		If yes, for what type of mitigation activities?	
Community Development Block Grant	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Could the resource be used to fund future mitigation activities?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		Has the funding resource been used in past for mitigation activities?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		If yes, for what type of mitigation activities? Stormwater grant	
Other federal funding programs (e.g. FEMA mitigation grants)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Could the resource be used to fund future mitigation activities?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Has the funding resource been used in past for mitigation activities?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		If yes, for what type of mitigation activities?	

Funding Resources	Have capability?	If Yes...	
State funding programs	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Could the resource be used to fund future mitigation activities?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Has the funding resource been used in past for mitigation activities?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		If yes, for what type of mitigation activities?	

How can these capabilities be expanded and improved to reduce risk?

Actions that can expand and improve existing authorities, plans, policies, and resources for mitigation include budgeting and passing policies and procedures for mitigation actions, adopting and implementing stricter mitigation regulations, approving the hiring and training of staff for mitigation activities, and approving mitigation updates to existing plans as new needs are recognized.

Erath County Unincorporated

Planning and Regulatory Assessment

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of natural hazards.

Type of Plans	Have capability?	Level	If Yes...		
Comprehensive or Master Plan	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Local <input checked="" type="checkbox"/> County <input type="checkbox"/> Region	Does the plan address natural hazards?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
			Does the plan identify projects to include in the mitigation strategy?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
			Can the plan be used to implement mitigation actions?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
Capital Improvement Plan (CIP)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Local	Does the plan address natural hazards?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:

Type of Plans	Have capability?	Level	If Yes...		
		<input type="checkbox"/> County <input type="checkbox"/> Region	Does the plan identify projects to include in the mitigation strategy?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
			Can the plan be used to implement mitigation actions?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
Economic Development Plan	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Local <input checked="" type="checkbox"/> County <input type="checkbox"/> Region	Does the plan address natural hazards?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
			Does the plan identify projects to include in the mitigation strategy?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
			Can the plan be used to implement mitigation actions?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
Local Emergency Operations Plan	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Local <input checked="" type="checkbox"/> County <input type="checkbox"/> Region	Does the plan address natural hazards?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
			Does the plan identify projects to include in the mitigation strategy?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
			Can the plan be used to implement mitigation actions?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
Continuity of Operations Plan	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Local	Does the plan address natural hazards?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:

Type of Plans	Have capability?	Level	If Yes...		
		<input checked="" type="checkbox"/> County <input type="checkbox"/> Region	Does the plan identify projects to include in the mitigation strategy? <input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:	
			Can the plan be used to implement mitigation actions? <input type="checkbox"/> Yes <input type="checkbox"/> No		Comments:
Transportation Plan	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Local <input checked="" type="checkbox"/> County <input type="checkbox"/> Region	Does the plan address natural hazards? <input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:	
			Does the plan identify projects to include in the mitigation strategy? <input type="checkbox"/> Yes <input type="checkbox"/> No		Comments:
			Can the plan be used to implement mitigation actions? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Stormwater Management Plan	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Local <input checked="" type="checkbox"/> County <input type="checkbox"/> Region	Does the plan address natural hazards? <input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:	
			Does the plan identify projects to include in the mitigation strategy? <input type="checkbox"/> Yes <input type="checkbox"/> No		Comments:
			Can the plan be used to implement mitigation actions? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Community Wildfire Protection Plan	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Local	Does the plan address natural hazards? <input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:	

Type of Plans	Have capability?	Level	If Yes...		
		<input checked="" type="checkbox"/> County <input type="checkbox"/> Region	Does the plan identify projects to include in the mitigation strategy?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
			Can the plan be used to implement mitigation actions?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
Green Infrastructure Plan	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Local <input checked="" type="checkbox"/> County <input type="checkbox"/> Region	Does the plan address natural hazards?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
			Does the plan identify projects to include in the mitigation strategy?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
			Can the plan be used to implement mitigation actions?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
Parks or Open Space Plan	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Local <input checked="" type="checkbox"/> County <input type="checkbox"/> Region	Does the plan address natural hazards?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
			Does the plan identify projects to include in the mitigation strategy?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
			Can the plan be used to implement mitigation actions?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
Hazard Mitigation Plan	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Local	Does the plan address natural hazards?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments:

Type of Plans	Have capability?	Level	If Yes...		
		<input checked="" type="checkbox"/> County <input type="checkbox"/> Region	Does the plan identify projects to include in the mitigation strategy?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
			Can the plan be used to implement mitigation actions?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments:

Land Use Planning and Ordinances	Have capability?	If Yes...		
Zoning Ordinance	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Is the ordinance an effective measure for reducing hazard impacts?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
		Is the ordinance adequately administered and enforced?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
Subdivision Ordinance	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Is the ordinance an effective measure for reducing hazard impacts?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
		Is the ordinance adequately administered and enforced?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
Floodplain Ordinance	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Is the ordinance an effective measure for reducing hazard impacts?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
		Is the ordinance adequately administered and enforced?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Comments:

Land Use Planning and Ordinances	Have capability?	If Yes...		
Flood Insurance Rate Maps (FIRM)	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Is the FIRM an effective measure for reducing hazard impacts?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
		Is the FIRM adequately administered and enforced?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
Natural Hazard Specific Ordinance (e.g., stormwater, wildfire)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Is the ordinance an effective measure for reducing hazard impacts?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
		Is the ordinance adequately administered and enforced?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
Acquisition of land for open space and public recreation uses	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Is the ordinance an effective measure for reducing hazard impacts?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:
		Is the ordinance adequately administered and enforced?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comments:

Building Code, Permitting, and Inspections	Have capability?	
Building Code	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Version/Year: Only Commercial Properties ICE 2012
Building Code Effectiveness Grading Schedule (BGEES) Score	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Score:
Fire Department ISO Rating	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Rating: 9
Site Plan Review Requirements	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review method: Only Subdivisions through

		Comm. Court, Sanitation, Fire Marshal
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Administrative and Technical Assessment

Administrative and technical capabilities include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions.

Administration	Have capability?	If Yes...
Planning Commission	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Describe capability:
Mitigation Planning Committee	<input checked="" type="checkbox"/> Yes	Describe capability: Identifies hazards, conducts a risk and vulnerability assessment, and creates and monitors mitigation actions.
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Describe capability: Clearing barrow ditches, trimming trees and Shoring up bridges.
Mutual Aid Agreements	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Describe capability: Agreements with surrounding jurisdictions.

Staff	Have capability? FT/PT*	If Yes...	
*Full-time (FT) or part-time (PT) position			
Chief Building Official	<input type="checkbox"/> Yes-FT <input type="checkbox"/> Yes- PT <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Is staffing adequate to enforce regulations?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Is staff trained on natural hazards and mitigation?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Floodplain Administrator	<input checked="" type="checkbox"/> Yes-FT <input type="checkbox"/> Yes- PT <input type="checkbox"/> No <input type="checkbox"/> N/A	Is staffing adequate to enforce regulations?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		Is staff trained on natural hazards and mitigation?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Emergency Manager	<input checked="" type="checkbox"/> Yes-FT <input type="checkbox"/> Yes- PT <input type="checkbox"/> No	Is staffing adequate to enforce regulations?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Staff	Have capability? FT/PT*	If Yes...	
*Full-time (FT) or part-time (PT) position			
	<input type="checkbox"/> N/A	Is staff trained on natural hazards and mitigation?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Community Planner	<input type="checkbox"/> Yes-FT <input type="checkbox"/> Yes- PT <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Is staffing adequate to enforce regulations?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Is staff trained on natural hazards and mitigation?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Civil Engineer	<input type="checkbox"/> Yes-FT <input type="checkbox"/> Yes- PT <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Is staffing adequate to enforce regulations?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Is staff trained on natural hazards and mitigation? Available by Contract	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
GIS Coordinator	<input checked="" type="checkbox"/> Yes-FT <input type="checkbox"/> Yes- PT <input type="checkbox"/> No <input type="checkbox"/> N/A	Is staffing adequate to enforce regulations?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		Is staff trained on natural hazards and mitigation?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Public Works Director	<input type="checkbox"/> Yes-FT <input type="checkbox"/> Yes- PT <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Is staffing adequate to enforce regulations?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Is staff trained on natural hazards and mitigation?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Fire Chief	<input type="checkbox"/> Yes-FT <input checked="" type="checkbox"/> Yes- PT <input type="checkbox"/> No <input type="checkbox"/> N/A	Is staffing adequate to enforce regulations?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Is staff trained on natural hazards and mitigation?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Environmental Director	<input checked="" type="checkbox"/> Yes-FT <input type="checkbox"/> Yes- PT <input type="checkbox"/> No <input type="checkbox"/> N/A	Is staffing adequate to enforce regulations?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		Is staff trained on natural hazards and mitigation?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Technical	Have capability?	If Yes...	
Warning Systems/Services (e.g., Reverse 911, outdoor warning signals)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Describe capability. User subscribed	
		Has capability been used to assess or mitigate risk in the past?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		If yes, for what type of event?	
Hazard data and information	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Describe capability:	
		Has capability been used to assess or mitigate risk in the past?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		If yes, for what type of event?	
Grant writing	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Describe capability.	
		Has capability been used to assess or mitigate risk in the past?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		If yes, for what type of event?	
HaZUS analysis or GIS software	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Describe capability:	
		Has capability been used to assess or mitigate risk in the past?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		If yes, for what type of event?	

Education and Outreach Assessment

Education and outreach programs and methods can be used to implement mitigation activities and communicate hazard-related information.

Program or Organization	Have capability?	If Yes...	
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Could the program or organization help implement future mitigation activities?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		Describe program or organization and how it relates to disaster resilience and mitigation: LEPC, Red Cross Volunteer Fire Department	
Ongoing public education or information program (e.g., responsible water use, fire	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Could the program or organization help implement future mitigation activities?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Program or Organization	Have capability?	If Yes...	
safety, household preparedness, environmental education)		Describe program or organization and how it relates to disaster resilience and mitigation: School presentations, CPR Classes	
Natural disaster or safety related school programs	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Could the program or organization help implement future mitigation activities?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		Describe program or organization and how it relates to disaster resilience and mitigation: School presentations	
Public/private partnership initiatives addressing disaster-related issues	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Could the program or organization help implement future mitigation activities?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		Describe program or organization and how it relates to disaster resilience and mitigation: Pipeline Safety Meetings, LEPC	
StormReady certification	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		
Firewise Communities Certification	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		

Financial Assessment

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resources	Have capability?	If Yes...	
Capital Improvements Project funding	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Could the resource be used to fund future mitigation actions?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Has the funding resource been used in past?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		If yes, for what type of mitigation activities?	
Authority to levy taxes for specific purposes	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Could the resource be used to fund future mitigation actions?	<input type="checkbox"/> Yes

Funding Resources	Have capability?	If Yes...	
	<input type="checkbox"/> N/A		<input checked="" type="checkbox"/> No
		Has the funding resource been used in past?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		If yes, for what type of mitigation activities?	
Fees for water, sewer, gas, and/or electric services	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Could the resource be used to fund future mitigation actions?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Has the funding resource been used in past?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		If yes, for what type of mitigation activities?	
Impact fees for new development	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Could the resource be used to fund future mitigation actions?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Has the funding resource been used in past?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		If yes, for what type of mitigation activities?	
Stormwater utility fee	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Could the resource be used to fund future mitigation actions?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Has the funding resource been used in past?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		If yes, for what type of mitigation activities?	
Incurrence of debt through general obligation bonds and/or special tax bonds	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Could the resource be used to fund future mitigation actions?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		Has the funding resource been used in past?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		If yes, for what type of mitigation activities?	

How can these capabilities be expanded and improved to reduce risk?

Actions that can expand and improve existing authorities, plans, policies, and resources for mitigation include budgeting and passing policies and procedures for mitigation actions, adopting and implementing stricter mitigation regulations, approving the hiring and training of staff for mitigation activities, and approving mitigation updates to existing plans as new needs are recognized.

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Appendix C: NCTCOG Programs

The [North Central Texas Council of Governments \(NCTCOG\)](#) is a voluntary association of, by and for local governments, established to assist in regional planning. NCTCOG's purpose is to strengthen both the individual and collective power of local governments and to help them recognize regional opportunities, eliminate unnecessary duplication, and make joint decisions. NCTCOG consists of many departments that implement programs and projects that address the mitigation goals of the participating jurisdictions.

The Environment & Development Department at NCTCOG plays a major role in regional coordination and management of reports and projects that improve regional resilience to natural hazards through the following programs:

- **The Corridor Development Certificate (CDC)** – The CDC process aims to stabilize flood risk along the Trinity River. The CDC process does not prohibit floodplain development but ensures that any development that does occur in the floodplain will not raise flood water levels or reduce flood storage capacity. A CDC permit is required to develop land within a specific area of the Trinity floodplain called the Regulatory Zone, which is similar to the 100-year floodplain.
 - Under the CDC process, local governments retain ultimate control over floodplain permitting decisions, but other communities along the Trinity River Corridor are given the opportunity to review and comment on projects in their neighbor's jurisdiction. As the Metroplex economy continues to grow and develop, the CDC process will prevent increased flood risks
- **NCTCOG-OneRain Contrail Flood Warning Software**- Contrail software that delivers automated real-time data collection, processing, validation, analysis, archiving and visualization of hydrometeorological and environmental sensor data.
- **The *integrated* Stormwater Management (iSWM) Program**- The iSWM™ Program for Construction and Development is a cooperative initiative that assists cities and counties to achieve their goals of water quality protection, streambank protection, and flood mitigation, while also helping communities meet their construction and post-construction obligations under state stormwater permits.
 - Development and redevelopment by their nature increase the amount of imperviousness in our surrounding environment. This increased imperviousness translates into loss of natural areas, more sources for pollution in runoff, and heightened flooding risks. To help mitigate these impacts, more than 60 local governments are cooperating to proactively create sound stormwater management guidance for the region through the *integrated* Stormwater Management (iSWM) Program.
- **16-County Watershed Management Initiative**- Communities from across the region come together to collaborate on how to reduce the risks of flooding in their communities.
- **Texas Smartscape**- Texas SmartScape™ is a landscape program crafted to be "smart" for North Central Texas. Based on water-efficient landscape principles, it promotes the use of plants suited to our region's soil, climate, and precipitation that don't require much—if any—additional irrigation, pesticides, fertilizer, or herbicides to thrive.

- The two main goals of the program are to:
 - Improve stormwater runoff quality
 - Conserve local water supplies
- The Transportation Department promotes the following programs:
- **Bicycle-Pedestrian**- The passage of the 1991 Intermodal Surface Transportation Efficiency Act prompted NCTCOG to include non-motorized transportation network improvements in regional planning efforts. NCTCOG established the Bicycle and Pedestrian program in 1992 to address the various activities related to implementing bicycle and pedestrian facilities as an alternative mode of regional transportation.
- **Sustainable Development**- As land uses influence regional travel patterns and demand on the transportation system, and transportation connects land uses and provides access to developments, both need to be planned in conjunction with one another. NCTCOG supports Sustainable Development: mixed-use, infill, and transit-oriented developments that reduce vehicle miles traveled, enable the use of alternative modes of transportation, promote economic development, and improve air quality.

Appendix D: Public Meeting Documents

The participants advertised public meetings to discuss the development of this Hazard Mitigation Action Plan, including the co-hosted meeting on July 25, 2019 at Erath County's Texas Health Resources Hospital. The announcements of the public meetings are below.

City of Dublin




City of Stephenville

www.stephenvilletx.gov/public-meeting-scheduled-to-discuss-the-erath-county-hazard-migation-action-plan/

Texas Emergency M... NCTCOG INTRANET MassTransit: NCTC... Boards | Trello Realize Your Potenti... LISTSERV 16.0 - List... Flood mitigation re... FEMA eServices Ap... D25 Toastm

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PUBLIC MEETING SCHEDULED TO DISCUSS THE ERATH COUNTY HAZARD MITIGATION ACTION PLAN

July 22, 2019—A public meeting to discuss the Erath County Hazard Mitigation Action Plan (HazMAP) is scheduled for Thursday, July 25 at 12:30PM in the Texas Health Resources Hospital Conference Room located at 441 N. Belknap, Stephenville, TX 76401.

The participating jurisdictions in Erath County are updating the current multi-jurisdictional Hazard Mitigation Action Plan (HazMAP) in order to create a more resilient and safer community for residents, businesses, and visitors. As natural hazards are becoming more frequent and damages more costly, mitigation actions are key to keeping the community safe. We are requesting citizen involvement in the update of the Erath County HazMAP. By completing and updating the HazMAP, participating jurisdictions are entitled to apply for future federal relief dollars to fund specific mitigation projects, designed to reduce and/or eliminate vulnerabilities resulting from disaster events throughout the County.

During the meeting, the public is invited to make comments or suggestions. Local emergency management officials will be on hand to answer any questions. All comments received from the public will be documented and considered for inclusion in the HazMAP.

This HazMAP is being completed through a cooperative effort of officials from Erath County and the cities of Dublin and Stephenville.

If you have questions, please contact your local Office of Emergency Management.

TAX RATE INFO

APPROVED BUDGET FY 2018-2019

2018 TAX RATE ORDINANCE

CONTACTS & REQUESTS

REQUEST AN INSPECTION

SUBMIT APPLICATIONS ONLINE

REPORT A VIOLATION

REPORT A PROBLEM

BULK ITEM PICK-UP

PUBLIC INFORMATION REQUEST

CITIZEN BUDGET REQUEST

FRIENDLY LINKS

STEPHENVILLE SURVEY

MONTHLY NEWSLETTER AND HAPPENINGS

CHAMBER OF COMMERCE

CITY COUNCIL MEETINGS AND AGENDAS

ERATH COUNTY

CORE VALUES

FOOD SERVICE INSPECTION REPORTS

Erath County Unincorporated

ok.com/Erath-County-Emergency-Management-505878139448835/

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Erath County Emergency Management

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Erath County Emergency Management
Published by Susan Mills Driskill (7) · 3 mins

Public meeting scheduled to discuss the Erath County Hazard Mitigation Act Plan 7-25-2019 at 12:30pm

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North Central Texas Council of Governments

FOR IMMEDIATE RELEASE
JUN 25 2019
JF SA A M PMA
JUN 25 2019
SUSAN MILLS DRISKILL
ERATH COUNTY, TEXAS

Public Meeting Scheduled to Discuss
THE ERATH COUNTY HAZARD MITIGATION ACTION PLAN

July 25, 2019 – A public meeting to discuss the Erath County Hazard Mitigation Action Plan (HxMAP) is scheduled for Thursday, July 25 at 12:30PM in the Texas Health Resources Hospital Conference Center located at 441 N. Bellway, Stephenville, TX 79481.

The participating jurisdictions in Erath County are updating the current multi-jurisdictional Hazard Mitigation Action Plan (HxMAP) in order to create a more resilient and safer community for residents, businesses, and visitors. As natural hazards are becoming more frequent and damages more costly, mitigation actions are key to keeping the community safe. We are requesting citizen involvement in the update of the Erath County HxMAP. By completing and updating the HxMAP, participating jurisdictions are entitled to apply for future federal relief dollars to fund specific mitigation projects designed to reduce and/or eliminate vulnerabilities resulting from disaster events throughout the County.

During the meeting, the public is invited to make comments or suggestions. Local emergency management officials will be on hand to answer any questions. All comments received from the public will be documented and considered for inclusion in the HxMAP.

This HxMAP is being completed through a cooperative effort of officials from Erath County and the cities of Dublin and Stephenville.

If you have questions, please contact your local Office of Emergency Management.

Appendix E: Local Planning Teams

The following tables identify the members of the Local Planning Team (LPT) from each participating jurisdiction.

City of Dublin		
Agency/Organization	Position	Role in LPT
Office of Emergency Management	Co - Emergency Management Coordinator	General oversight, hazard identification, and plan development
Office of Emergency Management	Co - Emergency Management Coordinator Director	General oversight, hazard identification, and plan development
Public Works Department	Director	Hazard identification and plan development
Code Enforcement	Director	Vulnerabilities Assessment
City of Stephenville		
Agency/Organization	Position	Role in LPT
Fire Department	Captain/Training Coordinator	General oversight hazard identification, and plan development
Fire Department	Fire Chief	General oversight hazard identification, and plan development
Fire Department	Fire Marshall	Hazard identification and plan development
Fire Department	Fire Department Administration Assistant	Hazard identification and plan development
Public Works Department	Executive Administration Assistant	Hazard identification and plan development
GIS Department	GIS Coordinator	Hazard identification and plan development
Erath County Unincorporated		
Agency/Organization	Position	Role in LPT
Office of Emergency Management	Emergency Management Coordinator	General oversight, hazard identification, and plan development
Fire Rescue	Coordinator	Hazard identification and plan development
Emergency Services	EMS Director	Hazard Identification and plan development
Central Appraisal District	911 Coordinator	GIS/Mapping
Judge's Office	Administrative Secretary	Hazard Identification and plan development
Commissioner's Court	Commissioner	Hazard Identification and plan development