



Goliad County Multi-Hazard Mitigation Plan Update 2026

“Under the Federal Disaster Mitigation Act 2000 (DMA 2000 or “the Act”), the participating jurisdictions (participants) are required to have a Federal Emergency Management Agency (“FEMA”)-approved Local Hazard Mitigation Plan (“the Plan”) in order to be eligible for certain pre- and post-disaster mitigation funds. Adoption of this Plan by the participants and approval by FEMA will serve the dual objectives of providing direction and guidance on implementing hazard mitigation in the participating jurisdictions, and qualify the participants to obtain federal assistance for hazard mitigation. Solely to help achieve these objectives, the Plan attempts to systematically identify and address hazards that can affect the participants. Nothing this Plan is intended to be an admission, either expressed or implied, by or on behalf of the participants, of any obligation, responsibility, duty, fault or liability for any particular hazard or hazardous condition, and no such obligation, responsibility, duty, fault or liability should be inferred or implied from the Plan, except where expressly stated.”

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Background

Goliad County was established in 1836 and is located on the Coastal Plain, twenty-five miles inland from Copano Bay in Southeast Texas. The county was named after the vast Mexican Municipality of Goliad. It was one of the original twenty-three counties established by the First Congress of the Republic of Texas. Goliad County covers 859 square miles, of which most is nearly level to gently rolling Rio Grande Plain.

Texas frequently experiences severe rainfall and flooding, with half of the world's record rainfall occurring within 48 hours. Goliad County also faces hazards such as wildfires, extreme heat, lightning, and drought, all of which threaten safety, property, and quality of life.

Events can't be prevented, but mitigation can reduce their impact on people and property. FEMA defines mitigation as ongoing actions that lower or remove long-term risks from hazards.

Communities participate in hazard mitigation by developing plans to address potential risks. The Texas Division of Emergency Management (TDEM) reviews these plans, and FEMA, under the Disaster Mitigation Act of 2000, has the authority to review and approve them.

The Disaster Mitigation Act requires that hazard mitigation plans be reviewed and revised every five years to maintain eligibility for Hazard Mitigation Assistance (HMA) grant funding. FEMA approved the Goliad County HMAP Update in 2018, which then expired in 2023. Therefore, the County began developing a Hazard Mitigation Action Plan Update that incorporates two jurisdictions from the previous plan to regain eligibility for grant funding. The City of Goliad is not participating in the plan update. The HMAP Update planning process provided an opportunity for Goliad County and participating jurisdictions to evaluate successful mitigation actions and explore opportunities to avoid future disaster loss.

This is a multi-jurisdictional plan; the participating jurisdictions referred to within this Plan Update include: Goliad County, Goliad Independent School District (ISD), and Goliad Water Supply Corporation (GWSC).

Section 1: Introduction

Hazard mitigation is a valuable investment for community safety and sustainability. Local governments are best positioned to implement effective measures because they control development decisions. Reviewing a hazard mitigation plan requires identifying current vulnerabilities and predicting how future development will impact overall hazard risk.

Scope

The focus of the Plan Update is to identify activities to mitigate hazards classified as “high” or “moderate” risk, as determined through a detailed hazard risk assessment conducted for Goliad County and the participating jurisdictions. The hazard classification enables participating jurisdictions to prioritize mitigation actions based on hazards that pose the greatest risk to lives and property within the geographic scope.

Purpose

Goliad County and the participating jurisdictions worked together to update the Plan, aiming to protect people and buildings while lowering the costs associated with disaster response and recovery. The main objective is to reduce or eliminate long-term risks to life, property, daily operations, and the environment by identifying hazards and implementing practical mitigation strategies. This planning process allows local jurisdictions, stakeholders, and residents of Goliad County to review and develop effective actions that reduce the risk of future disasters that cause injury or property loss.

Participating jurisdictions within Goliad County and planning participants identified ten natural hazards to be addressed by the Plan Update. The specific goals of the Plan Update are to:

- Provide a comprehensive update to the 2018 HMAP.
- Minimize disruption to participating jurisdictions within Goliad County following a disaster;
- Streamline disaster recovery by articulating actions to be taken before a disaster strikes to reduce or eliminate future damage;
- Demonstrate a firm local commitment to hazard mitigation principles;
- Serve as a basis for future funding that may become available through grants and technical assistance programs offered by the state or federal government. The Plan will enable participating jurisdictions within Goliad County to take advantage of rapidly developing mitigation grant opportunities as they arise; and
- Ensure that participating jurisdictions within Goliad County maintain eligibility for the full range of future Federal disaster relief.

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Authority

The Plan is tailored specifically for participating jurisdictions within Goliad County and plan participants, including Planning Team members, stakeholders, and the general public who participated in the Plan Update development process. The Plan complies with all requirements promulgated by the Texas Division of Emergency Management (TDEM) and all applicable provisions of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Section 104 of the Disaster Mitigation Act of 2000 (DMA 2000) (P.L. 106-390), and the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 (P.L. 108-264), which amended the National Flood Insurance Act (NFIA) of 1968 (42 U.S.C. 4001, et al). Additionally, the Plan complies with the Interim Final Rules for the Hazard Mitigation Planning and Hazard Mitigation Grant Program (44 CFR, Part 201), which specify the criteria for approval of mitigation plans required in Section 322 of the DMA 2000 and standards found in FEMA's "Local Mitigation Policy Guide" (April 2023), and the "Local Mitigation Planning Handbook" (May 2023).

Section Summary

Sections 1 and 2 explain the Plan's purpose, development, and the roles of the Planning Team, stakeholders, and the public. Section 3 covers Goliad County's population and economy. Sections 4-14 review hazards, detailing each hazard's description, history, and risk assessment results, ordered by priority. Section 15 outlines mitigation goals; Section 16 reviews past actions; Section 17 lists current mitigation actions; and Section 18 discusses Plan maintenance.

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Plan Preparation and Development

Hazard mitigation planning brings together different stakeholders to help make communities more resilient to disasters. Section 2 outlines the steps in the planning process and explains in detail how both stakeholders and the public participate.

Overview of The Plan

Goliad County used the FEMA “Local Mitigation Planning Policy Guide” (April 2023) and the “Local Mitigation Planning Handbook” (May 2023) to develop the Plan Update. The overall planning process is shown in Figure 2-1 below.

Figure 2-1. Mitigation Planning Process



Goliad County and the participating jurisdictions met in November 2023 to begin organizing resources, identify Planning Team members, and conduct a Capability Assessment. The planning team reconvened on February 23, 2026, to discuss the plan update, reassess previous actions, review the capability assessment, address critical facilities, and identify additional hazard profile updates needed for the plan.

Planning Team

The Planning Team was formed using a direct representation model to coordinate planning efforts. Key duties included completing capability assessments, offering input on prior actions and hazard identification, setting mitigation goals, and creating strategies. As detailed in Table 2-1, team members participated by attending meetings, providing relevant data, updating on past actions, and reviewing and commenting on draft plans.

Table 2-1. Planning Team

Title	Agency or Department
County Judge	Goliad County Judge’s Office
Emergency Management Coordinator	Goliad County Emergency Management
IT Director	Goliad County
Indigent Health Administration	Goliad County
Fire Marshal/Constable	Goliad County
EMS Director	Goliad County EMS
Paramedic	Goliad County EMS
Sheriff	Goliad County Sheriff’s Office
Chief Deputy	Goliad County Sheriff’s Office
GISD Resource Officer	Goliad County Sheriff’s Office

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Title	Agency or Department
Ander-Weser Fire Chief	Goliad County VFD
Superintendent	Goliad Independent School District
Student Nutrition & School Security	Goliad Independent School District
President	Goliad Water Supply Company

Additionally, stakeholders were formally invited via email to engage in the planning process by participating in meetings, submitting comments on draft versions of the plan, and providing data to support informed decision-making. Further discussion regarding stakeholder involvement is provided below.

Drawing on findings from the completed Capability Assessment, jurisdictions within Goliad County outlined strategies to enhance future hazard mitigation initiatives by building upon existing capacities. For instance, each jurisdiction may pursue opportunities for cross-training or advancing staff technical expertise by participating in complementary training sessions offered by FEMA and the Texas Division of Emergency Management (TDEM), as well as by monitoring relevant courses and resources available on preparingtexas.org. Furthermore, jurisdictions can designate Planning Team members authorized to oversee Plan implementation and identify grant funding opportunities for staff expansion. Additional approaches for strengthening jurisdictional capabilities include the following:

Table 2-2. Opportunities for Improving and Expanding Existing Capabilities by Jurisdiction

Jurisdiction	Opportunities
Goliad County	<ul style="list-style-type: none"> • Develop a Capital Improvement Plan based on information in the risk assessment and identified mitigation projects within the HMAP. • Review current floodplain ordinances for opportunities to increase resiliency, such as modifying permitting or building codes. • Update Education and Awareness Public Outreach Program based on the 2026 plan.
Goliad ISD	<ul style="list-style-type: none"> • Create an ISD Capital Improvement Plan based on information in the risk assessment and identified mitigation projects within the HMAP. • Develop an all-hazards outreach program in coordination with Goliad County.

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Jurisdiction	Opportunities
Goliad Water Supply Corporation	<ul style="list-style-type: none"> • Create a Goliad WSC Capital Improvement Plan based on information in the risk assessment and identified mitigation projects within the HMAP. • Develop an all-hazards outreach program in coordination with Goliad County.

The Planning Team created actions to reduce risks from hazards such as wildfire, flooding, drought, and extreme heat. Measures include installing generators at key sites, preparing drought plans, and educating the public on mitigation techniques.

Planning Process

The Plan Update was prepared in four steps: organizing the Planning Team and conducting a capability assessment; identifying and assessing hazards at the Risk Assessment Workshop; developing mitigation strategies based on vulnerabilities; and establishing maintenance and implementation procedures, as detailed in Section 18. Participation records are provided in Appendix A.

During the Plan development workshops, participants considered:

- Current community risks;
- Hazard mitigation goals for present and future conditions;
- Available resources for the Plan Update;
- Implementation challenges (technical, political, legal, coordination);
- Expected results; and
- Roles of Goliad County jurisdictions, agencies, and partners in carrying out the Plan Update.

Planning meetings were held on the following dates:

Table 2-3: Planning Team Meetings

Planning Team Meeting Dates	
February 22, 2023	
June 5, 2023	August 16, 2024
December 15, 2023	November 7, 2024
April 11, 2024	February 23, 2026

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Kickoff Meetings

The Kickoff Workshop took place on February 22, 2023, at the Goliad County Courthouse. Officials and stakeholders, including local authorities, medical partners, volunteer fire departments, and neighboring communities, were informed about their roles in the planning process. Attendees received a project overview, and participants discussed the highest-risk hazards, future projects, and funding opportunities.

Hazard Identification

At the Kickoff Meeting and through e-mail and phone correspondence, the Planning Team conducted preliminary hazard identification. The Planning Team reviewed and considered a full range of natural hazards. Once identified, the teams narrowed the list to significant hazards by reviewing hazards affecting the area as a whole, the 2023 State of Texas Hazard Mitigation Plan, and initial study results from reputable sources, including federal and state agencies. Based on this initial analysis, the teams identified ten natural hazards that pose a significant threat to the planning area. During the February 23, 2026, meeting, the planning team confirmed the hazards affecting the area to be profiled in the Plan Update.

Risk Assessment

An initial risk assessment for participating jurisdictions within Goliad County was completed in April of 2024, and the results were discussed among the Planning Team members at the meeting held that day at the Goliad Courthouse. At the meeting, the characteristics and consequences of each hazard were evaluated to determine the extent to which the planning area would be affected, including potential danger to property and citizens.

Property and crop damage were estimated by gathering data from the National Centers for Environmental Information (NCEI) and the National Oceanic and Atmospheric Administration (NOAA). The assessment also examined the impact of various hazards on the built environment, including general building stock, critical facilities, lifelines, and infrastructure. The resulting risk assessment profiled hazard events, provided information on previous occurrences, estimated the probability of future events, and detailed the spatial extent and magnitude of impact on people and property.

During the February 23, 2026, meeting, the team again reassessed the hazards to ensure that all applicable hazards were being covered in the Plan Update.

The assessments were also used to set priorities for hazard mitigation actions based on potential loss of lives and dollar losses. A hazard profile and vulnerability analysis for each hazard are provided in Sections 5-14.

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Mitigation Review And Development

The Mitigation Strategy was developed by setting mitigation goals and identifying new actions. Initial and follow-up team meetings ensured updates were included. The Planning Team and stakeholders discussed and prioritized hazard mitigation actions, with jurisdictions actively involved in identifying measures to reduce risks. A structured process, using FEMA's STAPLE+E criteria, guided the selection and prioritization of actions, considering social, technical, administrative, political, legal, economic, and environmental factors.

During the meetings held on April 11, 2024, and November 7, 2024, the planning team discussed the plan and projects that could be completed, as well as potential projects they wanted to incorporate into the Plan Update.

Action plans detail proposed actions, costs, responsible parties, impacts on buildings, implementation schedules, priorities, and funding sources. The team chose mitigation options based on prior studies and feedback, federal and state funding details, and a comparative evaluation of project benefits and costs. Finalized mitigation actions were reviewed by the Planning Team and made available for public review in the draft Plan Update maintained by Goliad County and participating jurisdictions.

Review And Incorporation Of Existing Plans

Review

Background information utilized during the planning process included various studies, plans, reports, and technical information from sources such as FEMA, the United States Army Corps of Engineers (USACE), the U.S. Fire Administration, National Oceanic and Atmospheric Administration (NOAA), the Texas Water Development Board (TWDB), the Texas Commission on Environmental Quality (TCEQ), the Texas State Data Center, Texas Forest Service, the Texas Division of Emergency Management (TDEM), and local hazard assessments and plans. Section 4 and the hazard-specific sections of the Plan (Sections 5-14) summarize the relevant background information.

Specific background documents, including FEMA documents, provided information on hazard risk, current hazard mitigation actions, and potential mitigation actions. Previous hazard events, occurrences, and descriptions were identified through NOAA's National Centers for Environmental Information (NCEI). Results of past hazard events were found through searching the NCEI. The USACE studies were reviewed for their risk assessments and potential projects in the region. Information from the State Demographer on population and other projections was reviewed and included in Section 3 of the Plan. Data from the Texas Forest Service were used to rank wildfire hazard and

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identify appropriate grant opportunities. Materials from FEMA and TDEM were reviewed for guidance on the Plan Update's development requirements.

Incorporation Of Existing Plans Into The HMP Process

A Capability Assessment was conducted by key departments from the participating jurisdictions within Goliad County, which provided information on existing plans, policies, ordinances, and regulations to be integrated into the Plan Update's goals and objectives. The relevant information was included in Appendix B.

Existing projects and studies were utilized as a starting point for discussing hazard mitigation actions among the Planning Team members.

Additionally, several participating jurisdictions reviewed policies and ordinances. Other plans, such as the Emergency Operations Plan, were reviewed to identify any additional mitigation actions. Finally, the 2023 State of Texas Hazard Mitigation Plan, developed by TDEM, was discussed at the initial planning meeting to identify a specific set of hazards to address in the planning effort. The 2023 State Plan, along with FEMA materials, was also used as a guiding document in developing the Goliad County Multi-Hazard Mitigation Plan Update 2026.

Incorporation Of The HMP Into Other Planning Mechanisms

Planning Team members will integrate the Plan Update's implementation with other planning mechanisms for Goliad County, such as the Emergency Operations Plan. Existing plans for participating jurisdictions will be reviewed and, as appropriate, incorporated into the Plan Update. This section discusses how the participating jurisdictions within Goliad County will implement the Plan. It also addresses how the Plan will be evaluated and improved over time, and how the public will continue to be involved in the hazard mitigation planning process.

Participating jurisdictions within Goliad County will be responsible for implementing the hazard mitigation actions outlined in Section 17. Each hazard mitigation action has been assigned to a specific County, ISD, or special district department responsible for tracking and implementing it. A funding source has been listed for each identified hazard mitigation action and may be used to implement it. An implementation period has also been assigned to each hazard mitigation action as an incentive and to determine whether each action is implemented within that period.

Participating jurisdictions within Goliad County will integrate hazard mitigation actions contained in the Plan Update with existing planning mechanisms such as ordinances, Emergency Operations or Management Plans, and other local and area planning efforts. Goliad County will work closely with area organizations to coordinate the

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implementation of hazard mitigation actions that benefit the planning area in terms of financial and economic impact.

Upon formal adoption of the Plan Update, Planning Team members from the participating jurisdictions will review existing plans and building codes to guide development and ensure hazard mitigation actions are implemented. Each jurisdiction will be responsible for coordinating periodic reviews of the Plan Update with members of the Advisory Planning Team to ensure the integration of hazard mitigation strategies into these planning mechanisms and codes. The Planning Team will also conduct periodic reviews of various existing planning mechanisms and analyze the need for any revisions or updates in light of the approved Plan Update. Participating jurisdictions within Goliad County will ensure that future long-term planning objectives contribute to the Plan's goal of reducing the long-term risk to life and property from moderate and high-risk hazards. Within one year of the formal adoption of the Plan, existing planning mechanisms will be reviewed and analyzed in light of the Plan Update.

Planning Team members will review and, as necessary, revise the long-range goals and objectives in the Plan Update, as well as the strategic plan and budgets, to ensure they are consistent with it.

Furthermore, Goliad County will work with neighboring jurisdictions to advance the Plan Update's goals, as they apply to ongoing, long-range planning and actions to mitigate risk from natural hazards throughout the planning area.

Table 2-4 identifies types of planning mechanisms and examples of methods for incorporating the Plan into other planning efforts.

Table 2-4. Examples of Methods of Incorporation

Planning Mechanism	Incorporation of Plan
Annual Budget Review	Various departments and key personnel who participated in the planning process for participating jurisdictions within Goliad County will review the Plan and its mitigation actions during their annual budget review. Allowances will be made in accordance with the grant applications sought and the mitigation actions to be undertaken, as outlined in the implementation schedule for the specific action.
Grant Applications	The Plan will be evaluated by participating jurisdictions in Goliad County when seeking grant funding for mitigation projects. If a project is not in the Plan Update, a Plan

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Planning Mechanism	Incorporation of Plan
	Revision may be necessary to include the action in the Plan.
Regulatory Plans	Currently, several participating jurisdictions in Goliad County have regulatory plans in place, including Emergency Management Plans, Continuity of Operations Plans, Land Use Plans, and Evacuation Plans. The Plan Update will be consulted when County, ISD, and special district departments review or revise their current regulatory planning mechanisms, or when developing regulatory plans that are not currently in place.

Appendix B: Capability Assessment provides an overview of the Planning Team members' existing planning and regulatory capabilities. These existing capabilities provide the mechanisms to implement the objectives of the mitigation strategy. For example, the adoption of building codes and the implementation of land-use regulations have been shown to help communities avoid losses from natural hazard events. Currently, the County has building codes in place. Refer to Appendix B for a complete inventory of each participating jurisdiction's capabilities.

For the Plan Update, the HMP has served as a reference for reviewing and updating all plans and ordinances across the entire planning area, including all participating jurisdictions. The Emergency Management Plans developed for participating jurisdictions are updated every 5 years and incorporate goals, objectives, and actions identified in the mitigation plan.

Plan Review And Plan Update

As with the development of the Plan Update, participating jurisdictions within Goliad County will oversee the review and update process to ensure relevance and, if necessary, adjust. At the beginning of each fiscal year, Planning Team Members will meet to evaluate the Plan and review other planning mechanisms to ensure consistency with long-range planning efforts. In addition, planning participants will meet once a year, via conference call or presentation, to re-evaluate the prioritization of hazard mitigation actions. The plan may be amended to include additional hazard mitigation actions as they are developed.

Timeline For Implementing Mitigation Actions

The Planning Team (Tables 2-1 and A-1, Appendix A) will discuss the timeframe for implementing each hazard mitigation action. Considerations include when the action will be started, how existing planning mechanisms' timelines affect implementation, and

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when the action should be fully implemented. Timeframes may be general, and there will be short-, medium-, and long-term implementation goals based on the prioritization of each action, as identified on individual Hazard Mitigation Action worksheets included in the Plan Update for participating jurisdictions within Goliad County.

The Planning Team will evaluate and prioritize the most suitable hazard mitigation actions for the community to implement. The timeline for implementing actions will be partially guided by participating jurisdictions' comprehensive planning processes, budgetary constraints, and community needs. Participating jurisdictions within Goliad County are committed to addressing and implementing hazard mitigation actions aligned with and integrated into the Plan Update.

Overall, the Planning Team agrees that the goals and actions of the Plan Update shall align with the timeframe for implementing hazard mitigation actions, including annual reviews and updates of existing plans and policies.

Public And Stakeholder Involvement

A critical component of hazard mitigation planning is public participation and stakeholder involvement. Input from individual citizens and the community as a whole provides the Planning Team with a greater understanding of local concerns and increases the likelihood that hazard mitigation actions will be successfully implemented. If citizens and stakeholders, such as local businesses, non-profits, hospitals, and schools, are involved, they are more likely to gain a greater appreciation of the risks that hazards may present in their community and take steps to reduce or mitigate their impact.

The public was involved in the development of the Goliad County Hazard Mitigation Action Plan Update 2026 at various stages before the Plan's official approval and adoption. Public input was sought through three methods: a public meeting, a public survey, and the availability of the draft Plan Update for public review on participating jurisdictions' websites.

The Planning Team worked to identify local agencies, organizations, and community leaders that serve vulnerable populations and underserved communities. These organizations were included as stakeholders and invited to participate via email (Tables 2-5), including the local non-profit organizations, local health and hospital partners, and area volunteer fire departments. In addition, public notices were posted on public bulletin boards at public facilities. Public notices were also posted on the websites and social media accounts for several participating jurisdictions.

The draft Plan Update was made available to the general public for review and comment on participating jurisdictions' websites. At the public meeting, attendees were notified that the draft Plan Update would be available for review. No feedback was

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received on the draft Plan Update, although it was given on the public survey, and all relevant information was incorporated into the Plan Update. Public input was used to identify the hazards most concerning to County citizens, and the actions they felt should be included and prioritized.

The Plan Update will be advertised and posted on Goliad County and participating jurisdictions' websites upon FEMA's approval, and a copy will be kept at the Goliad County Office of Emergency Management.

Stakeholder Involvement

Stakeholder involvement is essential to hazard mitigation planning, as a wide range of stakeholders can provide input on specific topics and from various perspectives. Throughout the planning process, members of community groups, local businesses, neighboring jurisdictions, schools, and hospitals were invited to participate in developing the Plan Update. The Stakeholder Group (Table A-2 in Appendix A and Table 2-5 below) included a broad range of representatives from both the public and private sectors. It served as a key component of Goliad County's outreach efforts for the Plan Update. Documentation of stakeholder meetings is found in Appendix A. A list of organizations invited to attend, via email, is provided in Table 2-5. The stakeholders that were invited are listed below. Those in attendance have an (*) next to their Agency Name.

Table 2-5. Stakeholder Group

Agency	Title	Stakeholder Type
Hope Border Institute	Staff Member	Community Organization*
Court Appointed Special Advocates (CASA)	Staff Member	Community Organization*
BELONG	Staff Member	Nonprofit Organization*
Texas A&M Agri-Life	Extension Agent	State Agency*
Goliad County Historical Commission	Administrator	Local Agency*
La Bahia Nursing and Rehabilitation LP	Administrator	Healthcare Agency*
First Baptist Church	Administrator	Community Faith Organization*
Our Lady of Loreto Chapel	Administrator	Community Faith Organization*
Goliad Methodist Church	Administrator	Community Faith Organization*
Immaculate Conception Catholic Church	Administrator	Community Faith Organization*

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Stakeholders and participants from neighboring communities that attended the Planning Team and public meetings played a key role in the planning process. For example, public education and emergency services were among the biggest concerns for stakeholders, so participating jurisdictions included actions to promote early warning and communication, community education on mitigation, and partnerships to support response to extreme weather events.

Public Meetings

A public meeting was held in the planning area to gather input from the public and stakeholders. Topics of discussion included the purpose of hazard mitigation, the planning process, and types of natural hazards. Each participating jurisdiction within Goliad County released information about public meetings in their area to increase public participation in the Plan Update development process by posting on their websites, on social media platforms, including Facebook, in local media, and/or on bulletin boards in public facilities. A sampling of these notices is in Appendix A, along with documentation at the public meeting. Representatives from area associations and area residents were invited to participate.

The public meeting was held on the following date:

- March 9, 2026, Goliad County Courthouse

Public Participation Survey

In addition to public meetings, the Planning Team developed a public survey to solicit input from citizens and stakeholders during the planning process and to gather data on potential hazard mitigation actions or problem areas. Local officials promoted the survey, and a link to the survey was posted on participating jurisdictions' social media. A total of 12 surveys were completed online. The survey results are analyzed in Appendix D. Participating jurisdictions within Goliad County reviewed the survey input and decided which information to incorporate into the Plan as hazard mitigation actions. For example, results indicate that drought and extreme heat events are the hazards of greatest concern to the public. The public also expressed that some projects could be educational outreach campaigns, purchasing backup power generators for critical facilities, and creating a countywide communications system to eliminate radio dead zones were among the most desired types of mitigation actions. As a result, the Planning Team has included mitigation actions such as educating citizens about hazards that threaten the area and installing generators for critical facilities, both intended to reduce the risk of damage, injury, or illness.

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Background

Goliad, the county seat of Goliad County, originated as one of the oldest Spanish colonial municipalities in the state. The town is on the Southern Pacific Railroad, the San Antonio River, U.S. highways 59 and 183, and State Highway 239. It was established in October 1749, when colonizer José de Escandón recommended moving Nuestra Señora del Espíritu Santo de Zúñiga Mission and its royal protector, Nuestra Señora de Loreto de La Bahía del Espíritu Santo Presidio (Presidio La Bahía), from the Guadalupe River to a site named Santa Dorotea, on the San Antonio River. A new presidio, La Bahía, was built on a hill near the river, where sand, limestone, and timber were abundant. Around the presidio, the settlement of La Bahía grew, and on the opposite bank, Mission Espíritu Santo stood.

After the battle of San Jacinto, the old town was largely deserted, as many Hispanic citizens fled to Mexico and Anglo-Americans moved north of the river to the present townsite. The creation of a new town resulted from complications with land titles; people feared purchasing property in the old town because it was doubtful that appropriate Spanish or Mexican titles could be obtained.

Goliad County, named for the city, was established in 1836; Goliad became the county seat and, three years later, was incorporated under the Republic of Texas. A four-league grant offered to La Bahía during the Mexican era was validated and signed by Houston in 1844, and a post office opened in 1847. Paine Female Institute was founded in 1852, and Aranama College was chartered in 1854, but the college closed early in the Civil War, when most of the students left to join the Confederate Army. Paine Female Institute began accepting males in 1873, added a military academy in 1877, and eventually became Goliad College. The *Goliad Advance Guard* was published continuously from 1855 through the 1980s. Goliad was the scene of the Cart War in 1857. The Cart War

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Oak, or Hanging Tree, still standing on the north lawn of the courthouse lot, saw both court-approved hangings and unauthorized executions during the conflict, which Texas Rangers halted.

The railroad arrived in 1885–86, and Goliad grew to a population of 2,500 by 1890. A new courthouse was constructed in 1894. Local farmers raised cotton and later cattle, but the town's population declined as cotton farming declined. On May 18, 1902, a tornado destroyed more than 100 buildings, killed 115 people, and injured 230. Goliad had 1,261 residents in 1904, grew to 2,500 by 1925, fell to 1,400 during the Great Depression, and grew slowly afterward. In 1940, the town had two cotton gins, a gristmill, a poultry-packing plant, a broom factory, and 50 businesses. Still, in 1942, another disastrous storm hit the area, destroying the courthouse clock tower and turrets. La Bahia Downs, a racetrack, began hosting horse races in 1961. In 1976, Goliad's downtown square was listed in the National Register of Historic Places. In 1984–85, the Main Street Project renovated downtown buildings. By 1989, the population had increased to 2,285, and the major industries included oil, cattle ranching, other agribusiness, and tourism. In 1990, the population was 1,946. Throughout the 1990s, heritage tourism also contributed to the local economy, with Goliad State Historic Park and Presidio La Bahía among the area's attractions. In 2000, the population was 1,975, and there were 155 listed businesses. Goliad's weekly newspaper, *The Texan Express*, had been in publication since 1983. A general aviation airport, Goliad County Industrial Airpark, developed from a former naval landing field, opened in 2001. Goliad was recognized as a National Main Street City in 2003.¹

Figure 3-1 shows the general location of Goliad County.

Figure 3-1. Location of Goliad County

¹ <https://www.tshaonline.org/handbook/entries/goliad-tx>

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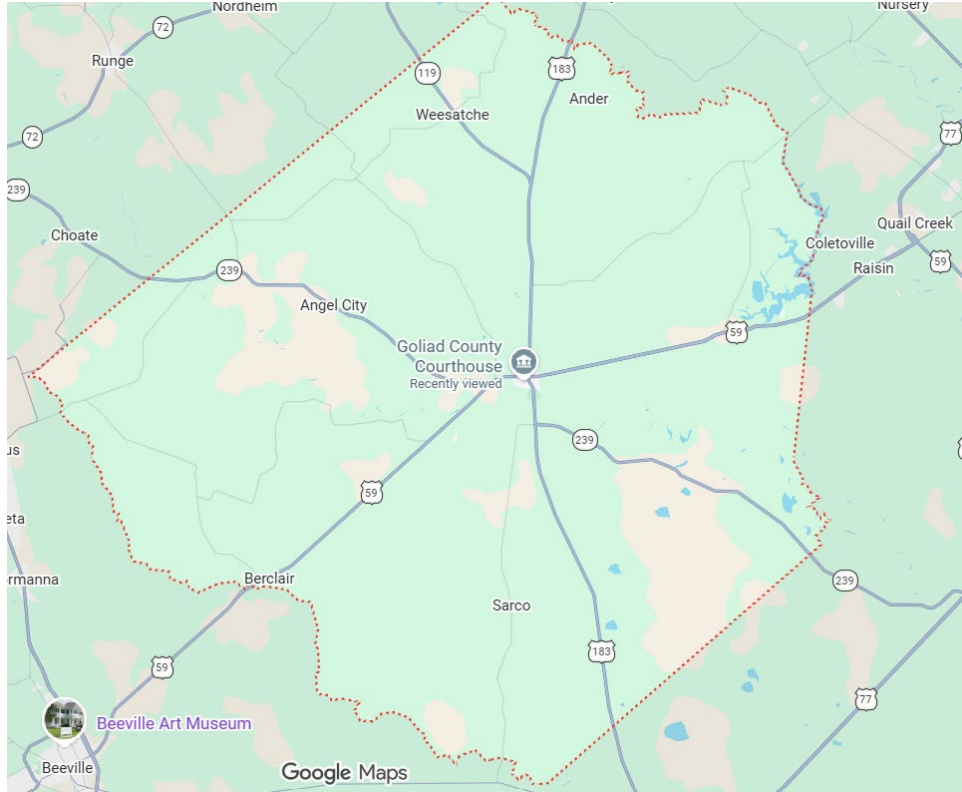
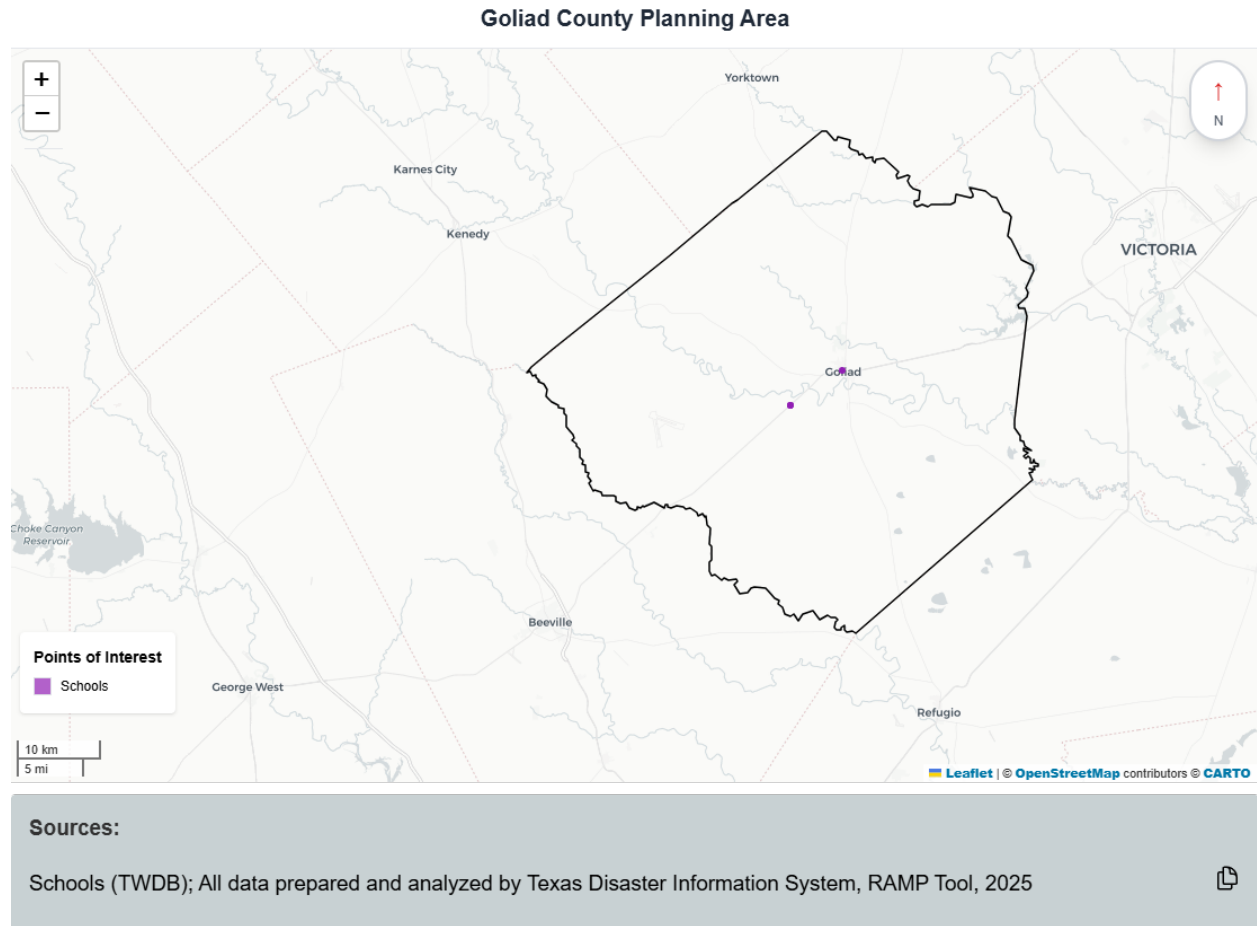


Figure 3-2 shows the location of the ISD locations within Goliad County that are covered in the risk assessment analysis of the Plan Update.

Figure 3-2. Goliad County Planning Area

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Provided in Table 3-1 below is a listing of the jurisdictions in Goliad County that participated in the Goliad County Multi-Hazard Mitigation Plan Update 2026.

Table 3-1. Participating Jurisdictions

Participating Jurisdictions	
Goliad County	
Goliad Independent School District (ISD)	Goliad Water Supply Corporation (GWSC)

Population And Demographics

According to the 2020 Census, Goliad County has an official population of 7,012 residents, a 3 percent decrease from the 2010 Census. Table 3-2 summarizes recent population trends in Goliad County and the participating jurisdictions, using data from the U.S. Census Bureau's 2024 American Community Survey (ACS) five-year estimates. Note that in some cases, the 2024 ACS estimates may differ from the 2020 Census counts; the ACS estimates are used throughout this section for consistency.²

Table 3-2. Population Distribution by Jurisdiction

Jurisdiction	2010 Census	2020 Census	2024 ACS	2010-2020 Difference
Goliad County	7,210	7,012	7,141	-198

Table 3-3 summarizes selected characteristics of vulnerable or sensitive populations in Goliad County and the participating jurisdictions, using data from the U.S. Census Bureau's 2024 American Community Survey (ACS) five-year estimates.

Between official U.S. Census population counts, the estimate is derived from a formula based on new residential building permits and household size. It is simply an estimate, and many variables are involved in accurately estimating the number of people living in an area at a given time.

Table 3-3. Estimated Vulnerable or Sensitive Populations³

Jurisdiction	Over 65	Under 5	With a Disability	Below Poverty Level	Non-English Speaking
Goliad County	1,752	341	1,168	918	970

ISD Population

Goliad ISD is a Class 3A district. They have three main campuses plus a District Alternative Education Program (DAEP): Goliad Elementary (PreK to 5), Goliad Middle School (grades 6-8, and Goliad High School (grades 9-12).

² Source: <https://demographics.texas.gov/Data/Decennial/2010/>, <https://www.census.gov/en.html> and <https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/2024/>

³ Source: 2024 American Community Survey 5-Year Estimates

Table 2-3: Goliad ISD Demographics

Jurisdiction	Number of Students	Number of Staff	Vulnerable Populations	
			Under 5	Staff Working Outdoors
Goliad Independent School District (ISD)	1,190	200	36	27

Special District

The Goliad County Water Supply Corporation (often referred to as Goliad Water Supply or GCWSC) is a nonprofit, member-owned rural water utility serving parts of Goliad County, Texas, particularly economically distressed or unincorporated/rural communities outside the City of Goliad. Established as a 501(c)(12) organization, it provides safe, reliable groundwater-based drinking water services, including systems like the Berclair Water System. It focuses on water distribution and related infrastructure in rural areas, often in coordination with entities such as the Goliad County Groundwater Conservation District for resource stewardship.

Table 2-4: Goliad Water Supply Corporation Demographics

Jurisdiction	Number of Customers	Number of Employees	Staff Working Outdoors
Goliad Water Supply Corporation	225	2	1

Population Growth

The official 2020 population of Goliad County is 7,012. Overall, Goliad County experienced a 17 percent increase in population between 1990 and 2020, adding 1,032 residents. Between 2010 and 2020, the County lost 198 residents (-3%). Table 3-6 provides historic growth rates in Goliad County.

Table 3-6. Population Growth by Jurisdictions 1990-2020⁴

Jurisdiction	1990	2000	2010	2020	Population Change 1990-2020	Percent of Change	Population Change 2010-2020	Percent of Change
Goliad County	5,980	6,928	7,210	7,012	1,032	17%	-198	-3%

Economic Impact

Building and maintaining infrastructure depends on the economy, and therefore, protecting infrastructure from natural hazard risks in the planning area is important to the participating jurisdictions in Goliad County. Whether it is expanding culverts under a road that washes out during flash flooding, shuttering a fire station, or flood-proofing a wastewater facility, infrastructure must be protected from natural hazards to continue providing essential utility and emergency response services in a fast-growing planning area.

According to the 2024 American Community Survey estimates, 51 percent of the population aged 16 and over is employed. The per capita income is \$38,705, and the median household income countywide is \$59,359. In 2024, families with incomes below the poverty line accounted for 13 percent of all families. Among families with children under 18, 13 percent are below the poverty level.

Tables 3-7 and 3-8 present the various occupations and industries in Goliad County, based on 2024 American Community Survey estimates.

Table 3-7. Occupations of the Employed Population in Goliad County⁵

Occupation	Estimate	Percent
Civilian employed population 16 years and over	2,798	-
Management, business, science, and arts occupations	868	31.0%
Sales and office occupations	544	19.4%
Natural resources, construction, and maintenance occupations	483	17.3%
Service occupations	465	16.6%
Production, transportation, and material moving occupations	438	15.7%

⁴ U.S. Census Bureau

⁵⁵ 2024 ACS 5 Year Estimates Data Profiles

Table 3-8. Industries of the Employed Population in Goliad County⁶

Industry	Estimate	Percent
Civilian employed population 16 years and over	2,798	-
Educational services, and health care and social assistance	836	29.9%
Agriculture, forestry, fishing and hunting, and mining	267	9.5%
Transportation and warehousing, and utilities	263	9.4%
Construction	254	9.1%
Retail trade	208	7.4%
Manufacturing	207	7.4%
Other services, except public administration	155	5.5%
Public administration	146	5.2%
Professional, scientific, and management, and administrative and waste management services	143	5.1%
Finance and insurance, and real estate and rental and leasing	95	3.4%
Arts, entertainment, and recreation, and accommodation and food services	91	3.3%
Wholesale trade	81	2.9%
Information	52	1.9%

Natural, Cultural, And Historic Resources

Goliad County offers a variety of outdoor recreational opportunities centered around its natural waterways, trails, and parks, making it suitable for activities such as hiking, biking, fishing, paddling, camping, and wildlife observation. The primary hub is Goliad State Park and Historic Site, situated along the San Antonio River, where visitors can engage in hiking and biking on trails including the 2.5-mile Angel of Goliad Hike and Bike Trail, which connects downtown Goliad to the park, showcasing native plants, trees, and fauna, and shorter paths like the Aranama Trail near the restored Mission Espíritu Santo. Additional activities in the park include picnicking, camping, including RV sites, tent camping, and screened shelters, fishing for species such as bass, catfish, and sunfish, and paddling or kayaking on the 6.6-mile Goliad Paddling Trail along the

⁶ 2024 ACS 5 Year Estimates Data Profiles

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San Antonio River, which features calm sections ideal for beginners and scenic features like rope swings.

Nearby, Coletto Creek Park and Reservoir, a 190-acre developed area adjacent to a 3,100-acre reservoir straddling Goliad and Victoria counties, provides year-round access for fishing, particularly largemouth bass, crappie, catfish, and others, boating, kayaking, swimming, water skiing, hiking, birdwatching, wildlife photography, and bow hunting in designated areas. Other options in the county include birding and photography along riverfront paths, such as at Branch River Park, as well as general nature exploration in a rural, subtropical setting with opportunities for picnicking and family-oriented outdoor pursuits. These activities leverage the county's proximity to the San Antonio River and reservoir systems, supporting both passive recreation and more active water-based endeavors in a historically rich environment.

To plan for hazard mitigation, it is essential to identify at-risk species in the area. Federally endangered species face extinction across most or all of their range, while threatened species are likely to become endangered soon. Both receive federal protection, which affects future mitigation projects. Candidate species are under consideration for listing but are not yet officially classified.

According to the U.S. Fish and Wildlife Service, as of February 2026, there are eight federally endangered, threatened, or candidate species in Goliad County, listed in Table 3-9. Additionally, one species is listed as in recovery (bald eagle) and one as resolved (golden orb).

Table 3-9. Endangered Species in Goliad County⁷

Type of Species	Common Name	Scientific Name	Species Status
Flowering Plants	Black Lace Cactus	<i>Echinocereus reichenbachii</i> var. <i>albertii</i>	Endangered
Birds	Attwater's Greater Prairie-Chicken	<i>Tympanuchus cupido attwateri</i>	Endangered
Clams	Guadalupe Orb	<i>Cyclonaias necki</i>	Endangered
Clams	False Spike	<i>Fusconaia mitchelli</i>	Endangered
Birds	Whooping Crane	<i>Grus americana</i>	Endangered
Mammals	Tricolored Bat	<i>Perimyotis subflavus</i>	Proposed Endangered
Birds	Rufa Red Knot	<i>Calidris canutus rufa</i>	Threatened

⁷ U.S. Fish and Wildlife Service, Environmental Conservation Online System <https://ecos.fws.gov/ecp/report/species-listings-by-current-range-county?fips=48175>

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Type of Species	Common Name	Scientific Name	Species Status
Insects	Monarch Butterfly	Danaus Plexippus	Proposed Threatened

Goliad County boasts a vibrant past, as evidenced by its officially recognized historic buildings and landmarks. Throughout the area, 13 distinct sites are listed in the National Register of Historic Places. Since many of these structures were built before the advent of modern building regulations, they often face heightened risks from natural disasters. Additionally, when including historic properties in mitigation or recovery efforts, special preservation rules and considerations apply. Table 3-10 below contains a detailed list of Goliad County’s historic sites and their locations.

Table 3-10. Historic Properties Listed on the National Register of Historic Places⁸

Property Name	Address	Location
Fair Oaks Ranch	14509 US 59 S	City of Berclair
Fannin Battleground State Historic Site	Address Restricted	City of Fannin
Charles H. and Catherine B. Baker House	401 S. Commercial St.	City of Goliad
Dr. L.W. and Martha E.S. Chilton House	242 N. Chilton St.	City of Goliad
Goliad County Courthouse Historic District	Roughly bounded by E. Franklin, S. Washington, E. Fannin and S. Chilton Sts.	City of Goliad
Goliad State Park Historic District	US 183 at the San Antonio River	City of Goliad
Nuestra Señora del Espíritu Santo de Zúñiga Site	Address Restricted	City of Goliad
Old Market House Museum	S. Market and Franklin Sts.	City of Goliad
Capt. Barton Peck House	W of Goliad at Hill and Post Oak St.	City of Goliad
Presidio Nuestra Señora de Loreto de la Bahía	1 mi. S of Goliad State Park on U.S. 183	City of Goliad
Ruins of Mission Nuestra Señora del Rosario de los Cujanes	Address Restricted	City of Goliad
San Antonio River Valley Rural Historic District (West of Goliad)	Address Restricted	City of Goliad

⁸ National Register of Historic Places

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Property Name	Address	Location
Jessie W. Stoddard House	Jct. of US 183, Fannin, and Hord Sts.	City of Goliad

Existing Land Use And Development Trends

The zoning ordinance sets forth regulations and standards for the extent of uses allowed in certain areas. A zoning map shows the areas within a community where the various zoning districts and standards are located and provides an overall picture of the types of development in a community and how it intends to continue to grow. Currently, none of the participating jurisdictions has a zoning ordinance in place.

A review of building permits can also provide a picture of the built environment and the number of buildings under construction in the county and each jurisdiction. Table 3-11 lists the number of residential buildings and total units authorized by permit in each jurisdiction for which data were available between 2019 and 2024. The data includes the total number of units permitted. Permits are reported annually in September, and the data includes that from 2019 through 2024 to demonstrate growth. Of the residential building permits issued in this period, all were for single-family buildings, and none were for multi-family buildings. Housing type can also indicate an individual's ability to recover from a disaster.

Table 3-11. Building Permits, By Jurisdiction, 2019-2023⁹

Jurisdiction	2019	2020	2021	2022	2023	2024
	Total Units					
Goliad County	0	0	42	2	8	0

Some housing in Goliad County is more vulnerable than newer site-built homes. There are 700 mobile or manufactured homes (20 percent of housing) and about 1,450 single-family residences built before 1980 (41 percent), which generally have lower construction standards and higher risk during hazards. Table 3-11 shows housing inventory data from the American Community Survey.

⁹ U.S. Census Bureau, Building Permit Survey, 1992-2021, <https://www.census.gov/construction/bps/>

Table 3-11. Housing Inventory and Vulnerable Structures, By Jurisdiction¹⁰

Jurisdiction	Total Housing Units	Built Before 1980	Mobile Homes
Goliad County	3,547	1,450	700
Goliad ISD	-	2	0
Goliad WSC	-	4	0

Changes In Vulnerability

The Goliad County planning area has experienced a 4 percent increase in overall population between 2010 and 2020. The American Community Survey estimates the total number of housing units in the planning area for 2024 at 10,468. The total number of building permits issued between 2019 and 2023 represents approximately 0.6 percent of the total number of housing units in the planning area. The overall population decrease, combined with a decrease in housing units, indicates no significant increase in vulnerability to all hazards across populations and the built environment.

Future Growth And Development

To assess how future growth and development may influence hazard vulnerability in Goliad County, it is important to examine trends in population growth, patterns of land occupancy and vacancy, the likelihood of future development in hazard-prone areas, and current planning and growth management strategies. This section provides an analysis of projected population changes and their associated economic impacts.

Population projections from 2010 to 2050 are listed in Table 3-12, as provided by the Texas State Data Center and the Institute for Demographic and Socioeconomic Research. Population projections are based on a 0.5 scenario growth rate, which is 50 percent of the population growth rate that occurred during 2000-2010. This information is only available at the county level; however, the population projection shows an increase in population density, indicating overall growth.

Table 3-12. Goliad County Population Projections¹¹

Land Area (Sq. Mi.)	2030	2040	2050	2060	2020-2060 Change	2020-2060 % Change
	Population					
852	7,127	6,920	6,620	6,245	-767	-10.9%

¹⁰ 2024 ACS 5-Year Survey

¹¹ Texas State Data Center and the Institute for Demographic and Socioeconomic Research

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Comprehensive Plans are guiding documents in a community that set forth a vision, goals, policies, and guidelines to direct future physical, social, and economic development within a jurisdiction. Comprehensive Plans are part of a continuous process to provide an environment for citizens and to consider the community's general desire to conserve, preserve, and protect the natural environment of their jurisdiction. These plans guide city staff, decision-makers, and citizens in making decisions that affect the community, with an understanding of the long-term effects. None of the participating jurisdictions has a Comprehensive Plan, but has other plans in place. Refer to Appendix B, Capability Assessment, for a complete list of participating jurisdictions with Comprehensive Plans.

Section 4: Risk Assessment

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Description

Section 4 is the first phase of the Risk Assessment, providing background information for the hazard identification process and descriptions of the identified hazards. The Risk Assessment continues with Sections 5 through 14, which include hazard descriptions and vulnerability assessments.

Upon reviewing the full range of natural hazards outlined in FEMA planning guidance, participating jurisdictions in Goliad County identified 10 natural hazards addressed in the Hazard Mitigation Plan Update. They are deemed significant, as shown in Table 4-1. The hazards were identified through input from Planning Team members and a review of the current 2023 State of Texas Hazard Mitigation Plan (State Plan). Readily available online information from reputable sources, such as federal and state agencies, was also evaluated and utilized to supplement information as needed.

In general, there are three main categories of natural hazards: atmospheric, hydrologic, and technological. Atmospheric hazards are events or incidents associated with weather-generated phenomena. The following have been identified as significant for the Planning Area: extreme heat, hailstorm, hurricane/tropical storm, lightning, severe winter storm, tornado, and windstorm (Table 4-1).

Hydrologic hazards are events or incidents associated with water-related damage and account for over 75 percent of federal disaster declarations in the United States. Hydrologic hazards identified as significant for the planning area include drought and flood.

For the Risk Assessment, the wildfire hazard is classified as “other,” as it is not atmospheric, hydrologic, or technological.

Table 4-1. Hazard Descriptions

Hazard	Description
Atmospheric	
Extreme Heat	Extreme heat is a condition in which temperatures hover 10 degrees or more above the region's average high temperature for an extended period.
Hailstorm	Hailstorms are a potentially damaging phenomenon associated with severe thunderstorms. Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to the rapid rising of warm air into the upper atmosphere and subsequent cooling of the air mass.
Hurricane/Tropical Storm	A hurricane is an intense tropical weather system of strong thunderstorms with a well-defined surface circulation and maximum sustained winds of 74 mph or higher.
Lightning	Lightning is a sudden electrostatic discharge that occurs during an electrical storm. This discharge occurs between electrically charged regions of a cloud, between two clouds, or between a cloud and the ground.
Severe Winter Storm	Severe winter storms may include snow, sleet, freezing rain, or a mix of these wintry precipitation forms. Blizzards, the most dangerous of all winter storms, combine low temperatures, heavy snowfall, and winds of at least 35 mph, reducing visibility to only a few yards. Ice storms occur when moisture falls and immediately freezes upon impact with trees, power lines, communication towers, structures, roads, and other hard surfaces. Winter and ice storms can down trees, cause widespread power outages, damage property, and result in fatalities and injuries.
Tornado	A tornado is a violently rotating column of air that has contact with the ground and is often visible as a funnel cloud. Its vortex rotates cyclonically, with wind speeds ranging from 40 mph to 300 mph. The destruction caused by tornadoes ranges from light to catastrophic, depending on the storm's location, intensity, size, and duration.
Windstorm	A thunderstorm occurs when an observer hears thunder. Radar observers use the intensity of the radar echo to distinguish between rain showers and thunderstorms. Lightning detection networks routinely track cloud-to-ground flashes and, by extension, thunderstorms. Thunderstorms can create extreme wind events, including straight-line winds. Wind is the horizontal motion of the air past a given point, beginning with differences in air pressure.
Hydrologic	
Drought	A prolonged period of less than normal precipitation, such that the lack of water causes a serious hydrologic

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Hazard	Description
	imbalance. Common effects of drought include crop failure, water supply shortages, and fish and wildlife mortality.
Flood	The accumulation of water within a body of water, which results in the overflow of excess water onto adjacent lands, is usually referred to as a floodplain. The floodplain is the land adjoining the channel of a river, stream, ocean, lake, or other watercourse or water body that is susceptible to flooding. Most floods fall into three categories: riverine, coastal, and shallow flooding.
Other	
Wildfire	A wildfire is an uncontrolled fire burning in an area of vegetative fuels such as grasslands, brush, or woodlands. Heavier fuels with high continuity, steep slopes, high temperatures, low humidity, low rainfall, and high winds all increase the risk to people and property in wildfire hazard areas or along the urban/wildland interface. Wildfires are part of the natural management of forest ecosystems, but human factors are the main cause of most wildfires.

Hazards that were not considered significant and were not included in the Plan Update are located in Table 4-2, along with the evaluation process used for determining the significance of each of these hazards. Hazards not identified for inclusion at this time may be addressed during future evaluations and updates.

Table 4-2. Other Hazards Deferred

Hazard Considered	Reason for Determination
Coastal Erosion	The planning area is not located on the coast, so coastal erosion does not pose a risk.
Earthquake	According to the State Plan, an earthquake occurrence for the Goliad County planning area is considered exceedingly rare. Although a small event is possible, it would pose little to no risk for the area. There is no history of impact to critical structures, systems, populations, or other community assets or vital services as a result of an earthquake, and none is expected in the future.
Expansive Soils	There is no history of impacts to critical structures, systems, populations, or other community assets or vital services resulting from expansive soils, and none is expected in the future.
Dam Failure	The planning area contains six dams, none of which is deemed to pose a significant risk to the planning area, meaning no loss of life or impact to critical facilities or infrastructure is expected in the event of a dam failure.

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Hazard Considered	Reason for Determination
Land Subsidence	There are no historical records of land subsidence in the planning area, and it is located in an area where such occurrences are considered rare. There is no history of impact on critical structures, systems, populations, or other community assets or vital services resulting from land subsidence, and none is expected in the future.

Disaster Declaration History

One way to understand the hazards that pose a risk to Goliad County is to identify past hazard events that triggered federal or state disaster declarations. Federal and state declarations may be granted when the severity and magnitude of an event exceed the local government's ability to respond and recover. Disaster assistance is supplemental and sequential. Table 4-3 lists state and federal disaster declarations received by Goliad County. Many of the disaster events were regional or statewide in scope.

Between 2000 and 2025, Goliad County received 14 federal disaster declarations. Of the 14 federally declared disasters, the highest number (9) were related to hurricanes, followed by biological events (2), severe winter storms (2), and fire (1).

In addition to the 14 federally declared disasters, there have been 33 U.S. Department of Agriculture (USDA) Secretarial disaster designations between 2012 and 2025. The Secretary of Agriculture is authorized to designate counties as disaster areas to make emergency loans available to producers suffering losses in those counties and in contiguous counties.¹ Of the 33 USDA designations for Goliad County, many listed multiple factors as having caused the disaster area designation. The leading cause was drought, which was included in 28 designations. Other factors listed include excessive heat (8 designations), high wind (7), fire/wildfire (7), insects (7), and excessive rain (4).

Table 4-3. Disaster Declaration History in Goliad County, 2000-2025

Year	Declaration Title	Hazard	Declaration Type	Disaster Number
2003	Texas Hurricane Claudette	Hurricane	DR	DR-1479
2005	Hurricane Katrina	Hurricane	EM	EM-3216
2005	Hurricane Rita	Hurricane	EM	EM-3261
2006	Texas Extreme Wildfire Threat	Fire	DR	DR-1624

¹ United States Department of Agriculture https://www.fsa.usda.gov/Assets/USDA-FSA-Public/usdafiles/FactSheets/emergency_disaster_designation_declaration_process-factsheet.pdf

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Year	Declaration Title	Hazard	Declaration Type	Disaster Number
2007	Hurricane Dean	Hurricane	EM	EM-3277
2008	Hurricane Gustav	Hurricane	EM	EM-3290
2008	Hurricane Ike	Hurricane	EM	EM-3294
2017	Hurricane Harvey	Hurricane	DR	DR-4332
2020	Covid-19 Pandemic	Biological	DR	DR-4485
2020	Texas Covid 19	Biological	EM	EM-3458
2020	Hurricane Hanna	Hurricane	EM	EM-3530
2021	Texas Severe Winter Storms	Severe Winter Storm	DR	DR-4586
2021	Texas Severe Winter Storm	Severe Winter Storm	EM	EM-3554
2024	Hurricane Beryl	Hurricane	DR	DR-4798

Natural Hazards And Climate Change

Climate change refers to long-term changes in temperature and weather patterns that can alter the risk of natural hazards. It is projected to heighten threats such as sea-level rise, stronger storms, and greater wind and flood damage. Texas is among the most vulnerable states to both sudden and gradual climate impacts.

Climate change is expected to lead to higher average temperatures and to increased frequency, duration, and intensity of extreme heat events. Without reductions in global emissions, the state of Texas is projected to experience an additional 30 to 60 days per year with temperatures above 100°F than it does now.²

The State Climatologist's *Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036*, identifies ongoing and likely future trends through 2036 based on analyses of historical observations of temperatures, precipitation, and extreme weather. Table 4-4 highlights future trends in extreme weather from the report.

² Kloesel, K., B. Bartush, J. Banner, D. Brown, J. Lemery, X. Lin, C. Loeffler, G. McManus, E. Mullens, J. Nielsen-Gammon, M. Shafer, C. Sorensen, S. Sperry, D. Wildcat, and J. Ziolkowska, 2018: Southern Great Plains. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 987–1035. doi: 10.7930/NCA4.2018.CH23. <https://nca2018.globalchange.gov/chapter/23/>

Table 4-4. Future Trends in Extreme Weather in Texas³⁴

Hazards	Expected Trends
Extreme Temperatures	<ul style="list-style-type: none"> • The average annual surface temperature in 2036 is expected to be 3.0°F warmer than the 1950-1999 average and 1.8°F warmer than the 1991-2020 average. • Nearly double the number of 100°F days by 2036 compared to 2001-2020. • Higher frequency of 100°F days in urban areas. • The number of nighttime temperatures below 32°F is expected to decrease. • The number of frost days per year is expected to decrease. • The coolest days of the summer are expected to continue becoming warmer. • The number of heatwaves per year and the number of days per year classified as heatwaves are expected to increase.
Precipitation	<ul style="list-style-type: none"> • Precipitation has increased by 10 percent or more in eastern Texas, but little trend is present in western Texas. • Precipitation trends to 2036 are likely to be dominated by natural variability. • Extreme precipitation is expected to increase in intensity on average statewide by 6-10 percent compared to the 1950-1999 averages and 2-3 percent relative to the 2001-2020 averages. • This translates to an increase in the frequency of extreme rain of 30-50 percent relative to the climatological expected frequency in 1950-1999 and 10-15 percent relative to 2001-2020. • Annual precipitation is projected to increase, while the number of extreme precipitation events (>2”) will remain relatively consistent.
Drought	<ul style="list-style-type: none"> • Increasing temperatures, rainfall variability, and other factors will, on balance, decrease water availability, but impact changes will vary strongly across applications. • Impact trends to be highly sector-specific, with the impacts possibly smaller for agriculture than for surface water supply.
Flood	<ul style="list-style-type: none"> • No long-term river flooding trend has been identified in the observations, nor is such a trend projected at this point,

³ Gammon-Nielsen, John, Holman, Sara, Buley, Austin and Jorgensen, Savannah. Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, 2021 Update. Texas A&M University Office of the Texas State Climatologist. October 7, 2021. <https://climatexas.tamu.edu/files/ClimateReport-1900to2036-2021Update>

⁴ University of Texas at Austin, February 2023, Austin Future Climate, Climate Change Predictions for the City of Austin 2022, Technical Report.

Hazards	Expected Trends
	<p>except perhaps for the most extreme floods and areas with normally high rainfall.</p> <ul style="list-style-type: none"> • Urban flooding is projected to increase, both as a simple matter of urban population increase and because of the projected increase in precipitation intensity, which drives flooding in fast-response drainages like those usually found in urban areas. • The climate-driven trend in urban flood frequency should be similar to the climate-driven trend in extreme precipitation frequency: 30-50 percent in 2036 relative to 1950-1999 and 10-15 percent relative to 2001-2020. • Areas already experiencing flooding are likely to see an increase in frequency and magnitude of events.
Winter Weather	<ul style="list-style-type: none"> • As the climate warms, the likelihood of winter weather decreases. • Both extreme cold and snowfall are either becoming less frequent or are expected to do so. • Widespread snowfall events in Texas, such as the one that took place in February 2021, are extremely rare. • Fewer cold spells are projected to occur per year, but the length of cold spells will be longer when they do occur.
Thunderstorms, Wind, Hail, Lightning	<ul style="list-style-type: none"> • Historical trend data is unreliable. • Indirect evidence supports an increase in the number of days capable of producing severe thunderstorms and an increase in the frequency of very large hail in early springtime. Still, these possible trends are too uncertain to quantify.
Wildfire	<ul style="list-style-type: none"> • Weather and climate drivers of wildfire risk are projected to increase the risk of wildfires throughout the state, primarily due to increased rates of drying and increased fuel load.

Overview Of Hazard Analysis

The methodologies used to develop the Risk Assessment include historical analysis and a statistical approach. Both methodologies provide estimates of potential impact by using a common, systematic evaluation framework.

Records retrieved from the National Centers for Environmental Information (NCEI) and the National Oceanic and Atmospheric Administration (NOAA) were reported for participating jurisdictions within Goliad County. The remaining records, which identify the occurrence of hazard events in the planning area and the maximum recorded magnitude of each event, were also evaluated.

Section 4: Risk Assessment

The use of geographic information system (GIS) technology to identify and assess risks in Goliad County, and to evaluate community assets and their vulnerability to hazards.

The four general parameters that are described for each hazard in the Risk Assessment include frequency of return, approximate annualized losses, a description of general vulnerability, and a statement of the hazard's impact.

Frequency of return was calculated by dividing the number of events in the recorded time period for each hazard by the overall time period during which events were recorded. The frequency of return statements is defined in Table 4-5, and impact statements are defined in Table 4-6 below.

Table 4-5. Frequency of Return Statements

Probability	Description
Highly Likely	The event is probable in the next year.
Likely	The event is probable in the next three years.
Occasional	The event is probable in the next five years
Unlikely	The event is probable in the next ten years

Table 4-6. Impact Statements

Potential Severity	Description
Substantial	Multiple deaths. Complete shutdown of facilities for 30 days or more. More than 50 percent of the property was destroyed or had major damage.
Major	Injuries and illnesses resulting in permanent disability. Complete shutdown of critical facilities between one and four weeks. More than 25 percent of the property was destroyed or had major damage.
Minor	Injuries and illnesses do not result in permanent disability or a complete shutdown of critical facilities for up to one week. More than 10 percent of the property was destroyed or had major damage.
Limited	Injuries and illnesses can be treated with first aid, shutting down critical facilities and services for 24 hours or less. Less than 10 percent of the property was destroyed or had major damage.

Section 4: Risk Assessment

Each hazard profile includes a description of a general Vulnerability Assessment. Vulnerability is the total of assets that are subject to damage from a hazard, based on historical damage records. Assets in the region were inventoried and, where appropriate, defined in hazard zones. The total amount of damages, including property and crop damages, for each hazard is divided by the total number of assets (building value totals) in that community to determine the percentage of damage that each hazard can cause to the community. Risk and consequences will be addressed and covered within each hazard profile under the Vulnerability and Impact section, as well as under the Assessment of Impact sections, where applicable.

To better understand how future growth and development in the Goliad County region might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts. Hazard vulnerability for all participating jurisdictions in Goliad County was reviewed in light of recent development changes across the planning area. The population of Goliad County has decreased by 3 percent between 2010 and 2020, according to the U.S. Census Bureau. Therefore, the vulnerability of the population, infrastructure, and buildings to hazards without geographic boundaries has not changed significantly.

Once loss estimates and vulnerability were known, an impact statement was prepared to assess the hazard's potential impact on assets within the affected area.

Hazard Ranking

During the 2026 planning process, the Planning Team conducted a risk-ranking exercise to gather input from the Planning Team and stakeholders. Table 4-7 presents the results of the risk assessment analysis, including the frequency of occurrence and potential severity, as well as the Planning Team's self-assessment of hazard ranking, based on local knowledge of past hazard events and impacts for each identified hazard. The definitions of frequency of occurrence and potential severity are in Tables 4-5 and 4-6.

Table 4-7. Hazard Risk Ranking

Hazard	Frequency of Occurrence	Potential Severity	Ranking
Drought	Highly Likely	Limited	High
Extreme Heat	Highly Likely	Limited	High
Wildfire	Highly Likely	Limited	High
Hailstorm	Highly Likely	Limited	Moderate

Section 4: Risk Assessment

Hazard	Frequency of Occurrence	Potential Severity	Ranking
Hurricane/Tropical Storm	Occasional	Limited	Moderate
Lightning	Highly Likely	Limited	Moderate
Tornado	Unlikely	Limited	Moderate
Windstorm	Highly Likely	Limited	Moderate
Flood	Likely	Substantial	Low
Winter Storm	Highly Likely	Limited	Low

Section 5: Drought

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Vulnerability and Impact	13
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Hazard Description

Drought refers to an extended period with significantly reduced rainfall that may last from one year to the next. It is a typical phenomenon occurring across nearly all climatic regions, regardless of whether they usually experience high or low average precipitation. Drought results from a prolonged decrease in expected natural precipitation, typically spanning at least one season. Droughts are generally categorized into meteorological, hydrologic, agricultural, and socioeconomic types. Table 5-1 provides definitions for each of these drought classifications.

Droughts rank among the most complicated natural hazards, largely because it's hard to clearly define exactly when they start or end. These events can trigger other problems, like intense heat and wildfires. The effects on wildlife and agriculture are significant—droughts can destroy crops, grazing fields, many edible plants, and sometimes even trees if conditions are severe enough. Wildfires often become a secondary threat during droughts, as dried-out vegetation offers ample fuel for fires. When a heat wave strikes during a drought, the combination creates an especially hazardous scenario.

Table 5-1. Drought Classification Definitions¹

Meteorological Drought	The degree of dryness or departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.
Hydrologic Drought	The effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.
Agricultural Drought	Soil moisture deficiencies relative to the water demands of plant life, usually crops.
Socioeconomic Drought	The effect of demands for water exceeding the supply as a result of a weather-related supply shortfall.

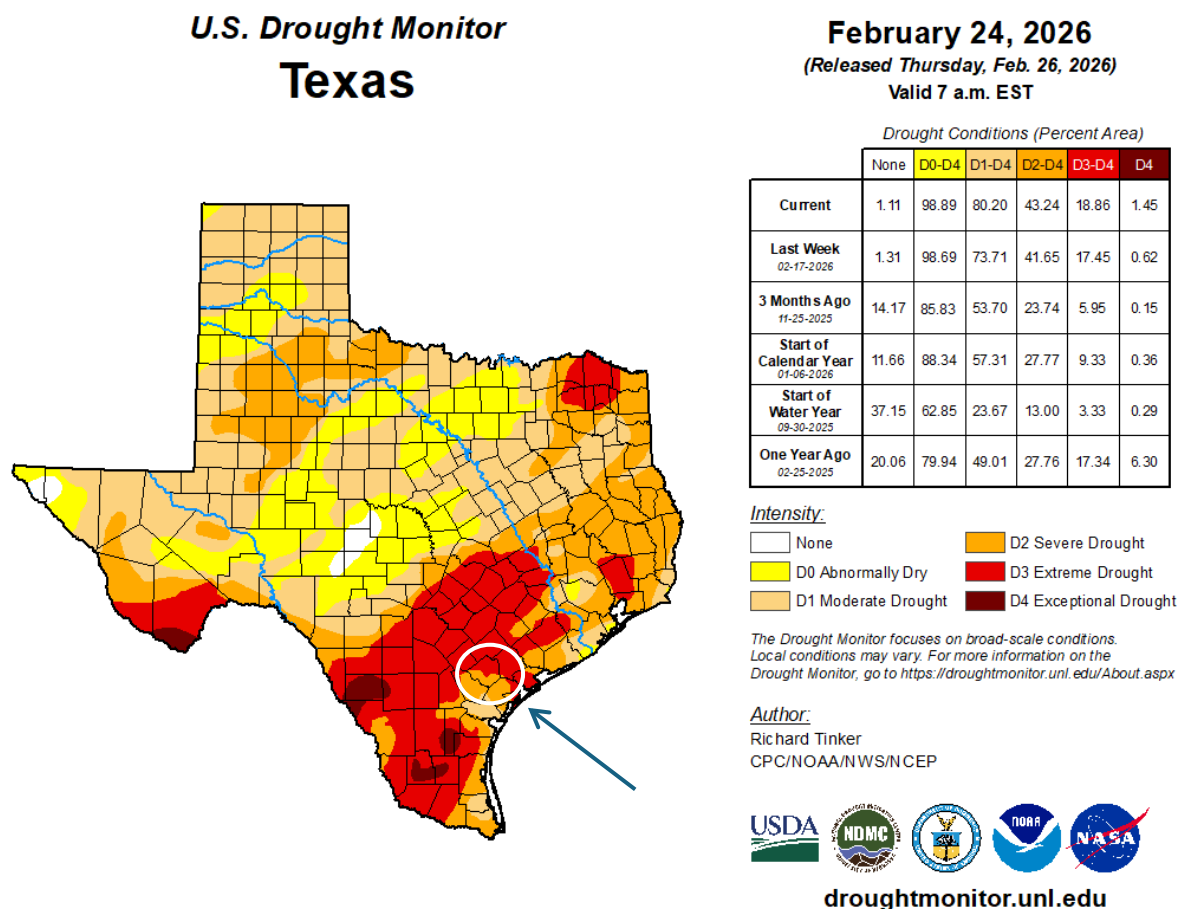
¹ Source: Multi-Hazard Identification and Risk Assessment: A Cornerstone of the National Mitigation Strategy, FEMA

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Location

Droughts occur regularly throughout Texas and the Goliad County planning area, including the ISD and special district, and are considered a normal condition. However, they can vary greatly in intensity and duration. The U.S. Drought Monitor, produced through a partnership between the National Drought Mitigation Center at the University of Nebraska-Lincoln, U.S. Department of Agriculture and the National Oceanic and Atmospheric Administration, shows the planning area is currently experiencing normal conditions (Figure 5-1) but has experienced a range of drought conditions from abnormally dry to exceptional drought conditions over the last decade (Figure 5-2). There is no distinct geographic boundary to drought; therefore, it can occur anywhere throughout the Goliad County planning area.

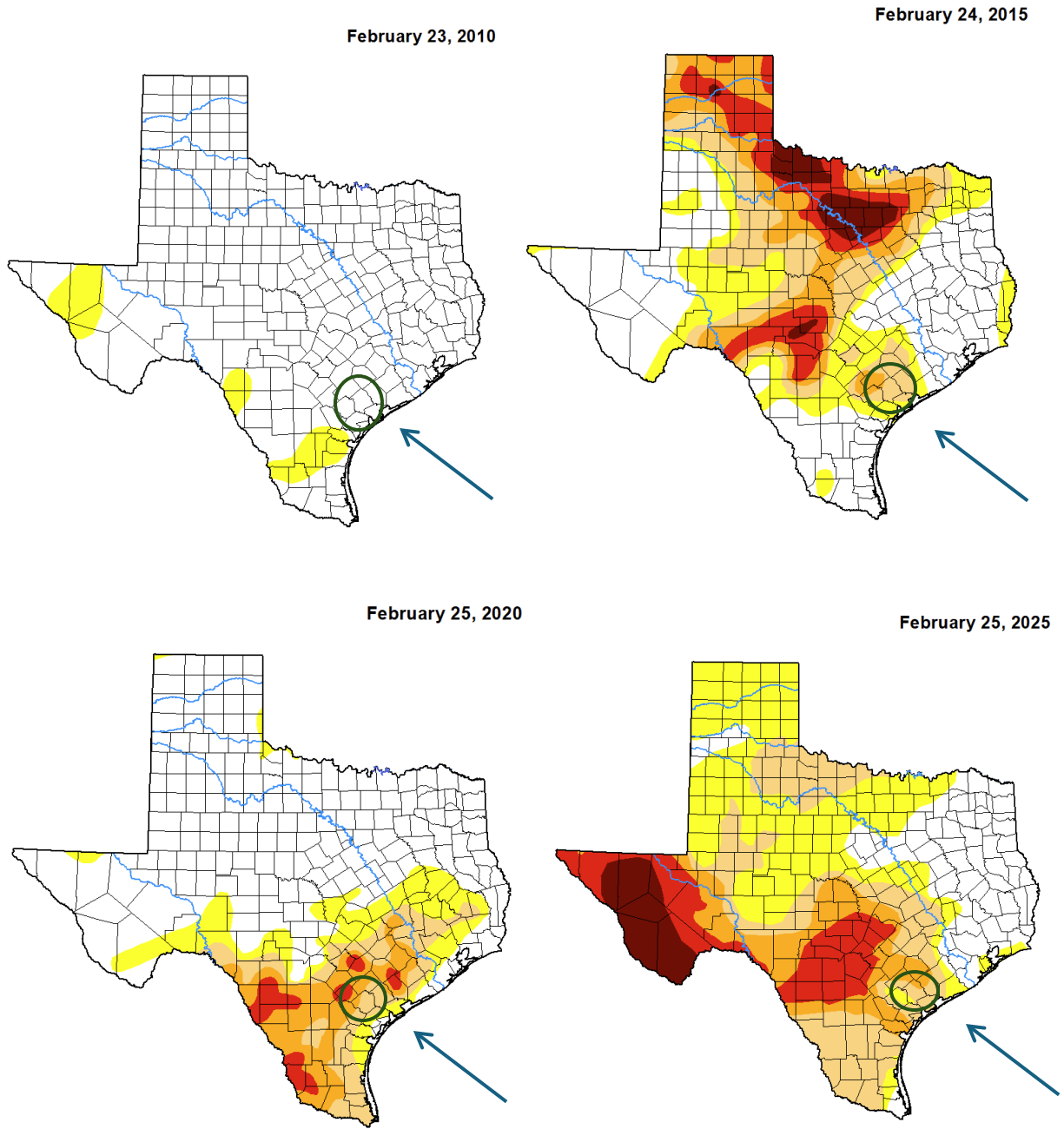
Figure 5-1. U.S. Drought Monitor, February 2026²



² The white circle with an arrow indicates the location of the County.

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Figure 5-2. U.S. Drought Monitor, February 2010, February 2015, February 2020, February 2025³



³ The dark green circle with an arrow indicates the location of the County.

Section 5: Drought

Intensity:

 None	 D2 Severe Drought
 D0 Abnormally Dry	 D3 Extreme Drought
 D1 Moderate Drought	 D4 Exceptional Drought

Extent

The Palmer Drought Index measures the extent of drought by assessing the duration and intensity of long-term drought-inducing circulation patterns. Long-term drought is cumulative, with the intensity of drought in the current month dependent on current weather patterns and the cumulative patterns of previous months. The hydrological impacts of drought (e.g., reservoir and groundwater levels) take longer to develop. Table 5-2 depicts the magnitude of drought, while Table 5-3 describes the classification descriptions.

Table 5-2. Palmer Drought Index

Drought Index	Drought Condition Classifications						
	Extreme	Severe	Moderate	Normal	Moderately Moist	Very Moist	Extremely Moist
Z Index	-2.75 and below	-2.00 to -2.74	-1.25 to -1.99	-1.24 to +.99	+1.00 to +2.49	+2.50 to +3.49	N/A
Meteorological	-4.00 and below	-3.00 to -3.99	-2.00 to -2.99	-1.99 to +1.99	+2.00 to +2.99	+3.00 to +3.99	+4.00 and above
Hydrological	-4.00 and below	-3.00 to -3.99	-2.00 to -2.99	-1.99 to +1.99	+2.00 to +2.99	+3.00 to +3.99	+4.00 and above

Table 5-3. Palmer Drought Category Descriptions

Category	Description	Possible Impacts	Palmer Drought Index
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures; fire risk above average. Coming out of drought, some lingering water deficits; pastures or crops not fully recovered.	-1.0 to -1.9

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Category	Description	Possible Impacts	Palmer Drought Index
D1	Moderate Drought	Some crop and pasture damage; fire risk is high; streams, reservoirs, or wells are low; some water shortages are developing or imminent; voluntary water-use restrictions are requested.	-2.0 to -2.9
D2	Severe Drought	Crop or pasture losses likely; fire risk very high; water shortages common; water restrictions imposed.	-3.0 to -3.9
D3	Extreme Drought	Major crop/pasture losses; extreme fire danger; widespread water shortages or restrictions.	-4.0 to -4.9
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; exceptional fire risk; shortages of water in reservoirs, streams, and wells, creating water emergencies.	-5.0 or less

Drought is monitored nationwide by the National Drought Mitigation Center (NDMC). Indicators describe broad-scale drought conditions across the U.S. and correspond to drought intensity.

Given historical drought occurrences and the location of the Goliad County planning area, the area can anticipate the full range of drought, from abnormally dry (D0) to exceptional drought (D4), according to the Palmer Drought Category. The entire planning area has experienced severe drought. This is the highest level of drought severity and the most extreme drought conditions the planning area can anticipate based on historical records.

Historical Occurrences

The Goliad County planning area may experience an extreme drought in any given year. According to the U.S. Drought Monitor, between January 2000 and 2025, the Goliad County planning area experienced 384 weeks (36.80%) in some level of drought, defined as Abnormally Dry (D0) or worse. The longest consecutive drought period during that time lasted 126 weeks. Goliad County has received 33 USDA disaster declarations for drought from 2012 through 2025.

Figure 5-3. Goliad County Drought Intensity, 2000-2025⁴

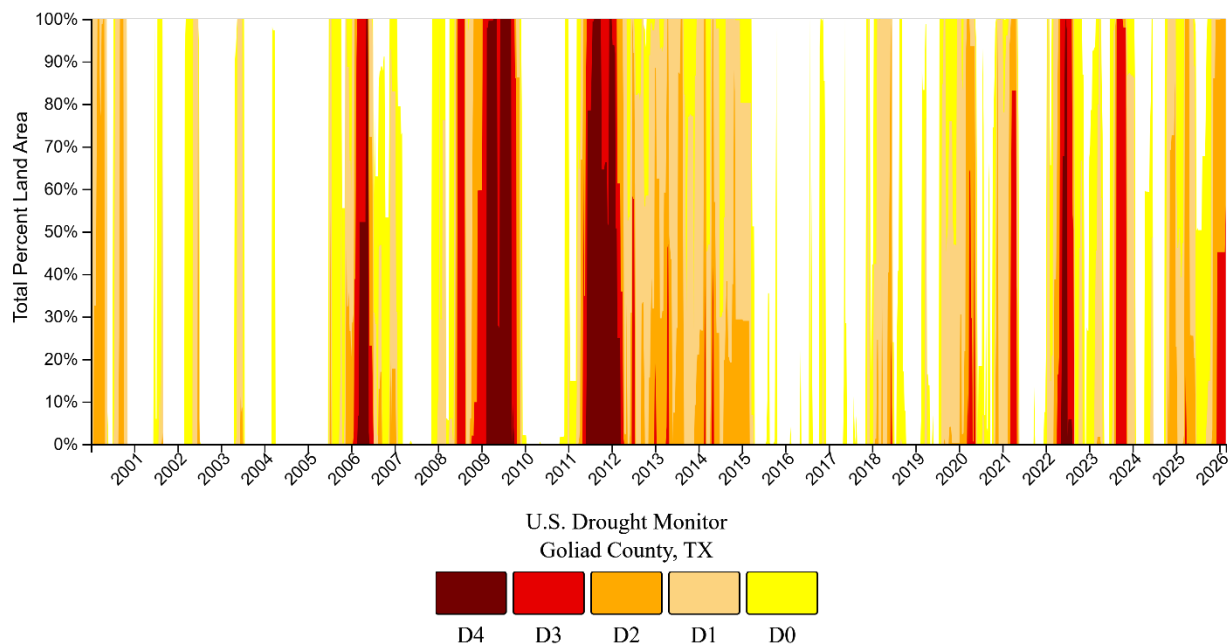


Table 5-4 lists historical events that have occurred in Goliad County as reported in the National Centers for Environmental Information Storm Events Database (NCEI). A total of 95 drought-impact reports were recorded in the NCEI across 25 unique drought periods affecting Goliad County from 2000 through 2025. Historical drought events reported in the NCEI database for the Goliad County planning area, including the ISD and special district, over the 25-year reporting period have resulted in no reported property or crop damages. There was one report from 1996 with no losses, then no reports until 2006; this table starts with the 2006 events.

Historical drought information shows drought activity across a multi-county forecast area for each event; the appropriate percentage of the total property and crop damage reported for the entire forecast area has been allocated to each county impacted by the event. Historical drought data are provided countywide from the NCEI Storm Events

⁴ Source: U.S. Drought Monitor

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database. The participating ISD and special district have no reported losses due to drought events.

Table 5-4. Historical Drought Events, 2000-2025

Jurisdiction	Date	Injuries	Deaths	Property Damage	Crop Damage
Goliad County	1/1/2006	0	0	\$0	\$0
Goliad County	2/1/2006	0	0	\$0	\$0
Goliad County	3/1/2006	0	0	\$0	\$0
Goliad County	4/1/2006	0	0	\$0	\$0
Goliad County	5/1/2006	0	0	\$0	\$0
Goliad County	6/1/2006	0	0	\$0	\$0
Goliad County	2/1/2008	0	0	\$0	\$0
Goliad County	3/1/2008	0	0	\$0	\$0
Goliad County	5/1/2008	0	0	\$0	\$0
Goliad County	6/1/2008	0	0	\$0	\$0
Goliad County	7/1/2008	0	0	\$0	\$0
Goliad County	8/1/2008	0	0	\$0	\$0
Goliad County	9/1/2008	0	0	\$0	\$0
Goliad County	10/1/2008	0	0	\$0	\$0
Goliad County	11/1/2008	0	0	\$0	\$0
Goliad County	12/1/2008	0	0	\$0	\$0
Goliad County	1/1/2009	0	0	\$0	\$0
Goliad County	2/1/2009	0	0	\$0	\$0

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Jurisdiction	Date	Injuries	Deaths	Property Damage	Crop Damage
Goliad County	3/1/2009	0	0	\$0	\$0
Goliad County	4/1/2009	0	0	\$0	\$0
Goliad County	5/1/2009	0	0	\$0	\$0
Goliad County	6/1/2009	0	0	\$0	\$0
Goliad County	7/1/2009	0	0	\$0	\$0
Goliad County	8/1/2009	0	0	\$0	\$0
Goliad County	9/1/2009	0	0	\$0	\$0
Goliad County	10/1/2009	0	0	\$0	\$0
Goliad County	11/1/2009	0	0	\$0	\$0
Goliad County	12/1/2009	0	0	\$0	\$0
Goliad County	4/1/2011	0	0	\$0	\$0
Goliad County	5/1/2011	0	0	\$0	\$0
Goliad County	6/1/2011	0	0	\$0	\$0
Goliad County	7/1/2011	0	0	\$0	\$0
Goliad County	8/1/2011	0	0	\$0	\$0
Goliad County	9/1/2011	0	0	\$0	\$0
Goliad County	10/1/2011	0	0	\$0	\$0
Goliad County	11/1/2011	0	0	\$0	\$0
Goliad County	12/1/2011	0	0	\$0	\$0
Goliad County	1/1/2012	0	0	\$0	\$0
Goliad County	2/1/2012	0	0	\$0	\$0
Goliad County	3/1/2012	0	0	\$0	\$0

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Jurisdiction	Date	Injuries	Deaths	Property Damage	Crop Damage
Goliad County	4/1/2012	0	0	\$0	\$0
Goliad County	6/5/2012	0	0	\$0	\$0
Goliad County	7/1/2012	0	0	\$0	\$0
Goliad County	11/1/2012	0	0	\$0	\$0
Goliad County	12/1/2012	0	0	\$0	\$0
Goliad County	1/1/2013	0	0	\$0	\$0
Goliad County	2/1/2013	0	0	\$0	\$0
Goliad County	3/1/2013	0	0	\$0	\$0
Goliad County	4/1/2013	0	0	\$0	\$0
Goliad County	5/1/2013	0	0	\$0	\$0
Goliad County	6/1/2013	0	0	\$0	\$0
Goliad County	7/1/2013	0	0	\$0	\$0
Goliad County	8/1/2013	0	0	\$0	\$0
Goliad County	9/1/2013	0	0	\$0	\$0
Goliad County	12/20/2013	0	0	\$0	\$0
Goliad County	1/1/2014	0	0	\$0	\$0
Goliad County	2/1/2014	0	0	\$0	\$0
Goliad County	3/1/2014	0	0	\$0	\$0
Goliad County	4/15/2014	0	0	\$0	\$0
Goliad County	5/1/2014	0	0	\$0	\$0
Goliad County	6/1/2014	0	0	\$0	\$0
Goliad County	8/10/2014	0	0	\$0	\$0

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Jurisdiction	Date	Injuries	Deaths	Property Damage	Crop Damage
Goliad County	9/1/2014	0	0	\$0	\$0
Goliad County	10/1/2014	0	0	\$0	\$0
Goliad County	11/1/2014	0	0	\$0	\$0
Goliad County	12/1/2014	0	0	\$0	\$0
Goliad County	1/1/2015	0	0	\$0	\$0
Goliad County	2/1/2015	0	0	\$0	\$0
Goliad County	3/1/2015	0	0	\$0	\$0
Goliad County	5/22/2018	0	0	\$0	\$0
Goliad County	6/1/2018	0	0	\$0	\$0
Goliad County	2/1/2020	0	0	\$0	\$0
Goliad County	3/1/2020	0	0	\$0	\$0
Goliad County	4/1/2020	0	0	\$0	\$0
Goliad County	5/1/2020	0	0	\$0	\$0
Goliad County	11/10/2020	0	0	\$0	\$0
Goliad County	2/20/2021	0	0	\$0	\$0
Goliad County	3/1/2021	0	0	\$0	\$0
Goliad County	4/1/2021	0	0	\$0	\$0
Goliad County	5/1/2021	0	0	\$0	\$0
Goliad County	3/1/2022	0	0	\$0	\$0
Goliad County	4/1/2022	0	0	\$0	\$0
Goliad County	5/1/2022	0	0	\$0	\$0
Goliad County	6/1/2022	0	0	\$0	\$0

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Jurisdiction	Date	Injuries	Deaths	Property Damage	Crop Damage
Goliad County	7/1/2022	0	0	\$0	\$0
Goliad County	8/1/2022	0	0	\$0	\$0
Goliad County	8/5/2023	0	0	\$0	\$0
Goliad County	9/1/2023	0	0	\$0	\$0
Goliad County	10/1/2023	0	0	\$0	\$0
Goliad County	11/1/2023	0	0	\$0	\$0
Goliad County	12/1/2024	0	0	\$0	\$0
Goliad County	1/1/2025	0	0	\$0	\$0
Goliad County	4/1/2025	0	0	\$0	\$0
Goliad County	5/1/2025	0	0	\$0	\$0
Goliad County	6/1/2025	0	0	\$0	\$0
Totals					

Table 5-5. Historical Drought Events Summary, 2000-2025

Jurisdiction	Drought Impacts	Injuries	Deaths	Property Damage	Crop Damage
Goliad County	95	0	0	\$0	\$0

Based on the historical drought events for the Goliad County planning area, 24 drought periods have occurred since the 2018 Plan.

Significant Events

June 2006

June 2006 brought a mix of relief and challenges to South Texas weather and drought conditions. Scattered, highly beneficial rainfall provided some respite from long-term drought across parts of the Coastal Bend and Victoria Crossroads, though it also triggered flash flooding in isolated areas. A major rainfall event from May 28 through June 2 delivered excessive totals, exceeding 10 inches in portions of Nueces and

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Kleberg counties, while additional rains on June 18 brought 1–2 inches to the Victoria area and northern Coastal Bend. On June 20, extremely heavy precipitation hammered Calhoun County and parts of Aransas, Refugio, and Victoria counties, with some spots in Calhoun receiving 10 to 15 inches in a single day.

Farther west across the Rio Grande Plains and northwest in the Nueces and Frio River basins, rainfall remained well below average, offering little meaningful relief.

By month's end, the U.S. Drought Monitor reflected ongoing severe conditions in drier western areas: exceptional drought persisted across the Rio Grande Plains. In contrast, severe-to-extreme drought covered the western Coastal Bend. Coastal counties and the Victoria Crossroads showed improvement, shifting to moderate drought or abnormally dry status.

Soil moisture improved in parts of the Coastal Bend and Victoria Crossroads, aiding crop growth and providing welcome relief for farmers. However, excessive rain in northern coastal zones likely caused waterlogging and crop damage. In the western Coastal Bend and Rio Grande Plains, insufficient rainfall left soils parched, with crops continuing to struggle. Ranchers across much of the region still depended heavily on supplemental hay for livestock, and some continued reducing herd sizes to manage feed shortages.

Reservoir storage showed mixed trends amid the uneven precipitation:

- Levels at Choke Canyon Reservoir and Lake Corpus Christi continued a slow decline, ending June at approximately 81.9% and 39% capacity, respectively.
- Lake Amistad pool levels also fell gradually.
- Coleto Creek Reservoir experienced a slight rise.

Wildfire risk dropped considerably across the coastal counties and Victoria Crossroads due to the wetter conditions, though it remained elevated in the western Coastal Bend and Rio Grande Plains. Fortunately, no major wildfires were reported in South Texas during the month.

Probability of Future Events

Based on available records of historical events, there have been 95 drought impacts reported in the NCEI across 25 drought periods (ranging in length from approximately 1 month to over 3 years) within a 24-year reporting period, indicating a probability of about 1 event per year. This frequency supports a “Highly Likely” probability of future events for the Goliad County planning area, including the ISD and special district. The impact of climate change could lead to longer, more severe droughts, exacerbating the current drought.

Vulnerability and Impact

Loss estimates were based on 24 years of statistical data from the NCEI and the U.S. Drought Monitor. A drought event frequency-impact analysis was then developed to determine the impact profile on agricultural products and estimate potential losses due to drought in the area. All existing and future buildings, facilities, and populations are exposed to this hazard and could potentially be impacted. However, drought impacts are most often experienced as water shortages, breaks in water lines, or crop and livestock losses on agricultural land, and typically have minimal impact on buildings.

The Goliad County Planning Team identified the following critical facilities as assets most important to the planning area and susceptible to a range of impacts from drought events. For a comprehensive list by participating jurisdiction, please see Appendix C.

Table 5-6. Critical Facilities Vulnerable to Drought Events

Critical Facilities	Potential Impacts
Emergency Response Services (EOC, Fire, Police, EMS, Hospitals)	<ul style="list-style-type: none"> • Increased law enforcement activities may be required to enforce water restrictions. • Firefighters may have limited water resources to aid in firefighting and suppression activities, increasing risk to lives and property. • Potential for an increased number of emergency calls as drought events can lead to cascading hazard events such as wildfires and flash flooding.
Airport, Academic Institutions, Community Residential Facilities, Day Care Facilities, Evacuation Centers & Shelters, Governmental Facilities	<ul style="list-style-type: none"> • Strain on staff as drought may cause health problems related to low water flows and poor water quality. • Water main breaks due to dry soil conditions could lead to facility closures. • Building foundations may crack due to dry soil conditions. • Operations dependent on water supply may be adversely impacted. • Economic disruptions due to cracked foundations and infrastructure damage as a result of soil shrinking and swelling cycles.
Commercial Suppliers (food, gas, etc.)	<ul style="list-style-type: none"> • Operations dependent on water supply may be adversely impacted. • Economic disruptions due to cracked foundations and infrastructure damage as a result of soil shrinking and swelling cycles.
Utility Services and Infrastructure (electric, water, wastewater, communications)	<ul style="list-style-type: none"> • Potential for an increased number of emergency calls as drought events can lead to cascading hazard events such as wildfires and flash flooding. • Water main breaks due to soil shrinking and swelling cycles could lead to facility closures. • Operations dependent on water supply may be adversely impacted.

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Even with the planning area relying on multiple water utility providers as well as local and private services, high demand can still deplete these resources during extreme drought conditions. As resources are depleted, potable water is in short supply, and overall water quality can suffer, elevating health concerns for all residents, but especially vulnerable populations, typically children, the elderly, and the ill. In addition, potable water is used for drinking, sanitation, patient care, sterilization, equipment, heating and cooling systems, and many other essential functions in medical facilities.

The average person will survive only a few days without potable water, and this timeframe can be drastically shortened for those people with more fragile health, typically children, the elderly, and people with disabilities. During summer drought or hot and dry conditions, elderly persons, small children, infants, those with disabilities, or those who do not have adequate cooling units in their homes may become more vulnerable to injury and/or death. In addition, people who speak a language other than English may be more vulnerable due to language barriers that limit their access to important information, such as weather-related warnings and safety instructions. The population over 65 in the Goliad County planning area is estimated at 24 percent of the total population, and children under the age of 5 are estimated at 6 percent. The population with a disability is estimated at 14 percent of the total population. An estimated 9 percent of the planning area population lives below the poverty level, and 13 percent speaks a language other than English (Table 5-7). Some participating ISDs and special districts also have vulnerable populations based on age or work location, such as employees who work outdoors, who may be subject to severe weather conditions (Table 5-8).

Table 5-7. Populations at Greater Risk by Participating Jurisdiction

Jurisdiction	Over 65	Under 5	With a disability	Below Poverty Level	Non-English Speaking
Goliad County	1,752	341	1,168	918	970

Table 5-8. Populations at Greater Risk by Participating Special Districts

Special District	Under 5	Staff Working Outdoors
Goliad ISD	36	27
Goliad WSC	-	1

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The planning area is also vulnerable to food shortages during droughts and when potable water is scarce. Potable water is used for drinking, sanitation, patient care, sterilization, equipment, heating and cooling systems, and many other essential functions in medical facilities. All residents in the Goliad County planning area could be adversely affected by drought, which could limit water supplies and pose health threats.

Droughts can have a major economic impact, affecting a wide range of sectors and extending beyond the regions directly affected by water shortages. Since water is essential for producing goods and delivering services, the consequences of prolonged droughts lasting several years can be both direct and indirect and often quite severe.

Severe drought often leads to significant declines in crop yields, which can reduce the availability of fresh local food, raise prices, and harm the overall local economy. In particular, ongoing drought conditions may negatively affect the agricultural sector throughout the Goliad County planning area.

Impacts of past droughts experienced in the Goliad County planning area, including participating ISD and special districts, have not resulted in injuries or fatalities, supporting a “Limited” severity of impact, meaning injuries and/or illnesses are treatable with first aid, shutdown of facilities and services for 24 hours or less, and less than 10 percent of property is impacted. There were no reported crop or property losses due to drought in the Goliad County planning area.

Assessment of Impacts

The Drought Impact Reporter was developed in 2005 by the University of Nebraska-Lincoln to provide a national database of drought impacts. Droughts can affect agriculture, business and industry, energy, fire, plants and wildlife, relief and response, restrictions, society and public health, tourism and recreation, and water supply and quality. The reports are submitted by individuals to Federal, State, and local agencies, as well as the general public. Table 5-9 lists the drought impacts to Goliad County from 2005 to 2025 based on reports received by the Drought Impact Reporter.

Table 5-9. Drought Impacts, 2005-2025

Drought Impacts 2005-2025	
Agriculture	1,860
Business & Industry	93
Energy	18

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Drought Impacts 2005-2025	
Fire	1,042
Plants & Wildlife	1,227
Relief, Response, & Restrictions	992
Society & Public Health	349
Tourism & Recreation	166
Water Supply & Quality	1,246

Drought has the potential to significantly impact individuals within the Goliad County planning area. Although drought events are relatively uncommon in the United States and generally pose minimal direct threat to public health and safety, severe water shortages may lead to an insufficient supply for essential human needs. According to recent U.S. Census data, Goliad County's population has fluctuated, with a notable decline over the past decade. Should this trend persist, future growth could challenge the existing water infrastructure and increase demand within the planning area. Severe drought conditions are frequently associated with a range of effects, including:

- Dry clay soil may cause shifts and breaks in water main lines, often requiring water shut-offs to multiple residences during repairs.
- Intensified drought can elevate the number of health-related issues, such as diminished sewage flows, heightened pollution concentrations, reduced firefighting capacity, and cross-connection contamination.
- Public safety risks from forest, range, and wildfires rise as water availability and pressure decrease.
- Law enforcement activities may escalate to enforce water restrictions during periods of scarcity.
- Severe water shortages undermine the supply and quality of water for human consumption.
- Firefighters may face limited water resources for suppression efforts, increasing threats to life and property.
- Drought conditions heighten risks of wildfires and dust storms.
- The community may incur increased operational costs for the enforcement of water restrictions and rationing.

Section 5: Drought

- Prolonged drought can result in higher incidences of illness and disease related to water scarcity.
- Utility providers may experience revenue declines as water supplies dwindle.
- Utilities may curtail energy generation and service delivery to prioritize critical needs amidst shortages.
- Fish and wildlife populations may suffer from reduced food supply and habitat quality, with elevated risk of disease, particularly for aquatic species.
- Eight federally endangered, threatened, or candidate species reside in Goliad County; severe or long-term drought may lead to reductions or extinctions among these species.
- Plant life is susceptible to extended drought, with wind and erosion exacerbating declining soil quality. Urban tree canopies, including those in county and city parks, remain vulnerable.
- Annual and perennial crop production, along with overall crop quality, are at significant risk, potentially resulting in increased food costs.
- Livestock grazing may become restricted, leading to lower livestock weights, increased mortality rates, and higher feed expenses.
- Persistent drought has the potential to adversely affect economic development prospects for the region.

The magnitude of drought-related damage is determined by its duration and intensity. The degree of preparedness and preemptive planning undertaken by communities, local enterprises, and individuals significantly influences the economic and financial outcomes following a drought event.

Climate Change Impacts

With the range of factors influencing drought conditions, it is impossible to make quantitative statewide projections of drought trends; however, many factors point toward increased drought severity. Drought will continue to be driven largely by variability in precipitation over multiple decades, with long-term precipitation trends expected to be relatively small. Other factors affecting drought impacts, such as increased temperatures and improved plant water-use efficiency, decrease water availability but will make drought impact trends highly sector-specific, with impacts possibly smaller for agriculture than for surface water supply.⁵

According to the U.S. Climate Explorer, the Goliad County planning area is at a higher risk of drought due to more frequent dry spells. A dry spell is a period of consecutive

⁵ Cleaveland, M. K., T. H. Votteler, D. K. Stahle, R. C. Casteel, and J. L. Banner, 2011: Extended Chronology of Drought in South Central, Southeastern and West Texas. *Texas Water Journal*, 2, 54-96, as cited in as cited in Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, Texas A&M University Office of the Texas State Climatologist, 2021 update.

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days without precipitation, and historically, Goliad County has averaged 18 dry spells per year. The highest projection range for 2035-2064 indicates the possibility of up to one additional dry spell per year. In addition, it is projected that future changes in Goliad County will include increased temperatures; according to the U.S. Climate Explorer, the planning area may experience a 5°F increase in average extreme heat temperatures. Historically, extreme temperatures averaged 100°F in Goliad County, but between 2035 and 2064, the average will be 105°F, increasing the severity and frequency of drought events.

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Hazard Description

Extreme heat refers to an extended period of unusually high temperatures combined with significant humidity. During the summer months, such conditions are prevalent across Texas, including the Goliad County planning area. The County frequently experiences prolonged heat waves, often accompanied by elevated humidity.

While extreme heat can adversely affect buildings and facilities, its primary concern is the risk it poses to public safety and health. Key human health risks linked to extreme heat include heat cramps, sunburn, dehydration, fatigue, heat exhaustion, and potentially heat stroke. Children, older adults, and individuals with health vulnerabilities, particularly those on fixed incomes who may be unable to afford consistent air-conditioning, are especially at risk. These groups may also face social isolation, lacking immediate support from family or friends.

Additionally, critical infrastructure can suffer from extreme heat. High temperatures generally drive increased electricity usage as households, educational institutions, and businesses seek to maintain comfortable indoor environments. This surge in demand can result in energy shortages and potential blackouts.

Location

Extreme heat events can occur anywhere throughout the Goliad County planning area, including the ISD and special district.

Extent

The severity or intensity of an extreme heat event is assessed based on temperature relative to humidity. As defined by the National Oceanic and Atmospheric Administration (NOAA), this correlation is known as the "Heat Index," illustrated in Figure 6-1. The Heat

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Index quantifies the apparent temperature, reflecting how hot it feels when high temperatures are combined with elevated humidity.

Figure 6-1. Extent Scale for Extreme Heat¹

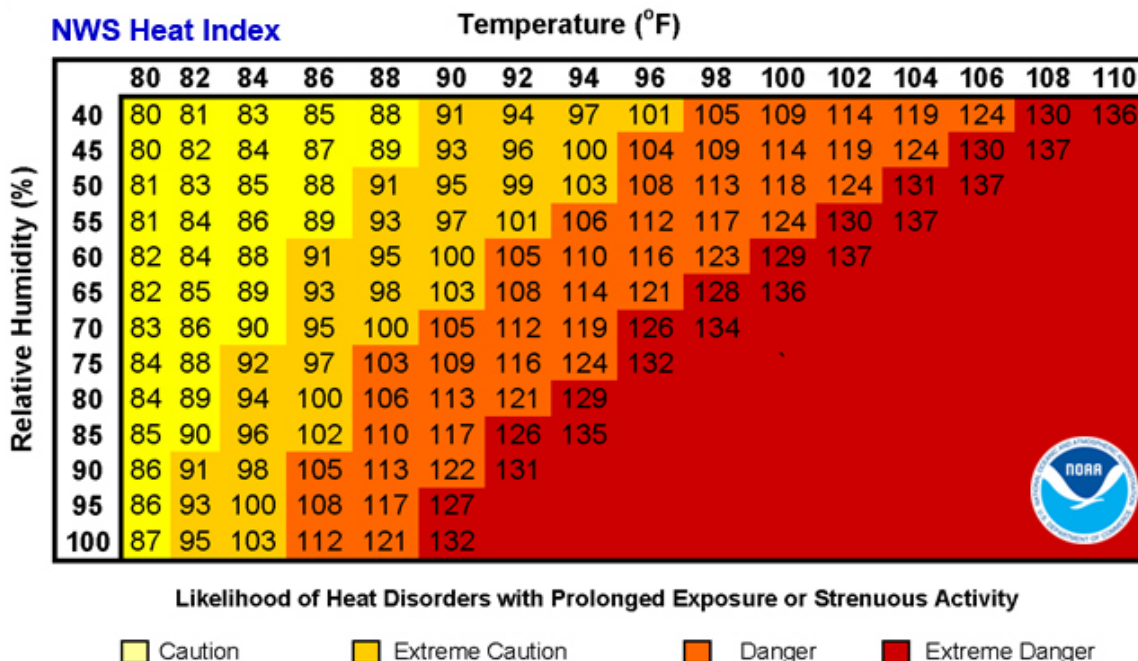


Figure 6-1 presents an index that categorizes levels of caution by relative humidity and temperature. For instance, when temperatures are at or below 90 degrees Fahrenheit (°F), heightened vigilance is advised if humidity reaches 40 percent or above.

The chart’s shaded areas delineate potential symptoms or conditions that may develop based on the event’s severity. The “Caution” category indicates a risk of fatigue from heat exposure. “Extreme Caution” signals the risk of sunstroke, muscle cramps, or heat exhaustion, while the “Danger” level indicates these symptoms are probable. “Extreme Danger” highlights a substantial risk of heat stroke. The National Weather Service (NWS) issues alerts as referenced in Table 6-1, corresponding to the Heat Index.

Table 6-1. Heat Index and Warnings

Category	Heat Index	Possible Heat Disorders	Warning Type
Extreme Danger	125°F and higher	Heat stroke, or sunstroke, is likely.	An Excessive Heat Warning is issued if the Heat Index rises above 105°F at least 3 hours during the day or above 80°F at night.

¹ Source: NOAA

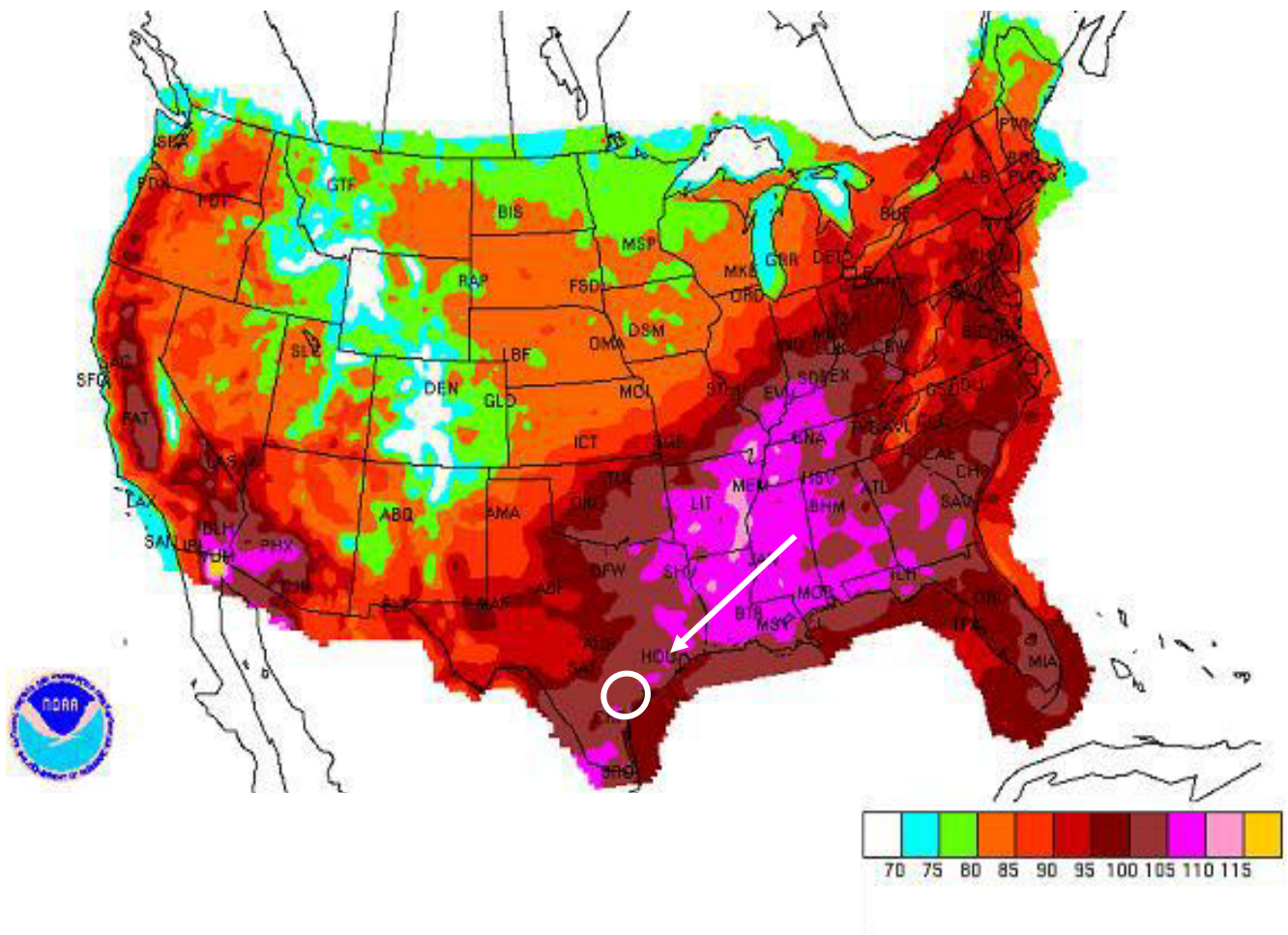
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Category	Heat Index	Possible Heat Disorders	Warning Type
Danger	103 – 124°F	Sunstroke, muscle cramps, and/or heat exhaustion are likely to occur. Heatstroke is possible with prolonged exposure and/or physical activity.	An Excessive Heat Warning is issued if the Heat Index rises above 105°F at least 3 hours during the day or above 80°F at night.
Extreme Caution	90 – 103°F	Sunstroke, muscle cramps, and/or heat exhaustion are possible with prolonged sun exposure and/or physical activity.	A Heat Advisory will be issued to warn that the Heat Index may exceed 105°F.
Caution	80 – 90°F	Fatigue is possible with prolonged exposure and/or physical activity.	A Heat Advisory will be issued to warn that the Heat Index may exceed 105°F.

Because of its geography and semi-arid, hot, subtropical climate, Goliad County regularly faces high temperatures each summer. Residents, especially children and seniors, should be careful and avoid spending too much time outside during heat advisories or excessive heat warnings. People who work or spend long periods outdoors are at increased risk.

Figure 6-2, which uses NOAA data from 1838 to 2015, shows daily maximum heat indexes. Goliad County is marked with a white circle and maroon shading, indicating an average daily heat index between 100°F and 105°F. This means the county often experiences dangerously high temperatures in this range, requiring precautions to prevent issues such as sunstroke, muscle cramps, heat exhaustion, or even heat stroke during physical activity or extended exposure. The hottest month recorded in Goliad County was June 2023, when temperatures hit 112°F. This represents the most extreme heat expected in the planning area based on historical trends.

Figure 6-2. Average Daily Maximum Heat Index Days²



Historical Occurrences

The National Centers for Environmental Information (NCEI) Storm Events database, administered by the National Oceanic and Atmospheric Administration (NOAA), serves as a comprehensive national repository of historical storm event data. Extreme heat occurrences have been sourced from the NCEI, which documents such events at the county level. Specifically, Goliad County has recorded five extreme heat events within the designated planning area (refer to Table 6-2). The NCEI provides detailed records of

² NRDC and the white circle indicates the Goliad County planning area.

Section 6: Extreme Heat

extreme heat incidents across multi-county forecast areas for each event, with proportional reporting of property and crop damage allocated to each affected county.

Historical data on extreme heat events within special districts are included in the Goliad County summaries, as these entities do not report separately in the NCEI database. Independent school districts (ISDs) and other special districts reported no additional impacts beyond those attributed to the county events.

This Risk Assessment incorporates only those extreme heat events documented in the official record; it is acknowledged that further incidents may have gone unreported both before and during the established recording period. Given the limited number of reported events, average high-temperature analyses have been used to estimate the likelihood of future occurrences.

Table 6-2. Historical Extreme Heat Events, 1996 – 2025³

Jurisdiction	Date	Deaths	Injuries	Property Damage	Crop Damage
Goliad County	5/10/2006	0	0	\$0	\$0
Goliad County	6/15/2023	0	0	\$0	\$0
Goliad County	6/17/2023	0	0	\$0	\$0
Goliad County	6/21/2023	0	0	\$0	\$0
Goliad County	5/27/2024	0	0	\$0	\$0
TOTALS		0	0	\$0	\$0

Table 6-3. Historical Extreme Heat Events Summary, 1996 – 2025

Jurisdiction	Number of Events	Deaths	Injuries	Property Damage	Crop Damage
Goliad County	5	0	0	\$0	\$0

Based on the list of historical extreme heat events for the Goliad County planning area, four events have been reported to NCEI since the 2018 Plan.

³ NOAA, NCEI Storm Events Database

Significant Events

June 15 to June 21, 2023

An upper-level ridge persisted and intensified over South Texas from June 15 to 19, creating prolonged hot, humid conditions. This pattern brought excessive heat across the coastal plains and Brush Country starting on the 15th. Heat index values soared, peaking at 125°F in Kingsville and 120°F in Corpus Christi on the 15th, and climbing even higher to 129°F in Kingsville and 125°F in Corpus Christi on the 17th.

Record-breaking high temperatures were observed in parts of South Texas during this stretch. Notably, Laredo set its record high of 115°F on the 19th, while Cotulla reached 116°F on the same day. The intense and sustained heat resulted in numerous heat-related illnesses and fatalities across the region. By month's end, reports confirmed 10 heat-related deaths in Laredo and 2 in Beeville.

The extreme heat and elevated humidity extended into the latter half of June. Afternoon heat indices hovered around 120°F in Kingsville and Corpus Christi from the 20th through the 23rd, with a maximum of 127°F recorded in Kingsville on the 20th. Cotulla again hit a high temperature of 116°F on the 21st.

Probability of Future Events

According to historical records, the Goliad County planning area has experienced five events in a 29.5-year reporting period. Historical records, combined with an analysis of maximum average temperatures, provide a probability of at least one event per year. This frequency supports a “Highly Likely” probability of future events for the planning area.

Vulnerability and Impact

While the entire Goliad County planning area is exposed to extreme temperatures, existing buildings, infrastructure, and critical facilities are unlikely to sustain significant damage from extreme heat events. Therefore, any estimated property losses associated with the extreme heat hazard are anticipated to be minimal across the area.

Every summer, heat-related illness becomes a significant public health issue throughout much of the United States. Mortality rates increase during heat waves, and excessive heat is an important contributing factor to deaths from other causes, particularly among the elderly. Extreme temperatures pose a significant threat to the County's population's life and safety. Heat casualties, for example, are typically caused by inadequate air conditioning or heat exhaustion. The most vulnerable population to heat-related casualties is the elderly or infirm, who often live on fixed incomes and cannot afford to run air conditioning regularly. This population is sometimes isolated, with no immediate family or friends to look out for their well-being. Children may also be more vulnerable if

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left unattended in vehicles. Populations living below the poverty level are often unable to run air conditioning regularly and are limited in their ability to seek medical treatment.

In Goliad County, the population over 65 is estimated at 25 percent of the total, and children under 5 at 5 percent. The population with a disability is estimated at 16 percent of the total population. An estimated 13 percent of the planning area population lives below the poverty level, and 14 percent of the population speaks English 'less than very well' (Table 6-4).

Extreme heat events disproportionately affect vulnerable and underserved populations, who may be more susceptible to health risks. People below the poverty line are less likely to afford air conditioning during the hot summer months. It is also less likely to have access to medical care. In addition, people who speak a language other than English may be more vulnerable due to language barriers that limit their access to important information, such as weather-related warnings and safety instructions.

Table 6-4. Populations at Greater Risk by Participating Jurisdiction

Jurisdiction	Over 65	Under 5	With a Disability	Below Poverty Level	Non-English Speaking
Goliad County	1,752	341	1,168	918	970

Table 6-5. Populations at Greater Risk for Special Districts

Jurisdiction	Under 5	Staff who work outdoors
Goliad ISD	36	27
Goliad WSC	-	1

Extremely high temperatures can have significant secondary impacts, including droughts, water shortages, increased fire danger, and a surge in energy demand. The possibility of rolling blackouts increases as unseasonably high temperatures hit a normally mild month with low power demand. Typically, more than 12 hours' warning is provided before the onset of an extreme heat event.

Overall, there were no property or crop losses in the planning area due to extreme heat. There were also no fatalities or injuries due to extreme heat. Based on historical losses and damage to the built environment, the impact of extreme heat events on the Goliad County planning area would be considered limited, meaning critical facilities and

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services would shut down for 24 hours or less, and less than 10 percent of property would be destroyed or suffer major damage.

Table 6-6. Extreme Heat Event Damage Totals, 1996 – 2025

Jurisdiction	Property and Crop Loss	Estimated Average Annual Loss
Goliad County	\$0	\$0

The Goliad County Planning Team identified the following critical facilities as the most important to the planning area and as susceptible to a range of impacts from extreme heat events. The following critical facilities would be vulnerable to extreme heat events in the Goliad County planning area. For a comprehensive list by participating jurisdiction, please see Appendix B.

Table 6-7. Critical Facilities Vulnerable to Extreme Heat Events

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS, Hospitals)	<ul style="list-style-type: none"> Emergency operations, services, and response times may be significantly impacted by power outages and/or communication disruptions. Exposure to heat can cause heat illness among first responders, especially those operating heavy equipment. Roads may become impassable due to excessive heat, causing asphalt roads to soften and concrete roads to shift or buckle, thereby impacting emergency response times. Extended power outages due to increased usage may lead to looting, property destruction, and theft, further burdening law enforcement resources.
Airport, Academic Institutions, Community Residential Facilities, Day Care Facilities, Evacuation Centers & Shelters, Governmental Facilities	<ul style="list-style-type: none"> Facilities, infrastructure, or critical equipment, including communications systems, may be damaged, destroyed, or otherwise rendered inoperable. Power outages due to increased usage could disrupt critical care. Backup power sources could be damaged. Evacuations may be necessary due to extended power outages, breaks in water main lines, or other associated damage to facilities. Facilities, infrastructure, or critical equipment, including communications systems, may be damaged, destroyed, or otherwise rendered inoperable. Economic disruption from power outages negatively impacts airport services and area businesses reliant on airport operations.

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CRITICAL FACILITIES	POTENTIAL IMPACTS
Commercial Suppliers (food, gas, etc.)	<ul style="list-style-type: none"> Facilities, infrastructure, or critical equipment, including communications systems, may be damaged, destroyed, or otherwise rendered inoperable. Essential supplies, such as medicines, water, food, and equipment, may be delayed.
Utility Services and Infrastructure (electric, water, wastewater, communications)	<ul style="list-style-type: none"> Emergency operations, services, and response times may be significantly impacted by power outages and/or communication disruptions. Roads may become impassable due to excessive heat, causing asphalt roads to soften and concrete roads to shift or buckle, thereby impacting emergency response times. Breaks in water main lines or other associated damage to facilities.

Assessment of Impacts

The greatest risk from extreme heat is to public health and safety. Extreme heat conditions can be frequently associated with a variety of impacts, including:

- Goliad County vulnerable populations, particularly the elderly (25 percent of total population), children under 5 (5 percent of total population), and those with a disability (16 percent of total population), can face serious or life-threatening health problems from exposure to extreme heat, including hyperthermia, heat cramps, heat exhaustion, and heat stroke (or sunstroke).
- Response personnel, including utility workers, public works personnel, and other professions where individuals are required to work outside, are more susceptible to extreme heat-related illnesses because their exposure is typically greater.
- High energy demand periods can outpace energy supply, potentially creating the need for rolling brownouts that would elevate the risk of illness for vulnerable residents.
- Highways and roads may be damaged by excessive heat, causing asphalt roads to soften and concrete roads to shift or buckle.
- Vehicle engines and cooling systems typically run harder during extreme heat events, leading to increased mechanical failures.
- Extreme heat events during drought can exacerbate environmental impacts, decreasing water and air quality and further degrading wildlife habitat.
- Extreme heat increases ground-level ozone (smog), increasing the risk of respiratory illnesses.

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- Negatively impacted water suppliers may face increased costs due to the transport of water resources or the development of supplemental water resources.
- Outdoor activities may increase the risk of school injuries or illnesses during extreme heat events.

The economic and financial impacts of extreme heat on the community will depend on the event's duration, energy demand, associated drought, and other factors. The level of preparedness and the extent of planning by the community, local businesses, and citizens will affect the overall economic and financial conditions before, during, and after an extreme heat event.

Climate Change Impacts

Climate change is expected to lead to higher average temperatures and to increased frequency, duration, and intensity of extreme heat events. Without reductions in global emissions, the state of Texas is projected to experience an additional 30 to 60 days per year with temperatures above 100°F than it does now.⁴

In addition, it is projected that future changes in Goliad County will include increased temperatures, with the planning area, according to the U.S. Climate Explorer, likely to experience a 5°F increase in average extreme heat temperatures. Historically, extreme temperatures in Goliad County averaged 100°F, but between 2035 and 2064, the average will be 105°F, increasing the severity and frequency of extreme heat events. Some projections show an even higher increase; however, the severity will depend on future overall emissions and is subject to change.

⁴ Nielsen-Gammon, John, Holman, Sara, Buley, Austin and Jorgensen, Savannah. Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, 2021 Update. Texas A&M University Office of the Texas State Climatologist. October 7, 2021. <https://climatexas.tamu.edu/files/ClimateReport-1900to2036-2021Update>

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Description

Flooding typically arises from excessive precipitation. The severity of a flood event depends on several key factors, including the topography and physiography of stream and river basins, precipitation patterns, prevailing weather conditions, antecedent soil moisture levels, and the extent of vegetation removal and impervious-surface coverage. Floods are generally protracted phenomena that can persist for multiple days.

Flood events are primarily categorized as either inland or coastal. Given Goliad County's inland geographic position, this section addresses only inland flooding. Inland, or riverine, flooding results from elevated precipitation and runoff within a stream or river's watershed, leading to overbank flows. Such events are most often caused by large-scale weather systems producing sustained rainfall across broad regions, rendering these floods both natural and unavoidable. Certain river floods occur seasonally when heavy winter or spring precipitation rapidly saturates river basins. Additionally, intense rains associated with remnants of hurricanes or tropical systems can induce river flooding.

Goliad County is exposed to episodes of extreme rainfall that, although often brief, can cause hazardous flash flooding. Flooding remains a recurring natural event in the region, occurring annually and spanning all seasons.

Location

A flood event can occur anywhere in Goliad County, including the ISD and special district within the planning area.

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Roughly 31.92 percent of Goliad County (175,544 acres out of 549,923) is in the FEMA 100-year floodplain. In contrast, roughly 0.04 percent (196 acres out of 549,923) of Goliad County is in the FEMA 500-year floodplain. Nearly every type of land use in Goliad County is found in both the FEMA 100-year and 500-year floodplains.

The FEMA 100-year floodplain covers 34.75 percent (40 acres out of 116) of the total land area within Goliad ISD's jurisdiction. The FEMA 500-year floodplain covers 0.04 percent (1 acre out of 116) of the total land area within Goliad ISD's jurisdiction. FEMA 500-year floodplain boundaries extend beyond the FEMA 100-year floodplain boundaries. However, the distribution of 500-year floodplain boundaries varies based on changes in topography and elevation.

All Goliad WSC property is located outside of a designated FEMA Special Flood Hazard Area. The impact of a FEMA 100-year flood event will vary. Although structural damages are expected to be minimal, Goliad WSC facilities may temporarily lose power due to downed power lines. Indirect effects may include limited access to Goliad WSC properties due to flooding in other areas of Goliad County.

The Flood Insurance Rate Maps (FIRMs) prepared by FEMA provide an overview of flood risk and can also be used to identify areas of the County vulnerable to flooding. FIRMs are used to regulate new development and to control the substantial improvement and repair of buildings that are substantially damaged. Flood Insurance Studies (FIS) are often developed in conjunction with FIRMs. The FIS typically contains a narrative of a community's flood history and discusses the engineering methods used to develop the FIRMs. The FIS also contains flood profiles to study flood sources and can be used to determine Base Flood Elevations (BFEs) in some areas.

Goliad County has a Flood Insurance Study (FIS). The FIS is dated October 19, 2010. This FIS compiles all previous flood information, including data collected from numerous waterways. This study indicates that the principal flood problems are due to the San Antonio River, which runs north to south through the County and the City of Goliad before joining the Guadalupe River near Tivoli. Other principal flood problems include runoff water draining into the San Antonio River and other bodies of water throughout the County, flooding that causes agricultural damage, and larger floods that cause urban damage.

The Flood Insurance Rate Map (FIRM) data provided by FEMA for Goliad County shows the following flood hazard areas:

- Zone A: Areas subject to inundation by the 1-percent-annual-chance flood event are generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance requirements and

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floodplain management standards apply. The FIRMs highlighted that most areas in Zone A are unincorporated.

- Zone AE: Areas subject to inundation by 1-percent-annual-chance shallow flooding. It is the base floodplain where BFEs are provided. AE zones are now used in the new-format FIRMs instead of A1-30 zones.
- Zone AO: Areas subject to inundation by 1-percent-annual-chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average flood depths derived from detailed hydraulic analyses are shown in this zone.
- Zone X: Moderate risk areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual-chance flood by a levee. No BFEs or base flood depths are shown within these zones.

Existing Flood Exposure for the participating jurisdictions is illustrated in Figures 7-1 to 7-2.

Figure 7-1. Existing Flood Exposure for Goliad ISD and Goliad County

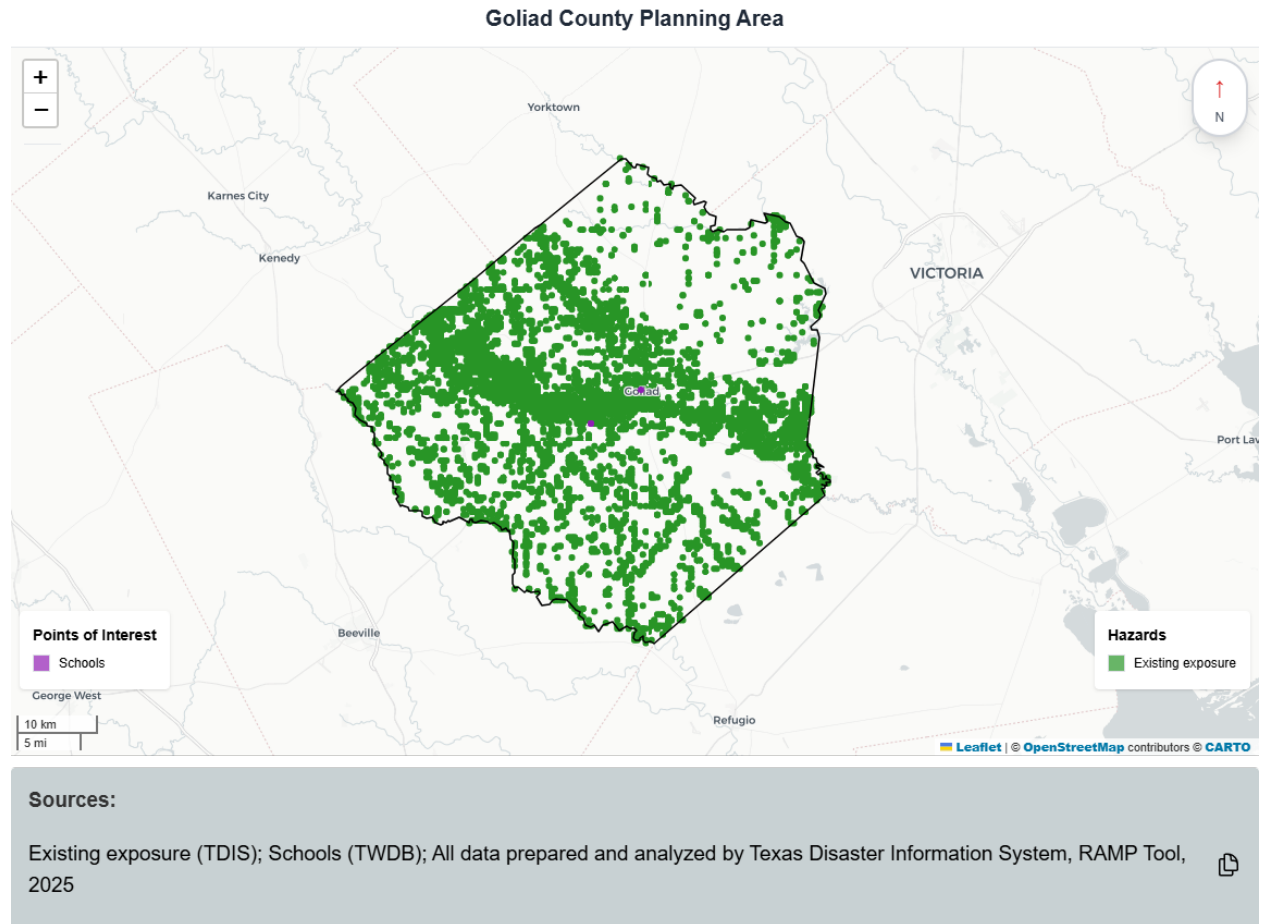
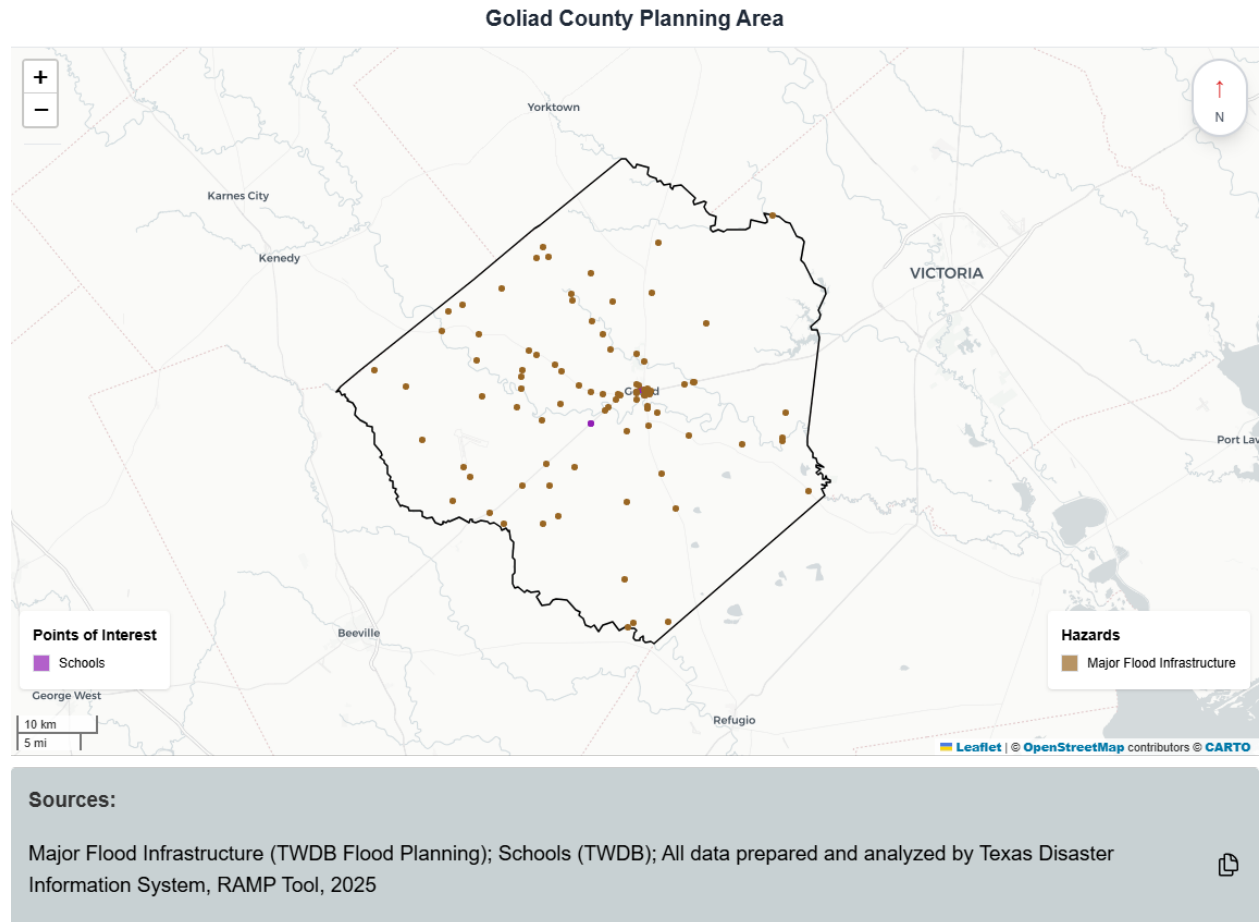


Figure 7-2. Estimated Flood Zones in Goliad Water Supply Corporation



Extent

The severity of a flood event is determined by several major factors, including stream and river basin topography and physiography; precipitation and weather patterns; recent soil moisture conditions; and the extent of vegetative clearing and impervious surfaces. Typically, floods are long-term events that may last for several days.

Determining the intensity and magnitude of a flood event depends on the flood zone, the location of the flood hazard area, and the depth of the floodwaters. The extent of flood damage is expected to be greater in areas that will convey a base flood. FEMA categorizes terrain according to how it will convey floodwater. Flood zones are categories mapped on FIRMs. Table 7-1 provides descriptions of FEMA flood zones and the flood impacts in terms of severity or potential harm. Flood Zones A, AE, AO, and X are the hazard areas mapped in the region. Figures 7-1 through 7-3 should be read in

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conjunction with the extent for flooding in Tables 7-1, 7-2, and 7-3 to determine the intensity of a potential flood event.

Table 7-1. Flood Zones

Intensity	Zone	Description
High	Zone A	Areas with a 1-percent-annual-chance of flooding and a 26 percent 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 A1-30	These are known as numbered A Zones (e.g., A7 or A14). This is the base floodplain where the FIRM shows a Base Flood Elevation (BFE) (old format).
	Zone AE	The base floodplain where BFEs are provided. AE Zones are now used in the new-format FIRMs instead of A1-A30 Zones.
	Zone AO	River or stream flood hazard areas and areas with a 1-percent-annual-chance or greater 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 percent 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	Areas with a 1-percent-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 percent chance of flooding over the life of a 30-year mortgage. BFEs derived from detailed analyses are shown at selected intervals within these zones.
	Zone A99	Areas with a 1-percent-annual-chance of flooding that will be protected by a federal flood control system where construction has reached specified legal requirements. No depths or BFEs are shown within these zones.
	Zone AR	Areas with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations.
Moderate to Low	Zone X 500	An area inundated by 500-year flooding; an area inundated by 100-year flooding with average depths of less than 1 foot or with drainage areas less than 1 square mile; or an area protected by levees from 100-year flooding.

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Zone A is interchangeably referred to as the 100-year flood, the 1-percent-annual-chance flood, the Special Flood Hazard Area (SFHA), or more commonly, the base flood. This is the area that will be inundated by the base flood and constitutes a threat to the planning area. The impact of a flood event can be more damaging in areas that will convey a base flood. Figures 7-3 and 7-4 illustrate the 100- and 500-Year Floodplains for the planning area. Figure 7-5 illustrates the future exposure, including the locations of the Goliad ISD campuses.

Figure 7-3: 100-Year Flood Plain Map for Goliad County

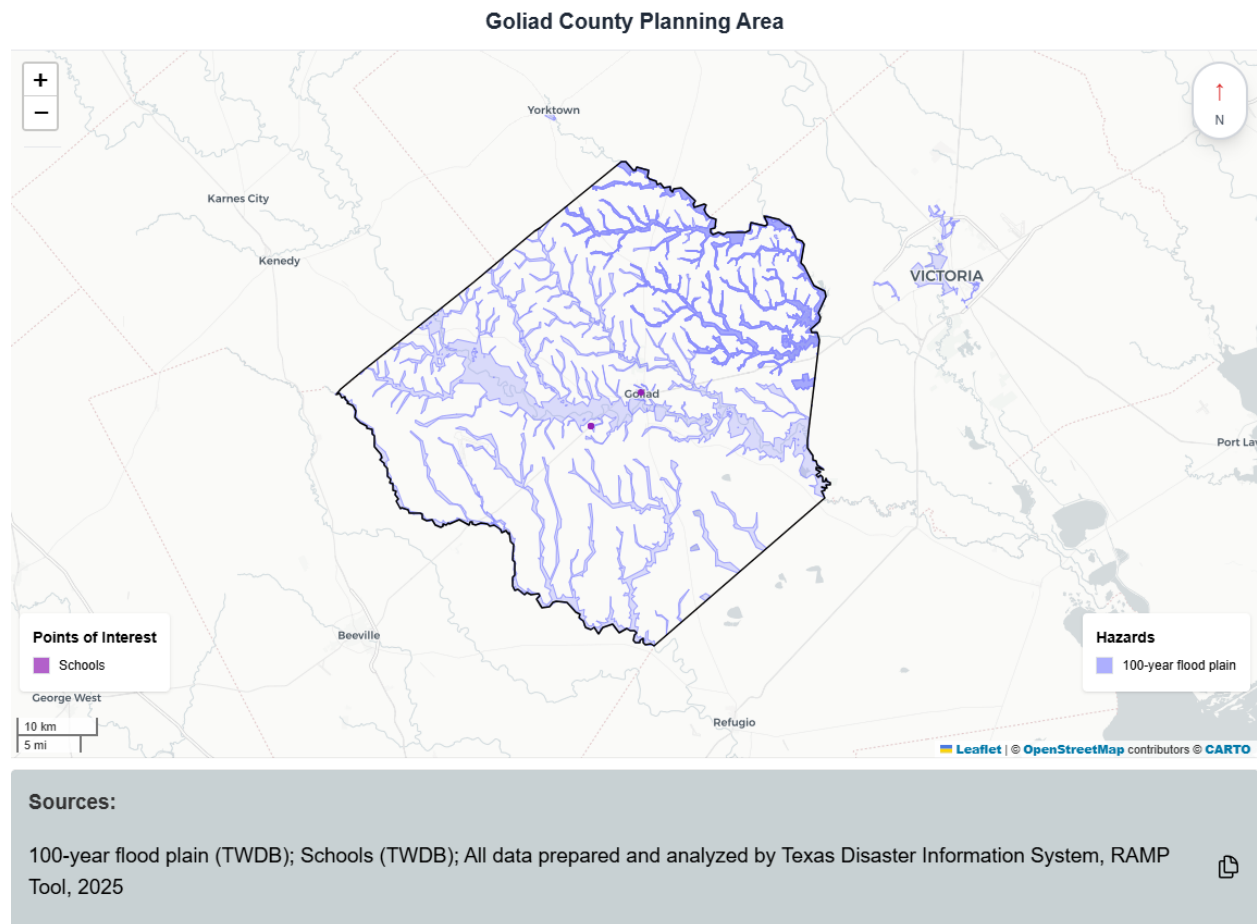


Figure 7-4: 500-Year Flood Plain Map for Goliad County

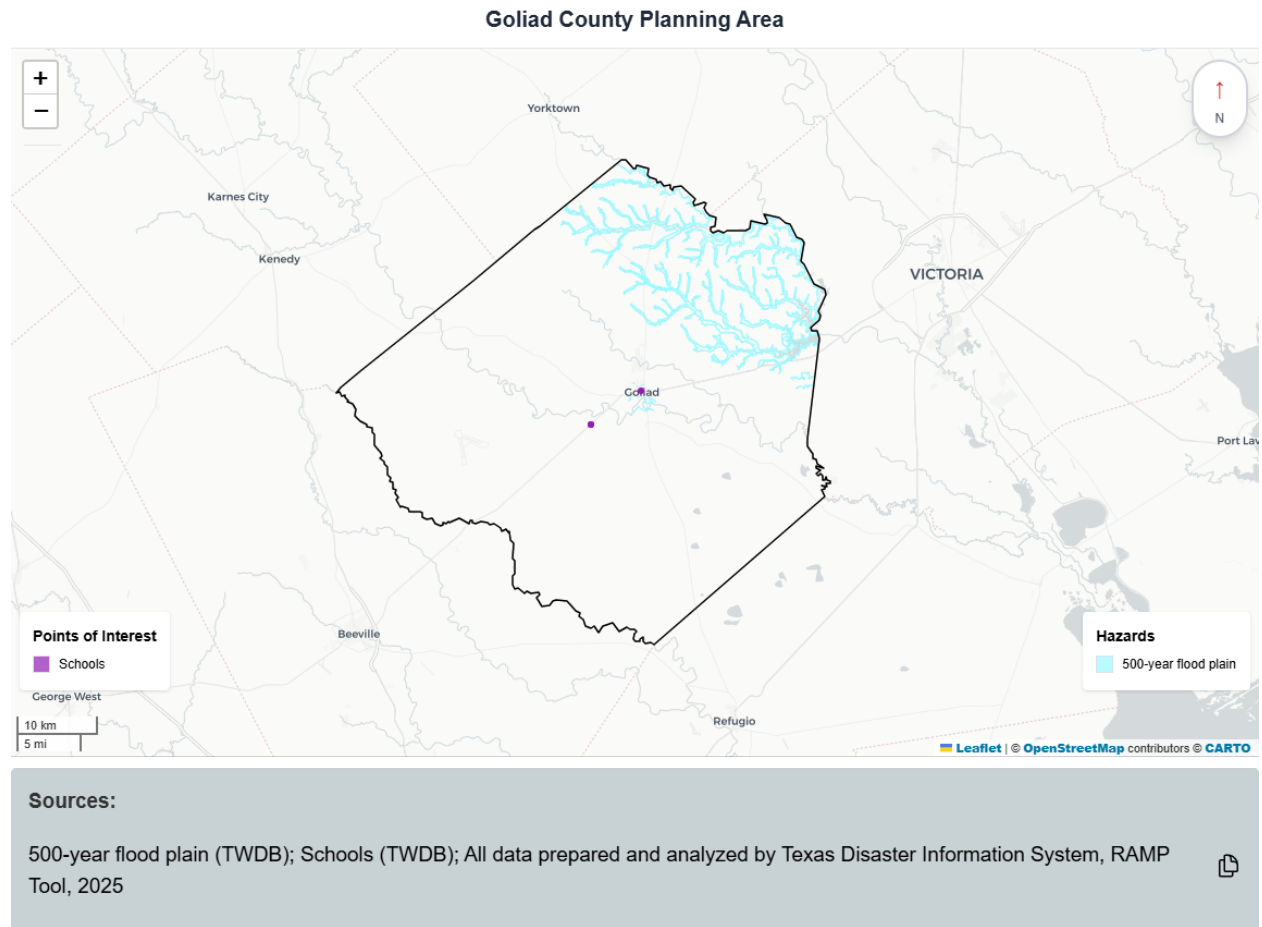
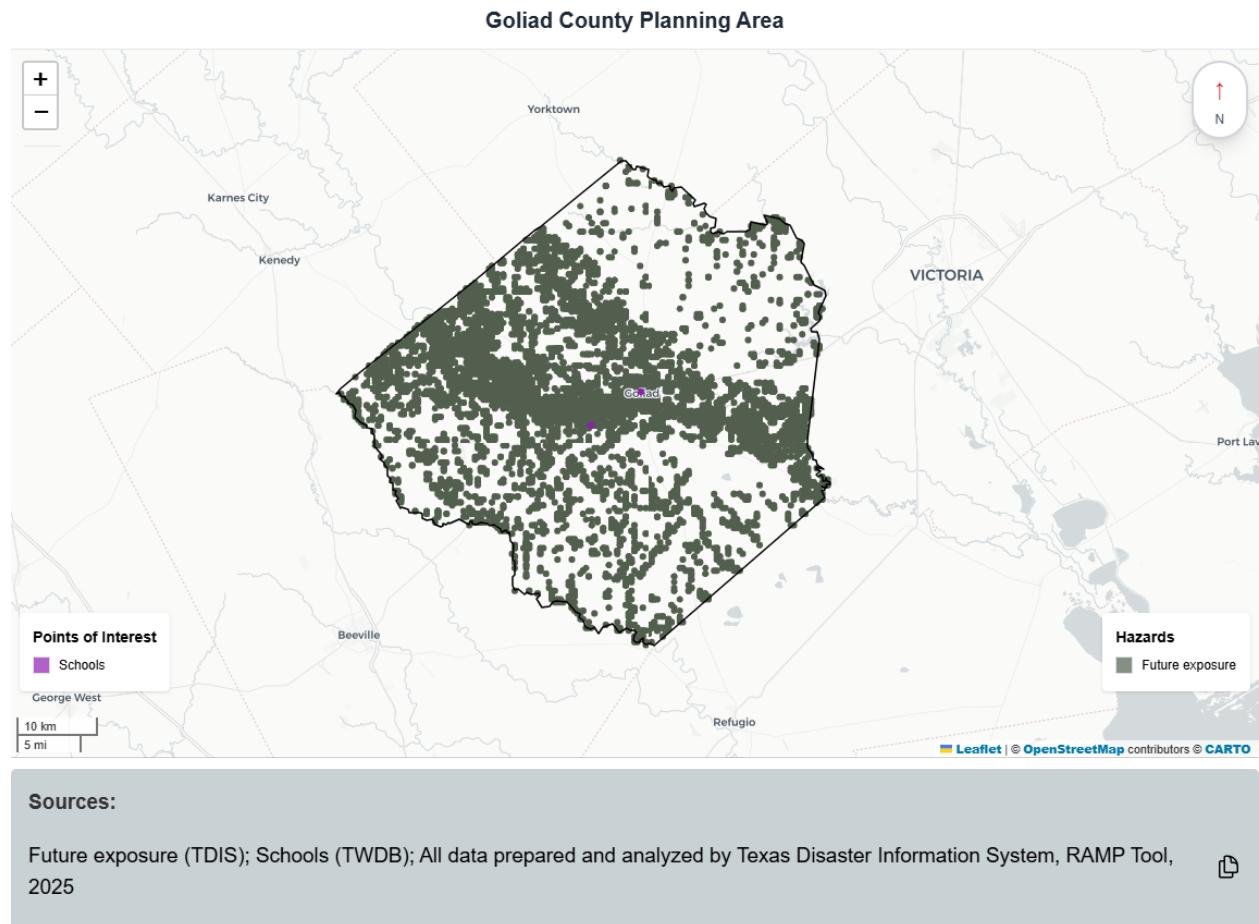


Figure 7-5: Future Flood Exposure for Goliad County



Structures built in the SFHA are subject to damage by rising waters and floating debris. Moving flood water exerts pressure on everything in its path and causes erosion of soil and solid objects. If not elevated above Base Flood Elevation, utility systems, such as heating, ventilation, air conditioning, fuel, electrical systems, sewage maintenance systems, and water systems, may also be damaged.

The depth of floodwater also determines the intensity and magnitude of a flood event. Table 7-2 describes the stream gauge data provided by the United States Geological Survey (USGS).

Table 7-2. Extent for Goliad County¹

Jurisdiction ²	Peak Flood Event
Goliad County	The San Antonio River, running throughout Goliad County and near the City of Goliad, reached an overflow elevation of 53 feet in September of 1967. The average peak flow for the San Antonio River is 29 feet at this site.

The worst flooding throughout the County, the ISD, and the special district has been estimated at depths of 10 feet or more. The flood record for the San Antonio River in Goliad County is 53.7 feet, set on September 23, 1967. Remnants of Hurricane Beulah caused this flooding. It is the highest level reached since recordkeeping began in 1905. This is the worst-case event that Goliad County and the participating jurisdictions may face, or even exceed, the previous worst-case 10' flood depths.

The range of flood intensity that the planning area can experience is high, or Zone A. Based on historical rainfall data, the planning area, including the ISD and special district, could expect to receive an average of 2 to 4 inches of rain within 2 hours, which could result in flash flooding.

The data described in Tables 7-1 and 7-2, together with Figures 7-1 through 7-3, and historical occurrences for the area, provide an estimated potential magnitude and severity for the Goliad County planning area. Areas near the San Antonio River and its tributaries are particularly at risk of flooding. For example, the unincorporated areas of Goliad County have areas designated as Zone A. Reading this figure alongside Table 7-1 indicates that the jurisdiction is at high risk of flooding.

Historical Occurrences

Historical evidence indicates that areas within the planning area are susceptible to flooding, particularly flash flooding. It is important to note that only reported flood events have been factored into this risk assessment; additional flood events likely went unreported before and during the recording period. Table 7-3 identifies historical flood events that resulted in damages, injuries, or fatalities within the Goliad County planning area, including the ISD and special district. Table 7-4 summarizes historical flood events by jurisdiction. Historical Data is provided by the Storm Prediction Center (NOAA), National Centers for Environmental Information (NCEI) database for Goliad County, and

¹ Severity estimated by averaging floods at certain stage level over the history of flood events. Severity and peak events are based on USGS data.

² Severity is provided where peak data was provided throughout for the County but unavailable for individual jurisdictions.

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the ISD and special district. There have been 38 recorded flood events in Goliad County.

Historical flood data for the ISD and special district do not report events separately from those of the county and city. At this time, the ISD and special district did not report any losses due to flooding.

Table 7-3 Historical Flood Events, 1996-2025³

Jurisdiction	Date	Deaths	Injuries	Property Damage	Crop Damage
Goliad County	3/18/1997	0	0	\$0	\$0
Goliad County	3/18/1997	0	0	\$0	\$0
Goliad County	3/18/1997	0	0	\$0	\$0
Goliad County	4/2/1997	0	0	\$0	\$0
Goliad County	6/21/1997	1	0	\$0	\$0
Goliad County	9/23/1997	0	0	\$0	\$0
Goliad County	9/23/1997	0	0	\$0	\$0
Goliad County	10/13/1997	0	0	\$0	\$0
Goliad County	10/18/1998	0	0	\$0	\$0
Goliad County	4/26/1999	0	0	\$0	\$0
Goliad County	5/5/2001	0	0	\$0	\$0
Goliad County	8/30/2001	0	0	\$0	\$0
Goliad County	8/30/2001	0	0	\$0	\$0
Goliad County	8/31/2001	0	0	\$0	\$0
Goliad County	8/31/2001	0	0	\$0	\$0
Goliad County	8/31/2001	0	0	\$0	\$0

³ All damage losses are in 2025 dollars

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Jurisdiction	Date	Deaths	Injuries	Property Damage	Crop Damage
Goliad County	9/1/2001	0	0	\$0	\$0
Goliad County	11/15/2001	0	0	\$0	\$0
Goliad County	11/16/2001	0	0	\$0	\$0
Goliad County	9/8/2002	0	0	\$0	\$0
Goliad County	9/8/2002	0	0	\$0	\$0
Goliad County	9/8/2002	0	0	\$0	\$0
Goliad County	9/19/2002	0	0	\$0	\$0
Goliad County	9/18/2003	0	0	\$0	\$0
Goliad County	4/2/2004	0	0	\$0	\$0
Goliad County	4/6/2004	0	0	\$0	\$0
Goliad County	11/20/2004	0	0	\$0	\$0
Goliad County	11/21/2004	0	0	\$34,100	\$0
Goliad County	9/17/2006	0	0	\$0	\$0
Goliad County	3/13/2007	0	0	\$0	\$0
Goliad County	3/31/2007	0	0	\$0	\$0
Goliad County	3/31/2007	0	0	\$0	\$0
Goliad County	7/2/2007	0	0	\$0	\$0
Goliad County	5/27/2009	0	0	\$0	\$0
Goliad County	4/27/2013	0	0	\$0	\$0
Goliad County	5/25/2013	0	0	\$0	\$0
Goliad County	4/22/2015	0	0	\$6,900	\$0
Goliad County	4/22/2015	0	0	\$34,400	\$0

Jurisdiction	Date	Deaths	Injuries	Property Damage	Crop Damage
Total Losses		1	0	\$75,400	\$0

Table 7-4 Summary of Historical Flood Events, 1996-2025⁴

Jurisdiction	Number of Events	Deaths	Injuries	Property Damage	Crop Damage
Goliad County	38	1	0	\$75,400	\$0

Based on the list of historical flood events for the Goliad County planning area and including the ISD and special district, no events have occurred since the 2018 Plan.

Significant Events

June 21, 1997

A nearly stationary cluster of showers and thunderstorms developed over the county, leading to intense, localized rainfall. By 3:00 p.m. CST, numerous roadways were flooded. Torrential downpours delivered 5 to 6 inches of rain in roughly 3 hours, causing a nearby creek to rise rapidly and become dangerously swift. Between 4:00 and 5:00 p.m. CST, a 21-year-old man drowned after attempting to cross the swollen creek on horseback.

Probability Of Future Events

Based on 38 recorded historical occurrences within a 29.5-year reporting period within the Goliad County planning area, including the ISD and special district, flooding is considered “Likely,” meaning an event is probable within the next three years.

Vulnerability And Impact

A property’s vulnerability to a flood depends on its location and proximity to the floodplain. Structures along the banks of a waterway are the most vulnerable and often result in recurring losses. Goliad County encourages development outside of the floodplain. Historical property and crop losses indicate a Minor impact on the planning area, with less than 10 percent of structures destroyed or sustaining major damage, and critical facilities shut down for 24 hours or less. However, due to one fatality, the impact of the flood for the entire planning area would be considered “Substantial” with multiple deaths possible depending on the size and duration of the event.

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Table 7-5 highlights the impacts on critical facilities. For a comprehensive list of identified critical facilities by participating jurisdiction, please see Appendix B.

Table 7-5. Critical Facilities in the Floodplain by Participating Jurisdiction

Critical Facility Type	Potential Impacts
<p>Emergency Response Departments (EOC, Fire, Police, EMS), Hospitals</p>	<ul style="list-style-type: none"> • Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. • Rising flood waters can damage emergency vehicles. • Flood-related rescues may be necessary at swift and low water crossings or in flooded neighborhoods where roads have become impassable, placing first responders in harm’s way. • Evacuations may be required for entire neighborhoods because of rising floodwaters, further taxing limited response capabilities and increasing sheltering needs for displaced residents. • Power outages could disrupt communications, delaying emergency response times. • Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. • Washed-out roads and bridges can impede emergency response vehicle access to areas. • Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel. • First responders are exposed to downed power lines, contaminated and unusual debris, hazardous materials, and generally unsafe conditions. • Extended power outages and evacuations may lead to possible looting, destruction of property, and theft, further burdening law enforcement resources.
<p>Airport, Academic Institutions, Community Residential Facilities, Day Care Facilities, Evacuation Centers & Shelters, Governmental Facilities</p>	<ul style="list-style-type: none"> • Rising flood waters can damage structures. • Power outages could disrupt critical care. • Backup power sources could be damaged, inundated, or otherwise inoperable. • Critical staff may be impacted and unable to report for duty, limiting response capabilities. • Evacuations may be necessary due to extended power outages, gas line ruptures, or inundation of facilities. • Additional emergency responders and critical aid workers may not be able to reach the area for days.

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Critical Facility Type	Potential Impacts
	<ul style="list-style-type: none"> • Power outages and infrastructure damage may prevent larger airports from acting as temporary command centers for logistics, communications, and emergency operations. • Temporary break in operations may significantly inhibit post-event evacuations. • Damaged or destroyed highway infrastructure may substantially increase the need for airport operations.
<p>Utility Services and Infrastructure (electric, water, wastewater, communications)</p>	<ul style="list-style-type: none"> • Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. • Rising flood waters can damage emergency service vehicles. • Flood-related rescues may be necessary at swift and low water crossings or in flooded neighborhoods where roads have become impassable, placing emergency service workers in harm's way. • Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel. • Service responders are exposed to downed power lines, contaminated and unusual debris, hazardous materials, and generally unsafe conditions. • Extended power outages and evacuations may lead to possible looting, destruction of property, and theft, further burdening law enforcement resources.

Historic loss estimates for floods are presented in Table 7-6 below. Considering 38 flood events over a 29.5-year period, the frequency is approximately one to two events every year.

Table 7-6. Average Annualized Losses by Jurisdiction, 1996-2025

Jurisdiction	Total Property & Crop Loss	Average Annual Loss Estimates
Goliad County	\$75,400	\$2,600

While all citizens are at risk of flood-related impacts, forced relocation and disaster recovery disproportionately affect low-income residents who lack the financial means to travel, afford a long-term stay away from home, and rebuild or repair their homes. In

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addition, due to factors like limited mobility, communication difficulties, medical needs, reliance on support services, transportation challenges, housing accessibility issues, and possible shortages in emergency shelter accommodations, the elderly, children, and people with disabilities are also disproportionately affected by flooding events. People who speak a language other than English may be more vulnerable due to language barriers that limit their access to important information, such as weather-related warnings and safety instructions.

The population over 65 in the Goliad County planning area is estimated at 25 percent of the total population, and children under 5 are estimated at 5 percent. The population with a disability is estimated at 16 percent of the total population. In addition, an estimated 13 percent of the planning area's population lives below the poverty level, and 14 percent speaks a language other than English. The participating ISD and special district also have vulnerable populations based on age or work location, such as employees who work outdoors, who may be subject to severe weather conditions (Table 7-8).

Table 7-7. Populations at Greatest Risk by Jurisdiction⁵

Jurisdiction	Over 65	Under 5	With a Disability	Below Poverty Level	Non-English Speaking
Goliad County	1,752	341	1,168	918	970

Table 7-8. Populations at Greater Risk by Participating Special District

Special District	Under 5	Staff Working Outdoors
Goliad ISD	36	27
Goliad WSC	-	1

Assessment Of Impacts

Flooding is the deadliest natural disaster in the U.S. each year. It poses a constant and significant threat to the health and safety of people in the Goliad County planning area. Impacts to the planning area can include:

- Flood-related rescues may be necessary at swift water and low water crossings or in flooded neighborhoods where roads have become impassable, placing first responders in harm's way.

⁵ 2024 ACS

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- Evacuations may be required for entire neighborhoods because of rising floodwaters, further taxing limited response capabilities and increasing sheltering needs for displaced residents.
- Health risks and threats to residents are elevated after the flood waters have receded due to contaminated flood waters (untreated sewage and hazardous chemicals) and mold growth typical in flooded buildings and homes.
- Significant flood events often result in widespread power outages, increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.
- Extended power outages can result in an increase in structure fires and/or carbon monoxide poisoning, as individuals attempt to cook or heat their home with alternate, unsafe cooking or heating devices, such as grills.
- Floods can destroy or make residential structures uninhabitable, requiring shelter or relocation of residents in the aftermath of the event.
- First responders are exposed to downed power lines, contaminated and potentially unstable debris, hazardous materials, and generally unsafe conditions, elevating the risk of injury to first responders and potentially diminishing emergency response capabilities.
- Emergency operations and services may be significantly impacted due to damaged facilities.
- Significant flooding can result in the inability of emergency response vehicles to access areas of the community.
- Critical staff may suffer personal losses or otherwise be impacted by a flood event and be unable to report for duty, limiting response capabilities.
- City or county departments may be flooded, delaying response and recovery efforts for the entire community.
- Private sector entities that the planning area and its residents rely on, such as utility providers, financial institutions, and medical care providers, may not be fully operational and may require assistance from neighboring communities until full services can be restored.
- Damage to infrastructure may slow economic recovery since repairs may be extensive and lengthy.
- Some businesses not directly damaged by the flood may be negatively impacted while utilities are being restored or water recedes, further slowing economic recovery.
- When the community is affected by significant property damage, it is anticipated that funding would be required for infrastructure repair and restoration, temporary services and facilities, overtime pay for responders, as well as normal day-to-day operating expenses.

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- Displaced residents may not be able to return to work, further slowing economic recovery immediately.
- Residential structures substantially damaged by a flood may not be rebuilt for years, and uninsured or underinsured residential structures may never be rebuilt, reducing the tax base for the community.
- Large floods may result in a dramatic population fluctuation, as people are unable to return to their homes or jobs and must seek shelter and/or work outside of the affected area.
- Businesses that are uninsured or underinsured may have difficulty reopening, which results in a net loss of jobs for the community and a potential increase in the unemployment rate.
- Recreation activities may be unavailable, and tourism can be unappealing for years following a large flood event, devastating directly related local businesses and negatively impacting economic recovery.
- Flooding may cause significant disruptions of clean water and sewer services, elevating health risks and delaying recovery efforts.
- The psychosocial effects on flood victims and their families can traumatize them for long periods of time, creating long-term increases in medical treatment and services.
- Extensive or repetitive flooding can lead to decreases in property value for the affected community.
- Flood poses a potential catastrophic risk to annual and perennial crop production and overall crop quality, leading to higher food costs.
- Flood-related declines in production may lead to an increase in unemployment.
- Large floods may result in loss of livestock, potential increased livestock mortality due to stress and water-borne disease, and increased cost for feed.

The overall extent of damage caused by floods depends on the extent, depth, and duration of flooding, as well as the flow velocities in the flooded areas. The level of preparedness and pre-event planning by the community, local businesses, and citizens will contribute to the overall economic and financial conditions in the aftermath of a flood.

Climate Change Impacts

River flooding in Texas is projected to have no substantial change through 2036. This is largely due to the construction of dams and reservoirs for flood management in the 20th century. There is a mixture of historical trends categorized by season, with no one clear trend to project. In addition, meteorological drivers of river flooding (increased rainfall intensity and decreased soil moisture) are projected to exert competing influences. On balance, if an increasing trend in river flooding is present, it will be most evident in the

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most extreme flood events or in the wettest parts of the state, where rainfall is so abundant that a decrease in soil moisture would have little mitigating impact.⁶

According to the United States Environmental Protection Agency, sea-level rise may contribute to increased coastal flooding and related impacts. Sea level is rising more rapidly along the Texas coast due to groundwater pumping than to climate change alone; however, both are contributing factors. If the oceans and atmosphere continue to warm as projected, sea levels are expected to rise by 2 to 5 feet along the Texas coast over the next century. Rising sea levels submerge wetlands and dry land, erode beaches, and exacerbate coastal flooding.

In addition, tropical storms and hurricanes have become more intense during the past 20 years. Although warming oceans provide these storms with more potential energy, scientists are not sure whether the recent intensification reflects a long-term trend. Nevertheless, hurricane wind speeds and rainfall rates are likely to increase as the climate continues to warm. Whether or not storms become more intense, coastal homes and infrastructure will flood more often as sea levels rise, because storm surges will be higher.⁷

According to the U.S. Climate Explorer, which analyzes the top regional hazards for Goliad County, according to the National Climate Assessment, and compares projections for the middle third of this century (2035-2064) with average conditions observed from 1961-1990, the planning area may see a slight increase in precipitation events. Annual counts of intense rainstorms, those that drop two or more inches in one day, are not projected to increase. Any increase can lead to more frequent flood and flash-flood events.

National Flood Insurance Program (NFIP) Participation

Flood insurance offered through the National Flood Insurance Program (NFIP) is the best way for home and business owners to protect themselves financially against the flood hazard. Goliad County participates in the NFIP and is in good standing with it.

As an additional indicator of floodplain management responsibility, communities may choose to participate in FEMA's Community Rating System (CRS). This is an incentive-based program that enables communities to undertake flood-mitigation activities beyond NFIP requirements. Currently, none of the participating communities in the planning area is part of the CRS.

⁶ Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, Texas A&M University Office of the Texas State Climatologist, 2021 update.

⁷ What Climate Change Means for Texas. United States Environmental Protection Agency. August 2016.

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The NFIP participating jurisdiction, Goliad County, currently has in place standard flood damage prevention ordinances that include minimum NFIP standards for new construction and substantial improvements to structures. The NFIP participating jurisdiction, Goliad County, is considering adopting higher regulatory NFIP standards to limit or further regulate floodplain development. It is noted that special districts and ISDs are not eligible participants in the NFIP.

The flood hazard areas throughout Goliad County are subject to periodic inundation, which may adversely affect public safety, resulting in loss of life and property, health and safety hazards, disruption of commerce and governmental services, and extraordinary public expenditures for flood protection and relief. Flood losses are created by the cumulative effect of obstructions in floodplains, which increase flood heights and velocities, and by the occupancy of flood hazard areas by uses vulnerable to flooding and hazardous to other lands because they are inadequately elevated, flood-proofed, or otherwise protected from flood damage. Mitigation actions are also included to address flood maintenance issues, including routine debris clearing from roadside ditches and bridges, and the expansion of drainage culverts and stormwater structures to convey floodwater more effectively.

It is the purpose of Goliad County to continue promoting public health, safety, and general welfare by minimizing public and private losses from flooding in specific areas. The NFIP participating jurisdiction, Goliad County, is guided by its local Flood Damage Prevention Ordinance. These communities will continue to comply with NFIP requirements through their local permitting, inspection, and record-keeping requirements for new and substantially developed construction. Further, the NFIP program promotes sound development in floodplain areas and includes provisions designed to:

- Protect human life and health;
- Minimize expenditure of public money for costly flood control projects;
- Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- Minimize prolonged business interruptions;
- Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone, and sewer lines, streets, and bridges located in floodplains;
- Help maintain a stable tax base by providing for the sound use and development of flood-prone areas in such a manner as to minimize future flood blight areas; and
- Ensure that potential buyers are notified that the property is in a flood area.

To accomplish these tasks, Goliad County seeks to observe the following guidelines to achieve flood mitigation:

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- Restrict or prohibit uses that are dangerous to health, safety, or property in times of flood, such as filling or dumping, that may cause excessive increases in flood heights or velocities;
- Require that uses vulnerable to floods, including facilities that serve such uses, be protected against flood damage at the time of initial construction, as a method of reducing flood losses;
- Control the alteration of natural floodplains, stream channels, and natural protective barriers, which are involved in the accommodation of floodwaters;
- Control filling, grading, dredging, and other development, which may increase flood damage; and
- Prevent or regulate the construction of flood barriers that will unnaturally divert floodwaters, or that may increase flood hazards to other lands.

NFIP Compliance And Maintenance

The NFIP participating jurisdiction, Goliad County, has developed mitigation actions that relate to either NFIP maintenance or compliance. Compliance and maintenance actions are in Section 17.

A majority of the planning team identified flooding as a significant hazard during hazard ranking activities at the planning meetings. As such, many of the mitigation actions were developed with flood mitigation in mind. A majority of these flood actions address NFIP compliance and the implementation of flood awareness programs. Goliad County recognizes the need and is working to adopt higher NFIP regulatory standards to further minimize flood risk in the communities. In addition, the County is focusing on public education about flooding. This includes promoting flood insurance availability by placing NFIP brochures and flyers in public libraries and public meeting places.

Goliad County has a designated floodplain administrator. All floodplain administrators in the planning area will continue to comply with the NFIP, including floodplain administration, zoning ordinances, and development regulations. The floodplain ordinance adopted by each participating jurisdiction outlines the minimum development requirements for Special Flood Hazard Areas.

Goliad County has a permitting process in place, and the local floodplain administrator is responsible for coordinating inspections of damaged homes located in the floodplain. Following a flood event, local officials inspect damaged homes to determine whether the damage is substantial. Substantially damaged homes must be brought into compliance. Similarly, proposed improvements to homes located in the floodplain are reviewed by local building officials to determine if a substantial improvement is proposed. The floodplain administrator oversees permitted repairs and improvements to ensure compliance during the rebuilding or improvement process.

Repetitive Loss

The Flood Mitigation Assistance (FMA) Grant Program, administered by FEMA, provides federal funding to help states and communities implement mitigation measures to reduce or eliminate the long-term risk of flood damage to buildings insured under the National Flood Insurance Program. The Texas Water Development Board (TWDB) administers the FMA grant program for the State of Texas. One of the goals of the FMA program is to reduce the burden on the NFIP from repetitive-loss and severe-repetitive-loss properties through mitigation activities that significantly reduce or eliminate the threat of future flood damage.

Repetitive Loss properties are defined as structures that are:

- Any insurable building for which 2 or more claims of more than \$1,000 each, paid by the National Flood Insurance Program (NFIP) within any 7 year period, since 1978;
- May or may not be currently insured under the NFIP.

Severe Repetitive Loss properties are defined as structures that are:

- Covered under the NFIP and have at least 4 flood-related damage claim payments (building and contents) over \$5,000.00 each, and the cumulative amount of such claims payments exceeds \$20,000; or
- At least 2 separate claim payments (building payments only) have been made, with the cumulative amount of the building portion of such claims exceeding the market value of the building.

In either scenario, at least 2 of the referenced claims must have occurred within any 7-year period and must be greater than 10 days apart.⁸ Table 7-9 shows repetitive loss and severe repetitive loss properties for the Goliad County planning area. Table 7-9 shows repetitive loss and severe repetitive loss properties for the Goliad County planning area.

Table 7-9: Repetitive Loss and Severe Repetitive Loss Properties

Jurisdiction	Building Type	Number of Structures	Number of Losses	Severe Repetitive Loss Property
Goliad County	Single Family	2	4	Yes

⁸ Texas Water Development Board

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Hazard Description

Hailstorm events represent a potentially destructive consequence of severe thunderstorms. During the early phases of hailstorm development, ice crystals originate within a low-pressure system as a result of the rapid ascent of warm air into the upper atmosphere, followed by cooling of the air mass. Over time, frozen droplets accumulate to form larger ice crystals, which eventually descend as precipitation in the form of round or irregularly shaped ice masses, typically exceeding 0.75 inches in diameter. The dimensions of hailstones are directly correlated with the intensity and magnitude of the storm. Robust updraft winds are essential for maintaining hailstones in suspension within thunderclouds, and the strength of these updrafts is driven by thermal heating at the Earth’s surface. Greater temperature differentials above the ground contribute to prolonged suspension times and larger hailstones.

According to the National Insurance Crime Bureau (NICB), between 2018 and 2020, the State of Texas had the greatest number of hail loss claims in the U.S., with 605,866 loss claims (23 percent of total hail claims in the U.S.) due to hail events. In this two-year period, Texas experienced a total of 584 severe hail days. Five of the top ten cities for hail loss claims between 2017 and 2019 were in Texas, three of which were in the Dallas-Fort Worth metropolitan area.¹

In 2021, 6.8 million properties in the U.S. experienced one or more damaging hail events, resulting in a total of \$16.5 billion in insured losses. Texas had the highest number of properties affected by hail, with over 1.5 million properties or 17 percent of total properties in the state affected; an increase of 80,000 properties affected between

¹ Source: Manasek, Thomas, “2018-2020 United States Hail Loss Claims and Questionable Claims” (National Insurance Crime Bureau, March 15, 2021). <http://www.rmii.org/downloads/PUBLIC%202018%20-%202020%20Hail%20foreCAST-%20TJM.pdf>

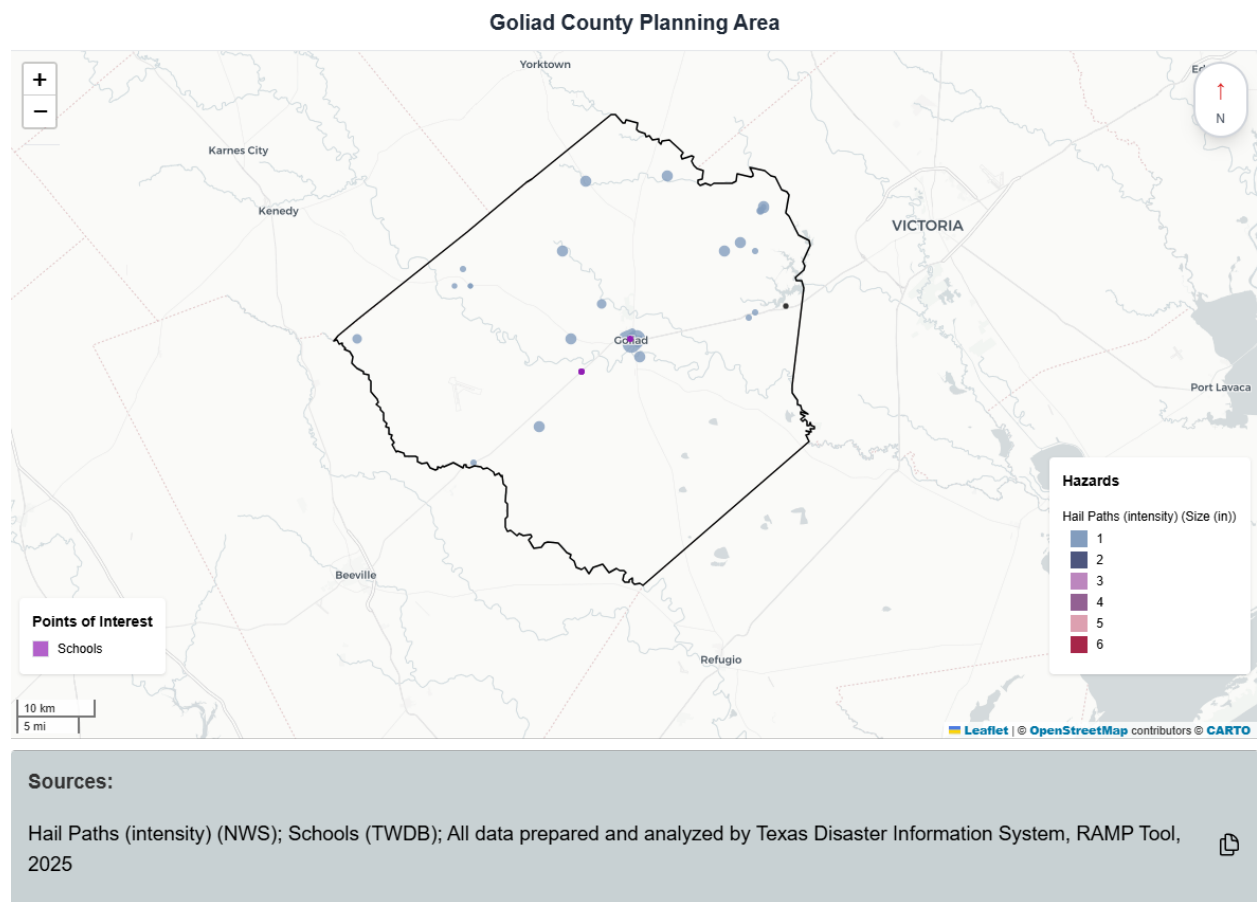
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2020 and 2021. Texas hailstorms accounted for almost a quarter of total U.S. properties affected by hail in 2021.

Location

Hailstorms are an extension of severe thunderstorms that could potentially cause severe damage. As a result, they are not confined to any specific geographic location and can vary greatly in size, location, intensity, and duration. Therefore, the entire Goliad County planning area, including the ISD and special district, is equally at risk from hail. Refer to Figure 8-1 for the location of hail paths in the planning area.

Figure 8-1: Hail Paths for Goliad County



Extent

The National Weather Service (NWS) classifies a storm as “severe” if there is hail three-quarters of an inch in diameter (approximately the size of a penny) or greater, based on radar intensity or as seen by observers. The intensity category of a hailstorm depends on hail size and the potential damage it could cause, as depicted in the National Centers for Environmental Information (NCEI) Intensity Scale in Table 8-1.

Table 8-1: Hail Intensity and Magnitude Scale²

Size Code	Intensity Category	Size (diameter inches)	Descriptive Term	Typical Damage
H0	Hard Hail	Up to 0.33	Pea	No damage
H1	Potentially Damaging	0.33 - 0.60	Marble	Slight damage to plants and crops
H2	Potentially Damaging	0.60 - 0.80	Dime	Significant damage to plants and crops
H3	Severe	0.80 - 1.20	Nickel	Severe damage to plants and crops
H4	Severe	1.2 – 1.6	Quarter	Widespread glass and auto damage
H5	Destructive	1.6 – 2.0	Half Dollar	Widespread destruction of glass, roof, and risk of injuries
H6	Destructive	2.0 – 2.4	Ping Pong Ball	Aircraft bodywork dented, and brick walls pitted
H7	Very Destructive	2.4 – 3.0	Golf Ball	Severe roof damage and risk of serious injuries
H8	Very Destructive	3.0 – 3.5	Hen Egg	Severe damage to all structures
H9	Super Hailstorms	3.5 – 4.0	Tennis Ball	Extensive structural damage could cause fatal injuries
H10	Super Hailstorms	4.0+	Baseball	Extensive structural damage could cause fatal injuries

Table 8-1 presents an intensity scale ranging from H0 to H10, determined by factors such as hail size (both distribution and maximum diameter), texture, fall speed, storm movement velocity, and wind strength. Analysis of historical data for Goliad County, including the ISD and special district, indicates that the region may experience hailstorms with intensities from H0 (pea-sized hail) up to H10 (baseball-sized hail). The largest recorded hail event reached three inches in diameter (classified as H8) on April 18, 1976. Additional details regarding these occurrences can be found in the Historical Occurrences section below. Based on the historical record, similar events represent the likely upper limit of hailstorm severity anticipated in the planning area.

² Source: NCEI Intensity Scale, based on the TORRO Hailstorm Intensity Scale.

Historical Occurrences

Historical events are shown in Table 8-2. All reported events have been listed. A total of 71 reported historical hail events impacted the Goliad County planning area between 1959 and 2025; these events were reported to NCEI and NOAA databases and may not represent all hail events that have occurred during the past 66 years. The ISD and special district do not report events separately, except for county and city events. The participating ISD or special district reported no hail damage.

Table 8-2: Damaging Historical Hail Events, 1959-2025

Jurisdiction	Date	Magnitude (inches)	Deaths	Injuries	Property Damage	Crop Damage
Goliad County	6/3/1962	1.5	0	0	\$0	\$0
Goliad County	2/9/1966	0.75	0	0	\$0	\$0
Goliad County	4/18/1976	3	0	0	\$0	\$0
Goliad County	4/18/1976	2.75	0	0	\$0	\$0
Goliad County	5/4/1979	0.75	0	0	\$0	\$0
Goliad County	2/27/1987	0.75	0	0	\$0	\$0
Goliad County	4/29/1988	0.75	0	0	\$0	\$0
Goliad County	7/12/1990	1.75	0	0	\$0	\$0
Goliad County	5/28/1992	1.75	0	0	\$0	\$0
Goliad County	10/12/1993	2.75	0	0	\$0	\$0
Goliad County	4/15/1994	1.75	0	0	\$110,000	\$0
Goliad County	4/15/1994	1.75	0	0	\$1,100,000	\$0
Goliad County	4/15/1994	1.75	0	0	\$1,100,000	\$0
Goliad County	5/12/1994	0.88	0	0	\$11,000	\$0
Goliad County	4/10/1995	1.75	0	0	\$0	\$0
Goliad County	4/22/1995	1.75	0	0	\$0	\$0

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Jurisdiction	Date	Magnitude (inches)	Deaths	Injuries	Property Damage	Crop Damage
Goliad County	6/4/1996	1	0	0	\$0	\$0
Goliad County	6/20/1996	0.75	0	0	\$0	\$0
Goliad County	6/20/1996	1.75	0	0	\$0	\$0
Goliad County	8/13/1996	0.75	0	0	\$0	\$0
Goliad County	8/14/1996	0.75	0	0	\$0	\$0
Goliad County	4/4/1997	1.75	0	0	\$0	\$0
Goliad County	5/27/1997	1	0	0	\$0	\$0
Goliad County	5/28/1997	0.75	0	0	\$0	\$0
Goliad County	5/28/1997	1	0	0	\$0	\$0
Goliad County	6/17/1997	0.75	0	0	\$0	\$0
Goliad County	12/23/1997	1.75	0	0	\$0	\$0
Goliad County	12/23/1997	0.75	0	0	\$0	\$0
Goliad County	2/16/1998	1	0	0	\$0	\$0
Goliad County	2/18/1998	1.75	0	0	\$0	\$0
Goliad County	2/26/1998	0.75	0	0	\$0	\$0
Goliad County	3/7/1998	0.75	0	0	\$0	\$0
Goliad County	6/15/1998	1.25	0	0	\$0	\$0
Goliad County	6/15/1998	1.75	0	0	\$0	\$0
Goliad County	7/27/2000	1.75	0	0	\$0	\$0
Goliad County	5/5/2001	0.88	0	0	\$0	\$0
Goliad County	11/15/2001	0.75	0	0	\$0	\$0
Goliad County	11/15/2001	1	0	0	\$0	\$0

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Jurisdiction	Date	Magnitude (inches)	Deaths	Injuries	Property Damage	Crop Damage
Goliad County	11/15/2001	1	0	0	\$0	\$0
Goliad County	11/15/2001	1	0	0	\$0	\$0
Goliad County	11/15/2001	1	0	0	\$0	\$0
Goliad County	4/8/2002	0.75	0	0	\$0	\$0
Goliad County	5/29/2002	1.75	0	0	\$0	\$0
Goliad County	5/29/2002	1.75	0	0	\$0	\$0
Goliad County	12/23/2002	0.75	0	0	\$0	\$0
Goliad County	11/23/2004	0.75	0	0	\$0	\$0
Goliad County	11/23/2004	1.75	0	0	\$0	\$0
Goliad County	3/27/2005	1	0	0	\$0	\$0
Goliad County	3/13/2007	1.75	0	0	\$0	\$0
Goliad County	3/14/2007	1.75	0	0	\$0	\$0
Goliad County	5/27/2009	1.75	0	0	\$0	\$0
Goliad County	5/26/2011	1.75	0	0	\$0	\$0
Goliad County	4/15/2012	1.75	0	0	\$0	\$0
Goliad County	4/15/2012	1.5	0	0	\$0	\$0
Goliad County	4/15/2012	1.75	0	0	\$14,000	\$0
Goliad County	4/15/2012	1	0	0	\$7,000	\$0
Goliad County	5/10/2012	0.88	0	0	\$0	\$0
Goliad County	4/16/2015	1	0	0	\$0	\$0
Goliad County	4/22/2015	1	0	0	\$0	\$0
Goliad County	5/25/2015	1	0	0	\$14,000	\$0

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Jurisdiction	Date	Magnitude (inches)	Deaths	Injuries	Property Damage	Crop Damage
Goliad County	5/27/2016	1.75	0	0	\$14,000	\$0
Goliad County	11/7/2016	1	0	0	\$0	\$0
Goliad County	6/4/2017	2.75	0	0	\$330,000	\$0
Goliad County	6/4/2017	1	0	0	\$7,000	\$0
Goliad County	6/4/2017	1.25	0	0	\$7,000	\$0
Goliad County	6/4/2017	1	0	0	\$0	\$0
Goliad County	5/9/2019	1	0	0	\$6,000	\$0
Goliad County	6/6/2019	1	0	0	\$0	\$0
Goliad County	4/9/2020	1.5	0	0	\$0	\$0
Goliad County	4/20/2024	1.5	0	0	\$0	\$0
Goliad County	4/21/2024	1	0	0	\$0	\$0
Totals		Max Extent	0	0	\$2,720,000	

Table 8-3: Historical Hail Events Summary, 1959-2025

Jurisdiction	Date	Magnitude (inches)	Deaths	Injuries	Property Damage	Crop Damage
Goliad County	71	3	0	0	\$2,720,000	\$0

Based on the list of historical hail events for the Goliad County planning area, including the ISD and special district, five of the events have occurred since the 2018 Plan, according to reports in the NCEI database.

Significant Events

April 15, 1994

Golf ball-sized hail was reported throughout the County, particularly in Weesatche and Fannin near Coleto Creek. There were reported property losses of \$1,100,000 (2026 dollars).

May 9, 2019

Strong to severe thunderstorms formed along a frontal boundary over south central Texas and along the Rio Grande during the afternoon. The storms moved east-southeast into South Texas during the evening. Damaging winds and quarter-sized hail occurred from Beeville and Goliad southeast to near Rockport. Quarter-sized hail occurred in Goliad.

Probability of Future Events

Based on available records of historic events, 71 events in a 66-year reporting period for Goliad County provide an average annual occurrence of one to two events per year. This frequency supports a “Highly Likely” probability of future events for the Goliad County planning area, including the ISD and special district.

Vulnerability and Impact

A significant portion of hail-related damage affects crops, as even small hailstones can rapidly destroy plants. Vehicles, building roofs, residential structures, and landscaping are also highly susceptible to hail impacts. Additionally, utility systems located on rooftops and within critical facilities are at increased risk of sustaining considerable damage during hail events. Hailstorms present safety hazards to individuals who may be injured by hail, falling trees, or branches. The risk to residents and visitors is particularly heightened during outdoor activities and events when hailstorms occur with minimal warning. Portable structures, such as those commonly used at schools and construction sites, are generally more vulnerable to hail damage than conventional site-built facilities.

The Goliad County planning area features mobile or manufactured home parks throughout the planning area. These parks are typically more vulnerable to hail events than typical site-built structures. In addition, manufactured homes are located sporadically throughout the planning area, including all participating jurisdictions, and are therefore more vulnerable. U.S. Census data indicate that 700 manufactured homes (20 percent of the total housing stock) are located in the Goliad County planning area. In addition, 41 percent (approximately 1,450 structures) of the housing structures in the Goliad County planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damage during significant wind events.

Table 8-4: Structures at Greater Risk by Participating Jurisdiction

Jurisdiction	Structures Built Before 1980	Manufactured Homes
Goliad County	1,450	700
Goliad ISD	2	0
Goliad WSC	4	0

While all citizens are at risk of hail, forced relocation, and disaster recovery, these impacts disproportionately affect low-income residents who lack the financial means to travel, afford a long-term stay away from home, and rebuild or repair their homes. While warning times for this type of hazard event should be substantial enough for these individuals to seek shelter, the elderly, children, and people with disabilities may have trouble taking shelter due to mobility issues or a lack of awareness, making them more susceptible to injury or harm. In addition, people who speak a language other than English may be more vulnerable due to language barriers that limit their access to important information, such as weather-related warnings and safety instructions.

In Goliad County, the population over 65 is estimated at 25 percent of the total, and children under 5 at 5 percent. The population with a disability is estimated at 16 percent of the total population. An estimated 13 percent of the planning area population lives below the poverty level, and 14 percent of the population speaks English ‘less than very well’ (Table 8-5).

Table 8-5: Populations at Greatest Risk by Jurisdiction

Jurisdiction	Over 65	Under 5	With a Disability	Below Poverty Level	Non-English Speaking
Goliad County	1,752	341	1,168	918	970

The participating ISD and special district also have vulnerable populations based on age or work location, such as employees who work outdoors, who may be subject to severe weather conditions (Table 8-6).

Table 8-6: Populations at Greater Risk by Special District

Special District	Under 5	Staff who work outdoors
Goliad ISD	36	27
Goliad WSC	-	1

The Goliad County Planning Team identified the following critical facilities (Table 8-7) as assets most important to the planning area and susceptible to a range of impacts from hail events. For a comprehensive list by participating jurisdiction, please see Appendix B.

Table 8-7: Critical Facilities Vulnerable to Hail

Critical Facility Type	Potential Impact
Emergency Response Services (EOC, Fire, Police, EMS), Hospitals, and Medical Centers	<ul style="list-style-type: none"> Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. Hailstones can damage emergency vehicles. Power outages could disrupt communications, delaying emergency response times. Accumulated hail on the streets may impede emergency response vehicle access to areas. Extended power outages and evacuations may lead to possible looting, destruction of property, and theft, further burdening law enforcement resources.
Airport, Academic Institutions, Animal Shelter, Evacuation Centers & Shelters, Governmental Facilities, Residential/ Assisted Living Facilities	<ul style="list-style-type: none"> Hailstones can damage structures. Power outages could disrupt critical care. Backup power sources could be damaged. Evacuations may be necessary due to extended power outages, gas line ruptures, or structural damage to facilities. Power outages and infrastructure damage may prevent larger airports from acting as temporary command centers for logistics, communications, and emergency operations. Temporary break in operations may significantly inhibit post-event evacuations. Damaged or destroyed highway infrastructure may substantially increase the need for airport operations.
Commercial Supplier (Food, fuel, etc.)	<ul style="list-style-type: none"> Facilities or infrastructure may be damaged, destroyed, or otherwise inaccessible. Essential supplies like medicines, water, food, and equipment deliveries may be significantly delayed.
Utility Services and Infrastructure (electric,	<ul style="list-style-type: none"> Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications.

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Critical Facility Type	Potential Impact
water, wastewater, communications)	<ul style="list-style-type: none"> • Power outages could disrupt communications, delaying emergency response times. • Accumulated hail on the streets may impede service response vehicle access to areas. • Extended power outages and evacuations may lead to possible looting, destruction of property, and theft, further burdening law enforcement resources.

Hail has been known to cause injury to humans and occasionally has been fatal. Overall, the estimated property and crop losses in the planning area over the 66-year reporting period were \$2,720,000, with an average annualized loss of \$14,200. Based on historic losses, the impact of hail damage on the Goliad County planning area can be considered “Limited”, meaning minor quality of life lost, critical facilities and services shut down for 24 hours or less, and less than 10 percent of property destroyed or with major damage.

Table 8-8: Estimated Annualized Losses by Jurisdiction

Jurisdiction	Total Property & Crop Loss	Average Annual Loss Estimate
Goliad County	\$2,720,000	\$41,200

Assessment of Impacts

Hailstorms can endanger people and often create hazardous scenarios. Common impacts of hail include:

- Hail can make roads treacherous during and after a storm, which may prevent essential personnel from reaching their posts and delay emergency responders trying to protect public health and safety.
- Both individuals and first responders caught outdoors face risks such as being hit by hailstones, falling branches, or toppled trees, potentially leading to injuries or fatalities.
- Large hail often causes major roof, siding, and window damage to homes, sparking an increase in insurance claims, higher premiums, and possible harm to residents.
- Vehicles may suffer significant damage depending on how big the hail is and how long the storm lasts.
- Widespread power outages are common after hail events, posing extra risks to vulnerable people who depend on electricity for health or safety reasons.

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- If power stays out for an extended period, there could be more house fires or carbon monoxide poisoning, as people turn to unsafe methods like grills to cook or heat their homes.
- Emergency workers face added dangers from downed power lines, damaged buildings, hazardous spills, and debris, which not only puts them at risk but can also hamper their response efforts.
- Businesses that aren't physically damaged may still struggle while waiting for roads to reopen and utilities to return, slowing the overall economic recovery.
- Companies that rely heavily on utilities could face even worse setbacks if they lack backup power sources.
- Major hailstorms can severely damage power infrastructure, sometimes requiring days or weeks to repair fully.
- Serious hail can devastate crops, resulting in substantial economic losses locally and regionally.
- Livestock and wildlife may be hurt, killed, or lose their habitats due to hail.
- Parks and recreational areas might become inaccessible for a time because of prolonged outages or blocked access roads.
- Historic sites and properties are especially susceptible since their materials may be fragile and regulations often prevent changes; Goliad County, for example, has 13 sites listed on the National Register of Historic Places.

The economic and financial impacts of hail will depend entirely on the scale of the event, what is damaged, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning conducted by the community, local businesses, and citizens will contribute to the overall economic and financial conditions in the aftermath of any hail event.

Climate Change Impacts

Although the impact of climate change on the frequency and severity of hail events is uncertain, some climate studies aim to provide insight into future hailstorm conditions. As ocean temperatures rise due to climate change, more moisture is evaporating into the atmosphere. The warm, moist air masses that fuel severe weather may become more unstable on average, which could favor the development of more thunderstorms and hail. However, it is also suggested that, in a warming climate, the average melting level in thunderstorms will rise, meaning small hailstones will have a greater chance of melting as they fall to the ground. Therefore, hail may become less frequent, but large hail can still occur when it does, increasing the risk of damage.³

³ Source: Yale Climate Connections, Hailstorms and Climate Change, March 17, 2022

Section 9: Hurricane/Tropical Storm

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Hazard Description

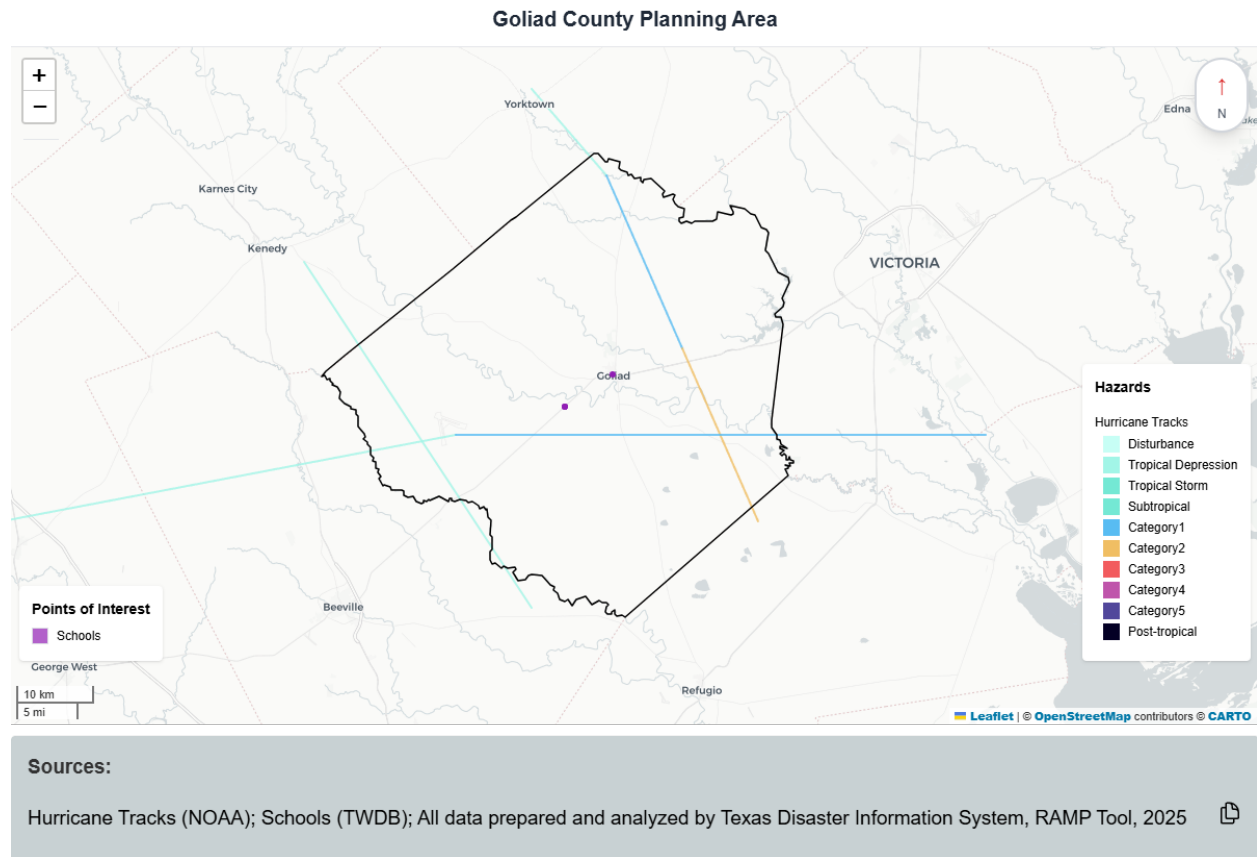
According to the National Oceanic and Atmospheric Administration (NOAA), a hurricane is defined as an intense tropical cyclone distinguished by severe thunderstorms, a clearly organized surface circulation, and sustained winds of at least 74 mph.

Hurricanes are classified based on wind intensity using the Saffir-Simpson Hurricane Scale, with Category 1 representing the lowest wind speeds and Category 5 the highest. It is important to note that these categories are relative; lower-category storms can occasionally result in greater damage than higher-category hurricanes due to factors such as landfall location and associated hazards. Additionally, tropical storms, while not meeting hurricane thresholds, may also cause significant destruction and loss of life, particularly through flooding.

Hurricanes originate as tropical depressions that intensify into tropical storms when their maximum sustained winds reach 35-64 knots (39-73 mph). At this stage, storms become more organized and take on a circular structure characteristic of hurricanes. Notably, tropical storms can pose significant risks even without developing into hurricanes; their high winds and heavy rainfall can endanger lives and property, as demonstrated by Tropical Storm Frances in southeast Texas during September 1998. When sustained winds reach 74 mph or higher, the storm is classified as a hurricane. The severity of hurricanes making landfall is categorized based on wind speed and associated potential damage. Tropical storm-force winds are sufficiently hazardous to warrant precautionary measures; thus, emergency managers aim to complete evacuations and shelter arrangements before their arrival, which precedes the onset of hurricane-force winds.

Figure 9-1 illustrates the hurricane tracks for the Goliad County planning area.

Figure 9-1: Hurricane Tracks for Goliad County



Location

Goliad County, the ISD, and the special district are subject to impacts from a hurricane/tropical storm. The location of Goliad County near the coast makes the planning area, including the ISD and special district, vulnerable to threats directly and indirectly related to hurricanes, such as high-force winds and flooding. While the County is not located along the Gulf coast, the southeast jurisdictional boundary is located approximately 70 miles from the Gulf of Mexico/Gulf of America coast, making it susceptible to hurricanes. Hurricanes and tropical storms can impact Goliad County from June to November, the official Atlantic U.S. hurricane season. Goliad County is in a low-to-moderate risk area for hurricane wind speeds up to 200 miles per hour (mph).

Location is often described in terms of Tier I and II counties, designated by the Texas Department of Insurance (TDI) for windstorm insurance purposes, to represent differing levels of loss exposure in coastal and adjacent counties. Tier I includes those counties adjacent to the Gulf of Mexico/Gulf of America, and Tier II includes those counties adjacent to Tier I counties.

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Goliad County is a Tier II County. As a Tier II county, all of Goliad County and the participating jurisdictions are in direct threat of tropical storms and hurricanes, including associated flooding and high winds.

Although tropical storm and hurricane effects begin to diminish as they move inland, the winds alone from Hurricane Harvey reached as far as 140 miles from the eye of the storm.

Tropical storms and hurricanes vary widely in size, location, intensity, and duration. According to the Goliad County 2013 CHAMPS Report, Goliad County's proximity to the coast places it among the top 20 percent of all Texas counties in terms of recorded hurricane and tropical storm impacts, including damage dollars, injuries, and deaths.

Extent

As a hurricane develops, the barometric pressure (measured in millibars or inches) at its center falls, and winds increase. If the atmospheric and oceanic conditions are favorable, it can intensify into a tropical depression. When maximum sustained winds reach or exceed 39 miles per hour, the system is designated a tropical storm, given a name, and closely monitored by the National Hurricane Center in Miami, Florida. When sustained winds reach or exceed 74 miles per hour, the storm is deemed a hurricane.

Hurricanes are categorized according to the strength and intensity of their winds using the Saffir-Simpson Hurricane Scale (Table 9-1). A Category 1 storm has the lowest wind speeds, while a Category 5 hurricane has the highest. However, a lower category storm can inflict greater damage than higher category storms depending on where they strike, the amount of storm surge, other weather they interact with, and how slow they move.

Table 9-1: Saffir-Simpson Hurricane Wind Scale

Category	Maximum Sustained Wind (MPH)	Minimum Surface Pressure (Millibars)	Storm Surge (Feet)	Damage
1	74-95	Greater than 980	3-5	Minor to Moderate
2	96-110	979-965	6-8	Moderate to Extensive
3	111-130	964-945	9-12	Extensive (Major Hurricane)
4	131-155	944-920	13-18	Severe (Major Hurricane)

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Category	Maximum Sustained Wind (MPH)	Minimum Surface Pressure (Millibars)	Storm Surge (Feet)	Damage
5	155+	Less than 920	19+	Catastrophic (Total Failure)

Based on historical storm tracks, most hurricanes had been downgraded to tropical storms by the time they reached the Goliad County planning area, including the ISD and special district. However, the average estimated extent to be mitigated is based on the intensity of historical hurricanes at landfall.

Goliad County and the participating jurisdictions are located far enough from the coast that storm surge is unlikely to have a local impact.

The worst hurricanes and tropical storms in Goliad County and the participating jurisdictions have measured as high as Category 5 on the Saffir-Simpson scale, dropped over 22" in rainfall, injured up to 78 people, and caused property and crop damages in excess of \$52.8 million.

Future hurricanes and tropical storms may meet or exceed previous worst-case Category 5 storms in terms of strength, rainfall, flooding, damage dollars, injuries, and deaths.

Historical Occurrences

According to the historical hurricane tracks from NOAA's National Hurricane Center, there have been 11 storms that are known to have come within 60 miles of the Goliad County planning area from 1996 through 2025. Historical systems that have tracked in proximity to the planning area, bringing storm systems, excessive precipitation, and potentially damaging winds to Goliad County, the ISD, and the special district are listed in Table 9-2 below.

Table 9-2: Historical Hurricane/Tropical Storm Events, 1996-2025

Date	Storm Name	Category (max)
8/21/1998 to 8/24/1998	Tropical Storm Charley	Tropical Storm
9/8/1998 to 9/13/1998	Tropical Storm Frances	Tropical Storm
8/4/2002 to 8/9/2002	Tropical Storm Bertha	Tropical Storm
9/5/202/02 to 9/11/2002	Tropical Storm Faye	Tropical Storm
7/7/2003 to 7/17/2003	Hurricane Claudette	Category 1
8/15/2007 to 8/19/2007	Tropical Storm Erin	Tropical Storm
9/4/2010 to 9/10/2010	Tropical Storm Hermoine	Tropical Storm
7/27/2011 to 7/30/2011	Tropical Storm Don	Tropical Storm
6/16/2015 to 6/21/2015	Tropical Storm Bill	Tropical Storm
8/16/2017 to 9/2/2017	Hurricane Harvey	Category 4
9/17/2020 to 9/25/2017	Tropical Storm Beta	Tropical Storm

Table 9-3 lists the storms that have impacted the Goliad County planning area from 1996 through 2023 as reported in the NCEI. Not all events reported by the NOAA National Hurricane Center are recorded in the NCEI, so damages and events are likely underreported. Historical hurricane data for Goliad County is provided on a countywide basis per the NCEI and NOAA databases.

Historical hurricane data for the participating ISD and special district are provided within the jurisdiction in which the special district or ISD resides, as they do not have events reported separately and apart from jurisdiction events. The Goliad ISD reported \$660,000 (2026 dollars) in damages, and Goliad WSC reported \$130,000 (2026 damages) in damages, both due to Hurricane Harvey. These damage amounts have been added to the reported NCEI events in Table 9-3.

Table 9-3: Hurricane/Tropical Storm Historical Events 1950-2025

Jurisdiction	Date	Deaths	Injuries	Property Losses	Crop Losses
Goliad County	8/26/2017	0	0	\$2,100,000	\$0

Based on the list of historical hurricane events for the Goliad County planning area, including the ISD and special district, no events have occurred since the 2018 Plan, according to data from the National Hurricane Center.

Significant Events

August 25, 2017 – Hurricane Harvey

On August 25, 2017, Hurricane Harvey made landfall on the Texas Gulf Coast as a Category 4 hurricane and inflicted significant damage, including in Goliad County and the participating jurisdictions. Damages were estimated at over \$2 million, with \$1,300,000 (2026 dollars) in the City of Goliad, roughly \$660,000 (2026 dollars) in the Goliad Independent School District, and roughly \$130,000 (2026 dollars) in the Goliad Water Supply Corporation. Rainfall associated with Harvey reached over 22”11 in parts of Goliad County.

Probability of Future Events

Hurricanes occur in seasonal patterns between June 1 and November 30. Based on the historical frequency of hurricanes and tropical storms in Goliad County and the participating jurisdictions outlined above, the likelihood of a hurricane or tropical storm affecting any or all the participating jurisdictions is “Occasional,” meaning an event is possible in the next five years.

Vulnerability and Impacts

Hurricane and tropical storm events can cause major damage to large areas; hence, all existing buildings, facilities, and populations are equally exposed and vulnerable to this hazard and could potentially be impacted. Goliad County planning area features multiple mobile or manufactured home parks. These mobile home parks are typically more vulnerable to hurricanes than site-built structures. U.S. Census data indicate that 700 manufactured homes (20 percent of the total housing stock) are located in the Goliad County planning area. In addition, 41 percent (approximately 1,450 structures) of the housing structures in the Goliad County planning area were built before 1980.

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These structures would typically be built to lower or less stringent construction standards than newer construction. They may be more susceptible to damage during significant events.

Table 9-4. Structures at Greater Risk

Jurisdiction	Structures built before 1980	Manufactured Homes
Goliad County	1,450	700
Goliad ISD	2	0
Goliad WSC	4	0

While all citizens are at risk of hurricane-related impacts, forced relocation and disaster recovery disproportionately affect low-income residents who lack the financial means to travel, afford a long-term stay away from home, and rebuild or repair their homes. The elderly, children, and people with disabilities may have trouble taking shelter due to mobility issues or a lack of awareness, making them more susceptible to injury or harm. In addition, people who speak a language other than English may be more vulnerable due to language barriers that limit their access to important information, such as weather-related warnings and safety instructions. The population over 65 in the Goliad County planning area is estimated at 25 percent of the total population, and children under the age of 5 are estimated at 5 percent. The population with a disability is estimated at 16 percent of the total population. An estimated 13 percent of the planning area population lives below the poverty level, and 14 percent speaks a language other than English (Tables 9-5).

Table 9-5. Populations at Greater Risk by Participating Jurisdiction

Jurisdiction	Over 65	Under 5	With a Disability	Below Poverty Level	Non-English Speaking
Goliad County	1,752	341	1,168	918	970

The participating ISD and special district also have vulnerable populations, including those under 5, and those who work outdoors may be subject to severe weather conditions (Table 9-6).

Table 9-6. Populations at Greater Risk by Participating Special Districts

Special District	Under 5	Staff who work outdoors
Goliad ISD	35	27
Goliad WSC	-	1

The Goliad County Planning Team identified the following critical facilities as assets most important to the planning area and susceptible to a range of impacts from hurricane and tropical storm events. For a comprehensive list by participating jurisdiction, please see Appendix B.

Table 9-7: Critical Facilities Vulnerable to Hurricane and Tropical Storm Events

Critical Facilities	Potential Impacts
Emergency Response Services (EOC, Fire, Police, EMS), Hospitals, and Medical Centers	<ul style="list-style-type: none"> • Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. • Emergency vehicles can be damaged by falling trees or flying debris. • Power outages could disrupt communications, delaying emergency response times. • Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. • Debris/downed trees can impede emergency response vehicle access to areas. • Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel. • First responders are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions. • Extended power outages and evacuations may lead to possible looting and destruction of property
Academic Institutions, Animal Shelter, Evacuation Centers & Shelters, Governmental Facilities, Residential/	<ul style="list-style-type: none"> • Structures can be damaged by falling trees or flying debris. • Power outages could disrupt critical care. • Backup power sources could be damaged. • Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. • Evacuations may be necessary due to extended power outages, gas line ruptures, or structural damage to facilities.

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Critical Facilities	Potential Impacts
Assisted Living Facilities	
Commercial Supplier (Food, fuel, etc.)	<ul style="list-style-type: none"> • Facilities or infrastructure may be damaged, destroyed, or otherwise inaccessible. • Essential supplies like medicines, water, food, and equipment deliveries may be significantly delayed. • Additional emergency responders and critical aid workers may not be able to reach the area for days.
Utility Services and Infrastructure (electric, water, wastewater, communications)	<ul style="list-style-type: none"> • Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. • Emergency vehicles can be damaged by falling trees or flying debris. • Power outages could disrupt communications, delaying emergency response times. • Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. • Debris/downed trees can impede emergency response vehicle access to areas. • Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel. • First responders are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions.

Table 9-8 shows the impact or loss estimation for storms impacting Goliad County. Damages within the NCEI database are reported at the county level. Annual loss estimates were based on the 29.5-year reporting period for such damages. The average annual loss estimate for the Goliad County planning area is approximately \$45,000 (2026 dollars).

Table 9-8: Summary of Hurricane Events and Potential Annualized Losses, 1996-2025

Jurisdiction	Total Property & Crop Loss	Average Annual Loss Estimates
Goliad County	\$1,300,000	\$45,000
Goliad ISD	\$660,000	\$22,800
Goliad WSC	\$130,000	\$4,500

Section 9: Hurricane/Tropical Storm

With limited reported damages and no reported injuries or fatalities, the potential severity of impact from a hurricane for Goliad County planning area, including all participating jurisdictions, ISDs, and special districts, is considered to be “Limited”, meaning injuries and illnesses are treatable with first aid, shutdown of critical facilities and services for 24-hours or less, and less than ten percent of property destroyed or with major damage.

Assessment of Impacts

Hurricanes and tropical storms present serious dangers to communities and public safety officials. With climate change potentially causing stronger hurricanes, these risks may become even greater. Effects on the area can include:

- People caught in storms could be injured or killed by flying debris, falling branches, or trees.
- Buildings may be damaged or destroyed by fallen trees, endangering those inside.
- Roads, especially bridges, can become hazardous during hurricanes, increasing the chance of accidents and making evacuations risky if not well-timed.
- Emergency evacuations might be needed before a hurricane arrives, requiring coordination between responders, evacuation routes, and shelters.
- Debris and downed trees can block roads, preventing emergency vehicles from reaching areas in need.
- Fallen power lines may make roads unsafe and stop first responders from providing help.
- High winds during a hurricane can keep responders from answering emergency calls due to unsafe conditions.
- Widespread power outages are common, putting vulnerable individuals at greater risk if they depend on electricity for health or safety.
- Long-term loss of power can lead to more house fires and carbon monoxide poisonings as people use unsafe methods for heating or cooking.
- Extended outages can be fatal for those who rely on electricity to live independently.
- Severe storms may break gas lines and knock down trees and power lines, raising the risk of fires during and after the storm.
- Major hurricanes can cause lengthy evacuations and require extra personnel and resources for search, rescue, and recovery while protecting residents and property.
- First responders face hazards like downed wires, unstable debris, dangerous substances, and generally unsafe situations.

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- Disaster operations may suffer due to damaged facilities or lost communication abilities.
- Essential staff may not be able to get to work, limiting emergency responses.
- County and city departments themselves could be damaged, slowing community recovery efforts.
- Key businesses like utilities, banks, and healthcare providers may not function fully and might need outside support until normal services resume.
- The local economy can be disrupted, reducing funding for programs and services due to losses in revenue both short- and long-term.
- Even undamaged businesses can struggle if roads remain blocked or utilities take time to restore, further hampering economic recovery.
- Older buildings, especially those built before modern codes, are usually more susceptible to hurricane damage. For example, in Goliad County, 41% of homes were built before 1980, and 13 historic buildings predate current building standards.
- Parks and urban vegetation may be flattened or flooded by strong winds and heavy rain.
- Large hurricanes create significant financial strain as communities must pay for repairs, temporary services, overtime for workers, and ongoing daily operations.
- Businesses heavily dependent on utilities may experience more severe impacts without backup power.
- As the population grows, so does the number of homes and people exposed to hurricane risks. Ongoing public education about these hazards is essential to the Planning Team's mitigation strategy.

The economic and financial impacts of hurricane events on the area will depend on the scale of the event, what is damaged, and how quickly repairs to critical economic components can be implemented. The level of preparedness and pre-event planning by the community, local businesses, and citizens will also contribute to the overall economic and financial conditions in the aftermath of any hurricane.

Climate Change Impacts

According to the United States Environmental Protection Agency, tropical storms and hurricanes in Texas have become more intense over the past 20 years. Although warming oceans provide these storms with more potential energy, scientists are not sure whether the recent intensification reflects a long-term trend. Nevertheless, hurricane wind speeds and rainfall rates are likely to increase as the climate continues

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to warm. Whether or not storms become more intense, coastal homes and infrastructure will be affected as the sea level rises and storm surges rise.¹

The current climate assessment report for Texas indicates an expected increase in the intensity of very strong hurricanes, despite an expected lack of increase, or even a decrease, in hurricane frequency overall. Different research studies have produced some conflicting results. While some recent research has pointed to an apparent trend of U.S. tropical cyclones moving more slowly at landfall, as with Hurricane Harvey, other research suggests that Texas may be spared such a slowdown. At this point, the enhanced risk is difficult to quantify. Still, substantial scientific progress on this topic is likely as climate models become better at simulating the observed spatial distribution, frequency, and intensity of hurricanes.²

¹ Source: What Climate Change Means for Texas. United States Environmental Protection Agency. August 2016

² Source: Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, Texas A&M University Office of the Texas State Climatologist, 2021 update.

Section 10: Lightning

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Hazard Description

Lightning is an electrical discharge resulting from the buildup of positive and negative charges within a thunderstorm, creating a “bolt” when the buildup becomes strong enough. This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning can reach temperatures of up to 50,000 degrees Fahrenheit. Lightning rapidly heats the sky as it flashes, but the surrounding air cools afterward. This rapid heating and cooling of the surrounding air causes the thunder, which often accompanies lightning strikes. While most often affiliated with severe thunderstorms, lightning often strikes outside of heavy rain and might occur as far as 10 miles away from any rainfall.

According to the National Weather Service (NWS), the 10-year (2012–2021) average for fatalities is 23 people, with an average of 300 injuries in the United States each year from lightning. Lightning can occur as cloud-to-ground flashes or as intra-cloud lightning flashes. Direct lightning strikes can cause significant damage to buildings, critical facilities, infrastructure, and communication equipment, affecting emergency response. Lightning also ignites wildfires that can cause widespread property damage before firefighters can contain and suppress them.

Location

Lightning can strike anywhere and is a common occurrence in Texas. The Goliad County planning area is in a region of the country that is moderately susceptible to a lightning strike. Therefore, lightning could occur at any location within the entire planning area. It is assumed that the entire Goliad County planning area, including the ISD and special district, is uniformly exposed to the threat of lightning.

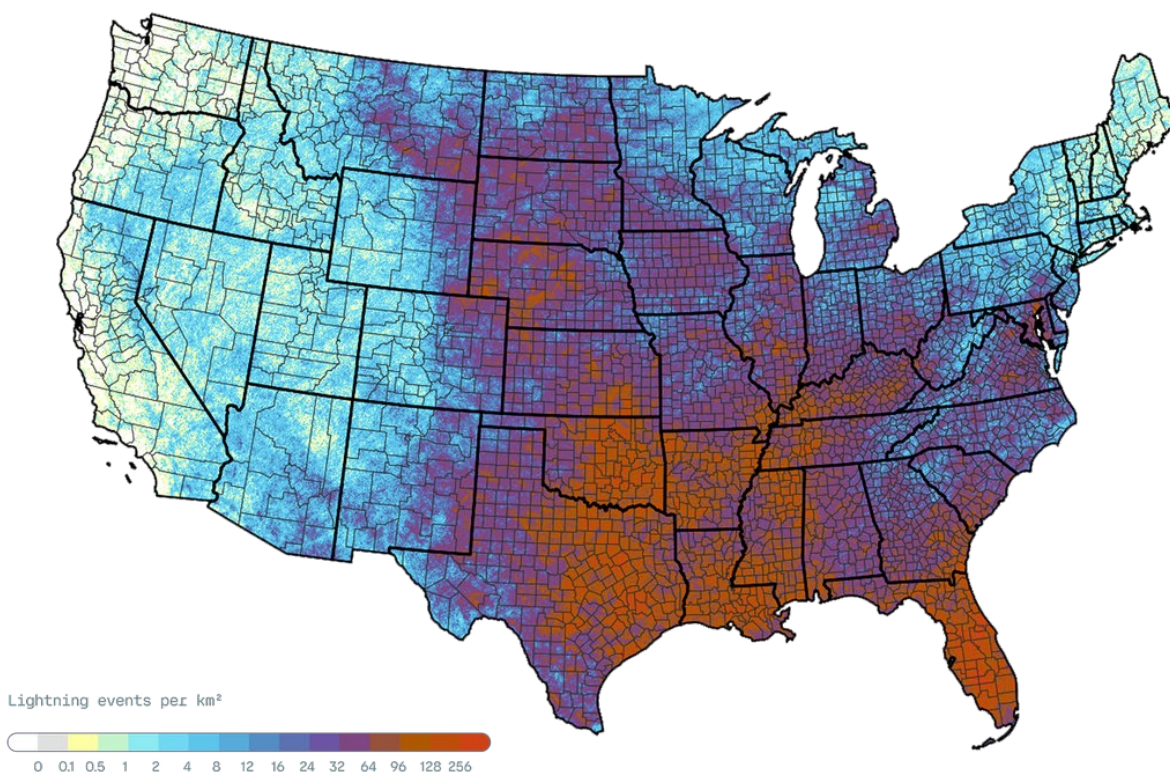
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Extent

According to the 2025 Annual Lightning Report by Vaisala, the State of Texas ranks sixth in the U.S. for lightning strike density with an average of 68.1 flashes per square mile.¹

Vaisala's U.S. National Lightning Detection Network lightning flash density map shows an average of 60 to 80 lightning events per square mile per year for the Goliad County planning area. This rate equates to approximately 68,160 flashes per year for the entire planning area, including the ISD and special district. Figure 10-1 shows the lightning density for Goliad County.

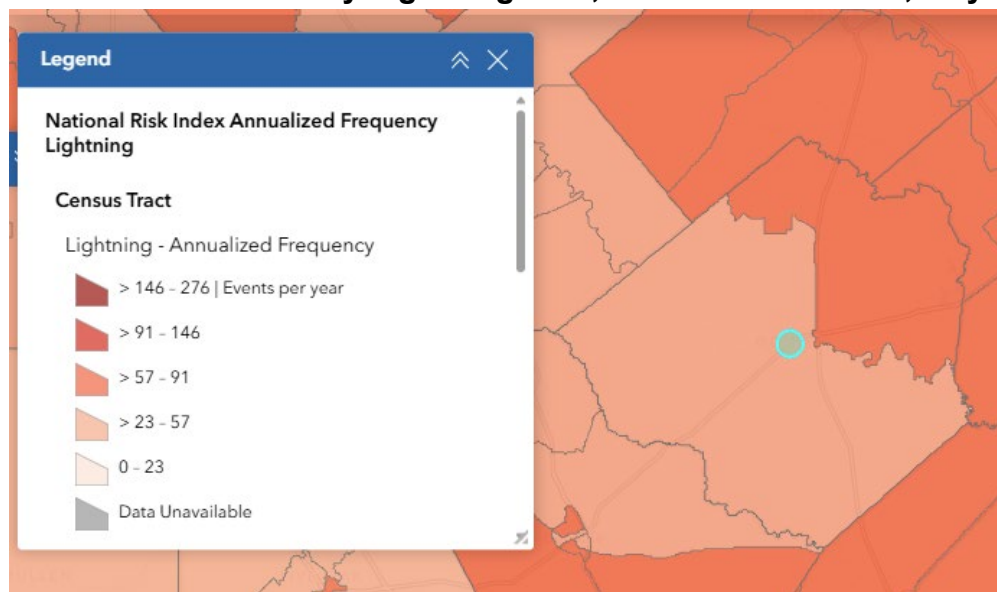
Figure 10-1. Goliad County Lightning Density, Vaisala 2025 Annual Lightning Report



FEMA's National Risk Index includes an analysis of the planning area's expected annual loss and the community's risk factor, which incorporates social vulnerability and community resilience to determine the area's lightning risk relative to the rest of the United States. Goliad County is located in an area where the extent is classified as relatively low (Figure 10-2).

¹Source: <https://www.xweather.com/annual-lightning-report-2025#us-lightning-statistics>

Figure 10-2. Goliad County Lightning Risk, National Risk Index, May 2024



Historical Occurrences

Since January 1996, there has been one recorded lightning event in the Goliad County planning area, according to NCEI records. Multiple lightning events likely went unreported both before and during the recording period. The NCEI is a national data source under the National Oceanic and Atmospheric Administration and is considered a reliable source of hazard information. However, the flash density for the planning area, along with input from local team members, indicates that regular lightning occurs across the area that has not been reported.

Historical lightning data for ISDs or special districts do not report events separately from those reported for the county and city. At this time, the participating ISD and special districts have not reported lightning-related losses.

Table 10-1. Historical Lightning Events, 1996-2025

Jurisdiction	Date	Deaths	Injuries	Property Damage	Crop Damage
Goliad County	8/11/2004	0	0	\$344,800	\$0

Based on the list of historical lightning events for the Goliad County planning area, including the participating ISD and special districts, there have been four reported events since the 2018 Plan.

Section 10: Lightning

Significant Events

8/11/2004

Lightning struck and set a home on fire in the Lakewood subdivision. The home was a total loss.

Probability of Future Events

Based on historical records and input from the planning team, the probability of occurrence for future lightning events in the Goliad County planning area, including the participating ISD and special district, is considered “Highly Likely”, or an event is probable in the next year. The planning team stated that lightning occurs regularly in the area. According to the 2025 Annual Lightning Report by Vaisala, the Goliad County planning area, including the participating ISD and special district, is in a region that experiences approximately 68.1 lightning flashes per square mile per year (approximately 68,160 flashes per year). It can be expected that future lightning events will continue to threaten life and cause minor property damage throughout the planning area. Impacts of climate change are not expected to increase the average frequency of lightning events, but may increase the intensity of events when they do occur.

Vulnerability and Impact

Vulnerability is difficult to evaluate because lightning events can occur at varying intensities, in random locations, and can cause a broad range of damage depending on the strike location. Due to the randomness of these events, all existing and future structures and facilities in the Goliad County planning area, including the participating ISD and special district, could be affected and remain vulnerable to lightning-related injury and property loss.

The direct and indirect losses associated with these events include injury and loss of life, damage to structures and infrastructure, agricultural losses, utility failure (power outages), and stress on community resources. The entire population of the Goliad County planning area, including the participating ISD and special district, is considered exposed to the lightning hazard. The peak lightning season in Texas is from June to August, with the most fatalities occurring in July. Fatalities most often occur when people are outdoors and/or participating in recreation. The population outdoors during a lightning event is considered at greater risk of lightning strikes than those inside a structure. Moving to a lower-risk location will decrease a person’s vulnerability.

The entire general building stock and all infrastructure of the Goliad County planning area are considered exposed to the lightning hazard. Lightning can cause damage to buildings, start electrical and forest fires, and damage infrastructure such as power transmission lines and communication towers.

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While all citizens are at risk of lightning's impacts, forced relocation and disaster recovery are drastically affected by low-income residents who lack the financial means to travel, afford a long-term stay away from home, and rebuild or repair their homes. In addition, people who speak a language other than English may be more vulnerable due to language barriers that limit their access to important information, such as weather-related warnings and safety instructions. Tables 10-3 and 10-4 list these vulnerable populations, along with several others, for Goliad County, the participating jurisdictions, ISDs, and special districts.

The population over 65 in the Goliad County planning area is estimated at 25 percent of the total population, and children under 5 are estimated at 5 percent. The population with a disability is estimated at 16 percent of the total population. An estimated 13 percent of the planning area population lives below the poverty level, and 14 percent of the population speaks English 'less than very well' (Table 10-3).

Table 10-3. Populations at Greatest Risk by Jurisdiction

Jurisdiction	Over 65	Under 5	With a Disability	Below Poverty Level	Non-English Speaking
Goliad County	1,752	341	1,168	918	970

Some participating ISDs and special districts also have vulnerable populations based on age or work location, such as employees who work outdoors and may be subject to severe weather conditions (Table 10-4).

Table 10-4. Populations at Greater Risk by Participating in Special Districts

Special District	Under 5	Staff who work outdoors
Goliad ISD	36	27
Goliad WSC	-	1

The Goliad County Planning Team identified the following critical facilities (Table 10-5) as assets most important to the planning area and susceptible to a range of impacts from lightning events. For a comprehensive list by participating jurisdiction, please see Appendix C.

Table 10-5. Critical Facilities Vulnerable to Lightning Events

Critical Facilities	Potential Impacts
<p>Emergency Response Services (EOC, Fire, Police, EMS), Hospitals, and Medical Centers</p>	<ul style="list-style-type: none"> • Emergency operations and services may be significantly impacted due to power outages, damaged facilities, fires, and/or loss of communications as a result of lightning strikes. • Emergency vehicles, including critical equipment, can be damaged by lightning strikes or by falling trees damaged by lightning. • Power outages could disrupt communications, delaying emergency response times. • Downed trees due to lightning strikes can impede emergency response vehicle access to areas. • Lightning strikes can be associated with structure fires and wildfires, further straining the capacity and resources of emergency personnel. • Extended power outages may lead to possible looting, destruction of property, and theft, further burdening law enforcement resources.
<p>Airport, Academic Institutions, Animal Shelter, Evacuation Centers & Shelters, Governmental Facilities, Residential/ Assisted Living Facilities</p>	<ul style="list-style-type: none"> • Structures can be damaged by falling trees or lightning. • Power outages could disrupt critical care. • Backup power sources could be damaged. • Evacuations may be necessary due to extended power outages, fires, or other associated damages to facilities.
<p>Commercial Supplier (food, fuel, etc.)</p>	<ul style="list-style-type: none"> • Facilities, infrastructure, or critical equipment, including communications, may be damaged, destroyed, or otherwise inoperable. • Essential supplies like medicines, water, food, and equipment deliveries may be delayed.
<p>Utility Services and Infrastructure (electric, water, wastewater, communications)</p>	<ul style="list-style-type: none"> • Emergency operations and critical services may be significantly impacted due to power outages, damaged facilities, fires, and/or loss of communications as a result of lightning strikes. • Emergency vehicles, including critical equipment, can be damaged by lightning strikes or by falling trees damaged by lightning. • Power outages could disrupt communications, delaying emergency response times. • Downed trees due to lightning strikes can impede emergency response vehicle access to areas. • Lightning strikes can be associated with structure fires and wildfires, further straining the capacity and resources of emergency personnel. • Extended power outages may lead to possible looting, destruction of property, and theft, further burdening law enforcement resources.

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Based on historical structural damage and no reported injuries or fatalities over the 29.5-year reporting period, the impact of lightning events would be considered “Limited” with injuries or illness treated with first aid, critical facilities and services shut down for 24 hours or less, and less than 10 percent of property destroyed. Overall, the total loss estimate for the planning area (2026 dollars) is \$344,800 with an average annualized loss of \$11,600 (Table 10-6).

Table 10-6. Potential Annualized Losses by Jurisdiction

Jurisdiction	Total Property & Crop Loss	Average Annual Loss Estimates
Goliad County	\$344,800	\$11,600

Assessment of Impacts

Lightning events significantly threaten public safety and can complicate emergency response efforts. Impacts in the Goliad County planning area include:

- Parks and green spaces may require evacuation during lightning, risking resident and visitor safety.
- Older and historic structures, often lacking fire-resistant materials or mitigation measures, are more vulnerable to damage; 41 percent of homes predate 1980, and 13 historic buildings are listed in the area.
- Lightning-induced brush fires can harm vegetation, degrade air quality, and affect public health.
- Exposure to storms puts individuals at risk of injury or death from direct strikes.
- Falling trees damaged by lightning can injure occupants and cause property loss.
- Power outages from lightning increase risks for those dependent on electricity for health or safety.
- Extended outages may lead to more structure fires and carbon monoxide poisoning as people turn to unsafe heating or cooking methods.
- Structure fires and wildfires from lightning endanger residents and responders.
- Emergency services and communication networks may be disrupted, impeding response and recovery.
- Damaged city and county departments can delay community-wide recovery efforts.
- Economic losses stem from outages and fires, reducing community revenue and affecting businesses, especially those lacking backup power sources.

Section 10: Lightning

The economic and financial impacts of lightning on the area will depend entirely on the scale of the event, what is damaged, and how quickly repairs to critical economic components can be implemented. The level of preparedness and pre-event planning done by the community, local businesses, and citizens will also contribute to the overall economic and financial conditions in the aftermath of any significant lightning event.

Climate Change Impacts

As CO₂ increases and the land surface warms, stronger updrafts are more likely to produce lightning. In a climate with twice as much CO₂, we may see fewer lightning storms overall but stronger storms, with a 5 percent increase in lightning. Lightning damage is also likely to increase because of its role in igniting forest fires, where dry vegetation, also caused by rising temperatures, creates more 'fuel' for fires, so even a small climate change may have huge consequences. While the impact of climate change on our weather remains uncertain, researchers agree that implementing simple measures like lightning detection systems and installing grounding systems in buildings could go a long way toward preventing deaths and injuries.²

Lightning events pose a significant risk to people and property throughout the planning area. The economic and financial impacts of lightning on the area will depend entirely on the scale of the event, what is damaged, and how quickly repairs to critical economic components can be implemented. While no increase in the number of hazard events is anticipated, the impact of the hazard may lead to higher losses. As populations grow and urban development continues to expand, overall vulnerability and impact are expected to increase over the next five years.

² Source: Environmental Journal, Nathan Neal, January 11, 2021.

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Hazard Description

A severe winter storm includes snow, ice, or freezing rain, and is often marked by strong winds and low temperatures. Wind chill refers to how cold it feels on skin exposed to these conditions, as it measures heat loss from both wind and temperature, not just the thermometer reading. This measurement is important for health, since higher winds cause your body to lose heat faster, increasing the risk of frostbite and hypothermia.

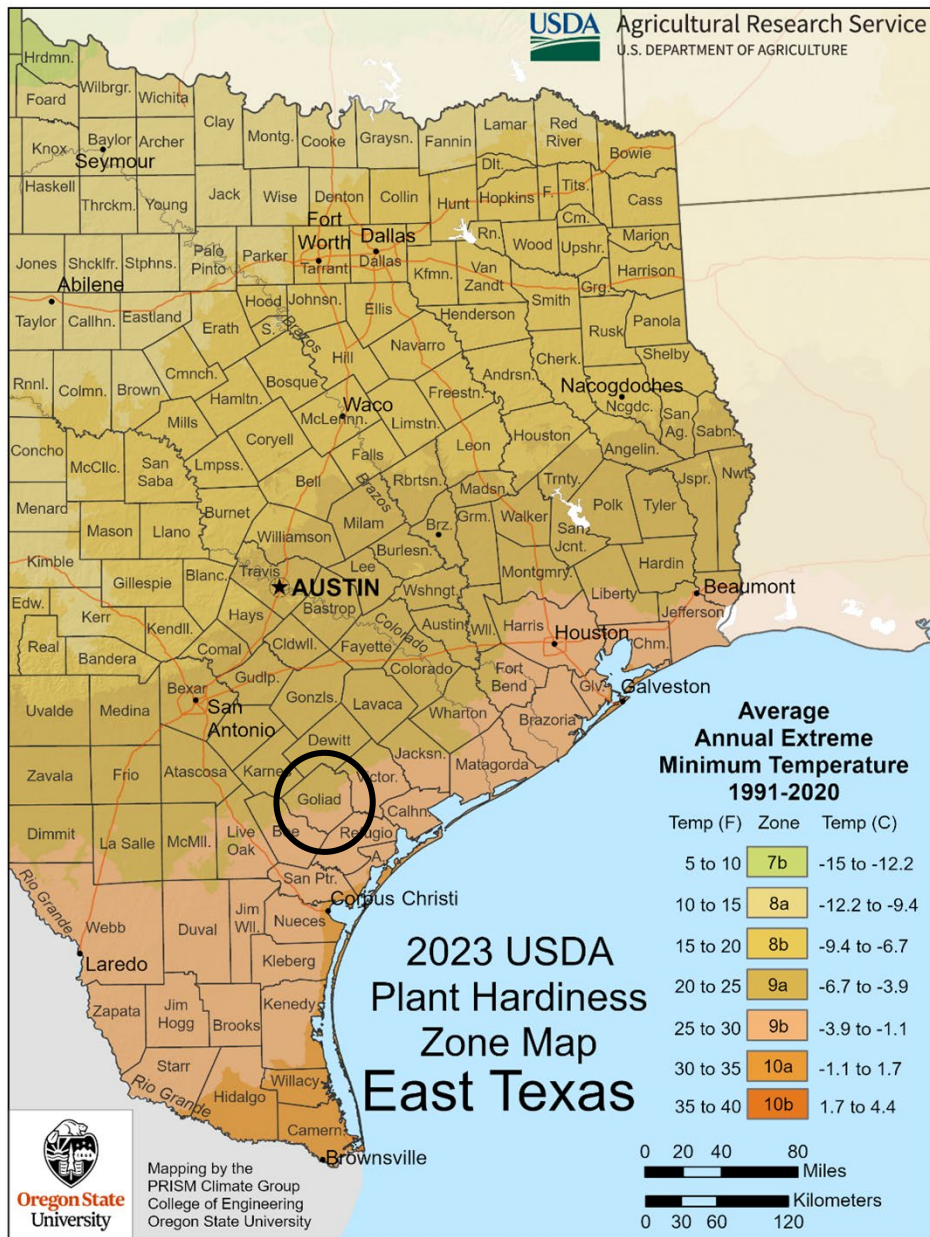
Winter storms often lead to major challenges, including widespread power outages, hazardous road conditions, and damage from falling trees or branches. In the Goliad County planning area, winter weather typically arrives with strong cold fronts moving south from central Canada. These fronts can bring a sharp fall in temperature, sometimes dropping it below freezing. This shift is usually marked by cold, heavy rainfall that may turn into freezing rain, sleet, and ice buildup.

Goliad County typically sees 14 or fewer days each year with temperatures dipping below freezing. The region experiences various winter weather conditions, including wind chill, frost, freezing rain, sleet, snow, and cold temperatures. Winters in Goliad County are usually brief, ranging from mild to cool, dry, and windy, with average daytime highs in the low to mid-50s°F and nighttime lows in the 40s°F. Rain is frequent during the season, but freezing temperatures and snowfall are relatively rare.

As shown in Figure 11-1, the Goliad County planning area is in USDA Hardiness Zones 9a and 9b, with annual minimum temperatures between 20°F and 30°F. During periods of ice and snow accumulation, response times may increase until public works road crews can make major roads passable. Table 11-1 describes the types of winter weather that may occur in the Goliad County planning area.

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Figure 11-1. Annual Minimum Temperature¹



¹ Source: USDA

Table 11-1. Types of Winter Weather

Type Of Winter Weather	Description
Freezing Rain or Freezing Drizzle	Rain or drizzle is likely to freeze upon impact, resulting in a coating of ice glaze on roads and all other exposed objects.
Sleet	Small particles of ice are usually mixed with rain. If enough sleet accumulates on the ground, travel becomes hazardous.
Blizzard	Sustained wind speeds of at least 35 mph are accompanied by considerable falling or blowing snow. This alert is the most perilous winter storm with visibility dangerously restricted.
Frost/Freeze	Below-freezing temperatures are expected and may cause significant damage to plants, crops, and fruit trees.
Wind Chill	A strong wind combined with a temperature slightly below freezing can have the same chilling effect as a temperature nearly 50 degrees lower in a calm atmosphere. The combined effect of wind and temperature on exposed flesh is called the wind-chill factor.

Location

Winter storm events are not confined to specific geographic boundaries. Therefore, all existing and future buildings, facilities, and populations in Goliad County and all participating jurisdictions are vulnerable to winter weather hazards and could be impacted.

Extent

The extent or magnitude of a severe winter storm is measured in intensity based on the temperature and level of accumulations, as shown in Table 11-2.

Table 11-2. Magnitude of Severe Winter Storms

Intensity	Temperature Range (Fahrenheit)	Extent Description
Mild	40° – 50°	Winds less than 10 mph and freezing rain or light snow falling for short durations with little or no accumulations
Moderate	30° – 40°	Winds 10 – 15 mph and sleet and/or snow up to 4 inches
Significant	25° – 30°	Intense snow showers accompanied by strong gusty winds between 15 and 20 mph, with significant accumulation

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Intensity	Temperature Range (Fahrenheit)	Extent Description
Extreme	20° – 25°	Wind-driven snow that reduces visibility, heavy winds (between 20 and 30 mph), and sleet or ice up to 5 millimeters in diameter
Severe	Below 20°	Winds of 35 mph or more, and snow and sleet greater than 4 inches

The Goliad County planning area, including ISD and special district, has 18 previous occurrences recorded from 1996 through 2025 in the National Centers for Environmental Information (NCEI) Storm Events Database. The planning area has never experienced a blizzard, but it has been subject to ice storms, extreme cold, sleet, and winter storms. The worst winter storm event the area has had was on February 12, 1958, when they received 6 inches of snow.²

The average number of cold days is similar for the entire planning area, including the ISD and special district. Therefore, the intensity or extent of a winter storm event to be mitigated for the area ranges from moderate to significant according to the definitions in Table 10-2. The Goliad County planning area, including ISD and special district, can expect anywhere from 0.1 to 6.0 inches of ice and snow during a winter storm event, with temperatures between 20°F and 25°F and winds ranging from 0 to over 35 mph.

Historical Occurrences

The NCEI is a national data source organized under the National Oceanic and Atmospheric Administration and considered a reliable resource for historical event data. According to historical NCEI records, there have been 18 winter weather events in the Goliad County planning area since 1996 (Table 11-3).

Historical winter storm event data for the ISD and special district are provided within the Goliad County events. In the NCEI database, these entities do not have events reported separately from those in the reported county. The ISD or special district reported no other impacts.

Table 11-3. Historical Winter Storm Events, 1996 – 2025³

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Goliad County	12/24/2004	0	0	\$0	\$0
Goliad County	12/8/2006	0	0	\$0	\$0
Goliad County	1/16/2007	0	0	\$0	\$0

² Source: NOAA

³ Note: Monetary damages have been inflated to their 2026 value.

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JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Goliad County	1/8/2010	0	0	\$0	\$0
Goliad County	2/3/2011	0	0	\$0	\$0
Goliad County	1/24/2014	0	0	\$69,524	\$0
Goliad County	12/7/2017	0	0	\$0	\$0
Goliad County	2/14/2021	0	0	\$185,500	\$0
Goliad County	2/14/2021	0	0	\$0	\$0
Goliad County	2/14/2021	0	0	\$0	\$0
Goliad County	2/16/2021	0	0	\$0	\$0
Goliad County	2/3/2022	0	0	\$0	\$0
Goliad County	2/4/2022	0	0	\$0	\$0
Goliad County	12/22/2022	0	0	\$0	\$0
Goliad County	1/14/2024	0	0	\$0	\$0
Goliad County	1/15/2024	0	0	\$0	\$0
Goliad County	1/7/2025	0	0	\$0	\$0
Goliad County	1/20/2025	0	0	\$0	\$0
TOTALS		0	0	\$255,024	

Table 11-4. Historical Winter Storm Events Summary, 1996 – 2025

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY DAMAGES	CROP DAMAGES
Goliad County	18	0	0	\$255,024	\$0

There have been 11 events since the 2018 Plan.

Significant Events

January 24, 2014

A powerful Arctic cold front swept through South Texas on the afternoon of January 23, 2014, ushering in a dramatic temperature plunge and wintry precipitation. Ahead of the front, temperatures were in the 60s and 70s°F; behind it, readings dropped sharply, about 20°F in just 3 hours and 30°F within 6 hours. Strong post-frontal winds gusted across the region, averaging 35–40 mph in most areas, with peaks of 49 mph at Bob Hall Pier, 48 mph at Naval Air Station Corpus Christi, and 46 mph at Corpus Christi International Airport during the evening.

Overrunning moisture, combined with an upper-level disturbance, fueled the development of precipitation behind the front. As temperatures fell into the 30s°F, a wintry mix began as early as 8:00 PM CST on the 23rd across the northern Brush

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Country. By late evening and overnight, as the Arctic air mass deepened, freezing rain and freezing drizzle, occasionally mixed with sleet, became predominant across much of South Texas. The precipitation tapered off near the coast around 9:00 AM CST on the 24th.

Ice accumulations were generally light, ranging from less than 0.10 inch to about 0.125 inch ($\frac{1}{8}$ inch) across most of the region. No ice formed along portions of the middle Texas coast, where temperatures stayed just above freezing. However, accumulations reached around $\frac{1}{8}$ inch in parts of Jim Wells, Live Oak, Bee, Goliad, and Victoria counties. In Goliad specifically, ice buildup had significant impacts: power outages affected roughly half the city during the early morning hours of the 24th, and an accident occurred on an overpass near Fannin on U.S. Highway 59 due to icy conditions.

The slick roads and bridges triggered multiple vehicle accidents throughout South Texas. Sections of Interstate 35, Interstate 37, and U.S. Highway 181, including the Harbor Bridge, were briefly closed during the morning of the 24th but reopened by around 10:00 AM CST as temperatures gradually rose above freezing. Numerous schools delayed or canceled classes, flights at Victoria Regional Airport faced several-hour delays, and scattered power outages were reported throughout the region.

February 2021 – Winter Storm Uri

Winter Storm Uri was one of the most impactful winter events in the state's history. The winter storm lasted a week and brought snow, sleet, and freezing rain to much of Texas. The storm began on February 10, 2021, when a cold front brought a surge of cold air to the Area. On February 13, the winter storm hit the region, including Goliad County, and many areas were placed under a Winter Storm Warning.

In Goliad County, freezing temperatures affected the area from the 13th to the 18th. A long-duration cold spell led to power outages and water pressure issues. Damages to homes occurred when frozen pipes burst.

Probability of Future Events

According to historical records, the Goliad County planning area has experienced 18 winter weather events over a 29.5-year reporting period. The probability of a future winter weather event affecting the Goliad County planning area, including the ISD and special district, is considered "Highly Likely," with a winter storm event probable within the next year.

Vulnerability and Impact

Extreme cold and freezing temperatures can cause water pipes to freeze and burst, and allow ice to accumulate on power lines. This ice can cause lines to snap under the weight, causing tree branches to fall and damage them, resulting in lengthy power outages.

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These conditions may also drive up heating fuel use, potentially causing energy shortages and price increases. The risk of house fires and fatalities goes up during these times, often due to improper use of alternative heating methods. Winter storms make firefighting especially challenging because water sources may be frozen.

The Goliad County Planning Team has highlighted certain critical facilities (listed in Table 11-5) as particularly important to the area and vulnerable to various winter weather hazards. For a full inventory of key facilities by participant, refer to Appendix C.

Table 11-5. Critical Facilities Vulnerable to Winter Storm Events

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS), Hospitals, and Medical Centers	<ul style="list-style-type: none"> • Power outages or communication failures can seriously affect emergency operations, services, and response times. • Snow and ice can make roads impossible to travel on, which may delay emergency service response times.
Airport, Academic Institutions, Animal Shelter, Evacuation Centers and Shelters, Governmental Facilities, Residential/ Assisted Living Facilities	<ul style="list-style-type: none"> • Power outages could disrupt critical care. • Water pipes can freeze and burst, leading to flooding within facilities. • Facilities, infrastructure, or critical equipment, including communications, may be damaged, destroyed, or otherwise inoperable. • Economic disruption due to power outages negatively impacts airport services as well as area businesses reliant on airport operations. • Increased exposure risks for outdoor workers.
Commercial Supplier (food, fuel, etc.)	<ul style="list-style-type: none"> • Facilities, infrastructure, or critical equipment, including communications, may be damaged, destroyed, or otherwise inoperable. • Essential supplies like medicines, water, food, and equipment deliveries may be delayed.
Utility Services and Infrastructure (electric, water, wastewater, communications)	<ul style="list-style-type: none"> • Utility operations, services, and response times may be significantly impacted due to power outages and/or loss of communications. • Roads may become impassable due to snow and/or ice, impacting response times by emergency services. • Power outages could disrupt critical care. • Water pipes can freeze and burst, leading to flooding within facilities.

People and animals are at risk of health problems from prolonged exposure to cold air. Elderly people are at greater risk of death from hypothermia during these events, especially in neighborhoods with older housing stock. According to the U.S. Centers for Disease Control, every year, hypothermia kills about 600 Americans, half of whom are 65 years of age or older.

Due to factors like limited mobility, communication difficulties, medical needs, sensitivity to cold temperatures, reliance on support services, transportation challenges, housing accessibility issues, and possible shortages in emergency shelter accommodations, people with disabilities are particularly vulnerable to winter storms. Inclusive measures

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are crucial for addressing these vulnerabilities and ensuring their safety during severe weather events.

Populations living below the poverty line may not be able to afford to heat regularly or for extended periods. In addition, people who speak a language other than English may be more vulnerable due to language barriers that limit their access to important information, such as weather-related warnings and safety instructions.

The population over 65 in the Goliad County planning area is estimated at 25 percent of the total population, and children under 5 are estimated at 5 percent. The population with a disability is estimated at 16 percent of the total population. An estimated 13 percent of the planning area population lives below the poverty level, and 14 percent of the population speaks English 'less than very well' (Table 11-6).

Table 11-6. Populations at Greater Risk of Winter Storm Events⁴

Jurisdiction	Over 65	Under 5	With a Disability	Below Poverty Level	Non-English Speaking
Goliad County	1,752	341	1,168	918	970

The special districts also have vulnerable populations based on age or work location, such as those working outdoors, who are at greater risk of lightning during winter storms (Table 11-7).

Table 11-7. Populations at Greater Risk by Participating in Special Districts

Special District	Under 5	Staff Working Outdoors
Goliad ISD	36	27
Goliad WSC	-	1

Older homes tend to be more vulnerable to winter weather events. Homes built before 1980 are generally more vulnerable to winter storm damage because they were constructed before modern energy codes, insulation standards, and wind-resistance requirements became mandatory. These older homes often lack adequate insulation, feature single-pane windows, and have outdated plumbing and electrical systems that cannot withstand extreme cold or power outages. Approximately 41 percent of the housing units in the planning area (an estimated 1,450 structures) were built before 1980 (Table 11-8).

⁴ Source: U.S. Census Bureau 2024 data for Goliad County

Table 11-8. Structures at Greater Risk of Winter Storm Events

Jurisdiction	Structures Built Before 1980	Manufactured Homes
Goliad County	1,450	700
Goliad ISD	2	-
Goliad WSC	4	-

Winter weather has been known to cause injury to humans and occasionally has been fatal; two fatalities and one injury have resulted from winter weather in Goliad County historically. Overall, the total property and crop loss estimate for the planning area is \$255,024 (in 2026 dollars), with an average annualized loss of \$8,645. Based on historical losses and damage to the built environment, the impact of winter weather events on the Goliad County planning area would be considered limited, meaning critical facilities and services would shut down for 24 hours or less, and less than 10 percent of property would be destroyed or sustain major damage.

Table 11-9. Winter Storm Event Damage Totals, 1996 – 2025

JURISDICTION	PROPERTY AND CROP LOSS	AVERAGE ANNUAL LOSS ESTIMATES
Goliad County	\$255,024	\$8,645

Impacts

The greatest risk posed by winter storm hazards is to public health and safety. The impact of climate change could lead to longer, more intense winter storm events, exacerbating current winter storm impacts. Worsening winter storm conditions can be frequently associated with a variety of impacts, including:

- Vulnerable populations, particularly the elderly (25 percent of the total population), children under 5 (5 percent of the total population), and those with a disability (16 percent of the total population), can face serious or life-threatening health problems from exposure to extreme cold, including hypothermia and frostbite.
- Loss of electric power or other heat source can result in increased potential for fire injuries or hazardous gas inhalation because residents burn candles for light or use fires or generators to stay warm.
- Response personnel, including utility workers, public works personnel, debris removal staff, tow truck operators, and other first responders, are subject to injury or illness resulting from exposure to extreme cold temperatures.

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- Response personnel would be required to travel in potentially hazardous conditions, elevating the life safety risk due to accidents and potential contact with downed power lines.
- Operations or service delivery may experience impacts from electricity blackouts due to winter storms.
- Power outages are possible throughout the planning area due to downed trees and power lines and/or rolling blackouts.
- Critical facilities without emergency backup power may not be operational during power outages.
- Limitations may impact emergency response and service operations on access and mobility if roadways are closed, unsafe, or obstructed.
- Hazardous road conditions will likely lead to increases in automobile accidents, further straining emergency response capabilities.
- Depending on the severity and scale of damage caused by ice and snow events, damage to power transmission and distribution infrastructure can require days or weeks to repair.
- Winter storms can reduce the efficacy of shaded fuel breaks for wildfire mitigation, as treated areas were more likely to have downed trees and limbs than untreated areas.
- Winter storms can result in damage to endangered species habitat and increased fuel loads within forested habitats.
- Older structures built to less stringent building codes may suffer greater damage as they are typically more vulnerable to impacts of winter storm events. Approximately 41 percent of homes in the County were built before 1980. Similarly, historic buildings and sites are properties due to their historic status. There are 13 historical sites listed on the National Register of Historic Places for Lavaca County.
- Schools may be forced to shut early due to treacherous driving conditions.
- Exposed water pipes may be damaged by severe or late-season winter storms at both residential and commercial structures, causing significant damage.

The economic and financial impacts of winter weather on the community will depend on the scale of the event, what is damaged, and how quickly repairs to critical economic components can be implemented. The level of preparedness and pre-event planning by the community, local businesses, and citizens will also contribute to the overall economic and financial conditions in the aftermath of a winter storm.

Climate Change Impacts

Climate change is expected to reduce the number of extreme cold events statewide but increase their variability.⁵ Extreme cold events will continue to be possible. Still, winters

⁵ Fourth National Climate Assessment. Chapter 23 Southern Great Plains. U.S. Global Change Program. 2018.

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are becoming milder overall, and the frequency of extreme winter weather events is decreasing due to Arctic warming and reduced extreme cold air from that region.⁶ A trend that is expected to continue with winter extremes estimated to be milder by 2036 compared to extremes in the historic record.⁷

⁶ Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, Texas A&M University Office of the Texas State Climatologist, 2021 update.

⁷ Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, Texas A&M University Office of the Texas State Climatologist, 2021 update.

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Hazard Description

Tornadoes are among the most violent storms on the planet. A tornado is a rapidly rotating column of air extending between, and in contact with, a cloud and the surface of the earth. The most violent tornadoes can cause tremendous destruction and have wind speeds of 250 miles per hour (mph) or more. In extreme cases, winds may approach 300 mph. Damage paths can be more than 1 mile wide and 50 miles long.

The most powerful tornadoes are produced by “Supercell Thunderstorms.” These thunderstorms form when horizontal wind shear (winds moving in different directions at different altitudes) begins to rotate the storm. This horizontal rotation can be tilted vertically by violent updrafts, and the rotation radius can shrink, forming a vertical column of very quickly swirling air. This rotating air can eventually reach the ground, forming a tornado.

Table 12-1. Variations among Tornadoes

Weak Tornadoes	Strong Tornadoes	Violent Tornadoes
<ul style="list-style-type: none"> • 69 percent of all tornadoes • Less than 5% of tornado deaths • Lifetime 1-10+ minutes • Winds less than 110 mph 	<ul style="list-style-type: none"> • 29 percent of all tornadoes • Nearly 30% of all tornado deaths • May last 20 minutes or longer • Winds 110 – 205 mph 	<ul style="list-style-type: none"> • 2 percent of all tornadoes • 70 percent of all tornado deaths • Lifetime can exceed one hour • Winds greater than 205 mph

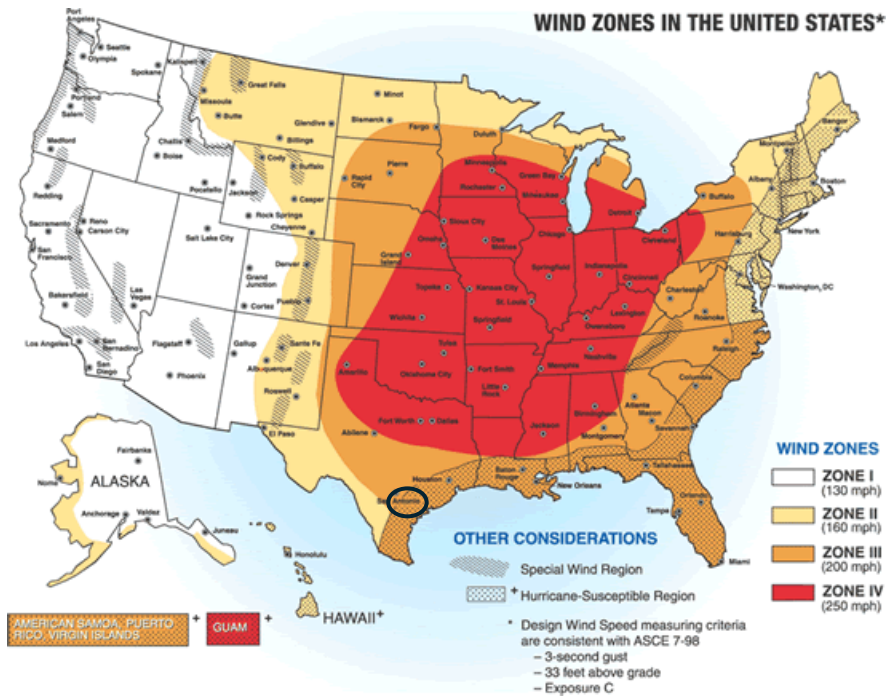
Location

Tornadoes do not have a specific geographic boundary and can occur throughout the county. It is assumed that the entire Goliad County planning area, including the ISD and

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special district, is uniformly exposed to tornado activity. The entire Goliad County planning area is in Wind Zone III (Figure 12-1), where tornado winds can reach 200 mph. The black circle indicates Goliad County.

Figure 12-1. FEMA Wind Zones in the United States



Extent

The extent of damage caused by tornadoes varies considerably, from minor to catastrophic, depending on the storm's intensity, size, and duration. Tornadoes most severely impact lightly constructed structures, such as residential buildings, with mobile homes being particularly vulnerable.

Before 2007, tornado intensities were assessed using the original Fujita Scale, which estimated wind speeds based on observed structural damage. In February 2007, the Enhanced Fujita Scale was introduced, incorporating advancements over the traditional scale. The original Fujita Scale exhibited several limitations; it lacked diverse damage indicators, did not account for variations in construction quality, and offered no definitive link between specific damages and corresponding wind speeds. These shortcomings occasionally led to inconsistent tornado ratings and potential overestimates of wind velocities. The Enhanced Fujita Scale maintains the fundamental structure and six-category framework of its predecessor while providing more nuanced evaluations of

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tornado damage, improved standardization, and broader consideration of structural types. Table 12-2 presents both scales for reference, as tornadoes before 2007 are still classified according to the original Fujita Scale.

Table 12-2. The Fujita and Enhanced Fujita Tornado Scale¹

Enhanced Fujita Scale			
Category	Wind Speed	Damage Level	Damage
EF0	65-85 MPH	Gale	The environment sustained minor damage: tree branches are broken, some shallow-rooted trees are uprooted, and some chimneys are damaged.
EF1	86-110 MPH	Weak	The environment sustained moderate damage: mobile homes were tipped over, windows were broken, roof tiles may have been blown off, and some tree trunks snapped.
EF2	111-135 MPH	Strong	The environment sustained considerable damage: mobile homes were destroyed, roofs were damaged, debris flew in the air, and large trees were snapped or uprooted.
EF3	136-165 MPH	Severe	The environment sustained severe damage: roofs and walls were ripped off buildings, small buildings were destroyed, and most trees were uprooted.
EF4	166-200 MPH	Devastating	The environment sustained devastating damage: well-built homes were destroyed, buildings were lifted off their foundations, cars were blown away, and large debris flew through the air.
EF5	200+ MPH	Incredible	The environment sustained incredible damage: well-built homes are lifted from their foundations, reinforced concrete buildings are damaged, tree bark is stripped, and car-sized debris flies through the air.

¹ Source: <http://www.tornadoproject.com/fscale/fscale.htm>

Fujita Scale			
Category	Wind Speed	Intensity	Damage
F0	45-78 MPH	Gale	Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; signboards damaged.
F1	79-117 MPH	Moderate	Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
F2	118-161 MPH	Significant	Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off the ground.
F3	162-209 MPH	Severe	Roofs and some walls were torn off well-constructed houses; trains were overturned; most trees in the forest were uprooted; heavy cars were lifted off the ground and thrown.
F4	210-261 MPH	Devastating	Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown, and large missiles generated.
F5	262-317 MPH	Incredible	Strong-frame houses leveled off, foundations swept away; automobile-sized missiles fly through the air at over 100 meters (109 yds); trees debarked; incredible phenomena will occur.

Previous tornadoes should be reviewed using both the Fujita and Enhanced Fujita Scales, as events before 2007 are rated on the original Fujita Scale. The strongest tornado recorded in the planning area was an F3. Located in Wind Zone III, the area could see tornadoes ranging from EF0 to EF5.

Historical Occurrences

The National Centers for Environmental Information (NCEI) Storm Events database, maintained by the National Oceanic and Atmospheric Administration (NOAA), serves as a comprehensive national resource for historical storm event data. While the NCEI provides the most extensive archive of such events, this risk assessment considers only incidents documented in the NCEI, unless explicitly stated otherwise. It should be acknowledged that numerous occurrences may not have been reported and are therefore not reflected in the dataset.

Historical tornado data about the ISD and special districts are not individually distinguished from county-level event reports. Over the 71-year reporting period, neither the ISD nor the special district recorded any damages attributable to tornado activity.

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For the Goliad County planning area, NOAA’s Storm Prediction Center, and the NCEI Storm Events databases document 20 events in total. The most significant event during this period was an F1 tornado in 1981, which caused \$870,000 (2026 dollars) in damage.

Table 12-4. Historical Tornado Events, 1954-2025

Jurisdiction	Date	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Goliad County	11/8/1963	F1	0	0	\$0	\$0
Goliad County	9/20/1967	-	0	0	\$0	\$0
Goliad County	9/20/1967	-	0	0	\$0	\$0
Goliad County	9/20/1967	-	0	0	\$0	\$0
Goliad County	9/20/1967	-	0	0	\$0	\$0
Goliad County	9/20/1967	-	0	0	\$0	\$0
Goliad County	9/20/1967	-	0	0	\$0	\$0
Goliad County	9/21/1967	-	0	0	\$0	\$0
Goliad County	9/21/1967	-	0	0	\$0	\$0
Goliad County	9/22/1967	-	0	2	\$2,400	\$0
Goliad County	4/18/1976	F0	0	0	\$0	\$0
Goliad County	8/30/1981	F0	0	0	\$0	\$0
Goliad County	10/22/1981	F1	0	0	\$870,000	\$0
Goliad County	5/17/1986	F0	0	0	\$0	\$0
Goliad County	9/16/1988	F0	0	0	\$0	\$0
Goliad County	11/15/2001	F1	0	0	\$0	\$0
Goliad County	11/15/2001	F0	0	0	\$0	\$0
Goliad County	9/8/2002	F0	0	0	\$0	\$0

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Jurisdiction	Date	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Goliad County	9/8/2002	F0	0	0	\$0	\$0
Goliad County	9/4/2007	EF0	0	0	\$0	\$0
Total		Max Extent	0	2	\$872,400	\$0

Table 12-5. Summary of Historical Tornado Events, 1954-2025

Jurisdiction	Events	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Goliad County	20	F1	0	2	\$872,400	\$0

Based on the list of historical tornado events for the Goliad County planning area, including the ISD and special district, there have been no recorded events since the 2018 Plan was adopted.

Significant Events

September 8, 2002

There were multiple short-lived tornadoes spawned across the Coastal Bend from Tropical Depression Fay. In addition, several reports of funnel clouds were received from law enforcement and the public.

Probability of Future Events

Tornadoes can occur at any time of year or day, but they most often occur during spring afternoons and evenings. There is also a smaller spike in tornado activity in the fall when the seasons shift from warm to cold. In the Goliad County planning area, which includes the ISD and special district, 20 tornadoes were reported over 71 years, averaging about one tornado every 10 years. Based on this frequency, there is an “Unlikely” chance of a tornado occurring in the next decade within this area.

Vulnerability and Impact

Because tornadoes frequently cross jurisdictional boundaries, all existing and future buildings, facilities, and populations throughout Goliad County—including the ISD and special districts—are at risk of exposure and potential impact from this hazard. The destruction caused by tornadoes typically stems from high wind speeds, airborne debris, lightning strikes, and large hail.

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Tornadoes usually travel from southwest to northeast but can move in any direction. This unpredictability makes it challenging to assess the vulnerability of people and property, as tornadoes vary in strength, occur at random locations, and leave relatively narrow paths of damage. While all structures are vulnerable due to the random nature of tornadoes, three types are especially prone to harm:

- Manufactured homes;
- Homes built with pier and beam construction (which are more easily lifted); and
- Buildings with large open spaces, such as shopping malls, gymnasiums, and factories.

Tornadoes pose serious threats to people, who may be injured by flying debris, falling trees or branches, downed utility lines, and poles. Blocked roadways can hinder emergency response efforts. Power outages are common during tornadoes and can put residents, visitors, and hospital patients at risk of health and safety issues.

Mobile or manufactured home parks are scattered throughout Goliad County, making them generally more susceptible to tornado damage than typical site-built structures. Additionally, individual manufactured homes are located sporadically across the area, further increasing vulnerability. According to U.S. Census data, there are about 700 manufactured homes in the Goliad County planning area, making up 20 percent of the total housing stock. Furthermore, 41 percent (approximately 1,450 units) of the area's housing was constructed before 1980. These older buildings were typically built to less rigorous standards than newer ones and may therefore face a higher risk of damage from severe winds (see Table 12-6).

Table 12-6. Structures at Greater Risk by Participating Jurisdiction

Jurisdiction	Structures built before 1980	Manufactured Homes
Goliad County	1,450	700
Goliad ISD	2	0
Goliad WSC	4	0

Although tornadoes pose risks to all citizens, forced relocation and disaster recovery efforts disproportionately affect low-income residents who may lack the financial resources required for travel, extended stays away from home, or home repair and reconstruction. Elderly individuals, children, and persons with disabilities may face challenges in seeking shelter due to mobility limitations or limited awareness, thereby increasing their susceptibility to injury or harm. Furthermore, individuals who speak a language other than English may face additional vulnerabilities, as language barriers

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can restrict access to critical information, such as weather warnings and safety instructions.

Within the Goliad County planning area, approximately 25 percent of the population is aged 65 or older, while children under five years comprise an estimated 5 percent. Individuals with disabilities are estimated to make up 16 percent of the total population. Additionally, 13 percent of residents live below the poverty line, and 14 percent primarily communicate in a language other than English (see Table 12-7).

Table 12-7. Populations at Greater Risk by Participating Jurisdiction

Jurisdiction	Over 65	Under 5	With a Disability	Below Poverty Level	Non-English Speaking
Goliad County	1,752	341	1,168	918	970

The participating ISD and special district also have vulnerable populations based on age or work location, such as employees who work outdoors and may be subject to severe weather conditions (Table 12-8).

Table 12-8. Populations at Greater Risk by Participating Special Districts

Special District	Under 5	Staff Working Outdoors
Goliad ISD	36	27
Goliad WSC	-	1

The Goliad County Planning Team identified the following critical facilities as assets most important to the planning area and susceptible to a range of impacts from tornado events (Table 12-9). The critical infrastructure most vulnerable to tornadoes is power and communications facilities. Failures of these facilities can result in service loss and cascading impacts, posing an enormous risk to individuals dependent on electricity as a medical necessity. For a comprehensive list by participating jurisdiction, please see Appendix C.

Table 12-9. Critical Facilities Vulnerable to Tornado Event

Critical Facilities	Potential Impacts
Emergency Response Services (EOC, Fire, Police, EMS),	<ul style="list-style-type: none"> Emergency operations and services may be significantly affected by damaged facilities and/or loss of communications. Emergency vehicles can be damaged by falling trees or flying debris.

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Critical Facilities	Potential Impacts
Hospitals, and Medical Centers	<ul style="list-style-type: none"> • Power outages could disrupt communications, delaying emergency response times. • Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. • Debris/downed trees can impede emergency response vehicle access to areas.
Airport, Academic Institutions, Animal Shelter, Evacuation Centers & Shelters, Governmental Facilities, Residential/ Assisted Living Facilities	<ul style="list-style-type: none"> • Power outages could disrupt critical care. • Backup power sources could be damaged. • Evacuations may be necessary due to extended power outages, fires, or other facility damage. • Power outages and infrastructure damage may prevent larger airports from acting as temporary command centers for logistics, communications, and emergency operations. • A temporary break in operations may significantly inhibit post-event evacuations.
Commercial Supplier (Food, fuel, etc.)	<ul style="list-style-type: none"> • Facilities or infrastructure may be damaged, destroyed, or otherwise inaccessible. • Essential supplies, such as medicines, water, food, and equipment, may be significantly delayed. • Additional emergency responders and critical aid workers may not be able to reach the area for days.
Utility Services and Infrastructure (electric, water, wastewater, communications)	<ul style="list-style-type: none"> • Emergency operations and services may be significantly affected by damaged facilities and/or loss of communications. • Emergency vehicles can be damaged by falling trees or flying debris. • Power outages could disrupt communications, delaying emergency response times. • Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. • Debris/downed trees can impede emergency response vehicle access to areas.

The total loss estimate due to tornado events over the 71-year reporting period is \$872,400 (2026 dollars), with an average annual loss of \$12,200. Based on historical structural damage and the two reported injuries, the impact of tornado events would be considered “Limited,” with injuries or illness treated with first aid, less than 10 percent of structures destroyed or with major damage, and critical facilities shut down for 24 hours.

Table 12-10. Estimated Average Annual Losses by Jurisdiction

Jurisdiction	Total Property and Crop Loss	Average Annual Loss Estimates
Goliad County	\$872,400	\$12,200

Assessment of Impacts

Tornadoes pose a significant risk to the population and can create dangerous situations. Often, ensuring public health and safety is difficult. The impact of climate change could lead to larger, more severe tornadoes, exacerbating current tornado impacts. More destructive tornado conditions can be frequently associated with a variety of impacts, including:

- Individuals exposed to the storm can be struck by flying debris, falling limbs, or downed trees, causing serious injury or death.
- Structures can be damaged or crushed by falling trees, which can result in physical harm to the occupants.
- Manufactured homes (20 percent of the total housing stock) may suffer substantial damage as they are more vulnerable than typical site-built structures.
- Portable classrooms may also suffer substantial damage as they would be more vulnerable than other classroom structures.
- Significant debris and downed trees can result in emergency response vehicles being unable to access areas of the community.
- Downed power lines may result in roadways being unsafe for use, which may prevent first responders from answering calls for assistance or rescue.
- Tornadoes often result in widespread power outages, increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.
- Extended power outages can result in an increase in structure fires and/or carbon monoxide poisoning as individuals attempt to cook or heat their home with alternate, unsafe cooking or heating devices, such as grills.
- Tornadoes can destroy or make residential structures uninhabitable, requiring shelter or relocation of residents in the aftermath of the event.
- First responders must enter the damage area shortly after the tornado passes to begin rescue operations and to organize cleanup and assessment efforts; therefore, they are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions, elevating the risk of injury to first responders and potentially diminishing emergency response capabilities.

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- Historical sites and properties are placed at a higher risk of impact due to materials used and the inability to change properties due to their historic status. The Goliad County planning area has 13 historical properties.

The economic and financial impacts of a tornado event on the community will depend on the scale of the event, what is damaged, the costs of repair or replacement, the number of lost business days in impacted areas, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning by the community, local businesses, and citizens will contribute to the overall economic and financial conditions in the aftermath of a tornado.

Climate Change Impacts

The impacts of climate change on the frequency and severity of tornadoes are unclear. According to the Texas A&M 2021 Climate Report Update, the most robust trend in Texas tornado activity is an increased likelihood of larger outbreaks. However, the factors contributing to this trend are not expected to continue. Tornadoes form in less than 10 percent of thunderstorms, usually supercell thunderstorms in a wind-shear environment that promotes rotation.²

Based on available climate models, the environmental conditions needed for severe thunderstorms are projected to become more likely, resulting in an overall increase in the number of days capable of producing them and in the potential for tornadoes to develop from these storms.³

² Treisman, Rachel. *The exact link between tornadoes and climate change is hard to draw. Here's why.* NPR. December 13, 2021. <https://www.npr.org/2021/12/13/1063676832/the-exact-link-between-tornadoes-and-climate-change-is-hard-to-draw-heres-why>

³ Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, Texas A&M University Office of the Texas State Climatologist, 2021 update.

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Hazard Description

FEMA describes a wildfire as an unplanned fire burning in natural or wildland areas such as forests, shrublands, grasslands, or prairies. Texas is one of the fastest-growing states in the nation, with much of this growth occurring adjacent to metropolitan areas. This population increase across the state will affect counties and communities in the Wildland Urban Interface (WUI). The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth in the WUI substantially increases wildfire risk. In Texas, nearly 85 percent of wildfires occur within 2 miles of a community.

Wildfires can spread quickly under the right environmental conditions, particularly in the wildland-urban interface and intermix. Most ignition sources for wildfires result from human activities, such as an electrical line sparking dry grasses, an improperly discarded cigarette, burning debris, or arson.

Wildfires spread based on the type and quantity of the fuel surrounding them. Fuel can include everything from trees, underbrush, and dry grassy fields to homes. The amount of flammable material surrounding a fire is called the fuel load. Weather and environmental conditions, such as drought, wind, and extreme heat, can accelerate the spread of fires.¹ A wildfire often begins unnoticed and spreads quickly, igniting brush, trees, and homes. For example, a wildfire may be started by a campfire that was not doused properly, a tossed cigarette, burning debris, or arson.

Texas has seen a significant increase in wildfires over the past 30 years, including wildland, urban interface, and intermix fires. Wildland fires are fueled almost exclusively by natural vegetation, whereas interface or intermix fires are urban/wildland fires in which vegetation and the built environment provide the fuel.

¹ NOAA Weather Forecasting: <https://scijinks.gov/wildfires/>

Location

A wildfire incident can have devastating consequences, driven by human activities, drought, lightning, or wind events, depending on conditions. Wildfires can vary greatly in terms of size, location, intensity, and duration. While wildfires are not confined to any specific geographic location, they are most likely to occur in open grasslands.

The Texas A&M Forest Service Wildfire Risk Assessment Portal (TxWRAP) provides historical wildfire data for Texas counties along with mapping resources that include data layers on the WUI, ignition density, and fire damage potential for communities throughout the Goliad County planning area, along with multiple tips, recommendations, and mitigation solutions for communities and residents. The TxWRAP portal was used to generate the maps in this profile.

The threat to people and property from a wildfire event is greater in the fringe areas where developed areas meet open grasslands, such as the Functional Wildland Urban Interface (WUI) (Figure 13-1). The Functional WUI is based on a comprehensive building footprint dataset, fire-intensity modeling, and simulations of ember production and transport. The Zones used in the Functional WUI are described below. Critical facilities are only mapped within the Direct Exposure Zone of the WUI, as these structures face the greatest risk from wildfire due to their proximity to flammable vegetation and potential fire pathways.

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

The **Indirect Exposure Zone** is non-burnable land cover within 1,500 meters of burnable land cover that is within 75 meters of a structure, meaning that embers and home-to-home spread could reach within this zone. Indirectly exposed structures would benefit from structural hardening to resist ignition from embers and nearby structures. Still, defensible space is usually not required given the zone's heavily developed nature.

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

The **Sources of Ember Load to Buildings (SELB) Zone** is a critical area or burnable land cover that produces embers capable of reaching nearby buildings. Ember production is a function of fire type and intensity, and ember travel is a function of wind speed and direction. Fuel treatment in this zone is a priority to reduce ember load on nearby buildings.

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The **Little-to-No Exposure Zone** is non-burnable land within 75 meters of a structure but more than 1,500 meters from a large contiguous block of burnable land cover. Flames, even from home-to-home spread, and embers are unlikely to reach the Little-to-No Exposure Zone. However, smoke and evacuations could still impact this area. Support should be given to those most vulnerable in the community. A wildfire evacuation in this zone is unlikely.

As shown in Figure 13-1, Goliad County and all participating jurisdictions are subject to wildfire impacts. Categorically, 86 percent of the land is in the Wildfire Transmission Zone, which is unpopulated land, with 10 percent being in the Ember Load to Buildings Zone, which is areas that could be impacted by embers, 3 percent of the land is in the Primary Exposure Zone, which means these structures are within 1500 meters of burnable land, and 1 percent of the land is water.

Figure 13-1: Wildland Urban Interface (WUI) for Goliad County and Goliad WSC

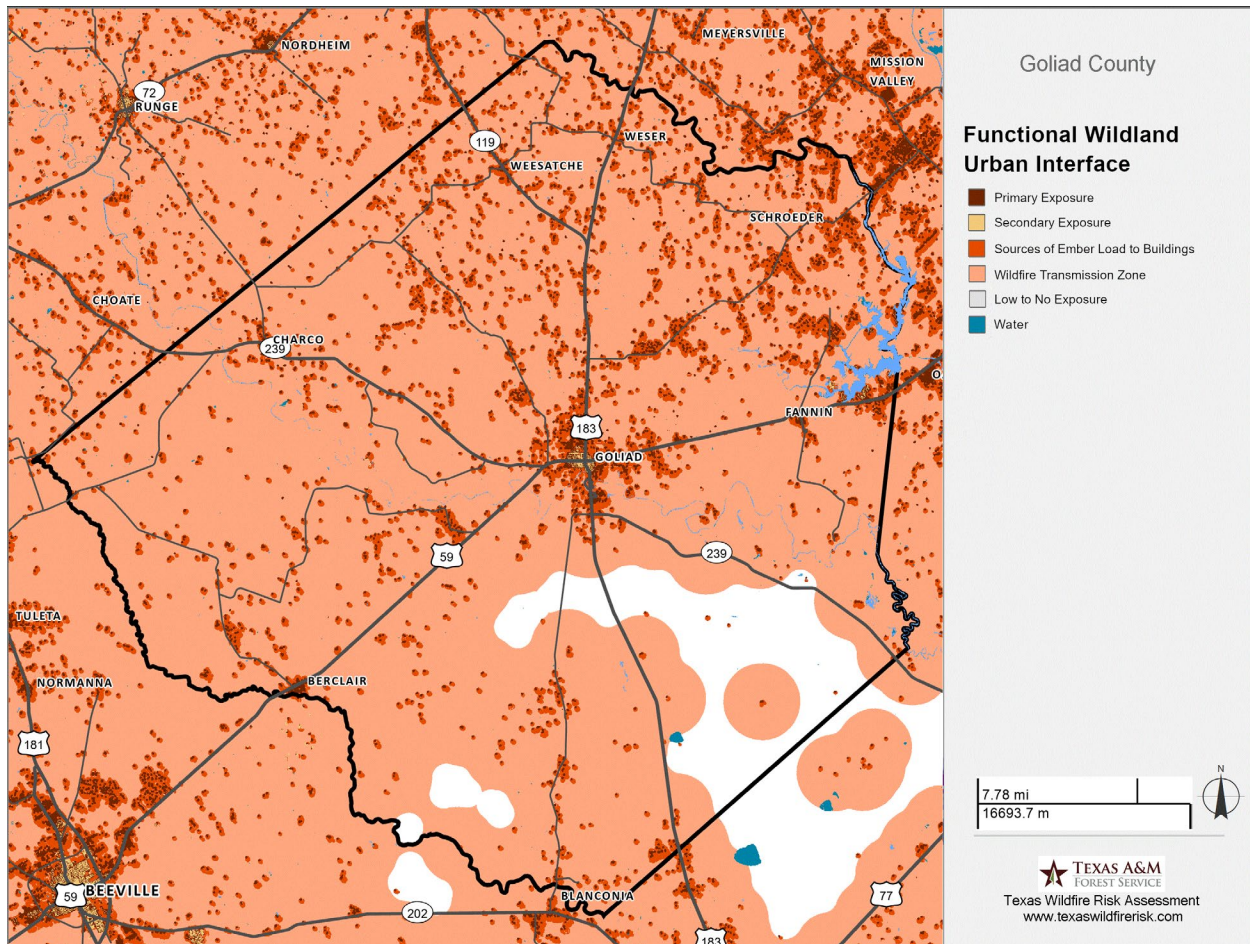
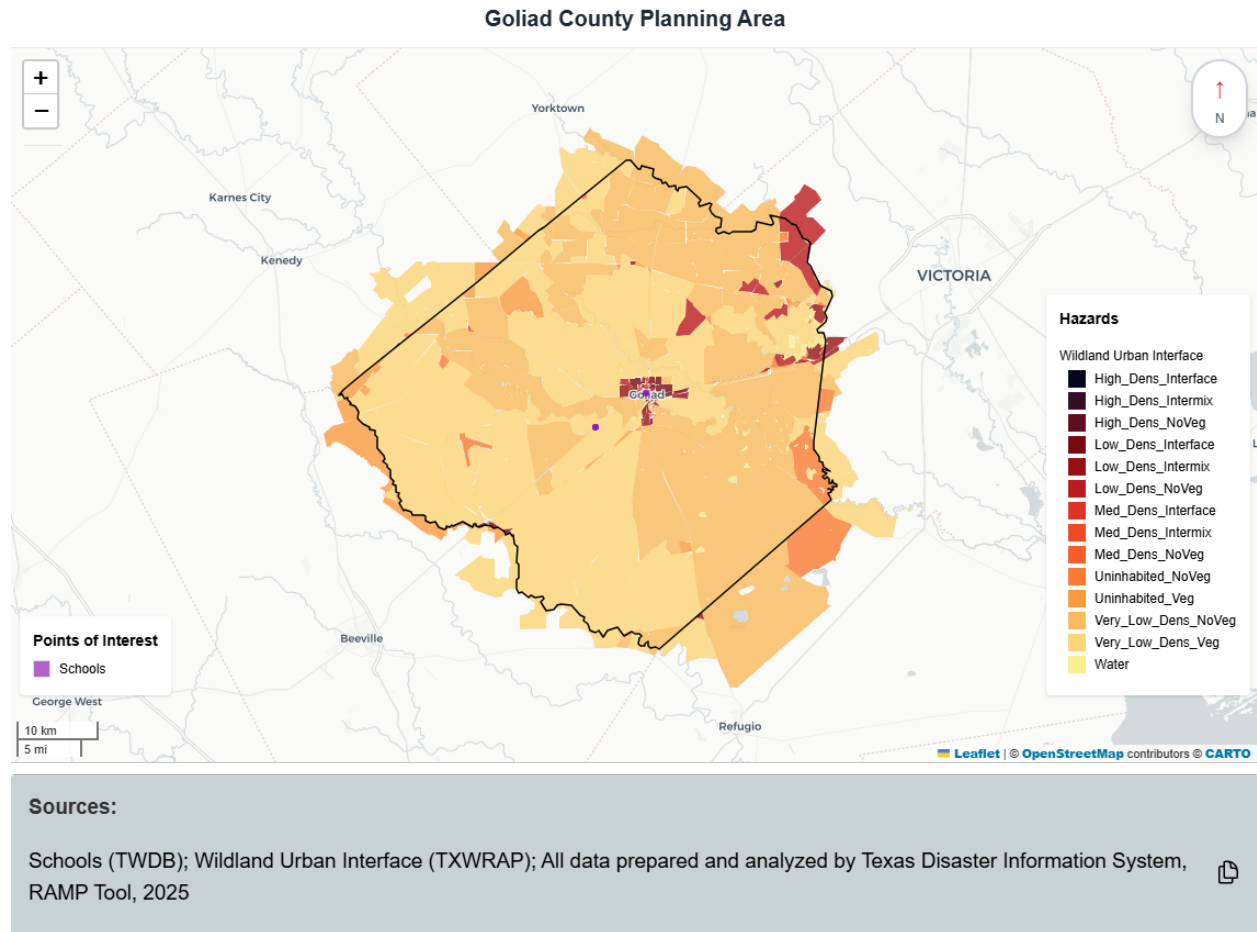


Figure 13-2: Wildland Urban Interface for Goliad ISD



Extent

Risk for a wildfire event is measured by magnitude and intensity using the Keetch-Byram Drought Index (KBDI). This mathematical system relates current and recent weather conditions to potential fire behavior. The KBDI determines forest fire potential based on a daily water balance, derived by balancing a drought factor with precipitation and soil moisture (assumed to have a maximum storage capacity of eight inches), and is expressed in hundredths of an inch of soil moisture depletion.

Each color in Figures 13-3 and 13-4 represents the drought index at that location for that date. The drought index ranges from 0 to 800. A drought index of 0 represents no moisture depletion, and a drought index of 800 represents absolutely dry conditions.

Figure 13-3: Keetch-Byram Drought Index (KBDI) for the State of Texas, 3/4/2026

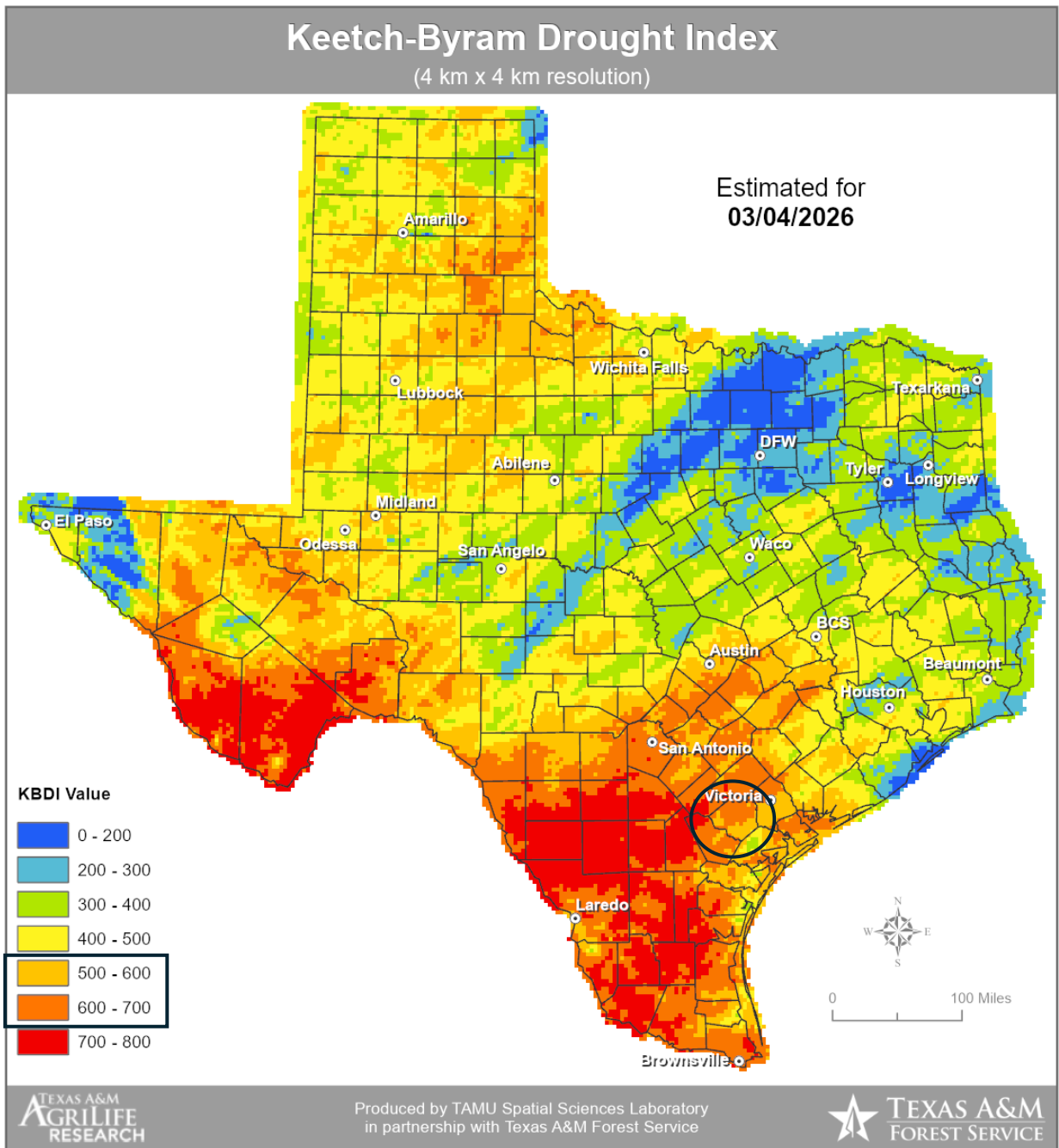
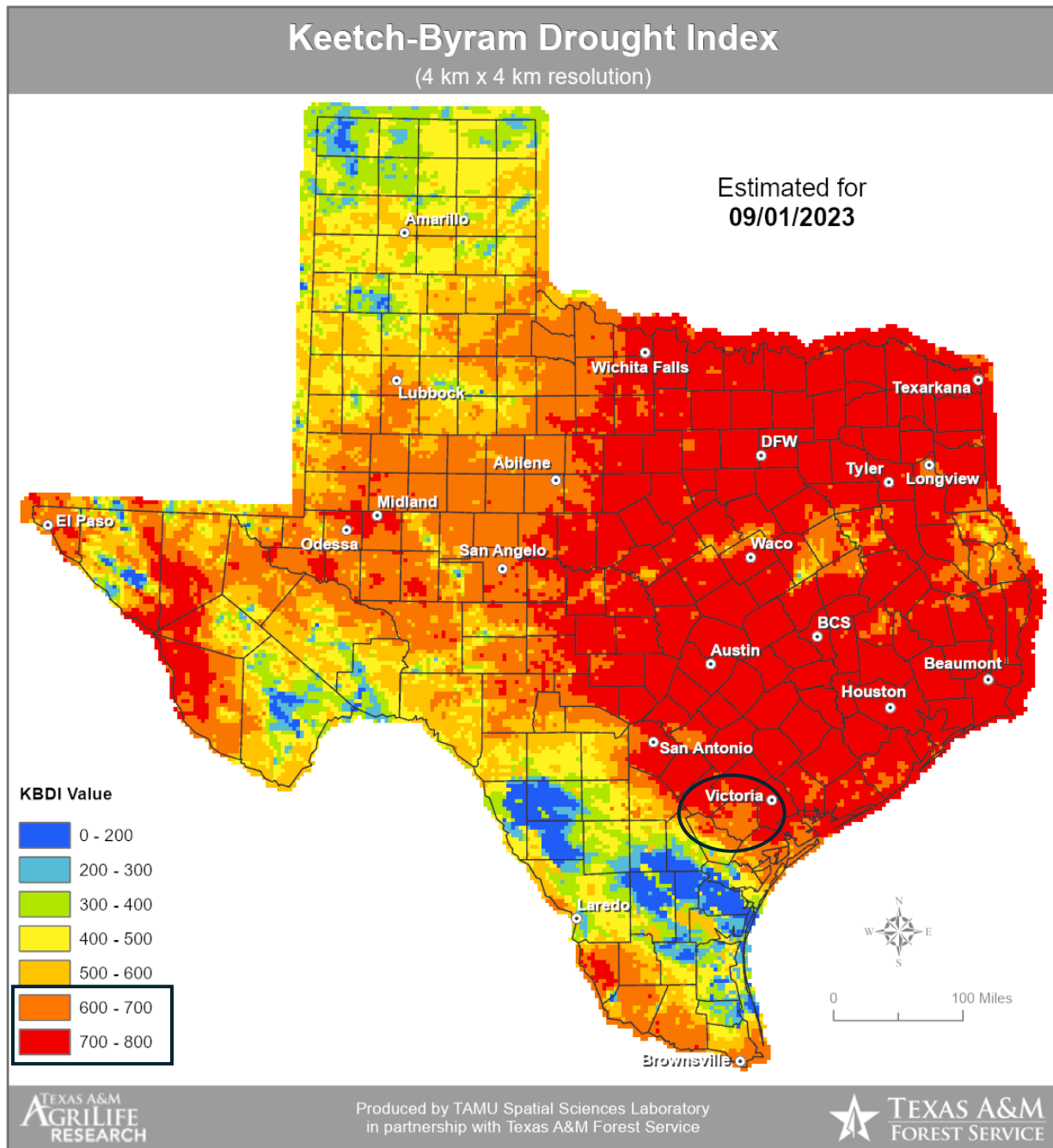


Figure 13-4: Keetch-Byram Drought Index (KBDI) for the State of Texas, 9/1/2023



Fire behavior can be categorized into four distinct levels on the KBDI:

- **0 -200:** Soil and fuel moisture are high. Most fuels will not readily ignite or burn. However, with sufficient sunlight and wind, cured grasses and some light surface fuels will burn in spots and patches.

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- **200 -400:** Fires more readily burn and will carry across an area with no gaps. Heavier fuels will not readily ignite and burn. Expect smoldering and the resulting smoke to carry into and possibly through the night.
- **400 -600:** Fires intensity begins to increase significantly. Fires will readily burn in all directions, exposing mineral soils in some locations. Larger fuels may burn or smolder for several days, creating possible smoke and control problems.
- **600 -800:** Fires will burn to mineral soil. Stumps will burn to the end of underground roots, and spotting will be a major problem. Fires will burn through the night, and heavier fuels will burn more intensely, contributing to fire intensity.

The KBDI is a good measure of the readiness of fuels for wildfire. It should be noted that the area experiences changes in precipitation and soil moisture, while caution should be exercised in drier, hotter conditions.

The intensity range for the Goliad County planning area, including the ISD and special district, during a wildfire event is 700 to 800. The average extent to be mitigated for the planning area is a KBDI of 450. Based on historical occurrences and readily available fuel, the planning area can anticipate a KBDI range from 0 to 800. At the high end of this range, fires will burn to mineral soil. Stumps will burn to the end of underground roots, and spotting will be a major problem. Fires will burn through the night, and heavier fuels will burn more intensely, contributing to fire intensity.

The Texas Forest Service's Fire Intensity Scale (FIS) identifies areas with high fuel hazards and dangerous fire behavior potential. This scale considers fuel conditions as well as a range of wind and weather scenarios. These estimates include contributions from crown fuel and crowning fire intensity. Crown fuels (the branches, leaves, and needles of tall trees) are the primary fuel layer in crown fires, and the intensity of a crown fire is determined by factors such as fuel load, moisture content, and wind conditions, which can lead to rapid fire spread and high temperatures.

The FIS provides a standard scale to measure potential wildfire intensity. The FIS consists of 5 classes, with a tenfold difference in order of magnitude. The minimum class, Class 1, represents very low wildfire intensities, and the maximum class, Class 5, represents very high wildfire intensities. Refer to descriptions below.

Table 13-1. Characteristic Fire Intensity Scale (FIS)

FIS Class	Class Description
Class 1 Very Low	Very small, discontinuous flames, usually less than 1 foot in length; very low rate of spread; no spotting. Fires are typically easy for firefighters with basic training and non-specialized equipment to suppress.

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FIS Class	Class Description
Class 2 Low	Small flames, usually less than 2 feet long; a small amount of very short-range spotting is possible. Trained firefighters, equipped with protective gear and specialized tools, can easily suppress fires.
Class 3 Moderate	Flames up to 9 feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozers and plows are generally effective. Increasing potential for harm or damage to life and property.
Class 4 High	Large Flames, up to 40 feet in length; short-range spotting common; medium-range spotting possible. A direct attack by trained firefighters, engines, and dozers is generally ineffective; an indirect attack may be effective but carries a significant risk of harm to life and property.
Class 5 Very High	Flames exceed 200 feet; expect extreme fire behavior.

The Goliad County planning area is susceptible to wildfires of varying intensities. Figure 13-5 identifies the wildfire intensity for the planning area.

Figure 13-5: Goliad County and Goliad WSC Fire Intensity Scale

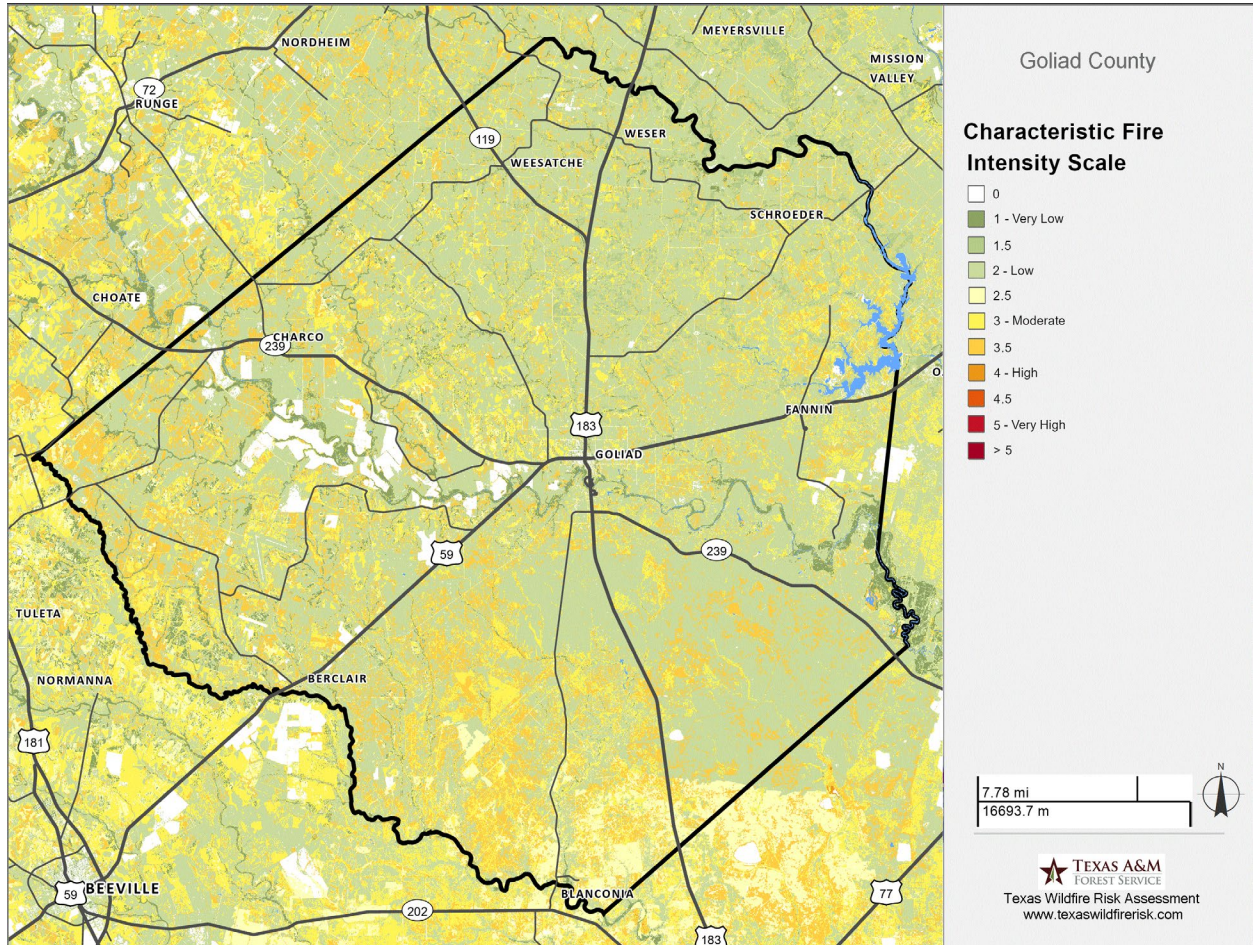
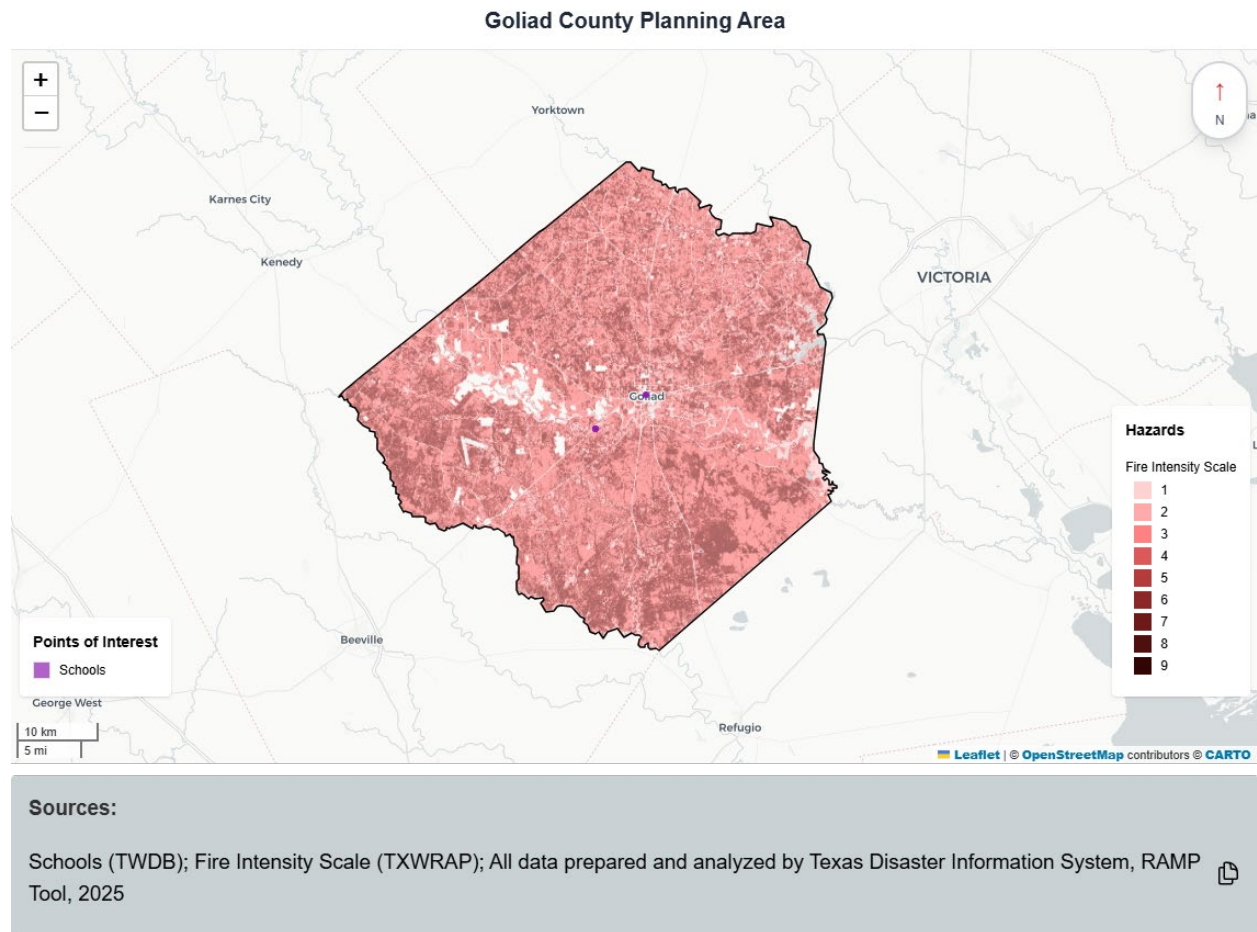


Figure 13-6: Goliad ISD Fire Intensity Scale



Historical Occurrences

The NECI Storm Database includes four wildfire reports from 1996 to 2025. There were no property or crop damage losses reported. The database fires were the Plummer Ranch Fire, the Tower Road Fire, the unnamed August 2019 wildfire, and the Sarco Fire.

The Texas A&M Forest Service (TFS) reported 415 wildfire events for the Goliad County planning area between 2005 and 2024. The TFS began collecting wildfire reports by volunteer fire departments in 2005. Any reports listed in the table below apply to Goliad County and all participating jurisdictions. Table 13-2 identifies the number of wildfires and total acreage burned each year within the county boundaries.

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Table 13-2: TFS Wildfire Historical Occurrences 20013-2024

Jurisdiction	Date	Acres Burned	Wildfire Events	Injuries	Deaths	Property Damage	Crop Damage
Goliad County	2006	525	43	0	0	\$0	\$0
Goliad County	2007	405	13	0	0	\$0	\$0
Goliad County	2008	7,656	54	0	0	\$0	\$0
Goliad County	2009	1,231	31	0	0	\$0	\$0
Goliad County	2010	49	10	0	0	\$0	\$0
Goliad County	2011	1,481	48	0	0	\$0	\$0
Goliad County	2012	396	18	0	0	\$0	\$0
Goliad County	2013	170	19	0	0	\$0	\$0
Goliad County	2014	99	20	0	0	\$0	\$0
Goliad County	2015	40	1	0	0	\$0	\$0
Goliad County	2016	353	9	0	0	\$0	\$0
Goliad County	2017	1,897	31	0	0	\$0	\$0
Goliad County	2018	2,665	7	0	0	\$0	\$0
Goliad County	2019	1,799	4	0	0	\$0	\$0
Goliad County	2020	205	3	0	0	\$0	\$0
Goliad County	2021	30	3	0	0	\$0	\$0
Goliad County	2022	2,556	53	0	0	\$0	\$0
Goliad County	2023	189	34	0	0	\$0	\$0
Goliad County	2024	55	14	0	0	\$0	\$0
Totals		21,801	415	0	0	\$0	\$0

Section 13: Wildfire

9,749 acres have been burned, and 158 fires have been reported since the 2018 Plan.

The National Wildfire Coordinating Group (NWCG) provides an additional way to measure extent by accounting for fire size. Based on NWCG numbers, the largest fires in Goliad County and the participating jurisdictions have been Class F events. Based on Texas A&M Forest Service data, the average fire in Goliad County and the participating jurisdictions is a Class C event.

Table 13-3: NWCG Size Class of Fire Table

Class	Description
Class A	¼ acre or less
Class B	More than ¼ acre, but less than 10 acres
Class C	10 acres or more, but less than 100 acres
Class D	100 acres or more, but less than 300 acres
Class E	300 acres or more, but less than 1,000 acres
Class F	1,000 acres or more, but less than 5,000 acres
Class G	5,000 acres or more

Previous wildfires in Goliad County and the jurisdictions addressing the hazard have ranged from Class 1 to Class 4 on the Characteristic Fire Intensity Scale, with flames up to 30 feet long, and from Class A to Class F on the National Wildfire Coordinating Group Size Class of Fire scale (NWCGSCF). Most fires were small and contained quickly. However, the worst-reported fire in Goliad County burned 3,000 acres.

Future fire events in Goliad County and the participating jurisdictions may meet or exceed previous worst-case Class F (NWCGSCF) and Class 4 (FIS) wildfires in intensity, acreage burned, and damage inflicted.

Probability

Wildfires can occur at any time during the year. As populations grow, the potential of wildfire increases. Fire departments in Goliad County respond to at least 30 wildfires per year. Combined with 415 historical wildfire events from 2005 to 2024, the wildfire risk in Goliad County and all participating jurisdictions is “Highly Likely” to occur within the next year. Wildfires occur across the County, putting all jurisdictions at risk.

Vulnerability and Impacts

Impacts from a wildfire in Goliad County and the participating jurisdictions may include, but are not limited to, crop damage or destruction, damage or destruction of agricultural, residential, commercial, and industrial buildings, and escaped, lost, injured, or killed livestock and pets. In the worst cases, residents may be injured or killed.

Goliad County and the participating jurisdictions addressing wildfire are home to many vulnerable residents. Increased vulnerability may be due to many factors, including but not limited to: age, physical ability, financial means, housing type, and housing condition. Many of these vulnerabilities often overlap.

The jurisdictions recognize that vulnerable populations may need additional support in preparing for and recovering from wildfires.

Residents of mobile homes, specifically those built before HUD's Manufactured Housing and Standards requirements were introduced in 1976, are of particular concern¹⁵. These structures are more fire-prone and have a higher incidence of occupant deaths than modern manufactured homes.

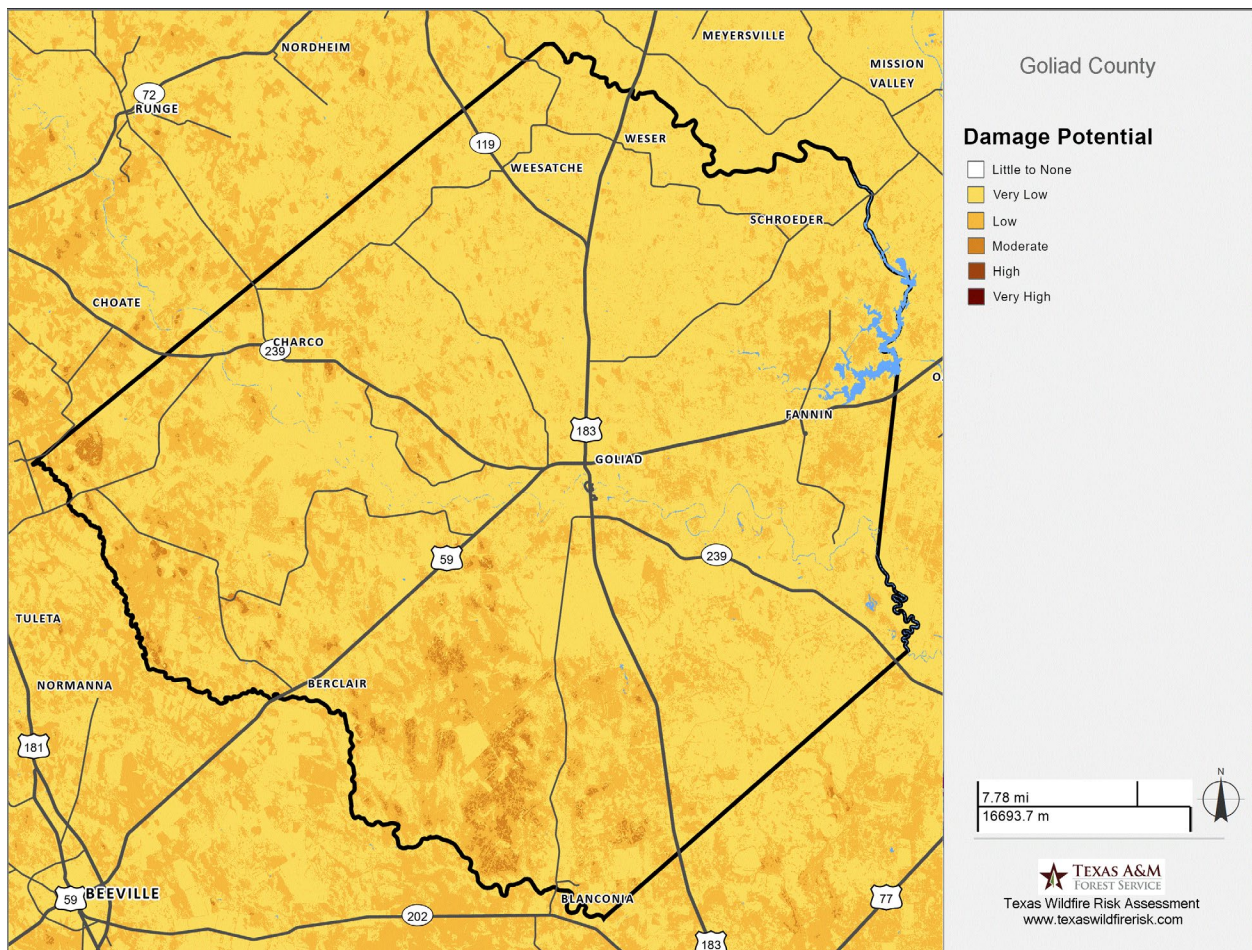
Residents of sub-standard structures are also of particular concern. Structures in substandard condition ahead of a wildfire, whether due to structural damage, missing windows or doors, or holes in exterior walls or the roof, may be less safe during a wildfire than structures in standard condition. Exterior damage may make the homes more prone to fire by more readily exposing flammable materials to flame. Missing windows and other exterior gaps may leave residents and structures prone to smoke inhalation and smoke damage.

All of these issues may increase damage and lead to injuries or loss of life.

There are 42 critical facilities located throughout the County and jurisdictions addressing wildfire. Many of these critical facilities are located in the wildland urban interface (WUI), as defined by the Texas A&M Forest Service. Because of their location in the WUI, their development density, and their proximity to wildland areas, these facilities are believed to be particularly susceptible to future wildfire threats.

As shown in Figure 13-7, the damage potential in the planning area, including the participating ISD and special district, is limited, with 70 percent very low, 29 percent low, and 1 percent moderate.

Figure 13-7: Damage Potential for Goliad County, ISD, and Goliad WSC



The impact of major wildfire events can be substantial. Such events can cause multiple deaths, shut down facilities for 30 days or more, and cause more than 50 percent of affected properties to be destroyed or suffer major damage.

For the Goliad County planning area, including all participating jurisdictions, the impact from a wildfire event is considered “Limited,” meaning injuries and/or illnesses are typically treatable with first-aid, complete shutdown of facilities and services for 24 hours or less, and less than 10 percent of property is destroyed or with major damage. The severity of impact is gauged by acreage burned, homes and structures lost, injuries, and fatalities.

Impacts

Impacts from a wildfire in Goliad County and the participating jurisdictions may include, but are not limited to, crop damage or destruction; damage or destruction of agricultural, residential, commercial, and industrial buildings; and escaped, lost, injured, or killed livestock and pets. In the worst cases, residents may be injured or killed.

Climate Change Impacts

Modeled projections of future climate indicate a likely increase in the frequency of fire weather in this region, including higher temperatures and greater rainfall variability. In areas already affected by wildfire hazards, the fire season is likely to last longer and include more days with weather conditions conducive to fire spread, due to longer periods without rain. Climate projections indicate that fire severity could also increase. It would be prudent to design projects in this area to be robust to increases in the severity and frequency of wildfire hazards. Areas with very low or low wildfire hazard could see an increase in wildfire hazard, as climate projections indicate an expansion of the wildfire hazard zone. Consider local studies on the impacts of climate change on wildfire trends before deciding whether to design projects to withstand fire of greater intensity than those previously experienced in this region.

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Hazard Description

Thunderstorms create extreme wind events, which include straight-line winds. Wind is the horizontal motion of the air past a given point, beginning with differences in air pressure. Pressure that is higher at one place than another sets up a force pushing from high to low pressure; the greater the pressure difference, the stronger the force. The distance between the high-pressure and low-pressure areas also determines how fast the moving air accelerates.

Thunderstorms are created when heat and moisture near the Earth's surface are transported to the upper levels of the atmosphere. By-products of this process are the clouds, precipitation, and wind that become the thunderstorm.

According to the National Weather Service (NWS), a thunderstorm occurs when thunder accompanies rainfall. Radar observers use the intensity of radar echoes to distinguish between rain showers and thunderstorms.

Straight-line winds are responsible for most thunderstorm wind damage. One type of straight-line wind, the downburst, is a small area of rapidly descending air beneath a thunderstorm. A downburst can cause damage equivalent to a strong tornado and make air travel extremely hazardous.

Location

Thunderstorm wind events can develop in any geographic location and are considered a common occurrence in Texas. Therefore, a thunderstorm wind event could occur at any location within the Goliad County planning area. These storms develop randomly and are not confined to any geographic area within the County. It is assumed that the entire Goliad County planning area, including the participating ISD and special district, is uniformly exposed to the threat of thunderstorm winds.

Extent

The Beaufort Wind Scale measures the extent or magnitude of a thunderstorm wind event. Table 14-1 describes the different intensities of wind in terms of speed and effects, from calm to violent and destructive.

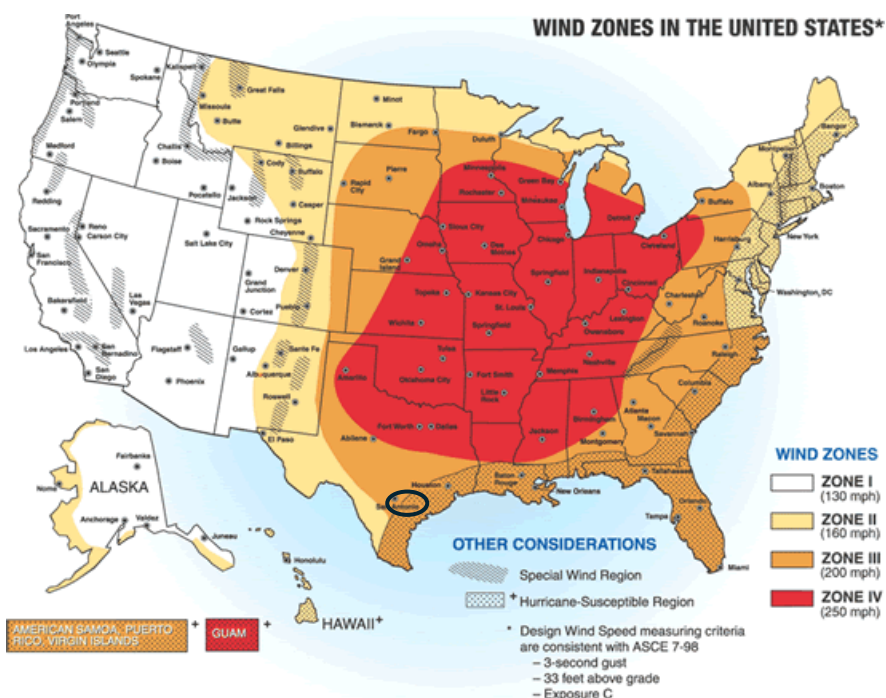
Table 14-1. Beaufort Wind Scale¹

Force	Wind (MPH)	Wind (knots)	WMO Classification	Appearance of Wind Effects
0	Less than 1	Less than 1	Calm	Calm, smoke rises vertically
1	1-3	1-3	Light Air	Smoke drift indicates wind direction, still wind vanes
2	4-7	4-6	Light Breeze	Wind felt on the face, leaves rustle, vanes begin to move
3	8-12	7-10	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
4	13-18	11-16	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches move
5	19-24	17-21	Fresh Breeze	Small trees and leaves begin to sway
6	25-31	22-27	Strong Breeze	Larger tree branches moving, whistling in the wires
7	32-38	28-33	Near Gale	Whole trees are moving, resistance felt walking against wind
8	39-46	34-40	Gale	Whole trees in motion, resistance felt walking against wind
9	47-54	41-47	Strong Gale	Slight structural damage occurs, slate blows off roofs
10	55-63	48-55	Storm	Seldom experienced on land, trees broken or uprooted, considerable structural damage.
11	64-72	56-63	Violent Storm	If experienced on land, widespread damage
12	72-83	64-71	Hurricane	Violence and destruction

Figure 14-1 displays the wind zones as derived from NOAA. The black circle represents Goliad County.

¹ Source: World Meteorological Organization

Figure 14-1. Wind Zones in the United States



The planning area experiences at least one thunderstorm wind event every year. The Goliad County planning area, including the ISD and special district, is located within Wind Zone II, meaning it can experience winds up to 160 mph. The Goliad County planning area has experienced a significant wind event, or an event with winds in the range of “Force 12” on the Beaufort Wind Scale, with winds above 72 mph. This is the worst anticipated for the entire planning area, including the ISD and special district, based on historical events.

Based on a search of past events between 1996 through 2025, the greatest magnitude wind event that Goliad County planning area experienced was 65 knots, or 74 mph, during a hurricane event occurring on July 15, 2003. There was no reported property or crop damage as a result of this event.

Historical Occurrences

The National Centers for Environmental Information (NCEI) Storm Events database is a national data source organized under the National Oceanic and Atmospheric Administration. The NCEI is the largest archive of historical storm-event data; however, only incidents recorded in the NCEI have been factored into this risk assessment unless otherwise noted. Many occurrences have likely gone unreported over the past 28 years. Tables 14-2 and 14-3 depict historical occurrences of thunderstorm wind events in the Goliad County planning area, based on the NCEI database.

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Since 1996, 42 thunderstorm wind events have been known to have occurred in the Goliad County planning area. Table 14-3 presents information on known historical events that impacted the Goliad County planning area, resulting in damage, injury, or fatalities. The strongest event reported in the planning area occurred in Goliad County in July of 2003, with reported wind speeds of 65 knots (74 mph).

Historical thunderstorm wind data for participating ISDs and special districts are provided within the jurisdictions in which they are located, as these entities do not report events separately from city and county events. None of the participating ISDs or special districts provided events or damages separate and apart from the NCEI events.

It is important to note that high wind events associated with other hazards, such as tornadoes, are not accounted for in this section. Property damage estimates are not always available. Where an estimate has been provided for losses, the dollar amounts have been modified for inflation to indicate the damage in 2026 dollars.

Table 14-2. Historical Thunderstorm Wind Speeds, 1996-2025

Maximum Wind Speed Recorded (knots)	Number of Reported Events
0-30	8
31-40	0
41-50	13
51-60	19
61-70	2
71-80	0
81-90	0
91-100+	0
Unknown	0

Table 14-3. Historical Thunderstorm Wind Events, 1996-2025

Jurisdiction	Date	Magnitude (knots)	Deaths	Injuries	Property Damage	Crop Damage
Goliad County	5/8/1980	0	0	0	\$0	\$0
Goliad County	5/15/1980	0	0	0	\$0	\$0
Goliad County	8/10/1980	0	0	0	\$0	\$0

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Jurisdiction	Date	Magnitude (knots)	Deaths	Injuries	Property Damage	Crop Damage
Goliad County	7/11/1981	53	0	0	\$0	\$0
Goliad County	10/22/1981	0	0	0	\$0	\$0
Goliad County	5/10/1986	0	0	0	\$0	\$0
Goliad County	5/10/1986	0	0	0	\$0	\$0
Goliad County	4/30/1993	0	0	0	\$0	\$1,100
Goliad County	10/12/1993	0	0	0	\$0	\$11,200
Goliad County	9/18/1996	52	0	0	\$0	\$0
Goliad County	5/27/1997	50	0	0	\$0	\$0
Goliad County	12/23/1997	50	0	0	\$0	\$0
Goliad County	1/6/1998	50	0	0	\$0	\$0
Goliad County	2/21/1998	50	0	0	\$0	\$0
Goliad County	2/26/1998	50	0	0	\$0	\$0
Goliad County	6/15/1998	50	0	0	\$0	\$0
Goliad County	5/18/1999	50	0	0	\$0	\$0
Goliad County	7/23/2000	55	0	0	\$0	\$0
Goliad County	7/27/2000	60	0	0	\$0	\$0
Goliad County	6/26/2002	60	0	0	\$0	\$0
Goliad County	12/23/2002	50	0	0	\$0	\$0
Goliad County	6/13/2003	57	0	0	\$0	\$0
Goliad County	6/13/2003	57	0	0	\$0	\$0
Goliad County	7/15/2003	65	0	0	\$0	\$0
Goliad County	4/28/2013	50	0	0	\$0	\$0

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Jurisdiction	Date	Magnitude (knots)	Deaths	Injuries	Property Damage	Crop Damage
Goliad County	5/31/2014	50	0	0	\$0	\$0
Goliad County	4/22/2015	52	0	0	\$13,800	\$0
Goliad County	4/22/2015	56	0	0	\$13,800	\$0
Goliad County	5/30/2015	53	0	0	\$0	\$0
Goliad County	3/18/2016	60	0	0	\$68,600	\$0
Goliad County	5/27/2016	54	0	0	\$0	\$0
Goliad County	6/4/2017	52	0	0	\$0	\$0
Goliad County	7/15/2017	52	0	0	\$6,600	\$0
Goliad County	7/15/2017	52	0	0	\$6,600	\$0
Goliad County	5/9/2019	52	0	0	\$12,700	\$0
Goliad County	5/9/2019	52	0	0	\$0	\$0
Goliad County	4/9/2020	56	0	0	\$31,800	\$0
Goliad County	6/14/2021	61	0	0	\$60,100	\$0
Goliad County	5/25/2022	50	0	0	\$5,500	\$0
Goliad County	5/25/2022	43	0	0	\$5,500	\$0
Goliad County	5/25/2022	43	0	0	\$1,100	\$0
Goliad County	6/3/2022	56	0	0	\$0	\$0
Total			0	0	\$226,100	\$12,300

Table 14-4. Summary of Historical Events by Jurisdiction, 1996-2025

Jurisdiction	Number of Events	Magnitude (knots)	Deaths	Injuries	Property Damage	Crop Damage
Goliad County	42	65	0	0	\$226,100	\$12,300

Section 14: Windstorm

Based on the list of historical thunderstorm wind events for the Goliad County planning area, including the ISD and special district, eight of the events have occurred since the 2018 Plan.

Significant Events

July 11, 2003 – Hurricane Claudette

Claudette began as a tropical wave in the far eastern Atlantic and strengthened into a tropical storm as she moved into the central Caribbean Sea. As Claudette passed the Yucatan Channel and entered the Gulf of Mexico on Friday, July 12th, the steering currents relaxed, and she slowed her northwesterly movement. Claudette produced tropical storm force winds and heavy rains primarily on her eastern quadrant, which spanned a large portion of the central Gulf and produced wave heights up to 15 feet. As early as Sunday, July 13th, large swells were reaching the dunes on Padre Island. Claudette wobbled slowly toward the middle Texas coast in very weak steering currents. The upper-level shear in this system relaxed as expected, providing the environment for Claudette to strengthen into a Hurricane. Claudette made landfall as a Category 1 hurricane on the Saffir/Simpson Scale near Port O'Connor, Texas (Calhoun County) on Tuesday, July 15th, around 1030 am. Claudette continued inland during the afternoon of the 15th across Victoria, Goliad, and Bee counties, weakening to a Tropical Storm.

Claudette continued moving west across Live Oak, McMullen, and La Salle counties during the evening and into the EWX CWA. Claudette continued into Northwestern Mexico and into the Big Bend of Texas before dissipating on July 17th. The heaviest rainfall with Claudette fell across Bee, Goliad, and Refugio Counties. Widespread 4- to 6-inch amounts were estimated across these counties by the CRP WSR-88D. Elsewhere along the path of Claudette, totals ranged from 2 to 5 inches. Further south in CRP, southern CWA totals remained under 1 inch, except for a thin band of 4 to 6-inch amounts stretching from the Padre Island National Seashore north into Refugio County.

Probability of Future Events

Most thunderstorm winds occur in spring and fall, particularly in March, April, May, and September. Based on available records of historic events, there have been a total of 42 events in a 29-year reporting period, which provides a probability of one to two events per year. Even though the intensity of thunderstorm wind events is not always damaging for the Goliad County planning area, including the ISD and special district, the frequency of occurrence for a thunderstorm wind event is “Highly Likely.” This means that an event is probable within the next year for the Goliad County planning area.

Vulnerability and Impact

Vulnerability is difficult to evaluate because thunderstorm wind events can occur at varying strengths, in random locations, and can create relatively narrow paths of

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destruction. Due to the randomness of these events, all existing and future structures and facilities within the Goliad County planning area, including the ISD and special district, could potentially be impacted and remain vulnerable to possible injury and property loss from strong winds.

Trees, power lines and poles, signage, manufactured housing, radio towers, concrete block walls, storage barns, windows, garbage receptacles, brick facades, and vehicles, unless reinforced, are vulnerable to thunderstorm wind events. More severe damage involves windborne debris; in some instances, patio furniture and other lawn items have been blown around, and, very commonly, debris from damaged structures has in turn damaged other buildings not directly impacted by the event. In numerous instances, roofs have been reported torn off buildings. Portable buildings typically used at schools and construction sites are more vulnerable to thunderstorm winds than site-built structures and could pose a greater risk of wind-blown debris.

According to the American Community Survey (ACS) five-year estimates for 2024, a total of 1,450 manufactured homes (41 percent of total housing stock) are located in the Goliad County planning area. In addition, 20 percent (approximately 700 structures) of the housing structures in the Goliad County planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damage during significant wind events.

Table 14-5. Structures at Greater Risk by Participating Jurisdiction

Jurisdiction	Built before 1980	Manufactured Homes
Goliad County	1,450	700
Goliad ISD	2	0
Goliad WSC	4	0

In Goliad County, the population over 65 is estimated at 25 percent of the total, and children under 5 at 5 percent. The population with a disability is estimated at 16 percent of the total population. An estimated 13 percent of the planning area population lives below the poverty level, and 14 percent of the population speaks English 'less than very well' (Table 14-6).

While all citizens are vulnerable to the impacts of thunderstorm winds, forced relocation and disaster recovery disproportionately affect low-income residents who lack the financial means to travel, afford a long-term stay away from home, and rebuild or repair their homes. An estimated 13 percent of the population in the planning area lives below

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the poverty level (Table 14-6). In Goliad County, the population over 65 is estimated at 25 percent of the total, and children under 5 at 5 percent. The population with a disability is estimated at 16 percent of the total population. While 14 percent of the population speaks English 'less than very well' (Table 14-6).

While warning times for these types of hazard events should be substantial enough for these individuals to seek shelter, the elderly, children, and people with disabilities may have trouble taking shelter due to mobility issues or a lack of awareness, making them more susceptible to injury or harm. In addition, people who speak a language other than English may be more vulnerable due to language barriers that limit their access to important information, such as weather-related warnings and safety measures.

Table 14-6. Populations at Greatest Risk by Jurisdiction

Jurisdiction	Over 65	Under 5	With a Disability	Below Poverty Level	Non-English Speaking
Goliad County	1,752	341	1,168	918	970

The participating ISD and special districts also have vulnerable populations based on age or work location, such as employees who work outdoors, who may be subject to severe weather conditions (Table 14-7).

Table 14-7. Populations at Greater Risk by Participating Special District

Special District	Under 5	Staff Working Outdoors
Goliad ISD	36	27
Goliad WSC	-	1

The Goliad County Planning Team identified the following critical facilities (Table 14-8) as assets most important to the planning area and susceptible to a range of impacts from thunderstorm wind events. The critical infrastructure most vulnerable to thunderstorms is power and communications facilities. Failures of these facilities can result in service loss and cascading impacts, including an enormous risk to individuals who depend on electricity for medical care. For a comprehensive list by participating jurisdiction, please see Appendix C.

Table 14-8. Critical Facilities Vulnerable to Thunderstorm Wind Event

Critical Facility Type	Potential Impacts
<p>Emergency Response Services (EOC, Fire, Police, EMS), Hospitals, and Medical Centers</p>	<ul style="list-style-type: none"> • Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. • Emergency vehicles can be damaged by falling trees or flying debris. • Power outages could disrupt communications, delaying emergency response times. • Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. • Debris/downed trees can impede emergency response vehicle access to areas. • Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel. • First responders are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions.
<p>Airport, Academic Institutions, Animal Shelter, Evacuation Centers & Shelters, Governmental Facilities, Residential/ Assisted Living Facilities</p>	<ul style="list-style-type: none"> • Structures can be damaged by falling trees or flying debris. • Power outages could disrupt critical care. • Backup power sources could be damaged. • Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. • Evacuations may be necessary due to extended power outages, gas line ruptures, or structural damage to facilities. • Power outages and infrastructure damage may prevent larger airports from acting as temporary command centers for logistics, communications, and emergency operations. • Temporary break in operations may significantly inhibit post-event evacuations. • Damaged or destroyed highway infrastructure may substantially increase the need for airport operations.
<p>Commercial Supplier (food, fuel, etc.)</p>	<ul style="list-style-type: none"> • Facilities, infrastructure, or critical equipment, including communications, may be damaged, destroyed, or otherwise inoperable. • Essential supplies like medicines, water, food, and equipment deliveries may be delayed. • Economic disruption due to power outages and fires negatively impacts airport services as well as area businesses reliant on airport operations.
<p>Utility Services and Infrastructure (electric, water, wastewater, communications)</p>	<ul style="list-style-type: none"> • Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. • Emergency vehicles can be damaged by falling trees or flying debris.

Critical Facility Type	Potential Impacts
	<ul style="list-style-type: none"> • Power outages could disrupt communications, delaying emergency response times. • Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. • Debris/downed trees can impede emergency response vehicle access to areas. • Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel.

A thunderstorm wind event can also result in traffic disruptions, injuries, and, in rare cases, fatalities. The impact of thunderstorm winds experienced in the Goliad County planning area, including the ISD and special district, has resulted in no injuries or fatalities. Based on historical analysis, the impacts of thunderstorm wind events would be considered “Limited,” meaning injuries and illness are typically treatable with first aid, less than 10 percent of property is destroyed or suffers major damage, and critical facilities are shut down for less than 24 hours. Overall, over the past 29 years, there have been \$238,400 in damages (2026 dollars) in the Goliad County planning area due to thunderstorm wind events. The estimated average annual loss from a thunderstorm wind event is \$8,220.

Table 14-9. Estimated Annualized Losses by Participating Jurisdiction

Jurisdiction	Total Property & Crop Loss	Average Annual Loss Estimates
Goliad County	\$238,400	\$8,220

Assessment of Impacts

Thunderstorm wind events have the potential to pose a significant risk to people and can create dangerous and difficult situations for public health and safety officials. Thunderstorm wind conditions can be frequently associated with a variety of impacts, including:

- Individuals exposed to the storm can be struck by flying debris, falling limbs, or downed trees, causing serious injury or death.
- Structures can be damaged or crushed by falling trees, which can result in physical harm to the occupants.
- Significant debris and downed trees can result in emergency response vehicles being unable to access areas of the community.

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- Downed power lines may result in roadways being unsafe for use, which may prevent first responders from answering calls for assistance or rescue.
- Thunderstorm wind events often result in widespread power outages, increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.
- Extended power outages often increase structure fires and carbon monoxide poisoning, as individuals attempt to cook or heat their homes with alternate, unsafe cooking or heating devices, such as grills.
- Critical staff may be unable to report for duty, limiting response capabilities.
- Private sector entities that residents rely on, such as utility providers, financial institutions, and medical care providers, may not be fully operational and may require assistance from neighboring communities until full services can be restored.
- Economic disruption negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue.
- Some businesses not directly damaged by thunderstorm wind events may be negatively impacted while roads are cleared and utilities are being restored, further slowing economic recovery.
- Older structures, specifically those built before 1980 (41 percent of the planning area), were built to less stringent building codes and may suffer greater damage as they are typically more vulnerable to thunderstorm winds.
- Recreational areas such as community parks and green spaces may be damaged or inaccessible due to downed trees or debris, causing temporary impacts to associated businesses in the area.

Historical sites and properties are at higher risk of impact due to the materials used and the inability to modify them because of their historic status. There are 13 historical sites listed on the National Register of Historic Places for Goliad County.

The economic and financial impacts of thunderstorm winds on the area will depend entirely on the scale of the event, what is damaged, and how quickly repairs to critical economic components can be implemented. The level of preparedness and pre-event planning done by the community, local businesses, and citizens will also contribute to the overall economic and financial conditions in the aftermath of any thunderstorm wind event.

Climate Change Impacts

The impacts of climate change on the frequency and severity of severe thunderstorm wind events are unclear. According to the Texas A&M 2021 Climate Report Update, changes in severe thunderstorm reports over time have been more closely linked to

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changes in population than changes in the hazard event. At this time, there is low confidence in an ongoing trend in the overall frequency and severity of thunderstorm events due to the lack of climate records for severe thunderstorms. Based on available climate models, the environmental conditions conducive to severe thunderstorms are projected to become more likely, resulting in an overall increase in the number of days capable of producing them.²

² Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, Texas A&M University Office of the Texas State Climatologist, 2021 Update.

Section 15: Mitigation Strategy

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<i>Goal 2: Reduce Disruptions to Essential Public Services and Infrastructure</i>	2
<i>Goal 3: Reduce Economic Impacts on Individuals, Businesses, And Area Institutions</i>	2
<i>Goal 4: Reduce Losses to Civic, Cultural, And Environmental Resources</i>	3

Background

The Planning Team met on February 23, 2026, to discuss the goals and objectives for the Plan Update. They determined that the goals and objectives from the previous plan were still applicable to the Plan Update. The following goals and objectives take a broad approach to improving outcomes before, during, and after these anticipated natural hazard events.

The mitigation actions selected by the County and participating jurisdictions are designed to address specific hazard-related issues and support the desired goals and objectives.

Goal 1: Reduce Loss of Life and Injury to Persons

Objective 1.1

Improve the delivery and effectiveness of warning messages

Objective 1.2

Preserve public and private emergency response capabilities (9-1-1, law enforcement, fire service, emergency medical services, emergency management)

Objective 1.3

Utilize available mitigation measures to prevent or reduce life-threatening impacts of natural hazards.

Objective 1.4

Reduce obstacles to the timely and safe evacuation of flood hazard areas

Objective 1.5

Reduce vulnerability to individuals living in mobile homes/manufactured housing.

Objective 1.6

Reduce life-or-death-threatening impacts on individuals with special physical care requirements.

Objective 1.7

Section 15: Mitigation Strategy

Reduce secondary impacts to health and safety from cascading effects

Goal 2: Reduce Disruptions to Essential Public Services and Infrastructure

Objective 2.1

Minimize disruption to and enhance the rapid restoration of utilities

Objective 2.2

Minimize disruption to and enhance the rapid restoration of essential transportation infrastructure.

Objective 2.3

Minimize disruption to governmental, educational, and other public institutions.

Goal 3: Reduce Economic Impacts on Individuals, Businesses, And Area Institutions

Objective 3.1

Increase home and business owner investment in available mitigation measures for private property.

Objective 3.2

Increase participation by homeowners and business owners in appropriate insurance programs.

Objective 3.3

Increase public and private sector development and use of operations continuity strategies.

Objective 3.4

Utilize available mitigation measures to prevent or reduce economic losses from natural hazards.

Objective 3.5

Reduce the vulnerability of existing development by encouraging property owners to participate in buyout or floodproofing opportunities.

Objective 3.6

Reduce vulnerability of future development by utilizing available planning and structural standards.

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Goal 4: Reduce Losses to Civic, Cultural, And Environmental Resources

Objective 4.1

Protect public investments in community-owned facilities and infrastructure through appropriate structural, non-structural, and financial methods.

Objective 4.2

Reduce future losses to the non-profit sector through participation in available mitigation opportunities.

Objective 4.3

Reduce vulnerability of historically or culturally significant structures

Objective 4.4

Minimize environmental impacts from cascading effects

Section 16: Previous Actions

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Overview

This section reviews the 2018 Goliad County Multi-Hazard Mitigation Plan. In February 2026, planning team members assessed previous actions for each jurisdiction and updated their status as completed, deferred, or deleted. The results are shown in the 2026 Analysis box.

Section 16: Previous Actions

Goliad County Actions

Mitigation Action	Educational Outreach
Objective	This action will create a program to educate the public about specific mitigation actions for hazards, including but not limited to Participating in the National Flood Insurance Program, Wildfire Fuels Reduction, Improving thermal insulation, Community Cooling Facilities, Structural Hardening, Reducing Potential Debris, etc.
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Drought, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	Less than \$10,000 per hazard
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
2026 Analysis	Complete

Section 16: Previous Actions

Mitigation Action	Purchase Back Up Power Generators
Objective	Installing generators at critical facilities will help ensure physical safety for facility occupants and maintain electronic systems functionality during power outages.
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	Highest
Estimated Cost	More than \$100,000 Each for Fixed Generators, Including Associated Engineering Costs. Less than \$100,000 Each for Portable Generators
Potential Funding Source (s)	County, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing infrastructure
2026 Analysis	Complete

Section 16: Previous Actions

Mitigation Action	Harden Facilities
Objective	This action proposes hardening facilities. Hardening will include but is not limited to building protective walls around exposed gas tanks and cylinders, shielding roof-mounted equipment, upgrading windows and doors to reduce vulnerability to wind and projectiles, and increasing thermal insulation.
Hazard	Hailstorm, Tornado, Hailstorm, Severe Winter Storm, Windstorm
Priority	High
Estimated Cost	Greater than \$100,000
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Long Term – Greater than 5 Years
Target	Existing infrastructure
2026 Analysis	Complete

Section 16: Previous Actions

Mitigation Action	Construct Community Safe Rooms
Objective	The action's goal is to minimize local population vulnerability to hazard events by providing community safe rooms.
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado
Priority	Medium
Estimated Cost	Less than \$10,000 to establish program. Safe Room costs will vary by structure.
Potential Funding Source (s)	County, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population and infrastructure
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Implement a tree trimming program
Objective	This action will develop and implement a tree trimming program to minimize the amount of debris generated during natural hazard events.
Hazard	Hurricane / Tropical Storm, Wildfire, Drought, Severe Winter Storm, Windstorm
Priority	High
Estimated Cost	\$10,000 - \$100,000
Potential Funding Source (s)	County, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future infrastructure
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Replace current landscaping with varieties that will reduce hazard vulnerabilities
Objective	This action's goal is to reduce vulnerability by replacing current landscaping with plants that perform multiple tasks including but not limited to: erosion control, reducing flammability, and reducing water usage.
Hazard	Flood, Hurricane / Tropical Storm, Wildfire, Drought
Priority	High
Estimated Cost	\$10,000 - \$100,000
Potential Funding Source (s)	County, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	1-5 Years
Target	Existing and future infrastructure
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Upgrade existing drainage pump stations
Objective	This action proposes upgrading existing drainage pump stations to reduce the potential impacts of future flood events.
Hazard	Flood
Priority	High
Estimated Cost	Greater than \$1,000,000
Potential Funding Source (s)	County, FEMA FMA, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	5 Years
Target	Existing infrastructure
2026 Analysis	Defer to plan update, in progress

Section 16: Previous Actions

Mitigation Action	Install check valves
Objective	This action proposes installing check valves to prevent backflow and reduce the potential impacts of future flood events related to local canal systems backing up.
Hazard	Flood
Priority	High
Estimated Cost	\$250,000
Potential Funding Source (s)	County, FEMA FMA, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	5 Years
Target	Existing infrastructure
2026 Analysis	Defer to plan update, in progress

Section 16: Previous Actions

Mitigation Action	Purchase Portable Pumps
Objective	This action proposes purchasing portable pumps that can be deployed as needed to reduce the potential impacts of future flood events.
Hazard	Flood
Priority	High
Estimated Cost	\$250,000
Potential Funding Source (s)	County, FEMA FMA, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	5 Years
Target	Existing infrastructure
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Construct Storm Drainage Infrastructure
Objective	This action proposes constructing new storm drainage infrastructure and/or improving existing infrastructure to reduce the potential impacts of future flood events.
Hazard	Flood
Priority	High
Estimated Cost	Greater than \$1,000,000
Potential Funding Source (s)	County, FEMA FMA, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	5 Years
Target	Existing infrastructure
2026 Analysis	Defer to plan update, in progress

Section 16: Previous Actions

Mitigation Action	Install Warning Systems
Objective	An automated flood warning system will help limit local vulnerability to flooding by providing residents with up-to-date information on where flooding is occurring.
Hazard	Flood
Priority	High
Estimated Cost	Greater than \$1,000,000
Potential Funding Source (s)	County, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Develop and Implement Wildfire Fuels Reduction Program in WUI
Objective	The County will re-evaluate all existing wildfire reduction measures to identify strengths and weaknesses in order to develop and enforce a new program to reduce wildfire impacts by removing wildfire fuels in the WUI.
Hazard	Wildfire
Priority	Medium
Estimated Cost	Greater than \$100,000
Potential Funding Source (s)	County, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population and infrastructure
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Develop and Implement a New Drought Contingency Plan
Objective	The County will re-evaluate all existing drought control measures to identify strengths and weaknesses in order to develop and enforce a new drought contingency plan.
Hazard	Drought
Priority	Medium
Estimated Cost	\$10,000 - \$100,000
Potential Funding Source (s)	County, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population and infrastructure
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Develop and Implement a New Water Conservation Ordinance
Objective	The County will re-evaluate all existing water use control measures to identify strengths and weaknesses in order to develop and enforce a new or updated water conservation plan.
Hazard	Drought
Priority	High
Estimated Cost	\$10,000 - \$100,000
Potential Funding Source (s)	County, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	1-5 Years
Target	Existing and future population and infrastructure
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Replace Water Fixtures with Low-Flow Units
Objective	This action's goal is to limit water consumption at County-owned and maintained facilities by replacing traditional water fixtures with low-flow units.
Hazard	Drought
Priority	High
Estimated Cost	\$10,000 - \$100,000
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	1 - 5 Years
Target	Existing and future infrastructure
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Set up Cooling Centers in Existing Facilities
Objective	The action's goal is to increase extreme heat resilience by limiting vulnerable populations' exposure to extreme heat.
Hazard	Extreme Heat
Priority	High
Estimated Cost	Less than \$10,000
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	1 - 5 Years
Target	Existing and future population
2026 Analysis	Complete

Section 16: Previous Actions

Mitigation Action	Set up Warming Centers in Existing Facilities
Objective	The action's goal is to increase severe winter storm resilience by limiting vulnerable populations' exposure to extreme cold.
Hazard	Severe Winter Storm
Priority	High
Estimated Cost	Less than \$10,000
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	1 - 5 Years
Target	Existing and future population
2026 Analysis	Complete

Section 16: Previous Actions

Mitigation Action	Develop and Implement a new tie-down ordinance for manufactured/mobile homes, temporary buildings, and unrestrained advertisement signs
Objective	The County will re-evaluate all existing tie-down measures to identify strengths and weaknesses in order to develop and enforce a new tie-down ordinance.
Hazard	Windstorm
Priority	Medium
Estimated Cost	Less than \$10,000
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1 - 5 Years
Target	Existing and future population and infrastructure
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Install Surge Protection to Protect Electronic Assets
Objective	This action proposes installing surge protection at all public facilities to prevent damage to critical electronic devices including but not limited to: computers, servers, audio/visual equipment, laboratory equipment, and appliances.
Hazard	Lightning
Priority	High
Estimated Cost	\$10,000 - \$100,000
Potential Funding Source (s)	County, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing infrastructure
2026 Analysis	Complete

Section 16: Previous Actions

Mitigation Action	Install Grounding Systems to Protect Electronic Assets
Objective	This action proposes installing grounding systems including but not limited to: lightning arresters, grounding rods, and grounding electrodes at all public facilities to prevent damage to critical electronic devices including but not limited to: computers, servers, audio/visual equipment, laboratory equipment, and appliances.
Hazard	Lightning
Priority	High
Estimated Cost	\$10,000 - \$100,000
Potential Funding Source (s)	County, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing infrastructure
2026 Analysis	Complete

Section 16: Previous Actions

Mitigation Action	Joint EOC, EMS, Fire Station with propane generator
Objective	Existing EOC doubles as a JP Court, Polling Location, and a Conference Room. Unable to equip for optimal use. Existing FIRE & EMS stations are metal buildings that cannot house all equipment which must be stored off site to accommodate the needs of the City and the County. A new Joint EOC, EMS, Fire station will provide space to shelter essential first responders during mutual aid & joint agency events.
Hazard	Flood, Hurricane / Tropical Storm, Wildfire, Drought, Tornado, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	\$6,500,000
Potential Funding Source (s)	County, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	15,000 sq. ft. FEMA shelter Dome and Community Multi-purpose Center
Objective	There is no existing community safe room for Goliad City/County; This facility would serve an approximate population of 10,000.
Hazard	Flood, Hurricane / Tropical Storm, Wildfire, Drought, Tornado, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	\$2,225,000
Potential Funding Source (s)	County, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Standby Generators
Objective	One county generator to operate courthouse; one at library to run communication hub; and one to run the EMS/EOC
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	\$250,000.00
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Radio repeater
Objective	This action will help eliminate radio dead spots in Goliad County.
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	\$7,500
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Alert Sirens for Unincorporated Communities of Berclair, Charco, Weesatche, Ander-Weser, Schroeder, Cologne, Fannin, and Sarco
Objective	No existing Alert Sirens in the listed unincorporated communities within Goliad County. Sarco & Berclair are applicants to become designated Colonias as of 09/29/2017. Charco will possibly become a Colonia in the future because it meets the criteria. The approximate population served by each of these sirens is 700.
Hazard	Flood, Hurricane / Tropical Storm, Wildfire, Drought, Tornado, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	\$80,000.00
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Redundant Internet/Network
Objective	This action will create a redundant internet/network system to provide backup in the event of a system-wide failure.
Hazard	Flood, Hurricane / Tropical Storm, Wildfire, Drought, Tornado, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	\$25,000.00
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
2026 Analysis	Complete

Section 16: Previous Actions

Mitigation Action	Cold Storage
Objective	This action will provide the County with a contingency site to house county vaccines.
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Drought, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	\$2,000.00
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Rainwater capture
Objective	This action will provide a rainwater capture system at POD.
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Drought, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	\$10,000.00
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Water filtration system
Objective	This action will provide a water filtration system at POD.
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Drought, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	\$10,000.00
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Mobile EOC Command Center trailer
Objective	This action will provide the County with a contingency EOC and mobile communications trailer, as well as necessary equipment.
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Drought, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	\$300,000.00
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Stream level detection devices
Objective	This action will install wireless stream water level detection devices at 22 existing rain gauges on bodies of water in the City and County of Goliad. These devices would report water levels in real time.
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Drought, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	\$13,200.00
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
2026 Analysis	Complete

Section 16: Previous Actions

Mitigation Action	Ice Machine
Objective	This action would provide the County with an ice machine at POD for emergency and medical use.
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Drought, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	\$10,000.00
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Goliad Independent School District

Mitigation Action	Educational Outreach
Objective	This action will create a program to educate ISD students, faculty, and staff about specific mitigation actions for hazards, including but not limited to Participating in the National Flood Insurance Program, Wildfire Fuels Reduction, Improving thermal insulation, Community Cooling Facilities, Structural Hardening, Reducing Potential Debris, etc....
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Drought, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	Less than \$10,000 per hazard
Potential Funding Source(s)	Goliad ISD, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad ISD Superintendent's Office
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
2026 Analysis	Complete

Section 16: Previous Actions

Mitigation Action	Purchase Back Up Power Generators
Objective	Installing generators at critical facilities will help ensure physical safety for facility occupants and maintain electronic systems functionality during power outages.
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	Highest
Estimated Cost	More than \$100,000 Each for Fixed Generators, Including Associated Engineering Costs. Less than \$100,000 Each for Portable Generators
Potential Funding Source (s)	Goliad ISD, FEMA PDM, FEMA HMGP
Responsible Department	Goliad ISD Superintendent's Office
Implementation Schedule	Short Term - 1-5 Years
Target	Existing infrastructure
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Harden Facilities
Objective	This action proposes hardening facilities. Hardening will include but is not limited to building protective walls around exposed gas tanks and cylinders, shielding roof-mounted equipment, and increasing thermal insulation.
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Drought, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	Greater than \$100,000
Potential Funding Source (s)	Goliad ISD, FEMA PDM, FEMA HMGP
Responsible Department	Goliad ISD Superintendent's Office
Implementation Schedule	Long Term - Greater than 5 Years
Target	Existing infrastructure
2026 Analysis	Complete

Section 16: Previous Actions

Mitigation Action	Implement a tree trimming program
Objective	This action will develop and implement a tree trimming program to minimize the amount of debris generated during natural hazard events.
Hazard	Wildfire, Severe Winter Storm
Priority	High
Estimated Cost	\$10,000 - \$100,000
Potential Funding Source (s)	Goliad ISD, FEMA PDM, FEMA HMGP
Responsible Department	Goliad ISD Superintendent's Office
Implementation Schedule	Short Term – 1- 5 Years
Target	Existing and future infrastructure
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Construct storm drainage information
Objective	This action proposes constructing new storm drainage infrastructure and / or improving existing infrastructure to reduce the potential impacts of future flood events.
Hazard	Flood
Priority	High
Estimated Cost	Greater than \$1,000,000
Potential Funding Source (s)	Goliad ISD, FEMA PDM, FEMA HMGP
Responsible Department	Goliad ISD Superintendent's Office
Implementation Schedule	5 Years
Target	Existing infrastructure
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Develop and Implement a new drought contingency plan
Objective	Goliad ISD will re-evaluate all existing drought control measures to identify strengths and weaknesses in order to develop and enforce a new drought contingency plan.
Hazard	Drought
Priority	Medium
Estimated Cost	\$10,000 - \$100,000
Potential Funding Source (s)	Goliad ISD, FEMA PDM, FEMA HMGP
Responsible Department	Goliad ISD Superintendent's Office
Implementation Schedule	Short Term – 1- 5 Years
Target	Existing and future population and infrastructure
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Goliad Water Supply Corporation

Mitigation Action	Purchase back up power generators
Objective	Installing generators at critical facilities will help ensure physical safety for facility occupants and maintain electronic systems functionality during power outages.
Hazard	Flood, Hurricane/Tropical Storm, Tornado
Priority	Highest
Estimated Cost	More than \$100,000 Each for Fixed Generators, Including Associated Engineering Costs. Less than \$100,000 Each for Portable Generators
Potential Funding Source(s)	Goliad WSC, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad WSC Board of Directors
Implementation Schedule	Short Term - 1-5 Years
Target	Existing infrastructure
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Educational Outreach
Objective	This action will create a program to educate the public about specific mitigation actions for hazards, including but not limited to Participating in the National Flood Insurance Program, Wildfire Fuels Reduction, Improving thermal insulation, Community Cooling Facilities, Structural Hardening, Reducing Potential Debris, etc.
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Drought, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	Less than \$10,000 per hazard
Potential Funding Source(s)	Goliad WSC, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad WSC Board of Directors
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Harden Facilities
Objective	This action proposes hardening facilities. Hardening will include but is not limited to elevating low-lying equipment, upgrading windows and doors to reduce vulnerability to wind and projectiles, and increasing thermal insulation.
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Drought, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	Greater than \$100,000
Potential Funding Source (s)	Goliad WSC, FEMA PDM, FEMA HMGP
Responsible Department	Goliad WSC Board of Directors
Implementation Schedule	Long Term - Greater than 5 Years
Target	Existing infrastructure
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Construct Flood Control Infrastructure
Objective	This action proposes constructing new flood control infrastructure, including dikes, to reduce the potential impacts of future flood events, especially for low-lying equipment.
Hazard	Flood
Priority	High
Estimated Cost	Greater than \$1,000,000
Potential Funding Source (s)	Goliad WSC, FEMA PDM, FEMA HMGP
Responsible Department	Goliad WSC Board of Directors
Implementation Schedule	5 Years
Target	Existing infrastructure
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Construct Storm Drainage Infrastructure
Objective	This action proposes constructing new storm drainage infrastructure and / or improving existing infrastructure to reduce the potential impacts of future flood events.
Hazard	Flood
Priority	High
Estimated Cost	Greater than \$1,000,000
Potential Funding Source (s)	Goliad WSC, FEMA PDM, FEMA HMGP
Responsible Department	Goliad WSC Board of Directors
Implementation Schedule	5 Years
Target	Existing infrastructure
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Increase Water Storage Capacity
Objective	This action proposes increasing water storage capacity at Goliad WSC facilities in order to provide additional water supply during times of system failures due to electrical outages.
Hazard	Hurricane/Tropical Storm, Wildfire, Tornado, Drought, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	Greater than \$1,000,000
Potential Funding Source (s)	Goliad WSC, FEMA PDM, FEMA HMGP
Responsible Department	Goliad WSC Board of Directors
Implementation Schedule	5 Years
Target	Existing infrastructure
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Develop and Implement a New Drought Contingency Plan
Objective	The WSC will re-evaluate all existing drought control measures to identify strengths and weaknesses in order to develop and enforce a new drought contingency plan.
Hazard	Drought
Priority	Medium
Estimated Cost	\$10,000 - \$100,000
Potential Funding Source (s)	Goliad WSC, FEMA PDM, FEMA HMGP
Responsible Department	Goliad WSC Board of Directors
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population and infrastructure
2026 Analysis	Defer to plan update

Section 16: Previous Actions

Mitigation Action	Develop and Implement a New Severe Winter Weather Contingency Plan
Objective	The WSC will re-evaluate all existing severe winter weather control measures to identify strengths and weaknesses in order to develop and enforce a new severe winter weather contingency plan.
Hazard	Severe Winter Storm
Priority	Medium
Estimated Cost	\$10,000 - \$100,000
Potential Funding Source (s)	Goliad WSC, FEMA PDM, FEMA HMGP
Responsible Department	Goliad WSC Board of Directors
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population and infrastructure
2026 Analysis	Defer to plan update

Section 17: Mitigation Actions

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Overview

Mitigation Action Plan Prioritization

The planning team has identified at least one mitigation action for each natural hazard. Action items were identified and prioritized in consideration of the following criteria:

- 1) Life safety and property protection improvements
- 2) Cost effectiveness- do the actions' future benefits exceed their implementation costs
- 3) Technical feasibility- is the action reasonable given its technical requirements
- 4) Political acceptability
- 5) Administrative capabilities and legal authorities from implementation
- 6) Funding availability
- 7) The action's environmental impacts
- 8) The action's social acceptability
- 9) The action's ability to reduce risk to more than one hazard
- 10) The ease of implementation
- 11) The availability of a local champion
- 12) The action's relationship to other community objectives

In addition to considering an action's cost-effectiveness as described above, the planning team evaluated cost-effectiveness, Environmental Soundness, and technical feasibility as they relate to construction projects. Mitigation actions relating to physical infrastructure will meet the State's standards as outlined below:

- A. Any state government construction project, regardless of potential funding source, must be cost-effective, technically feasible, and meet all the appropriate federal, state, and local environmental laws and regulations before it is started.
- B. State government projects funded by Federal Mitigation Grant Programs administered by TDEM must meet specific criteria related to cost effectiveness, environmental soundness, and technical feasibility. These are outlined in the applicable FEMA grant program guidance.

Each jurisdiction has its own established process for integrating new actions, codes, ordinances, plans, and studies into its existing capabilities. The planning team will

Section 17: Mitigation Actions

ensure that each jurisdiction's various departments continue to integrate hazard mitigation actions into their day-to-day processes.

Each new mitigation action below outlines the following requirements: the identified responsible department head or delegate will research all relevant information to confirm the action's feasibility and prioritization, formulate a plan of action, confirm funding sources, and identify any fiscal implications associated with the mitigation action.

As part of each jurisdiction's commitment to transparency, all relevant information, including but not limited to that described above and in each action's description, will be presented to the public before the action is formally adopted for implementation. After public notification, the integration process will follow the outline in the chart below.

Goliad County is a participant in the National Flood Insurance Plan. As part of that commitment, when creating flood actions, the planning team reviewed several actions to make their community more resilient to flood events and to increase flood insurance education.

Each jurisdiction has selected actions identified as high or medium priority and aligned with TDEM's recommended mitigation actions. However, many of the mitigation actions below depend on external grant funding for implementation. For all actions likely to require grant funding, potential sources have been identified. However, grant funding is awarded competitively, so applying does not guarantee funding. Goliad County and the participating jurisdictions have a successful history of applying for and receiving grant funding to implement physical infrastructure actions. Budget constraints will remain the determining factor for how and when each action is implemented.

Section 17: Mitigation Actions

Goliad County Actions

Mitigation Action	Construct Community Safe Rooms
Objective	The action's goal is to minimize local population vulnerability to hazard events by providing community safe rooms.
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado
Priority	Medium
Estimated Cost	Less than \$10,000 to establish program. Safe Room costs will vary by structure.
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population and infrastructure
Type	Structure and Infrastructure

Mitigation Action	Implement a tree trimming program
Objective	This action will develop and implement a tree trimming program to minimize the amount of debris generated during natural hazard events.
Hazard	Hurricane / Tropical Storm, Wildfire, Drought, Severe Winter Storm, Windstorm
Priority	High
Estimated Cost	\$10,000 - \$100,000
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future infrastructure
Type	Structure and Infrastructure

Section 17: Mitigation Actions

Mitigation Action	Replace current landscaping with varieties that will reduce hazard vulnerabilities
Objective	This action's goal is to reduce vulnerability by replacing current landscaping with plants that perform multiple tasks including but not limited to: erosion control, reducing flammability, and reducing water usage.
Hazard	Flood, Hurricane / Tropical Storm, Wildfire, Drought
Priority	High
Estimated Cost	\$10,000 - \$100,000
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	1-5 Years
Target	Existing and future infrastructure
Type	Structure and Infrastructure

Mitigation Action	Upgrade existing drainage pump stations
Objective	This action proposes upgrading existing drainage pump stations to reduce the potential impacts of future flood events.
Hazard	Flood
Priority	High
Estimated Cost	Greater than \$1,000,000
Potential Funding Source(s)	County, FEMA FMA, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	5 Years
Target	Existing infrastructure
Type	Structure and Infrastructure

Section 17: Mitigation Actions

Mitigation Action	Install check valves
Objective	This action proposes installing check valves to prevent backflow and reduce the potential impacts of future flood events related to local canal systems backing up.
Hazard	Flood
Priority	High
Estimated Cost	\$250,000
Potential Funding Source(s)	County, FEMA FMA, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	5 Years
Target	Existing infrastructure
Type	Structure and Infrastructure

Mitigation Action	Purchase Portable Pumps
Objective	This action proposes purchasing portable pumps that can be deployed as needed to reduce the potential impacts of future flood events.
Hazard	Flood
Priority	High
Estimated Cost	\$250,000
Potential Funding Source(s)	County, FEMA FMA, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	5 Years
Target	Existing infrastructure
Type	Structure and Infrastructure

Section 17: Mitigation Actions

Mitigation Action	Construct Storm Drainage Infrastructure
Objective	This action proposes constructing new storm drainage infrastructure and/or improving existing infrastructure to reduce the potential impacts of future flood events.
Hazard	Flood
Priority	High
Estimated Cost	Greater than \$1,000,000
Potential Funding Source(s)	County, FEMA FMA, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	5 Years
Target	Existing infrastructure
Type	Structure and Infrastructure

Mitigation Action	Install Warning Systems
Objective	An automated flood warning system will help limit local vulnerability to flooding by providing residents with up-to-date information on where flooding is occurring.
Hazard	Flood
Priority	High
Estimated Cost	Greater than \$1,000,000
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
Type	Structure and Infrastructure

Section 17: Mitigation Actions

Mitigation Action	Develop and Implement Wildfire Fuels Reduction Program in WUI
Objective	The County will re-evaluate all existing wildfire reduction measures to identify strengths and weaknesses in order to develop and enforce a new program to reduce wildfire impacts by removing wildfire fuels in the WUI.
Hazard	Wildfire
Priority	Medium
Estimated Cost	Greater than \$100,000
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population and infrastructure
Type	Structure and Infrastructure

Mitigation Action	Develop and Implement a New Drought Contingency Plan
Objective	The County will re-evaluate all existing drought control measures to identify strengths and weaknesses in order to develop and enforce a new drought contingency plan.
Hazard	Drought
Priority	Medium
Estimated Cost	\$10,000 - \$100,000
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population and infrastructure
Type	Local Plans and Regulations

Section 17: Mitigation Actions

Mitigation Action	Develop and Implement a New Water Conservation Ordinance
Objective	The County will re-evaluate all existing water use control measures to identify strengths and weaknesses in order to develop and enforce a new or updated water conservation plan.
Hazard	Drought
Priority	High
Estimated Cost	\$10,000 - \$100,000
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	1-5 Years
Target	Existing and future population and infrastructure
Type	Local Plans and Regulations

Mitigation Action	Replace Water Fixtures with Low-Flow Units
Objective	This action's goal is to limit water consumption at County-owned and maintained facilities by replacing traditional water fixtures with low-flow units.
Hazard	Drought
Priority	High
Estimated Cost	\$10,000 - \$100,000
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	1 - 5 Years
Target	Existing and future infrastructure
Type	Structure and Infrastructure

Section 17: Mitigation Actions

Mitigation Action	Develop and Implement a new tie-down ordinance for manufactured/mobile homes, temporary buildings, and unrestrained advertisement signs
Objective	The County will re-evaluate all existing tie-down measures to identify strengths and weaknesses in order to develop and enforce a new tie-down ordinance.
Hazard	Windstorm
Priority	Medium
Estimated Cost	Less than \$10,000
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1 - 5 Years
Target	Existing and future population and infrastructure
Type	Structure and Infrastructure

Section 17: Mitigation Actions

Mitigation Action	Joint EOC, EMS, Fire Station with propane generator
Objective	Existing EOC doubles as a JP Court, Polling Location, and a Conference Room. Unable to equip for optimal use. Existing FIRE & EMS stations are metal buildings that cannot house all equipment which must be stored off site to accommodate the needs of the City and the County. A new Joint EOC, EMS, Fire station will provide space to shelter essential first responders during mutual aid & joint agency events.
Hazard	Flood, Hurricane / Tropical Storm, Wildfire, Drought, Tornado, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	\$6,500,000
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
Type	Defer to plan update

Section 17: Mitigation Actions

Mitigation Action	15,000 sq. ft. FEMA shelter Dome and Community Multi-purpose Center
Objective	There is no existing community safe room for Goliad City/County; This facility would serve an approximate population of 10,000.
Hazard	Flood, Hurricane / Tropical Storm, Wildfire, Drought, Tornado, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	\$2,225,000
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
2026 Analysis	Defer to plan update

Section 17: Mitigation Actions

Mitigation Action	Standby Generators
Objective	One county generator to operate courthouse; one at library to run communication hub; and one to run the EMS/EOC
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	\$250,000.00
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
Type	Structure and Infrastructure

Section 17: Mitigation Actions

Mitigation Action	Radio repeater
Objective	This action will help eliminate radio dead spots in Goliad County.
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	\$7,500
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
Type	Preparedness

Section 17: Mitigation Actions

Mitigation Action	Alert Sirens for Unincorporated Communities of Berclair, Charco, Weesatche, Ander-Weser, Schroeder, Cologne, Fannin, and Sarco
Objective	No existing Alert Sirens in the listed unincorporated communities within Goliad County. Sarco & Berclair are applicants to become designated Colonias as of 09/29/2017. Charco will possibly become a Colonia in the future because it meets the criteria. The approximate population served by each of these sirens is 700.
Hazard	Flood, Hurricane / Tropical Storm, Wildfire, Tornado, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	\$80,000.00
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
2026 Analysis	Defer to plan update

Section 17: Mitigation Actions

Mitigation Action	Cold Storage
Objective	This action will provide the County with a contingency site to house county vaccines.
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	\$2,000.00
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
Type	Preparedness

Section 17: Mitigation Actions

Mitigation Action	Rainwater capture
Objective	This action will provide a rainwater capture system at POD.
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Drought, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	\$10,000.00
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
Type	Natural Systems Protection

Section 17: Mitigation Actions

Mitigation Action	Water filtration system
Objective	This action will provide a water filtration system at POD.
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Drought, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	\$10,000.00
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
Type	Preparedness

Section 17: Mitigation Actions

Mitigation Action	Mobile EOC Command Center trailer
Objective	This action will provide the County with a contingency EOC and mobile communications trailer, as well as necessary equipment.
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Drought, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	\$300,000.00
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
2026 Analysis	Defer to plan update

Section 17: Mitigation Actions

Mitigation Action	Ice Machine
Objective	This action would provide the County with an ice machine at POD for emergency and medical use.
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Drought, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	\$10,000.00
Potential Funding Source(s)	County, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad County Judge & Commissioners' Court Goliad County Office of Emergency Management
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
Type	Preparedness

Section 17: Mitigation Actions

Goliad Independent School District (ISD)

Mitigation Action	Purchase Back Up Power Generators
Objective	Installing generators at critical facilities will help ensure physical safety for facility occupants and maintain electronic systems functionality during power outages.
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	Highest
Estimated Cost	More than \$100,000 Each for Fixed Generators, Including Associated Engineering Costs. Less than \$100,000 Each for Portable Generators
Potential Funding Source(s)	Goliad ISD, FEMA PDM, FEMA HMGP
Responsible Department	Goliad ISD Superintendent's Office
Implementation Schedule	Short Term - 1-5 Years
Target	Existing infrastructure
Type	Structure and Infrastructure

Section 17: Mitigation Actions

Mitigation Action	Implement a tree trimming program
Objective	This action will develop and implement a tree trimming program to minimize the amount of debris generated during natural hazard events.
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	\$10,000 - \$100,000
Potential Funding Source(s)	Goliad ISD, FEMA PDM, FEMA HMGP
Responsible Department	Goliad ISD Superintendent's Office
Implementation Schedule	Short Term – 1- 5 Years
Target	Existing and future infrastructure
Type	Local Plans and Regulations

Mitigation Action	Construct storm drainage information
Objective	This action proposes constructing new storm drainage infrastructure and / or improving existing infrastructure to reduce the potential impacts of future flood events.
Hazard	Flood
Priority	High
Estimated Cost	Greater than \$1,000,000
Potential Funding Source(s)	Goliad ISD, FEMA PDM, FEMA HMGP
Responsible Department	Goliad ISD Superintendent's Office
Implementation Schedule	5 Years
Target	Existing infrastructure
Type	Structure and Infrastructure

Section 17: Mitigation Actions

Mitigation Action	Develop and Implement a new drought contingency plan
Objective	Goliad ISD will re-evaluate all existing drought control measures to identify strengths and weaknesses in order to develop and enforce a new drought contingency plan.
Hazard	Drought
Priority	Medium
Estimated Cost	\$10,000 - \$100,000
Potential Funding Source(s)	Goliad ISD, FEMA PDM, FEMA HMGP
Responsible Department	Goliad ISD Superintendent's Office
Implementation Schedule	Short Term – 1- 5 Years
Target	Existing and future population and infrastructure
Type	Local Plans and Regulations

Section 17: Mitigation Actions

Goliad Water Supply Corporation (GWSC)

Mitigation Action	Educational Outreach
Objective	This action will create a program to educate the public about specific mitigation actions for hazards, including but not limited to Participating in the National Flood Insurance Program, Wildfire Fuels Reduction, Improving thermal insulation, Community Cooling Facilities, Structural Hardening, Reducing Potential Debris, etc.
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Drought, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	Less than \$10,000 per hazard
Potential Funding Source(s)	Goliad WSC, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad WSC Board of Directors
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population
Type	Education and Awareness

Section 17: Mitigation Actions

Mitigation Action	Purchase back up power generators
Objective	Installing generators at critical facilities will help ensure physical safety for facility occupants and maintain electronic systems functionality during power outages.
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	Highest
Estimated Cost	More than \$100,000 Each for Fixed Generators, Including Associated Engineering Costs. Less than \$100,000 Each for Portable Generators
Potential Funding Source(s)	Goliad WSC, FEMA PDM, FEMA HMGP
Responsible Department(s)	Goliad WSC Board of Directors
Implementation Schedule	Short Term - 1-5 Years
Target	Existing infrastructure
2026 Analysis	Defer to plan update

Section 17: Mitigation Actions

Mitigation Action	Harden Facilities
Objective	This action proposes hardening facilities. Hardening will include but is not limited to elevating low-lying equipment, upgrading windows and doors to reduce vulnerability to wind and projectiles, and increasing thermal insulation.
Hazard	Flood, Hurricane/Tropical Storm, Wildfire, Tornado, Drought, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	Greater than \$100,000
Potential Funding Source(s)	Goliad WSC, FEMA PDM, FEMA HMGP
Responsible Department	Goliad WSC Board of Directors
Implementation Schedule	Long Term - Greater than 5 Years
Target	Existing infrastructure
Type	Structure and Infrastructure

Mitigation Action	Construct Flood Control Infrastructure
Objective	This action proposes constructing new flood control infrastructure, including dikes, to reduce the potential impacts of future flood events, especially for low-lying equipment.
Hazard	Flood
Priority	High
Estimated Cost	Greater than \$1,000,000
Potential Funding Source(s)	Goliad WSC, FEMA PDM, FEMA HMGP
Responsible Department	Goliad WSC Board of Directors
Implementation Schedule	5 Years
Target	Existing infrastructure
Type	Structure and Infrastructure

Section 17: Mitigation Actions

Mitigation Action	Construct Storm Drainage Infrastructure
Objective	This action proposes constructing new storm drainage infrastructure and / or improving existing infrastructure to reduce the potential impacts of future flood events.
Hazard	Flood
Priority	High
Estimated Cost	Greater than \$1,000,000
Potential Funding Source(s)	Goliad WSC, FEMA PDM, FEMA HMGP
Responsible Department	Goliad WSC Board of Directors
Implementation Schedule	5 Years
Target	Existing infrastructure
Type	Structure and Infrastructure

Mitigation Action	Increase Water Storage Capacity
Objective	This action proposes increasing water storage capacity at Goliad WSC facilities in order to provide additional water supply during times of system failures due to electrical outages.
Hazard	Hurricane/Tropical Storm, Wildfire, Tornado, Drought, Extreme Heat, Hailstorm, Severe Winter Storm, Windstorm, Lightning
Priority	High
Estimated Cost	Greater than \$1,000,000
Potential Funding Source(s)	Goliad WSC, FEMA PDM, FEMA HMGP
Responsible Department	Goliad WSC Board of Directors
Implementation Schedule	5 Years
Target	Existing infrastructure
Type	Structure and Infrastructure

Section 17: Mitigation Actions

Mitigation Action	Develop and Implement a New Drought Contingency Plan
Objective	The WSC will re-evaluate all existing drought control measures to identify strengths and weaknesses in order to develop and enforce a new drought contingency plan.
Hazard	Drought
Priority	Medium
Estimated Cost	\$10,000 - \$100,000
Potential Funding Source(s)	Goliad WSC, FEMA PDM, FEMA HMGP
Responsible Department	Goliad WSC Board of Directors
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population and infrastructure
Type	Local Plans and Regulations

Mitigation Action	Develop and Implement a New Severe Winter Weather Contingency Plan
Objective	The WSC will re-evaluate all existing severe winter weather control measures to identify strengths and weaknesses in order to develop and enforce a new severe winter weather contingency plan.
Hazard	Severe Winter Storm
Priority	Medium
Estimated Cost	\$10,000 - \$100,000
Potential Funding Source(s)	Goliad WSC, FEMA PDM, FEMA HMGP
Responsible Department	Goliad WSC Board of Directors
Implementation Schedule	Short Term - 1-5 Years
Target	Existing and future population and infrastructure
Type	Local Plans and Regulations

Section 18: Plan Maintenance

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Hazard Description

The following explains how the participating jurisdictions in Goliad County and the general public will be involved in implementing, evaluating, and enhancing the Plan over time. When the plan is discussed in all maintenance procedures, it includes mitigation actions and hazard assessments. The sustained hazard mitigation planning process consists of four main parts:

- Incorporation
- Monitoring and Evaluation
- Updating
- Continued Public Involvement

Incorporation

Participating jurisdictions within Goliad County will be responsible for further development and implementation of mitigation actions. Each action has been assigned to a specific department within the participating jurisdictions. The following describes how participating jurisdictions will incorporate elements of the mitigation plan into other planning mechanisms.

Process Of Incorporation

Once the Plan Update is adopted, participating jurisdictions in Goliad County will implement actions based on priorities and available funding. The planning area currently implements policies and programs to reduce loss of life and property from hazards. The mitigation actions developed for this Plan Update enhance this ongoing effort and will be implemented through other program mechanisms where possible.

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The potential funding sources listed for each identified action may be used when the jurisdiction seeks funds to implement actions. An implementation time period or a specific implementation date has been assigned to each action to incentivize task completion and to gauge whether actions are implemented in a timely manner.

Participating jurisdictions within Goliad County will integrate the implementation of their mitigation actions with other plans and policies, such as construction standards and emergency management plans, and ensure that these actions or proposed projects are reflected in other planning efforts.

Coordinating and integrating components of other plans and policies with the goals and objectives of the Plan Update will further maximize funding and enable possible cost-sharing for key projects, thereby reducing loss of life and property and mitigating hazards affecting the area.

Upon formal adoption of the Plan Update, planning team members from each participating jurisdiction will work to integrate the hazard mitigation strategies into other plans and codes as they are developed. Participating team members will conduct periodic reviews of plans and policies, at least once per year, and analyze the need for revisions in light of the approved Plan. The planning team will review all comprehensive land use plans (applicable jurisdictions only), capital improvement plans (applicable jurisdictions only), annual budget reviews, emergency operations or management plans (applicable jurisdictions only), and transportation plans (applicable jurisdictions only) to guide and control development. Participating jurisdictions will ensure that, in the future, capital improvement planning (applicable jurisdictions only) also contributes to the goals of this hazard mitigation Plan Update to reduce the long-term risk to life and property from all hazards. Within one year of the formal adoption of the Hazard Mitigation Plan Update, each jurisdiction will review existing planning mechanisms.

Goliad County is committed to supporting the participating jurisdictions as they implement their mitigation actions. Planning team members will review and, as necessary, revise the long-range goals and objectives in the strategic plan and budgets to ensure they are consistent with this mitigation action plan. Additionally, the planning area will advance the goals of this hazard mitigation plan through routine, ongoing, long-range planning, budgeting, and work processes.

Table 18-1 identifies types of planning mechanisms and examples of methods for incorporating the Plan Update into other planning efforts. The team members, listed in Table 18-2 below, will be responsible for the review of these planning mechanisms and their incorporation into the plan, with the exception of the Floodplain Management Plans; the jurisdictions that have a Floodplain Administrator on staff will be responsible for incorporating the plan when floodplain management plans are updated, or new plans are developed.

Table 18-1. Methods of Incorporation of the Plan

Planning Mechanism	Department/Title Responsible	Incorporation of Plan
Annual Budget Review	Goliad County Emergency Management Coordinator, Goliad ISD Superintendent, Goliad WSC President	Various departments and key personnel who participated in the planning process for participating jurisdictions within Goliad County will review the Plan and the mitigation actions therein during their annual budget review. Allowances will be made in accordance with the grant applications sought and the mitigation actions to be undertaken, in line with the implementation schedule for the specific action.
Grant Applications	Goliad County Emergency Management Coordinator, Goliad ISD Superintendent, Goliad WSC President	The Plan will be evaluated by participating jurisdictions in Goliad County when seeking grant funding for mitigation projects. If a project is not in the Plan Update, a Plan Revision may be necessary to include the action in the Plan.
Regulatory Plans	Goliad County Emergency Management Coordinator, Goliad ISD Superintendent, Goliad WSC President	Currently, several participating jurisdictions in Goliad County have regulatory plans in place, including Emergency Management Plans and Evacuation Plans. The Plan Update will be consulted when County, ISD, and special district departments review or revise their current regulatory planning mechanisms, or when developing regulatory plans that are not currently in place.

Monitoring and Evaluation

Periodic revisions of the Plan are required to ensure that goals, objectives, and mitigation actions are kept current. When the plan is discussed in these sections, it

Section 18: Plan Maintenance

includes the risk assessment and mitigation actions as part of the monitoring, evaluation, updating, and review process. Revisions may be required to ensure the Plan complies with federal and state statutes and regulations. This section outlines the procedures for completing Plan revisions, updates, and reviews. Table 18-2 indicates the department and title of the party responsible for Plan monitoring, evaluating, updating, and reviewing the Plan.

Table 18-2. Team Members Responsible for Plan Monitoring, Evaluating, Updating, and Reviewing the Plan

Jurisdiction	Title
Goliad County	Emergency Management Coordinator
Goliad ISD	Superintendent
Goliad WSC	President

Monitoring

Designated Planning Team members are responsible for monitoring, evaluating, updating, and reviewing the Plan, as shown in Table 18-2. Individuals holding the title listed in Table 18-2 will be responsible for monitoring the Plan annually. Plan monitoring includes reviewing and incorporating into the Plan other existing planning mechanisms that relate or support goals and objectives of the Plan; monitoring the incorporation of the Plan into future updates of other existing planning mechanisms as appropriate; reviewing mitigation actions submitted and coordinating with various County, ISD, and special district departments to determine if mitigation actions need to be re-evaluated and updated; evaluating and updating the Plan as necessary; and monitoring plan maintenance to ensure that the process described is being followed, on an annual basis, throughout the planning process. The Planning Team will develop a brief report identifying policies and actions in the plan that have been successfully implemented, as well as any changes to the implementation process needed for continued success. A summary of meeting notes will report the particulars involved in developing an action into a project. In addition to the annual monitoring, the Plan will be reviewed similarly immediately after extreme weather events, including but not limited to state- and federally declared disasters.

Evaluation

As part of the evaluation process, the Planning Team will assess changes in risk; determine whether the implementation of mitigation actions is on schedule; determine whether there are any implementation problems, such as technical, political, legal, or

Section 18: Plan Maintenance

coordination issues; and identify changes in land development or programs that affect mitigation priorities for each respective department or organization.

The Planning Team will meet annually to evaluate the Plan, identify any needed changes, and assess the Plan's effectiveness in achieving its stated purpose and goals. The team will evaluate the number of mitigation actions implemented and the loss reduction associated with each action. Actions that have not been implemented will be evaluated to determine whether social, political, or financial barriers are impeding implementation and whether any changes are necessary to improve the action's viability. The team will evaluate changes in land development and/or programs that affect mitigation priorities in their respective jurisdictions. The annual evaluation process will help to determine if any changes are necessary. In addition, the Plan will be evaluated similarly immediately after extreme weather events, including, but not limited to, state- and federally declared disasters.

Updating

Plan Revisions

At any time, minor technical changes may be made to update the Goliad County Hazard Mitigation Action Plan Update 2026. Material changes to mitigation actions or major changes in the overall direction of the Plan or the policies contained within it must be subject to formal adoption by the participating jurisdictions.

The participating jurisdictions within Goliad County will review the proposed revisions and vote to accept, reject, or amend them. Upon ratification, the Revision will be transmitted to TDEM.

In determining whether to recommend approval or denial of a Plan Revision request, participating jurisdictions will consider the following factors:

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

Five (5) Year Review

The Plan will be thoroughly reviewed by the Planning Team at the end of three years from the approval date, to determine whether there have been significant changes in the planning area that necessitate changes in the types of mitigation actions proposed. Factors that may affect the content of the Plan include new developments in identified

Section 18: Plan Maintenance

hazard areas, increased exposure to hazards, disaster declarations, changes in the capability to address hazards, and changes to federal or state legislation.

The Plan review process provides participating jurisdictions within Goliad County with an opportunity to evaluate successful mitigation actions, identify losses avoided due to the implementation of specific mitigation measures, and address mitigation actions that may not have been successfully implemented as assigned.

It is recommended that the Planning Team (Section 2, Table 2-2) meet to review the Plan at the end of three years, as grant funds may be necessary to develop a five-year update. Reviewing planning grant options in advance of the five-year Plan update deadline is recommended, given that grant and planning cycles can exceed a year.

Following the Plan review, any necessary revisions will be summarized and implemented in accordance with the reporting procedures and Plan Revision process outlined herein. Upon completion of the review, update, and revision process, the revised Plan will be submitted to TDEM for final review and approval in coordination with FEMA.

Continued Public Involvement

Public input was integral to the preparation of this Plan and will remain essential for Plan updates. The Public will be directly involved in the annual evaluation, monitoring, reviews, and cyclical updates. Changes or suggestions to improve or update the Plan will provide opportunities for additional public input.

The public can review the Plan on the participating jurisdictions' websites, where officials and the public are invited to provide ongoing feedback via email.

The Planning Team may also designate voluntary citizens from the planning area or willing stakeholder members from private-sector businesses involved in the Plan's development to provide feedback annually. Stakeholders and the immediate community must maintain a vested interest in preserving the planning area's functionality in relation to the mitigation plan's overall goals. The Planning Team is responsible for notifying stakeholders and community members annually and for maintaining the Plan.

Media, including local newspapers and radio stations, will be used to notify the public of any maintenance or periodic review activities during the implementation, monitoring, and evaluation phases. Additionally, local news media will be contacted to provide information on Plan updates, the status of grant applications, and project implementation. Local and social media outlets, such as Facebook, will keep the public and stakeholders apprised of potential opportunities to fund and implement mitigation projects identified in the Plan.

Appendix A: Planning Team and Meeting Documentation

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Overview

The Goliad County Multi-Hazard Mitigation Plan Update 2026 was organized using a direct representative model. A Planning Team from the participating jurisdictions, shown in Table A-2, was formed to coordinate planning efforts and request input and participation in the planning process. Table A-3 comprises stakeholders who were invited to provide Plan input. Public outreach efforts and meeting documentation are provided in this appendix.

The Planning Team held meetings on the following dates:

Table A-1: Planning Team Meetings

Planning Team Meeting Dates	
February 22, 2023	
June 5, 2023	August 16, 2024
December 15, 2023	November 7, 2024
April 11, 2024	February 23, 2026

The Planning Team table is listed below.

Table A-2: Planning Team

Title	Agency or Department
County Judge	Goliad County Judge's Office
Emergency Management Coordinator	Goliad County Emergency Management
IT Director	Goliad County
Indigent Health Administration	Goliad County
Fire Marshal/Constable	Goliad County
EMS Director	Goliad County EMS
Paramedic	Goliad County EMS
Sheriff	Goliad County Sheriff's Office

Appendix A: Planning Team and Meeting Documentation

Title	Agency or Department
Chief Deputy	Goliad County Sheriff's Office
GISD Resource Officer	Goliad County Sheriff's Office
Ander-Weser Fire Chief	Goliad County VFD
Superintendent	Goliad Independent School District
Student Nutrition & School Security	Goliad Independent School District
President	Goliad Water Supply Company

Stakeholders

The following groups listed in Table A-3 represent organizations invited to stakeholder meetings, public meetings, and workshops throughout the planning process, and include members of community groups, non-profit organizations, private businesses, utility providers, neighboring counties, schools and universities, state and federal agencies, and legislators. The public was also invited to participate via e-mail throughout the planning process. Many of the invited organizations and stakeholders participated and were integral to providing comments and data for the Plan.

Table A-3 Stakeholder Group

Agency	Title	Stakeholder Type
Hope Border Institute	Staff Member	Community Organization
Court Appointed Special Advocates (CASA)	Staff Member	Community Organization
BELONG	Staff Member	Nonprofit Organization
Texas A&M Agri-Life	Extension Agent	State Agency
Goliad County Historical Commission	Administrator	Local Agency
La Bahia Nursing and Rehabilitation LP	Administrator	Healthcare Agency
First Baptist Church	Administrator	Community Faith Organization
Our Lady of Loreto Chapel	Administrator	Community Faith Organization
Goliad Methodist Church	Administrator	Community Faith Organization

Appendix A: Planning Team and Meeting Documentation

Agency	Title	Stakeholder Type
Immaculate Conception Catholic Church	Administrator	Community Faith Organization

Meeting Documentation

Meeting documentation is **For Official Use Only (FOUO)** and may be exempt from public release under the Freedom of Information Act (FOIA).

Goliad County held a series of Planning Team meetings: an initial meeting on February 22, 2023; a hazard identification meeting on April 11, 2024; two mitigation strategy meetings on November 7, 2024, and February 23, 2026. At each of these workshops, members of the Planning Team discussed the planning process, expressed opinions, and volunteered information. Goliad County hosted a public meeting in March of 2026. The sign-in sheets for each meeting and public meeting are included below. For more details on the workshops and planning process, see Section 2.

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Figure A-1: Goliad County Kickoff Meeting February 22, 2023

Goliad County HM Planning Team Meeting 2/22/2023

Name	Title	Jurisdiction	Email	Phone Number
Mike Bennett	County Judge	Goliad County	Mbennett@goliadcountytexas.gov	361-645-3337
Sarah Ontiveros	EMC	Goliad County	sontiveros@goliadcountytexas.gov	361-405-9170
Matt Redfearn	IT Director	Goliad County	mredfearn@goliadcountytexas.gov	361-645-3337
Kevin Story	Fire Marshal	Goliad County	kstory@goliadcountytexas.gov	361-645-3451
Holly Gregory	EMS Director	Goliad County EMS	hgregory@goliadcountytexas.gov	361-645-3337
Roy Boyd	Sheriff	Goliad County Sheriff's Office	sheriff@goliadcountytexas.gov	361-645-1262
Tim Futch	Chief Deputy	Goliad County Sheriff's Office	tfutch@goliadcountytexas.gov	361-645-3451
Rebecca Weise	Staff	Goliad County Sheriff's Office	rweise@goliadcountytexas.gov	361-645-3451
Holly Lyon	Superintendent	Goliad ISD	hlyon@goliadisd.org	361-645-3259
Brandon Huber	President	Goliad WSC	brandonhuber@tisd.net	361-722-9215
Brian Yanta	Extension Agent	Texas A&M Agri-Life	Brian.yanta@ag.tamu.edu	361-645-3337

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Figure A-2: Goliad County Planning Team Meeting June 5, 2023

Goliad County HM Planning Team Meeting 6/5/2023

Name	Title	Jurisdiction	Email	Phone Number
Mike Bennett	County Judge	Goliad County	Mbennett@goliadcountytexas.gov	361-645-3337
Sarah Ontiveros	EMC	Goliad County	sontiveros@goliadcountytexas.gov	361-405-9170
Kevin Story	Fire Marshal	Goliad County	kstory@goliadcountytexas.gov	361-645-3451
Matt Redfearn	IT Director	Goliad County	mredfearn@goliadcountytexas.gov	361-645-3337
Holly Gregory	EMS Director	Goliad County EMS	hgregory@goliadcountytexas.gov	361-645-3337
Roy Boyd	Sheriff	Goliad County Sheriff's Office	sheriff@goliadcountytexas.gov	361-645-1262
Tim Futch	Chief Deputy	Goliad County Sheriff's Office	tfutch@goliadcountytexas.gov	361-645-3451
Rebecca Weise	Staff	Goliad County Sheriff's Office	rweise@goliadcountytexas.gov	361-645-3451
Holly Lyon	Superintendent	Goliad ISD	hlyon@goliadisd.org	361-645-3259
Brandon Huber	President	Goliad WSC	brandonhuber@tisd.net	361-722-9215
Brian Yanta	Extension Agent	Texas A&M Agri-Life	Brian.yanta@ag.tamu.edu	361-645-3337
Lynda Breeding	Goliad County Historical	Goliad County	goliadhistoric@goliadcountytexas.gov	361-645-3337
Katy Garcia		Goliad County	kgarcia@goliadcountytexas.gov	361-645-3337
Bill Zappe		Goliad County	bzappe@goliadcountytexas.gov	361-645-3337
Khalil Coltrain	Hope/Belong	Non-profit agency	Khalil.coltrain@lcra.org	

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Figure A-3: Goliad County Planning Team Meeting December 15, 2023

Goliad County HM Planning Team Meeting 12/15/2023

Name	Title	Jurisdiction	Email	Phone Number
Mike Bennett	County Judge	Goliad County	Mbennett@goliadcountytexas.gov	361-645-3337
Sarah Ontiveros	EMC	Goliad County	sontiveros@goliadcountytexas.gov	361-405-9170
Kevin Story	Fire Marshal	Goliad County	kstory@goliadcountytexas.gov	361-645-3451
Holly Gregory	EMS Director	Goliad County EMS	hgregory@goliadcountytexas.gov	361-645-3337
Roy Boyd	Sheriff	Goliad County Sheriff's Office	sheriff@goliadcountytexas.gov	361-645-1262
Tim Futch	Chief Deputy	Goliad County Sheriff's Office	tfutch@goliadcountytexas.gov	361-645-3451
Rebecca Weise	Staff	Goliad County Sheriff's Office	rweise@goliadcountytexas.gov	361-645-3451
Brandon Huber	President	Goliad WSC	brandonhuber@tisd.net	361-722-9215
Brian Yanta	Extension Agent	Texas A&M Agri-Life	Brian.yanta@ag.tamu.edu	361-645-3337
Lynda Breeding	Goliad County Historical	Goliad County	goliadhistoric@goliadcountytexas.gov	361-645-3337
Katy Garcia		Goliad County	kgarcia@goliadcountytexas.gov	361-645-3337
Bill Zappe		Goliad County	bzappe@goliadcountytexas.gov	361-645-3337
Dustin Meaux		Goliad County	dmeaux@goliadcountytexas.gov	361-645-3259
Corey Edwards			Coreyedwards9215@gmail.com	
Mark Jacobs			mjacobs@tisd.net	

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Figure A-4: Goliad County Planning Team Meeting April 11, 2024

Goliad County HM Planning Team Meeting 4/11/2024

Name	Title	Jurisdiction	Email	Phone Number
Mike Bennett	County Judge	Goliad County	Mbennett@goliadcountytexas.gov	361-645-3337
Sarah Ontiveros	EMC	Goliad County	sontiveros@goliadcountytexas.gov	361-405-9170
Kevin Story	Fire Marshal	Goliad County	kstory@goliadcountytexas.gov	361-645-3451
Holly Gregory	EMS Director	Goliad County EMS	hgregory@goliadcountytexas.gov	361-645-3337
Roy Boyd	Sheriff	Goliad County Sheriff's Office	sheriff@goliadcountytexas.gov	361-645-1262
Tim Futch	Chief Deputy	Goliad County Sheriff's Office	tfutch@goliadcountytexas.gov	361-645-3451
Rebecca Weise	Staff	Goliad County Sheriff's Office	rweise@goliadcountytexas.gov	361-645-3451
Brandon Huber	President	Goliad WSC	brandonhuber@tisd.net	361-722-9215
Brian Yanta	Extension Agent	Texas A&M Agri-Life	Brian.yanta@ag.tamu.edu	361-645-3337
Lynda Breeding	Goliad County Historical	Goliad County	goliadhistoric@goliadcountytexas.gov	361-645-3337
Katy Garcia		Goliad County	kgarcia@goliadcountytexas.gov	361-645-3337
Bill Zappe		Goliad County	bzappe@goliadcountytexas.gov	361-645-3337
Dustin Meaux		Goliad County	dmeaux@goliadcountytexas.gov	364-645-3259
Corey Edwards			Coreyedwards9215@gmail.com	
Mark Jacobs			mjacobs@tisd.net	

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Goliad County HM Planning Team Meeting 4/11/2024

Chalisse Mackey		Goliad County	cmackey@goliadcountytx.gov	361-645-3337
Cynthia Ramirez	Hope/Belong	Non-profit agency	cramirez@sjrctexas.org	
Caleb Breshears		Goliad County	cbreshears@goliadcountytx.gov	361-645-3337
Rickey Carbajal		Goliad County	rcarbajal@goliadcountytx.gov	361-645-3337
Earl Henning			Mr.earlhenning@gmail.com	
Valerie McGill		Goliad County	cmcgill@goliadcountytx.gov	361-645-3451
Adaniel Munselle		Goliad County	amunselle@goliadcountytx.gov	361-645-3337
Luke Drosche		Texas A&M Agrilife	Luke.drosche@ag.tamu.edu	

Figure A-5: Goliad County Planning Team Meeting August 16, 2024

Goliad County HM Planning Team Meeting 8/16/2024

Name	Title	Jurisdiction	Email	Phone Number
Mike Bennett	County Judge	Goliad County	Mbennett@goliadcountytx.gov	361-645-3337
Sarah Ontiveros	EMC	Goliad County	sontiveros@goliadcountytx.gov	361-405-9170
Roy Boyd	Sheriff	Goliad County Sheriff's Office	sheriff@goliadcountytx.gov	361-645-1262
Tim Futch	Chief Deputy	Goliad County Sheriff's Office	tfutch@goliadcountytx.gov	361-645-3451
Rebecca Weise	Staff	Goliad County Sheriff's Office	rweise@goliadcountytx.gov	361-645-3451
Lynda Breeding	Goliad County Historical	Goliad County	goliadhistoric@goliadcountytx.gov	361-645-3337
Dustin Meaux		Goliad County	dmeaux@goliadcountytx.gov	364-645-3259
Chalisse Mackey		Goliad County	cmackey@goliadcountytx.gov	361-645-3337
Cynthia Ramirez	Hope/Belong	Non-profit agency	cramirez@sjrctexas.org	
Valerie McGill		Goliad County	cmcgill@goliadcountytx.gov	361-645-3451

Figure A-6: Goliad County Planning Team Meeting, November 17, 2024

Appendix A: Planning Team and Meeting Documentation

Goliad County HM Planning Team Meeting 11/7/2024

Name	Title	Jurisdiction	Email	Phone Number
Mike Bennett	County Judge	Goliad County	Mbennett@goliadcountytexas.gov	361-645-3337
Sarah Ontiveros	EMC	Goliad County	sontiveros@goliadcountytexas.gov	361-405-9170
Roy Boyd	Sheriff	Goliad County Sheriff's Office	sheriff@goliadcountytexas.gov	361-645-1262
Tim Futch	Chief Deputy	Goliad County Sheriff's Office	tfutch@goliadcountytexas.gov	361-645-3451
Rebecca Weise	Staff	Goliad County Sheriff's Office	rweise@goliadcountytexas.gov	361-645-3451
Lynda Breeding	Goliad County Historical	Goliad County	goliadhistoric@goliadcountytexas.gov	361-645-3337
Dustin Meaux		Goliad County	dmeaux@goliadcountytexas.gov	361-645-3259
Holly Smith		STRAC	Holly.smith@strac.org	
Pete Elizondo		Goliad County	pelizondo@goliadcountytexas.gov	361-645-3337
Chalisse Mackey		Goliad County	cmackey@goliadcountytexas.gov	361-645-3337
Cynthia Ramirez	HOPE/Belong	Non-profit agency	cramirez@sjrctexas.org	
Valerie McGill		Goliad County	vmcgill@goliadcountytexas.gov	361-645-3451

Figure A-7: Goliad County Planning Team Meeting, February 23, 2026

Appendix A: Planning Team and Meeting Documentation

Goliad County Hazard Mitigation Plan
February 23, 2026
10:00 AM

SIGN-IN SHEET

NAME	ORGANIZATION	EMAIL
Sarah Entiveros	Goliad County	santiveros@goliadcountytx.gov
Judy Lucio	TDEM	judy.lucio@tdem.texas.gov
Patrick Reid	TDEM	Patrick.Reid@tdem.texas.gov
Rheanicia Hale	TDEM	Rheanicia.Hale@tdem.texas.gov

Figure A-8: Goliad County Public Meeting, March 9, 2026


Appendix A: Planning Team and Meeting Documentation

Personnel Check-in Sheet						
Incident Name: Goliad County Public Meeting		Location: Goliad, TX		Personnel Resource Type:		Date/Time: 3/9/26
Name	Agency	Phone Number	Date In	Time In	Date Out	Time Out
Pat Edwards		3				Pat Edwards
John Creech	Apesatche JFD	979-226-1067				
Es DOBBS, II		979-320-4100				
Ken Edwards	Goliad County	361-676-2345				
RM Bennett	Goliad County	281-793-0691				
Kirby Blum	Goliad "	361-935-3774				
Dickie Dumm	Doliad Co	361-645-3294				Dickie Dumm
Nevin Fanc	Goliad County	361-645-4781				
Rheasonia Wade	TDFM	325-284-9441				Rheasonia Wade

Figure A-9: Public Meeting Flyer posted on Goliad WSC bulletin board, March 2026

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request. Please c
needed.

County of Goliad



NOTICE OF POSSIBLE QUORUM
OF THE GOLIAD COUNTY COMMISSIONERS COURT
PUBLIC NOTICE

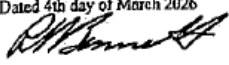
Notice is hereby given that members of the Commissioners Court of Goliad County may be attending the meetings as described below. The possibility exists that a quorum of the court will be in attendance at this specified meeting and action may be taken. This notice is being posted to comply with the Texas Open Meetings Act.

Event: Hazard Mitigation Plan Update
Public Meeting to discuss planning for a disaster resilient future.

Date & Time: March 9th, 2026


Location: 2nd Floor County/District Courtroom
Goliad County Courthouse

Dated 4th day of March 2026



Goliad County Judge, Mike Bennett

CERTIFICATE OF POSTING
1:12 o'clock P.M.
MAR 04 2026



CERTIFICATE OF POSTING
MAR 18 2026

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Figure A-10: Public Meeting Flyer posted on Goliad County Website, March 2026

County of Goliad



NOTICE OF POSSIBLE QUORUM OF THE GOLIAD COUNTY COMMISSIONERS COURT PUBLIC NOTICE

Notice is hereby given that members of the Commissioners Court of Goliad County may be attending the meetings as described below. The possibility exists that a quorum of the court will be in attendance at this specified meeting and action may be taken. This notice is being posted to comply with the Texas Open Meetings Act.

Event: Hazard Mitigation Plan Update
Public Meeting to discuss planning for a disaster resilient future.

Date & Time: March 9th, 2026

Location: 2nd Floor County/District Courtroom
Goliad County Courthouse

Dated 4th day of March 2026

Goliad County Judge, Mike Bennett

CERTIFICATE OF POSTING

1:12 o'clock P.M.

MAR 04 2026

Virgie Quinn
County Clerk, Goliad County, Texas
By: [Signature]



PLAN DE MITIGACIÓN DE RIESGOS


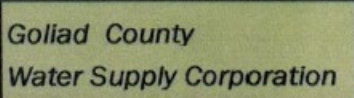


AVISO PÚBLICO

9 de Marzo, 2026
5:30 PM - 6:30 PM

ASISTE A LA REUNIÓN EN:
Goliad County Courthouse
County/District Courtroom
127 North Courthouse Square
Goliad, TX 77963

Queremos su opinión para la planificación de un futuro resiliente a desastres para el condado de Goliad. Participa en la reunión pública y haz escuchar tu voz.

¿Preguntas? Contacto:
Sarah Ontiveros
Emergency Management Coordinator
(361)645-3337 | sontiveros@goliadcountytexas.gov



HAZARD MITIGATION PLAN UPDATE PUBLIC NOTICE

March 9, 2026
5:30 PM - 6:30 PM

ATTEND MEETING AT:
Goliad County Courthouse
County/District Courtroom
127 North Courthouse Square
Goliad, TX 77963

We want your input in planning for a disaster resilient future for Goliad County. Participate in a public meeting and let your voice be heard.

Questions? Contact:
Sarah Ontiveros
Emergency Management Coordinator
(361)645-3337 | sontiveros@goliadcountytexas.gov


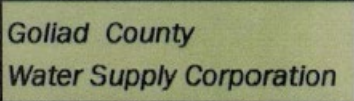




Figure A-11: Promotion of Public Survey from Goliad County Website, March 2026

The screenshot shows the Goliad County Emergency Management website. At the top, a banner reads: "will provide the leadership and support to reduce the loss of life and property through an all-hazards emergency management program of mitigation, preparedness, response, and recovery throughout Goliad County." Below this is a navigation menu with "QUICKLINKS" including Home, County Offices, Financial Transparency, Trustee/Foreclosure Sales, Elections, Market House Museum, Goliad County Library, Grants Administration, Employment Opportunities, Human Resources, Useful Forms and Information, and Commissioners Court Agendas & Public Notices. A "Notary Public" section states: "This office provides notary public services free of charge to the public. In order to have a signature notarized, the person(s) signing the document must provide a current, valid, state-issued photo identification card (Driver's License, Military ID, etc)." The central focus is a "BURN BAN IN EFFECT" graphic with a red prohibition sign over flames. To the right is a teal box titled "Goliad County Hazard Mitigation Plan Public Survey" containing a QR code. Below the burn ban graphic is a "County of Goliad" official order titled "DECLARATION OF LOCAL STATE OF DISASTER" regarding a "CRISIS PREVENTION OUTDOOR BURNING" ban, dated 03/03/2026.

Appendix B: Capability Assessment

Overview	1
Jurisdictional Capability Assessment.....	2

Overview

A Community Capability Assessment is a key part of Hazard Mitigation Planning, helping evaluate a community’s current planning and regulatory ability to carry out mitigation strategies.

Starting on Page 2, the Capability Assessment Checklist shows current local and County policies, plans, and regulations for Planning Team members. **All items that are in place in the jurisdiction are marked with an “X” on the table.**

Appendix B: Capability Assessment

Jurisdictional Capability Assessment

Capability Item	Goliad County	Goliad ISD	Goliad WSC
Plans/Ordinances			
Capital Improvement Plan			X
Climate Change Adaptation Plan			
Community Wildfire Protection Plan			
Comprehensive/Master Plan/Land Use Plan			
Continuity of Operations Plan			X
Drought Contingency Plan/Water Restriction Protocol		X	X
Economic Development Plan			X
Emergency Management Action Plan	X	X	X
Emergency Operations Plan	X		X
Evacuation Plan	X	X	
Extreme Heat Protocol	X	X	
Hazard Mitigation Plan	X	X	
Stormwater Management Ordinance/Plan			X
Transportation Plan	X	X	
Policies/Ordinances			
Building Codes	X	X	
Fire Code	X	X	
Flood Damage Prevention Ordinance	X		
Floodplain Ordinance			
Manufactured Home Restrictions			

Appendix B: Capability Assessment

Capability Item	Goliad County	Goliad ISD	Goliad WSC
Stormwater Ordinance			X
Subdivision Regulations	X	X	
Wildfire Ordinance			
Zoning Ordinance/Land Use Restrictions		X	X
Programs/Studies			
Firewise Community			
Floodplain Maps/Flood Insurance Studies (FIS)			
H&H Studies			
Mutual Aid Agreements	X	X	
National Flood Insurance Program (NFIP) Participant			
Public Education and Awareness Programs			X
Storm Drainage System Maintenance Program			X
StormReady Community			
Warning System/Services (outdoor warning sirens/reverse 911, etc.)	X	X	

Appendix C: Critical Facilities

Overview 1

Overview

This Appendix is For Official Use Only (FOUO) and may be exempt from public release under FOIA. Table C-1 shows all critical facilities identified in the risk assessment by type and location, based on input from Planning Team members. Goliad ISD and Goliad WSC reported no critical facilities and are therefore not included.

Table C-1: Goliad County Critical Facilities List

Critical Facility Name	Address	City
Abrameit Building & Supply	453 N Jefferson St.	Goliad
Bum Phillips Charities	2981 S Riverdale Lane	Goliad
Dollar General	250 E Pearl St.	Goliad
Goliad Auto Parts	515 N Jefferson St.	Goliad
Goliad County Courthouse	127 N Courthouse Sq.	Goliad
Goliad County EMS	414 W Ward St.	Goliad
Goliad County Fairgrounds	925 S HWY 183	Goliad
Goliad County Food Pantry	611 E End St.	Goliad
Goliad County Franklin Street Annex	329 W Franklin St.	Goliad
Goliad County Library	320 S Commercial St.	Goliad
Goliad County Sheriff	701 E End St.	Goliad
Goliad Elementary	161 N Welch St.	Goliad
Goliad Family Practice	139 W Franklin St.	Goliad
Goliad Feed Co.	610 E End St.	Goliad
Goliad High School	746 Tiger Dr.	Goliad
Goliad ISD Administration	161 N Welch St.	Goliad
Goliad Middle School	659 N Tiger Dr.	Goliad
Goliad Pharmacy & Gifts	208 S Commercial St.	Goliad
Goliad Senior Citizen Center	601 W Pearl St.	Goliad
Goliad WSC – Berclair Water Plant		Goliad
Goliad WSC – Fannin Water Plant		Goliad
Goliad WSC – La Bahia Water Plant		Goliad
Julie Wimberly Homemaking Building	925 US HWY 183	Goliad
La Bahia Nursing & Rehabilitation	225 E Ward St.	Goliad
Lowe’s Market	400 W Pearl St.	Goliad

Appendix C: Critical Facilities

Critical Facility Name	Address	City
Municipal Auditorium	925 US HWY 183	Goliad
Wastewater Treatment Plant	501 S Mt. Auburn St.	Goliad
Whataburger	348 E Pearl St.	Goliad
The Learning House	144 S Market Street	Goliad
NTEX Construction	1751 US 59 N	Goliad
Circle K	420 E Pearl St.	Goliad
The Texan	534 E Pearl St.	Goliad
Chamber of Commerce	339 S Jefferson St.	Goliad
AG Med Supply	1552 US Hwy 59 N	Goliad
Best Western Inn & Suites	754 E Pearl St.	Goliad
Pct 1 County Barn	611 E End St.	Goliad
Pct 2 County Barn	16930 HWY 59	Goliad
Pct 3 County Barn	133 W 884	Weesatche
Pct 4 County Barn	10101 FM 1961	Goliad
Executive Inn & Suites	124 S Jefferson St.	Goliad
Goliad Animal Clinic	1592 US HWY 59 N	Goliad
Goliad County Rural Transit	329 W Franklin St.	Goliad

Appendix D: Public Survey Results

Overview	1
Public Survey Results	2

Overview

Goliad County prepared a public survey that requested public opinion on a wide range of questions relating to natural hazards. The survey was made available via the participating jurisdictions' websites. This survey link was also distributed at the public meeting.

A total of 12 surveys were collected, the results of which are analyzed in Appendix D. The purpose of the survey was twofold: 1) to solicit public input during the planning process, and 2) to help the jurisdictions identify any potential actions or problem areas.

All public survey results were discussed and shared with the Planning Team before finalizing the plan. These results are also provided below. The survey results provide information regarding the public's experience with natural hazards, their perceived hazards of concern, recommended mitigation actions, and additional valuable insights. Overall, this survey enhances the mitigation planning process by ensuring the plan properly represents the community, is informed through local knowledge, and promotes equity.

Appendix D: Public Survey Results

Public Survey Results

1. How long have you lived in Goliad County

● Less than 1 year	0
● 1-5 years	2
● 6-10 years	4
● More than 10 years	6



2. Are you familiar with hazard mitigation?

● Yes	6
● No	6



Appendix D: Public Survey Results

3. Have you ever been impacted by a disaster?

● Yes	8
● No	4



4. How concerned are you about future disasters in Goliad County?

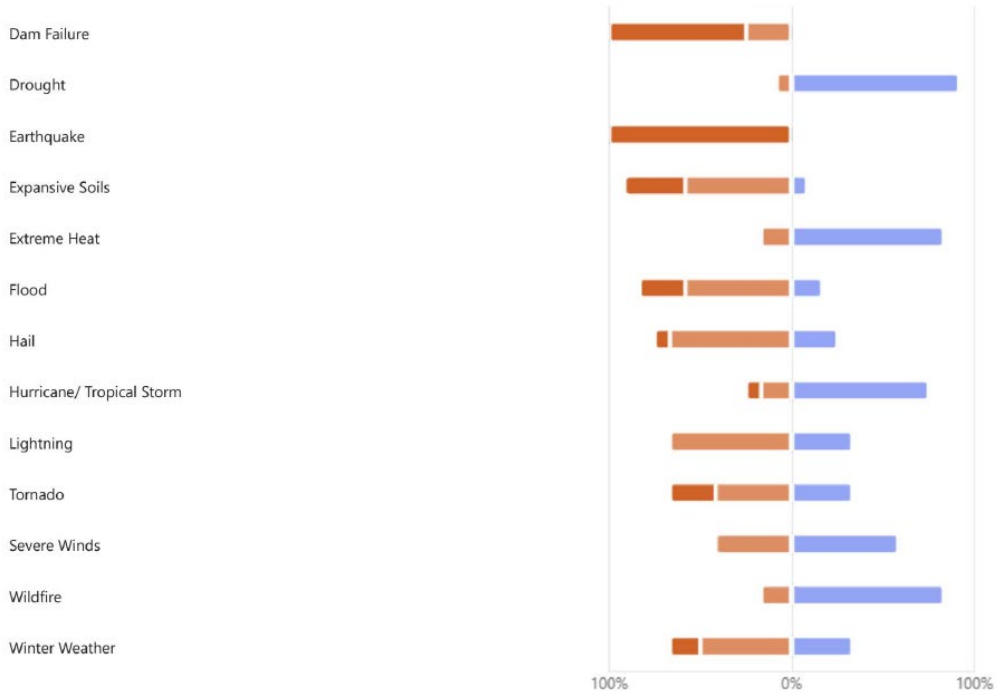
● Very concerned	5
● Somewhat concerned	6
● Neither concerned nor uncon...	1
● Somewhat unconcerned	0
● Very unconcerned	0



Appendix D: Public Survey Results

5. Rate your concern for each of the natural hazards listed below for Goliad County (0 point)

● Low ● Moderate ● High ● Don't know



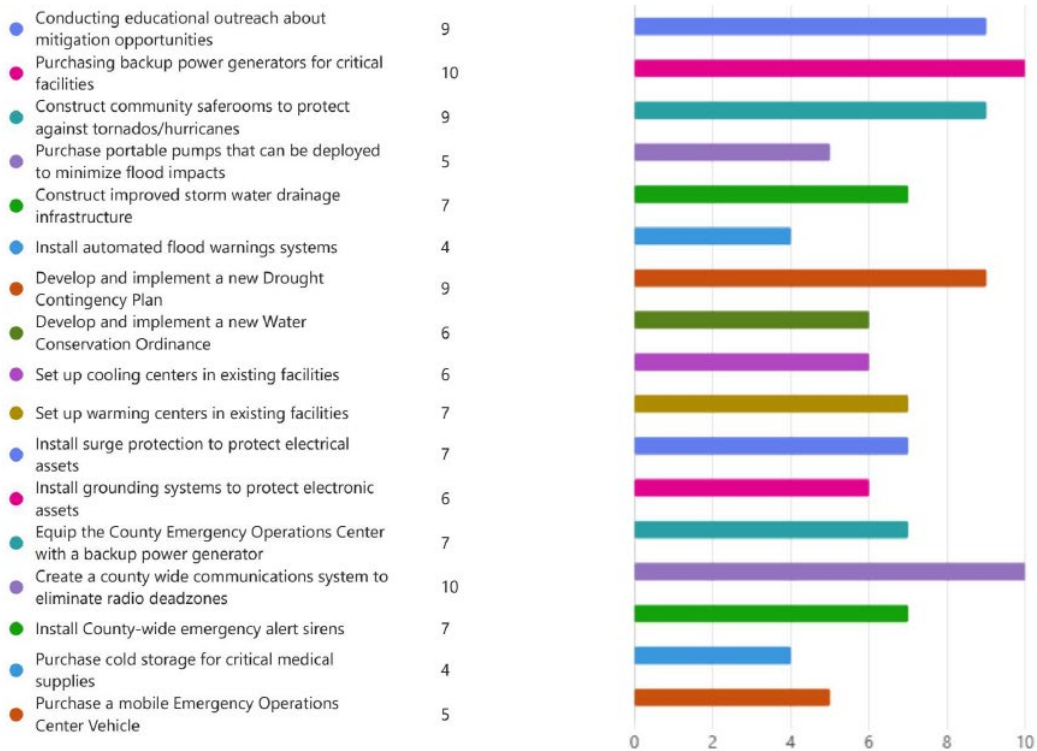
6. Are there other natural hazards you are concerned about? (0 point)

3
Responses

Latest Responses
"No"
...

Appendix D: Public Survey Results

7. Would you support Goliad County conducting any of the following hazard mitigation actions? (Select all that apply) (0 point)



8. Are there other hazard mitigation actions you would like Goliad County to consider? (0 point)

3
Responses

Latest Responses
"No"
...

9. Any additional comments or suggestions you would like to share with the planning team? (0 point)

3
Responses

Latest Responses
"No more taxes for these projects"
...