Thank you for joining our Aransas County HMAP Bluebeam Review Session. Your feedback is important to us.

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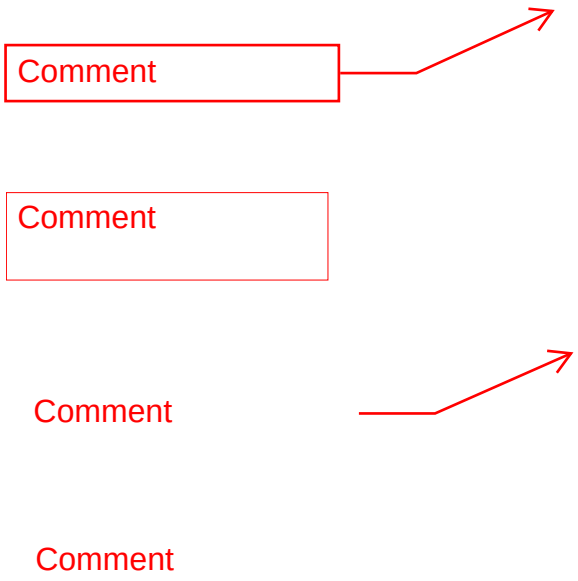
Contact me if you need guidance with Bluebeam tools, Laura Casset 512-633-7606



Comments are marked in red. If additional clarification is needed a note will be added in green. Once the comment has been addressed it will be marked with a yellow highlight. The final checker will then add a blue check mark to indicate that the comment was read, addressed, and incorporated into the final document.

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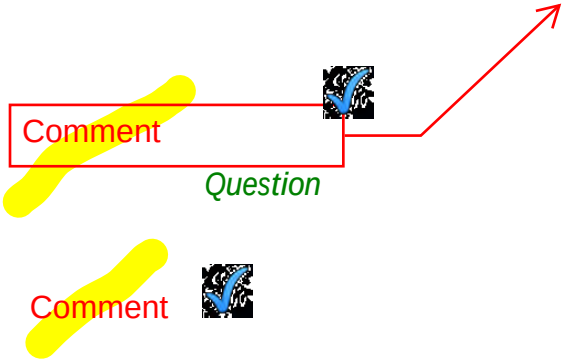

Aransas County Texas
Multi-Jurisdictional
Hazard Mitigation Action Plan

10/2/2017

Lockwood, Andrews & Newnam, Inc.
A LEO A DALY COMPANY

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Section 1: Overview

Introduction

Planning Area

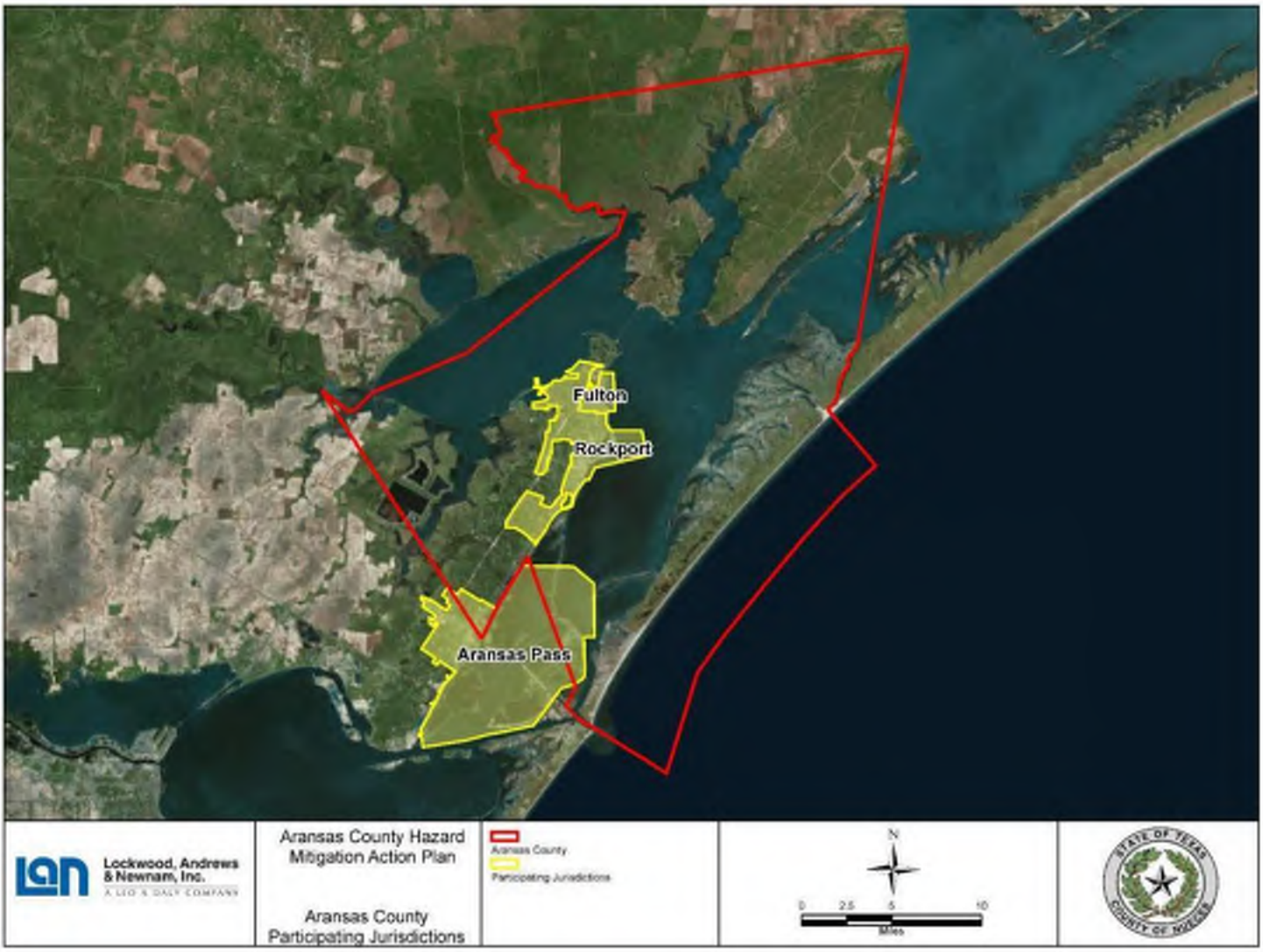
Aransas County is located on the south central coast of Texas, and has a land area of 252 square miles and a water area of 276 square miles.

Figure 1-1. Aransas County Location Map

Aransas County's previous Hazard Mitigation Action Plan, or Plan, was part of the regional plan sponsored by Coastal Bend Council of Governments (CBCOG). Due to state preference that plans may not include more than one county, Aransas County has chosen to prepare a new countywide multi-jurisdictional Plan for 2017. Participating jurisdictions in the Aransas County Multi-Jurisdictional Plan are:

- Unincorporated Aransas County,
- Aransas Pass,
- City of Fulton, and
- City of Rockport.

Figure 1-2. Planning Area Map



The multi-jurisdictional plan approach is effective in addressing natural hazard risk because the participating jurisdictions generally face the same natural hazards, have similar assets, and have successfully partnered in the past.

Plan Participants

At least one representative and one staff member from each participating jurisdiction forms the Planning Team. For purposes of defining roles, stakeholders are individuals or groups that are vested in and affected by a mitigation action or policy. Examples of stakeholders include business owners, chamber of commerce, neighborhood associations, Red Cross, hospital districts, and private organizations. Public outreach

also plays an important role in the Plan development. Stakeholders and the public were encouraged to participate in the development of the Plan. Section 2 includes a list of Planning Team members and activities and meetings held that involved the Planning Team and the public.

Hazard Mitigation Action Planning

Aransas County and the jurisdictions therein are susceptible to a wide range of natural hazards, including floods, hurricanes and tropical storms, drought, extreme heat, lightning, coastal erosion, hailstorms, tornados, and wildfire. These life-threatening hazards can destroy property, disrupt the economy, and lower the overall quality of life for residence. The impact of hazards can be lessened in terms of their effect on people and property through effective hazard mitigation action planning and implementation. This Plan provides an opportunity for Aransas County and the other participating jurisdictions to evaluate successful mitigation actions and explore opportunities to reduce future disaster loss.

Scope

The focus of the mitigation action plan is to reduce future losses within Aransas County by identifying mitigation strategies based on a detailed hazard risk analysis, including both an assessment of regional hazards and vulnerability. The mitigation strategies seek to identify potential loss-reduction opportunities. The goal of this effort is to work towards more disaster-resistant and resilient communities throughout Aransas County.

The scope of the hazards considered herein are those associated with natural hazards. Other planning frameworks exist in the region for hazards not addressed here, including man-made hazards such as security concerns, critical infrastructure protection, hazardous materials response, medical and public health response to terrorism. Agencies and organizations who may be contacted for further information on these topics include local emergency management agencies, Local Emergency Planning Committees (LEPCs), law enforcement agencies, fire departments, state and public health departments, local drinking water suppliers, local offices of the Texas Commission on Environmental Quality, the U.S. Coast Guard, and the Coastal Bend Council of Governments.

Section 2: Planning Process

Plan Development

Mitigation planning involves bringing together community leaders to identify natural hazards threatening their community and define key actions to implement with the goal of achieving a more disaster-resistant community. This section provides an overview of the planning process, highlighting key steps as well as providing a detailed description of how stakeholders and the public were involved.

Planning Team

A group discussion was held on May 1, 2017, immediately following the Grant Award Kick off meeting with participating jurisdictions, and Lockwood Andrews and Newnam (LAN) to identify Planning Team members. The Planning Team members identified include one member from each of the participating jurisdictions (see Table 2-1). Additionally, the discussion included identifying Plan stakeholders, discussing options for engaging the public, and setting a date for the plan kickoff meeting. The group also reviewed and discussed the previous hazards and mitigation actions included in the 2012 regional Coastal Bend Council of Governments (CBCOG) Plan.

Planning Team members were asked to attend all workshops scheduled during the planning process; any Planning Team members that did not attend scheduled workshops were contacted by phone or email and given a copy of the meeting's PowerPoint Presentation. Some of the responsibilities of the Planning Team included: completing Capability Assessment Surveys, providing a public survey to the general public, providing input regarding the identification of hazards, ranking hazards, identifying critical facilities, identifying mitigation goals, and developing new mitigation strategies.

The Aransas County Multi-Jurisdictional Plan was organized using a direct representative model, as Aransas County acted as the direct representative for participating jurisdictions in this effort. Each participating jurisdiction also had a local planning team to execute planning tasks at the local level.

Table 2-1. Planning Team

JURISDICTION	POSITION OR TITLE	AGENCY
Aransas County	Emergency Management Coordinator	Emergency Management
City of Aransas Pass	City Planner	Community Development
City of Fulton	Community Planner	Development Services Department
City of Rockport	Community Planner	Development Services Department

Planning Process

In 2012 the CBCOG coordinated a regional HMAP process and secured FEMA approval for participating Counties (including Aransas) and Cities (including Aransas Pass, Fulton, and Rockport). Recognizing the need for a new plan, because of a state preference for plans to be no larger than one county, the Aransas County Emergency Management Coordinator began informal discussions between other Emergency Management Coordinators within Aransas County and their jurisdiction's interest in participating in a joint HMAP process. Based upon the shared interest in planning together, Aransas County submitted a Hazard Mitigation Grant Program (DR-4245) to support the cost of hiring a consultant to assist with the planning process and plan development. Each participating jurisdiction included a letter of support for the grant. FEMA, via TDEM, awarded the grant in May 2017 and the process to create an Inter-local agreement also took place to share the cost and define responsibilities across the jurisdictions. All participating jurisdictions had their governing boards approve the Inter-local agreement and sign onto the planning process in fall of 2015 (including appointment of their HMAP planning team representatives and their local planning team). Also during fall 2015 a request for proposals for consultant services to develop a hazard mitigation action plan. Several proposals were received and evaluated and LAN was selected and awarded the contract.

The process used to prepare this Plan included the following steps outlined in the Local Mitigation Plan Review Guide (FEMA, 2013). After the Planning Team was organized, a Capability Assessment Survey was developed and distributed at the Kick-Off Workshop on July 6, 2017. Both the Planning Team and public ranked hazards. Specific mitigation strategies were discussed at the Mitigation Workshops on August 17, 2017 and August 22, 2017. Finally, Plan Maintenance and implementation procedures were developed and are included in Section 18. A schedule of planning activities is included as Table 2-2.

Table 2-2. Schedule of Planning Tasks

Timeline	Service/Deliverable
July 6, 2017	Kickoff Meeting Held, Capability Assessment issued; identified and evaluated hazards; begin drafting Plan
August 17, 2017	Risk Assessment Workshop Held for Planning Team; Reviewed the Risk Analysis Results; Reviewed Mitigation Strategy objectives
August 22, 2017	Mitigation Strategy Workshop Held for Planning Team; Reviewed and completed mitigation worksheets
October 2, 2017	Plan Draft provided to Planning Team for review and comment
October 13, 2017	Submitted Plan Draft to TDEM for review
November 3, 2017 *(assuming FEMA review completed)*	FEMA Approval of Plan; Participating jurisdictions adopt Plan by resolution

Kickoff Workshop

The Planning Team Kickoff Workshop was a Public Meeting that was held in Aransas County Commissioner's Court Chambers in the City of Rockport on July 6, 2017. Adjacent jurisdictions were invited to attend by the Aransas County Emergency Management Coordinator. Aransas County served as the coordinating jurisdiction on behalf of the planning team. The initial meeting provided an opportunity to inform participating jurisdictions officials and key department personnel about how the planning process pertained to their distinct roles and responsibilities, and also to involve stakeholder groups and the general public. In addition to the kickoff presentation, participants received the following information:

- Project overview regarding the planning process;
- Public survey access information;
- Hazard ranking form;
- Capability Assessment survey for completion.

A hazard ranking exercise was conducted at the Kickoff public meeting to get input from residents and rank natural hazards affecting the planning area. Participants ranked hazards in terms of level of risk, frequency of occurrence, and potential impact. Overall, residents ranked Hurricanes/Tropical Storms as the highest hazard risk followed by

Floods, Drought, Windstorms, Extreme Heat, Lighting, Coastal Erosion, Tornado, Hailstorms, Wildfire, and Severe Winter Storms.

The Planning Team Kickoff Workshop was well-attended, with members from each of the participating jurisdictions present. Efforts were made to document key participants. The following table highlights participants for each jurisdiction. For a comprehensive list of meeting attendees, meeting handouts, and documentation refer to Appendix D.

Table 2-3. Kickoff Workshop Participation Summary

JURISDICTION	KEY PARTICIPANTS		PARTICIPATION
	POSITION OR TITLE	AGENCY	
Unincorporated Aransas County	Emergency Management Coordinator	Office of Emergency Management	✓ Present for Plan Overview ✓ Received Public Survey Access Information ✓ Participated in Hazard Ranking Exercise ✓ Received Capability Assessment
City of Aransas Pass	Community Planner	Community Development	✓ Present for Plan Overview ✓ Received Public Survey Access Information ✓ Participated in Hazard Ranking Exercise ✓ Received Capability Assessment
City of Fulton	Community Planner	Developmental Services	✓ Present for Plan Overview ✓ Received Public Survey Access Information ✓ Participated in Hazard Ranking Exercise ✓ Received Capability Assessment

JURISDICTION	KEY PARTICIPANTS		PARTICIPATION
	POSITION OR TITLE	AGENCY	
City of Rockport	Community Planner	Developmental Services	✓ Present for Plan Overview ✓ Received Public Survey Access Information ✓ Participated in Hazard Ranking Exercise ✓ Received Capability Assessment

Hazard Identification

Hazard identification and ranking was a major component of the Plan Kickoff Meeting. Following the Kickoff Meeting the Planning Team reviewed the public input received concerning the hazard ranking and formulated the final ranked list of natural hazards to be incorporated into the Plan. Hazards identification is documented in detail in Section 3 of this Plan.

Risk Assessment

A preliminary risk assessment for the Aransas County Multi-Jurisdictional Plan was completed in August 2017 and the results were presented to Planning Team members at a workshop on August 17, 2017. The resulting risk assessment profiled hazard events, provided information on previous occurrences, estimated probability of future events, and detailed the spatial extent and magnitude of impact on people and property. A hazard profile and vulnerability analysis for each of the natural hazards can be found in Sections 5 through 16 in this Plan.

Mitigation Review and Development

The mitigation strategy development for the Plan involved creating mitigation goals and new mitigation actions. Previous mitigation actions from the CBCOG regional plan and the recently adopted Floodplain Management Plan, were reviewed as a baseline for new actions, goals, and objectives. The Planning Team reviewed their respective mitigation actions from the previous plan to determine projects that are still viable and may be included in the Aransas County Multi-Jurisdictional Plan.

An inclusive and structured process was used to develop and prioritize mitigation actions for this Plan, including the following steps:

1. Potential mitigation actions were developed and the list narrowed down to those that were most likely to be implemented, most cost-effective in reducing risk, and most likely to receive political and community support.
2. A Problem Statement was developed for each hazard to determine actions to mitigate the specific problem or risk, background information on why the action is needed was documented as well as who (by title) will oversee implementation of the project. Timeframe for implementation was defined and any obstacles to implementation such as local environmental groups opposing the project or lack of community support was identified.
3. Participants were provided an inventory of federal and state funding sources that could potentially assist in implementing the proposed mitigation actions. Planning Team Members considered benefits that would result from the mitigation actions versus the cost of those projects. Economic impact of implementing one action over another was a consideration.
4. Planning Team Members identified and prioritized proposed actions, costs and benefits, effects on existing buildings and future development, implementation schedules, and potential funding sources.

Table 2-4. Planning Team Meeting Attendance Summary

Jurisdiction	Kickoff & Public Meeting	Risk Assessment Workshop	Mitigation Strategy Workshop
Meeting Date	**July 6, 2017**	**August 17, 2017**	**August 22, 2017**
Unincorporated Aransas County	X	X	X
City of Aransas Pass	X	X	X
City of Fulton	X	X	X
City of Rockport	X	X	X

X = Attended. Detailed attendance records are included in Appendix C.

C = Did not attend.

Resources and Existing Plans

Resources

A variety of resources were utilized in compiling the data needed to perform the hazard analysis. Resources included FEMA, the United States Army Corps of Engineers (USACE), Texas A&M Forest Service, National Oceanic and Atmospheric Administration (NOAA), the 2011 National Land Cover Database, the Texas Water Development Board (TWDB), the Texas Geographic Society, the Texas State Data Center, the Texas Division of Emergency Management (TDEM), and local hazard event reports.

Incorporation of Existing Plans

Current projects and studies were utilized as a starting point for discussing mitigation actions and how to incorporate the Plan into other local planning mechanisms such as budgetary, administrative, and development initiatives. Previous hazard events, occurrences, and hazard risk data were identified through NOAA's National Climatic Data Center (NCDC), Texas Geographic Society, U.S. Geographic Society, U.S. Department of Agricultural, local reporting, and other sources. The preliminary results were presented at the Risk Assessment webinar in order to facilitate a discussion to help participants develop actions for their jurisdiction. Furthermore, these studies were used as a starting point for suggesting grant and mitigation activities based on local and FEMA's Hazard Mitigation Assistance (HMA) funding.

Assessing Future Community Capabilities

Local capability to implement identified mitigation actions can be challenging. Communities can benefit from Mutual Aid Agreements with their neighboring County. This increases their capability to undertake and implement mitigation actions. Executing future cooperative agreements with the County and neighboring jurisdictions to maximize budget and grant monies was discussed at the Mitigation Strategy workshop.

Public and Stakeholder Involvement

An important component of 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 of successfully implemented mitigation actions. If citizens and stakeholders are involved they are more likely to gain a greater appreciation of the hazards present in their community and take steps to reduce their impact. Neighboring communities as well as local and regional stakeholders were invited via email and phone and provided an overview of the planning process and how they may work with participating jurisdictions

to apply for future project funding to implement mitigation projects relative to their specific hazard risks.

Stakeholders

The following groups represent a partial list of organizations invited to provide input into the Plan.

Table 2-5. Plan Stakeholders

JURISDICTION / ENTITY	TITLE
Unincorporated Aransas County	Emergency Management Coordinator/Assistant County Engineer
City of Aransas Pass	Floodplain Manager, Community Planner
City of Fulton	Emergency Management Coordinator/Mayor
City of Rockport	Mayor/City Planner/Director of Public Works
Rockport Parks Department	Parks Director
Aransas County Navigation District	Chairman
Aransas County School Superintendents	Superintendent ACISD
Mission-Aransas Reserve	Advisory Board
Aransas County AgriLife Extension	County Coordinator

Public Participation

Public involvement in the development of the plan included two public meetings prior to Plan approval and adoption. Public input was sought using three methods: open public meetings; public survey; and the draft Plan was made available for public review on the Aransas County website, as well as other social media platforms.

Reaching the segment of the public without access to computers or the Internet was a consideration in garnering public support. In addition to the copies of the draft Plan hosted on planning partner websites, planning partners held paper copies so citizens without internet access had an opportunity to review the plan. Articles were developed for the local newspaper and posted to news websites. Public Meetings Notices and information regarding the project were also posted through normal public notification channels. Plan publicity was shared to social media platforms and community websites.

Public Participation Survey

In addition to the open public meetings, Aransas County Multi-Jurisdictional Plan participants were able to solicit input from citizens and stakeholders through the use of a

Public Survey. The survey was designed to obtain data and information from the residents of participating jurisdictions. Participating communities solicited surveys through their websites. Copies of the survey were distributed by local officials and at public meetings. A total of 70 responses to the survey were completed which provided valuable input in the development of the Plan. A summary of the survey findings is provided in Appendix B.

Public feedback assisted in driving the direction of hazard profiling, developing mitigation actions for areas of concern expressed in the survey, and allowed for the community to voice their concerns and involve those interested in the HMAP for the participating jurisdictions future involvement. Public feedback was also used in the cost-benefit analysis and prioritization of mitigation actions by factoring public opinion into the ranking criteria.

Section 3: Hazard Identification and Risk Assessment Overview

Hazard Identification

The purpose of this section is to provide background information for the hazard identification process, as well as descriptions for the natural hazards identified.

Upon a review of the full range of natural hazards suggested under FEMA planning guidance, the participating jurisdictions identified 12 hazards that are to be addressed in the Plan. These hazards were identified utilizing input from Planning Team members, and a review of the current State of Texas Hazard Mitigation Plan ("State Plan").

Table 3-1. Hazard Descriptions

HAZARD	RANKING	DESCRIPTION
Hurricanes/ Tropical Storms	1	Hurricanes and tropical storms are intense tropical weather systems that produce damaging winds, generate storm surge, and heavy rainfall.
Flood	2	A flood is the accumulation of water within a body of water, which results in the overflow of excess water onto adjacent lands, usually floodplains. The floodplain is the land adjoining the channel of a river, stream, ocean, lake or other watercourse susceptible to flooding. Flooding is the partial or complete inundation of otherwise normally dry land. Types of flooding include riverine, coastal, and shallow flooding.

Table 3-1. Hazard Descriptions (Cont.)

HAZARD	RANKING	DESCRIPTION
Drought	3	Droughts can be classified as meteorological, hydrological, agricultural, or socioeconomic droughts. A meteorological drought is a reduction of precipitation from the expected average or typical precipitation patterns. A hydrologic drought occurs when below average rainfall impacts streams, lakes, reservoirs, and groundwater levels. Agricultural droughts are brought on by insufficient moisture in the soil, typically impacting crops. Socioeconomic droughts occur when water demand exceeds supply due to a precipitation-related supply shortfall. Droughts may initiate or exacerbate other hazards, such as extreme heat or wildfires.
Windstorms	4	A windstorm is a storm with high winds or violent gusts with little or no rain. The windstorm hazard excludes extreme wind events that occur with other wind-related natural hazards such as hurricanes, tropical storms, and tornados which are addressed elsewhere in this plan.
Extreme Heat	5	Extreme heat is the condition whereby temperatures hover ten degrees or more above the average high temperature in a region for an extended period. If extreme heat conditions persist, it may be considered a heat wave.
Lightning	6	Lightning is a sudden electrostatic discharge during an electrical storm between electrically charged regions of a cloud, between that cloud and another cloud, or between a cloud and the ground.
Coastal Erosion	7	Coastal erosion is the "loss of land, marshes, wetlands, beaches, or other coastal features within the coastal zone because of the actions of wind, waves, tides, storm surges, subsidence, or other forces"[1]. Coastal erosion may result in the temporary redistribution of coastal sediments, or the long-term loss of coastal sediments and sediment accumulation.

[1] Texas Natural Resources Code, Section 33.601

Table 3-1. Hazard Descriptions (Cont.)

HAZARD	RANKING	DESCRIPTION
Tornado	8	A tornado is a violently rotating column of air extending between, and in contact with, a cloud and the surface of the earth. Tornadoes have wind speeds of 250 miles per hour or more. Damage paths can be in excess of one mile wide and 50 miles long.
Hailstorm	9	Hail is a form of precipitation that occurs when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere where they freeze into ice. Nearly all severe thunderstorms produce hail aloft, though it may melt before reaching the ground. Multi-cell thunderstorms produce many hailstones, but not usually large hailstones. In the life cycle of the multi-cell thunderstorm, the mature stage is relatively short so there is not much time for growth of the hailstone. Supercell thunderstorms have sustained updrafts that support large hail formation by repeatedly lifting the hailstones into the very cold air at the top of the thunderstorm cloud. In general hail 2 inches (5 cm), a little larger than golf ball, or larger in diameter is associated with supercells. Non-supercell storms are capable of producing golf ball size hail. In all cases, the hail falls when the thunderstorm's updraft can no longer support the weight of the ice. The stronger the updraft the larger the hailstone can grow[2].
Wildfire	10	A wildfire is an uncontrolled fire almost exclusively fueled by natural vegetative fuels. Fuel may come in the form of grass, brush, or tress. Wildfire risk increases with high concentrations of connected fuels. Meteorological conditions such as high temperatures, low humidity, droughts, and high wind can also increase wildfire risk. Humans are the most common source of initial ignition in wildfires. Sparks from agricultural, industrial, or automobile activity may start a wildfire.

[2] NOAA

HAZARD	RANKING	DESCRIPTION
Severe Winter Storms	11	A severe winter storm event is defined as a storm with snow, ice, or freezing rain. Severe winter storms are rare for the Texas Coastal area. Sever winter storms may include snowstorms, blizzards, cold waves and ice storms. Snowstorms include four or more inches of snow in a 12-hour period. Blizzards are characterized by low temperatures and strong winds in excess of 35 mph with large amounts of drifting snow. A cold wave is a winter cold front with a drastic drop in temperature. An ice storm occurs when rain falls out of the warm and moist upper layers of the atmosphere into a cold and dry layer near the ground.[3]
Earthquake	12	Earthquake is a term used to describe both sudden slip on a fault, the resulting ground shaking and radiated seismic energy caused by the slip, or by volcanic or magmatic activity, or other sudden stress changes in the earth.[4]

Risk Assessment Overview

The risk assessment includes seven general parameters that are described for each hazard; description, location, extent, occurrence, probability, impact, and vulnerability.

Frequency of return, or probability, was calculated by dividing the number of events in the recorded time period for each hazard by the overall time period that the resource database recorded events.

Applicable hazard profiles include a description of a general vulnerability assessment. Vulnerability is the total of assets that are subject to damages from a hazard (based on historic recorded damages). Assets in the region were inventoried and defined in hazard zones where appropriate.

[3] State of Texas Mitigation Plan Update 2013
[4] https://earthquake.usgs.gov/learn/glossary/?term=earthquake

Section 4: Vulnerability Assessment Overview

Vulnerable Assets Overview

Vulnerable assets are those that are susceptible to damage and loss from hazard events. A community's vulnerability to a natural hazard is measured as a function of that community's existing and future vulnerable assets including, but not limited to, populations, critical and non-critical infrastructure, property, and systems. Quantifying existing assets is the first step in defining a community's vulnerability to natural hazards. Existing assets are defined below for the county and participating jurisdictions.

The City of Rockport is the county seat and the largest city in the county. Populations for the unincorporated county and participating jurisdictions are included in the Existing Asset sections below. A description of the county land cover is shown in Table 4-1.

Table 4-1 – Aransas County Land Cover[1]

Land Cover Type	Percent of Area
Residential	5%
Commercial and Industrial	0.2%
Agricultural	3%
Forested, Shrub, and Grassland	14%
Wetlands	25%
Unknown and Barren	4%
Water	49%

[1] Homer, C.G., Dewitz, J.A., Yang, L., Jin, S., Danielson, P., Xian, G., Coulston, J., Herold, N.D., Wickham, J.D., and Megown, K., 2015, Completion of the 2011 National Land Cover Database for the conterminous United States-Representing a decade of land cover change information. *Photogrammetric Engineering and Remote Sensing*, v. 81, no. 5, p. 345-354

Critical Facilities

For the purpose of hazard mitigation, FEMA defines critical facilities as hospitals, fire stations, police stations, courthouse, communications, and similar facilities where essential programs/services are provided. Other facilities such as public schools may be deemed by a community to be a critical facility as well. These facilities should be given special consideration when formulating regulatory alternatives and floodplain management plans. A critical facility should not be located in a floodplain if at all possible. If located in a floodplain it should be provided a higher level of protection so that it can continue to function and provide services during and after a flood. Hazard mitigation actions to mitigate risk to critical facilities located in the 100-year floodplain, or potentially impacted by future flood conditions, are included in this Plan by jurisdiction. Critical Facilities are tabulated in Appendix D of the Plan.

Unincorporated Aransas County Existing Assets

POPULATION*
4,914 (Unincorporated)

*Source: U.S. Census Bureau [2011-2015 American Community Survey 5-Year Estimates] Unincorporated Aransas County figure represents the balance of the total population in the county, less each individual jurisdiction participating in the plan.

CRITICAL INFRASTRUCTURE	
Type	**Quantity**
Major Roadways	69 Miles
Rail	3.8 Miles
Crop Land*	10,504 Acres; $952,941 Value

*Census of Agriculture, 2012 (The latest Agriculture Census published 2012)

NON-CRITICAL FACILITIES: PROPERTY*	
Commercial and Residential	
Parcels	**Total Improvement Value**
13,800	$777,545,526

*Aransas County Appraisal District, 2016 Appraisal Roll

City of Aransas Pass Existing Assets

POPULATION*
8,067

*Source: U.S. Census Bureau [2011-2015 American Community Survey 5-Year Estimates]

CRITICAL INFRASTRUCTURE	
Type	**Quantity**
Major Roadways	18 Miles
Rail	3.7 Miles
Crop Land*	10 Acres; $8,582 Value

*Census of Agriculture, 2012 (The latest Agriculture Census published 2012)

NON-CRITICAL FACILITIES: PROPERTY*			
Commercial		**Residential**	
Parcels	**Total Improvement Value**	**Parcels**	**Total Improvement Value**
604	$8,023,576	995	$11,325,380

*Aransas County Appraisal District, 2016 Appraisal Roll

City of Fulton Existing Assets

POPULATION*
1,319

*Source: U.S. Census Bureau [2011-2015 American Community Survey 5-Year Estimates]

CRITICAL INFRASTRUCTURE	
Type	**Quantity**
Major Roadways	2.75 Miles
Rail	0 Miles
Crop Land*	0 Acres; $0 Value

*Census of Agriculture, 2012 (The latest Agriculture Census published 2012)

NON-CRITICAL FACILITIES: PROPERTY*	
Commercial and Residential	
Parcels	**Total Improvement Value**
1,239	$122,408,970

*Aransas County Appraisal District, 2016 Appraisal Roll

City of Rockport Existing Assets

POPULATION*
9,992

*Source: U.S. Census Bureau [2011-2015 American Community Survey 5-Year Estimates]

CRITICAL INFRASTRUCTURE	
Type	**Quantity**
Major Roadways	31 Miles
Rail	4.8 Miles
Crop Land*	46 Acres; $111,476 Value

*Census of Agriculture, 2012 (The latest Agriculture Census published 2012)

NON-CRITICAL FACILITIES: PROPERTY*			
Commercial		**Residential**	
Parcels	**Total Improvement Value**	**Parcels**	**Total Improvement Value**
1,634	$242,443,666	5,865	$737,234,996

*Aransas County Appraisal District, 2016 Appraisal Roll

Vulnerable Future Assets

Future growth and development in the county may affect hazard vulnerability. For identification of a community's future assets, it is useful to consider anticipated population growth, development trends, and planning and development management efforts. Based on population projections for the county planning area provided by the Texas State Data Center, the county, overall, is expected to shrink approximately 6% from 2015 to 2040.

Future assets is another important matrix to access a jurisdiction's vulnerability to natural hazards. With development comes the need to address the risk of natural hazards for larger populations and increased numbers of non-critical and critical facilities. Historically, hurricanes, tropical storms, and flooding has been a widespread problem for the Plan area; potential for these hazards creates limitations for urban land uses. A goal of community officials in the Plan area is to develop strategies to ensure that future development has reduced risk of impact by natural hazards while not inhibiting community growth. Vulnerability including potential dollar losses is defined for each hazard by jurisdiction in Sections 5 through Section 16 of this Plan.

Section 5: Hurricane and Tropical Storms

Hurricane and Tropical Storms Hazard Overview

Description

Hurricanes and tropical storms are intense tropical weather systems that produce damaging winds, generate storm surge, and heavy rainfall.

Location

Hurricanes and tropical storms do not have a specific geographic boundary and can occur throughout the county uniformly. It is assumed that the county planning area including all participating jurisdictions are uniformly exposed to hurricane and tropical storm activity. According to FEMA Wind Zones in the United States, the entirety of Aransas County is identified as a Hurricane-Susceptible Region and is located in Wind Zone III, associated to winds as high as 200 mph.

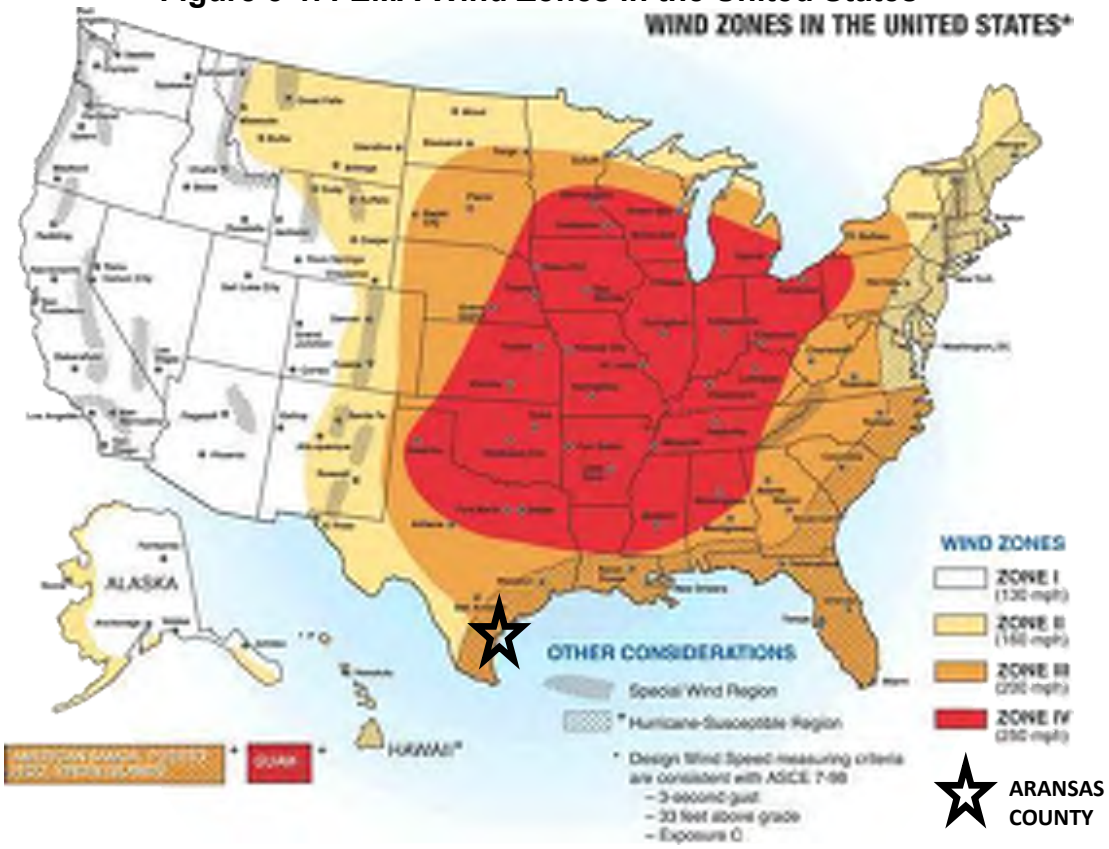
The effects of a hurricane can be felt as far as 150 miles from the center of the storm. The most damaging effects of a storm, both in terms of wind damage and storm surge, are likely to be felt within the radius of maximum wind (RMW). The average RMW of Atlantic hurricanes has been observed to be about 30 miles[1]. A 30-mile buffer applied to the storms that have occurred in the planning area encompasses the entire planning area. Consequently, the entire planning area should be considered at risk of hurricane or tropical storm damage.

In the late hours of August 25, 2017, Hurricane Harvey made landfall as a Category 4 hurricane near the City of Rockport. At the time of this Plan development, the initial recovery efforts have only just begun. Official statistics for damages, deaths, and injuries have yet to be finalized and released. The numerical figures presented in this report do not reflect the impact of Hurricane Harvey. Even without statistical support, it is clear that the impacts of Hurricane Harvey are devastating. It is only the lack of complete data that

[1] Source: A Note on the Radius of Maximum Wind for Hurricanes, S.A. Hsu and Zhondge Yan, 1998

prevents a thorough, quantitative assessment of Hurricane Harvey from being included in this Plan.

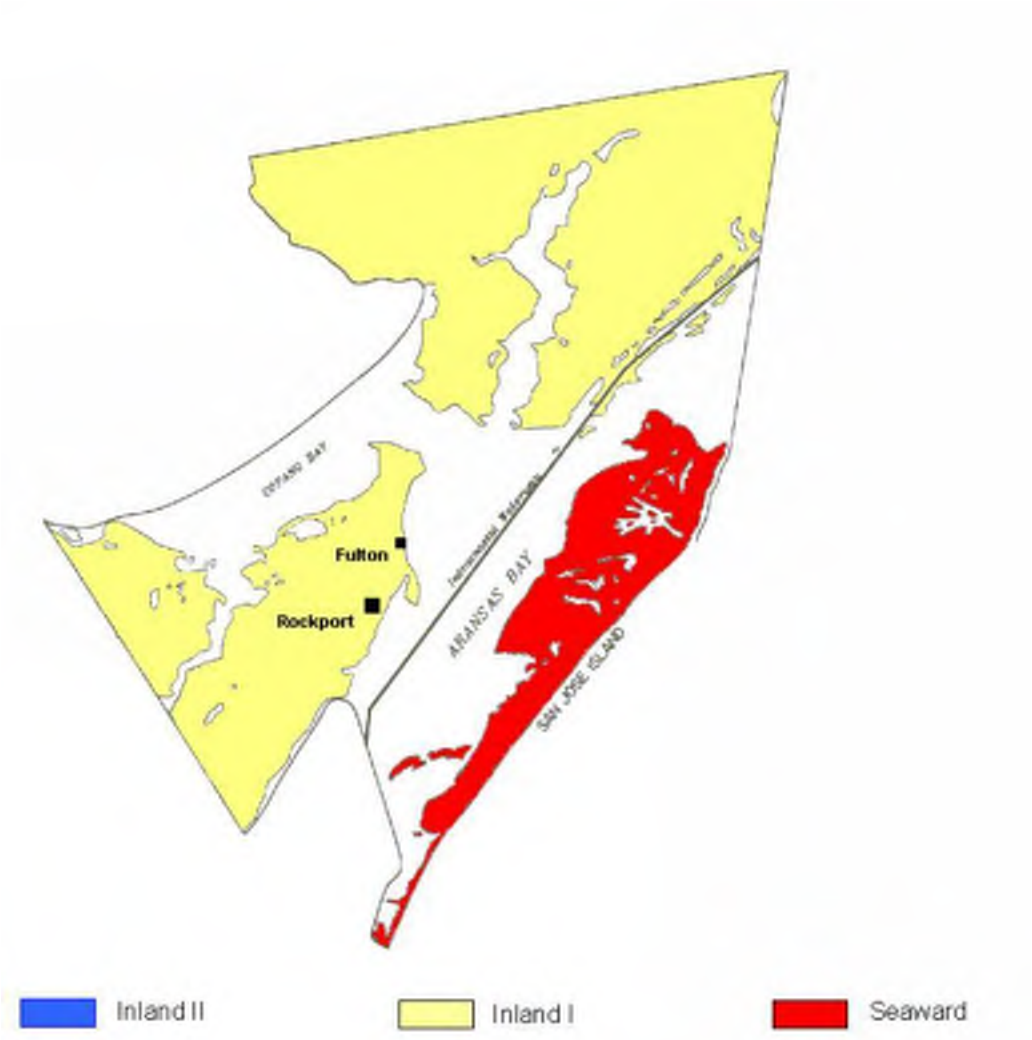
Figure 5-1. FEMA Wind Zones in the United States



The Texas Windstorm Insurance Association (TWIA) was established under the Texas Department of Insurance (TDI) by the Texas Legislature in 1971 following Hurricane Celia. TWIA provides windstorm and hail insurance along the Texas seacoast. Recommended design and inspection requirements for structures along the coast have been developed by TDI based on historical damages. Three designated catastrophe areas have been defined for Aransas County. Designated catastrophe areas are established for territories subject to unusually frequent and severe damage resulting from windstorm or hailstorms. Designated catastrophe areas for Aransas County include: Seaward and Inland I. Adopted design wind speeds for these designated catastrophe areas are shown in Figure 8-2 and defined below:

- Seaward: 130 mph 3-second gust design wind speed
- Inland I: 120 mph 3-second gust design wind speed

Figure 5-2 TDI Designated Catastrophe Areas



Extent

Hurricane intensity is categorized by the Saffir-Simpson Scale, ranked 1 – 5, in order of lowest to highest wind speed. This scale, while it is based on a limited suite of characteristics of hurricane intensity, provides an informative framework with which hurricanes can be discussed. Category 3, 4, and 5 storms are considered to be the most dangerous hurricanes. There is a significant potential for property damage and loss of life associated with Category 3 -5 storms. Only 20% of the total tropical hurricane landfalls are from Category 3-5 storms, yet Category 3-5 storms have caused 70% of the hurricane-related damage in the United States. Category 1 and 2 storms, while generally not as dangerous as Category 3-5 storms, still require consideration and preparation. For example, Hurricane Ike was a Category 2 storm, yet was the third most destructive hurricane to make landfall in the United States. Table 5-1 describes Saffir-Simpson Scale hurricane categories and associated storm surge estimates.

Table 5-1. Saffir-Simpson Hurricane Wind Scale[2]

Category	Maximum Sustained Wind Speed (MPH)
1	74-95
2	96-110
3	111-129
4	130-155
5	157+

Occurrences

The typical Atlantic hurricane season runs from June to October. While the majority of storms occur within this range, storms have occurred outside of this window. Between 1851 and 2015, a total of 21 unique storms crossed the planning area. A detailed breakdown of storms by intensity and jurisdiction is presented in Table 5-2.

Table 5-2. Historical Occurrences[3]

Hurricanes and Tropical Storms Intersecting Planning Area (1851 – 2017)							
Jurisdiction	**Total Storms**	**Tropical Storms & Depressions**	**Category 1 Hurricanes**	**Category 2 Hurricanes**	**Category 3 Hurricanes**	**Category 4 Hurricanes**	**Category 5 Hurricanes**
Aransas County	21	6	7	2	4	2	1

Probability

The annual probability and reoccurrence intervals of tropical storms and hurricanes is presented in Table 5-3. Probability and reoccurrence intervals are calculated by dividing the number of events by the observation period. It should be noted that these probabilities reflect the previous occurrence of the center of a storm tracking over a jurisdiction. In actuality, due to the size of these storms, the impacts would be felt across the planning area.

Table 5-3. Reoccurrence Probability for Planning Area

Annual Probability of Storms by Jurisdiction							
Jurisdiction	**Future Storms**	**Tropical Storms & Depressions**	**Category 1 Hurricanes**	**Category 2 Hurricanes**	**Category 3 Hurricanes**	**Category 4 Hurricanes**	**Category 5 Hurricanes**
Aransas County	12.7%	3.6%	4.2%	1.2%	2.4%	1.2%	0.6%

[2] Landsea, C.W., Pielke, R.A. Jr., Mestas-Nunez, A.M., Knaff, J.A. (1999) Atlantic Basin Hurricanes: Indices of Climatic Changes. *Climactic Change*, 42:89-129.

[3] NOAA

Impact

Aransas County is a coastal county; the entire planning area will be vulnerable to the impacts of wind, surge, and rain brought on by hurricanes and tropical storms. While all jurisdictions are impacted by hurricanes and tropical storms, the impacts felt by each jurisdiction may vary depending upon the characteristics of a particular storm. Storm surge travels with the storm and may make landfall ahead of the center of the storm. Storm surge can cause severe flooding in coastal areas; impacting the jurisdictions along the coast.

Additionally, hurricanes and tropical storms produce large amounts of rain. This rain can overwhelm drainage systems. Even hurricanes or tropical storms that have weakened after making landfall can continue to drop significant quantities of water. This water can lead to flooding.

The impacts to communities from a Category 5 storms could be near complete destruction of any and all assets. Houses and commercial property could be destroyed. In addition to the destruction of property, populations can be displaced if their homes are destroyed. Power and other utilities can be interrupted, even by lower category storms. Crops can be severely damaged, resulting in economic impacts.

Vulnerability

Due to Aransas County's location on the Texas coast and the size and power of hurricanes and tropical storms, particularly Category 4 and 5 storms, all assets within the participating jurisdictions are vulnerable to potential damage by hurricanes and tropical storms.

Unincorporated Aransas County Hurricane and Tropical Storms Hazard

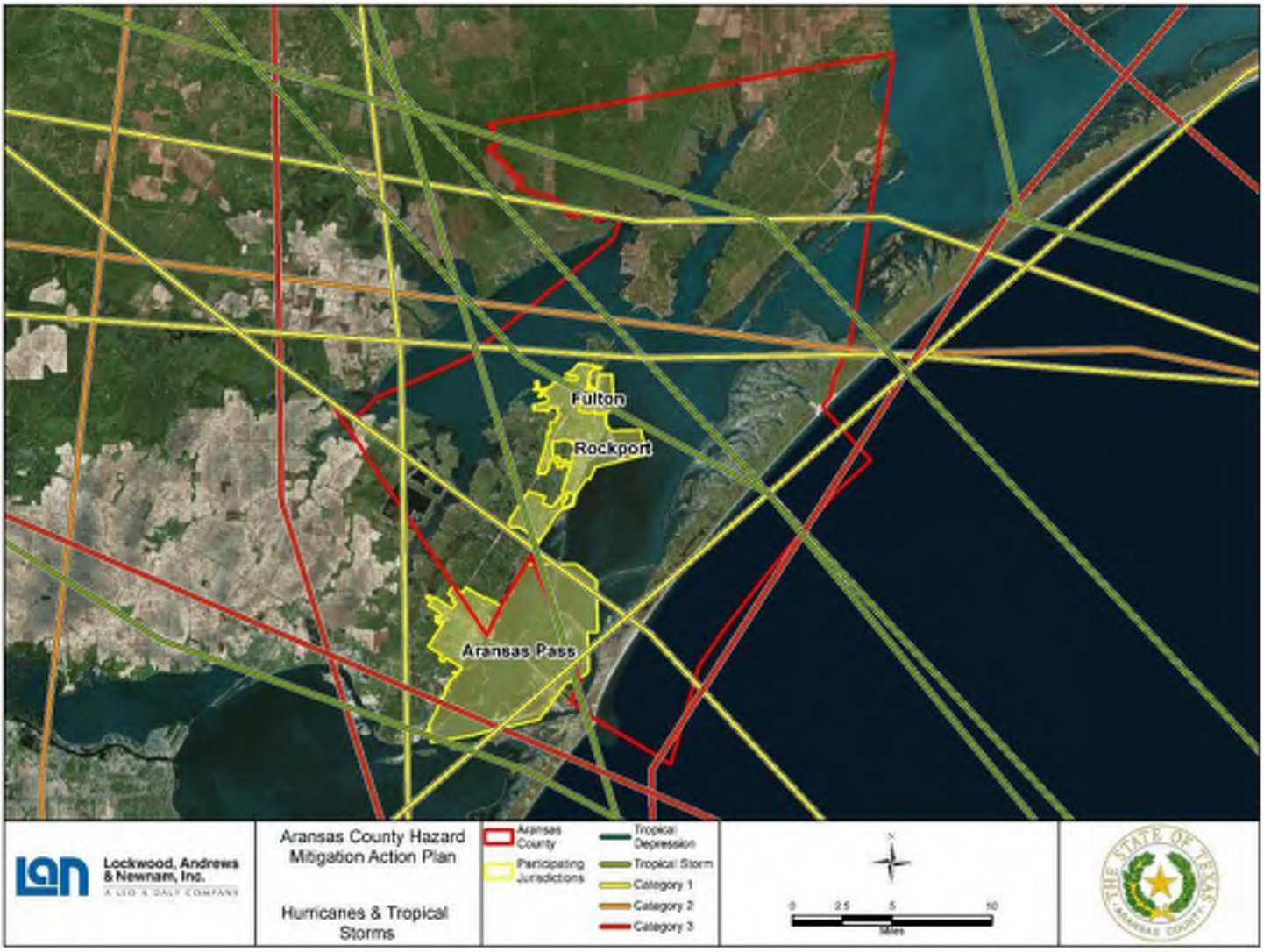
LOCATION	
Area at Risk	**Designated Catastrophe Area**
County Wide (Unincorporated)	Seaward and Inland I

OCCURENCE	EXTENT					
Total Storms	**Tropical Storms & Depressions**	**Category 1 Hurricanes**	**Category 2 Hurricanes**	**Category 3 Hurricanes**	**Category 4 Hurricanes**	**Category 5 Hurricanes**
21	6	7	2	4	1	1

PROBABILITY						
Future Storms	**Tropical Storms & Depressions**	**Category 1 Hurricanes**	**Category 2 Hurricanes**	**Category 3 Hurricanes**	**Category 4 Hurricanes**	**Category 5 Hurricanes**
13%	3.7%	4.3%	1.2%	2.4%	0.6%	0.6%

IMPACT & VULNERABILITY	
Total Population	**Land Area (Acres)**
5,551	316,489
Commercial and Residential Parcels	**Total Improvement Value**
13,800	$777,545,526
Crop Area (Acres)	**Crop Value**
10,504	$954,941
Highway (Miles)	**Railroad (Miles)**
69	3.8

Figure 5-3. Map of Hurricane & Tropical Storms for Unincorporated Aransas County (1842 – 2016)



City of Aransas Pass Hurricane and Tropical Storms Hazard

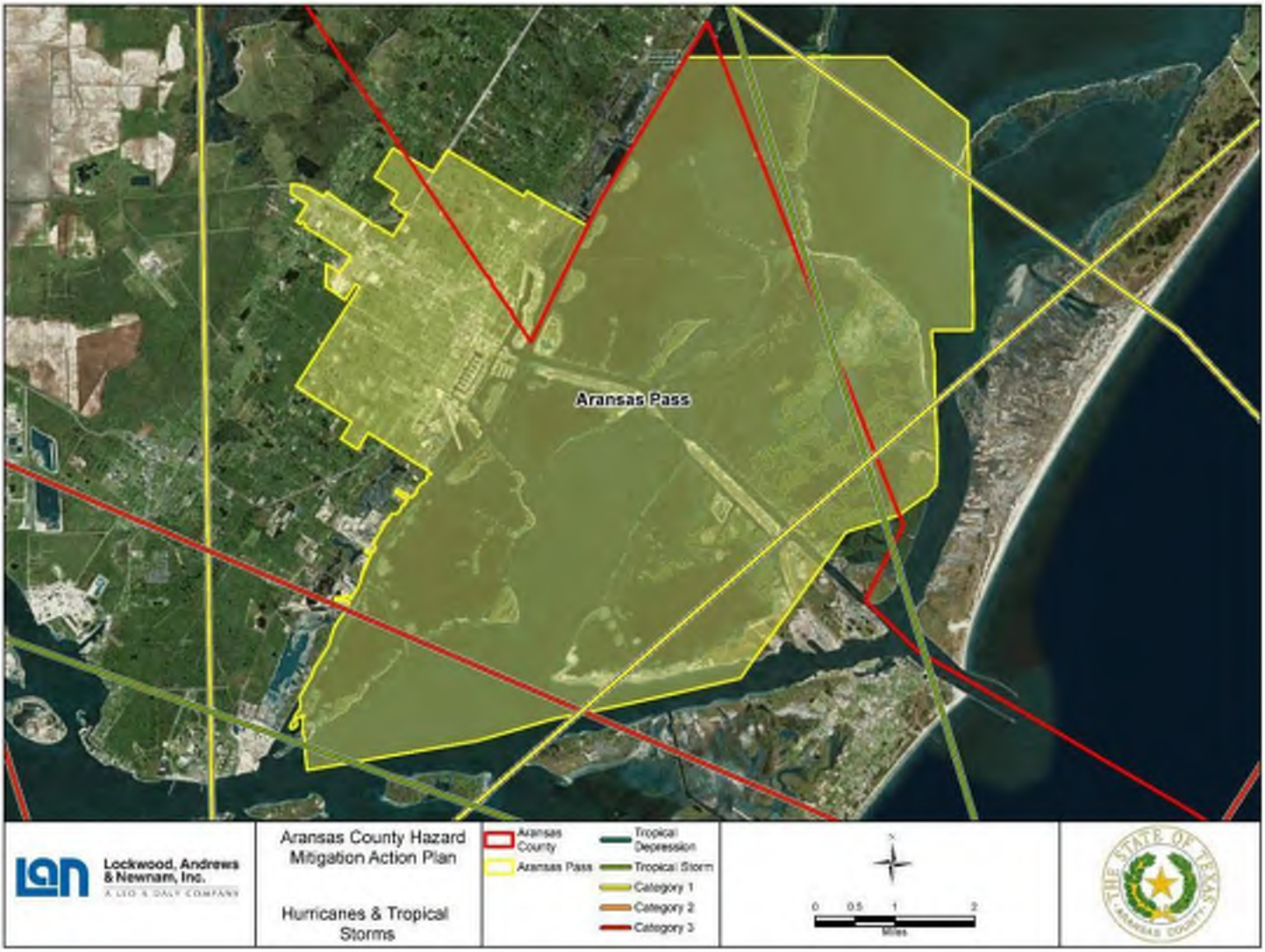
LOCATION	
Area at Risk	**Designated Catastrophe Area**
City Wide	Inland I

OCCURENCE	EXTENT					
Total Storms	**Tropical Storms & Depressions**	**Category 1 Hurricanes**	**Category 2 Hurricanes**	**Category 3 Hurricanes**	**Category 4 Hurricanes**	**Category 5 Hurricanes**
12	4	4	1	3	0	0

PROBABILITY						
Future Storms	**Tropical Storms & Depressions**	**Category 1 Hurricanes**	**Category 2 Hurricanes**	**Category 3 Hurricanes**	**Category 4 Hurricanes**	**Category 5 Hurricanes**
7.3%	4%	2.4%	0.6%	1.8%	0%	0%

IMPACT & VULNERABILITY	
Total Population	**Land Area (Acres)**
8,067	33,575
Residential Parcels	**Residential Total Improvement Value**
995	$11,325,380
Commercial Parcels	**Commercial Total Improvement Value**
604	$8,023,576
Crop Area (Acres)	**Crop Value**
10.01	$8,582
Highway (Miles)	**Railroad (Miles)**
18	3.7

Figure 5-4. Map of Hurricane & Tropical Storms for City of Aransas Pass (1842 – 2016)



City of Fulton Hurricane and Tropical Storms Hazard

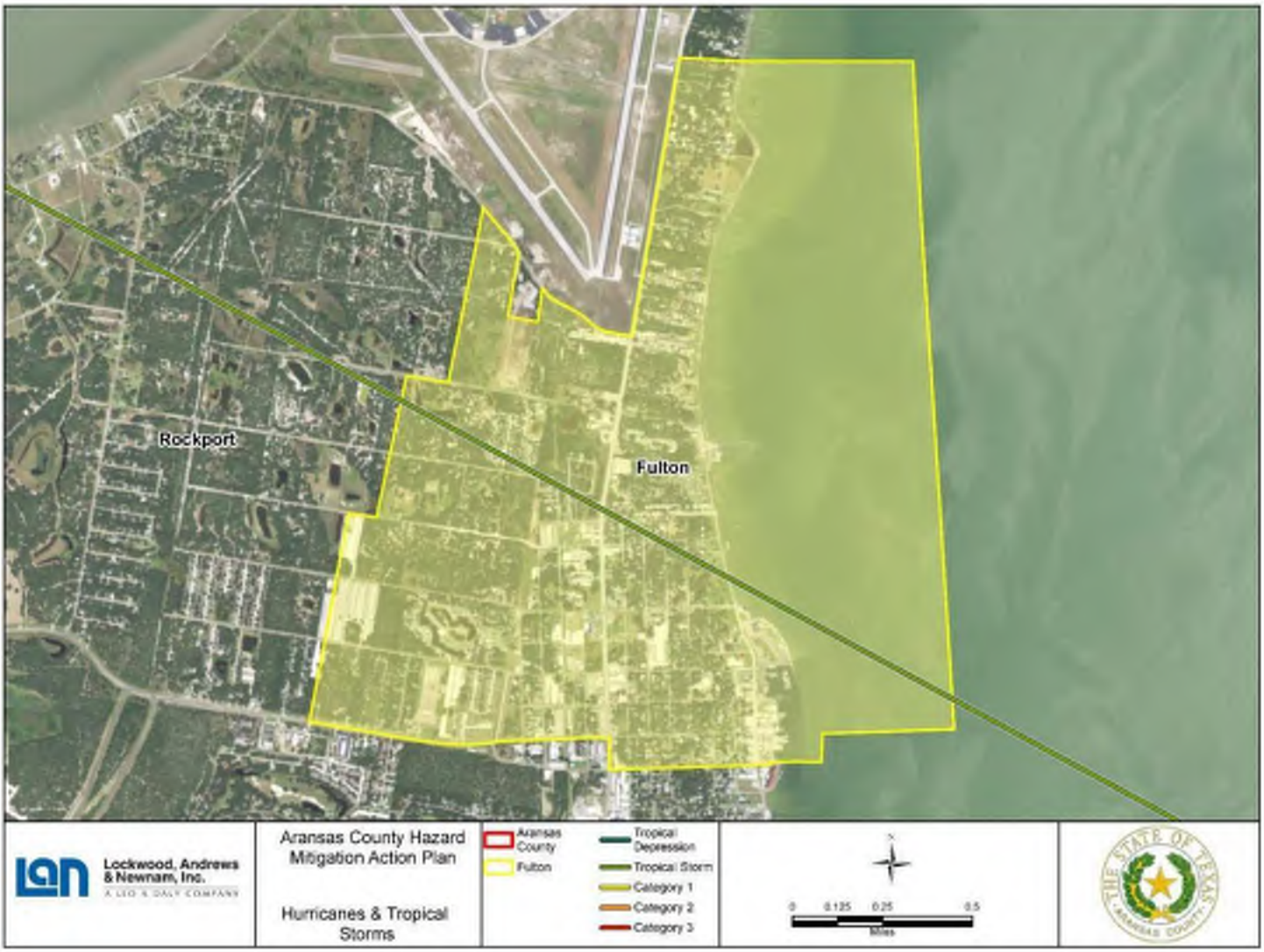
LOCATION	
Area at Risk	**Designated Catastrophe Area**
City Wide	Inland I

OCCURENCE	EXTENT					
Total Storms	**Tropical Storms & Depressions**	**Category 1 Hurricanes**	**Category 2 Hurricanes**	**Category 3 Hurricanes**	**Category 4 Hurricanes**	**Category 5 Hurricanes**
13	4	5	1	2	1	0

PROBABILITY						
Future Storms	**Tropical Storms & Depressions**	**Category 1 Hurricanes**	**Category 2 Hurricanes**	**Category 3 Hurricanes**	**Category 4 Hurricanes**	**Category 5 Hurricanes**
7.9%	2.5%	3%	0.6%	1.2%	0.6%	0%

IMPACT & VULNERABILITY	
Total Population	**Land Area (Acres)**
1,319	1,573
Commercial and Residential Parcels	**Total Improvement Value**
1,239	$122,408,970
Crop Area (Acres)	**Crop Value**
0	$0.00
Highway (Miles)	**Railroad (Miles)**
2.75	0

Figure 5-5. Map of Hurricane & Tropical Storms for City of Fulton (1851 – 2017)



City of Rockport Hurricane and Tropical Storms Hazard

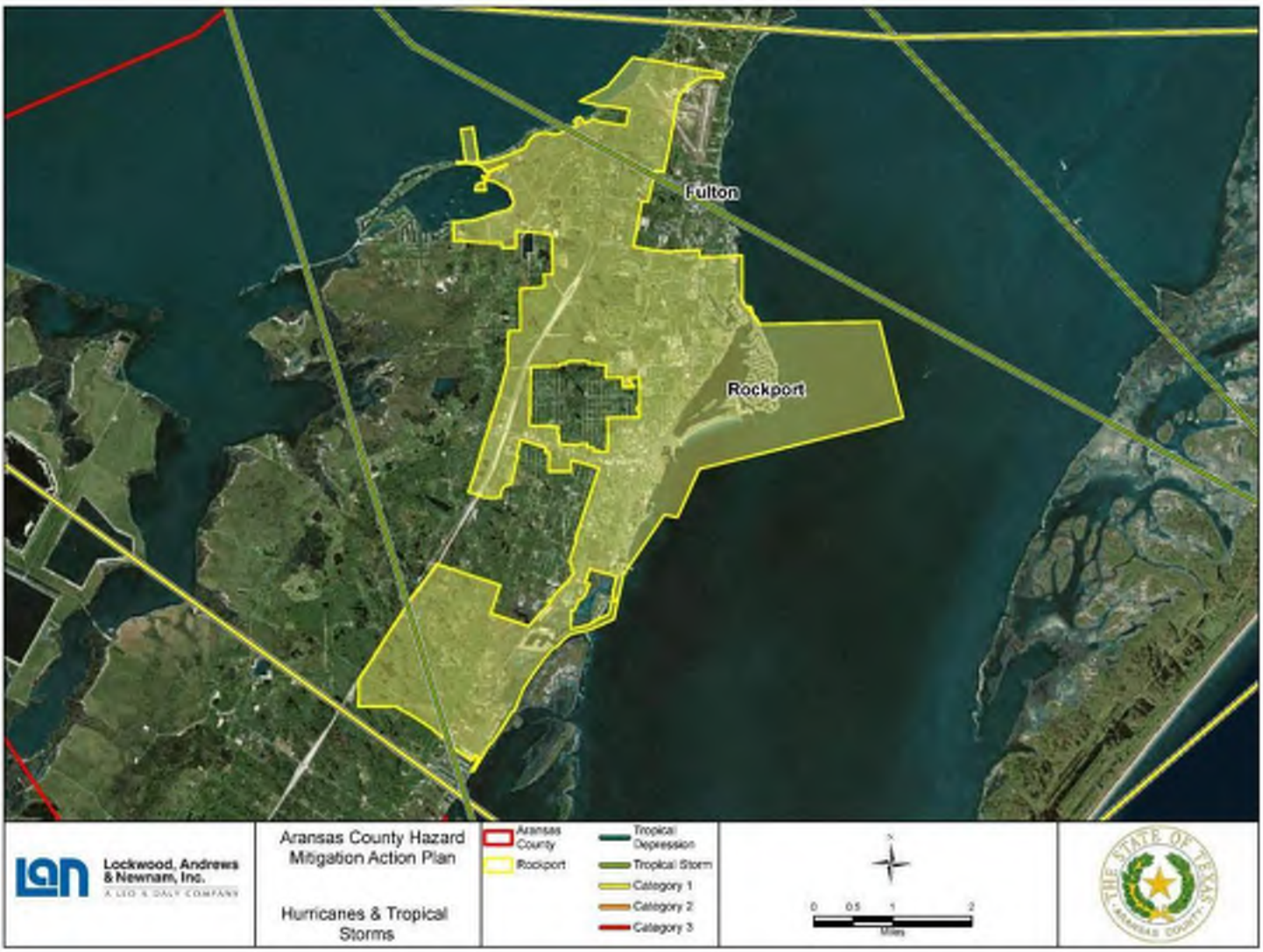
LOCATION	
Area at Risk	**Designated Catastrophe Area**
City Wide	Inland I

OCCURENCE	EXTENT					
Total Storms	**Tropical Storms & Depressions**	**Category 1 Hurricanes**	**Category 2 Hurricanes**	**Category 3 Hurricanes**	**Category 4 Hurricanes**	**Category 5 Hurricanes**
15	5	5	1	3	1	0

PROBABILITY						
Future Storms	**Tropical Storms & Depressions**	**Category 1 Hurricanes**	**Category 2 Hurricanes**	**Category 3 Hurricanes**	**Category 4 Hurricanes**	**Category 5 Hurricanes**
9.1%	3%	3%	0.6%	1.8%	0.6%	0%

IMPACT & VULNERABILITY	
Total Population	**Land Area (Acres)**
9,992	12,032
Residential Parcels	**Residential Total Improvement Value**
5,865	$737,234,996
Commercial Parcels	**Commercial Total Improvement Value**
1,634	$242,443,666
Crop Area (Acres)	**Crop Value**
46	$111,476
Highway (Miles)	**Railroad (Miles)**
31	4.8

Figure 5-6. Map of Hurricane & Tropical Storms for City of Rockport (1842 – 2016)



Section 6: Flood

Flood Hazard Overview

Description

A flood is the accumulation of water within a body of water, which results in the overflow of excess water onto adjacent lands, usually floodplains. The floodplain is the land adjoining the channel of a river, stream, ocean, lake or other watercourse susceptible to flooding. Flooding is the partial or complete inundation of otherwise normally dry land. Types of flooding include riverine, coastal, and shallow flooding. Three types of flooding occur in the planning area: 1) Coastal Flooding; 2) Flash Flooding; 3) Riverine Flooding.

Location

Sources of flooding in the Aransas County area include coastal flooding, riverine flooding, and flooding resulting from poor drainage, otherwise referred to as localized flooding. FEMA flood maps are the number one resource for defining location of flood hazard for a community. Current effective FEMA flood maps for Aransas County were released 2/17/2016. The Flood Map project is part of a nation-wide effort to update coastal flood risk data. In Texas, this project includes 17 of 18 coastal counties. New FIS data and modeling enable coastal counties and communities to make informed decisions regarding land use development, risk identification, and mitigation and recovery as it pertains to reducing hazard risk from flood.

Adoption of updated flood maps in conjunction with development of a new county-wide Hazard Mitigation Plan provides Aransas County and its communities an opportunity to coordinate and implement these two planning mechanisms into land use policies, regulations, and ordinances, and to alter the built environment to build resiliency to natural hazards over time. Higher regulatory standards may also be considered by communities to be more aligned with the county's regulations, and to more effectively, and responsibly, manage the local National Flood Insurance Program (NFIP).

This report section includes floodplain maps for each participating jurisdiction with the effective 2016 FEMA Flood Insurance Rate Maps (FIRMs) floodplain extents.

Extent

Magnitude of flood hazards is expressed in term of maximum flood depth experienced by the jurisdiction based upon historical records and FEMA Flood Insurance Studies. Generally, homes that are impacted by more than four feet of flood depth are considered by FEMA as a complete loss. Therefore, flood depth combined with number of homes impacted by floods is one measure of a community's vulnerability to flood damage. FEMA flood maps designated Special Flood Hazard Areas that indicate areas of the County that have a 1% annual chance of inundation. A 0.2% annual chance of inundation floodplain has also been designated by FEMA, further detailing the extent of flood hazards in Aransas County.

Occurrences

Flood occurrences in Aransas County are documented in several databases. The 2016 FEMA FIS for Aransas County contains coastal flooding information. The NCDC Storm Event Database reports flash flooding. The NCDC data reports include event details such as property damage, crop damage, injury and death. The State of Texas Hazard Mitigation plan also makes mention of a flash flood event in Aransas County.

As noted in Section 5, Hurricane Harvey made landfall in the planning area on the night of August 25, 2017. At the time of this Plan development, official damage, death, and injury figures have not been released. Due to this lack of data, figures from Hurricane Harvey are not discussed in this report. The Planning Team recognizes the significance of Hurricane Harvey. It is only a lack of complete data that prevents a full-scale, quantitative assessment of Hurricane Harvey from being included in this plan.

Table 6.1 through Table 6.6 identifies historic flooding events for Aransas County by flood source. Table 6.1 does not include all tropical cyclones to affect Aransas County; rather, it references the storms for which storm surge data in the area is available. Table 6.7 includes a summary of the flood related disaster declarations for Aransas County.

Table 6-1. FEMA Coastal Flooding Records

Storm Name	Date	Storm Surge Elevation in Aransas County (ft.)
1919 Storm	Sept. 2 – 15, 1919	11.1 - 16
1942 Storm	Aug. 21 –13, 1942	3.4
1945 Storm	Aug. 24 – 29, 1945	3.7
Hurricane Carla	Sept. 11, 1961	7.5 – 10.3
Hurricane Beulah	Sept. 5 – 22, 1967	6.0 – 6.5
Hurricane Celia	July 30 – Aug. 5, 1970	9.2 – 11.4
Hurricane Gilbert	Sept. 16 – 17, 1988	3.7
Hurricane Harvey	Aug. 25 – 26, 2017	Unknown

Table 6-2. Aransas County Flash Flooding Events

Start Date	Location	Property Damage	Local Rainfall Amount
04/3/1997	Rockport	N/A	8-12 in
10/09/1997	Countywide	$0	8-22 in
10/13/1997	Countywide	$0	8-22 in
09/16/1998	Rockport	$0	N/A
09/17/1998	Holiday Beach	$0	N/A
10/18/1997	Fulton	$0	N/A
10/18/1997	Rockport	$0	N/A
10/06/1997	Rockport	$0	N/A
08/23/1999	Rockport	$0	N/A
03/14/2000	Rockport	$0	7 in
11/04/2000	Rockport	$0	5.71 in
08/31/2001	Countywide	$0	N/A
10/28/2002	Countywide	$0	N/A
10/28/2002	South Central	$0	N/A
10/28/2002	Countywide	$0	N/A
05/08/2004	Countywide	$127,000	7 in
05/13/2005	Countywide	$0	4.81 in
03/06/2006	North Portion	$0	5.96 in
09/11/2005	Rockport	$0	2-3 in
05/29/2006	Rockport	$0	N/A
06/01/2006	Rockport	$0	4-6 in
07/05/2006	Rockport	$1,500,000	5-8 in
07/04/2007	Aransas Refuge	$0	4-10 in
11/19/2009	Airport	$0	4-8 in
01/15/2010	Rockport	$0	2-4 in
09/19/2010	Rockport	$0	7 in
09/20/2010	Rockport	$0	7 in
09/29/2013	Rockport	$0	2-3 in
03/21/2015	Rockport	$0	2.65 in
04/14/2015	Rockport	$0	3.14 in
05/22/2015	Rockport	$0	.44 in
06/17/2015	Rockport	$100,000	4.36 in

Table 6-3. Riverine Flooding Flood Categories for Copano Creek near Refugio (National Weather Service [NWS], Advanced Hydrologic Service, 2016)

Major Flood Stage:	17 feet
Moderate Flood Stage:	14 feet
Flood Stage:	12 feet
Action Stage:	5 feet

Table 6-4. Riverine Flooding - Historic Crests of Copano Creek near Refugio (NWS, Advanced Hydrologic Prediction Service, 2016)

Crest Rank	Feet	Date
1	21.00	09/12/1971
2	18.60	12/31/1996
3	17.26	07/08/2007
4	17.00	12/31/1997
5	14.75	05/17/2004
6	14.28	11/23/2009
7	14.14	09/22/2010
8	14.12	05/18/2016
9	14.02	07/04/2007
10	12.32	06/18/2015
11	12.27	04/10/2004
12	12.13	01/16/2010
13	12.00	12/31/1998

Table 6-5. Riverine Flooding - Flood Categories for Mission River at Refugio (National Weather Service [NWS], Advanced Hydrologic Service, 2016)

Major Flood Stage:	30 feet
Moderate Flood Stage:	26 feet
Flood Stage:	23 feet
Action Stage:	20 feet

Table 6-6. Riverine Flooding - Historic Crests of Copano Creek near Refugio (NWS, Advanced Hydrologic Prediction Service, 2016)

Crest Rank	Feet	Date
1	38.25	09/12/1971
2	36.50	09/21/1967
3	34.85	07/01/1990
4	33.30	07/07/1942
5	32.30	05/17/1938
6	32.30	08/01/1914
7	30.80	10/19/1998
8	29.95	07/06/2007
9	29.10	12/23/1992
10	28.52	05/15/2004
11	28.38	04/08/2004
12	28.18	04/05/1997
13	27.61	05/07/1966
14	26.53	06/18/1981
15	25.89	06/14/1981
16	25.86	06/23/1993
17	25.33	05/05/1981
18	25.22	03/20/1997
19	25.07	09/21/2010
20	24.95	07/08/1981
21	24.93	02/11/1993
22	24.80	04/19/1992
23	24.16	04/12/1985

Table 6-7. Aransas County Flood-Related Disaster Declarations

Disaster Number	Declaration Date	Incident Start Date	Incident End Date
246	07/05/1968	07/05/1968	07/05/1968
313	09/18/1971	09/18/1971	09/18/1971
603	09/25/1979	09/25/1979	09/25/1979
930	12/26/1991	12/20/1991	1/14/1992
4332	8/25/2017	8/23/2017	

Probability

Probability and frequency of return were calculated by dividing the number of flood events in the recorded time period for flood hazard by the overall time period that the resource database has recorded events. Estimated probability of future flood events has been calculated for each participating jurisdiction. The probabilities shown in the jurisdictional tables are based on previous occurrences documented by the NCDC database.

Impact

Impacts of flooding frequently include damage to people, property, buildings, and infrastructure. Flooding may cause bridge and road closures, service disruptions, and injuries and fatalities. Flood impacts are summarized in the jurisdictional tables. Disaster Declarations at the county level are detailed in Table 6-7.

Vulnerability

Asset vulnerability to flood for each jurisdiction can be found in the jurisdictional tables below. Major infrastructure is defined at critical utility lines (gas, water, etc.), highway, and rail access.

NFIP Participation

One of the most powerful tools businesses and homeowners have to protect themselves from flooding is flood insurance through the National Flood Insurance Program (NFIP). Aransas County and the participating jurisdictions participate in the NFIP.

Aransas County and participating jurisdictions have a total of 98 repetitive loss properties, having received a total of $5,613,920 in flood insurance payments. Repetitive Loss properties are properties that have received two or more payments of $1,000 within a ten-year period. Of those 98 repetitive loss properties, 14 are severe repetitive loss properties. Severe repetitive loss properties are properties that have received four NFIP

payments of over $5,000 each. A jurisdictional breakdown of repetitive and severe repetitive loss properties can be found in the summary table for each jurisdiction.

All participating jurisdictions have developed mitigation actions related to NFIP compliance and maintenance. These mitigation actions can be seen in Section 17. All participating communities identified flooding as a hazard of particular relevance. Consequently, numerous mitigation actions were developed to help mitigate the impacts of future floods. Many of these actions relate to continued compliance with the NFIP and public outreach projects that exceed the NFIP minimum standards. As a whole, the participating jurisdictions recognize the flood mitigation benefits of exceeding the NFIP minimum standards.

Unincorporated Aransas County Flood Hazard

LOCATION		EXTENT
Flooding Types	Major Flooding Source	Maximum Historical Flood Depth (Feet)
Riverine Localized Coastal	Aransas Bay Copano Bay San Antonio Bay	16

OCCURENCES	
Number of Floods (Range: 1950-2016)	Risk to Health and Safety (No. Incidences by Type)
33	0 deaths, 0 injuries

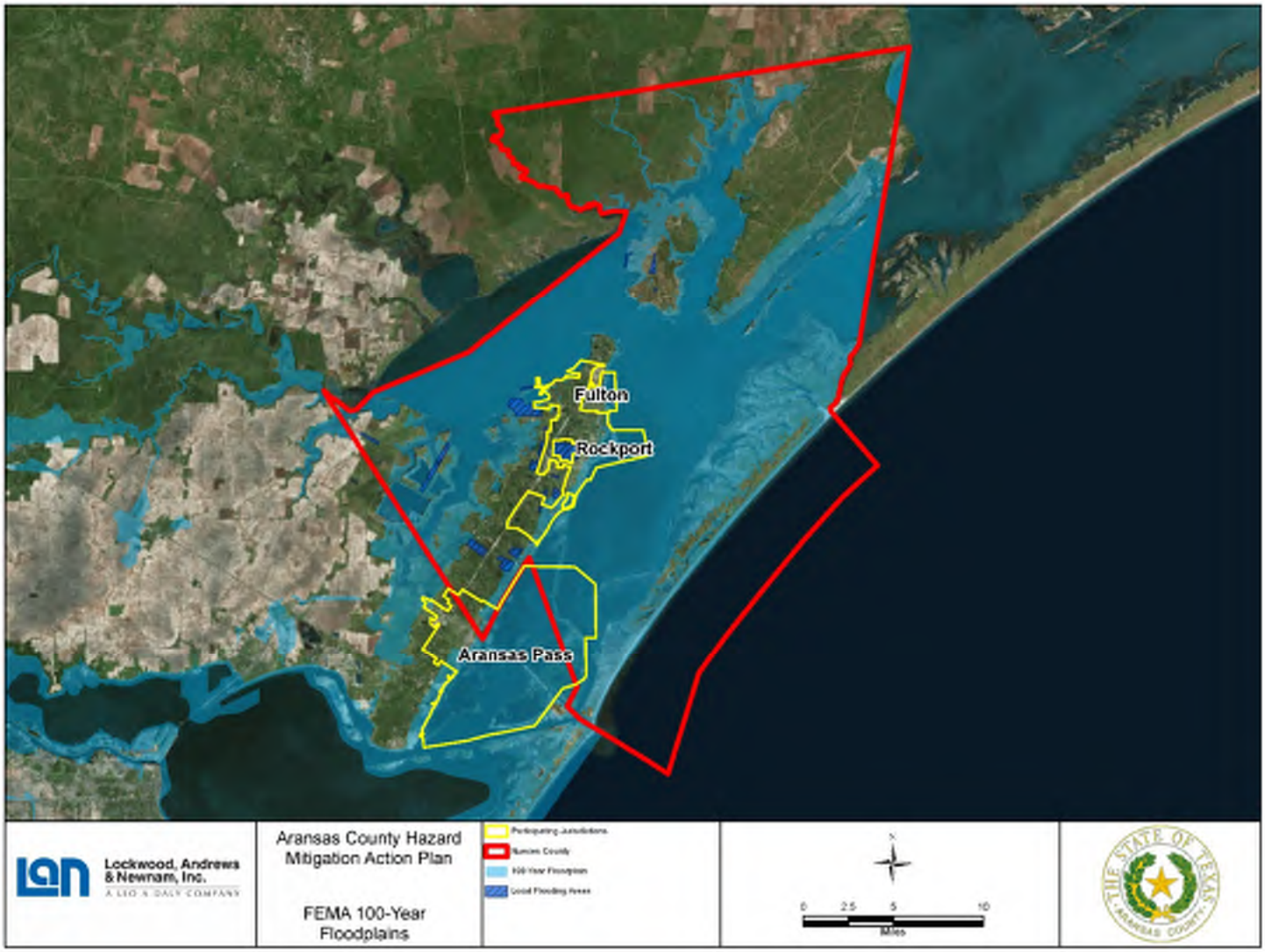
PROBABILITY	
Future Flood Events Likelihood	1 Flood X Years
50% annual chance	2

IMPACT			
Parcels in SFHA	Property Value in SFHA	Highway at Risk (Mile)	Railroad at Risk (Mile)
4,017	$214,757,356	13.5	3

VULNERABILITY			
Repetitive Loss Structures (No.)	Repetitive Loss Payments	Severe Repetitive Loss Structures (No.)	Severe Repetitive Loss Payments
29	$1,076,953	3	$508,499

Repetitive Loss Structure NFIP Occupancy Status	Number of Repetitive Loss Structures
Assumed Condominium	1
Other Residential	1
Other Nonresidential	2
Single Family Residential	25

Figure 6-1. Map of FEMA Floodplains for Unincorporated Aransas County



City of Aransas Pass Flood Hazard

LOCATION		EXTENT
Flooding Types	Major Flooding Source	Maximum Flood Depth (Feet)
Localized Riverine	Redfish Bay	11*

*based upon 500-year depth of flooding from FIS

OCCURENCES	
Number of Floods (Range: 1950 - 2016)	Risk to Health and Safety (No. Incidences by Type)
0	0 death, 0 injury

PROBABILITY	
Future Flood Events Likelihood	1 Flood X Years
1.5% annual chance**	66 years**

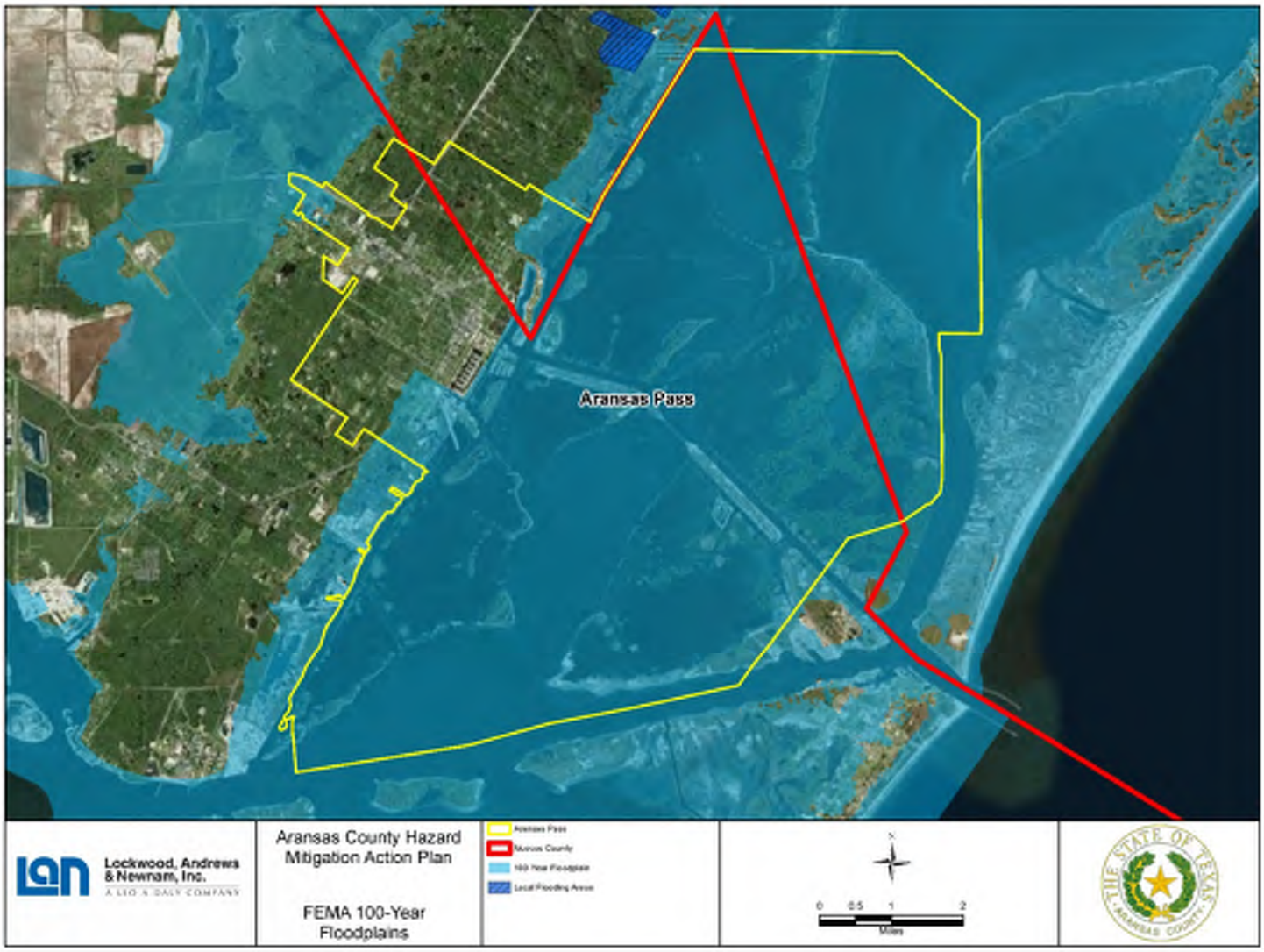
**based upon minimum non-zero probability in planning area

IMPACT			
Parcels in SFHA	Property Value in SFHA	Highway at Risk (Mile)	Railroad at Risk (Mile)
161	$4,188,889	0.74	0.8

VULNERABILITY			
Repetitive Loss Structures (No.)	Repetitive Loss Payments	Severe Repetitive Loss Structures (No.)	Severe Repetitive Loss Payments
45	$3,544,598	8	$2,112,381

Repetitive Loss Structure NFIP Occupancy Status	Number of Repetitive Loss Structures
Assumed Condominium	6
Other Nonresidential	14
Single Family Residential	25

Figure 6-2. Map of FEMA Floodplains for City of Aransas Pass



City of Fulton Flood Hazard

LOCATION		EXTENT
Flooding Types	Major Flooding Source	Maximum Flood Depth (Feet)
Coastal Localized	Localized Aransas Bay	16.5'*

*based upon 500-year depth of flooding from FIS

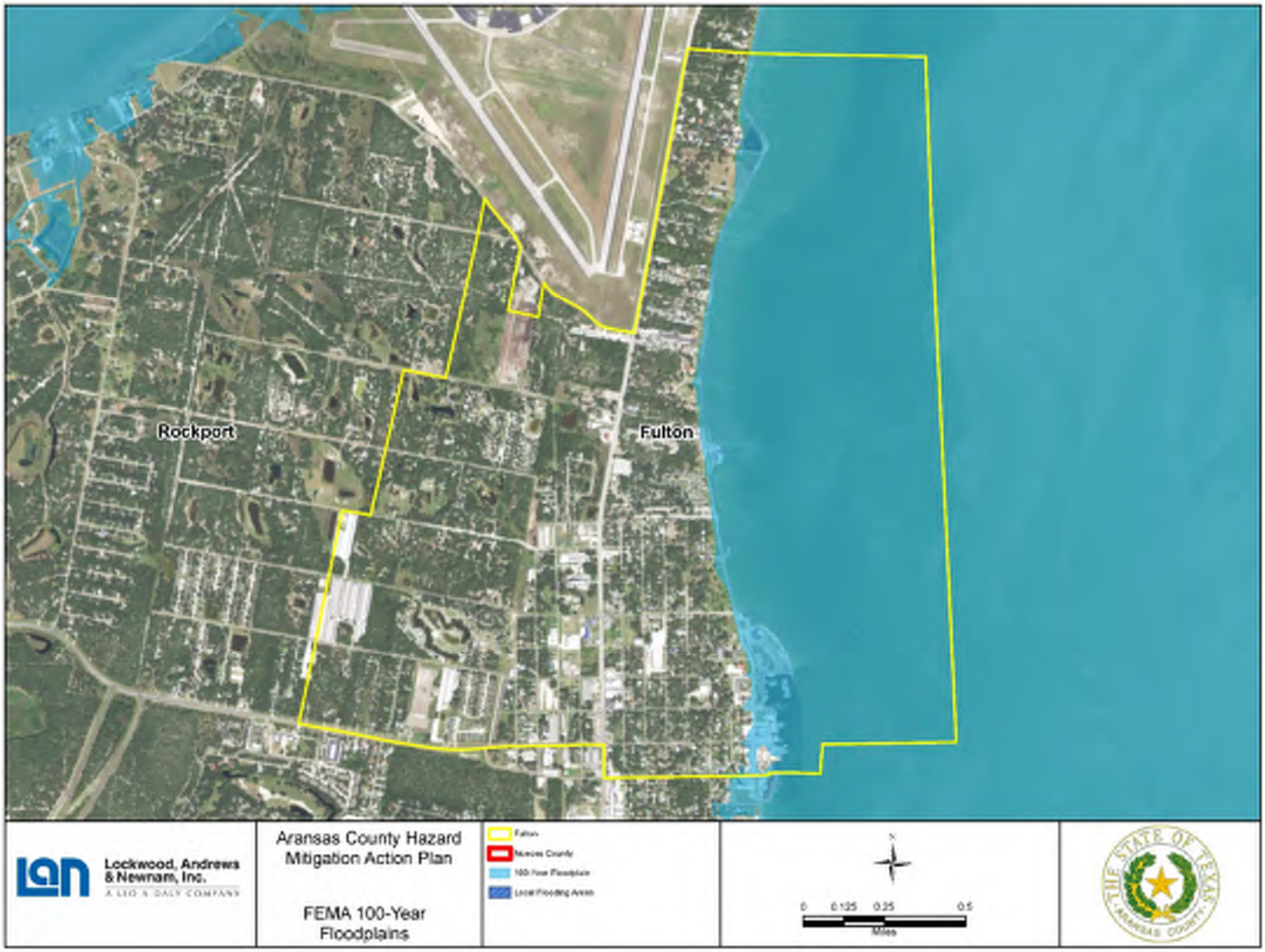
OCCURENCES	
Number of Floods (Range: 1950 - 2016)	Risk to Health and Safety (No. Incidences by Type)
1	0 death, 0 injury

PROBABILITY	
Future Flood Events Likelihood	1 Flood X Years
1.5% annual chance	66 years

IMPACT			
Parcels in SFHA	Property Value in SFHA	Highway at Risk (Mile)	Railroad at Risk (Mile)
29	$1,951,470	0	0

VULNERABILITY			
Repetitive Loss Structures (No.)	Repetitive Loss Payments	Severe Repetitive Loss Structures (No.)	Severe Repetitive Loss Payments
0	$0	0	$0

Figure 6-3. Map of FEMA Floodplains for City of Fulton



City of Rockport Flood Hazard

LOCATION		EXTENT
Flooding Types	Major Flooding Source	Maximum Flood Depth (Feet)
Localized Coastal	Aransas Bay Copano Bay	11

*based upon 500-year depth of flooding from FIS

OCCURENCES	
Number of Floods (Range: 1950-2016)	Risk to Health and Safety (No. Incidences by Type)
21	0 deaths, 0 injuries

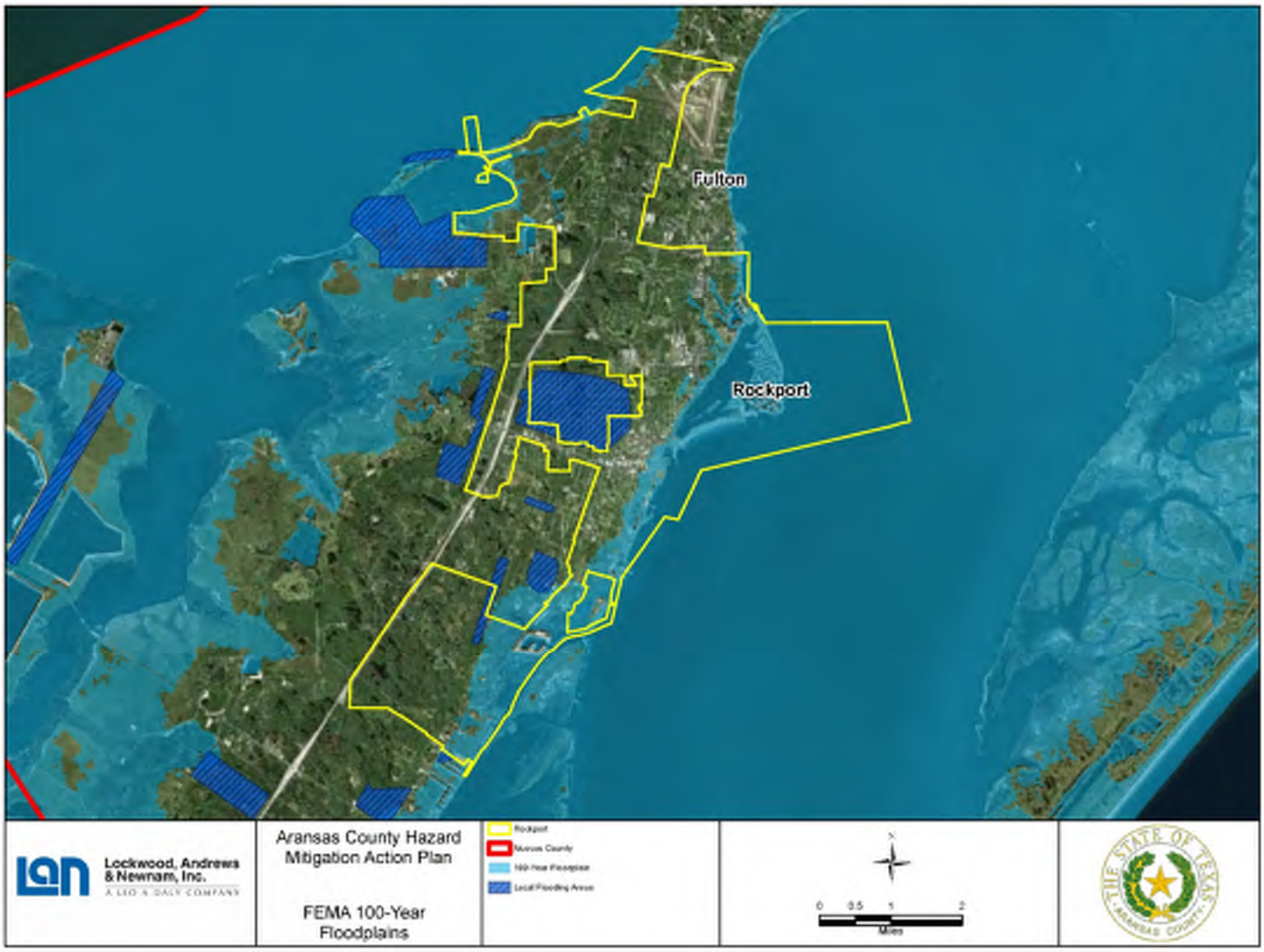
PROBABILITY	
Future Flood Events Likelihood	1 Flood X Years
32% annual chance	3.14 years

IMPACT			
Parcels in SFHA	Property Value in SFHA	Highway at Risk (Mile)	Railroad at Risk (Mile)
1,886	$218,889,447	3.75	3

VULNERABILITY			
Repetitive Loss Structures (No.)	Repetitive Loss Payments	Severe Repetitive Loss Structures (No.)	Severe Repetitive Loss Payments
24	$992,368	3	$295,137

Repetitive Loss Structure NFIP Occupancy Status	Number of Repetitive Loss Structures
Assumed Condominium	4
Business Nonresidential	1
Other Nonresidential	11
Single Family Residential	8

Figure 6-4. Map of FEMA Floodplains for City of Rockport



Section 7: Drought

Drought Hazard Overview

Description

Droughts can be classified as meteorological, hydrological, agricultural, or socioeconomic droughts. A meteorological drought is a reduction of precipitation from the expected average or typical precipitation patterns. A hydrologic drought occurs when below average rainfall impacts streams, lakes, reservoirs, and groundwater levels. Agricultural droughts are brought on by insufficient moisture in the soil, typically impacting crops. Socioeconomic droughts occur when water demand exceeds supply due to a precipitation-related supply shortfall. Droughts may initiate or exacerbate other hazards, such as extreme heat or wildfires.

Location

The spatial extent of a drought tends to be relatively large, often stretching across multiple counties. Consequently, the entirety of Aransas County is vulnerable to the impact of a drought. Crops and livestock are vulnerable to drought. Unincorporated Aransas County is the only jurisdiction within the planning area that has agricultural area. Additional information about agricultural vulnerability can be found in the jurisdictional tables.

Extent

The Palmer Hydrologic Drought Index is a value calculated monthly by NOAA. The PHDI index takes the balance between environmental water supplies and demands. The index typically ranges between -6 to +6. Negative numbers indicate a period of drought. Positive numbers indicate wet periods.

Table 7-1. Drought Extents

PHDI Value Range	Qualitative Drought Extent
0 to -0.5	Normal
-0.5 to -1.0	Incipient Drought

PHDI Value Range	Qualitative Drought Extent
-1.0 to -2.0	Mild Drought
-2.0 to -3.0	Moderate Drought
-3.0 to -4.0	Severe Drought
< -4.0	Extreme Drought

Occurrences

Droughts in Aransas County typically occur in the summer months. The months of May and June have the lowest average PHDI. Aransas County lacks a drought monitoring station; consequently, PHDI values for Aransas County are calculated by a distance-weighted average of nearby three North American Drought Monitor stations. Stations USW00012912 in Victoria County, USW00012924 in Nueces County, and USW00012935 in Matagorda County were used to calculate the PHDI values for Aransas County.

Table 7-2. Summary of Aransas County Drought Occurrences

Severity	Months on Record (1953 – 2017)	Percent of Total Time
Incipient Drought	49	6%
Mild Drought	75	10%
Moderate Drought	103	13%
Severe Drought	85	11%
Extreme Drought	27	3%
Total Months of Drought (PHDI <-1)	290	37%

Table 7-3. Aransas County Historical PHDI Values (1953 – 2017)

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
1953	-1.00	-0.88	-1.81	-2.18	-2.17	-2.10	-2.40	-0.42	-0.94	-0.55	-0.81	-0.71
1954	-1.14	-2.08	-2.33	-1.98	-2.20	-2.60	-3.07	-3.44	-3.52	-3.10	-3.29	-3.54
1955	-3.52	-3.25	-3.54	-3.84	-3.79	-4.16	-4.28	-4.05	-3.17	-3.19	-3.10	-3.29
1956	-3.33	-3.50	-3.69	-2.84	-2.83	-3.12	-3.34	-3.59	-3.94	-4.01	-4.10	-3.52
1957	-3.85	-3.76	-2.68	-2.04	-0.60	-0.49	-1.04	-2.00	-1.72	-1.41	-0.49	-0.80
1958	2.29	2.82	2.47	2.00	0.98	-0.11	-0.62	-2.10	-1.02	0.60	0.43	1.54
1959	1.34	2.42	1.92	2.10	2.09	2.12	2.29	3.00	2.25	2.69	2.30	2.21
1960	1.86	1.77	1.90	1.90	1.42	2.02	1.91	2.63	1.76	2.65	2.73	3.92
1961	3.86	3.78	3.01	3.02	2.18	2.62	3.38	3.16	2.57	1.58	1.63	0.07
1962	-0.90	-1.58	-2.28	-2.08	-2.54	-2.38	-2.81	-3.29	-3.07	-3.51	-3.49	-2.93
1963	-3.07	-2.85	-3.16	-3.52	-3.99	-3.61	-3.78	-3.75	-4.08	-4.27	-3.68	-3.40
1964	-3.05	-2.63	-2.33	-2.76	-2.73	-3.00	-3.03	-2.75	-2.22	-2.49	-2.77	-2.38
1965	-2.35	-1.53	-1.47	-1.76	-1.71	-1.85	-2.05	-2.32	-2.53	-2.54	-2.49	-1.83
1966	-1.13	-0.40	-0.62	0.55	1.65	1.84	2.17	2.48	1.74	0.98	-1.62	-1.93
1967	-1.66	-1.49	-1.92	-2.50	-2.67	-3.36	-3.47	-2.81	0.50	0.76	0.45	0.26
1968	1.42	2.01	1.87	1.51	2.76	4.20	5.08	4.60	4.11	3.49	3.23	2.41
1969	0.85	1.27	1.31	2.45	2.02	1.25	-0.64	-0.75	-0.96	-0.96	-0.38	0.08
1970	0.25	0.06	1.36	1.21	1.58	2.07	2.24	2.42	2.58	2.43	1.81	0.07
1971	-0.71	-1.95	-2.34	-2.30	-2.36	-2.69	-3.18	-2.34	-0.08	0.48	0.23	1.32
1972	1.06	0.92	0.37	0.17	1.86	1.78	2.16	2.14	2.32	1.90	1.96	1.34
1973	1.39	1.47	0.92	1.39	0.20	2.24	2.48	2.68	3.14	3.78	2.94	2.25
1974	2.24	1.48	1.19	0.68	1.35	1.63	1.14	0.33	0.30	0.48	0.67	0.57
1975	0.26	-0.48	-1.07	-2.21	-2.25	-2.17	-1.46	-0.81	-0.81	-0.83	-1.31	-0.64
1976	-0.97	-1.83	-2.16	-1.58	-1.21	-1.53	1.80	1.67	1.41	1.86	2.49	3.15
1977	3.33	2.97	2.57	3.04	2.57	3.05	2.86	2.27	1.63	1.38	1.57	-0.01
1978	0.31	0.50	0.13	0.00	-0.94	0.78	1.29	0.27	1.65	1.24	1.14	1.39
1979	2.19	1.97	1.94	2.26	2.59	2.41	3.23	3.07	4.32	3.55	2.85	2.36
1980	2.29	1.84	1.65	0.30	0.56	-0.18	-0.58	0.90	0.97	0.21	0.33	-0.12
1981	0.01	-0.15	0.01	-0.18	0.92	2.54	3.70	4.42	3.32	4.04	3.28	3.06
1982	2.25	3.51	2.81	2.46	2.70	2.00	0.81	-0.52	-2.28	-2.19	0.20	-0.14
1983	-0.21	0.43	1.68	1.12	0.21	-0.88	1.68	1.66	1.76	1.92	1.72	1.35
1984	2.12	1.57	1.17	0.14	-1.08	-1.67	-1.97	-2.27	-2.35	-0.59	-0.47	-0.32
1985	0.12	0.38	1.78	2.31	1.77	1.72	1.52	0.95	0.45	-0.38	-0.70	-0.72
1986	-0.89	-1.57	-1.88	-2.38	-1.94	-1.69	-2.16	-1.86	-2.15	-1.09	0.81	1.92
1987	1.89	2.63	2.12	1.64	1.71	2.37	2.89	2.73	1.92	1.12	1.27	0.40
1988	-0.67	-0.91	-1.28	-1.48	-1.94	-2.33	-2.43	-2.80	-2.63	-2.81	-3.41	-3.34
1989	-2.76	-2.80	-2.81	-2.60	-3.23	-2.92	-2.88	-3.09	-3.31	-3.56	-3.39	-3.24
1990	-3.34	-2.73	-1.93	-0.58	-0.90	-1.52	-0.69	-1.08	-1.36	-2.14	-2.20	-2.46
1991	-0.37	-0.26	-0.10	0.94	0.94	1.38	1.38	1.31	2.14	1.64	0.80	2.47
1992	3.19	4.00	4.03	4.34	5.29	4.66	4.45	4.04	3.30	2.33	3.01	2.58
1993	2.32	2.18	2.76	2.92	3.75	4.90	4.64	3.51	2.47	1.88	1.45	1.81
1994	1.39	0.41	0.32	0.52	0.41	0.87	0.52	0.18	0.06	0.85	0.20	1.19
1995	1.46	1.08	1.74	1.82	1.72	1.34	0.87	1.05	0.64	0.96	0.81	1.24

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
1996	0.31	-0.25	-1.30	-1.33	-1.91	-1.76	-2.24	-1.02	-1.14	-1.52	-1.78	-2.00
1997	-1.81	-1.82	0.61	2.72	2.94	2.56	1.91	-0.04	0.55	2.72	2.74	2.31
1998	1.95	2.13	2.17	1.66	0.26	-1.79	-2.37	-1.80	-0.23	1.64	2.59	2.33
1999	1.69	0.53	0.67	-0.21	-0.39	-0.24	0.55	0.53	0.33	-0.65	-1.78	-2.09
2000	-2.29	-2.71	-2.45	-2.53	-2.23	-2.38	-2.89	-3.36	-3.62	-3.66	-3.09	-2.68
2001	-2.12	-2.40	-1.80	-2.26	-2.26	-2.11	-2.23	-0.54	-0.29	-0.11	1.98	1.94
2002	1.38	0.54	0.10	-0.78	-1.41	-1.46	-0.87	-1.15	-0.98	1.09	1.45	1.76
2003	1.66	1.43	1.36	0.52	-1.27	-1.33	0.09	-0.58	0.41	0.53	0.36	-0.30
2004	0.13	0.30	0.01	1.31	2.53	3.54	3.52	2.89	2.55	2.08	3.50	2.21
2005	1.73	1.91	2.38	1.73	1.59	0.98	1.00	0.07	-0.29	-0.29	-0.67	-1.07
2006	-2.13	-2.51	-2.98	-3.45	-3.10	-2.01	1.47	1.97	1.83	1.94	1.14	1.09
2007	2.22	1.46	2.19	2.03	2.28	2.00	5.70	6.37	5.51	4.60	3.73	2.71
2008	2.73	1.91	1.77	1.54	-0.89	-1.61	-0.50	-0.24	-0.76	-1.13	-1.22	-2.40
2009	-2.87	-3.30	-3.27	-3.51	-3.94	-4.50	-4.86	-5.17	-4.48	-4.01	-2.95	-1.91
2010	-1.13	2.45	2.28	2.05	1.71	1.78	3.17	2.57	3.67	2.80	2.39	1.79
2011	2.10	0.94	0.46	-0.78	-2.06	-2.61	-3.18	-3.78	-4.08	-3.98	-4.19	-4.14
2012	-4.25	-3.52	-3.16	-2.80	-2.94	-3.32	-3.04	-3.36	-3.20	-3.75	-4.13	-4.43
2013	-4.23	-4.26	-4.49	-4.22	-4.54	-4.89	-4.62	-4.64	-4.13	-3.94	-3.43	-3.58
2014	-3.65	-3.74	-3.41	-3.75	-3.43	-3.59	-3.73	-3.69	-3.52	-3.44	-2.68	-2.53
2015	-2.02	-2.04	0.79	1.68	3.12	3.15	2.77	2.54	2.66	2.60	2.18	1.50
2016	0.92	0.43	1.04	1.22	1.51	1.76	1.28	1.65	1.12	-1.41	-1.69	-1.44
2017	-1.70	-1.32	-0.79	-0.77	-0.91	-0.86						

Probability

Probability, or frequency of return, was calculated by dividing the number of months of drought in the recorded time period by the overall time period that the resource database has recorded events for that jurisdiction. A drought may cover several jurisdictions; however, a drought event is recorded for the jurisdiction based on the levels of severity and the length in time of each occurrence. Table 7-3 provides a general overview of drought severity, probability, and return interval. Probability for future drought events is defined for the county and each participating jurisdiction in the following sections.

Table 7-3. Aransas County Drought Probability

Drought Extent	Estimated Annual Probability	Estimated Return Interval
Incipient Drought	6%	17 years
Mild Drought	10%	10 years
Moderate Drought	13%	8 years
Severe Drought	11%	9 years
Extreme Drought	3%	33 years

Impact

Common effects of drought include crop failure, water supply shortages, and fish and wildlife mortality. There is very low risk of loss of life or damage to structures associated with drought. Droughts may cause water shortages and require regulators to enact water rationing. The impacts of drought tend to be felt most by agriculture and related industries. Droughts can damage crops and pastoral lands and in severe cases, droughts may kill trees and cause loss of livestock. Dead vegetation from drought can serve as fuel for wildfires.

Crop insurance is purchased by agricultural producers such as farmers and ranchers to protect their investment in the event of natural disaster like drought, hail, or flood. The extent of crop loss due to drought occurrences is difficult to quantify because a drought during a growing season can impact the next two years of crop production. Documentation of agricultural losses due to drought is typically filed by the land owner directly with the policy holder and is not a matter of public record. For this reason, historical crop damages caused by drought is not quantified herein.

Economic impacts of droughts may be complex and far ranging. Water is required to produce many goods and services. If impacts are felt in basal levels of supply chains there is potential for measurable downstream effects. The impacts of a drought may be felt by many interconnected industries and may reach well beyond the temporal or spatial extents of the drought.

The latest major drought on record was the 2011 Texas Drought which had a total direct cost of agricultural loss estimated at $5.2 billion with an estimated $3.5 billion in indirect cost for a total of $8.7 billion in losses state wide. Some of this cost is associated to decreased state park attendance, demanding $4.6 million to keep parks open to the public[1].

Vulnerability

Communities with a greater proportion of crop area may be more vulnerable to the economic impacts of drought. Cropland was calculated by using the 2011 National Land Cover Dataset, published in 2015. This data is the most recent data of its type.

Droughts may potentiate the effects of other hazards. For example, droughts may remove water from vegetation, rendering areas more vulnerable to wildfires. Wildfire hazards are discussed in Section 14 of the Plan.

[1] Testimony at TWDB Work Session Meeting (October 21, 2014)

Unincorporated Aransas County Drought Hazard

LOCATION
County Wide (Unincorporated)

OCCURENCE	EXTENT				
Months of Drought (PHDI <-1) 1953-2017	Magnitude (PHDI Description)				
	Months of Incipient Drought	Months of Mild Drought	Months of Moderate Drought	Months of Severe Drought	Months of Extreme Drought
290	49	75	103	85	27

PROBABILITY					
Annual Chance of Drought (PHDI <-1)	Magnitude (PHDI Description)				
	Annual Chance of Incipient Drought	Annual Chance of Mild Drought	Annual Chance of Moderate Drought	Annual Chance of Severe Drought	Annual Chance of Extreme Drought
37%	6%	10%	13%	11%	3%

IMPACT
Crop and Pasture Damage
Values of historical crop and pasture damages caused by drought are not available in the public domain by jurisdiction as confirmed by AgriLife.

VULNERABILITY	
Crop and Pasture Land*	
Acres	Percent of Total Jurisdictional Area
10,504	3.3%

*2011 National Land Cover Dataset, Latest Version

City of Aransas Pass Drought Hazard

LOCATION
City Wide

OCCURENCE	EXTENT				
Months of Drought (PHDI <-1) 1953-2016	Magnitude (PHDI Description)				
	Months of Incipient Drought	Months of Mild Drought	Months of Moderate Drought	Months of Severe Drought	Months of Extreme Drought
290	49	75	103	85	27

PROBABILITY					
Annual Chance of Drought (PHDI <-1)	Magnitude (PHDI Description)				
	Annual Chance of Incipient Drought	Annual Chance of Mild Drought	Annual Chance of Moderate Drought	Annual Chance of Severe Drought	Annual Chance of Extreme Drought
37%	6%	10%	13%	11%	3%

IMPACT
Crop and Pasture Damage
Values of historical crop and pasture damages caused by drought are not available in the public domain by jurisdiction as confirmed by AgriLife.

VULNERABILITY	
Crop and Pasture Land*	
Acres	Percent of Total Jurisdictional Area
10	0.03%

*2011 National Land Cover Dataset, Latest Version

City of Fulton Drought Hazard

LOCATION
City Wide

OCCURENCE	EXTENT				
Months of Drought (PHDI <-1) 1953-2016	Magnitude (PHDI Description)				
	Months of Incipient Drought	Months of Mild Drought	Months of Moderate Drought	Months of Severe Drought	Months of Extreme Drought
290	49	75	103	85	27

PROBABILITY					
Annual Chance of Drought (PHDI <-1)	Magnitude (PHDI Description)				
	Annual Chance of Incipient Drought	Annual Chance of Mild Drought	Annual Chance of Moderate Drought	Annual Chance of Severe Drought	Annual Chance of Extreme Drought
37%	6%	10%	13%	11%	3%

IMPACT
Crop and Pasture Damage
Values of historical crop and pasture damages caused by drought are not available in the public domain by jurisdiction as confirmed by AgriLife.

VULNERABILITY	
Crop and Pasture Land*	
Acres	Percent of Total Jurisdictional Area
0	0%

*2011 National Land Cover Dataset, Latest Version

City of Rockport Drought Hazard

LOCATION
City Wide

OCCURENCE	EXTENT				
Months of Drought (PHDI <-1) 1953-2016	Magnitude (PHDI Description)				
	Months of Incipient Drought	Months of Mild Drought	Months of Moderate Drought	Months of Severe Drought	Months of Extreme Drought
290	49	75	103	85	27

PROBABILITY					
Annual Chance of Drought (PHDI <-1)	Magnitude (PHDI Description)				
	Annual Chance of Incipient Drought	Annual Chance of Mild Drought	Annual Chance of Moderate Drought	Annual Chance of Severe Drought	Annual Chance of Extreme Drought
37%	6%	10%	13%	11%	3%

IMPACT
Crop and Pasture Damage
Values of historical crop and pasture damages caused by drought are not available in the public domain by jurisdiction as confirmed by AgriLife.

VULNERABILITY	
Crop and Pasture Land*	
Acres	Percent of Total Jurisdictional Area
46	0.4%

*2011 National Land Cover Dataset, Latest Version

Section 8: Windstorms

Windstorms Hazard Overview

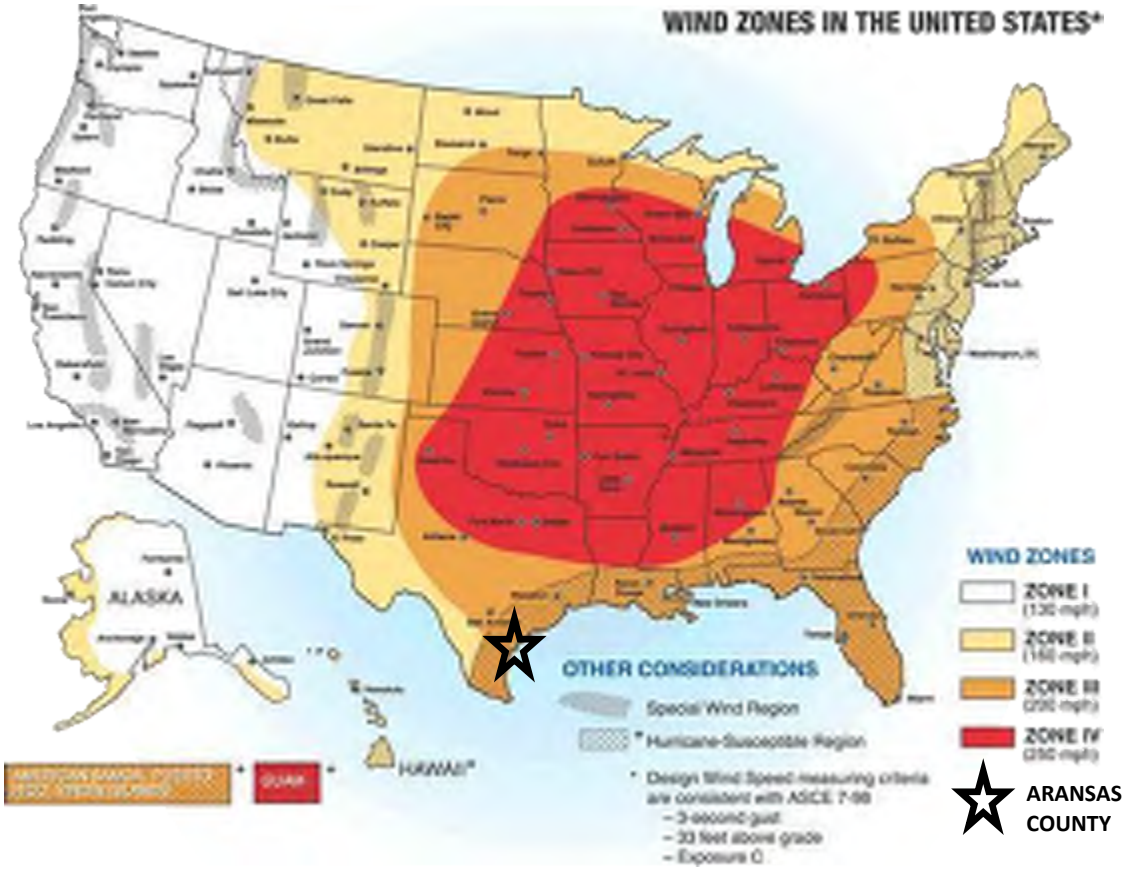
Description

A windstorm is a storm with high winds or violent gusts with little or no rain. The windstorm hazard excludes extreme wind events that occur with other wind-related natural hazards such as hurricanes, tropical storms, and tornados which are addressed elsewhere in this plan.

Location

Windstorms do not have any specific geographic boundary and can occur throughout the county uniformly. It is assumed that the county planning area including all participating jurisdictions are uniformly exposed to windstorm activity. According to FEMA Wind Zones in the United States, Aransas County is located in Wind Zone III, associated to winds as high as 200 mph.

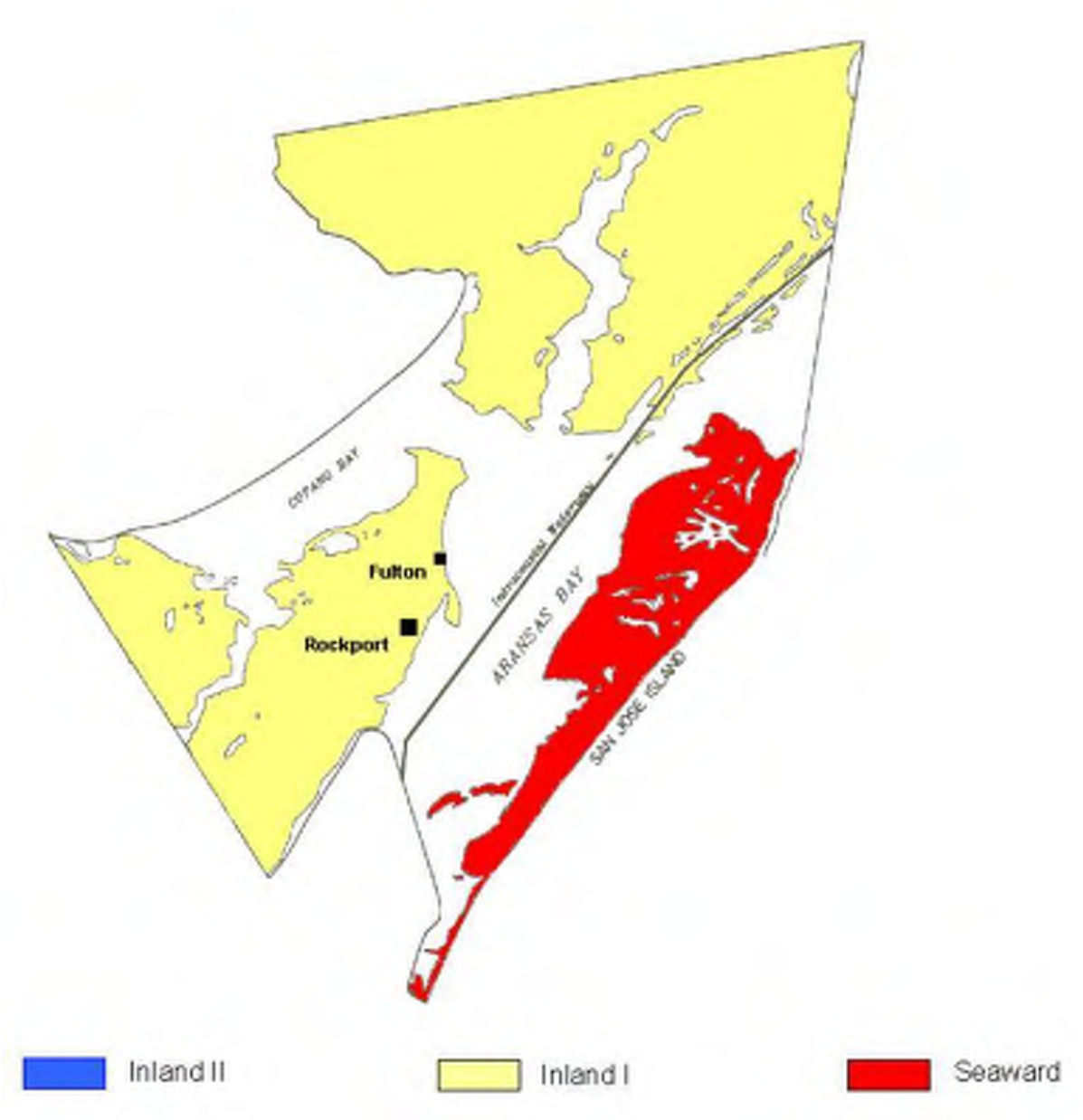
Figure 8-1. FEMA Wind Zones in the United States



The Texas Windstorm Insurance Association (TWIA) was established under the Texas Department of Insurance (TDI) by the Texas Legislature in 1971 following Hurricane Celia. TWIA provides windstorm and hail insurance along the Texas seacoast. Recommended design and inspection requirements for structures along the coast have been developed by TDI based on historical damages. Three designated catastrophe areas have been defined for Aransas County. Designated catastrophe areas are established for territories subject to unusually frequent and severe damage resulting from windstorm or hailstorms. Designated catastrophe areas for Aransas County include: Seaward and Inland I. Adopted design wind speeds for these designated catastrophe areas are shown in Figure 8-2 and defined below:

- Seaward: 130 mph 3-second gust design wind speed
- Inland I: 120 mph 3-second gust design wind speed

Figure 8-2. TDI Designated Catastrophe Areas



Extent

Windstorms extent is defined using the Beaufort Wind Scale. Table 8-1 summarizes the Beaufort Wind Scale.

Table 8-1. Beaufort Wind Scale

Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects	
			On the Water	On Land
0	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1	1-3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light Breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted, small tree branches move
5	17-21	Fresh Breeze	Moderate waves 4-8 ft. taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Larger waves 8-13 ft., whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Sea heaps up, waves 13-19 ft., white foam streaks off breakers	Whole trees moving, resistance felt walking against wind
8	34-40	Gale	Moderately high (18-25 ft.) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Twigs breaking off trees, generally impedes progress
9	41-47	Strong Gale	High waves (23-32 ft.), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs
10	48-55	Storm	Very high waves (29-41 ft.) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	56-63	Violent Storm	Exceptionally high (37-52 ft.) waves, foam patches cover sea, visibility more reduced	
12	64+	Hurricane	Air filled with foam, waves over 45 ft., sea completely white with driving spray, visibility greatly reduced	

Source: www.spc.noaa.gov/faq/tornado/beaufort.html

Occurrences

Windstorms can occur at any time of year but they are typically more common during the spring and early summer. In Aransas County from 1956 – 2016, 69% of all windstorms took place between the months of March and June. According to the National Oceanic and Atmospheric Administration (NOAA) Storm Prediction Center, Aransas County has experienced 45 (recorded) windstorm events over the course of the record period from 8/20/1956 to 6/2/2016 (60 years). Table 8-2 includes a summary of windstorm events from 1950 to 2006, categorizing the events by wind speed. Table 8-3 includes a comprehensive list of all windstorm events on record within Aransas County. Historical windstorm events are mapped for the county and each participating jurisdiction in the following sections.

Table 8-2. Historical Windstorm Occurrence Summary, 1956-2016

Number of Events	Extent (Wind Speed in Knots)						
	Unknown	50-54	55-59	60-64	65-69	70-74	75+
45	4	9	12	8	5	4	3

Table 8-3. Historical Windstorm Events, 1956-2016[1]

Date	Jurisdiction	Extent: Wind Speed (knots)	Injuries	Fatalities	Property Damage	Crop Damage
1956-08-20	Aransas County	70	0	0	Unknown	Unknown
1964-05-31	Aransas County	0	0	0	Unknown	Unknown
1968-05-10	Aransas County	60	0	0	Unknown	Unknown
1968-05-11	Aransas Pass	61	0	0	Unknown	Unknown
1969-11-26	Aransas Pass	67	0	0	Unknown	Unknown
1970-09-01	Aransas Pass	57	0	0	Unknown	Unknown
1974-03-15	Aransas Pass	57	0	0	Unknown	Unknown
1975-12-24	Aransas Pass	56	0	0	Unknown	Unknown
1980-05-13	Aransas County	0	0	0	Unknown	Unknown
1980-08-10	Aransas Pass	95	0	0	Unknown	Unknown
1981-10-31	Aransas County	60	0	0	Unknown	Unknown
1983-03-23	Aransas County	57	0	0	Unknown	Unknown
1985-05-20	Rockport	0	0	0	Unknown	Unknown
1985-05-20	Rockport	61	0	0	Unknown	Unknown
1986-05-17	Rockport	0	0	0	Unknown	Unknown
1986-08-21	Rockport	56	0	0	Unknown	Unknown
1986-08-21	Rockport	56	0	0	Unknown	Unknown
1991-06-29	Aransas Pass	57	0	0	$500 - $5,000	Unknown
1996-11-24	Aransas Pass	60	0	0	Unknown	Unknown
1998-10-06	Aransas County	60	0	0	Unknown	Unknown
1999-05-12	Aransas County	50	0	0	Unknown	Unknown
1999-05-18	Rockport	55	0	0	Unknown	Unknown
1999-05-18	Rockport	65	0	0	Unknown	Unknown
2000-03-14	Rockport	57	0	0	Unknown	Unknown
2000-03-14	Aransas Pass	65	0	0	Unknown	Unknown
2002-09-19	Aransas County	51	0	0	Unknown	Unknown
2003-03-26	Aransas Pass	66	0	0	Unknown	Unknown
2003-06-13	Rockport	52	0	0	Unknown	Unknown
2005-05-08	Rockport	52	0	0	Unknown	Unknown
2007-03-13	Rockport	52	0	0	Unknown	Unknown
2009-10-25	Aransas Pass	61	0	0	Unknown	Unknown
2010-06-02	Rockport	61	0	0	Unknown	Unknown
2010-06-02	Aransas Pass	65	0	0	Unknown	Unknown
2011-01-09	Aransas County	78	0	0	Unknown	Unknown
2011-01-09	Rockport	78	0	0	Unknown	Unknown
2012-05-10	Fulton	70	0	0	Unknown	Unknown
2012-05-10	Rockport	70	0	0	Unknown	Unknown

[1] NOAA

Table 8-3. Historical Windstorm Events, 1956-2016[2] (cont.)

Date	Jurisdiction	Extent: Wind Speed (knots)	Injuries	Fatalities	Property Damage	Crop Damage
2012-05-10	Aransas County	70	0	0	Unknown	Unknown
2015-04-17	Aransas County	56	0	0	Unknown	Unknown
2015-04-17	Rockport	56	0	0	Unknown	Unknown
2015-05-24	Aransas County	52	0	0	Unknown	Unknown
2015-05-24	Rockport	52	0	0	Unknown	Unknown
2016-03-09	Aransas County	52	0	0	Unknown	Unknown
2016-03-19	Aransas Pass	52	0	0	Unknown	Unknown
2016-06-02	Aransas County	56	0	0	Unknown	Unknown

Probability

Probability, or frequency of return, was calculated by dividing the number of windstorm events in the recorded time period by the overall time period that the resource database has recorded events for that jurisdiction. Note, historical events are documented as a function of the path of the storm. A windstorm may travel over several jurisdictions; consequently, the windstorm event is recorded for all jurisdictions through which the windstorm passed. Probability for future windstorm events is defined for the county and each participating jurisdiction in the following sections.

Impact

Windstorm impacts are documented by the number of deaths, injuries, property damage, and crop damage. Table 8-4 provides a summary of impacts for Aransas County as a whole. Impacts to the county and participating jurisdictions is documented in the following sections.

Table 8-4. Historical Windstorm Impacts Summary, 1956-2016

Number of Events	Deaths	Injuries	Property Damage	Crop Damage
45	0	0	>$5,000	Unknown

In addition to the direct, historical impacts in Table 8-4, vulnerable assets and potential maximum impacts are listed in the jurisdictional tables. Because the impacts of windstorms are closely tied to the extent of the event and windstorms are expected to be evenly distributed throughout the planning area, maximum impacts are listed in the jurisdictional tables. Fortunately, it is unlikely that a worst case scenario windstorm would ever take place and maximize damages. Windstorms can cause indirect impacts by

[2] NOAA

damaging power lines and other above-ground utilities. Crop losses and population displacement from housing damage could cause additional economic losses.

Vulnerability

Windstorms often cross-jurisdictional boundaries; therefore, all existing and future buildings, facilities, and populations in and around Aransas County are exposed to windstorm hazard and are at potential risk of impact. The damage caused by a windstorm is typically a result of high wind velocity and wind-blown debris. Vulnerability of humans and property is difficult to evaluate given that windstorm form at different strengths and in random locations. Property damage is typically most significant for structures of light construction. Three types of structures are more likely to suffer damage: manufactured homes, homes on crawlspaces (more susceptible to lift), and buildings with large spans, such as shopping malls, gymnasiums, and factories. Vulnerability is defined for the county and participating jurisdictions in the following sections.

Unincorporated Aransas County Windstorms Hazard

LOCATION	
Area at Risk	**Designated Catastrophe Area**
County Wide (Unincorporated)	Seaward and Inland I

Number of Events	Extent (Wind Speed in Knots)						
	Unknown	50-54	55-59	60-64	65-69	70-74	75+
15	2	4	3	3	0	2	1

IMPACT				
Number of Events	**Deaths**	**Injuries**	**Property Damage**	**Crop Damage**
15	0	0	Unknown	Unknown

PROBABILITY			
Number of Events	**Record Time Period**	**Time Period Years**	**Probability**
15	8/20/1956 to 6/2/2016	60	25%

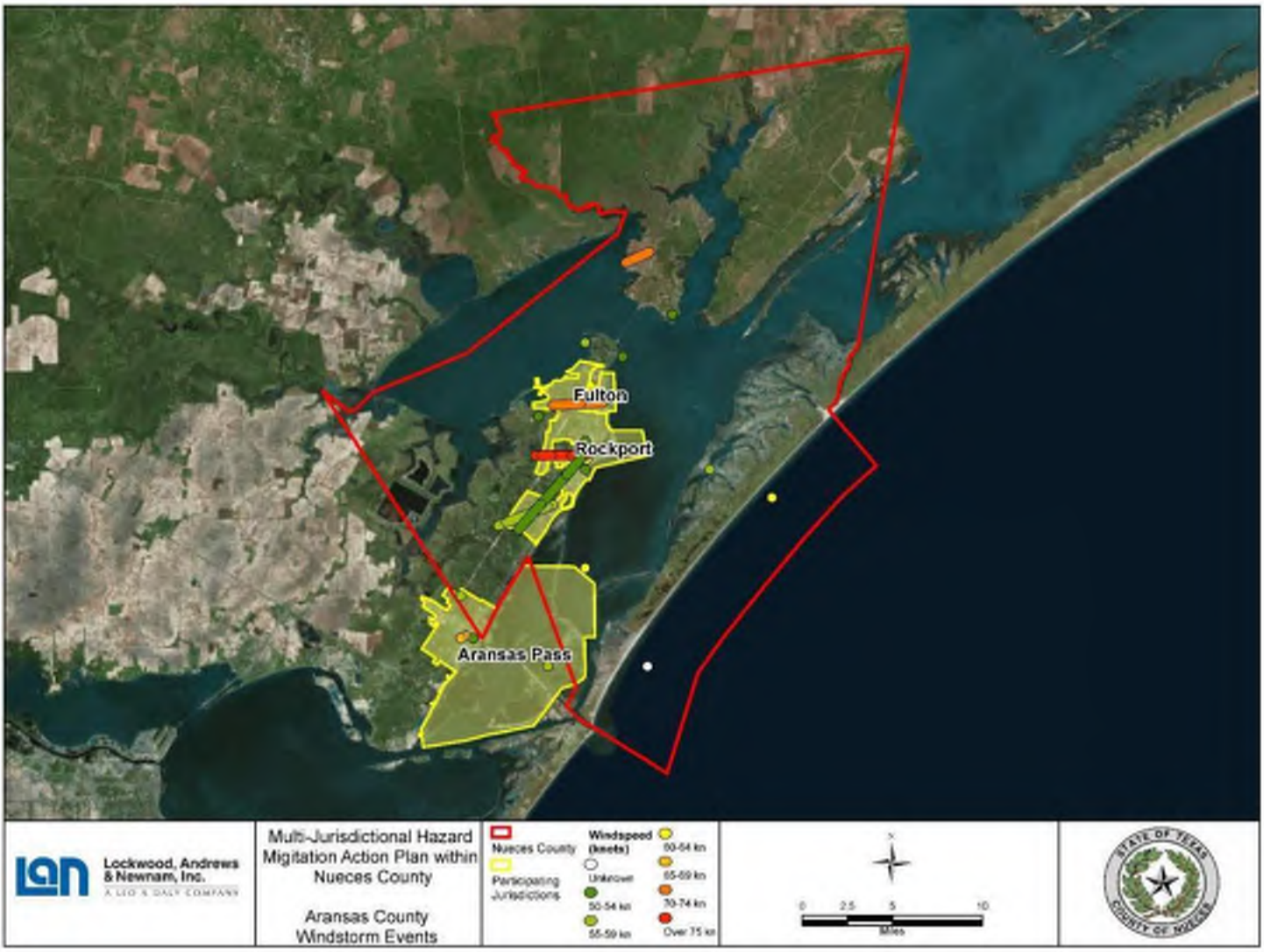
VULNERABILITY			
Population (County)*	**Property Value****	**Crop Land*****	
	Commercial and Residential	**Acres**	**Value**
4,914	$777,545,526	10,503.91	$954,941.82

* US Census Bureau American Community Survey 2015 Estimates. Unincorporated population derived from County population less the populations of participating communities.

**Aransas County Appraisal District 2016

***Census of Agriculture, 2012 (The latest Agriculture Census published 2012)

Figure 8-3. Unincorporated Aransas County Windstorm Events



City of Aransas Pass Windstorms Hazard

LOCATION	
Area at Risk	Designated Catastrophe Area
City Wide	Inland 1

Number of Events	Extent (Wind Speed in Knots)						
	Unknown	50-54	55-59	60-64	65-69	70-74	75+
13	0	1	4	3	4	0	1

IMPACT				
Number of Events	Deaths	Injuries	Property Damage	Crop Damage
13	0	0	>$5,000	Unknown

PROBABILITY			
Number of Events	Record Time Period	Time Period Years	Probability
13	8/20/1956 to 6/2/2016	60	22%

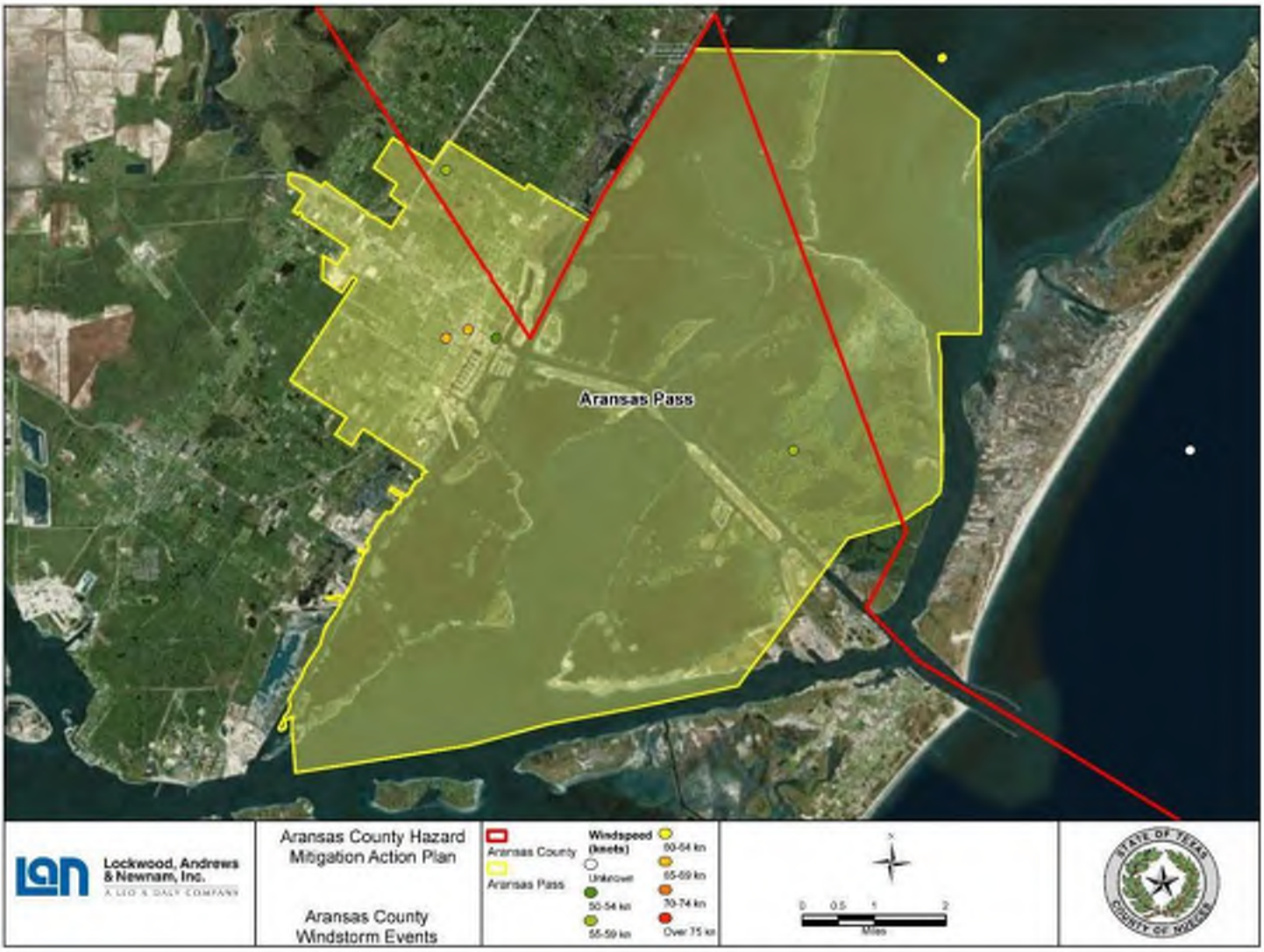
VULNERABILITY				
Population (City)*	Property Value**		Crop Land***	
	Commercial	Residential	Acres	Value
8,067	$8,023,576	$11,325,380	10	$8,582

*US Census Bureau American Community Survey 2015 Estimates

**Aransas County Appraisal District 2016

***Census of Agriculture, 2012 (The latest Agriculture Census published 2012)

Figure 8-4. City of Agua Dulce Windstorm Events



City of Fulton Windstorms Hazard

LOCATION	
Area at Risk	**Designated Catastrophe Area**
City Wide	Inland 1

Number of Events	Extent (Wind Speed in Knots)						
	Unknown	50-54	55-59	60-64	65-69	70-74	75+
1	0	0	0	0	0	1	0

IMPACT				
Number of Events	**Deaths**	**Injuries**	**Property Damage**	**Crop Damage**
1	0	0	Unknown	Unknown

PROBABILITY			
Number of Events	**Record Time Period**	**Time Period Years**	**Probability**
1	8/20/1956 to 6/2/2016	60	1.7%

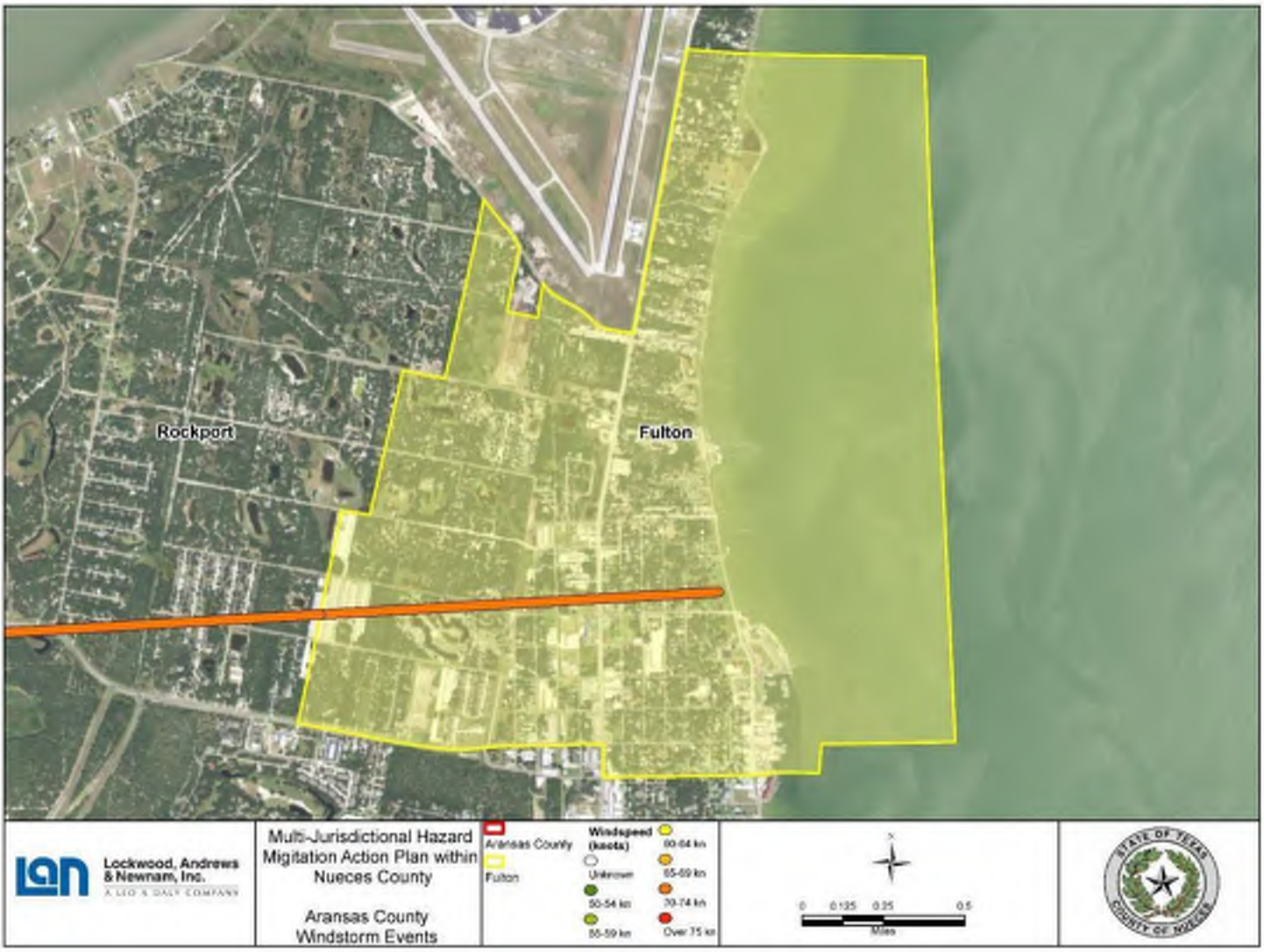
VULNERABILITY			
Population (City)*	**Property Value****	**Crop Land*****	
	Commercial and Residential	**Acres**	**Value**
1,319	$122,152,820	0	$0

*US Census Bureau American Community Survey 2015 Estimates

**Aransas County Appraisal District 2016

***Census of Agriculture, 2012 (The latest Agriculture Census published 2012)

Figure 8-5. City of Fulton Windstorm Events



City of Rockport Windstorms Hazard

LOCATION	
Area at Risk	Designated Catastrophe Area
City Wide	Inland 1

Number of Events	Extent (Wind Speed in Knots)						
	Unknown	50-54	55-59	60-64	65-69	70-74	75+
16	2	4	5	2	1	1	1

IMPACT				
Number of Events	Deaths	Injuries	Property Damage	Crop Damage
16	0	0	Unknown	Unknown

PROBABILITY			
Number of Events	Record Time Period	Time Period Years	Probability
16	8/20/1956 to 6/2/2016	60	27%

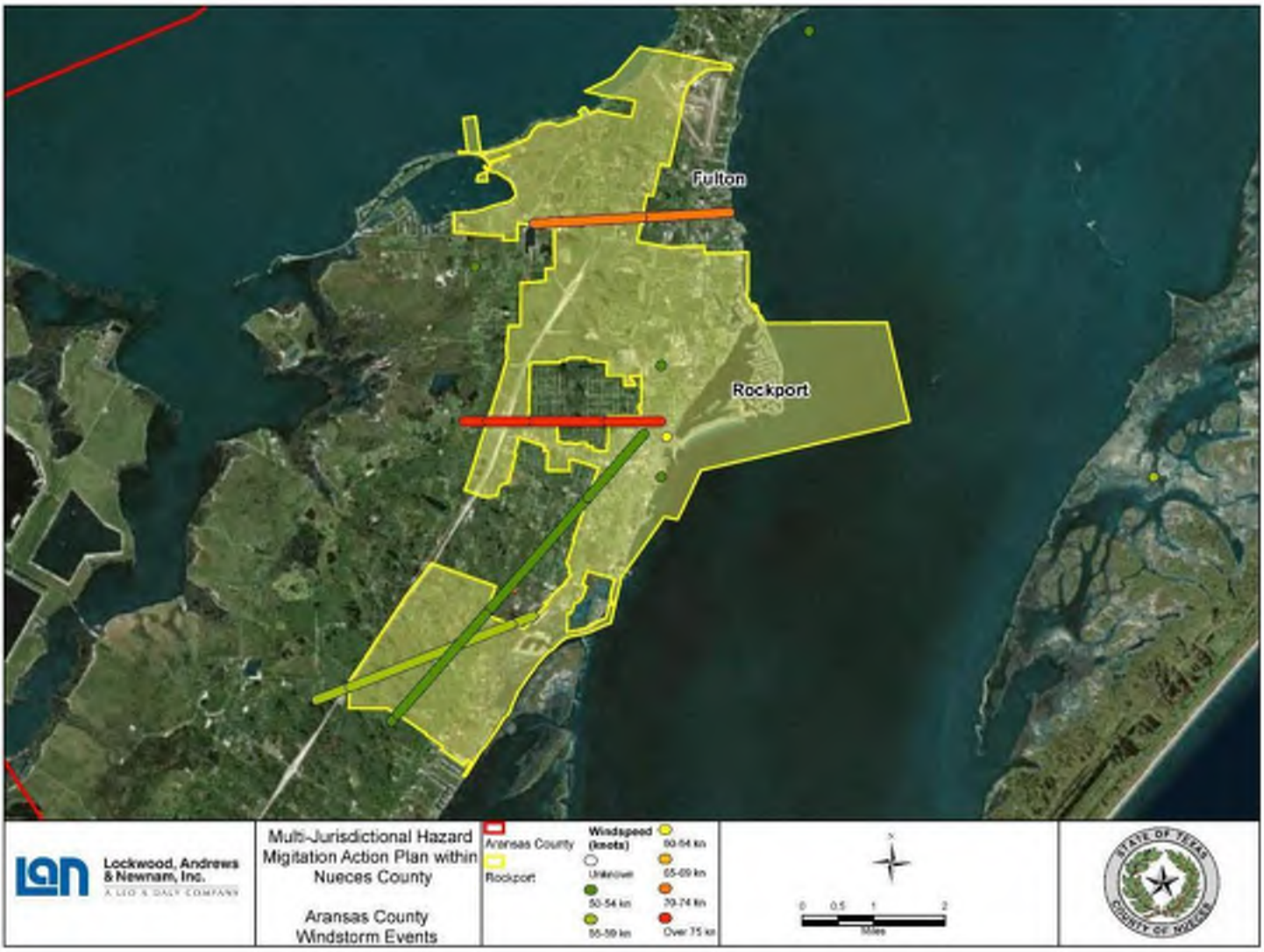
VULNERABILITY				
Population (City)*	Property Value**		Crop Land***	
	Commercial	Residential	Acres	Value
9,992	$242,443,666	$737,234,996	46	$111,476

*US Census Bureau American Community Survey 2015 Estimates

**Aransas County Appraisal District 2016

***Census of Agriculture, 2012 (The latest Agriculture Census published 2012)

Figure 8-5. City of Rockport Windstorm Events



Section 9: Extreme Heat

Extreme Heat Hazard Overview

Description

Extreme heat is the condition whereby temperatures hover ten degrees or more above the average high temperature in a region for an extended period. If extreme heat conditions persist, it may be considered a heat wave.

Location

Climate and weather drive extreme heat. The spatial and temporal ranges at which these forces operate are large in scale, putting the entire planning area at risk.

A phenomenon known as urban heat island is when urban areas are warmer than nearby rural areas due to human activities. Man-made surfaces such as concrete and asphalt absorb thermal energy from the sun during the day. At night this thermal energy is released. This cyclical process ensures that ambient temperature remain high through the city. Heat islanding can cause temperatures to be up to 10 degrees higher in urban areas than in surrounding rural areas.

Extent

Extreme heat is most dangerous in the summer months. Extreme heat is not just a factor of temperature; humidity plays a role as well. An extreme heat event may occur with air temperature as low as 80°F if the relative humidity is over 40%. An 80°F temperature seems low, particularly for Texas in the summer, so people may not be aware of the risk to extreme heat and therefore may not adequately prepared for the effects of extreme heat. Citizens of the planning area, particularly populations vulnerable to extreme heat, should avoid prolonged heat exposure.

Table 9-1. NOAA's National Weather Service Heat Index, Temperature (F°)

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

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution | Extreme Caution | Danger | Extreme Danger

NOAA's National Weather Service Heat Index table shows how humidity and temperature interact to endanger people who are engaged in strenuous activity or are exposed to the environment without any protection. It should be noted that these risks exist even if the area is not currently experiencing conditions that qualify as an extreme heat event. The normal high temperatures may be enough to endanger human health.

Occurrences

Extreme heat events typically occur in summer months during periods of high heat and high humidity. The National Climatic Data Center (NCDC) has one recorded extreme heat event for Aransas County during the period of record, 1950 to 2016. Events are recorded at the county level; comments may reflect noteworthy events at the municipal level (See Table 9-3). Tables 9-2 and 9-4 provide temperature and heat index values that suggestive of the most hazardous conditions that can be expected in the future.

Table 9-2 – Previous maximum temperatures

Jurisdiction	Date	Temperature	Heat Index
Unincorporated Aransas County*	September 2000	105°	137°+
Aransas Pass*	September 2000	105°	137°+
Fulton*	September 2000	105°	137°+
Rockport	September 2000	105°	137°+

*There is not a National Weather Service monitoring station in the jurisdiction; listed temperatures are estimates based on the Rockport monitoring station. Early September 2000 set record high temperatures across the South Texas and Coastal Bend areas.

Table 9-3. Previous Occurrences: National Climatic Data Center

Date	Comments
7/11/2010	An 18-month-old boy died after he was left inside a parked vehicle in Aransas County, near Aransas Pass. The outside air temperature was in the low 90s with a heat index value of near 105.

The National Weather Service station in Rockport monitors weather conditions in Aransas County (insert period of record here). Table 9-4 summarizes the top five hottest days on record for the station. These values represent the most hazardous than can be expected in the future. While these records are not consecutive, and do not constitute an extreme heat event, they demonstrate that temperatures in Aransas County can be dangerous or deadly, particularly to vulnerable populations.

Table 9-4. Previous Occurrences: National Weather Service Records (Meteorological Station USC00417704)

Date	High Temperature	Heat Index
9/6/2000	105°	137°+
9/25/2005	103°	137°+
9/3/2011	103°	137°+
9/5/2011	103°	137°+
6/26/2012	102°	137°+

Probability

The single historical heat event reported by NCDC from 1950 to 2016 suggests that the planning area and all participating jurisdictions can expect a 1.5% annual occurrence of extreme heat events. The expected reoccurrence interval of extreme heat events is 66 years. Based on historical records, hazardous conditions are expected to take place in the summer months of June through September. While conditions may not always qualify as an extreme heat event, conditions may still dangerous or deadly.

Impact

The greatest risk associated to extreme heat events is the impact on humans. Buildings are less likely to be damaged by extreme heat. The populations most at risk are children, the elderly, those in poor health, and those who spend large portions of their time outside. According to the latest compiled study on heat related deaths by the National Center for Environmental Health, from 1999-2009, the most recent years for which a report of this nature has been compiled, extreme heat exposure led to 7,233 deaths in the United States. The victims of extreme heat tended to be male (69%) and over the age of 65 (39%). The overwhelming majority of deaths (94%) occurred in the summer months of May to September.

Extreme heat can impact agricultural industries in the form of crop or livestock losses. Extreme heat can cause economic impacts related to damage of crop and grazing lands caused by reduced productivity of workers.

Vulnerability

Due to the uniformity of extreme heat events across the planning area, jurisdictional variations in vulnerability provide the most informative perspective from which to examine differences in extreme heat within the planning area. Males and those over the age of 65 tend to be the populations most vulnerable to extreme heat hazards. Demographic information regarding these populations follow in the jurisdictional tables. Agricultural assets are also vulnerable to extreme heat. Livestock can be killed and crops can be damaged by extreme heat. Information regarding the vulnerability of agricultural assets follows in the jurisdictional tables.

Unincorporated Aransas County Extreme Heat Hazard

LOCATION
County Wide (Unincorporated)

VULNERABILITY			
Total Population	**Male Population**	**Total Population Over 65**	**Male Population Over 65**
24,292	12,031	6,316	3,044

Agricultural Area (Acres)	Agricultural Area (Percentage of Jurisdiction)	Agricultural Value
10,504	3%	$954,942

City of Aransas Pass Extreme Heat Hazard

LOCATION
City Wide

VULNERABILITY			
Total Population	Male Population	Total Population Over 65	Male Population Over 65
8,067	4,114	1,476	609

Agricultural Area (Acres)	Agricultural Area (Percentage of Jurisdiction)	Agricultural Value
10	0.03%	$8,582

City of Fulton Extreme Heat Hazard

LOCATION
City Wide

VULNERABILITY			
Total Population	**Male Population**	**Total Population Over 65**	**Male Population Over 65**
1,319	605	410	185

Agricultural Area (Acres)	Agricultural Area (Percentage of Jurisdiction)	Agricultural Value
0	0%	$0.00

City of Rockport Extreme Heat Hazard

LOCATION
City Wide

VULNERABILITY			
Total Population	Male Population	Total Population Over 65	Male Population Over 65
9,992	4,757	2,448	1,132

Agricultural Area (Acres)	Agricultural Area (Percentage of Jurisdiction)	Agricultural Value
11,839	0.4%	$111,476

Section 10: Lightning

Lightning Hazard Overview

Description

Lightning is a sudden electrostatic discharge during an electrical storm between electrically charged regions of a cloud, between that cloud and another cloud, or between a cloud and the ground.

Location

Statewide there is predictable spatial variation in the frequency of lightning strikes; however, when examining lighting activity at smaller scales, such as county or city level, the distribution of lightning events is evenly distributed. Lightning does not have any specific geographic boundary and can occur throughout the county uniformly. It is assumed that the county planning area including all participating jurisdictions are uniformly exposed to lightning activity.

Extent

Lightning extents is defined in terms of the frequency of lightning strikes within a set time frame; otherwise referred to as Lightning Activity Levels (LAL). Lightning Activity Levels are described in more detail in Table 10-1.

Table 10-1. Lightning Activity Levels (LAL)

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

All participating jurisdictions are vulnerable to LAL1 through LAL5. The worst lightning extent the planning area and all participating jurisdictions can expect to experience is LAL5.

Occurrence

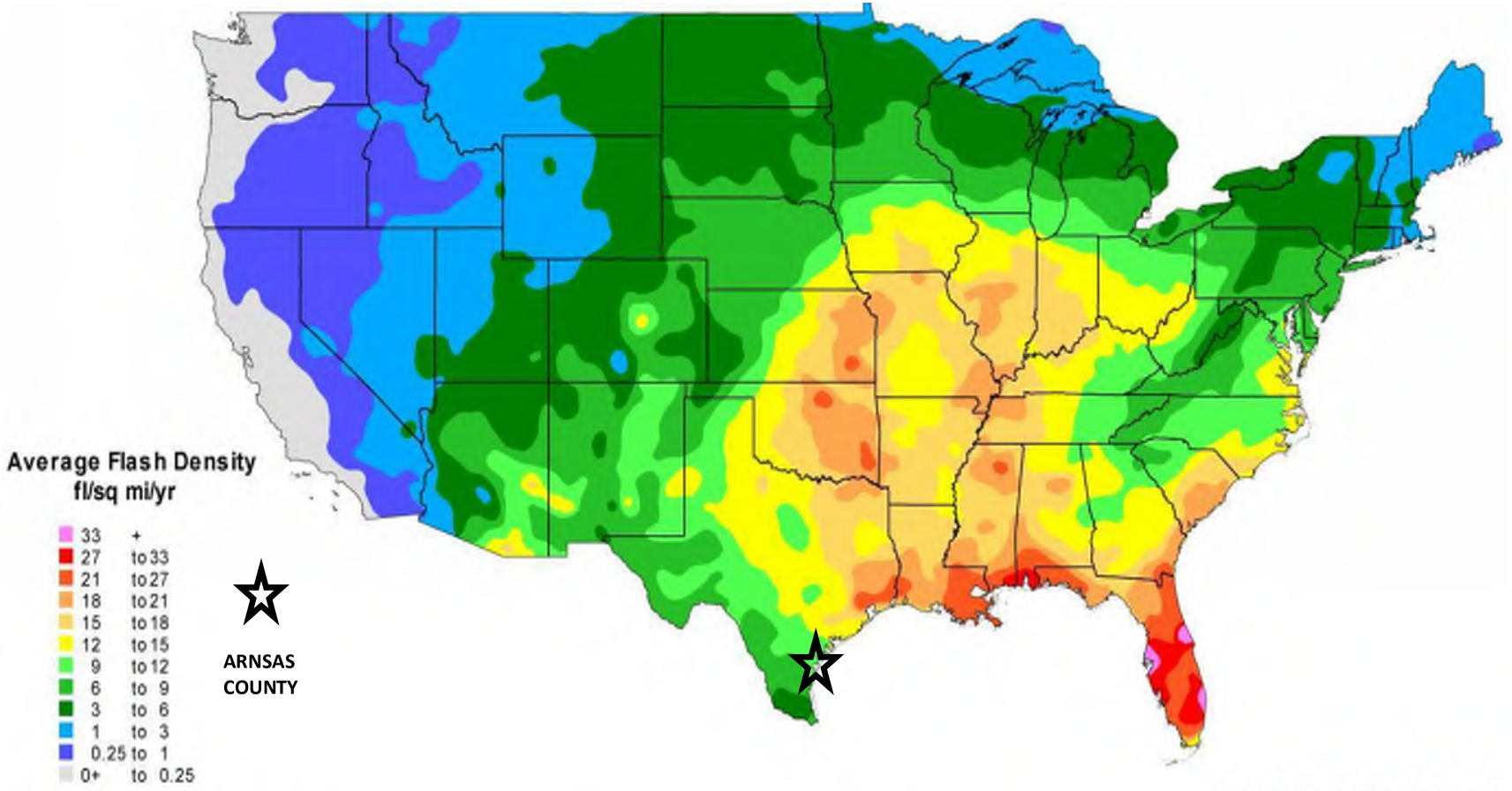
Average Flash Density for the United States is summarized in Figure 10-1. Specific lighting events for the County are recorded by the National Climatic Data Center (NCDC) which includes two records of lightning strikes within the planning area, both recorded by the Rockport Airport (period of record: 1950 – 2016). Both events involved lightning striking oil tanks near the airport on Farm to Market Road 1781.

Texas A&M Forest Service (TFS) records from 2005 to 2015 include six lightning-started wildfires within in the planning area; four in Unincorporated Aransas County, one in Rockport, and one in Fulton.

Lightning occurrences are discussed in greater detail in the jurisdictional tables.

[1] From http://www.prh.noaa.gov/hnl/pages/LAL.php

Figure 10-1. Cloud-to-Ground Lightning Incidence in the Continental U.S. (1997-2010)



Probability

The probability of a lightning strike is calculated by dividing the number of events by the number of years for which records exist. The City of Aransas Pass has no recorded lightning events. This does not indicate that the jurisdiction has a zero probability of lightning strikes. More likely, this is reflective of a lack of reporting rather than a lack of lightning. Lighting is assumed to be take place uniformly within the planning area. The Cities of Fulton and Rockport share a 10% annual probability. This annual probability will be applied to Aransas Pass as well.

Impact

Individual lightning strikes have a small spatial extent. Only buildings/facilities hit by lightning are expected to be damaged. Facility shutdowns due to lightning strikes are expected to be less than 24 hours. Lightning strikes on or near people can cause serious injury and even death; none of which have been recorded in the County.

Lightning strikes have the potential to spark wildfires, cause explosions or fires if they hit combustible materials, or damage power infrastructure. Lightning impacts are provided for each jurisdiction as a function of the potential future losses including commercial property value and agricultural value. Commercial property value for each jurisdiction was compiled from the Aransas County Appraisal Role. Agricultural value for each jurisdiction is a function of the total agricultural lands shown in the National Land Cover Database divided by the total agricultural land for the county and multiplied by the total agricultural value for Aransas County from the 2012 Agricultural Census.

Vulnerability

Vulnerably to lightning strikes are in the form of assets that may be damaged by a strike such as agricultural land that would be vulnerable to lightning-started wildfires. Commercial buildings are often taller than residential buildings, particularly single family residential buildings, and may be at greater risk of lightning strikes. Therefore, communities with higher concentrations of commercial buildings may be more vulnerable to lightning strikes.

Unincorporated Aransas County Lightning Hazard

OCCURENCES
NCDC and TFS Record
05/23/2009 – Lightning started a 25-acre fire 05/24/2009 – Lightning started a 25-acre fire 07/18/2012 – Lightning struck oil tank battery near FM1781 ($10,000 damage) 09/13/2012 – Lighting started a one-acre fire 11/20/2012 – Lightning started a two-acre fire 04/25/2013 – Lightning struck tank filled with sea water and crude oil near FM 1781 ($10,000 damage)

OCCURENCES		
Number of Events (Range: 2005-2015)	**Risk to Health and Safety (Number of Incidences Recorded by Type)**	**Property Damage**
6	0 death, 0 injury	$20,000

PROBABILITY	
Future Lightning Event Likelihood	**1 Lightning Event X Years**
60% annual chance	1 lightning event every 1.67 years

IMPACT	
Commercial and Residential Property Value	**Agricultural Value**
$777,545,526	$954,942

VULNERABILITY		
Number of Commercial Parcels	**Agricultural Area (Acres)**	**Agricultural (Percent of Jurisdictional Area)**
13,800	10,504	3%

City of Aransas Pass Lightning Hazard

OCCURENCES
NCDC and TFS Records
No NCDC or TFS Records

OCCURENCES		
Number of Events (Range: 2005-2015)	Risk to Health and Safety (Number of Incidences Recorded by Type)	Property Damage
0	0 death, 0 injury	$0

PROBABILITY	
Future Lightning Event Likelihood	1 Lightning Event X Years
10% Annual Chance*	1 lightning event every 10 years*

*Based upon minimum probability of the planning area

IMPACT	
Commercial Property Value	Agricultural Value
$8,023,576	$8,582

VULNERABILITY		
Number of Commercial Parcels	Agricultural Area (Acres)	Agricultural (Percent of Jurisdictional Area)
604	10	0.02%

City of Fulton Lightning Hazard

OCCURENCES
TFS Record
06/09/2013 – Lightning started 3-acre wildfire

OCCURENCES		
Number of Events (Range: 2005-2015)	**Risk to Health and Safety (Number of Incidences Recorded by Type)**	**Property Damage**
1	0 death, 0 injury	$0

PROBABILITY	
Future Lightning Event Likelihood	**1 Lightning Event X Years**
10% Annual Chance	1 lightning event every year*

*Based upon minimum probability of the planning area

IMPACT	
Commercial and Residential Property Value	**Agricultural Value**
$122,408,970	$0.00

VULNERABILITY		
Number of Commercial Parcels	**Agricultural Area (Acres)**	**Agricultural (Percent of Jurisdictional Area)**
1,239	0	0%

City of Rockport Lightning Hazard

OCCURENCES
TFS Record
07/18/2009 – Lightning started a 10-acre fire

OCCURENCES		
Number of Events (Range: 2005-2015)	**Risk to Health and Safety (Number of Incidences Recorded by Type)**	**Property Damage**
1	0 death, 0 injury	$0

PROBABILITY	
Future Lightning Event Likelihood	**1 Lightning Event X Years**
10% Annual Chance	1 lightning event every 10 years

IMPACT	
Commercial Property Value	**Agricultural Value**
$242,443,666	$111,475.89

VULNERABILITY		
Number of Commercial Parcels	**Agricultural Area (Acres)**	**Agricultural (Percent of Jurisdictional Area)**
1,634	45.8	0.4%

Section 11: Coastal Erosion

Coastal Erosion Hazard Overview

Description

Coastal erosion is the "loss of land, marshes, wetlands, beaches, or other coastal features within the coastal zone because of the actions of wind, waves, tides, storm surges, subsidence, or other forces"[1]. Coastal erosion may result in the temporary redistribution of coastal sediments, or the long-term loss of coastal sediments and sediment accumulation.

[1] Texas Natural Resources Code, Section 33.601

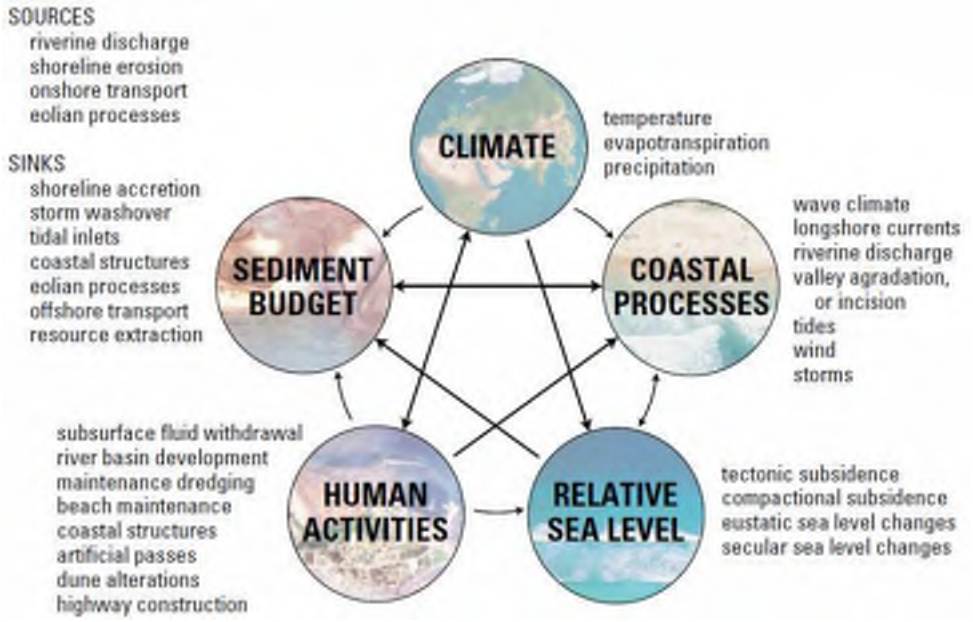
The United States Geologic Survey (USGS) has identified eleven primary natural process and human activities that cause coastal land loss; these are summarized in Table 11-1. These primary causes for coastal land loss can impact the coast concurrently resulting in severe rates of erosion. Figure 11-1 illustrates how this processes jointly impact the coast.

Table 11-1. USGS Primary Causes of Coastal Land Loss[2]

Primary Causes of Coastal Land Loss	
Natural Processes	
Agent	**Examples**
Erosion	waves and currents storms landslides
Sediment Reduction	climate change stream avulsion source depletion
Submergence	land subsidence sea-level rise
Wetland Deterioration	herbivory freezes fires saltwater intrusion
Human Activities	
Agent	**Examples**
Transportation	boat wakes, altered water circulation
Coastal Construction	sediment deprivation (bluff retention) coastal structures (jetties, groins, seawalls)
River Modification	control and diversion (dams, levees)
Fluid Extraction	water, oil, gas, sulfur
Climate Alteration	global warming and ocean expansion increased frequency and intensity of storms
Excavation	dredging (canal, pipelines, drainage) mineral extraction (sand, shell, heavy mins.)
Wetland Destruction	pollutant discharge traffic failed reclamation burning

[2] Source: https://pubs.usgs.gov/of/2003/of03-337/landloss.pdf

Figure 11-1. USGS Interacting Factors That Influence Coastal Land Loss[3]



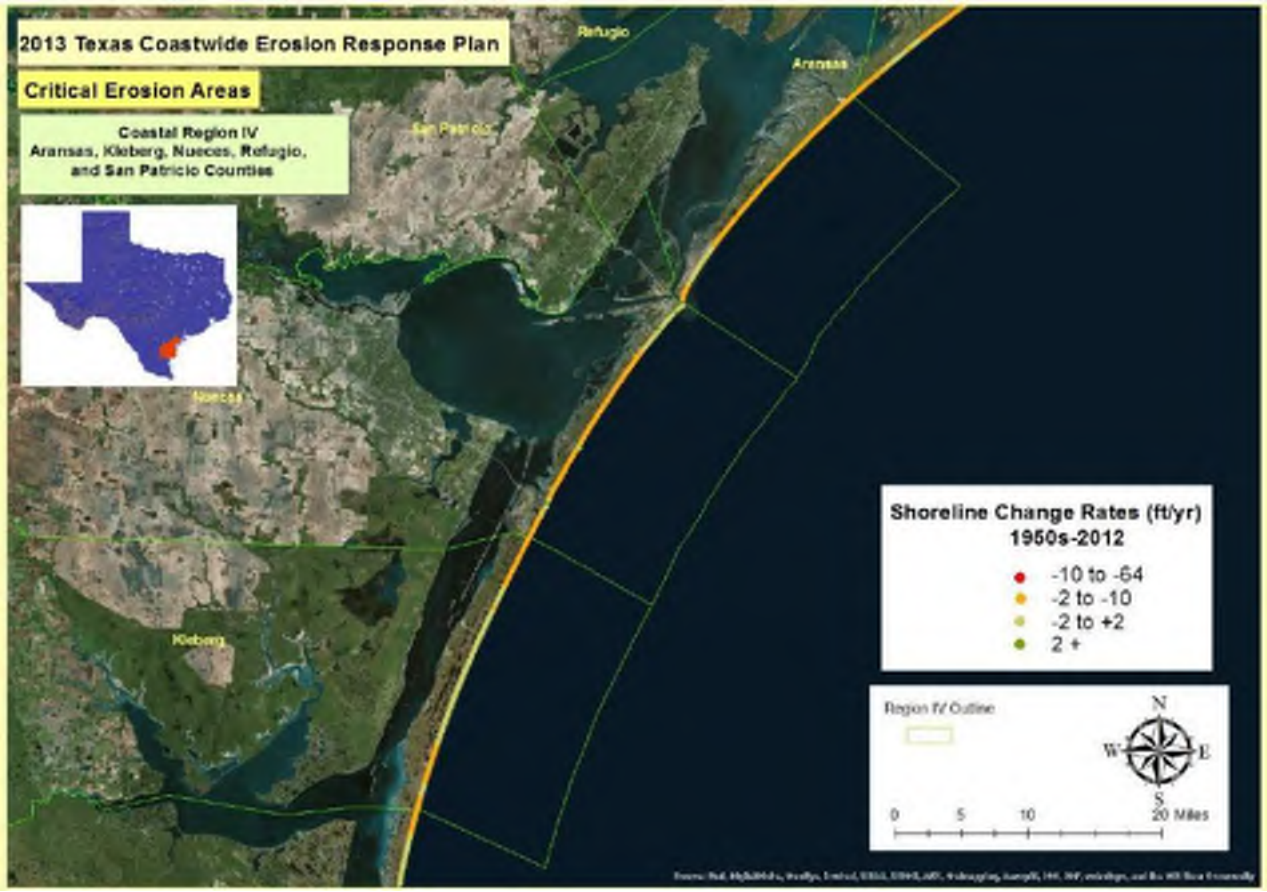
Location

Aransas County is one of five counties located in Texas' Coastal Region IV as shown in Figure 11-2. The Texas General Land Office defines five regions of the Texas coast in their Texas Coastwide Erosion Response Plan[4]. Coastal erosion in Aransas County impacts the gulf-facing shoreline, Laguna, bays, islands, navigable waterways, channels, harbors, and marinas. The primary impact along the gulf-facing shoreline is erosion which then contributes to deposition within adjacent waterways and channels as sediment is redistributed by wave and tidal currents.

[3] Source: https://pubs.usgs.gov/of/2003/of03-337/landloss.pdf

[4] http://www.glo.texas.gov/coast/coastal-management/forms/files/coastwide-erosion-response-plan.pdf

Figure 11-2. Coastal Region IV – Critical Erosion Areas[5]



Gulf-Facing Shoreline

Aransas County has 19.4 miles of gulf-facing shoreline consisting primarily of low-elevation sandy beaches and dunes along the narrow barrier island of San Jose Island.[6]

Laguna, Bays, and Islands

Behind the barrier islands are 184 miles of additional shorelines along the bays, port facilities, marinas, and numerous large and small islands, including wetlands, and estuaries.[7]

[5] Source: http://www.glo.texas.gov/coast/coastal-management/forms/files/coastwide-erosion-response-plan.pdf

[6] Texas Mitigation Plan, 2013

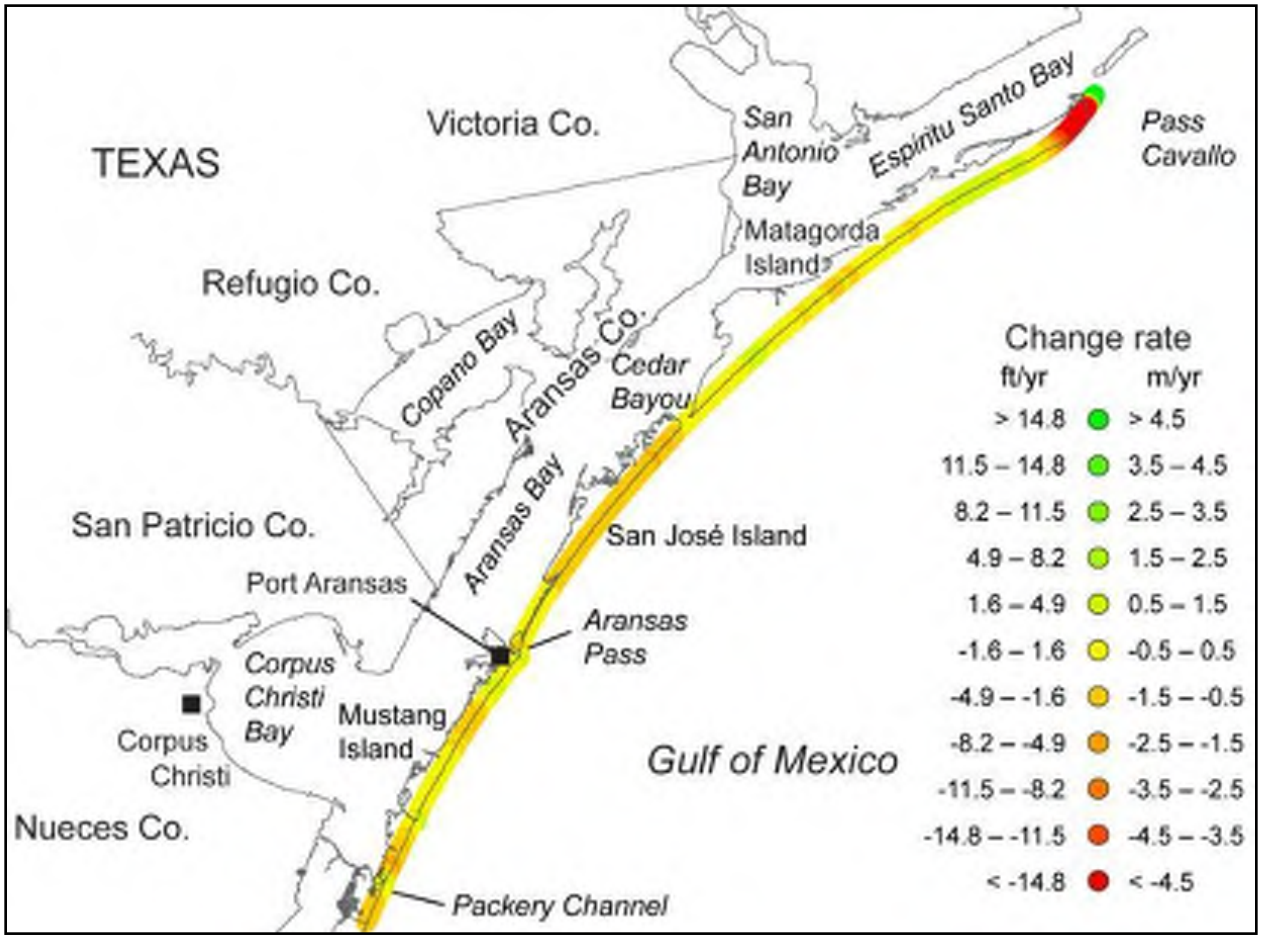
[7] Texas Mitigation Plan, 2013

Shorelines Change Rates

The Texas Coastwide Erosion Response Plan (updated 2013, the most recent date of publication) identifies critical erosion areas for the Aransas County Gulf shoreline. Critical coastal erosion areas are coastal eroding areas that the Land Commissioner "finds to be a threat to: public health, safety, or welfare; public beach use or access; general recreation; traffic safety; public property or infrastructure; private commercial or residential property; fish or wildlife habitat; or an area of regional or national importance."[8]

Figure 11-3, an excerpt from a Bureau of Economic Geology report[9], illustrates the changing rate of the Gulf Coast shoreline near Aransas County from 1930 – 2012. The report finds that Aransas County experienced an annual average of 2.49 feet of erosion from 1930 – 2012. The shorelines along Aransas County's bays experience similar rates of erosion

Figure 11-3. Gulf Coast Shoreline Change Rate



[8] The Texas Administrative Code, §§15.1-15.10, and Texas Natural Resources Code, Subchapter H, Sec. 33.601

[9] http://www.beg.utexas.edu/coastal/presentations_reports/gulfShorelineUpdate_2012.pdf

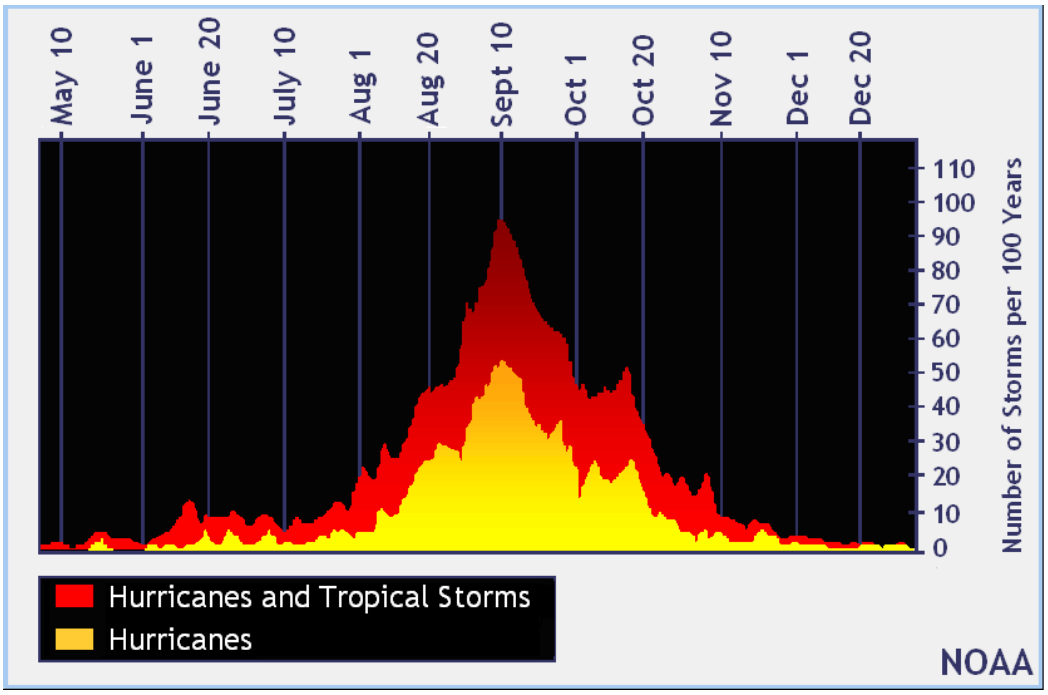
Occurrences

Coastal erosion is sporadic and episodic, occurring over short and long-term periods and at different rates along the coast line.

Short-Term

Coastal erosion is most apparent over short periods when rates are accelerated due to extreme weather events such as tropical storms and hurricanes. Storms and hurricanes that enter the Gulf of Mexico cause coastal erosion within Aransas County regardless of where the storm makes landfall. Tropical storms and hurricanes within the Gulf cause increased winds and tidal forces that can extend hundreds of miles from the center of the storm. The number of tropical cyclones that enter the Atlantic Basin (including the Atlantic Ocean, the Caribbean Sea, and the Gulf of Mexico) is summarized in Figure 11-4. Based on this data the hurricane season for Aransas County is from June to November.

Figure 11-4. Number of Tropical Cyclones per 100 Years (NOAA)



Hurricane Harvey made landfall in the planning area in the late hours of August 25, 2017. At the time of this Plan development the full extent of coastal erosion caused by Harvey is not yet quantified but may result in one of the most powerful sources of coastal erosion in recent years.

A comparison of the coastal erosion rates based on 2010 Texas GLO data indicates that 16 miles of the 19 miles of Aransas County's Gulf-facing shoreline is classified as critical erosion (i.e., greater than -2 feet/year). This accounts for 6.8% of the State total, or 84.2% of Aransas County's total Gulf-facing shoreline as summarized in Table 11-2.

Table 11-2. Critical Erosion for Aransas County Gulf Coastline[10]

Amount of Shoreline		Gulf Coastline			
Gulf	Bay	Critical Erosion			Erosion Rates
		Miles	% of State Total	% of County Total	
19mi.	356mi.	16mi	6.8%	84.2%	-2 to -7 ft/yr

The bay shorelines also experienced similar short-term erosion.

Long-Term

Long-term erosion is less apparent; long-term or slow rates of erosion are caused by seasonal changes such as El Nino, rising sea levels, and other long-term human activities and natural processes like climate change. The 2014 Bureau of Economic Geology report describes erosion rates for Aransas County over several different time periods. These values are summarized in Table 11-3. Areas of expected long-term, Gulf-facing erosion are detailed in the jurisdictional tables.

Table 11-3. Gulf Shoreline Erosion Rates for Aransas County

Time Period	Net Rate (ft/yr)	Range (ft/yr)	Area change rate (ac/yr)
1930 – 2012	-2.49	-5.2 to 1.3	-5.68
1950 – 2012	3.24	-5.9 to 0.98	-7.41
2000 - 2012	3.38	-13 to 11.15	7.66

Probability

Coastal erosion is a continual process with erosion rates that vary over time. As stated above, the most significant cause of short-term coastal erosion is the effect of tropical storms and hurricanes. The annual probability of the occurrence of tropical storms and hurricane for the County and each participating jurisdiction is summarized in Section 5 of this plan. However, because any tropical storm or hurricane that enters the Gulf has an impact on coastal erosion for the entirety of the Gulf Coast the more representative probability for reoccurrence is summarized in the CEPRA 2015 report which indicates that three hurricanes impact the Texas Gulf Coast every four years.

The Bureau of Economic Geology at the University of Texas at Austin measured coastal shoreline erosion as a historical shoreline change rate based on averages over a 90-year

[10] Texas GLO, 2010

period. The results of this assessment indicate that Aransas County's Gulf-facing shoreline is experiencing a mean erosion rate of 2.49 feet/year.

Impact

Coastal erosion results in the loss of agricultural, industrial, maritime shipping, commercial and recreational boating, residential land, public parks, wetlands and critical infrastructure. These impacts are experienced directly by the jurisdictions that border the Gulf; all jurisdictions in this plan have coastlines vulnerable to coastal erosion. The Texas GLO's Texas Coastal Resiliency Master Plan, dated March 2017, includes the following statement concerning impacts by coastal erosion, "if left unaddressed, will continue to have adverse impacts on infrastructure, natural resources, economic activities, and the health and safety of residents."

A healthy beach and dune system can reduce damage to property and critical infrastructure by absorbing some of the energy from storm surges and waves. Beach and dune restoration projects to repair damage caused by coastal erosion are a continual economic burden for the coastal jurisdictions. Additionally, loss of coastal property and beaches may reduce property values and reduce tourism along the coast.

Navigable waterways and small watercraft canal and channel systems, including the Gulf Intracoastal Waterway (GIWW), are impacted by sediment accretion. Dredging of major and minor channels to remove excess sediment to restore access for commercial and private ships is a constant economic strain on the coastal jurisdictions. Coastal erosion and accretion has a notable impact on the ports, coastal petrochemical facilities, road infrastructure, and commercial businesses.

The portions of jurisdictions that do not border the Gulf may not be impacted directly by coastal erosion but they do experience indirect impacts. Indirect impacts include the economic impact of addressing coastal erosion issues. These costs are redistributed to the community through higher taxes, and increased cost of goods and services. Additionally, inland portions of the participating jurisdictions may rely on the coast for the opportunity of participating in and benefiting from the tourist industry which is directly impacted by the health of the beaches and dune systems.

Vulnerability

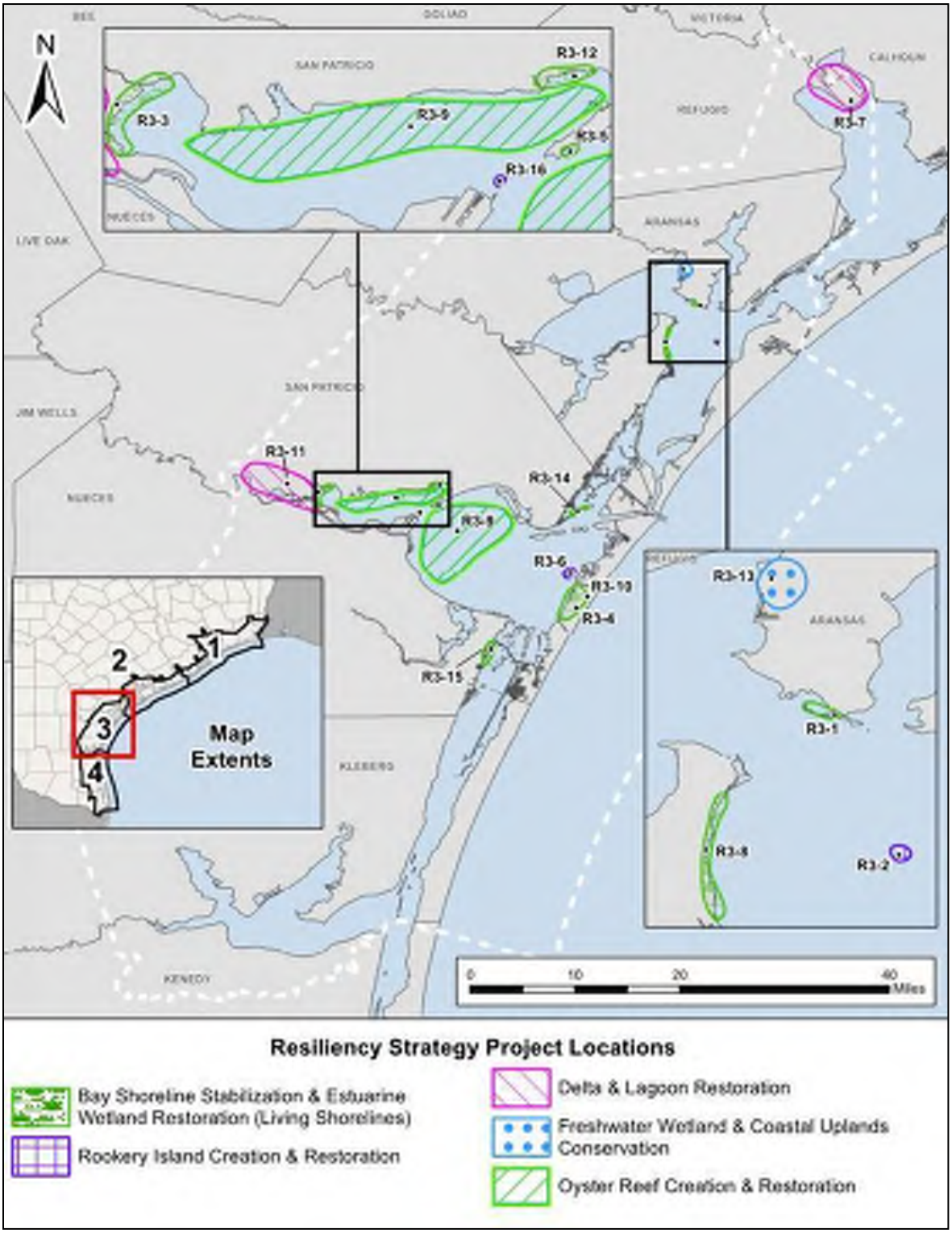
Private and public lands, infrastructure, and industry along the coast are directly vulnerable to the impacts of coastal erosion. The navigable waterways and small watercraft canal and channel systems, including the Gulf Intracoastal Waterway (GIWW), are directly vulnerable to the impacts of coastal erosion and accretion. The Texas GLO's Coastal Resiliency Master Plan identified key issues and proposed solutions to address Aransas County's vulnerability to coastal erosion. The resultant list of projects with associated costs are summarized in Table 11-5 and are shown in Figure 11-3.

Table 11-5. Strategies & Projects to Address Aransas County Coastal Vulnerabilities[11]

Strategy	ID	Tier 1 Projects	Estimated Cost Range
Bay Shoreline Stabilization and Estuarine Wetland Restoration (Living Shorelines)	R3-1	Goose Island State Park Living Shoreline	$1M - $3M
	R3-8	Fulton Beach Road Living Shoreline	$4.5M – $15M
Freshwater Wetland & Coastal Uplands Conservation	R3-13	Shell Point Ranch Wetlands Protection	$2M - $5M
Rookery Island Creation & Restoration	R3-2	Long Reef Rookery Island Shoreline Stabilization	$1M - $3M

[11] Texas GLO's Coastal Resiliency Master Plan, March 2017

Figure 11-3. Map of Projects to Address Aransas County Vulnerabilities[12]



[12] Texas GLO's Coastal Resiliency Master Plan, March 2017

Unincorporated Aransas County Coastal Erosion Hazard

LOCATION	
Gulf-Facing Shoreline	19 Miles
Laguna, Bays, and Islands	169 Miles

EXTENT		
Gulf-Facing Shoreline Change Rate (ft/yr)*		
Minimum	Maximum	Average
-2	-7	-2.49

*Bay-facing shoreline erosion rates are not well documented but are also expected to be in the range of 2.49ft/yr

OCCURENCE
Coastal erosion is a continual process. Coastal erosion occurs over short and long-term periods and at different rates along the coast line.

PROBABILITY		
Short-Term Coastal Erosion		
Number of Gulf of Mexico Tropical Storms & Hurricanes	Period of Record (Years)	Probability
75	100	3 HURRICANES IMPACT THE TEXAS COAST EVERY 4 YEARS
Long-Term Gulf-Facing Coastal Erosion		
Total Gulf-Facing Shoreline (Miles)	Percentage of Gulf-Facing Shoreline Vulnerable to Coastal Erosion	Length of Gulf-Facing Shoreline Vulnerable to Coastal Erosion (Miles)
19	84.2%	16

IMPACT & VULNERABILITY		
Coastal Property Value (Commercial and Residential)	Coastal Crop Land	
	Acres	Estimated Value
$111,840,280	4,921	$447,374

City of Aransas Pass Coastal Erosion Hazard

LOCATION	
Gulf-Facing Shoreline	0 Miles
Laguna, Bays, and Islands	21 Miles

EXTENT		
Gulf-Facing Shoreline Change Rate (ft/yr)		
Minimum	Maximum	Average
N/A*	N/A*	N/A*

*Aransas Pass does not have a Gulf-Facing Shoreline. Bay-facing shoreline erosion rates are not well documented but are expected to be in the range of 2.49ft/yr

OCCURENCE
Coastal erosion is a continual process. Coastal erosion occurs over short and long-term periods and at different rates along the coast line.

PROBABILITY		
Short-Term Coastal Erosion		
Number of Gulf of Mexico Tropical Storms & Hurricanes	Period of Record (Years)	Probability
75	100	3 HURRICANES IMPACT THE TEXAS COAST EVERY 4 YEARS
Long-Term Gulf-facing Coastal Erosion		
Total Gulf-Facing Shoreline Miles	Percentage of Gulf-Facing Shoreline Vulnerable to Coastal Erosion	Length of Gulf-Facing Shoreline Vulnerable to Coastal Erosion (Miles)
N/A	N/A	N/A

IMPACT & VULNERABILITY			
Coastal Property Value		Coastal Crop Land	
Commercial	Residential	Acres	Estimated Value
$66,560	$0	0	$0.00

City of Fulton Coastal Erosion Hazard

LOCATION	
Gulf-Facing Shoreline	0 Miles
Laguna, Bays, and Islands	2.2 Miles

EXTENT		
Gulf-Facing Shoreline Change Rate (ft/yr)		
Minimum	Maximum	Average
N/A*	N/A*	N/A*

*City of Fulton does not have a Gulf-Facing Shoreline. Bay-facing shoreline erosion rates are not well documented but are expected to be in the range of 2.49ft/yr

OCCURENCE
Coastal erosion is a continual process. Coastal erosion occurs over short and long-term periods and at different rates along the coast line.

PROBABILITY		
Short-Term Coastal Erosion		
Number of Gulf of Mexico Tropical Storms & Hurricanes	Period of Record (Years)	Probability
75	100	3 HURRICANES IMPACT THE TEXAS COAST EVERY 4 YEARS
Long-Term Gulf-facing Coastal Erosion		
Total Gulf-Facing Shoreline Miles	Percentage of Gulf-Facing Shoreline Vulnerable to Coastal Erosion	Length of Gulf-Facing Shoreline Vulnerable to Coastal Erosion (Miles)
N/A	N/A	N/A

IMPACT & VULNERABILITY		
Coastal Property Value (Commercial and Residential)	Coastal Crop Land	
	Acres	Estimated Value
$1,575,970	0	$0.00

City of Rockport Coastal Erosion Hazard

LOCATION	
Gulf-Facing Shoreline	0 Miles
Laguna, Bays, and Islands	16.5 Miles

EXTENT		
Gulf-Facing Shoreline Change Rate (ft/yr)		
Minimum	Maximum	Average
N/A	N/A	N/A

*City of Rockport does not have a Gulf-Facing Shoreline. Bay-facing shoreline erosion rates are not well documented but are expected to be in the range of 2.49ft/yr

OCCURENCE
Coastal erosion is a continual process. Coastal erosion occurs over short and long-term periods and at different rates along the coast line.

PROBABILITY		
Short-Term Coastal Erosion		
Number of Gulf of Mexico Tropical Storms & Hurricanes	Period of Record (Years)	Probability
75	100	3 HURRICANES IMPACT THE TEXAS COAST EVERY 4 YEARS
Long-Term Gulf-facing Coastal Erosion		
Total Gulf-Facing Shoreline Miles	Percentage of Gulf-Facing Shoreline Vulnerable to Coastal Erosion	Length of Gulf-Facing Shoreline Vulnerable to Coastal Erosion (Miles)
N/A	N/A	N/A

IMPACT & VULNERABILITY			
Coastal Property Value		Coastal Crop Land	
Commercial	Residential	Acres	Estimated Value
$17,396,315	$54,090,551	25	$60,312

Section 12: Tornado

Tornado Hazard Overview

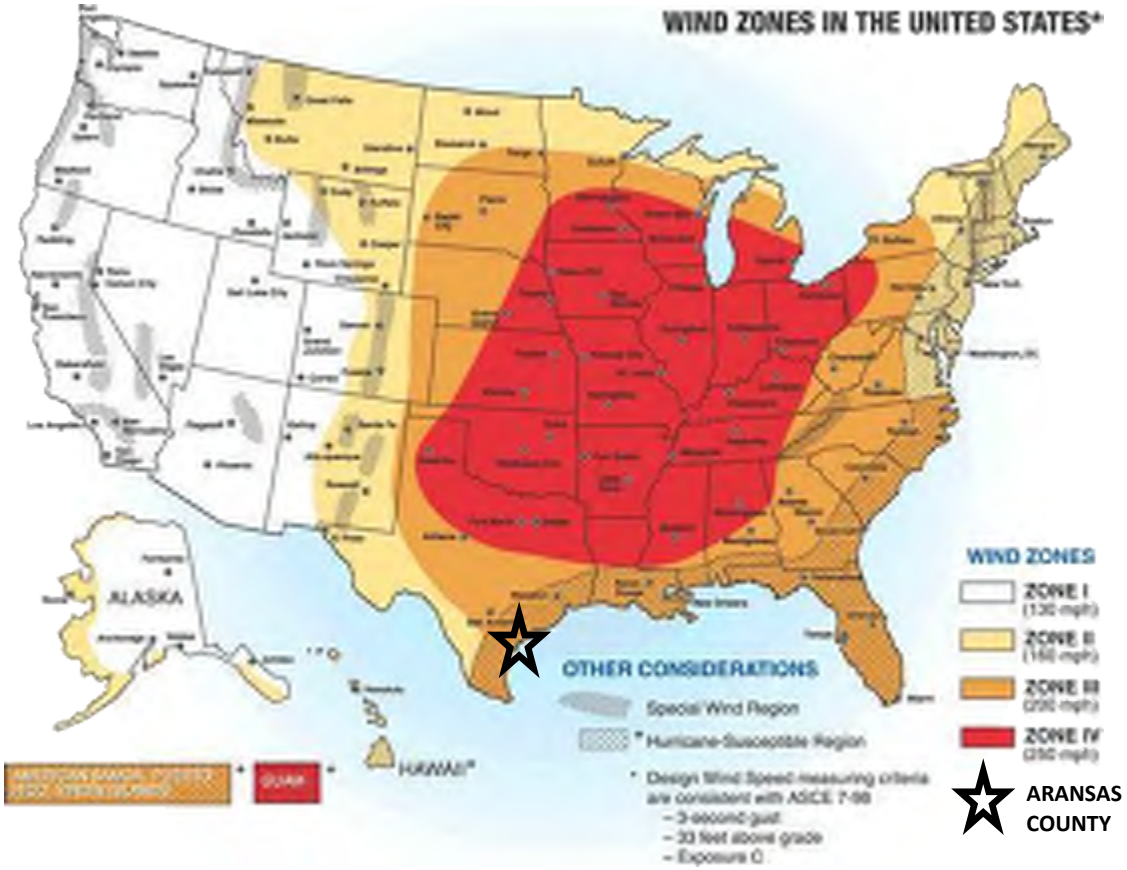
Description

A tornado is a violently rotating column of air extending between, and in contact with, a cloud and the surface of the earth. Tornadoes have wind speeds of 250 miles per hour or more. Damage paths can be in excess of one mile wide and 50 miles long.

Location

Tornadoes do not have a specific geographic boundary and can occur throughout the county uniformly. It is assumed that the county planning area, including all participating jurisdictions, are uniformly exposed to tornado activity. According to FEMA Wind Zones in the United States, Aransas County is located in Wind Zone III, associated to winds as high as 200 mph.

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



Extent

Tornado damage is currently defined using the Enhanced Fujita Scale which took effect on February 1st, 2007; the preceding scale was called the Fujita Tornado Damage Scale. The Enhanced Fujita Scale is summarized in Table 12-1. The Enhanced Fujita Scale has 28 Damage Indicators (DI), or types of structures and vegetation, each with a varying number of Degrees of Damage (DoD). Damage Indicators are summarized in Table 12-2. Each Damage Indicator has a unique Degree of Damage Scale. For example, Small Barns and Farm Outbuildings (SBO) Degree of Damage Scale is provided as Table 12-3. For unique Degree of Damage Scales for the remaining Damage Indicators refer to National Oceanic and Atmospheric Administration website (http://www.spc.noaa.gov/faq/tornado/ef-scale.html).

Table 12-1. Enhanced Fujita Scale[1]

Scale	Wind Speed (mph)	Relative Frequency	Potential Damage	Example of Damage
EF0	65 - 85	56.88%	**Minor or no damage.** Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over. Confirmed tornadoes with no reported damage (i.e., those that remain in open fields) are always rated EF0.	
EF1	86 - 110	31.07%	**Moderate damage.** Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.	
EF2	111 - 135	8.80%	**Considerable damage.** Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.	
EF3	136 - 165	2.51%	**Severe damage.** Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations are badly damaged.	
EF4	166 - 200	0.66%	**Extreme damage.** Well-constructed and whole frame houses completely leveled; cars and other large objects thrown up to 300 feet and small missiles generated.	
EF5	> 200	0.08%	**Total destruction of buildings.** Strong-framed, well-built houses leveled off foundations are swept away; steel-reinforced concrete structures are critically damaged; tall buildings collapse or have severe structural deformations; some cars, trucks and train cars can be thrown approximately 1 mile.	

[1] NOAA

Table 12-2. Damage Indicators

Number	Damage Indicator (Abbreviation)	Degrees of Damage (DoD)
1	Small barns, farm outbuildings (SBO)	8
2	One- or two-family residences (FR12)	10
3	Single-wide mobile home (MHSW)	9
4	Double-wide mobile home (MHDW)	12
5	Apt, condo, townhouse (3 stories or less)	6
6	Motel (M)	10
7	Masonry apt. or motel (MAM)	7
8	Small retail bldg. (fast food) (SRB)	8
9	Small professional (doctor office, branch bank) (SPB)	9
10	Strip mall (SM)	9
11	Large shopping mall (LSM)	9
12	Large, isolated ("big box") retail bldg. (LIRB)	7
13	Automobile showroom (ASR)	8
14	Automotive service building (ASB)	8
15	School - 1-story elementary (interior or exterior halls) (ES)	10
16	School - jr. or sr. high school (JHSH)	11
17	Low-rise (1-4 story) bldg. (LRB)	7
18	Mid-rise (5-20 story) bldg. (MRB)	10
19	High-rise (over 20 stories) (HRB)	10
20	Institutional bldg. (hospital, govt. or university) (IB)	11
21	Metal building system (MBS)	8
22	Service station canopy (SSC)	6
23	Warehouse (tilt-up walls or heavy timber) (WHB)	7
24	Transmission line tower (TLT)	6
25	Free-standing tower (FST)	3
26	Free standing pole (light, flag, luminary) (FSP)	3
27	Tree – hardwood (TH)	5
28	Tree – softwood (TS)	5

Table 12-3. Small Barns and Farm Outbuildings (SBO)

Degrees of Damage (DoD)	Damage Description	Expected Wind Speed (mph)	Lower Bound Wind Speed (mph)	Upper Bound Wind Speed (mph)
1	Threshold of visible damage	62	53	78
2	Loss of wood or metal roof panels	74	61	91
3	Collapse of doors	83	68	102
4	Major loss of roof panels	90	78	110
5	Uplift or collapse of roof structures	93	77	114
6	Collapse of walls	97	81	119
7	Overturning or sliding of entire structure	99	83	118
8	Total destruction of building	112	94	131

Occurrences

Tornado producing storms can occur at any time of year and at any time of day, but they are typically more common in the spring months during the late afternoon and evening hours. A smaller high frequency period can emerge in the fall during the brief transition between the warm and cold seasons. According to the National Oceanic and Atmospheric Administration (NOAA) National Centers For Environmental Information Storm Event Database Aransas County has experienced 19 (recorded) tornado events over the course of the record period from 11/1/1950 to 11/30/2016 (66 years). Table 12-4 includes a summary of tornado events from 1950 to 2006 using the Fujita Scale and Table 12-5 summarizes tornado events from 2007 to 2016 using the latest magnitude scale the Enhanced Fujita Scale. Table 12-6 includes a comprehensive list of all tornadoes on record within Aransas County. Historical tornado events are mapped for the county and each participating jurisdiction in the following sections.

Table 12-4. Historical Tornado Occurrence Summary, 1950-2006

Number of Events	Magnitude (Fujita Scale)						
	N/A	F0	F1	F2	F3	F4	F5
10	0	4	4	1	1	0	0

Table 12-5. Historical Tornado Occurrence Summary, 2007-2016

Number of Events	Magnitude (Enhanced Fujita Scale)						
	N/A	EF0	EF1	EF2	EF3	EF4	EF5
9	0	7	1	1	0	0	0

Table 12-6. Historical Tornado Events, 1950-2016

Date	Jurisdiction	Extent: Fujita Scale (pre-2007), Enhanced Fujita Scale (post-2007)	Injuries	Fatalities	Property Damage	Crop Damage
1953-10-23	Aransas County	2	0	0	$5,000 - $50,000	Unknown
1967-09-20	Fulton	3	3	0	$50,000 - $500,000	Unknown
1968-05-11	Aransas Pass	1	0	0	$500 - $5,000	Unknown
1968-05-11	Aransas Pass	1	0	0	$500 - $5,000	Unknown
1973-04-15	Aransas County	0	0	0	Unknown	Unknown
1973-06-13	Aransas County	1	0	0	$500 - $5,000	Unknown
1978-09-11	Aransas County	0	0	0	Unknown	Unknown
1981-08-29	Aransas Pass	1	0	0	$5,000 - $50,000	Unknown
1993-06-11	Rockport	0	0	0	$5,000 - $50,000	Unknown
1999-08-22	Rockport	0	0	0	Unknown	Unknown
2007-09-11	Aransas County	0	0	0	Unknown	Unknown
2007-09-29	Aransas Pass	1	0	0	Unknown	Unknown
2008-07-23	Aransas County	0	0	0	Unknown	Unknown
2009-08-30	Aransas County	0	0	0	Unknown	Unknown
2009-08-30	Aransas Pass	0	0	0	Unknown	Unknown
2010-06-02	Aransas County	2	0	0	Unknown	Unknown
2010-06-30	Aransas County	0	0	0	Unknown	Unknown
2010-07-01	Rockport	0	0	0	Unknown	Unknown
2012-05-10	Aransas County	0	0	0	Unknown	Unknown

Probability

Probability, or frequency of return, was calculated by dividing the number of tornado events in the recorded time period by the overall time period that the resource database has recorded events for that jurisdiction. Note, historical events are documented as a function of the origin of the touchdown location. A tornado may travel over several jurisdictions; however, the tornado event is solely recorded for the jurisdiction of the tornado origin. Table 12-7 provides a general overview of tornado severity, probability, impacts, and defining characteristics. Probability for future tornado events is defined for the county and each participating jurisdiction in the following sections.

Table 12-7. Tornado Severity Defined

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

Impact

Tornados impacts are documented by the number of deaths, injuries, property damage, and crop damage. Table 12-8 provides a summary of impacts for Aransas County as a whole. Impacts to the county and participating jurisdictions is documented in the following sections.

Tornadoes, depending upon extent, can destroy anything they come into contact with. Location of tornado touchdowns cannot be predicted; therefore, all assets, property, and populations within the planning area are considered vulnerable to tornadoes. Properties within the planning area may experience power outages or other utility failures even if they're not destroyed during a tornado event. Homes destroyed by tornadoes will lead to displaced populations. Crops and commercial property destroyed in tornado events will have negative economic impacts.

Table 12-8. Aransas County Historical Tornado Impacts Summary, 1950-2016

Number of Events	Deaths	Injuries	Property Damage	Crop Damage
19	0	3	$665,000	Unknown

Vulnerability

Tornadoes typically cross jurisdictional boundaries; therefore, all existing and future buildings, facilities, and populations in and around Aransas County are exposed to tornado hazard and are at potential risk of impact. The damage caused by a tornado is typically a result of high wind velocity, wind-blown debris, lightning, and large hail. Vulnerability of humans and property is difficult to evaluate given that tornadoes form at different strengths and in random locations. Property damage is typically most significant for structures of light construction. Three types of structures are more likely to suffer damage: manufactured homes, homes on crawlspaces (more susceptible to lift), and buildings with large spans, such as shopping malls, gymnasiums, and factories. Vulnerability is defined for the county and participating jurisdictions in the following sections.

Unincorporated Aransas County Tornado Hazard

LOCATION
County Wide (Unincorporated)

OCCURENCE	EXTENT						
Number of Events 1950-2006*	Magnitude (Fujita Scale)						
	N/A	F0	F1	F2	F3	F4	F5
4	0	2	1	1	0	0	0
Number of Events 2007-2016*	Magnitude (Enhanced Fujita Scale)						
	N/A	EF0	EF1	EF2	EF3	EF4	EF5
6	0	5	0	1	0	0	0

* Fujita Scale replaced with Enhanced Fujita Scale in 2007

PROBABILITY			
Number of Events	Record Time Period	Time Period Years	Probability
10	11/1/1950 to 11/30/2016	66	1 TORNADO TOUCHDOWN ESTIMATED EVERY 6.6 YEARS

IMPACT			
Number of Events	Deaths	Injuries	Property Damage
10	0	0	$55,000

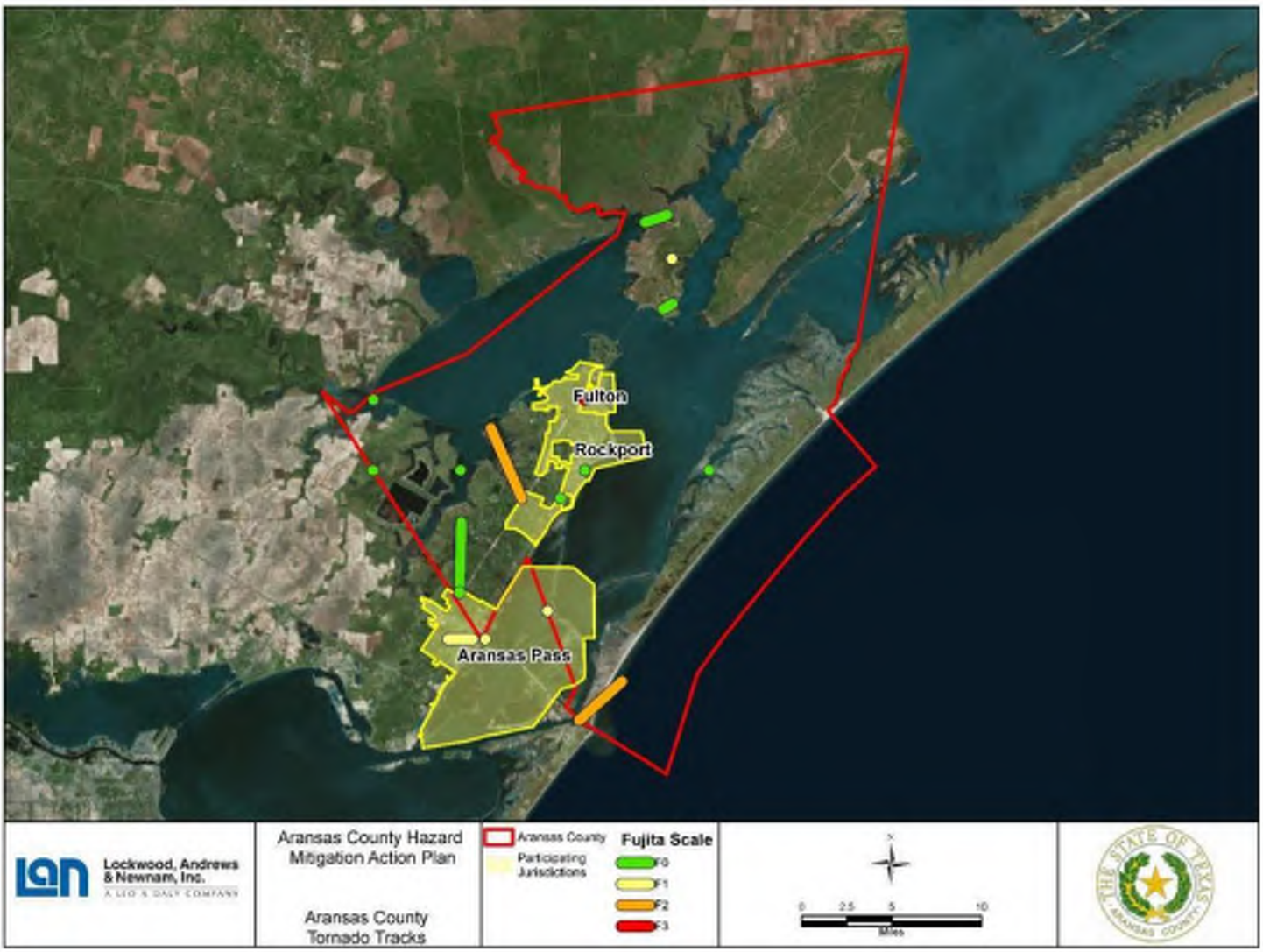
VULNERABILITY			
Population (County)*	Property Value**	Crop Land***	
	Commercial and Residential	Acres	Value
4,914	$777,545,526	10,504	$954,942

* US Census Bureau American Community Survey 2015 Estimates. Unincorporated population derived from County population less the populations of participating communities.

**Aransas County Appraisal District 2016

***Census of Agriculture, 2012 (The latest Agriculture Census published 2012)

Figure 12-2. Unincorporated Aransas County Tornado Hazard Map (1950 – 2016)



City of Aransas Pass Tornado Hazard

LOCATION
City Wide

OCCURENCE	EXTENT						
Number of Events 1950-2006*	Magnitude (Fujita Scale)						
	N/A	F0	F1	F2	F3	F4	F5
3	0	0	3	0	0	0	0
Number of Events 2007-2016*	Magnitude (Enhanced Fujita Scale)						
	N/A	EF0	EF1	EF2	EF3	EF4	EF5
2	0	1	1	0	0	0	0

* Fujita Scale replaced with Enhanced Fujita Scale in 2007

PROBABILITY			
Number of Events	Record Time Period	Time Period Years	Probability
5	11/1/1950 to 11/30/2016	66	1 TORNADO TOUCHDOWN ESTIMATED EVERY 13 YEARS

IMPACT			
Number of Events	Deaths	Injuries	Property Damage
0	0	0	$60,000

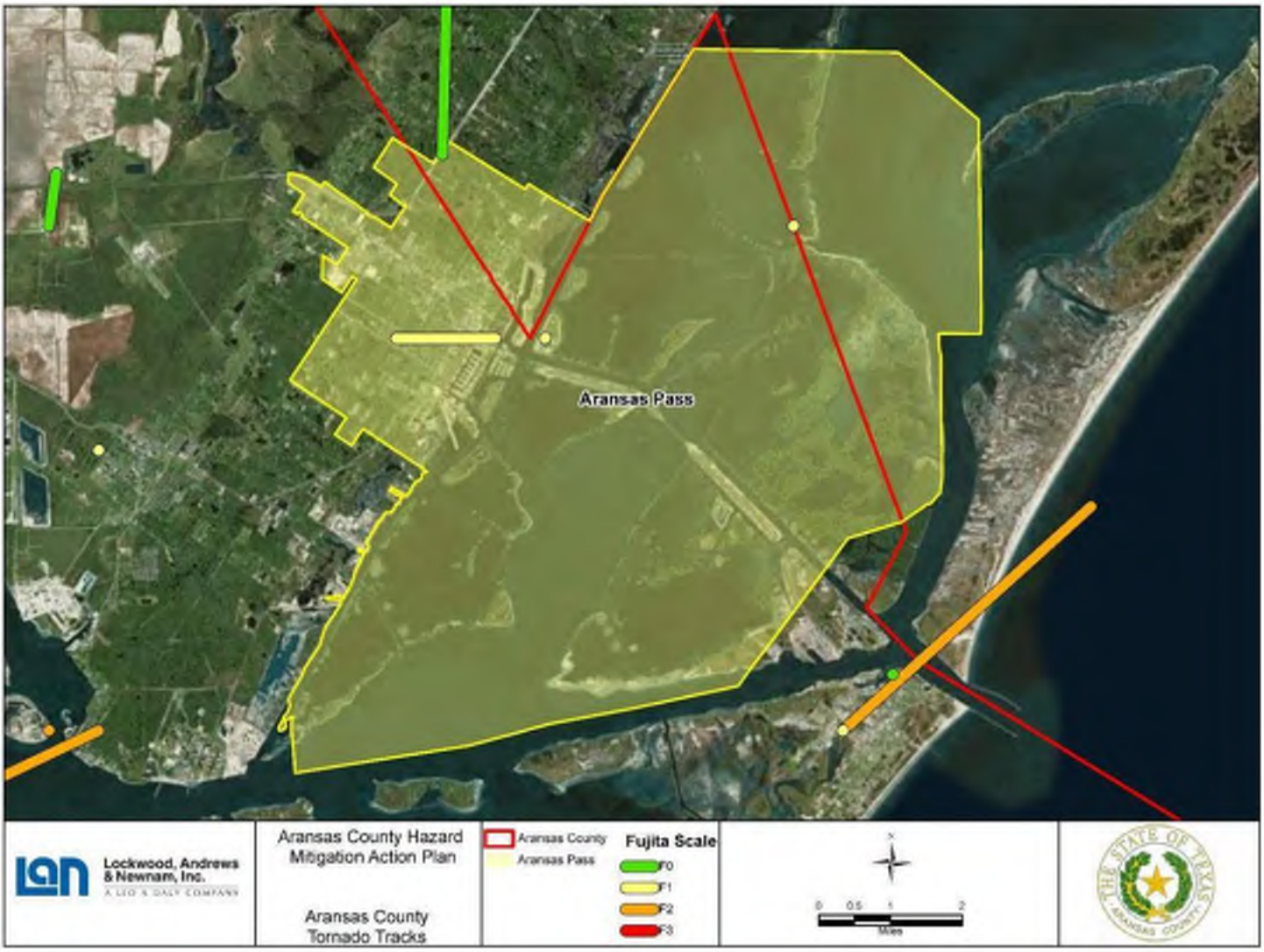
VULNERABILITY				
Population (City)*	Property Value**		Crop Land***	
	Commercial	Residential	Acres	Value
8,067	$8,023,576	$11,325,380	10	$8,582

*US Census Bureau American Community Survey 2015 Estimates

**Aransas County Appraisal District 2016

***Census of Agriculture, 2012 (The latest Agriculture Census published 2012)

Figure 12-3. City of Aransas Pass Tornado Hazard Map (1950 – 2016)



City of Fulton Tornado Hazard

LOCATION
City Wide

OCCURENCE	EXTENT						
Number of Events 1950-2006*	Magnitude (Fujita Scale)						
	N/A	F0	F1	F2	F3	F4	F5
0	0	0	0	0	0	0	0
Number of Events 2007-2016*	Magnitude (Enhanced Fujita Scale)						
	N/A	EF0	EF1	EF2	EF3	EF4	EF5
1	0	0	0	0	1	0	0

* Fujita Scale replaced with Enhanced Fujita Scale in 2007

PROBABILITY			
Number of Events	Record Time Period	Time Period Years	Probability
1	11/1/1950 to 11/30/2016	66	1 TORNADO TOUCHDOWNS ESTIMATED EVERY 66 YEARS

IMPACT			
Number of Events	Deaths	Injuries	Property Damage
1	0	3	$500,000

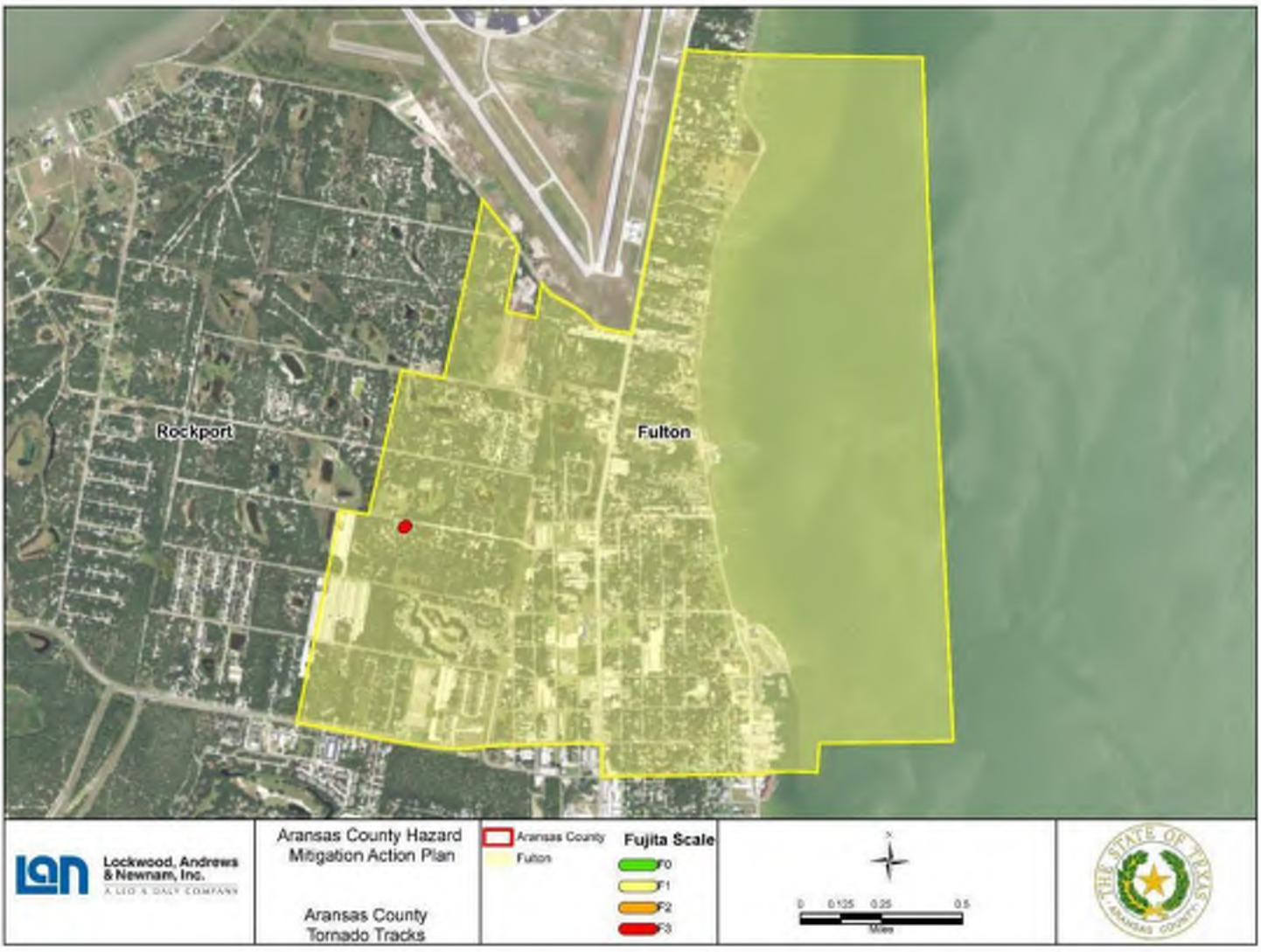
VULNERABILITY			
Population (City)*	Property Value**	Crop Land***	
	Commercial and Residential	Acres	Value
1,319	$122,408,970	0	$0.00

*US Census Bureau American Community Survey 2015 Estimates

**Aransas County Appraisal District 2016

***Census of Agriculture, 2012 (The latest Agriculture Census published 2012)

Figure 12-4. City of Fulton Tornado Hazard Map (1950 – 2016)



City of Rockport Tornado Hazard

LOCATION
City Wide

OCCURENCE	EXTENT						
Number of Events 1950-2006*	Magnitude (Fujita Scale)						
	N/A	F0	F1	F2	F3	F4	F5
2	0	2	0	0	0	0	0
Number of Events 2007-2016*	Magnitude (Enhanced Fujita Scale)						
	N/A	EF0	EF1	EF2	EF3	EF4	EF5
1	0	1	0	0	0	0	0

* Fujita Scale replaced with Enhanced Fujita Scale in 2007

PROBABILITY			
Number of Events	Record Time Period	Time Period Years	Probability
3	11/1/1950 to 11/30/2016	66	1 TORNADO TOUCHDOWNS ESTIMATED EVERY 22 YEARS

IMPACT			
Number of Events	Deaths	Injuries	Property Damage
3	0	0	$50,000

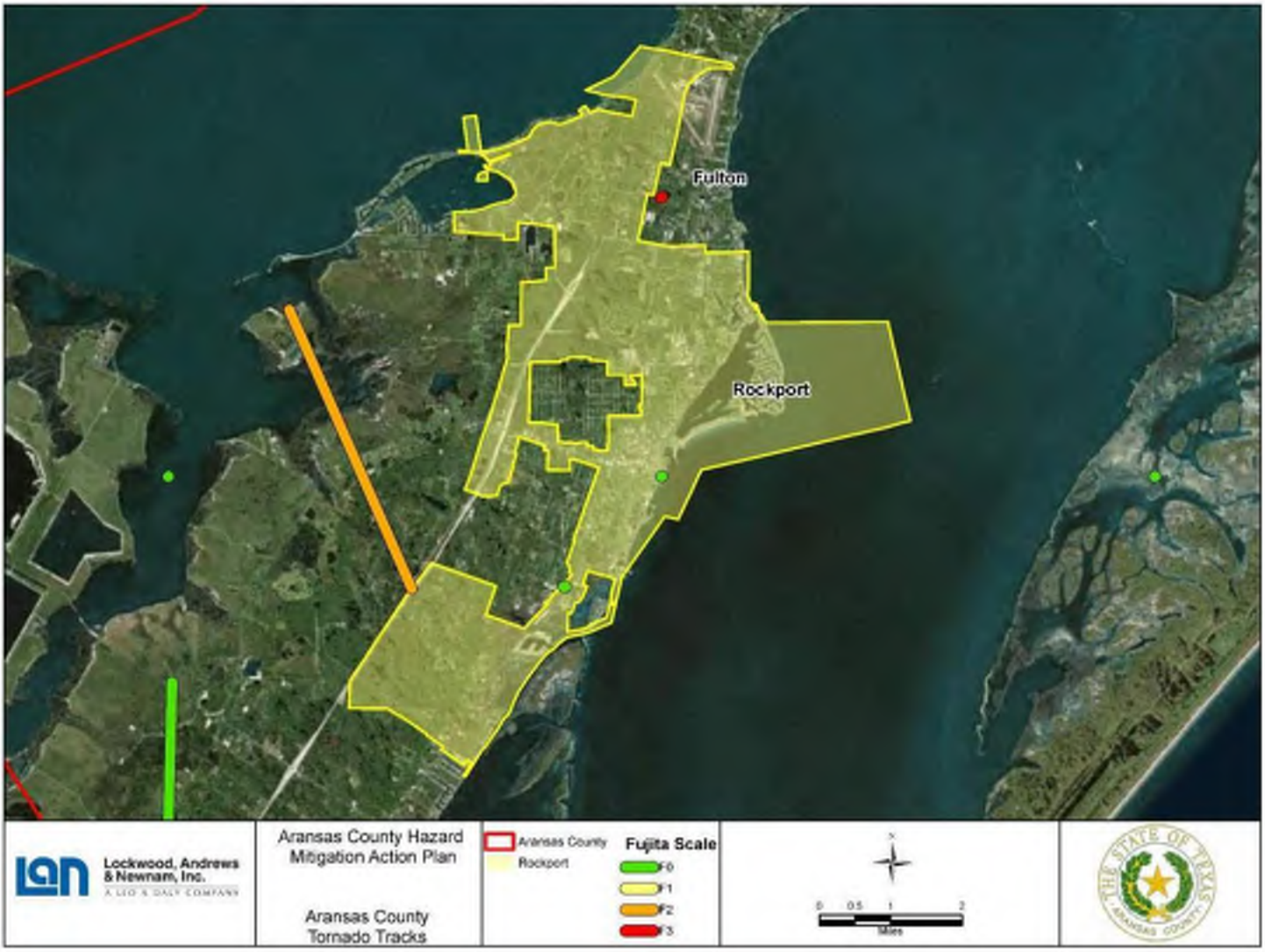
VULNERABILITY				
Population (City)*	Property Value**		Crop Land***	
	Commercial	Residential	Acres	Value
9,992	$242,443,666	$737,234,996	46	$111,476

*US Census Bureau American Community Survey 2015 Estimates

**Aransas County Appraisal District 2016

***Census of Agriculture, 2012 (The latest Agriculture Census published 2012)

Figure 12-5. City of Rockport Tornado Hazard Map (1950 – 2016)



Section 13: Hailstorm

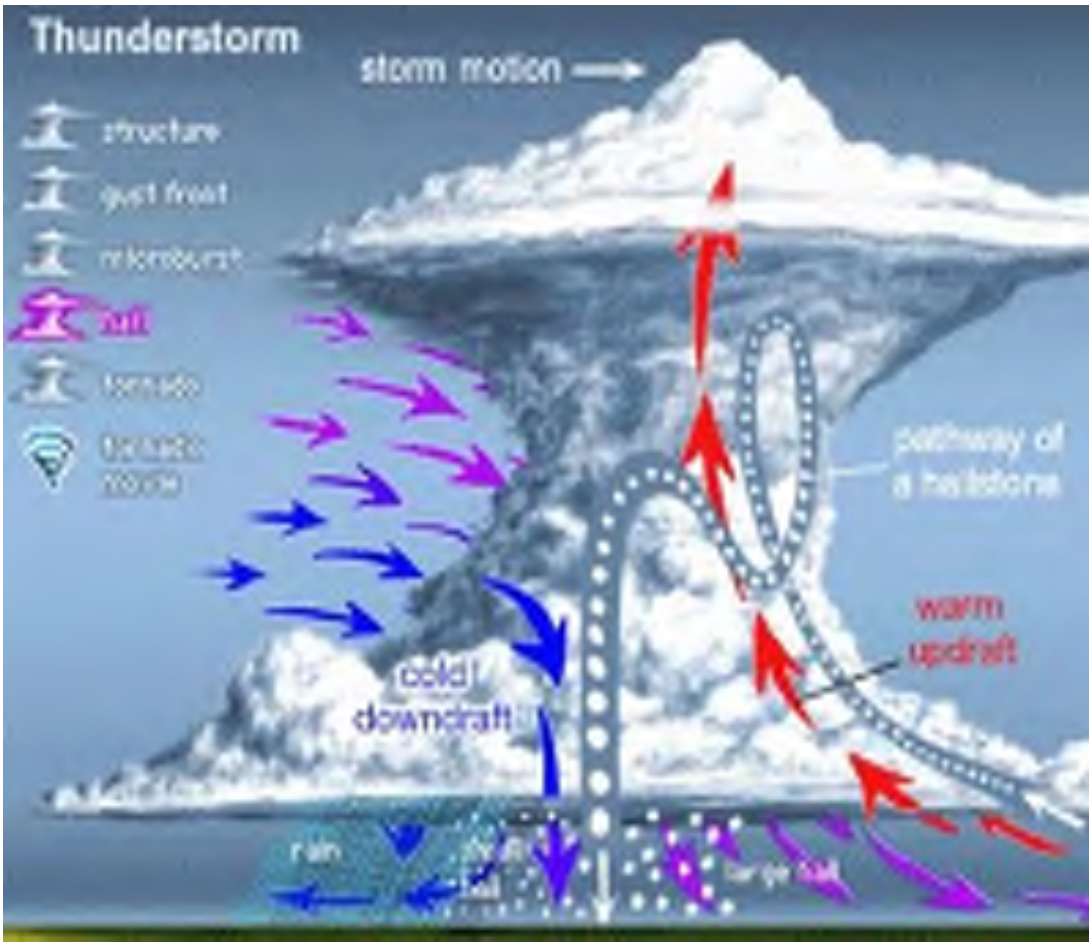
Hailstorm Hazard Overview

Description

Hail is a form of precipitation that occurs when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere where they freeze into ice. Nearly all severe thunderstorms produce hail aloft, though it may melt before reaching the ground. Multi-cell thunderstorms produce many hailstones, but not usually large hailstones. In the life cycle of the multi-cell thunderstorm, the mature stage is relatively short so there is not much time for growth of the hailstone. Supercell thunderstorms have sustained updrafts that support large hail formation by repeatedly lifting the hailstones into the very cold air at the top of the thunderstorm cloud. In general hail 2 inches (5 cm), a little larger than golf ball, or larger in diameter is associated with supercells. Non-supercell storms are capable of producing golf ball size hail. In all cases, the hail falls when the thunderstorm's updraft can no longer support the weight of the ice. The stronger the updraft the larger the hailstone can grow[1].

[1] NOAA

Figure 13-1: Hail Development within a Thunderstorm



Location

Hailstorms do not have a specific geographic boundaries and can occur throughout the county uniformly. It is assumed that the county planning area including all participating jurisdictions are uniformly exposed to damage from hailstorms.

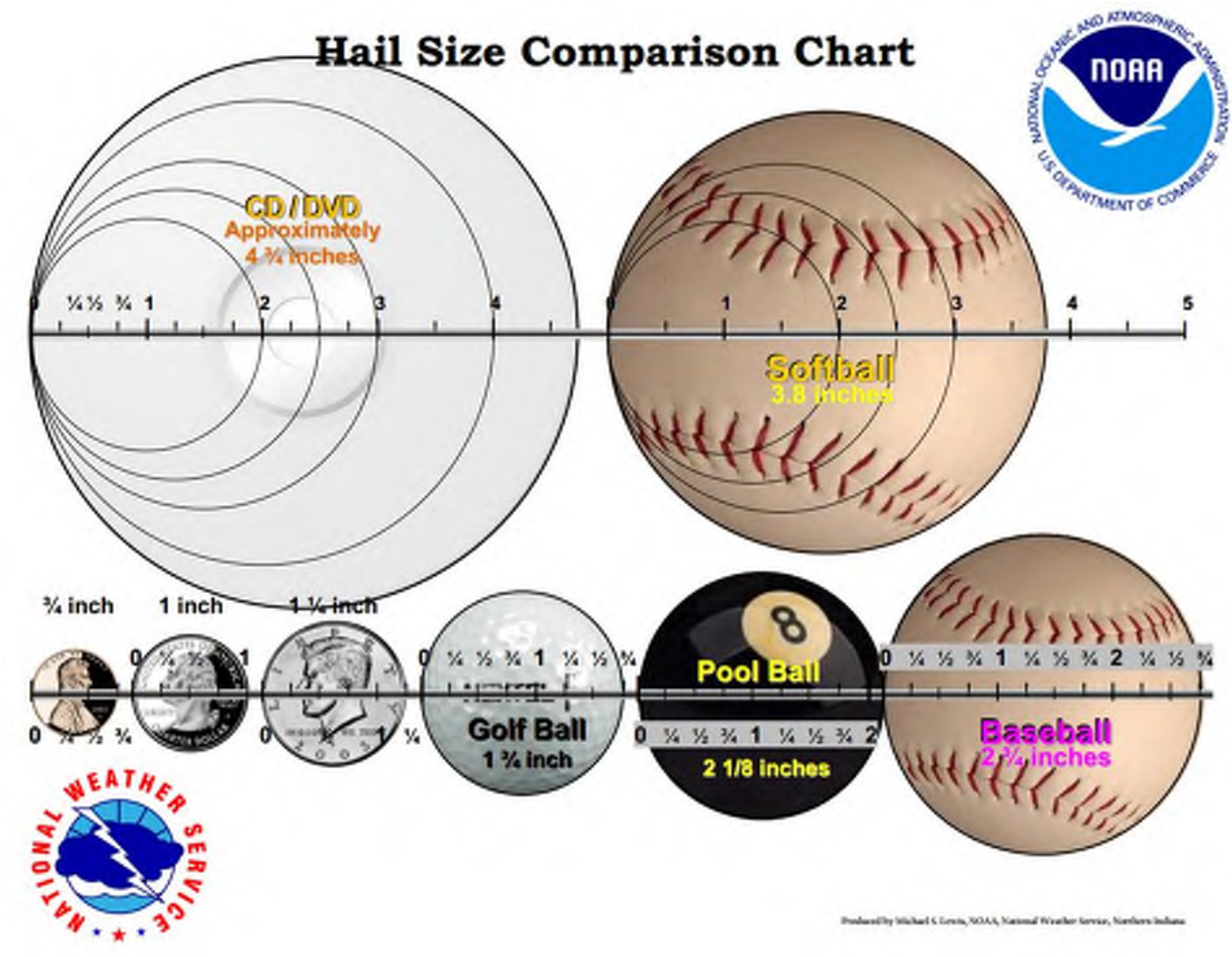
Extent

Much of the damage inflicted by hail is to crops. Even relatively small hail can shred plants to ribbons in a matter of minutes. Vehicles, roofs of buildings and homes, and landscaping are the other things most commonly damaged by hail.

Hail has been known to cause injury to humans, and occasionally has been fatal. There have been no recorded fatalities or Injuries in the region.

Hail size is estimated by comparing it to a known object. Most hailstorms are made up of a mix of sizes, and only the very largest hail stones pose serious risk to people caught in the open. Hail of quarter size and larger is considered severe. The extent of hailstorm is uniform across the region

Figure 13-2: Hail Size Comparison Chart[2]



[2] NOAA

Table 13-1. Estimating Hail Size[3]

Size	Relative Frequency	Potential Damage	Example of Damage
Pea	¼" Diameter	**Virtually no damage.** Slight Damage to plants.	
Marble	½" Diameter	**Virtually no structural damage.** Some damage to plants.	
Quarter	1" Diameter	**Some severe damage.** Dents to vehicles. Extensive damage to crops, plants, minor bodily damage.	
Ping Pong Ball	11/2" Diameter	**Severe damage.** Paint damaged on cars; shingle roof damage; limbs broken; extensive damage to crops. Extensive bodily injury.	
Golf Ball	13/4"	**Severe damage.** Damage to windows, metal roofs pitted, aircraft pitted, trees damaged, total crop damage.	
Tennis Ball	21/2"	**Extreme Damage** Damage to roof tiles, Significant structural damage to buildings, risk of serious bodily injury.	
Baseball	3"	**Extreme Damage** Cars and airplanes severely damaged, damage to forests, humans and animals seriously in danger.	
Softball	41/2"	**Total Destruction** Buildings destroyed, fatalities in humans and animals; cars and airplanes destroyed, forest severely damaged.	

[3] NOAA

Occurrences

Hail producing storms can occur at any time of year and at any time of day, but they are typically more common in the spring and summer months during the late afternoon and evening hours. A smaller high frequency period can emerge in the fall during the brief transition between the warm and cold seasons. According to the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information Storm Prediction Center, Aransas County has experienced 117 (recorded) hailstorm events over the course of the record period from 03/21/1956 to 04/22/2015 (59 years). Table 13-2 includes a summary of hailstorm events from 1956 to 2015 and Table 13-3 includes a comprehensive list of all hailstorms on record within Aransas County.

Table 13-2. Historical Hailstorm Occurrence Summary, 1950-2015

Number of Events	Magnitude (Size of Hail)						
	3/4"	7/8"	1"	11/4"	11/2"	13/4"	23/4"
24	9	2	8	0	2	3	0

Table 13-3. Historical Hailstorm Events, 1968-2015

Date	Jurisdiction	Extent: Size of Hail	Injuries	Fatalities	Property Damage	Crop Damage
1968-05-17	Aransas Pass	1.5	0	0	Unknown	Unknown
1969-11-26	Aransas Pass	1.75	0	0	Unknown	Unknown
1976-04-07	Aransas Pass	0.75	0	0	Unknown	Unknown
1986-03-13	Aransas County	1	0	0	Unknown	Unknown
1986-05-17	Rockport	1	0	0	Unknown	Unknown
1995-04-11	Rockport	0.75	0	0	Unknown	Unknown
1996-04-05	Aransas Pass	1	0	0	Unknown	Unknown
1998-01-31	Fulton	0.75	0	0	Unknown	Unknown
1998-01-31	Rockport	0.75	0	0	Unknown	Unknown
1998-03-07	Rockport	1	0	0	Unknown	Unknown
2000-03-18	Aransas County	0.75	0	0	Unknown	Unknown
2000-03-18	Rockport	1	0	0	Unknown	Unknown
2003-03-26	Aransas Pass	0.75	0	0	Unknown	Unknown
2003-03-26	Rockport	1	0	0	Unknown	Unknown
2004-02-24	Aransas Pass	0.88	0	0	Unknown	Unknown
2005-05-08	Aransas County	0.75	0	0	Unknown	Unknown
2005-05-08	Rockport	0.75	0	0	Unknown	Unknown
2007-03-13	Rockport	1	0	0	Unknown	Unknown
2009-06-03	Aransas County	1.75	0	0	Unknown	Unknown
2011-01-09	Aransas Pass	1.5	0	0	Under $50	Unknown
2012-05-15	Aransas Pass	0.75	0	0	Unknown	Unknown
2012-05-15	Aransas County	1	0	0	Under $50	Unknown
2012-05-15	Rockport	1.75	0	0	Under $50	Unknown
2012-12-04	Aransas County	0.88	0	0	Unknown	Unknown

Probability

Probability, or frequency of return, was calculated by dividing the number of hailstorm events in the recorded time period by the overall time period that the resource database has recorded events for that jurisdiction. A hailstorm may travel over several jurisdictions; however, the hailstorm event is solely recorded for the jurisdiction of the hailstorm origin. Table 13-4 provides a general overview of hailstorm severity, probability, impacts, and defining characteristics. Probability for future hailstorm events is defined for the county and each participating jurisdiction in the following sections.

Table 13-4. Hailstorm Severity Defined

Minor Damage	Severe Damage	Extreme Damage
36% of all hailstorms. $0 to Less than $100 in damage. No bodily injuries if exposed to the hail.	45% of all hailstorms $500 to $50,000 in damages. Minor bodily injuries if exposed to the hail.	17% of all hailstorms $100,000 to $5,000,000 in damages. Fatalities possible if exposed to hail.

Impact

Hailstorm impacts are documented by the number of deaths, injuries, property damage, and crop damage. Table 13-5 provides a summary of impacts for Aransas County as a whole. Impacts to the county and participating jurisdictions is documented in the following sections.

Table 13-5. Historical Hailstorm Impacts Summary, 1955-2015

Number of Events	Deaths	Injuries	Property Damage	Crop Damage
24	0	0	<$1000	Unknown

Vulnerability

Hailstorms typically cross jurisdictional boundaries; therefore, all existing and future buildings, facilities, and populations in and around Aransas County are exposed to hail hazard and are at potential risk of impact. The damage caused by a hail is dependent upon the size of the “hail stones” and result in damage to vehicles, buildings, roofs, plants, trees, and especially crops. Vulnerability of humans and property is difficult to quantify given that hailstorms form at different strengths and in random locations. Property damage is typically most significant for vehicles and structures of light construction. Three types of structures are more likely to suffer damage: manufactured homes and recreational vehicles. Agricultural crops are especially vulnerable to 1” or greater size hail and can lead to total crop failure. Vulnerability is defined for the county and participating jurisdictions in the following sections.

Unincorporated Aransas County Hailstorm Hazard

LOCATION
County Wide (Unincorporated)

OCCURENCE	EXTENT						
Number of Events 1968-2012*	Magnitude (Size of Hail)						
	3/4"	7/8"	1"	11/4"	11/2"	13/4"	23/4"
6	2	1	2	0	0	1	0

PROBABILITY			
Number of Events	Record Time Period	Time Period Years	Probability
6	5/17/1968 to 5/15/2012	44	1 HAILSTORM ESTIMATED EVERY 7.33 YEARS

IMPACT				
Number of Events	Deaths	Injuries	Property Damage	Crop Damage
6	0	0	Under $50	Unknown

VULNERABILITY			
Population (County)*	Property Value**	Crop Land***	
	Commercial and Residential	Acres	Value
4,914	$777,545,526	10,504	$954,942

* US Census Bureau American Community Survey 2015 Estimates. Unincorporated population derived from county population less the populations of participating communities.

**Aransas County Appraisal District 2016

***Census of Agriculture, 2012 (The latest Agriculture Census published 2012)

City of Aransas Pass Hailstorm Hazard

LOCATION
City Wide

OCCURENCE	EXPECTED EXTENT*						
Number of Events 1968-2012	Magnitude (Size of Hail)						
	3/4”	7/8”	1”	11/4”	11/2”	13/4”	23/4”
8	3	1	1	0	2	1	0

PROBABILITY			
Number of Events	Record Time Period	Time Period Years	Probability
8	5/17/1968 to 5/15/2012	44	18% annual chance, or one hailstorm every 5.5 years **

IMPACT				
Number of Events	Deaths	Injuries	Property Damage	Crop Damage
8	0	0	Under $50	Unknown

VULNERABILITY				
Population (City)*	Property Value**		Crop Land***	
	Commercial	Residential	Acres	Value
8,067	$8,023,576	$11,325,380	10	$8,582

*US Census Bureau American Community Survey 2015 Estimates

**Aransas County Appraisal District 2016

***Census of Agriculture, 2012 (The latest Agriculture Census published 2012)

City of Fulton Hailstorm Hazard

LOCATION
City Wide

OCCURENCE	EXTENT						
Number of Events 1968-2012	Magnitude (Size of Hail)						
	3/4”	7/8”	1”	11/4”	11/2”	13/4”	23/4”
1	1	0	0	0	0	0	0

PROBABILITY			
Number of Events	Record Time Period	Time Period Years	Probability
1	5/17/1968 to 5/15/2012	44	1 HAILSTORM EVENT ESTIMATED EVERY 44 YEARS

IMPACT				
Number of Events	Deaths	Injuries	Property Damage	Crop Damage
1	0	0	Unknown	Unknown

VULNERABILITY			
Population (City)*	Property Value**	Crop Land***	
	Commercial and Residential	Acres	Value
1,319	$122,408,970	0	$0

* US Census Bureau American Community Survey 2015 Estimates

**Aransas County Appraisal District, Reappraisal Plan 2015-2016

***Census of Agriculture, 2012 (The latest Agriculture Census published 2012)

City of Rockport Hailstorm Hazard

LOCATION
City Wide

OCCURENCE	EXTENT						
Number of Events 1956-2015	Magnitude (Size of Hail)						
	3/4"	7/8"	1"	11/4"	11/2"	13/4"	23/4"
9	3	0	5	0	0	1	0

PROBABILITY			
Number of Events	Record Time Period	Time Period Years	Probability
9	5/17/1968 to 5/15/2012	44	1 HAILSTORM ESTIMATED EVERY 5 YEARS

IMPACT				
Number of Events	Deaths	Injuries	Property Damage	Crop Damage
9	0	0	Under $50	Unknown

VULNERABILITY				
Population (City)*	Property Value**		Crop Land***	
	Commercial	Residential	Acres	Value
9,992	$242,443,666	$737,234,996	46	$111,476

* US Census Bureau American Community Survey 2015 Estimates

**Aransas County Appraisal District, Reappraisal Plan 2015-2016

***Census of Agriculture, 2012 (The latest Agriculture Census published 2012)

Section 14: Wildfire

Wildfire Hazard Overview

Description

A wildfire is an uncontrolled fire almost exclusively fueled by natural vegetative fuels. Fuel may come in the form of grass, brush, or tress. Wildfire risk increases with high concentrations of connected fuels. Meteorological conditions such as high temperatures, low humidity, droughts, and high wind can also increase wildfire risk. Humans are the most common source of initial ignition in wildfires. Sparks from agricultural, industrial, or automobile activity may start a wildfire.

Location

Wildfires are most common in areas where wildland and urban areas abut, known as the Wildland Urban Interface (WUI). The areas of Aransas County that feature WUI are the most vulnerable to wildfire. The urban centers of communities lack the concentrations of fuels required to feed wildfires. The rural areas of the planning area lack the degree of human activity that is associated with ignition. Areas where human activity takes place and fuel concentrations and connectivity are sufficient to fuel wildfire are the areas where wildfires are most likely.

Extent

Risk to wildfire can be measured by using the Keetch-Byram Drought Index (KBDI). KBDI relates weather conditions and expected, potential fire behavior. KBDI is based upon daily water balance, precipitation, and soil moisture. KBDI ranges from 0 to 800. A KBDI score of 0 indicates no water depletion, while a score of 800 represents absolutely dry conditions.

Table 14-1. Keetch-Byram Drought Index Scores Defined

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

Based on Texas A&M Forest Service data, Aransas County has an average KBDI of 62. The maximum KBDI experienced by Aransas County is 310. The minimum KBDI experienced by Aransas County is 9. This is a generally low to moderate level of risk. Because KBDI indicates current conditions, care should be taken to ensure that current KBDI is examined to determine risk. Droughts or extreme weather conditions may drive KBDI up or down in a short time.

Wildfire threat for Texas is also quantified by the Texas A&M Forest Service using a unitless index ranging from 1 to 7. The Texas A&M Forest Service assigns the qualitative descriptions of Low, Moderate, High, and Very High to index scores of 1, 3, 5, and 7, respectively to describe wildfire risk. The wildfire threat index is a model; significant wildfires have taken place outside of areas of high risk. Conversely, there are areas of high risk that have not experienced a wildfire. This variability is expected and is consistent with other natural disaster forecasting models. Threat index scores of 5, 6, and 7 are mapped and used to assess vulnerability later in this document.

Occurrences

Records from the Texas A&M Forest Service (TFS) from January 2006 to November 2015, period of record, the planning area experienced 38 wildfires that impacted 10 or more acres, seven wildfires impacted 100 or more acres, resulting in a total burned area

of 6,345 acres. TFS records indicate that burning of brush or household trash is the most common known cause of fires in Aransas County, causing 89 fires. Powerlines and smoking are the next two most common sources of ignition. Some fires have an unknown sources of ignition. Records of occurrence for each jurisdiction are provided in the jurisdictional tables.

Other data sources for wildfire reports include the National Climate Data Center (NCDC) which indicate that six wildfires occurred in Aransas County between 2008 and 2009; these had a combined damage total of $200,000. No other damages were reported by the NCDC.

Table 14-2. Historical Wildfire Occurrences (TFS and NCDC records) *

Start Date	Area Burned (Acres)	Cause of Wildfire
1/1/2006	0.2	Amusement
1/1/2006	1	Not specified
1/2/2006	1	Unsafe burning of household trash
1/2/2006	1	Unsafe burning of household trash
1/4/2006	1	Not specified
1/8/2006	1	Brush pile burning
1/18/2006	1	Unsafe burning of household trash
1/30/2006	100	Not specified
2/2/2006	2	Brush pile burning
2/7/2006	1	Not specified
2/11/2006	3	Not specified
2/27/2006	2	Brush pile burning
3/1/2006	1	Brush pile burning
3/1/2006	1	Welding equipment use (fence-building, equipment modification, etc.)
3/23/2006	25	Oil field equipment (pump jacks, faulty electric lines, etc.)
1/1/2007	0	Fireworks

*Due to the large number of wildfire events, additional records from 2005 through 2011 are included as Appendix E

Probability

Hazard probability, or reoccurrence intervals, are calculated based upon the number of historical events during the period of record. For example, if four wildfires were recorded during a 50 year reporting period, the reoccurrence interval would be 1 wildfire every 13

years, or an 8% annual chance of experiencing a wildfire. Probabilities for each jurisdiction are shown in the jurisdictional tables.

Impact

The impact of wildfire is described in terms of property exposure. Data from the Aransas County Appraisal District and the Texas A&M Forest Service is used to define residential and commercial property located in high wildfire risk areas. These values are shown in the jurisdictional tables.

Vulnerability

Wildfire vulnerability is quantified for each jurisdiction utilizing the Texas A&M Forest Service wildfire threat index extent. Critical facilities located in the areas of Aransas County with High to Very High wildfire Threat extent (index values 5, 6, and 7) are summarized in Table 14-3. Other vulnerabilities for the areas of High to Very High wildfire threat extent are shown in the jurisdictional tables.

Table 14-3. Critical Facilities Located in High to Very High Wildfire Threat Areas

Facility	City
Aransas County Service Center(includes EOC)	Rockport
Aransas County Environmental Health	Rockport
Live Oak Learning Center	Rockport
TxDOT Rockport Office	Rockport
U.S. Post Office - Rockport	Rockport
AEP Service Center	Aransas Pass
AEP Power Substation - Aransas Pass	Aransas Pass
Allegiance Ambulance	Rockport
Coastal Care EMS	Rockport
Oak Crest Nursing Center	Rockport
Public Works Service Center	Aransas Pass
Public Works Service Center	Rockport
Rockport Volunteer Fire Department Substation	Rockport
Water Tower	Rockport
Water Tower	Rockport
AEP Power Substation - Aransas Pass	Rockport

Pastoral and crop lands have the potential to be impacted by wildfire. Crops and pastures can become fuel for wildfires. Wildfires that do not pose a direct threat to human lives or safety can still be damaging due to their impacts on economies dependent upon crop or livestock production. The 2011 National Land Cover Database (NLCD) dataset was used to calculate pasture and crop area by jurisdiction. The 2011 NLCD data, released in 2015, is the most up-to-date data of its type. Pasture and crop area, combined into the term “Agricultural Area,” are outlined in the jurisdictional tables.

Unincorporated Aransas County Wildfire Hazard

LOCATION
County Wide (Unincorporated)

EXTENT		
Top-3 Sources of Ignition (Excludes Unknown)	**Total Burned Acreage**	**Maximum Single Fire Acreage**
Debris Burning Powerlines Incendiary	1,587	165

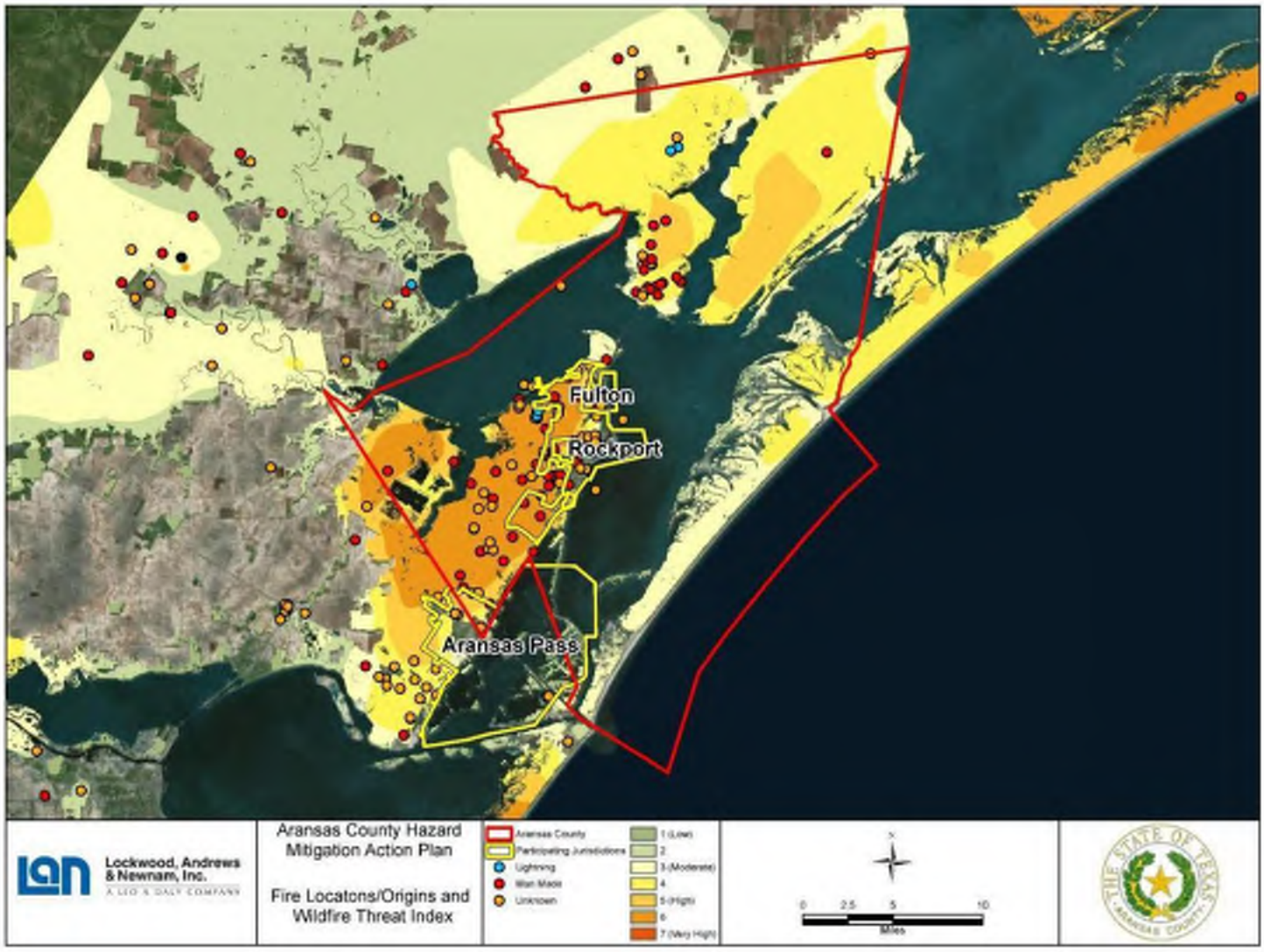
OCCURENCES		
Number of Fires (Range: 2006-2015)	**Risk to Health and Safety (Number Incidences by Type)**	**Property Damage**
93	0 deaths, 0 injuries	$200,000

PROBABILITY	
Future Wildfire Events Likelihood	**Reoccurrence Interval**
1033% annual chance	1 fire every 35 days

IMPACT
Residential and Commercial Property Risk
$777,545,526

VULNERABILITY			
People at Risk	**Agricultural Area (%)**	**Highway at Risk (Mile)**	**Railroad at Risk (Mile)**
4,914	3%	51	4.2

Figure 14-1. Fire Locations / Origins and Wildfire Threat Index for Unincorporated Aransas County



City of Aransas Pass Wildfire Hazard

LOCATION
City Wide

EXTENT		
Sources of Ignition	**Total Burned Acreage**	**Maximum Single Fire Acreage**
Powerlines Children playing with matches	439	100

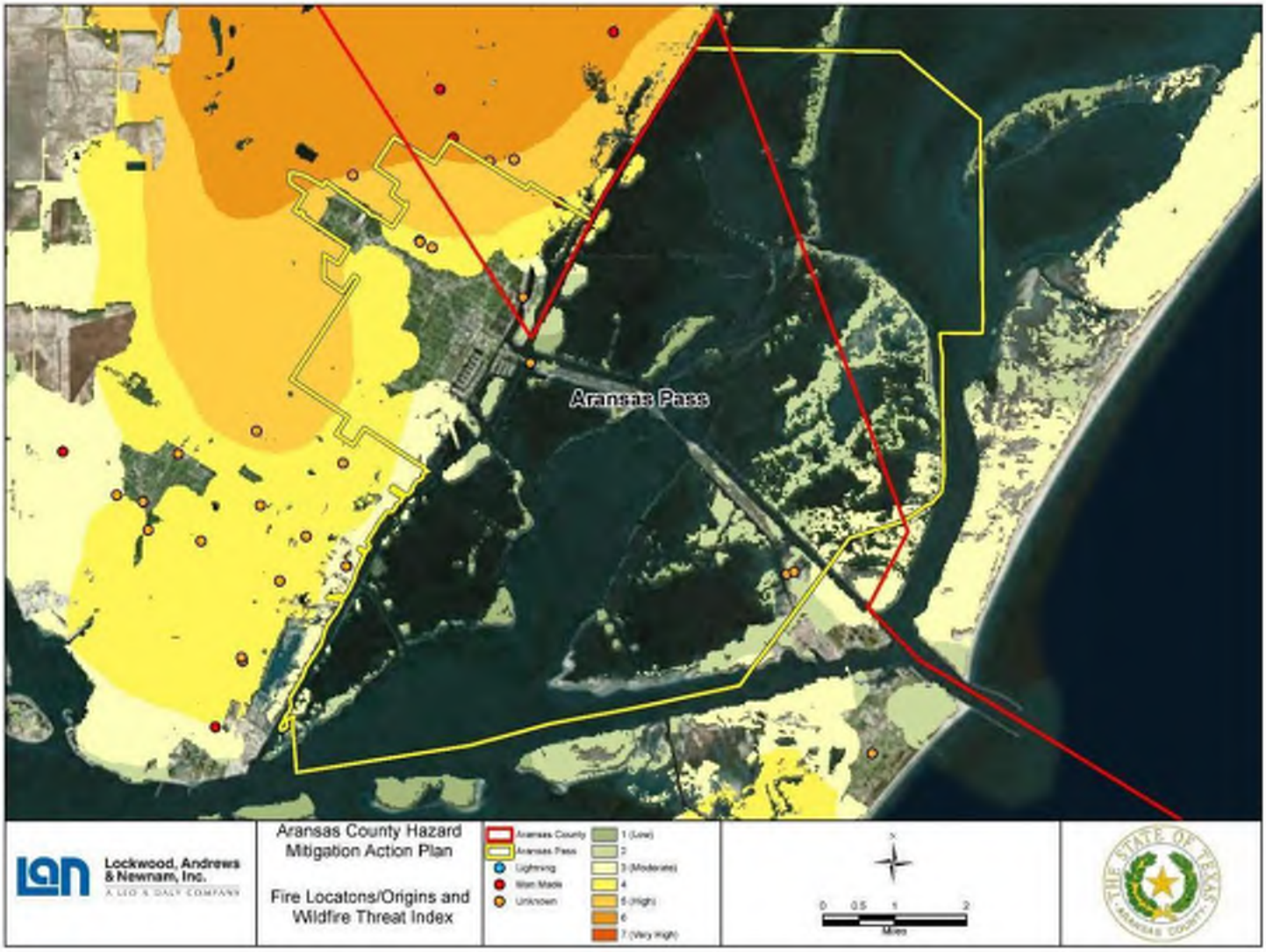
OCCURENCES		
Number of Fires (Range: 2006-2015)	**Risk to Health and Safety (Number Incidences by Type)**	**Property Damage**
10	0 deaths, 0 injuries	$0

PROBABILITY	
Future Wildfire Events Likelihood	**Reoccurrence Interval**
111% annual chance	1 fire every 0.9 years

IMPACT	
Residential Property Risk	**Commercial Property Risk**
$11,325,380	$8,023,576

VULNERABILITY			
People at Risk	**Agricultural Area (%)**	**Highway at Risk (Mile)**	**Railroad at Risk (Mile)**
8,067	0.03%	4	0.01

Figure 14-2. Fire Locations / Origins and Wildfire Threat Index for City of Aransas Pass



City of Fulton Wildfire Hazard

LOCATION
City Wide

EXTENT		
Sources of Ignition	**Total Burned Acreage**	**Maximum Single Fire Acreage**
Debris burning Welding equipment	118	60

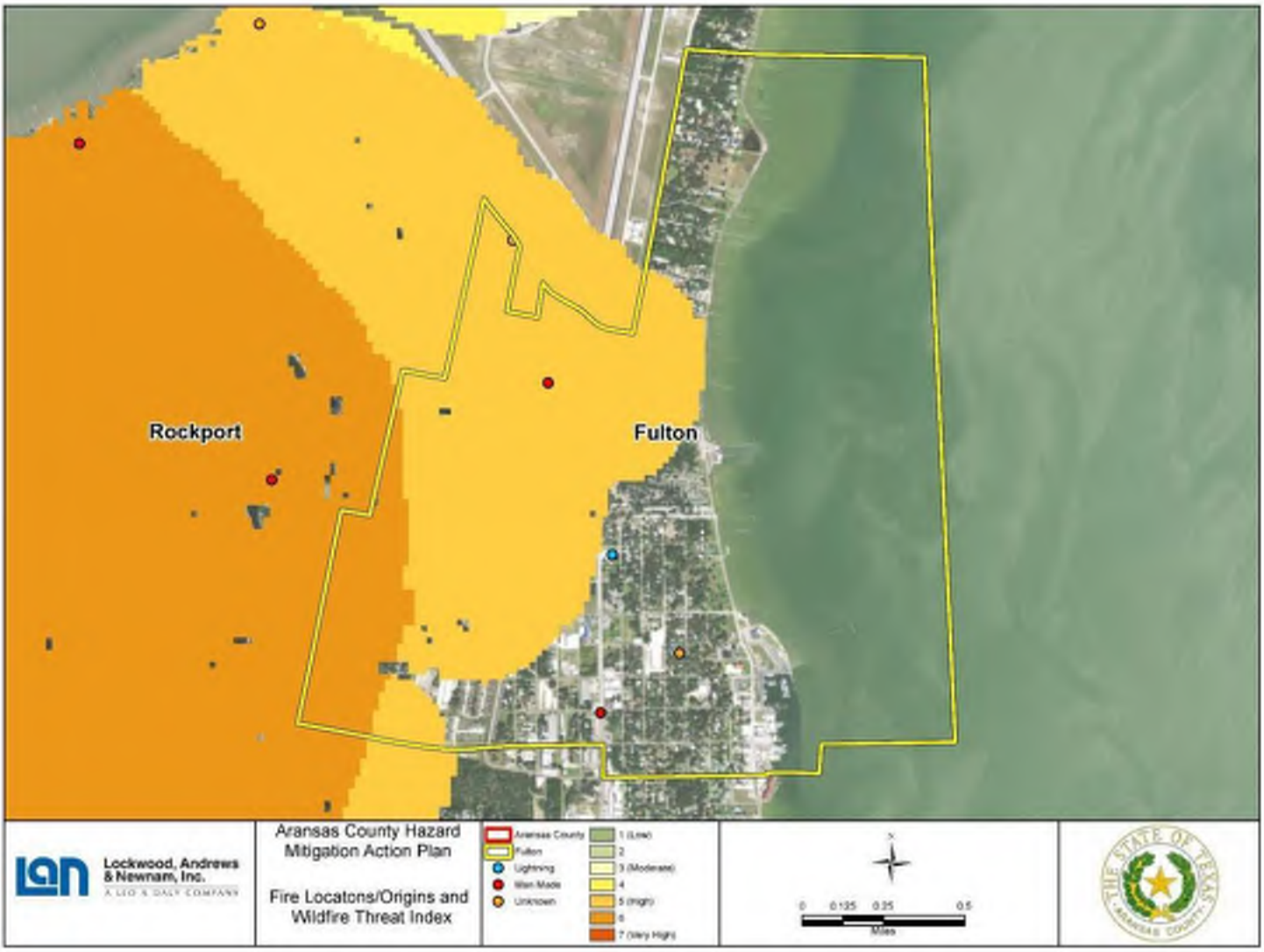
OCCURENCES		
Number of Fires (Range: 2006-2015)	**Risk to Health and Safety (Number Incidences by Type)**	**Property Damage**
9	0 deaths, 0 injuries	$0

PROBABILITY	
Future Wildfire Events Likelihood	**Reoccurrence Interval**
100% annual chance	1 fire every 1 year

IMPACT
Residential and Commercial Property Risk
$122,408,970

VULNERABILITY			
People at Risk	**Agricultural Area (%)**	**Highway at Risk (Mile)**	**Railroad at Risk (Mile)**
1,319	0%	1.4	0

Figure 14-3. Fire Locations / Origins and Wildfire Threat Index for City of Fulton



City of Rockport Wildfire Hazard

LOCATION
City Wide

EXTENT		
Top-3 Sources of Ignition (Excludes Unknown)	**Total Burned Acreage**	**Maximum Single Fire Acreage**
Debris Burning Smoking Children playing with matches	328	100

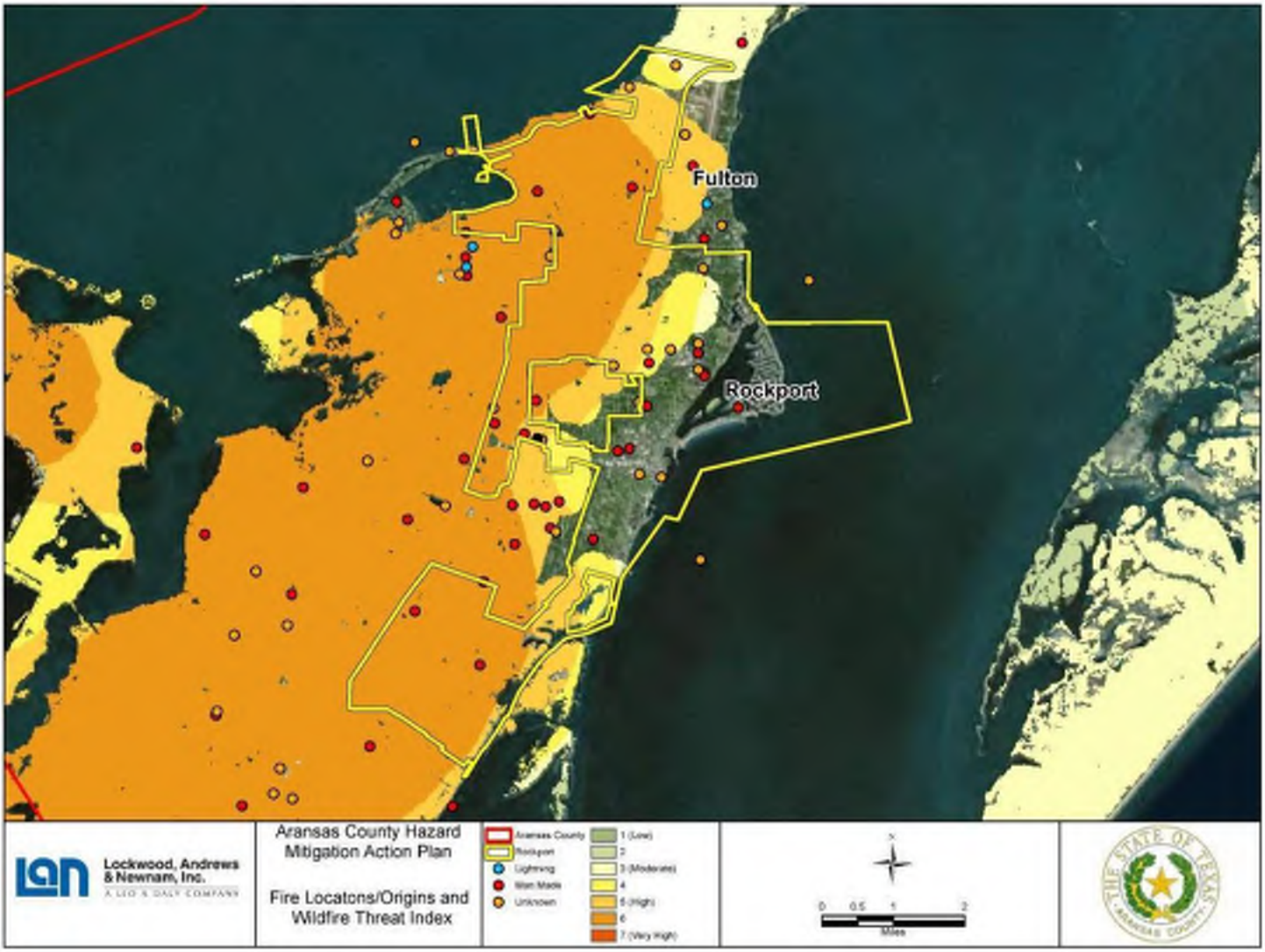
OCCURENCES		
Number of Fires (Range: 2006-2015)	**Risk to Health and Safety (Number Incidences by Type)**	**Property Damage**
49	0 deaths, 0 injuries	$0

PROBABILITY	
Future Wildfire Events Likelihood	**Reoccurrence Interval**
544% annual chance	1 fire every 2 months

IMPACT	
Residential Property Risk	**Commercial Property Risk**
$737,234,996	$242,443,666

VULNERABILITY			
People at Risk	**Agricultural Area (%)**	**Highway at Risk (Mile)**	**Railroad at Risk (Mile)**
9,992	0.4%	25	3

Figure 14-4. Fire Locations / Origins and Wildfire Threat Index for City of Rockport



Section 15: Severe Winter Storms

Severe Winter Storms Hazard Overview

Description

A severe winter storm event is defined as a storm with snow, ice, or freezing rain. Severe winter storms are rare for the Texas coastal area. Severe winter storms may include snowstorms, blizzards, cold waves and ice storms. Snowstorms include four or more inches of snow in a 12-hour period. Blizzards are characterized by low temperatures and strong winds in excess of 35 mph with large amounts of drifting snow. A cold wave is a winter cold front with a drastic drop in temperature. An ice storm occurs when rain falls out of the warm and moist upper layers of the atmosphere into a cold and dry layer near the ground.[1]

Location

Winter storms vary in location, intensity and duration but are considered rare occurrences in Aransas County and participating jurisdictions. It is assumed that all of the jurisdictions are uniformly exposed to winter storm events; therefore, all areas of the county are equally at risk.

Extent

Table 15−1 displays the magnitude of severe winter storms. Aransas County has never experienced a blizzard, but based on previous occurrences, Aransas County has been subject to winter storm watches, warnings, freezing rain, sleet, snow and wind chill.

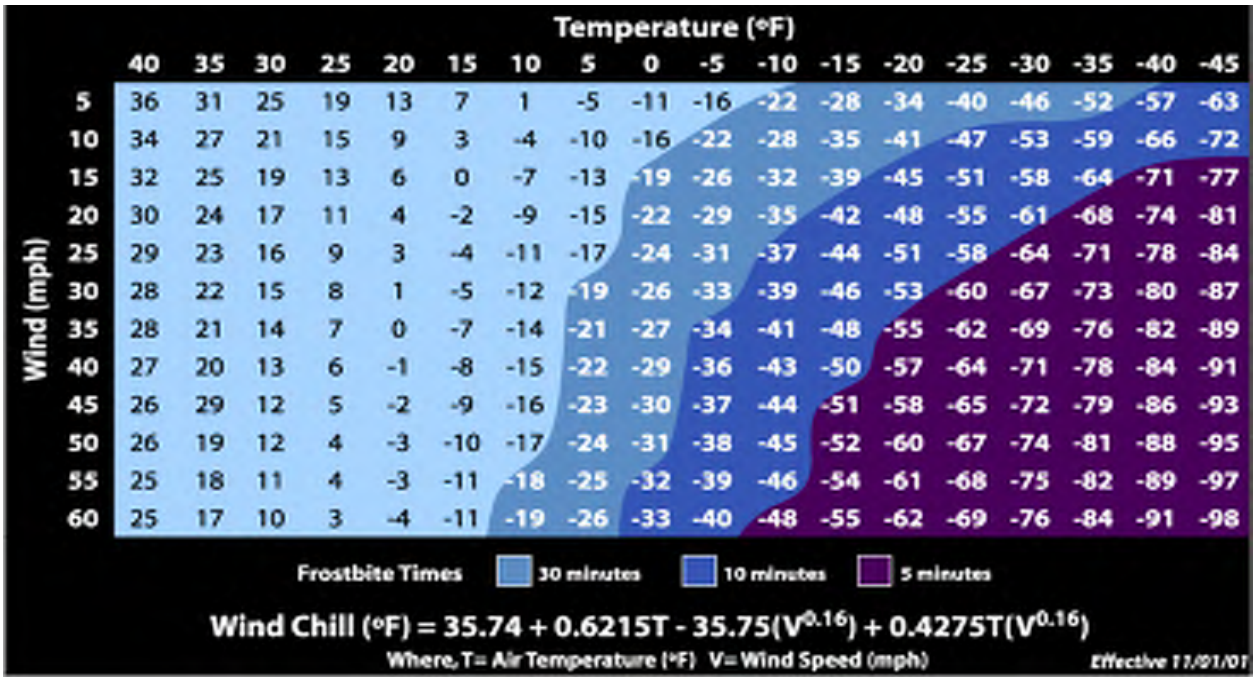
[1] State of Texas Mitigation Plan Update 2013

Table 15-1. Extent Scale - Winter Weather Alerts

Winter weather advisory	This alert may be issued for a variety of severe conditions. Weather advisories may be announced for snow, blowing or drifting snow, freezing drizzle, freezing rain, or a combination of weather events.
Winter storm watch	Severe winter weather conditions may affect your area (freezing rain, sleet or heavy snow may occur separately or in combination).
Winter storm warning	Severe winter weather conditions are imminent.
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 usually mixed with rain. If enough sleet accumulates on the ground, it makes travel hazardous.
Blizzard warning	Sustained wind speeds of at least 35 mph are accompanied by considerable falling or blowing snow. This alert is the most perilous winter storm with visibility dangerously restricted.
Frost/freeze warning	Below freezing temperatures are expected and may cause significant damage to plants, crops and fruit trees.
Wind chill	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 cooling power of the wind and temperature on exposed flesh is called the wind−chill factor.

Wind chill temperature is a measure of how cold the wind makes real air temperature feel to the human body, similar to the heat index for extreme heat. Wind can dramatically accelerate heat loss from the body, a blustery 30˚ day would feel just as cold as a calm day with 0˚ temperatures. The wind−chill factor, described in Figure 15−1, is an index developed by the National Oceanic and Atmospheric Administration. The chart is only applicable for temperatures below 40˚. Average lows for winter months in Aransas County are typically above 50˚ which reduces the chances of a wind-chill factor adversely impacting the area.

Figure 15-1. Wind Chill Chart[2]



Historical temperature minimums and snowfall maximums are presented in Table 15-2. The values presented in Table 15-2 are representative of the most hazardous conditions the planning area can be expected to face.

Table 15-2 Historical Extents*

Jurisdiction	Temperature (°F)	Snowfall (inches)
Unincorporated Aransas County*	12°	6”
Aransas Pass*	12°	6”
Fulton*	12°	6”
Rockport	12°	6”

*Records are limited by the presence of a National Weather Service weather station within the jurisdiction. Marked records are estimates.

Occurrences

Severe winter storm events in Aransas County are rare. January is the typical month when snow, sleet or freezing rain is most likely to be observed. However, winter weather conditions can occur at any time during the winter and early spring months. Table 15-3

[2] NOAA

shows historical occurrences for the plan area starting in 1950, according to the National Climatic Data Center (NCDC). There have been relatively few storms recorded, it is likely that a number of occurrences have gone unreported.

Table 15-3. Historical Winter Storm Events by Jurisdiction (NCDC, 1950-2016)

JURISDICTION	DATE	NUMBER OF REPORTED EVENTS	TYPES OF EVENTS	DEATHS	INJURIES	PROPERTY DAMAGE (2009 DOLLARS)	CROP DAMAGE (2009 DOLLARS)
Aransas	01/08/2010	1	Frost/Freeze	0	0	Negligible	Negligible
Aransas	02/03/2011	1	Ice Storm	0	0	Negligible	Negligible
TOTALS[1]		**2**		**0**	**0**	**Negligible**	**Negligible**

Probability

Hazard probability or reoccurrence intervals are calculated based upon the number of historical events during the period of examination. For example, if five winter Storms were to have taken place during a 66 year reporting period, the reoccurrence interval would be about 13 years, or a 7.5% annual chance of a winter storm.

Impact

Impacts of severe winter storms on humans are direct and indirect. The leading cause of death during winter storms is transportation accidents. Hypothermia and frostbite are other dangers from exposure to very cold winter temperatures.

All buildings and facilities are exposed to severe winter storms and could potentially be impacted. The agricultural industry in Aransas County is not usually effected by winter storms as crops are not usually planted during the winter months. Past reported property damages indicate that economic impacts due to severe winter storms in the plan area have been minor.

Vulnerability

Table 15-5 shows potential annualized property losses for each jurisdiction based on past reports of property and crop damages in each jurisdiction (NCDC, 1950−2016) and exposure of agricultural assets. “Negligible” indicates that the annualized expected property losses are less than $5,000.

Table 15-5. Potential Crop Losses by Jurisdiction (Severe Winter Storm)

JURISDICTION	TOTAL EXPOSURE	ANNUALIZED LOSS (AL)	ANNUALIZED LOSS RATIO(ALR)
Aransas County	$954,942	Negligible	0%
Aransas Pass	$8,582	Negligible	0%
Fulton	$0.00	Negligible	0%
Rockport	$111,476	Negligible	0%
TOTALS FOR STUDY AREA	**$1,075,000**	Negligible	0%

Unincorporated Aransas County Severe Winter Storms Hazard

LOCATION
County Wide (Unincorporated)

OCCURENCE	EXTENT			
Number of Events 1950-2006*	Magnitude (Size of Hail)			
	Frost/Freeze	Winter Weather	Ice Storm	Snow
2	1	0	1	0

PROBABILITY			
Number of Events 1950-2006	Record Time Period	Time Period Years	Probability
2	1/1/1950 to 5/31/2017	67	1 EXTREME WINTER EVENT ESTIMATED EVERY 33.5 YEARS

IMPACT				
Number of Events	Deaths	Injuries	Property Damage	Crop Damage
2	0	0	Negligible	Negligible

VULNERABILITY			
Population	Property Value*	Crop Land**	
	Commercial and Residential	Acres	Value
4,914	$777,545,526	10,504	$954,942

*Aransas County Appraisal District, Reappraisal Plan 2015-2016

**Census of Agriculture, 2012 (The latest Agriculture Census published 2012)

City of Aransas Pass Severe Winter Storms Hazard

LOCATION
City Wide

OCCURENCE	EXTENT			
Number of Events 1950-2006*	Magnitude (Size of Hail)			
	Frost/Freeze	Winter Weather	Ice Storm	Snow
2	1	0	1	0

PROBABILITY			
Number of Events 1950-2006*	Record Time Period	Time Period Years	Probability
2	1/1/1950 to 5/31/2017	67	1 EXTREME WINTER EVENT ESTIMATED EVERY 33.5 YEARS

IMPACT				
Number of Events	Deaths	Injuries	Property Damage	Crop Damage
2	0	0	Negligible	Negligible

VULNERABILITY				
Population	Property Value*		Crop Land**	
	Commercial	Residential	Acres	Value
8,067	$8,023,576	$11,325,380	10	$8,582

*Aransas County Appraisal District, Reappraisal Plan 2015-2016

**Census of Agriculture, 2012 (The latest Agriculture Census published 2012)

Town of Fulton Severe Winter Storms Hazard

LOCATION
City Wide

OCCURENCE	EXTENT			
Number of Events 1950-2006*	Magnitude (Size of Hail)			
	Frost/Freeze	Winter Weather	Ice Storm	Snow
2	1	0	1	0

PROBABILITY			
Number of Events 1950-2006*	Record Time Period	Time Period Years	Probability
2	1/1/1950 to 5/31/2017	67	1 EXTREME WINTER EVENT ESTIMATED EVERY 33.5 YEARS

IMPACT				
Number of Events	Deaths	Injuries	Property Damage	Crop Damage
2	0	0	Negligible	Negligible

VULNERABILITY			
Population	Property Value*	Crop Land**	
	Commercial and Residential	Acres	Value
1,319	$122,408,970	0	$0

*Aransas County Appraisal District, Reappraisal Plan 2015-2016

**Census of Agriculture, 2012 (The latest Agriculture Census published 2012)

City of Rockport Severe Winter Storms Hazard

LOCATION
City Wide

OCCURENCE	EXTENT			
Number of Events 1950-2006*	Magnitude (Size of Hail)			
	Frost/Freeze	Winter Weather	Ice Storm	Snow
2	1	0	1	0

PROBABILITY			
Number of Events 1950-2006*	Record Time Period	Time Period Years	Probability
2	1/1/1950 to 5/31/2017	67	1 EXTREME WINTER EVENT ESTIMATED EVERY 33.5 YEARS

IMPACT				
Number of Events	Deaths	Injuries	Property Damage	Crop Damage
2	0	0	Negligible	Negligible

VULNERABILITY				
Population	Property Value*		Crop Land**	
	Commercial	Residential	Acres	Value
9,992	$242,443,666	$737,234,996	46	$111,476

*Aransas County Appraisal District, Reappraisal Plan 2015-2016

**Census of Agriculture, 2012 (The latest Agriculture Census published 2012)

Section 16: Earthquake

Earthquake Hazard Overview

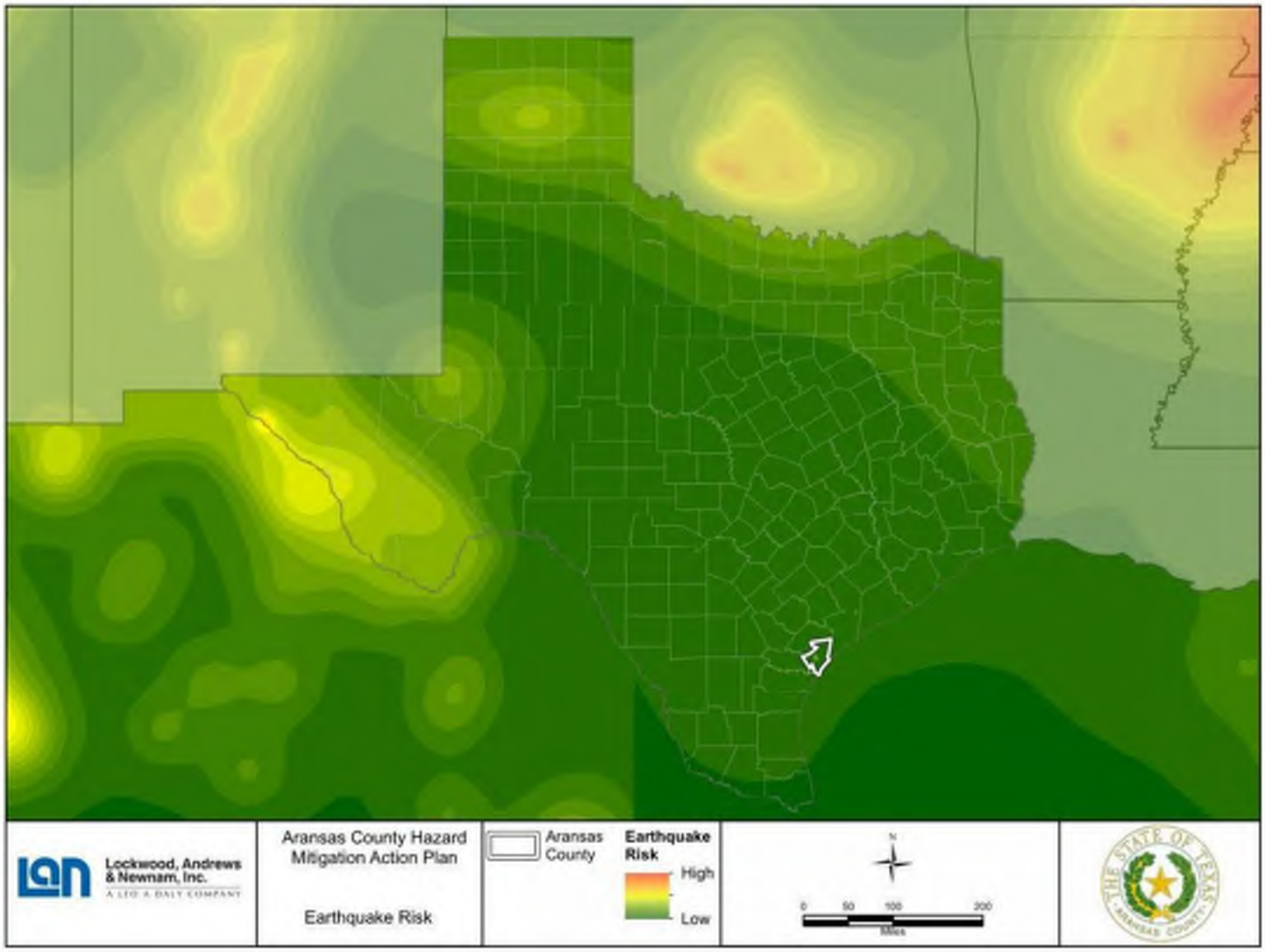
Description

An earthquake is a sudden release of energy that creates a movement in the earth's crust. Most earthquake-related property damage and deaths are caused by the failure and collapse of structures due to ground shaking. The level of damage that results from an earthquake depends on the extent and duration of the shaking.

Location

Two regions within the state of Texas experience earthquakes regularly. Aransas County does not fall within these two regions. The State Hazard Mitigation Action Plan reports that "[outside of these two regions] in Texas, earthquakes are exceedingly rare." A map of earthquake hazard is show in Figure 16-1.

Figure 16-1. USGS EARTHQAKE RISK



Extent

Earthquake extent can be described in terms of magnitude, often known as the "Richter Scale." Magnitude is calculated from measurements taken from seismographs. The measurements are corrected to compensate for the distance from the epicenter. The magnitude scale is a logarithmic scale. For example, a magnitude 4 quake caused 0.1 inches of ground motion, an otherwise identical magnitude 5 quake would cause 1 inch of ground motion, and a magnitude 6 quake would cause 10 inches of ground motion. Table 16-1 gives some examples of the impacts of earthquakes at different hazard extents.

Table 16-1. Earthquake Local Magnitude[1]

Magnitude	Earthquake Effects
Less than 2.5	Usually not felt, but can be recorded by seismograph
2.5 to 5.4	Often felt, but only causes minor damage
5.5 to 6.0	Slight damage to buildings and other structures
6.1 to 6.9	May cause a lot of damage in very populated areas
7.0 to 7.9	Major earthquake. Serious damage
Greater than 8.0	Great earthquake. Can totally destroy communities near the epicenter

Earthquakes extent can also be described in terms of the Modified Mercalli Intensity. The Modified Mercalli Intensity scale uses twelve grades of intensity to qualitatively describe the extent of earthquakes near the epicenter of the earthquake. The Modified Mercalli Intensity Scale always uses Roman numerals to avoid confusion with earthquake magnitude. The Modified Mercalli Intensity scale is shown in Table 16-2.

Table 16-2 Modified Mercalli Intensity Scale[2]

Modified Mercalli Intensity Scale	Description
I	Not felt except by a very few under especially favorable conditions.
II	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.

[1] NOAA

[2] https://earthquake.usgs.gov/learn/topics/mag_vs_int.php

Table 16-2 Modified Mercalli Intensity Scale (cont.)[3]

Modified Mercalli Intensity Scale	Description
VIII	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
XII	Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Occurrences

According to United State Geographical Services (USGS) Earthquake Hazard Program database of events, Aransas County experienced no earthquakes in the period of record (1888 – 2017).[4]

Probability

USGS estimates that Aransas County and participating jurisdictions have a less-than-one-percent chance of damage from an earthquake in 2017. Models for 2016 also show a less-than-one-percent chance of damage from an earthquake for Aransas County.

Impact

Historical earthquake impacts are documented by the number of deaths, injuries, property damage, and crop damage. In addition, subterranean utilities or services can be impacted by earthquakes. For example, earthquake damage can cause underground sanitary sewer collection systems to rupture or backup. Drinking water distribution pipes can be contaminated if pressure gaps occur allowing untreated groundwater to enter. Gas and underground power lines can also be damaged and generate hazardous conditions. Table 16-3 provides a summary of impacts for all of Aransas County. Impacts to the county and participating jurisdictions are documented in the jurisdictional tables.

[3] https://earthquake.usgs.gov/learn/topics/mag_vs_int.php
[4] https://earthquake.usgs.gov/earthquakes/search/

Table 16-3. Historical Earthquake Impacts Summary, 1888-2017

Number of Events	Deaths	Injuries	Property Damage	Crop Damage
0	0	0	$0	$0

Vulnerability

All structures and populations within Aransas County and participating jurisdictions are vulnerable to the impacts of earthquakes.

Unincorporated Aransas County Earthquake Hazard

LOCATION
County Wide (Unincorporated)

OCCURENCE	EXTENT					
Number of Events 1888-2017	Magnitude					
	Less than 2.5	2.5 – 5.4	5.5 – 6.0	6.1 – 6.9	7.0 -7.9	Greater than 8.0
0	0	0	0	0	0	0

PROBABILITY			
Number of Events	Record Time Period	Time Period Years	Probability
0	1888 - 2017	129	< 1% annual chance*

*Based upon USGS estimates

IMPACT			
Number of Events	Deaths	Injuries	Property Damage
0	0	0	$0

VULNERABILITY	
Population (County)**	Property Value*** (Commercial and Residential)
4,914**	$777,545,526

**US Census Bureau American Community Survey, 2015

***Aransas County Appraisal District, 2017

City of Aransas Pass Earthquake Hazard

LOCATION
County Wide (Unincorporated)

OCCURENCE	EXTENT					
Number of Events 1888-2017	Magnitude					
	Less than 2.5	2.5 – 5.4	5.5 – 6.0	6.1 – 6.9	7.0 -7.9	Greater than 8.0
0	0	0	0	0	0	0

PROBABILITY			
Number of Events	Record Time Period	Time Period Years	Probability
0	1888 - 2017	129	< 1% annual chance*

*Based upon USGS estimates

IMPACT			
Number of Events	Deaths	Injuries	Property Damage
0	0	0	$0

VULNERABILITY		
Population	Property Value***	
	Commercial	Residential
8,067**	$8,023,576	$11,325,380

**US Census Bureau American Community Survey, 2015

***Aransas County Appraisal District, 2017

City of Fulton Earthquake Hazard

LOCATION
County Wide (Unincorporated)

OCCURENCE	EXTENT					
Number of Events 1888-2017	Magnitude					
	Less than 2.5	2.5 – 5.4	5.5 – 6.0	6.1 – 6.9	7.0 -7.9	Greater than 8.0
0	0	0	0	0	0	0

PROBABILITY			
Number of Events	Record Time Period	Time Period Years	Probability
0	1888 - 2017	129	<1% annual chance*

*Based upon USGS estimates

IMPACT			
Number of Events	Deaths	Injuries	Property Damage
0	0	0	$0

VULNERABILITY	
Population	Property Value***
	Commercial and Residential
1,319**	$122,408,970

**US Census Bureau American Community Survey, 2015

***Aransas County Appraisal District, 2017

City of Rockport Earthquake Hazard

LOCATION
County Wide (Unincorporated)

OCCURENCE	EXTENT					
Number of Events 1888-2017*	Magnitude					
	Less than 2.5	2.5 – 5.4	5.5 – 6.0	6.1 – 6.9	7.0 -7.9	Greater than 8.0
0	0	0	0	0	0	0

PROBABILITY			
Number of Events	Record Time Period	Time Period Years	Probability
0	1888 - 2017	129	< 1% annual chance*

*Based upon USGS estimates

IMPACT			
Number of Events	Deaths	Injuries	Property Damage
0	0	0	$0

VULNERABILITY		
Population	Property Value***	
	Commercial	Residential
9,992**	$242,443,666	$737,234,996

*Texas Association of Counties, 2015

**US Census Bureau American Community Survey, 2015

***Aransas County Appraisal District, 2017

Section 17: Mitigation Strategy

Mitigation Strategy

The Planning Team reviewed the goals and objectives from the 2012 Coastal Bend Mitigation Action Plan. Mitigation actions, new and old, are prioritized to reflect overall mitigation strategy, which is to reduce and eliminate the long-term risk of loss of life and property damage from the full range of disasters affecting the planning area.

Each mitigation action is presented by jurisdiction in the section below. Each mitigation action included is in priority order (high, moderate, low). The participating communities used similar methods for ranking their mitigation actions. Participating jurisdictions evaluated mitigation actions considering the following criteria: Life & Safety, Property Protection, Technical Feasibility, Political Feasibility, Legality, Environmental Impacts, Social Impacts, Administrative Feasibility, the presence of a Local Champion for the action, and finally if the action supported other community objectives. Additionally, mitigation actions ranking took into account best estimate of cost, potential funding source and identifies which department or agency will administer the action and the action timeline.

Each jurisdiction has multiple authorities to implement the mitigation strategy. Authority includes, but is not limited to, local planning and zoning, public works efforts, emergency management, tax authority, building codes and ordinances. As detailed in Section 6 of the report, the jurisdictions participate in the NFIP. General hazard mitigation goals for the participating jurisdictions are defined below.

Goal 1
Protect public health and safety

Objective 1.1

Implement mitigation actions that will assist in protecting lives and property by making homes, businesses, public facilities, and infrastructure more resistant to high-risk hazards.

Objective 1.2

Maximize the utilization of the latest technology to provide adequate warning, communication, and mitigation of hazard events.

Objective 1.3

Reduce the danger to, and enhance protection of, high risk areas during hazard events.

Objective 1.4

Ensure that public and private facilities and infrastructure meet established building codes and enforce the codes to address any deficiencies.

Goal 2

Protect new and existing properties.

Objective 2.1

Reduce repetitive losses to the National Flood Insurance Program (NFIP).

Objective 2.2

Use the most cost-effective approach to protect existing buildings and public infrastructure from hazards.

Objective 2.3

Review existing ordinances, building codes, and safety procedures and enforce regulatory measures to ensure they protect lives and property.

Goal 3

Build and support partnerships to enhance mitigation to continuously become less vulnerable to hazards.

Objective 3.1

Build and support local partnerships to continuously become less vulnerable to hazards.

Objective 3.2

Build a cadre of committed volunteers to safeguard the community before, during, and after a disaster.

Objective 3.3

Build hazard mitigation concerns into planning and budgeting processes.

Goal 4

Leverage outside funds for investment in hazard mitigation.

Objective 4.1

Maximize the use of outside sources of funding to help communities with local match requirements for implementing hazard mitigation actions to reduce risk.

Objective 4.2

Maximize participation of property owners in protecting their properties.

Objective 4.3

Maximize insurance coverage to provide financial protection against hazard events.

Objective 4.4

Prioritize mitigation projects based on cost-effectiveness, starting with those sites facing the greatest threat to life, health and property.

Goal 5

Increase the understanding of residents for the need for mitigation, and steps they can take to protect people and properties.

Objective 5.1

Heighten public awareness of the full range of natural and man-made hazards they face.

Objective 5.2

Educate the public on actions they can take to prevent or reduce the loss of life or property from all hazards.

Objective 5.3

Publicize and encourage the adoption of appropriate hazard mitigation measures.

All Participating Jurisdictions Mitigation Actions

ALL JURISDICTIONS MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Design and implement a program for public education. The program will educate citizens on methods of hazard mitigation and risk reduction	Hurricanes & Tropical Storms, Flood, Drought, Windstorm, Extreme Heat, Lightning, Tornadoes, Hailstorms, Wildfire, Winter Storms, Earthquakes, Coastal Erosion - HIGH	Less than $2,500 - County and municipal budgets	County Office of Emergency Management, Local Emergency Management Offices	Education and Awareness	New and existing buildings will benefit from a citizenry that is well-versed in the ways of natural hazard mitigation.	Currently included in Capital Improvements Project (CIP) List	1 year to design and implement; outreach messages are reviewed and updated annually.
Install hurricane shutters on all critical facilities	Hurricane & Tropical Storms - HIGH	$500,000 - County and Municipal Budgets, Pre-Disaster Mitigation (PDM), HMGP	County Office of Emergency Management, Local Emergency Management Offices	Structure and Infrastructure	New and existing buildings and infrastructure will benefit from uninterrupted service from less-hazard-vulnerable critical facilities	Currently included in CIP List	2 years to design program; shutters inspected annual once installed
Create heat exhaustion policies for employees	Extreme Heat - HIGH	Less than $2,500, County and Municipal Budgets	County Office of Emergency Management, Local Emergency Management Offices	Education and Awareness	New and existing building and infrastructure will benefit from uninterrupted service from heat-exhaustion-savvy public employees	To be incorporated into annual public outreach and public education programs	1 year to design and implement program; education performed annually once the program is implemented

ALL JURISDICTIONS MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Create a county-wide wetlands preservation plan	Coastal Erosion, Flood, Hurricanes & Tropical storms - HIGH	Less than $2,500, County and Municipal Budgets, CMP	County Office of Emergency Management, Local Emergency Management Offices	Local Plan and Regulations, Natural System Protection	New and existing buildings will benefit from the protection from flooding, storm surge, and coastal erosion that wetlands confer	To be incorporated into existing natural systems protection plans and mechanisms and coastal preservation plan	1 year to design and implement; plan is reviewed annually for improvement
Buyouts of RL properties	Flood, Hurricanes & Tropical Storms - HIGH	$500,000 - HMGP, Flood Mitigation Assistance (FMA), CDBG DR	County Office of Emergency Management, Local Emergency Management Offices	Structure and Infrastructure	New and existing structure and infrastructure will not be harmed by the removal of RL properties	To be incorporated into existing hazard planning and protection mechanisms, incorporate into real estate disclosure requirements	LENGTH to buyout existing properties; opportunities for additional buyouts examined annually
Achieve StormReady community certification	Hurricane & Tropical Storms - HIGH	$0 - County and Municipal Budgets; Emergency Management Performance Grant (EMPG)	County Office of Emergency Management, Local Emergency Management Offices	Local Plans and Regulations	New and existing structures and infrastructure will benefit from having StormReady community certifications	To be incorporated into smart growth / growth management plan	1 year to implement program; annual maintenance and review of program

ALL JURISDICTIONS MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Design and implement a debris removal program in local drainage systems	Flood - HIGH	Less than $2,500 - Regular County and Municipal Department Budgets	Public Works	Structure and Infrastructure	New and existing buildings and infrastructure will benefit from improved stormwater conveyance	To be incorporated into floodplain & stormwater management ordinance	1 year to design and implement program; drainage system inspection and maintenance to take place annually
Get generators and quick connects for all schools and critical facilities - design and implement an emergency generator program for critical facilities and schools	Hurricanes & Tropical Storms, Flood, Drought, Windstorm, Extreme Heat, Lightning, Tornadoes, Hailstorms, Wildfire, Winter Storms, Earthquakes - MEDIUM	$1,500,000 - Jurisdictional Budget, Planned Renovations, Hazard Mitigation Grant Program (HMGP)	County Office of Emergency Management, Local Emergency Management Offices	Structure and Infrastructure	New and existing critical facilities will benefit by having generators in place before being impacted by a natural hazard. Other new and existing buildings will benefit by having uninterrupted service from critical facilities	To be incorporated into annual maintenance plan for public buildings	4 years to make improvements; annual upkeep and inspection
Create an erosion response plan	Coastal Erosion - MEDIUM	Less than $2,500, County and Municipal Budgets, Coastal Management Program (CMP) grant	County Office of Emergency Management, Local Emergency Management Offices	Local Plans and Regulations, Natural Systems Protection	New and existing buildings and infrastructure will benefit from coastal erosion protection	To be incorporated into existing hazard planning mechanisms and coastal preservation plan	1 year to design and implement plan; plan reviewed annually once implemented

ALL JURISDICTIONS MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Install lightning sirens in public spaces of congregation	Lightning - MEDIUM	$55,000, Emergency Management Program Grant (EMPG), HMGP, County and Municipal Budgets	County Office of Emergency Management, Local Emergency Management Offices	Structure and Infrastructure	New and existing buildings will not be negatively impacted by the presence of lightning sirens	To be incorporated into existing hazard planning mechanisms	1 year to design and install; maintained annually
Upgrade underground utilities to critical facilities	Hurricanes & Tropical Storms, Windstorms, Hailstorms, Lightning, Tornadoes, Wildfire, Winter Storms, Earthquakes - MEDIUM	$100,000 - County and Municipal Budgets, Future Bond, CWSRF, DWSRF, HMGP	County Office of Emergency Management, Local Emergency Management Offices	Structure and Infrastructure	New and existing buildings and infrastructure will benefit from uninterrupted service from less-hazard-vulnerable critical facilities	To be incorporated into Capitol Improvement Project Lists	4 years to design and install; services reviewed annually
Purchase NOAA All-Hazard radios for all critical facilities	Hurricanes & Tropical Storms, Flood, Drought, Windstorm, Extreme Heat, Lightning, Tornadoes, Hailstorms, Wildfire, Winter Storms, Earthquakes - MEDIUM	$150 - County and Municipal Budgets; Pre-Disaster Mitigation (PDM), HMGP	County Office of Emergency Management, Local Emergency Management Offices	Structure and Infrastructure	New and existing structures and infrastructure will benefit by having well-informed critical facility operators	To be incorporated into hazard planning and protection	I year to acquire new radios; radios tested annually

Unincorporated Aransas County Mitigation Actions

UNINCORPORATED ARANSAS COUNTY MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
St. Charles Bay Shoreline/Lamar Beach Road - the creation of new habitat will provide erosion protection improvements	Coastal Erosion - HIGH	$3,426,000 Regular department budget, Future Bond, USACE Emergency Funding	City Public Works	Structure and Infrastructure	Reduce threat of coastal erosion to new and existing buildings and infrastructure	Currently included in CIP List	2 years to make improvements; annual upkeep and inspection
Precinct 1/1A - Poinciana/Weeping Willow - Projects 1, 2: Surface stormwater conveyance improvements from Weeping Willow Rd to FM1069	Flood - HIGH	$605,880 - Regular Department Budget, Future Bond, Clean Water State Revolving Fund (CWSRF), HMGP	Stormwater Management	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure by making improvements to the County drainage system	Currently included in CIP List	5 years to make improvements; annual upkeep and inspection once implemented
Precinct 4 - Tule Creek - Mesquite Bypass - Project 1: Subsurface drainage system from 12th St (Fulton) to Aransas Bay	Flood - HIGH	$1,769,900 - Regular Department Budget, Future Bond, CWSRF, HMGP	Stormwater Management	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure by making improvements to the County drainage system	Currently included in CIP List	5 years to make improvements; annual upkeep and inspection once implemented

UNINCORPORATED ARANSAS COUNTY MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Precinct 4 - South Central Lamar - Project 1: Surface stormwater conveyance system from Bee Tree Circle (Lamar) to Copano Bay with 6-ac stormwater management pond west of SH35	Coastal Erosion, Flood, Hurricanes & Tropical storms - HIGH	$160,380 - Regular Department Budget, Future Bond, CWSRF, HMGP	Stormwater Management	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure by making improvements to the County drainage system	Currently included in CIP List	5 years to make improvements; annual upkeep and inspection once implemented

UNINCORPORATED ARANSAS COUNTY MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Precinct 1/2 - Griffith St. Projects 1, 2, 3: Surface stormwater conveyance system improvements. The projects have two routes, one begins at Griffith Street and the other begins at Ivy Lane. The two routes converge at existing Cape Valero drainage channel. Drainage structure will be placed under FM 1069 at two locations.	Flood - HIGH	$591,030 - Regular Department Budget, Future Bond, CWSRF, HMGP	Stormwater Management	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure by making improvements to the County drainage system	Currently included in CIP List	5 years to make improvements; annual upkeep and inspection once implemented

UNINCORPORATED ARANSAS COUNTY MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Precinct 1/1A - Palm Harbor - Project 1: Create outfall to Aransas Bay, improvements to surface and subsurface conveyance system, drainage structures under SH 35 Business	Flood - HIGH	$400,895 - Regular Department Budget, Future Bond, CWSRF, HMGP	Stormwater Management	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure by making improvements to the County drainage system	Currently included in CIP List	5 years to make improvements; annual upkeep and inspection once implemented
Precinct 3 - West FM 3036 - Projects 1, 2, 3, 4, 5: Installation of drainage structure under FM 1781, surface stormwater conveyance system improvements and 50ac property acquisition for regional stormwater management pond	Flood - HIGH	$955,990 - Regular Department Budget	Stormwater Management	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure by making improvements to the County drainage system	Currently included in CIP List	5 years to make improvements; annual upkeep and inspection once implemented

UNINCORPORATED ARANSAS COUNTY MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Precinct 1/1A - Estes Flats - Projects 1, 2, 3: Surface stormwater conveyance system and drainage structure under SH 35 Business	Flood - HIGH	$445,060 - Regular Department Budget	Stormwater Management	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure by making improvements to the County drainage system	Currently included in CIP List	5 years to make improvements; annual upkeep and inspection once implemented
Precinct 4 - Southeast Lamar - Projects 1, 2, 3: Subsurface conveyance system	Flood - HIGH	$239,030 - Regular Department Budget, Future Bond, CWSRF, HMGP	Stormwater Management	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure by making improvements to the County drainage system	Currently included in CIP List	5 years to make improvements; annual upkeep and inspection once implemented
Precinct 1/1A - Club Lake - Project 2: Surface stormwater conveyance improvements from Club Lake to FM1069	Flood - HIGH	$417,560 - Regular Department Budget	Stormwater Management	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure by making improvements to the County drainage system	Currently included in CIP List	5 years to make improvements; annual upkeep and inspection once implemented

UNINCORPORATED ARANSAS COUNTY MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Precinct 2 - Copano Heights - Projects 1, 2, 3: Surface stormwater conveyance system improvements from Copano Heights through Bailey Ranch with drainage structures under FM 1781 at two locations	Flood - HIGH	$2,090,550 - Regular Department Budget, Future Bond, CWSRF, HMGP	Stormwater Management	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure by making improvements to the County drainage system	Currently included in CIP List	5 years to make improvements; annual upkeep and inspection once implemented
Precinct 4 - Spanish woods - Projects 1, 2, 3: Surface conveyance system and drainage structures under Loop 1781, Sanctuary Drive and Spanish Woods Drive	Flood - HIGH	$692,120 - Regular Department Budget, Future Bond, CWSRF, HMGP	Stormwater Management	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure by making improvements to the County drainage system	Currently included in CIP List	5 years to make improvements; annual upkeep and inspection once implemented

UNINCORPORATED ARANSAS COUNTY MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Precinct 1/1A - Southwest 1069 - Projects 2, 3: Improve upon inadequate right-of-way width on County roads in this watershed, improve upon undersized structures under FM1069, create an outfall channel from FM1069 to Port Bay	Flood - HIGH	$1,323,476 - Regular Department Budget, Future Bond, CWSRF, HMGP	Stormwater Management	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure by making improvements to the County drainage system	Currently included in CIP List	5 years to make improvements; annual upkeep and inspection once implemented
Precinct 1/1A - Northeast AP - Project 1	Flood - HIGH	$2,125,200 - Regular Department Budget, Future Bond, CWSRF, HMGP	Stormwater Management	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure by making improvements to the County drainage system	Currently included in CIP List	5 years to make improvements; annual upkeep and inspection once implemented

UNINCORPORATED ARANSAS COUNTY MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Precinct 4 - Lowering of Picton/Sorenson - Project 5	Flood - HIGH	$114,400 - Regular Department Budget, Future Bond, CWSRF, HMGP	Stormwater Management	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure by making improvements to the County drainage system	Currently included in CIP List	5 years to make improvements; annual upkeep and inspection once implemented
Precinct 1/1A - Southeast 35 - Project 2	Flood - HIGH	$167,200 - Regular Department Budget, Future Bond, CWSRF, HMGP	Stormwater Management	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure by making improvements to the County drainage system	Currently included in CIP List	5 years to make improvements; annual upkeep and inspection once implemented
Precinct 1/1A - Southeast 35 - Project 1	Flood - HIGH	$246,510 - Regular Department Budget, Future Bond, CWSRF, HMGP	Stormwater Management	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure by making improvements to the County drainage system	Currently included in CIP List	5 years to make improvements; annual upkeep and inspection once implemented

UNINCORPORATED ARANSAS COUNTY MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Precinct 3 - West Tule - Pond/Channel Widening - Projects 2, 3	Flood - HIGH	$979,000 - Regular Department Budget, Future Bond, CWSRF, HMGP	Stormwater Management	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure by making improvements to the County drainage system	Currently included in CIP List	5 years to make improvements; annual upkeep and inspection once implemented
Precinct 3 - Henderson Street Property - Project 4	Flood - HIGH	$1,074,150 - Grant funding and Regular Department Budget	Stormwater Management	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure by making improvements to the County drainage system	Currently included in CIP List	5 years to make improvements; annual upkeep and inspection once implemented
Precinct 4 - Tule Creek East Ponds - Project 6	Flood - HIGH	$1,017,500 - Regular Department Budget, Future Bond, CWSRF, HMGP	Stormwater Management	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure by making improvements to the County drainage system	Currently included in CIP List	5 years to make improvements; annual upkeep and inspection once implemented

UNINCORPORATED ARANSAS COUNTY MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
County Courthouse - Repair flood damage and flood proof structure to withstand future flood events	Flood - HIGH	$1,500,000 - Regular Department Budget; FEMA Public Assistance (PA); HMGP	Public Works	Structure and Infrastructure	New and existing buildings and infrastructure will benefit from improved flood proofing	To be included in Harvey recovery initiatives	2 year to design and implement improvements; inspections to take place annually
Get generators and quick connects for all schools and critical facilities - design and implement an emergency generator program for critical facilities and schools	Hurricanes & Tropical Storms, Flood, Drought, Windstorm, Extreme Heat, Lightning, Tornadoes, Hailstorms, Wildfire, Winter Storms, Earthquakes - MEDIUM	$3,125,000 Regular department budget, Hazard Mitigation Grant Program (HMGP)	City Public Works	Structure and Infrastructure	Reduce threat of coastal erosion to new and existing buildings and infrastructure	To be incorporated into annual maintenance plan for public lands and right-of-way	6 months to make improvements; annual upkeep and inspection
Shell Ridge Road - the construction of new habitat will provide erosion protection improvements	Coastal Erosion - LOW	$2,375,700 Regular department budget, Future Bond, USACE Emergency Funding	City Public Works	Structure and Infrastructure	Reduce threat of coastal erosion to new and existing buildings and infrastructure	Currently included in Capital Improvements Project (CIP) List	2 years to make improvements; annual upkeep and inspection

UNINCORPORATED ARANSAS COUNTY MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Newcomb's Point - the construction of new habitat will provide erosion protection improvements	Coastal Erosion - LOW	$3,028,500 Regular department budget, Future Bond, USACE Emergency Funding	City Public Works	Structure and Infrastructure	Reduce threat of coastal erosion to new and existing buildings and infrastructure	Currently included in CIP List	2 years to make improvements; annual upkeep and inspection

City of Aransas Pass Mitigation Actions

CITY OF ARANSAS PASS MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Design and implement plan for debris removal in local drainage system	Flood - HIGH	Less than $2,500 - Regular Department Budget	Public Works	Structure and Infrastructure	New and existing buildings and infrastructure will benefit from improved stormwater conveyance	Currently included in CIP List	1 year to design and implement program; annual inspections once implemented
Join CRS Program	Flood - HIGH	$50,000 - Regular Department Budget; NOAA Small Projects Grant	Planning Department	Local Plans and Regulations	New and existing buildings and infrastructure will benefit from improved stormwater conveyance	To be incorporated into existing stormwater and floodplain management mechanisms	1 year to join program; recertification annually, reverifications once every five years
Install bulkheads at Conn Brown Harbor	Coastal Erosion, Flood, Hurricanes & Tropical storms - HIGH	$1,000,000 - Regular Department Budget; Future Bond, USACE Continuing Authorities	Public Works	Structure and Infrastructure	New and existing buildings and infrastructure protected by the bulkheads will benefit from reduced vulnerability to coastal erosion and storm surge	To be included in CIP list	1 year to design and install bulkheads; inspected annually once installed
Do an assessment of pump stations and improve existing pump stations or install new pump stations as needed	Flood - HIGH	$5,500,000 - Certificates of Obligation; Regular Department Budget; Future Bond; CWSRF	Public Works	Structure and Infrastructure	New and existing buildings and infrastructure will benefit from improved stormwater management	To be included in CIP list	2 year to design and implement improvements; inspections to take place annually

CITY OF ARANSAS PASS MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Develop and adopt a stormwater master plan	Flood - HIGH	Less than $2,500 - Regular Department Budget; HMGP, FMA, CMP	Planning Department	Local Plans and Regulations	New and existing buildings and infrastructure will benefit from improved stormwater management	To be incorporated into existing stormwater management plans	1 year to design and adopt new plan; plan reviewed on an annual basis
Purchase land behind levees	Flood - HIGH	$500,000- HMGP; Regular Department Budget; FMA; USACE Emergency Response	Planning Department	Structure and Infrastructure	New buildings and infrastructure will benefit by not being placed in a flood-prone location	To be incorporated into existing planning measures and zoning ordinance	1 year to identify areas for purchase; program reviewed annually
Develop and implement a buyout program	Flood - HIGH	$500,000 - Regular Department Budget, HMGP, FMA	Planning Department	Structure and Infrastructure	New buildings and infrastructure will benefit by not being placed in a flood-prone location	To be incorporated into existing planning measures and floodplain management ordinance	1 year to design and implement; program reviewed annually
Replace drying beds at waste water treatment plant with belt press	Flood - HIGH	$750,000 - Regular Department Budget; CWSRF; HMGP	Public Works	Structure and Infrastructure	New and existing buildings and infrastructure will benefit by improved service from the waste water treatment plan	Included in facility operations and maintenance schedule	1 year to design and implement the improvements, beds to be inspected annually

CITY OF ARANSAS PASS MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
A second water tower outside the floodplain	Hurricanes & Tropical Storms, Flooding - HIGH	$3,500,000 - Bonds	Public Works	Structure and Infrastructure	New and existing buildings and infrastructure will benefit from uninterrupted water service from a second water tower	To be incorporated into CIP List	2 years to build; inspected and maintained annually
Transfer boxes with wiring for ready-hookup to generators for lift stations	Flooding - HIGH	$500,000 - Regular Department Budget, HMGP	Public Works	Structure and Infrastructure	New and existing buildings and infrastructure will benefit from uninterrupted service provided by lift stations	To be incorporated into annual maintenance plan for public lands and right-of-way	1 year to acquire and install; inspected annually
Get generators and quick connects for all schools and critical facilities - design and implement an emergency generator program for critical facilities and schools	Hurricanes & Tropical Storms, Flood, Drought, Windstorm, Extreme Heat, Lightning, Tornadoes, Hailstorms, Wildfire, Winter Storms, Earthquakes - MEDIUM	$10,000 - Regular department budget, Hazard Mitigation Grant Program (HMGP)	Public Works	Structure and Infrastructure	Existing Public Works and City Hall buildings will directly benefit from reduced vulnerability to lighting. New and existing buildings and infrastructure will benefit from uninterrupted service from the Public Works and City Hall buildings	To be incorporated into annual maintenance plan for public lands and right-of-way	1 year to design and install lightning rods; inspected annually

CITY OF ARANSAS PASS MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Design and install HVAC in critical facilities, especially public works and city hall buildings	Extreme Heat, Winter Storms - MEDIUM	$10,000 - Regular Department Budget; Future Bond, Pre-Disaster Mitigation (PDM)	Public Works	Structure and Infrastructure	Existing Public Works and City Hall buildings employees will directly benefit from reduced environmental vulnerability. New and existing buildings and infrastructure will benefit from uninterrupted service from the Public Works and City Hall buildings	Currently included in Capital Improvements Project (CIP) List	2 year to design and install lightning rods; inspected annually
Review and update zoning regulations to reduce population density in areas vulnerable to hazards	Hurricanes & Tropical Storms, Flood, Lightning, Wildfire, Coastal Erosion - MEDIUM	Less than $2,500 - Regular Department Budget	Planning Department	Local Plans and Regulations	New buildings and infrastructure will benefit by not being located in hazard-vulnerable areas. Existing buildings and infrastructure will not be harmed from improved zoning regulations.	To be incorporated into zoning ordinance and subdivision regulations	1 year to design and conduct zoning improvements; reviewed annually

CITY OF ARANSAS PASS MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Design and implement an asset management system	Hurricanes & Tropical Storms, Flood, Drought, Windstorm, Extreme Heat, Lightning, Tornadoes, Hailstorms, Wildfire, Winter Storms, Earthquakes, Coastal Erosion - MEDIUM	$50,000 - Regular Department Budget; Coastal Management Program (CMP)	Public Works	Local Plans and Regulations	New buildings and infrastructure will benefit either directly by ensuring that assets are well managed or indirectly by receiving improved service from the directly-benefiting buildings and assets.	To be incorporated into annual city planning agenda	1 year to design and implement system; system updated annually
Update and improve sea gates that protect the city and harbor	Hurricanes & Tropical Storms, Coastal Erosion - MEDIUM	$1,000,000 - Regular Department Budget; Future Bond; USACE Continuing Authorities	Public Works	Structure and Infrastructure	New and existing buildings and infrastructure protected by the sea gates will benefit from reduced vulnerability to coastal erosion and storm surge	To be included in CIP list	2 year to design and install sea gates; inspected annually once installed
Maintain the adoption of the most current I-Codes and BCEGS rating	Hurricanes & Tropical Storms, Flood, Windstorm, Lightning, Tornadoes, Hailstorms, Wildfire, Earthquakes - MEDIUM	Less than $2,500 - Regular Department Budget	Building Department	Local Plans and Regulations	New and existing buildings and infrastructure will benefit from updated I-Codes and BCEGS ratings. New existing construction will receive the greatest benefit	To be incorporated into existing hazard plans and processes	1 year to adopt the most recent codes and improve BCEGS rating; reviewed annually

CITY OF ARANSAS PASS MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Design and implement an open space plan, adopt regulations that prohibit development in identified areas	Hurricanes & Tropical Storms, Flood, Heat, Hailstorms, Wildfire, Coastal Erosion - MEDIUM	Less than $2,500 - Regular Department Budget	Planning Department	Local Plans and Regulations	New buildings and infrastructure will benefit by not being located in hazard-vulnerable areas. Existing buildings and infrastructure will not be harmed from improved regulations.	To be incorporated into subdivision ordinance and floodplain management ordinance	1 year to design and adopt plans and regulations; efficacy reassessed annually
Design and implement a coastal erosion study to identify projects	Coastal Erosion - MEDIUM	Less than $2,500 - Regular Department Budget; CMP; USACE Emergency Response	Planning Department	Local Plans and Regulations	New and existing buildings and infrastructure will benefit by reduced vulnerability to coastal erosion	To be added to city planning agenda	1 year to design and execute study; project feasibility reviewed annually
Communications Improvements - Motorola radios	Hurricanes & Tropical Storms, Flood, Windstorm, Extreme Heat, Lightning, Tornadoes, Hailstorms, Wildfire, Winter Storms, Earthquakes - MEDIUM	$1,200 - Regular Department Budget	Emergency Operations	Structure and Infrastructure	New and existing buildings and infrastructure will benefit from improved emergency management coordination	To be incorporated into existing emergency management plans and practices	1 year to acquire radios, tested annually

CITY OF ARANSAS PASS MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Improve high school gymnasium to meet FEMA shelter requirements	Hurricanes & Tropical Storms, Flood, Windstorm, Extreme Heat, Lightning, Tornadoes, Hailstorms, Wildfire, Winter Storms, Earthquakes - MEDIUM	$250,000 - Regular Department Budget, HMGP	Emergency Operations	Structure and Infrastructure	New and existing buildings and infrastructure will not be negatively impacted by these improvements. The citizens of Aransas Pass will benefit from a shelter location that meets FEMA requirements	To be incorporated into annual maintenance plan for public lands and right-of-way	1 year to make improvements; inspection and testing performed annually

Town of Fulton Mitigation Actions

TOWN OF FULTON MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Design and implement a debris removal program in local drainage systems	Flood - HIGH	$5,000 - Regular Department Budget	Public Works	Structure and Infrastructure	New and existing buildings and infrastructure will benefit from improved stormwater conveyance	Currently included in CIP List	1 year to design and implement program; drainage system inspection and maintenance to take place annually
Update Stormwater master plan	Flood - HIGH	Less than $2,500 - Regular Department Budget; HMGP; CMP	Street Department	Local Plans and Regulations	New and existing buildings and infrastructure will benefit from improved stormwater management	To be incorporated into existing hazard plan	1 year to design and conduct zoning improvements; reviewed annually
Get generators and quick connects for all schools and critical facilities - design and implement an emergency generator program for critical facilities and schools	Hurricanes & Tropical Storms, Flood, Drought, Windstorm, Extreme Heat, Lightning, Tornadoes, Hailstorms, Wildfire, Winter Storms, Earthquakes - MEDIUM	$2,005,000 Regular department budget, Hazard Mitigation Grant Program (HMGP)	Fulton Public Works	Structure and Infrastructure	Reduce threat of coastal erosion to new and existing buildings and infrastructure	To be incorporated into annual maintenance plan for public lands and right-of-way	2 years to make improvements; annual upkeep and inspection

TOWN OF FULTON MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Design and conduct an lightning vulnerability study	Lightning - MEDIUM	Less than $2,500 - Regular Department Budget	Public Works	Structure and Infrastructure	New and existing building and infrastructure will benefit from a better understanding of lightning vulnerability in the community	Currently included in Capital Improvements Project (CIP) List	1 year to design and conduct study; study revisited when new construction or improvements takes place

City of Rockport Mitigation Actions

CITY OF ROCKPORT MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Cove Harbor Bulkheads - bulkhead construction will provide erosion protection improvements	Coastal Erosion - HIGH	$1,000,000 - Regular department budget; Future Bond; USACE Continuing Authorities	Public Works	Structure and Infrastructure	Reduce threat of coastal erosion to new and existing buildings and infrastructure	Currently included in CIP List	2 years to make improvements; annual upkeep and inspection
Stormwater Crossing at FM 1781 - Upgrade/replacement of box culverts to accommodate growth	Flood - HIGH	$171, 248 - Future Bond; CWSRF	Street Department	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure	To be incorporated into CIP List	3 years to make improvements; annual upkeep and inspection
Master Plan - Drainage Improvements - Project 1 - SH 35 BUS - Traylor Ave & Tule Park Dr.	Flood - HIGH	$996,175 - Future Bond; CWSRF	Street Department	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure	To be incorporated into CIP List	2 years to make improvements; annual upkeep and inspection
Master Plan - Drainage Improvements - Project 2 - SH 35 BUS - Enterprise & Maple	Flood - HIGH	$540,798 - Future Bond; CWSRF	Street Department	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure	To be incorporated into CIP List	2 years to make improvements; annual upkeep and inspection

CITY OF ROCKPORT MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Master Plan - Drainage Improvements - Project 6 - Enterprise from Pearl St (FM2165) to Omohundro & Live Oak at Maple	Flood - HIGH	$1,079,118 - Future Bond; CWSRF	Street Department	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure	To be incorporated into CIP List	2 years to make improvements; annual upkeep and inspection
Master Plan - Drainage Improvements - Project 3 - Market St (FM1069) at SH 35 Bypass, Hickory & Steart	Flood - HIGH	$1,411,411 - Future Bond; CWSRF	Street Department	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure	To be incorporated into CIP List	3 years to make improvements; annual upkeep and inspection
Master Plan - Drainage Improvements - Project 4 - Market St (FM1069) at SH 35 BUS	Flood - HIGH	$791,725 - Future Bond; CWSRF	Street Department	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure	To be incorporated into CIP List	3 years to make improvements; annual upkeep and inspection
Master Plan - Drainage Improvements - Project 5 - Market St (FM1069) at Burton & Kossuth	Flood - HIGH	$3,135,881 - Future Bond; CWSRF	Street Department	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure	To be incorporated into CIP List	3 years to make improvements; annual upkeep and inspection
Master Plan - Drainage Improvements - Project 7 - Market St (FM1069) at Church St (Loop 70)	Flood - HIGH	$349,414 - Future Bond; CWSRF	Street Department	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure	To be incorporated into CIP List	Over 4 years; once implemented, upkeep and inspection will occur annually

CITY OF ROCKPORT MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Master Plan - Drainage Improvements - Project 8 - Pearl St (FM2165) at Orleans & Laurel	Flood - HIGH	$2,813,827 - Future Bond; CWSRF	Street Department	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure	To be incorporated into CIP List	Over 4 years; once implemented, upkeep and inspection will occur annually
Construction and Upgrades to substandard roadways - Construction of approx. 2 miles/year due to annexation and development	Flood - HIGH	$1,348,301- Future Bond; CWSRF	Street Department	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure	To be incorporated into annual maintenance plan for public lands and right-of-way	Over 4 years; once implemented, upkeep and inspection will occur annually
RCC Lakes - removal of sediment for drainage improvements	Flood - HIGH	$376,800 - Future Bond; CWSRF	Street Department	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure	To be incorporated into annual maintenance plan for public lands and right-of-way	Over 4 years; once implemented, upkeep and inspection will occur annually
Concho Street Drainage - Construction of drainage pipe down Concho starting at low west Hwy 35 to Harbor	Flood - HIGH	$2,192,971 - Future Bond; CWSRF	Street Department	Structure and Infrastructure	Reduce the threat of flooding to new and existing buildings and infrastructure	To be incorporated into CIP List	Over 4 years; once implemented, upkeep and inspection will occur annually

CITY OF ROCKPORT MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Design and conduct an engineering study to address flooding in downtown Rockport	Flood - HIGH	$1,000,000 - HMGP funding, departmental budget	Street Department	Local Plans and Regulations	New and existing buildings and infrastructure will benefit from a better understanding of the community's vulnerability to flooding.	To be incorporated into existing hazard plan	2 year to design and conduct study; reviewed on an annual basis
Update Stormwater master plan	Flood - HIGH	$200,000 - Regular Department Budget; HMGP; CMP	Street Department	Local Plans and Regulations	New and existing buildings and infrastructure will benefit from improved stormwater management	To be incorporated into City Plan	1 year to design and conduct zoning improvements; reviewed annually
Purchase Gordon Stanley Pond	Flood - HIGH	$100,000 - Regular Department Budget; HMGP; CMP	Planning Department	Natural Systems Protection	New buildings and infrastructure will benefit by not being located in hazard-vulnerable areas. Existing buildings and infrastructure will not be harmed from the purchase of the pond	To be incorporated into City Plan	1 year to purchase pond
Repair outfalls of pump station that pump into Aransas Bay	Flood - HIGH	$2,000,000 - CIP project funding; Regular Department Budget; CWSRF	Public Works	Structure and Infrastructure	New and existing buildings and infrastructure will benefit from improved stormwater management	To be included in facility operations and maintenance schedule	1 year to design and implement improvements; inspections to take place annually

CITY OF ROCKPORT MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Do an assessment of pump stations and improve existing pump stations or install new pump stations as needed	Flood - HIGH	$2,000,000 - Certificates of Obligation; Regular Department Budget; HMGP; CWSRF	Public Works	Structure and Infrastructure	New and existing buildings and infrastructure will benefit from improved stormwater management	To be included in facility operations and maintenance schedule	2 year to design and implement improvements; inspections to take place annually
City Hall - Repair flood damage and flood proof structure to withstand future flood events	Flood - HIGH	$1,500,000 - Regular Department Budget; FEMA Public Assistance (PA); HMGP	Public Works	Structure and Infrastructure	New and existing buildings and infrastructure will benefit from improved flood proofing	To be included in Harvey recovery initiatives	2 year to design and implement improvements; inspections to take place annually
Get generators and quick connects for all schools and critical facilities - design and implement an emergency generator program for critical facilities and schools	Hurricanes & Tropical Storms, Flood, Drought, Windstorm, Extreme Heat, Lightning, Tornadoes, Hailstorms, Wildfire, Winter Storms, Earthquakes - MEDIUM	$2,300,000 RESTORE Act funding, Regular department budget, Hazard Mitigation Grant Program (HMGP)	Public Works	Structure and Infrastructure	Reduce threat of coastal erosion to new and existing buildings and infrastructure	To be incorporated into annual maintenance plan for public lands and right-of-way	4 years to make improvements; annual upkeep and inspection

CITY OF ROCKPORT MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Little Bay Hydraulic Restoration - remove sediment from the bay and use it for nourishment and habitat restoration projects. The project will protect habitat from coastal erosion and improve the eco-tourism economy	Coastal Erosion - MEDIUM	$7,266,070 - Regular department budget; Future Bond; Coastal Management Program (CMP) grant	Public Works	Structure and Infrastructure	Reduce threat of coastal erosion to new and existing buildings and infrastructure	Currently included in Capital Improvements Project (CIP) List	18 months to make improvements; annual upkeep and inspection
Design and conduct a lightning vulnerability assessment study	Lightning - MEDIUM	Less than $2,500 - HMGP funding, departmental budget	Office of Emergency Management	Local Plans and Regulations	New and existing buildings and infrastructure will benefit from a better understanding of the community's vulnerability to lightning	To be incorporated into existing hazard plan	1 year to design and conduct study; reviewed on an annual basis

CITY OF ROCKPORT MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Review and update zoning regulations to reduce population density in areas vulnerable to hazards	Hurricanes & Tropical Storms, Flood, Lightning, Wildfire, Coastal Erosion - MEDIUM	Less than $2,500 - Regular Department Budget	Planning Department	Local Plans and Regulations	New buildings and infrastructure will benefit by not being located in hazard-vulnerable areas. Existing buildings and infrastructure will not be harmed from improved zoning regulations.	To be incorporated into floodplain management ordinance and zoning ordinance	1 year to design and conduct zoning improvements; reviewed annually
Maintain the adoption of the most current I-Codes and BCEGS rating	Hurricanes & Tropical Storms, Flood, Windstorm, Lightning, Tornadoes, Hailstorms, Wildfire, Earthquakes - MEDIUM	Less than $2,500 - Regular Department Budget	Building Department	Local Plans and Regulations	New and existing buildings and infrastructure will benefit from updated I-Codes and BCEGS ratings. New existing construction will receive the greatest benefit	To be incorporated into existing hazard plans and processes	1 year to adopt the most recent codes and improve BCEGS rating; reviewed annually

CITY OF ROCKPORT MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Design and implement outreach projects for special needs populations	Hurricanes & Tropical Storms, Flood, Drought, Windstorm, Extreme Heat, Lightning, Tornadoes, Hailstorms, Wildfire, Winter Storms, Earthquakes, Coastal Erosion - MEDIUM	Less than $2,500 - Regular Department Budget	Planning Department, Emergency Operations Department	Local Plans and Regulations	New and existing buildings, infrastructure, and populations will benefit from a more educated citizenry	To be incorporated into City Plan	1 year to design and implement outreach program, outreach items reviewed annually
Design and implement outreach projects for tourist populations	Hurricanes & Tropical Storms, Flood, Drought, Windstorm, Extreme Heat, Lightning, Tornadoes, Hailstorms, Wildfire, Winter Storms, Earthquakes, Coastal Erosion - MEDIUM	Less than $2,500 - Regular Department Budget; CMP	Planning Department, Emergency Operations Department	Local Plans and Regulations	New and existing buildings, infrastructure, and tourist populations will benefit from a more educated citizenry	To be incorporated into City Plan	1 year to design and implement outreach program, outreach items reviewed annually

CITY OF ROCKPORT MITIGATION ACTIONS							
MITIGATION ACTION: PROJECT TITLE & DESCRIPTION	**HAZARD ADDRESSED & PRIORITY**	**COST & POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW & EXISTING BUILDINGS**	**INCORPORATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Design and implement an open space plan, adopt regulations that prohibit development in identified areas	Hurricanes & Tropical Storms, Flood, Heat, Hailstorms, Wildfire, Coastal Erosion - MEDIUM	Less than $2,500 - Regular Department Budget; CMP	Planning Department	Local Plans and Regulations	New buildings and infrastructure will benefit by not being located in hazard-vulnerable areas. Existing buildings and infrastructure will not be harmed from improved regulations.	To be incorporated into floodplain management ordinance and zoning ordinance	1 year to design and adopt plans and regulations; efficacy reassessed annually

Section 18: Plan Maintenance

Plan Maintenance Procedures

The following is an explanation of how the Planning Team will implement the Plan, and continue to evaluate and enhance it over time. In order to ensure that the Plan remains current and relevant, the following plan maintenance procedures will be addressed:

- Ensure the mitigation strategy remains current and is implemented according to Plan procedures.
- Secure and maintain an ongoing mitigation program throughout the community.
- Integrate short and long-term mitigation objectives into community officials' daily roles and responsibilities.
- Continued Public Involvement and maintain momentum by routine engagement of the Plan's progress.

Monitoring and Evaluation

Periodic tracking of the Plan is required to ensure that the goals, objectives, and mitigation action plans are implemented over time. Revisions may be necessary to ensure that the Plan is in full compliance with federal regulations and state statutes. This section outlines the procedures for completing such revisions, updates, and Plan review. Table 18-1 indicates the department or title responsible for this action.

Table 18-1. Team Members Responsible for Plan Maintenance

JURISDICTION / ENTITY	TITLE
Unincorporated Aransas County	Emergency Management Coordinator
City of Aransas Pass	Community Planner
City of Fulton	Rockport Community Planner
City of Rockport	Floodplain Manager/Community Planner

Monitoring

The planning team representing each participating jurisdiction will convene a meeting annually to monitor the plan and track the status of each jurisdiction's identified mitigation actions over the 5-year cycle of the Plan. Aransas County as coordinating entity will make arrangements to bring the team together. Mitigation Actions will be assigned to team members in advance of the meetings to prepare status reports to share with the team. Mitigation action status updates will include continued feasibility for implementation and funding.

Evaluation

Each jurisdiction will evaluate changes in risk, determine whether the implementation of mitigation actions is on schedule, or if there are any implementation issues such as changes in stated purposes or goals that affect mitigation priorities in each participating jurisdictions' respective department or organization. The Plan Maintenance group will meet on an annual basis to identify any needed changes in the Plan based upon their evaluation activities.

Updating

Annual reports submitted by the designated Team member from each community evaluating the Plan will be used to keep the Plan updated.

Five Year Review

The Plan will be thoroughly reviewed by the appointed Planning Team at the end of three years from the approval date to determine whether there have been any significant changes in the area that may necessitate changes in the types of mitigation actions proposed. Aransas County, as coordinating entity, will make arrangements to bring the team together and begin the update process 2 years prior to plan expiration. New flood studies and new development in flood-prone areas, an increased exposure to hazards, disaster declarations, the increase or decrease in capability to address hazards, and changes to federal or state regulations are examples of factors that may affect the content of the Plan.

The Plan review provides the Planning Team an opportunity to evaluate those actions that have been successful and to explore documenting potential losses avoided due to the implementation of specific mitigation measures. The Plan review also provides the opportunity to address mitigation actions that may not have been successfully implemented as assigned. It is recommended that the Planning Team meet to review the Plan at the end of three years as grant funds may be necessary for the development of a five-year update. Due to the timelines for grant cycles, it is wise to begin planning grant options in advance of the five-year deadline. Following the review, any revisions deemed

necessary will be summarized and implemented according to the reporting procedures and Plan amendment process outlined herein. Upon completion of the review and update/amendment process, the revised Plan will be submitted to TDEM for final review and approval in coordination with FEMA.

Incorporating the Plan into Other Planning Mechanisms

The County and participating entities will work to integrate the hazard mitigation strategies into other planning mechanisms. The Planning Team will ensure that future growth, disaster recovery, historic preservation, flood response plans, and other planning mechanisms will be consistent with the goals of the Plan.

Key Planning Team members from the participating jurisdictions, will meet annually, more often if warranted, to ensure mitigation actions prioritized as high to moderate are tracked and monitored based on federal Disaster Declarations, HMGP and PDM funding cycles, and other non-federal funding sources that help communities meet the local HMA match.

The potential funding sources listed for each identified action may be used when the Planning Team member begins to seek funds to implement actions. An implementation time period, or a specific implementation date, has been assigned to each action as an incentive for completing each task and gauging whether actions are implemented in a timely manner.

Existing plans for the participating jurisdictions will be reviewed in light of the Plan, and Team Members will incorporate any mitigation policies and actions into these plans as appropriate. Table 18-1 indicates Planning Team member roles for incorporating actions, method of incorporation, and approving authority. Table 18-2 identifies planning mechanisms available for the participating jurisdictions and provides examples of how the Plan will be incorporated into current efforts.

Table 18-2. Planning Mechanisms and Method to Incorporate into the Plan

Studies, Plans, and Planning Mechanisms	Date
Texas	
Statewide Long-Range Transportation Plan 2035, TxDOT	2015
Regional	
Coastal Bend COG Mitigation Action Plan	2011
Regional Public Transportation Plan 2011 for the Coastal Bend Region. CC MPO; Transportation Coordination Network of the Coastal Bend	2011

Studies, Plans, and Planning Mechanisms	Date
Aransas County	
FEMA Flood Insurance Study: Aransas County, Texas and Incorporated Areas	2016
Aransas County Floodplain Management & Watershed Protection Order	2016
Aransas County Stormwater Master Plan & Management Manual	2012
Capital Improvement Program	2016
Aransas County Subdivision Regulations	2009
Aransas Pass	
Capital Improvement Program. City of Aransas Pass	2016/2017
Code of Ordinances. Part II. Chapter 5 Building and Construction. Article VIII. Flood Damage. City of Aransas Pass	2012
Code of Ordinances. Part II. Chapter 5.5 Landscaping. Sec. 5.5-4. Reduction of Landscaping. City of Aransas Pass	2012
Code of Ordinances. Part II. Chapter 5 Buildings and Construction. Article VIII. Flood Damage. City of Aransas Pass	2012
Zoning Map. City of Aransas Pass	2014
Aransas Pass Coastal Resilience Plan	2016
Fulton	
Flood Prevention Ordinance. Ordinance No.270	2016
Planning and Capacity Building Study	2004
TCDP Drainage and Water Improvements Study	2004
City of Rockport Drainage Master Plan	2001
Storm Drainage Design Manual for the City of Rockport, Texas	2000
Rockport	
A Cultural Plan for the Rockport Cultural Arts District. City of Rockport	2015
A Vision for the Heritage District and Downtown Rockport. Halff Associates	2006
Annual Budget and Capital Improvement Program. City of Rockport	2015/2016
Comprehensive Plan. City of Rockport	1999
Floodplain Ordinance. Ordinance No. 1658. City of Rockport	2015

Studies, Plans, and Planning Mechanisms	Date
Rockport (cont.)	
Future Land Use Plan w/ETJ. City of Rockport	2014
Heritage District Zoning Overlay Code. City of Rockport	2012
Master Drainage Plan. City of Rockport	2016
Rockport Land Use Study. Texas Sea Grant	2012
Stormwater Ordinance. Ordinance No. 1663. City of Rockport	2009
Subdivision Ordinance. Ordinance No. 1663. City of Rockport	2010
Tree and Landscape Ordinance. Ordinance No. 1349. City of Rockport	2010
Zoning Map. City of Rockport	2014
Zoning Ordinance. Ordinance No.1027. City of Rockport	2010

It will be the responsibility of each participating jurisdiction to determine department or title of personnel responsible for implementation of mitigation strategies and implementation procedures.

All jurisdictions will comply with local and state requirements while incorporating this Plan into existing planning mechanisms. A list of planning mechanisms available to the jurisdictions can be found in Appendix A. The mitigation actions in Section 17 describe the planning mechanisms into which the mitigation actions will be integrated. In the process of integrating the mitigation actions into new and existing planning mechanisms, the participating jurisdictions will:

- Aransas County – Actions will be presented to Commissioner's Court by the responsible department. Upon approval by Commissioner's Court, approved actions will be acted upon and/or integrated into existing planning mechanisms.
- City of Aransas Pass – Actions will be presented to City Council by the responsible department. Upon approval by City Council, approved actions will be acted upon and/or integrated into existing planning mechanisms.
- City of Fulton– Actions will be presented to City Council by the responsible department. Upon approval by City Council, approved actions will be acted upon and/or integrated into existing planning mechanisms.
- City of Rockport – Actions will be presented to City Council by the responsible department. Upon approval by City Council, approved actions will be acted upon and/or integrated into existing planning mechanisms.

Expansion of Capabilities

Planning Mechanism	Expansive Capabilities
All Participating Jurisdictions	
City Staff	All participating jurisdictions have city or county staff. While the number and involvement of these staff members in the planning process varies, all participating jurisdictions benefit from the presence of staff members. Staff are involved in the planning process and the implementation of mitigation actions. Staff will be able to help planning team members, serve as stakeholders, and coordinate the monitoring and maintenance process of this Plan.
Annual Budget Review	All participating jurisdictions have an annual budget review. Jurisdictions will incorporate the Plan while conducting their annual budget reviews. High priority mitigation actions will be reviewed and may potentially receive funds to
Unincorporated Aransas County	
Stormwater Management Plan	The Plan will be consulted when updating and maintaining the County's stormwater management plan. Both documents share the goal of reducing damage and minimizing the negative impacts of development on stormwater.
Emergency Operations Plan	The Plan will be consulted when updating and maintaining the County's Emergency Operations Plan. Both documents share the goal of public safety. Many of the mitigation actions in this Plan relate to emergency operations and must be integrated.
Capital Improvement Plan	Many of the mitigation actions found in this Plan will be enacted through capital improvement projects. Consequently, the County's Capital Improvement Plan must consult the Plan for hazard mitigation projects that could be incorporated into the Capital Improvement Plan. Prioritization should be given to high priority actions.

Unincorporated Aransas County (cont.)	
Floodplain Order	The Plan will be used in updating the floodplain order and ensuring sound floodplain management. The goals of both documents are to reduce vulnerability to flooding hazards. The Plan will be consulted for NFIP compliance, flood risk, and extent. Information from this Plan will be reviewed for inclusion in other documents, including the floodplain order.
City of Aransas Pass	
Stormwater Management Plan	The Plan will be consulted when updating and maintaining the City's stormwater management plan. Both documents share the goal of reducing damage and minimizing the negative impacts of development on stormwater.
Emergency Operations Plan	The City is part of the Aransas County Emergency Operations Plan. The Plan will be consulted when updating and maintaining the County's Emergency Operations Plan. Both documents share the goal of public safety. Many of the mitigation actions in this Plan relate to emergency operations and must be integrated.
Capital Improvements Plan	Many of the mitigation actions found in this Plan will be enacted through capital improvement projects. Consequently, the City's Capital Improvement Plan must consult the Plan for hazard mitigation projects that could be incorporated into the Capital Improvement Plan. Prioritization should be given to high priority actions.
Floodplain Management Plan	The Plan will be used in updating the floodplain management plan and ensuring sound floodplain management. The goals of both documents are to reduce vulnerability to flooding hazards. The Plan will be consulted for NFIP compliance, flood risk, and extent. Information from this Plan will be reviewed for inclusion in other documents, including the floodplain management plan.

City of Rockport	
Stormwater Management Plan	The Plan will be consulted when updating and maintaining the City's stormwater management plan. Both documents share the goal of reducing damage and minimizing the negative impacts of development on stormwater.
Emergency Operations Plan	The City is part of the Aransas County Emergency Operations Plan. The Plan will be consulted when updating and maintaining the County's Emergency Operations Plan. Both documents share the goal of public safety. Many of the mitigation actions in this Plan relate to emergency operations and must be integrated.
Capital Improvements Plan	Many of the mitigation actions found in this Plan will be enacted through capital improvement projects. Consequently, the City's Capital Improvement Plan must consult the Plan for hazard mitigation projects that could be incorporated into the Capital Improvement Plan. Prioritization should be given to high priority actions.
Stormwater Ordinance	The Plan will be consulted when updating and maintaining the City's stormwater ordinance. Both documents share the goal of reducing damage and minimizing the negative impacts of development on stormwater.
NFIP Community Rating System	The Plan includes information regarding the location, extent, and probability of flooding hazards. This information can and should be used in the City's Community Rating System (CRS) program. One of the major goals of the CRS program is to go above the minimum standards of the NFIP. Many of the mitigation actions identified in this Plan involve exceeding the minimum standards of the NFIP. By incorporating this Plan into the City's CRS program, the goals of flooding hazard reduction can be met.
Floodplain Ordinance	The Plan will be used in updating the floodplain ordinance and ensuring sound floodplain management. The goals of both documents are to reduce vulnerability to flooding hazards. The Plan will be consulted for NFIP compliance, flood risk, and extent. Information from this Plan will be reviewed for inclusion in other documents, including the floodplain ordinance.

Continued Public Involvement

Input from the stakeholders and public was an integral part of the preparation of this Plan and will continue as the Plan grows and changes. This Plan will be posted on the Aransas County website and the City of Rockport website where local officials and the public will be invited to provide ongoing feedback. The task of notifying stakeholders and community members on an annual basis will be held with the identified Aransas County Planning Team members tasked with updates and annual Plan review. The Planning Team will have the added task of maintaining the Plan as a part of their job description. Media such as the local newspaper and radio stations will be used to notify the public of any maintenance or periodic review activities taking place. Public participation will be sought during the implementation, monitoring, and evaluation phases of the plan.

Appendix A: Capability Assessment

Jurisdiction and/or Dept.:	Aransas County	
Name and Title:	Diana Espinosa Assistant County Engineer	

1. PLANNING AND REGULATORY CAPABILITY - Please indicate whether the following planning or regulatory tools (plans, ordinances, codes or programs) are currently in place or under development for your jurisdiction. Please provide additional comments or explanations in the space provided or with attachments.

Planning and Regulatory Resource	Yes	No	Comments
Comprehensive / Master Plan			
Stormwater Management Plan / Ordinance			
Emergency Operations Plan	x		
Capital Improvements Plan			
Floodplain Management Plan	x		
Economic Development Plan			
Transportation Plan			
Wildfire Protection Plan			
Stormwater Ordinance	x		
NFIP Community Rating System (CRS Program)		x	
Floodplain Ordinance	x		

Building Code (include name/year under Comments)			
Zoning Ordinance			
Acquisition of Land for Open Space/Recreation Use			
2. ADMINISTRATIVE AND TECHNICAL CAPABILITY - Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources			
Staff / Personnel Resources	**Yes**	**No**	**Comments**
Maintenance program to reduce risk (tree trimming, clearing drainage systems)	**x**		
Mutual Aid Agreements (between neighboring jurisdictions)	**x**		
Mitigation Planning Committee	**x**		
Community Planner		**x**	
Staff Engineer	**x**		
Emergency manager	**x**		
Floodplain manager	**x**		
Personnel skilled in Geographic Information Systems (GIS)		**x**	
Warning Systems/outdoor siren, reverse 911, other		**x**	
Grant Writer		**x**	
Hazard Data/historical disaster data		**x**	

Chief Building Official		**x**	
3. FISCAL CAPABILITY - Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes*			
Financial Resources	**Yes**	**No**	**Comments**
Capital Improvement Programming	**x**		
Community Development Block Grants (CDBG)			
Stormwater Utility Fees	**x**		
Development Impact Fees	**x**		
Authority to levy taxes for specific purposes	**x**		
Other: _____			
4. EDUCATION AND OUTREACH - Please identify any education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information such as school programs, StormReady, FireWise programs, environmental protection, evacuation plan, emergency preparedness, public education programs.			
5. PREVIOUS MITIGATION ACTIVITIES - Please list any previous mitigation activities (e.g. structural and/or planning projects or grants) that have been or will be implemented for your community. Please include the title of the project or grant along with any start or completion dates and the department or agency responsible.			
Tulle Creek Restoration Project.			

Jurisdiction and/or Dept.:	City of Aransas Pass		
Name and Title:	Katherine Comeaux, Planner		
1. PLANNING AND REGULATORY CAPABILITY - Please indicate whether the following planning or regulatory tools (plans, ordinances, codes or programs) are currently in place or under development for your jurisdiction. Please provide additional comments or explanations in the space provided or with attachments.			
Planning and Regulatory Resource	**Yes**	**No**	**Comments**
Comprehensive / Master Plan		X	Projected completion date: 2019
Stormwater Management Plan / Ordinance			Future plans for a Stormwater Management Plan and ordinance; no current action towards this goal
Emergency Operations Plan	X		
Capital Improvements Plan	X		
Floodplain Management Plan	X		
Economic Development Plan		X	
Transportation Plan		X	
Continuity of Operations Plan		X	
Wildfire Protection Plan		X	
Stormwater Ordinance		X	
NFIP Community Rating System (CRS Program)	X		
Floodplain Ordinance	X		
Building Code (include name/year under Comments)	X		IBC 2012
Zoning Ordinance	X		
Acquisition of Land for Open Space/Recreation Use		X	
2. ADMINISTRATIVE AND TECHNICAL CAPABILITY - Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources			
Staff / Personnel Resources	**Yes**	**No**	**Comments**
Maintenance program to reduce risk (tree trimming, clearing drainage systems)	X		
Mutual Aid Agreements (between neighboring jurisdictions)	X		

Mitigation Planning Committee		X	
Community Planner	X		
Staff Engineer		X	
Emergency manager	X		
Floodplain manager	X		
Personnel skilled in Geographic Information Systems (GIS)	X		
Warning Systems/outdoor siren, reverse 911, other	X		
Grant Writer		X	
Hazard Data/historical disaster data	X		
Chief Building Official	X		
3. FISCAL CAPABILITY - Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes*			
Financial Resources	**Yes**	**No**	**Comments**
Capital Improvement Programming	X		
Community Development Block Grants (CDBG)	X		
Stormwater Utility Fees		X	
Development Impact Fees		X	
Authority to levy taxes for specific purposes		X	
Other: _____			
4. EDUCATION AND OUTREACH - Please identify any education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information such as school programs, StormReady, FireWise programs, environmental protection, evacuation plan, emergency preparedness, public education programs.			
City website and social media used to provide hazard-related information to the public; Code Red used to alert public in the event of emergencies			
5. PREVIOUS MITIGATION ACTIVITIES - Please list any previous mitigation activities (e.g. structural and/or planning projects or grants) that have been or will be implemented for your community. Please include the title of the project or grant along with any start or completion dates and the department or agency responsible.			
Adoption of the Aransas County Multi-Jurisdiction Floodplain Management Plan, Development of Coastal Resiliency Document			

Jurisdiction and/or Dept.:	Town of Fulton		
Name and Title:	Amanda Torres, Community Planner		
1. PLANNING AND REGULATORY CAPABILITY - Please indicate whether the following planning or regulatory tools (plans, ordinances, codes or programs) are currently in place or under development for your jurisdiction. Please provide additional comments or explanations in the space provided or with attachments.			
Planning and Regulatory Resource	**Yes**	**No**	**Comments**
Comprehensive / Master Plan			
Stormwater Management Plan / Ordinance			
Emergency Operations Plan	x		County Level
Capital Improvements Plan			
Floodplain Management Plan	x		
Economic Development Plan			
Transportation Plan	x		
Wildfire Protection Plan			
Continuity of Operations Plan			
Stormwater Ordinance	x		
NFIP Community Rating System (CRS Program)			
Floodplain Ordinance	x		

Building Code (include name/year under Comments)	x		
Zoning Ordinance	x		
Acquisition of Land for Open Space/Recreation Use			
2. ADMINISTRATIVE AND TECHNICAL CAPABILITY - Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources			
Staff / Personnel Resources	**Yes**	**No**	**Comments**
Maintenance program to reduce risk (tree trimming, clearing drainage systems)		x	
Mutual Aid Agreements (between neighboring jurisdictions)	x		
Mitigation Planning Committee	x		
Community Planner		x	
Staff Engineer		x	
Emergency manager	x		County Level
Floodplain manager	x		
Personnel skilled in Geographic Information Systems (GIS)		x	
Warning Systems/outdoor siren, reverse 911, other		x	
Grant Writer		x	
Hazard Data/historical disaster data		x	
Chief Building Official	x		

3. FISCAL CAPABILITY - Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes*

Financial Resources	**Yes**	**No**	**Comments**
Capital Improvement Programming		x	
Community Development Block Grants (CDBG)			
Stormwater Utility Fees			
Development Impact Fees	x		
Authority to levy taxes for specific purposes	x		
Other: _____			

4. EDUCATION AND OUTREACH - Please identify any education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information such as school programs, StormReady, FireWise programs, environmental protection, evacuation plan, emergency preparedness, public education programs.

5. PREVIOUS MITIGATION ACTIVITIES - Please list any previous mitigation activities (e.g. structural and/or planning projects or grants) that have been or will be implemented for your community. Please include the title of the project or grant along with any start or completion dates and the department or agency responsible.

Jurisdiction and/or Dept.:	Rockport, TX		
Name and Title:	Amanda Torres, Community Planner		
1. PLANNING AND REGULATORY CAPABILITY - Please indicate whether the following planning or regulatory tools (plans, ordinances, codes or programs) are currently in place or under development for your jurisdiction. Please provide additional comments or explanations in the space provided or with attachments.			
Planning and Regulatory Resource	**Yes**	**No**	**Comments**
Comprehensive / Master Plan	X		
Stormwater Management Plan / Ordinance	X		
Emergency Operations Plan	X		County level only
Capital Improvements Plan	X		
Floodplain Management Plan	X		
Economic Development Plan	X		
Transportation Plan			Transportation Plan is through an MPO
Continuity of Operations Plan	X		
Wildfire Protection Plan		X	
Stormwater Ordinance	X		
NFIP Community Rating System (CRS Program)		X	
Floodplain Ordinance	X		
Building Code (include name/year under Comments)	X		
Zoning Ordinance	X		
Acquisition of Land for Open Space/Recreation Use		X	
2. ADMINISTRATIVE AND TECHNICAL CAPABILITY - Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources			
Staff / Personnel Resources	**Yes**	**No**	**Comments**
Maintenance program to reduce risk (tree trimming, clearing drainage systems)	X		
Mutual Aid Agreements (between neighboring jurisdictions)	X		
Mitigation Planning Committee	X		
Community Planner	X		
Staff Engineer		X	

Emergency manager	X		County Level
Floodplain manager	X		
Personnel skilled in Geographic Information Systems (GIS)		X	
Warning Systems/outdoor siren, reverse 911		X	
Grant Writer		X	
Hazard Data/historical disaster data		X	
Chief Building Official	X		

3. FISCAL CAPABILITY - Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes*

Financial Resources	**Yes**	**No**	**Comments**
Capital Improvement Programming	X		
Community Development Block Grants (CDBG)	X		
Stormwater Utility Fees		X	
Development Impact Fees		X	
Authority to levy taxes for specific purposes	X		
Other: Building, Platting, Inspection Fees	X		

4. EDUCATION AND OUTREACH - Please identify any education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information such as school programs, StormReady, FireWise programs, environmental protection, evacuation plan, emergency preparedness, public education programs.

The City of Rockport already has in place outreach programs that are a joint effort with local citizen groups, non-profit group, local schools, faith based organizations that promote disaster safety, emergency preparedness, needs based populations, and mutual aid agreements. These associations also promote, responsible water use, fire safety, household preparedness, environmental education.

5. PREVIOUS MITIGATION ACTIVITIES - Please list any previous mitigation activities (e.g. structural and/or planning projects or grants) that have been or will be implemented for your community. Please include the title of the project or grant along with any start or completion dates and the department or agency responsible.

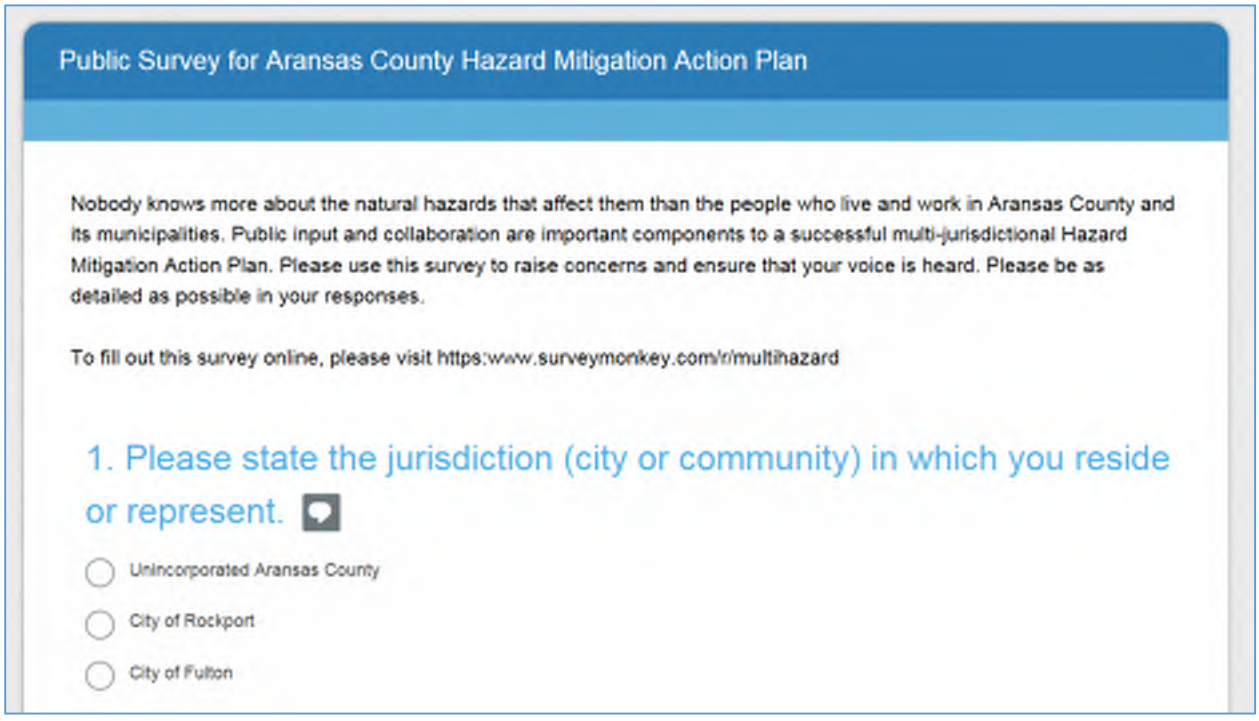
2.7-Million-dollar drainage improvements in south Rockport and adopted new regulations in that area to force new development to comply with the new drainage; Generators for lift stations; Revise flood ordinance to an 18" freeboard requirement in the SFHA; Coastal shore stabilization projects throughout the city. Currently working on project along Bayshore Drive in Key Allegro; Rockport County Club Lakes dredging projects.

Appendix B: Public Survey

Overview

Aransas County prepared a public survey with questions for the public concerning their opinions regarding natural hazards. The survey was made available on the Aransas County website. Survey results are depicted on the following pages, showing the percentage of responses for each answer. For questions that did not provide a multiple-choice answer, or that required an explanation, comments are summarized where similar.

Figure B-1: Screen Shot of Public Survey Link on Aransas County Website

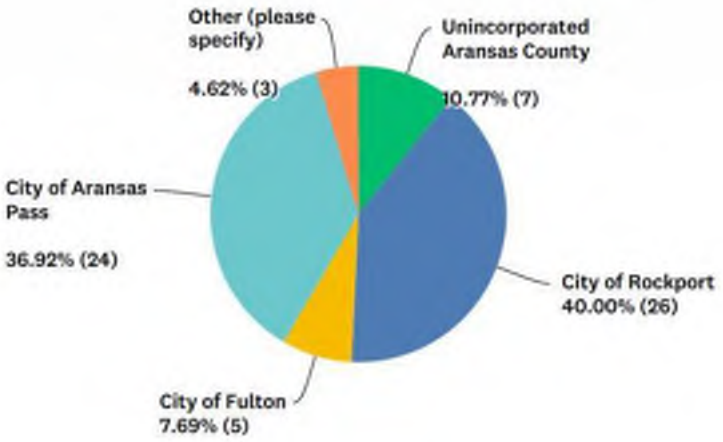


Public Survey Questions & Results

Question #1:

Q1 Please state the jurisdiction (city or community) in which you reside or represent.

Answered: 65 Skipped: 0



ANSWER CHOICES		RESPONSES	
Unincorporated Aransas County		10.77%	7
City of Rockport		40.00%	26
City of Fulton		7.69%	5
City of Aransas Pass		36.92%	24
Other (please specify)	Responses	4.62%	3

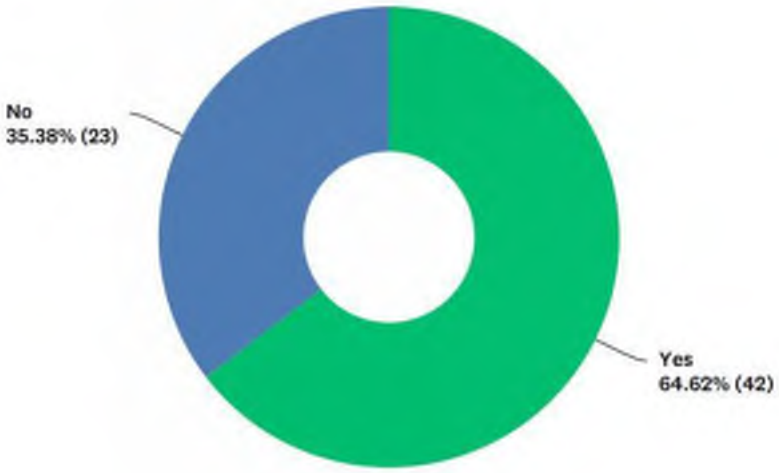
Responses:

1. Holiday Beach
2. Ingleside on the Bay
3. Portland

Question #2

Q2 Have you ever experienced or been impacted by a natural disaster?

Answered: 65 Skipped: 0

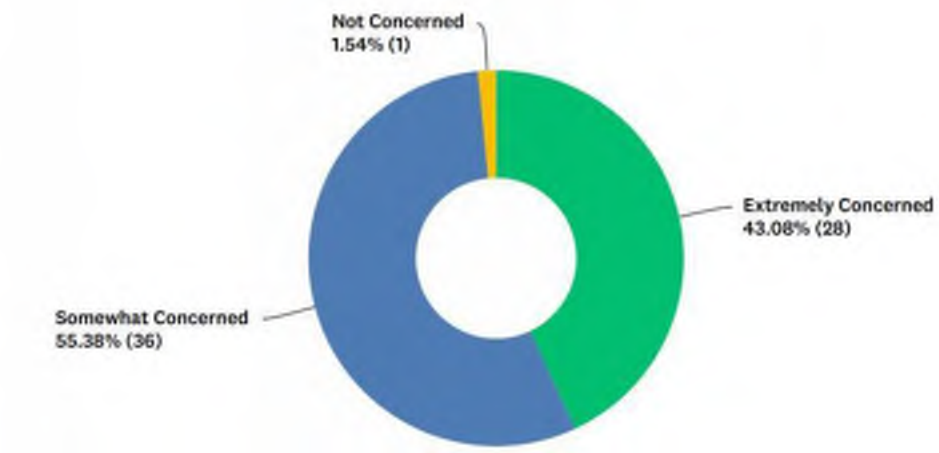


ANSWER CHOICES	RESPONSES	
Yes	64.62%	42
No	35.38%	23
TOTAL		65

Question #3

Q3 How concerned are you about the possibility of your community being impacted by a natural disaster?

Answered: 65 Skipped: 0

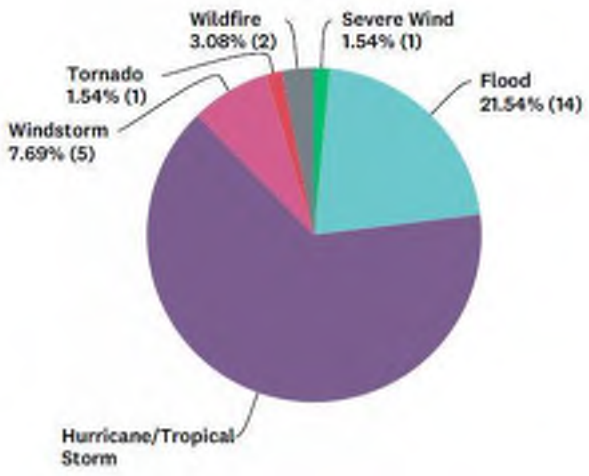


ANSWER CHOICES	RESPONSES	
Extremely Concerned	43.08%	28
Somewhat Concerned	55.38%	36
Not Concerned	1.54%	1
TOTAL		65

Question #4

Q4 Please select the natural hazard you think presents the HIGHEST threat to your neighborhood.

Answered: 65 Skipped: 0

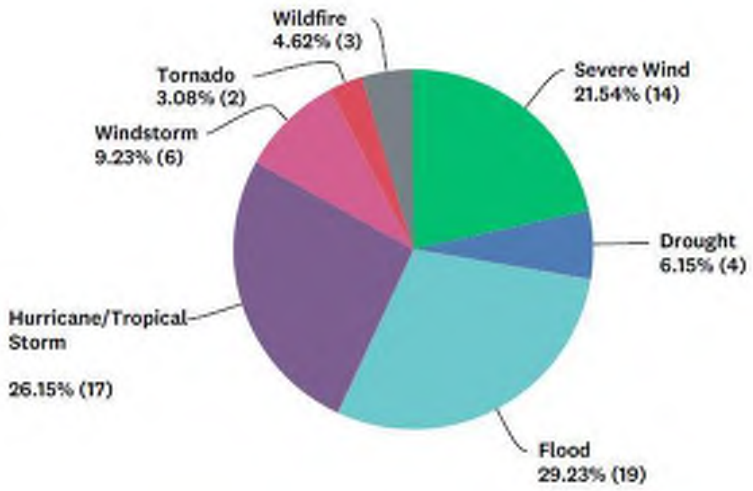


ANSWER CHOICES	RESPONSES	
Severe Wind	1.54%	1
Drought	0.00%	0
Extreme Temperature	0.00%	0
Flood	21.54%	14
Hailstorm	0.00%	0
Hurricane/Tropical Storm	64.62%	42
Windstorm	7.69%	5
Lightning	0.00%	0
Tornado	1.54%	1
Wildfire	3.08%	2
Severe Winter Storm	0.00%	0
Earthquake	0.00%	0
TOTAL		65

Question #5

Q5 Please select the natural hazard you think represents the SECOND HIGHEST threat to your neighborhood

Answered: 65 Skipped: 0

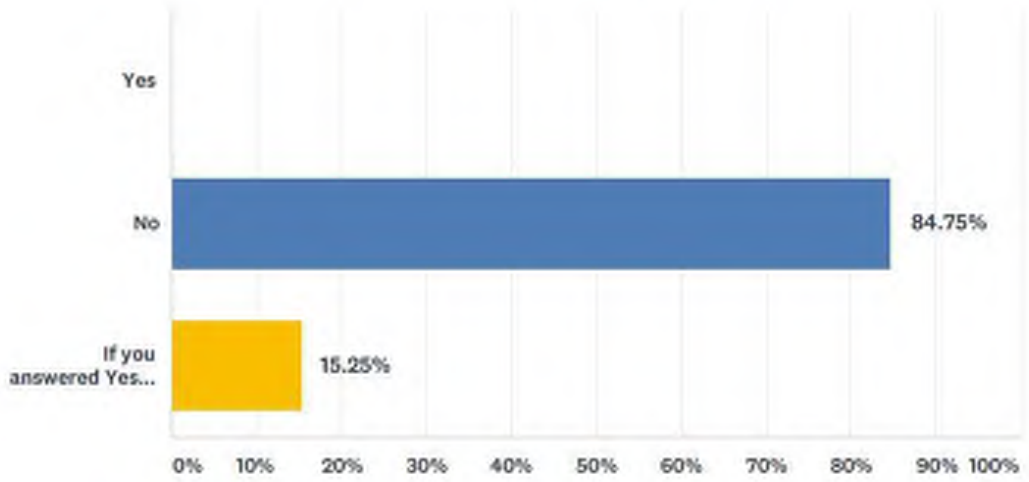


ANSWER CHOICES	RESPONSES	
Severe Wind	21.54%	14
Drought	6.15%	4
Extreme Temperature	0.00%	0
Flood	29.23%	19
Hailstorm	0.00%	0
Hurricane/Tropical Storm	26.15%	17
Windstorm	9.23%	6
Lightning	0.00%	0
Tornado	3.08%	2
Wildfire	4.62%	3
Severe Winter Storm	0.00%	0
Earthquake	0.00%	0
TOTAL		65

Question #6

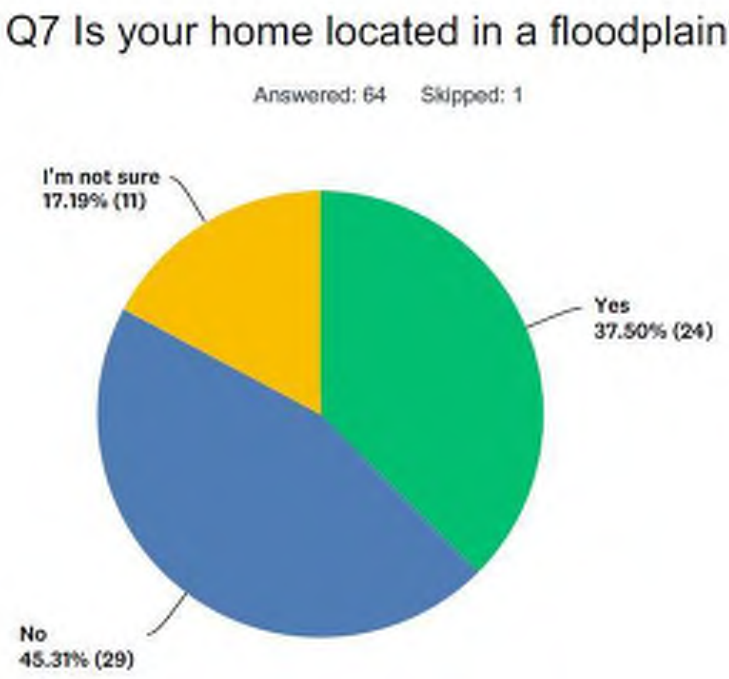
Q6 Is there another natural hazard not listed above that you think represents a wide-scale threat to your neighborhood? If yes, please explain:

Answered: 59 Skipped: 6



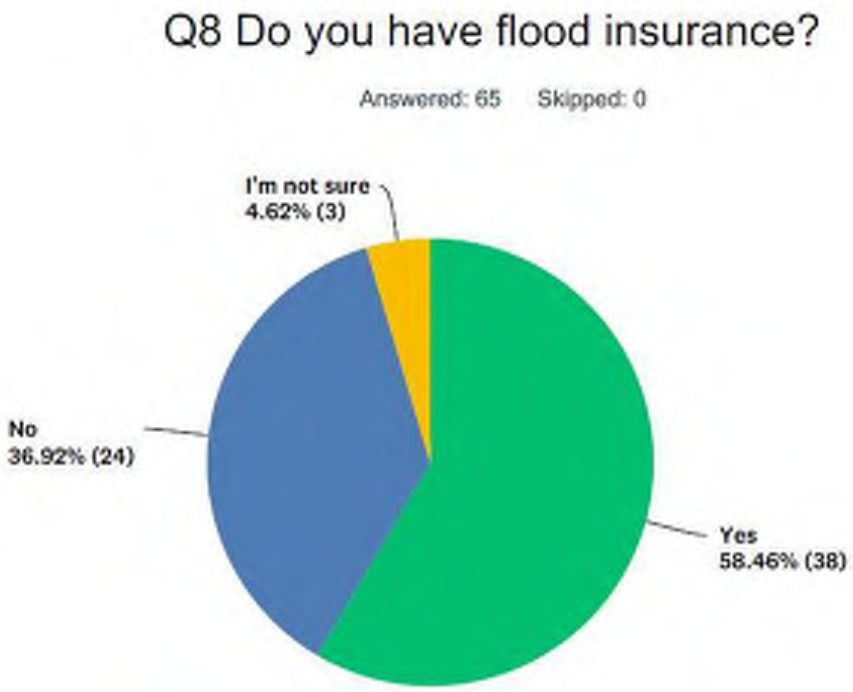
ANSWER CHOICES	RESPONSES	
Yes	0.00%	0
No	84.75%	50
If you answered Yes, please describe.	15.25%	9
TOTAL		59

Question #7



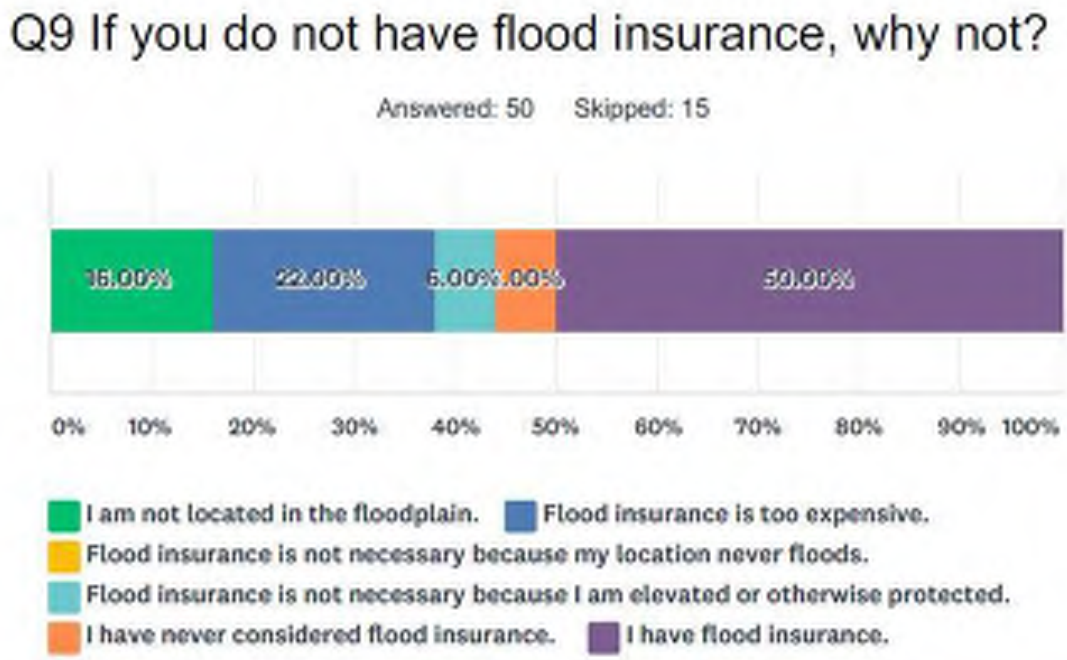
ANSWER CHOICES	RESPONSES	
Yes	37.50%	24
No	45.31%	29
I'm not sure	17.19%	11
TOTAL		64

Question #8



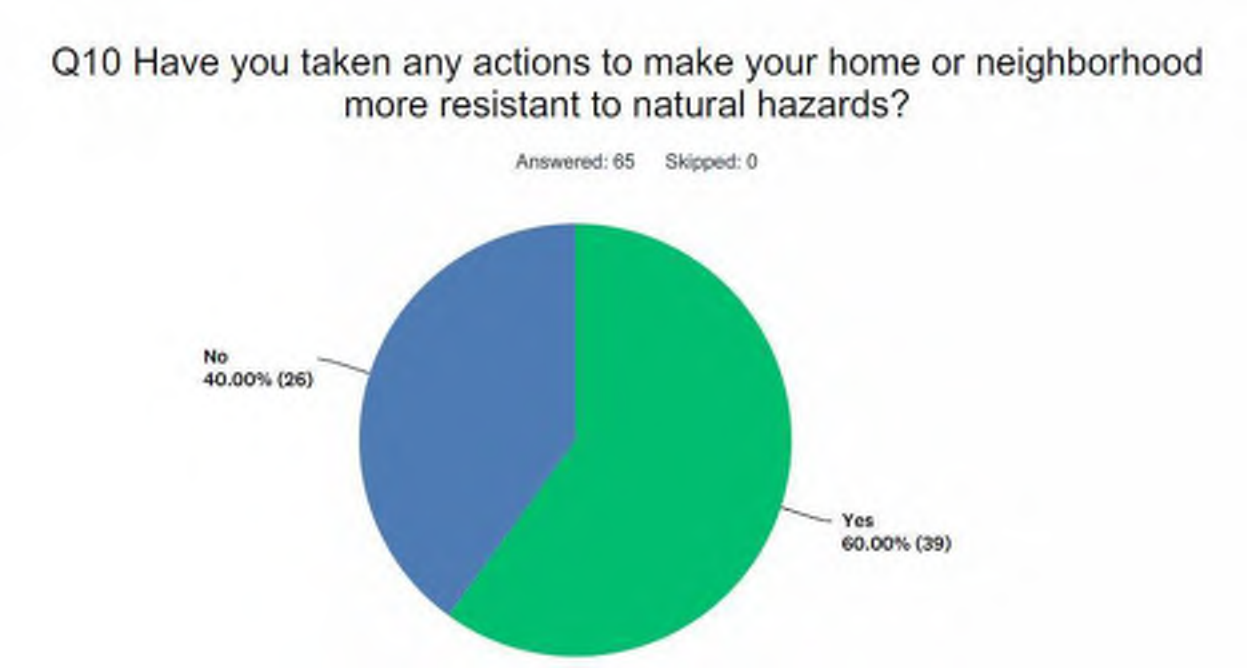
ANSWER CHOICES	RESPONSES	
Yes	58.46%	38
No	36.92%	24
I'm not sure	4.62%	3
TOTAL		65

Question #9



ANSWER CHOICES	RESPONSES	
I am not located in the floodplain.	16.00%	8
Flood insurance is too expensive.	22.00%	11
Flood insurance is not necessary because my location never floods.	0.00%	0
Flood insurance is not necessary because I am elevated or otherwise protected.	6.00%	3
I have never considered flood insurance.	6.00%	3
I have flood insurance.	50.00%	25
TOTAL		50

Question #10



ANSWER CHOICES	RESPONSES	
Yes	60.00%	39
No	40.00%	26
TOTAL		65

Responses:

1. My yard is slightly elevated

2. Clearing brush, proper roofing, downspout drainage, security meet up points w/ time, and back up even that based on air, land or ocean best exit or access. Shelter in Place and back up list of what TO HAVE for HOW LONG

3. Keep yard mowed and clear of all brush. Recently up-dated our electrical system and hot water heater to meet current building codes.

4. Sandbags

5. Just moved here working on a plan

6. Verified TDI certification for improvements done by prior owners. Window shutters.

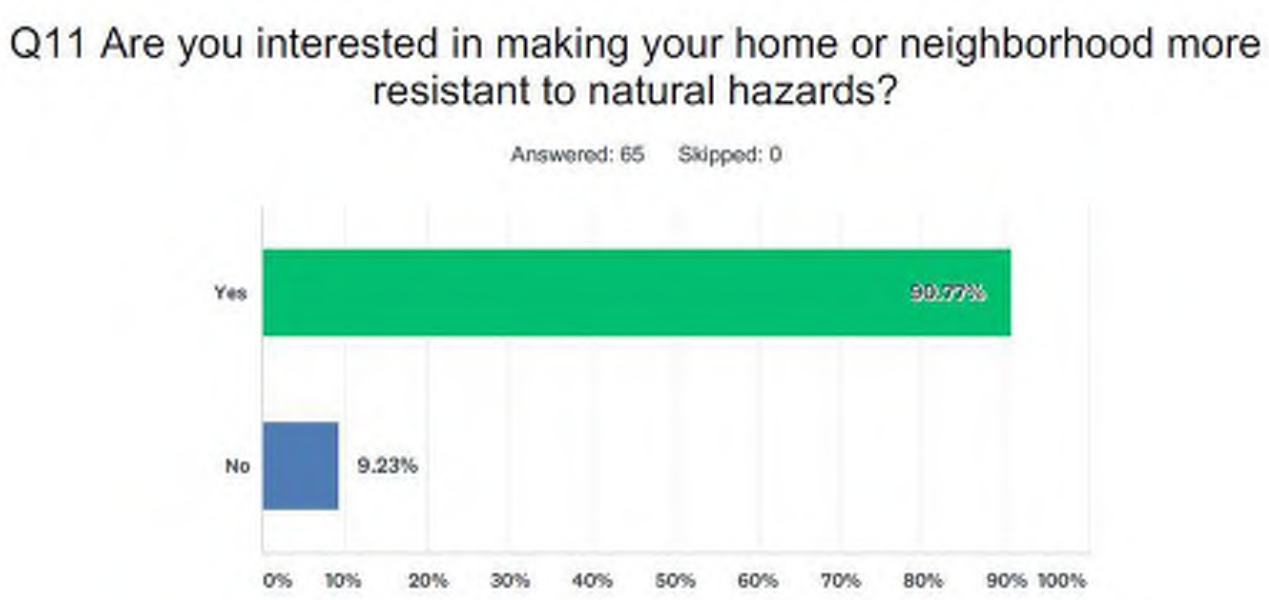
7. Ordered a whole house backup generator

8. Update drainage

9. Hurricane shelters

10. Hurricane Shelters
11. Automatic shutters
12. Storm windows & door covers
13. Storm shutters
14. Storm/impact resistant doors and windows
15. I. C. F. home construction, metal roof, solar panels on carport
16. Hurricane Shutters, new roof (flat roof)
17. Precut boards for windows, hurricane plan and hurricane preparedness kit
18. Hurricane panels, gutters, remove tree limbs from near house.
19. Our building is built up a little bit where our extensive equipment is.
20. Talking to city government
21. We cut the branches that might break and hit the house
22. Secured outbuildings
23. Keep trash picked up and out of storm drains
24. structural upgrades
25. Maintain undergrowth
26. Shutters
27. Engineered strong house on stilts
28. put a better roof on, have window boards for hurricanes, house up off ground so no flooding
29. Clean out the drainage ditches
30. Trimmed trees
31. Trim overhead trees to protect from house damage.
32. Due to flooding, have raised floors and removed drywall on lower walls. Have installed reusable flooring and removed carpeting where possible
33. maximized drainage on property

Question #11



ANSWER CHOICES	RESPONSES	
Yes	90.77%	59
No	9.23%	6
TOTAL		65

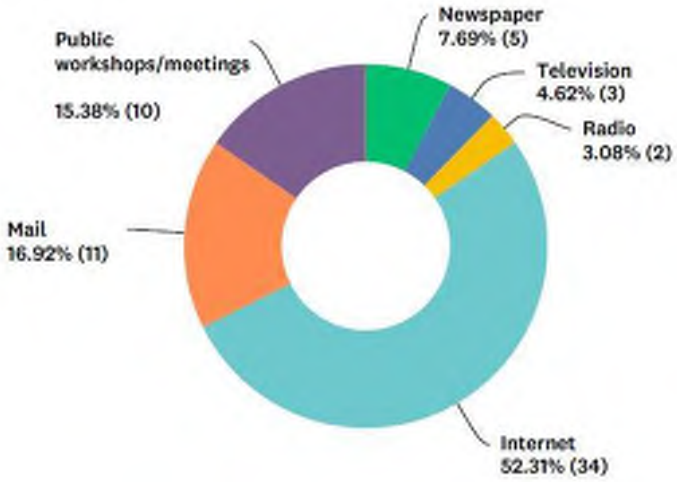
Responses:
1. Update drains & ditches
2. Mitigation
3. Hel finance better protection like shutters
4. Proper drainage when we have high tide
5. I'm not really sure but there is definitely a drainage issue in downtown Rockport after heavy rains
6. Fix the drainage in the streets
7. Fix the pathetic "sea wall" that will wash away
8. Improvements to storm surge barriers and drainage back out from those barriers

9. Improve drainage for the City of Aransas Pass
10. I'd like to see how local government could stop a hurricane or tornado
11. Be more like AP
12. Improve storm drainage system
13. Clean out drainage ditches
14. Resources; in the event of a disaster what are the steps, how to get information
15. Help the community better be prepared. Like picking up little from the streets, so they bang into other people houses
16. Improve drainage and watershed flow, automatic pumps
17. Need to fix the drainage

Question #12

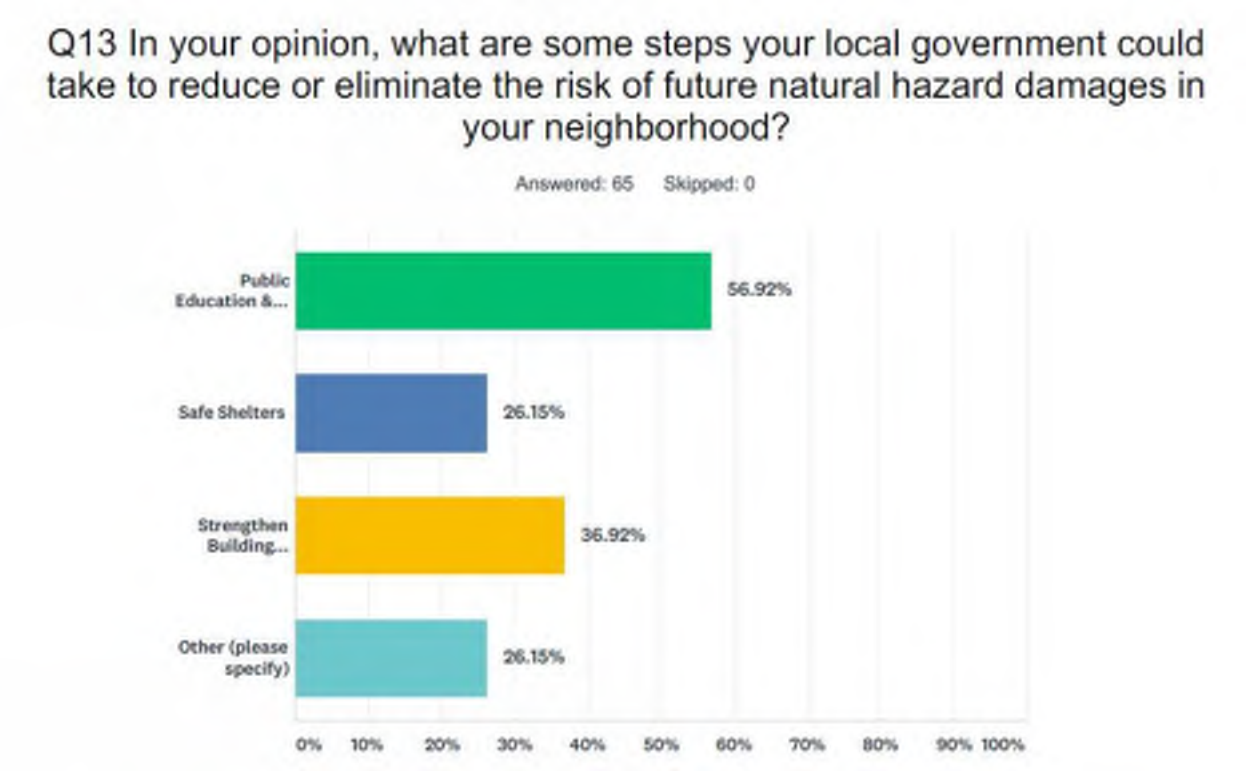
Q12 What is the most effective way for you to receive information about how to make your home and neighborhood more resistant to natural hazards?

Answered: 65 Skipped: 0



ANSWER CHOICES	RESPONSES	
Newspaper	7.69%	5
Television	4.62%	3
Radio	3.08%	2
Internet	52.31%	34
Mail	16.92%	11
Public workshops/meetings	15.38%	10
School meetings	0.00%	0
TOTAL		65

Question #13



ANSWER CHOICES	RESPONSES	
Public Education & Awareness	56.92%	37
Safe Shelters	26.15%	17
Strengthen Building Codes/Requirements	36.92%	24
Other (please specify)	26.15%	17
Total Respondents: 65		

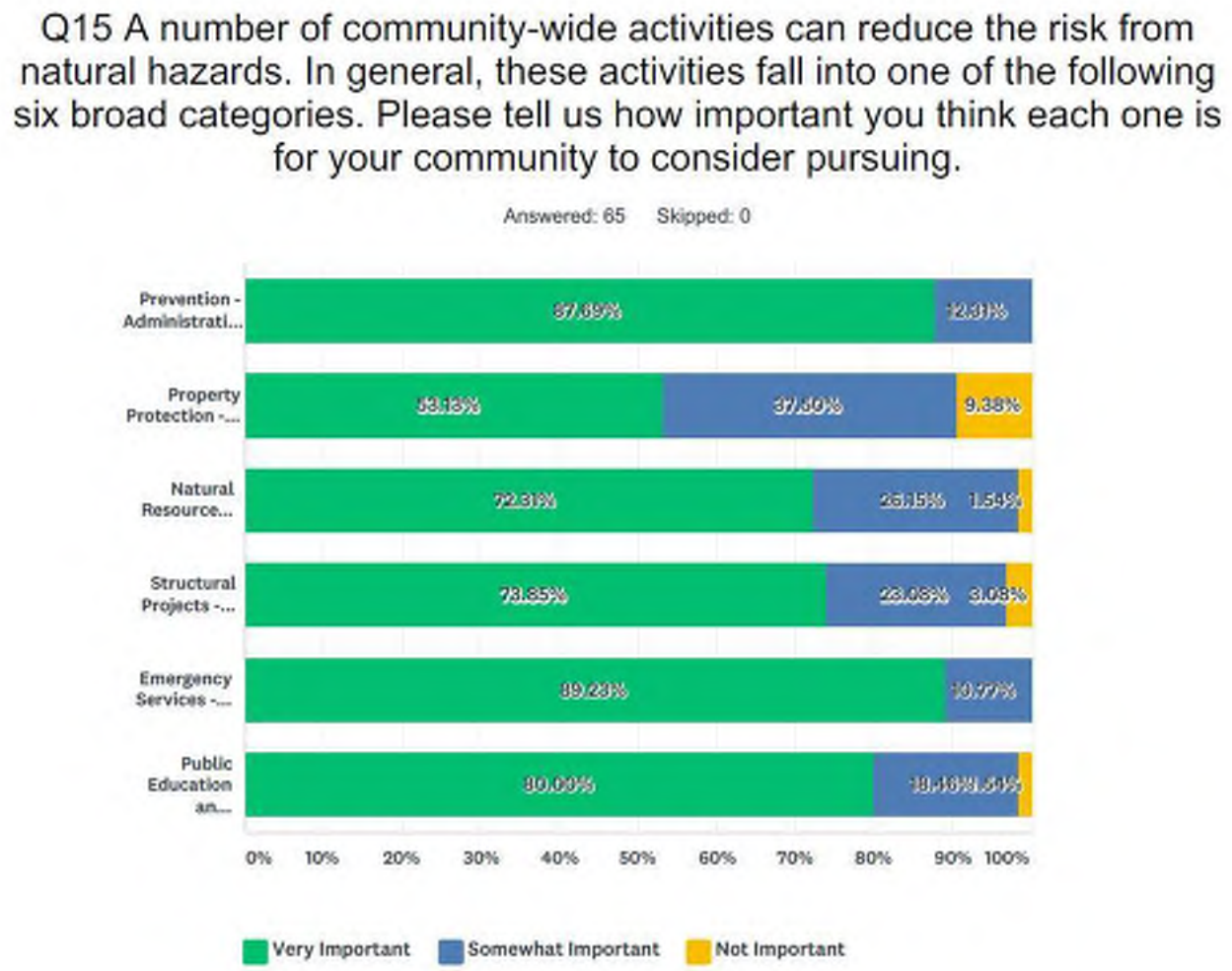
Question #14

What other issues regarding the reduction of risk and loss associated with natural hazards or disasters in the community do you find important?

Responses

1	Communication.
2	Shelters for fulltime rvers
3	The lack of local government restrictions on building and elevation changes due to building.
4	Highly resistant to forced evacuation and blocked return after storm has passed. If I have sufficient water, power generation and propane supply, I should not be restricted from returning to my life and ability to protect my property and livestock.
5	Educating children: Natural disaster, but also protecting themselves with knowledge of Meet Up locations, their name/contact information/relative name and location. Second House Pet safety and mobility in floods and transport Third Large Animal relocation: Horse and cattle sanctuary post or pre-disaster
6	It would be good if the neighbors also participated.
7	Where to go with pets. Pets are usually not welcome in emergency shelters causing many people to either abandon their pets or avoid shelters
8	Fast response time
9	Warnings of weather that we get from news X
10	Heavy/gridlocked traffic getting out of neighborhood, or out of Rockport entirely, in the event a quick evacuation is needed.
11	Mitigation
12	Self awareness and personal responsibility.
13	Food/water reserves; improvement of restoration of power capabilities
14	Earlier storm notices before tv goes out
15	Protection of the environment to avoid erosion and other issues will help prevent or will mitigate damage
16	better drainage and infrastructure
17	pumps that work
18	The flooding seems to be really bad in town. Might want to work on better drainage
19	A community action plan involving residents. Training of the action plan to all interested parties.
20	Drainage
21	Emergency shelters and food banks
22	Lack of confidence in our city officials.
23	The city not doing its job, to protect the citizens.
24	Not sure
25	Public info for evacuation plans and/or safe shelters.
26	Improved monitoring of trash collecting in ditches plugging drainage. (better Code Enforcement of dumpster problems)

Question #15



Answer Options	Very Important	Somewhat Important	Not Important	Response Count
Prevention - Administrative or regulatory actions that influence the way land is developed and buildings are built. Examples include planning and zoning, building codes, open space preservation, and floodplain regulations.	57	8	0	65
Property Protection - Actions that involve the modification of existing buildings to protect them from a hazard or removal	34	24	60	64

from the area. Examples include acquisition, relocation, elevation and structural retrofits.				
Natural Resource Protection - Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. Examples include floodplain protection, habitat preservation, and riparian buffers.	47	171	1	65
Structural Projects - Actions intended to lessen the impact of a hazard by modifying the natural progression of the hazard. Examples include dams, levees, seawalls, detention/retention basins, channel modification, retaining walls and storm sewers.	48	15	2	65
Emergency Services - Actions that protect people and property during and immediately after an event. Examples include warning systems, evacuation planning, and protection of critical emergency facilities or systems.	58	7	0	65
Public Education and Awareness - Actions to inform citizens about hazards and the techniques they can use to protect themselves and their property. Examples include outreach projects, library materials and demo events.	55	12	1	65

Question #16

Q16

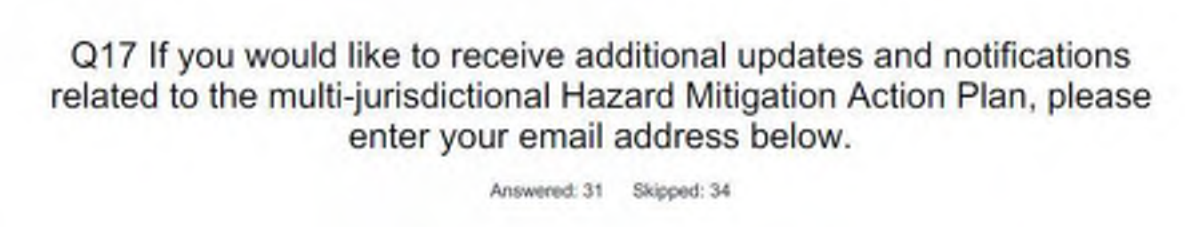
Do you have any other comments, questions, or concerns?

Answered: 10 Skipped: 55

Responses

1	I do not want to be restricted from returning to my home immediately after a hurricane. I will have ability to generate my own power, with sufficient fuel to maintain operation over a lengthy period. Sufficient food and water for a lengthy period. I must be able to provide for my 2 horses on my property on a daily basis. Transport and stabling at a distant site is cost and time prohibitive. We are self sufficient and proved ourselves throughout a 9 day period without power due to an ice storm in Oklahoma in December 2007. Our ability to sustain ourselves was unlimited. After either H. Ike or H. Rita, my mother was barred from returning to her house in Beaumont for a month. That imposed significant hardship on her during that time. It was totally unnecessary.
2	Publicize the list of what to have to take out of the home. What to have in the home... Easy format: LIKE A BOOK MARK SIZE WITH THE LIST.... Lots of them, at the library, church, grocery, movie theater as FREE take-aways
3	I am a member of UMCOR early response. I think more people should take the course.
4	There are factories in San Patricio County, with more yet to be built, which use deadly toxic chemicals which if released could blow into Rockport. Rockport city and county officials need to make sure they are connected to all emergency service providers in San Patricio in case there is a need to warn us to evacuate or shelter in place.
5	Downtown flooding issues need to be addressed and remedied!
6	no
7	I don't believe our city officials are down to earth and actually realize what the citizens of the city will need and do need.
8	A lot oh garbage and trash laying around town in high winds can become lethal flying trash
9	I would like to know what the city's plan is for a hurricane, evacuation order, how to get information when we are away. Is there going to be a central meeting area the days prior to an evacuation? What department will offer briefings during evacuation? Will it be webcasts?
10	Simple things like making sure tras, junk on the sides if the street do not become flying hazards. This is becoming worse in AP.

Question #17



Note: Personal email addresses were omitted from these results for privacy.

Appendix C: Meeting Documentation

Public Announcements

Aransas County Multi-Jurisdictional Hazard Mitigation Action Plan

PUBLIC SERVICE ANNOUNCEMENT

06/21/2017

Aransas County is sponsoring the development of a **Multi-Jurisdictional Mitigation Action Plan**, or ***Plan*.** *Mitigation* is defined by the Federal Emergency Management Agency (FEMA) as *sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects*. The goal of the Plan is to address natural hazards that could potentially affect the county-wide area. The purpose of the mitigation plan is twofold: to protect people and structures and to minimize the costs of disaster response and recovery.

Plan participants include unincorporated Aransas County, the Cities Aransas Pass, Fulton and Rockport. Upon FEMA approval and Plan adoption, the County and participating jurisdictions become eligible to apply for certain FEMA grant funding under the Hazard Mitigation Assistance (HMA) program. These grant funds may be used to identify and implement mitigation projects to reduce risk from natural hazards such as flood, tornado, and wildfire.

HMA grant funding may be available for critical projects such as buyouts and structural elevation of repetitive flood loss structures, drainage projects, and hardening critical facilities to minimize future damage from natural disasters that affect the planning area. Funds from these federal grant programs may be awarded to local governments to implement mitigation projects identified as part of a FEMA-approved Mitigation Action Plan.

Aransas County has secured the services of LAN Engineering to assist in project development. LAN has professional expertise in floodplain management, stormwater engineering, grant application and management, and disaster and mitigation planning.

The hazard mitigation planning process involves multiple steps to analyze past and future hazard events that impact the area, and how these hazard risks and events affect people, buildings, and critical infrastructure. Another key component of the risk assessment will be to assess the potential future impact of hazards based upon the current and projected development trends and plans for Aransas County and participating jurisdictions.

Public participation is critical to the success of the mitigation planning process. The general public will be invited to participate in the hazard mitigation planning process from beginning to end. The County will encourage public input through meeting announcements, information disseminated on the website, social media, and through a public survey posted to the County's website. Public meetings will be used to solicit input, participation, and feedback from all interested attendees. These public meetings can help further define the hazards and actions to be taken to reduce hazard risk and protect people and property.

Aransas County will seek to ensure that the general public, businesses and other stakeholders remain aware of the planning process and are given an opportunity to participate and comment. This includes making components of the Draft plan available for public review and comment in advance of any formal consideration or approval. A Public Survey has been posted to the Aransas County's website to seek public input into the Plan at:

In accordance with federal planning requirements, Aransas County, and the participating jurisdictions listed above, must review, approve, and adopt the Plan. The completed Plan will be submitted for formal approval by LAN to the Texas Division of Emergency Management (TDEM) and FEMA. Questions regarding the project may be directed to Janine Ellington, Project Manager for LAN at (830) 713-0264 or jeellington@lan-inc.com

Kickoff Planning Meeting Invitation, June 21, 2017

FOR IMMEDIATE RELEASE
Contact: Janine Ellington
LAN Engineering
(713) 821-0264
June 21, 2017

FEMA Hazard Mitigation Action Plan Public Announcement & Kickoff July 6, 2017

A public meeting on **Thursday, July 6, 2017** to gather public input for a FEMA Mitigation Action Plan, or *Plan*. The Multi-Jurisdictional Plan participants include unincorporated areas of Aransas County, the Cities of Aransas Pass, Rockport and Fulton. The meeting is at **5:30p.m. at Aransas County Commissioner's Court, 301 N. Live Oak, Rockport, TX 78382.** The general public, area businesses and organizations located throughout the planning area are invited and encouraged to attend.

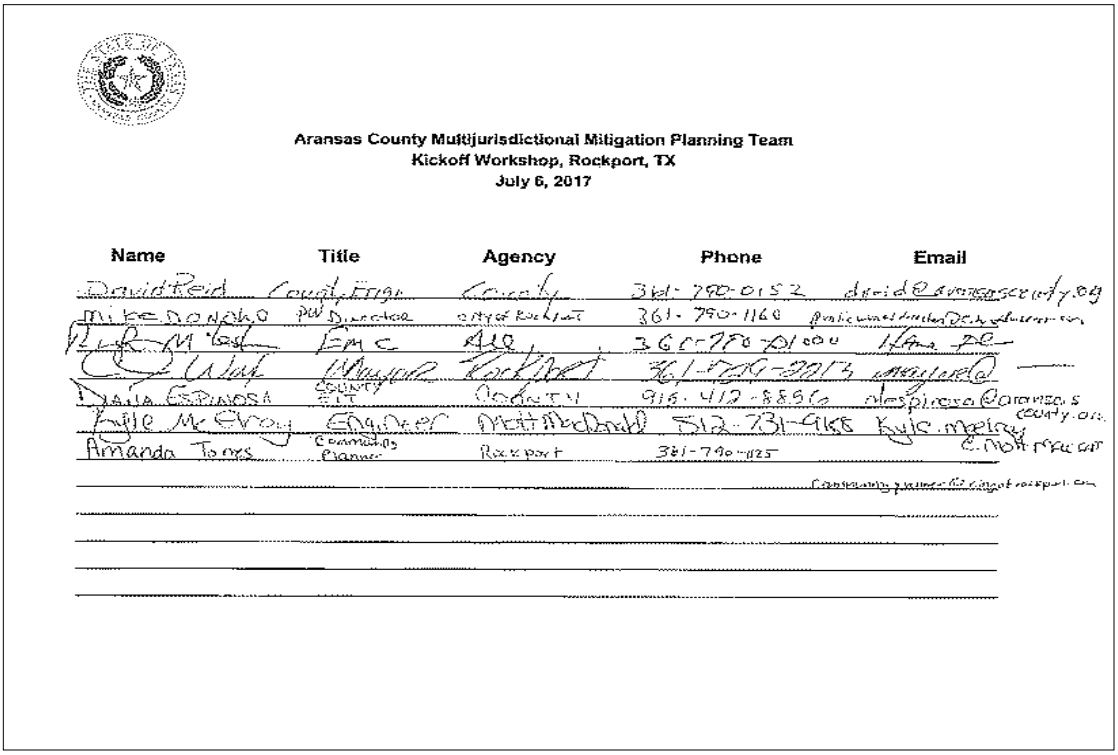
Under the Disaster Mitigation Act of 2000, the Federal Emergency Management Agency (FEMA) requires communities to develop a mitigation plan to minimize or eliminate the long-term risk to human life and property from known hazards. *Mitigation* is defined by FEMA as sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects. Hazards that may pose a risk and potentially result in a disaster include drought, flood, hurricane, tornado, wildfire, and other high hazards.

Communities with a FEMA-approved Plan are eligible for certain grant funding under the Hazard Mitigation Assistance (HMA) program to fund critical projects such as Buyouts and Structural Elevation of repetitive flood loss structures, drainage projects, and hardening critical facilities to minimize future damage from natural disasters that affect the County planning area.

The purpose of the public meeting is to provide a project overview from LAN, consultant to the project, and solicit information from citizens. Public input will help the Planning Team to identify and analyze potential hazards affecting residents and recommend possible actions to reduce their impact throughout Aransas County and the planning area.

Detailed information about the planning process can be obtained by contacting Janine Ellington, Project Manager, at (713) or jeellington@lan-inc.com

Kickoff Meeting Sign-In Sheet, July 6, 2017



Aransas County Multijurisdictional Mitigation Planning Team
Kickoff Workshop, Rockport, TX
July 6, 2017

Name	Title	Agency	Phone	Email
David Reid	Coord, Emg.	County	361-790-0152	david@aransascounty.org
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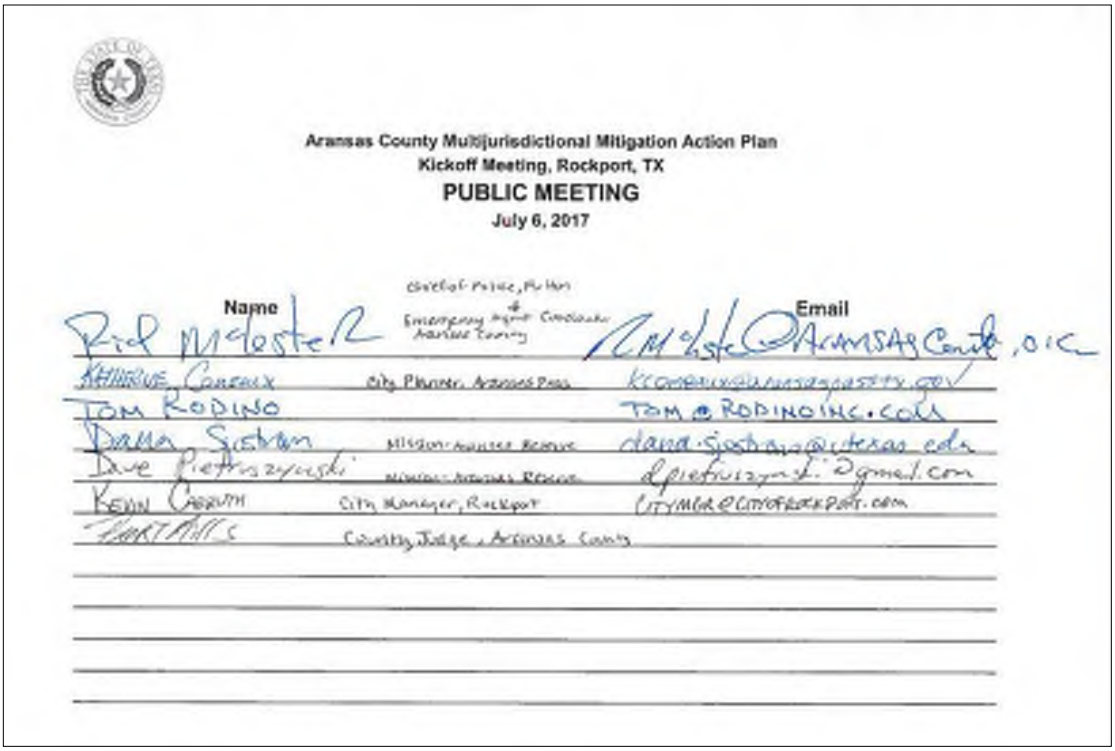
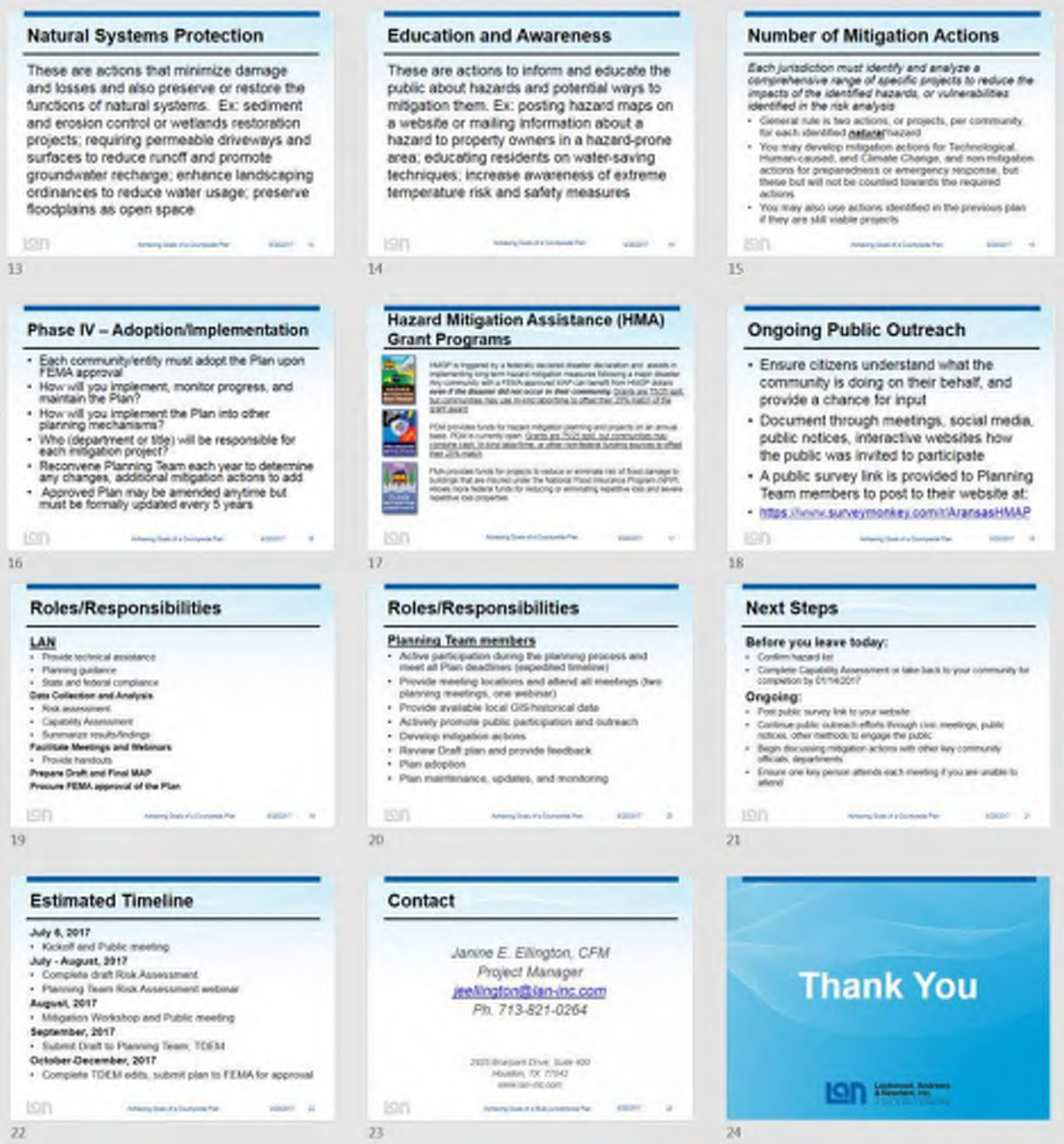
Amanda Toms	Community Planner	Rockport	361-790-1125	Community.planner@cityofrockport.com



Aransas County Multijurisdictional Mitigation Action Plan
Kickoff Meeting, Rockport, TX
PUBLIC MEETING
July 6, 2017

Name		Email
Rick McMaster	Chief of Police, Rockport & Emergency Mgmt Coordinator, Aransas County	RMcMaster@AransasCounty.org
Katherine Corteaux	City Planner, Aransas Pass	KCorteaux@aransaspass.tx.gov
TOM RODINO		TOM@RODINOINC.COM
Dana Stobaugh	Mission Aransas Reserve	dana.stobaugh@utexas.edu
Dave Pietruszewski	Mission Aransas Reserve	dpietruszewski.2@gmail.com
KEVIN GRIFFITH	City Manager, Rockport	CITYMGR@CITYOFROCKPORT.COM
[illegible]	County Judge, Aransas County	

Kickoff Meeting PowerPoint Presentation, July 6, 2017


Natural Systems Protection
These are actions that minimize damage and losses and also preserve or restore the functions of natural systems. Ex: sediment and erosion control or wetlands restoration projects; requiring permeable driveways and surfaces to reduce runoff and promote groundwater recharge; enhance landscaping ordinances to reduce water usage; preserve floodplains as open space
13
Education and Awareness
These are actions to inform and educate the public about hazards and potential ways to mitigation them. Ex: posting hazard maps on a website or mailing information about a hazard to property owners in a hazard-prone area; educating residents on water-saving techniques; increase awareness of extreme temperature risk and safety measures
14
Number of Mitigation Actions
Each jurisdiction must identify and analyze a comprehensive range of specific projects to reduce the impacts of the identified hazards, or vulnerabilities identified in the risk analysis
General rule is two actions, or projects, per community for each identified natural hazard
You may develop mitigation actions for Technological, Human-caused, and Climate Change, and non-mitigation actions for preparedness or emergency response, but these but will not be counted towards the required actions
You may also use actions identified in the previous plan if they are still viable projects
15
Phase IV – Adoption/Implementation
Each community/entity must adopt the Plan upon FEMA approval
How will you implement, monitor progress, and maintain the Plan?
How will you implement the Plan into other planning mechanisms?
Who (department or title) will be responsible for each mitigation project?
Reconvene Planning Team each year to determine any changes, additional mitigation actions to add
Approved Plan may be amended anytime but must be formally updated every 5 years
16
Hazard Mitigation Assistance (HMA) Grant Programs
17
Ongoing Public Outreach
Ensure citizens understand what the community is doing on their behalf, and provide a chance for input
Document through meetings, social media, public notices, interactive websites how the public was invited to participate
A public survey link is provided to Planning Team members to post to their website at:
https://www.surveymonkey.com/r/AransasHMAP
18
Roles/Responsibilities
LAN
Provide technical assistance
Planning guidance
State and federal compliance
Data Collection and Analysis
Risk assessment
Capability Assessment
Summarize results/findings
Facilitate Meetings and Webinars
Provide handouts
Prepare Draft and Final MAP
Procure FEMA approval of the Plan
19
Roles/Responsibilities
Planning Team members
Active participation during the planning process and meet all Plan deadlines (expedited timeline)
Provide meeting locations and attend all meetings (two planning meetings, one webinar)
Provide available local GIS/historical data
Actively promote public participation and outreach
Develop mitigation actions
Review Draft plan and provide feedback
Plan adoption
Plan maintenance, updates, and monitoring
20
Next Steps
Before you leave today:
Confirm hazard list
Complete Capability Assessment or take back to your community for completion by 01/14/2017
Ongoing:
Post public survey link to your website
Continue public outreach efforts through civic meetings, public notices, other methods to engage the public
Begin discussing mitigation actions with other key community officials, departments
Ensure one key person attends each meeting if you are unable to attend
21
Estimated Timeline
July 6, 2017
Kickoff and Public meeting
July - August, 2017
Complete draft Risk Assessment
Planning Team Risk Assessment webinar
August, 2017
Mitigation Workshop and Public meeting
September, 2017
Submit Draft to Planning Team, TDEM
October-December, 2017
Complete TDEM edits, submit plan to FEMA for approval
22
Contact
Janine E. Ellington, CFM
Project Manager
jellington@lan-inc.com
Ph. 713-821-0264
23
Thank You
24

Multi-Jurisdictional Hazard Mitigation Action Plan Workshop Sign-In Sheet, August 22, 2017

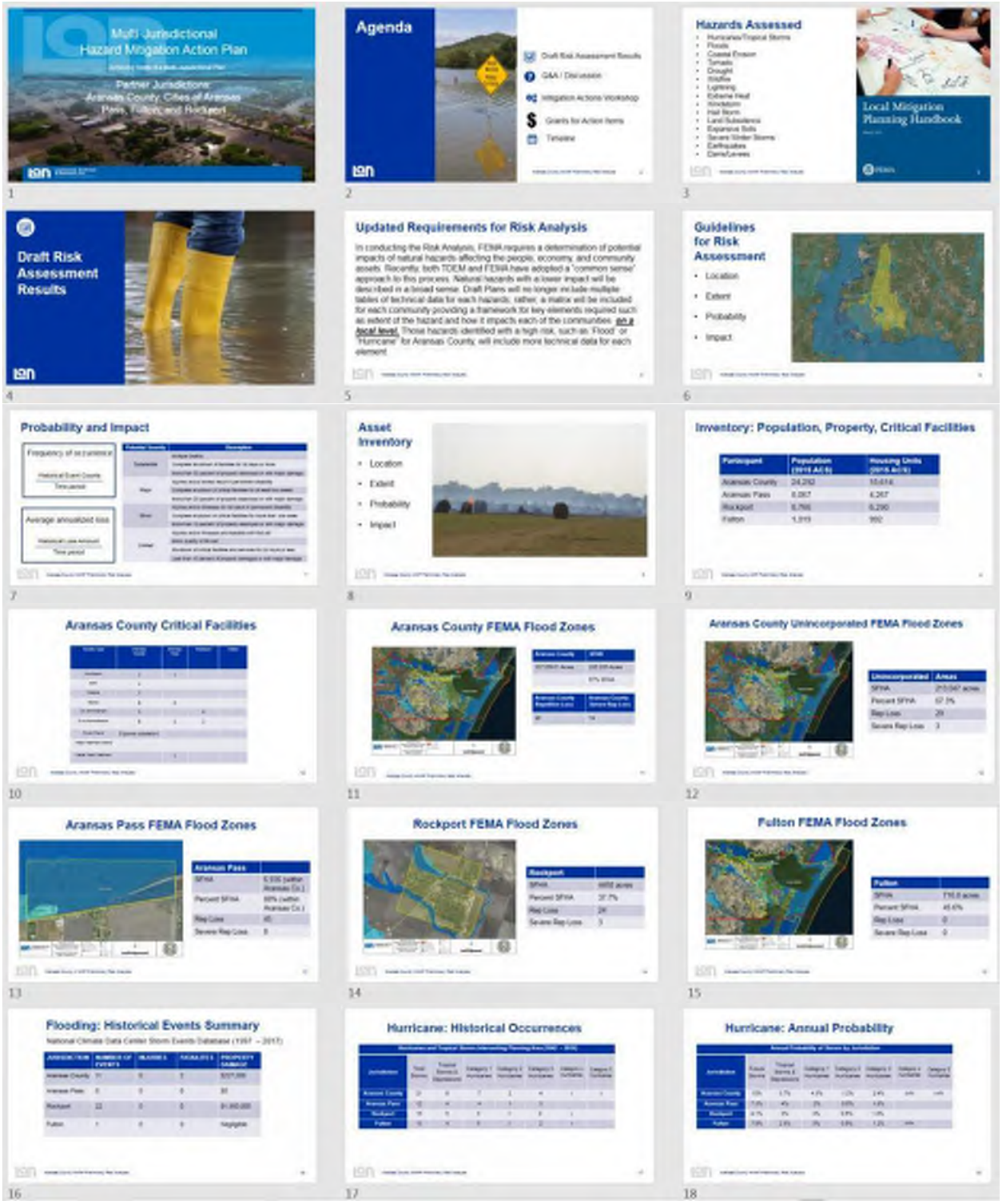
Aransas County Multijurisdictional Mitigation Planning Team
Mitigation Workshop, Rockport, TX
August 22, 2017

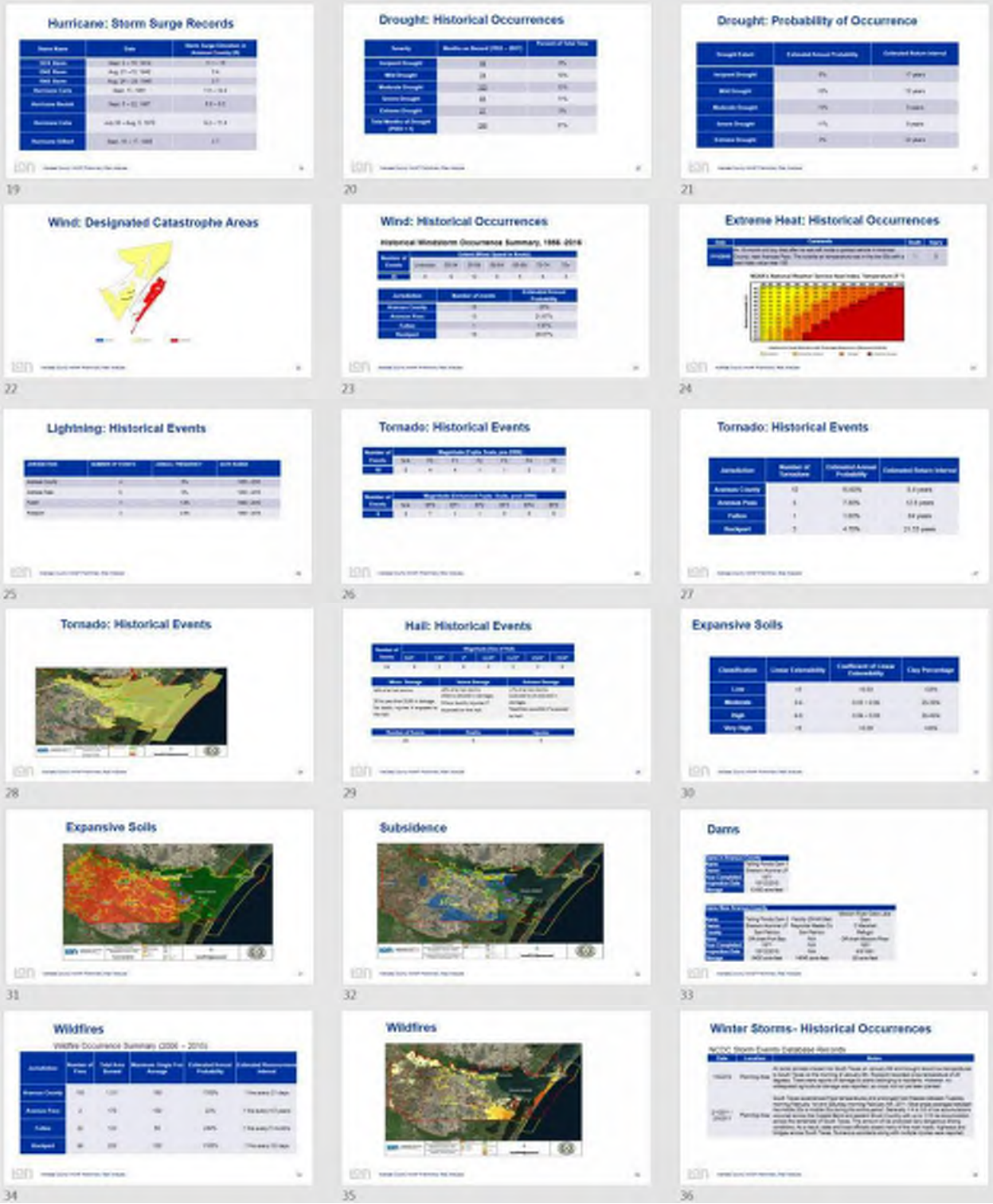
Name	Title	Agency	Phone	Email
Rick McLester	EMC	Aransas Co		
DIANA ESPINOSA	E.I.T.	ARANSAS COUNTY	915-412-8856	despinosa@aransascounty.org
Ryan Piccarazzi	"	City of Rockport	361-205-2113	streets@cityofrockport.com
Matt Olenick	Floodplain	Fulton	361-463-3467	townoffulton.shop@gmail.com
KATHERINE COMEAUX	PLANNER, CFM	CITY OF AP	361-244-5086	[illegible]
Amanda Torres	Floodplain Administrator	City of Rockport	361-790-1125	communityplanner@cityofrockport.com

Aransas County Multijurisdictional Mitigation Planning Team
Mitigation Workshop, Rockport, TX
August 22, 2017

Name	Title	Agency	Phone	Email
Janine Ellington		LNW	830-660-1205	jellington@lan.com

Multi-Jurisdictional Hazard Mitigation Action Plan PowerPoint Presentation, August 22, 2017




Hurricane: Storm Surge Records
19
Drought: Historical Occurrences
20
Drought: Probability of Occurrence
21
Wind: Designated Catastrophe Areas
22
Wind: Historical Occurrences
23
Extreme Heat: Historical Occurrences
24
Lightning: Historical Events
25
Tornado: Historical Events
26
Tornado: Historical Events
27
Tornado: Historical Events
28
Hail: Historical Events
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Expansive Soils
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Expansive Soils
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Subsidence
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Planning Process Timeline

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Contact Info
Janine Ellington, CFM
Tak Makino, CFM
Laura Casset, P.E, CFM

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HMAP Natural Hazards Ranking Sheets

Aransas County Multi-Jurisdictional Hazard Mitigation Action Plan Natural Hazards Ranking Sheet

NOTE: This is not a technical exercise. Results will be compiled and included in the Risk Assessment Overview of the Plan. The hazard ranking is based on your experience as a community official or resident of the Aransas County area. Place a mark in the appropriate column and row indicating level of risk. Consider frequency of occurrence of each hazard as well as the potential impact when ranking the hazards.

Aransas County

Hazard	Not Applicable (N/A)	Low (L)	Moderate (M)	High (H)
Floods				H
Hurricane/Tropical Storm				H
Wildfire				H
Tornado			M	
Drought				H
Coastal Erosion				H
Dam/Levee Failure		L		
Earthquakes		L		
Expansive Soils			M	
Extreme Heat				H
Hailstorm				H
Land Subsidence		L		
Severe Winter Storm		L		
Windstorms			M	
Lightning			M	

Aransas County Multi-Jurisdictional Hazard Mitigation Action Plan Natural Hazards Ranking Sheet

City of Aransas Pass

NOTE: This is not a technical exercise. Results will be compiled and included in the Risk Assessment Overview of the Plan. The hazard ranking is based on your experience as a community official or resident of the Aransas County area. Place a mark in the appropriate column and row indicating level of risk. Consider frequency of occurrence of each hazard as well as the potential impact when ranking the hazards.

Hazard	Not Applicable (N/A)	Low (L)	Moderate (M)	High (H)
Floods				X
Hurricane/Tropical Storm				X
Wildfire				X
Tornado		X		
Drought				X
Coastal Erosion			X	
Dam/Levee Failure	X			
Earthquakes		X		
Expansive Soils		X		
Extreme Heat				X
Hailstorm				X
Land Subsidence				X
Severe Winter Storm		X		
Windstorms				X
Lightening				X

Aransas County Multi-Jurisdictional Hazard Mitigation Action Plan Natural Hazards Ranking Sheet

City of Fulton

NOTE: This is not a technical exercise. Results will be compiled and included in the Risk Assessment Overview of the Plan. The hazard ranking is based on your experience as a community official or resident of the Aransas County area. Place a mark in the appropriate column and row indicating level of risk. Consider frequency of occurrence of each hazard as well as the potential impact when ranking the hazards.

Hazard	Not Applicable (N/A)	Low (L)	Moderate (M)	High (H)
Floods				H
Hurricane/Tropical Storm			M	
Wildfire				H
Tornado			M	
Drought				H
Coastal Erosion				H
Dam/Levee Failure		L		
Earthquakes		L		
Expansive Soils			M	
Extreme Heat				H
Hailstorm				H
Land Subsidence				H
Severe Winter Storm		L		
Windstorms			M	
Lightning			M	

Aransas County Multi-Jurisdictional
Hazard Mitigation Action Plan
Natural Hazards Ranking Sheet

City of Rockport

NOTE: This is not a technical exercise. Results will be compiled and included in the Risk Assessment Overview of the Plan. The hazard ranking is based on your experience as a community official or resident of the Aransas County area. Place a mark in the appropriate column and row indicating level of risk. Consider frequency of occurrence of each hazard as well as the potential impact when ranking the hazards.

Hazard	Not Applicable (N/A)	Low (L)	Moderate (M)	High (H)
Floods				H
Hurricane/Tropical Storm			M	
Wildfire				H
Tornado			M	
Drought				H
Coastal Erosion				H
Dam/Levee Failure		L		
Earthquakes		L		
Expansive Soils			M	
Extreme Heat				H
Hailstorm				H
Land Subsidence				H
Severe Winter Storm		L		
Windstorms			M	
Lightning			M	

Planning Team Participants, August 22, 2017

Participant	Community
Rick McLester	Aransas County
Diana Espinosa	Aransas County
Ryan Picarazzi	City of Rockport
Matt Olenick	City of Fulton
Katherine Comeaux	City of Aransas Pass
Janine Ellington	LAN

Appendix D: Critical Facilities

Aransas County Governmental Critical Facilities.

Critical Facility	Location	In SFHA?
Aransas County Courthouse & Jail	301 N. Live Oak, Rockport, TX 78382	No; 500-year floodplain
Aransas County Service Center (includes EOC)	1931 FM 2165, Rockport, TX 78382	No
Aransas County Sheriff's Office	714 E. Concho, Rockport, TX 78382	No; 500-year floodplain
Aransas County Tax Office	319 N. Church St, Rockport, TX 78382	No; 500-year floodplain
Aransas County Appraisal District	601 S. Church St, Rockport, TX 78382	No; 500-year floodplain
Aransas County Environmental Health	880 Airport, Rockport, TX 78382	No
Aransas County Airport	421 John D. Wendell, Rockport, TX 78382	No

Aransas County Independent School District Critical Facilities.

Critical Facility	Location	In SFHA?
Administrative Office	1700 Omohundro, Rockport, TX 78382	No
Little Bay Primary School	2000 Hwy 35 N., Rockport, TX 78382	No
Live Oak Learning Center	31 Griffith Dr., Rockport, TX 78382	No
Fulton Learning Center	314 N. 6th St, Fulton, TX 78358	No
Rockport-Fulton Middle School	1701 Colorado Ave, Rockport, TX 78382	No
Rockport-Fulton High School	1801 Omohundro, Rockport, TX 78382	No
Operations Office	619 N. Live Oak, Rockport, TX 78382	No
Transportation Office	1502 Sonny Watkins, Rockport, TX 78382	No

Other Critical Facilities in the County; but Not Affiliated with any Local Governmental Entities.

Critical Facility	Location	In SFHA?
TxDOT Rockport Office	1401 FM 3036, Rockport, TX 78382	No
U.S. Post Office – Rockport	1550 FM 2165, Rockport, TX 78382	No
U.S. Post Office – Fulton	301 Cactus, Fulton, TX 78358	No
U.S. Post Office – Aransas Pass	634 S. Commercial, Aransas Pass, TX 78336	No
Lamar Volunteer Fire Department Substation	302 Bois D' Arc, Rockport, TX 78382	No
AEP Service Center	2120 Hwy 35, Aransas Pass, TX 78336	No
AEP Power Substation – Aransas Pass	State Highway 35 Bus., Rockport, TX 78382	**Yes; 100-year Floodplain**
AEP Power Substation – Aransas Pass	510 S. Euclid, Aransas Pass, TX 78336	No
AEP Power Substation – Aransas Pass	2051 SH 188, Aransas Pass, TX 78336	No
AEP Power Substation – Rockport	1941 FM 2165, Aransas Pass, TX 78336	No
AEP Power Substation – Rockport	Eller Lane, Rockport, TX 78382	No
AEP Power Substation - Lamar	7561 Highway 35 N., Rockport, TX 78382	**Yes; 100-year Floodplain**
Care Regional Medical Center	1711 W. Wheeler, Aransas Pass, TX 78336	No
Allegiance Ambulance	400 Enterprise, Rockport, TX 78382	No
Coastal Care EMS	1121 W. Market St, Rockport, TX 78382	No
Rockport Harbor	911 Navigation Circle, Rockport, TX 78382	**Yes; 100-year Floodplain**
Cove Harbor	Cove Harbor Drive, Rockport, TX 78382	No; 500-year floodplain
Fulton Harbor	Fulton Beach Rd, Fulton, TX 78358	**Yes; 100-year Floodplain**
San Patricio County Navigation District Marina	426 East Ransom, Aransas Pass, TX 78336	**Yes; 100-year Floodplain**
Rockport Coastal Care Center	1004 Young Street, Rockport, TX 78382	No
Rockport Coastal Care Center	1004 Young Street, Rockport, TX 78382	No

Other Critical Facilities in the County; but Not Affiliated with any Local Governmental Entities. (cont.)

Critical Facility	Location	In SFHA?
Oak Crest Nursing Center	1902 FM 3036, Rockport, TX 78382	No
Gulf Pointe Plaza	1008 Enterprise Blvd, Rockport, TX 78382	No
Lexington Place Nursing Home	1661 W. Yoakum Ave, Aransas Pass, TX 78336	No

City of Aransas Pass Critical Facilities.

Critical Facility	Location	In SFHA?
City Hall/Fire Department/Police Department	600 W. Cleveland, Aransas Pass, TX 78336	No
Public Works Service Center	601 N. Avenue A, Aransas Pass, TX 78336	No
Wastewater Treatment Plant	1000 E. Ransom, Aransas Pass, TX 78336	No
Water Tower	1845 W Wheeler, Aransas Pass, TX 78336	No
Water Tower	1909 S Commercial, Aransas Pass, TX 78336	No
Water Tower	S Euclid & E Wilson, Aransas Pass, TX 78336	No
Conn Brown Harbor	Huff Street, Aransas Pass, TX 78336	**Yes; 100-year Floodplain**

Aransas Pass Independent School District Critical Facilities (none are in Aransas County).

Critical Facility	Location	In SFHA?
Administrative Office	2300 McMullen Lane, Aransas Pass, TX 78336	No
Faulk Early Childhood	430 S. 8th, Aransas Pass, TX 78336	No
Kieberger Elementary	748 W. Goodnight, Aransas Pass, TX 78336	No
Charlie Marshall Elementary	2300 McMullen Lane, Aransas Pass, TX 78336	No
AC Blunt Middle School	2103 Demory Ln, Aransas Pass, TX 78336	No
Aransas Pass High School	450 S Avenue A, Aransas Pass, TX 78336	No
Walter Noble Alternative School	701 W. Wheeler, Aransas Pass, TX 78336	No
Maintenance & Transportation Office	808 W. Yoakum, Aransas Pass, TX 78336	No

Town of Fulton Critical Facilities.

Critical Facility	Location	In SFHA?
City Hall/ Police Department/ Fire Dept.	209 N 7th, Fulton, TX 78358	No
City Operations Office/ 2nd Fire Station	301 N. 9th St, Fulton, TX 78358	No

City of Rockport Critical Facilities.

Critical Facility	Location	In SFHA?
City Hall	622 E. Market, Rockport, TX 78382	0.2% Annual Chance
Public Works Service Center	2751 S.H. 35 Bypass, Rockport, TX 78382	No
Wastewater Treatment Plant	1401 N. Pearl, Rockport, TX 78382	No
Information Technology/ Public Works Annex	402 E Laurel, Rockport, TX 78382	No
Rockport Volunteer Fire Department Substation	119 Freeze Lane, Rockport, TX 78382	0.2% Annual Chance
Rockport Volunteer Fire Department Substation	1608 West Terrace Blvd, Rockport, TX 78382	No
Rockport Volunteer Fire Department Substation	902 Henderson, Rockport, TX 78382	No
Rockport Volunteer Fire Department Central Station	212 Gagon, Rockport, TX 78382	No
Water Tower	2751 S.H. 35 Bypass, Rockport, TX 78382	No
Water Tower	901 Palmetto, Rockport, TX 78382	No
Water Tower	1303 S Kossuth, Rockport, TX 78382	No
Compressed Natural Gas Station	1995 Stadium Drive, Rockport, TX 78382	No

Appendix E: Wildfire Occurrences

Start Date	Area Burned (Acres)	Cause of Wildfire*
1/1/2006	1	Not specified
1/2/2006	1	Unsafe burning of household trash
1/2/2006	1	Unsafe burning of household trash
1/4/2006	1	Not specified
1/8/2006	1	Brush pile burning
1/18/2006	1	Unsafe burning of household trash
1/30/2006	100	Not specified
2/2/2006	2	Brush pile burning
2/7/2006	1	Not specified
2/11/2006	3	Not specified
2/27/2006	2	Brush pile burning
3/1/2006	1	Brush pile burning
3/1/2006	1	Welding equipment use (fence-building, equipment modification, etc.)
3/23/2006	25	Oil field equipment (pump jacks, faulty electric lines, etc.)
3/1/2007	1	Unsafe burning of household trash
3/22/2007	1	Warming or cooking
2/5/2008	100	Not specified
3/18/2008	1	Not specified
9/4/2008	40	Not specified
1/2/2009	1	Brush pile burning
1/21/2009	75	Bush hogs, lawn mowers, weed eaters, etc.
1/21/2009	100	Brush pile burning
1/22/2009	4	Not specified
2/4/2009	43.6	Brush pile burning
2/6/2009	40	Not specified
2/6/2009	160	Not specified
3/4/2009	100	Pasture and field burning (including grass, crop residues)
3/16/2009	1	Unsafe burning of household trash
3/26/2009	2	Brush pile burning
4/2/2009	1	Power Lines
4/2/2009	70	Power Lines
4/5/2009	30	Not specified
4/9/2009	5	Not specified
4/12/2009	1	Power Lines

Start Date	Area Burned (Acres)	Cause of Wildfire*
4/28/2009	1	Amusement
4/28/2009	30	Not specified
4/28/2009	50	Amusement
5/18/2009	5	Power Lines
5/23/2009	25	Origin traceable to lightning
5/24/2009	25	Origin traceable to lightning
6/3/2009	50	Vehicles (catalytic converters, faulty mufflers, dragging metal)
6/23/2009	20	Unsafe burning of household trash
7/4/2009	1	Not specified
7/4/2009	1	Not specified
7/4/2009	6	Not specified
7/5/2009	15	Not specified
7/8/2009	2	Unsafe burning of household trash
7/18/2009	10	Origin traceable to lightning
7/23/2009	5	Playing with matches
8/8/2009	5	Warming or cooking
8/28/2009	100	Not specified
10/1/2009	4000	Not specified
10/18/2009	1	Not specified
3/17/2010	1	Oil field equipment (pump jacks, faulty electric lines, etc.)
3/26/2010	1	Brush pile burning
4/2/2010	1	Warming or cooking
4/2/2010	1	Warming or cooking
5/3/2010	1	Brush pile burning
5/3/2010	1	Brush pile burning
5/19/2010	1	Brush pile burning
5/28/2010	1	Brush pile burning
4/21/2011	1	Not specified
4/22/2011	1	Not specified
4/22/2011	3	Not specified
4/23/2011	2.5	Unsafe burning of household trash
4/23/2011	3	Not specified
4/23/2011	25	Not specified
4/27/2011	1	Brush pile burning
4/27/2011	30	Not specified
4/27/2011	50	Not specified
4/27/2011	70	Origin traceable to smoking

Start Date	Area Burned (Acres)	Cause of Wildfire*
4/28/2011	12	Not specified
5/5/2011	1	Not specified
5/5/2011	1	Not specified
5/5/2011	2	Origin traceable to smoking
5/14/2011	1	Not specified
6/9/2011	1	Playing with matches
6/19/2011	1	Origin traceable to smoking
6/19/2011	1	Not specified
6/25/2011	1	Not specified
6/29/2011	1	Fireworks
7/14/2011	2	Origin traceable to smoking
7/19/2011	1	Not specified
8/18/2011	4	Unsafe burning of household trash
8/23/2011	1	Not specified
8/23/2011	1	Not specified
8/23/2011	1	Not specified
8/24/2011	1	Not specified
9/3/2011	1	Unsafe burning of household trash
9/5/2011	1	Not specified
9/5/2011	2	Not specified
9/5/2011	2	Not specified
9/5/2011	10	Not specified
9/6/2011	1	Not specified
9/6/2011	1	Not specified
9/6/2011	2	Not specified
9/6/2011	3	Not specified
9/6/2011	5	Not specified
9/7/2011	1	Not specified
9/28/2011	21.5	Not specified
10/3/2011	1	Not specified
1/2/2012	15	Not specified
2/20/2012	1	Burning leaves and garden spots
2/22/2012	2	Unsafe burning of household trash
3/7/2012	3	Brush pile burning
7/4/2012	1	Fireworks
7/4/2012	2.5	Fireworks
7/4/2012	2.5	Fireworks

Start Date	Area Burned (Acres)	Cause of Wildfire*
7/5/2012	1	Brush pile burning
9/13/2012	1	Origin traceable to lightning
10/19/2012	4	Not specified
10/25/2012	1	Brush pile burning
11/12/2012	2	Power Lines
11/20/2012	2	Origin traceable to lightning
1/20/2013	5	Playing with matches
6/9/2013	3	Origin traceable to lightning
7/6/2013	20	Brush pile burning
1/14/2014	1	Unsafe burning of household trash
1/14/2014	1	Unsafe burning of household trash
2/25/2014	1	Brush pile burning
2/25/2014	2	Not specified
3/12/2014	1.1	Unsafe burning of household trash
3/15/2014	2	Unsafe burning of household trash
4/19/2014	13	Brush pile burning
4/24/2014	2	Not specified
4/28/2014	15	Not specified
5/3/2014	10	Brush pile burning
5/3/2014	20	Unsafe burning of household trash
5/4/2014	1	Brush pile burning
5/4/2014	2	Not specified
5/4/2014	2	Not specified
5/5/2014	1	Not specified
5/5/2014	2	Not specified
5/5/2014	2	Not specified
6/10/2014	1	Power Lines
6/10/2014	2	Not specified
6/11/2014	1	Not specified
7/25/2014	5	Unsafe burning of household trash
7/25/2014	60	Burning leaves and garden spots
11/1/2014	4	Not specified
12/24/2014	10	Fireworks
3/7/2015	50	Not specified
4/7/2015	1	Amusement
10/1/2015	2	Not specified
11/18/2015	4	Brush pile burning

*Fire data is reported by fire departments. Wildfires of unknown origin may have initially been reported as "Unknown Cause" or "Miscellaneous." They have been recoded to "Not specified."

Appendix F: Adoption Resolution

Appendix G: Plan Maintenance Tools

Aransas County Multi-Jurisdictional

Hazard Mitigation Action Plan

Meetings and Public Involvement Activities

Date	Event	Comments

Plan Evaluation Checklist

Goal/Objective	Address Current Needs?	
	Yes	No
Goal 1: Minimize loss of life, in jury, damage to property, the economy, and natural systems		
• Objective 1.1: Protect the life, health and safety of residents		
• Objective 1.2: Protect existing/new critical facilities and infrastructure		
• Objective 1.3: Provide protection for future/existing developments		
• Objective 1.4: Provide backup power to critical facilities/infrastructure		
• Objective 1.5: Minimize impacts from all hazards		
Goal 2: Maintain and enhance emergency management/mitigation capabilities		
• Objective 2.1: Update/develop plans, studies, and mapping for all hazards		
• Objective 2.2: Incorporate/improve hazard mitigation strategies into ordinances, plans and policies		
• Objective 2.3: Conduct/develop drills/training for all hazards		
• Objective 2.4: Implement and maintain the Multi-Jurisdictional Hazard Mitigation Action Plan		
• Objective 2.5: Participate in programs that promote hazard mitigation strategies		
• Objective 2.6: Build, obtain, and maintain critical facilities and equipment		
Goal 3: Maintain public education and awareness activities		
• Objective 3.1: Expand public outreach campaigns for all hazards		
• Objective 3.2: Promote disaster preparedness planning for families		

Planning Considerations	Address Current Needs?	
	Yes	No
Has the nature or magnitude of the risks identified in the plan changed? If yes, comment below.		
Are the resources adequate for implementing the plan? If no, comment below		
Have there been any implementation problems such as technical, political, legal or coordination issues with other agencies for the mitigation actions identified? If yes, reference action by selecting "Delayed" on the Project Implementation worksheet with a comment describing issue in implementation		
Should personnel/agency changes be made to the Galveston County Multi-Jurisdiction Hazard Mitigation Committee? If yes, complete the mitigation planning team worksheet.		
Have there been changes to the participating communities' capabilities that improve or impair the progress of the mitigation strategies identified in the plan? If yes, please comment below.		

Mitigation Planning Team Worksheet

Use this worksheet to identify partner organizations to invite to participate on the planning team. Some organizations do not need to be involved in every decision of the planning process but are stakeholders that require outreach and involvement during the planning process. Revise the list of general partners below to reflect the organizations in your community. Mark which organizations will be invited to participate on the planning team and which will be involved through stakeholder outreach activities.

Planning Team – The core group responsible for making decisions, guiding the panning process, and agreeing upon the final contents of the plan.

Stakeholders – Individuals or groups that affect or can be affected by a mitigation action or policy.

Partner Organizations	Planning Team	Stakeholder	Notes
Local Agencies			
Building Code Enforcement			
City Management/County Administration			
Emergency Management			
Fire Department/District			
Floodplain Administration			
Geographic Information Systems			
Parks and Recreation			
Planning/Community Development			
Public Works			
Stormwater Management			
Transportation (Roads and Bridges)			
City Council/Board of Commissioners			
Planning Commission			
Planning/Community Development			
Regional/Metropolitan Planning Organization(s)			
City/County Attorney's Office			
Economic Development Agency			
Local Emergency Planning Committee			
Police/Sherriff's Department			
Sanitation Department			
Tax Assessor's Office			
Special Districts and Authorities			
Airport, Seaport Authorities			
Fire Control District			
Flood Control District			
School District(s)			
Transit Authority			
Utility District			

Partner Organizations	Planning Team	Stakeholder	Notes
Non-Governmental Organizations			
American Red Cross			
Chamber of Commerce			
Community/Faith-Based Organizations			
Environmental Organizations			
Homeowners Associations			
Neighborhood/Community Organizations			
Utility Companies			
State Agencies			
State Emergency Management Agency			
State Dam Safety			
State Department of Transportation			
State Fire and Forestry Agency			
State Geological Survey			
State Water Resources Agency			
State National Flood Insurance Program Coordinator			
State Planning Office			
Federal Agencies			
Federal Emergency Management Agency			
Land Management Agencies (USFS/NPS/BLM)			
National Weather Service			
US Army Corps of Engineers			
US Department of Housing and Urban Development			
US Department of Transportation			
US Environmental Protection Agency			
US Geological Survey			
Other			
Tribal Officials			
Colleges/Universities			
Land Developers and Real Estate Agencies			
Major Employers and Businesses			
Professional Associations			
Neighboring Jurisdictions			

Note: Multi-jurisdictional planning teams require at least one representative for each participating jurisdiction. This worksheet can be used by each jurisdiction to identify their local sub-team.

Mitigation Action Implementation Worksheet

Jurisdiction Name: **Date:**

Reference Mitigation Action Number	In Progress	Delayed*	No Longer Required	Completed	Completion Date	Comment

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