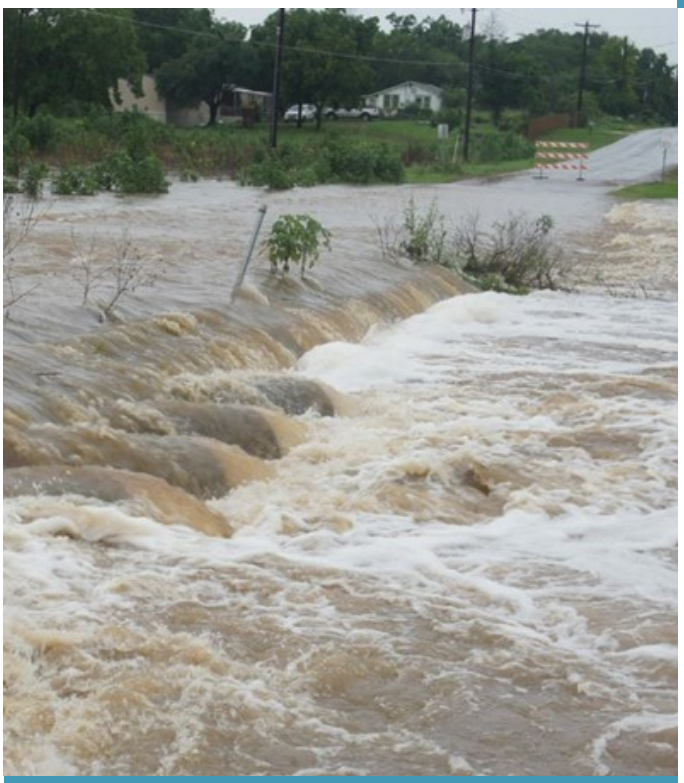

Chapter 7– Flood Response Information and Activities

31 TAC §361.42

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7 Flood Response Information and Activities

Texas Water Development Board (TWDB) guidance states that regional flood planning groups (RFPGs) are to summarize the nature and types of flood response preparations in the basin including recovery. It specifies, however, that RFPGs "shall not perform analyses or other activities related to planning for disaster response or recovery activities." The focus of this chapter is to present flood response information gathered through stakeholder outreach to flood-related authorities in the Nueces basin and provide general recommendations on flood response activities as a tool for others in the basin to use to develop flood response and recovery programs.

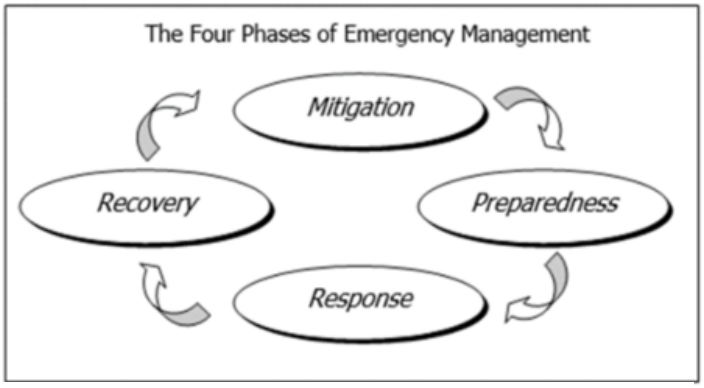
7.1 Types of Flooding in the Nueces Region

As discussed previously in Chapter 2 (Section 2.1.1.4), the three primary types of flooding in the Nueces Basin include riverine; pluvial, including urban flooding; and coastal flooding. In the 24,094-square-mile (15,420,000 acre) basin included in the Nueces Flood Planning Region (NFPR), the land surface elevation ranges from 2,400 feet mean sea level (msl) near Rocksprings in Edwards County to near sea-level (0 feet msl) in the coastal area near Corpus Christi. These elevation differences across the region and different soil types cause different types of flood risk. The NFPR was sub-divided into four subregions with this in mind, as shown in Figure 1-2. The upper basin is more prone to riverine flash floods; the upper and lower mid-basins are prone to riverine floods but are not flashy in nature like the upper basin; and the lower basin is more susceptible to coastal floods. Cities located in all subregions are prone to pluvial and urban flooding where inadequate local drainage is exceeded. This causes overtopping of drainage systems and flood flows to pool in the streets. Flash floods are caused by heavy rainfall over a relatively short period of time, resulting in flood water accumulating quickly that is powerful, extremely dangerous, and hampers mobility and emergency access for flood response. **Stormwater in the upper and lower mid-basin of the Nueces Region is typically conveyed through streets and engineered drainage features that were not effectively designed or maintained for effective flood control. Furthermore, many of these areas in the mid-basin have had inaccurate or no flood modeling or mapping to serve as a basis for flood mitigation. When such flood events occur, it is imperative that plans are in place to combat the effects of the flooding.**

7.2 The Nature and Types of Flood Response Preparations

There are four phases to emergency management:

- **Flood Mitigation:** The implementation of actions, including structural and non-structural solutions, to reduce flood risk to protect against the loss of life and property.
- **Flood Preparedness:** Actions, aside from mitigation, that are taken before flood events to prepare for flood response activities.
- **Flood Response:** Actions taken during and in the immediate aftermath of a flood event.
- **Flood Recovery:** Actions taken after a flood event involving repairs or other actions necessary to return to pre-event conditions.



Source: Federal Emergency Management Agency, 1998. IS-010 Emergency Management Institute: Animals in Disaster, Module A: Awareness and Preparedness

For example, when a severe rain event is projected to occur, steps are taken for **preparedness**: disaster preparedness plans are in place, drills and exercises are performed, an essential supply list is created, and potential vulnerabilities are assessed. During the **response** phase, disaster plans are implemented, search and rescue may occur, and low water crossing (LWC) barricades may be erected. In the **recovery** phase, evaluation of flood damage, rebuilding damaged structures, and removing debris occurs.

Mitigation is an important step of the four phases of emergency management. Hazard mitigation is defined as any sustained action taken to reduce or eliminate the continued risk to life and property from hazard events. It is an on-going process that seeks to break the cycle of damage and restoration in hazardous areas.

Flood mitigation is the primary focus of the regional flood planning process through the RFPG efforts to identify and recommend flood management evaluations (FMEs), flood management strategies (FMSs), and flood management projects (FMPs). The plan may also include FMEs, FMSs, and FMPs that focus on flood preparedness.

Examples of mitigation actions include regulatory requirements for reduction of flood risk, watershed planning, flood mapping updates, drainage infrastructure improvements,

property acquisition and relocation, or public outreach projects. Examples of preparedness actions include installing disaster warning systems, purchasing radio communications equipment, or conducting emergency response training.

7.3 Flood Response Activities for Local Entities in the Nueces Region

The Nueces Region's ability to prepare, respond, recover, and mitigate disaster events is determined by several factors. With a clear understanding of a community's capabilities, a recognition of the entities with whom coordination is key, and knowledge of the actions sustained to promote resiliency, the region can be better equipped to implement sound measures for flood mitigation and preparedness.

The purpose of flood risk management is to help prevent or reduce flood risk through either structural or non-structural means or a combination of the two. The responsibility for flood risk management is shared amongst federal, state, and local government agencies; private-sector stakeholders; and the general public.

The major responsibilities of the county governments in the 31 counties located within the NFPR include providing public safety, holding elections at every level of government, maintaining Texans' most important records; building and maintaining roads, bridges, and in some cases, county airports; providing emergency management services; providing health and safety services; collecting property taxes for the county and sometimes for other taxing entities; issuing vehicle registration and transfers; and registering voters.

Cities, or municipalities, generally take responsibility for parks and recreation services, police and fire departments, housing services, emergency medical services, municipal courts, transportation services (including public transportation), and public works (streets, sewers, signage, and so forth). There are 57 municipalities within the NFPR.

There are 50 "other" governmental entities within the NFPR that have various levels of flood management authority. These include associations that represent river authorities, water control improvement districts, drainage districts, member local governments, mainly cities and counties, that seek to provide cooperative planning, coordination, and technical assistance on issues of mutual concern that cross jurisdictional lines. River authorities or districts in Texas are public agencies established by the state legislature and given authority to develop and manage the waters of the state. The Nueces Region has five river authorities within its region that each have the power to conserve, store, control, preserve, use, and distribute the waters of a designated geographic region for the benefit of the public. A drainage district is a special purpose district created by the Texas Legislature and governed by County Commissioners Courts. It is a government

agency established to reduce the effects of flooding through improvement of drainage features. There are four drainage control districts in the NFPR.

These 138 total entities and/or political subdivisions in the NFPR described above and listed in Chapter 1 (Section 1.3.1) were considered during development of the 2023 Nueces Regional Flood Plan (NRFP). During plan development, it was determined that many of the “other” governmental entities do not actively engage in flood response activities, and instead support local county and municipalities in administering flood mitigation and response programs.

To examine the state of its flood preparedness, the Nueces Regional Flood Planning Group (NRFPG) obtained emergency management plans, hazard mitigation plans, and other regional and local flood planning studies from county and local jurisdictions. An emergency management plan is a course of action developed to mitigate the damage of potential events that could endanger an organization's ability to function. Such a plan should include measures that provide for the safety of personnel and, if possible, property and facilities.

Hazard mitigation planning reduces loss of life and property by minimizing the impact of disasters. It begins with state, regional, and local governments identifying natural disaster risks and vulnerabilities that are common in their area. After identifying these risks, they develop long-term strategies for protecting people and property from similar events. Mitigation plans are key to breaking the cycle of disaster damage and reconstruction. Having an up-to-date hazard mitigation action plan (HMAP) is key in assessing risk and in developing mitigation actions.

The NRFPG collected hazard mitigation plans, emergency management plans, and ordinances for local entities in the Nueces Region that covered 21 counties and 30 municipalities in the Nueces Basin, as shown in Table 7-1.

Table 7-1. Summary of Nueces Basin entities with flood hazard mitigation plans, flood management plans, and ordinances

Entity Name	Type of Entity	Level of Engagement (none, low, medium, high)	Ordinance Adopted	Ordinance date	Flood hazard, mitigation action, or emergency management plan	Flood hazard, mitigation action or emergency management plan	Floodplain management plan	Floodplain management plan date
Aransas County	County	Medium	X	2019	X	2017	X	2017
Atascosa County	County	--	X	2013	X	2020	--	--
Bandera County	County	Medium	X	2020	X	2014	--	--
Bee County	County	--	X	2010	X	2012	--	--
Bexar County	County	Medium	X	2007	X	2014	--	--
Duval County	County	Low	--	--	X	2020	--	--
Frio County	County	Low	X	2016	X	2018	--	--
Jim Wells County	County	--	--	--	X	2012	--	--
Karnes County	County	Medium	X	2010	--	--	--	--
Kerr County	County	Medium	X	2020	--	--	--	--
Kleberg County	County	--	--	--	X	2012	--	--
La Salle County	County	--	X	2008	--	--	--	--
Live Oak County	County	--	--	--	X	2012	--	--
Mcmullen County	County	--	X	2013	X	2020	--	--
Medina County	County	High	X	--	--	--	--	--
Nueces County	County	High	X	--	X	2017	--	--
Real County	County	Medium	X	--	--	--	--	--
Refugio County	County	Low	X	2014	X	2021	--	--
San Patricio County	County	High	X	2019	X	2012	--	--
Webb County	County	High	X	2019	X	--	--	--
Wilson County	County	Medium	X	2010	--	--	--	--
Agua Dulce	Municipality	--	--	--	X	2017	--	--
Alice	Municipality	--	X	2017	--	--	--	--
Aransas Pass	Municipality	--	X	--	X	2017	X	2017
Beeville	Municipality	Low	--	--	X	--	--	--
Bishop	Municipality	Medium	X	2001	X	2017	--	--
Charlotte	Municipality	--	X	2009	X	2020	--	--
Christine	Municipality	--	X	--	X	2020	--	--
Corpus Christi	Municipality	High	X	--	X	2017	--	--
Cotulla	Municipality	Low	X	--	--	--	--	--
Driscoll	Municipality	--	--	--	X	2017	--	--
Fulton	Municipality	--	X	--	X	2017	X	2017

Entity Name	Type of Entity	Level of Engagement (none, low, medium, high)	Ordinance Adopted	Ordinance date	Flood hazard, mitigation action, or emergency management plan	Flood hazard, mitigation action or emergency management plan	Floodplain management plan	Floodplain management plan date
Gregory	Municipality	High	X	2019	X	2018	--	--
Hondo	Municipality	Medium	X	--	--	--	--	--
Ingleside	Municipality	High	X	--	X	2018	--	--
Ingleside on the Bay	Municipality	Medium	X	--	X	2018	--	--
Jourdanton	Municipality	--	X	--	X	2020	--	--
Lytle	Municipality	--	X	--	X	2020	--	--
Mathis	Municipality	--	--	--	X	2018	--	--
Odem	Municipality	--	--	--	X	2018	--	--
Pearsall	Municipality	--	X	--	X	--	--	--
Petronila	Municipality	--	--	--	X	2017	--	--
Pleasanton	Municipality	--	X	--	X	2020	--	--
Port Aransas	Municipality	High	X	--	X	2017	--	--
Portland	Municipality	High	X	--	X	2018	--	--
Poteet	Municipality	--	--	--	X	2020	--	--
Robstown	Municipality	--	X	--	X	2017	--	--
Rockport	Municipality	--	X	2015	X	2017	X	2017
San Patricio	Municipality	--	--	--	X	2018	--	--
Sinton	Municipality	Medium	--	--	X	2018	--	--
Taft	Municipality	--	--	--	X	2018	--	--

7.4 Flood Preparedness Measures in the Nueces Flood Planning Region

Flood preparedness is the first line of action that an entity can take prior to the occurrence of a flood events to prepare for flood response. In the NFPR, flood preparedness measures were identified for 23 counties and 41 cities based on information gathered from local stakeholders with flood-related authority, internet queries, and previous local and regional flood plans. Table 7-2 lists the names of entities and their flood preparedness measures.

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Table 7-2. Flood Preparedness Measures for Entities in the Nueces Flood Planning Region

Entity Name	Type of Entity	*Flood Preparedness Measures*																		
		Develop management plan with regular updates	Public Information Plan/Officer	Prepare staging areas	Build flood early warning systems	Protect buildings against flood damage at initial construction	Master plan of all flood-related projects	Land use practices and policies to reduce future flooding	Have Floodplain Administrator	Have Emergency Management Coordinator	Develop evacuation plan	Storm/Stormwater management plan	Consider higher standards list	Subdivision regulations	Floodplain regulations	National Flood Insurance Program (NFIP) minimum requirements	Local Floodplain ordinance with higher standards (greater than NFIP)	Drainage Master Plan	Developed Flood Plan	Erosion Response Plan	Emergency Operations Plan
Aransas County	County	X	X	--	--	X	X	X	X	X	--	X	X	X	X	X	X	X	X	--	X
Atascosa County	County	--	--	--	--	--	--	--	X	X	--	--	X	X	--	--	--	--	--	--	X
Bandera County	County	--	--	--	X	--	--	--	X	--	--	--	--	X	X	X	--	--	X	--	--
Bee County	County	--	--	--	--	X	--	--	X	X	--	--	--	X	--	--	--	--	--	--	--
Bexar County	County	X	X	--	--	--	--	--	X	--	--	--	--	X	X	--	X	--	--	--	--
Duval County	County	--	--	--	--	--	--	--	X	--	--	--	--	--	--	--	--	--	--	--	X
Frio County	County	--	--	--	--	--	--	--	X	--	--	--	--	X	X	X	--	--	--	--	X
Jim Wells County	County	--	--	--	--	--	--	--	--	X	--	--	--	X	--	--	--	--	--	--	--
Karnes County	County	--	--	--	--	X	--	--	X	X	--	--	--	X	X	--	X	--	--	--	X
Kerr County	County	--	--	--	--	X	--	--	X	--	--	--	X	X	X	X	--	--	--	--	--
Kleberg County	County	--	--	--	--	--	--	--	--	X	--	X	--	--	--	--	--	--	--	--	--
La Salle County	County	--	--	--	--	X	--	--	X	--	--	--	--	X	--	--	--	--	--	--	--
Live Oak County	County	--	--	--	--	--	--	--	--	X	--	--	--	--	--	--	--	--	--	--	--
McMullen County	County	--	X	--	--	--	--	--	X	X	--	X	--	X	--	--	--	--	--	--	--
Medina County	County	--	--	--	--	X	--	--	X	--	--	--	X	X	X	X	X	--	--	--	--
Nueces County	County	--	--	--	--	--	--	X	X	X	--	X	--	--	--	--	--	X	X	X	X
Real County	County	--	--	--	X	--	--	--	X	--	--	--	--	X	X	X	--	--	--	--	--
Refugio County	County	--	--	--	--	X	--	--	X	X	--	--	--	X	X	--	--	--	--	--	X
San Patricio County	County	X	--	--	--	X	--	--	X	X	--	--	--	X	X	--	X	--	X	--	--
Uvalde County	County	--	--	--	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Webb County	County	--	--	--	--	X	--	--	X	--	--	--	--	X	X	--	X	--	--	--	--
Wilson County	County	--	--	--	--	--	--	--	X	X	--	--	--	X	X	--	X	--	--	--	X
Zavala County	County	--	--	--	--	--	--	--	--	--	--	--	--	X	X	--	X	--	--	--	--
Agua Dulce	Municipality	--	--	--	--	--	--	X	--	X	--	--	--	--	--	--	--	--	--	--	X
Alice	Municipality	--	--	--	--	--	--	--	X	X	--	--	X	--	--	--	--	--	--	--	--
Aransas Pass	Municipality	X	X	--	--	--	--	--	X	X	--	X	--	X	X	--	--	--	X	--	X
Bayside	Municipality	X	--	--	--	X	--	--	X	X	--	--	--	X	X	--	--	--	--	--	X

Entity Name	Type of Entity	Flood Preparedness Measures																		
		Develop management plan with regular updates	Public Information Plan/Officer	Prepare staging areas	Build flood early warning systems	Protect buildings against flood damage at initial construction	Master plan of all flood-related projects	Land use practices and policies to reduce future flooding	Have Floodplain Administrator	Have Emergency Management Coordinator	Develop evacuation plan	Storm/Stormwater management plan	Consider higher standards list	Subdivision regulations	Floodplain regulations	National Flood Insurance Program (NFIP) minimum requirements	Local Floodplain ordinance with higher standards (greater than NFIP)	Drainage Master Plan	Developed Flood Plan	Erosion Response Plan	Emergency Operations Plan
Beeville	Municipality	--	--	--	--	--	--	X	--	--	--	--	--	--	--	X	--	--	--	--	--
Benavides	Municipality	--	--	--	--	--	--	--	X	--	--	--	--	--	--	--	--	--	--	--	X
Bishop	Municipality	--	--	--	--	X	--	X	X	X	--	X	--	X	X	X	--	--	X	--	X
Charlotte	Municipality	--	--	--	--	--	--	--	X	--	--	--	X	--	--	--	--	--	--	--	--
Christine	Municipality	--	--	--	--	--	--	--	X	--	--	--	--	--	--	--	--	--	--	--	--
Corpus Christi	Municipality	--	--	--	--	--	--	X	X	X	--	X	--	X	X	--	X	--	--	X	X
Cotulla	Municipality	--	--	--	--	--	--	--	X	--	--	--	--	X	X	X	--	--	--	--	--
Driscoll	Municipality	--	--	--	--	--	--	--	X	--	--	--	--	--	--	--	--	--	--	--	--
Freer	Municipality	--	--	--	--	--	--	--	X	--	--	--	--	--	--	--	--	--	--	--	X
Fulton	Municipality	--	--	--	--	--	--	--	X	X	--	--	--	X	X	--	--	--	X	--	X
Gregory	Municipality	--	--	--	--	X	--	--	X	X	--	--	--	X	X	X	X	--	--	--	--
Hondo	Municipality	--	--	--	--	--	--	--	X	--	--	--	--	X	X	X	--	--	--	--	--
Ingleside	Municipality	--	--	--	--	--	--	--	X	X	--	--	X	X	X	--	X	--	--	--	--
Ingleside on the Bay	Municipality	--	--	--	--	--	--	--	X	X	--	--	--	--	--	X	--	--	--	--	--
Jourdanton	Municipality	--	X	--	--	--	--	--	X	X	--	--	--	X	--	--	--	--	--	--	--
Kingsville	Municipality	--	--	--	--	--	--	--	X	X	--	--	X	--	--	--	--	--	--	--	--
Lake City	Municipality	--	--	--	--	--	--	--	--	X	--	--	--	--	--	--	--	--	--	--	--
Lakeside	Municipality	--	--	--	--	--	--	--	--	X	--	--	--	--	--	--	--	--	--	--	--
Leakey	Municipality	--	--	--	--	--	--	--	--	--	--	--	--	X	X	X	--	--	--	--	--
Lytle	Municipality	--	--	--	--	--	--	--	X	X	--	--	--	X	--	--	--	--	--	--	--
Mathis	Municipality	--	--	--	--	--	--	--	--	X	--	--	--	--	--	--	--	--	--	--	--
Odem	Municipality	--	--	--	--	--	--	--	--	X	--	--	--	--	--	--	--	--	--	--	--
Petronila	Municipality	--	--	--	--	--	--	--	--	X	--	--	--	--	--	--	--	--	--	--	X
Pleasanton	Municipality	--	X	--	--	--	--	--	X	X	--	--	--	X	--	--	--	--	--	--	X
Port Aransas	Municipality	--	--	--	--	--	--	--	X	X	--	--	--	X	X	X	X	--	--	--	--
Portland	Municipality	--	--	--	--	--	--	--	X	X	--	--	--	X	X	--	X	--	--	--	--
Poteet	Municipality	--	--	--	--	--	--	--	--	X	--	--	--	X	--	--	--	--	--	--	--
Refugio	Municipality	X	--	--	--	X	--	--	X	X	--	--	--	X	X	--	--	--	--	--	X
Robstown	Municipality	--	--	--	--	--	--	X	X	X	--	--	--	--	--	--	--	--	--	--	X

Entity Name	Type of Entity	*Flood Preparedness Measures*																		
		Develop management plan with regular updates	Public Information Plan/Officer	Prepare staging areas	Build flood early warning systems	Protect buildings against flood damage at initial construction	Master plan of all flood-related projects	Land use practices and policies to reduce future flooding	Have Floodplain Administrator	Have Emergency Management Coordinator	Develop evacuation plan	Storm/Stormwater management plan	Consider higher standards list	Subdivision regulations	Floodplain regulations	National Flood Insurance Program (NFIP) minimum requirements	Local Floodplain ordinance with higher standards (greater than NFIP)	Drainage Master Plan	Developed Flood Plan	Erosion Response Plan	Emergency Operations Plan
Rockport	Municipality	X	X	--	--	X	X	X	X	X	--	X	X	X	X	X	X	X	X	--	X
Rocksprings	Municipality	X	X	--	--	--	--	--	--	--	--	X	--	--	--	--	--	--	--	--	--
San Diego	Municipality	--	--	--	--	--	--	--	X	--	--	--	--	--	--	--	--	--	--	--	X
San Patricio	Municipality	--	--	--	--	--	--	--	--	X	--	--	--	--	--	--	--	--	--	--	--
Sinton	Municipality	--	--	--	--	--	--	--	--	X	--	--	--	X	X	X	--	--	--	--	--
Taft	Municipality	--	--	--	--	--	--	--	--	X	--	--	--	--	--	--	--	--	--	--	--
Uvalde	Municipality	--	--	--	--	--	--	--	X	--	--	--	--	X	X	--	X	--	--	--	--
Woodsboro	Municipality	X	--	--	--	X	--	--	X	X	--	--	--	X	X	--	--	--	--	--	X

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7.5 Flood Response and Recovery Measures in the Nueces Flood Planning Region

Flood response actions are actions taken during and in the immediate aftermath of a flood event. Flood recovery involves repair or other actions after a flood event to restore to pre-flood conditions. Table 7-3 lists the names of entities and their flood response and recovery measures.

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Table 7-3. Flood Response and Recovery Measures for Entities in the Nueces Region

Entity Name	Type of Entity	*Flood Response and Recovery Measures*														
		High Water Marks	Contact Residents	Conducts evacuations (with Safety Precautions for Flood Responders)	Provides shelters during flood response	Closes flooded roads	Operates flood warning systems	Assess road and property damage	List and schedule repairs and replacements	Fire or police department responds	Pump out flooded areas	Emergency Operations Center (EOC) is activated	EOC to deploy necessary supplies	Field operation plan during flood event	Stream gage monitoring	Use Traffic Control Plan
Aransas County	County	X	X	--	--	--	X	X	--	--	--	--	X	--	--	--
Atascosa County	County	--	--	--	--	--		X	--	X	--	--	--	--	--	--
Bandera County	County	--	--	X	--	--	X	--	--	--	--	--	--	X	X	X
Frio County	County	--	--	--	--	--	--	--	--	X	--	--	--	--	--	--
Nueces County	County	--	--	--	--	--	X	X	X	--	--	--	--	--	--	--
Uvalde County	County	--	--	--	--	--	--	--	--	--	--	--	--	--	X	--
Agua Dulce	Municipality	--	--	--	--	--	X	--	--	--	--	--	--	--	--	--
Aransas Pass	Municipality	--	--	--	--	X	X	X	--	--	X	X	--	--	--	--
Beeville	Municipality	--	--	--	--	--	--	--	--	X	--	X	--	--	--	--
Bishop	Municipality	--	--	--	--	--	X	--	--	--	--	--	--	--	--	--
Corpus Christi	Municipality	--	--	--	--	X	X	X	X	--	X	X	--	--	--	--
Fulton	Municipality	--	--	--	--	--	X	--	--	--	--	--	--	--	--	--
Ingleside	Municipality	--	--	--	--	X	--	X	--	X	X	--	--	--	--	--
Pearsall	Municipality	--	--	--	--	--	--	--	--	X	--	--	--	--	--	--

Entity Name	Type of Entity	*Flood Response and Recovery Measures*														
		High Water Marks	Contact Residents	Conducts evacuations (with Safety Precautions for Flood Responders)	Provides shelters during flood response	Closes flooded roads	Operates flood warning systems	Assess road and property damage	List and schedule repairs and replacements	Fire or police department responds	Pump out flooded areas	Emergency Operations Center (EOC) is activated	EOC to deploy necessary supplies	Field operation plan during flood event	Stream gage monitoring	Use Traffic Control Plan
Petronila	Municipality	--	--	--	--	--	X	--	--	--	--	--	--	--	--	--
Robstown	Municipality	--	--	X	--	--	X	--	--	--	--	--	--	--	--	--
Rockport	Municipality	--	--	--	--	X	X	X	X	X	X	--	--	--	--	--

7.6 State Agencies that Provide Flood Response Support

State agencies play an important role in flood response and can help provide support and resources for flood preparation activities.

The state hazard mitigation plan is an effective instrument to reduce losses by reducing the impact of disasters upon people and property. Although mitigation efforts cannot eliminate impacts of disastrous events, the plan endeavors to reduce the impacts of hazardous events to the greatest extent possible. The plan evaluates, profiles, and ranks natural and human-caused hazards affecting Texas as determined by frequency of event, economic impact, deaths, and injuries. The plan

- assesses hazard risk,
- reviews current state and local hazard mitigation and climate adaption capabilities, and
- develops strategies and identifies state agency (and other entities) potential actions to address needs.

Table 7-4 summarizes various state contributing entities and partners with a description of their role related to flood response. Specific activities related to the NFPG (Region 13) are also noted.

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Table 7-4. State Agency Roles in Flood Response Activities

Agency	State or Federal	Role	Region 13 specific notes	Actions within Region 13
Texas General Land Office (GLO)	State	Restoring critical infrastructure and mitigating future damage through resilient community planning. More than $14 billion have been allocated for recovery and mitigation.	GLO Region 3 serves Aransas, Kenedy, Kleberg, Nueces, Refugio, and San Patricio Counties	Fulton Beach Road Projection (Aransas), Shell Point Ranch Wetlands Protection (Aransas), Lamar Beach Road Protection (Aransas), Flour Bluff Living Shoreline (Aransas), Newcomb's Point Shoreline Stabilization (Aransas), Little Bay Restoration Initiative (Aransas), Baffin Bay Watershed Monitoring and Management Plan (Kenedy, Kleberg), Tern Island and Triangle Tree Island Rookery Habitat Protection (Kleberg), Coastal Ben Gulf Barrier Island Conservation (Kleberg), Aransas National Wildlife Refuge Dagger Point Shoreline Preservation (Nueces), Portland Living Shoreline (Nueces), Nueces River Delta Shoreline Stabilization (Nueces, San Patricio), Guadalupe Delta Estuary Restoration (Refugio), Guadalupe River and Delta Wildlife Management Area Acquisition (Refugio), Indian Point Marsh Area Living Shoreline (San Patricio), Corus Christi Bay Wastewater, Stormwater Quality and Pollution Management Improvements (San Patricio)

Agency	State or Federal	Role	Region 13 specific notes	Actions within Region 13
Texas Water Development Board (TWDB)	State	Designated as the State National Flood Insurance Program (NFIP) Coordinating Agency for Texas. TWDB administers the state and regional flood planning process with the flood planning regions.	Not applicable	Not applicable
Texas Park and Wildlife Department (TPWD)	State	Texas Parks and Wildlife Game Wardens are often first on the scene to assist local law enforcement to search for and rescue victims of disasters - especially flood victims.	Not applicable	Not applicable
Texas Division of Emergency Management (TDEM)	State	Ensure the state and its local governments respond to and recover from emergencies and disasters and implement plans and programs to help prevent or lessen the impact of emergencies and disasters	Region 3 serves Aransas, Bee, Brooks, Dimmit, Duval, Edwards, Jim Hogg, Jim wells, Kenedy, Kinney, Kleberg, LaSalle, Live Oak, Maverick, Nueces Real, Refugio, San Patricio, Uvalde, Webb, and Zavala. Region 6 serves Atascosa, Bandera, Bexar, Frio, Goliad, Karnes, Kerr, McMullen, Medina, Wilson	Not applicable

Agency	State or Federal	Role	Region 13 specific notes	Actions within Region 13
Texas State Soil and Water Conservation Board (TSSWCB)	State	Works to ensure that the State's network of over 2,000 flood control dams are protecting lives and property by providing operation, maintenance, and structural repair grants to local government sponsors.	Flood control dams within Region 13 counties are eligible	Not applicable
Texas Department of Transportation (TxDOT)	State	TxDOT has been working with state and federal emergency planners to refine the evacuation process for emergencies such as hurricanes and flash floods	Evacuation routes have been refined for Corpus Christi, including Aransas Pass and Port Aransas	Evacuation routes include counties in Region 13
Texas Engineering Extension Service (TEEX)	State	Established to enhance the capabilities of emergency responders and local officials to prepare for, respond to, and recover from catastrophic events resulting from natural events, etc. TEEX is the sponsoring agency for Texas Task Force 1, which includes one of the country's most extensive water rescue program.	Not applicable	Not applicable

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Dams and levees are owned and operated by individuals, private and public organizations, and the government. The responsibility for maintaining a safe dam resides with the owner. A dam failure resulting in an uncontrolled release of the reservoir can have a devastating effect on persons and property downstream. It is critical that dam owners are part of the flood planning process to ensure collaborative and cohesive flood planning.

There are 506 dams in the NFPR, and 116 of these dams are regulated by the Texas Commission on Environmental Quality (TCEQ's) Dam Safety Program. As part of the Dam Safety Program, owners of significant and high hazard dams are required to submit an Emergency Action Plan (EAP) to the TCEQ. Dam EAPs document responsibilities during flood response and identify the flood inundation area. Of the 116 TCEQ regulated dams, 28 have an EAP on file with TCEQ.

The NFPR also includes 23 flood control dams constructed and operated by the Natural Resources Conservation Service (NRCS). The NRCS dams are in Duval, Jim Wells, Uvalde, Atascosa, and Live Oak Counties. A preliminary evaluation was performed to categorize dam hazard using the following classification:

- High Hazard- There are structures in the downstream floodplain. A high hazard classification indicates that if the dam were to fail, there would be large consequences (such as loss of life), not that the dam is in a condition that is more likely to fail.
- Significant Hazard- There are no structures in the downstream floodplain, but there are up to two structures near the downstream floodplain.
- Low Hazard- There are no structures in or near the downstream floodplain.

Table 7-5 summarizes the NRCS flood control dams in the NFPR.

Table 7-5 NRCS Dams in the Nueces Basin - 2021

Hazard Potential	No of State Regulated Dams
High Hazard Potential	15
Significant Hazard Potential	2
Low Hazard Potential	4
Unknown*	2

*Dams not analyzed due to lack of readily available information. At this time, only 21 out of 23 NRCS regulated dams were evaluated.

7.7 Federal Agencies Flood Response Support

There are several federal agencies that provide support and resources for flood preparation activities.

The **Federal Emergency Management Agency (FEMA)** is an agency of the U.S. Department of Homeland Security (DHS). While on-the-ground support of disaster recovery efforts is a major part of FEMA's charter, the agency provides state and local governments with experts in specialized fields and funding for rebuilding efforts and relief funds for infrastructure by directing individuals to access low-interest loans, in conjunction with the Small Business Administration. FEMA also provides funds for training of response personnel throughout the United States and its territories as part of the agency's preparedness effort.

The **National Weather Service (NWS)** mission is to provide weather, water and climate data, forecasts, warnings, and impact-based decision support services for the protection of life and property and enhancement of the national economy. NWS provides flash flood indicators through watches, warnings, and emergency notices.

- Flash Flood WATCH is issued when conditions look favorable for flash flooding. A watch usually encompasses several counties. This is the time the public should start thinking about their plan of action and where they would go if water begins to rise.

- Flash Flood WARNING is issued when dangerous flash flooding is happening or will happen soon. A warning is usually a smaller, more specific area. This can be issued due to excessive heavy rain or a dam/levee failure. This is when the public must act quickly as flash floods are an imminent threat to them and their family. They may only have seconds to move to higher ground.

- Flash Flood EMERGENCY is issued for the exceedingly rare situations when extremely heavy rain is leading to a severe threat to human life and catastrophic damage from a flash flood is happening or will happen soon. Typically, emergency officials are reporting life threatening water rises resulting in water rescues/evacuations.

The NWS has developed a simplified, quick loading radar website called Local Standard Radar https://www.weather.gov/radar_lite to help emergency managers with flood preparations and notifications to residents.

The United States Geological Survey (USGS) obtains and monitors rainfall, water surface stage, and peak river flows; measures high water marks; and maintains stream gage stations that are vital in capturing flood data for future flood preparedness and flood mitigation programs. Using rainfall totals, intensity, and river stage response, the

USGS is able to estimate flow travel times for early flood warning. The USGS provided partnership cooperative funding with the Bandera County River Authority Groundwater District (BCRAGD) and TWDB to construct the Bandera County Texas Flood Early Warning System for Medina and Sabinal Rivers. This program aides in protection of human life, livestock, reduction of property damage, and overall public safety.

The **National Oceanic and Atmospheric Administration (NOAA)** is a scientific and regulatory agency within the U.S. Department of Commerce that forecasts weather, monitors oceanic and atmospheric conditions, charts the seas, conducts deep sea exploration, and manages fishing and protection of marine mammals and endangered species in the U.S. exclusive economic zone. NOAA provides historical data that can help communities determine their future probability of flood events and is key in the planning and mitigation process.

The **U.S. Corps of Engineers (USACE)** is responsible for a wide range of efforts in the United States, including addressing safety issues related to waterways, dams, and canals but also environmental protection, emergency relief, hydroelectric power, and much more. USACE composed of several districts and the NFPR includes both the Fort Worth District and Galveston District. The USACE Flood Risk Management Program (FRMP) works across the agency to focus the policies, programs and expertise of USACE toward reducing overall flood risk. This includes the appropriate use and resiliency of structures such as levees and floodwalls, as well as promoting alternatives when other approaches (e.g., land acquisition, flood proofing, etc.) reduce the risk of loss of life, reduce long-term economic damages to the public and private sector, and improve the natural environment. USACE is currently conducting flood and drainage studies within the NFPR, which are described in greater detail in Chapter 2.

Daily river forecasts are issued by **River Forecast Centers (RFCs)** using hydrologic models based on rainfall, soil characteristics, precipitation forecasts, and several other variables. Some RFCs also provide peak flow forecasts. A wide variety of users rely on these forecasts, including those in agriculture, hydroelectric dam operation, and water supply resources. The forecasts can provide essential information on the river levels and conditions.

7.8 Emergency Information

There are various means by which data can be collected and disseminated in a flood event. These include gauges to measure the current flood risk and communication systems to alert the public.

Two types of gauges used are rain gauges and stream gauges. A rain gauge is a meteorological instrument that measures precipitation in a given amount of time per unit area. It collects water falling on it and records the change over time in the rainfall depth.

Stream gauging is a technique used to measure the discharge, or the volume of water moving through a channel per unit time, of a stream. The height of water in the stream channel, known as a stage or gauge height, can be used to determine the discharge in a stream. Within the NFPG, there are 50 U.S. Geological Survey (USGS) stream gages.

In addition to the NWS, local news stations or radio stations are vital components in relaying real time information to local residents of inclement weather and flooding. They can also alert residents to low water crossing closings, dam or levee breaches, and other potential dangers. They can also issue flood watches, warnings, and emergency notifications.

An Emergency Alert System (EAS) is software that provides alert messages during an emergency. Messages can interrupt radio and television to broadcast emergency alert information. Messages cover a large geographic footprint. Emergency message audio/text may be repeated twice, but EAS activation interrupts programming only once, then regular programming continues.

A reverse 911 system allows an agency to pull up a map on a computer, define an area and send off a recorded phone message to each business or residence in that area. It can provide data to residents of flood dangers in their area.

School emergency alert systems are tools that allows schools to communicate quickly to staff, students, first responders, and others so that they can take appropriate action in the event of an emergency. Various versions of this tool are used in schools through the region from daycares to K-12 grade, as well as universities.