

# Texas Water Development Board Flood Planning Presentation Regional Flood Planning Group 2<sup>nd</sup> Meeting

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- Flooding 101 (20 minutes)

# Flooding 101

# Flooding 101: Watersheds

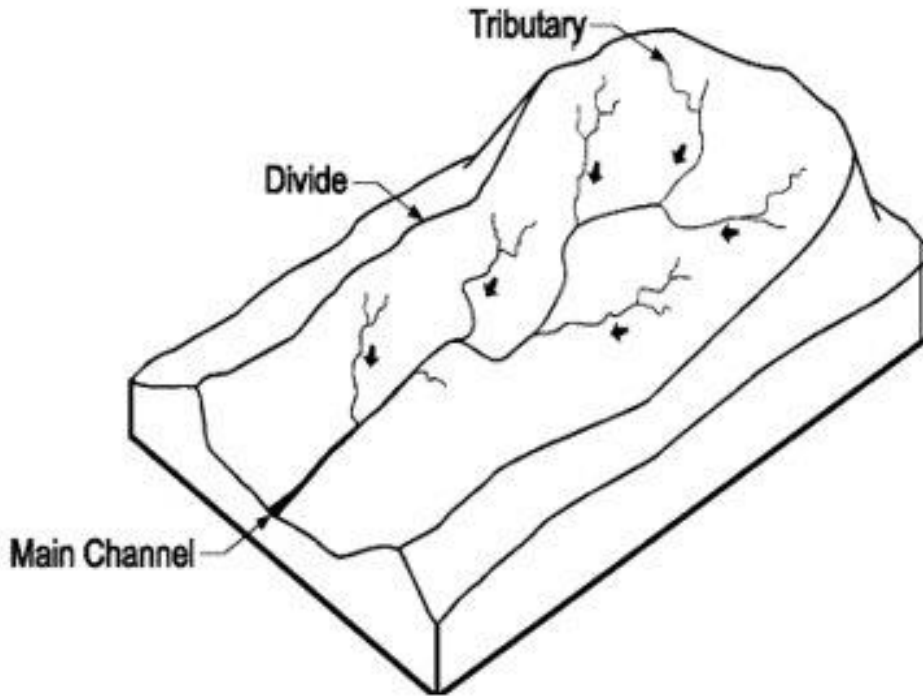
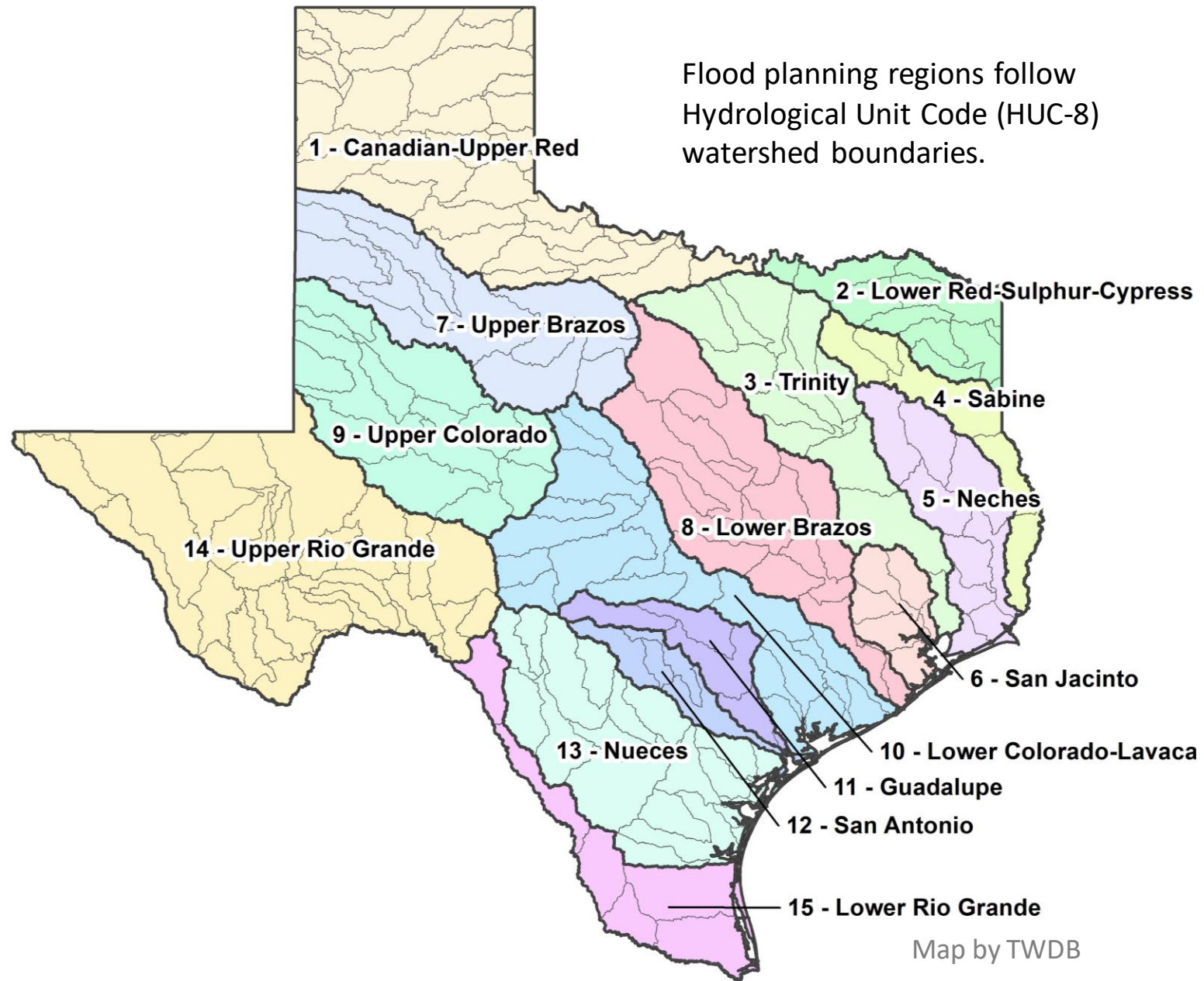


Figure 1-2. Riverine Watershed and Floodplain

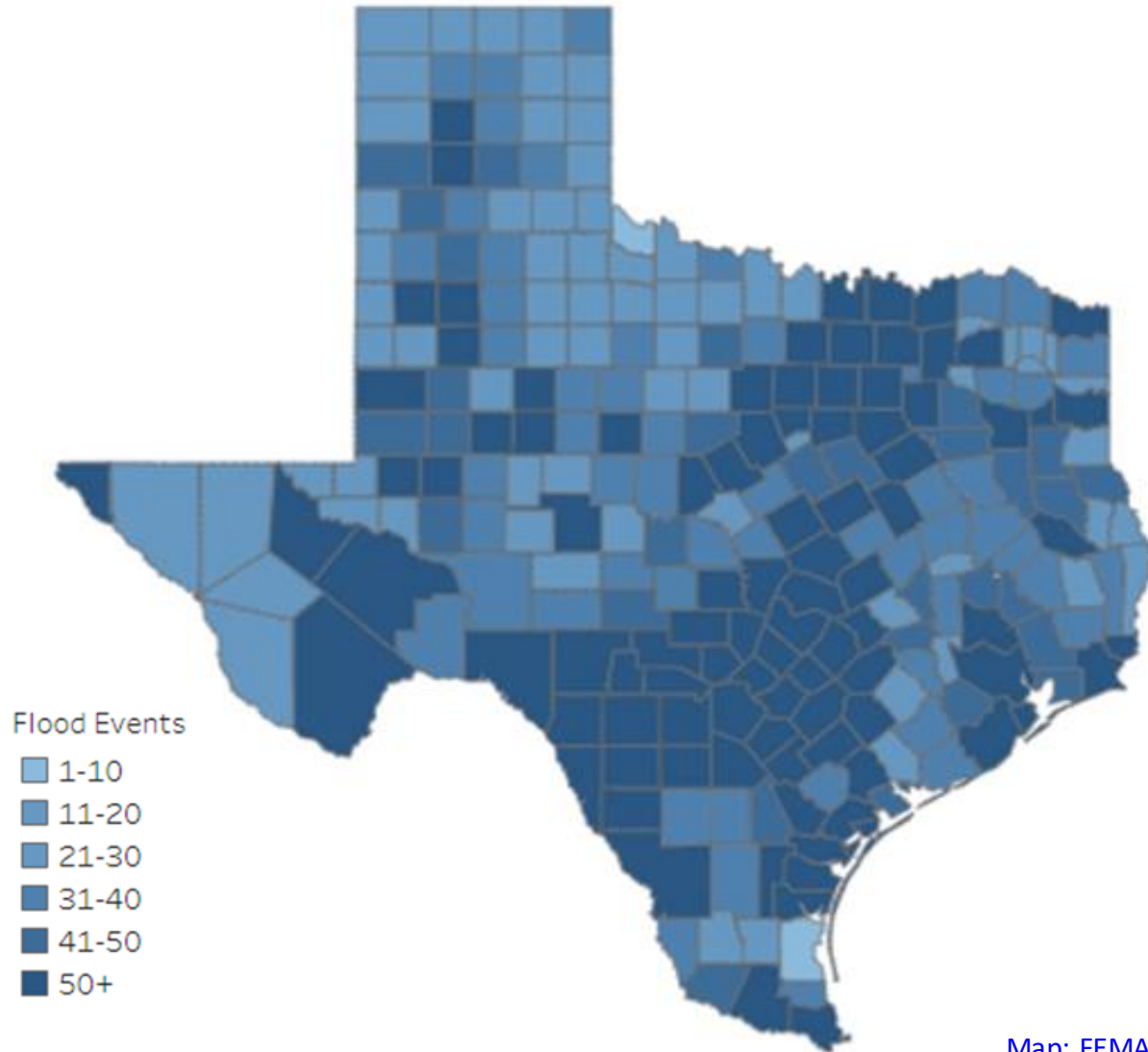
Image by FEMA



Flood planning regions follow Hydrological Unit Code (HUC-8) watershed boundaries.

Map by TWDB

# Flooding 101: Flooding in Texas

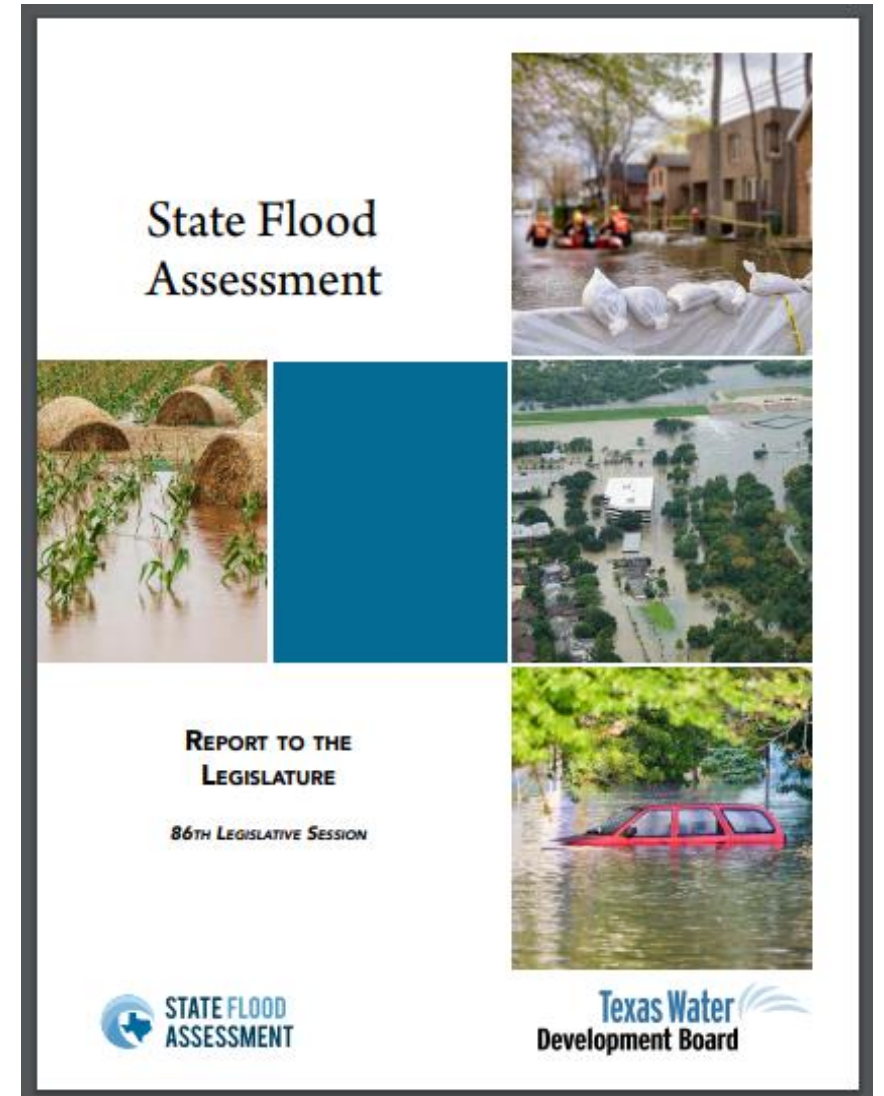


Flood Events

- 1-10
- 11-20
- 21-30
- 31-40
- 41-50
- 50+

[Map: FEMA](#)

[Data: NOAA Storm Event Database 1996-2020](#)



[-State Flood Assessment, 2019](#)

# Flooding 101: What is a Flood?

A general and temporary condition of partial or complete inundation of normally dry land area from overflow of inland or tidal waters or from the unusual and rapid accumulation or runoff of surface waters from any source.



Agricultural flooding damaging crops and hay.

# Flooding 101: Floodplains

The area of land subject to periodic inundation by floodwaters.

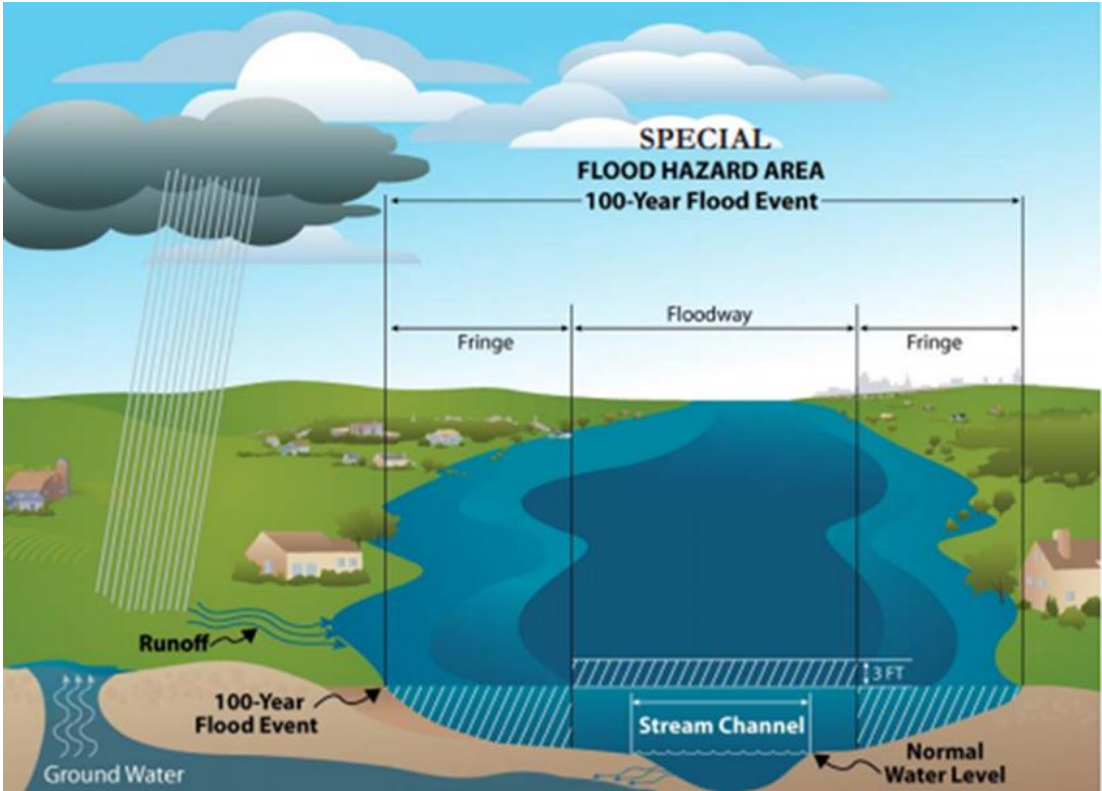


Image: FEMA



Image: FEMA

# Flooding 101: Benefits of Floods

When floodplains are preserved in their natural state, they provide many benefits:

- Reduce severity of floods by storing floodwaters, reducing flood velocities, and curbing sedimentation and erosion
- Contribute to groundwater recharge
- Provide recreation and quality of life
- Create habitats for many plants and animals.

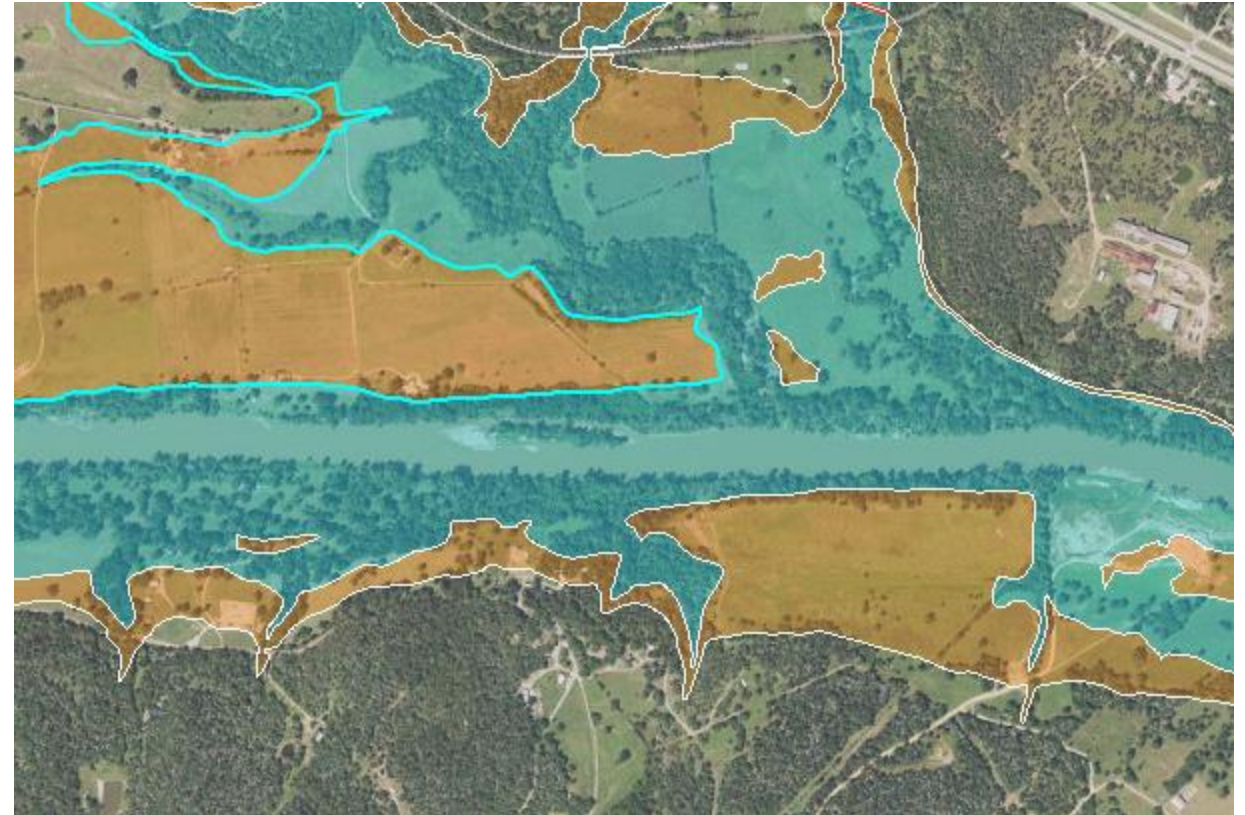


Wetlands at Galveston Island State Park provide natural ecosystem services.

Image: [Yinan Chen CC-PD](#)

# Flooding 101: Quantifying Flood Events

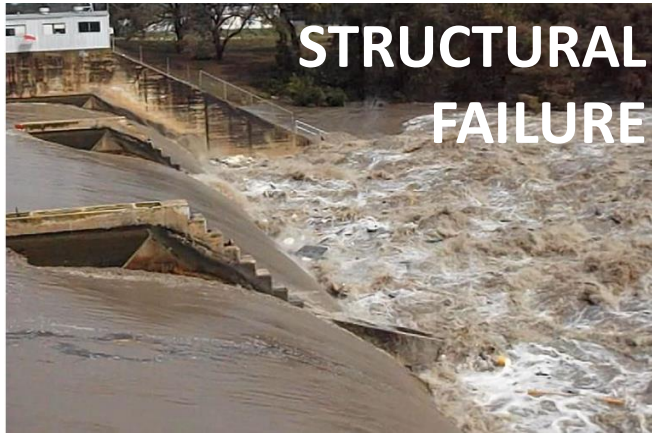
- 1.0% annual chance flood event
  - flood event having a 1.0% chance of happening in any given year
  - also referred to as the "base flood" or "100-year flood"
- 0.2% annual chance flood event
  - flood event having a 0.2% chance of happening in any given year
  - also referred to as the "500-year flood"



The 1% annual chance floodplain is shown in blue.  
The 0.2% annual chance floodplain is shown in orange.  
Image by FEMA



# Flooding 101: Types of Flooding



2019 Lake Dunlap Spillway Failure.  
Guadalupe-Blanco River Authority



Texas National Guard, Houston, TX  
Texas National Guard CC-BY-2.0



Blue Hole Park, South San Gabriel River,  
Georgetown, TX. FEMA



Flash flooding in San Marcos, TX. [CC-BY-SA-3.0](#)



Cadillac Ranch sculpture near Amarillo, TX.  
© Rachel Goad, used by permission.



Coastal flooding in Galveston, TX  
[pixabay, no attrib. req.](#)

# Flooding 101: Flood Mitigation

The implementation of actions, including both **structural** and **non-structural solutions**, to reduce flood risk to protect against the loss of life and property.



Mangroves on the Texas Coast stabilize shorelines and help absorb storm surge; an example of a non-structural flood mitigation solution.

Photo by Univ. Of Texas Marine Science Institute



Galveston Seawall, a structural flood mitigation solution. Image by [Yinan Chen CC-PD](#)

# Flooding 101: Structural Solutions to Flooding

Examples include the construction of levees, dikes, floodwalls/seawalls, dams, channel alterations, culverts, flood gates, and detention and retention basins.



Anzelduas Dam on the Rio Grande near Mission, TX. Image: TWDB



Storm Drains



Streambank Stabilization in Austin, TX. Image by City of Austin Watershed Protection

# Flooding 101: Non-Structural Solutions to Flooding

Examples include open space preservation, property buyouts and relocation, zoning and building codes, wetland restoration, elevated structures, flood warning systems, educational campaigns, and participation in the National Flood Insurance Program.



Homes that survived the ~20-foot-high storm surge of Hurricane Ike in Bolivar Peninsula, near the community of Caplen.

Image: TWDB



Turn Around, Don't Drown educational campaign.

Image: Weather.gov



Engineered Wetlands in in the Houston Audubon Society's The Oaks Nature Preserve . Image: TWDB

# Flooding 101: National Flood Insurance Program

Based on an agreement between local communities and the federal government.

- Local communities agree to adopt floodplain management regulations to reduce flood risks
- The federal government makes flood insurance and disaster assistance available to the community



Image by FEMA / National Flood Insurance Program

# Future Presentation Topics

- TWDB Regional Flood Planning Grant:
  - RFA Details
  - Summary of Scope of Work
- What else would your group like to have presented?



Shoal Creek flooding, Austin, TX. Image: TWDB

# Questions?