Types of Coastal Flooding in Texas:

What Communities Need to Know

Sea Grant
TEXAS
AT TEXAS A&M UNIVERSITY

Flooding is the #1 most frequent natural disaster in Texas, affecting more communities and causing more damage than tornadoes, wildfires, or hurricanes.

NUISANCE FLOODING

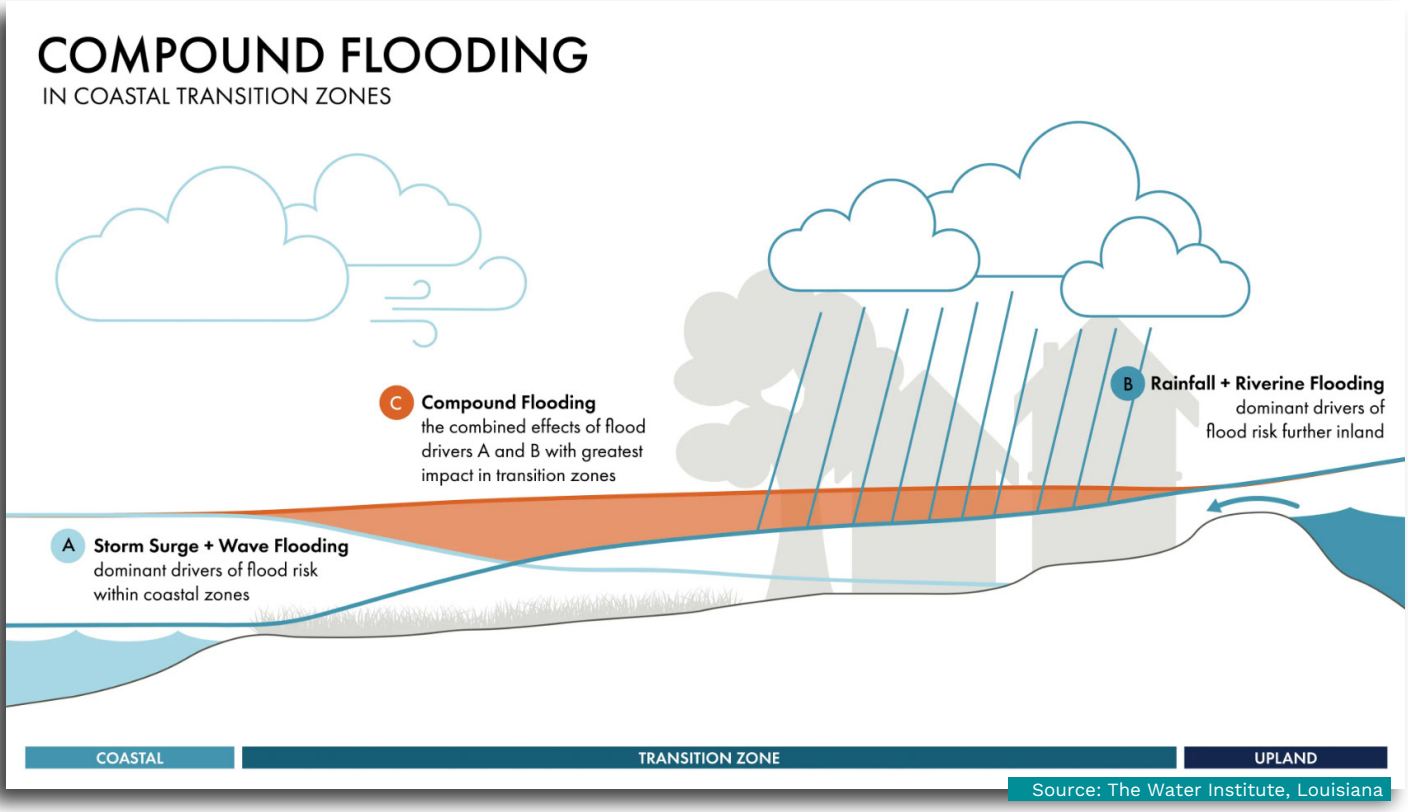
- Occurs even without rain when tides, swells, waves, or winds push water into streets and yards.
- Common in low-lying areas and communities, large and small, along the Gulf Coast

WHY IT MATTERS

Frequent "small" floods can accumulate damage and increase repair and insurance costs. Flooding can block roads, damage property, corrode infrastructure, and overwhelm stormwater systems.

COMPOUND FLOODING

- The combination of coastal flooding sources (e.g., storm surge) and riverine (fluvial) flooding from heavy rainfall occur at the same time — for example, storm surge and tides pushing water inland while heavy rainfall and swollen rivers bring water downstream. Add wave action and higher sea levels, and flooding becomes deeper and more widespread.



Source: The Water Institute, Louisiana

WHY IT MATTERS

Floodwater can extend farther inland than expected, and can last longer because both coastal and inland pathways are blocked at the same time.

DID YOU KNOW? TEXAS COMPOUND FLOODING EVENTS

- **Hurricane Harvey (2017):** 275,000+ homes flooded from the combined effects of extreme rainfall, river flooding, and coastal surge.
- **Tropical Storm Imelda (2019):** 40+ inches of rain triggered rainfall + river/bayou flooding, creating widespread inland compound flooding.
- **Rio Grande Valley (March 2025):** Nearly 20 inches of rain crushed prior daily, multi-day, and monthly (March) records; there were 6 fatalities and new record gauge levels along the Arroyo Colorado River of 30.44 feet.

Compound flooding can catch communities off guard; planning and awareness are critical.

HURRICANE/STORM SURGE FLOODING

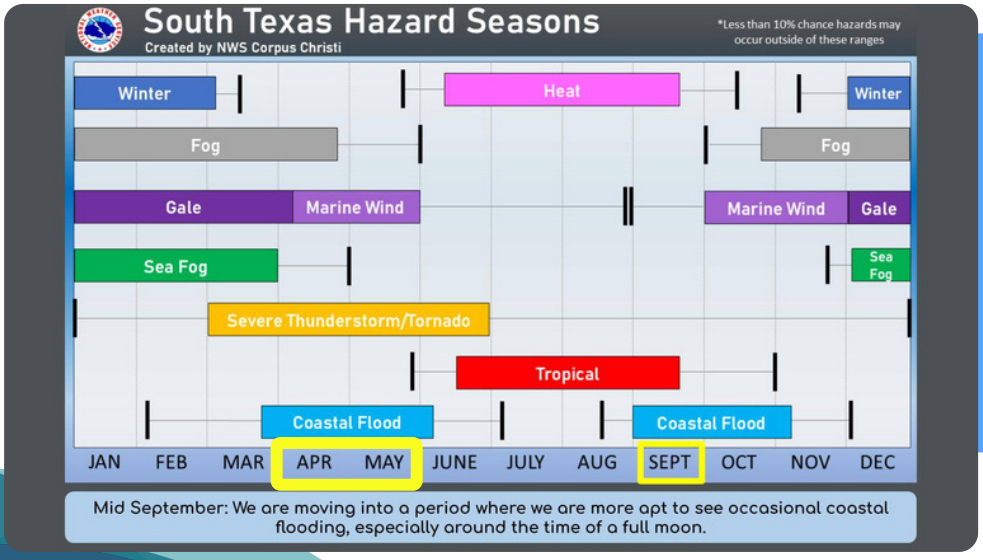
- Occurs when a tropical cyclone (hurricane or tropical storm) drives elevated water — surge plus tides — onto the coast; strong winds and waves amplify the flooding.
- Especially impacts Texas's Gulf Coast because of the shallow gentle slope of the shelf leads to higher surge heights

DID YOU KNOW? TEXAS STORM SURGE EVENTS

- **Hurricane Rita (2005):** Storm tide levels reached 8–10 ft in parts of eastern Texas; Sabine Pass recorded nearly 10 ft of surge, flooding low-lying communities
- **Hurricane Ike (2008):** Storm surge reached about 15 ft east of Galveston. Caused severe coastal flooding, particularly on the Bolivar Peninsula and in Galveston County

WHY IT MATTERS

When a hurricane or tropical storm drives a surge, it can inundate coastal communities, erode protective dunes and wetlands, damage infrastructure (roads, power stations, ports), and force evacuations. Unlike nuisance flooding, the depths and speeds of water are far greater, and the event may hit with little warning.



National Weather Service Corpus Christi created this graphic showing the primary hazard seasons in Texas. Mid-September and April-May are typically heavier coastal flooding seasons. Overlap of seasons increases flood exposure, particularly in early summer.

References: *Texas Homeowner's Handbook to Prepare for Coastal Natural Hazards*, Texas Sea Grant, 2018; Texas Parks and Wildlife Department, National Oceanic and Atmospheric Administration, National Weather Service, and Conrad Blucher Institute at Texas A&M University Corpus Christi
Texas Sea Grant: www.texasseagrant.org