

CLIMATE CHANGE IN TEXAS

One in five Texans lives in a floodplain, state's first-ever analysis shows

As it prepares a statewide flood prevention plan, the state found that almost 6 million Texans live in an area susceptible to floodwaters.

BY **ERIN DOUGLAS** JULY 28, 2023 5 AM CENTRAL

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Almost 6 million Texans, or about 20% of the population, live in an area susceptible to flooding, according to first-of-its-kind data gathered as part of a statewide effort to harden Texas against floods and rising sea levels.

The analysis is part of the Texas Water Development Board's first statewide flood plan, still in development, which the Legislature required in a 2019 law passed in response to Hurricane Harvey. Flood risks in Texas are increasing as climate change brings heavier precipitation, stronger hurricanes and sea level rise and as the state's population continues to climb.

More than 2.4 million Texans live in areas that have a 1% chance of flooding each year, known as the 100-year floodplain, [the analysis found](#). Another 3.5 million people live in areas with a 0.2% chance of flooding each year, known as the 500-year floodplain.

One-fifth of the state's land — roughly 56,000 square miles — now fall within the 100-year floodplain, TWDB staff said in a presentation this week.

It will likely cost Texas tens of billions of dollars to protect people and property from floods. The first projects proposed in the plan add up to \$38 billion, including the massive [coastal barrier proposal](#) with its "Ike Dike," a huge gate system proposed for the mouth of Galveston Bay.

"Getting this program up and running is a really big deal," TWDB Chair Brooke Paup said before the board approved the 15 regional plans, a major step in creating the statewide

flood plan. Each region is built around one of the state's major watersheds.

"I know it'll truly go so far to save lives and people's homes," Paup said.

As climate change worsens, higher global temperatures increase the amount of moisture in the air and thus the risk of extreme rainfall events, [the Texas state climatologist](#) and a [national climate assessment](#) have found. Heavier precipitation linked to climate change likely increased Hurricane Harvey's total rainfall by as much as 19%, [one study found](#). Almost 50 inches of rain fell in some areas of Houston during Harvey — the [highest rainfall amount](#) in a single storm for any place in the continental U.S.

At the same time, higher global temperatures are melting glaciers, increasing sea levels around the world — including in Texas — and making coastlines more vulnerable to storm surges. Between 2000 and 2019, rising sea levels caused the Texas coastline to retreat about 4 feet per year on average, according to a 2021 University of Texas Bureau of Economic Geology report for the Texas General Land Office.

Reem Zoun, director of flood planning at the TWDB, said that to decide how to prevent flooding in Texas, the agency first needed to identify which areas of the state were at the most risk. The analysis identified how many buildings, homes, people, hospitals, roads and agricultural areas are in a floodplain.

The San Jacinto region, which includes Harris County and Galveston, has the most people living in a floodplain: almost 2.5 million people are in a 100- or 500-year floodplain. The Lower Rio Grande region, which spans much of Texas' southern border and includes the Rio Grande Valley, is next with about 1 million people at risk.

Though floodplains are defined by the Federal Emergency Management Agency, the agency does not map every inch of the U.S. and its maps have long been criticized as out of date and underestimating actual flood risk.

Texas used existing flood data to create the maps that served as a baseline that regions could add to with their own flood hazard maps — if any existed — and supplement with knowledge from local water managers. In regions with very little data, gaps were filled with data from a contracted flood risk modeling data company called Fathom.

Sixty-three of Texas' 254 counties had no existing flood hazard information prior to the planning effort, according to the TWDB.

In the Canadian-Upper Red region, for example, which includes much of the Panhandle and

Wichita Falls, hardly any flood maps existed, while 98% of the Lower Red-Sulphur-Cypress region in the northeast corner of the state had inadequate flood mapping, James Bronikowski, TWDB's manager for regional flood planning told the board on Tuesday.

The TWDB often functions as a water infrastructure bank and intends to use the planning process to help finance the construction of flood prevention projects with low-cost loans and grants, although the cost of the projects far outweighs the money that's been dedicated to the agency by lawmakers.

During the 2023 legislative session, lawmakers allocated \$625 million to finance flood prevention projects through the Flood Infrastructure Fund. Once the statewide flood plan is finalized, projects will have to be included in the plan in order to access those funds.

Another \$550 million of the surplus was allocated to the coastal barrier project that includes the Ike Dike.

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