

THE CAT RESOURCE CENTER

CENTRAL TEXAS FLOODING

July 3-6, 2025

Between July 3-6, 2025, Central Texas experienced catastrophic flash flooding caused by a convective system fueled in part by remnant moisture from former Tropical Storm Barry. The Guadalupe River rose rapidly, surpassing the recent peak levels of the historic 1987 flood. A major disaster has been declared, with Kerr County hardest hit. Over 12,000 structures were damaged in Tom Green County alone. At least 119 fatalities have been confirmed statewide, with 173 people still missing as of July 9, 2025. Widespread urban flooding, rescues, and infrastructure damage have been reported across the region.

Compounding Factors Lead to a Disastrous Scenario

Key Components



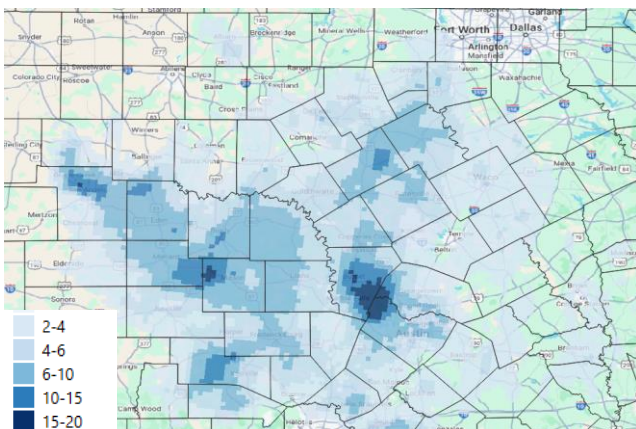
Rainfall – Between 6-10 inches of rain fell across the Guadalupe River in Central Texas, with localized areas seeing over 15 inches throughout the weekend. Friday July 4th saw the worst of the rain, with 6.5 inches falling in just 3 hours.



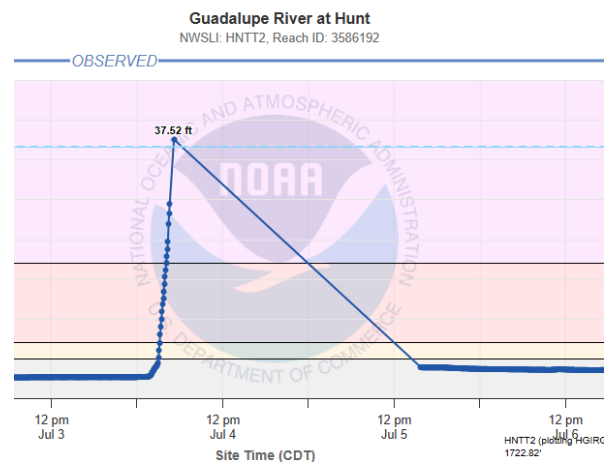
Local Geography – The impacted area falls within Flash Flood Alley, a region in Texas known for its often and occasionally deadly flooding. Steep hills, a semi-arid climate, and clay-heavy soils make it difficult for the ground to absorb water, resulting in high volumes of runoff. This can rapidly swell rivers and creeks within minutes. The impacted areas also contained many low-lying campsites with a history of flooding.



Flash Flooding – Due to the intense rainfall, rivers rose at an alarmingly fast rate. Within 4 hours, the Guadalupe River at Hunt, TX rose from 7.7 feet to a peak of 37.5 feet at 5:00 am CDT. Water volumes were so intense that the gauge temporarily failed, and estimates place the river's actual peak at 39 feet. Because the peak in water discharge happened early in the morning, fewer people were awake to heed warning alerts.



4-day estimated total precipitation, July 4-7 (legend in inches)
Source: National Water Prediction Center and Guy Carpenter



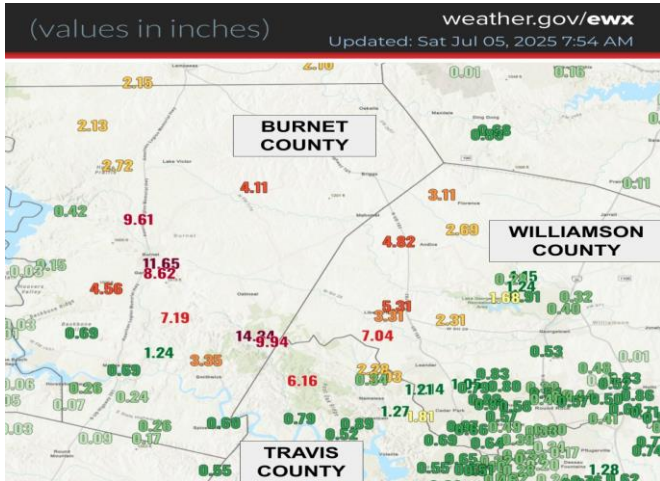
Gauge data from the Guadalupe River at Hunt, Texas
Source: National Water Prediction Center

Storm Timing and Rural Location

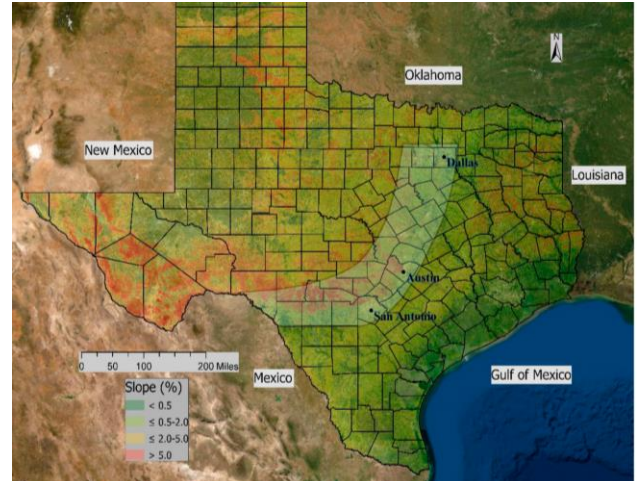
Notably, the impacted sections of the Guadalupe River are home to popular campsites and summer programs. The 4th of July holiday weekend resulted in these rural campsites being busier, and thus more populated, than usual. Some of the camps are built within FEMA regulatory flood zones, as shown below, and the risk of flooding is known in the region.

While the local National Weather Service issued warnings ahead of the most intense flooding, the remote area reportedly has poor cell service, and some towns lacked adequate funding for warning sirens. There is currently no evidence to suggest that NWS warnings were delayed.

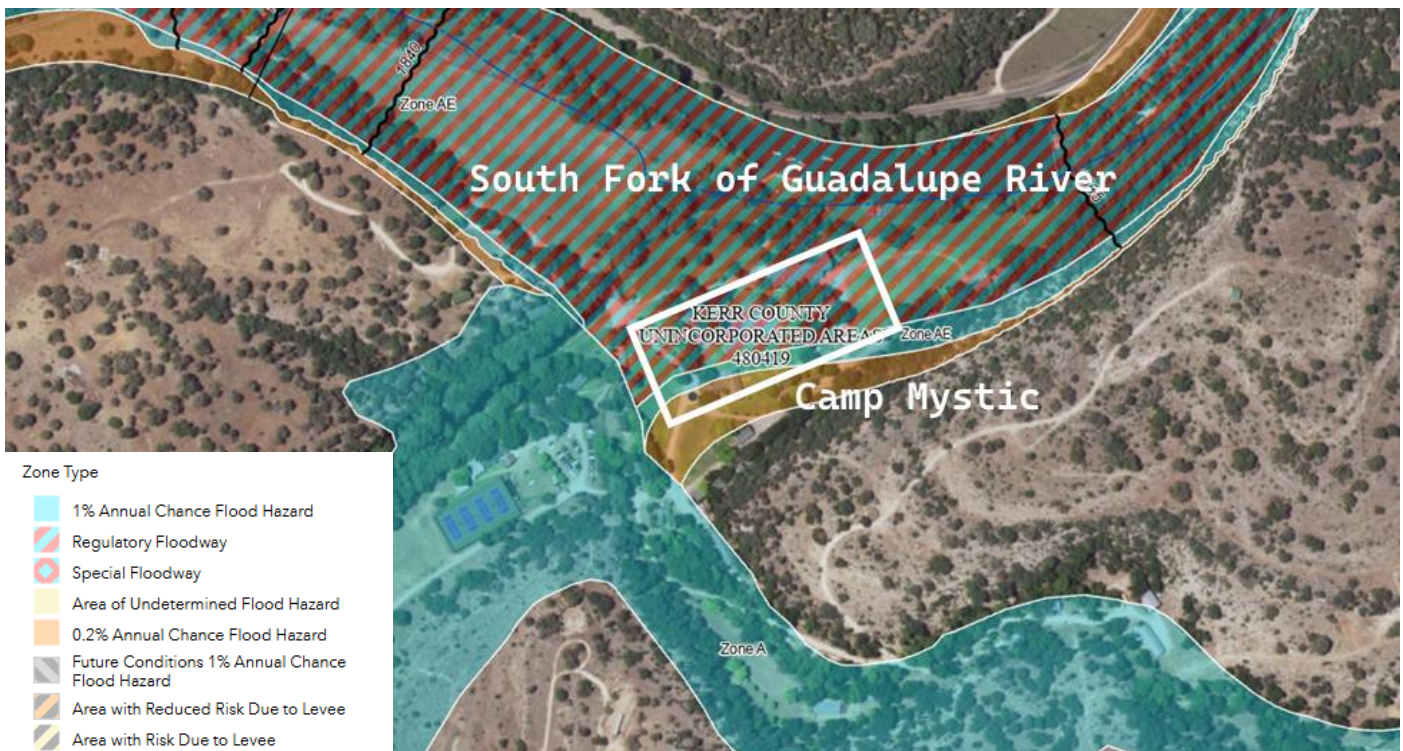
In addition to the system impacting a remote part of the state, the storm saw its highest intensity early in the morning. Fast-moving nighttime storms can be particularly disastrous, as most people will be asleep when warnings and alarms are issued.



Rainfall totals over 6 hours, released at 7:54 am, July 5, 2025
Source: NWS Austin/San Antonio



Flash Flood Alley in Texas (light green crescent)
Source: GIS Application: Flood Risk Management, 2020



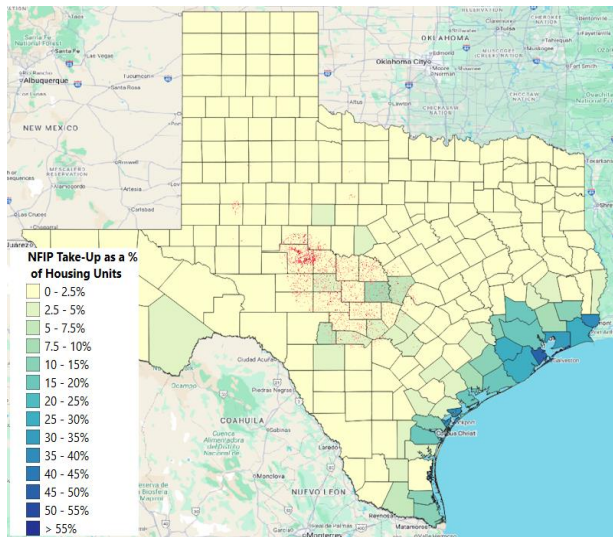
FEMA regulatory flood zones around Camp Mystic, an area especially hard hit by the flooding
Source: FEMA, ArcGIS

Insurance Implications and Guy Carpenter (GC) View of Flood Risk

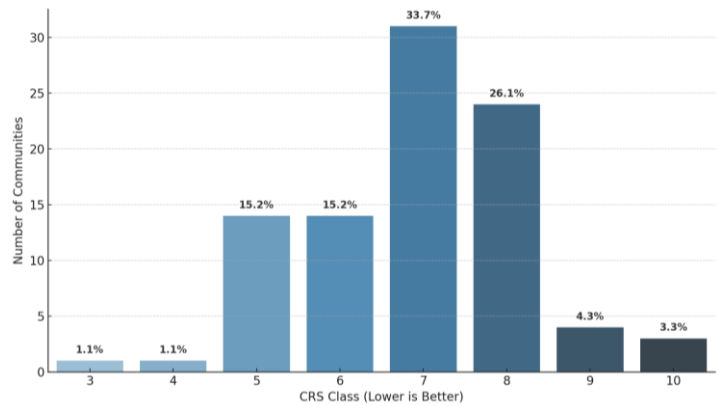
NFIP Take-Up Rates and CRS Class

Most Central Texas counties devastated by the July 4 weekend flash flooding show extremely low NFIP participation levels. Despite the well-documented flood vulnerability of the Hill Country, these inland regions lack the insurance coverage seen in coastal counties, such as Harris and Galveston. The disaster along the Guadalupe River underscores the growing protection gap in areas where flood risk is high, but perceived risk and insurance uptake remain low.

The Community Rating System (CRS), a voluntary program under NFIP, rewards communities for implementing floodplain management practices that exceed minimum NFIP requirements. Only 17% of CRS-participating communities in Texas have achieved a Class 5 or better rating, highlighting the limited uptake of the highest flood mitigation standards for the state.



Distribution of CRS Classes Across Texas Communities



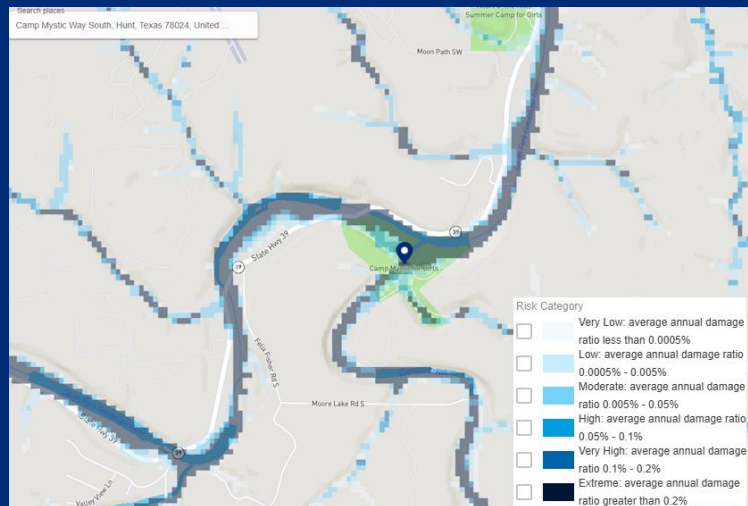
NFIP Take-up Rate and CRS Classes for Texas.

Source: GC, NFIP, and KatRisk.

GC View of Flood Risk

GC developed a global riverine flood risk rating product as part of a multi-peril solution to enhance our clients' underwriting and portfolio management.

GC also incorporated adjustments to the baseline fluvial risk rating by modeling the effects of climate change in future scenarios of 1.5°C, 2°C, and 3°C of warming to account for increased flood potentials.



GC Fluvial Risk Rating Map, showing Camp Mystic site within Extreme Riverine Flood Risk. Source: GC

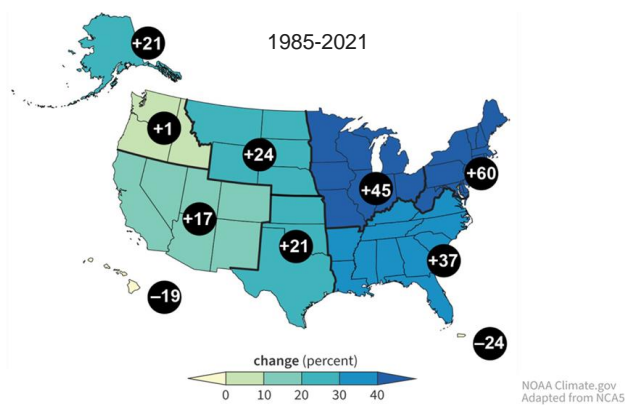
Climate Change and Heavy Rainfall Events

Heavy Precipitation More Common in a Warmer World

The Intergovernmental Panel on Climate Change (IPCC) highlights that heavy precipitation events have increased in frequency and intensity in many regions, leading to greater risks of flooding and other related impacts (IPCC, 2021). For every degree Celsius of warming, the atmosphere can hold approximately 7% more moisture. This enhanced moisture content contributes to more intense rainfall events and a higher likelihood of heavy precipitation.

The increase in extreme precipitation is not uniform; some regions are experiencing more frequent and intense downpours, while others may see a decrease in overall precipitation but an increase in the intensity of the heaviest events. The consensus among IPCC climate models indicates an acceleration in the changes to extreme precipitation events, highlighting the need for policymakers and the insurance industry to promote effective flood management strategies and resilience planning to mitigate the impacts of heavy rainfall.

Heavy Precipitation Events Are Becoming More Frequent and Intense

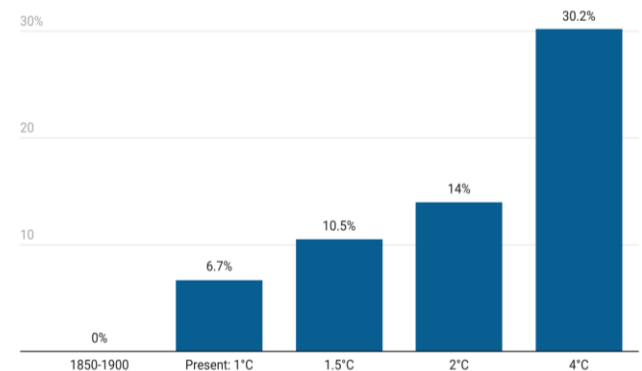


Observed change in precipitation on the heaviest 1% of days 1958-2021

Source: NOAA Climate.gov, National Climate Assessment 5

Extreme Storms Get Wetter As Temperatures Rise

As temperatures rise, the intensity of storms increases, the IPCC's latest assessment report shows. The chart shows how much wetter heavy one-day storms that historically occurred about once every 10 years are likely to become as temperatures rise.



Compared to the 1850-1900 average, 1° Celsius increase = 1.8° Fahrenheit increase.

Chart: The Conversation/CC-BY-ND • Source: IPCC Sixth Assessment Report

Source: IPCC Report

Increasing Flood Risk

This week's widespread flood events across the United States also underscored the growing systemic risk posed by inland and tropical rainfall-driven flooding:

- The remnants of Tropical Storm Chantal dropped over 10 inches of rain across central North Carolina on July 6, resulting in heavy localized flooding and at least 6 fatalities
- Over 5 inches of rain fell in just 90 minutes in the Chicago metro area on July 8, leading to localized flash flooding
- Heavy rainfall combined with recent burn scars resulted in the Rio Ruidoso, a mountain river in New Mexico, rising over 20 feet in under an hour on July 8. This led to localized flooding in Ruidoso and at least 3 fatalities.

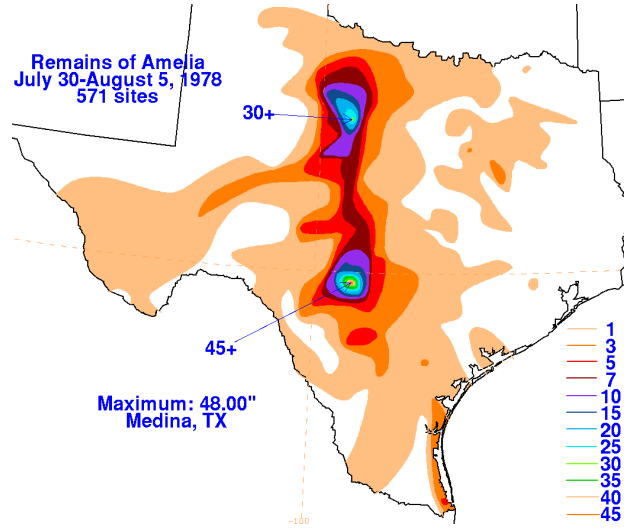
These events, spanning diverse geographies and flood types—tropical, monsoonal, and pluvial—reinforce the urgent need for insurers and reinsurers to reevaluate exposure in non-coastal zones, improve flood mitigation and resilience measures, and assess the implications of climate change on flood frequency and severity.

Historical Parallels

July 30-August 5, 1978

The remnants of Tropical Storm Amelia caused extensive flooding in the Texas Hill Country. Up to 48 inches of water fell, with the Medina River valley taking the brunt.

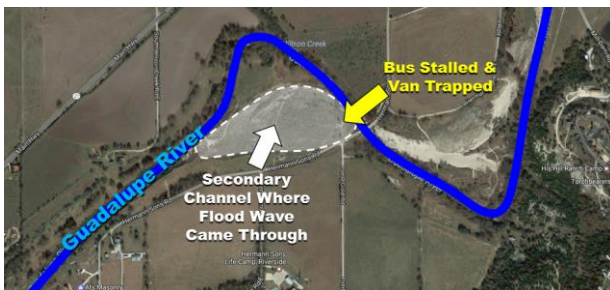
Overall, the storm caused 33 fatalities across Texas, 8 of which were tied to the Guadalupe River. The flood is still considered one of the worst in state history, with an estimated \$540M (adjusted for inflation).



Rainfall totals from the remnants of Tropical Storm Amelia
Source: WPC



NWS survey picture of the Guadalupe River in flood on July 17, 1987



Map of campgrounds and location where bus stalled and van became trapped. Source: NWS Austin/San Antonio.

July 16th, 1987

A series of severe thunderstorms passed over the Texas Hill Country, and up to 11.5 inches of rain fell west of Hunt, Texas. The Guadalupe River ultimately crested at 31.5 feet in the town of Comfort. At its peak, the flood was nearly two-thirds of a mile from its normal banks.

Much like the 2025 floods, the 1987 flood peaked early in the morning. Local campsites along the river were flooded, many of which hosted summer programs. 10 people died, all teenagers, when an evacuating bus and van became stranded in the flood waters.

General Disclaimer: Statements or analysis concerning or incorporating tax, accounting or legal matters are general observations or applications based solely on our experience as reinsurance brokers and risk consultants and may not be relied upon as tax, accounting or legal advice, which we are not authorized to provide. All such matters should be reviewed with the recipient's own qualified advisors in these areas. The data, analysis, summaries, marketing materials, or other work product (collectively, the "Materials") provided by Guy Carpenter are provided "as is," without warranty of any kind whether express or implied. The information contained in this document is based on sources we believe reliable, but we do not guarantee its accuracy or completeness. Recipients are cautioned not to place undue reliance on the contents, calculations or any forward-looking statement within the Materials. Guy Carpenter undertakes no obligation to update or revise the Materials, whether as a result of new information, research, future events, or otherwise. The Materials are not a contract or an offer to enter into a contract, understanding or any other type of agreement concerning a potential business relationship. Guy Carpenter is not conveying or transferring any intellectual property rights in the Materials, absent a specific, written agreement, in each instance. If any trademarks and service marks are contained herein, they remain the property of their respective owners. If you have viewed the Materials in a publication, or you can reasonably expect that Guy Carpenter may release the Materials to unaffiliated recipients, the information therein is not intended to be taken as advice with respect to any individual situation and cannot be relied upon as such.

©2025 Guy Carpenter & Company LLC. All rights reserved.