

"We Didn't Know This Flood Was Coming"

By [Mike Smith](#) - [July 05, 2025](#)

[Note, no more updates to this story as of 1pm Tuesday;
there is an updated story [here](#).]

...so said the chief executive of Kerr County, Texas, Rob Kelly. He went on to say, "We had no reason to believe that this was going to be anything like what's happened here, none whatsoever."

I'm sorry to report that he is probably correct. The flood was underforecast and the "emergency" warnings were later than they could have been. In fairness, as of the time of this update, 1:30pm Monday, the U.S. Geological Survey has determined this was the highest crest on the Guadalupe River at Hunt, Texas, since the river gauge was installed.

As of 1p Tuesday, 105 have been confirmed to have been killed and "dozens" are missing. Those numbers imply a total death toll near 130.

This past autumn, Hurricane Helene killed 249. In 2011, a single tornado killed 161 in Joplin. *We must stop these mega-disasters!*

This is another tragic example of why America desperately needs a National Disaster Review Board to study this catastrophe and why might have been done better so as to prevent future flood catastrophes. Until a NDRB is created by Congress, we are doomed to unnecessary loss of life due to floods, tornadoes and other natural disasters. Please write your congresspeople and ask them to create a NDRB. It is easy to do using their websites (example: www.cornyn.senate.gov/share-opinion/).

In the absence of a NDRB, I am providing this limited report on this catastrophic event.

For valuable background data and history of floods in Texas' "flash flood alley," go [here](#).

The Storm

[7:30p Monday] The U.S. Geological Survey reached the Hunt river gauge and determined the river stage Friday morning was the highest in the recorded history of the river. It is not surprising the river stage was underforecast nor is that fact a criticism of the NWS. Meteorologists can only do so much.

[Original Text] Based on data from the University of Oklahoma, a preliminary estimate is that a flood of this magnitude has a 0.5% to 1% chance of occurring in any given year (sometimes mislabeled, as in the legend at right, as a "100-year flood" or a 100 to 200-year flood). The heaviest rain fell over the South Fork of the Guadalupe River just upstream of many of the camp sites, see county map below. This information is available to the NWS and is updated hourly. There are multiple reports that say the flooding began at two of the camps right around 4 am.

Flood Recurrence Interval. Note the darkest color is along the South Fork of the Guadalupe River southwest (upstream) of the camps.

Map of Kerr County, Texas. The diamonds south of Hunt are some of the camp sites. Most or all of the missing children are from Camp Mystic.

We are going to discuss the sequence of warnings as well as the meteorology the night of the 3rd and 4th for the area in the map above. There were other serious floods this weekend but they are not covered in this report.

The Warnings

A flash flood *watch* was issued the evening of the 3rd. A watch means that conditions for flooding -- over a broad area -- existed. The NWS did a fine job with the watch as its computerized guidance material as of 7pm on the 3rd, completely missed the heavy rains.

The National Weather Service (NWS) has three types of flood warnings pertinent to the morning of the fourth:

- Flood warning (FW) is issued for rivers and is valid for a specific point, often where a river gauge is located (for forecast and comparison purposes to previous floods).
- Flash flood warning (FFW) is issued when a rapid rise of water level is expected, usually in the following three hours or less.
- Flash flood emergency (FFE) is issued when the extent of the flash flooding is forecast to be of a life-threatening nature.

Please read these words of the National Weather Service which describe the two types of flash flood warnings:

"The National Weather Service (NWS) began issuing Flash Flood Emergency warnings in 2003. These warnings are reserved for exceedingly rare and life-threatening flash flood events, often involving catastrophic damage and requiring immediate action, such as water rescues or evacuations. The designation was introduced to highlight the most severe flooding situations, distinct from standard Flash Flood Warnings, to better communicate urgency to the public and emergency managers." -- from a NWS summary via AI.

Above are the words of the National Weather Service.

Since the NWS made the addition of flash flood emergency warnings, I -- and others -- have expressed concern that we are inadvertently training the public to put less emphasis on ordinary flash flood warnings. This is especially the case since we sometimes do not have the meteorological and hydrological skill to consistently separate the two threat levels, regular and emergency.

The river flood warnings (FW) are usually aimed at emergency managers, barge operators, boat concession operators, etc., as very few members of the public know the location of flood gauges and the river heights pertinent to their locations.

Here is a table of the pertinent warnings and related information the morning of the 4th:

Time	Type	Info Contained in Warning Message
1:14a	FFW	Kerr County
3:33a	FW	Guadalupe River at Hunt, moderate flooding
3:35a	FFW	Continue FFW for Kerr County
4:00a	FW	Guadalupe at Hunt, major flooding, rise to 23.8'
4:03a	FFE	Flash flood emergency south central Kerr County
4:23a	Radar image	FFE appended to radar image; 5-10" had fallen
4:46a	FW	Guadalupe River at Guadalupe River at Kerrville
5:08a	Hydrograph	Guadalupe R @ Hunt, "life-threatening situation"
5:23a	FW	Guadalupe River @ Comfort, moderate flood
5:34a	FFE	Guadalupe River at Hunt and downstream

~~The first mention I can find of a "flash flood emergency" was contained in the radar image caption below:~~ The 4:03am FFE did not appear in the College of DuPage list I consulted. Thanks to reader Mark Conner for finding it at the Iowa State University archive and sending it to me. The gray area inside the white (above) is 10+ inches of rain as estimated by radar (see scale at top). Keep in mind that if "major" flooding is being measured at Hunt (see hydrograph below), the river is at least as high or higher south toward the camps! ~~. the major flood stage had already occurred at the camps upstream along the South Fork of the Guadalupe where the heaviest rain had fallen. See map of Kerr County (above). A radar image of this nature would not trigger weather radios, automatic television bulletins, StormCall (telephone call warnings), et cetera.~~

As indicated above, there was a flash flood emergency issued at 4:03am. Unfortunately, that was coincident with the flooding of several of the campgrounds. The warning was well done for those downstream toward Kerrville.

The hydrograph for the Guadalupe River -- based on the river gauge east (downstream) of the town of Hunt is below. *The surge of floodwaters would have reached the camps sooner than indicated on the graph.* The stage shown, which may not have been the crest, was the second highest ever measured at Hunt.

Both infrared satellite and radar indicate torrential rains were in progress by around 1am over the South Fork of the Guadalupe (where most of the camps were located). You can see the rapid rise begin about 2am. "Moderate" flooding is shown at about 3am and "major" flooding around 4am. **It is hard to understand -- given the radar, satellite and hydrograph data -- why the flash flood emergency wasn't issued by 3am.**

[Sunday, Noon] *The New York Times* has a story today that mentions the NWS's San Angelo office in connection with this tragedy. That office had no warning responsibility -- at all -- for the Guadalupe River (pale blue) which is where the camp was located. All storm warnings for Kerr County are the responsibility of the San Antonio office.

Between the dark blue lines is Texas' Colorado River system. While floodwaters from a separate

storm complex flowed down that river toward Austin, the tragedy at the camps was completely outside of the Colorado's watershed.

The map shows an arrow pointing at the location Camp Mystic and the other camps located on the South Fork of the Guadalupe. There is no flow into that river -- at all -- from the north. The *Times* is attempting to make a political statement when there is none to be made.

The Camps and Emergency Management

We do *not* know:

- What system, if any, Camp Mystic or the other camps had to receive storm warnings.
- What procedures, if any, the camps had when flash flood warnings or flash flood emergencies were issued for their locations? They should be asked for tornado warnings.
- Whether there were staff briefings or staff + campers drills for high risk weather safety procedures?
- Do the camps have cell phones or landlines?
- The above questions should be asked of emergency management once the search and rescue activities for this tragic event are finished.
- **Addition at 5pm Saturday. Please see [this](#) from KXAN TV. As indicated here, there are many questions being asked about the action, or lack of action, by emergency management.**

DOGE

A reporter from CNN and others have asked on Twitter/X whether the DOGE cuts were responsible for the lack of adequate warning. The answer appears to be "no."

I'm told the Austin - San Antonio NWS forecast office had its meteorologist-in-charge and -- most important -- its hydrologist after the DOGE cuts. The latter is the person with the most responsibility for creating and overseeing flood warnings and flood warning programs at that office. It did not currently have a Science Operations Officer nor a Warning Coordination Meteorologist. However, those positions are usually 8-4:30 M-F and so would not have been on duty in the early morning of a holiday.

There were two meteorologist openings yesterday but that is pretty typical as people transferred, get promoted, etc. Might there have been some extra fatigue? Yes, that is possible but -- again -- this is pretty typical. It is also possible for a NWS office to transfer routine forecasts and other duties to its primary or secondary backup office(s) so they can focus on severe weather conditions. Off-duty personnel can also be called in. As it turns out, they had extra people on duty due to the flood threat.

Friday's flood in the Texas Hill Country was similar to an even **worse (meteorologically) flash flood in Tennessee in 2021** when 17 inches of rain fell and 18 perished in the middle of the night. In that case, as well as yesterday's, the warnings were inadequate. Of course, the 2021 event had nothing to do with DOGE.

In 2016, **a horrible flash flood** -- which occurred in daylight during business hours -- occurred at Greenbrier West Virginia with 26 killed. There was almost no warning at all from the NWS. The point is that poorly warned floods occurred long before DOGE existed.

Finally, there is no climate change connection. Major flash floods **in that part of Texas are becoming less common**.