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**Waverly's 'long and
skinny' geography
breeding ground for
deadly floods,
scientists say**



experts say.

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W AVERLY, Tenn. — Terri Owen was woken up Saturday morning by a friend screaming for her to get up.

Water from the nearby Trace Creek was pouring into the neighborhood where she was staying with her friend on the eastside of Waverly.

"We didn't have time to go anywhere the water was coming so quickly," Owen said. "As it kept rising, we were to go we were just hoping it would eventually stop."

In Humphreys County, Waverly bore the brunt of Saturday's flooding. As rapid currents laid waste to the small town of 4,300 people, floodwater left destruction and death in its path. The extreme weather event killed 20 people.

Many residents from the area told The Tennessean they believe the elevated railroad tracks north of town — located along Highway 70 about three miles east of the Waverly city center — acted as a levee that kept raging floodwater from spreading out.



Flood damage is seen in Waverly, Tenn., on Sunday, Aug. 22, 2021.

JOSIE NORRIS / THE TENNESSEAN

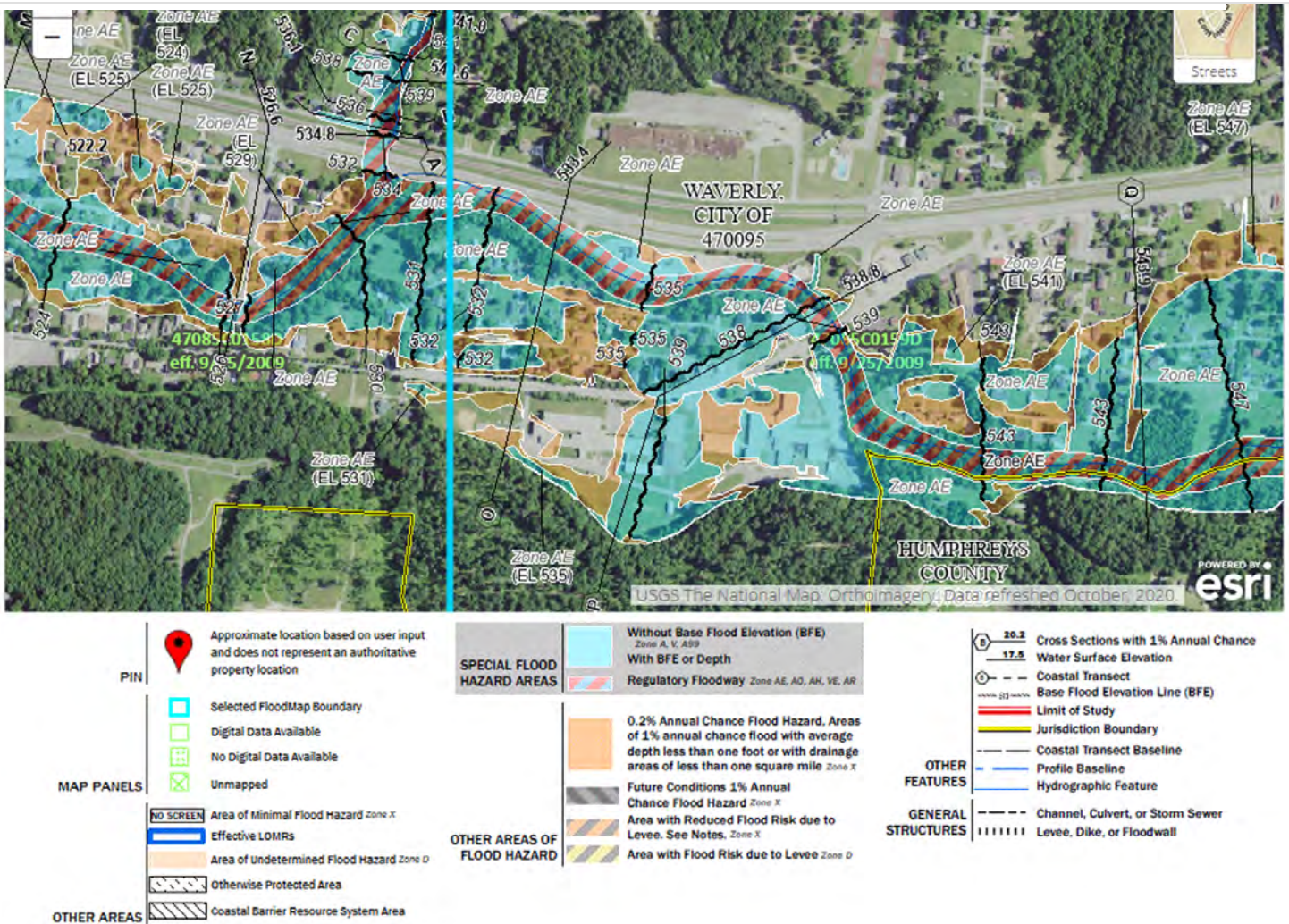
Robby Street, who leads a Dickson swiftwater rescue team, said when the ground under the tracks finally washed out, it was “like a dam broke.”

“Everyone we talked to said the water was rising like normal then all of a sudden in a matter of seconds it went...to six-foot deep,” Street said.

Read more: Waverly area storms are once-in-a-thousand-years event

But while the railroad track did restrict the waterflow, scientists say that is not the main problem.

Sandwiched between hills to the north and south, Waverly sits particularly vulnerable to flood damage when overflowing rain water from Trace Creek rushes downstream toward the "long and skinny" town, experts said. Most of the city is designated as a special flood hazard area by the Federal Emergency Management Agency, records show.



Most of Waverly is deemed a special flood hazard area, which is at high risk of flooding, according to a flood insurance rate map by the Federal Emergency Management Agency.

"With the intense rainfall and the slope of the basin, it really helps accelerate that water," said James LaRosa, hydrologist at National Weather Services in Nashville.

North of Waverly, the elevated railroad track could have worsened the problem by further narrowing the pathway and "restricting the water flow," said John Ayers, a professor in earth and environmental sciences at Vanderbilt University.

faster, rose higher and hit harder.

'This has changed Waverly forever': A return to normal not yet in sight for Humphreys County residents

Jaquita Buchanan, whose mother lived down street from where Owen was staying, said this round of flooding wasn't like anything they had seen before.

"Our mother knows if water reaches a certain point, they need to leave," Buchanan said.

"During this one, the water all came all at once."



Recovery efforts continue after flooding in Waverly, Humphreys County

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Their mother's house was sitting on top of a neighbor's smashed car, several feet from its original foundation. The only reason it hadn't drifted further down the road was a tree in the front yard pinned it in place.

Buchanan said their stepfather managed to get their mother to safety but was one of 20 who died in the flooding when he went back to help out other neighbors.

Experts are warning if nothing changes the floods could again consume Waverly.

"The problem is that there is a bottleneck at the end of their valley," Ayers said. "I think they are going to have a lot of flooding in the future, too."

Record rainfall funneled through narrow valley

Trace Creek has helped make Waverly what it is today. And nearly two centuries after the town was established, it is now what haunts them the most.

Trace Creek, which flows westward into the Tennessee River, originates near McEwen — a town less than 10 miles east of Waverly that saw a record-amount rainfall of 17 inches on Saturday.

The rain gauge in McEwen measured 3 inches of rainwater pouring down per hour for three consecutive hours, LaRosa said.

"That is astounding for any flood event here in Tennessee or in the tropics," LaRosa said.



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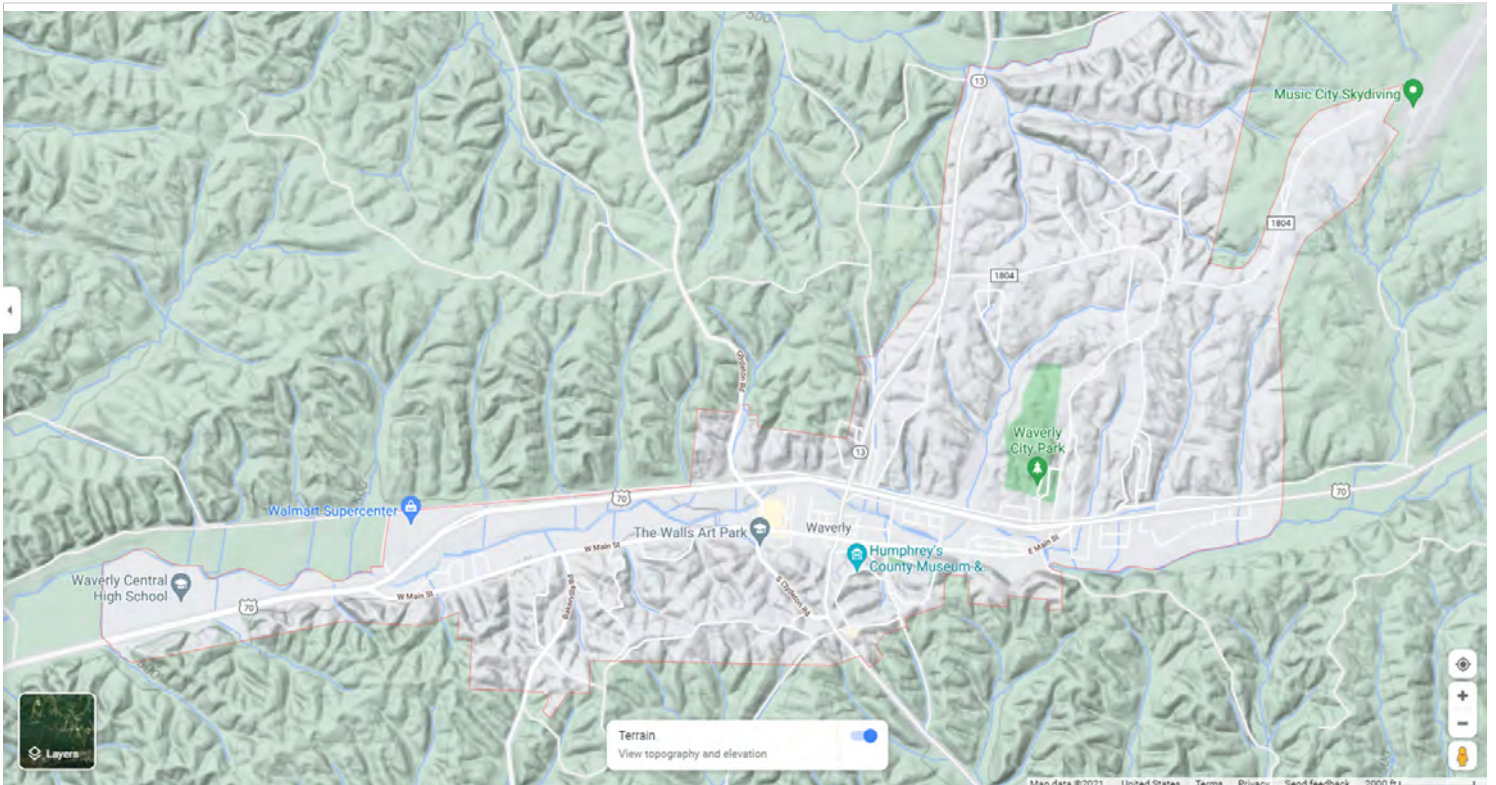
As rain fell, water flowed downstream toward Waverly, gaining speed as it pushed through the narrow valley parallel to Highway 70, Ayers and LaRosa said. Tributaries from nearby hills dumped more water along the way.

"They are kind of in a bad spot," LaRosa said. "Instead of having a flat, wide flood plain for the water to spread out, it just collects into a narrow spot."

Waverly Department of Public Safety Chief Grant Gillespie said the town sits in a funnel between several waterways. He said it was the "perfect storm," and had never seen so much rain in such a short period of time.

By mid-week state officials were still working on repairing the section of Highway 70 that leads into town from McEwen. The highway runs parallel to the railroad track, and TDOT workers were repairing holes in the track's foundation caused by the water and debris.

Parts of the CSX railroad line were damaged by the floods, Gillespie said. CSX spokesperson Sheriee Bowman said the railroad track did experience several washouts due to the rainfall, but the company has repaired the damage and train operations resumed by Wednesday.



Bowman did not answer if the elevated track contributed to the flood damage the town suffered.

While Nashville has resources to develop retention ponds to hold the water, or raise the foundation of houses, it would be hard for small towns like Waverly to develop similar flood mitigation plans, LaRosa said.

"If they are still there by the creek, the chances of them flooding are still there," he said.

"The only option that they have is to widen that (valley), which would be moving a lot of earth over a fairly good length of the creek," Ayers said.

Chris Gadd contributed reporting.

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