

UC Davis study finds next Napa earthquake could imperil Delta levees

Edward Ortiz, Sacramento Bee, 12-19-14

UC Davis scientists say the fault that caused a Napa Valley earthquake earlier this year could produce a temblor strong enough to cause levee failures in the Sacramento-San Joaquin Delta.

August's south Napa earthquake measured magnitude 6.0 and caused \$400 million in damage. It was the strongest the region had felt since the 1989 Loma Prieta earthquake.

After the quake, a team of UC Davis geology students and Mike Oskin, professor of geology at UC Davis, went out to measure the area. They discovered that the West Napa Fault was 45 miles long – almost twice as long as previously thought, said Oskin, lead researcher on the study.

The UC Davis research was presented Thursday at a meeting of the American Geophysical Union in San Francisco.

“The size of the fault correlates to magnitude of the quake,” said Oskin.

A stronger quake could be as intense as 7.0, he said, and could devastate the Napa area. “A large earthquake in Napa Valley is close enough to the Delta to cause some worry about levee stability,” Oskin added.

The threat of earthquakes has been a longtime concern in the Sacramento-San Joaquin Delta, said Nancy Vogel, spokeswoman for the California Department of Water Resources. “We have long known there is a seismic risk in the Delta,” Vogel said, adding that it was too soon for the department to respond to the research released Thursday.

Approximately 1,115 miles of levees protect 700,000 acres of lowland in the Delta, some of them old and privately built and owned. During the last century, there have been 162 Delta levee failures leading to flooded islands.

The U.S. Geological Survey's last estimate concluded that there was a 62 percent probability that an earthquake of magnitude 6.7 or greater would occur in the Bay Area between 2003 and 2032.

An earthquake of that magnitude is capable of causing levee failures in the Delta region and could result in fatalities, extensive property damage and the interruption of water exports from the Delta for an extended period, according to USGS estimates.

The West Napa Fault is much smaller than the Hayward, Calaveras or San Andreas faults, but it could still endanger levees, Oskin said. It starts south of Napa and heads northwest, ending several miles north of Calistoga.

Identifying the length of some faults can be difficult. Stretches of the West Napa Fault, for instance, are hidden under vegetation or on private property, making access difficult.

“We rely on topography. We see increments of things happening with each successive earthquake,” Oskin said. “We were well prepared to make observations.”

Right after the quake hit, UC Davis students went out to measure the area. They were able to develop a rupture map in less than 15 hours after the quake.

The students and researchers also established there is a pattern of activity in the Napa region. They did so by comparing this year's earthquake to the magnitude 5.0 Yountville earthquake that struck in 2000. It found that both earthquakes were on the same fault and that a small portion of that fault has ruptured twice in the past 15 years.

"Earthquakes are known to cluster, so maybe that's what happened," said Oskin.

Clusters of small earthquakes do not take up enough of the accumulated strain to reduce the likelihood of larger quakes, he said.