

**Headline: Quake a reminder of risk for levees**

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The 5.6-magnitude quake that shuddered through the hills northeast of San Jose on Tuesday evening was too small and too distant to pose much threat to Delta levees, state water officials said Wednesday.

The temblor, though, did send a reminder jolt about quakes and floods in a state where levee engineers have long considered it too costly to build a system that could withstand both at once.

The U.S. Army Corps of Engineers and the state Department of Water Resources recently began re-evaluating how much quake protection a levee truly needs.

The issue will take on new importance as the state begins to spend billions in bond money aimed at reinforcing a system of aging earthen walls that protect Sacramento and other communities from floodwaters.

"We have been trying to decide how to come to grips with seismic issues for levees," said Les Harder, the state's deputy director of Water Resources.

As recently as last year, John Hess, a top engineer with the Army Corps of Engineers in Sacramento, summed up the old view succinctly. The chance of a big quake coming just when high water puts levees under the most structural stress, Hess told the Bee, "is so rare and so incredible that no one would ever design levees for it."

Now, though, the corps is working on a technical document that will revisit that view, and probably change it, setting new guidelines for how levees should be certified, said corps spokesman Dave Killam.

In addition, the Water Resources Department expects to come out in the next two to three years with updated quake safety guidelines for urban levees that protect the biggest population centers. That will be followed by a statewide plan for 1,600 miles of levees by 2012.

"It could be we decide it's still not worth fixing thousands of miles of levees," said Harder. Instead, the state might opt in some areas for "a more robust repair scheme" that could mobilize quickly on post-quake levee fixes.

One area that's especially vulnerable to earthquakes is the Delta. Unlike Sacramento levees, which hold back floodwaters only rarely, the levees around Delta islands are under pressure daily from the waters where bay and river mingle.

The state has estimated a massive quake near the Delta could flood as many as 20 or 30 islands, with an in-rush of saltwater that could disable the system that pumps drinking water to much of California. Worst-case damages could reach \$60 billion, Harder said.

Moderate quakes like Tuesday's aren't what the state worries about.

"We don't expect to see serious damage until we're up in the 6-magnitude, or 6.5, and that would have to be fairly close ... either within the Delta or on the western edge," Harder said.

Still, the Water Resources Department did coordinate with local levee districts and sent a few engineers out on patrol in the Delta on Wednesday. No damage was found.

Inspections also were conducted along south bay and coastal roads by about two dozen state Transportation Department workers immediately after Tuesday's quake, but no problems were found, spokeswoman Lauren Wonder said.

The 5.6-magnitude quake, centered in rolling hills about nine miles northeast of downtown San Jose, was "right at the threshold of events that can cause damage," said Jack Boatwright, a seismologist with the U.S. Geological Survey in Menlo Park.

There were some toppled chimneys on ranch buildings in what's now a park, and some broken windows, but overall "we got a little bit lucky," Boatwright said. The quake's force "was sort of pointed away from where people live."

The quake, on the Calaveras Fault near its juncture with the Hayward fault, might be a precursor of more seismic activity on the Hayward Fault, Boatwright said.

The state Office of Emergency Services said the temblor has "significantly increased" quake prospects along the Hayward Fault, which slashes through densely populated East Bay communities. It urged Bay Area residents and government agencies to review their emergency plans.