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## Early quake warning system touted for Calif.

**Samantha Zee**  
Bloomberg News  
Nov. 10, 2005 12:00 AM

San Francisco Bay area residents and businesses may have a chance to prepare, however briefly, before an earthquake strikes since scientists have found a way to give warning, a study published in *Nature* shows.

San Francisco may receive as much as 20 seconds' warning of an impending temblor, said the study's co-author, Richard Allen of the University of California-Berkeley. The warning would come after a rupture has begun but before the shaking is felt tens of miles from the epicenter.

"It may be easier to give San Francisco an earlier warning of an earthquake than other U.S. cities because it is in a unique place," Allen, an assistant professor of Earth and planetary science, said in an interview. "That's because the city sits between the San Andreas and Hayward fault lines."

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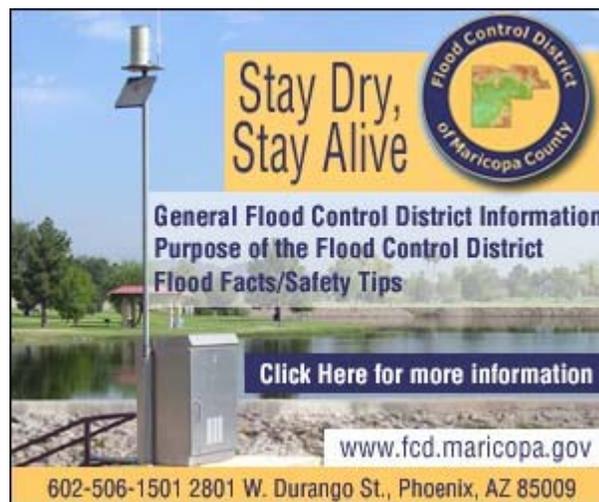
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along the northern half of the San Andreas Fault, an 806-mile fissure that runs almost the length of California. The city's downtown area lies less than six miles north of the fault, along which two of the most devastating earthquakes in the region have occurred in the past 100 years.

If a rupture occurred at the extreme northern end, the shock wave would take 80 seconds,

traveling nearly 2 miles per second, to reach San Francisco, the study said.

An early warning system could provide a critical buffer for residents, businesses and emergency responders, even if the time isn't sufficient to evacuate a building, the study said.

Utilities could shut down or isolate their systems, telecommunications companies reroute their traffic and airports halt takeoffs and landings.

Allen and co-author Erik Olson, a former graduate student at the University of Wisconsin at Madison, developed a way to predict the magnitude of the quake and its destructive potential within seconds of a rupture, before the quake is felt.

"When an earthquake has started, we can rapidly estimate what the magnitude is going to be, and that gives us a methodology for an earthquake early-warning system," Allen said. "We can tell the magnitude before the rupture is complete."

Allen and his colleagues are testing a system, called ElarmS, that would make such predictions, and the researchers are working with the U.S. Geological Survey to determine how accurate these warnings would be.

The ElarmS system, found at [www.elarms.org](http://www.elarms.org), could also warn rescue personnel of aftershocks, which can knock down unstable debris.

Any form of advance warning would be an advantage to a city like San Francisco, which the U.S. Geological Survey says has a 62 percent chance of an earthquake

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with a magnitude of 6.7 or greater before 2032.

A warning system "could be applied to any earth-quake prone region," Allen said.

"There are warning systems in Japan, Taiwan, Mexico and Turkey, which all use different approaches to estimate the hazard, but there isn't a warning system in the U.S.," he said. "It would be very useful to have one in the Pacific Northwest."

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