News

Posted on Thu, May. 01, 2003

Early-warning system could alert to impending earthquakes

BY SUSANNE QUICK
Milwaukee Journal Sentinel

MILWAUKEE -(KRT) - Scientists have developed an earthquake early-warning system that could give southern Californians a few precious seconds to get under a desk, shut down a commercial operation, get away from dangerous chemicals or high-tail it off a bridge.

Taking advantage of the low-energy pressure waves, called P-waves, that precede the more destructive earth-crashing surges, the S-waves, researchers believe this system could be used to provide at least some warning to people in compromising or dangerous positions.

"If you were directly over the epicenter, you'd maybe have anywhere from zero, one to three seconds," said Richard Allen, a professor of geology and geophysics at the University of Wisconsin-Madison and co-author of the paper in today's issue of Science.

"The farther away you are, the more time you'll have," he said. "But any warning time is helpful, even if it means just taking a step back from the hazardous materials you might be working with."

The system capitalizes on a dense network of sensors that are already littered around southern California, called the TriNet system.

"TriNet is used right now to report, real-time, on earthquakes," said Hiroo Kanamori of the California Institute of Technology's seismic laboratory and co-author of the paper.

The system detects the frequency and magnitude of S-waves, and transmits the data to a central processing center, which then forwards that information to emergency teams - detailing where

quakes have hit and where they have hit hardest.

By monitoring P-wave activity, this system could be transformed from a post-information network to an early warning one, said Allen.

And that could be a boon to people living in earthquake-prone areas.

But early warning systems are not new to seismology, Allen said. Mexico, Japan and Taiwan all have some form of alarm system set up.

However, these systems wouldn't be effective in the fault-ridden geological landscape of southern California, said Allen.

"There are two kinds of early warning systems," he said. "Front line and P-wave."

Taiwan and Mexico City use a front-line system. These kinds of systems detect earthquakes as they happen and then electronically transmit a warning to nearby cities and towns.

This system can only work if the populated areas are far enough from the shifting or crashing faults to receive the information before the quake.

For instance, Mexico City is more than 150 miles from its earthquake source, and therefore usually has about 70 seconds of headway before it's struck, Kanamori said.

But, Los Angeles straddles a web of dangerous fault zones, so any warning from such a system would probably come at the same time - or after - buildings and freeways started shaking.

And while P-waves have been used in Japan, there isn't a dense system of sensors like TriNet. And that's what makes Allen and Kanamori's system unique.

Michael Reichle, assistant director of the California's Geological Survey's department of conservation, thinks this new system has promise.

"This is something we've been talking about for a long time," he said. "This is a method that could be used to give us an estimate of how big the quake's going to be and when and where it's going to hit hardest."

Allen and Kanamori are now testing their system on earthquakes in the Los Angeles region to determine if it can provide accurate magnitude estimates in real time. There are no immediate plans to develop an actual warning system.

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"We've still got to work out a few bugs," said Allen. "Like false alarm issues."

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