

# Early warning for earthquakes on West Coast possible

**Mike Taugher, Bay Area News Group, 4-6-11**

Earthquake researchers say an early warning system in Japan saved lives and that a similar system should be built on the West Coast.

"We feel the U.S. deserves a similar type of system to what Japan already has," a UC Berkeley scientist said Tuesday.

"Early warning is a technical reality and we really should be pushing forward," added Richard Allen, associate director of the UC Berkeley Seismological Laboratory.

Mexico, Taiwan, Turkey and Romania also have early warning systems that were installed after deadly earthquakes.

"It's our hope that it won't take a killer earthquake in the U.S. to realize this system," said Doug Given, earthquake early warning coordinator at the U.S. Geological Survey.

They made their comments after a two-day meeting at UC Berkeley of seismologists, industry and government representatives, and participants. They said, budget issues notwithstanding, they were confident that such a system could give Californians a warning of a few seconds up to a minute ahead of a major earthquake.

That might be enough to stop or slow trains enough to avert derailments, halt surgeries, open elevator doors and warn students and workers to seek safety.

In Japan, the warning system was transmitted to computer screens and to schools March 11, giving five to 10 seconds warning to Sendai, the closest city to the epicenter, and about 25 to 30 seconds to Tokyo.

Allen showed a YouTube video from Japan where a computer user started filming after a screen popped up depicting the epicenter off the Japanese coast in bright red and a 28-second countdown to the earthquake.

Several seconds later, the videographer's television monitor started rocking gently on a shelf.

The shaking grew much stronger and the television at one point appeared close to falling over.

Early warning is made possible by taking advantage of the differences in two types of seismic waves that occur in all earthquakes. The first type is less damaging but faster-moving -- it's the wave that feels like a sudden bump.

Sensors can determine whether those waves portend a big earthquake and can send out electronic warnings faster than the more damaging, and slower moving, waves, which roll along like the ocean.

Because the system essentially is a bid to outrace the slower waves, the closer you are to the epicenter, the less warning you get.

That means an earthquake centered in the Bay Area might hit with a warning of just a few seconds, or less.

In the 1989 Loma Prieta earthquake centered in the Santa Cruz Mountains, such a system could have given 20 seconds of warning to Oakland and San Francisco, where most of the 60 fatalities occurred, Allen said.

It would take about \$80 million and five years to turn a prototype 400-sensor system into a fully functioning statewide early warning system, Allen said.

More sensors would have to be installed, some existing sensors would need to be upgraded, software would have to be retooled, equipment would have to be fortified to withstand earthquakes and information generated by the system would have to be communicated to utilities, personal computers and cellphones, schools, emergency responders and others.

Seismologists have predicted a 2-in-3 chance that a magnitude 6.7 or greater earthquake will hit the Bay Area by 2036.