

# Scientists Test Early Earthquake Warning Systems

Maggy Patrick, ABC News, 9-21-11

Six months after the massive earthquake in Japan, scientists in this country have started testing out a new warning system to alert Americans before a big quake.

The experiments are under way in California, ground zero of seismic activity in the United States, and though it might only provide a few seconds' warning, scientists say even that can make a big difference and save lives.

The National Research Council presented a 20-year road map to preparing the country for earthquakes, including quietly testing new warning systems in California. One early test involves a map of the state lighting up on a computer screen, with a red dot signifying an earthquake's point of origin. A clock then appears signaling a countdown to impact at key locations miles away from the starting point.

The system only saves seconds at this point, and is not yet broadcast to residents or businesses. With more testing, scientists hope to create an early warning system similar to one in Japan that sends out text messages and interrupts television programs when sensors detect a quake. It cost the Japanese \$500 million to create, but is credited with saving lives during the 9.1-magnitude earthquake that caused a devastating tsunami in March.

The American system is designed to sense the first beats of energy after a fault breaks and estimate the magnitude based on that limited information. A web of underground sensors can detect the different types of waves that come through -- the first "P" or primary wave that causes less damage, or the secondary "S" wave -- and issue an instant warning.

Project Chief Doug Given of the U.S. Geological Survey said trains can be stopped or slowed, air traffic controllers can stop take-offs or landings, power plants and factories can close valves, and children can dive under their desks for cover -- all in the matter of those seconds given in the warning.

The project is under way after scientists recognized that the U.S. has fallen behind other earthquake-prone countries that have taken steps toward developing a system of their own. Japan unveiled the first early warning network in the world in 2007. Mexico, Taiwan and Turkey have also created their own systems, although they are less sophisticated.

The United States has been testing three different warning systems since 2006, and launched a prototype known as "ShakeAlert" in February. For now, messages are only sent to about 30 scientists at USGS, California Institute of Technology and the University of California at Berkeley, where scientists are working out software problems with a very small budget.

The USGS has spent \$2 million on the project so far, but researchers believe it will cost an estimated \$80 million over five years to create a statewide alert system for the public.

"It's not perfect," Berkeley seismologist Richard Allen said. "Frankly, it's stuck together with duct tape, but it's operational."

Not all warning systems require much money. One 14-year-old in Chile rigged a \$75 quake alarm to his

computer and sends out warnings on his Twitter account. More than 70,000 people follow him, and so far, he's been accurate.

But the stakes are high in a business like this. Right now seven scientists are on trial in Italy for manslaughter for not informing the public of small tremors that led to a big earthquake that killed more than 300 people.

Now the scientists in the United States are looking to partner with private businesses to test the system around the country, with the Southern California Earthquake Center to independently verify if it indeed gives the warning that people were hoping to get.