

White House renews commitment to earthquake early warning system designed at UC Berkeley

By **Robert Sanders**, Media relations | FEBRUARY 2, 2016



The Obama administration and members of Congress today renewed their commitment to funding an earthquake early warning system along the Pacific Coast, with UC Berkeley's Richard Allen predicting that such a system could reduce injuries from an earthquake by at least 50 percent.

"The question is, 'Are we ready?'" Allen said during an Earthquake Resilience Summit at the White House. "I don't think that we are quite ready yet, but the fact that we are meeting here today means there is an opportunity to push this project forward and move to a full-blown earthquake early warning system in the next few years."

ShakeAlert: An earthquake warning from your cellphone



ShakeAlert is a prototype earthquake early warning system for the West Coast that was designed at UC Berkeley. ShakeAlert for cellphones would warn users when ground shaking from a nearby earthquake will reach them, allowing time to duck and cover, as in this video dramatization. Video by Roxanne Makasdjian and Stephen McNally, UC Berkeley.

The federal government appropriated \$8.2 million in this year's budget to test and improve a prototype early warning system called ShakeAlert, designed at UC Berkeley and now being tested along the West Coast. The total cost to set up such a network, however, is estimated to be \$38 million for the entire West Coast, with an additional \$16.1 million per year to maintain it.

The Gordon and Betty Moore Foundation, which has provided \$6.5 million to the research effort since 2011, announced today an additional commitment of \$3.6 million. The funds will go to UC Berkeley, Caltech and the University of Washington to support further research behind the technology to detect earthquakes, determine an earthquake's likely magnitude and provide a warning before shaking begins.

UC Berkeley scientists, led by Allen, will receive \$1 million of this to pursue a novel method to detect the shaking caused by earthquakes using sensors in smart phones designed to detect the orientation of the phone. Allen and his team are creating an app that could enhance early warning in places that already have seismic networks and early warning systems, including Japan, Turkey and Mexico, and provide the only seismic network in countries now lacking such systems, such as Nepal and Peru.

ShakeAlert

Earthquake early warning technology already works, as was demonstrated during the magnitude 6 Napa earthquake in 2014, when ShakeAlert provided Berkeley and other San Francisco area agencies with five seconds of warning. ShakeAlert is being tested by utilities, transportation systems and cities in the Los Angeles, San Francisco and Seattle areas, including BART, which hopes to use the warnings to slow or stop trains in advance of shaking.

Allen said that warnings could be provided via TV, computer and PA systems, as well as through the most ubiquitous electronic device today, the cellphone: "a warning in your pocket," Allen said.

The federal and Moore Foundation funding has taken the ShakeAlert system from its current demonstration version to a "production prototype" able to assess shaking detected by in-ground sensors distributed around the West Coast and issue a warning within one second. To reach full public operation, however, the system needs about one thousand more sensors in California, Oregon and Washington, more reliable telecommunications paths, and a campaign to educate the public about earthquake early warning alerts and how to respond to them.

Depending on the location of the quake, San Francisco could get 60-90 seconds of warning before the strongest shaking hits from a rupture on the northern part of the San Andreas Fault.

More likely, warning will give people seconds to tens of seconds to duck and cover or allow doctors to pause surgery. Systems are being developed to automatically open fire station doors so that trucks will not be trapped inside, direct elevators to the nearest floor and open the door and stop sensitive chemical processes to lessen the chance of spills.

The Earthquake Resilience Summit was hosted by John Holdren, the director of the White House Office of Science and Technology Policy (OSTP), and included remarks from Interior Secretary Sally Jewell, a resident of Seattle, which is potentially subject to a major quake from the Cascadia subduction zone off the coast.

The **summit**, streamed live from the White House, coincided with an announcement today by President Obama of an **executive order** establishing an Interagency Committee on Seismic Safety in Construction to make sure that all federal buildings, included leased space, are up to earthquake codes and standards to ensure that they are fully earthquake resilient and that employees are safe.

Earthquake risk

In his remarks, Holdren noted that Oregon and Washington have an estimated 15 percent chance of a magnitude 8-9 quake during the next 50 years, and an early warning system could potentially provide up to five minutes' warning. An early warning system would also provide alerts about tsunamis, one of the major threats of a Pacific Northwest quake.

By comparison, California has a 99.7 percent chance of a magnitude 6 or greater quake in the next 30 years. In past California quakes, half of all injuries were from falling objects. Even just a few seconds of warning would allow people to "duck, cover and hold on," preventing such injuries, Allen said.

In addition to the \$1 million to UC Berkeley, the Moore Foundation will give \$1 million each to Caltech scientists to develop a humanlike decision-making process to gather information from seismic networks to issue prompt and reliable alerts, and to University of Washington scientists to study implementation of a network of sensors on the ocean floor to provide early warning for earthquakes from the Cascadia subduction zone.

"We are delighted to advance the science of earthquakes in a way that promises a great benefit to the public," said Robert Kirshner, Ph.D., chief program officer for science at the Gordon and Betty Moore Foundation. "Supporting excellent scientists to learn more about nature while creating a warning system that can save lives and property is an objective we are proud to support."



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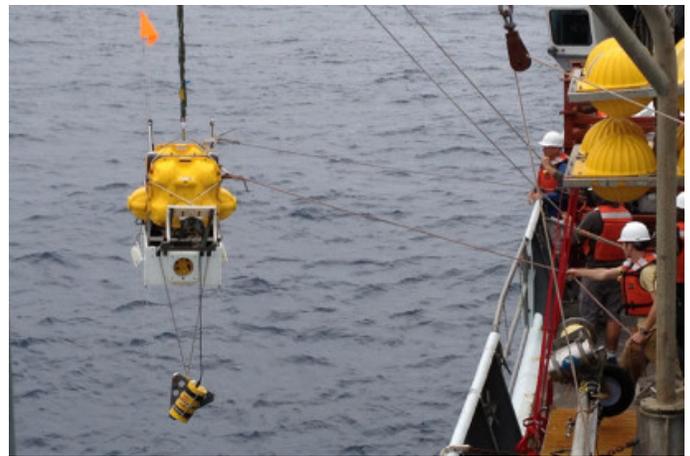
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