



Advancing Earthquake Resilience

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Summary: Public and private sectors taking steps to improve earthquake warning and safety.

At a White House summit today, the Administration, together with public and private stakeholders, is announcing important steps toward a future with greater earthquake safety based on the latest building codes and earthquake warning technologies. Among the actions is a new Executive Order signed by President Obama to set earthquake guidelines for Federal facilities. And Federal, State, local, public, and private stakeholders are announcing [a series of new actions and investments](#) that will help bring a reliable, extensive earthquake early-warning system closer to reality.



Tamara Dickinson, far left, of the White House Office of Science and Technology Policy with panelists, left to right, Suzette Kimball, USGS Director; Andrew Phelps, Oregon Office of Emergency Management; and Christina Curry of the California Office of Emergency Services.

Federal Earthquake Risk Management Standard

This Administration is committed to strengthening the security and resilience of the Nation against natural hazards to ensure public safety, economic strength, and national security. Toward this end, today the White House released an [Executive Order: Establishing a Federal Earthquake Risk Management Standard](#), which establishes a new, updated standard to (1) improve the resilience and enhance the capability of essential Federal buildings to function during and after an earthquake, and (2) reduce risk to the lives of persons who would be affected by earthquake failures in federally-owned, leased, assisted, and regulated buildings.

This new Executive Order (EO) formally revokes EO 12699 (January 1990): *Seismic Safety of Federal and Federally Assisted or Regulated New Building Construction* and EO 12941 (December 1994): *Seismic Safety of Existing Federally Owned or Leased Buildings*. Those EOs were issued in response to the California Loma Prieta and Northridge earthquakes, respectively. At the time they were issued, more than 20 years ago, the United States did not have national model seismic building codes and standards like those now available and being adopted today.



Lucy Jones, left, of the USGS with Alice Hill of the White House National Security Council.

Earthquake Early Warnings

Earthquakes can occur throughout the United States. The West Coast of the contiguous United States, along with Alaska, is especially vulnerable to serious earthquakes that can cause significant economic losses as well as human injury and death. One particular earthquake fault – the Cascadia Subduction Zone, which runs north from California past Oregon and Washington and ends off the coast of Vancouver Island, Canada – appears poised to deliver an earthquake and tsunami that would rival the 2011 Tohoku event. In southern California, a magnitude 7.8 earthquake on the San Andreas Fault could result in more than [50,000 casualties and \\$200 billion in damage](#).

An earthquake early warning system can reduce both human and financial losses by ensuring that people know when a quake is coming and can take steps to prepare. Such a system detects the initial, fast-moving, typically non-damaging “P waves” of an earthquake and analyzes these to determine the size and trajectory of the slower-moving and more damaging “S waves.”

Since the initial “S waves” travel slower than telecommunications systems, warnings can be sent ahead so people can take immediate action. They can drop, cover, and hold; turn off stoves; stop vehicles; and interrupt delicate or hazardous work (e.g., surgeries, construction). Automated systems can slow or stop trains to avoid derailments; open emergency vehicle bays so fire- and medical-response vehicles are ready to deploy; and place delicate and expensive equipment into a

safe mode to avoid shake damage. Also, integrating the earthquake early-warning system with the existing tsunami warning system can provide maximum time for evacuation.

Based on work by scientists and engineers at universities and at the United States Geologic Survey, as well as in other countries, a demonstration earthquake early-warning system has been developed and is in advanced testing phase in California, Oregon, and Washington. The system has sent live alerts to dozens of test users for more than two years, and the development of the system is being closely coordinated with State emergency managers. The performance of the system has been impressive. For example, accurate alerts were conveyed just four seconds after the start of the magnitude 6.0 earthquake in Napa California in August 2014, providing warning to scientists in the town of Napa nine seconds before the quake struck there.

Today's event reflects a whole-community approach in using the best possible science and technology for earthquake detection and warning and to develop resilience that will last.

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