nehrp SeismicWaves
How the National Earthquake Hazards Reduction Program Is Advancing Earthquake Safety
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The Benefits and Success of ShakeAlert

In the time it takes you to read this sentence, you could Drop, Cover, and Hold On – important steps to protect yourself during an earthquake. Seconds of warning before earthquake shaking arrives can give you time to get into a safe position and allow facilities to trigger automated safety actions. The U.S. Geological Survey-managed ShakeAlert® Earthquake Early Warning System is designed to provide those useful seconds of warning. The ShakeAlert System is a partnership with state and federal agencies, universities, and private funders across the West Coast and uses earthquake science and technology to quickly detect significant quakes.

How does it all work?

The ShakeAlert System first detects ground motion from an earthquake by using a growing network of over 1,500 seismic sensors installed across the West Coast. The goal is to have 1,675 stations contributing to the System by the end of 2025.

Ground motion data is sent to a processing center that estimates the location, magnitude, and shaking intensity of the earthquake in seconds. If it's large enough to meet USGS alerting thresholds in magnitude and shaking intensity, USGS issues a "ShakeAlert Message" that gets transmitted to USGS-licensed Alert Delivery Partners who deliver alerts to people or trigger automated actions.

How much warning you get, and if you get an alert, depends on several factors, including how far you are from the epicenter. Using USGS alert delivery guidelines, ShakeAlert Technical Partners set their own alerting thresholds, appropriate to the application.

ShakeAlert can protect people and infrastructure by triggering automatic actions like slowing down trains to prevent derailments, opening firehouse doors so they don't jam shut, and closing valves to protect water systems.

A ShakeAlert Message is an early warning from a network system that detects significant earthquakes quickly enough so that alerts can be delivered to people and automated systems potentially seconds before shaking arrives.

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Getting an alert on your phone

There are several ways to get ShakeAlert-powered alerts on a cell phone.

- Wireless Emergency Alert system (https://www.fcc.gov/consumers/guides/wireless-emergency-alerts-wea): a public safety system that allows people who own compatible mobile devices to receive geographically targeted, text-like messages alerting them of impending shaking from a nearby earthquake.
- Google (https://blog.google/products/android/earthquake-detection-and-alerts/): an integrated ShakeAlert-powered earthquake alert feature that is part of the Android Operating System. This service is available in California, Oregon, and Washington on Android-based cell phones.
- MyShake™ (https://myshake.berkeley.edu/): an app developed by UC Berkeley and sponsored by the California Governor's Office of Emergency Services (Cal OES). MyShake is currently operating in California, Oregon, and Washington.
- ShakeReadySD (https://www.alertsandiego.org/en-us/preparedness/SDEmergencyApp.html) a component of the Alert San Diego app that provides ShakeAlert-powered Earthquake Early Warning alerts. ShakeReadySD only delivers alerts to phones in California.

Getting an alert in a facility powered by ShakeAlert

Facilities have been implementing services that are powered by ShakeAlert; here are some examples of partners.

- The Los Angeles Metropolitan Transportation Authority (LA Metro) provides alerts to employees that an earthquake is occurring, and shaking is expected. The agency's system sends alerts to prompt operations staff to start earthquake response procedures to secure people and property.
- Providence Medford Medical Center in Oregon is fully integrated with the ShakeAlert system to make an overhead announcement: “Earthquake alert – Drop, Cover, Hold On.”
- The Santa Monica Library in southern California uses overhead speakers to alert patrons and staff to drop, cover, and hold on before shaking arrives.

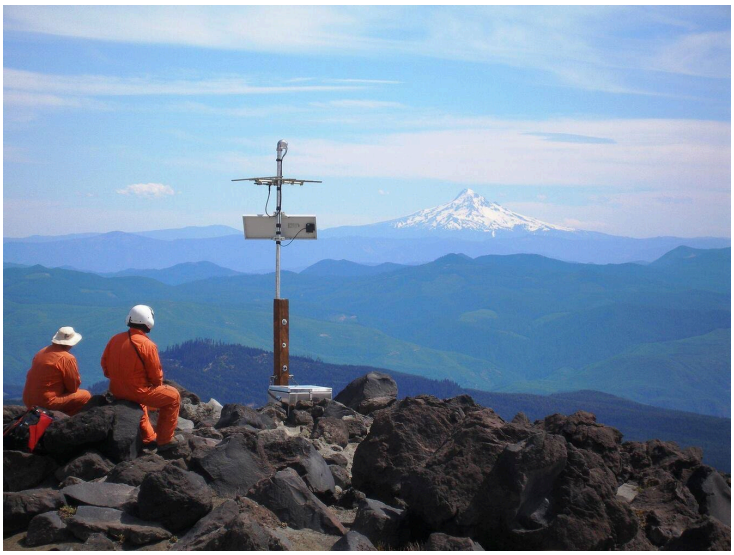
Staying safe with automated actions powered by ShakeAlert

Automated actions can help save life and property. Here are some partners who are part of the ShakeAlert System.

- The San Francisco Bay Area Rapid Transit District’s (BART’s) pioneering system powered by ShakeAlert triggers automated actions, like slowing trains.
- The Southern California Regional Rail Authority (Metrolink) adopted a new technology that uses ShakeAlert data to automatically apply the brakes to safely slow trains when an earthquake occurs.
- The City of Grants Pass, Public Works Department in Oregon works with ShakeAlert partner RH2 to close valves at water reservoirs and shuts off waterways when an earthquake is detected to prevent water loss from pipes that might burst during shaking.

What powers ShakeAlert

ShakeAlert is being built upon existing seismic monitoring capabilities that are part of the Advanced National Seismic System (ANSS), a USGS responsibility under the Earthquake Hazards Reduction Act, which establishes the four-agency National Earthquake Hazards Reduction Program. The USGS, with additional support from the states of California, Oregon and Washington, is supporting the expansion and upgrading of regional seismic networks that are part of the ANSS, including the Pacific Northwest Seismic Network and the California Integrated Seismic Network. In California, the California Governor's Office of Emergency Services (Cal OES), with partners, also supports the California Earthquake Early Warning (CEEW) Program to develop this EEW capability for the State.



Source/Usage: Some content may have restrictions. Visit Media (https://www.usgs.gov/media/images/two-engineers-sit-top-mount-st-helens-seismometer) to see details. Field engineers with the Pacific Northwest Seismic Network team at the University of Washington, install earthquake monitoring equipment on the slopes of Mount St. Helens, with Mount Hood in the distance.

ShakeAlert is a people-focused earthquake early warning system. An extensive team oversees communication, education, outreach, and technical engagement. To ensure that the ShakeAlert System keeps people as safe as possible, the team recruits new Technical Partners, improves how people use ShakeAlert System through social science studies, and creates educational materials that can be used in schools, museums, and in many other settings.

To learn how to become powered by ShakeAlert, visit https://drive.google.com/file/d/13sEXorNwSTstXle2UwD7v8Vt3Ds8Idx9/view