

**EARTHQUAKE
WARNING
CALIFORNIA**



CA Earthquake Early Warning Program

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Meeting Purpose

Provide a high-level overview of the California Earthquake Early Warning System (CEEWS).

Present key initiatives and projects.

Receive feedback and answer questions.

High-level overview: Vision

Save lives & protect property in an earthquake.

The system uses sensors across the state to detect earthquakes before humans can feel them and sends alerts to areas that could experience damaging levels of shaking.

The system still is in the buildout phase.

High-level overview: The team

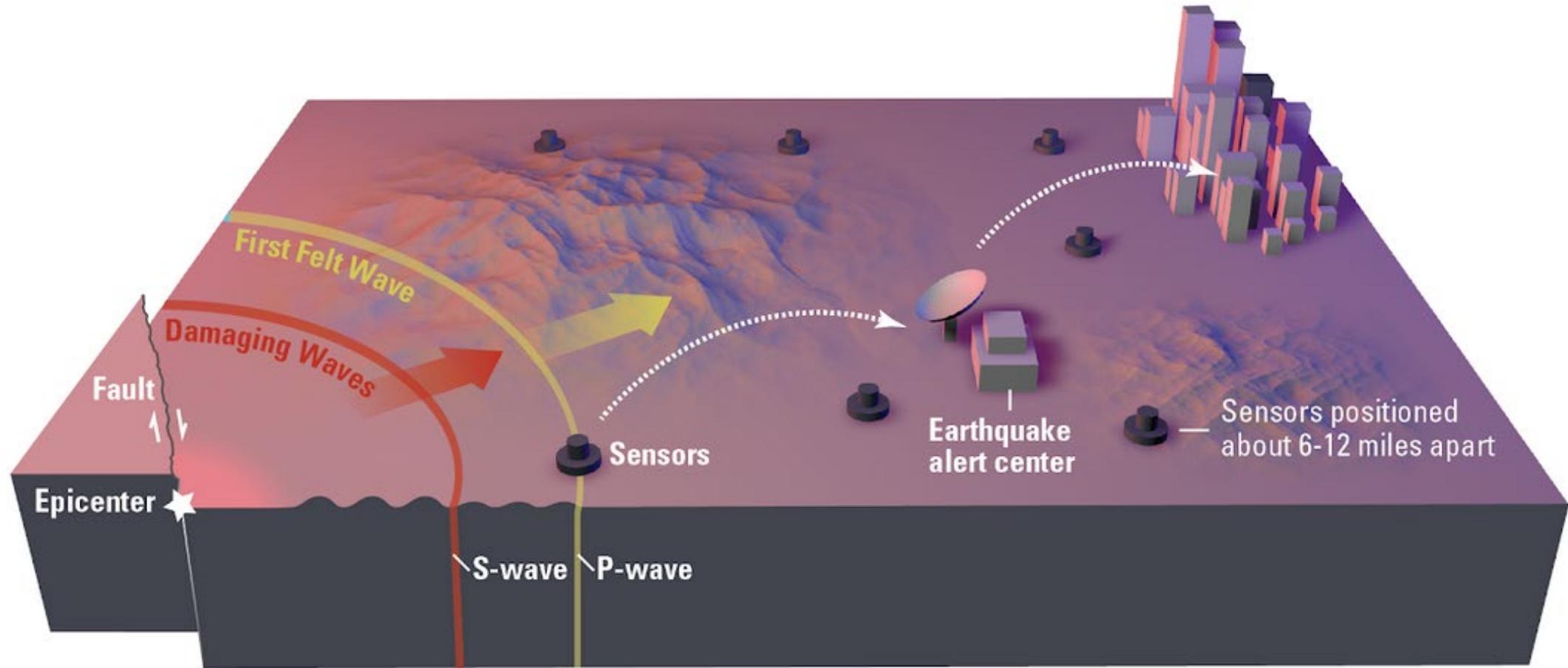
We work with State, federal, and university partners on science, technology, and public implementation.



Cal OES roles:

- Fund system buildout
- Fund research & development to improve system
- Conduct education & outreach

High-level overview: How it works



<https://www.caloes.ca.gov/cal-oes-divisions/earthquake-tsunami-volcano-programs/california-earthquake-early-warning-program>

High-level overview: Installing final stations

1,115 seismic stations needed

- 853 installed
- 262 stations funded

Almost there!

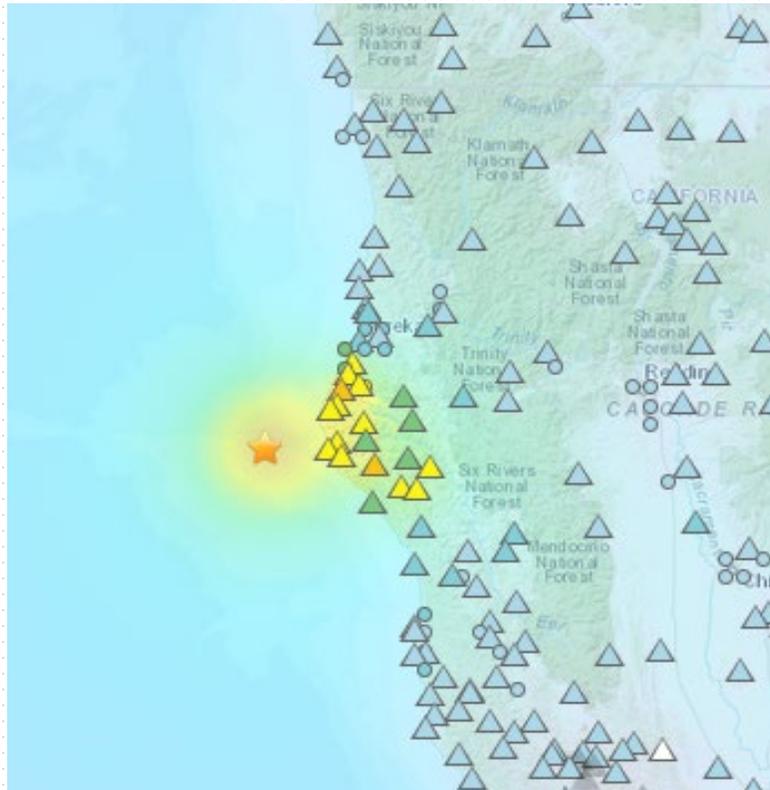


High-level overview: Important caveats

- Alerts are only sent to areas that might experience damaging levels of shaking.
 - Level of shaking depends on many factors, including earthquake magnitude and your distance away.
- The system only detects earthquakes in progress—in some cases there might be little or no warning from the system.
 - In most cases, alerts are sent within 20 seconds

High-level overview: Example

Petrolia earthquake (6.2 magnitude; December 20, 2021)
Alert sent in 11 seconds, gave users 0-15 seconds warning.



Los Angeles Times

James Kicklighter, a film director who lives in Los Angeles, was on a family trip across California and had made a stop in Eureka for lunch when the quake struck.

As he pulled into a restaurant's parking lot, Kicklighter received an alert from the state's [MyShake app](#). Kicklighter parked the car, and 15 seconds later, he and his husband, mom, stepdad and aunt watched as the pavement wobbled and the trees and buildings swayed.

Key projects: Public information

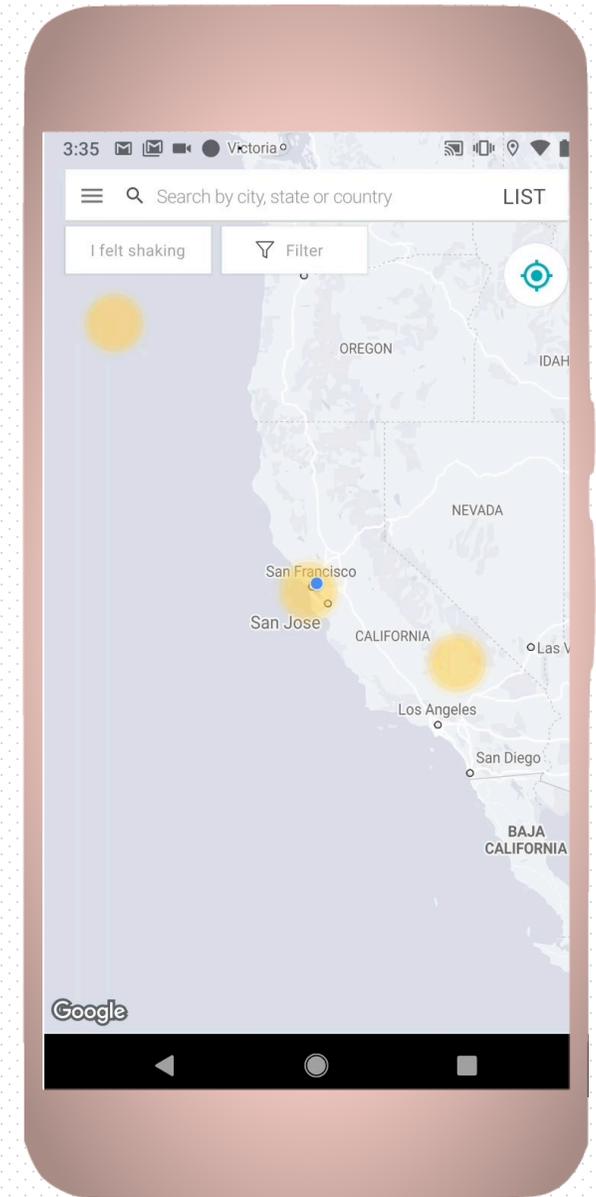


Public information campaign to help Californians access the best information to prepare for earthquakes.

High-level overview: Phone alerts



- Free app, funded by Cal OES & built by UC Berkeley
- Delivers earthquake alerts and other information
- Strong privacy protections



High-level overview: Phone alerts

ALERTING THRESHOLDS



INTENSITY	SHAKING
I	Not felt
II	Weak
III	Weak
IV	Light
V	Moderate
VI	Strong
VII	Very Strong
VIII	Severe
IX	Violent
X	Extreme

WIRELESS EMERGENCY ALERTS

WEA used in response to magnitude 5.0 earthquake to people who will experience shaking level IV (light) or greater.

MyShake

MyShake alerts used in response to magnitude 4.5 earthquake to people who will experience shaking level III (weak) or greater.

android

Android alerts used in response to magnitude 4.5 earthquake to people who will experience shaking level III (weak) or greater.

<https://earthquake.ca.gov/get-alerts/>

What should I do if I feel an earthquake or receive an earthquake alert?

Key projects: Public information

If Possible



Using Walker



Using Cane



Using Wheelchair



For more examples: <https://www.earthquakecountry.org/step5/>

High-level overview: System alerts

First Responder Mobilization – Open fire station doors for rapid deployment of emergency response equipment and personnel.

Health Care – Notify medical providers to stabilize and/or stop delicate procedures and maintain critical medical facility operations.

Utility Infrastructure - Safeguard energy sector grid and other utilities infrastructure for strong shaking with warning alarms and automatic controls to prevent combustions, flooding, and loss of water distribution systems.

Mass Transit Systems – Prevent fatal collisions or derailments by automatically slowing and/or stopping trains, clearing bridges, and diverting inbound airport traffic.

Workplace Safety – Employees take protective actions, initiate elevator recall procedures to ground floor, place sensitive equipment in safe mode, secure hazardous materials, and halt production lines to reduce damage.

Residence Safety -- Residents take protective actions, initiate elevator recall procedures to ground floor, and initiate actions to prevent residential fires.

Upcoming: expanding alert availability

First Responder Mobilization
Health Care
Utility Infrastructure

Mass Transit Systems
Workplace Safety
Residence Safety

Have ideas for specific use cases? Know of a building in a high-earthquake-risk area that might be interested to explore earthquake early warning?

Please let me know!
alistair.hayden@caloes.ca.gov

Other opportunities

- Please help us promote the MyShake app (it's free!)
 - I can send you draft language, fliers, etc.
- To get onto the list for MyShake focus group participants you can email myshake-info@berkeley.edu
- Participate in Great ShakeOut drills (October 20, 2022)
- Please send any feedback or ideas for Earthquake Early Warning to alistair.hayden@caloes.ca.gov

Resources

Sign up for earthquake alerts: <https://earthquake.ca.gov/>

Find hazards for where you live: <https://myhazards.caloes.ca.gov/>

Information from our partners:

<https://www.shakeout.org/california/>

<https://www.shakealert.org/>

A blue-tinted photograph of a coastal road. In the foreground, several cars are visible on the left side of the road. A large bus is on the right side. A speed limit sign with the number 30 is visible on the right. The road curves along a hillside with utility poles and power lines. The background shows a coastline with buildings and a body of water under a cloudy sky.

**Thank
you**