

Researchers at SSA discuss performance of earthquake early warning systems

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The future of earthquake early warning systems may be contained in smartphones—and vehicles, and "smart" appliances and the increasing number of everyday objects embedded with sensors and communication chips that connect them with a global network.

At a presentation at the 2017 Seismological Society of America's (SSA) Annual Meeting, Benjamin Brooks of the U.S. Geological Survey and colleagues will share data from a recent project in Chile that provided early detection, estimates and locations for earthquakes using a network of sensor boxes equipped with smartphones and consumer-quality GPS chips. Data collected by the sensor boxes is transmitted through an Android app developed by the researchers and analyzed to produce [earthquake](#) source models, which in turn can be used to create ground shaking forecasts and local tsunami warnings.

The sensor stations have successfully detected three magnitude 5 or larger earthquakes since December 2016, with no false alarms. Although the smartphone-based [sensors](#) in the study are distributed in a fixed network, Brooks and colleagues say, it may be possible to someday harness individual smartphones and "smart" appliances into a crowd-sourced network for earthquake early warning.

On the U.S West Coast, seismologists at the University of Washington are expanding and testing the capabilities of earthquake early warning systems already under development, such as the G-FAST [system](#) in the Pacific Northwest, and ShakeAlert in California. Brendan Crowell and

colleagues will discuss the performance of G-FAST as tested by 1300 simulated megathrust earthquakes of magnitudes between 7.5 and 9.5 in the Cascadia region. Renate Hartog will present data suggesting that the algorithms behind ShakeAlert can be configured to work for the Pacific Northwest as well as California, suggesting that a West Coast-wide earthquake early warning system could be closer to reality.

In other presentations at the SSA Annual Meeting, researchers will also discuss how earthquake early warning systems are developing ways to improve real-time ground motion alerts. Many early [warning](#) systems perform best when asked to pinpoint the magnitude and location of earthquakes, but ground motion warnings are also key to predicting and preventing infrastructure damage and destruction.

More information: "Toward Internet of Things Earthquake Early Warning: A Pilot Network in Chile" will be presented at the SSA Annual Meeting on Tuesday, April 18. All presentation abstracts for the 2017 SSA Annual Meeting can be accessed at meetings.seismosoc.org/abstracts

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