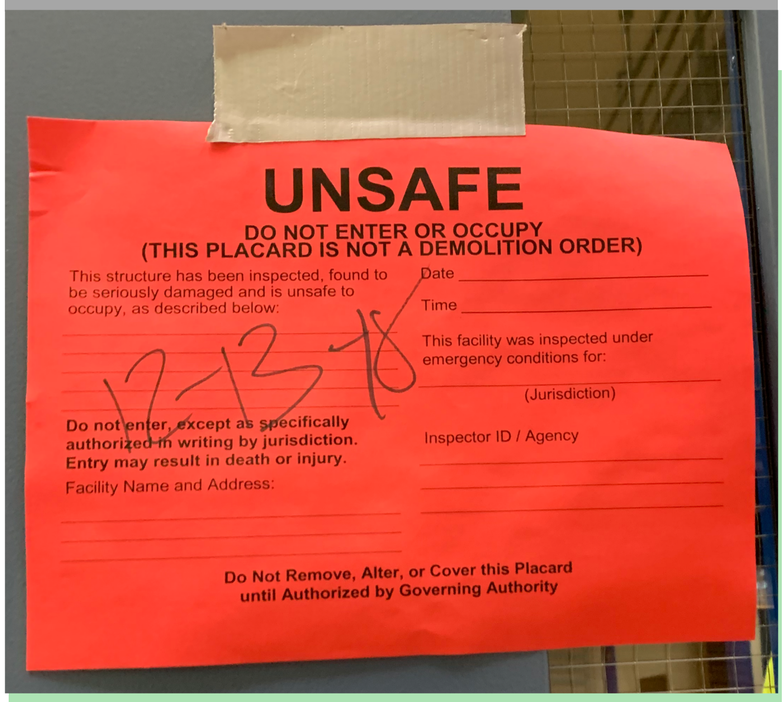
Schools, Earthquakes, and Early Warning Systems: Preliminary Findings from Alaska and California

Rachel Adams, Jolie Breeden, Jennifer Tobin, and Lori Peek,
Co-Principal Investigators
Natural Hazards Center, University of Colorado Boulder

Study Phase I



Recent **earthquake activity** in Anchorage and the Matanuska-Susitna Borough in Alaska (**November 2018**) and Ridgecrest and Trona in California (**July 2019**) underscores the importance of earthquake hazard mitigation and population- and school-level preparedness. In this first phase of the study, our team conducted qualitative research with school leaders to learn about **perceptions of Earthquake Early Warning (EEW) systems**, as well as **preparedness, response, impacts,** and **recovery** in schools affected by these recent earthquake events.

Research Methods

Study Sample: Engineers and K-12 school administrators, emergency managers, building officials, teachers, parents, and students in the Anchorage and Matanuska-Susitna School Districts in **Alaska** and the Sierra Sands Unified School District and the Trona Joint Unified School District in **California**.

Data Collection: We conducted in-depth interviews and focus groups with **88 participants** in Alaska in January and **25 participants** in California in February 2020.

Measures: We asked study participants about their recent earthquake experiences, gaps between preparedness and protective action decision-making, and their perceptions of EEW systems.

Preliminary Findings

Alaska:

- Earthquake drills occur at least two times/year in the schools
- 3 schools experienced severe damage and remain closed
- Students and staff displaced from closed locations joined other district schools
- Mixed emotional impacts were reported—parents and teacher reactions influenced students
- Most common action taken by students was to drop, cover, and hold on; some ran out of buildings
- There are mixed feelings about EEW—some respondents feel funding would be prohibitive to other safety approaches such as strengthening buildings

California:

- Earthquake drills occur at least once/year
- 2 schools remain closed
- Some students are still recovering emotionally
- Students were displaced to other district schools
- Teachers report that schools need better plans for special needs students and for students not in classrooms
- Respondents appeared receptive to EEW—but suggest it should: 1) be free and equally accessible to all schools; 2) have clear messaging and protocols for implementation; 3) offer mobile and alert system access

Discussion

Barriers to Implementing EEW:

- Limited/diverted funding
- Disruption in classroom
- Increased anxiety among students

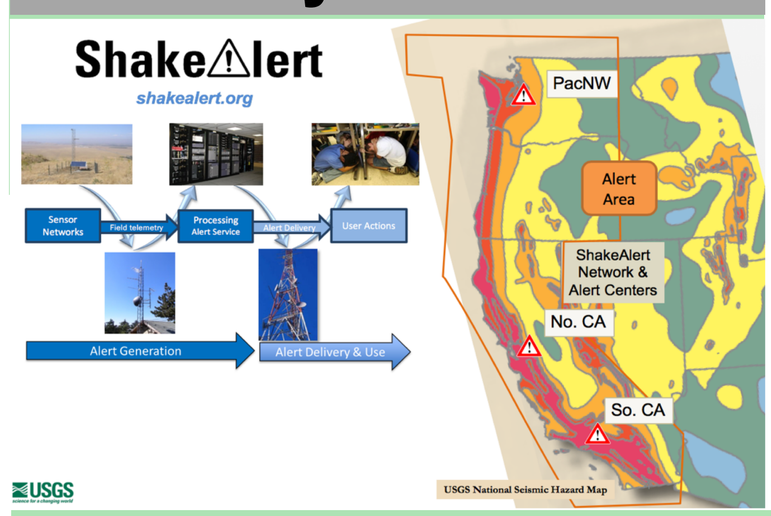
Benefits of Implementing EEW:

- Advanced warning to help students stay safe
- Reduced panic among teachers and administrators

Recommendations for Implementing EEW in Schools:

- EEW must be integrated with existing drills to be effective
- Mitigation might be more beneficial than EEW for structurally unsafe sites

Study Phase II



In October 2019, California became the first U.S. state to activate an **EEW system**. Other western states will join the network in coming years. Our team will conduct an **online survey** with school district officials in **Alaska**, **California**, **Oregon**, and **Washington** in April 2020. Specific research questions will be informed by our qualitative findings and review of the literature. We will assess preparedness levels and the readiness, willingness, and ability of districts to adopt EEW systems. We will gather recommendations for recommended protective actions, emergency preparedness, and structural mitigation.

Acknowledgments

*The Natural Hazards Center acknowledges the **USGS** for funding this study and thanks the USGS Social Science Working Group.*