

Earthquake Early Warning in the San Francisco Bay Area

What is earthquake early warning?

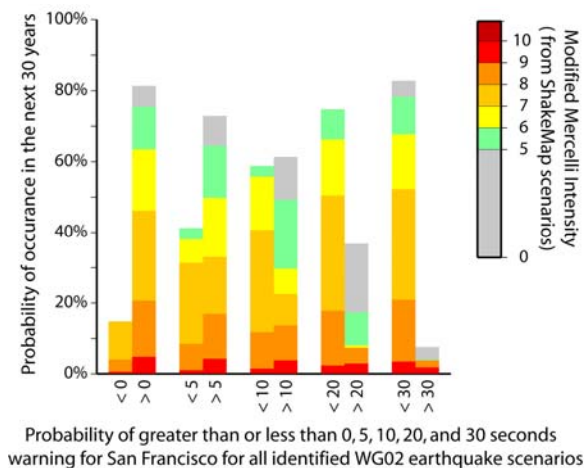
- Earthquake early warning systems can provide a few to a few tens of seconds warning prior to damaging ground shaking.
- Earthquake early warning systems are currently operational in Mexico, Taiwan and Japan but not in the United States.

Why do we need earthquake early warning?

- Current earthquake mitigation strategies focus on long-term ground shaking forecasts that can be used in building design and rapid post-event notification used for emergency response.
- Early warning systems allow for short-term mitigation including slowing and stopping of transportation systems, switching industrial and utility systems to a safe mode, and taking personal protective measures.
- Early warning would reduce the number of casualties and the cost of earthquakes in California.

What is the probability of a damaging earthquake for which a useful early warning would be available?

- The Working Group on California Earthquake Probabilities (WG02) estimates there is a 62% probability of a magnitude greater than 6.7 earthquake in the San Francisco Bay Area in the next 30 years.
- Using the ElarmS methodology* we can estimate the warning time available for any and all earthquake scenarios. WG02 provides the likely earthquake scenarios and their anticipated distribution of ground shaking.



- The figure shows the probability that an earthquake will occur within the next 30 years for which more, or less, than 0, 5, 10, 20 and 30 seconds warning would be available for the city of San Francisco.
- These warning times use only the existing seismic infrastructure in the region with a moderate improvement to telemetry.
- The color shows the intensity of ground shaking in downtown San Francisco using the ShakeMap color scale.

- **Conclusion: It is more likely than not that there would be greater than 20 seconds warning for the earthquakes most damaging to the city of San Francisco.**

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