

OREGON

IDAHO

California Geological Survey

SHAKING INTENSITY OVER 42 YEARS

A CUMULATIVE SHAKEMAP OF CALIFORNIA FROM 1981 TO 2023

Modified Mercalli Intensity (MMI) Scale

Intensity	I	II-III	IV	V	VI	VII	VIII	IX	X+
Shaking	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
Damage	None	None	None	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very heavy

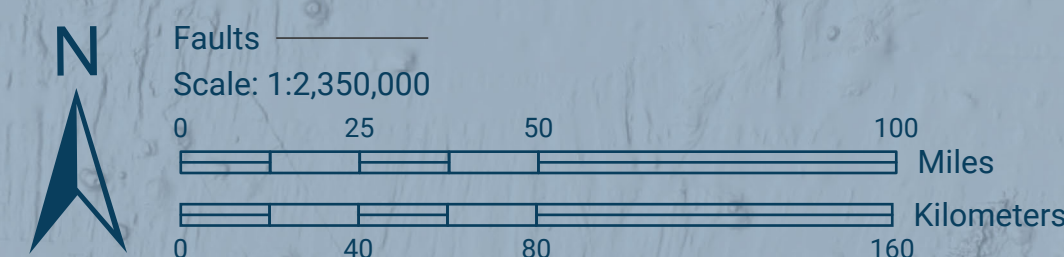
THIS MAP COMPILES ALL SHAKEMAPS GENERATED FROM 1981 TO 2023 for earthquakes of magnitude 4.0 and above. A ShakeMap is a representation of ground shaking produced by an earthquake. Specifically, ShakeMaps depict peak intensities of ground motions—acceleration and velocity—measured and recorded by seismographs.*

ShakeMaps are useful in emergency response because they portray the potential effects of earthquake shaking in a particular location. These effects can include human casualties, damage to lifelines, and how the earthquake was perceived by people in the impacted area. The effects of shaking on topography are also a feature of intensity; whether, for example, cracks, displacements, liquefaction, or landslides may have occurred.

*Occasionally, measured ground motion intensities are supplemented by eyewitness reports. Also, in areas where data are limited, prediction equations are used to estimate intensities.

Post Offices to Pixels: The Evolution of Earthquake Intensity Mapping

Historically, shaking intensities were derived in the months following an earthquake through questionnaires sent to post offices in the impacted area. Postal officials were asked to report the effects of shaking in their district and their observations were combined with those of scientists and engineers. When all the questionnaires and observations were combined, they were used to construct an intensity map of the earthquake. Now, with California's extensive seismographic network, intensity maps (ShakeMaps) can be automatically generated within minutes of an earthquake.



DISCLAIMER: ShakeMaps are products of an automated process and the raw input data are not always verified by a seismologist, therefore errors may exist. This product is not guaranteed to be 100% accurate, and conclusions drawn from it are the sole responsibility of the user. The Department of Conservation makes no warranties as to the suitability of this product for any particular purpose. Copyright © 2024 by the California Department of Conservation, California Geological Survey. All rights reserved. No part of this publication may be reproduced without written consent of the copyright owner. Data Sources: ShakeMaps from California Strong Motion Instrumentation Program, 2023. National Geographic-style basemap from ESRI, 2024. Multi-directional hillshade from ESRI, 2023. Map design by Meerea Kang, California Geological Survey.

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