



ShakeMap Disclaimer

To the maximum extent permitted by law, your use of ShakeMaps provided by the Commonwealth of Australia as represented by Geoscience Australia (including any associated data or services):

- is on an 'as-is' and 'as available' basis with all faults, and the Commonwealth of Australia disclaims all warranties, guarantees or representations of any kind, and
- is entirely at your own risk, and the Commonwealth of Australia disclaims any liability to you or anyone else for any liability whatsoever (including, without limitation, any liability for negligence).

ShakeMap – General information

What is a ShakeMap?

- A ShakeMap provides near-real-time maps of shaking intensity for a range of intensity types (e.g., peak ground acceleration, peak ground velocity and macroseismic intensity) following significant earthquakes.

What is the purpose of a ShakeMap?

- ShakeMaps provide useful information from a broad situational awareness perspective which is intended to be used on a scale of not less than 20 km.
- Globally, ShakeMaps have become an important tool for providing near-real-time situational awareness to first responders, emergency services and other applications where rapid intelligence on a potential earthquake disaster is required.
 - For example, if communication disruptions impede on ground assessment of an earthquake, emergency services might use a ShakeMap to inform how they prioritise resources to a region or town that ShakeMap estimates is more likely to have experienced significant ground shaking.

How are ShakeMaps made?

- A ShakeMap uses near-real-time instrumental data, together with felt-report data, and interpolates these data with theoretical model predictions to provide a modelled estimate of the ground shaking at a given location.
- Macroseismic intensity layers calculated by ShakeMap are based on the [Modified Mercalli Intensity \(MMI\) scale](#). The MMI scale is a qualitative measure of earthquake ground shaking based on felt effects and damage to structures. The MMI scale is not based on instrumental measurements.

ShakeMap - Accuracy Level

ShakeMaps are intended to provide rapid information for use on a broad spatial scale. Misuse of ShakeMaps to assess damage at specific locations or to particular structures is not appropriate because:

- The intensity of earthquake ground shaking can vary greatly over short distances. The intensity is dependent on the magnitude of the earthquake, the distance of the observer from the earthquake epicentre and the geology and topography at the observation site.

- The same intensity will not necessarily result in the same level of damage because damage depends heavily on the combination of the type of structure, the nature of the construction, and the particular details of the ground motion at a given location. For this reason, more or less damage than described in the MMI scale may occur.
- Large earthquakes can generate very long-period ground motions that can cause damage at large distances from the epicentre; although the intensity estimated from the ground motions may be small, effects to large structures (bridges, tall buildings, storage tanks) may be significant.
- The theoretical models used to create ShakeMaps result in decreased accuracy as distance from the epicentre of an earthquake increases.
- This information should be considered in concert with [general disclaimers](#) on earthquake information provided by the National Earthquake Alerts Centre.

ShakeMap - Inherent Limitations

ShakeMaps provide an approximation of earthquake ground shaking only and are not intended to provide absolute assessment of shaking intensity or damage potential for any given location. Inherent limitations of ShakeMaps include:

- ShakeMap model predictions consider the estimated geological conditions at a site and adjust the shaking intensities according to these conditions. However, geological inputs are based on [national-scale maps](#) of varying resolution and will not capture unique site-specific attributes that may affect the potential for ground-shaking amplification at any given location.
- Shaking intensity data used in these maps are estimated from community responses to an online questionnaire through Geoscience Australia's earthquakes webpage. While there is some effort to identify unusual individual observations, the final product may still contain erroneous submissions from the public.
- Intensity grids or contours calculated from ShakeMap depend on the input modelling assumptions, the quantity and quality of input data in the area of interest and the type of input data. Where a high density of input data exists, the software will "smooth" through data with variable intensities to provide an averaged shaking intensity. Therefore, variable intensity observations within close proximity may not be accurately reflected in ShakeMap grids and contours.
- Where very few, or no observations (i.e., instrumental or felt-report observations) exist, the estimated shaking is based solely on model assumptions.

ShakeMap – Time value

- ShakeMaps are provided on a near-real-time basis and therefore information accessed through this page may be preliminary in nature.
- ShakeMaps are updated by the National Earthquake Alerts Centre during the first 48 hours following the earthquake, in order to incorporate additional data from Felt Reports. The version number, and time of production, is printed at the bottom of each ShakeMap.