

Earthquake – Frequently Asked Questions

On 18 August 2016 at 2.30pm, a 5.8 magnitude earthquake occurred about 50 km off the coasts of Bowen and Airlie Beach and affected the Whitsunday region. The Whitsunday Disaster Management Group in consultation with the Geoscience Australia and the Bureau of Meteorology provide the following responses to a number of frequently asked questions.

For more information, please visit <http://www.ga.gov.au/earthquakes/> and <http://www.bom.gov.au/tsunami/?ref=fr>

Question: *What is the likelihood of an even bigger earthquake occurring at this location?*

Answer: *Geoscience Australia develops the National Seismic Hazard Assessment to support the update of the earthquake loading standard in the building code. Based on the last assessment, we expect that a magnitude 5.5 to occur, on average, every 2000 years. A larger magnitude 6.5 would be expected to occur, on average, every 15,000 years. These assessments are informed by what has happened in the past. Now that a magnitude 5.8 has occurred, we expect there is approximately a one per cent chance of a magnitude 6.0-6.5 earthquake occurring in the next two years.*

Question: *How long are the aftershocks likely to continue for?*

Answer: *Aftershocks of magnitude 3.5 and above would normally have died off within one to two weeks after the event, though there remains a chance of up to a month or two. The number of aftershocks decays rapidly after the event and we would see the number of aftershocks halving every few days to a week. This sequence appears to be following this typical pattern.*

Question: *What magnitude earthquake at this location would potentially generate a tsunami?*

Answer: *Geoscience Australia has not modelled tsunami from near offshore earthquake sources as part of the national offshore tsunami hazard assessment. However, we would expect that a very shallow earthquake of at least magnitude 6.5 and probably magnitude 7.0 would be required to generate a tsunami that would be observed at the coast.*

Question: *If a Tsunami was generated from this location, how long would it take to hit Bowen or Airlie Beach?*

Answer: *Tsunami travel time is influenced by the depth of the ocean between the earthquake source and the shore. As the earthquake occurred about 60kms offshore, we would expect that if a tsunami was generated, it would take around 30 minutes to arrive at the beach.*

Question: How long does it take for Tsunami warnings to be issued after an earthquake?

Answer: Tsunami No Threat or Tsunami Watch are issued within 30 mins of an earthquake (generally between 10 – 20 mins).

Question: Who receives the Tsunami warnings?

Answer: Tsunami warnings are displayed on the Bureau of Meteorology website. Warnings and No Threat Bulletins are also sent directly to State and Local Government disaster management authorities.

Question: If an evacuation is required in the middle of the night, how will I be notified?

Answer: Notification of Tsunami warnings could be through a range of mediums such as Television, Radio, E-mail, Internet, Social Media, loud speakers, door knocking from Emergency services e.t.c. and if time allows, the telephone 'Emergency Alert' system will likely be activated in the event of a Tsunami Warning which sends texts and phone voice messages to mobiles and landlines in selected warning areas. For further information about Emergency Alerts visit: www.emergencyalert.gov.au

Question: Will I receive a text message (Emergency Alert) for a Tsunami warning?

Answer: There is no guarantee that you will receive an Emergency Alert message for a number of reasons and circumstances. Emergency Alert is one of many ways emergency services can warn a community of a likely or actual emergency. For further information about Emergency Alerts visit: www.emergencyalert.gov.au .

Question: What protection does the Great Barrier Reef offer the Whitsunday's against tsunamis?

Answer: Research conducted following the Solomon's Island earthquake in 2007 showed that the Great Barrier Reef significantly weakened the tsunami impact. The modelling showed that the reefs delayed the tsunami arrival time by 5-10 minutes, decreased the amplitude of the first tsunami pulse to half or less, and lengthened the period of the tsunami. See *The Effect of the Great Barrier Reef on the Propagation of the 2007 Solomon Islands Tsunami Recorded in Northeastern Australia* by Baba, Mleczo, Burbidge, Cummins and Thio (2008) <http://link.springer.com/article/10.1007%2Fs00024-008-0418-5>

Question: If I feel an earthquake, should I immediately head to higher ground?

Answer: If you experience strong shaking for more than 30 seconds, get off the beach. If the strong shaking lasts longer than 60 seconds, go to higher ground.

Question: *What was the ARI or AEP of the 5.8 magnitude earthquake for the Whitsunday Region?*

Answer: *For the 200 by 200 km area centred on Proserpine, we would expect that a magnitude 5.8 earthquake to occur every few hundred years.*

Question: *What are the building standards for earthquakes?*

Answer: *In 1993 a standard for designing buildings in Australia for earthquake loads was released with national application. As a result, since about 1995 Australian buildings that are subject to engineered design have either been specifically designed for earthquake loads or have severe wind loading as the most demanding loading condition. Residential homes of framed construction (the most common type) are not typically designed for earthquake loads but are constructed to resist wind loads that give them resistance to earthquakes. Modern masonry buildings (including domestic scale) also have earthquake detailing requirements to make them more resistant which include ensuring the building elements are well tied together and that brick ties within cavities do not corrode in coastal regions.*

Question: *Do cyclone building standards applied to new structures in Qld help mitigate damage from earthquakes (are there commonalities)?*

Answer: *Wind design does provide sideways resistance to earthquake loads. Very tall CBD buildings in major capital cities generally are designed for much greater loads due to wind than corresponding loads for earthquake. In Australian cyclonic regions this would be also true of shorter medium to tall buildings and for all building regulation complaint light timber framed residential buildings. The greatest community risk from existing buildings is associated with older unreinforced masonry buildings that do not comply with current building regulations, more so if they are located on soft and deep coastal soils. These are also often vulnerable to wind loading.*

Question: *What advice can Geoscience Australia give the residents of the Whitsunday's regarding earthquakes and the continuing threat and risk to the community?*

Answer: *Earthquakes of the size of the magnitude 5.8 August event are rare in Australia. In the area from Bowen to Rockhampton and 100km inland and 100km offshore, we expect a magnitude 5.8 every few hundred years. Modern buildings in the Whitsundays that are designed for very severe wind loading (Wind Region C) are expected to be resilient to earthquake shaking. The greatest risk to building occupants in a strong earthquake is likely to be posed by non-structural components and building contents, such as where a poorly affixed light fitting falls from the ceiling or a tall and heavy bookcase overturns. In the event of strong shaking the best course of action would be to drop to the floor, take cover beneath a table or alongside a bench, and hold on so as to stay under or alongside the protection provided. The chance of complete building collapse is very small in a modern building, however, in an older unreinforced masonry building this course of action is more important as a masonry element may fall and injure occupants.*