

## FREQUENTLY ASKED QUESTIONS (FAQs) *EARTHQUAKES*

### What is an earthquake?

Earthquakes are caused by the movement of plates (huge slabs of rock) making up the surface of the Earth. The region where plates meet is called a plate boundary. The plates are slowly yet constantly moving, often locking together at plate boundaries causing a build-up of energy. When the plates eventually move out of this locked position the energy that is released may be felt as an earthquake. Most of the world's earthquakes occur along plate boundaries.

### Can earthquakes be predicted?

Scientists cannot predict the location, time and date of when an earthquake will occur. Forecasts can be made based on past patterns of activity in a region.

### What are some effects of earthquakes?

- Collapsing walls, buildings, and bridges.
- Falling furniture, shattering glass windows and mirrors.
- Falling electricity lines and utility poles.
- Broken gas lines.
- Floods caused by the collapse of dam walls.
- Rock slides or landslides.
- Tsunamis - sea waves which can be generated by very large earthquakes.
- Liquefaction - when solid ground behaves like a liquid and can no longer support buildings. This is common on reclaimed land.

### Can climate change or hot weather cause earthquakes?

No, climate change or hot weather does not cause earthquakes. Earthquakes are caused by processes deep within the Earth while hot weather and climate change are related to the atmosphere.

### Should we be concerned about earthquakes in the Eastern Caribbean?

Yes! The Eastern Caribbean is an example of an island arc system formed at a convergent plate boundary (more specifically, at a subduction zone, where two tectonic plates meet and the denser plate is forced beneath the lighter plate). This is the main cause of the seismic activity in the Eastern Caribbean

### What is the difference between volcanic earthquakes and tectonic earthquakes?

As magma makes its way through the crust to the surface of the earth, it breaks apart surrounding rock thereby generating volcanic earthquakes. Volcanic earthquakes are one of the main signs that a volcano is restless.

Tectonic earthquakes are caused by the movement of plates when energy accumulated within plate boundary zones is released. Tectonic earthquakes are usually larger than volcanic earthquakes.

### What is a foreshock/aftershock?

The terms foreshock and aftershock have no strict scientific definition. They are used to describe the events within an earthquake sequence to distinguish those events that preceded the main shock from those that followed it.

### Have there been any major earthquakes in the Eastern Caribbean in the past?

Yes, there have been quite a number of major earthquake events. The major ones are summarized in the following table:

Year	Location and Magnitude	Effects
1690	Above magnitude 8 near Antigua	Considerable destruction in Antigua, St. Kitts, Nevis, Montserrat. Fatalities unknown.

1766	Above magnitude 8 near Antigua	Trinidad devastated. Fatalities unknown
1839	Magnitude 6.5 close to Martinique	Approx 400 fatalities, many buildings destroyed
1906	Above mag 7 NW of Saint Lucia	Severe Damage in Saint Lucia and Martinique. No fatalities
1953	Above mag 7 NE of Saint Lucia	Felt at damaging intensities Saint Lucia, Barbados, St. Vincent
2004	Magnitude 6.3 NE of Dominica	Felt throughout Dominica as well as Guadeloupe, Antigua, Montserrat, Nevis and St. Vincent. One fatality in Dominica
2007	Magnitude 7.3 Martinique	Felt widely throughout the Eastern Caribbean islands

### Can geothermal exploration cause earthquakes?

Yes, geothermal exploration does have the capacity to *trigger* earthquakes. Deep earthquakes occurring below geothermal exploration depths are unlikely to have been caused by geothermal exploration.

### What is the safest way to protect myself during an earthquake?

- **STAY CALM. DO NOT PANIC. BE ALERT.**
- If inside stay inside, do not run out of the building as you may be injured by falling debris.
- If inside, **DROP, COVER and HOLD ON** until the shaking stops. Get under a sturdy desk, table or bed and hold on or stand in a strong doorway. *Do not use elevators or stairs.*
- Move away from windows, mirrors, glass doors, pictures, bookcases, hanging plants and heavy objects.
- If outside and there are no obvious signs of danger nearby, stay there.
- If outside, stay away from glass buildings, electricity poles and bridges.
- If in a vehicle, do not stop on or under a bridge.
- Always look out for falling plaster, bricks, lighting fixtures and other objects.

### What is the safest way to protect myself during if trapped under debris?

- Do not light a match.
- Do not move about or kick up dust.
- Cover your mouth with a handkerchief or clothing.
- Tap on a pipe or wall with a coin if possible, so rescuers can locate you.
- Use a whistle if one is available. Shout only as a last resort. Shouting can cause you to inhale dangerous amounts of dust.

### What is the difference between magnitude and intensity?

Magnitude is a value related to the energy generated by an earthquake. It is a fixed number that does not vary regardless of which island you are located. For example, the duration magnitude of the 2007 Martinique Earthquake which was widely felt throughout the Eastern Caribbean was Mag 7.3. Intensity scales categorise the severity of an earthquake at a given location by describing the effects on people, structures and geological formations (e.g. whether or not buildings were damaged, whether items fell from shelves etc.) Each degree of intensity is described by a Roman numeral, (I, II, III etc.) the largest being XII. So for this event the reported intensity was V in Trinidad and VI and above in Martinique.

### What is the role of the Seismic Research Centre?

The UWI Seismic Research Centre is the authority for information on earthquake and volcanic activity in the English-speaking Eastern Caribbean. When an earthquake occurs the Centre provides island governments with information on the size and location of the earthquake. Scientists also study earthquake patterns in the region to better understand where future earthquakes might occur. By monitoring volcanoes scientists are able to detect and warn island governments of any unrest potentially leading to eruptions.

### How can I connect with the UWI-SRC?

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