

# OUR ISLANDS

# ARE SINKING... IN BETWEEN EARTHQUAKES!

## Coral on the reefs tell us.

## 1 How do we know our islands are sinking?

We know they are sinking because BEACHES are slowly moving onto land and TREES that grew on land are now dead in the water off shore.

In many places CORALS contain information about how fast the islands have been sinking.

Modern instruments show the islands are also moving northeast toward Sumatra.



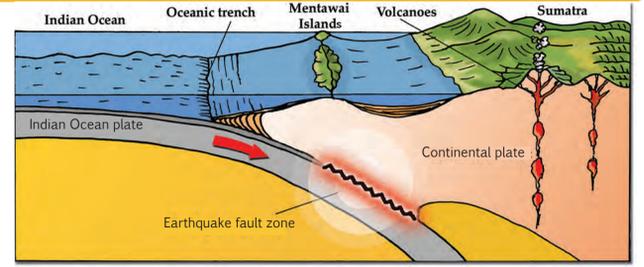
Coral growth patterns tell us how fast an island is sinking.

Cross section cut from coral head

## 2 Are sinking islands and earthquakes related?

**Yes!** The Indian Ocean plate pushes into and curves under western Sumatra. Most of the time the plates are stuck together, so while the plates slowly move during decades and centuries, pressure builds up as the islands get squeezed toward Sumatra and dragged down into the ocean.

But the land under western Sumatra is like a spring; when the plates break apart, pressure is released and the land suddenly springs back, creating a great earthquake.



Personal account of an earthquake taken from the historical record.  
1797 February 10, about 10pm. West coast of Sumatra. "The first shake lasted one minit, afterwards a tidal wave quickly rose, which with great power pushed into the river of Padang, so that the town was overflowed. Afterwards the water fell so widely, that even the river-bed was drained. This event repeated three times. The village of Ajer Manis at the beach was overflowed and at the same time many cottages were washed away...In the walls of most buildings rose cracks. During the whole night as well as during the whole day the ground was in a moving situation. Every 15-20 minits a hard shaking took place."

## 3 Scientific instruments also tell us.

The GPS (Global Positioning System) instruments deployed on the islands measure island movements very accurately.

The instruments show us that the islands are slowly moving northeast toward Sumatra about 40 mm per year.



Thanks to the people of the islands for their help and participation in our research.



## 4 What happens to the ocean if the islands suddenly move?

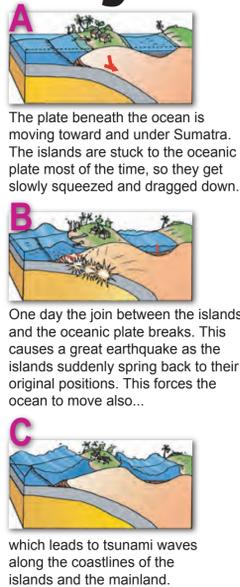
When the rocks beneath the islands spring back during an earthquake the sudden movement causes waves called TSUNAMIS.

When they hit land, tsunami waves can be very small (centimeters) to very large (tens of meters).

From the historic record: 1797-99  
"During the shake a tidal wave rose along the coast, which reached a height of 50 feet above the usual water-high. At this occasion a reef was lifted up, so that it was a danger for the navigation."



Both the great 1797 and 1833 earthquakes generated large tsunamis that killed many people and destroyed many homes on the islands.



## 5 How can we prepare for earthquakes and tsunamis?

Earthquakes may strike without warning. However, we can make preparations to avoid many earthquake dangers. For example...

Buildings made from wood or other light materials are safer than those made from heavy materials, because if they fall during an earthquake they are less likely to hurt us.

Following an earthquake, running to high ground far away from the beach may help you and your family avoid tsunami waves.

Stay prepared by developing and practicing family and community plans to deal with earthquakes, tsunamis and their aftermath.



**MORE EARTHQUAKE INFORMATION**

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