

# The story of tsunamis

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TOP: Large waves seen at Point Lobos, California. Photo by: Amit Patel via flickr. BELOW: Usually, tsunamis are generated by earthquakes. The movement of the ocean floor releases energy which leads to larger-than-usual waves. Image from: Wikimedia.

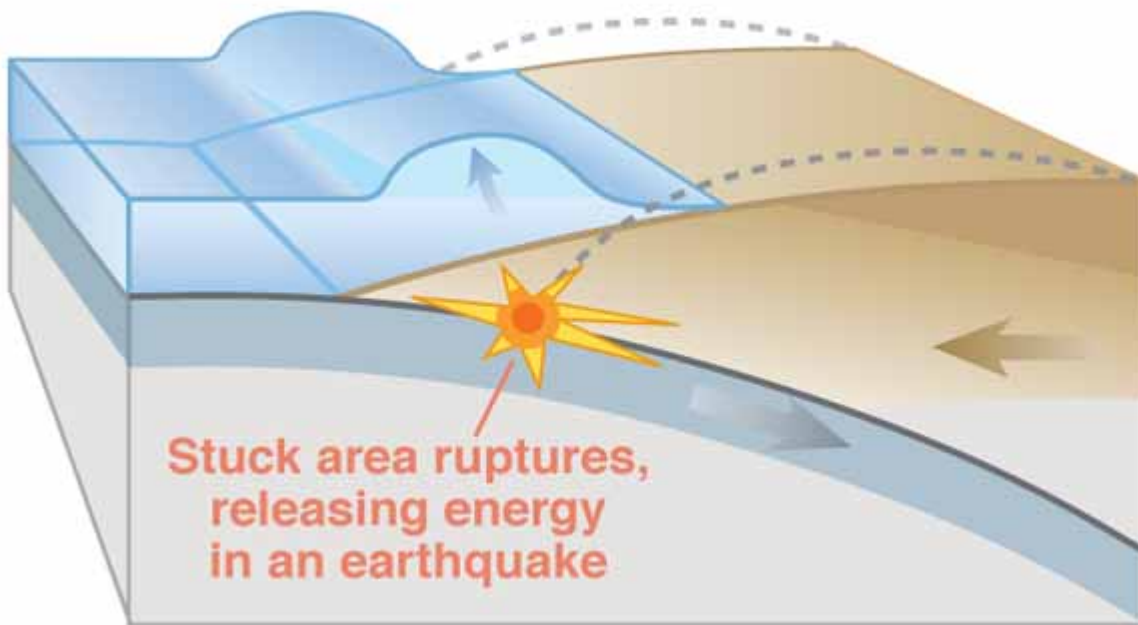
A tsunami is a set of large ocean waves. It is caused when the sea's surface is suddenly and strongly disturbed. When a tsunami is formed, it can destroy nearby coastal communities within minutes. A very large tsunami can also travel great distances across the ocean and destroy other communities thousands of miles away. Tsunami is a Japanese word that means "harbor wave."

Tsunamis are one of the deadliest kinds of natural disaster. Since 1850, they have killed more than 420,000 people and have caused billions of dollars of damage. Tsunamis happen around once a year somewhere in the world.

Scientists have no way of knowing when and where the next tsunami will strike. However, once a tsunami begins to form, it can be tracked. That allows scientists to come up with good guesses about where it is headed and how strong it will be.

## Tsunamis Usually Happen In The Pacific Ocean

### *Earthquake starts tsunami*



Tsunamis are most commonly caused by underwater earthquakes. The biggest tsunamis are produced by large, shallow earthquakes. Such earthquakes are caused by shifts in oceanic and continental plates. These plates are enormous slabs of solid rock. They are many thousands of miles across, and cover the ocean floor.

Tsunamis are common in the Pacific Ocean. They happen when dense oceanic plates slide under the lighter continental plates. When sections of a plate crack they can snap upward. As they move they cause waves in the ocean water.

This occurred on Dec. 26, 2004, when a huge earthquake struck the coastal region of Indonesia. The moving of the sea floor produced a tsunami more than 100 feet high. More than 130,000 people along the shoreline were killed. The tsunami then began to spread across the ocean. Within two hours, it had killed 58,000 people in Thailand, Sri Lanka and India.

Underwater landslides can also cause tsunamis. A July 17, 1998 tsunami began after an earthquake caused a large underwater landslide. Three waves more than 23 feet high struck a six-mile stretch of Papua, New Guinea coastline within 10 minutes of the earthquake. Three villages were completely swept away. Around 2,200 people were killed.

Volcanoes can also cause tsunamis. The eruption of the Krakatoa volcano in Indonesia on August 27, 1883 produced a 98-foot-high tsunami. It killed over 36,000 people.

## **Earthquake Activity Determines The Possibility Of Tsunamis**

Since 1946, the tsunami warning system has provided warnings of possible tsunami danger. The system keeps track of earthquake activity and wave behavior. However, it cannot say how strong a tsunami will be at a particular place.

By keeping track of underwater earthquakes, scientists are able to tell if a tsunami is possible. If a tsunami seems likely, a warning is issued. Once a tsunami begins to form, scientists then study ocean water levels. That information allows them to see how strong the tsunami is and where it is going.

However, it is still difficult to say how dangerous a tsunami will be in a particular place. The shape of a coastline can make a big difference in the strength of a tsunami. So can the depth and shape of the nearby ocean floor.

## **Warning Systems And Evacuation Plans Have Saved Lives**

In recent years, two things have helped reduce the number of deaths caused by tsunamis. One is computer modeling, which can predict how a tsunami will behave. The other is the deep-ocean tsunami detector.

Still, it is very important for people to be educated about tsunamis. In addition, warning systems and evacuation plans are necessary. A good evacuation plan gets people away from the coast as quickly as possible.

Compare two communities hit by tsunamis.

In 1993, the town of Aonae, Japan, was hit by a tsunami. In this case, the population was educated about tsunamis, a warning was given and evacuation plans were developed. As a result, only around 15 out of every 100 people at risk died.

The story was very different when a tsunami hit Warapa, Papua New Guinea, in 1998. About 40 out of every 100 people at risk died. In this case, the population was not educated about tsunamis and there was no warning system or evacuation plan.

**Quiz**

- 1 Read the second section, "Tsunamis Usually Happen In The Pacific Ocean."  
Read the final section, "Warning Systems And Evacuation Plans Have Saved Lives."  
How does the second section relate to the final section?
- (A) Both sections provide specific examples of the effects of tsunamis.
  - (B) Both sections compare and contrast different causes of tsunamis.
  - (C) The second section describes problems with studying tsunamis. The final section describes how scientists discovered a solution to the problems.
  - (D) The second section describes scientists' predictions about tsunamis. The final section provides information about whether they were correct.
- 2 Read the section "Earthquake Activity Determines The Possibility Of Tsunamis."  
Select the paragraph that uses order of events in its structure.
- 3 Look at the graphic "Earthquake starts tsunami."  
What does the blue arrow pointing upward represent?
- (A) the flow of broken oceanic plates sliding into the ocean floor
  - (B) the flow of trapped heat from the sun causing a tsunami wave to form
  - (C) the direction of continental plates traveling deeper into the ocean
  - (D) the direction of released energy moving to create a tsunami wave
- 4 Use the graphic and the article to select the TRUE statement below.
- (A) Tsunamis are caused when shifting continental plates crack.
  - (B) Tsunamis are most commonly caused by landslides.
  - (C) Tsunamis are the result of ocean temperatures that create waves.
  - (D) Tsunamis are usually the reason why earthquakes happen.