Tsunami

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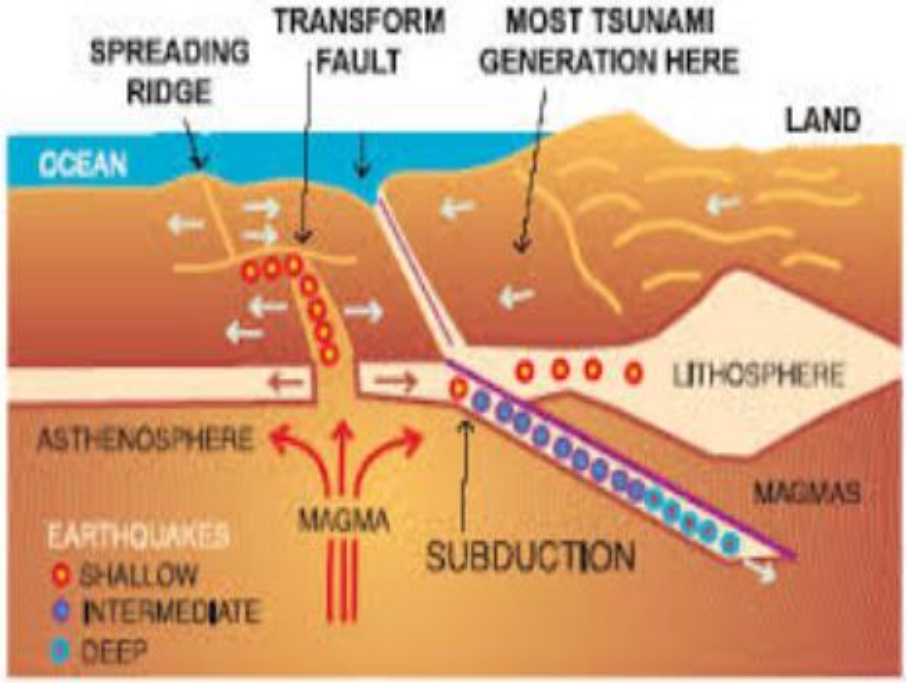
What is a tsunami?

A tsunami is a large ocean wave usually caused by an underwater earthquake or a volcanic explosion. Tsunamis are NOT tidal waves. Tidal waves are caused by the forces of the moon, sun, and planets upon the tides, as well as the wind as it moves over the water. With typical waves, water flows in circles, but with a tsunami, water flows straight. This is why tsunamis cause so much damage!

How are tsunamis generated?

Tsunamis are generated by any large, impulsive displacement of the sea level. The most common cause of a tsunami is sea floor uplift associated with an earthquake. Tsunamis are also triggered by landslides into or under the water surface, and can be generated by volcanic activity and meteorite impacts.

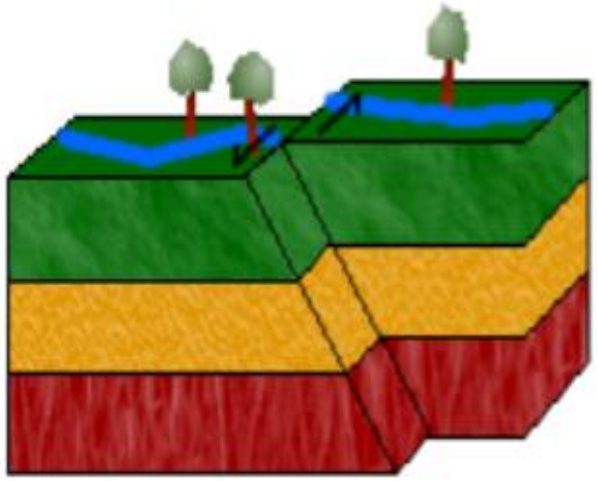


How often do tsunamis occur?

On the average, two tsunamis occur per year throughout the world which inflict damage near the source. Approximately every 15 years a destructive, ocean-wide tsunami occurs.

Can strike-slip (horizontal motion) earthquakes trigger tsunamis?

Yes, approximately 10-15% of damaging tsunamis are triggered by strike-slip earthquakes. This type of earthquake is less likely to trigger a tsunami than one with vertical motion. The waves are likely generated by associated landslides or motion of a sloping bathymetric feature. Tsunamis generated by strike-slip earthquakes normally affect regions near the source only.



What does the word "tsunami" mean?

Tsunami (soo-NAH-mee) is a Japanese word meaning harbor wave.

How fast do tsunamis travel?

Tsunami velocity depends on the depth of water through which it travels. Velocity equals the square root of the product of the water depth times the acceleration of gravity. Tsunamis travel approximately 475 mph in 15,000 feet of water. In 100 feet of water the velocity drops to about 40 mph.

How big is a tsunami?

Tsunamis range in size from inches to over a hundred feet. In deep water (greater than 600 feet), tsunamis are rarely over 3 feet and are not normally noticed by ships due to their long period or time between crests. As tsunamis propagate into shallow water, the wave height can increase by over 10 times. Tsunami heights vary greatly along a coast. The waves can be amplified by shoreline and sea floor features. A large tsunami can flood low-lying coastal land over a mile from the coast.

What are nature's signs that a tsunami may be imminent?

There are a few signs like hard ground shaking for 20+ seconds near the coast or a sudden sea level withdrawal. Tsunamis may be accompanied by loud, booming noises.

Can earthquakes and tsunamis be predicted?

No, earthquakes cannot be predicted. Once an earthquake has occurred, the arrival time of a tsunami, if generated, can be determined accurately. There is not normally enough time to accurately predict tsunami heights near the source. Away from the source, tsunami wave heights can be estimated based on mathematical tsunami models and observed wave heights.