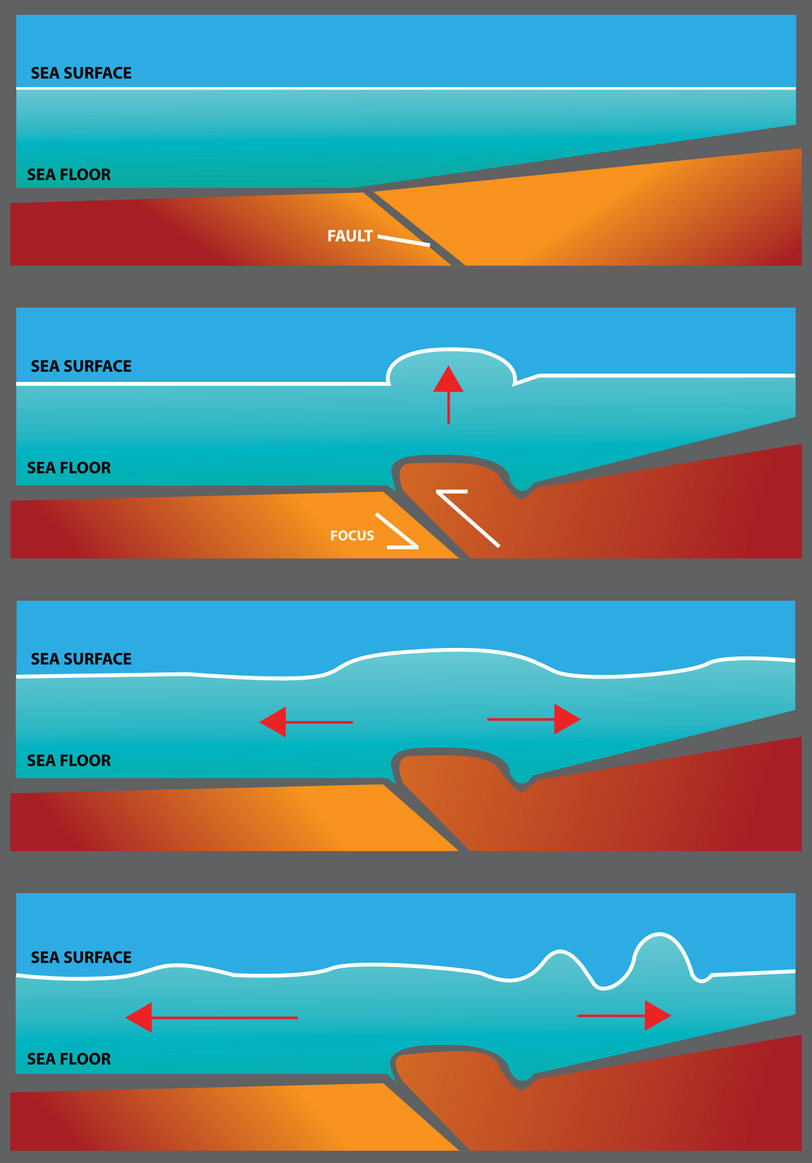
Tsunami Science

Tsunamis are a series of ocean waves caused by a sudden disturbance of the ocean floor – such as an earthquake or underwater landslide - that displaces a large mass of water. Tsunamis may also be caused by meteors and other extra-terrestrial objects which may impact the surface of the ocean.

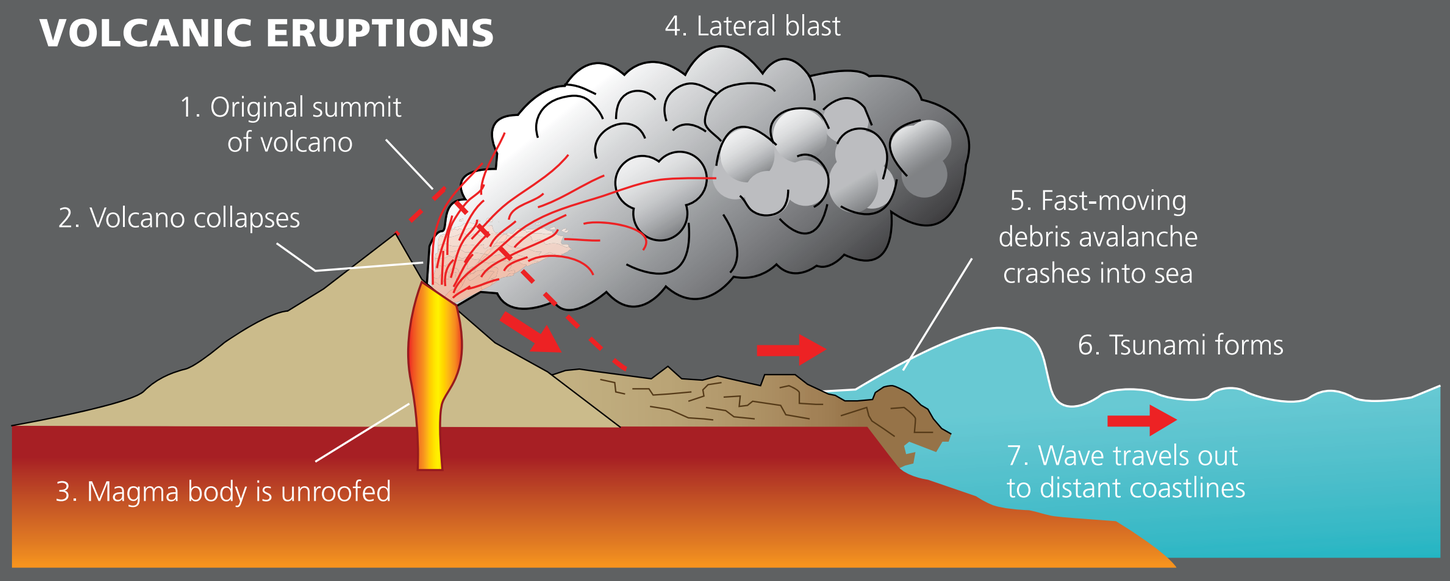
Main Causes

EARTHQUAKES



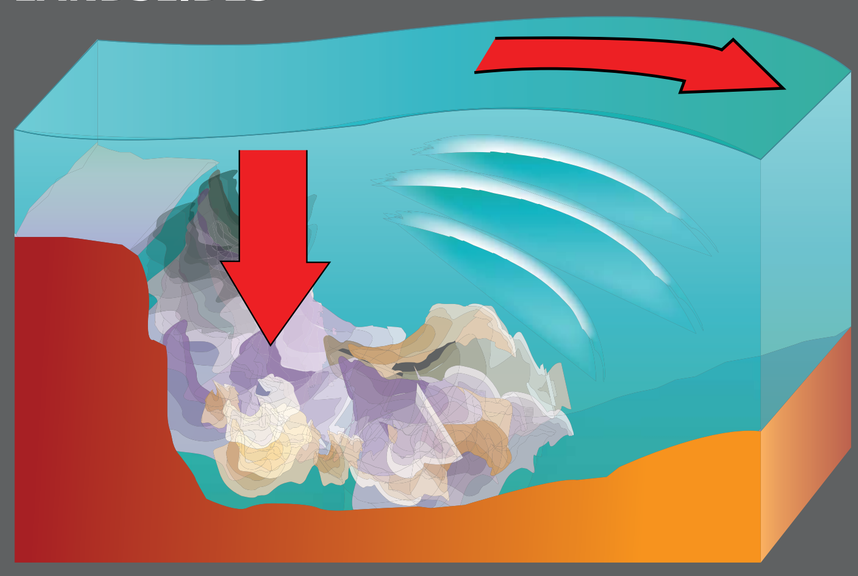
Large earthquakes occurring beneath the seafloor or close to the shore can generate tsunamis as illustrated in the above diagram.

VOLCANIC ERUPTIONS



As illustrated in the diagram above, volcanic eruptions occurring on land can cause tsunamis. Underwater volcanic eruptions can emit large volumes of volcanic material which displace the ocean and generate tsunami waves in the immediate area.

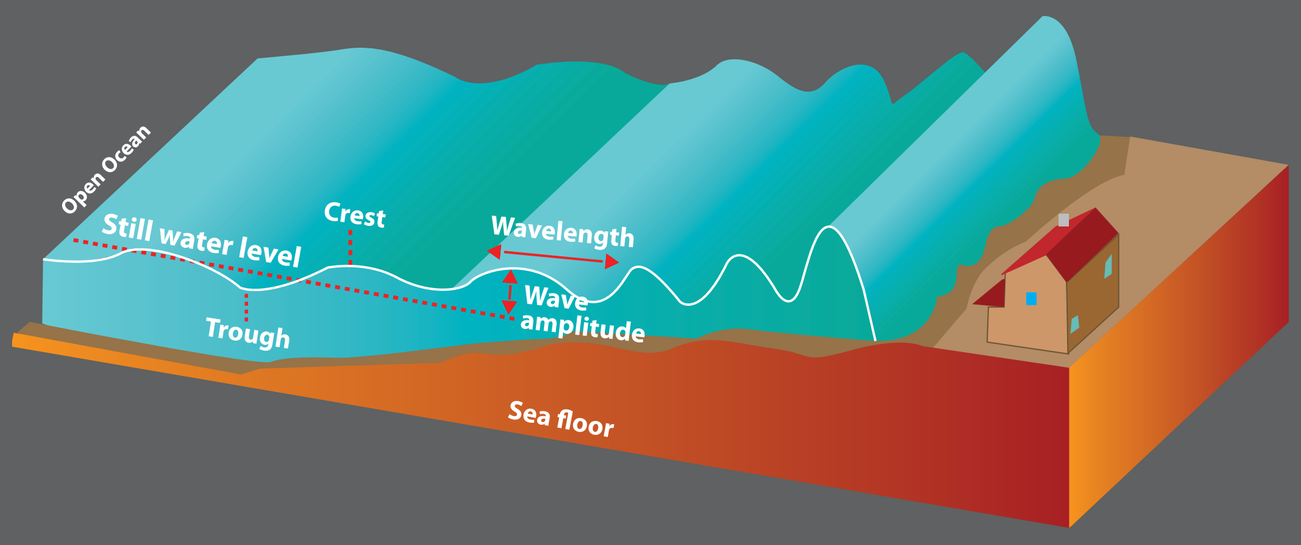
LANDSLIDES



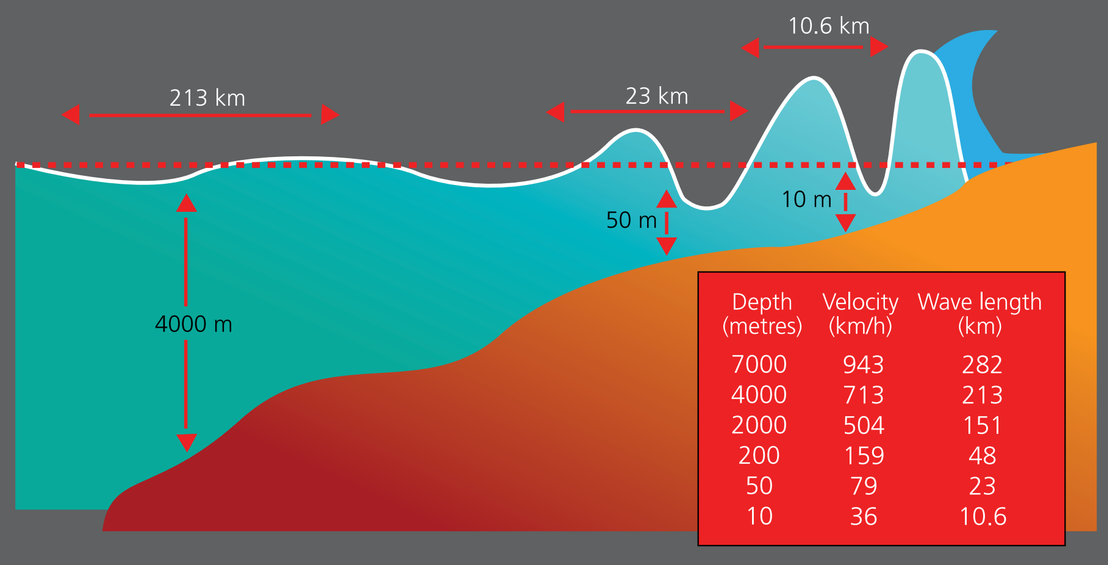
As illustrated in the diagram, underwater landslides can cause tsunamis when material loosened by the landslide moves violently, pushing the water in front of it. Landslides occurring on coastal land can force material into the sea, and disturb the water and also cause tsunamis.

Characteristics

Tsunamis slow down but grow in height as they come ashore.



Tsunami waves possess varying characteristics. Tsunami waves can reach as high as 10 metres or more and may strike with devastating force.



Depth (metres)	Velocity (km/h)	Wave length (km)
7000	943	282
4000	713	213
2000	504	151
200	159	48
50	79	23
10	36	10.6

The waves travel at jet airliner speeds in deep ocean but slow down and grow in height as they come ashore.

www.cdema.org www.weready.org www.uwiseismic.com

TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM PROJECT (2010)

Source: See Teacher Education Resource Kit Appendix.

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