Tsunami

Jayden, Ahzra, Zafira, Amber

What is a Tsunami?

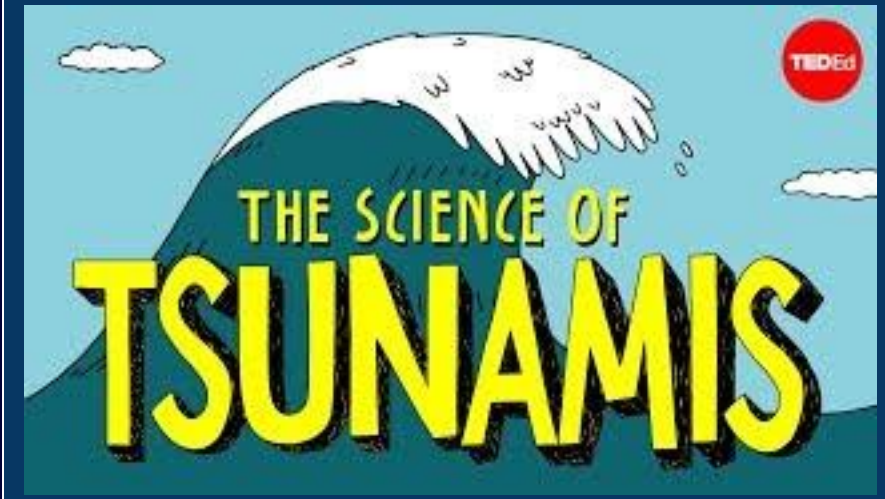
A Tsunami is a natural disaster caused by underwater disturbances.

Underwater disturbances that commonly cause Tsunamis include: Earthquakes, Landslides, Volcanic eruptions, etc.

The Pacific Ring of Fire and the Mediterranean-Asian Seismic Belt, are more susceptible to tsunamis due to frequent seismic and volcanic events.

Videos

3 min video



1 min video

How matter is involved in Tsunamis

The cycle of matter begins with an initial disturbance, followed by water displacement, wave propagation, travel across the ocean, reaching shallow coastal waters, and inundate coastal areas, causing destruction and flooding. The waves' energy compresses as they approach the coast.

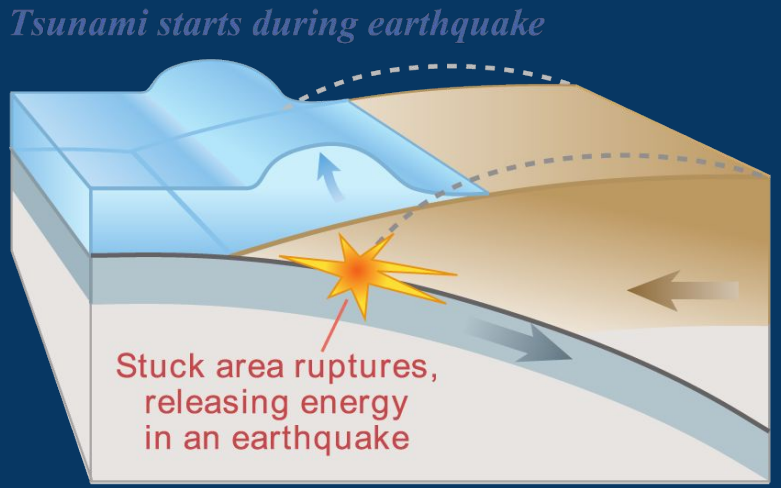
How Tsunamis affect the Earth systems

Tsunamis, caused by seismic events, can alter Earth's crust, alter water dynamics, impact air quality and weather patterns, disrupt coastal ecosystems, and cause extensive damage to human settlements and infrastructure. They can also disrupt the natural balance of ecosystems, affecting biodiversity. Understanding these impacts helps inform disaster preparedness, response, and recovery efforts to mitigate the devastating consequences of tsunamis on Earth's systems.

How does earthquakes make Tsunamis?

Earthquakes underwater push or pull the seafloor, creating big waves called tsunamis.

These waves can travel and become dangerous when they reach the coast.

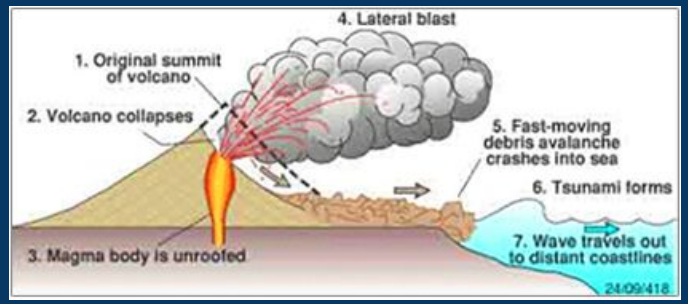


How do landslides make Tsunami's?

An earthquake near the ocean floor can cause the ocean floor to rise or fall, triggering a tsunami. This vertical displacement triggers the water above the ocean floor to regain balance. However, not all earthquakes cause tsunamis. Key earthquake characteristics that contribute to tsunami generation include location, magnitude, and depth. The water moves up and down to regain its balance.

How can volcanic eruptions cause Tsunamis?

When an undersea volcano erupts, a vast volume of water is displaced, resulting in a tsunami.



Furthermore, the collapse of volcanic islands or calderas into the sea can result in huge waves. Volcanic eruptions may also cause landslides to fall into the sea, displacing water and causing tsunamis.

Effects of Tsunamis

Earthquakes and tsunamis can cause significant damage to homes, businesses, ports, cultural resources, utilities, and critical infrastructure, potentially leading to loss of access to basic services like power, sewer, and water. Additionally, communications, transportation, and health services may be disrupted. Secondary hazards, such as fires, transportation accidents, and hazardous material releases, can be more devastating than direct destruction. These impacts can complicate evacuation, response, and recovery efforts, making it essential to prepare for potential disasters.

Ways to prevent and deal with Tsunamis

Tsunami hazard zone maps help communities identify areas of risk for people and assets, enabling them to focus preparedness, response, and mitigation efforts. Communities with a clear understanding of their tsunami risk are better equipped to protect the public, including planning and practicing tsunami response, warning the public, establishing evacuation routes, and educating residents and visitors about tsunami safety before a tsunami strikes.

Building Design to help prevent Collapse of Buildings

To prepare for and mitigate tsunami impacts, land-use planning and building design in tsunami hazard zones should focus on improving evacuation routes, building evacuation structures, limiting new development, designing structures to minimize damage, adopting tsunami-addressed building codes, protecting and strengthening existing infrastructure, moving community assets and vulnerable populations out of hazard zones, and planning for post-tsunami recovery.

Citations

Tsunami generation: Earthquakes | National Oceanic and atmospheric ... (2023, September 27).

Fukuji, T. (2023). *How Do Volcanic Eruptions Generate Tsunamis*. How do volcanic eruptions generate tsunamis? - international tsunami information center. http://itic.ioc-unesco.org/index.php?option=com_content&view=article&id=1159%3Ahow-do-volcanic-eruptions-generate-tsunamis&catid=1340&Itemid=2059

Fukuji, T. (2023b). What determines how destructive a tsunami will be near the origin and at a distant shore? - international tsunami information center. http://itic.ioc-unesco.org/index.php?option=com_content&view=article&id=1206%3Awhat-determines-how-destructive-a-tsunami-will-be-near-the-origin-and-at-a-distant-shore&catid=1340&Itemid=2051

Tsunamis: The effects. Tsunami. (n.d.-b). https://www.sms-tsunami-warning.com/pages/tsunami-effects#:~:text=Environmental%20impacts&text=A%20tsunami%20changes%20the%20landscape,thus%20poisoning%20the%20marine%20life

(3 min)“How Tsunamis Work - Alex Gendler.” Www.youtube.com, youtu.be/Wx9vPv-T51I?si=Z_anyVb8nt2jv4Jq.

(1 min) “What Is a Tsunami?” Www.youtube.com, youtu.be/cgApZbTXbVY?si=uG7dzAd-7P07MHrd.

The End