

Anak Krakatau Tsunami

January 22, 2019

Manifest pedagogy

In geography, many of geo-physical events which are in news have been asked as part of prelims, for example Barren Island question. Taking note of all geo-physical events of 2018 will be important aspect of preparation.

In news

Anak Krakatau Tsunami in Indonesia

Placing it in syllabus

Important Geophysical phenomena such as earthquakes, Tsunami, Volcanic activity, cyclone etc

Static dimensions

- Plate tectonics theory
- Concept of Plate boundaries

Current dimensions

- Anak Krakatau Tsunami and its causes
- Tsunami caused by volcano?

Content

Plate tectonics

- From the deepest ocean trench to the tallest mountain, plate tectonics explains the features and movement of Earth's surface in the present and the past.
- Plate tectonics is the theory that Earth's outer shell

is divided into several plates that glide over the mantle, the rocky inner layer above the core. The plates act like a hard and rigid shell compared to Earth's mantle. This strong outer layer is called the lithosphere, the lithosphere includes the crust and outer part of the mantle. Below the lithosphere is the asthenosphere, which is malleable or partially malleable, allowing the lithosphere to move around. How it moves around is an evolving idea.

- Earthquakes, volcanic activity, mountain-building, and oceanic trench formation occur along plate boundaries in zones that may be anything from a few kilometres to a few hundred kilometres wide.

Plate boundaries

- Subduction zones, or convergent margins, are one of the three types of plate boundaries. The others are divergent and transform margins.
- At a divergent margin, two plates are spreading apart, as at seafloor-spreading ridges or continental rift zones such as the East Africa Rift.
- Transform margins mark slip-sliding plates, such as California's San Andreas Fault, where the North America and Pacific plates grind past each other with a mostly horizontal motion.

Anak Krakatau Tsunami

The plates involved in Krakatau are the Eurasian plate and **the Indonesian-Australian plate**. At this **convergent plate boundary**, the Indonesian-Australian plate is sub-ducting underneath the Eurasian plate. Magma is rising up all along that boundary, making Indonesia a very active area.

At a convergent boundary, one plate sub-ducts under another. This allows hot magma from deep inside the earth to rise up into the cracks. Therefore at many convergent plate

boundaries, there are continental volcanic arcs, or volcanic island arcs. Some other examples of these include: the Aleutian Islands, the Tonga Islands, and the Himalayan's.



Reason for the Anak Krakatau Tsunami

- Unlike the end-of-September tsunami that killed thousands of Indonesians on the island of Sulawesi, this one wasn't generated by an earthquake.
- The **tsunami** was likely **caused** by undersea landslides due to the ongoing eruption of Anak Krakatau volcano located in the Sunda Strait.
- In crude terms, earthquakes generate tsunamis when a fault slips, and a large chunk of rock manages to push a sizeable amount of water out of the way. This water travels across the bay, sea, or ocean, piles up near land, and rushes ashore.
- While more detailed information about the exact sequence of events leading to the tsunami is still emerging, much of the evidence is currently pointing toward a landslide associated with the volcano's activity. A large portion of the southern flank of the volcano slid into the ocean, according to images from the European Space Agency's Sentinel-1 satellite

Failure of early Warning system?

- As this wasn't a tectonic earthquake-triggered event, there was no shaking at the beach before the first wave hit. In other words, there was no warning.
- The reason behind the lack of warning is the surprise source of the waves: Unlike past events triggered by earthquakes, this tsunami was most likely caused by the collapse of an offshore volcano.
- As pointed out by experts, the tsunami early warning systems are in place to pick up on those generated by

underwater tectonic plate boundaries. This tsunami was not only that type of tsunami, but even if buoys had been in place to detect it, Anak Krakatau was so close to the shoreline that any warning would have come through at extremely short notice, if at all.