

Krakatoa Stratovolcano & Archipelago - Indonesia

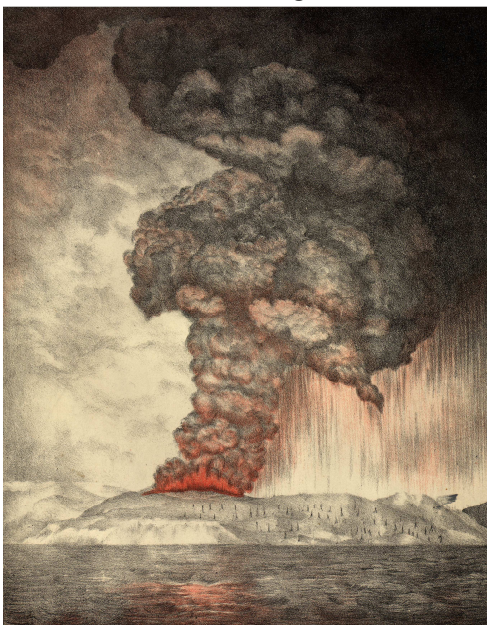


The Krakatoa (Krakatau) Archipelago is a small uninhabited archipelago of volcanic islands formed by the Krakatoa stratovolcano located in the Sunda Strait, nestled between the much larger islands of Java and Sumatra. As of 2018, the archipelago consists of four main islands: Verlaten (aka Sertung), Lang (aka Rakata Kecil, or Panjang), Rakata, and the currently volcanically active Anak Krakatoa. Together, the islands are a part of the Indonesian island arc system, created by the northeastward subduction of the Indo-Australian Plate.



1883 Krakatoa Eruption

While seismic activity around the volcano was intense in the years preceding the cataclysmic 1883 eruption, a series of lesser eruptions began on 20 May 1883. The volcano released huge plumes of steam and ash lasting until late August.



On 27 August, a series of four huge explosions almost entirely destroyed the island. The explosions were so violent that they were heard 1,930 mi away in Perth, Western Australia, and the island of Rodrigues near Mauritius, 3,000 mi away. The pressure wave from the third and most violent explosion was recorded on barographs around the world. Several barographs recorded the wave seven times over the course of five days: four times with the wave travelling away from the volcano to its antipodal point, and three times travelling back to the volcano; the wave rounded the globe three and a half times. Ash was propelled to a height of 80 km (260,000 ft). The sound of the eruption was so loud it was reported that if anyone was within 10 mi, they would have gone deaf.

The combined effects of pyroclastic flows, volcanic ashes, and tsunamis had disastrous results in the region and worldwide. The death toll recorded by the Dutch authorities was 36,417, although some sources put the estimate at more than 120,000. There are numerous documented reports of groups of human skeletons floating across the Indian Ocean on rafts of volcanic pumice and washing up on the east coast of Africa up to a year after the eruption.

We are indebted again to-day to Mr. W. Grigor Taylor, General Manager of the Telegraph Co. for the following service telegram received to-day from Batavia: -

Batavia, noon, 28th August. - All quiet again. Sky clear. Temperature went down ten degrees yesterday, quite chilly towards evening. Bamboo houses along beach washed away by tidal wave, which, however was not very high. Birds roosted during darkness, and cocks crowed hard, as ashes cleared away. Fish dizzy and caught with glee by natives. Town now covered with thin layer of ashes, giving roads a quaint, bright look. All through drizzly ash rain distinctly heard falling. Vibrations of atmosphere very strong during eruption, but earth did not quake. News just came from Anjer, the telegraph line having been restored.

Mountain Rawoon, 20 miles from Banjoewangie, has been in active eruption emitting huge column of smoke since yesterday.

Later: - Telegraph Inspector of Java Government lines reports "Yesterday morning early while trying to repair lines between Seran and Anjur saw high column sea approaching with roaring noise. Fled inland, knows nothing more of fate of Anier but believes all lost."

We learn from Mr. Strugnell, the intelligent signal sergeant at Mount Faber, that the loud reports which were heard during Sunday night and Monday morning came from Southward only. No sounds came from the Carimons, which appeared quite clear and free from smoke or cloud in the morning. Mr. Strugnell thought it quite possible that the sound of the explosions in Java may have reached Singapore, especially considering that the monsoon is at present blowing from that direction. He states that during his long residence at Mount Faber, now more than twenty years, he has never heard sounds of a similar description. They reminded him of discharges of very heavy artillery more than anything else.

**Two eyewitness accounts
from
the Batavia Telegram**

Effects of the 1883 Eruption

Krakatau produced an eruption column between 25 and 43 miles high, visible by all ships passing the Sunda Strait. Within two weeks the ash, gases and aerosols were blown by atmospheric winds westwards along the equator. Months after the eruption the volcanic cloud spread from the equatorial to the mid-latitude zones. The fine grains, trapped in the higher layers of earth's atmosphere, scattered the sunlight for many years to come, causing strange optical phenomena, like blood-red skies. British painter William Ascroft was so impressed by the colors that he produced hundreds of paintings, with date and exact time, after November 1883, showing the changing skies for over four years. The aerosols also caused a drop in the global temperature and influenced weather patterns, bringing a wet phase in Arizona's deserts.

As the Sunda Strait was and still is an important passage from the Indian Ocean to the Chinese Sea, news about the eruption and destruction of harbors and lighthouses in the area were of special interest to merchants, politicians and the public in general. Almost two thirds of the telegraph lines were in British hands, so British agencies could rely on a vast network to gather news about the worldwide effects and disturbances of the eruption. News from Australia to London traveled in just half a day on cable, while a letter delivered by steamship would have needed 45 days for the same distance. The newspaper, fueled by this quick and constant stream of eyewitness reports and eager to satisfy the interest of the public, wrote in great detail about the catastrophe. Geologists would later use those articles to compile a detailed report of the eruption of Krakatoa, and subsequent phenomena.

Krakatau was also the first scientifically well recorded and studied eruption of a volcano, from the very beginning to its disastrous ending. In May of 1883, the first clouds of vapor were noted above the crater, followed by a phase of quiescence until August of the very same year. During this phase, authorities organized geological expeditions to document the volcano and gather some samples of volcanic rocks. For the first time, the deadly effects of pyroclastic flows were noted, but not yet recognized as such.

Unfortunately, nobody realized the real danger of Krakatau. As the island was uninhabitable it was believed that it would pose no threat to human lives. Between August 26 and 27 a series of explosions almost totally annihilated the entire volcano, causing a series of tsunami-waves that killed 36,000 people along the coasts of Java and Sumatra. Higher waves as usual were noted along the coasts of the Pacific and Indian oceans. Pumice from the Krakatau was washed ashore the coast of Africa months after the disaster. Geologists only then realized how dangerous explosive volcanoes, as found along subduction zones around the Earth, really can be.

Global climate change appears to be related to volcanic eruptions. Tambora was even more powerful than Krakatoa but occurred in 1815, making studies for both eruptions difficult.

Anak Krakatau - Volcanic Activity



2008 photo

Anak Krakatau formed in 1883 in the collapsed caldera of Krakatoa. This young volcano has been particularly active since 1927.

Until its December 2018 collapse, Anak Krakatau had grown at 5.1 in per week on average since the 1950s. This equates to an average growth of 22 ft per year. Quiet periods of a few days have alternated with almost continuous Strombolian eruptions since then. Hot gases, rocks, and lava were released in an eruption in April 2008. Scientists monitoring the volcano warned people to stay out of a 1.9 mi zone around the island. On 6 May 2009, the Volcanological Survey of Indonesia raised the eruption alert status of Anak Krakatau to Level III. An expedition to the volcano revealed that a 330 ft wide lava dome was growing in its crater.



In January 2012, volcanologists at the University of Oregon warned that a tsunami caused by flank collapse of Anak Krakatau was likely, as it had formed on a steep slope at an edge of the big caldera formed in 1883. A new eruptive phase was observed from June 2018, and on 15 October 2018, Anak Krakatau had a strong Strombolian to weak Vulcanian eruption that sent lava bombs into the water, with one almost hitting a nearby boat.

2018 Eruption and subsequent activity

An eruption of the volcano on 22 December 2018, caused a deadly tsunami, with waves up to five meters in height making landfall. On 31 December 2018, the disaster agency gave the tsunami's death toll as 437, with 14,059 injured. The tsunami affected more than 186 miles of coastline in Sumatra and Java. More than 420 people died, and 40,000 were displaced. This made the eruption the deadliest volcanic eruption of the 21st century so far. Cone collapse—with tsunami generation—was considered a potential hazard immediately prior to the eruption. Scientists had modeled the possibility six years prior to the event, and had identified the western flank as the section of the volcano most likely to fail.



Following the December 2018 eruption, it was believed that the southwest sector of the volcano, including the summit, had collapsed during the eruption, triggering the tsunami. On 23 December, this was confirmed by satellite data and helicopter footage, with the main conduit seen erupting from underwater, producing Surtseyan-style activity.



The volcano lost over two-thirds of its volume due to this event. Its elevation above sea level was reduced. What had been a volcanic cone standing 340 meters high was reduced to just 110m tall.



Rakata (Greater Krakatau) in the background