

## A Short Note on Underwater Volcanic Eruption and Tsunami Waves Near Tonga Island

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### EDITORIAL

Tonga Island is located in the South Pacific Ocean and south of Samoa. Tonga is a volcanic island origin that means it is located in volcanic origin. Hunga Tonga-Hunga Hualapai is submarine volcano that is located in the South Pacific Ocean and nearly 70 kilometers north to Tonga. On 14<sup>th</sup> January 2022 and early morning of 15<sup>th</sup> January, a very large underwater eruption was started at Hunga Tonga. A large up thrust force of volcanic eruption on sea water caused to create tsunami waves. NASA reveals that the energy revealed by the volcanic eruption was 500 times more powerful than the atomic bomb named Little Boy dropped on 6<sup>th</sup> August 1945 on Japan's Hiroshima during World War II. It is the most violent in the last 30 years of volcanism record globally.

This is under the global tectonic junction runs along the rim of the Pacific Ocean and is known for its deep trenches. The shock waves produced during magma exploration cause tsunami waves. The tsunami waves reached and hits coasts on 15<sup>th</sup> January 2022 with the height 15 meters and above. The residents of Tonga capital city Nuku'alofa and Hawaii, Japan, and Tonga's largest island, Tongatapu were struggled with these tsunami waves. The overall radius of effected area is 300 miles wide. As per news reports 5 people were dead and more than 5 people were injured and some other people were reported as missing.

The volcanic eruption injects plume of ash, gas and steam into the air up to the height of 30 kilometers, it's like a mushroom cloud. Stratosphere is generally begins above 15 kilometers above the planet. But, in this eruption the dust and ash reaches nearly 35 kilometers above the planet in some places. This ash may cause skin diseases, air pollution and water pollution. And it causes to increase in temperature globally. The sea water is polluted with toxic volcanic discharge. The economical marine zone around 650,000 marine square kilometers is affected with ash and it causes to fish die-offs and livelihood.

The exposition cut domestic, overseas communications and an undersea internet cable. Some of scientists give statements about the eruption that the time of eruption is only 10 minutes, and

the satellite sensors in those days measured about 400,000 tons of sulfur dioxide (SO<sub>2</sub>) reaching the air. Sulfur dioxide and nitrogen oxide when reacts with oxygen in the atmosphere and water while raining causes acid rains. This acid rains harm environment for years.

When the superhot molten rock or magma hits the seawater with pressure then the sea water flashes into steam this steam instantly and it expands the explosion of ash many times over the normal pressure into the atmosphere with up thrust force.

The University of Bath in England's an atmospheric physicist Corwin Wright said that the Satellite readings showed that the shock wave reached in the atmosphere is far beyond the stratosphere, as high as 60 miles up, and propagated around the world at more than 600 miles an hour. And he said that "We have never seen anything really that covers the whole Earth like this, and certainly not from a volcano."

After the volcanic eruption Tonga faces food emergencies because of tsunami damaged crops with tainted water and leaves are covered with ash cut off the food supplies. Without cleaning crops it will affect health so, there is a need to clean the crop. But, there is a lack of water to wash away the ash from crops.

Tonga eruption is blamed for Peru's environmental emergency about 21 beaches on the Pacific coast were contaminated by an oil spill, may be the reason behind this oil spill is strong shock wave hit. The refinery run by Spain-based Repsol, the distance between Peru oil refinery to Hunga Tonga-Hunga Hualapai is submarine volcano is 11,000 kilometers (6,800 miles), this distance and strength of shock wave may cause to oil leak at refinery.

On January 20<sup>th</sup>, 2022 World Bank raised an emergency funding of USD 8 million to support the kingdom of Tonga and to recover from the devastating volcanic eruption and tsunami on January 15<sup>th</sup>. These funds will provide resource to the government of Tonga, government can use to reestablish basic services and help families who were most effected.

The history of Hunga Tonga-Hunga Ha'apai is beginning on 16<sup>th</sup> March 2009, a submarine eruption is happened on that day,

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**Received:** 20-Jan-2022, Manuscript No. JGG-22-e011; **Editor assigned:** 21-Jan-2022, PreQC No. JGG-22-e011 (PQ); **Reviewed:** 02-Feb-2022, QC No. JGG-22-e011; **Revised:** 07-Feb-2022, Manuscript No. JGG-22-e011 (R); **Published:** 15-Feb-2022, DOI: 10.35248/2381-8719-22.11.e011.

**Citation:** Doyle P (2022) A Short Note on Underwater Volcanic Eruption and Tsunami Waves Near Tonga Island. J Geol Geophys. 11:e011.

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and it is the first event in history of Tonga-Hunga volcano. And in November-December 2014 second historical event started, this time volcanic plumes and series of earthquakes occurred on

north of Tonga for several weeks. All we hope that speedy and healthy recovery of Tonga from this violent natural disaster.