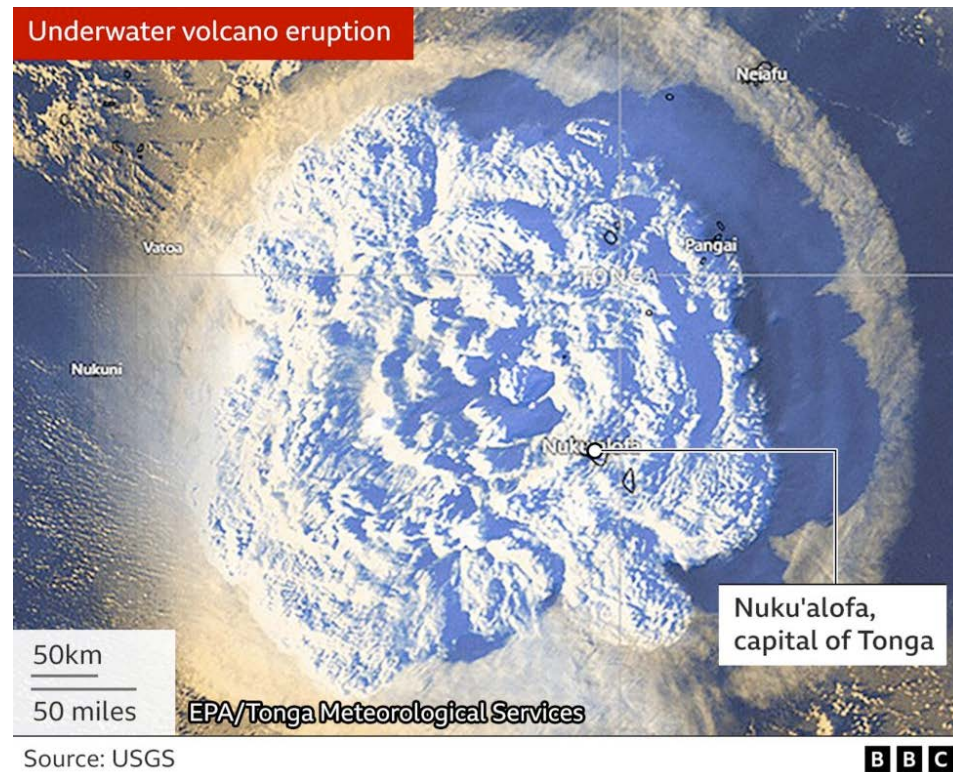


Weather Satellite Images

- <https://zoom.earth/#view=-20.6,-175.5,3.86z/date=2022-01-15,13:10,+8/layers=radar:off>
- <https://twitter.com/i/status/1482863990191443970>

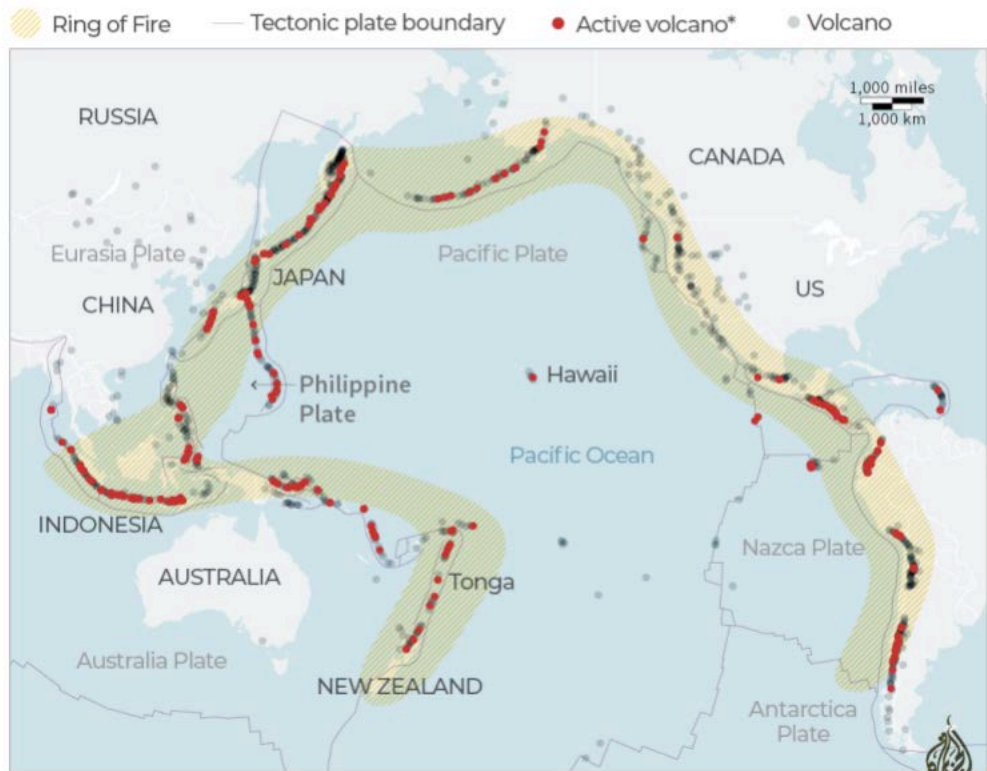


Volcanic Explosivity Index

VOLCANOES

Where are the world's volcanoes?

There are some **1,350 potentially active volcanoes** around the world, Many are located along a **40,000km arc known as the "Ring of Fire."**



* With last known eruption documented from 2000.
Source: Reuters; Global Volcanism Program, Smithsonian Institution; US Geological Survey

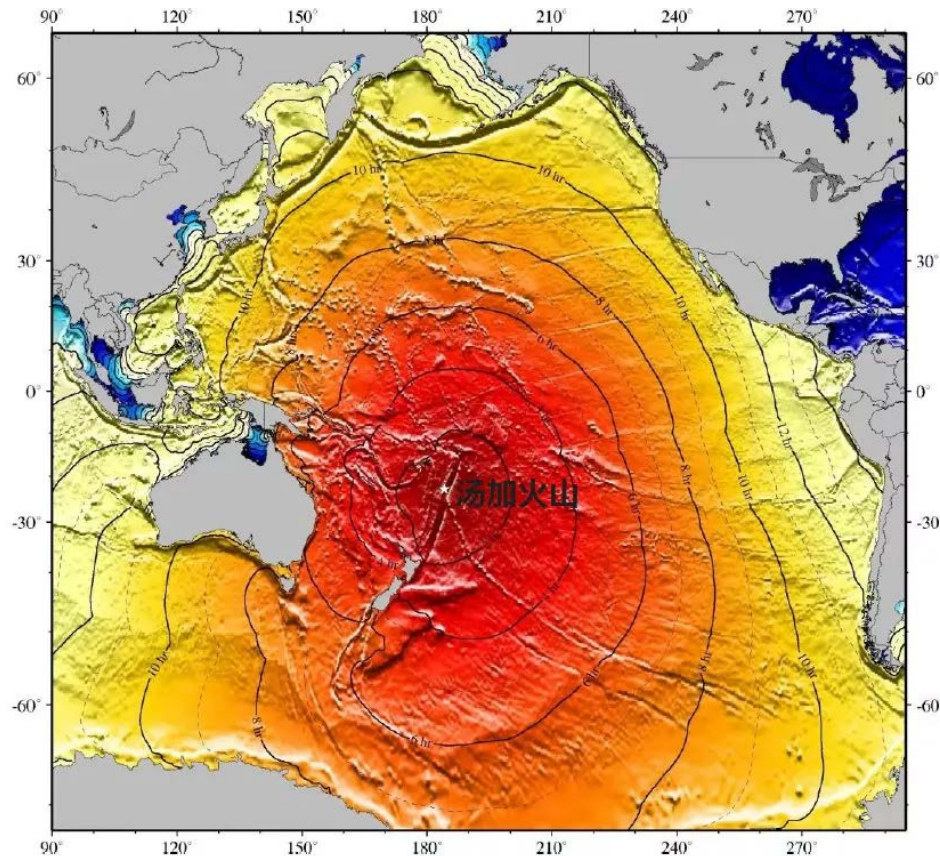
VEI	0	1	2	3	4	5	6	7	8
description de l'éruption	non explosive	faible	modérée	moyenne	importante	très importante			
qualificatif		effusive	explosive		cataclysmique	paroxysmale			
volume de téphra (m3)		10 ⁴	10 ⁶	10 ⁷	10 ⁸	10 ⁹	10 ¹⁰	10 ¹¹	10 ¹²
hauteur de la colonne éruptive (km)	<0,1	0,1 → 1	1 → 5	3 → 15	10 → 25	> 25			
injection troposphérique	négligeable	mineure	modérée	conséquente					
injection stratosphérique	nulle			possible	notable	conséquente			
produits	lave dôme		explosions		coulées pyroclastiques				
dynamisme	hawaiien	strombolien	phréatique	vulcanien		plinien			
éruptions connues TOTAL : 6295	699	845	3477	869	278	84	39	4	0

Find This Volcano

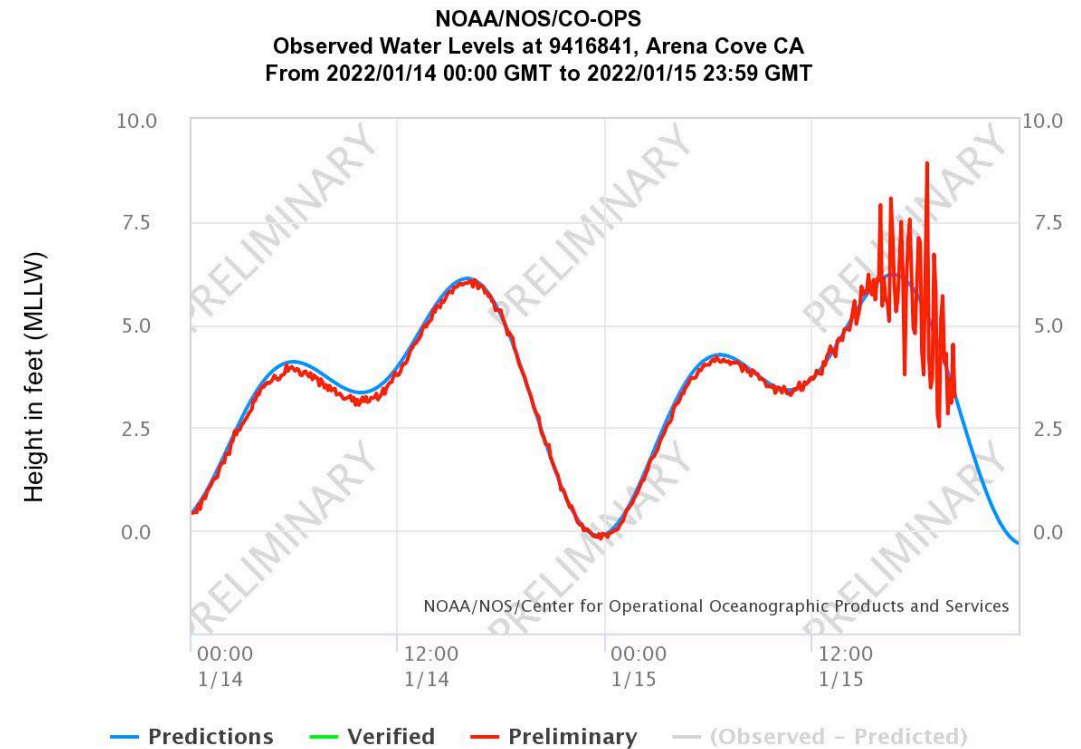
- Go to GeoMapApp
- Also check Global Volcanic Program

Tsunami Observations

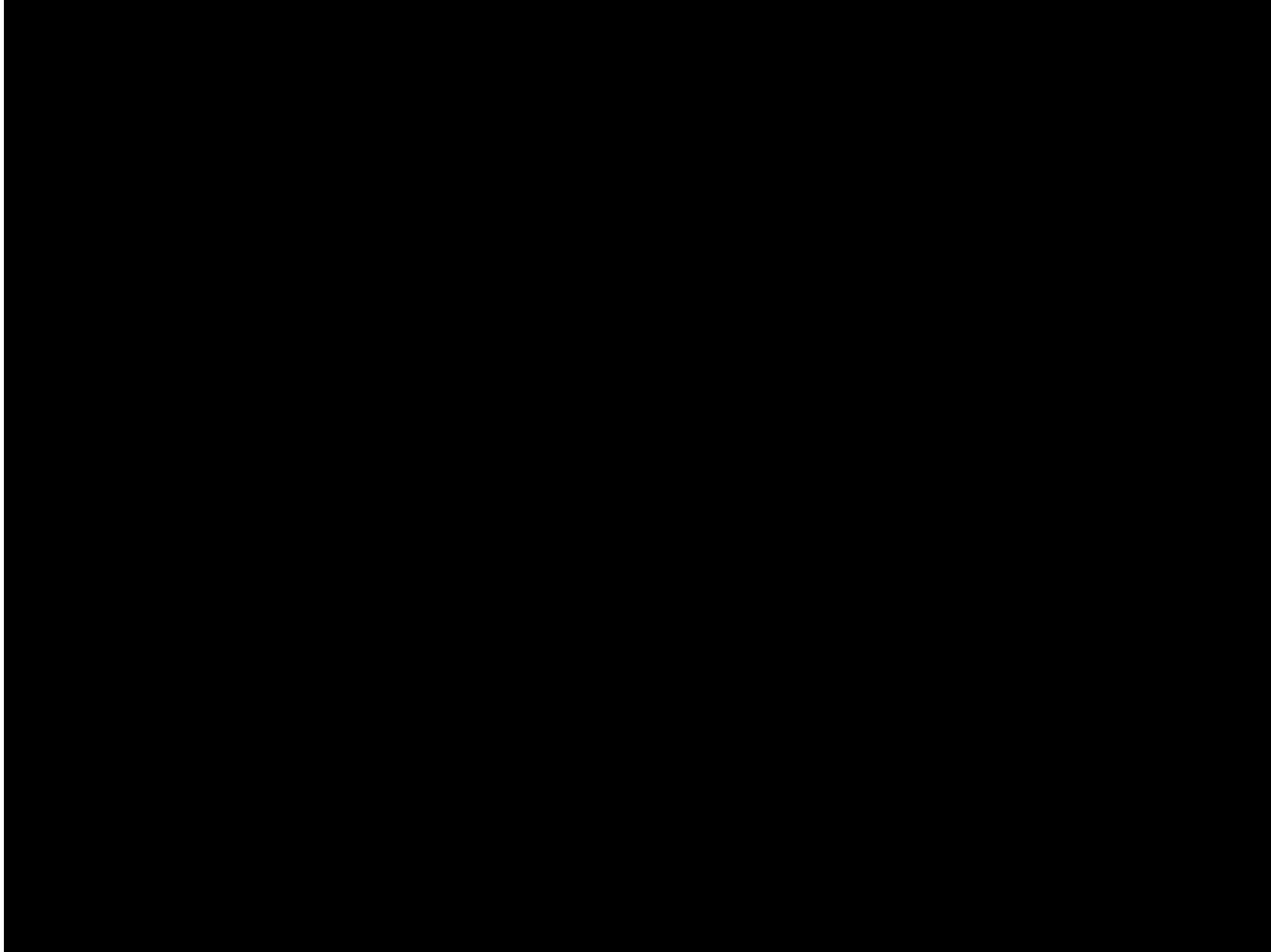
- <https://news.sky.com/story/tonga-tsunami-alert-as-undersea-volcano-eruption-causes-large-waves-to-hit-island-12516351>
- Tidal gauge data can be obtained: <https://www.psmsl.org/data/obtaining/>



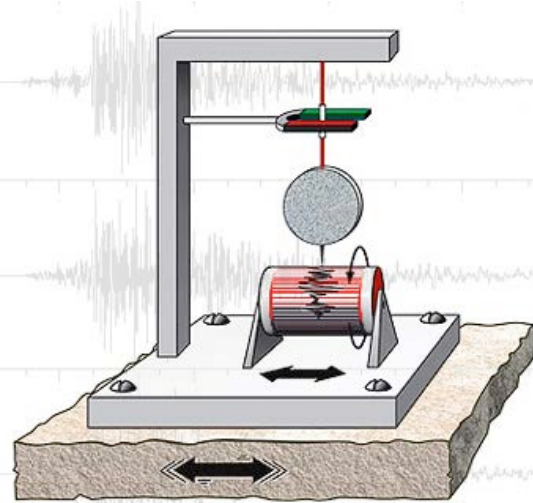
图片来源:自然资源部海啸预警中心



Tsunami Modeling



Seismic wave & atmospheric shock wave



Four Major Types of Seismograms

Tectonic like Earthquakes

(1) **deep earthquakes** and those located away from the volcano, which produce high-frequency signatures and sharp arrivals similar to tectonic earthquakes,

Shallow Volcanic Earthquakes

(2) **Shallow earthquakes**, located under the dome at depths of less than 3 kilometers, which produce medium-to low-frequency seismic arrivals

Surface Events

(3) **surface events**, such as gas and tephra events, rockfalls associated with dome growth, and snow and rock avalanches from the crater walls, which produce complicated signatures with no clear beginning or end.

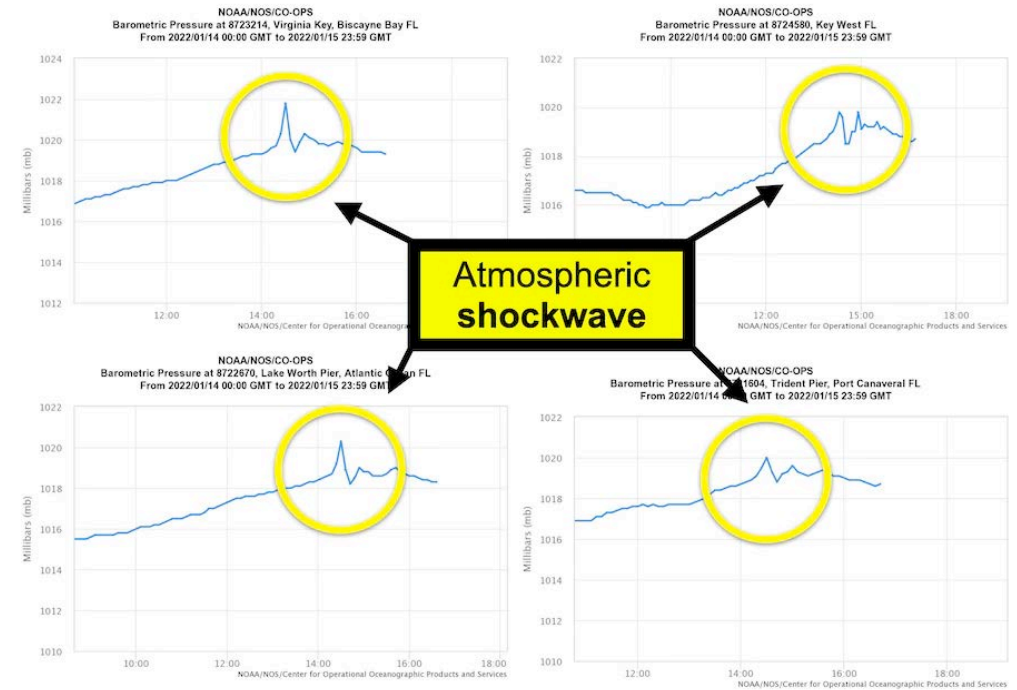
Harmonic Tremor

(4) **Harmonic tremor**, which is a long-lasting, very rhythmic signal whose origin is not well understood but which is often associated with active volcanoes.

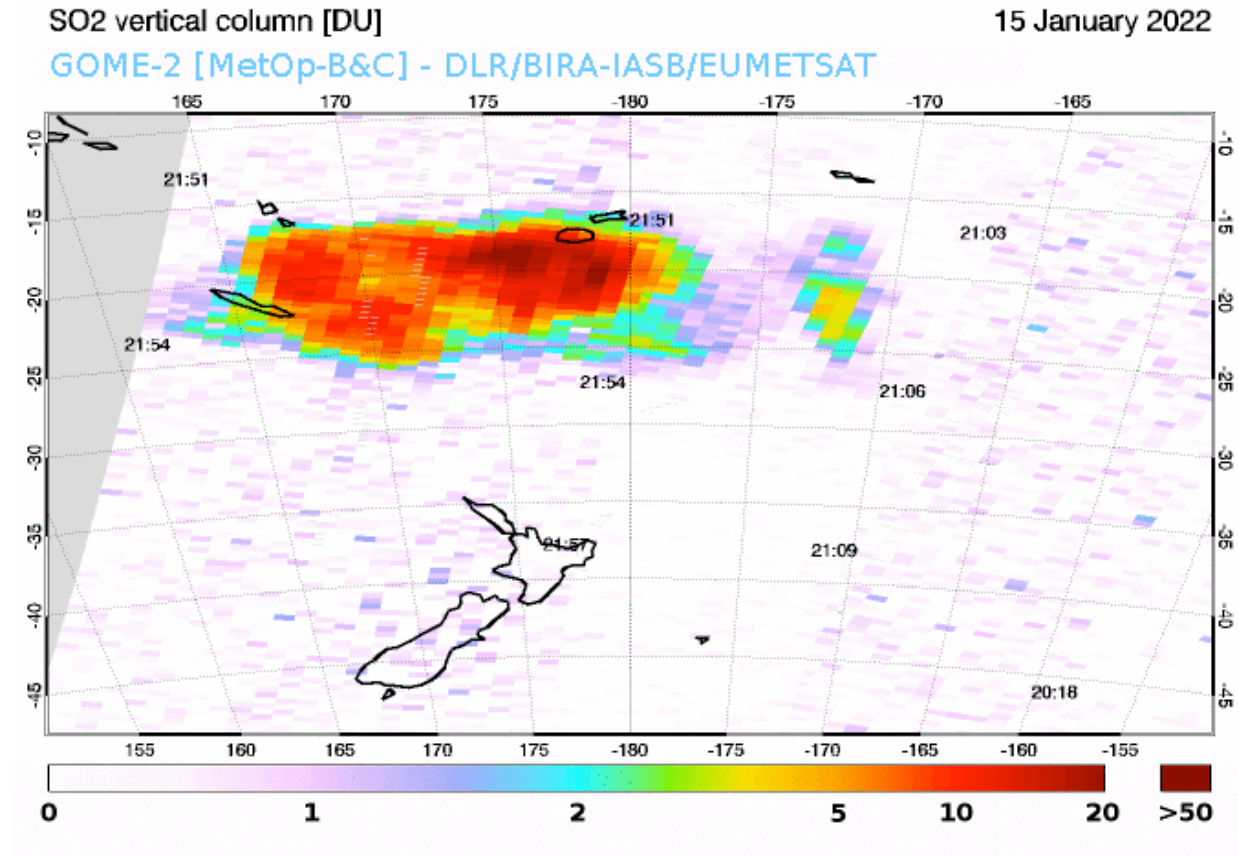


10 Seconds

Topinka, USGS/CVO, 1997, Modified from: Brantley and Topinka, 1984, Earthquake Information Bulletin

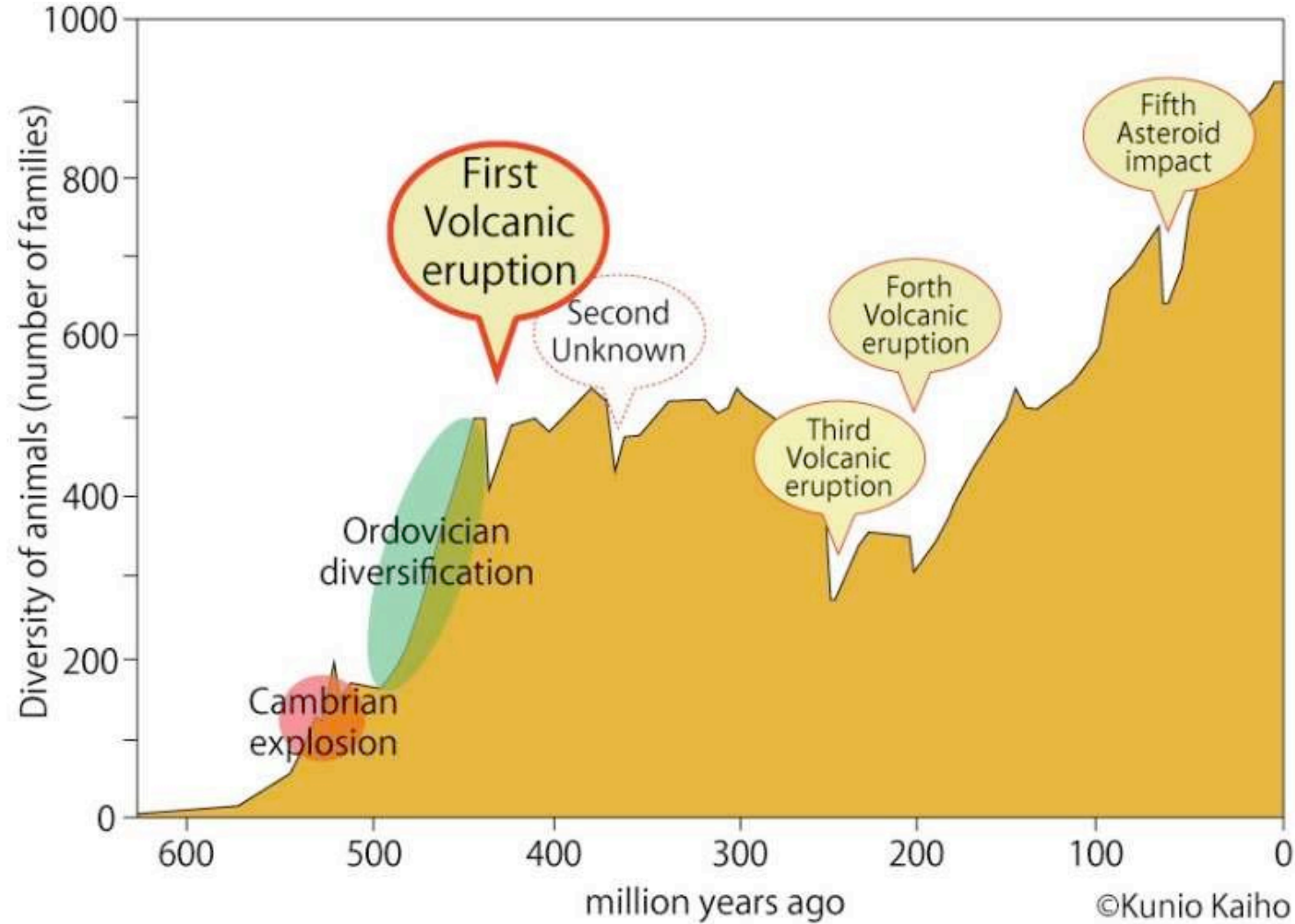


Long-term Climate Effects?



- Limited
- Volcanic ashes

Mass Extinction?



Ref: Jones, D. S., Martini, A. M., Fike, D. A., & Kaiho, K. (2017).