



HUNGA VOLCANO ERUPTION, EARTHQUAKE AND TSUNAMI

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Tonga Geological Services
04/02/2022



UNDERSTANDING THE GEOLOGICAL STRUCTURE

Post-caldera volcanism reveals shallow priming of an intra-ocean arc andesitic caldera: Hunga volcano, Tonga, SW Pacific

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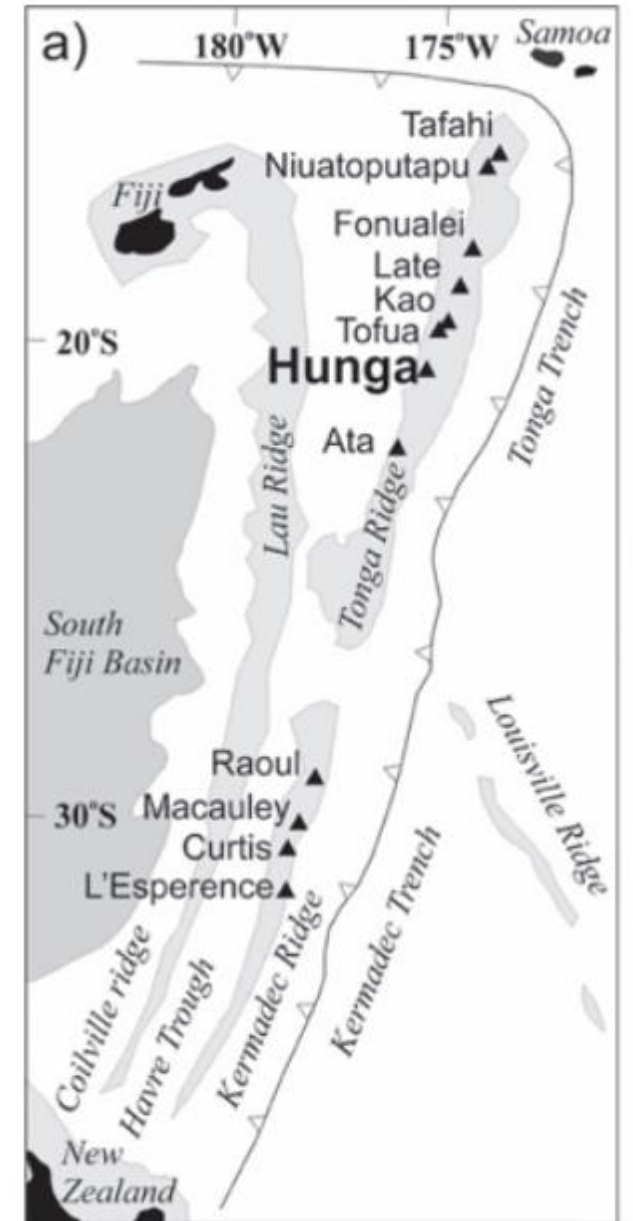
²*School of Environment, University of Auckland, Auckland, New Zealand*

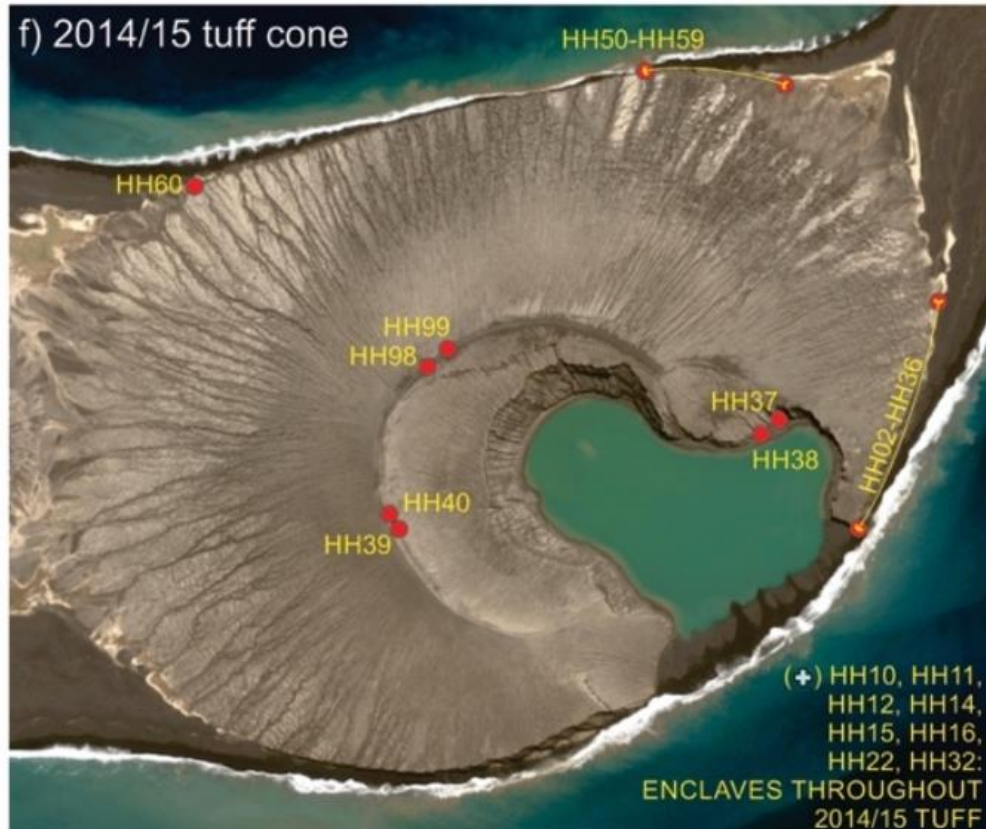
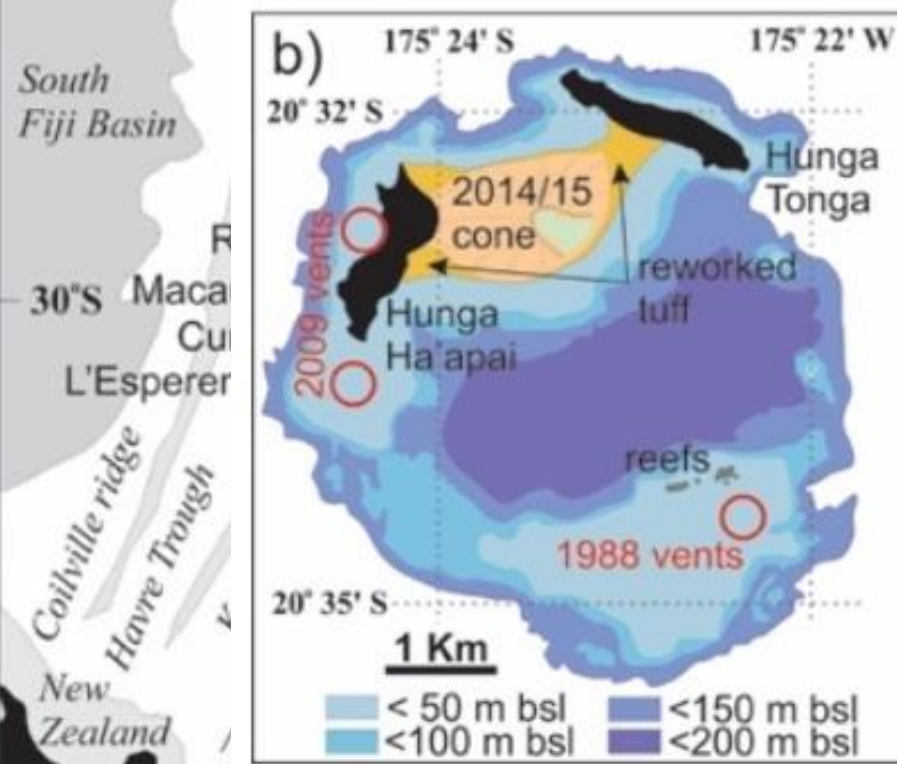
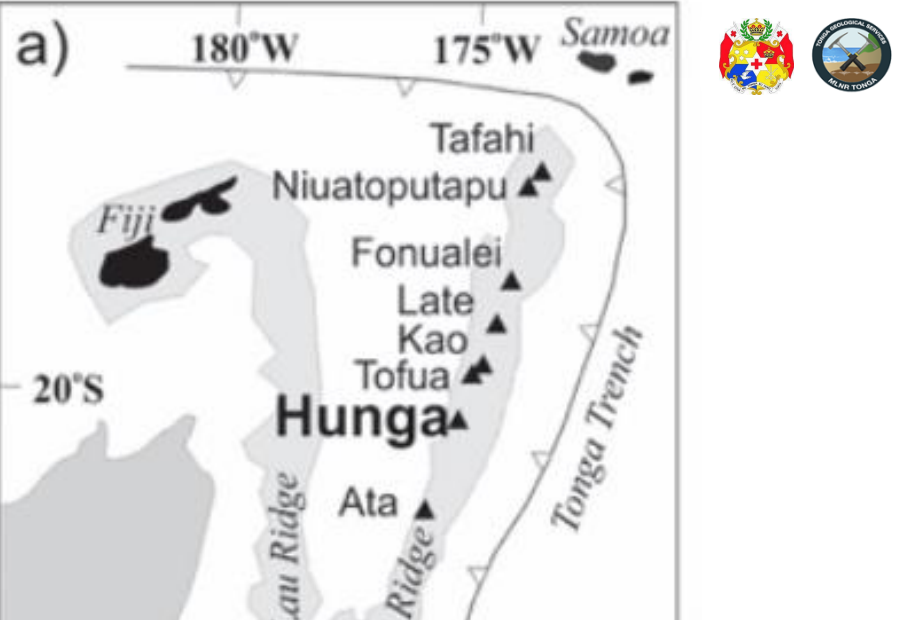
³*Istituto Nazionale di Geofisica e Vulcanologia, Rome, Italy*

⁴*Land Development and Engineering Ltd, Gisborne, New Zealand*

⁵*School of Geography, Environment and Earth Sciences, Victoria University of Wellington, Wellington, New Zealand*

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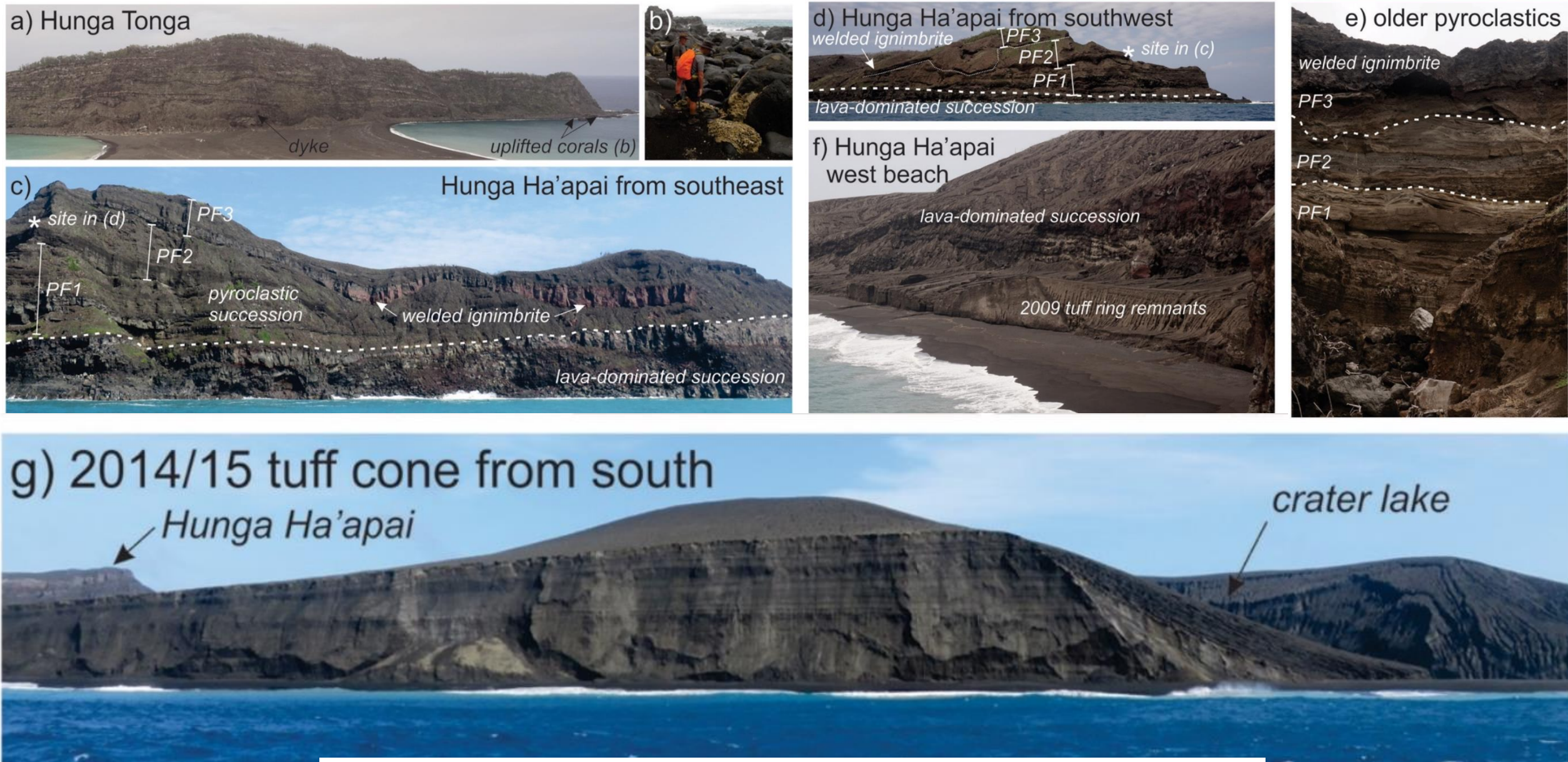


Figure 1. a) Regional geological setting of Hunga volcano in the central portion of the Tongan arc. b) Bathymetry of the summit area and caldera of the Hunga volcano modified from Cronin et al. (2017). c) satellite image of Hunga Tonga-Hunga Ha'apai taken in September 2015. d-f) detailed sampling localities on Hunga Tonga (d), Hunga Ha'apai (e) and the 2014/15 tuff cone (f).

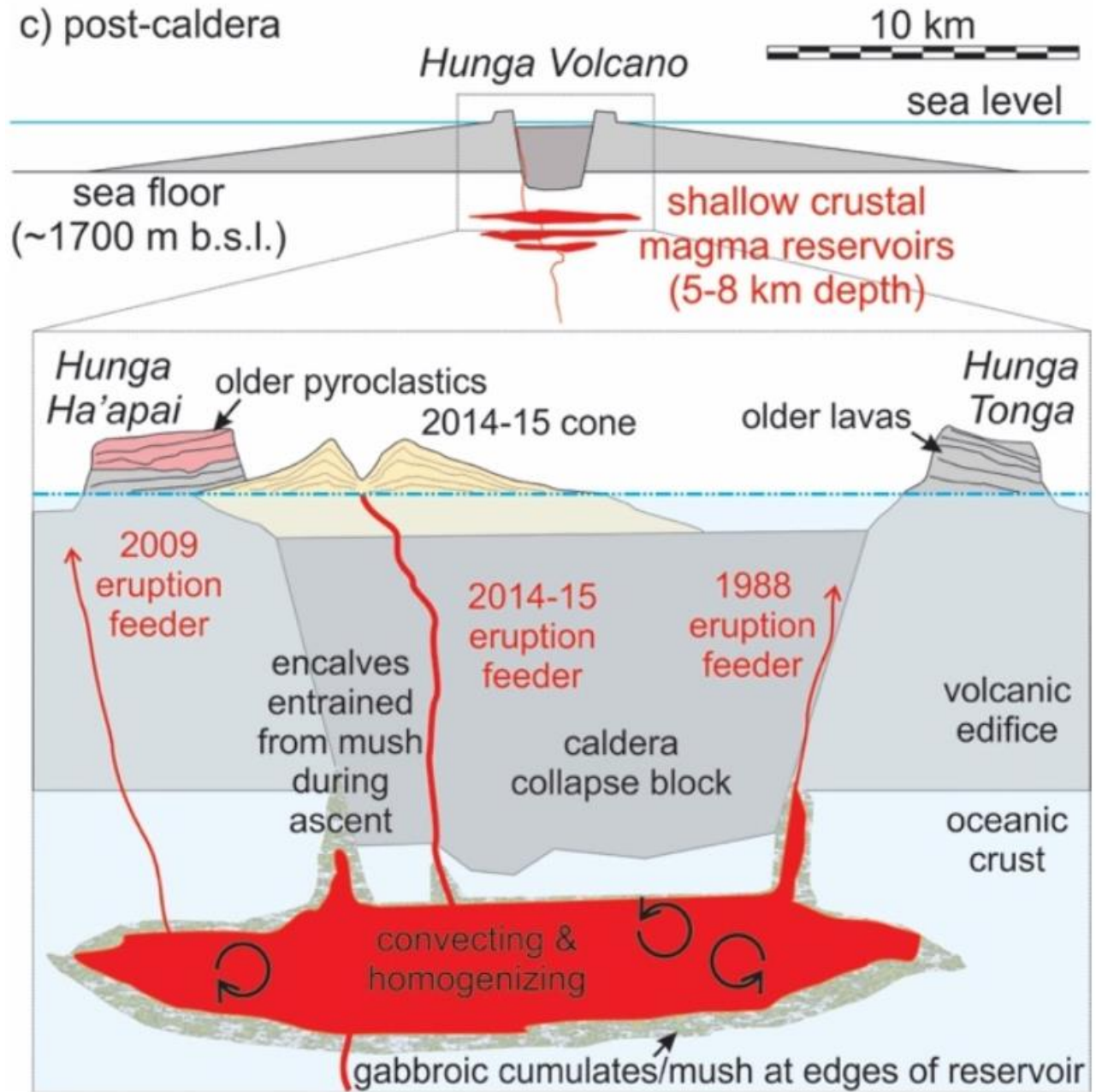
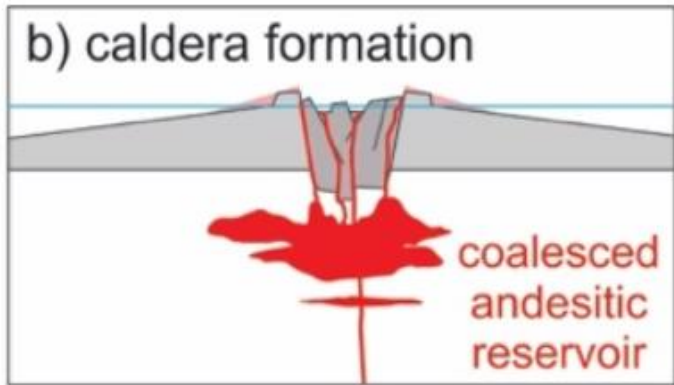
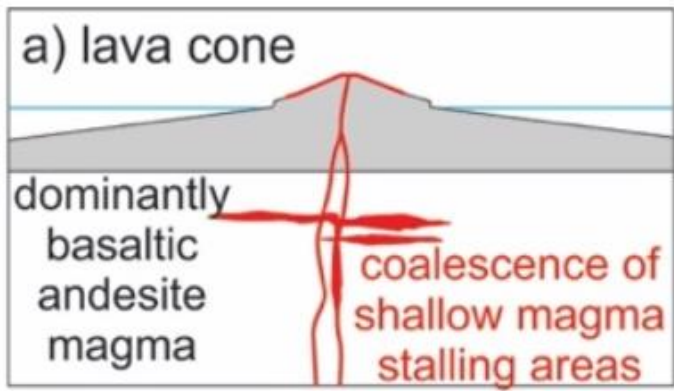
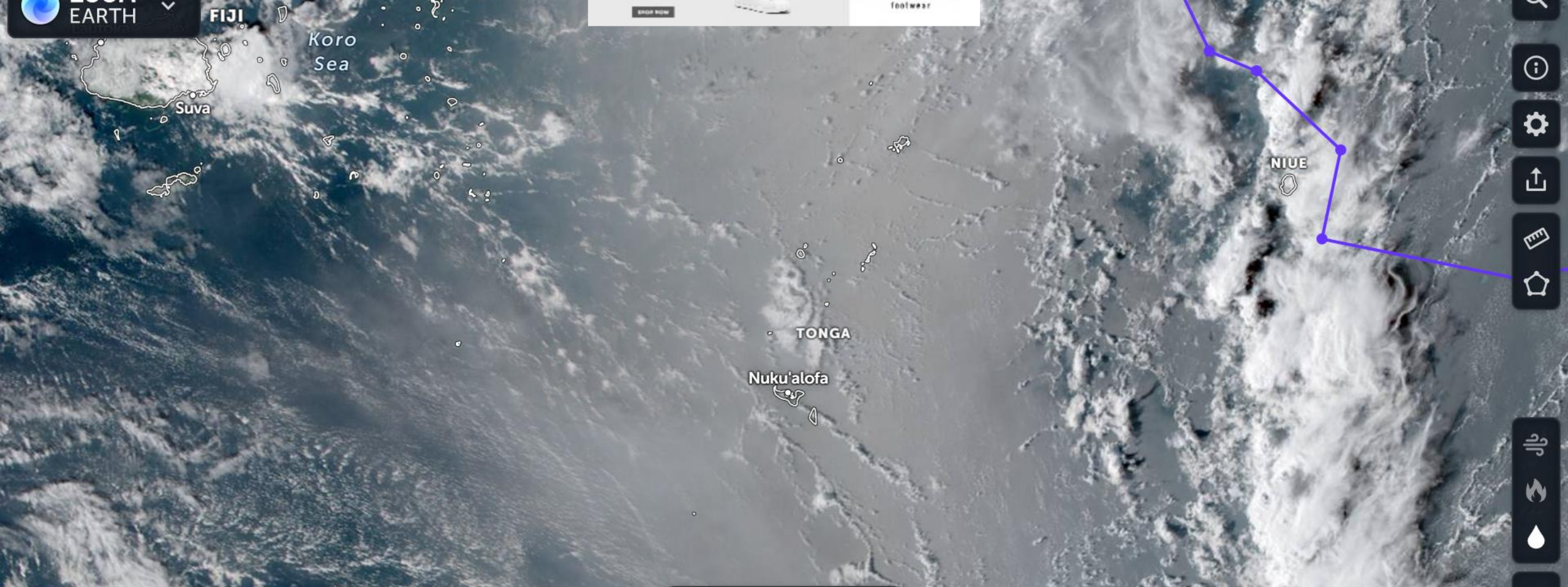


Figure 10. Conceptual model of Hunga volcano plumbing geometry. See text for details of the sequence of events and maturity of the plumbing system.

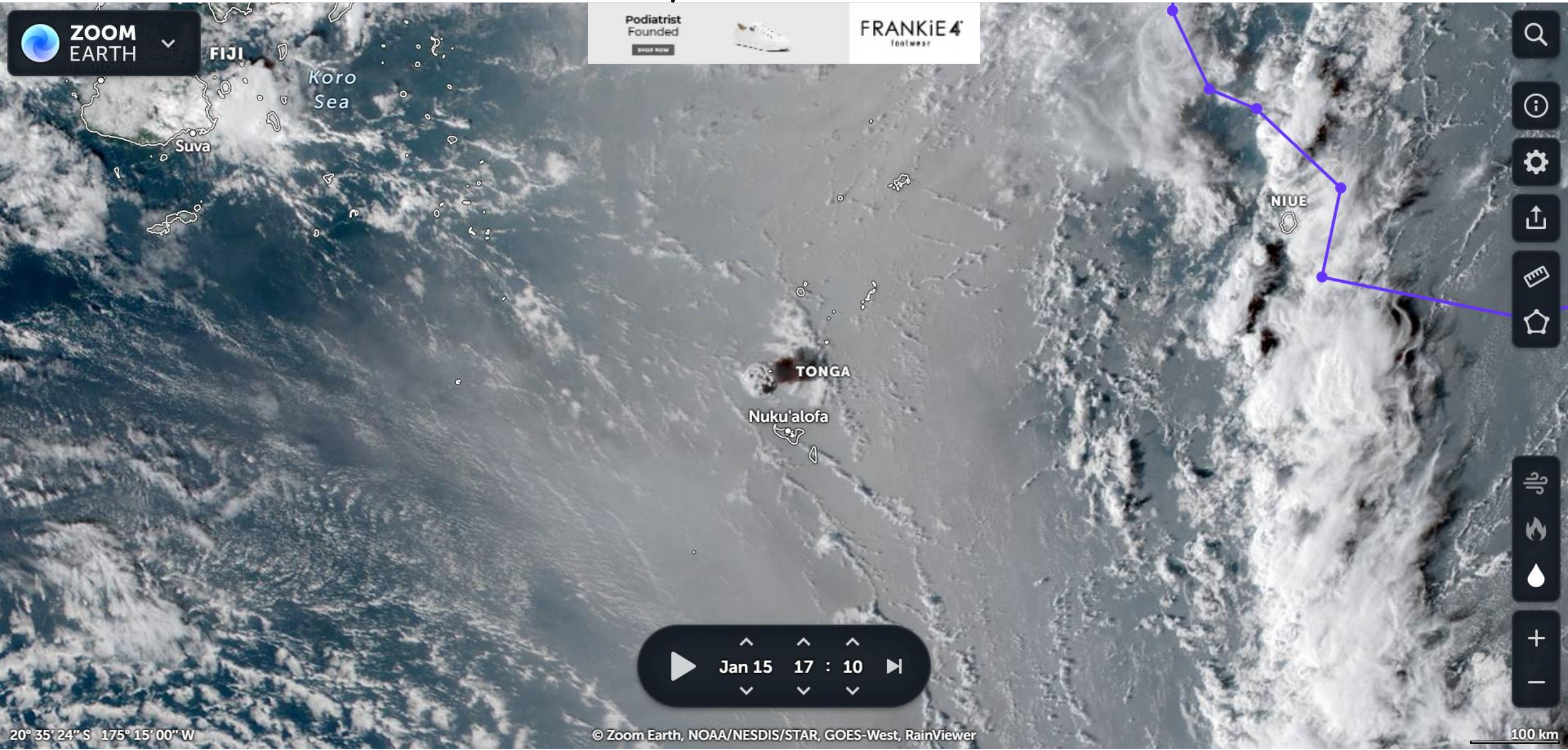




THE HUNGA ERUPTION

The eruption timeline

ERUPTION AT 5:07PM, 15 JAN 2022



ZOOM EARTH

Podiatrist Founded
FRANKIE 4 footwear

Jan 15 17 : 10

20° 35' 24" S 175° 15' 00" W

© Zoom Earth, NOAA/NESDIS/STAR, GOES-West, RainViewer

100 km



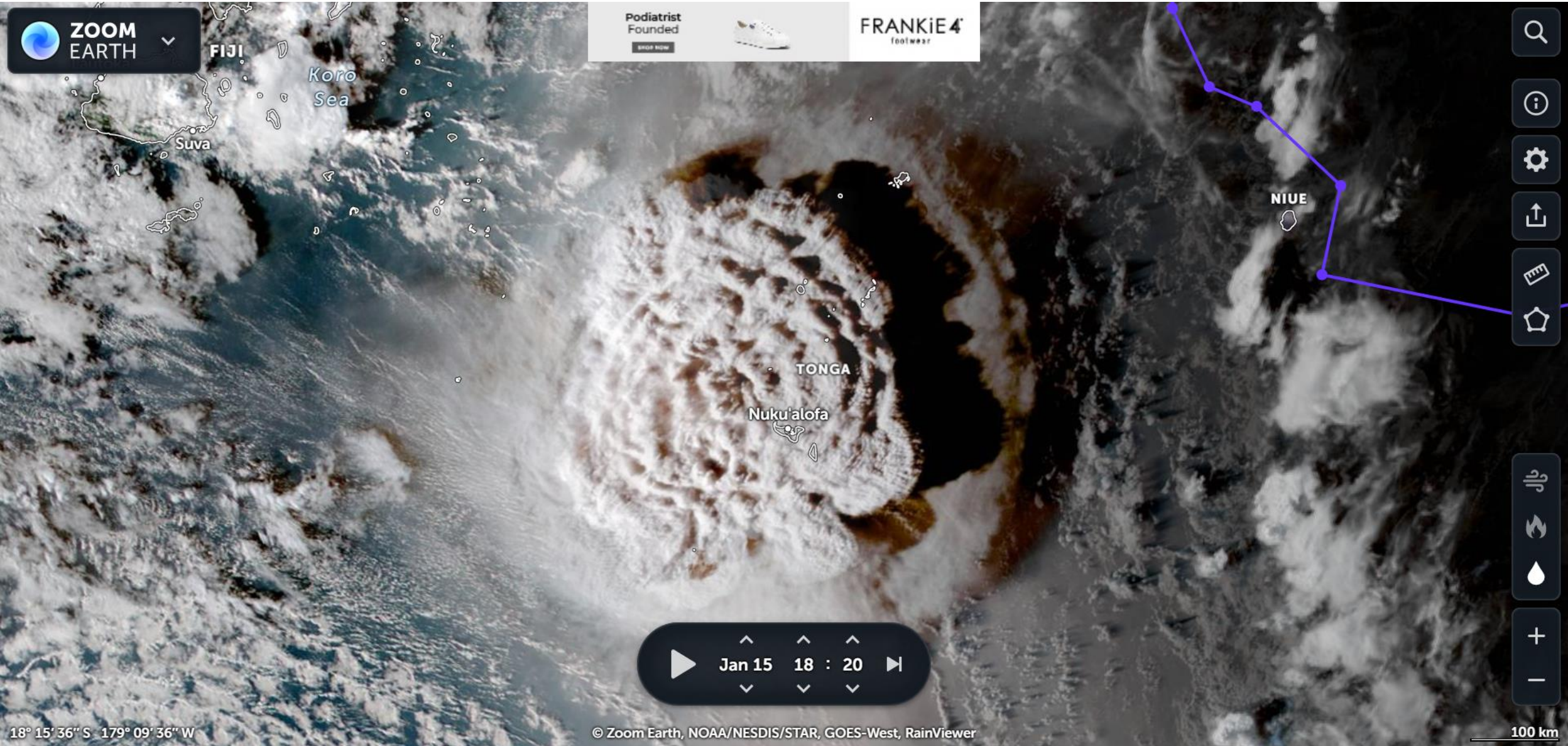
ERUPTION AT TAUFU'AHAU ROAD, NUKU'ALOFA CENTER 5:28PM, 15 JAN 2022



ERUPTION AT TAUFU'AHAU ROAD, NUKU'ALOFA CENTER 5:28PM, 15 JAN 2022



73MIN AFTER THE INITIAL ERUPTION AT 6:20PM



18° 15' 36'' S 179° 09' 36'' W

© Zoom Earth, NOAA/NESDIS/STAR, GOES-West, RainViewer

100 km



USGS All Earthquakes, Past Month

1 of 8975 earthquakes in map area.

Only List Earthquakes Shown on Map

Format: Magnitude | Sort: Newest First

5.8 Volcanic Eruption 68 km NNW ...
2022-01-15 17:14:45 (UTC+13:00) 0.0 km

DOWNLOAD

Didn't find what you were looking for?

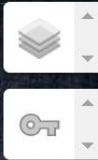
- Check your [Settings](#).
- [Which earthquakes are included on the map and list?](#)
- [Felt something not shown - report it here.](#)

M 5.8 Volcanic Eruption - 68 km NNW of Nuku'alofa, Tonga



Time: 2022-01-15 17:14:45 (UTC+13:00)
Location: 20.546°S 175.390°W
Depth:

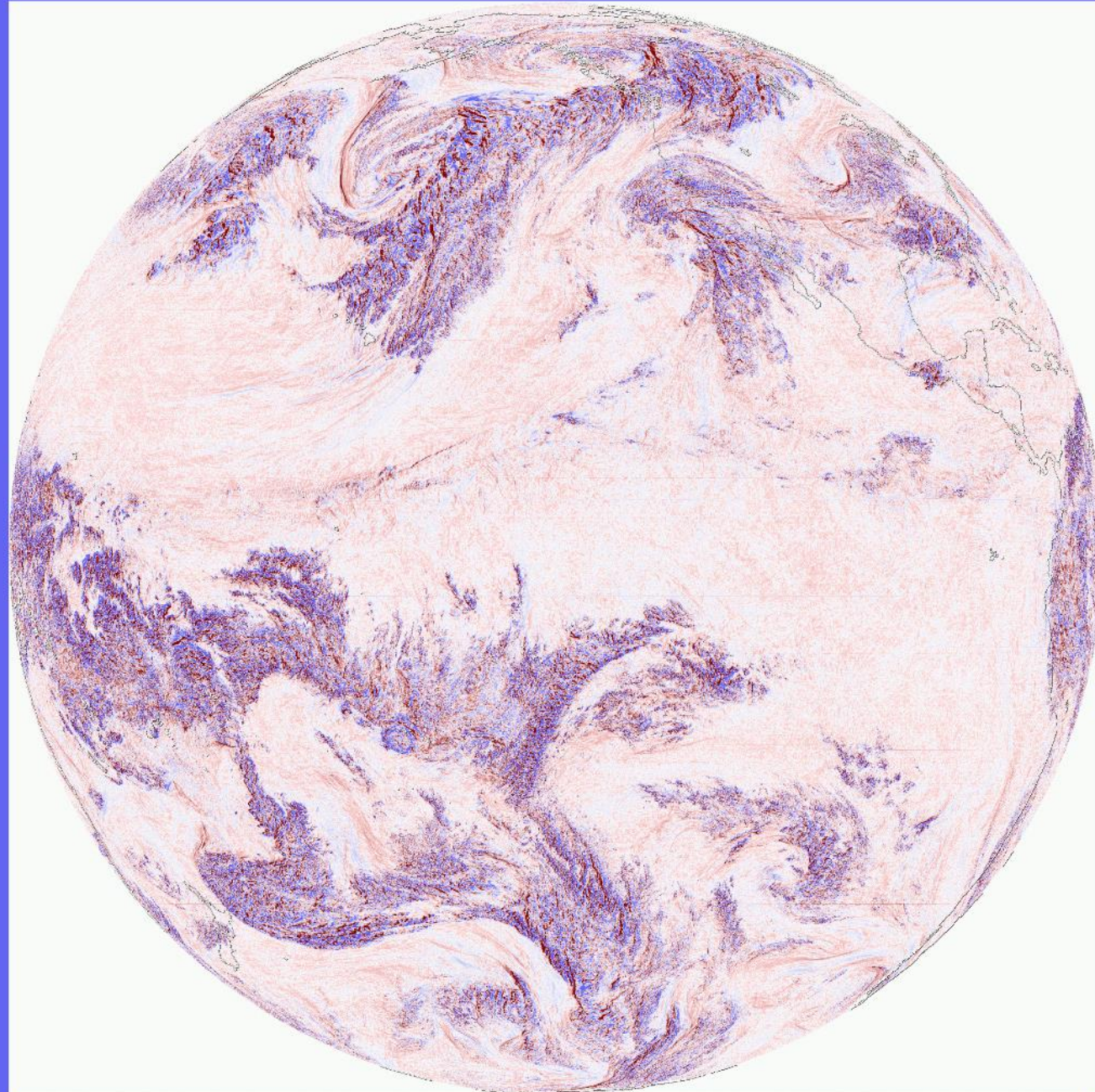
CLOSE



20.563°S : 175.390°W

THE ASH ERUPTION 5:14PM, 15/01/2022

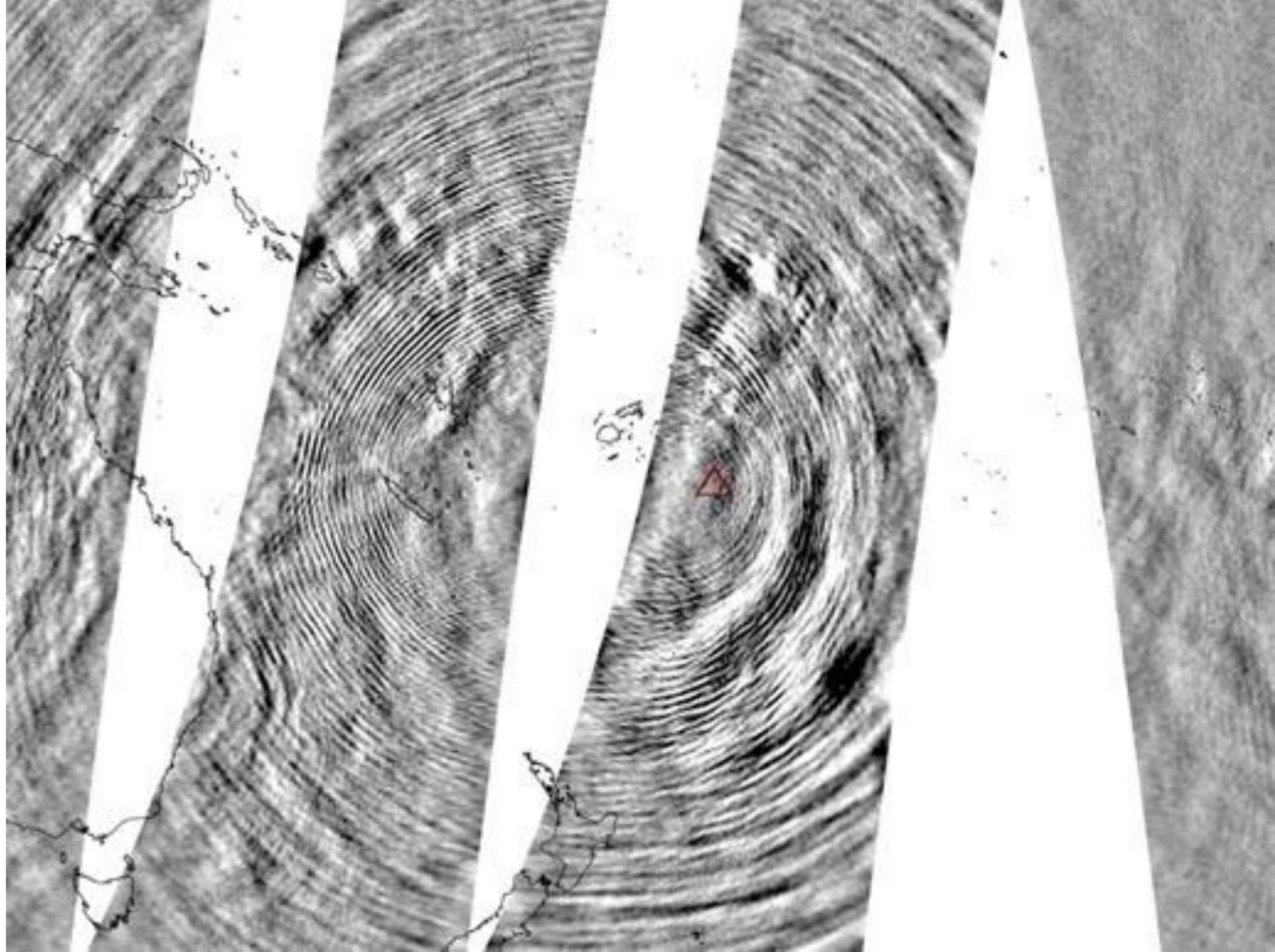




Shockwave travelled
3x around the globe

RADIAL RIPPLE WAVES

Originating from Hunga
Volcano



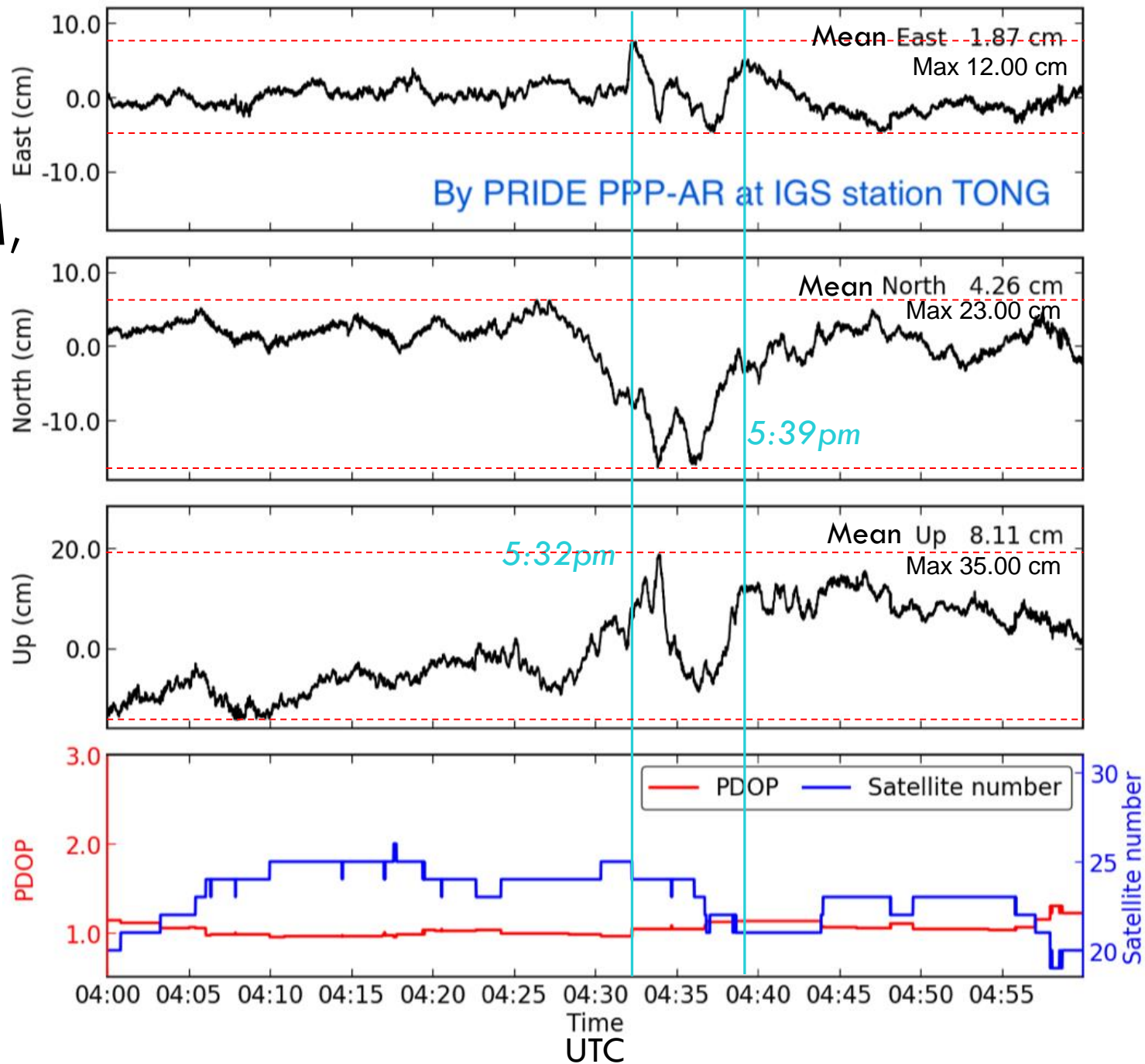
VIEWING 5MILES FROM THE SOUTHSIDE

5:00PM, 14/01/2022



VERTICAL AND HORIZONTAL DISPLACEMENTS 5:00PM – 6:00PM, 15/01/2022

Tonga International Geodetic Station (IGS) at 'Apifo'ou College, Ma'ufanga, Tongatapu Island.





THE LATE HUNGA VOLCANO
11:56AM, 30/12/2021



Early 2 Jan. 2022
with **new HTHH**
with protected
vent in crater
lake ... during
break in the
basal surges

New HTHH 2022



Planetscope: Jan.2, 2022

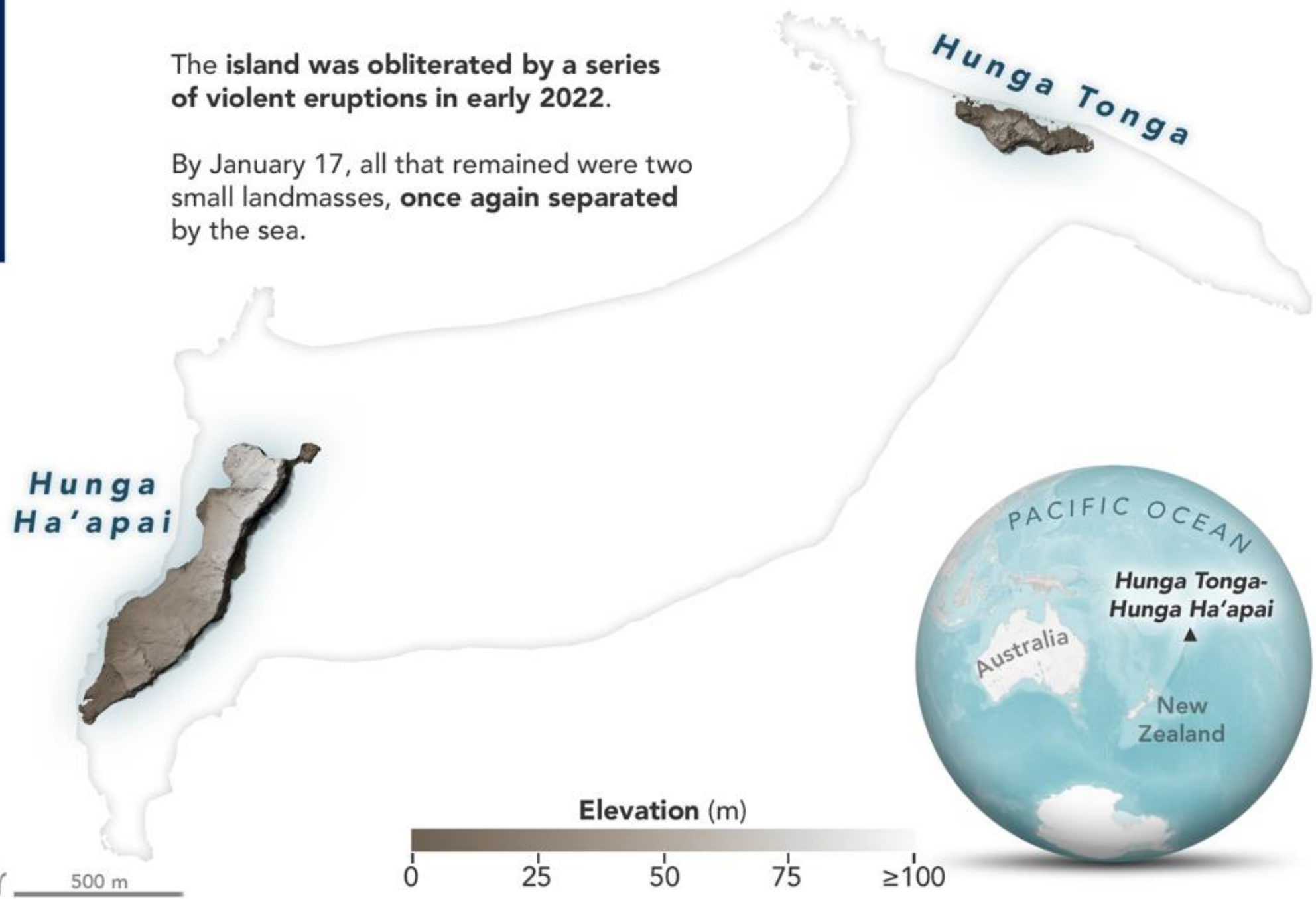




DEM from
Jan. 17, 2022
Maxar WV
stereo
(NASA RRNES
investigation
by Garvin,
Slayback, Kula,
Taylor et al. 2022)

The island was obliterated by a series
of violent eruptions in early 2022.

By January 17, all that remained were two
small landmasses, **once again separated**
by the sea.



HUNGA VOLCANO REMNANTS

20/01/2022

Hunga Ha'apai

Hunga Tonga

*Image captured by Tonga Broadcasting Commission
mission route to Niuafo'ou*





TSUNAMI IMPACT

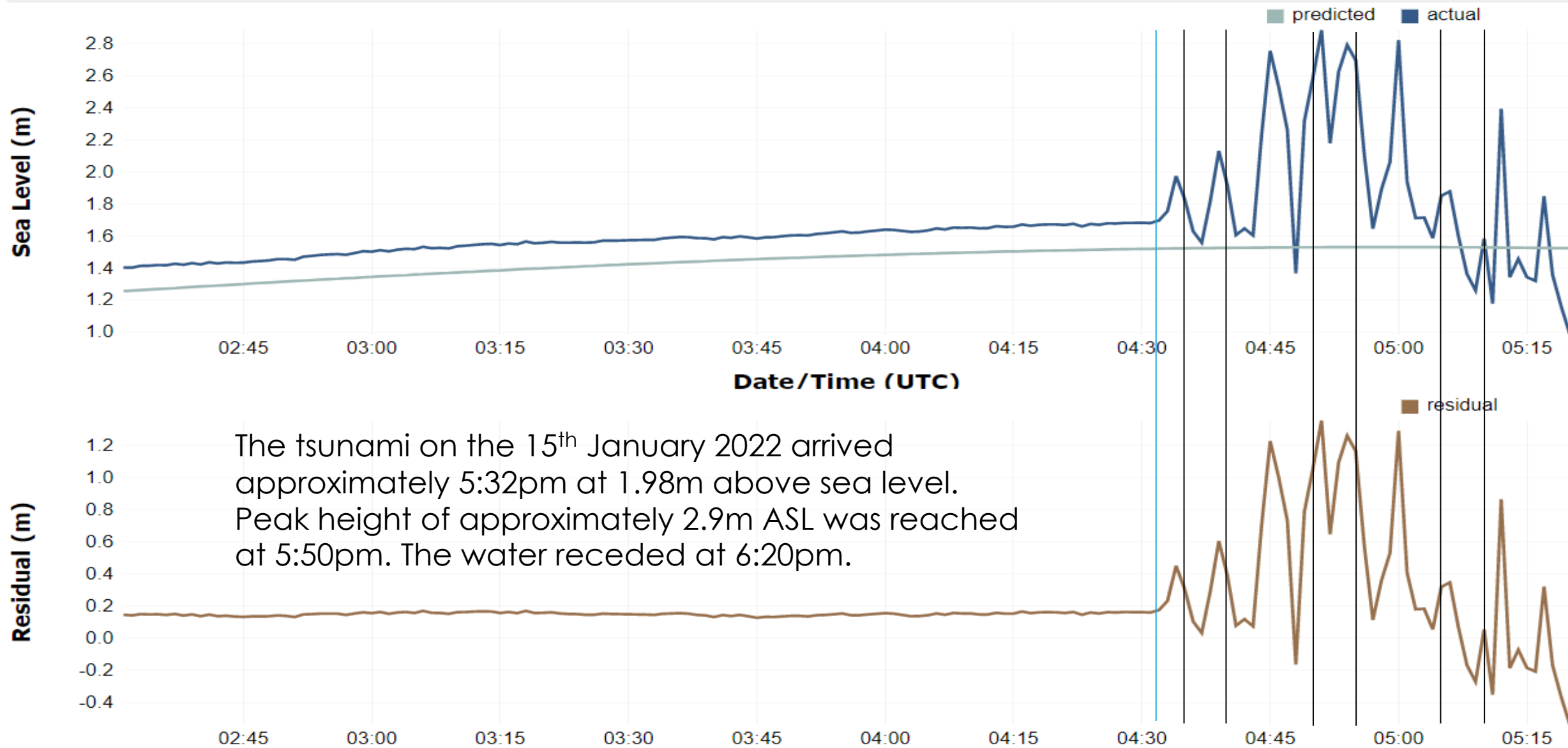
'Ohonua Urban Center, 'Eua Island. Total damage on the coastal area destroying petroleum depot, cemetery, banks, police station, Court House, Government buildings, shopping centers, wharf, bridge, residentials, resort, accommodations, communications, roads, etc.

Tonga - Nuku'alofa

Sea Level

3 hours of data displayed

Sea Level



MANGO



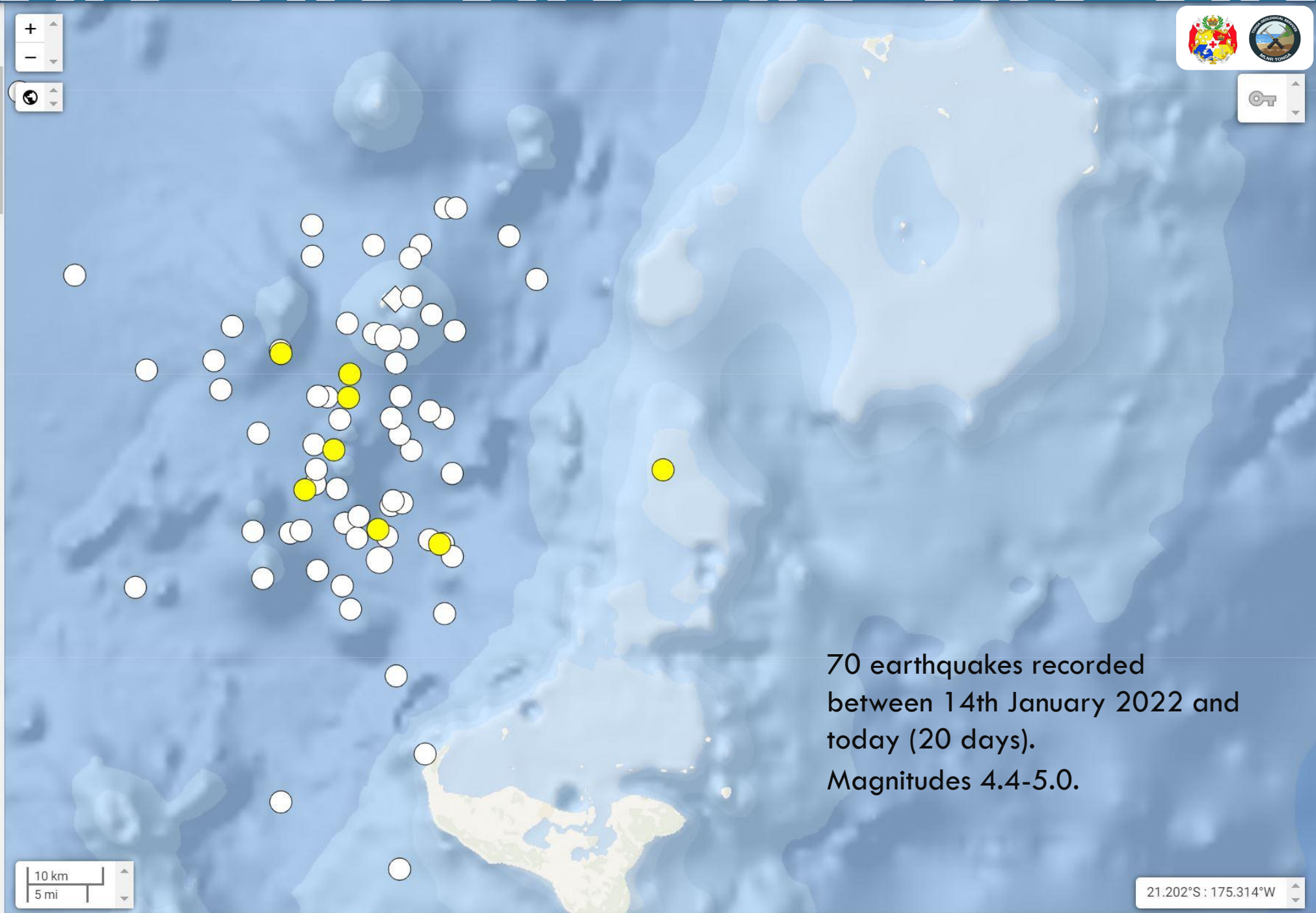
ON GOING MONITORING

NOMUKA





- 4.6 51 km NW of Nuku'alofa, Ton...
2022-02-03 05:30:00 (UTC+1... 10.0 km
- 4.9 53 km NNW of Nuku'alofa, To...
2022-02-02 08:57:59 (UTC+1... 10.0 km
- 4.6 36 km NNW of Nuku'alofa, To...
2022-02-01 11:18:32 (UTC+1... 10.0 km
- 4.7 58 km NNW of Nuku'alofa, To...
2022-02-01 09:07:13 (UTC+1... 10.0 km
- 4.6 43 km N of Kolonga, Tonga
2022-01-31 06:53:26 (UTC+1... 10.0 km
- 4.9 Tonga
2022-01-30 10:21:49 (UTC+1... 10.0 km
- 4.9 42 km NNW of Nuku'alofa, To...
2022-01-29 10:12:20 (UTC+1... 10.0 km
- 4.9 61 km NNW of Nuku'alofa, To...
2022-01-28 14:33:38 (UTC+1... 10.0 km
- 4.7 53 km NNW of Nuku'alofa, To...
2022-01-28 00:14:22 (UTC+1... 10.0 km
- 5.0 64 km NNW of Nuku'alofa, To...
2022-01-27 13:55:32 (UTC+1... 10.0 km
- 4.6 68 km N of Nuku'alofa, Tonga
2022-01-26 22:39:49 (UTC+1... 10.0 km
- 4.9 56 km NNW of Nuku'alofa, To...
2022-01-26 12:34:22 (UTC+1... 10.0 km



70 earthquakes recorded
between 14th January 2022 and
today (20 days).
Magnitudes 4.4-5.0.