

14th and 15th January 2022
Hunga Tonga Hunga Ha'apai (HTHH) Volcanic
Eruption and Tsunami

'Ofa Fa'anunu
Director of Tonga Meteorological Services



Two warning events based on Eruptions and subsequent Tsunami

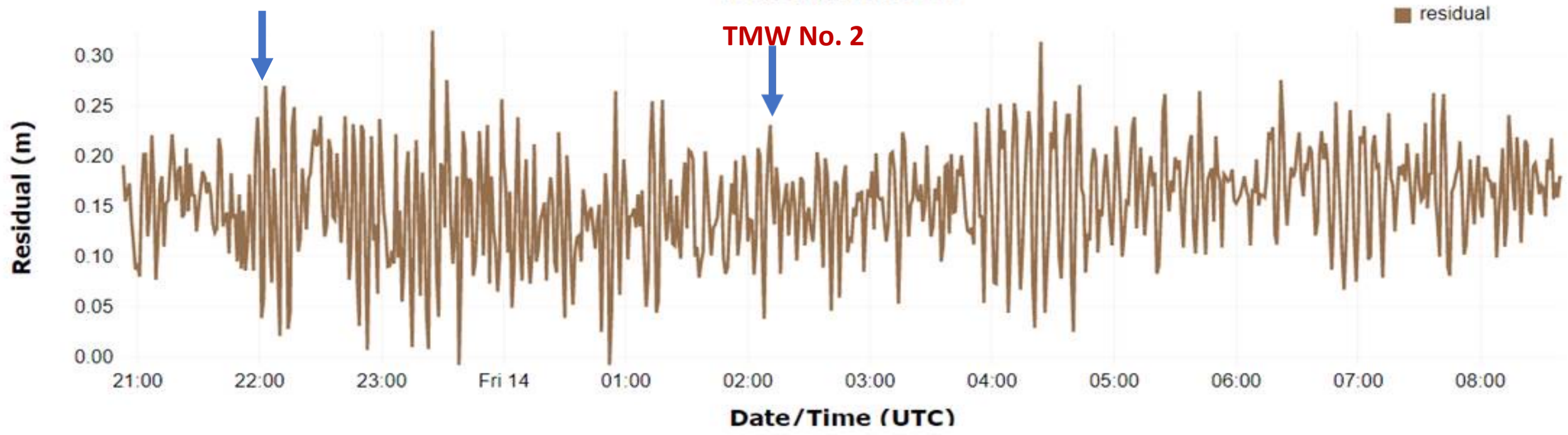
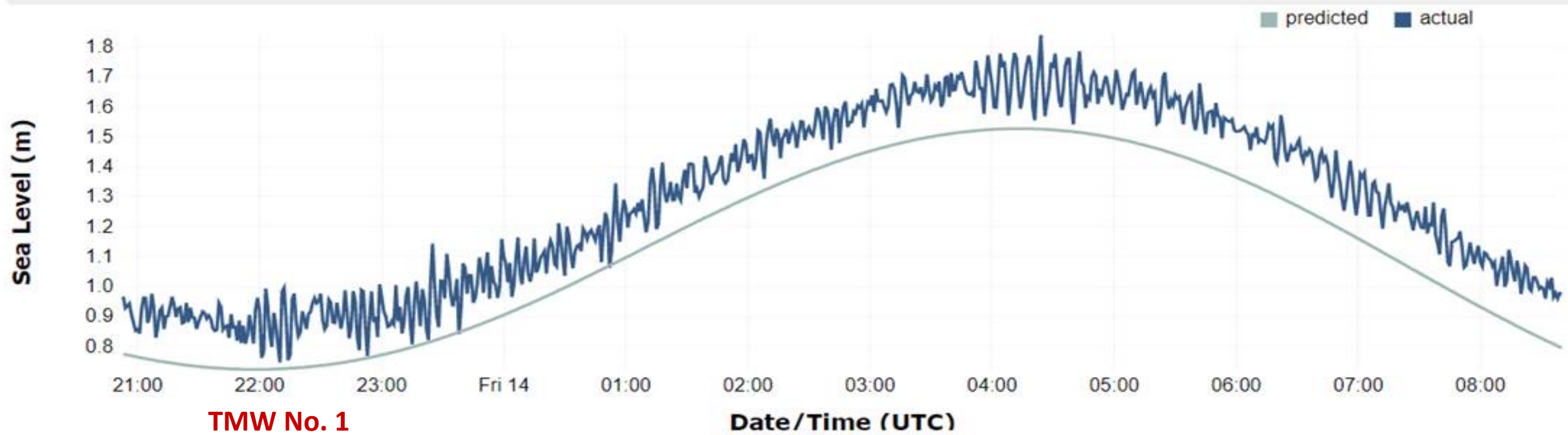
Event #1: 14th January 2022

Event #2: 15th January 2022

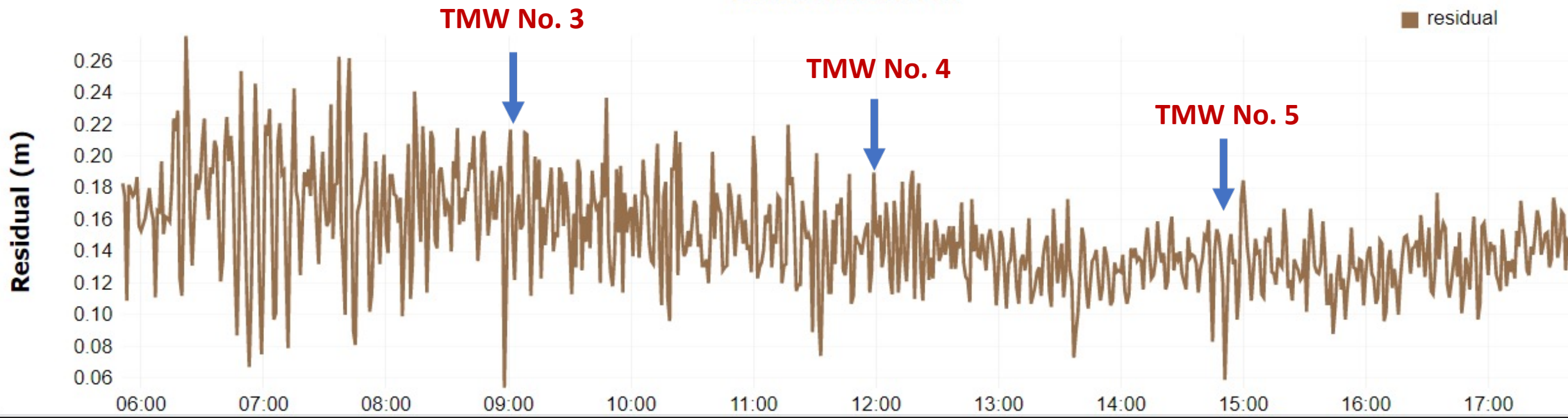
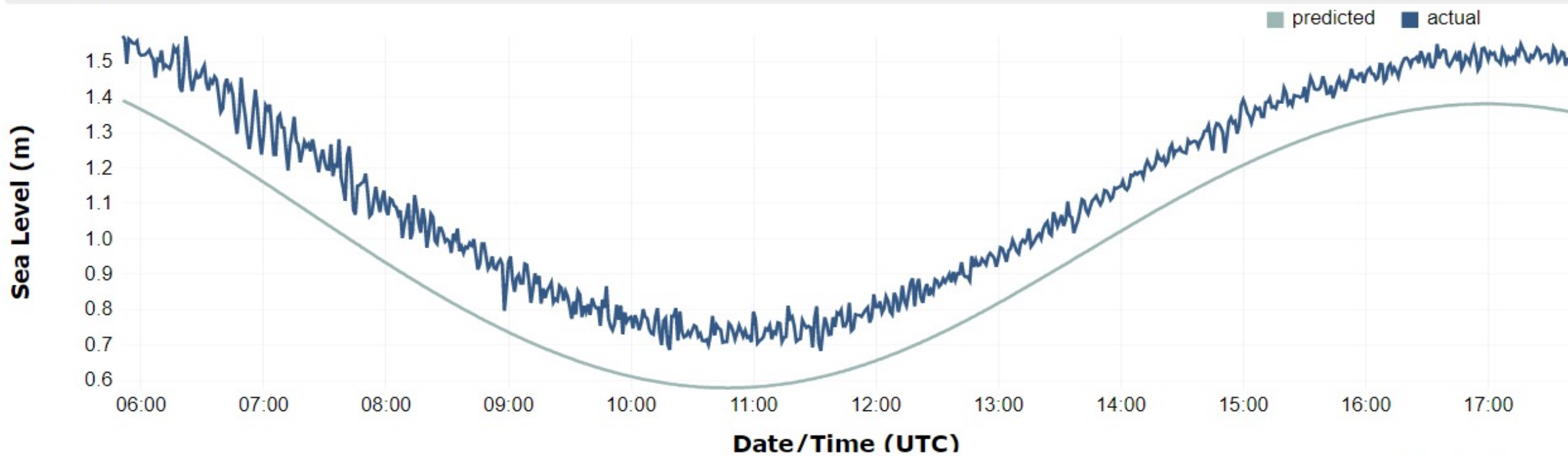
Event No 1 on 14th January 2022 timeline

- 7:00am Moderate to Strong Sulphur Smell in Nuku'alofa
- 8:00am Report of Ash Falls on Fono'i Island in Ha'apai
Report of Ash Falls from the Inter island Ferry by Meteorological Officer on approach to Tongatapu
- 11:12am **Tsunami Marine Warning No. 1** issued based on erratic tide changes from Mango Island in Ha'apai, Nuku'alofa Harbor area, and sea level readings on the Nuku'alofa
- 3:26pm **Tsunami Marine Warning No. 2** cancel of warnings for Northern Tongan Islands remain in force for South Ha'apai, Tongatapu and 'Eua
- 10:00am(15) **Tsunami Marine Warning No. 7** cancel of warnings for all Tonga

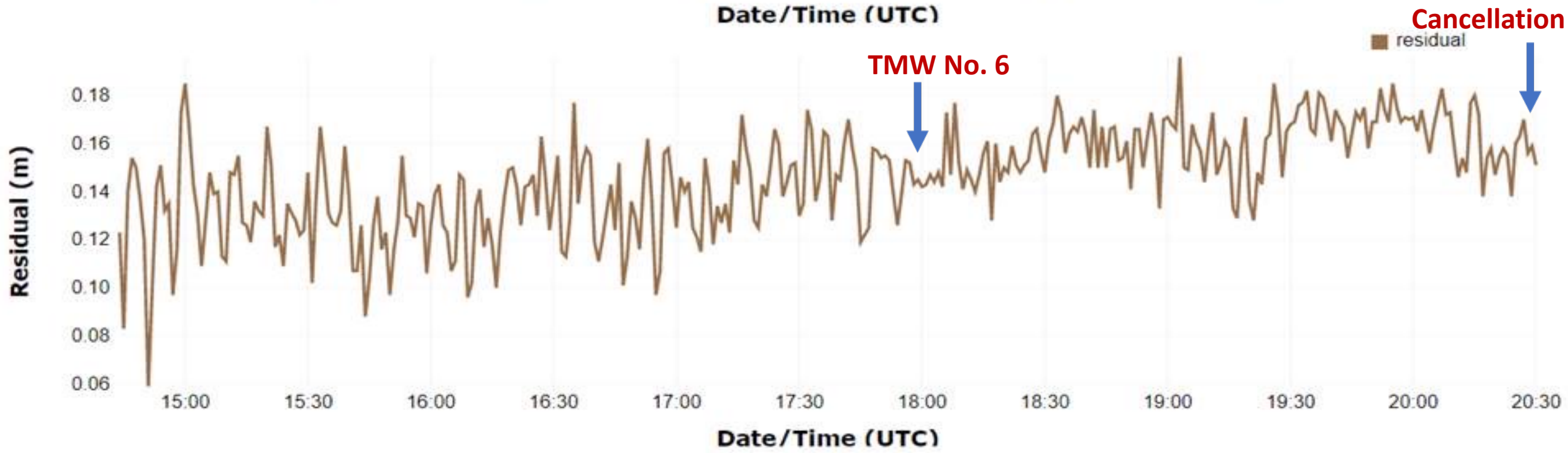
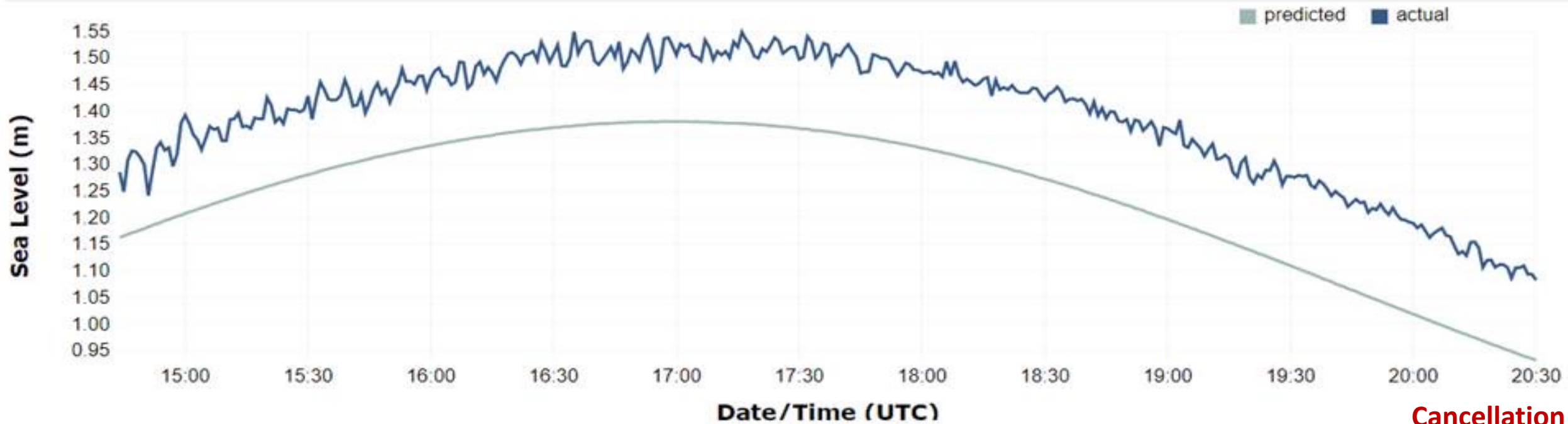
Sea Level



Sea Level



Sea Level



Event No 2 on 15th January 2022 timeline

- 17:13hr Eruption Observed from the MET Office
Geological Office informed
- 17:21hr Loud blast heard (Estimated time) from the volcano
- 17:30hr **Urgent Tsunami Warning for all Tonga** issued on AM Radio with evac advice based on unusually loud volcanic blast by duty officer on call from Director. Was difficult to raise the Radio due to congested lines
- 17:45hr **Tsunami Warning No. 1 for all Tonga** issued on AM Radio by Director with evac advice based on tide gauge readings
(Radio briefing every 2hrs based on sat phone calls to VAAC Wellington)
- 01:48hr (16) **Tsunami Marine Warning No. 1 for all Tonga** downgrade based on ocean observations by the Director of Geological Office

Event No 2 on 15th January 2022 timeline

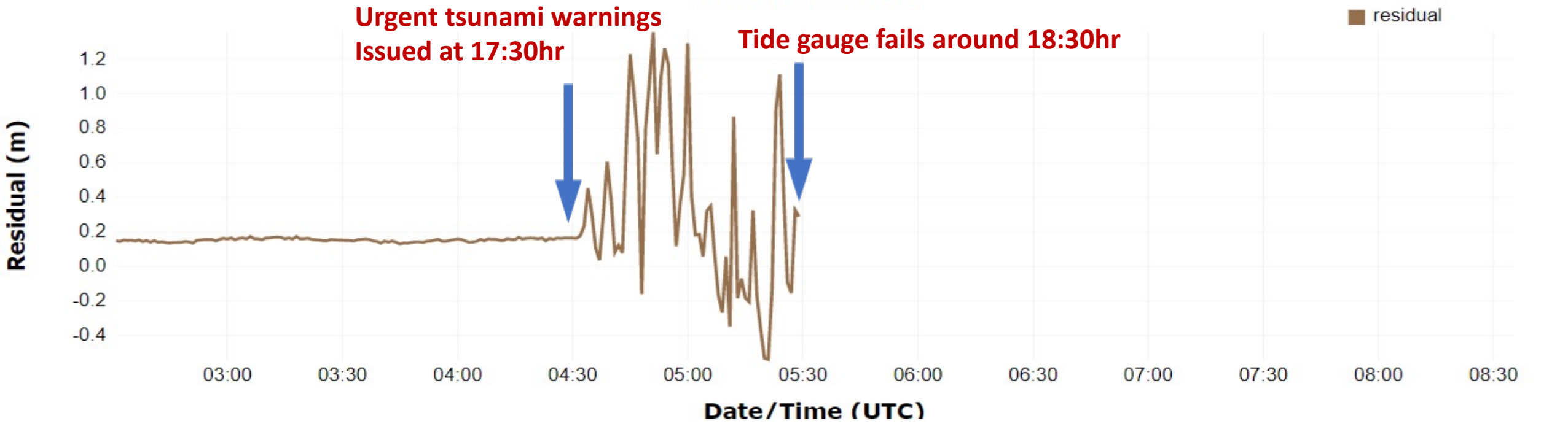
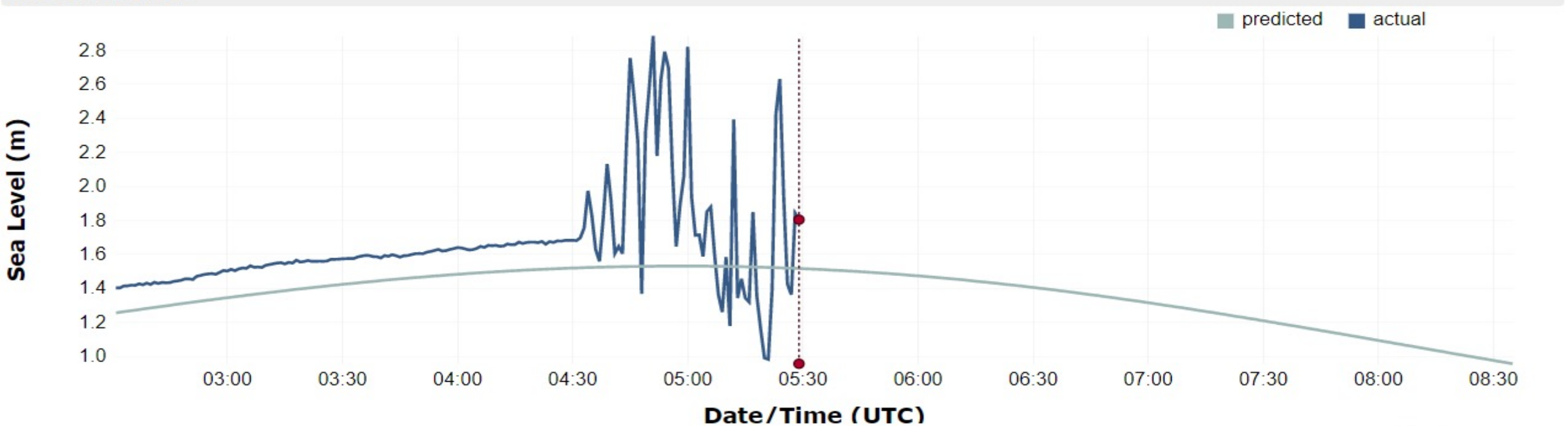
01:48hr (16th) to 10am (17th)

Tsunami Marine Warnings warnings cancelled for northern of Tonga

13:00hr

All warnings cancelled by Deputy Director

Sea Level

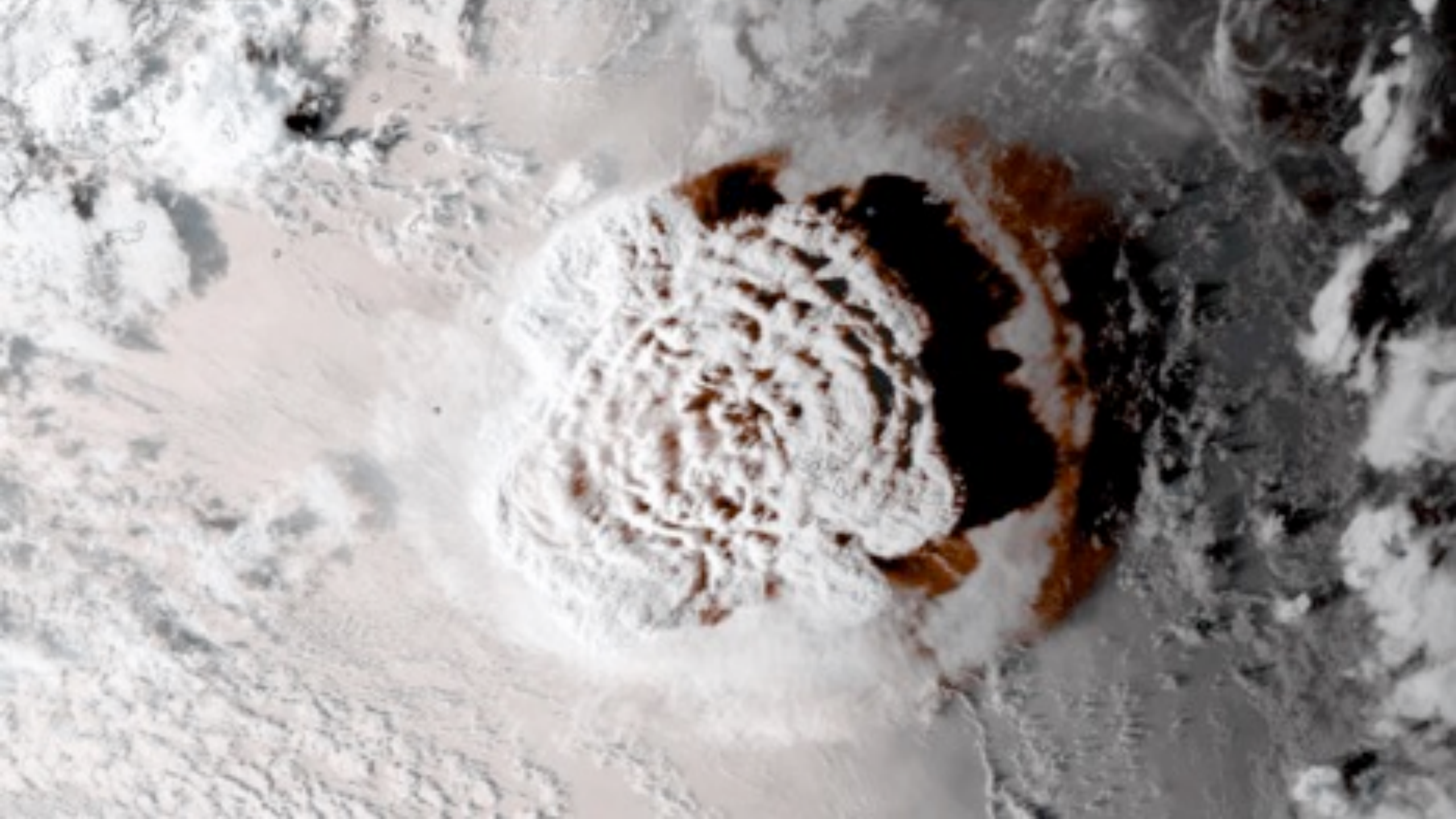


17:13hrs

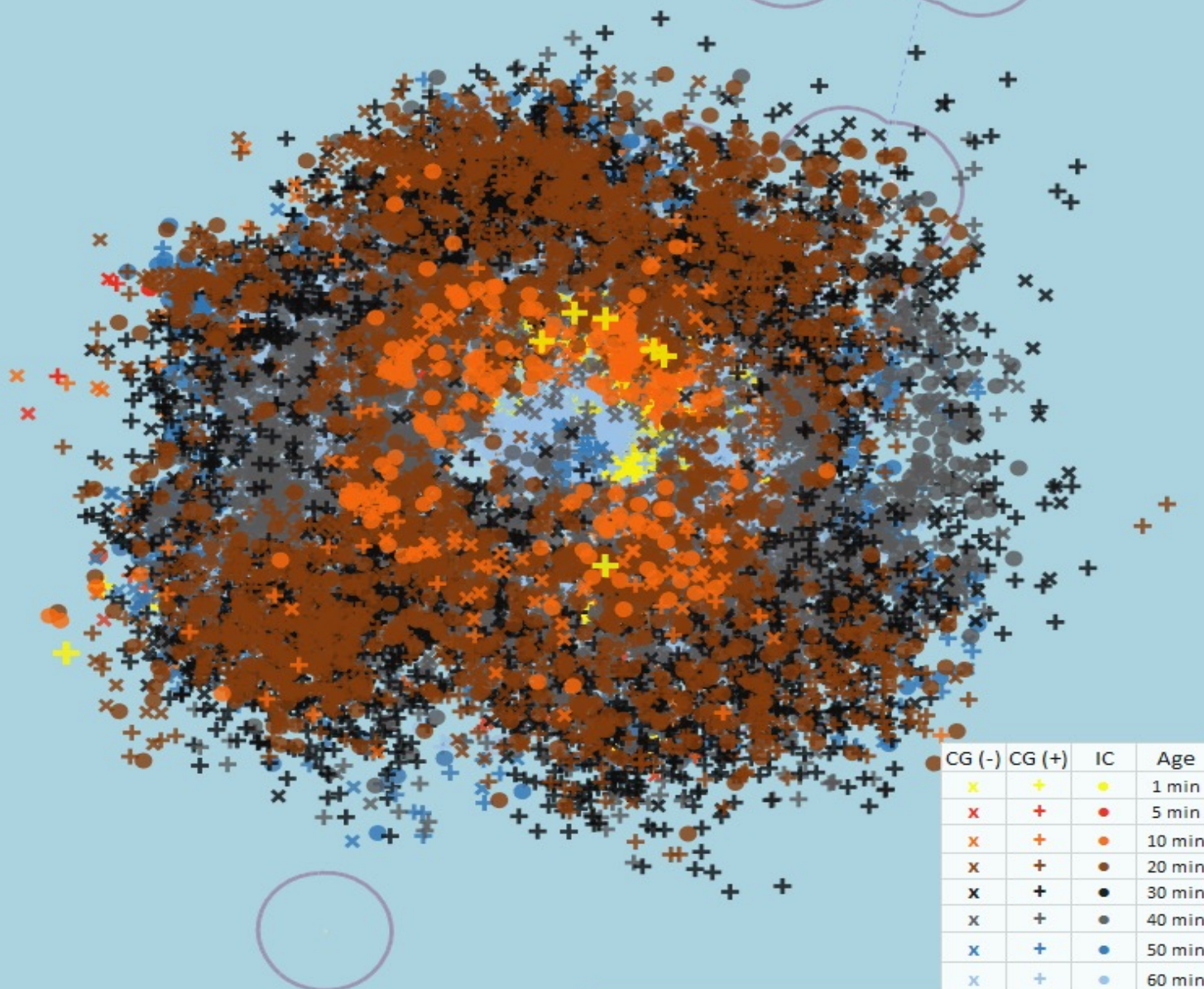


17:21hrs





Lightning Detection



Tsunami Warning for Tonga

No: 01

Issued at 5:45pm on 15 January 2022

A volcanic eruption has occurred with these parameters:

Origin time: -

Coordinates: Lat: 20.54 Lon: 175.38W

Depth: 0km

Magnitude: NIL

The above magnitude is provisional and may be increased or decreased as more seismic data becomes available.

Tsunami Warning

(Only Warnings issued by the Tonga Meteorological Service represent the official warning status for Tonga)

THIS IS THE NATIONAL TSUNAMI WARNING CENTRE.

Based on the ongoing volcanic eruption in the Hunga-Tonga Hunga-Ha'apai area and the observation reported that the sea waves already strike on the shore of Sopu and Ha'atafu, therefore , A TSUNAMI WARNING IS NOW INFORCE FOR TONGA.

Public are advised to keep away from low lying coastal areas, reefs and beaches. Mariners out at sea are advised to prepare to move to deep water.

The next bulletin will be issued as soon as new information is received. Listen to Radio Tonga.

NEOC Status:

The National Emergency Operation Centre (NEOC) is activated.

Normal NEOC contact details apply:

General Enquiries: (676) 26340

Issued by:

Message authorized by the Tonga Meteorological Service

General Enquiries: (676) 74 00062 or (676) 35 009

Duty Officer:

End of message

5:47pm



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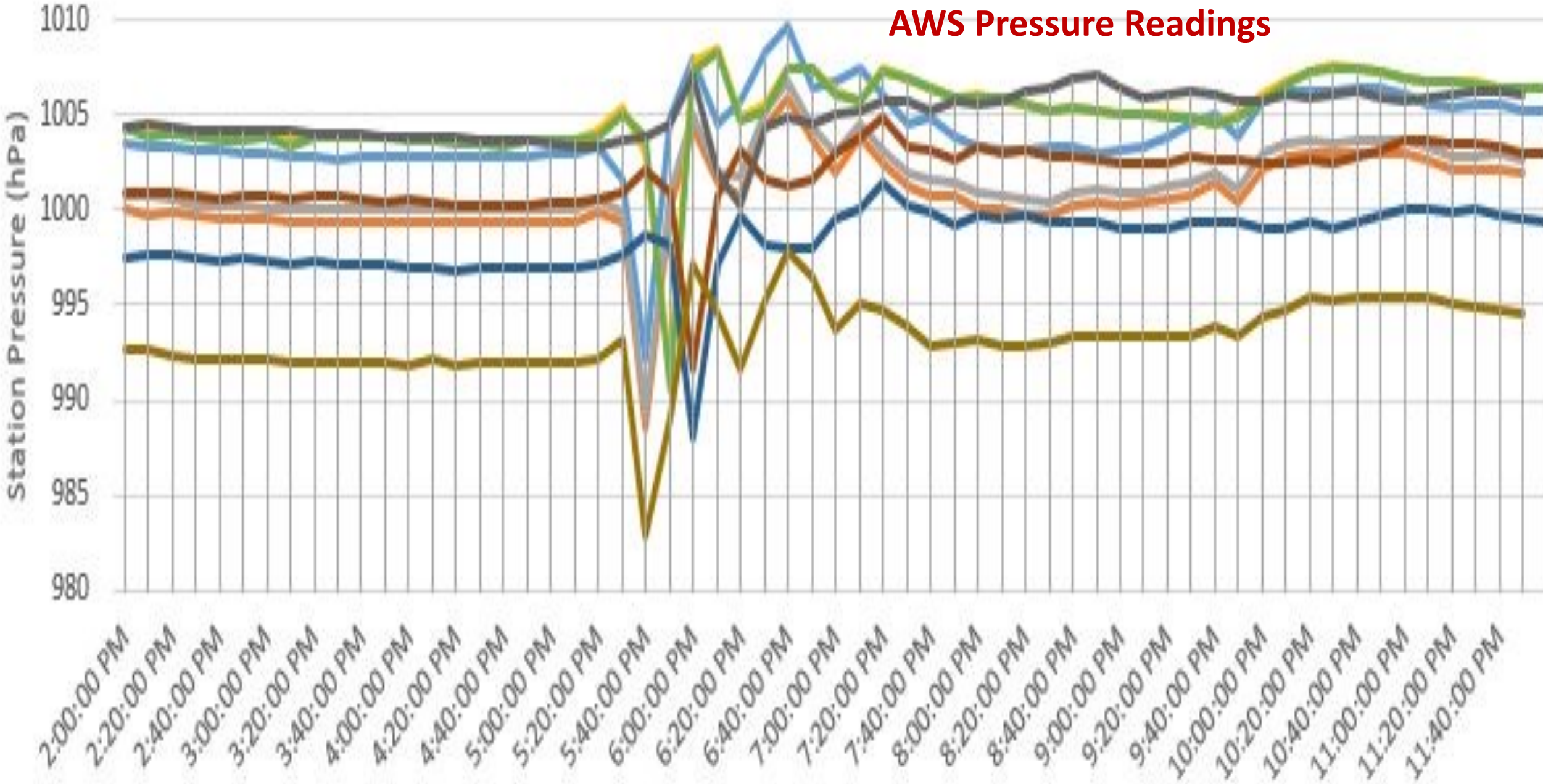
End of message

Operational Challenges:

- ▶ Internet disconnections (undersea cable cut) and No back up internet options (VSAT)
- ▶ Local communication break-downs/busy lines/difficulties to outer islands
- ▶ Difficult to pick up Satellite phone signal due to volcanic ash
- ▶ Disconnections to Himawari-cast Satellite Receive at MET Office (7:20pm)
- ▶ Inadequate staff protective gears/uniforms
- ▶ Volcanic Ash affecting communication systems
- ▶ Disruption to Earthquake and Tsunami monitoring systems

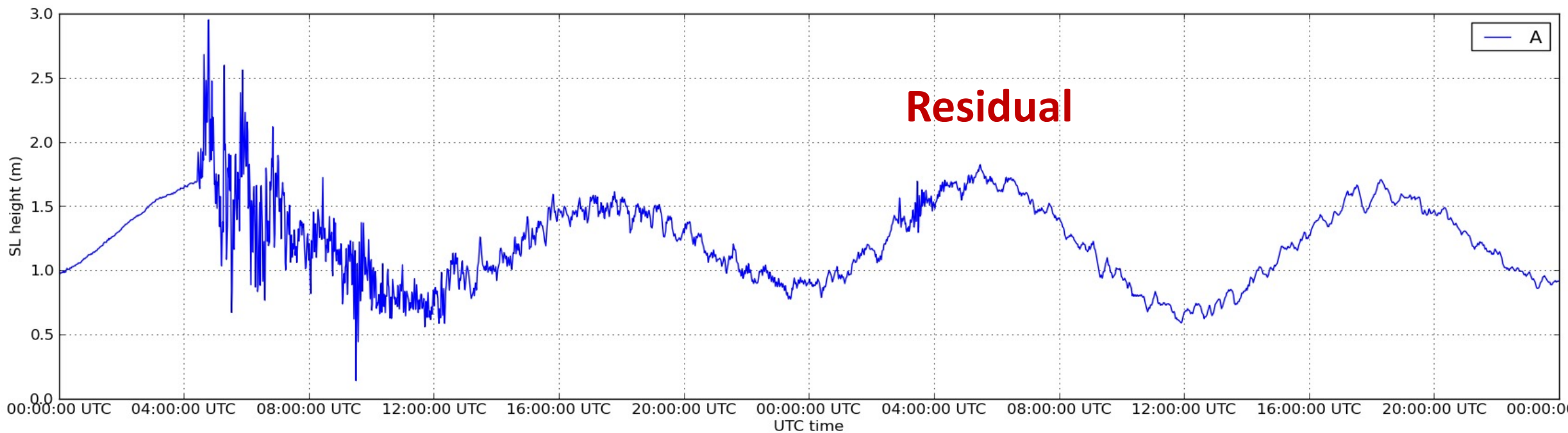
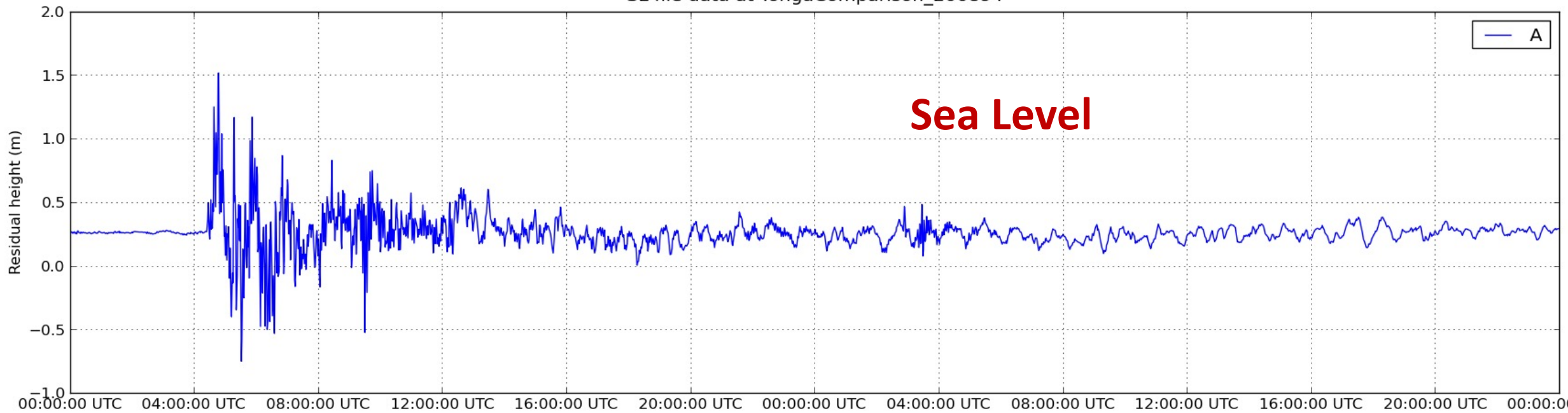


AWS Pressure Readings

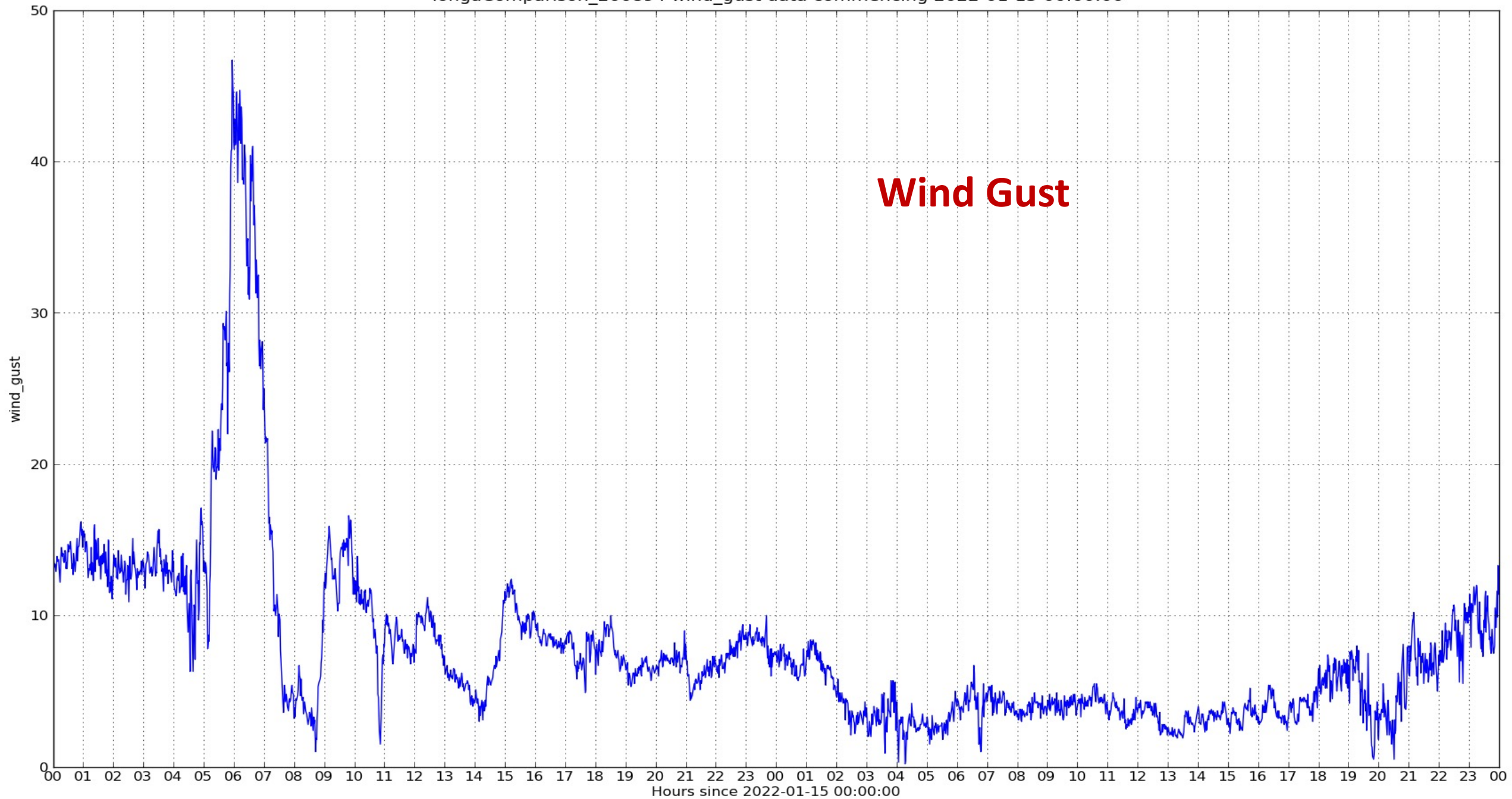


Saturday 15th of January 2022

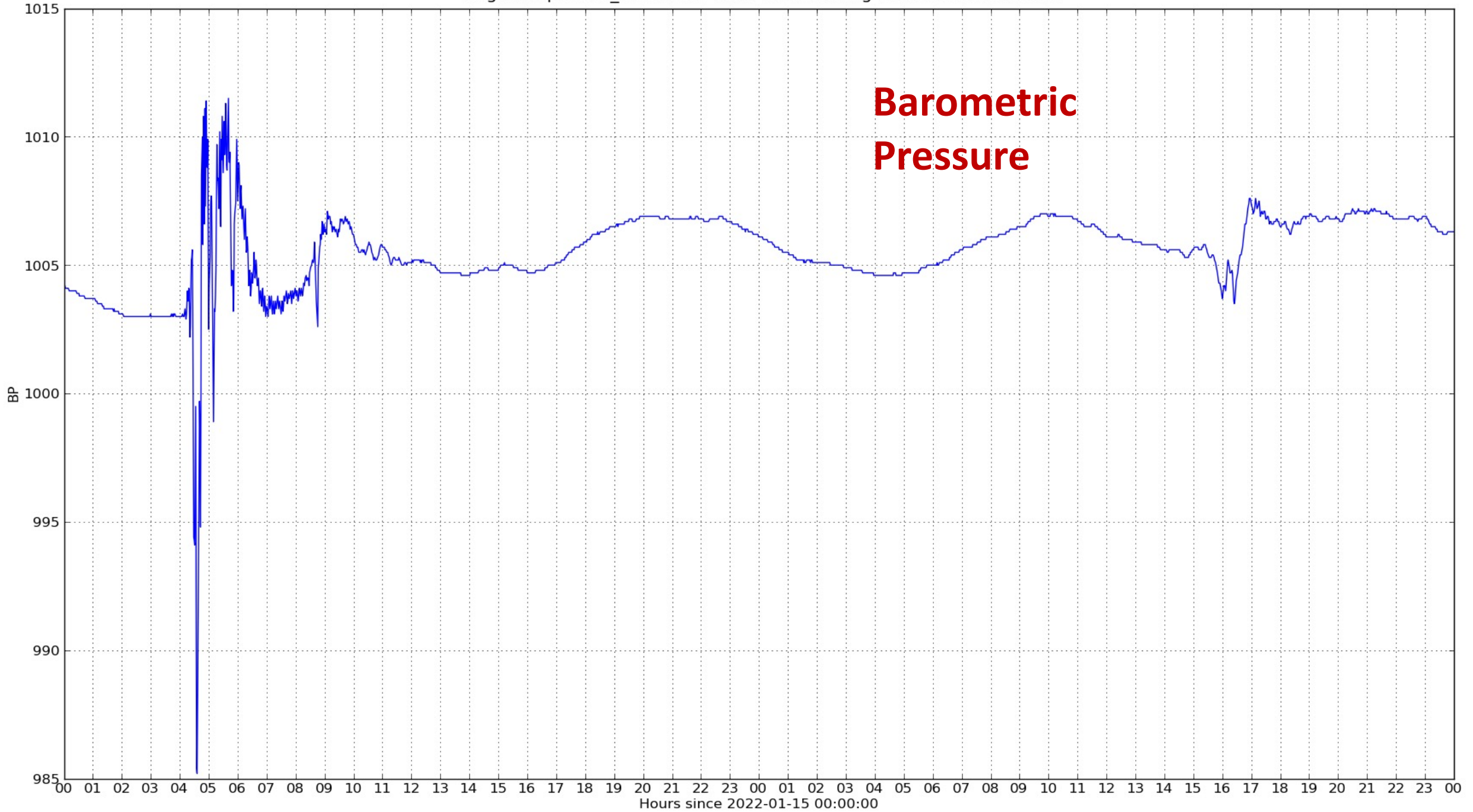
SL file data at TongaComparison_200894



TongaComparison_200894 wind_gust data commencing 2022-01-15 00:00:00



TongaComparison_200894 BP data commencing 2022-01-15 00:00:00



Impacts

- 4 deaths (1 Foreign National in Tbu and 3 locals from Ha'apai)
- 9 major Resorts totally destroyed
- Est. 160 homes seriously damaged or destroyed
- Certain crops like yams, sweet potato, vegetables and fruit trees almost totally destroyed
- Wave runup between 15-20m in some areas
- 500m inundation inland in Nomuka, Haapai
- 600m inundation inland at Mango, Haapai
- 2 islands (Mango, Atataa) and 1 village to the west of TBU (Kanokupolu) no go zones



17/11/2021

ERUPTION HUNGA TONGA-HUNGA HA'APAI - Tonga - November 17, 2021 TOT

planet



7/01/2022

HUNGA-TONGA HUNGA-HA'APAI - Tonga - January 7, 2022

planet



15/01/2022

HUNGA-TONGA HUNGA-HA'APAI PRE-ERUPTION - Tonga - January 15, 2022 - 3:26 p.m. TOT

planet







Kanokupolu
Weather Station



VA OPS
15-16/10/22
TONGA
MET

Asco Motors
P 1835
TONGA
TOYOTA



Impacts
Impacts

Impacts
Impacts







Recommendations for warning center

- Review SOPs to include more detail in volcano generated tsunami and warnings
- Volcanology training for warning personnel (should we have canceled the Tsunami Marine Warnings at 10am on Saturday?)
- **Establish a study group under the PTWS to research into exactly what happened (e.g. resulting in loss of life in Peru) and for PTWC to finalize regional procedures for quick advisory services for near source volcano generated tsunami**
- Awareness on natural warning signs (e.g. the Sulphur smell)
- Establish better communication redundancies
- Establish better communication protocols to address congested lines
- Improve seismic network and volcano monitoring
- Reconsider working arrangements with national response agencies e.g. to be under one roof



Special thanks to Volcanic Ash Advisory Centre
(VACC) Wellington (MetService NZ) they were our
beacon of hope during the event

Malo