

**14<sup>th</sup> and 15<sup>th</sup> 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**

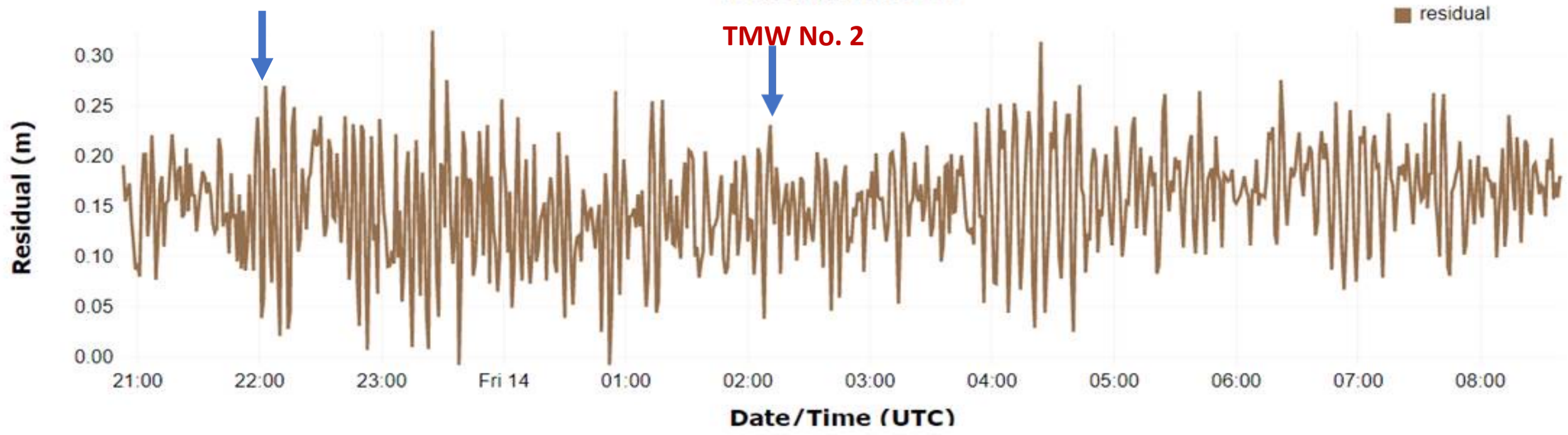
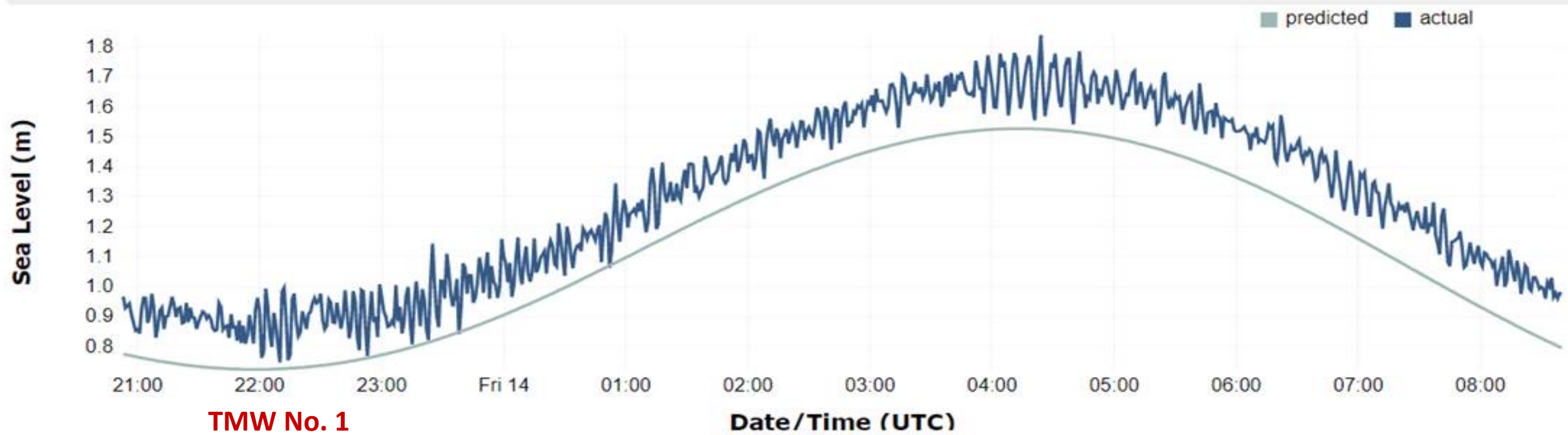
**Event #1: 14th January 2022**

**Event #2: 15th January 2022**

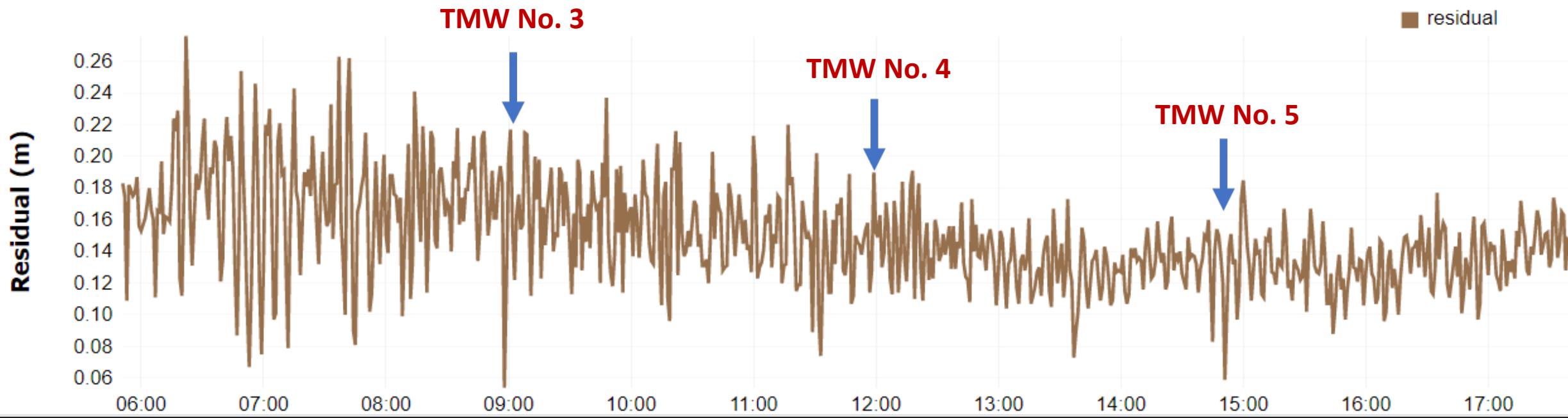
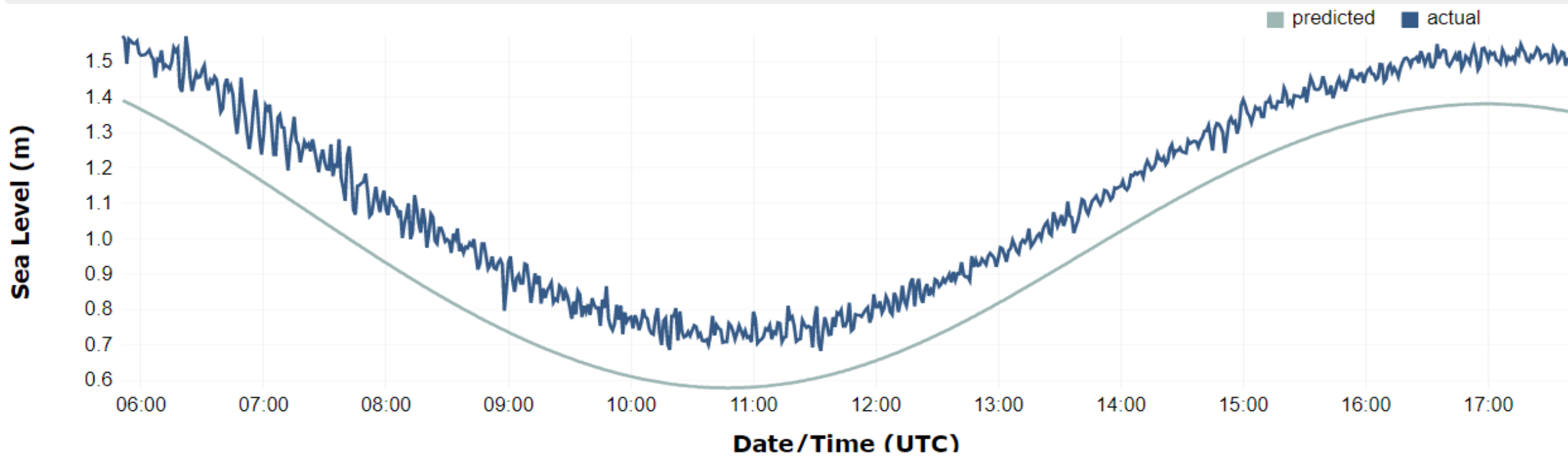
## Event No 1 on 14<sup>th</sup> January 2022 timeline

- 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

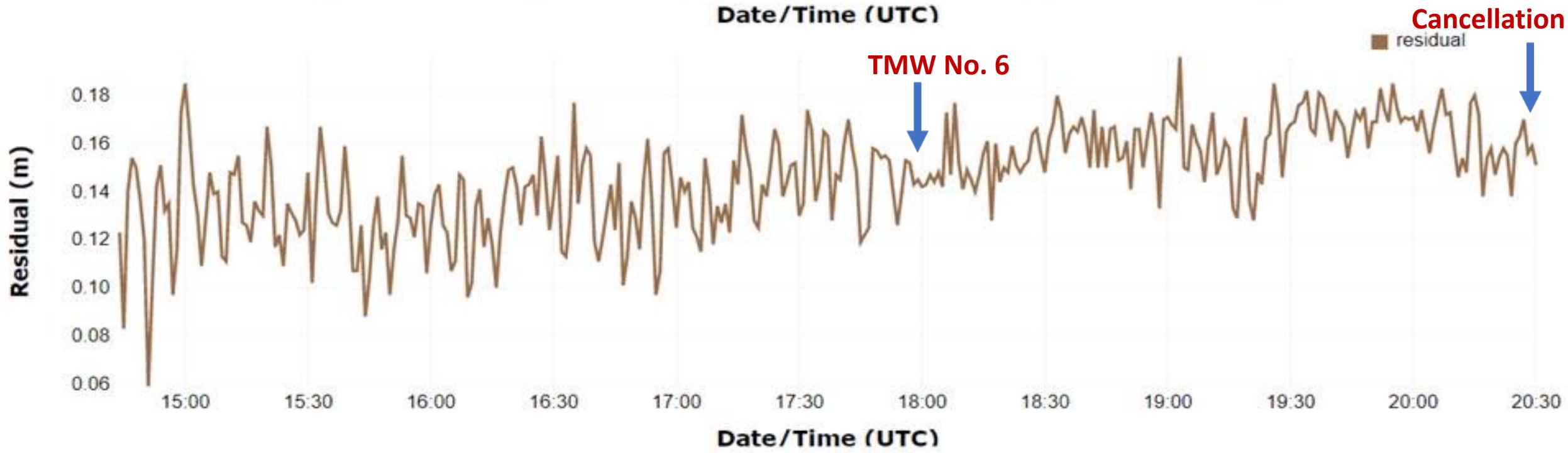
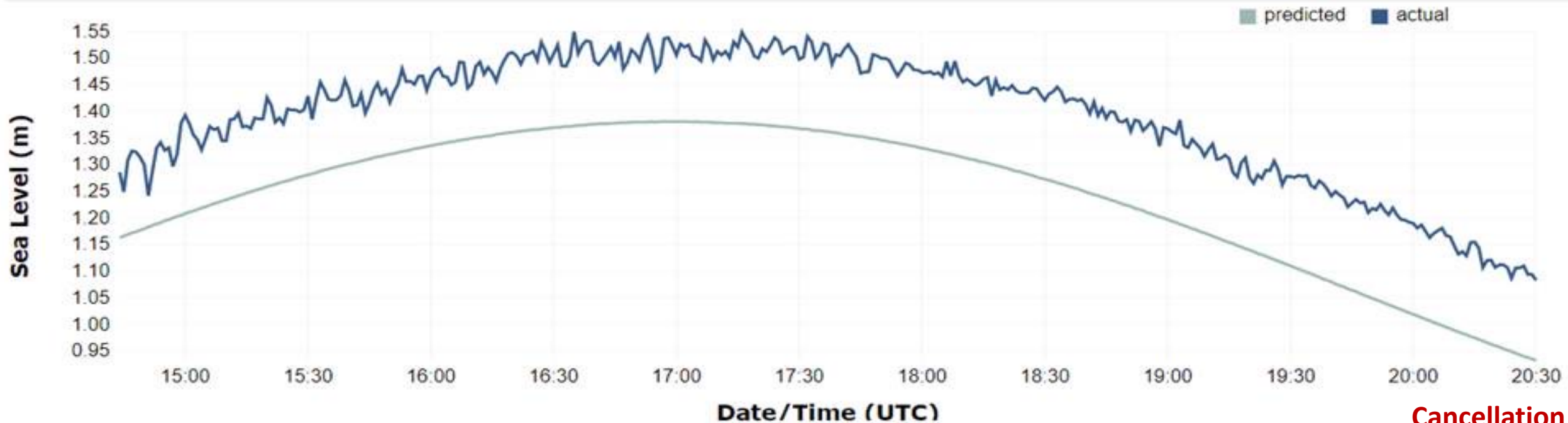
# Sea Level



# Sea Level



# Sea Level



## Event No 2 on 15<sup>th</sup> January 2022 timeline

- 17:13hr Eruption Observed from the MET Office  
Geological Office informed
- 17:23hr Loud blast heard (Est. time) from HTHH. Ears pop.
- 17:24hr **Urgent Tsunami Warning for all Tonga** issued on AM Radio with evac advice based on unusually loud volcanic blast by duty officer Sitamipa Paea. Repeatedly played by radio
- 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 15<sup>th</sup> January 2022 timeline

01:48hr (16<sup>th</sup>) to 10am (17<sup>th</sup>)

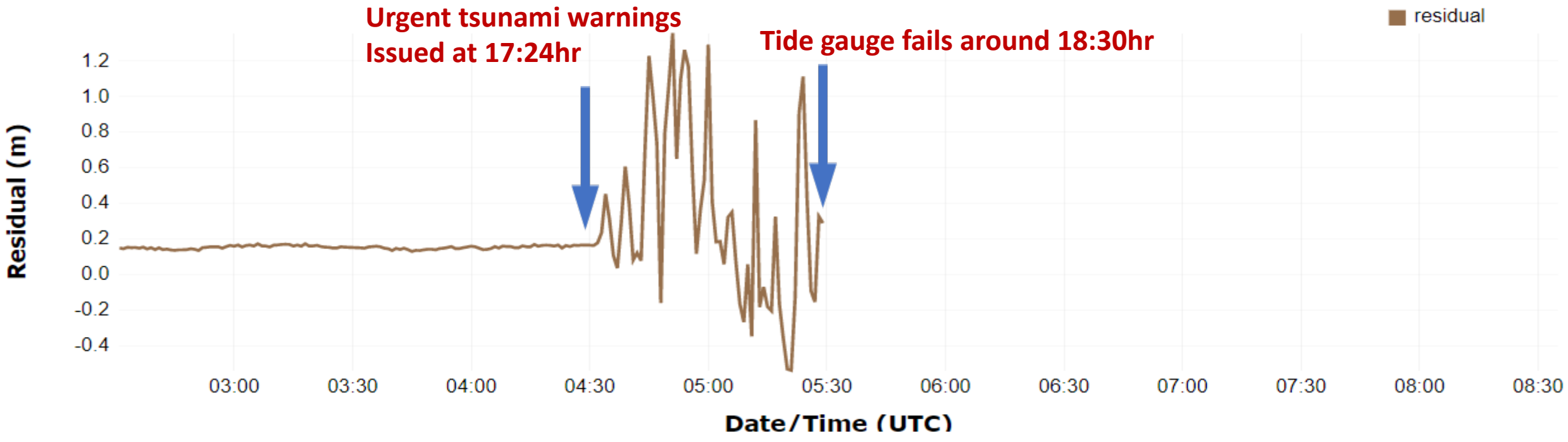
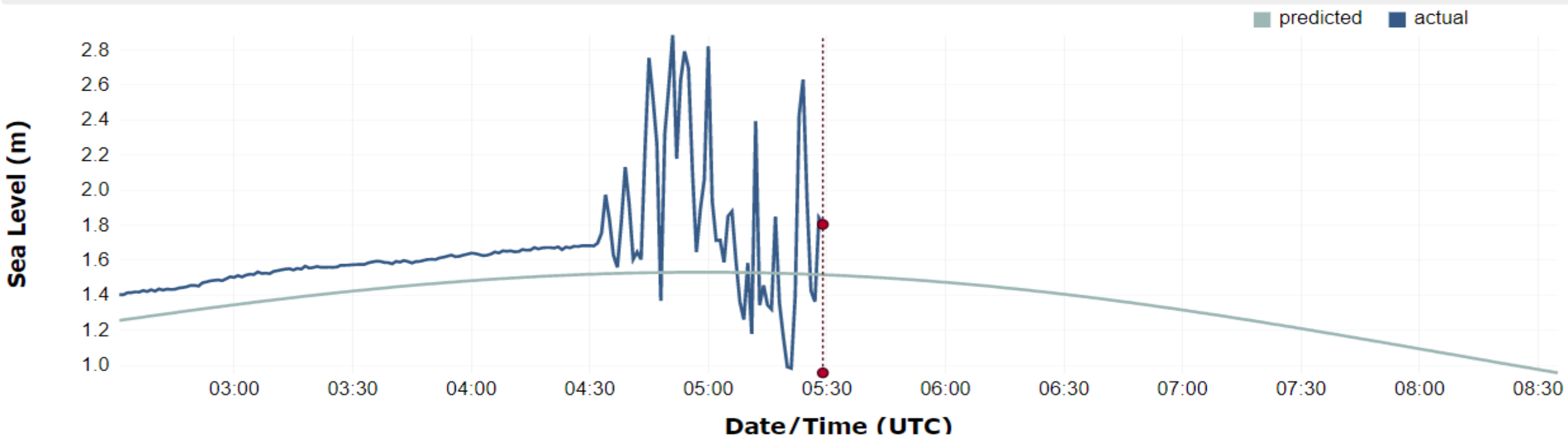
**Tsunami Marine Warnings** warnings cancelled for Northern Tonga

13:00hr

**All warnings cancelled** by Deputy Director



# Sea Level

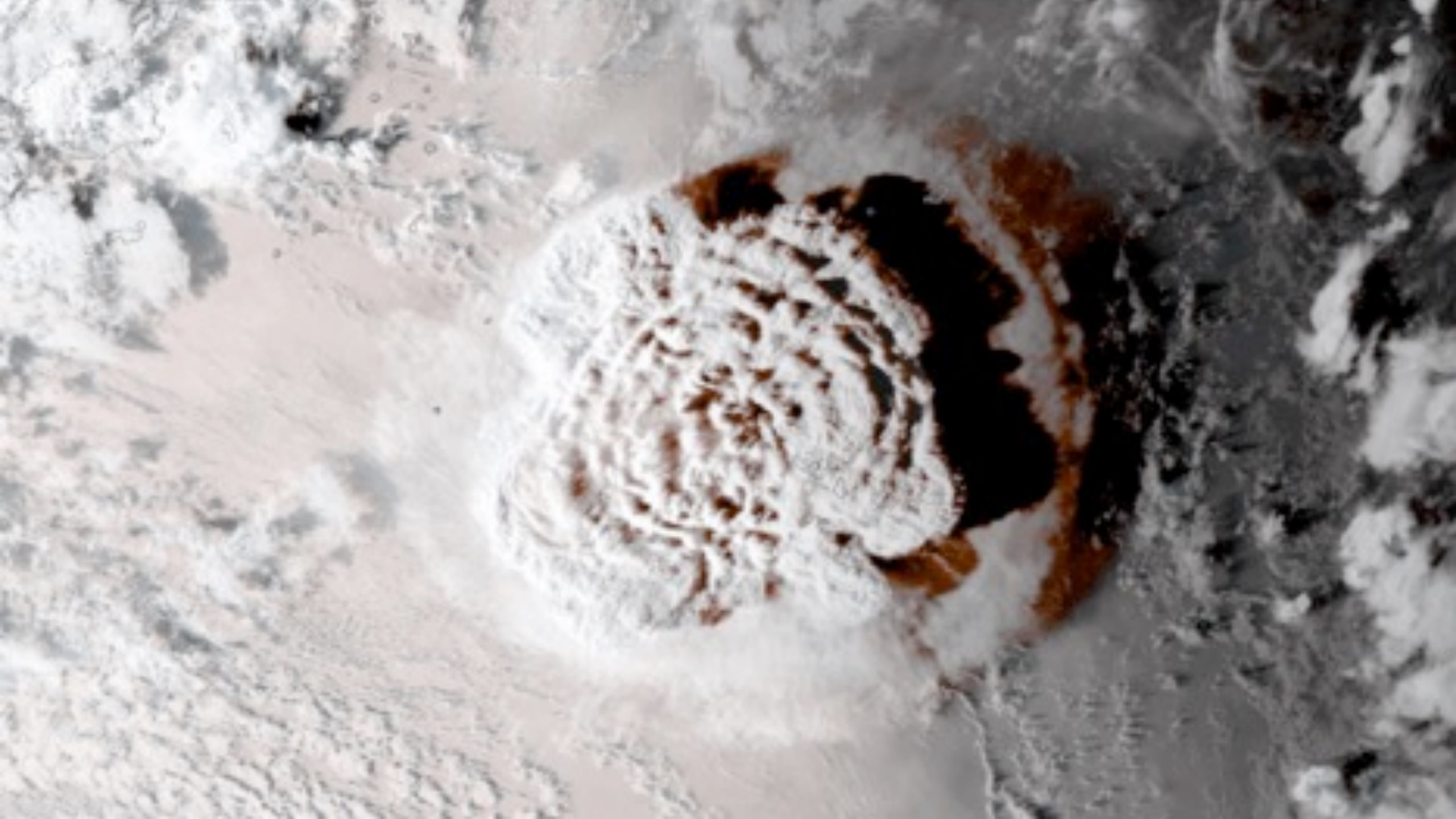


17:13hrs

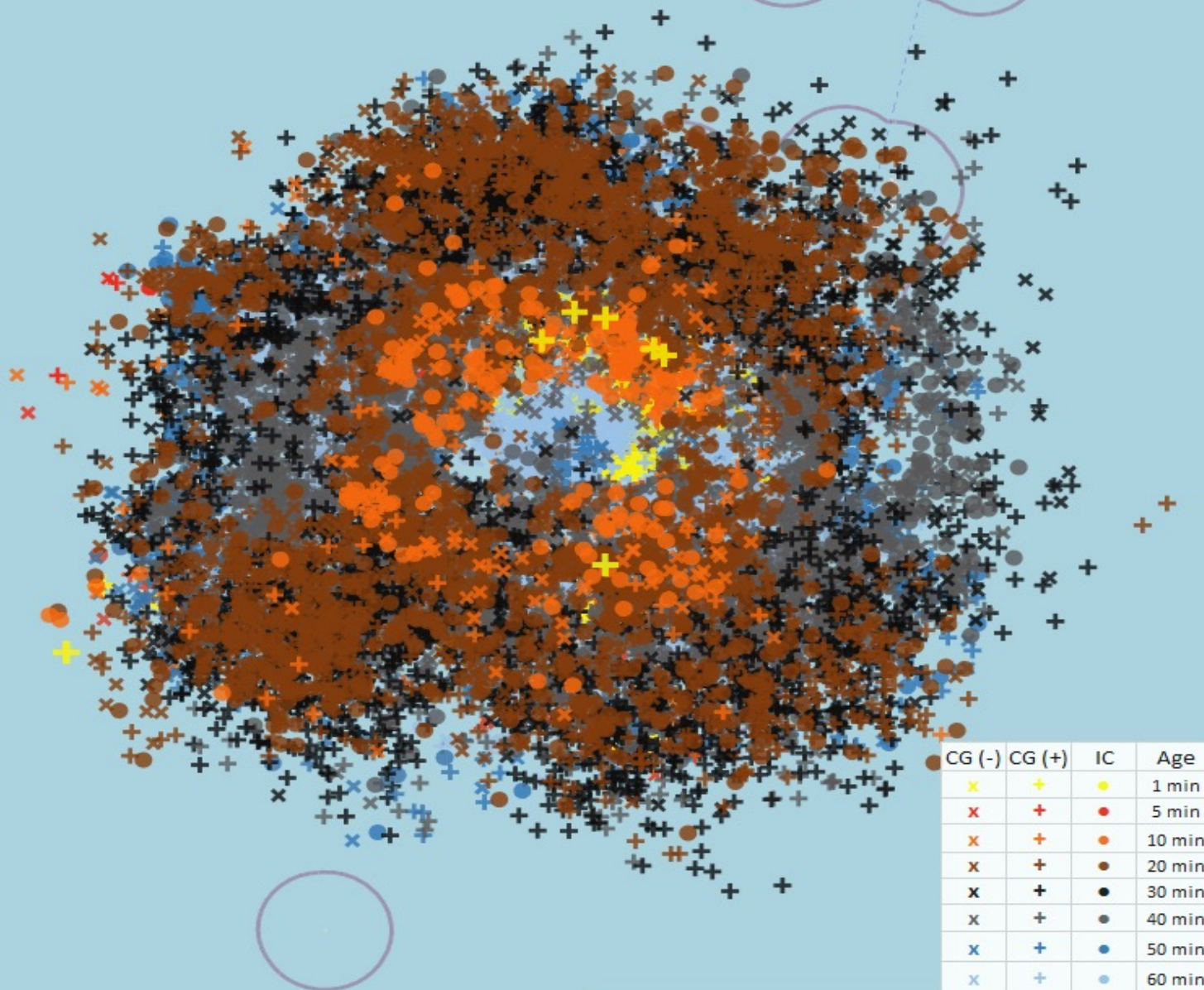


17:21hrs





# 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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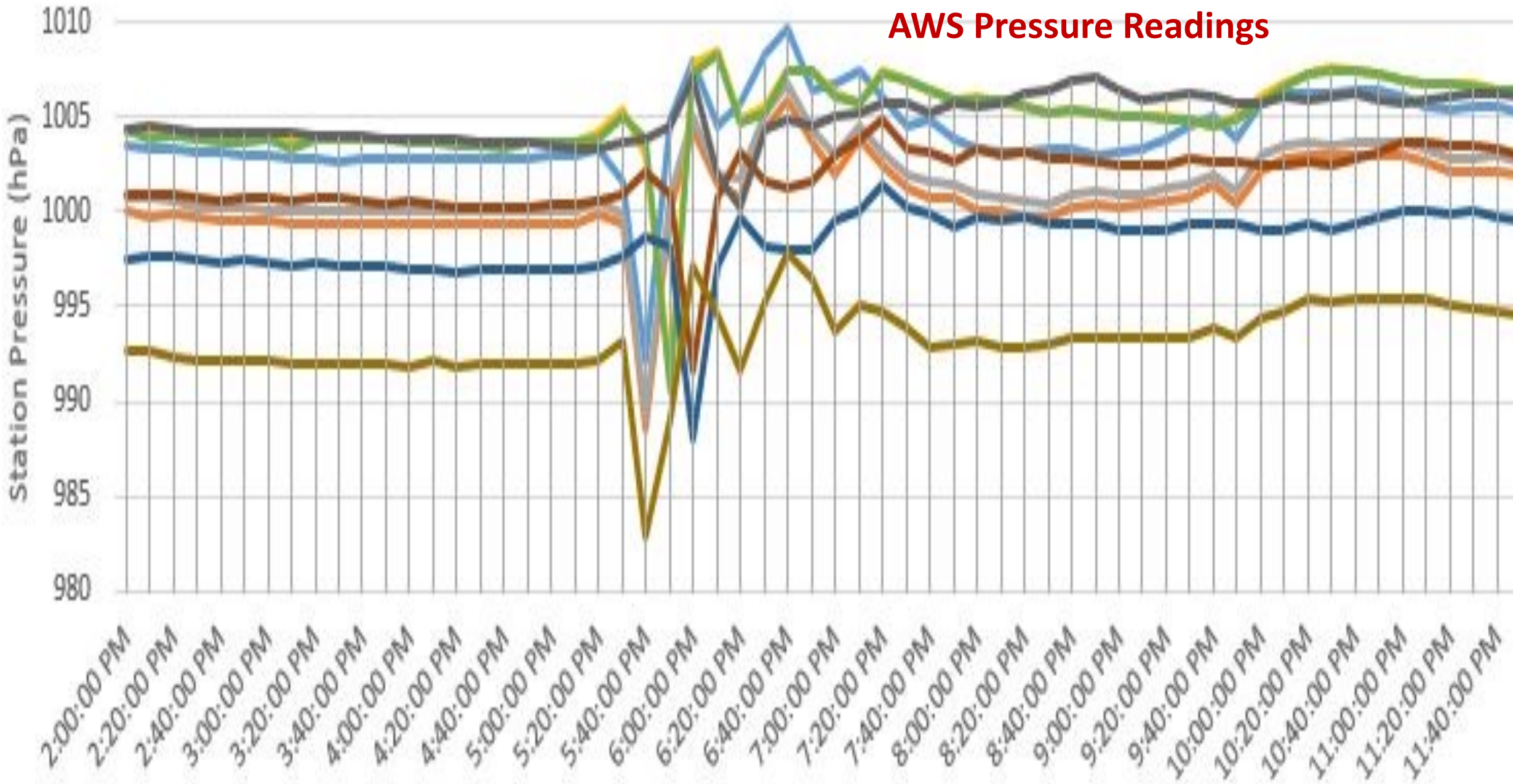


# Operational Challenges:

- ▶ 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

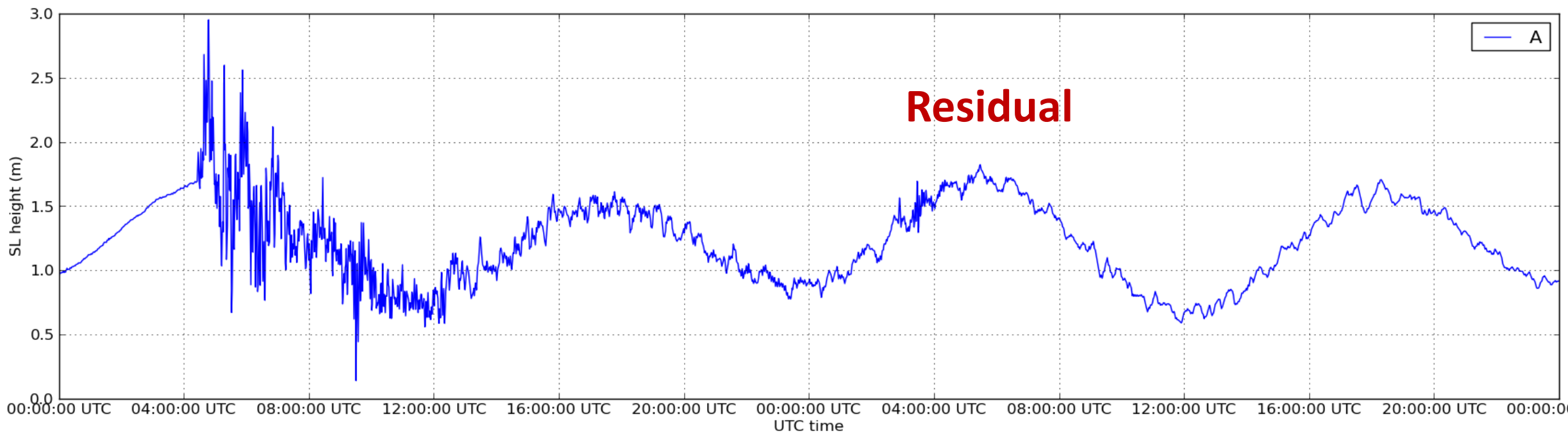
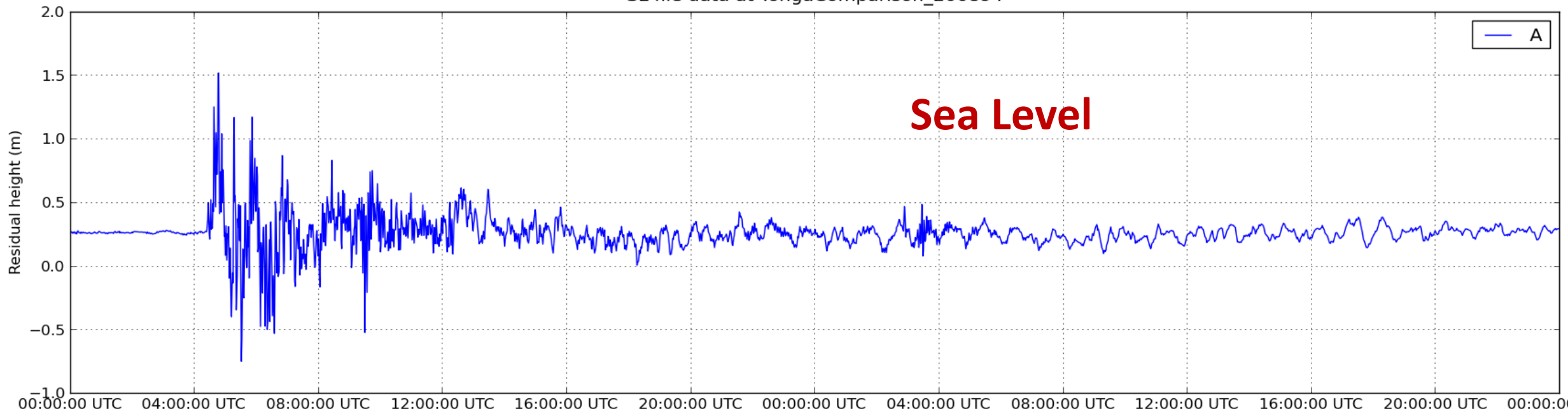


# AWS Pressure Readings

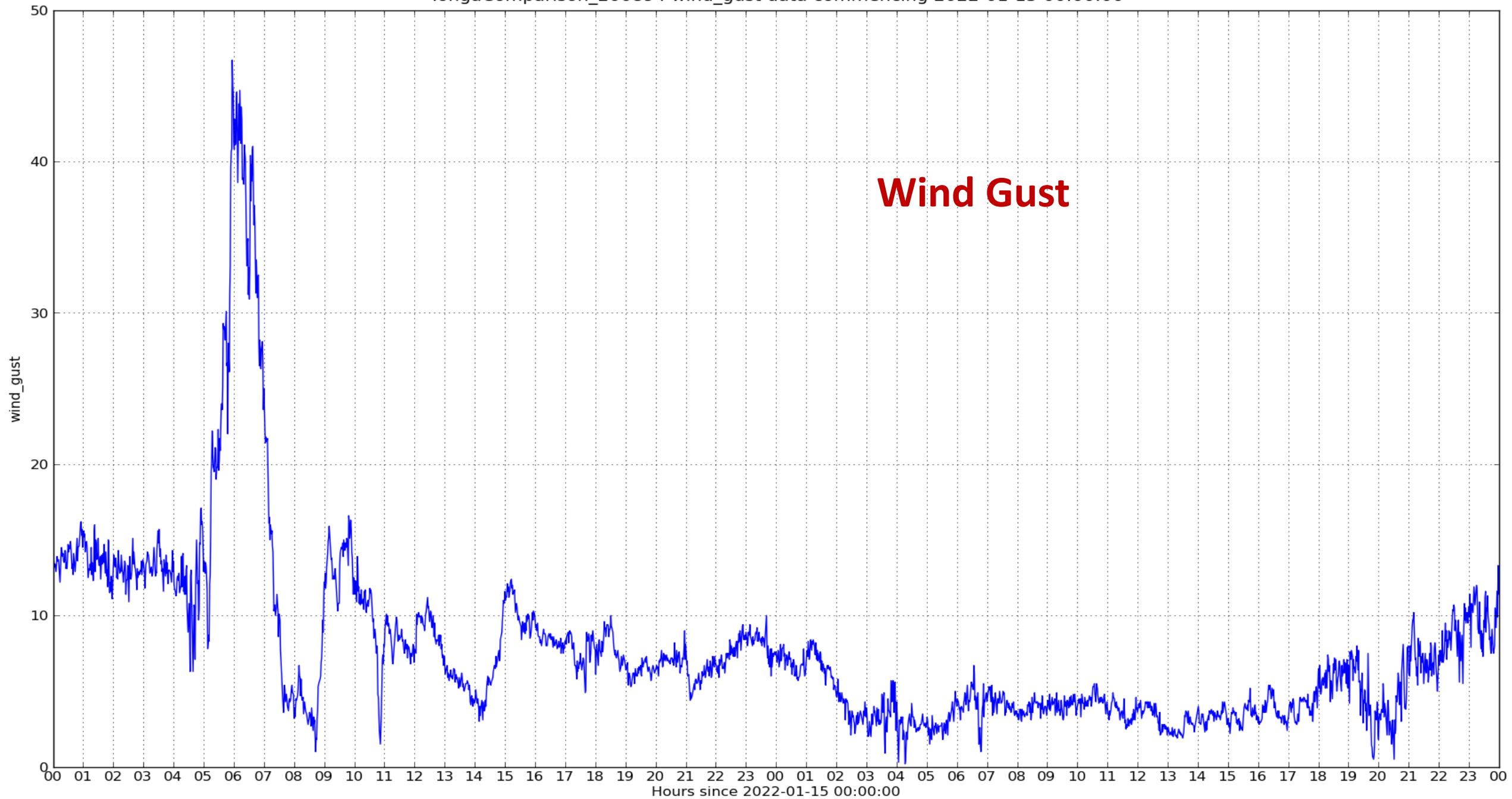


Saturday 15th of January 2022

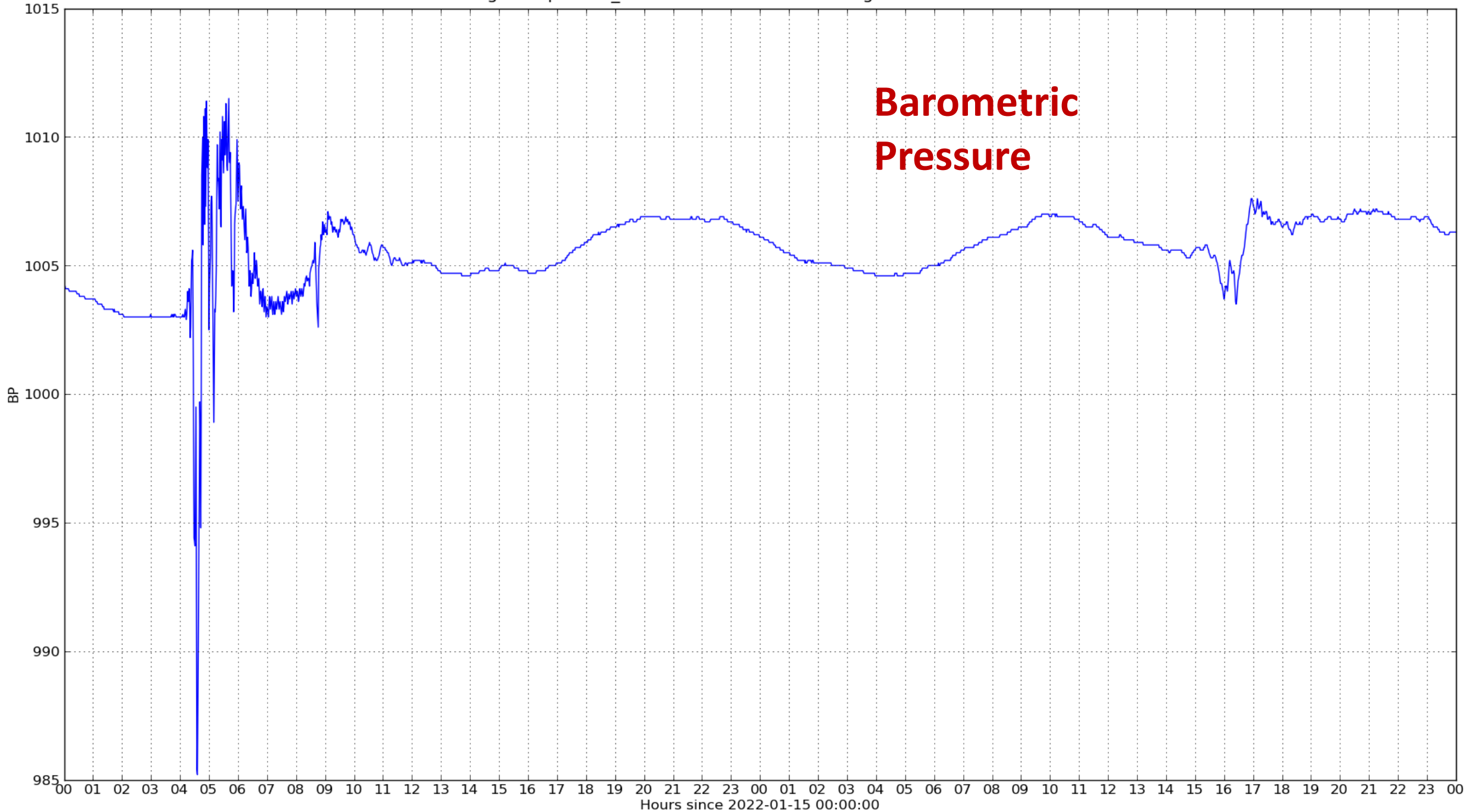
SL file data at TongaComparison\_200894



TongaComparison\_200894 wind\_gust data commencing 2022-01-15 00:00:00



TongaComparison\_200894 BP data commencing 2022-01-15 00:00:00



**Barometric  
Pressure**

## Impacts

- 4 deaths (1 Foreign National in Tbu and 3 locals from Ha'apai)
- 9 major Resorts totally destroyed
- Est. 200 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



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

17/11/2021



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

7/01/2022



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

15/01/2022





Damage to the ceiling of the MET Office from sonic blast





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 address operational lessons learnt in volcano generated tsunami
- Volcanology training for warning personnel
- **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