



# **Operational Response of the National Tsunami Warning Center**

**14<sup>th</sup> and 15<sup>th</sup> January 2022**

**Hunga Tonga-Hunga Ha'apai (HTHH)  
Volcanic Eruption and Tsunami Event**

**Presented by: Laitia Fifita  
Deputy Director  
Tonga Meteorological Services**



**Two warning events based on  
Eruptions and subsequent Tsunami**

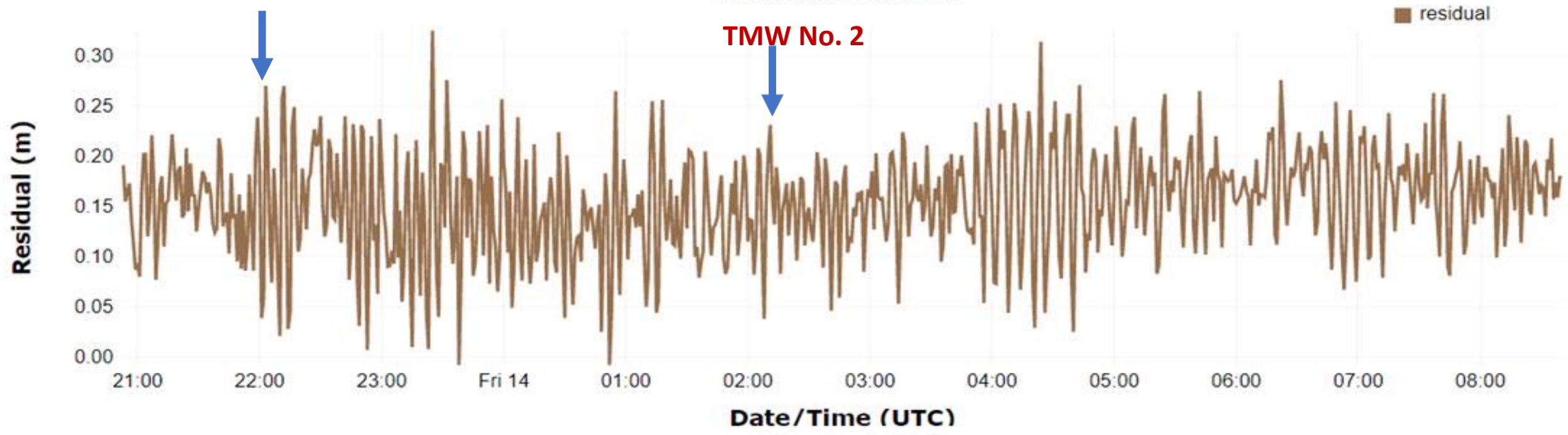
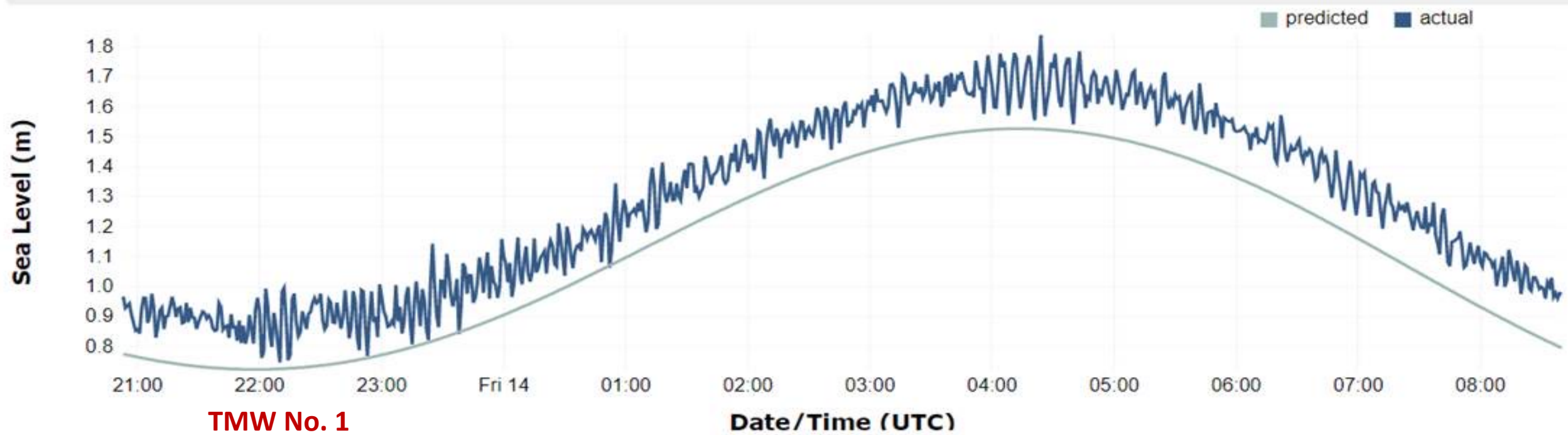
**Event #1: 14th January 2022**

**Event #2: 15th January 2022 (Major Event)**

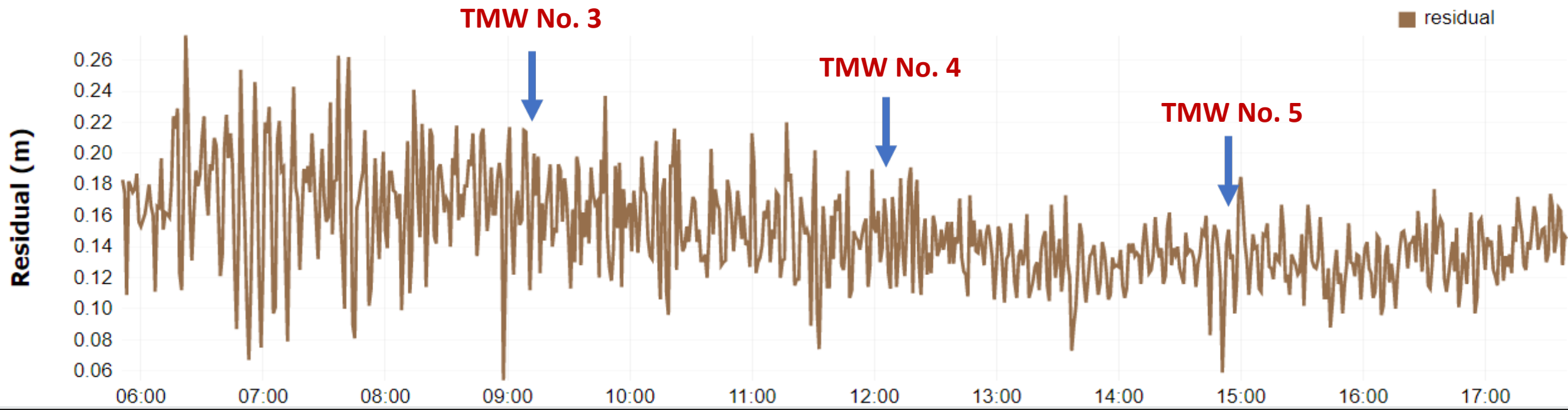
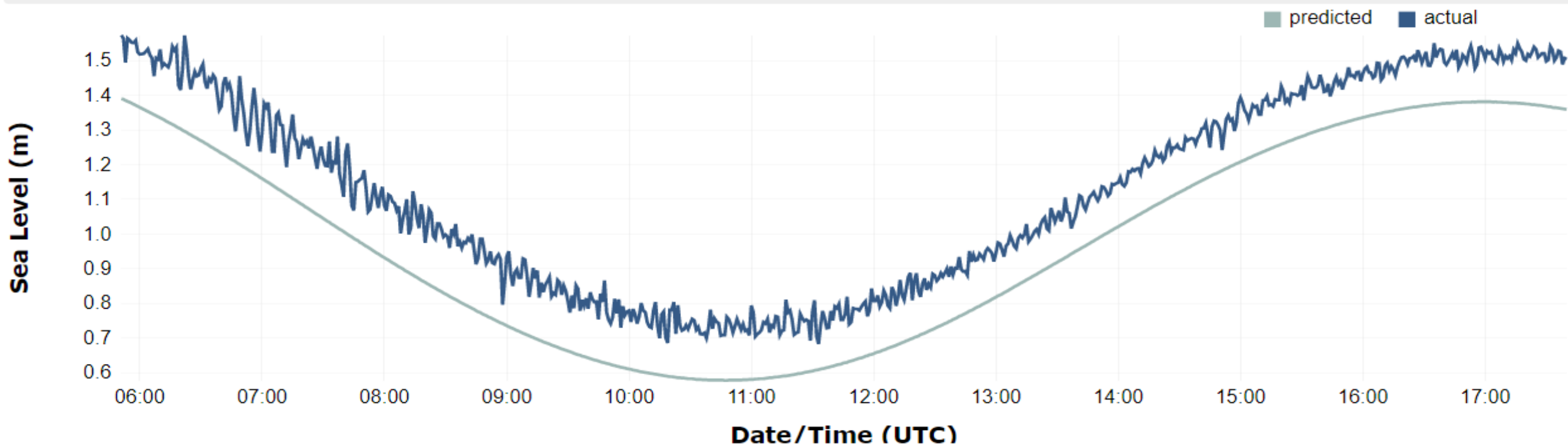
## Event No. 1 : Friday 14<sup>th</sup> January 2022 Timeline

- 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 but remained in force for South of Ha'apai, Tongatapu and 'Eua
- 10:00am(15<sup>th</sup> Jan): **Tsunami Marine Warning No. 7** cancel of warnings for all Tonga

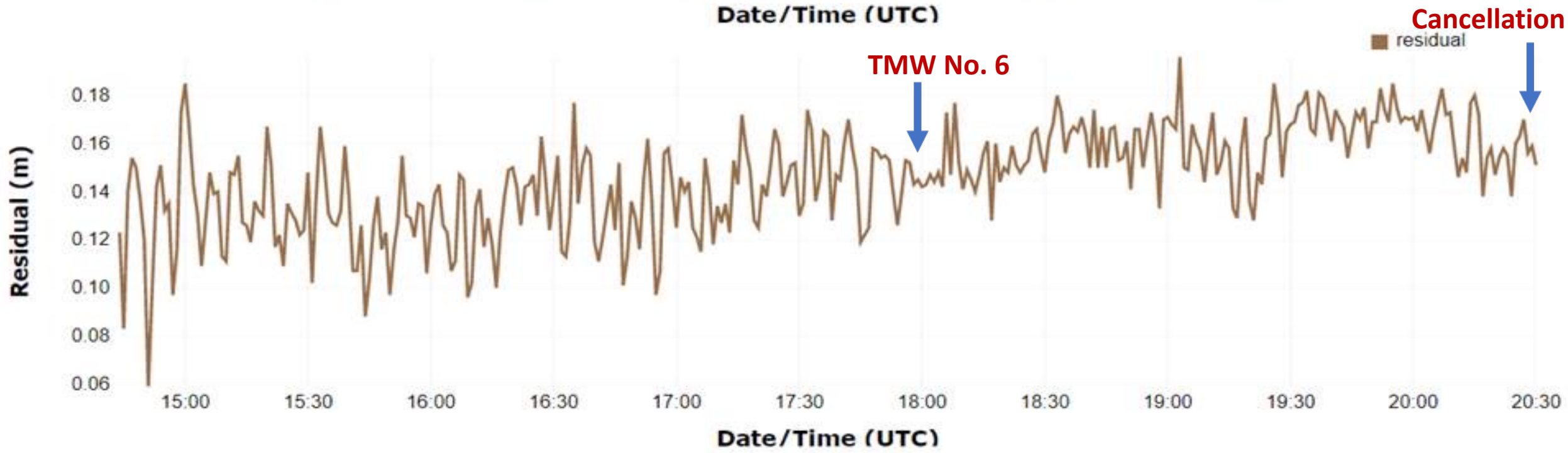
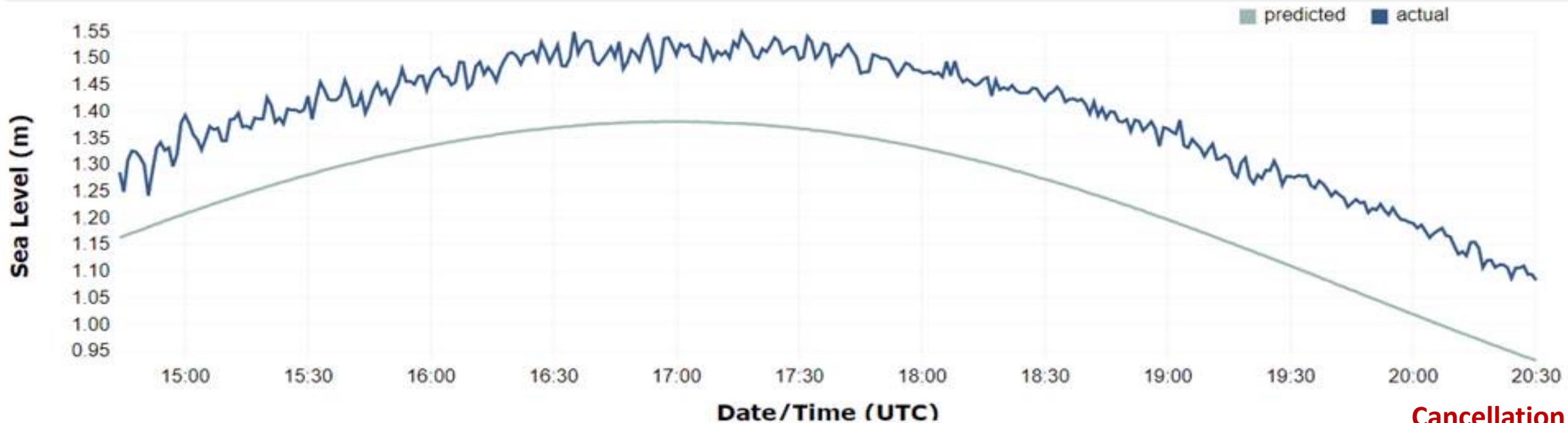
# Sea Level



# Sea Level



# Sea Level



## Event No. 2: Saturday 15<sup>th</sup> January 2022 Timeline

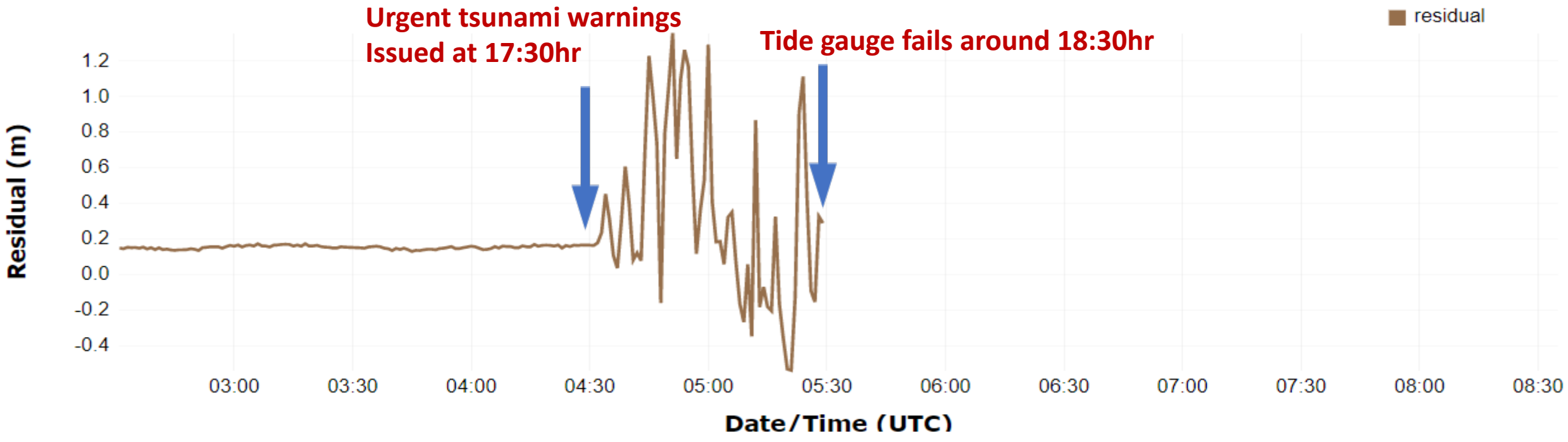
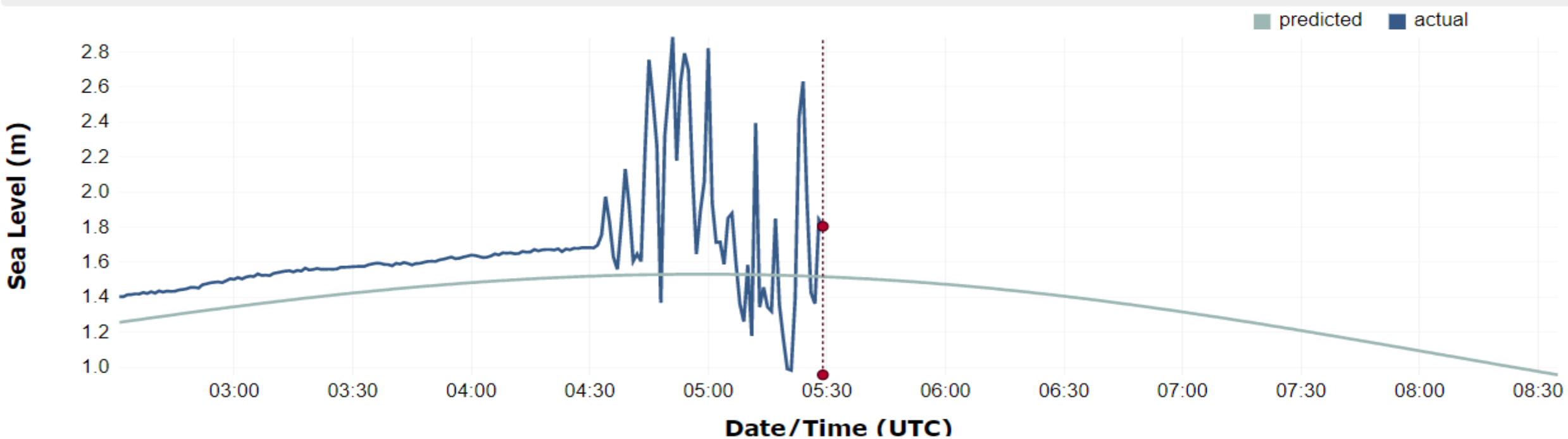
- 17:13hr: Eruption Observed from the MET Office, Geological Office informed
- 17:21hr: Loud explosive blast heard (Estimated time) from the volcano
- 17:30hr: **Urgent Tsunami Warning for all Tonga** issued on AM Radio with evac advice based on unusually loud volcanic blast by duty officer on call from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

## Event No.2 : 15<sup>th</sup> January 2022 Timeline

- 01:48hr (16<sup>th</sup>) to 10:00am (17<sup>th</sup>): **Tsunami Marine Warnings** cancelled for northern islands of Tonga (Niuas, Vava'u, Ha'apai)
- 13:00hr (17<sup>th</sup> Jan): **All warnings cancelled (Tongatapu and 'Eua)** by Deputy Director



# Sea Level

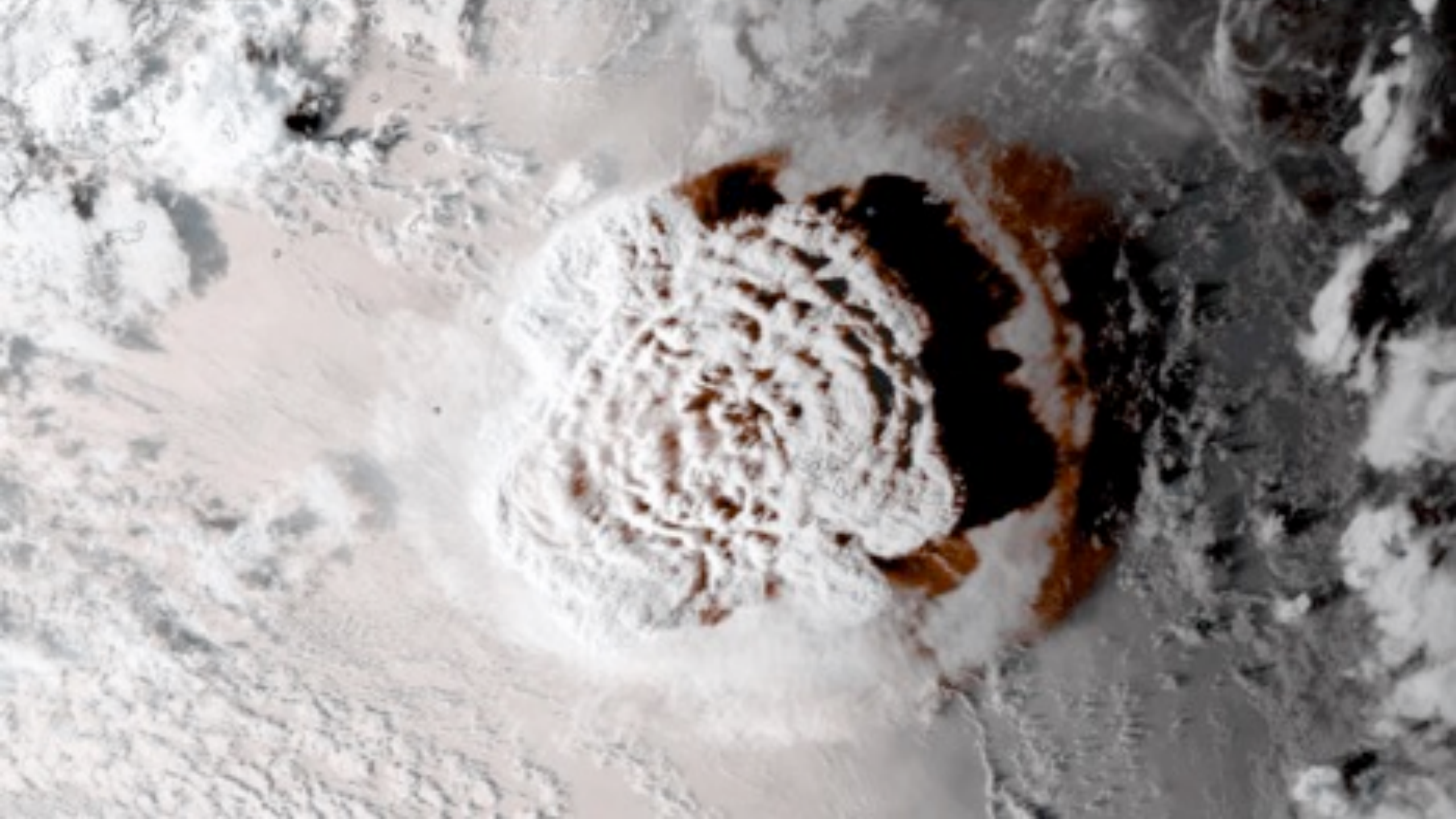


17:13hrs

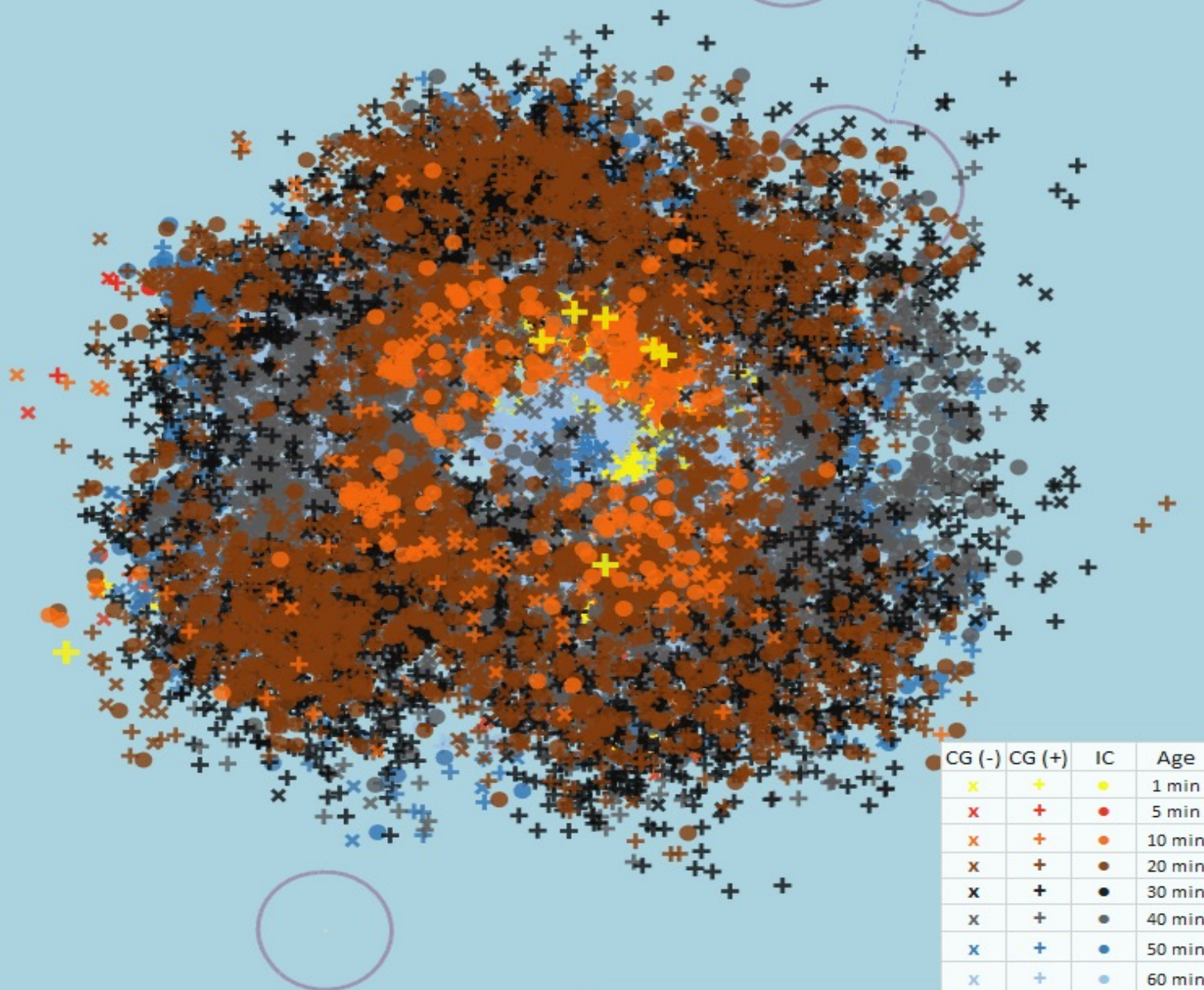


17:21hrs





# Lightning Detection



5:47pm



## 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

# Operational Challenges

- **Very limited knowledge to the behavior of Volcano generated Tsunami**
- **Lack of volcano monitoring scientific equipment, expertise and seismic stations at the time**
- **National Tsunami Warning Centre Standard Operating Procedures did not cover aspects of Volcano generated Tsunami**
- **Communication Breakdowns**



# Impacts

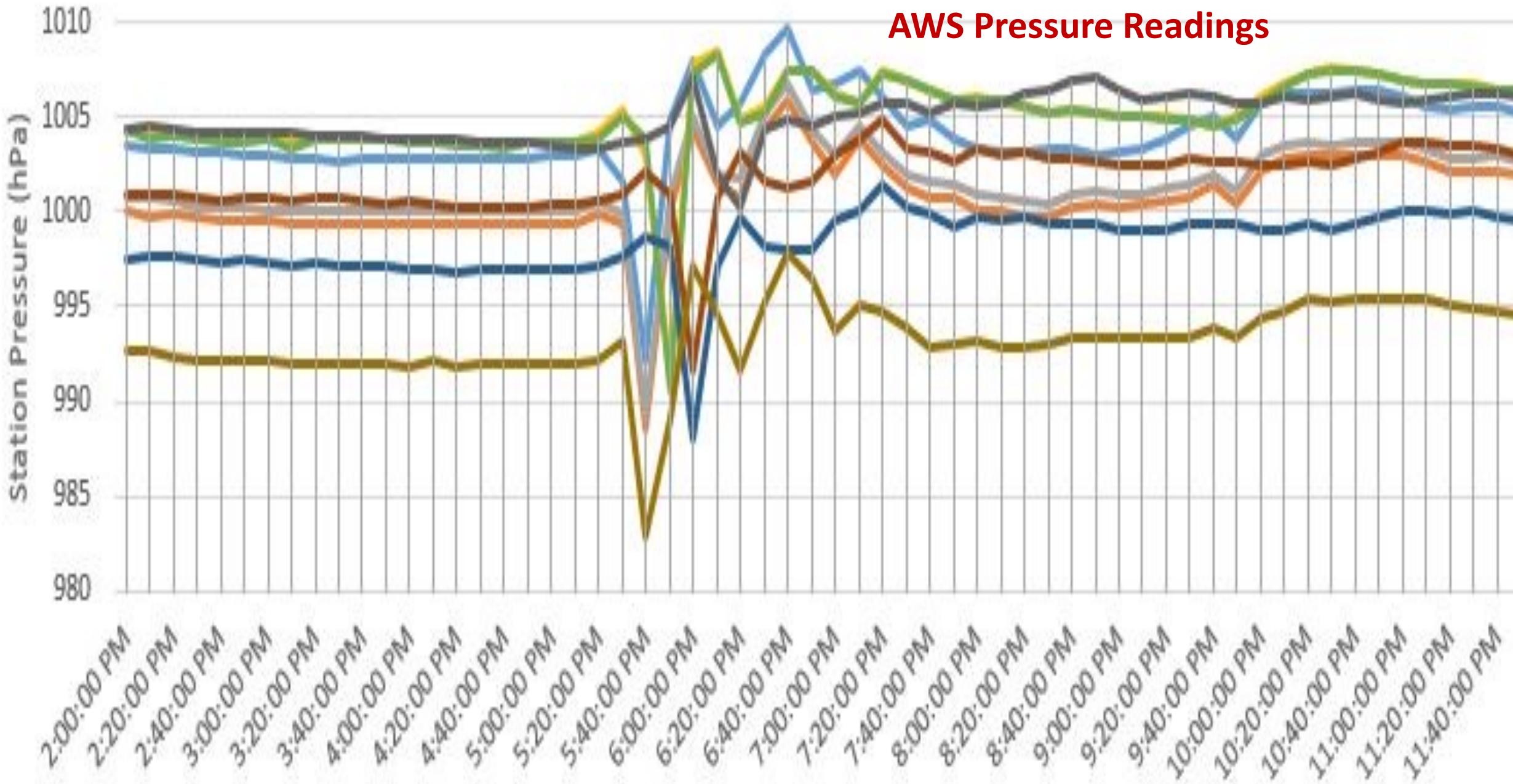
- 4 deaths (1 Foreign National in Tongatapu and 3 locals from Ha'apai)
- 9 major resorts destroyed
- Aprox. 160 homes seriously damaged or destroyed
- Certain crops like yams, sweet potato, vegetables and fruit trees destroyed
- Wave runup between 15-20m in some areas
- 500m inundation inland in Nomuka,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

# Recommendations for National Tsunami Warning Centre

- Review SOPs to include more details on volcano generated tsunami and warnings based on the findings and knowledge sharing from scientific research and workshops
- Volcanology training for warning personnel & improvement of volcano monitoring and seismic stations
- Tsunami competency framework established for National Tsunami Warning Centre
- More and on-going Community Awareness
- Establish better communication redundancies
- Establish better warning dissemination systems

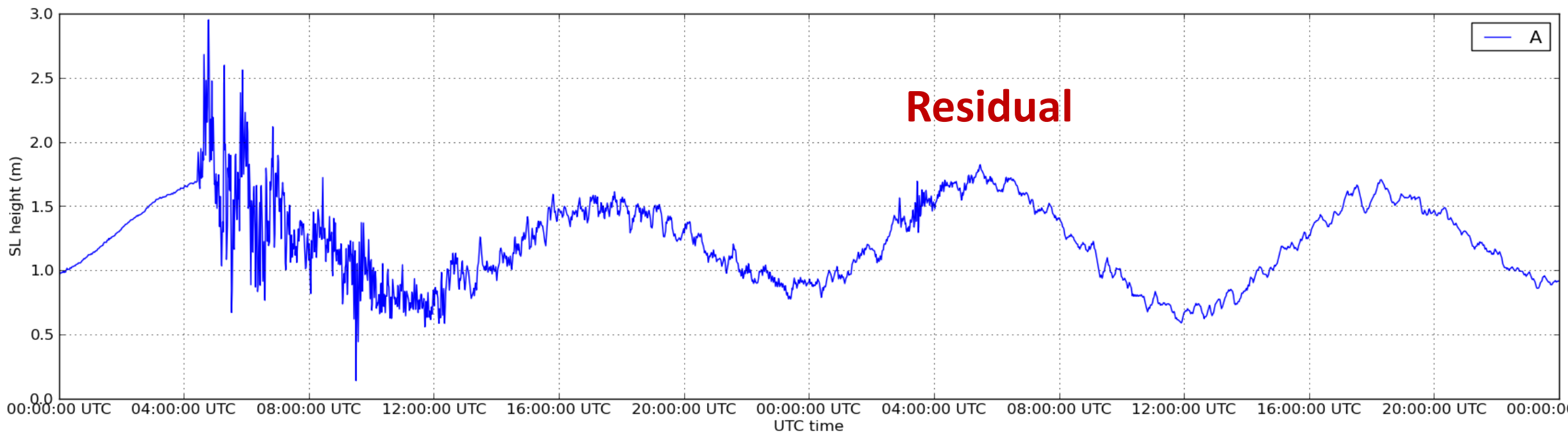
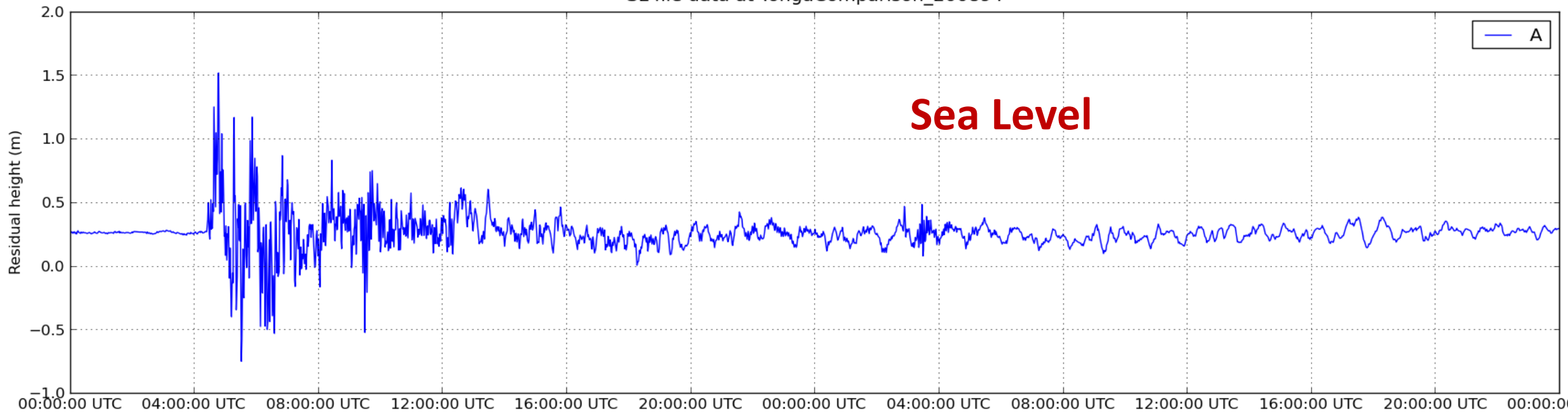


# AWS Pressure Readings

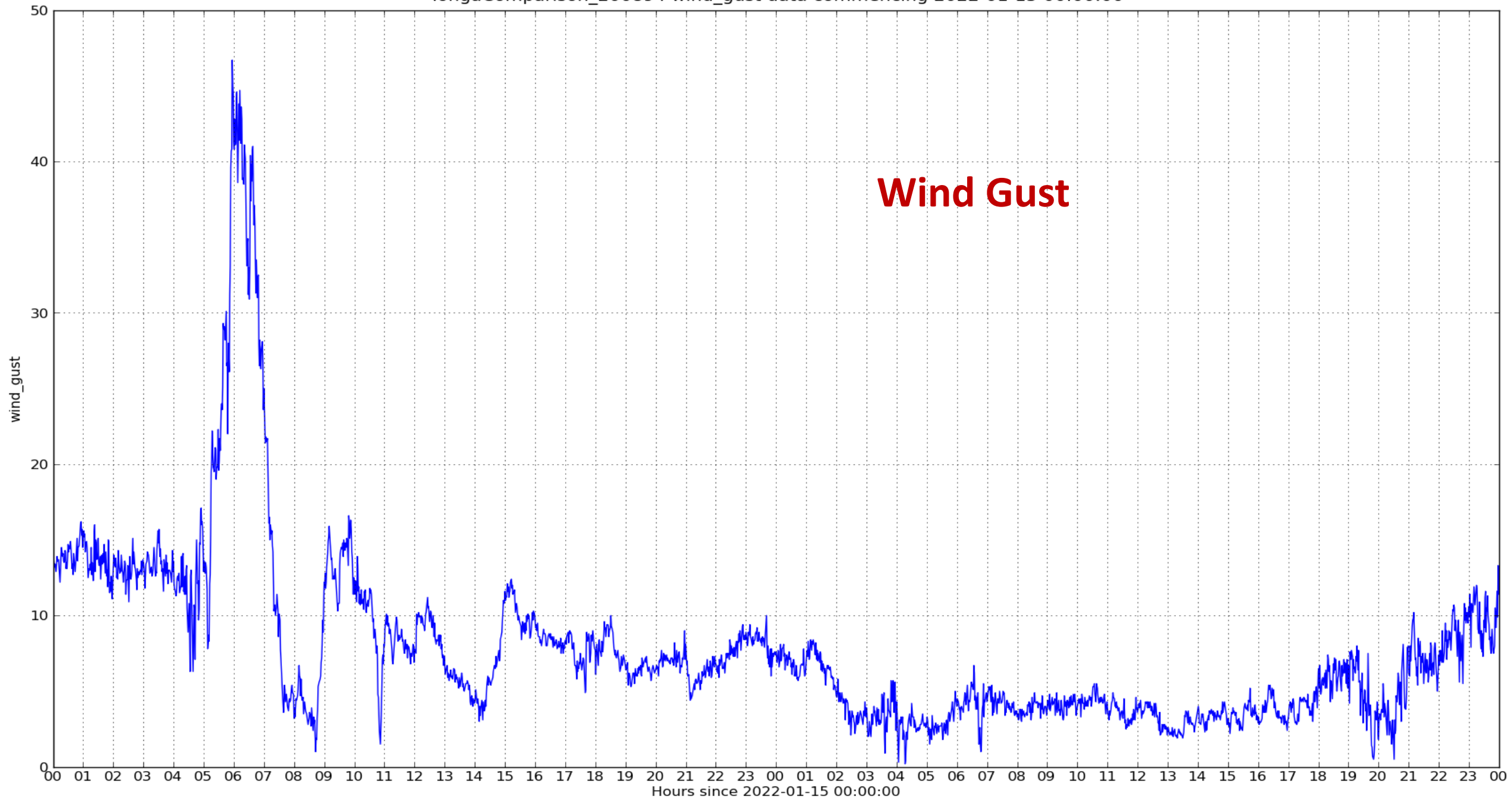


Saturday 15th of January 2022

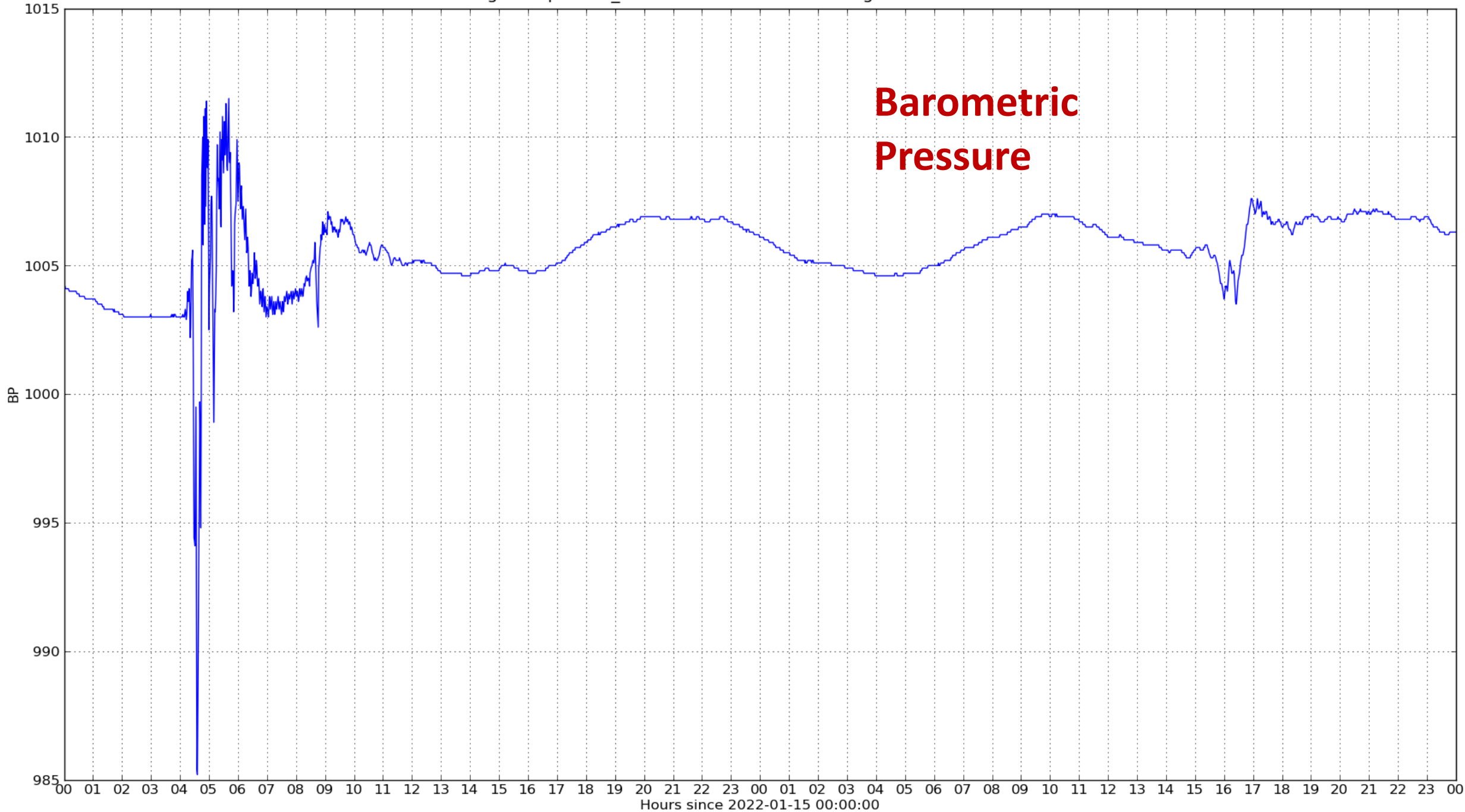
SL file data at TongaComparison\_200894



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



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





Thank You & Malo 'Aupito

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