



ICG/PTWS-XXX Meeting  
12-15 September 2023  
Nuku`alofa, Kingdom of Tonga

# **Expansion of the PTWS Earthquake Source Zone to the Southern Atlantic**

*From the WG2 Task Team of TSPs*

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Charles McCreery  
Chair, WG2 Task Team of TSPs  
Director, NOAA Pacific Tsunami Warning Center  
[charles.mccreery@noaa.gov](mailto:charles.mccreery@noaa.gov)

# The Issue

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- A large and complex earthquake with multiple ruptures, the largest an Mw 8.1, occurred in the South Sandwich Islands region on August 12, 2021.
- A tsunami was generated by this earthquake. It was recorded on gauges throughout the Pacific including as far away as Alaska and the Aleutian Islands.
- This is a very active seismic zone – with 29 magnitude 6.5 or greater earthquakes there just since the year 2000.
- This seismic zone is very close to Chilean coasts – part of the PTWS service area. Tsunami travel times to the Chilean bases in Antarctica are less than 2 hours and to Chile itself are less than 4 hours.
- This seismic zone is not part of the PTWS Earthquake Source Zone and therefore PTWS TSP products are not authorized for earthquakes in this zone unless a hazardous tsunami is forecast for or observed along PTWS coasts or there is reasonable cause for concern.

# Background

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## **Recommendation ICG/PTWS-XXIX.3**

Recommends that the PTWS Earthquake Source Zone be expanded to include the southernmost Atlantic seismic region to routinely provide Member States of the PTWS with information about the frequent large earthquakes from this region and any subsequent tsunami threat;

*The above recommendation was submitted to the TOWS-WG 15th session in February 2022 and was then in turn submitted to the IOC 55th Executive Council. However, the recommendation was removed from the IOC Decisions and expansion of the PTWS ESZ was not realized.*

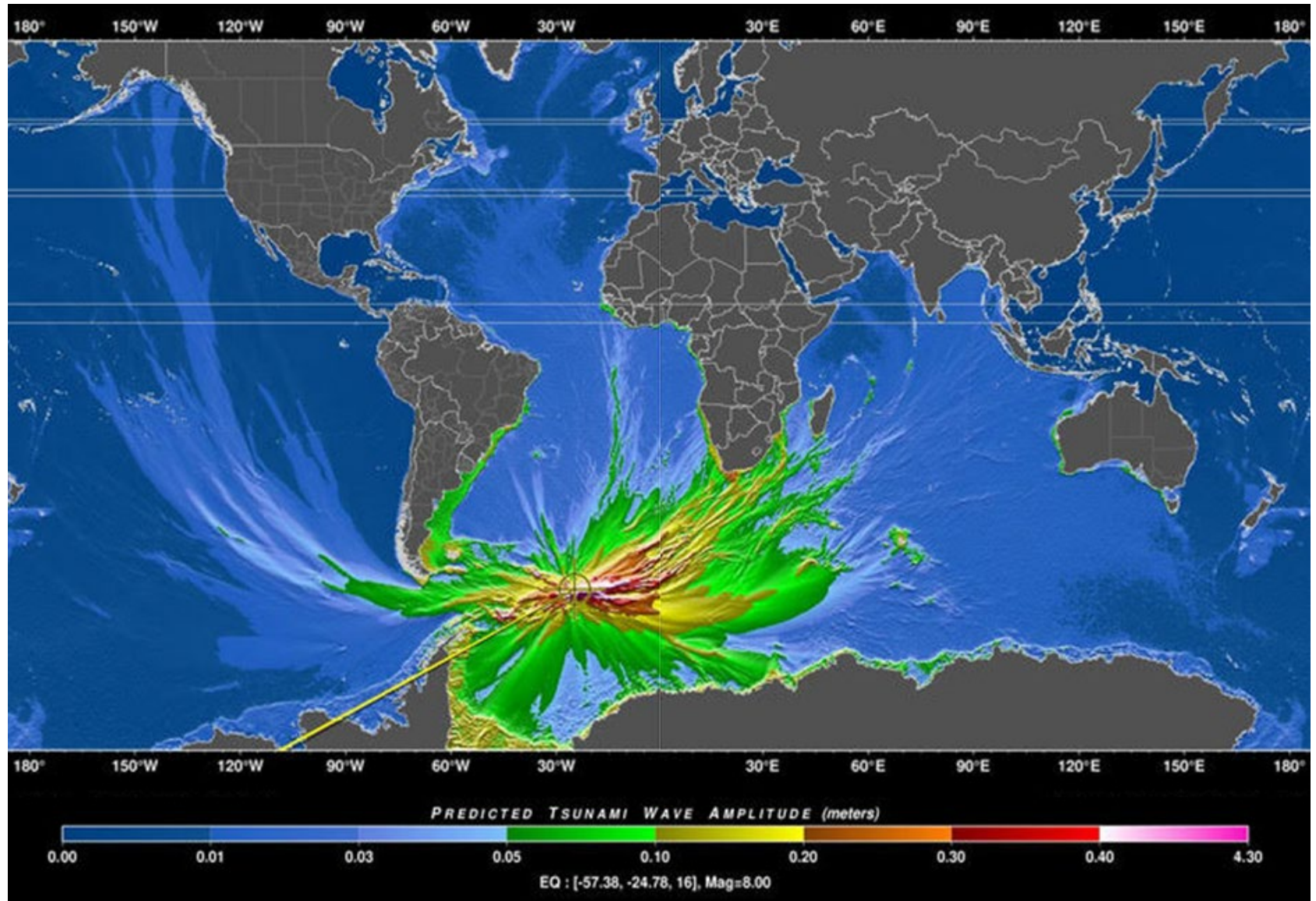
*The PTWS Steering Committee was held in March 2023 and it agreed on the following recommendation.*

## **Recommendation in the PTWS Steering Committee in March 2023**

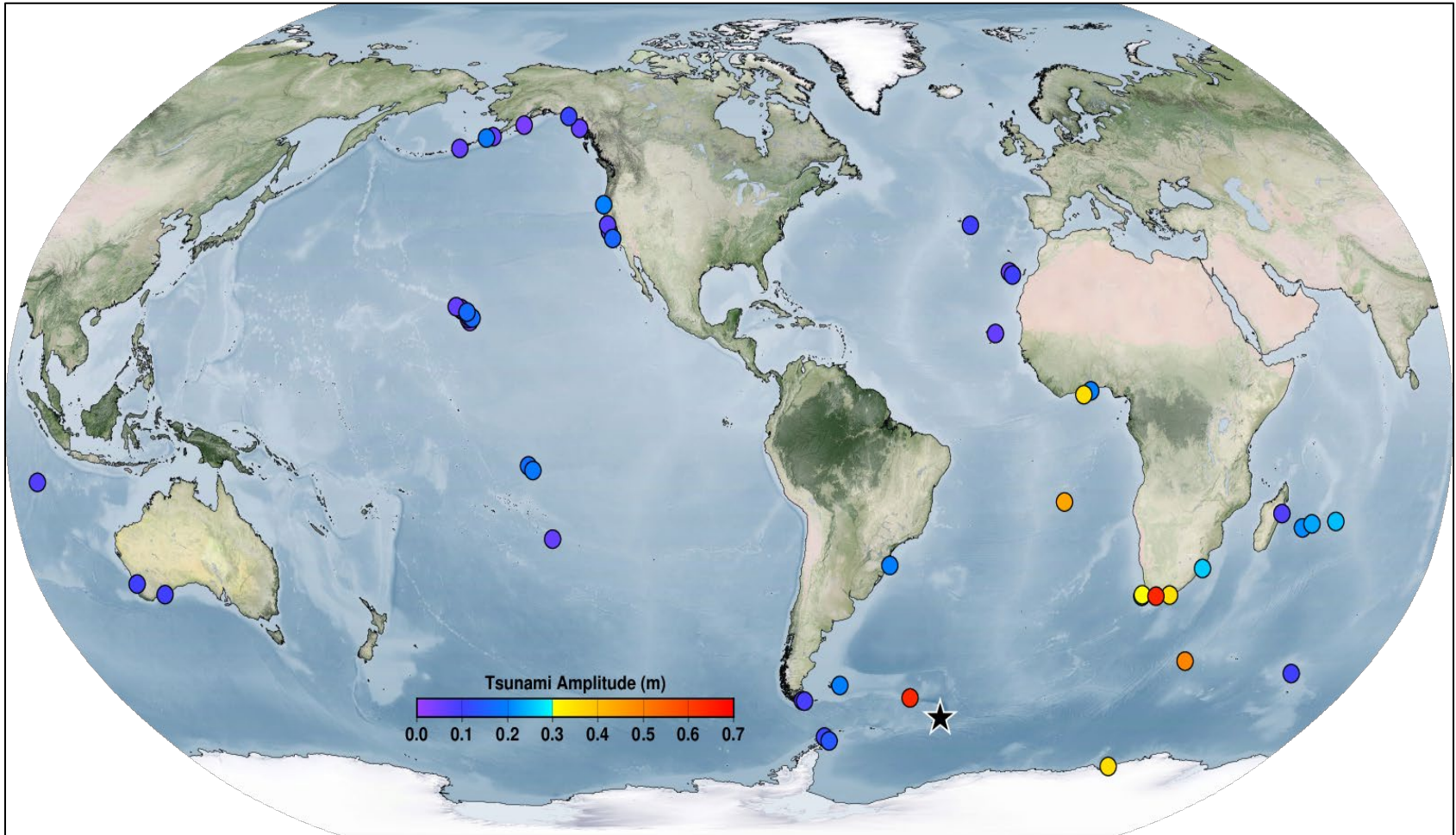
The Group recommended that the issue of expanding the PTWS earthquake source zone into the southern Atlantic Ocean to cover the seismicity associated with the Scotia Subduction Zone be discussed at ICG/PTWS-XXX in Tonga. If the ICG agrees with the expansion, then it will instruct the IOC to change the PTWS earthquake source zone map in the TS 130 (2016 version) and this decision will be reported back to the TT-TWO and the TOWS-WG.

# RIFT Model Tsunami Forecast

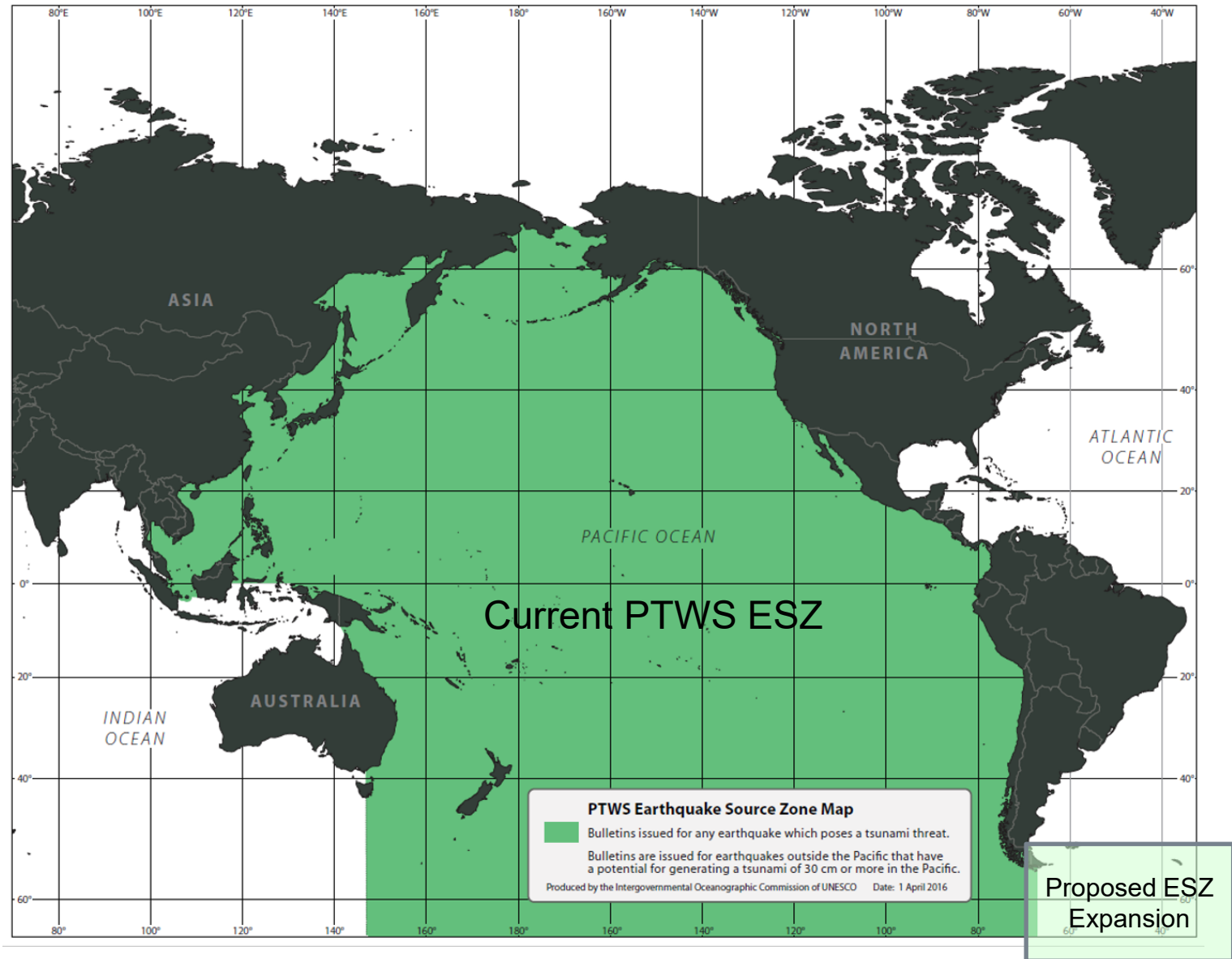
## August 12, 2021 South Sandwich Islands Earthquake



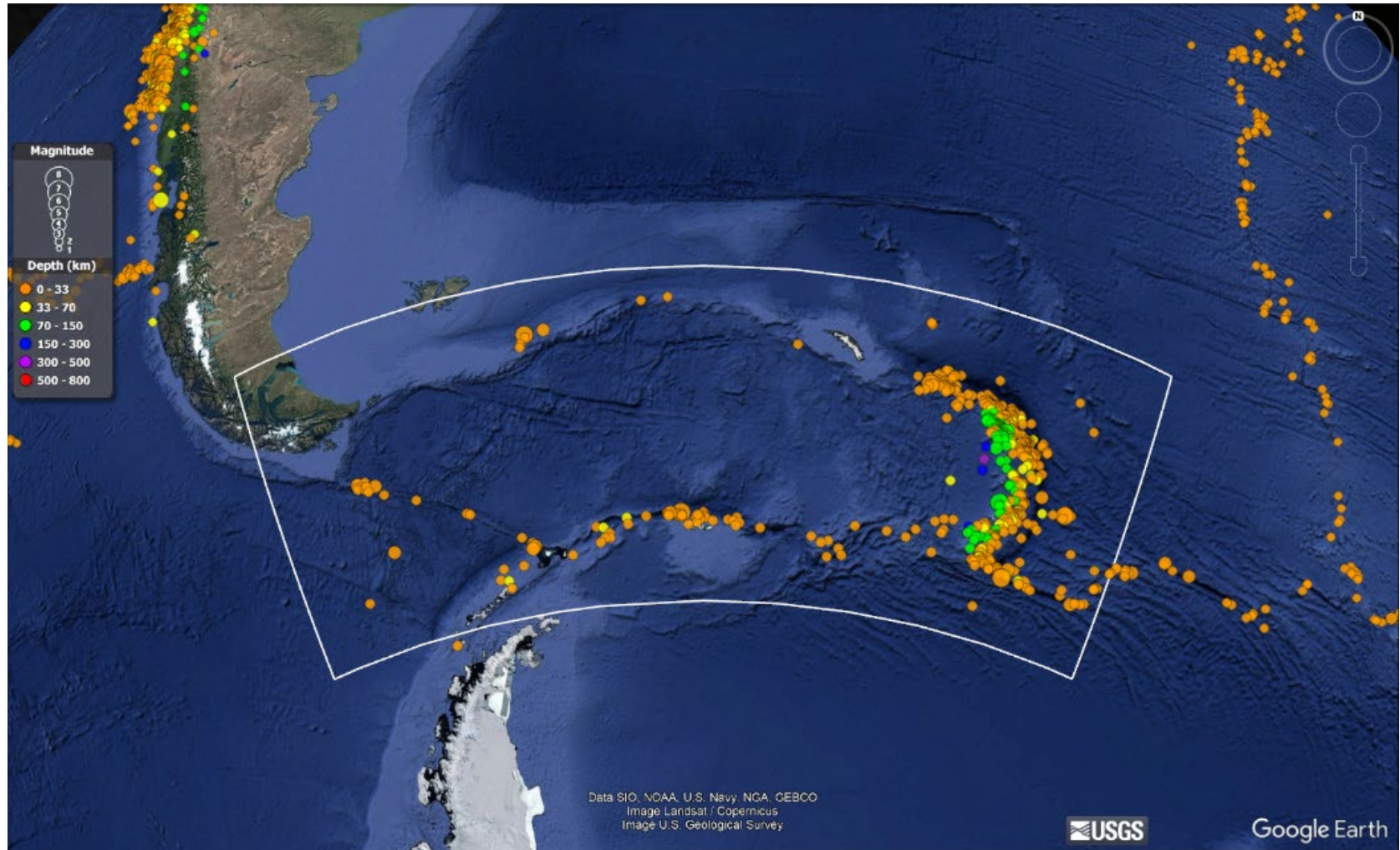
# Recorded Tsunami Amplitudes from the August 12, 2021 South Sandwich Islands Earthquake



# Current Limits and Proposed Expansion of the PTWS Earthquake Source Zone



## Proposed Expansion of PTWS Earthquake Source Zone: from 63° to 52° South latitude and from 72° to 18° West longitude



Dots show locations of historical earthquakes.

# Consequence of Expanding the ESZ

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- PTWC is the only TSP currently covering southeast Pacific seismic zones and it would be the only TSP covering the proposed expansion area.
- Additional PTWC Tsunami Information Statements would be issued to PTWS Member States once or twice per year for large earthquakes that occur in this zone.
- A Tsunami Threat Message would be issued by PTWC when appropriate for threatened PTWS coasts based on the initial earthquake magnitude or later based on RIFT forecast model results.
- This will make the PTWC response to earthquakes in this region be part of a routine procedure instead of being an ad hoc judgement call by the duty analyst.
- It will make the procedure more reliable and help protect PTWS coasts that may be threatened by a future event from this area.



## Recommendation

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- PTWS WG2 supports the recommendation made at the PTWS Steering Committee in March 2023. WG2 proposes to expand the PTWS Earthquake Source Zone to include an area extending from 63° to 52° South latitude and from 72° to 18° West longitude. This area contains a part of the southern Atlantic Ocean that encompasses the Scotia Arc and its adjacent seismic zones. If the ICG/PTWS endorses this change it will be implemented by the Pacific Tsunami Warning Center as soon as possible and subsequent earthquakes in this region with a magnitude of 6.5 or greater will trigger the issuance of PTWC tsunami information or tsunami threat products, as appropriate, to the PTWS.
- WG2 further proposes to request the IOC to change the PTWS Earthquake Source Zone map in the TS 130 (2016 version).



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# Thank You

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