



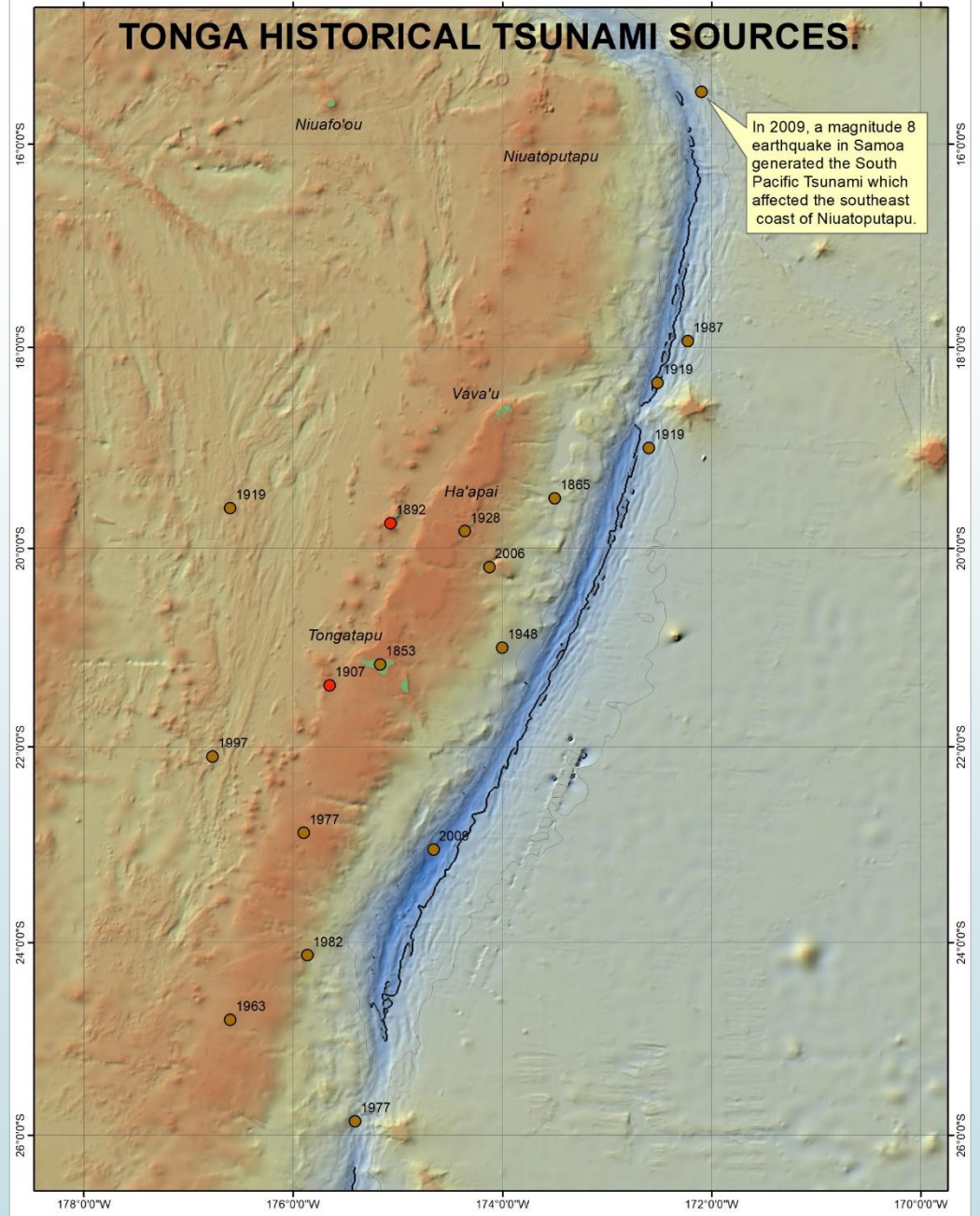
Geohazard Services Earthquake and Tsunami SOP

1

Tonga Joint Review of Tsunami Warning and
Response SOP Workshop 2024



TONGA HISTORICAL TSUNAMI SOURCES.

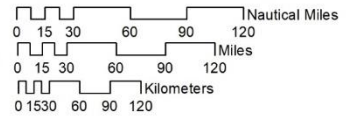


In 2009, a magnitude 8 earthquake in Samoa generated the South Pacific Tsunami which affected the southeast coast of Niuatoputapu.



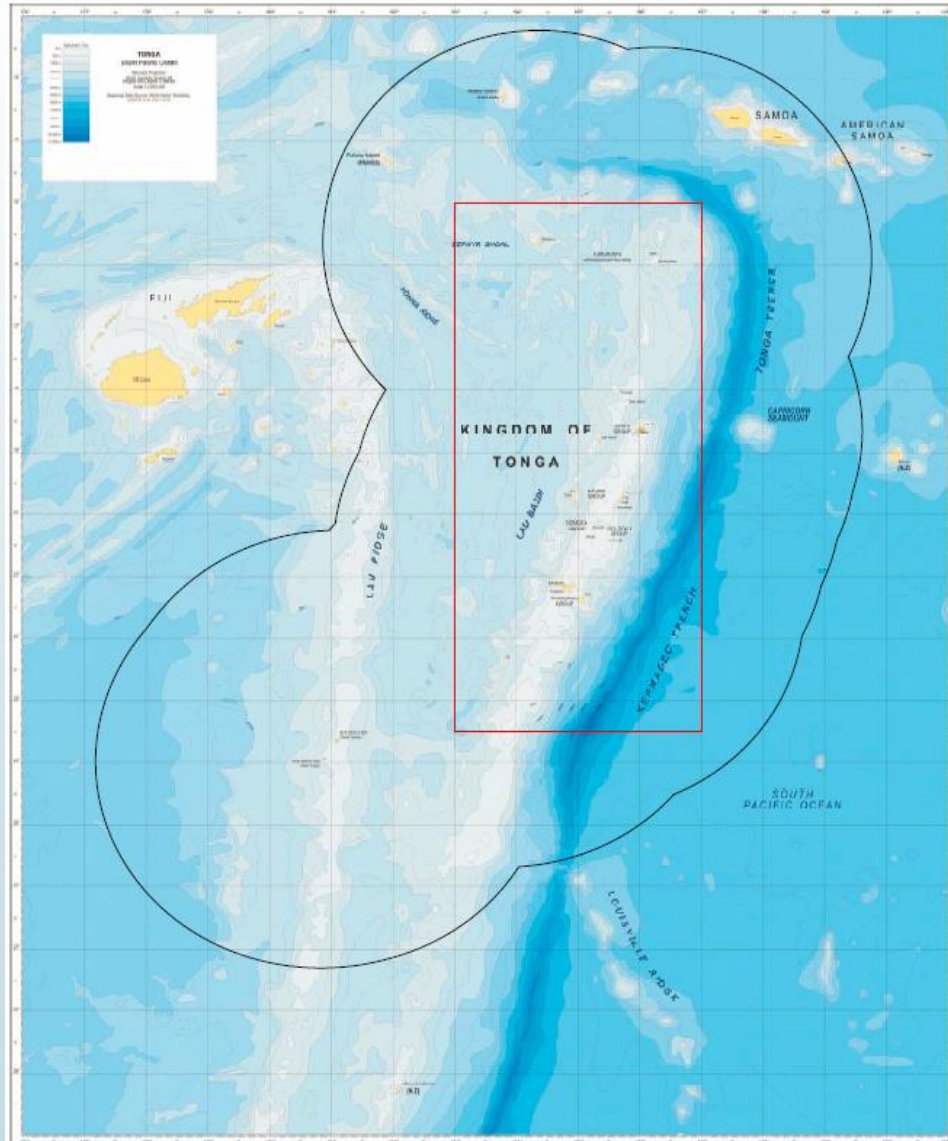
Tsunami Sources

- Earthquake
- Volcano

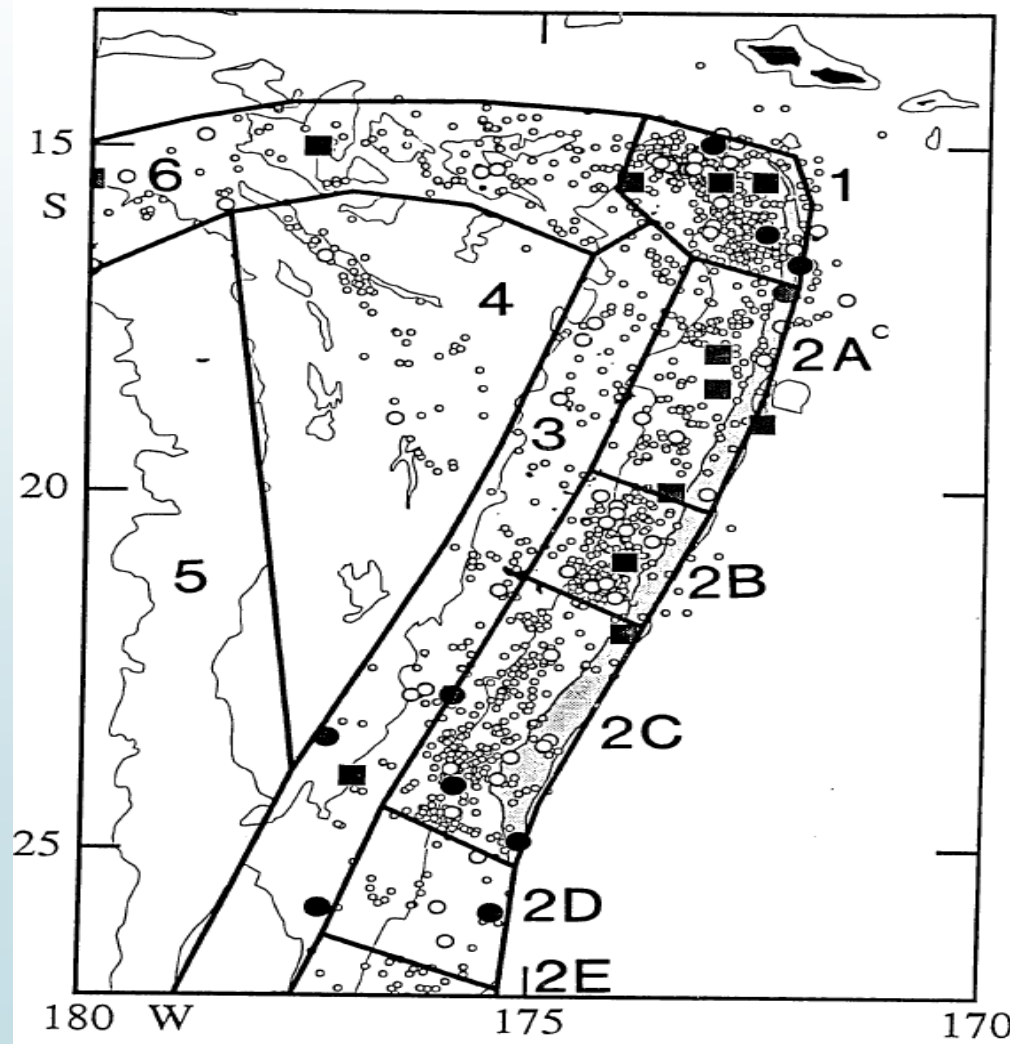


Produced by the Tonga Geological Services.
Data source:
National Geophysical Data Center/World Data Service
NCEI/WDS Global Historical Tsunami Database.
NOAA National Centers for Environmental Information.
doi:10.7289/V5PN93H7

Area of Responsibility



Seismotectonic Provinces in Tonga



1 – Northern end of the Tonga Trench (Samoa Corner)

2 – Tonga Arc

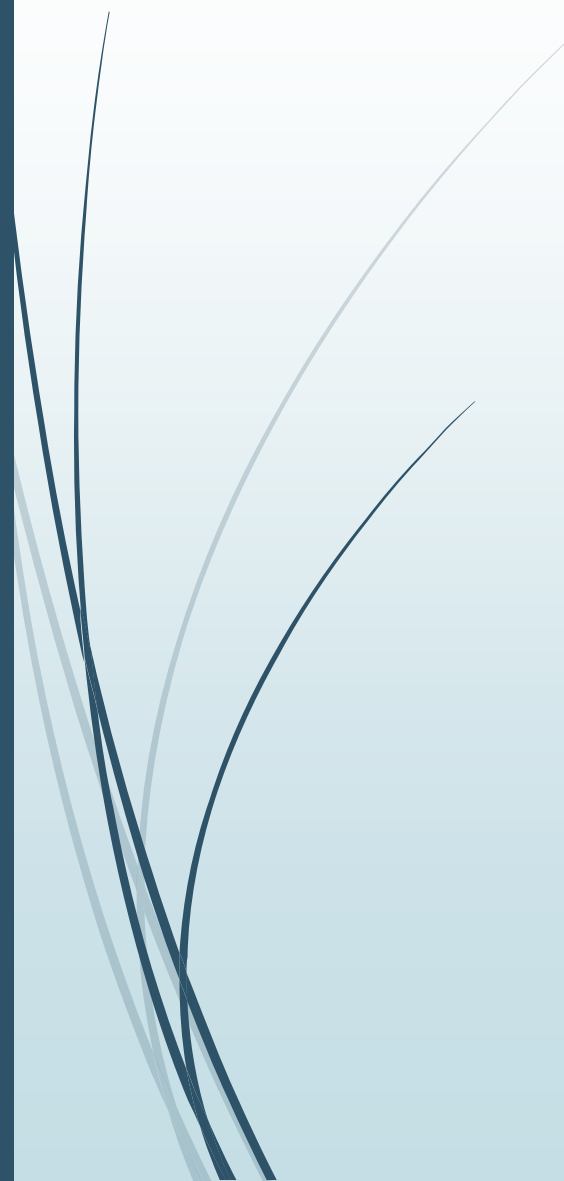
3 – Back Arc

4 – Lau Basin

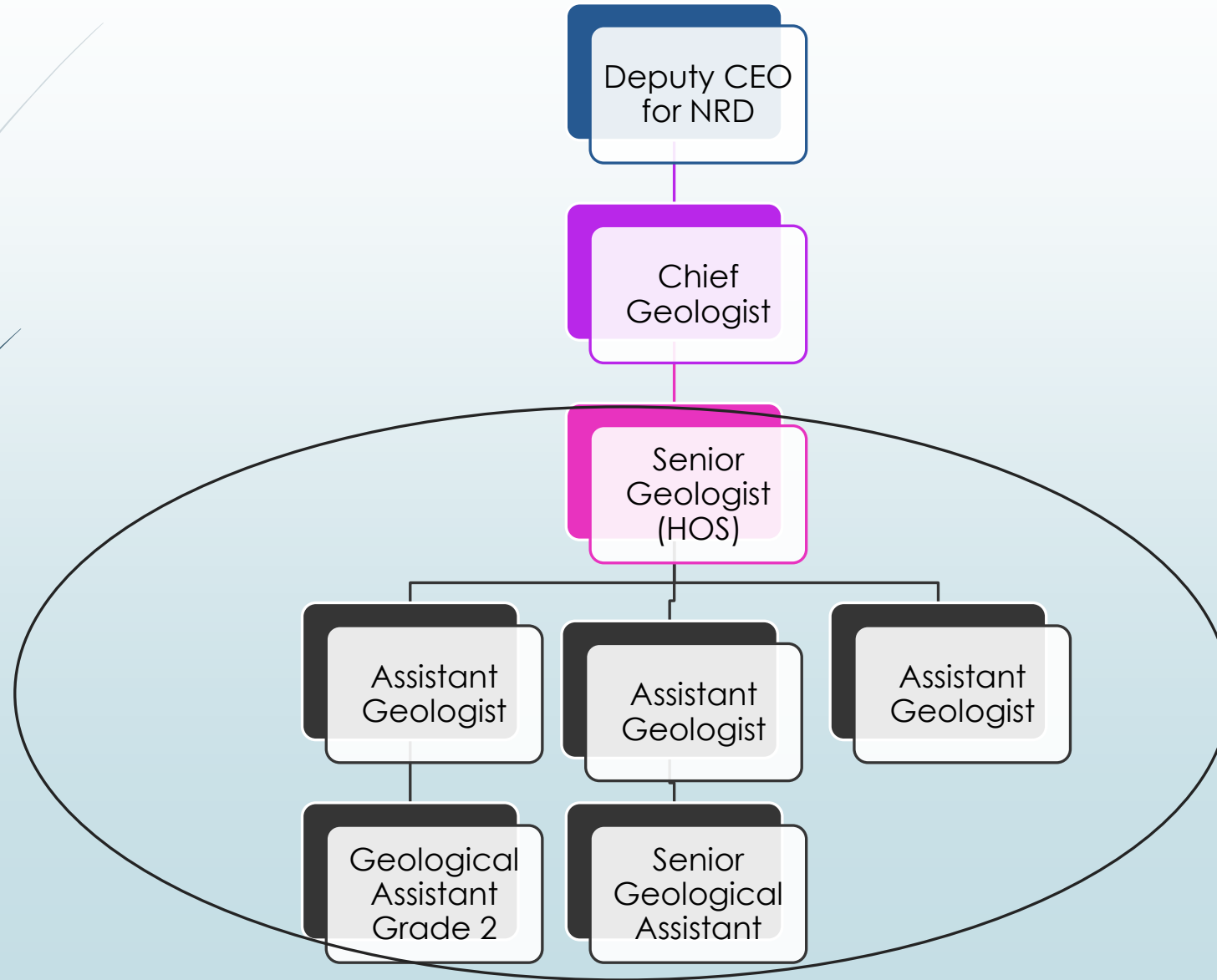
5 – Lau Ridge

6 – Fiji Fracture Zone

Earthquake Monitoring Process



Organizational Structure



Roles

- ▶ HOS: - Create duty roster
 - Supervise duty officers and approve reports to be disseminated
- ▶ Duty Officers: 1. Monitor SOH of stations
 - Make a weekly report and troubleshoot problems or report to ICT staff and supervisor
 - Submit to supervisor a troubleshoot report
- 2. Earthquake observation
 - Manually review every event during working hours
 - Report every felt/significant event to the supervisor for approval then disseminate the report to the info@nautralresources.gov.to mailing list

Volcano Monitoring Process

- ▶ VOLCAT
- ▶ Volcanic Ash Cloud
- ▶ Advisory level: aviation advisory level is an international standard
 - Sea advisory level
 - Terrestrial advisory level

Types of EQ alerts (Local)

Criteria for action: Earthquakes within 200 Nautical Miles.

Reporting
(No threat)

4.7 - 6.9Mag
< 70 KM

7.0 - 7.9Mag
> 50 KM

Assess Threat (Watch)

7.0 - 7.4Mag
30 - 50 KM

Assess Threat (Warning)

7.0 - 7.4Mag
< 30 KM

7.5 +Mag
< 50 KM

Communicate with MET and NEMO

Activate Significant EQ Advisory.

(Use icom radio/phone and Standard EQ report template)

Mercalli Scale (Local EQs)

- ▶ Urgent tsunami alert – 8
- ▶ Urgent tsunami warning – 9

Types of EQ alerts (Regional)

Regional Earthquake	<u>An earthquake epicenter located within 1000km to/from coastline of Tonga island groups.</u> <u>(Fiji, Tuvalu, Tokelau, Samoa, Wallis & Futuna, Niue, Vanuatu and NZ)</u>		
6.8mag – 7.0mag, 50km deep	≤ No Threat	Communicate with MET & NEMO Activate Significant EQ advisory	- Through icom radio, or phone - Standard EQ report template
7.1mag – 7.4mag, 50km deep	≤ Tsunami Alert	Communicate with MET & NEMO Issue information bulletin Activate Significant EQ advisory	AS ABOVE PLUS TSUNAMI INFORMATION BULLETIN
≥7.5mag, ≤ 30km deep	Tsunami Warning	Communicate with MET & NEMO Issue warning Bulletin Activate Significant EQ advisory	AS ABOVE PLUS TSUNAMI WARNING BULLETIN

Types of EQ alerts (Distant)

Distant Earthquake	<u>An earthquake epicenter located in the Pacific basin in distant source over 1000km to/ from coastline of Tonga island groups</u>		
6.8mag – 7.0mag, ≤ 30km deep	No Threat	Communicate with MET & NEMO Activate Significant EQ advisory	-Through icom radio, or phone -Standard EQ report template
7.1mag – 7.4mag, ≤ 30km deep	Tsunami Alert	Communicate with MET & NEMO Issue information bulletin Activate Significant EQ advisory	AS ABOVE PLUS TSUNAMI INFORMATION BULLETIN
≥7.5mag, ≤ 30km deep	Tsunami Warning	Communicate with MET & NEMO Issue warning Bulletin Activate Significant EQ advisory	AS ABOVE PLUS TSUNAMI WARNING BULLETIN

Thank you for listening

Malo 'Aupito