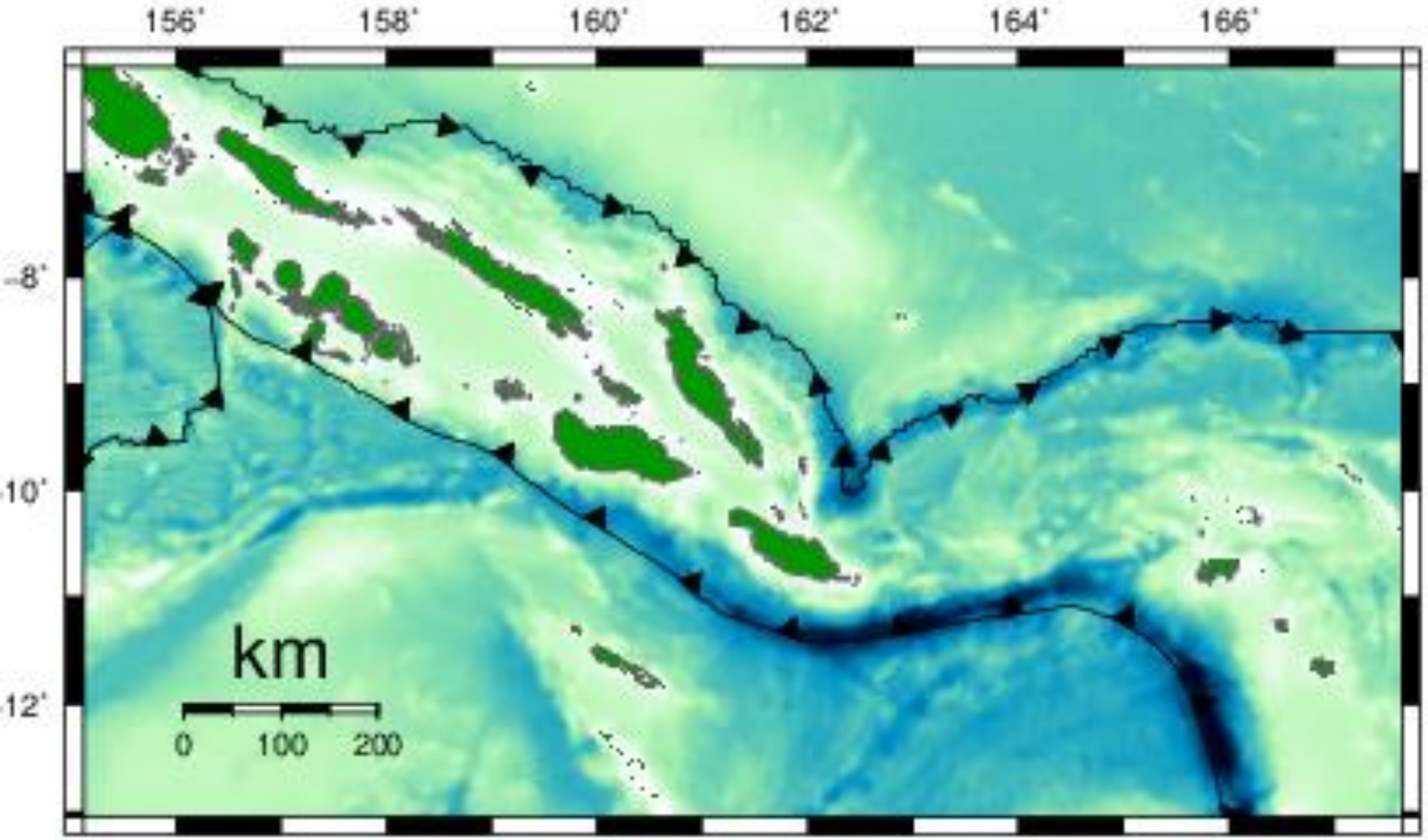
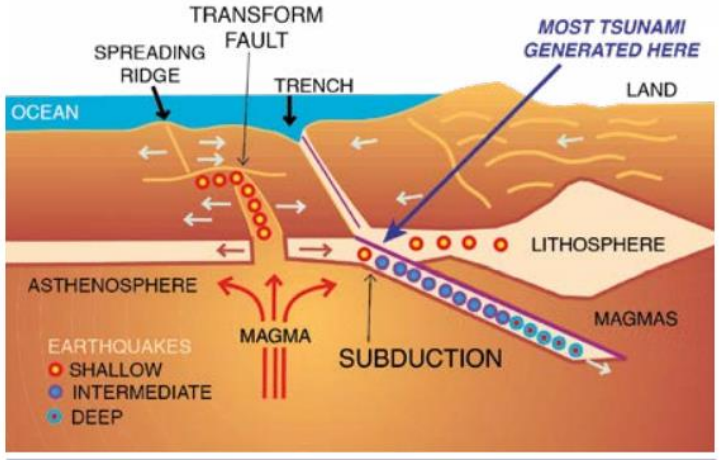
Geological Survey Division (GSD), Ministry of Mines, Energy & Rural Electrification

Seismological Section – Earthquake Monitoring, Volcanic Monitoring and Tsunami modelling



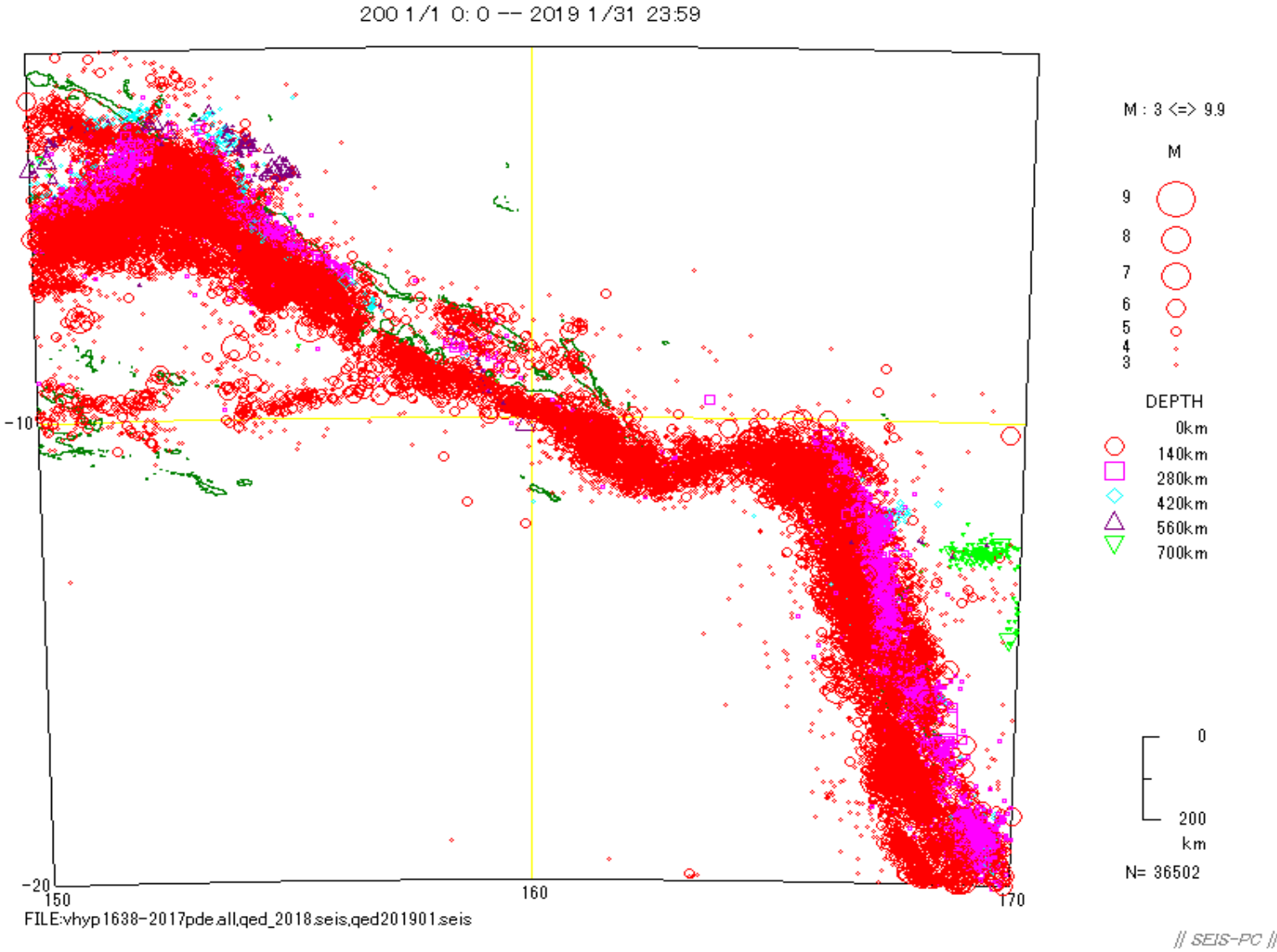
Subduction Zones

North and South



Seismicity

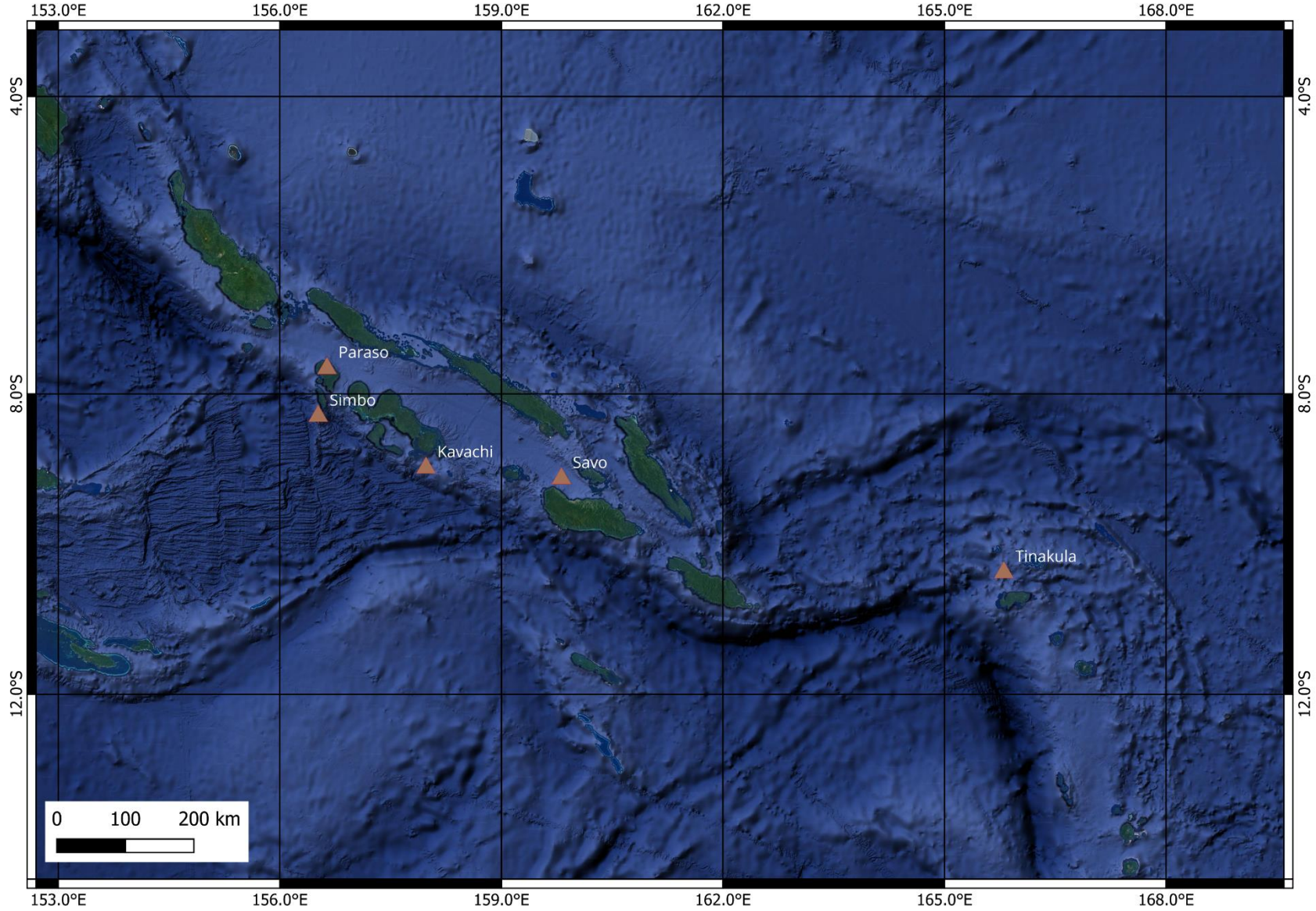
- Seismicity

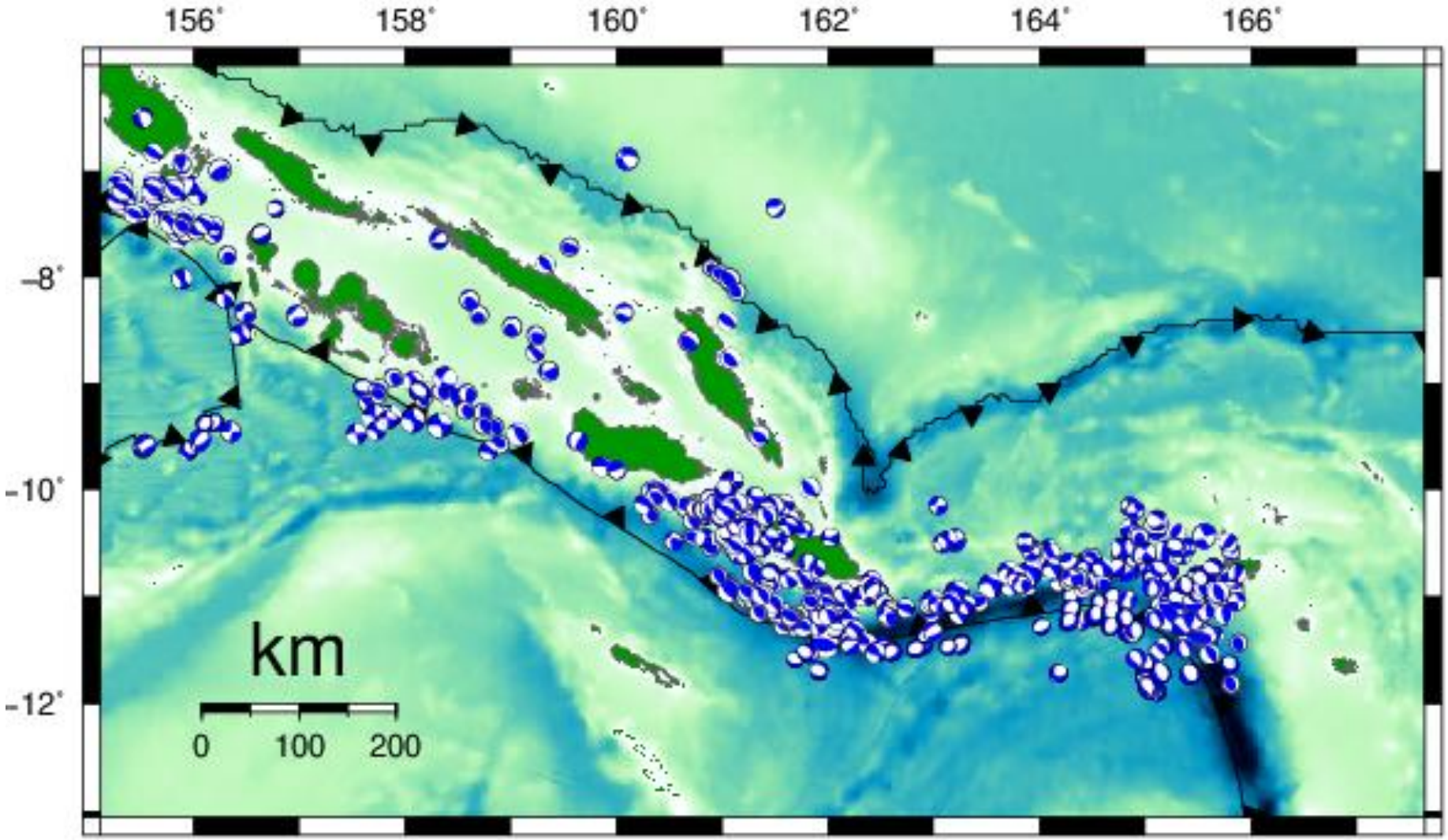


Source: Seis-PC (Ishikawa, 2019) software

Volcano, Solomon Islands

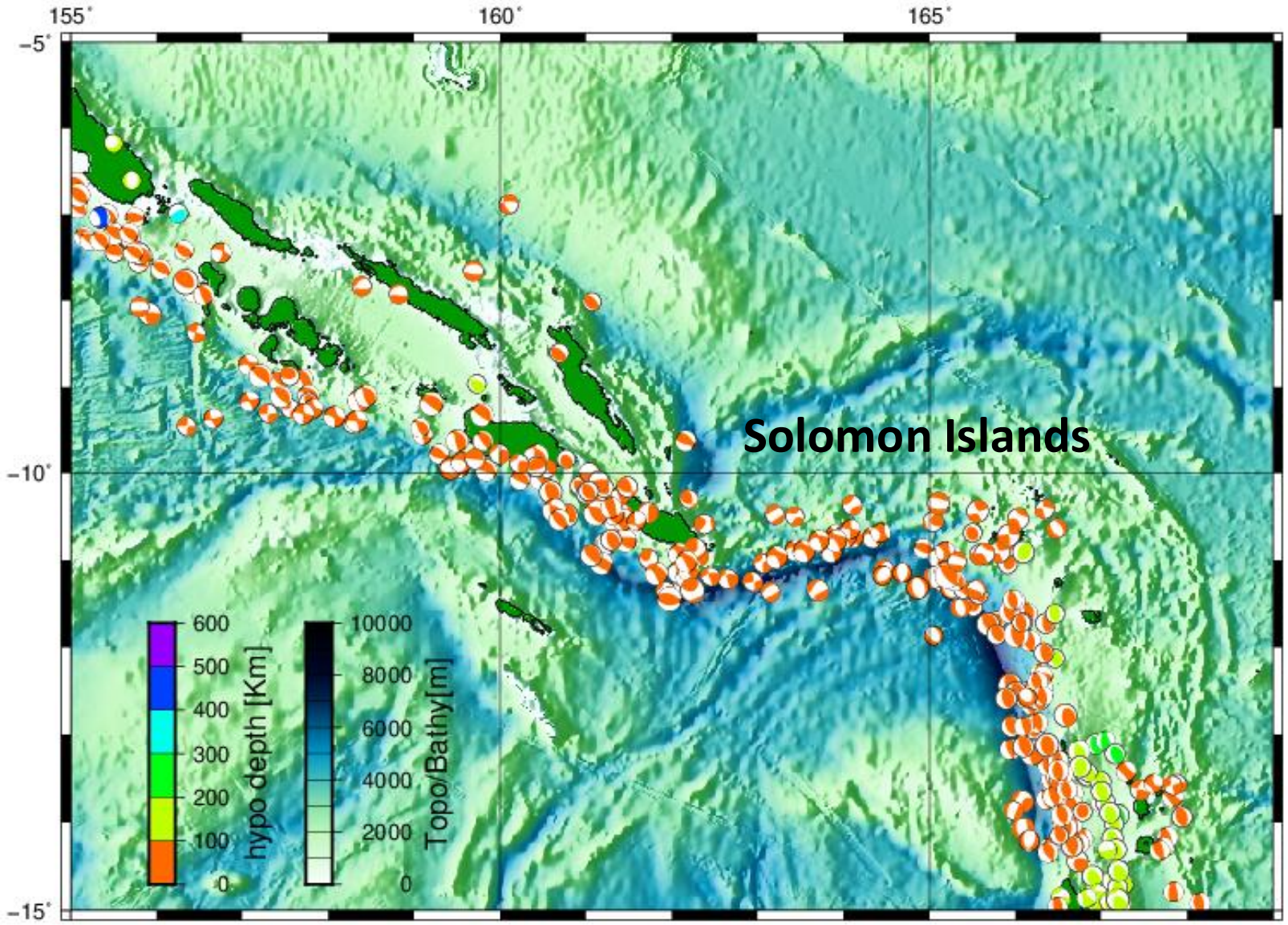
1. Savo
2. Tinakula
3. Kavachi
4. Paraso
5. Simbo





2013 to May 2022 seismic occurences for Solomon Islands (source: Global CMT -https://www.globalcmt.org/CMTsearch.html)

Seismicity Map of Solomon Islands

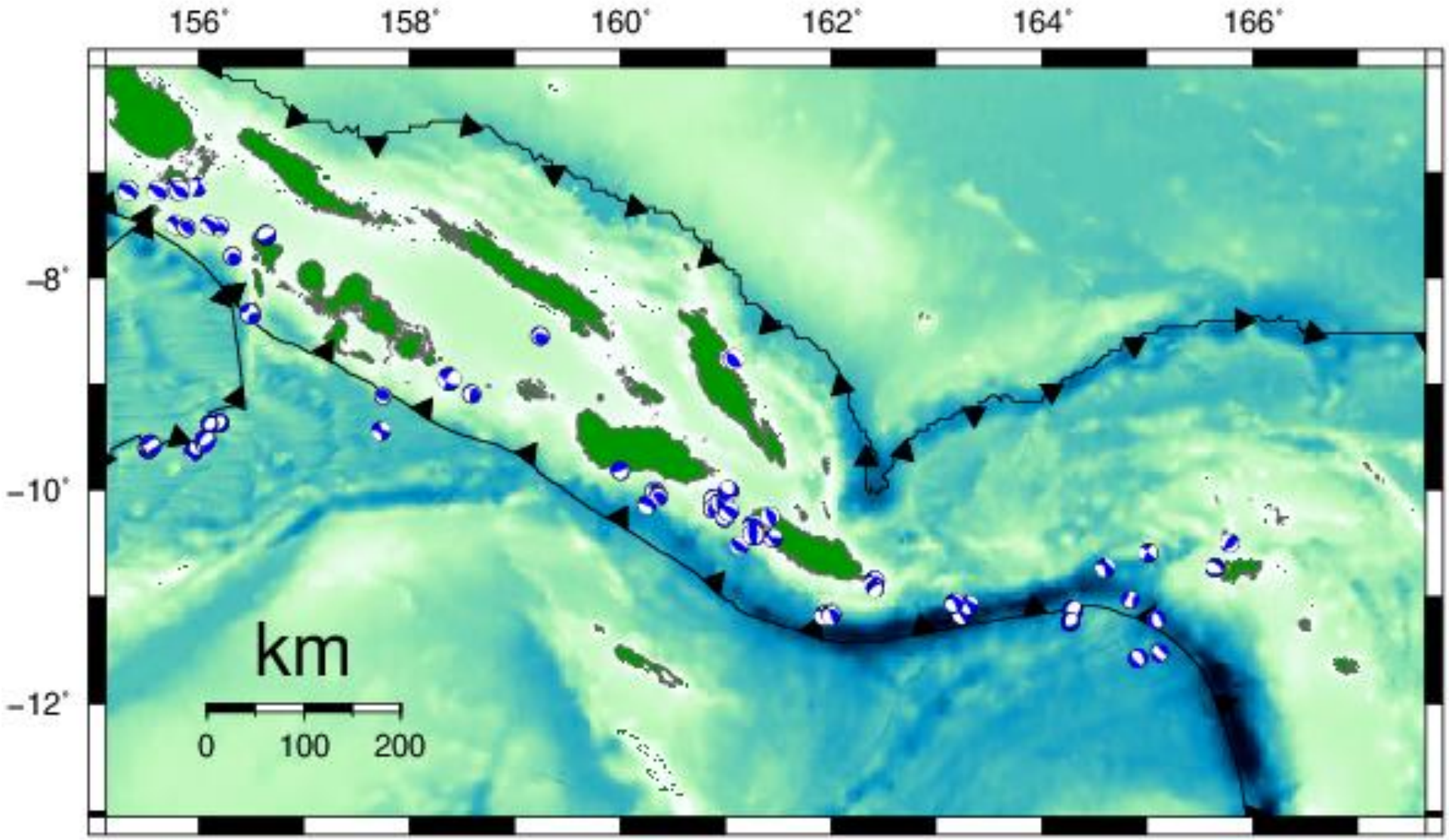


Global CMT Catalog
https://www.globalcmt.org

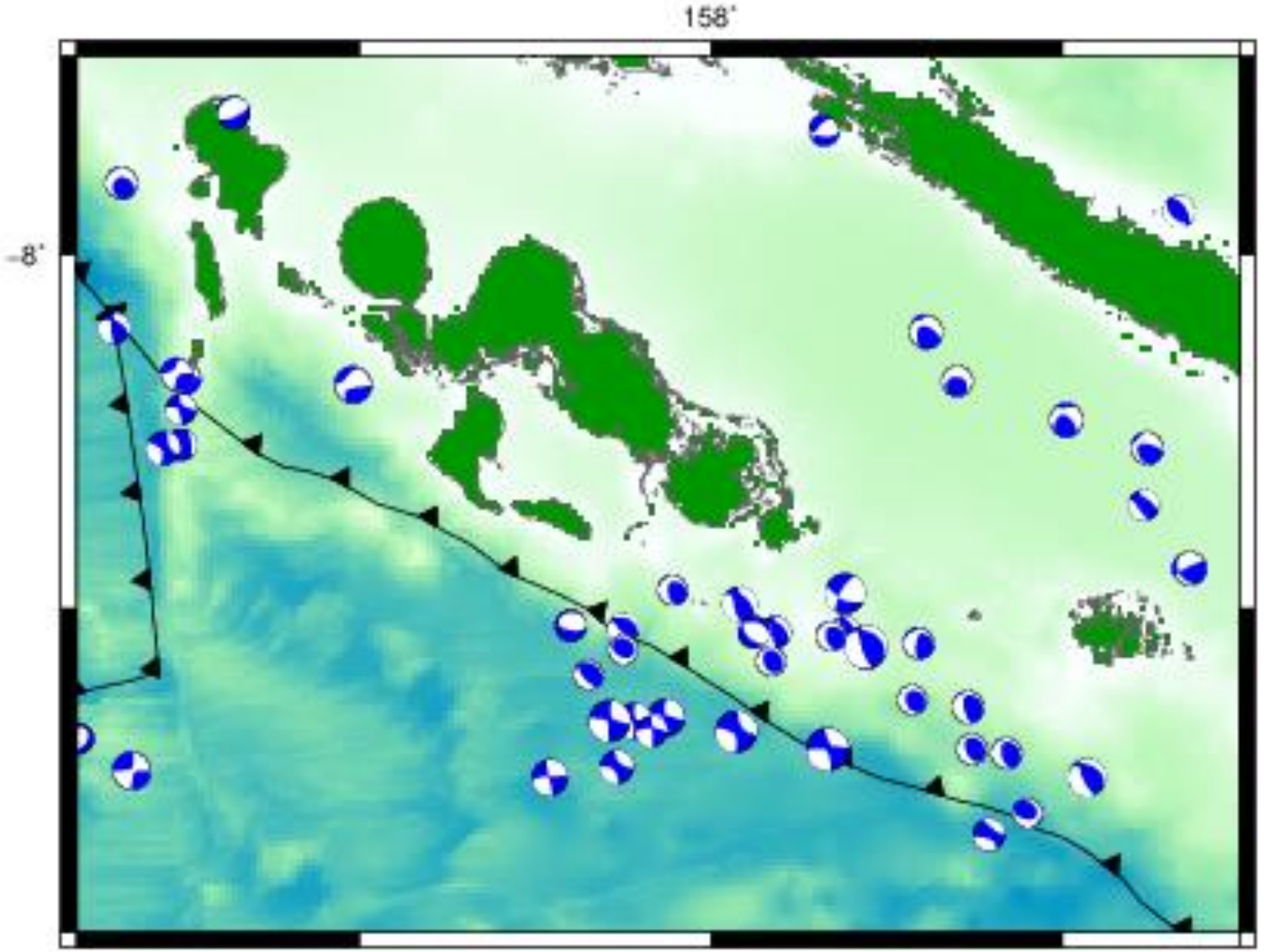
Data
- Start date: 1976
- End date: 2020

Depth
- 0 <=depth<= 1000km

Magnitude (Mw)
- 6 <=Mw <= 10



2020 to May 2022 seismic occurences for Solomon Islands (source: Global CMT -https://www.globalcmt.org/CMTsearch.html)



New Georgia group
Seismicity, 2007
Tsunami

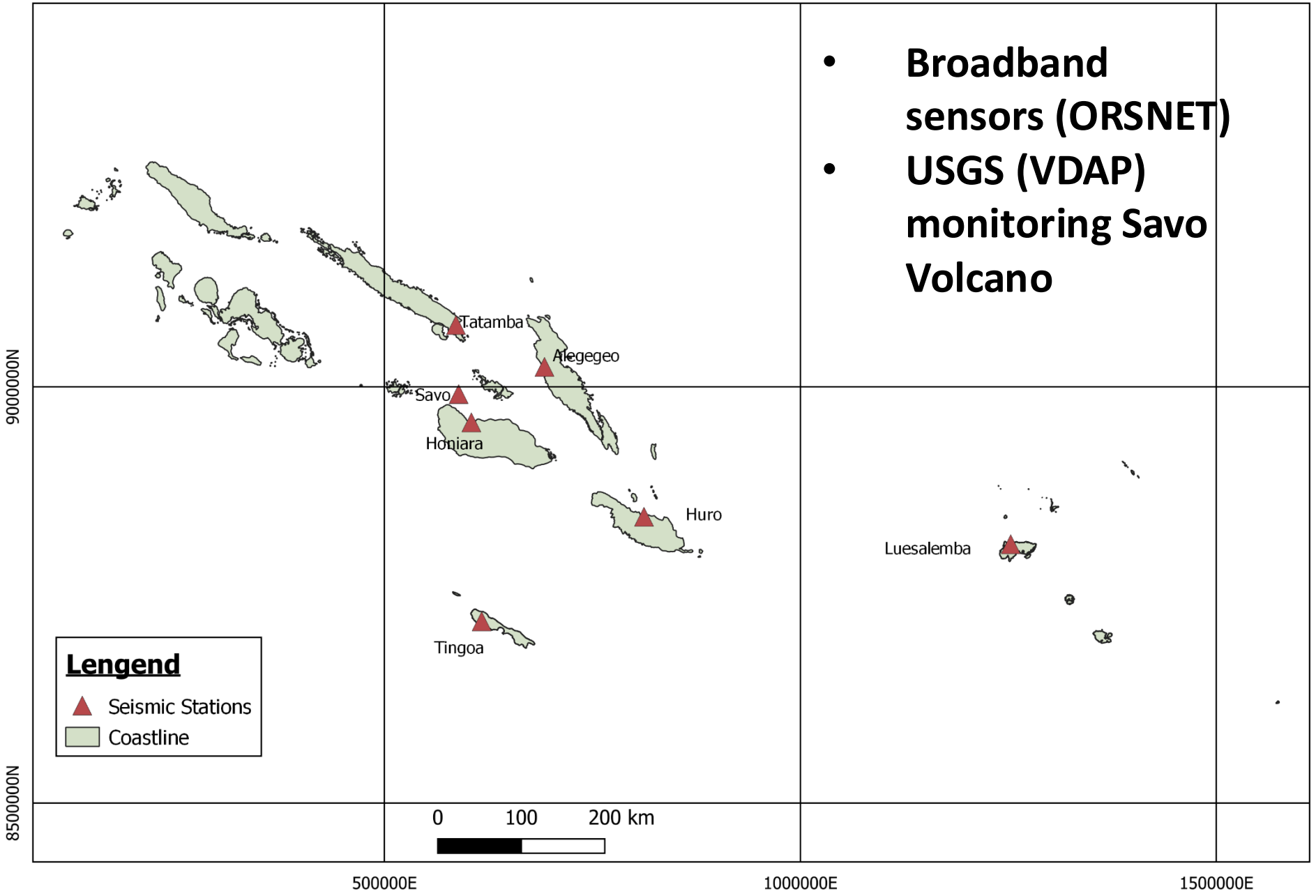
Historical Tsunami Events

- 2007 Event –Western Province (12.1m)
- 1939 Event – Guadalcanal (10.5m)
- 1931 Event – Makira (9m)
- 2013 Event – Temotu, Santa Cruz Islands (1.1m)

- Different Tsunami Heights

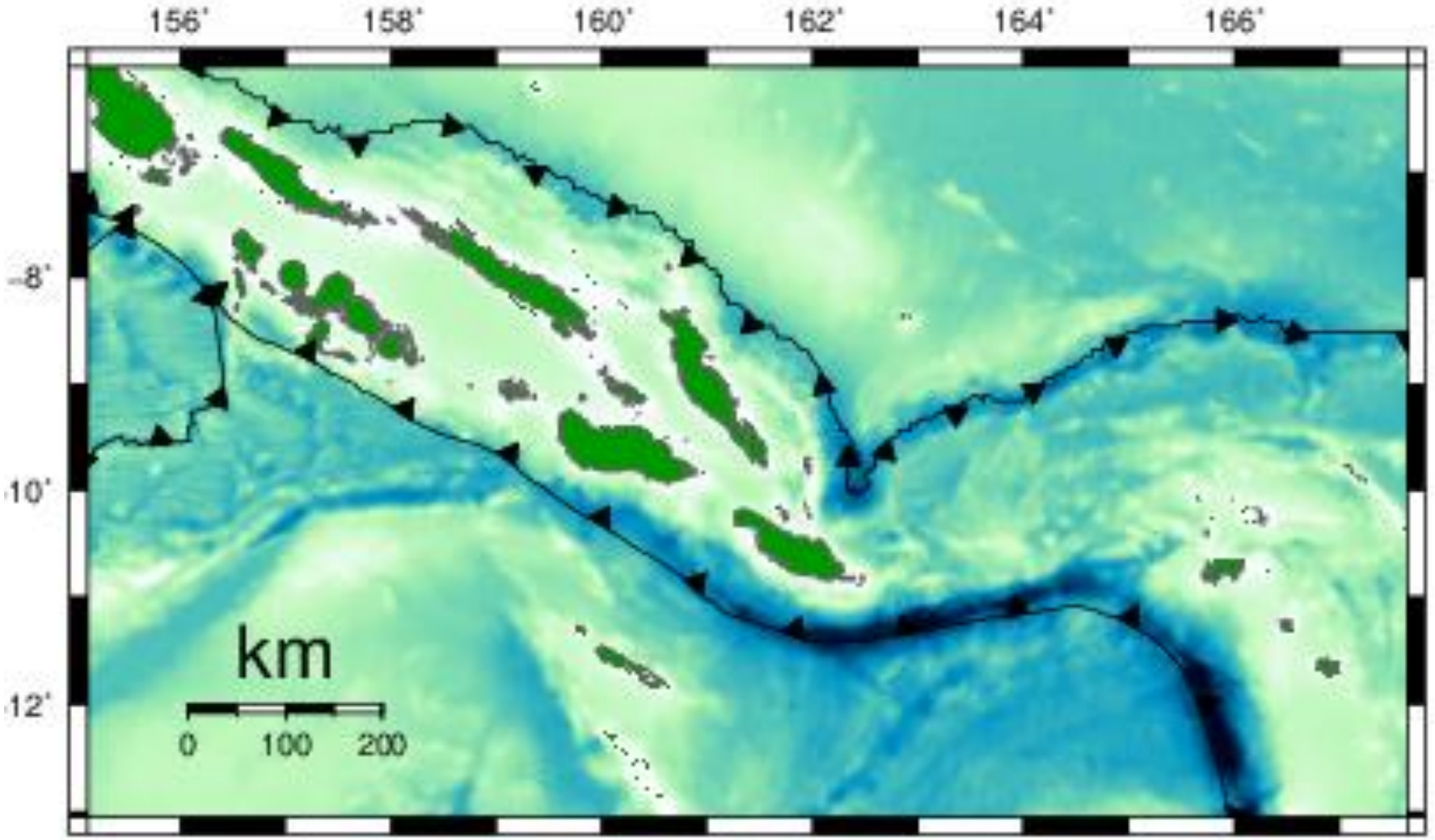
Tsunami events	Date	Magnitude	Province/Location	Wave height (metres)	No. of Death
1	3/10/1931	7.9	Makira	9	50
2	30/4/1939	8.1	Guadalcanal	10.5	12
3	20/4/1977	6.8	Guadalcanal	>1	34
4	21/4/1977	8.1	Guadalcanal	>1	18
5	10/8/1988	7.6	Makira	1	1
6	1/4/2007	8.1	Western	12	54
7	8/2/2013	8.0	Temotu	12.1	10
8	29/12/2016	7.8	Makira	1	1

SI Seismic Stations



- Broadband sensors (ORSNET)
- USGS (VDAP) monitoring Savo Volcano

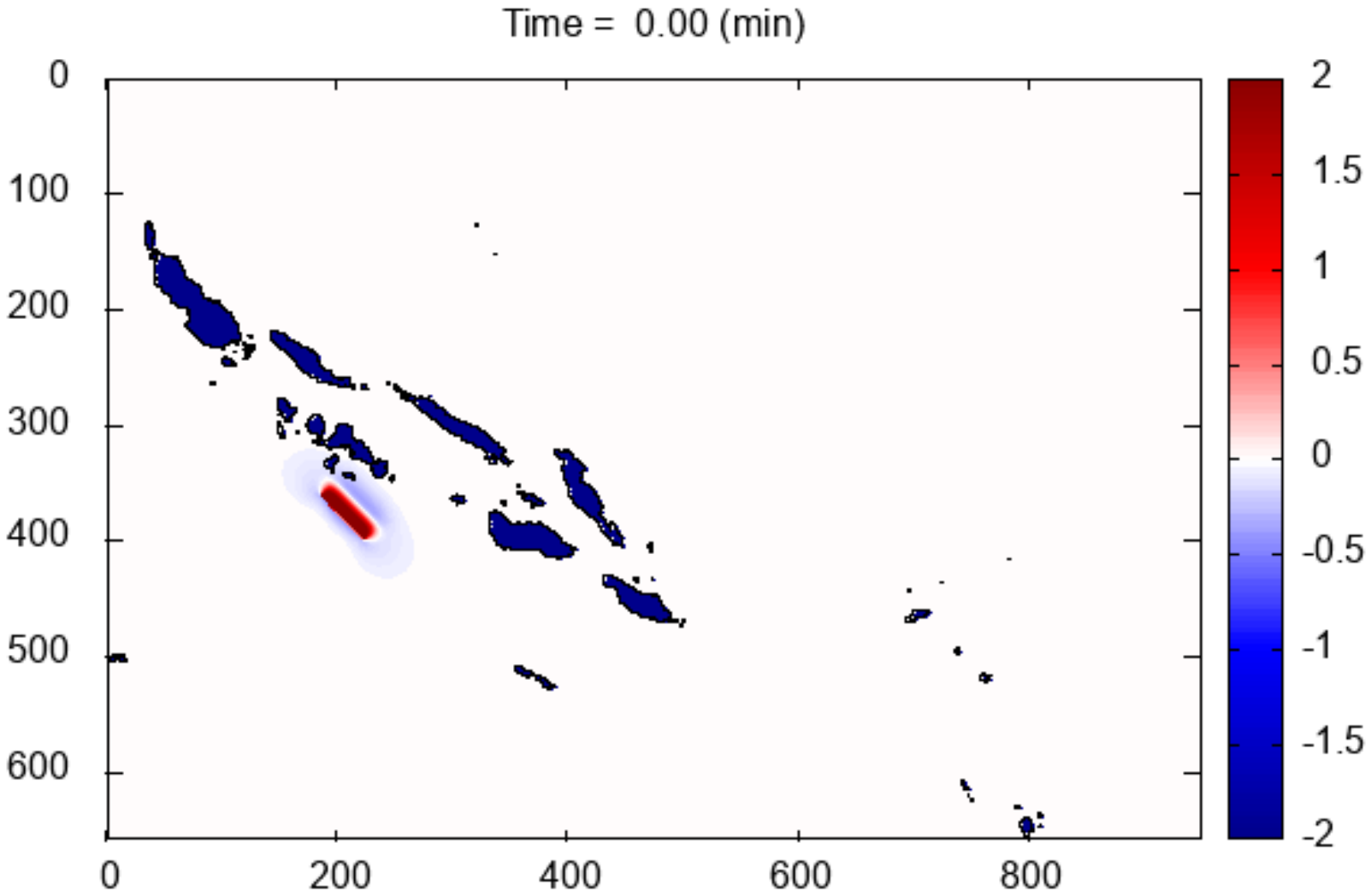
Tsunami Simulations

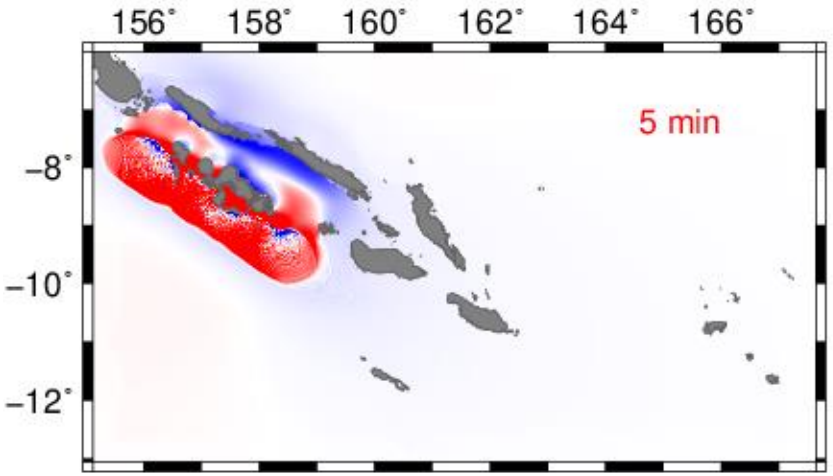


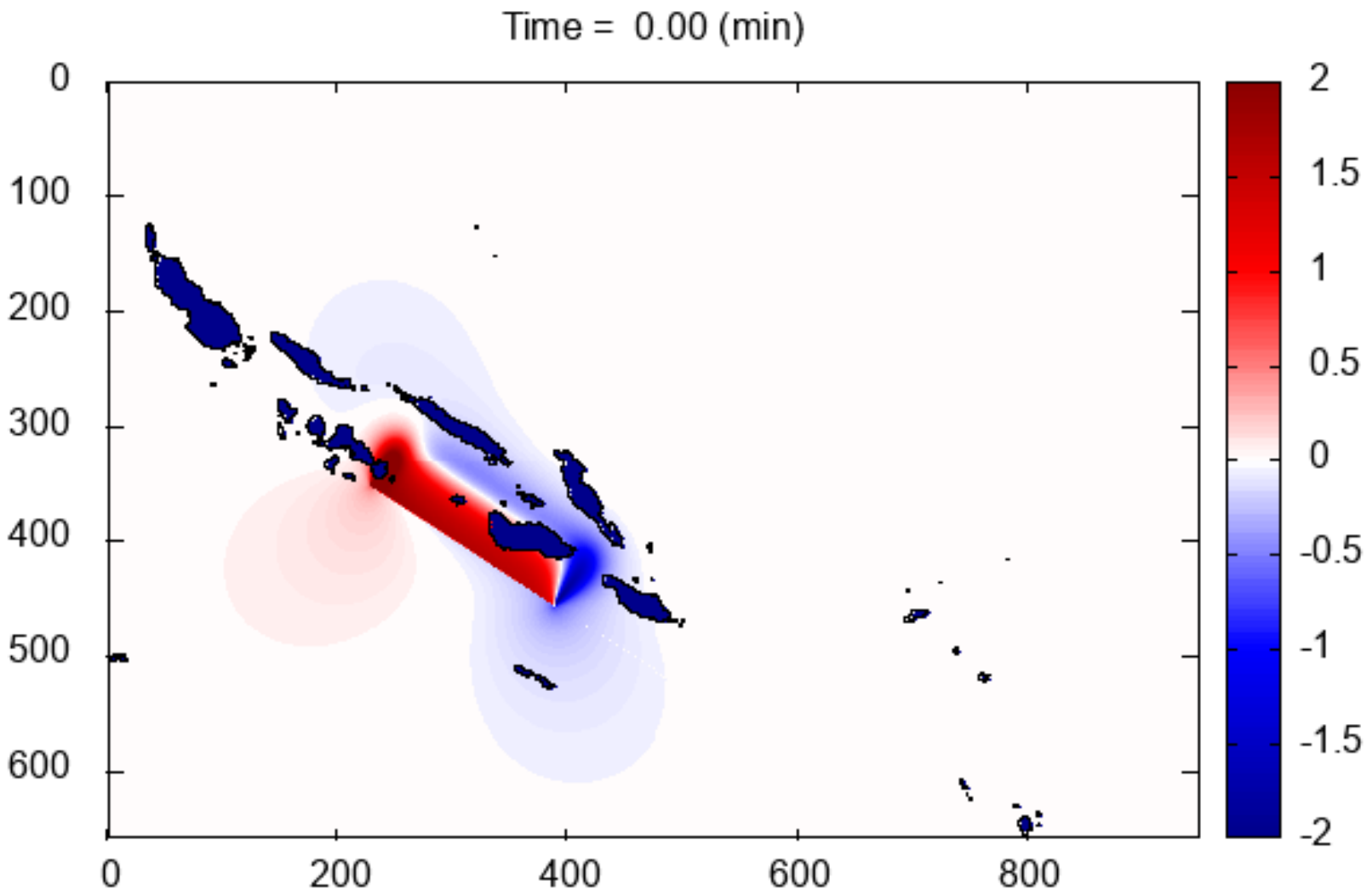
Data: GEBCO Resampled 1m for wave propagation – high seas and wave Heights
Arrival Time at the coasts

Earthquake Parameter (slip, dip, strike, rapture area…)

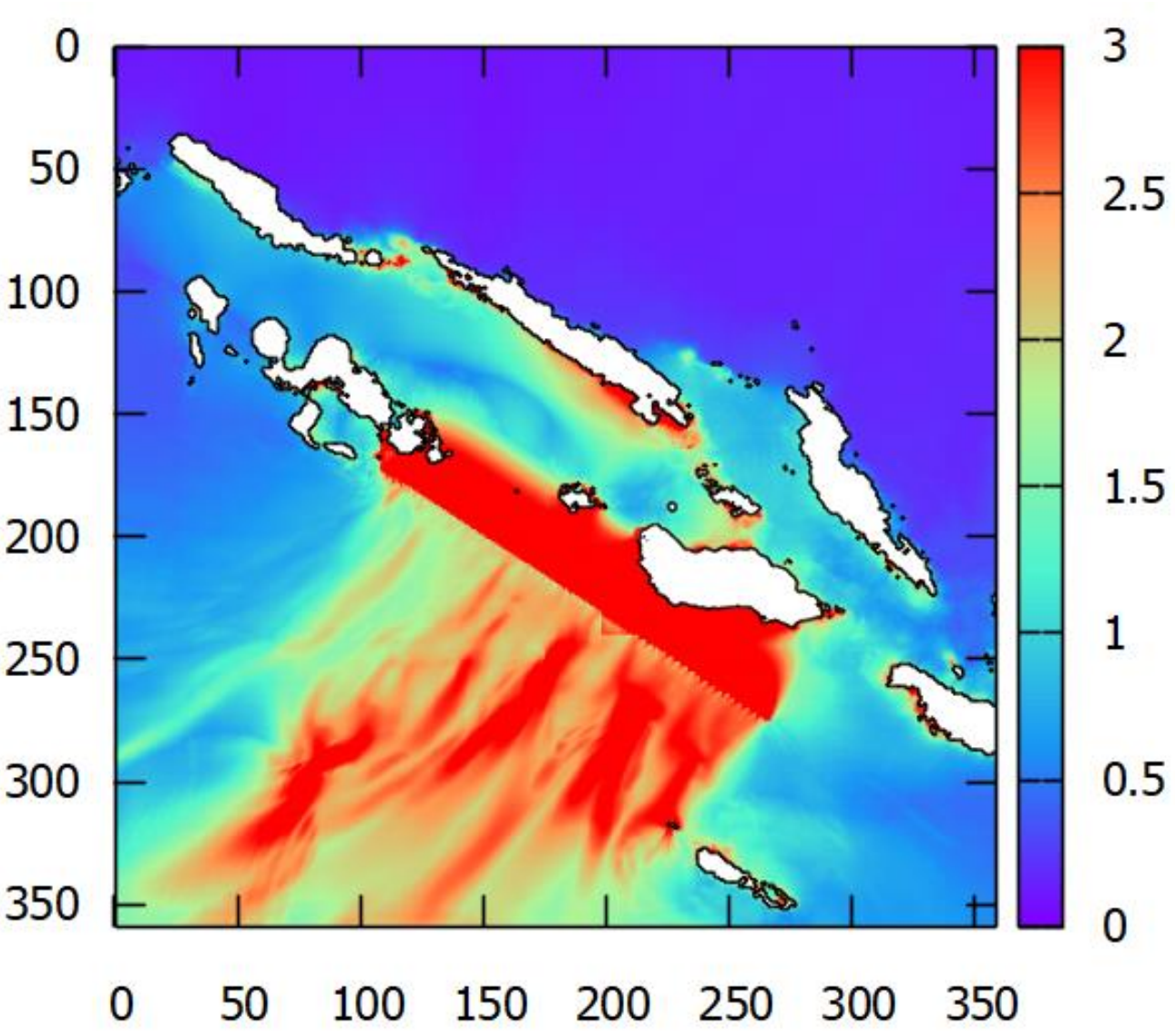
Tsunami Simulations






Time = 0.00 (min)
0
100
200
300
400
500
600
0
200
400
600
800
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2

Tsunami Heights - coastlines



Challenges

- **Data – finer grids for Solomon Islands**
- **Inundation – Data: for specific coastlines**
- **(Merged Topo with Bathymetry?)**

- **Volcano induced Tsunamis – Model and parameters**

Model to simulate slump collapse ? -

Thank you