TSUNAMI PROPAGATION AND INUNDATION MODELINGS ALONG THE SOUTH-EAST COAST OF PAPUA NEW GUINEA

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1. Fault parameters of Tsunami Sources

Table1. Fault parameters for earthquake scenarios.

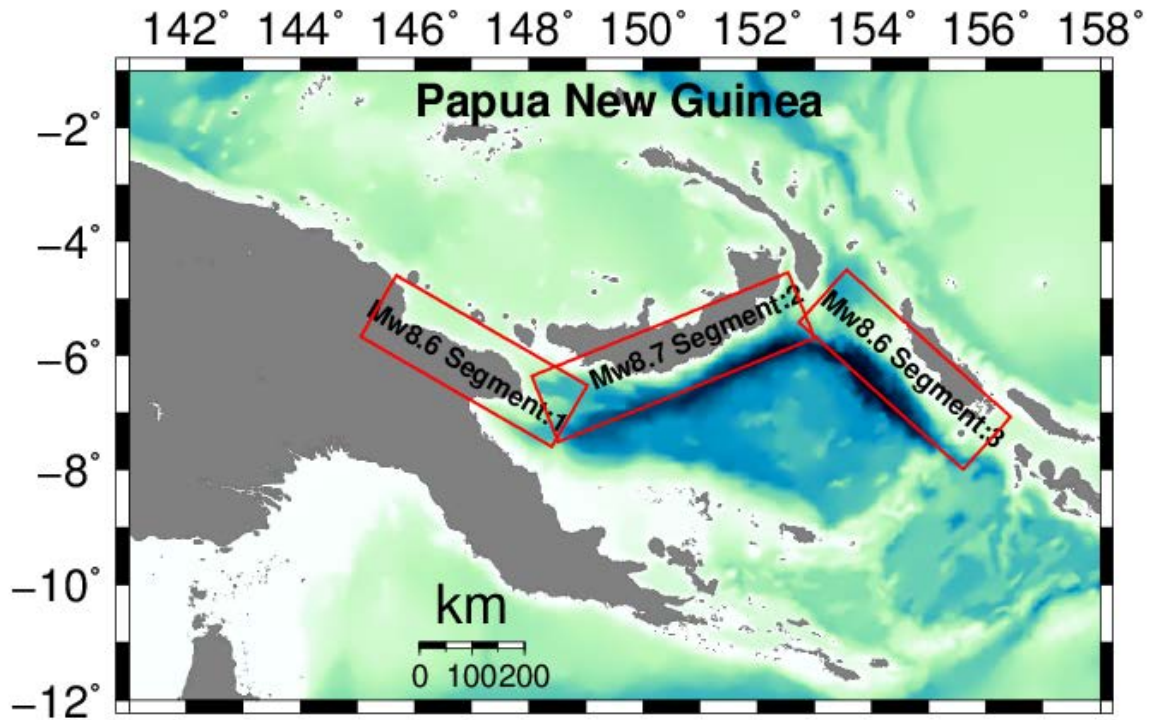| Scenario	Mw	Fault Location		Length, L (km)	Width, W (km)	Strike, θ (deg.)	Dip, δ (deg.)	Rake, λ (deg.)	Slip, u (m)
		Lon. (E)	Lat. (S)						
1	8.6	148.4	-7.6	426	146	300	20	90	3.6
2	8.7	153.0	-5.7	536	146	248	20	90	4.0
3	8.6	155.6	-8.0	426	146	312	20	90	3.6
A	8.1	149.0	-7.3	169	117	283	20	90	2.0
B	8.1	150.6	-6.8	169	117	253	20	90	2.0
C	8.1	152.3	-6.0	169	117	246	20	90	2.0
D	8.1	153.8	-6.2	169	117	290	20	90	2.0
E	8.1	154.9	-7.4	169	117	316	20	90	2.0

Figure 1. Fault segments from mega earthquake scenarios along Ramu-Markham Fault line and New Britain Trench. The earthquake scenarios were Mw8.6 segment_1, Mw8.7 segment_2 and Mw8.6 segment_3.
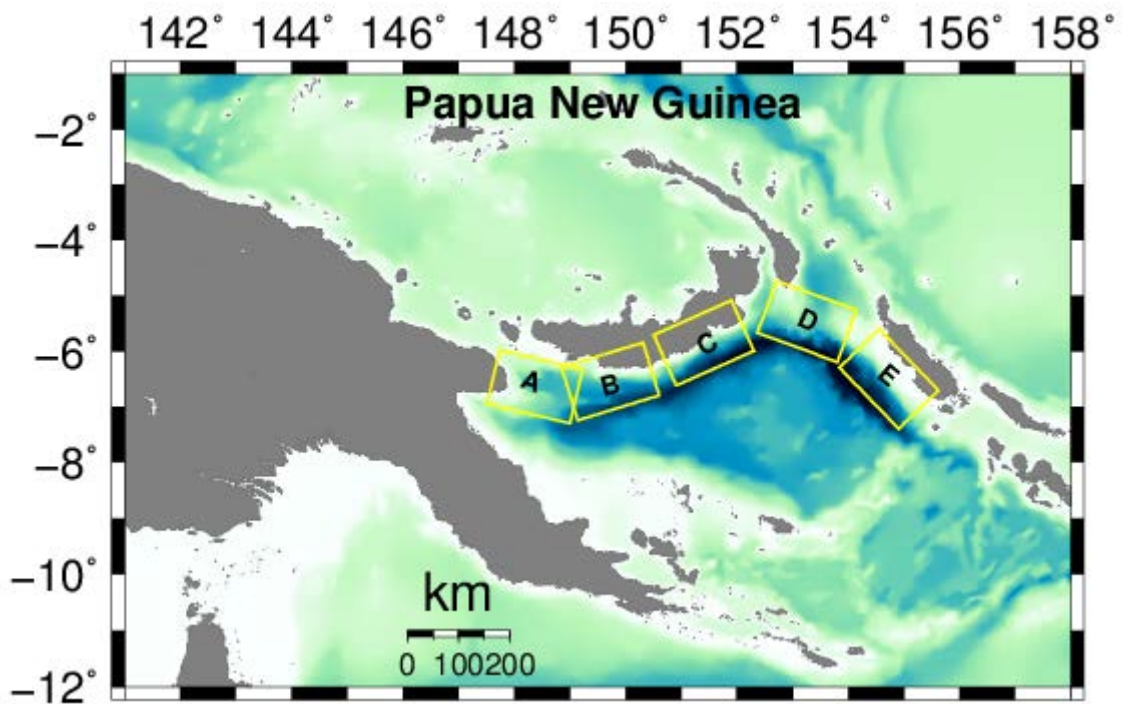

Figure 2. Fault segments for all Mw8.1 earthquake scenarios along Ramu-Markham Fault line and New Britain Trench. The earthquake scenarios were of segment_A, segment_B, segment_C, segment_D and segment_E.
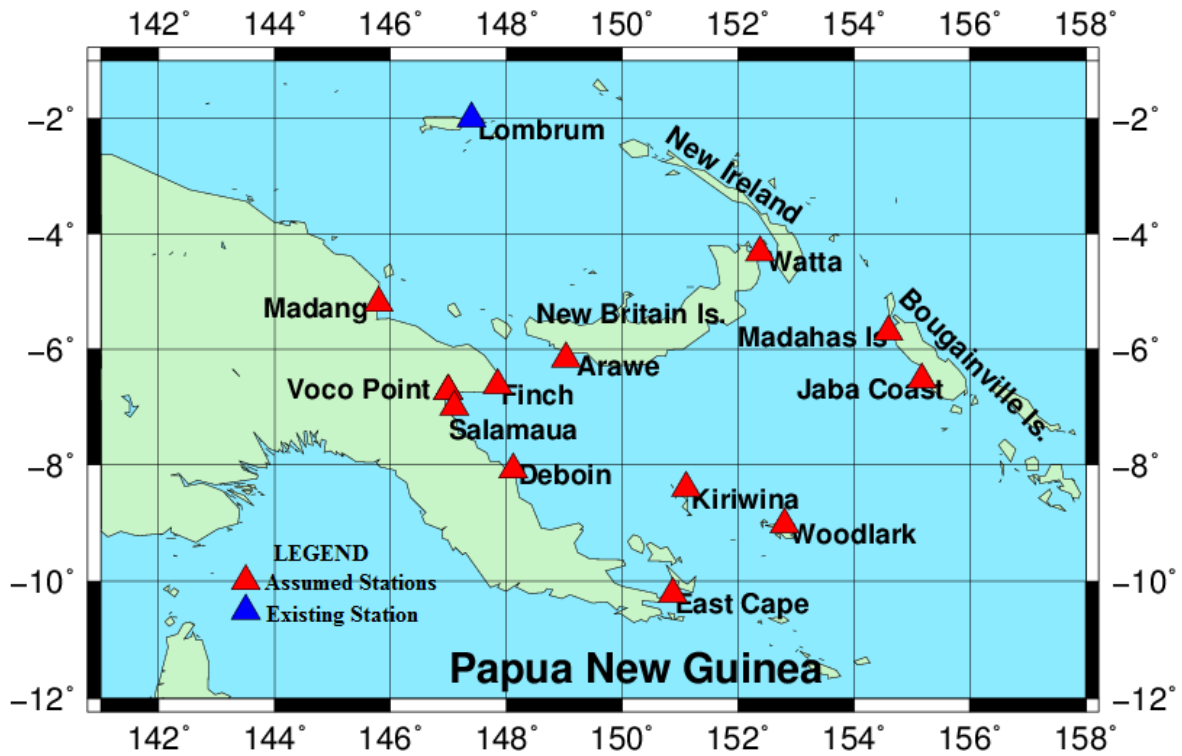
2. Tide Gauge Stations

Figure 3. Locations of assumed and existing tidal gauge stations in the study region.
The origin of the Cartesian coordinate is at the bottom left corner.

Table 2. Geographical coordinates of tidal stations, grid number in x and y coordinates for the assumed tidal gauge station. Existing tidal gauge, Lombrum, was not used in the computation.

Station No.	Local name	Latitude	Longitude	ix*	iy**	Depth (m)
1	Finch	06° 38' 36.98''	147° 51' 30.55''	412	325	11
2	Voco Point	06° 44' 22.14''	147° 00' 33.75''	362	316	14
3	Madang	05° 12' 45.07''	145° 48' 54.59''	289	413	3
4	Salamaua	07° 00' 45.47''	147° 04' 10.56''	364	299	1
5	Deboin Point	08° 05' 00''	148° 07' 00''	428	237	8
6	Woodlark Island	09° 02' 00''	152° 48' 13.07''	709	180	80
7	Kiriwana Island	08° 24' 13.31''	151° 07' 24.99''	605	216	11
8	East Cape	10° 13' 38.57''	150° 52' 30.96.''	591	107	44
9	Jaba Coast	06° 32' 41.82''	155° 10' 38.51''	851	330	18
10	Madahas Island	05° 35' 41.76''	154° 38' 44.86''	818	393	5
11	Watta Point	04° 19' 00''	152° 24' 00''	684	462	150
12	Arawe Point	06° 10' 54.09''	149° 02' 42.27''	484	350	9
13	Lombrum	02° 02' 29.53''	149° 22' 24.18''			

*ix is the grid number x direction, while ** iy is the grid number in y direction. The origin is taken at the bottom left, Figure 8.

3. Results (Tsunami Height)

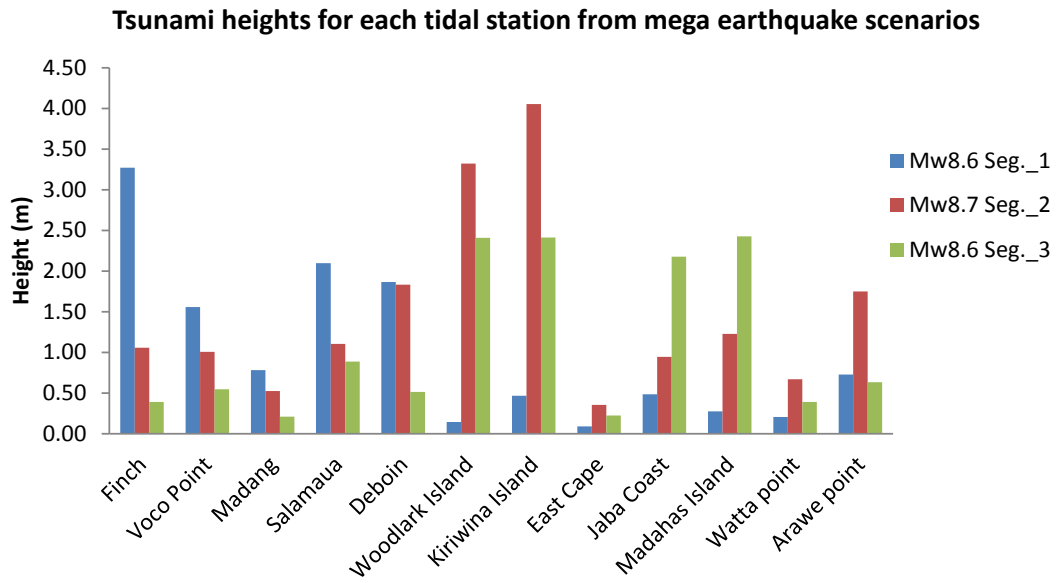**Tsunami heights for each tidal station from mega earthquake scenarios**

Figure 4. Calculated tsunami heights at various assumed tidal gauge stations from earthquake scenarios Mw8.6 segment_1, Mw8.7 segment_2 and Mw8.6 segment_3.
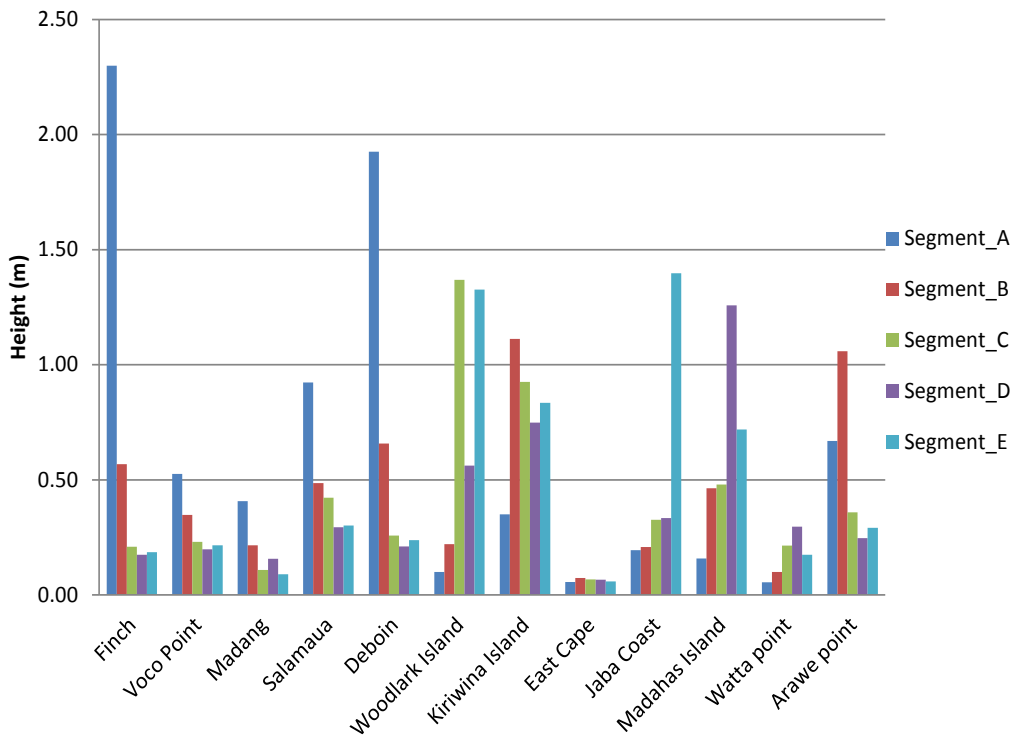

Figure 5. Tsunami heights obtained from calculation of all Mw8.1 earthquake scenarios.

4. Conditions for Computation

Table 3. Computation region and data used for simulation

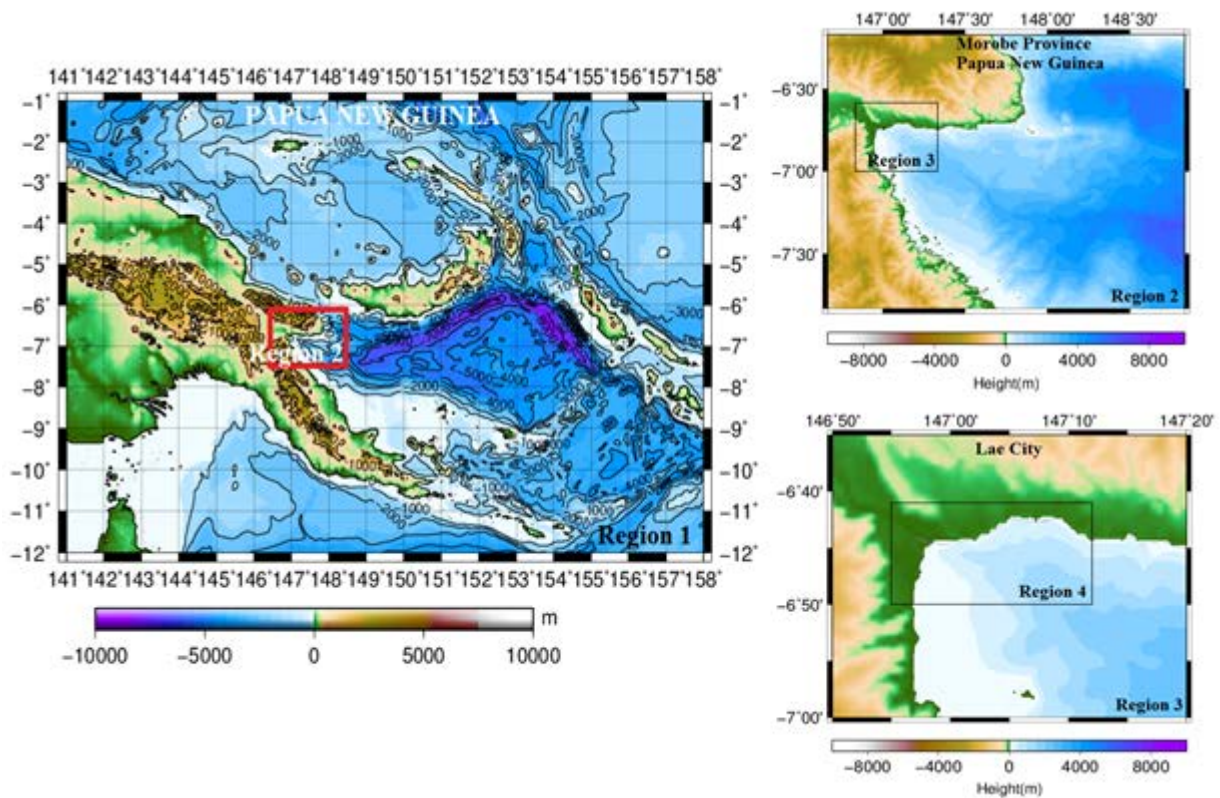| Region	Latitude	Longitude	Bathymetry	Topography	Spatial grid size, Δx	Grid dimension
1	1°S - 12°S	141°E-158°E	GEBCO 30''	GEBCO 30''	1'	1020 x 660
2	6°10'S – 7°50'S	146°40'E – 148°50'E	GEBCO 30''	GEBCO 30''	20''	390 x 300
3	6°35'S – 7°S	146°50'E – 147°:20'E	GEBCO 30''	GEBCO 30''	6.667''	270 x 225
4	6°41'S – 6°50'S	146°55'E – 147°12'E	GEBCO 30''	SRTM 3''	2.222''	459 x 243

Figure 6. Computation domain using nested grids. The target area is designated in figures on the right hand side. The left figure shows the GEBCO 30 arc-second bathymetry of Region 1.
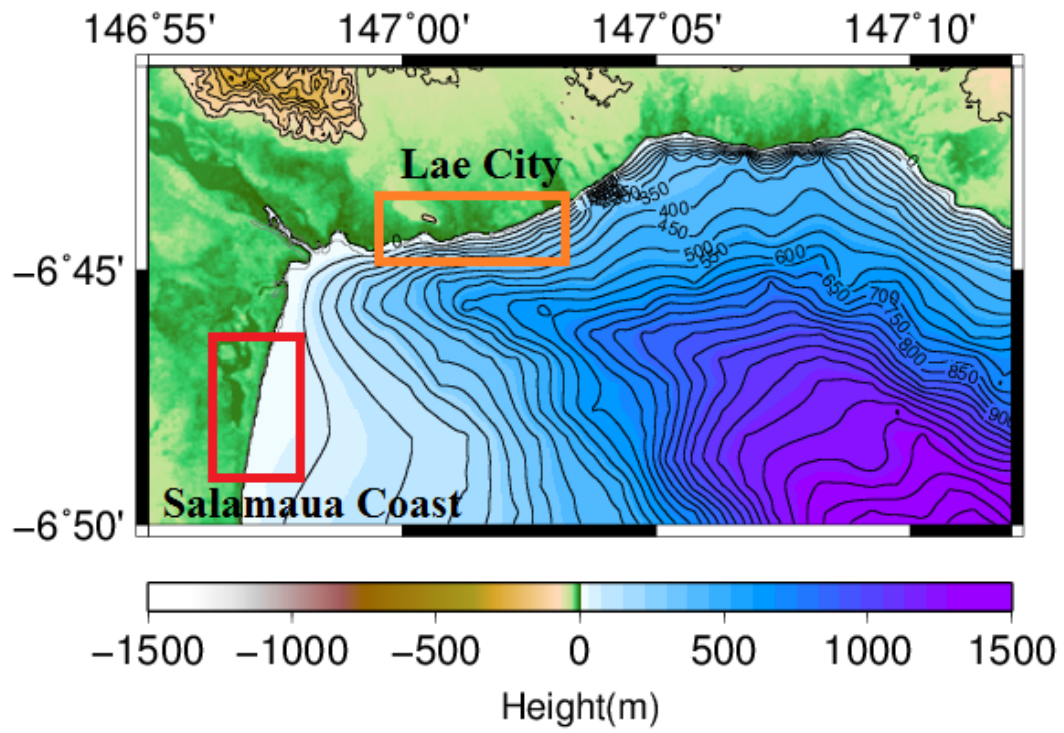
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Figure7. Region 4 and targets areas in nested computation domain. The orange rectangle indicates target area, Lae City, while red rectangle indicates target area, Salamaua coast. Contour lines are of 50 m interval.