STUDY ON TSUNAMI NUMERICAL MODELING FOR MAKING TSUNAMI HAZARD MAPS IN INDONESIA

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1. Fault Parameters of Tsunami Sources

Table 1. Fault parameters used for tsunami wave characteristic (Java case: Yukselme, 2006).

Name	left bottom corner		Depth (km)	Fault Length (m)	Fault Width (m)	Strike (°)	Dip (°)	Rake (°)	Slip (m)
	Lon (°)	Lat (°)							
Fault 0	102.1	-6.39	10	575440	144540	320	12	110	9.55
Fault 1	100.25	-4.25	10	575440	144540	320	12	110	9.55
Fault 2	98.48	-2.14,	10	575440	144540	320	12	110	9.55
Fault 3	96.71	-0.03	10	575440	144540	310	12	110	9.55
Fault 4	100.00	-1.00	10	300000	79000	320	12	110	9.55
Fault 0	102.1	-6.39	10	305500	101160	320	12	110	4.57
Fault 1	100.25	-4.25	10	305500	101160	320	12	110	4.57
Fault 2	98.48	-2.14,	10	305500	101160	320	12	110	4.57
Fault 3	96.71	-0.03	10	305500	101160	310	12	110	4.57
Fault 4	100.00	-1.00	10	300000	79000	320	12	110	6.00
Java case	107.82	-10.285	20	80900	40000	289	10	95	2.50

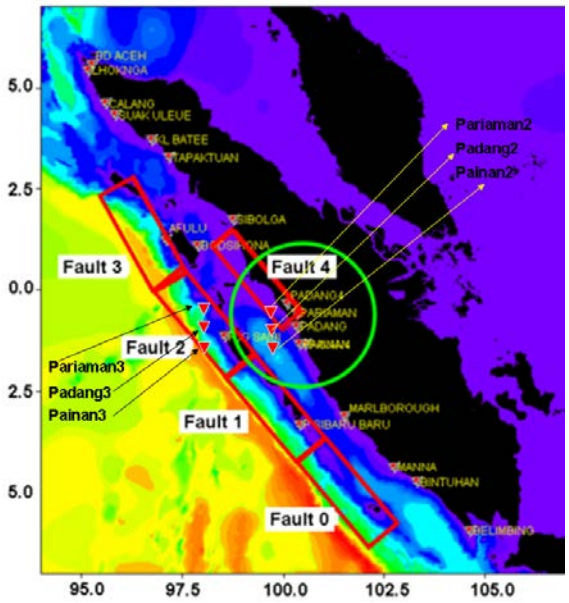


Figure 1. Fault location.

2. Tide Gauge Stations

Table 2. Assumed tide gauge stations in Sumatra.

No.	Station	Location		Depth (m)	No.	Station	Location		Depth (m)
		Lat. (°)	Lon. (°)				Lat. (°)	Lon. (°)	
1	Padang	-0.917	100.333	7	13	Pariaman	-0.630	100.115	9
2	Painan	-1.350	100.550	2	14	Marlborough	-3.150	101.533	3
3	Pjg Saibi	-1.167	98.550	37	15	Calang	4.600	95.600	30
4	Lhok Nga	5.433	95.183	15	16	Bd. Aceh	5.567	95.283	1
5	Kl. Btee	3.717	96.750	17	17	Sibolga	1.733	98.767	1
6	Suak Uleue	4.317	95.850	22	18	Tapaktuan	3.267	97.183	31
7	Afulu	1.233	97.100	1	19	Padang2	-0.917	99.533	1559
8	Bodsihona	1.083	97.883	8	20	Padang3	-0.917	97.533	5334
9	P. Sibarubaru	-3.350	100.417	19	21	Pariaman2	-0.630	99.533	850
10	Manna	-4.400	102.750	20	22	Pariaman3	-0.630	97.533	4996
11	Belimbing	-5.967	104.617	19	23	Painan2	-1.350	99.533	1619
12	Bintuhan	-4.767	103.300	9	24	Painan3	-1.350	97.533	5454

Table 3. Assumed tide gauge stations in Java.

No.	Station	Location		Depth (m)	No.	Station	Location		Depth (m)
		Lat. (°)	Lon. (°)				Lat. (°)	Lon. (°)	
1	BKR	-7.774	108.501	5	8	APL	-7.700	109.164	3
2	CKB	-7.689	108.562	1	9	TBY	-7.781	109.416	12
3	PDN	-7.699	108.624	4	10	CLC	-7.745	109.024	1
4	NK 1	-7.714	108.783	1	11	ADK	-7.797	109.668	2
5	NK 2	-7.674	108.835	4	12	DPK	-7.824	109.777	2
6	NK 3	-7.755	108.893	7	13	MCG	-8.038	109.336	3
7	NK 4	-7..780	108.996	2					

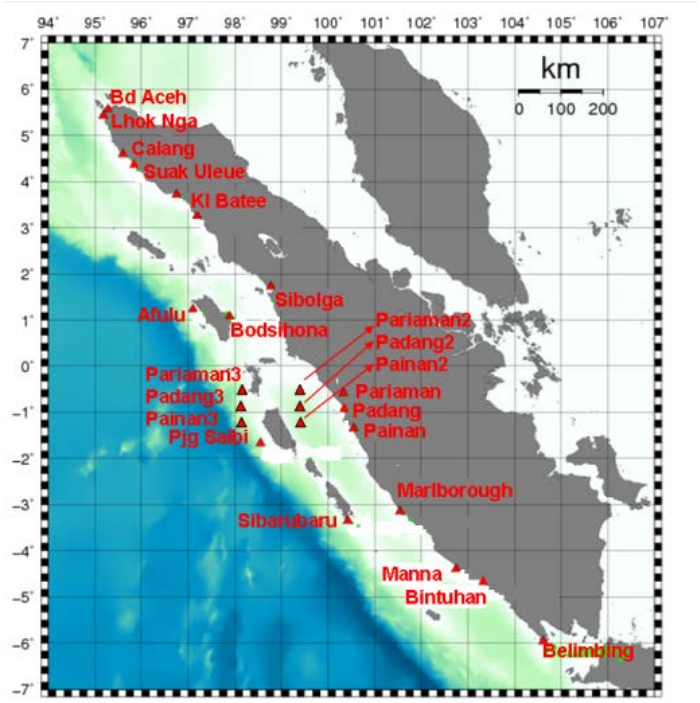


Figure 2. Location of assumed tide gauge stations (Sumatra).

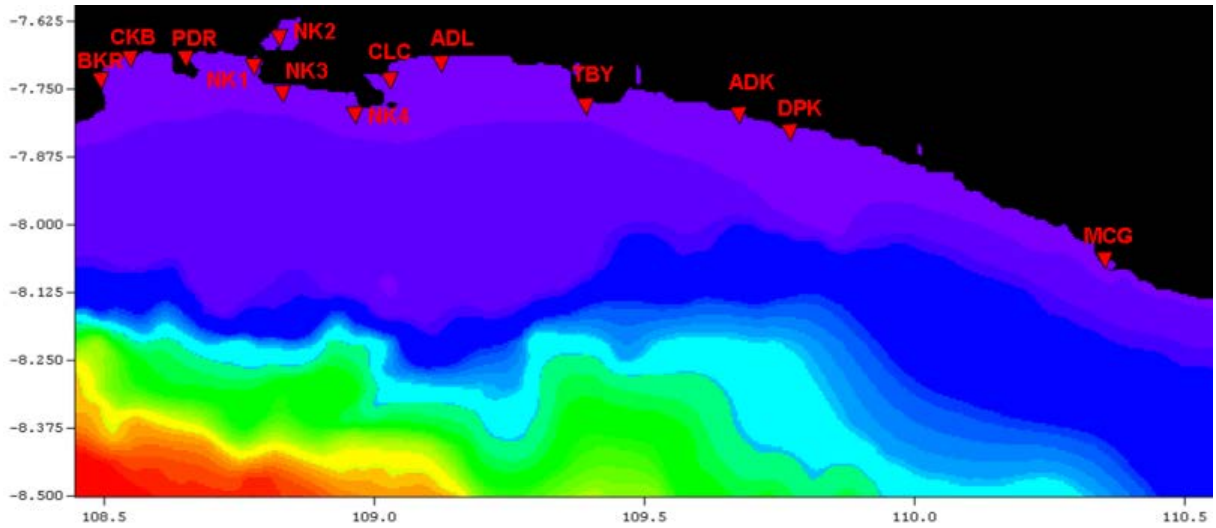
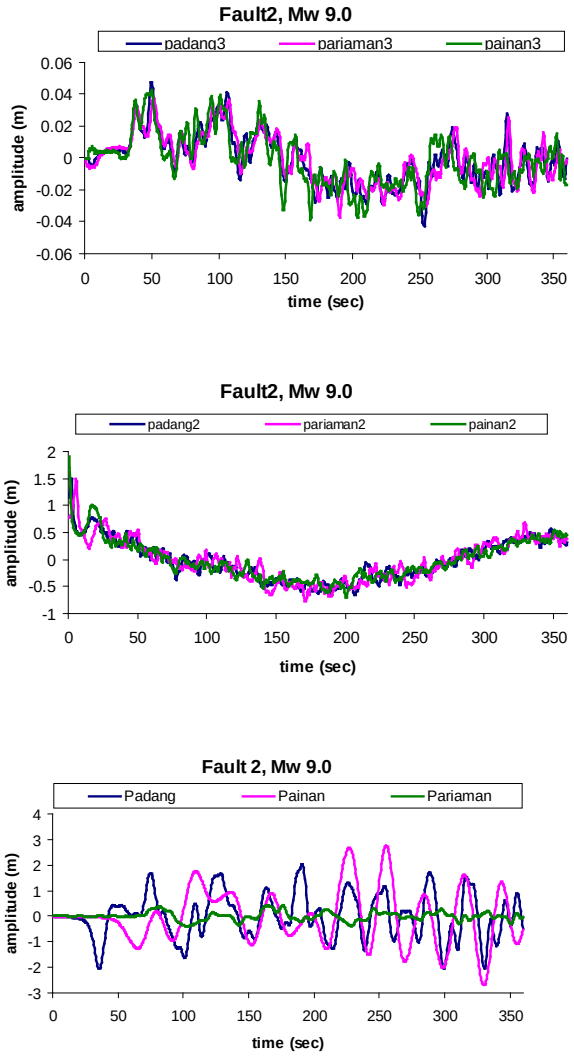
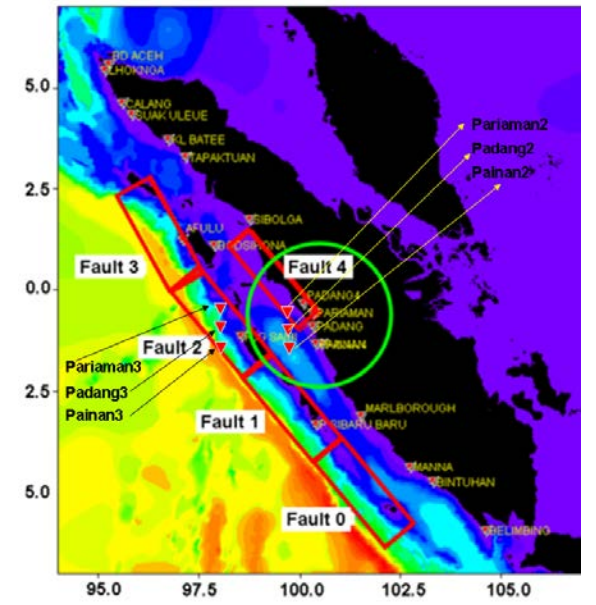


Figure 3. Location of assumed tide gauge stations (Java).

3. Results (Tsunami Height)





Tide Gauge	Depth (m)
Padang2	1559
Padang3	5334
Pariaman2	850
Pariaman3	4996
Painan2	1619
Painan3	5454
Padang	7
Pariaman	2
Painan	9

Figure 4. Left: different tsunami wave form that caused by variation of water depth, upper right: TG station and fault location.

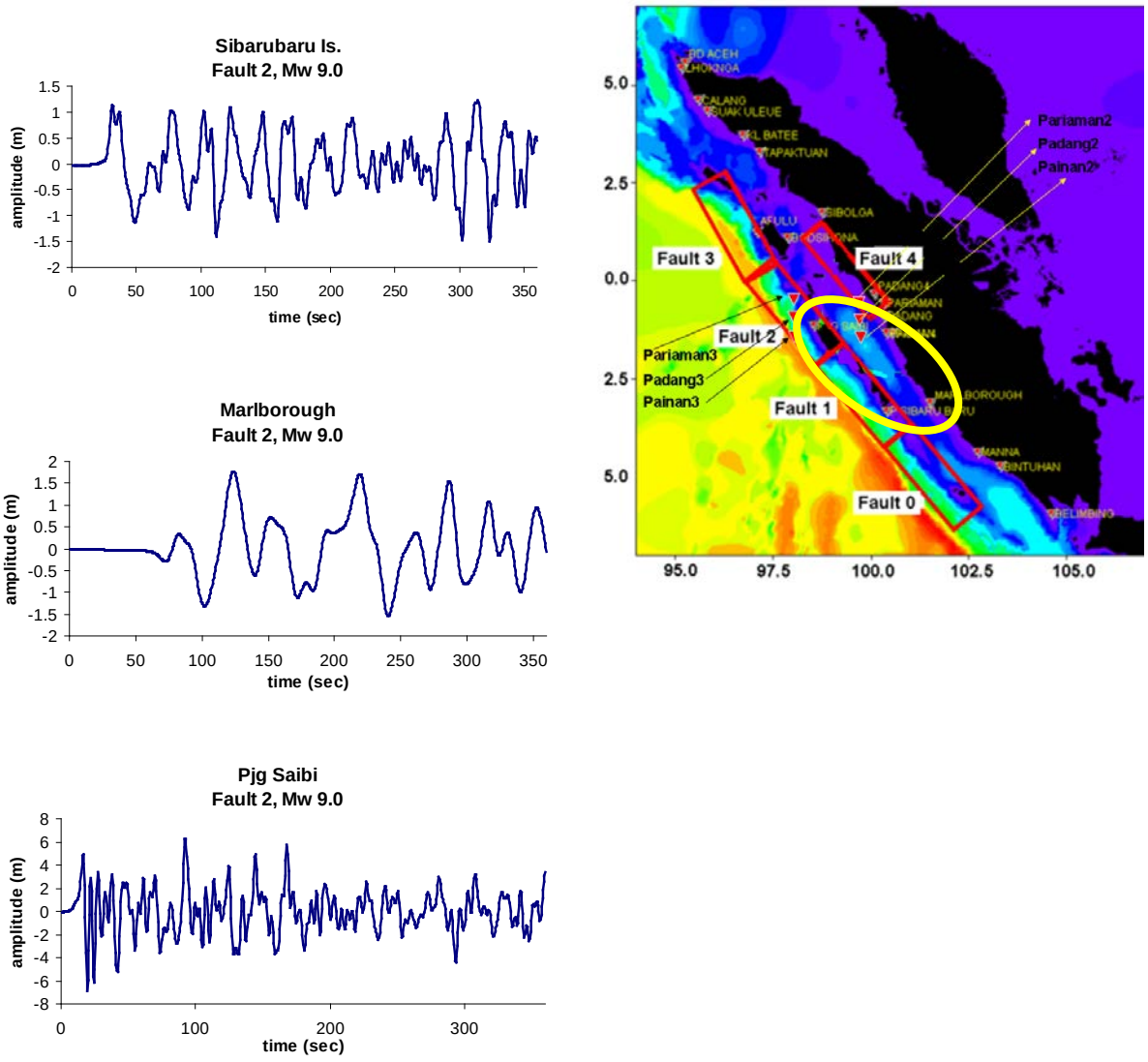


Figure 5. Left: wave form recorded at Sibarubaru Island, Marlborough and Panjang Saibi (yellow circle) show different waveform, affected by seafloor morphology. Right: location of tide gauge station and fault.

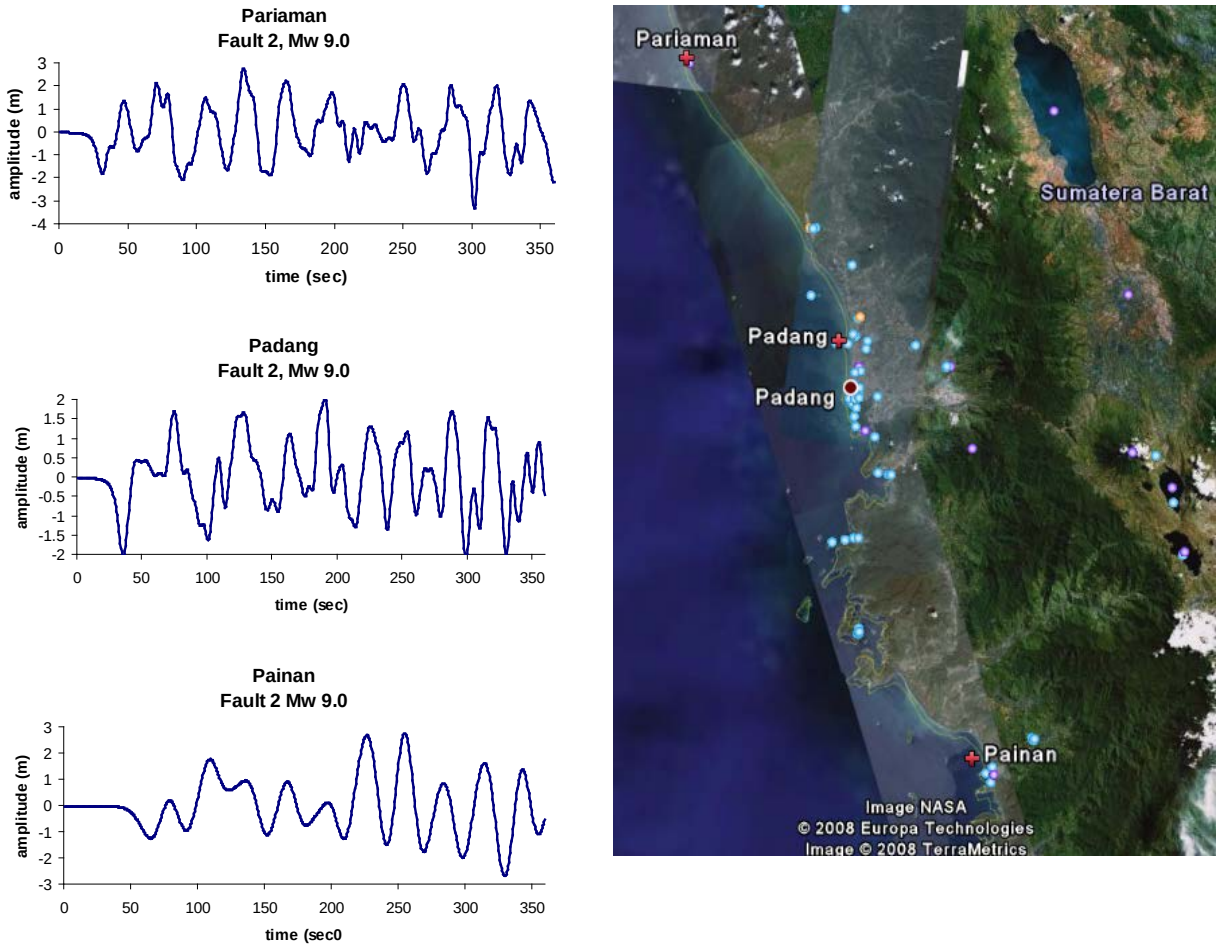


Figure 6. Left: tsunami waveforms recorded in Padang, Pariaman and Painan TG Station. Upper right: shoreline of Padang, Pariaman and Painan TG stations. Lower right: maximum tsunami height.

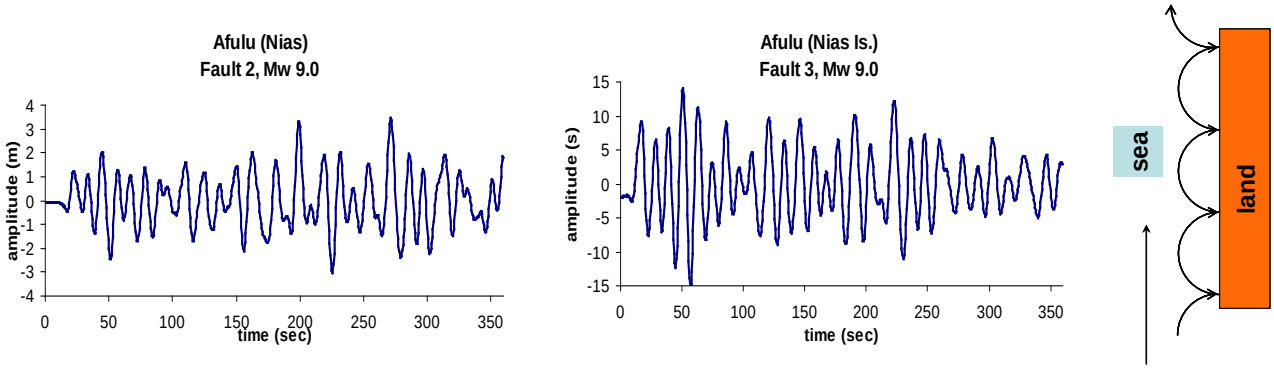


Figure 7**.** Left and center: waveform recording in Afulu TG station. Right: how tsunami wave propagates to Afulu.

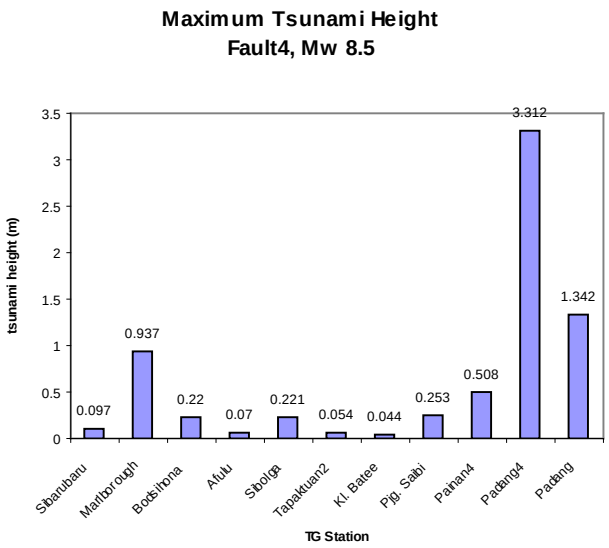


Figure 8. Maximum tsunami height at 11 TG stations.

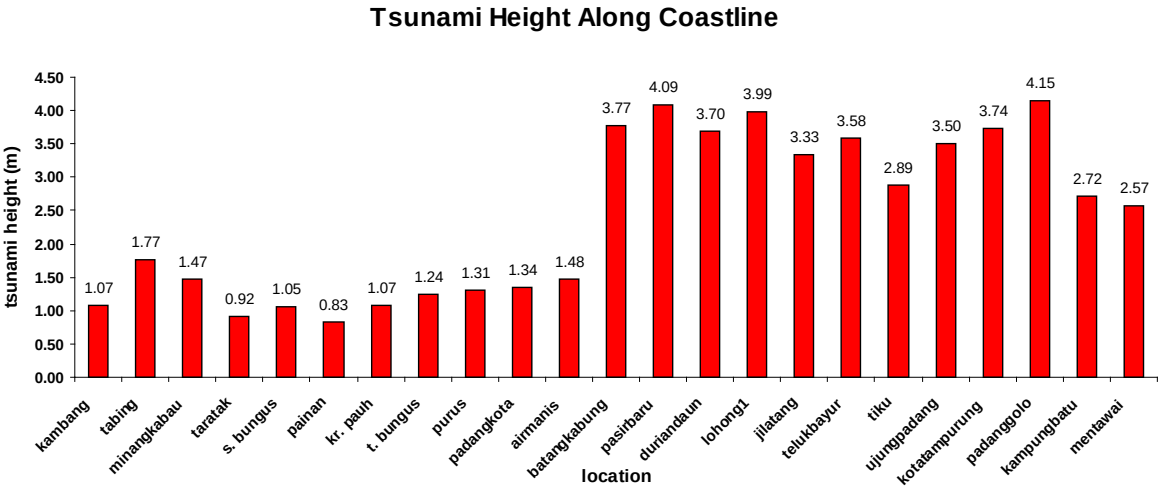


Figure 9. Maximum tsunami height inland at several locations.

4. Conditions for Computation

Tabe 4. Bathymetry data used for simulation.

Bathymetry data	1 arc-minute GEBCO