

TSUNAMI SIMULATION AND HAZARD ASSESSMENT ON THE BANGLADESH COAST

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1. Fault Parameters of Tsunami Sources

Table 1. Tsunami source parameters for Sumatra earthquake (M_w 9.1)
(From Fujii and Satake, 2007).

Subfault	Length (km)	Width (km)	Depth (km)	Strike (°)	Dip (°)	Rake (°)	Longitude (°)	Latitude (°)	Slip (m)
1	100	100	3	315	10	95	95.60	1.75	0.0
2	100	100	20	315	10	95	96.23	2.38	4.3
3	100	100	3	315	10	95	94.90	2.40	24.6
4	100	100	20	315	10	95	95.60	3.00	0.0
5	100	100	3	325	10	100	94.10	3.20	24.6
6	100	100	20	325	10	100	94.83	3.71	12.3
7	100	100	3	330	10	105	93.50	4.00	12.8
8	100	100	20	330	10	105	94.27	4.44	1.8
9	100	100	3	340	10	105	93.00	4.90	1.9
10	100	100	20	340	10	105	93.80	5.30	4.5
11	100	100	3	342	10	100	92.68	5.82	6.0
12	100	100	20	342	10	100	93.50	6.15	3.2
13	100	100	3	340	10	95	92.38	6.72	6.5
14	100	100	20	340	10	95	93.22	7.02	0.0
15	100	100	3	337	10	85	92.08	7.64	7.1
16	100	100	20	337	10	85	92.90	8.00	3.5
17	100	100	3	350	10	99	91.64	8.60	3.2
18	100	100	3	0	10	106	91.51	9.60	2.7
19	100	100	3	10	10	115	91.48	10.66	0.0
20	100	100	3	10	10	115	91.63	11.56	0.0
21	100	100	3	15	10	120	91.78	12.51	0.0
22	100	100	3	25	10	130	92.01	13.51	1.0

Table 2. Tsunami source parameters for scenario earthquake (M_w 8.0).

Case No.	Length (km)	Width (km)	Depth (km)	Strike (°)	Dip (°)	Rake (°)	Longitude (°)	Latitude (°)	Slip (m)
Case1	120.22	60.11	3	30	10	160	92.100	13.000	3.48
Case2	120.22	60.11	3	36	10	166	92.664	13.941	3.48
Case3	120.22	60.11	3	37	10	167	93.328	14.820	3.48
Case4	120.22	60.11	3	5	10	154	94.007	15.688	3.48
Case5	120.22	60.11	3	330	10	120	94.105	16.770	3.48
Case6	120.22	60.11	3	330	10	120	93.539	17.710	3.48
Case7	120.22	60.11	3	330	10	120	92.973	18.650	3.48
Case8	120.22	60.11	3	328	10	118	92.407	19.590	3.48
Case9	120.22	60.11	3	348	10	130	91.808	20.511	3.48
Case10	120.22	60.11	3	345	10	127	91.572	21.573	3.48

Table 3. Tsunami source parameters for scenario earthquake (M_w 8.5).

Case No.	Length (km)	Width (km)	Depth (km)	Strike (°)	Dip (°)	Rake (°)	Longitude (°)	Latitude (°)	Slip (m)
Case01	213.79	106.89	3	32	10	160	92.100	13.000	6.19
Case02	213.79	106.89	3	32	10	160	93.164	14.639	6.19
Case03	213.79	106.89	3	335	10	120	94.228	16.278	6.19
Case04	213.79	106.89	3	330	10	115	93.377	18.028	6.19
Case05	213.79	106.89	3	337	10	125	92.371	19.700	6.19
Case06	213.79	106.89	3	345	10	127	91.584	21.478	6.19

NB: Latitudes, Longitudes and Depths indicate the left bottom corner of each subfault or fault of scenario cases.

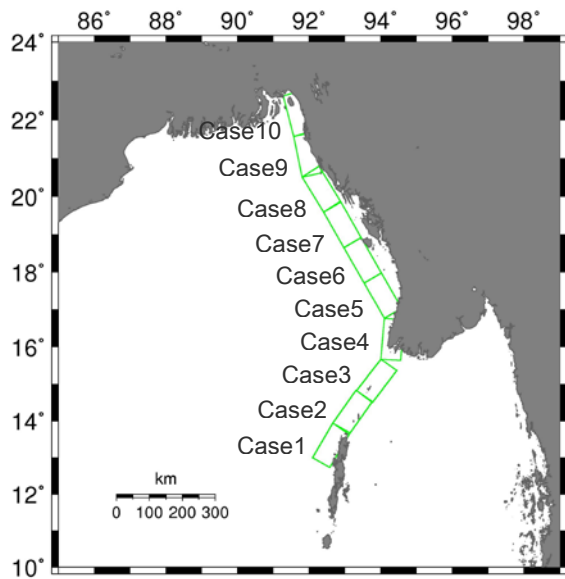


Figure 1. Tsunami source model(Mw8.0)

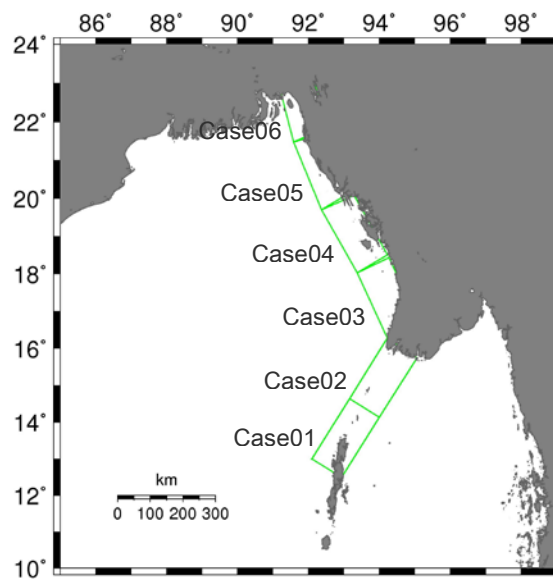


Figure 2. Tsunami source model (Mw8.5)

2. Tide Gage Stations

Table 4. Tidal gage stations on the Bangladesh coast.

Station	Latitude (North)			Longitude (East)			Depth (m)	Owner	Source
	deg	min	degree	deg	min	degree			
TG01	21	39	21.65	89	16	89.27	1.0	Assumed	
TG02	21	48	21.80	89	19	89.32	1.0	Assumed	
TG03	21	43	21.72	89	25	89.42	1.0	Assumed	
Hiron Point	21	48	21.80	89	29	89.48	5.0	BIWTA*	Mondal (...)
TG05	21	54	21.90	89	29	89.48	3.0	Assumed	
TG06	21	45	21.75	89	38	89.63	1.0	Assumed	
TG07	21	50	21.83	89	48	89.80	1.0	Assumed	
TG08	22	1	22.02	89	55	89.92	1.0	Assumed	
TG09	22	0	22.00	90	0	90.00	1.0	Assumed	
TG10	21	51	21.85	90	4	90.07	1.0	Assumed	
TG11(Kuakata)	21	48	21.80	90	11	90.18	1.0	Assumed	
Khepupara	21	54	21.90	90	17	90.28	1.0	BIWTA*	Mondal (...)
TG13	21	50	21.83	90	21	90.35	1.0	Assumed	
TG14	21	56	21.93	90	28	90.47	1.0	Assumed	
TG15	21	53	21.88	90	33	90.55	1.0	Assumed	
TG16	22	5	22.08	90	47	90.78	1.0	Assumed	
TG17	22	14	22.23	90	51	90.85	3.0	Assumed	

Char Changa	22	8	22.13	91	7	91.12	1.0	BIWTA*	Mondal (....)
TG19	22	17	22.28	91	11	91.18	1.0	Assumed	
TG20(Kumira)	22	30	22.50	91	42	91.70	1.0	Assumed	
TG21	22	40	22.67	90	52	90.87	1.0	Assumed	
TG22	22	34	22.57	90	47	90.78	1.0	Assumed	
TG23	22	34	22.57	91	16	91.27	1.0	Assumed	
TG24(Bhatiari)	22	25	22.42	91	44	91.73	1.0	Assumed	
TG25	22	44	22.73	91	22	91.37	1.0	Assumed	
Sandwip	22	29	22.48	91	24	91.40	1.0	BIWTA*	Mondal (....)
TG27	22	41	22.68	91	32	91.53	1.0	Assumed	
TG28	22	22	22.37	91	33	91.55	1.0	Assumed	
TG29	22	14	22.23	91	47	91.78	1.0	Assumed	
TG30	22	2	22.03	91	52	91.87	1.0	Assumed	
TG31	21	50	21.83	91	50	91.83	1.0	Assumed	
TG32	21	43	21.72	91	52	91.87	1.0	Assumed	
Cox's Bazar	21	25	21.42	91	58	91.97	1.0	BIWTA*	Mondal (....)
TG34	21	10	21.17	92	3	92.05	1.0	Assumed	
TG35	21	3	21.05	92	9	92.15	1.0	Assumed	
TG36	20	55	20.92	92	13	92.22	1.0	Assumed	
TG37	20	46	20.77	92	18	92.30	1.0	Assumed	
Shahpuri Island	20	48	20.80	92	20	92.33	1.0	BIWTA*	Mondal (....)
TG39	20	35	20.58	92	20	92.33	2.0	Assumed	

* Considered very minor correction in latitude or longitude due to bathymetry grid resolution during preparation of location data using GMT.

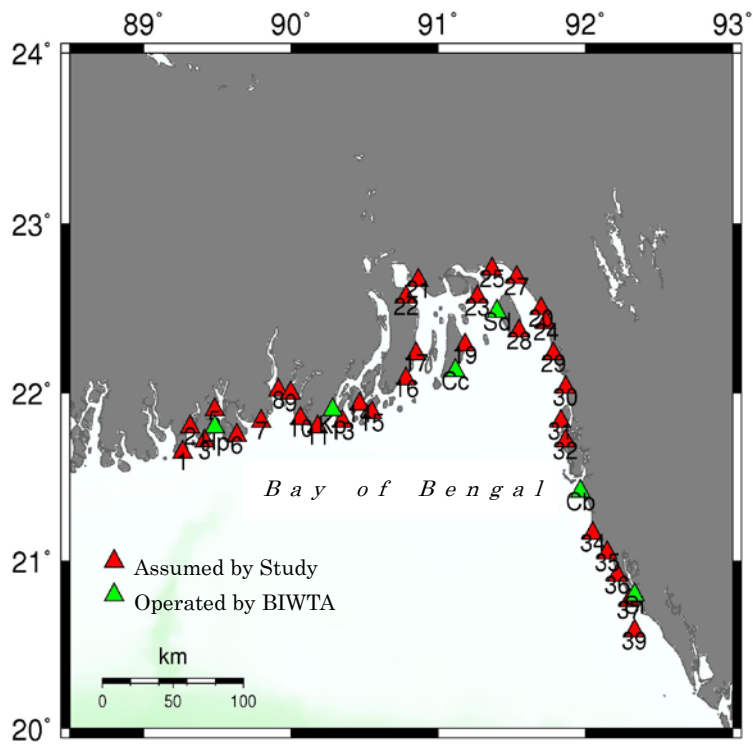


Figure 3. Tide Gauge stations as outpoints at Bangladesh coast (Assumed-33 and Operated by BIWTA-06).

3. Results (Tsunami Height)

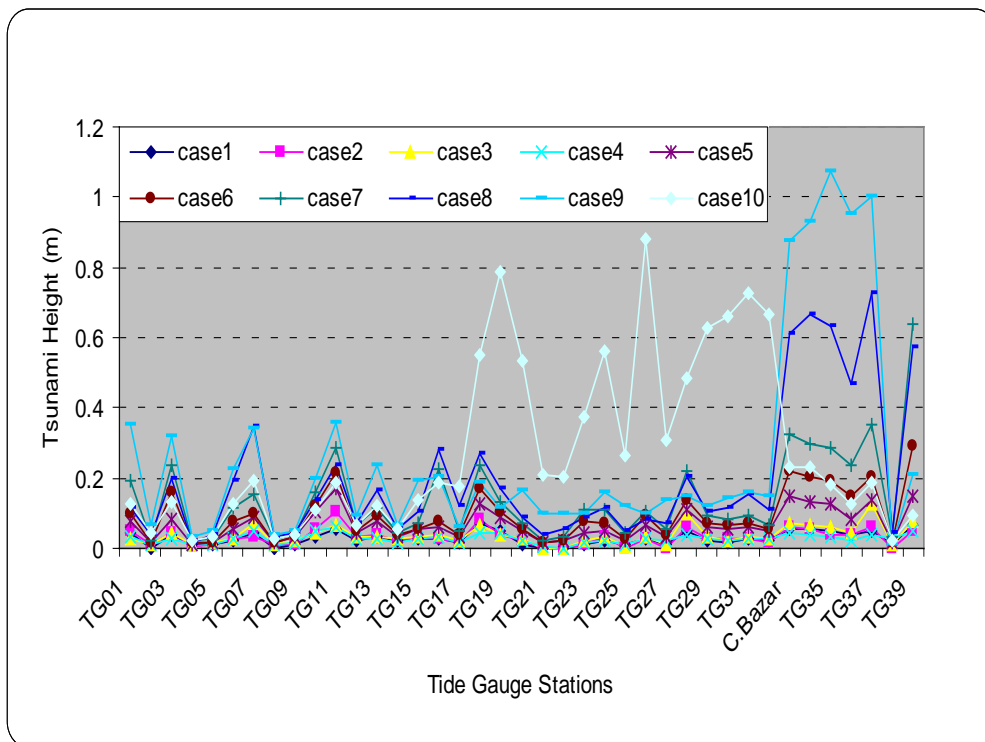


Figure 4. Maximum Tsunami Heights at 39 Outpoints for 10 cases of Scenario Earthquake (Mw 8.0).

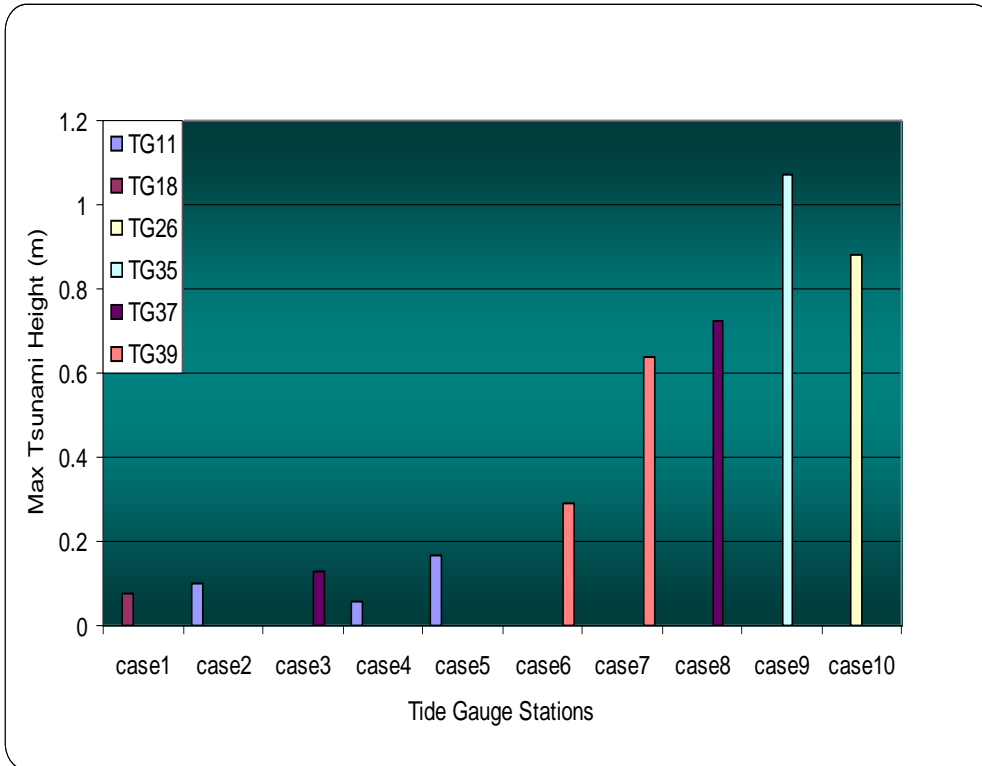


Figure 5. Maximum Tsunami Heights for 10 cases of Scenario Earthquake (Mw 8.0).

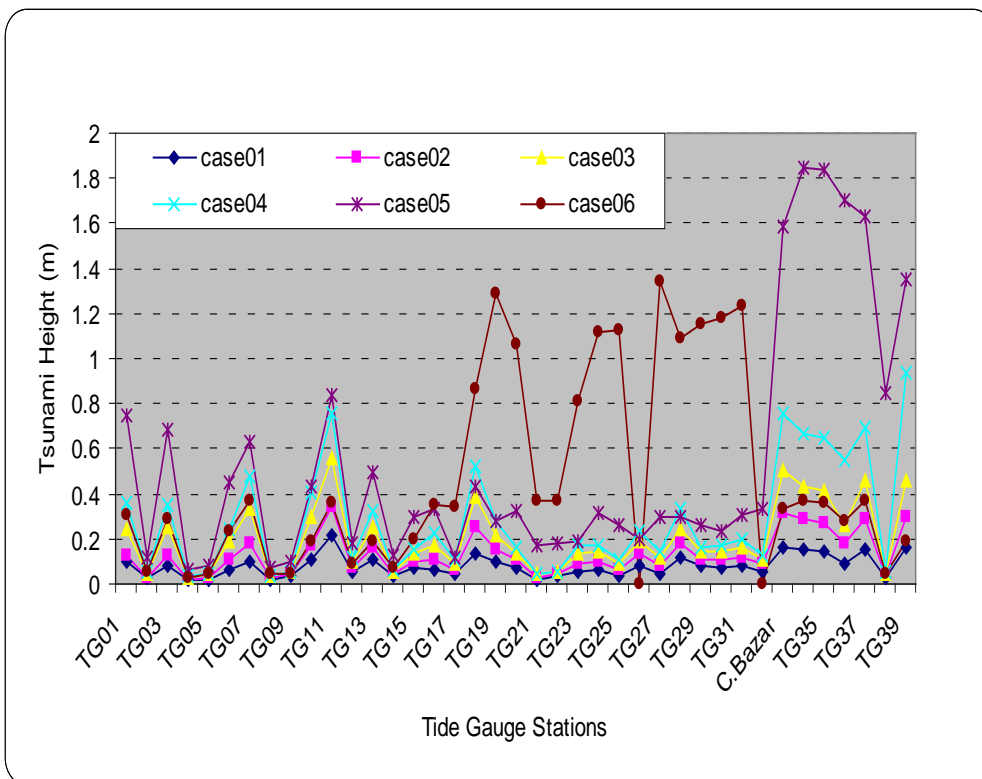


Figure 6. Maximum Tsunami Heights at 39 Outpoints for 6 cases of Scenario Earthquake (Mw 8.5).

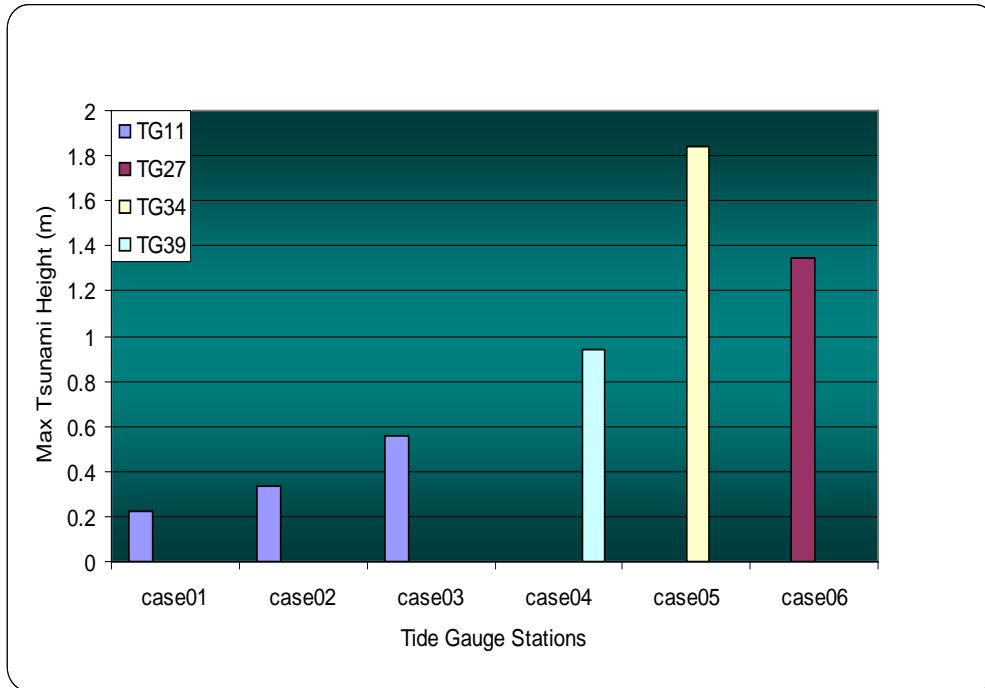


Figure 7. Maximum Tsunami Heights for 6 cases of Scenario Earthquake (Mw 8.5).

4. Conditions for Computation

Table 5. Region for computation and data used for simulation.

Area	85° E- 99 °E / 10° N-24° N (82° E- 100 °E / 0° N-24° N for Sumatra case)
Bathymetry data	1 arc-minute GEBCO
Δt	0.5s