

**UPDATING NUMERICAL SIMULATIONS FOR TSUNAMI FORECASTING DATABASE
CONSIDERING SOURCES ALONG THE MANILA TRENCH**

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1. Fault Parameters of Tsunami Sources

Table 1. Fault parameters with strike angle of 350° and dip angle of 22°.

M_w	DCF (km)	Depth of TLC (km)	Slip (cm)	Length (km)	Width (km)	Strike (deg)	Rake (deg)
7.5	0	0.000 *	223.9	70.8	35.4	350	90
7.5	10	3.369	223.9	70.8	35.4	350	90
7.5	20	13.37	223.9	70.8	35.4	350	90
7.5	30	23.37	223.9	70.8	35.4	350	90
8.0	0	0.000 *	398.1	125.9	62.9	350	90
8.0	10	0.000 *	398.1	125.9	62.9	350	90
8.0	20	8.219	398.1	125.9	62.9	350	90
8.0	30	18.219	398.1	125.9	62.9	350	90
8.5	0	0.000 *	708.0	223.9	111.9	350	90
8.5	10	0.000 *	708.0	223.9	111.9	350	90
8.5	20	0.000 *	708.0	223.9	111.9	350	90
8.5	30	9.041	708.0	223.9	111.9	350	90

Remark: * Depth of TLC had negative value and was forced to zero

Table 2. Fault parameters with strike angle of 300° and dip angle of 22°.

M_w	DCF (km)	Depth of TLC (km)	Slip (cm)	Length (km)	Width (km)	Strike (deg)	Rake (deg)
7.5	0	0.000 *	223.9	70.8	35.4	300	90
7.5	10	3.369	223.9	70.8	35.4	300	90
7.5	20	13.37	223.9	70.8	35.4	300	90
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8.5	30	9.041	708.0	223.9	111.9	300	90

Remark: * Depth of TLC had negative value and was forced to zero

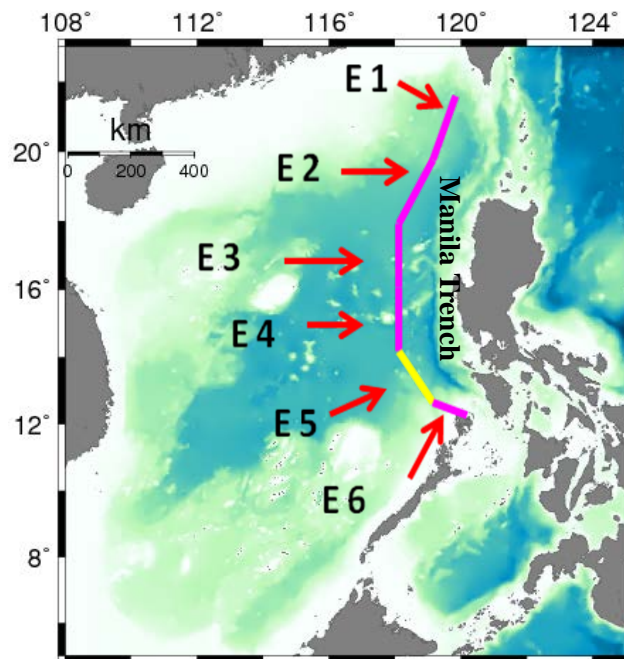


Figure 1. Suggested fault plane segments along the Manila Trench (Kirby et al., 2006).

Table 3. List of fault parameters suggested by Kirby et al. (2006).
 Segment E5 is chosen as the location of source point in this study.

Fault	E5
Longitude center of fault (deg)	119.6
Latitude center of fault (deg)	13.7
Length (km)	140
Width (km)	35
Strike (deg)	320
Dip (deg)	22
Rake (deg)	90
Slip(m)	7.63
Magnitude (Mw)	8.0

2. Source Points, Buoy Points and Forecast and Coastal Points

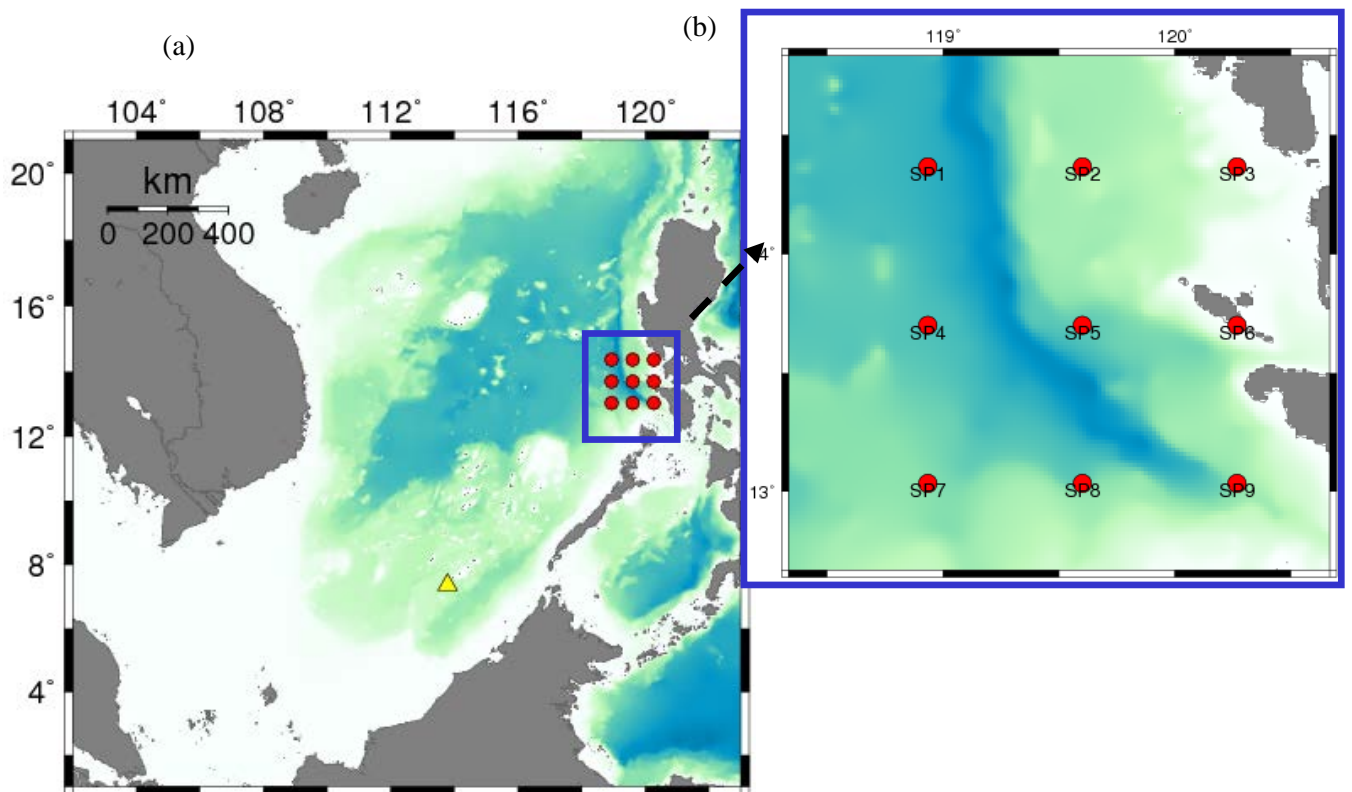


Figure 2. (a) Locations of 9 source points (red circles) with 1 buoy point (yellow triangle).
 (b) The magnified area of source points with a 40 arc –minutes distance interval to each other.

Table 4. Location of source points for tsunami simulation.

Source Point	Longitude (°E)	Latitude (°S)
1	118.93	14.37
2	119.6	14.37
3	120.27	14.37
4	118.93	13.70
5	119.6	13.70
6	120.27	13.70
7	118.93	13.03
8	119.6	13.03
9	120.27	13.03

3.4 Forecast and coastal points

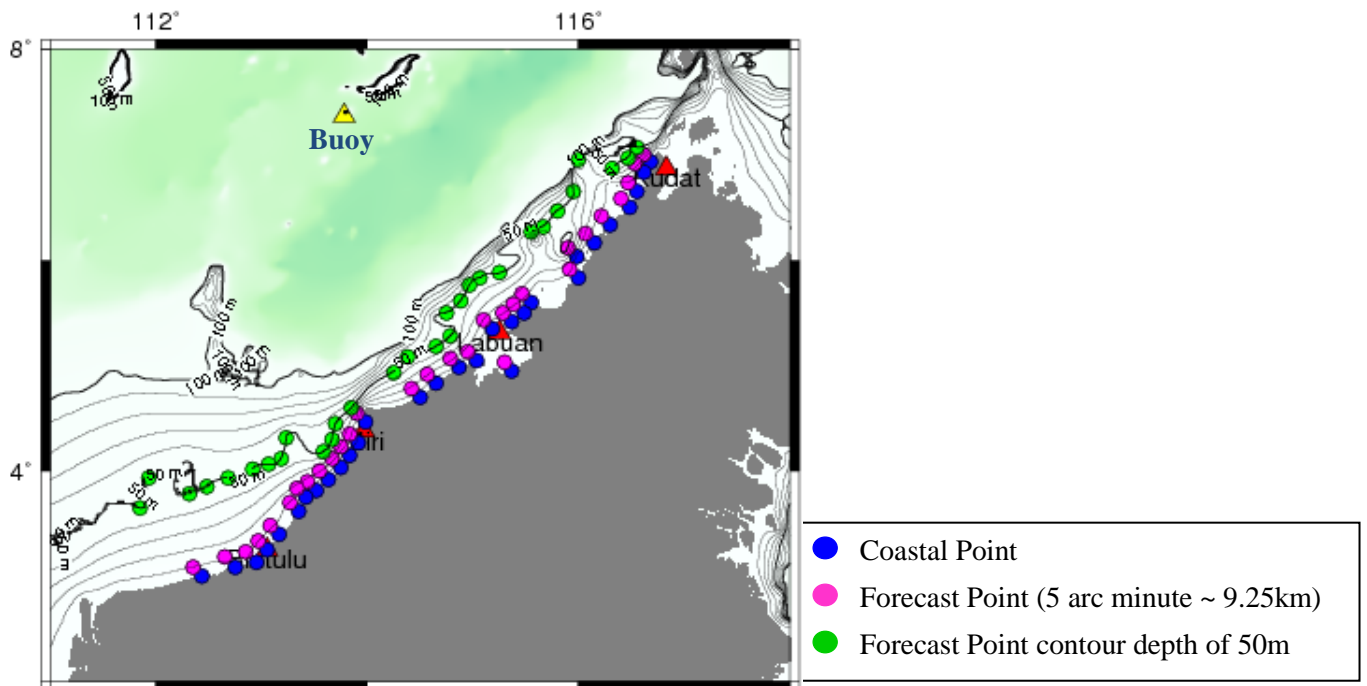


Figure 3. Location of coastal points (blue circles), forecast points with a fixed distance of 5 arc-minute (purple circles) and forecast points along the contour depth of 50 m (green circles).

Table 5. Location of coastal points.

Coastal points	Longitude(°E)	Latitude(°N)
KdtCp1	116.68	6.93
KdtCp2	116.62	6.83
KdtCp3	116.55	6.65
KdtCp4	116.48	6.50
KdtCp5	116.3	6.33
KdtCp6	116.15	6.17
KdtCp7	115.98	6.03
KdtCp8	116.0	5.83
LbnCp1	115.55	5.60
LbnCp2	115.48	5.5
LbnCp3	115.37	5.42
LbnCp4	115.18	5.35
LbnCp5	115.37	4.95
LbnCp6	115.03	5.05
LbnCp7	114.87	4.98
LbnCp8	114.65	4.83
LbnCp9	114.5	4.70
MiriCp1	113.98	4.47
MiriCp2	113.92	4.27
MiriCp3	113.83	4.15
MiriCp4	113.75	4.03
MiriCp5	113.63	3.92
MiriCp6	113.52	3.82
MiriCp7	113.42	3.75
MiriCp8	113.35	3.62
BtlCp1	113.17	3.40
BtlCp2	113.05	3.25
BtlCp3	112.95	3.13
BtlCp4	112.75	3.08
BtlCp5	112.43	3.00

Table 6. Location of forecast points with the fixed distances of 5 arc-minute.

Coastal points	Longitude(°E)	Latitude(°N)
KdtFp1	116.62	7.00
KdtFp2	116.53	6.92
KdtFp3	116.47	6.73
KdtFp4	116.40	6.58
KdtFp5	116.22	6.42
KdtFp6	116.07	6.25
KdtFp7	115.90	6.12
KdtFp8	115.92	5.92
LbnFp1	115.47	5.68
LbnFp2	115.38	5.58
LbnFp3	115.28	5.50
LbnFp4	115.10	5.43
LbnFp5	115.30	5.03
LbnFp6	114.95	5.13
LbnFp7	114.78	5.07
LbnFp8	114.57	4.92
LbnFp9	114.42	4.78
MiriFp1	113.90	4.55
MiriFp2	113.83	4.35
MiriFp3	113.75	4.23
MiriFp4	113.67	4.12
MiriFp5	113.55	4.00
MiriFp6	113.43	3.90
MiriFp7	113.33	3.83
MiriFp8	113.27	3.70
BtlFp1	113.08	3.48
BtlFp2	112.97	3.33
BtlFp3	112.85	3.23
BtlFp4	112.65	3.23
BtlFp5	112.35	3.08

Table 7. Location of forecast points at bathymetry contour depth of 50 m.

Coastal points	Longitude(°E)	Latitude(°N)
Kdt50m-1	116.55	7.07
Kdt50m-2	116.47	6.97
Kdt50m-3	116.32	6.87
Kdt50m-4	116.00	6.95
Kdt50m-5	115.95	6.65
Kdt50m-6	115.80	6.47
Kdt50m-7	115.67	6.32
Kdt50m-8	115.55	6.27
Lbn50m-1	115.25	5.88
Lbn50m-2	115.07	5.83
Lbn50m-3	114.97	5.77
Lbn50m-4	114.88	5.62
Lbn50m-5	114.75	5.50
Lbn50m-6	114.78	5.28
Lbn50m-7	114.65	5.18
Lbn50m-8	114.38	5.08
Lbn50m-9	114.25	4.93
Miri50m-1	113.85	4.60
Miri50m-2	113.70	4.45
Miri50m-3	113.67	4.30
Miri50m-4	113.58	4.18
Miri50m-5	113.23	4.32
Miri50m-6	113.18	4.12
Miri50m-7	113.07	4.07
Miri50m-8	112.92	4.02
Btl50m-1	112.68	3.93
Btl50m-2	112.48	3.85
Btl50m-3	112.32	3.78
Btl50m-4	111.93	3.93
Btl50m-5	111.85	3.65

3. Results (Tsunami Height)

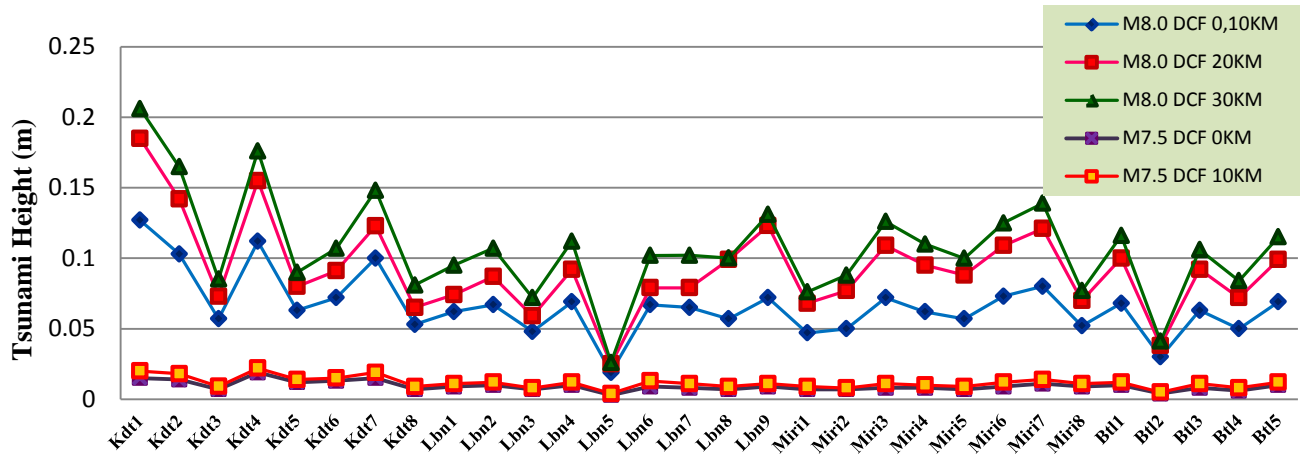


Figure 4. Tsunami heights at coastal point are obtained directly from tsunami simulation with different magnitudes and depths of center of fault (DCF) at source point 4.

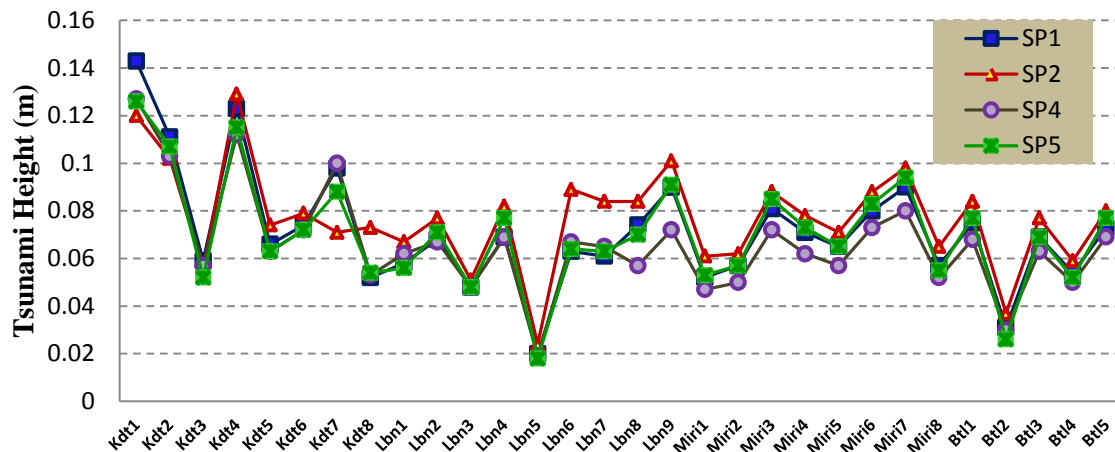


Figure 5. Tsunami heights at the coastal point are obtained directly from tsunami simulation at different sources with M_w 8.0 and depth (DCF) of 0 km.

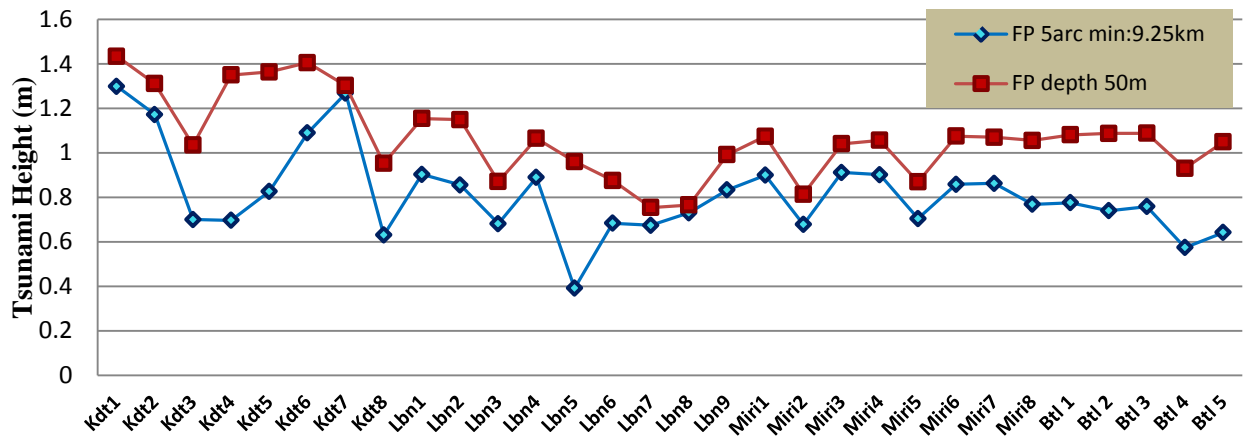


Figure 6. Tsunami heights from the coastal points obtained from Green’s law at source point 4, M_w 8.0, depth (DCF) of 0, 10 km with different types of forecast points.

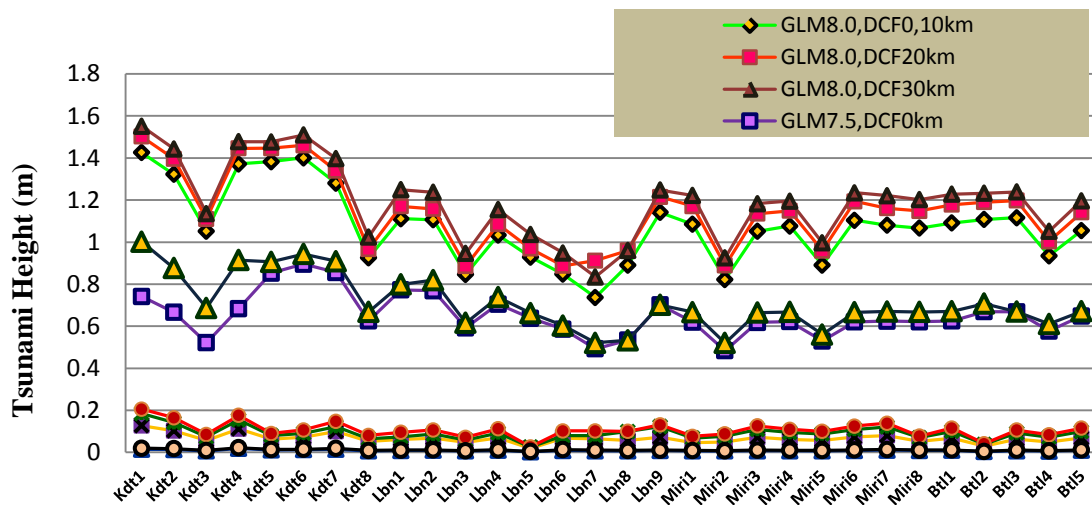


Figure 7. Tsunami heights at coastal point are obtained directly from tsunami simulation (CP) and calculation using Green’s law (GL) by different magnitudes and depths at source point 4.

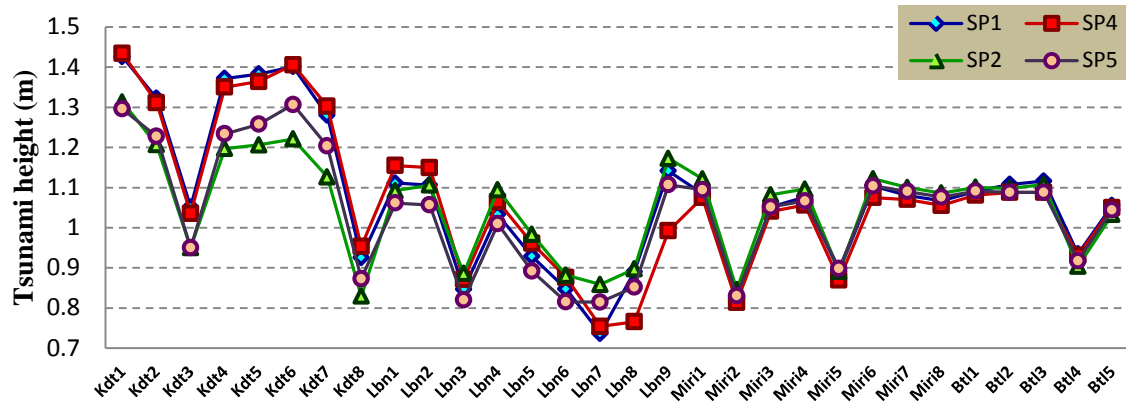


Figure 8. Tsunami heights at coastal points from calculation using Green's law for M_w 8.0 and depth of 0 km at different sources.

4. Conditions for Computation

Table 8. Region for computation and data used for simulation.

Area	102° E-123° E / 1° N- 21 °N (grid points 1260 / 1200)
Bathymetry data	1 arc-minute GEBCO
Δt	3.0s