

New Zealand gauges: Samoa Tsunami 2009

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A magnitude 8.0 earthquake at a depth of ~18 km occurred south of the Samoa Islands at 17:48 29 September UTC or 05:48 30 September in NZ Standard Time (NZST) [UTC+12]. The tsunami was recorded along all the east coast of New Zealand but also on most of the open-coast gauges on the west coast.

The following sea-level gauges were used for this post-event analysis using 1 minute data from 23:00 29 September to 12:59 01 October (NZST)

Table1: Location of source of sea-level gauge datasets

Station	Latitude (°N)	Longitude (°E)	Operating agency
Kaingaroa Chatham Is.	−43.7315	183.733	NIWA
Moturiki Is.	−37.6304	176.186	NIWA
Marsden Pt.	−35.842	174.5	Northland Regional Council]
Whitianga	−36.833	175.709	Environment Waikato
Sumner Head	−43.570	172.773	NIWA
Lyttelton Port	−43.6058	172.7222	Lyttelton Port Co. Ltd
Timaru Port	−44.392	171.254	PrimePort Timaru Ltd
Green Island	−45.9523	170.3867	NIWA
Charleston	−41.908	171.433	NIWA
Jackson Bay	−43.957	168.616	NTC, Bureau of Meteorology
Port Taranaki,	−39.055	174.033	Port Taranaki Ltd
Kapiti Island	−40.842	174.938	NIWA

Table2: Primary measures of the recorded tsunami waves

Station	Elapsed arrival time [hrs]	Arrival time [NZST 30 Sept]	Peak wave height (crest-to-trough) [m]	Peak wave amplitude [m]	Wave period at peak [min]	Elapsed time of peak [hrs]	Time at peak wave [NZST 30 Sept]
Kaingaroa Chatham Is.	4.22	10:01	0.89	0.39	11	5.37	11:10
Moturiki Is.	5.23	11:02	0.54	0.37	8	9.18	14:59
Marsden Pt.	5.95	11:45	0.13	0.08	8	11.57	17:22
Whitianga	5.53	11:20	0.27	0.17	21	12.28	18:08
Sumner Head	7.00	12:48	0.24	0.14	14	18.97	00:46 [1 Oct]
Lyttelton Port	7.22	13:01	0.43	0.24	11	13.53	19:20
Timaru Port	7.20	13:00	0.55	0.32	11	12.88	18:41
Green Island	6.77	12:34	0.21	0.12	10	8.92	14:43
Charleston	8.02	13:49	0.41	0.23	12	11.75	17:33
Jackson Bay	7.93	13:44	0.61	0.26	9	11.85	17:39
Port Taranaki,	6.77	12:34	0.31	0.16	11	19.93	01:44 [1 Oct]
Kapiti Island	–	–	negligible	–	–	–	–

Note: NZST is UTC+12 hrs and elapsed time is from the earthquake at 05:48 NZST 30 September

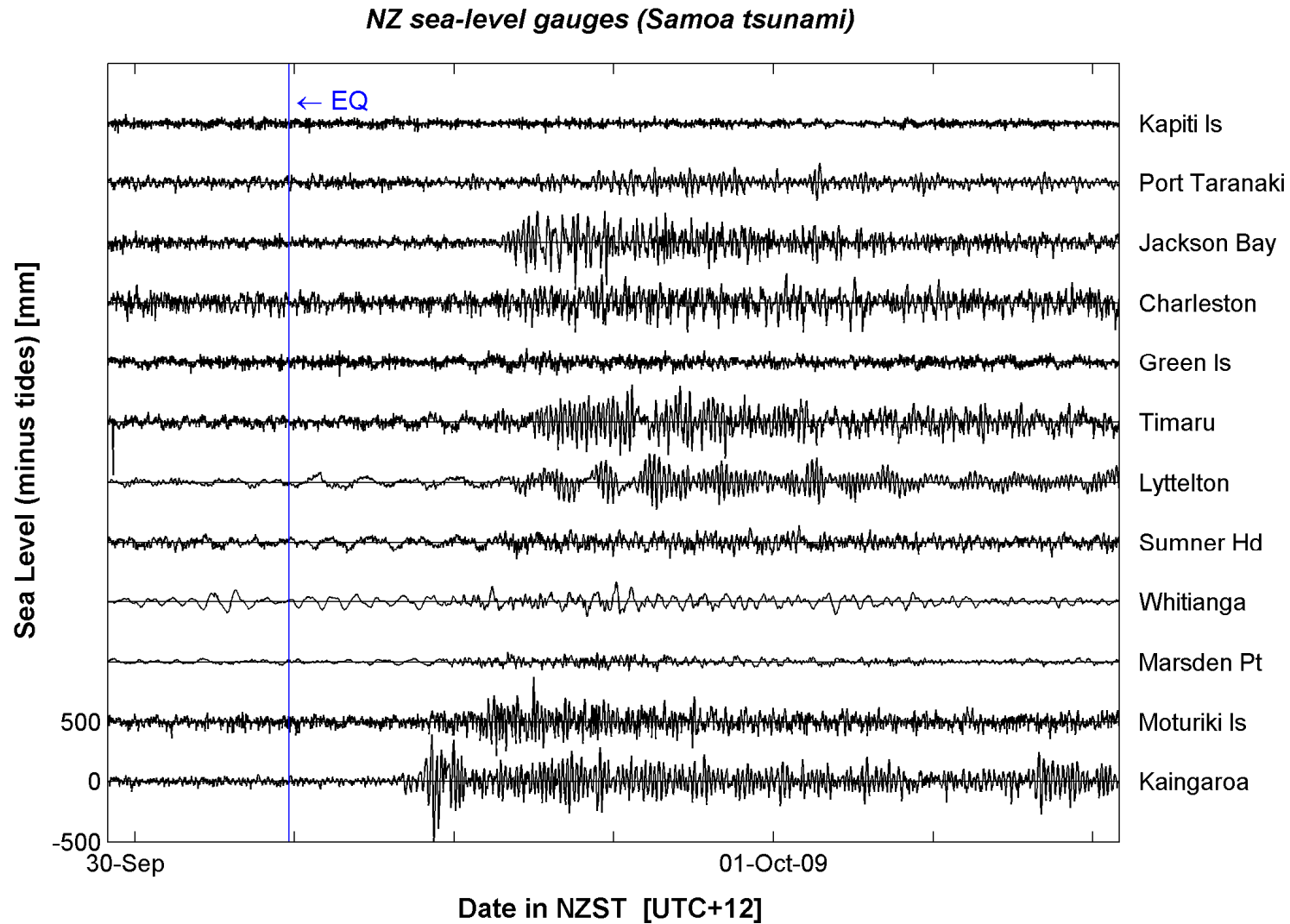


Figure A: Response of sea-level gauges in New Zealand to the Samoa tsunami [M 8.0 05:48 NZST 30-Sept-09], with the tide removed by wavelet digital band-pass filtering and **plotted in NZST [UTC+12]**. EQ marks the time of the earthquake.

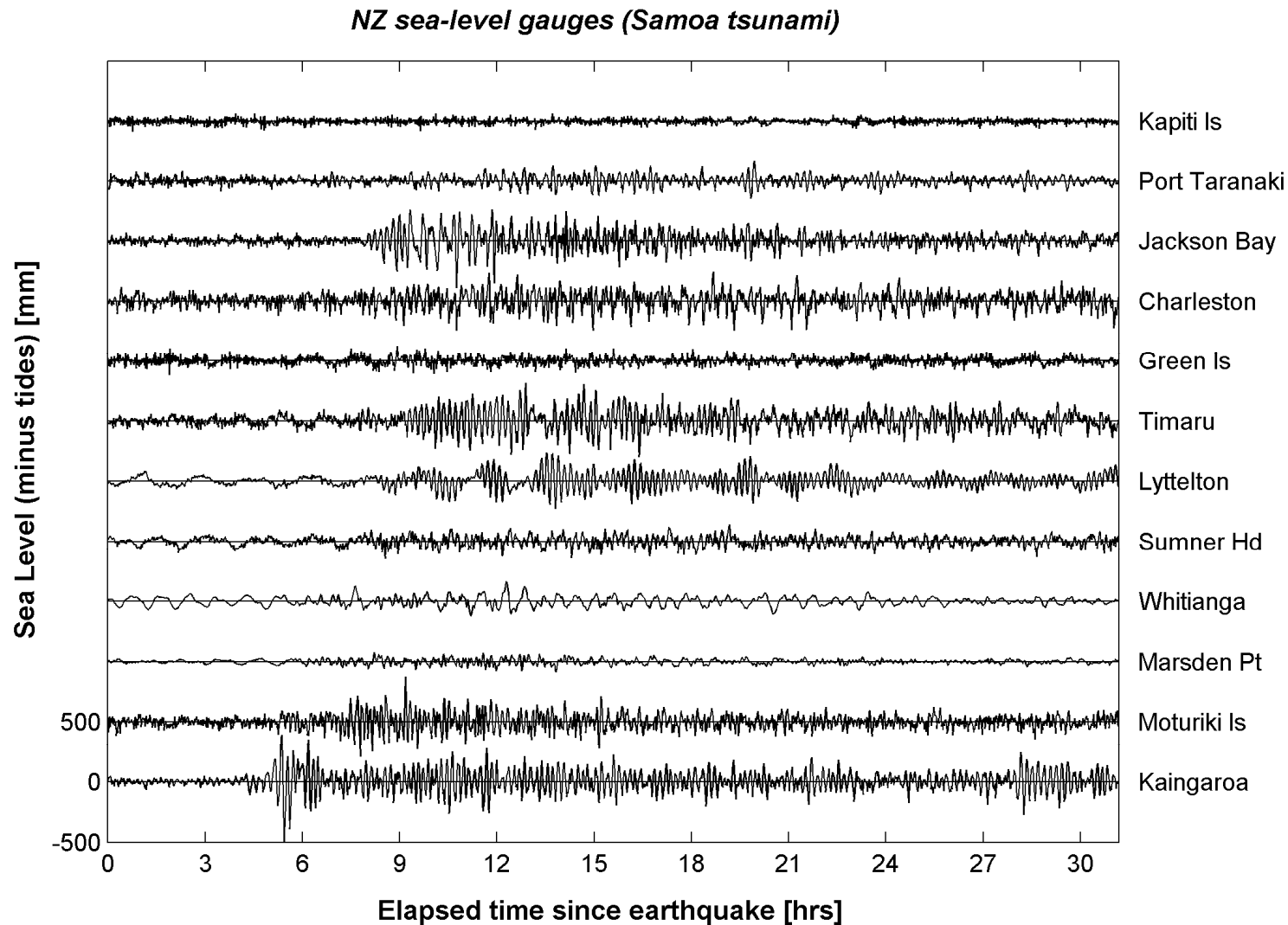


Figure B: Response of sea-level gauges in New Zealand to the Samoa tsunami [M 8.0 05:48 NZST 30-Sept-09], with the tide removed by wavelet digital band-pass filtering and **plotted in elapsed time since the earthquake.**

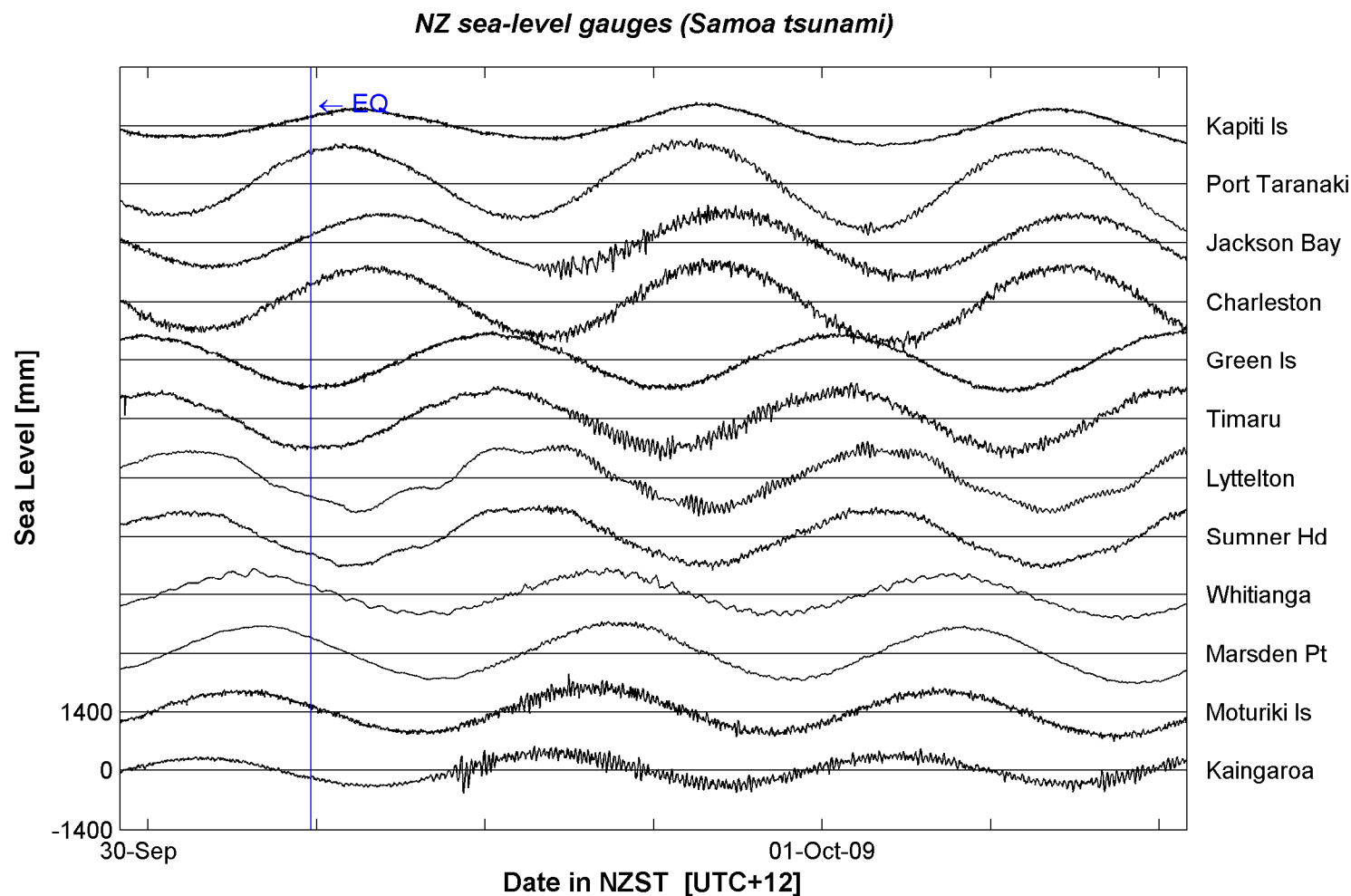


Figure C: Response of sea-level gauges in New Zealand to the Samoa tsunami [M 8.0 05:48 NZST 30-Sept-09] including the tide **plotted in NZST [UTC+12]**. EQ marks the time of the earthquake.

Acknowledgement: Sea-level gauge data regularly supplied by agencies listed in Table 1 and their ongoing contribution is acknowledged.