

Teignmouth Pier Tide Gauge

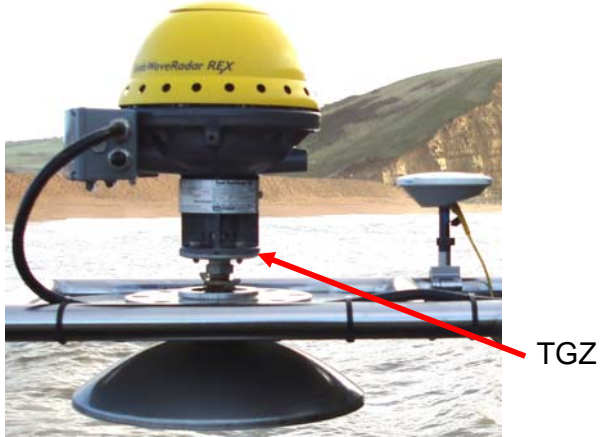
Location

OS: 294370E 72631N

WGS84 Latitude: 50° 32' 37.904" N Longitude: 03° 29' 31.720" W

Instrument

Rosemount WaveRadar Rex



Benchmarks

Benchmark	OS Co-ordinates	Description
TGBM	6.613 OD	Top of S/S horizontal frame bar

TGZ = 6.688m above Ordnance Datum Newlyn

TGZ = 9.338m above Admiralty Chart Datum

TGZ = 0.075m above TGBM

Datum information

All elevations are to Ordnance Datum Newlyn. The height of Chart Datum relative to Ordnance Datum at Teignmouth Approaches is -2.65m (Admiralty Tide Tables, Supplementary Table III).

Survey information

The site was last surveyed on 29 May 2008.

Site Characteristics

The Pier is on open coast. Spring tidal range is approx. 3.9m.

Service history

The radar was installed on 01 May 2008. No re-calibration of the instrument is required. The instrument was badly damaged during a thunderstorm on 01 July 2009 and had to be returned to the manufacturer in Sweden. The repaired instrument was re-deployed on 26 September.

Measurements

The Rex is a Frequency Modulated Continuous Wave radar, sampling at 4Hz. Tidal elevations are derived, every 10 minutes, as the one minute average of the 4Hz readings. The time stamp is the start of the measuring burst.

Data Quality

C1 (%)	Sample interval	Missing days
75	10 minutes	01 Jul – 25 Sep

Residuals and Elevations

Residuals and Elevations (OD and CD) for the whole year are shown in Figures 1 to 3 respectively.

Statistics

All times GMT

Month	Surge maxima		Surge minima	
	Value (m)	Date/Time	Value (m)	Date/Time
January	0.62	19-Jan-2009 04:40	-0.30	06-Jan-2009 01:20
February	0.67	05-Feb-2009 08:40	-0.48	13-Feb-2009 02:50
March	0.42	03-Mar-2009 17:00	-0.59	16-Mar-2009 02:50
April	0.34	07-Apr-2009 21:40	-0.38	21-Apr-2009 21:30
May	0.36	17-May-2009 11:30	-0.42	28-May-2009 19:30
June	0.36	26-Jun-2009 13:30	-0.33	13-Jun-2009 06:10
July	-	-	-	-
August	-	-	-	-
September	0.06	30-Sep-2009 02:40	-0.46	28-Sep-2009 05:40
October	0.32	07-Oct-2009 14:50	-0.36	15-Oct-2009 09:30
November	0.80	13-Nov-2009 19:20	-0.33	08-Nov-2009 23:10
December	0.78	29-Dec-2009 10:30	-0.59	18-Dec-2009 11:40

Month	Extreme maxima		Extreme minima	
	Elevation (OD)	Date/Time	Elevation (OD)	Date/Time
January	2.54	13-Jan-2009 08:00	-2.02	14-Jan-2009 02:00
February	2.56	09-Feb-2009 18:30	-2.31	11-Feb-2009 13:10
March	2.36	13-Mar-2009 07:50	-2.37	12-Mar-2009 13:00
April	2.36	09-Apr-2009 18:10	-2.00	11-Apr-2009 00:40
May	2.23	25-May-2009 18:40	-1.95	28-May-2009 02:20
June	2.40	25-Jun-2009 20:30	-1.93	24-Jun-2009 00:30
July	-	-	-	-
August	-	-	-	-
September	1.27	30-Sep-2009 15:40	-1.11	30-Sep-2009 21:40
October	2.47	20-Oct-2009 07:20	-2.15	18-Oct-2009 11:40
November	2.40	04-Nov-2009 06:50	-1.75	04-Nov-2009 00:10
December	2.45	06-Dec-2009 08:30	-1.87	04-Dec-2009 00:50

Month	Mean Level	
	No. of days	Elevation (OD)
January	31	0.341
February	28	0.246
March	31	0.204
April	30	0.265
May	31	0.208
June	30	0.287
July	0	-
August	0	-
September	5	0.125
October	31	0.258
November	30	0.398
December	31	0.355

Highest values in 2009			
Surge		Extreme	
Value (m)	Date/Time	Elevation (OD) (surge component)	Date/Time
0.80	13-Nov-2009 19:20	2.56 (0.39)	09-Feb-2009 18:30
0.80	14-Nov-2009 08:10	2.54 (-0.12)	11-Feb-2009 07:50
0.78	29-Dec-2009 10:30	2.54 (-0.01)	13-Jan-2009 08:00
0.71	29-Nov-2009 10:20	2.52 (-0.15)	12-Feb-2009 08:20
0.67	05-Feb-2009 08:40	2.47 (0.13)	20-Oct-2009 07:20
0.67	04-Feb-2009 19:40	2.47 (0.06)	15-Jan-2009 09:10
0.62	28-Dec-2009 09:30	2.45 (0.29)	06-Dec-2009 08:30
0.62	19-Jan-2009 04:40	2.42 (0.15)	09-Feb-2009 05:50
0.61	29-Dec-2009 11:40	2.41 (-0.15)	14-Jan-2009 08:30
-	-	2.40 (-0.04)	25-Jun-2009 20:30

Year	Annual surge maxima		Annual extreme maxima		Z ₀ (OD)	Annual recovery rate (C1)
	Value (m)	Date	Elevation (OD) (surge component)	Date		
2008	0.65	04-Dec-2008 05:20	2.56 (0.24)	04-Jul-2008 19:10	-	95
2009	0.80	13-Nov-2009 19:20	2.56 (0.39)	09-Feb-2009 18:30	0.284	75

General

The time series of 10 minute tidal elevations for one year is quality-checked in accordance with ESEAS guidelines, flagged and archived. The archived time series is continuous and monotonic, with missing data given as 9999. The missing data shown are days where the entire 24 hours of data are missing.

Monthly [extreme maxima/minima](#) are the maximum and minimum water levels from all measured data for that month. Monthly [surge maxima/minima](#) (residuals) are calculated in a similar manner from the time series of residuals. Residuals are derived as the measured tidal elevation minus the predicted tidal elevation.

The monthly Mean Level is calculated as the average of all readings for the given month. The annual Z₀ is the value of Mean Sea Level derived by the harmonic analysis of the year's data. These values should not be used for any purpose without consideration of the recovery rate.

Acknowledgements

Tidal predictions were produced using the TASK2000 software, kindly provided by the Permanent Service for Mean Sea Level (PSMSL), Proudman Oceanographic Laboratory. The Rex is mounted on Teignmouth Pier by kind permission of the Pier owners.

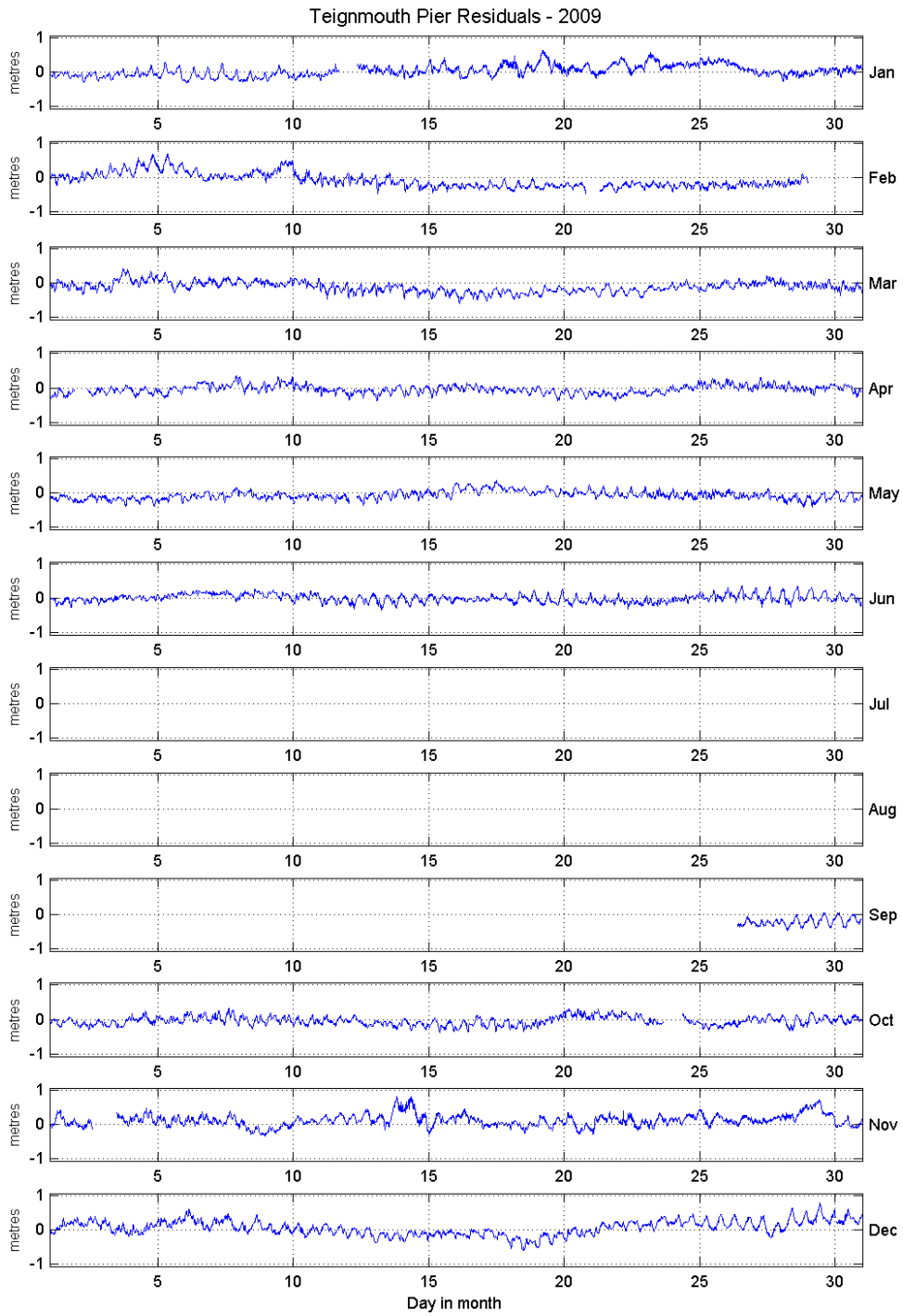


Figure 1 Residuals for 2009

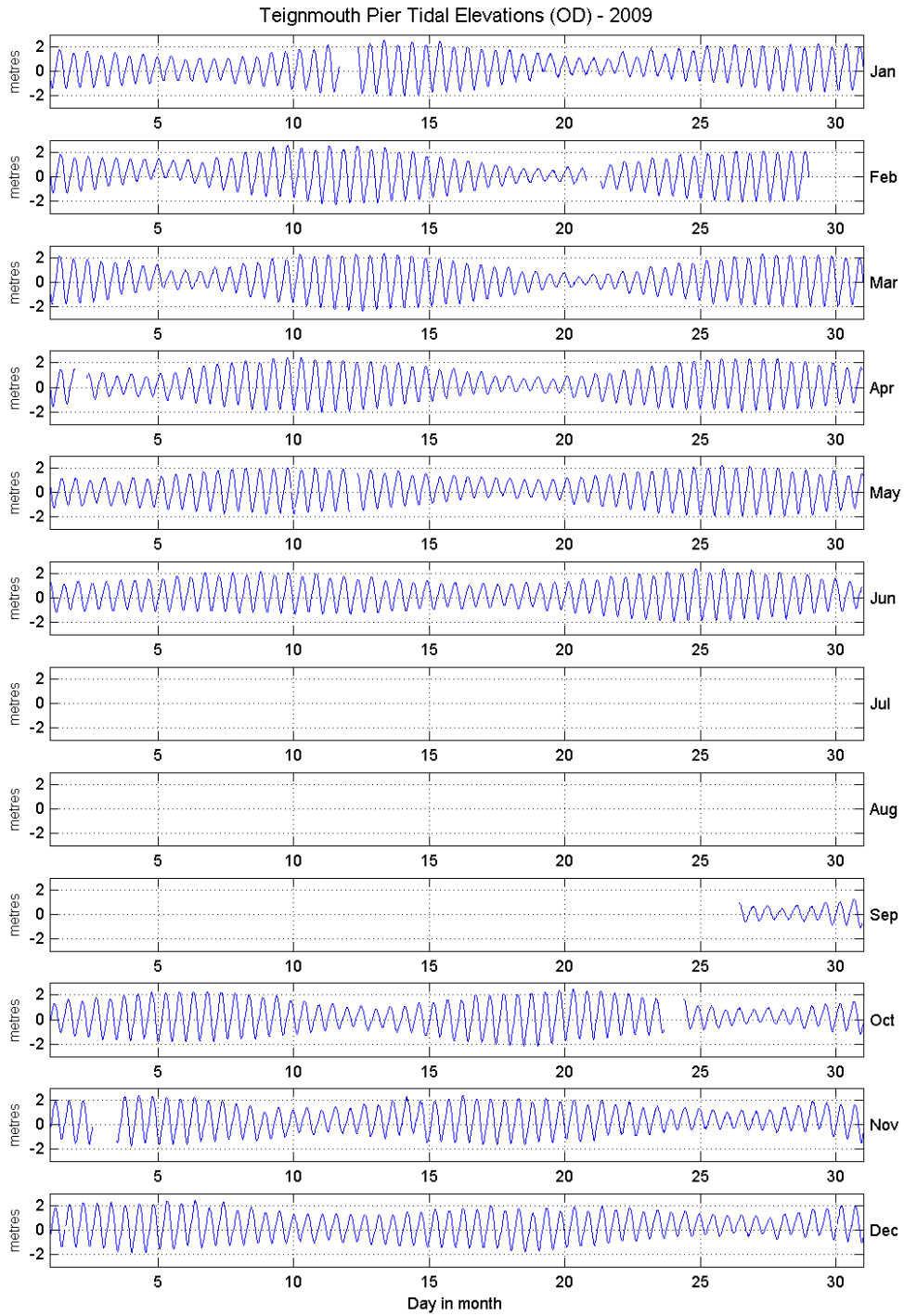


Figure 2 Tidal elevations relative to Ordnance Datum for 2009

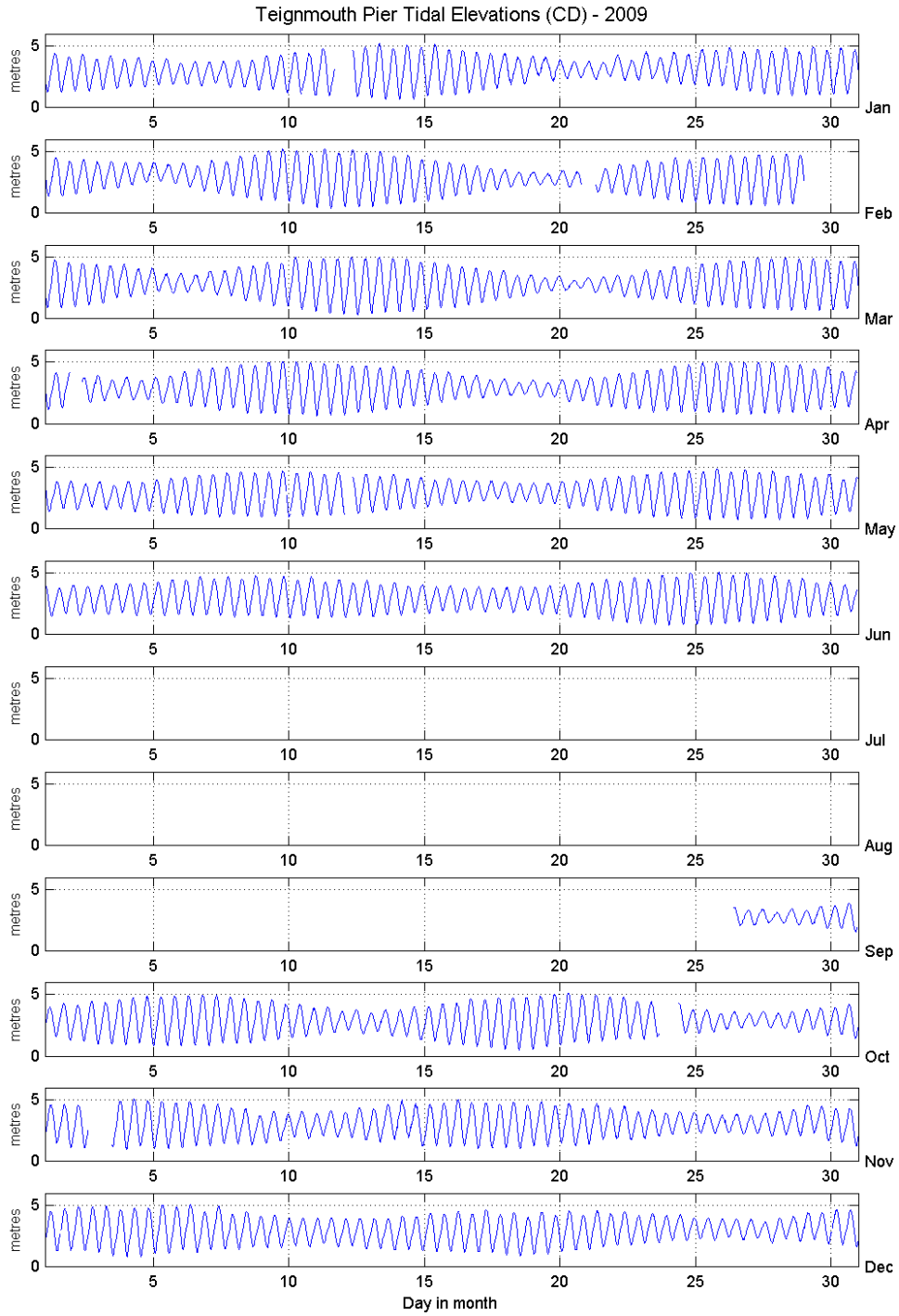


Figure 3 Tidal elevations relative to Chart Datum for 2009