

West Bay Harbour Tide Gauge

Location

OS: 346142.9E 90195.31N

WGS84 *Latitude:* 50° 42.532' N *Longitude:* 002° 45.846' E

West Bay Harbour, inner end of western breakwater

Instrument

Rosemount WaveRadar Rex



TGZ



<i>Benchmark</i>	<i>OS Co-ordinates</i>	<i>Description</i>
TGBM	4.607 OD	Top of horizontal S/S frame
TGZ =	4.647m above Ordnance Datum (Newlyn)	
TGZ =	6.897m above Admiralty Chart Datum	
TGZ =	0.040m above TGBM	

Datum information

Tidal elevations are measured reference to Ordnance Datum (Newlyn). The height of Chart Datum at Bridport relative to Ordnance Datum is -2.25m (Admiralty Tide Tables, Supplementary Table III).

Survey information

The site was last surveyed on 7 January 2008.

Site Characteristics

The breakwater is on open coast. Spring tidal range is approx. 2.5m. Some wave reflection can occur around the breakwater and harbour entrance.

Service history

The radar became operational on 31 January 2008. No re-calibration of the instrument is required.

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
78	10 minutes	01 Feb, 06-07 Jun, 14-15,19-29 Jul, 03-04 Aug, 22 Sep-27 Oct

Residuals and Elevations

Residuals and Elevations (OD and CD) for the whole year are shown in Figures 1 to 3 respectively. Tidal elevations are derived as the one minute average of the 4Hz readings. The time stamp is the start of the measuring burst.

Statistics

All times GMT

Month	Surge maxima		Surge minima	
	Value (m)	Date/Time	Value (m)	Date/Time
January	0.65	19-Jan-2009 06:00	-0.39	05-Jan-2009 21:50
February	0.53	05-Feb-2009 08:00	-0.38	14-Feb-2009 03:00
March	0.48	03-Mar-2009 16:50	-0.42	12-Mar-2009 00:50
April	0.39	08-Apr-2009 01:00	-0.38	20-Apr-2009 06:10
May	0.26	17-May-2009 12:30	-0.45	04-May-2009 20:30
June	0.29	09-Jun-2009 01:40	-0.33	01-Jun-2009 06:10
July	0.24	06-Jul-2009 07:10	-0.25	17-Jul-2009 22:30
August	0.32	20-Aug-2009 09:50	-0.28	12-Aug-2009 06:00
September	0.44	02-Sep-2009 18:20	-0.41	10-Sep-2009 05:20
October	0.25	29-Oct-2009 02:50	-0.24	28-Oct-2009 19:00
November	1.04	14-Nov-2009 08:20	-0.28	08-Nov-2009 19:40
December	0.68	06-Dec-2009 04:40	-0.39	18-Dec-2009 10:30

Month	Extreme maxima		Extreme minima	
	Elevation (OD)	Date/Time	Elevation (OD)	Date/Time
January	2.21	13-Jan-2009 08:20	-1.77	13-Jan-2009 13:20
February	2.36	09-Feb-2009 18:40	-2.00	11-Feb-2009 13:20
March	2.12	13-Mar-2009 08:00	-2.14	12-Mar-2009 12:50
April	2.09	10-Apr-2009 06:50	-1.74	26-Apr-2009 12:20
May	2.05	25-May-2009 18:50	-1.68	28-May-2009 02:10
June	2.16	24-Jun-2009 19:40	-1.69	24-Jun-2009 00:20
July	1.78	08-Jul-2009 19:20	-1.28	09-Jul-2009 00:40
August	2.27	22-Aug-2009 19:30	-2.01	22-Aug-2009 01:00
September	2.24	19-Sep-2009 18:50	-2.00	21-Sep-2009 01:10
October	1.49	31-Oct-2009 16:30	-1.24	31-Oct-2009 22:00
November	2.23	04-Nov-2009 06:40	-1.40	04-Nov-2009 00:10
December	2.17	05-Dec-2009 07:40	-1.55	18-Dec-2009 12:50

Month	Mean Level	
	No. of days	Elevation (OD)
January	31	0.264
February	27	0.177
March	31	0.121
April	30	0.149
May	31	0.120
June	28	0.211
July	22	0.299
August	29	0.203
September	21	0.160
October	4	0.167
November	30	0.458
December	31	0.370

Highest values in 2009			
Surge		Extreme	
Value (m)	Date/Time	Elevation (OD) (surge component)	Date/Time
1.04	14-Nov-2009 08:20	2.36 (0.39)	09-Feb-2009 18:40
0.99	13-Nov-2009 22:30	2.27 (-0.09)	11-Feb-2009 08:00
0.84	29-Nov-2009 10:20	2.27 (-0.02)	23-Aug-2009 20:40
0.77	14-Nov-2009 00:40	2.27 (-0.12)	22-Aug-2009 19:30
0.68	06-Dec-2009 04:40	2.26 (-0.05)	12-Feb-2009 08:00
0.66	28-Nov-2009 22:10	2.24 (-0.14)	19-Sep-2009 18:50
0.65	06-Dec-2009 04:20	2.23 (0.29)	04-Nov-2009 06:40
-	-	2.22 (0.21)	09-Feb-2009 06:10
-	-	2.21 (-0.03)	13-Jan-2009 08:20
-	-	2.21 (-0.21)	21-Aug-2009 19:10

Year	Annual surge maxima ¹		Annual extreme maxima ¹		Z ₀ (OD)	Annual recovery rate (C1)
	Value (m)	Date	Elevation (OD) (surge component)	Date		
2008	1.10	10-Mar-2008 05:20	2.22 (-0.04)	09-Mar-2008 07:00	-	88%
2009	1.04	14-Nov-2009 08:20	2.36 (0.39)	09-Feb-2009 18:40	0.232	78%

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.

¹ Due to the requirements of the Harbour owners, the Rex is sited at a lower elevation than ideal, and a combination of high surge, high spring tides and significant wave action can cause the instrument to be swamped. This appears to have happened on 10 March 2008 and, accordingly, the elevations given in the table may be an under-estimate of the actual tidal levels.

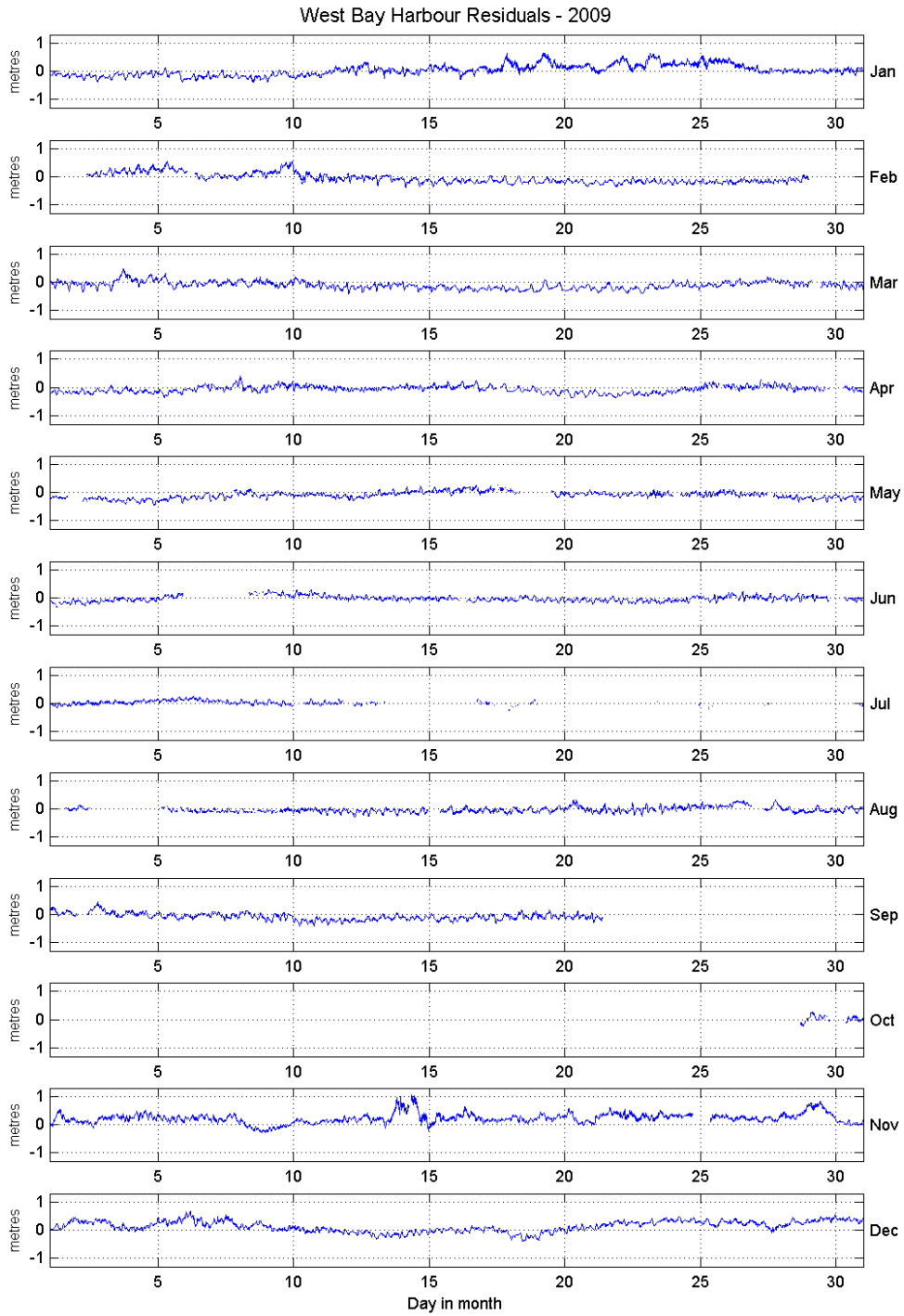


Figure 1 Residuals for 2009

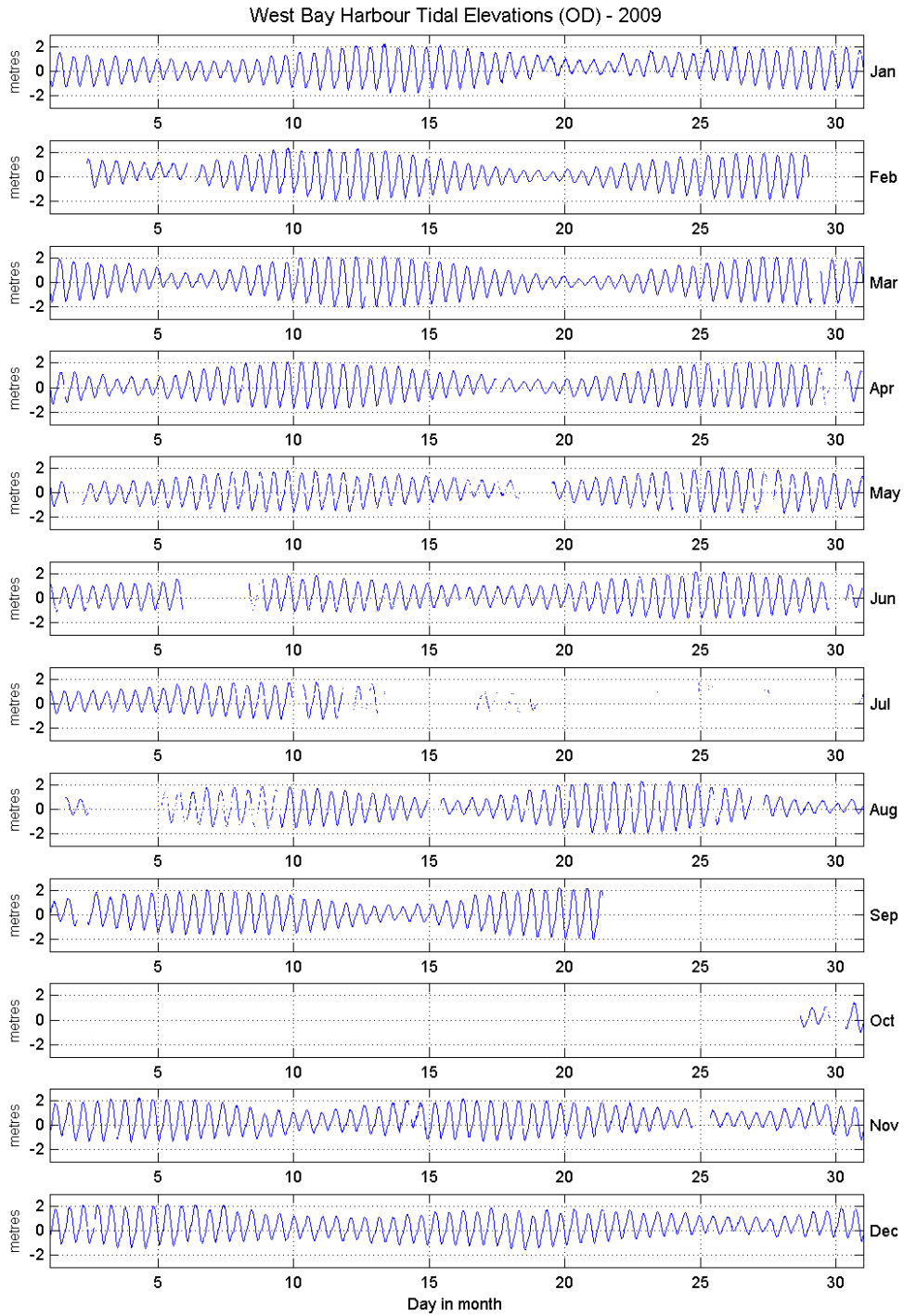


Figure 2 Tidal elevations relative to Ordnance Datum for 2009

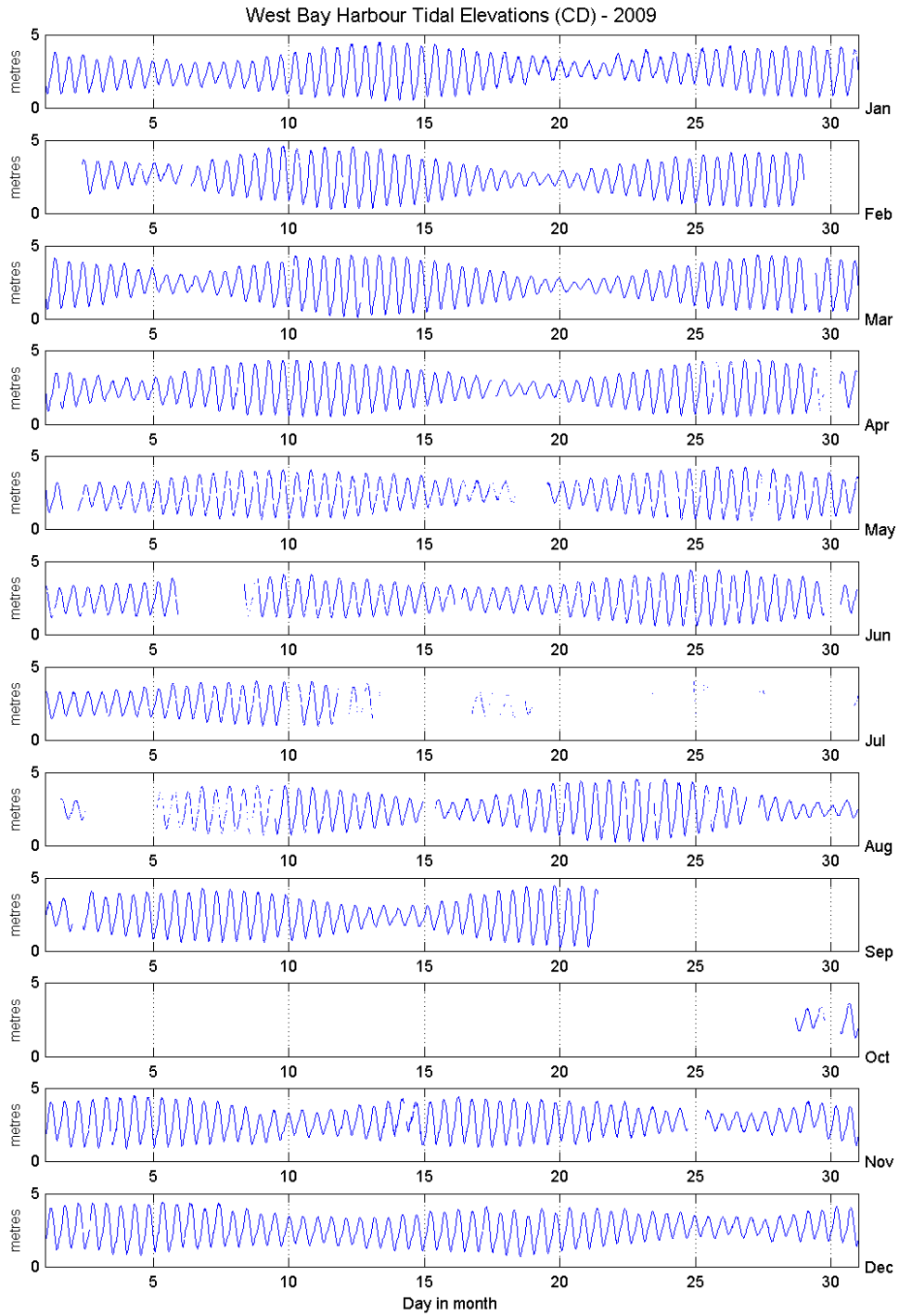


Figure 3 Tidal elevations relative to Chart Datum for 2009