

## West Bay Harbour Tide Gauge

### Location

OS: 346142.9E 90195.31N

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

Inner end of western breakwater

### Instrument Type

Etrometa step gauge (from 30 March 2011)

Rosemount WaveRadar REX (from 25 January 2008 to 23 March 2011)



### Benchmarks

#### Benchmark

TGBM = 3.951m above Ordnance Datum Newlyn

Aux1 = 3.556m above Ordnance Datum Newlyn

TGZ = -2.425m above Ordnance Datum Newlyn

TGZ = -0.175m above Chart Datum

TGZ = 6.376m below TGBM

#### Description

Cross-headed bolt embedded into top of concrete seawall

Top of step gauge

### Datum

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

### Survey information

The site was surveyed on 29 May 2008.

### Site characteristics

The breakwater is on open coast but some wave reflection can occur around the breakwater and harbour entrance. Spring tidal range is approx.3.2m.

### Data Quality

Recovery rate (%)	Sample interval
97	10 minutes

## Service history

The step gauge was last serviced in April 2014. No re-calibration of the instrument is required.

## Measurements

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

## Statistics

*All times GMT*

Month	Extreme maxima		Extreme minima	
	Elevation (OD)	Date/Time	Elevation (OD)	Date/Time
January	2.37	21-Jan-2015 06:40	-1.91	23-Jan-2015 01:10
February	2.52	20-Feb-2015 07:20	-1.94	21-Feb-2015 13:40
March	2.31	21-Mar-2015 07:30	-2.28	22-Mar-2015 13:20
April	2.20	19-Apr-2015 19:30	-2.10	19-Apr-2015 12:10
May	2.25	05-May-2015 19:30	-1.75	20-May-2015 13:20
June	1.97	04-Jun-2015 19:50	-1.66	17-Jun-2015 12:20
July	2.19	03-Jul-2015 19:50	-1.68	05-Jul-2015 01:50
August	2.51	31-Aug-2015 19:40	-1.87	31-Aug-2015 12:50
September	2.39	01-Sep-2015 20:30	-2.24	30-Sep-2015 01:00
October	2.61	29-Oct-2015 07:30	-2.04	01-Oct-2015 01:40
November	2.28	27-Nov-2015 07:10	-1.78	27-Nov-2015 00:10
December	2.32	26-Dec-2015 06:30	-1.44	27-Dec-2015 13:10

Month	Surge maxima		Surge minima	
	Value (m)	Date/Time	Value (m)	Date/Time
January	0.58	13-Jan-2015 05:10	-0.40	10-Jan-2015 16:10
February	0.64	22-Feb-2015 13:50	-0.34	07-Feb-2015 01:40
March	0.39	01-Mar-2015 03:00	-0.31	05-Mar-2015 12:50
April	0.26	02-Apr-2015 13:00	-0.28	28-Apr-2015 05:40
May	0.58	05-May-2015 13:40	-0.35	27-May-2015 05:50
June	0.42	01-Jun-2015 22:20	-0.49	09-Jun-2015 17:20
July	0.44	26-Jul-2015 11:30	-0.22	10-Jul-2015 06:40
August	0.43	26-Aug-2015 09:20	-0.14	12-Aug-2015 15:40
September	0.40	16-Sep-2015 14:40	-0.38	29-Sep-2015 02:00
October	0.44	05-Oct-2015 03:30	-0.32	20-Oct-2015 06:10
November	0.36	17-Nov-2015 03:30	-0.37	21-Nov-2015 10:20
December	0.78	24-Dec-2015 08:50	-0.33	04-Dec-2015 08:00

Month	Mean Level	
	No. of days	Elevation (OD)
January	30	0.319
February	28	0.219
March	31	0.145
April	30	0.166
May	31	0.261
June	30	0.196
July	31	0.304
August	31	0.334
September	30	0.314
October	31	0.354
November	30	0.395
December	31	0.445

Highest values in 2015			
Extreme		Surge	
Elevation (OD) (Surge component)	Date/Time	Value (m)	Date/Time
2.61 (0.19)	29-Oct-2015 07:30	0.78	24-Dec-2015 08:50
2.59 (0.20)	27-Oct-2015 18:30	0.74	30-Dec-2015 10:40
2.59 (0.16)	28-Oct-2015 19:10	0.67	30-Dec-2015 04:30
2.52 (0.29)	20-Feb-2015 07:20	0.64	22-Feb-2015 13:50
2.51 (0.08)	31-Aug-2015 19:40	0.61	23-Feb-2015 13:30
2.50 (0.20)	30-Oct-2015 08:30	0.59	22-Dec-2015 10:10
2.50 (0.19)	21-Feb-2015 08:20	0.58	05-May-2015 13:40
2.48 (0.08)	28-Oct-2015 06:40	0.58	13-Jan-2015 05:10
2.47 (0.17)	02-Aug-2015 20:00	0.55	31-Dec-2015 14:20
2.44 (0.11)	30-Aug-2015 18:50	0.55	25-Dec-2015 12:00

Year	Annual extreme maxima		Annual surge maxima		Z <sub>0</sub> (OD)	Annual recovery rate
	Elevation (OD) (Surge)	Date/Time	Value (m)	Date/Time		
2008 <sup>1</sup>	2.22 (-0.04)	09-Mar-2008 07:00	1.10	10-Mar-2008 05:20	-	88%
2009	2.36 (0.39)	09-Feb-2009 18:40	1.04	14-Nov-2009 08:20	0.232	78%
2010	2.34 (-0.08)	01-Feb-2010 07:50	0.66	11-Nov-2010 06:30	-	62%
2011	2.56 (0.30)	27-Oct-2011 06:30	0.79	12-Dec-2011 23:50	0.238	97%
2012	2.79 (0.45)	17-Oct-2012 07:20	0.71	31-Oct-2012 17:40	0.266	92%
2013	2.52 (0.32)	05-Nov-2013 07:00	0.98	23-Dec-2013 15:00	0.271	88%
2014	2.79 (0.64)	03-Feb-2014 09:00	1.15	05-Feb-2014 10:30	-	93%
2015	2.61 (0.19)	29-Oct-2015 07:30	0.78	24-Dec-2015 08:50	-	97%

<sup>1</sup> Due to the requirements of the Harbour owners, the tide gauge in 2008 was sited at a lower elevation than ideal. A combination of high surge, high spring tides and significant wave action caused the instrument to be swamped on 10 March 2008 and, accordingly, the elevations given in the table are likely to be an under-estimate of the actual tidal levels.

Tidal levels		
Observation period	July 2008 to December 2012	
Tide Level	Elevation (OD)	Elevation (CD)
HAT	2.52	4.77
MHWS	1.86	4.11
MHWN	0.86	3.11
MSL	0.23	2.48
MLWN	-0.41	1.85
MLWS	-1.40	0.85
LAT	-2.12	0.14

## 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  $Z_0$  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 TASK windows edition software, kindly provided by the Marine Data Products team at the UK National Oceanography Centre (Liverpool).

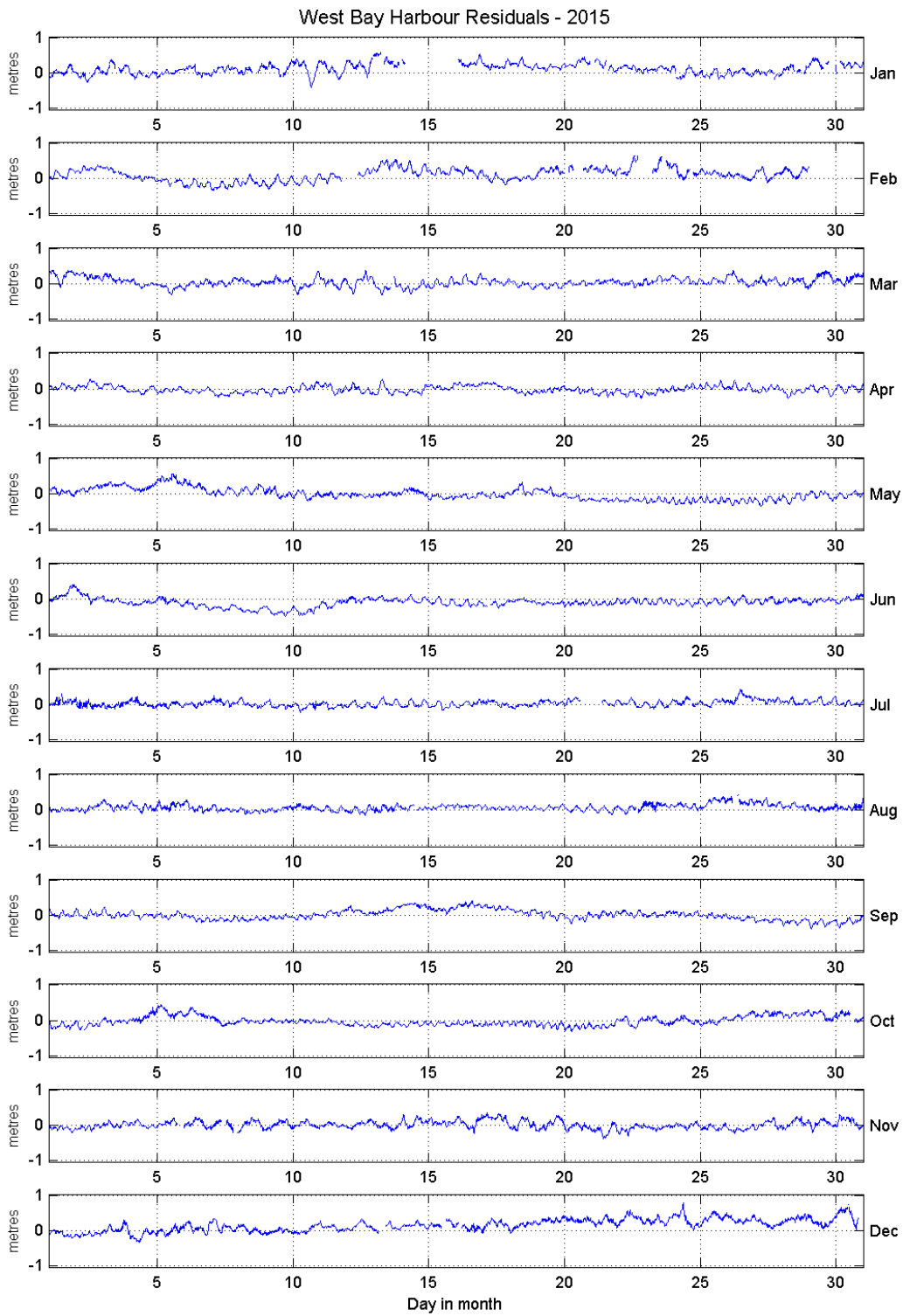


Figure 1: West Bay Harbour residuals for 2015

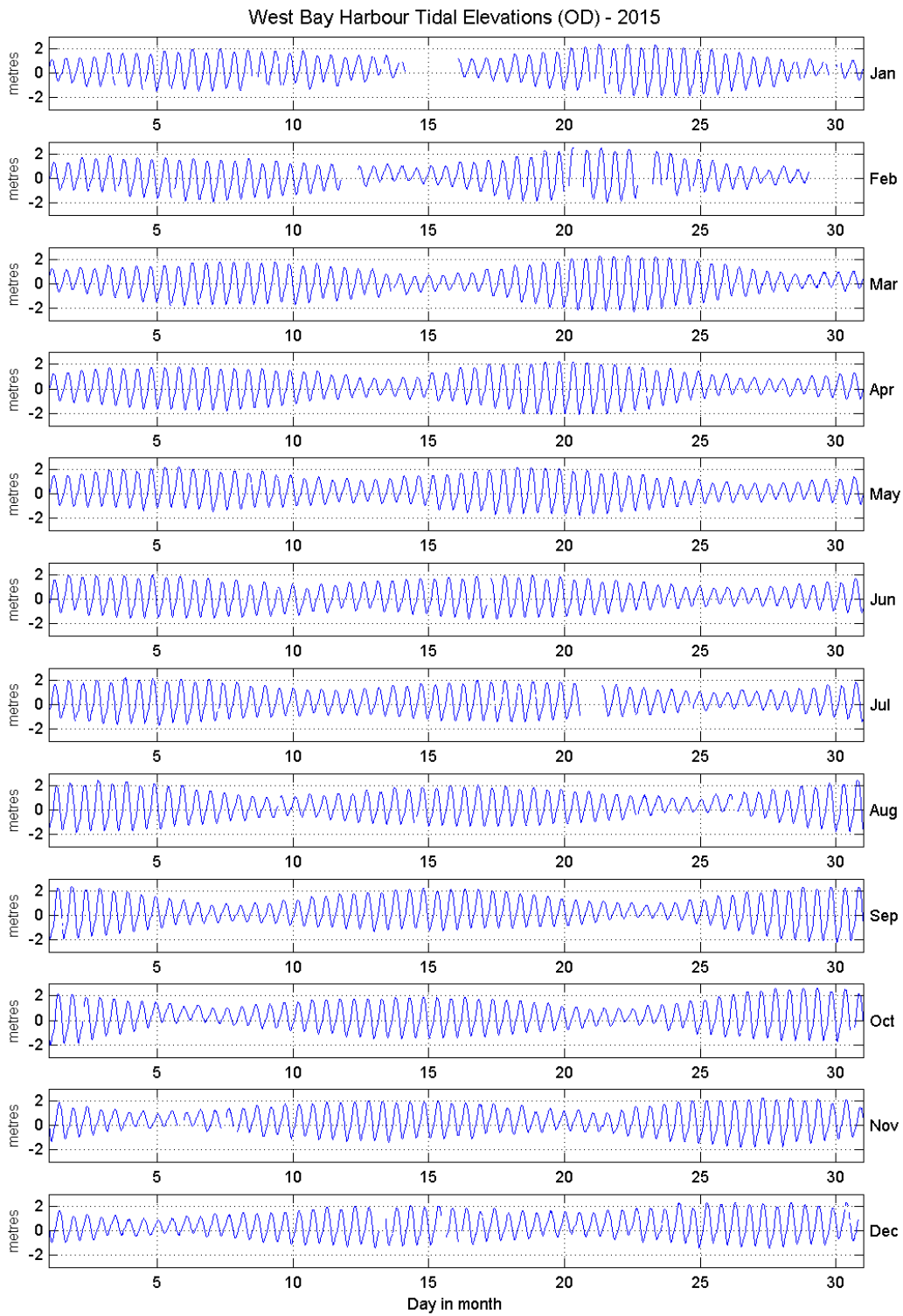


Figure 2: West Bay Harbour tidal elevations for 2015 relative to Ordnance Datum

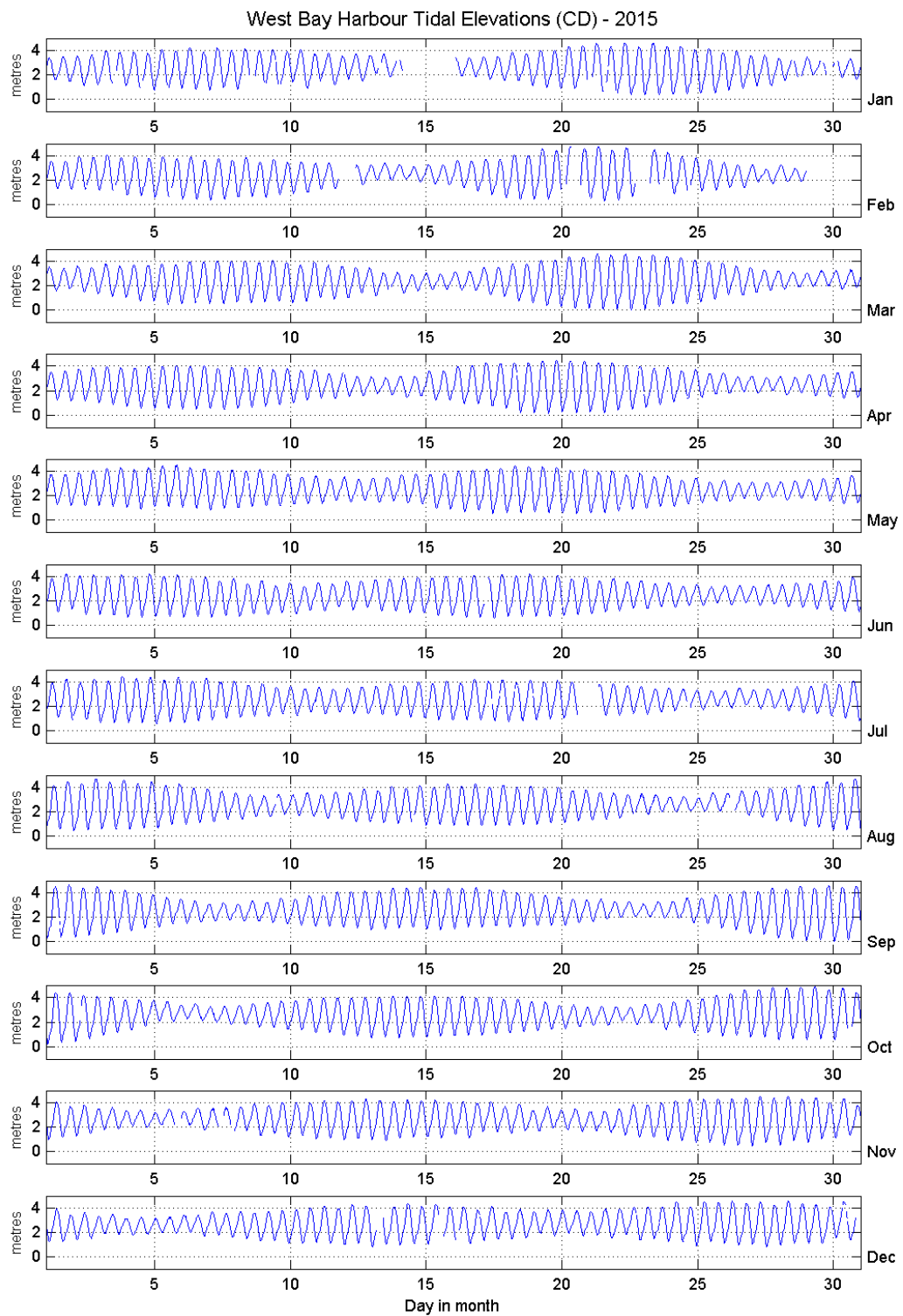


Figure 3: West Bay Harbour tidal elevations for 2015 relative to Chart Datum