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

Etrometa step gauge (from 30 March 2011)

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

Benchmarks

Benchmark	*Description*
TGBM = 3.951 m above Ordnance Datum Newlyn	Cross-headed bolt embedded into top of concrete seawall
Aux1 = 3.556 m above Ordnance Datum Newlyn	Top of step gauge
TGZ = -2.425 m above Ordnance Datum Newlyn	
TGZ = -0.175 m above Chart Datum	
TGZ = 6.376 m below TGBM	

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 first deployed on 30 March 2011 and is serviced at 9-monthly intervals. 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	2.23	12-Jan-2017 06:10	-1.84	14-Jan-2017 13:10
February	2.43	28-Feb-2017 07:40	-1.89	12-Feb-2017 00:30
March	2.32	31-Mar-2017 08:50	-1.97	30-Mar-2017 13:20
April	2.27	29-Apr-2017 21:00	-2.01	27-Apr-2017 12:30
May	2.26	26-May-2017 19:10	-1.82	26-May-2017 12:10
June	2.31	25-Jun-2017 19:40	-1.63	26-Jun-2017 01:00
July	2.28	25-Jul-2017 20:10	-1.73	25-Jul-2017 13:10
August	2.29	22-Aug-2017 19:00	-1.73	24-Aug-2017 01:10
September	2.38	08-Sep-2017 19:50	-1.73	22-Sep-2017 00:50
October	2.45	21-Oct-2017 07:10	-1.82	07-Oct-2017 00:30
November	2.28	07-Nov-2017 08:10	-1.84	06-Nov-2017 00:40
December	2.16	06-Dec-2017 08:00	-1.93	05-Dec-2017 00:30

Month	Surge maxima		Surge minima	
	Value (m)	Date/Time	Value (m)	Date/Time
January	0.42	27-Jan-2017 01:10	-0.36	18-Jan-2017 07:00
February	0.77	02-Feb-2017 20:10	-1.45	15-Feb-2017 22:10
March	0.55	05-Mar-2017 06:00	-0.30	13-Mar-2017 00:40
April	0.33	30-Apr-2017 07:10	-0.30	06-Apr-2017 20:30
May	0.40	12-May-2017 14:20	-0.22	24-May-2017 13:20
June	0.61	05-Jun-2017 19:40	-0.24	17-Jun-2017 07:50
July	0.35	21-Jul-2017 10:50	-0.28	16-Jul-2017 07:10
August	0.43	02-Aug-2017 09:10	-0.20	14-Aug-2017 06:40
September	0.52	12-Sep-2017 20:30	-0.21	26-Sep-2017 06:50
October	0.62	16-Oct-2017 11:40	-0.34	30-Oct-2017 19:10
November	0.48	22-Nov-2017 19:00	-0.45	15-Nov-2017 10:30
December	0.65	31-Dec-2017 18:30	-0.37	19-Dec-2017 00:10

Month	Mean Level	
	No. of days	Elevation (OD)
January	31	0.252
February	28	0.311
March	31	0.248
April	30	0.173
May	31	0.286
June	30	0.305
July	31	0.315
August	31	0.306
September	30	0.361
October	31	0.346
November	30	0.346
December	31	0.304

Highest values in 2017			
Extreme		**Surge**	
Elevation (OD) *(Surge component)*	Date/Time	Value (m)	Date/Time
2.45 *(0.33)*	21-Oct-2017 07:10	0.77	02-Feb-2017 20:10
2.43 *(0.24)*	28-Feb-2017 07:40	0.64	30-Dec-2017 01:50
2.38 *(0.17)*	08-Sep-2017 19:50	0.62	16-Oct-2017 11:40
2.37 *(0.27)*	19-Oct-2017 17:40	0.61	05-Jun-2017 19:40
2.34 *(0.27)*	27-Feb-2017 06:50	0.59	03-Feb-2017 14:10
2.32 *(0.15)*	31-Mar-2017 08:50	0.57	21-Oct-2017 11:10
2.31 *(0.04)*	25-Jun-2017 19:40	0.57	04-Feb-2017 17:40
2.30 *(0.07)*	26-Jun-2017 20:20	0.55	16-Oct-2017 10:40
2.29 *(0.01)*	22-Aug-2017 19:00	0.55	05-Mar-2017 06:00
2.28 *(0.02)*	25-Jul-2017 20:10	0.54	30-Dec-2017 23:00

Year	Annual extreme maxima		Annual surge maxima		Z_0 (OD)	Annual recovery rate
	Elevation (OD) *(Surge)*	Date/Time	Value (m)	Date/Time		
2008[1]	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%
2016	2.57 *(0.44)*	11-Feb-2016 08:20	1.04	27-Mar-2016 23:30		97%
2017	2.45 *(0.33)*	21-Oct-2017 07:10	0.77	02-Feb-2017 20:10	-	97%

[1] 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

The tide gauge is deployed by kind permission of West Bay Harbourmaster.

Tidal predictions and tide levels were produced by Fugro GB Marine Limited.

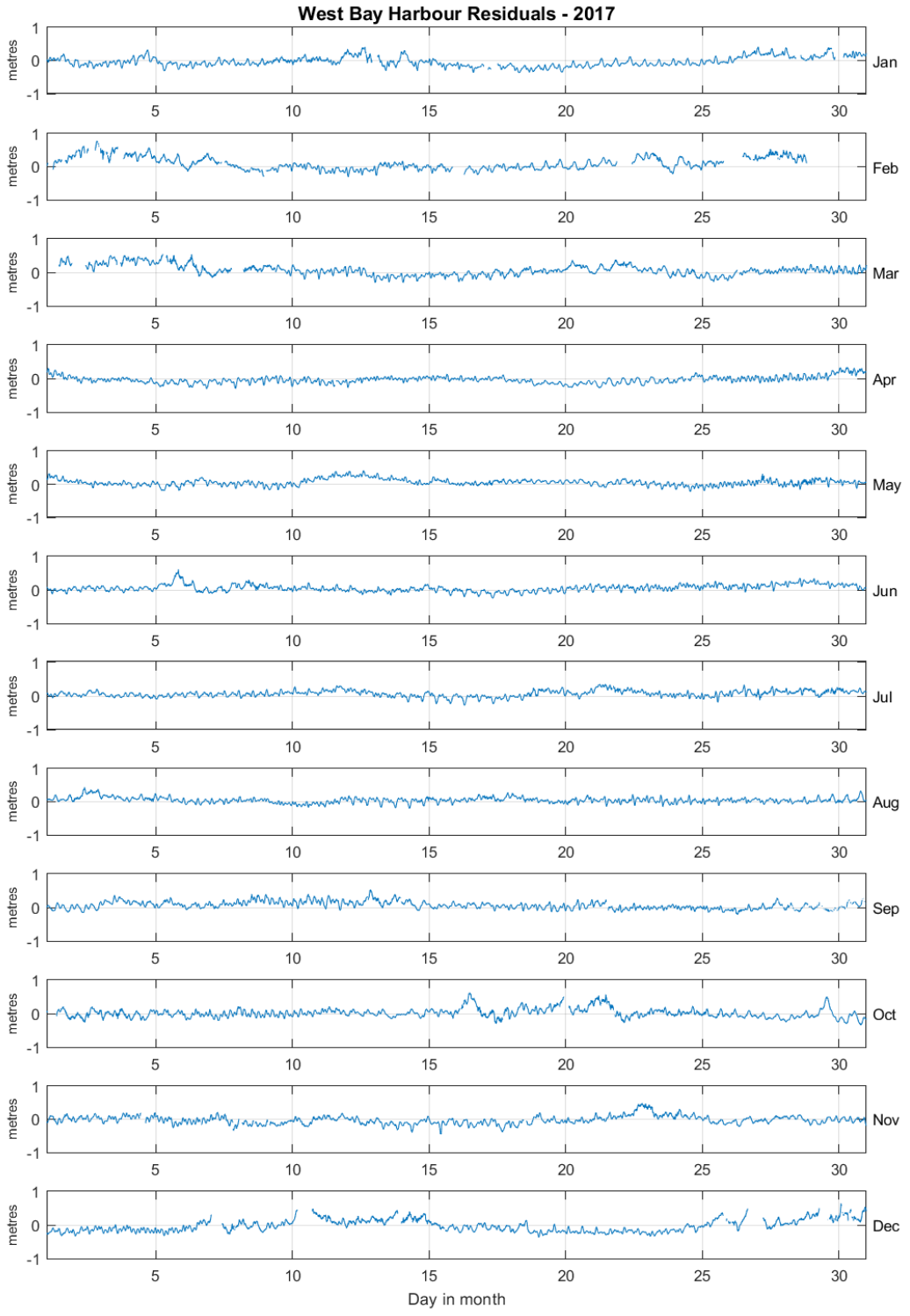

Figure 1: West Bay Harbour residuals for 2017

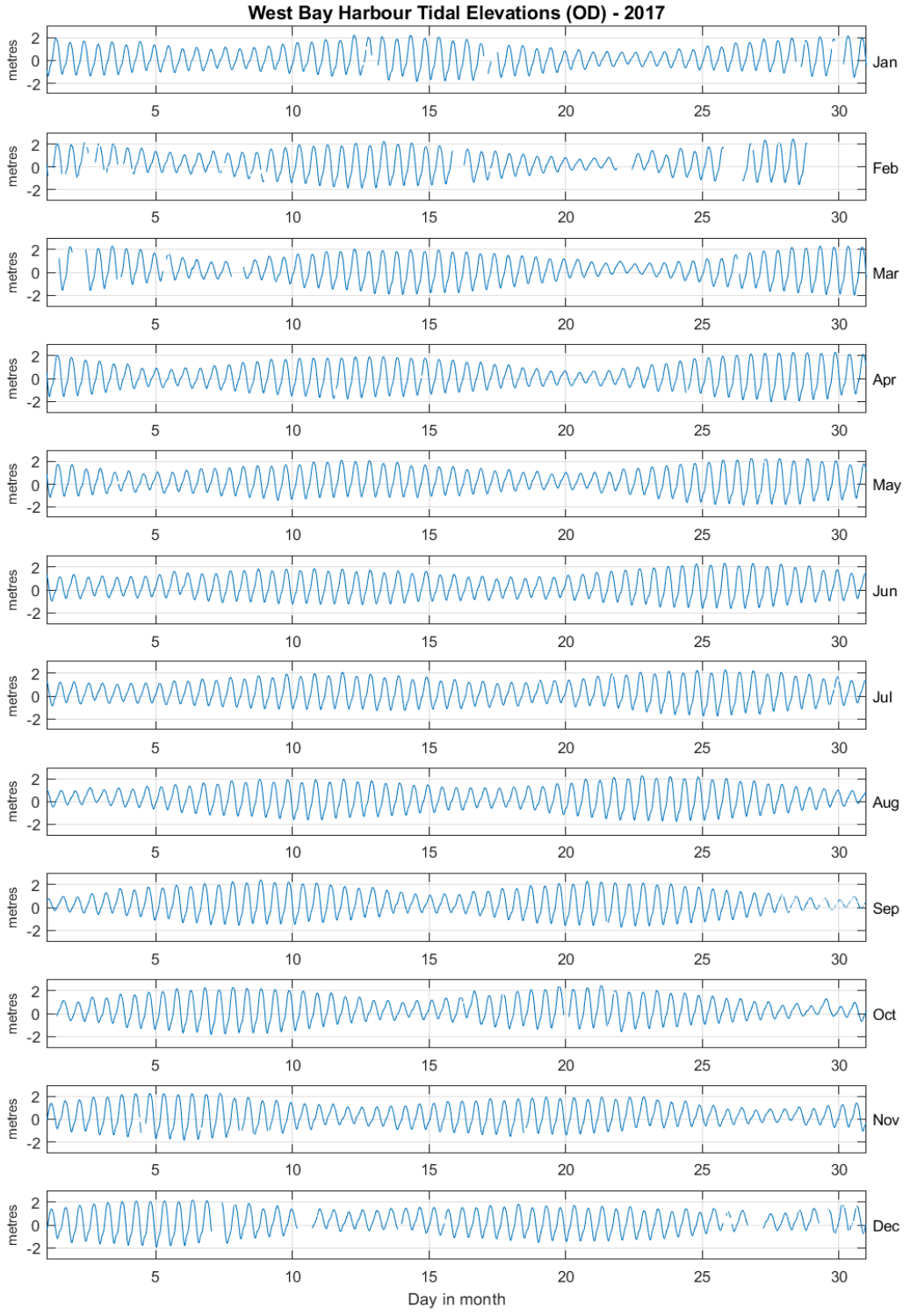

Figure 2: West Bay Harbour tidal elevations for 2017 relative to Ordnance Datum

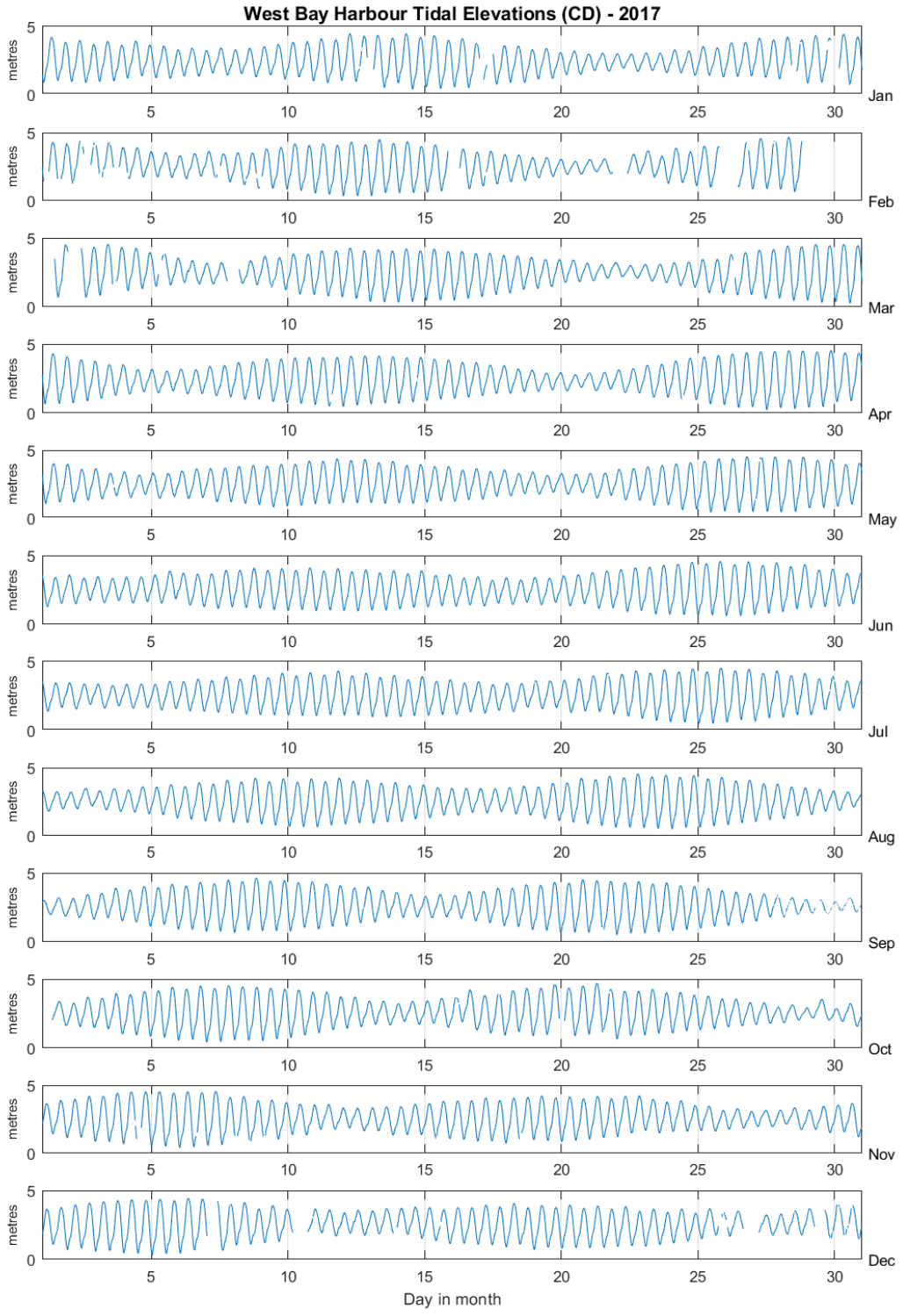

Figure 3: West Bay Harbour tidal elevations for 2017 relative to Chart Datum