

## 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*

TGBM = 3.951 m above Ordnance Datum Newlyn

Aux1 = 3.556 m above Ordnance Datum Newlyn

TGZ = -2.425 m above Ordnance Datum Newlyn

TGZ = -0.175 m above Chart Datum

TGZ = 6.376 m 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
94	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	2.55	05-Jan-2018 08:30	-1.61	31-Jan-2018 11:40
February	2.33	03-Feb-2018 08:20	-1.93	02-Feb-2018 13:10
March	2.53	04-Mar-2018 08:10	-1.92	21-Mar-2018 01:50
April	2.34	04-Apr-2018 08:50	-1.91	01-Apr-2018 00:10
May	2.17	16-May-2018 19:20	-1.87	17-May-2018 13:10
June	2.22	15-Jun-2018 19:40	-1.72	16-Jun-2018 01:20
July	2.36	29-Jul-2018 07:20	-1.81	15-Jul-2018 01:00
August	2.56	12-Aug-2018 19:30	-1.80	14-Aug-2018 01:30
September	2.49	11-Sep-2018 20:10	-1.84	12-Sep-2018 01:20
October	2.96	12-Oct-2018 08:00	-1.74	10-Oct-2018 00:20
November	3.56	09-Nov-2018 20:10	-1.44	26-Nov-2018 01:20
December	2.56	07-Dec-2018 06:20	-1.74	25-Dec-2018 01:20

Month	Surge maxima		Surge minima	
	Value (m)	Date/Time	Value (m)	Date/Time
January	0.62	16-Jan-2018 00:20	-0.45	07-Jan-2018 16:00
February	0.70	13-Feb-2018 06:30	-0.39	04-Feb-2018 15:00
March	0.65	11-Mar-2018 20:50	-0.39	21-Mar-2018 02:40
April	0.56	04-Apr-2018 07:20	-0.22	26-Apr-2018 21:40
May	0.40	02-May-2018 06:00	-0.25	04-May-2018 14:20
June	0.28	14-Jun-2018 04:10	-0.29	20-Jun-2018 17:40
July	0.81	29-Jul-2018 09:00	-0.16	14-Jul-2018 13:00
August	0.34	26-Aug-2018 08:50	-0.20	31-Aug-2018 05:10
September	0.40	22-Sep-2018 18:00	-0.34	25-Sep-2018 03:10
October	1.08	12-Oct-2018 11:20	-0.44	23-Oct-2018 02:20
November	1.60	09-Nov-2018 20:30	-0.23	18-Nov-2018 20:20
December	0.80	15-Dec-2018 12:40	-0.37	19-Dec-2017 00:10

Month	Mean Level	
	No. of days	Elevation (OD)
January	31	0.373
February	28	0.183
March	31	0.394
April	30	0.323
May	31	0.244
June	30	0.243
July	31	0.295
August	31	0.303
September	27	0.286
October	31	0.339
November	30	0.512
December	31	0.396

Highest values in 2018			
Extreme		Surge	
Elevation (OD) (Surge component)	Date/Time	Value (m)	Date/Time
3.56 (1.59)	09-Nov-2018 20:10	1.60	09-Nov-2018 20:30
2.96 (0.84)	12-Oct-2018 08:00	1.41	07-Nov-2018 02:30
2.84 (1.09)	07-Nov-2018 07:20	1.11	29-Nov-2018 08:50
2.80 (0.81)	12-Oct-2018 20:50	1.08	12-Oct-2018 11:20
2.73 (0.55)	08-Nov-2018 18:50	1.04	07-Nov-2018 00:10
2.72 (0.46)	11-Oct-2018 07:40	0.94	12-Oct-2018 17:20
2.63 (0.58)	06-Nov-2018 17:50	0.88	13-Oct-2018 15:10
2.63 (0.36)	10-Oct-2018 20:00	0.84	27-Nov-2018 14:00
2.56 (0.19)	12-Aug-2018 19:30	0.81	29-Jul-2018 09:00
2.56 (0.56)	07-Dec-2018 06:20	0.80	15-Dec-2018 12:40

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%
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%
2018	3.56 (1.59)	09-Nov-2018 20:10	1.60	09-Nov-2018 20:30	-	94%

<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

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

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

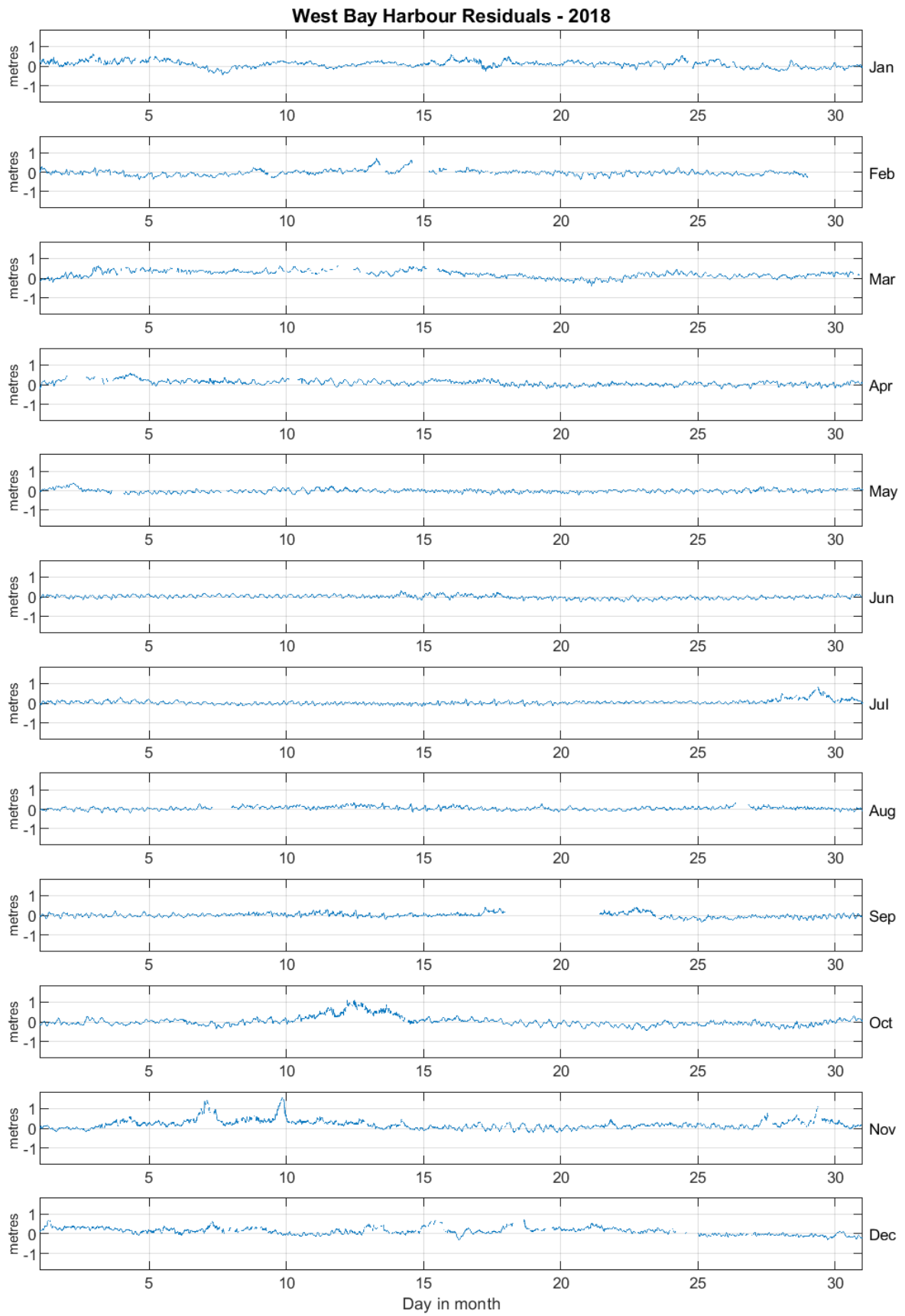


Figure 1: West Bay Harbour residuals for 2018

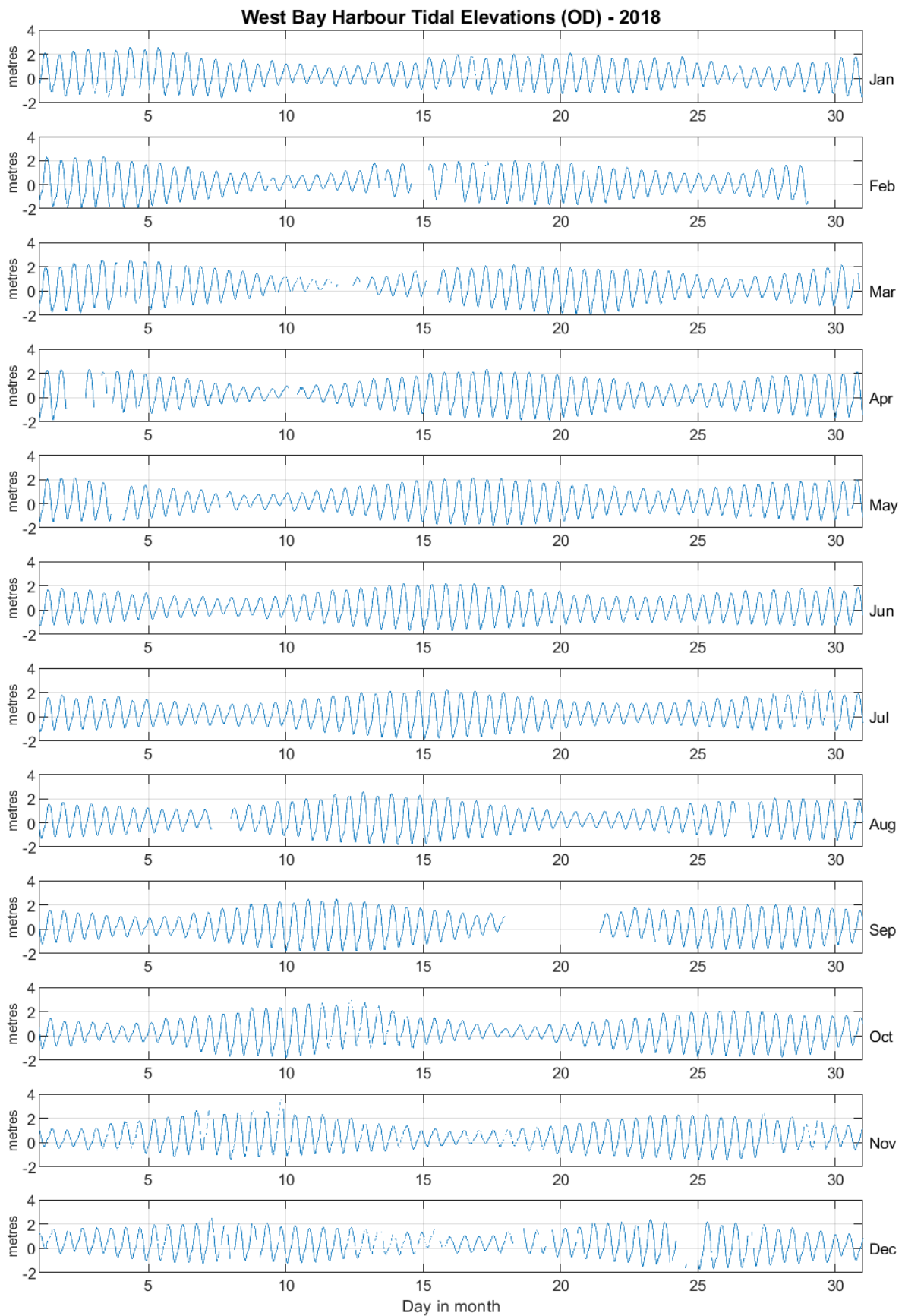
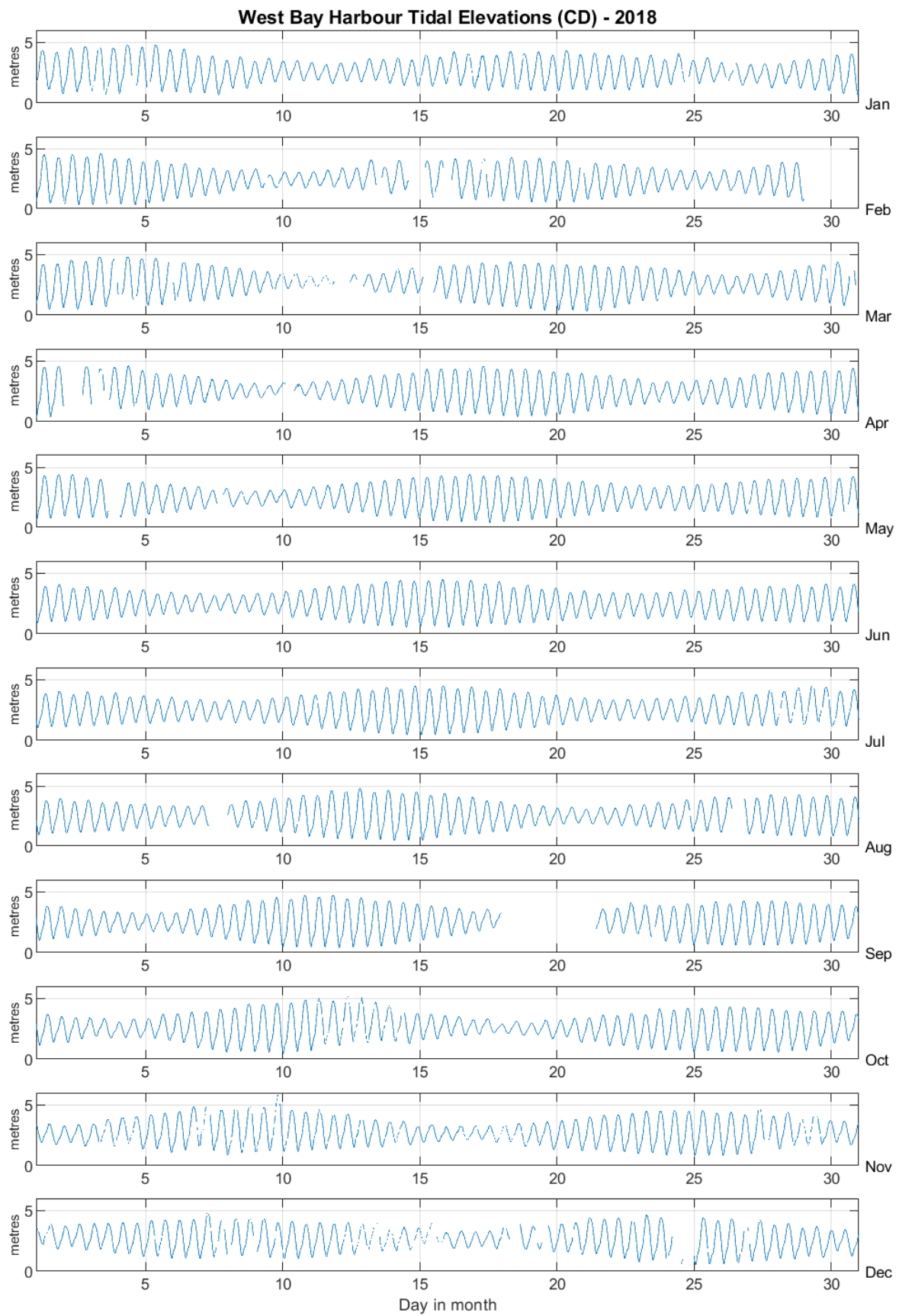


Figure 2: West Bay Harbour tidal elevations for 2018 relative to Ordnance Datum



**Figure 3:** West Bay Harbour tidal elevations for 2018 relative to Chart Datum