

## Herne Bay Tide Gauge

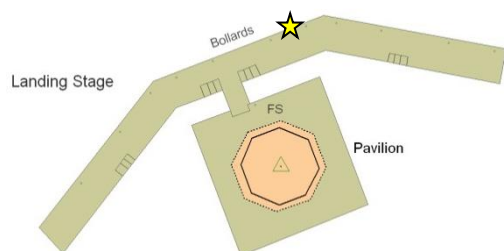
### Location

OS: 616895E 169377N

WGS84: *Latitude: 51° 22.919' N Longitude: 01° 6.934' E*

### Instrument

Etrometa Step Gauge



### Benchmarks

#### Benchmark

TGBM = 5.524 m above Ordnance Datum Newlyn

616894.912E 169376.689N

#### Description

Steel pin

TGZ = -3.510 m above Ordnance Datum Newlyn

TGZ = -0.790 m above Chart Datum

TGZ = 9.034 m below TGBM

### Datum

All data are to Ordnance Datum Newlyn. The height of Chart Datum relative to Ordnance Datum at Herne Bay is -2.72m (Admiralty Tide Tables, Supplementary Table III).

### Survey information

The site was last surveyed on 26 November 2004. All data prior to this date were re-adjusted to the new level.

### Site characteristics

The old pier head is now detached from the shore. Some wave reflection from the dolphin legs can occur. The frontage is along the outer Thames estuary. Spring tidal range is 4.9m.

## Data quality

Recovery rate (%)	Sample interval
98	10 minutes

## Service history

The step gauge became operational on 24 April 1996, and is serviced at 9-monthly intervals. No re-calibration of the gauge is necessary.

## Measurements

Prior to 01 May 2008, the step gauge measuring burst was 10 minutes at 2.56Hz, every 10 minutes, with the time stamp for the 10 minute average at the centre of the burst. From 00:00Z 01 May 2008, the measuring burst is 1 minute at 2.56 Hz, every 10 minutes, time stamped at the start of the burst.

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	3.33	08-Jan-2019 13:20:00	-2.56	22-Jan-2019 07:30:00
February	2.99	21-Feb-2019 13:40:00	-2.55	23-Feb-2019 09:20:00
March	3.05	23-Mar-2019 14:00:00	-2.73	22-Mar-2019 07:30:00
April	2.66	22-Apr-2019 14:20:00	-2.52	20-Apr-2019 07:00:00
May	2.83	04-May-2019 12:10:00	-2.15	07-May-2019 07:40:00
June	2.62	04-Jun-2019 13:00:00	-2.10	08-Jun-2019 22:20:00
July	2.74	07-Jul-2019 03:20:00	-2.22	04-Jul-2019 19:40:00
August	2.82	03-Aug-2019 01:30:00	-2.52	31-Aug-2019 19:30:00
September	3.42	30-Sep-2019 00:50:00	-2.63	02-Sep-2019 21:00:00
October	3.25	02-Oct-2019 02:20:00	-2.34	29-Oct-2019 19:10:00
November	3.04	29-Nov-2019 01:20:00	-2.22	24-Nov-2019 16:40:00
December	2.88	11-Dec-2019 11:10:00	-2.99	10-Dec-2019 18:00:00

Month	Surge maxima		Surge minima	
	Value (m)	Date/Time	Value (m)	Date/Time
January	2.05	08-Jan-2019 09:50:00	-0.52	16-Jan-2019 09:30:00
February	0.46	21-Feb-2019 05:10:00	-0.98	08-Feb-2019 22:20:00
March	1.18	25-Mar-2019 11:00:00	-1.66	12-Mar-2019 12:30:00
April	0.32	09-Apr-2019 22:40:00	-0.43	03-Apr-2019 21:20:00
May	0.69	04-May-2019 19:50:00	-0.55	29-May-2019 17:40:00
June	0.33	10-Jun-2019 19:20:00	-0.37	13-Jun-2019 18:20:00
July	0.38	06-Jul-2019 23:20:00	-0.38	22-Jul-2019 13:00:00
August	0.33	17-Aug-2019 12:30:00	-0.80	10-Aug-2019 16:00:00
September	0.71	15-Sep-2019 21:20:00	-0.57	11-Sep-2019 07:40:00
October	0.93	01-Oct-2019 22:30:00	-0.82	07-Oct-2019 16:00:00
November	0.77	28-Nov-2019 21:40:00	-0.50	11-Nov-2019 13:10:00
December	1.60	09-Dec-2019 16:50:00	-2.08	10-Dec-2019 20:20:00

Month	Mean Level	
	No. of days	Elevation (OD)
January	31	0.224
February	28	0.088
March	31	0.165
April	30	0.103
May	31	0.155
June	30	0.145
July	31	0.192
August	31	0.136
September	30	0.213
October	31	0.284
November	30	0.263
December	31	0.241

<b>Highest values in 2019</b>			
<b>Extreme</b>		<b>Surge</b>	
<b>Elevation (OD) (Surge component)</b>	<b>Date/Time</b>	<b>Value (m)</b>	<b>Date/Time</b>
3.42 (0.45)	30-Sep-2019 00:50:00	2.05	08-Jan-2019 09:50:00
3.33 (1.17)	08-Jan-2019 13:20:00	1.60	09-Dec-2019 16:50:00
3.25 (0.41)	02-Oct-2019 02:20:00	1.43	09-Dec-2019 18:00:00
3.15 (0.19)	01-Oct-2019 13:50:00	1.24	11-Dec-2019 07:10:00
3.11 (0.17)	30-Sep-2019 13:00:00	1.21	11-Dec-2019 07:00:00
3.06 (0.20)	02-Oct-2019 14:40:00	1.20	28-Jan-2019 01:00:00
3.05 (0.18)	27-Oct-2019 23:50:00	1.20	28-Jan-2019 00:40:00
3.05 (0.25)	23-Mar-2019 14:00:00	1.18	25-Mar-2019 11:00:00
3.04 (0.49)	29-Nov-2019 01:20:00	1.13	25-Mar-2019 11:30:00
3.04 (0.37)	28-Nov-2019 13:10:00	1.12	01-Jan-2019 16:40:00

Year	Annual extreme maxima		Annual surge maxima		Z <sub>0</sub> (OD)	Annual recovery rate
	Elevation (OD) (Surge)	Date/Time	Value (m)	Date/Time		
1996	3.11 (0.54)	13-Nov-1996 00:50	1.29	12-Sep-1996 20:30	-	60%
1997	3.16 (0.66)	11-Apr-1997 15:00	1.23	18-Feb-1997 17:40	-	88%
1998	3.35 (0.52)	08-Oct-1998 13:40	1.39	11-Mar-1998 18:40	-	90%
1999	3.15 (0.55)	27-Nov-1999 14:50	1.87	05-Feb-1999 11:00	-	76%
2000	3.20 (0.51)	22-Jan-2000 12:50	1.78	30-Jan-2000 03:40	-	84%
2001	3.28 (0.65)	08-Feb-2001 12:00	1.71	08-Nov-2001 14:30	-	91%
2002	3.14 (0.39)	07-Nov-2002 01:10	1.68	27-Oct-2002 22:10	0.141	99%
2003	3.09 (0.61)	08-Oct-2003 23:30	1.61	30-Jan-2003 18:00	0.172	100%
2004	3.35 (0.77)	13-Nov-2004 00:20	1.81	08-Feb-2004 21:10	-	96%
2005	3.35 (1.19)	16-Dec-2005 12:40	1.78	25-Nov-2005 01:10	0.148	84%
2006	3.18 (0.40)	07-Oct-2006 11:40	1.95	31-Oct-2006 22:20	0.141	87%
2007	3.35 (0.76)	25-Nov-2007 11:50	2.52	09-Nov-2007 06:50	0.168	97%
2008	3.14 (0.70)	21-Mar-2008 11:50	1.43	21-Nov-2008 12:30	-	70%
2009	2.99 (0.57)	04-Oct-2009 11:50	1.96	31-Mar-2009 09:10	0.140	98%
2010	2.97 (0.51)	23-Dec-2010 13:50	1.22	16-Dec-2010 15:50	0.172	93%
2011	3.28 (0.88)	28-Nov-2011 01:20	1.77	27-Nov-2011 21:30	0.141	95%
2012	3.03 (0.35)	17-Oct-2012 00:40	1.59	05-Jan-2012 18:50	0.133	98%
2013	4.10 (1.59)	06-Dec-2013 01:30	2.65	05-Dec-2013 21:20	0.130	69%
2014	3.28 (1.24)	21-Oct-2014 23:20	1.83	22-Oct-2014 03:40	-	61%
2015	3.10 (0.14)	21-Mar-2015 13:00	1.54	21-Nov-2015 14:50	-	97%
2016	3.15 (0.53)	10-Feb-2016 13:30	1.57	27-Dec-2016 06:20	-	95%
2017	3.32 (0.82)	14-Jan-2017 00:40	2.07	13-Jan-2017 20:30	-	95%
2018	3.20 (0.62)	30-Apr-2018 12:30	1.14	30-Apr-2018 08:20	-	93%
2019	3.42 (0.45)	30-Sep-2019 00:50	2.05	08-Jan-2019 09:50	0.185	98%

Tidal levels		
Observation period	March 2007 to December 2012	
Tide Level	Elevation (OD)	Elevation (CD)
HAT	3.02	5.75
MHWS	2.49	5.21
MHWN	1.45	4.17
MSL	0.15	2.87
MLWN	-1.16	1.57
MLWS	-2.19	0.53
LAT	-2.72	-0.00

## 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 and tide levels were produced by Fugro GB Marine Limited.

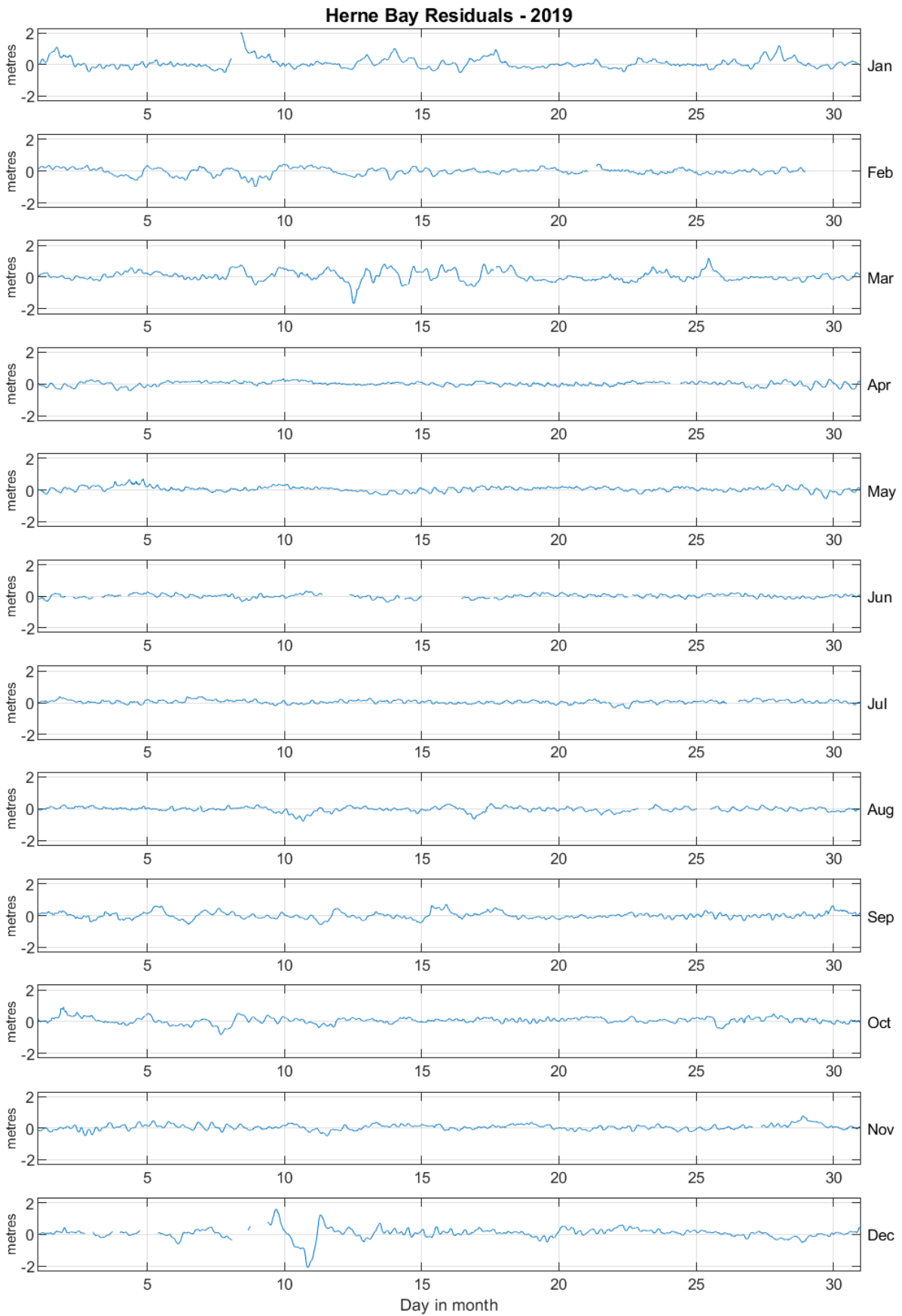
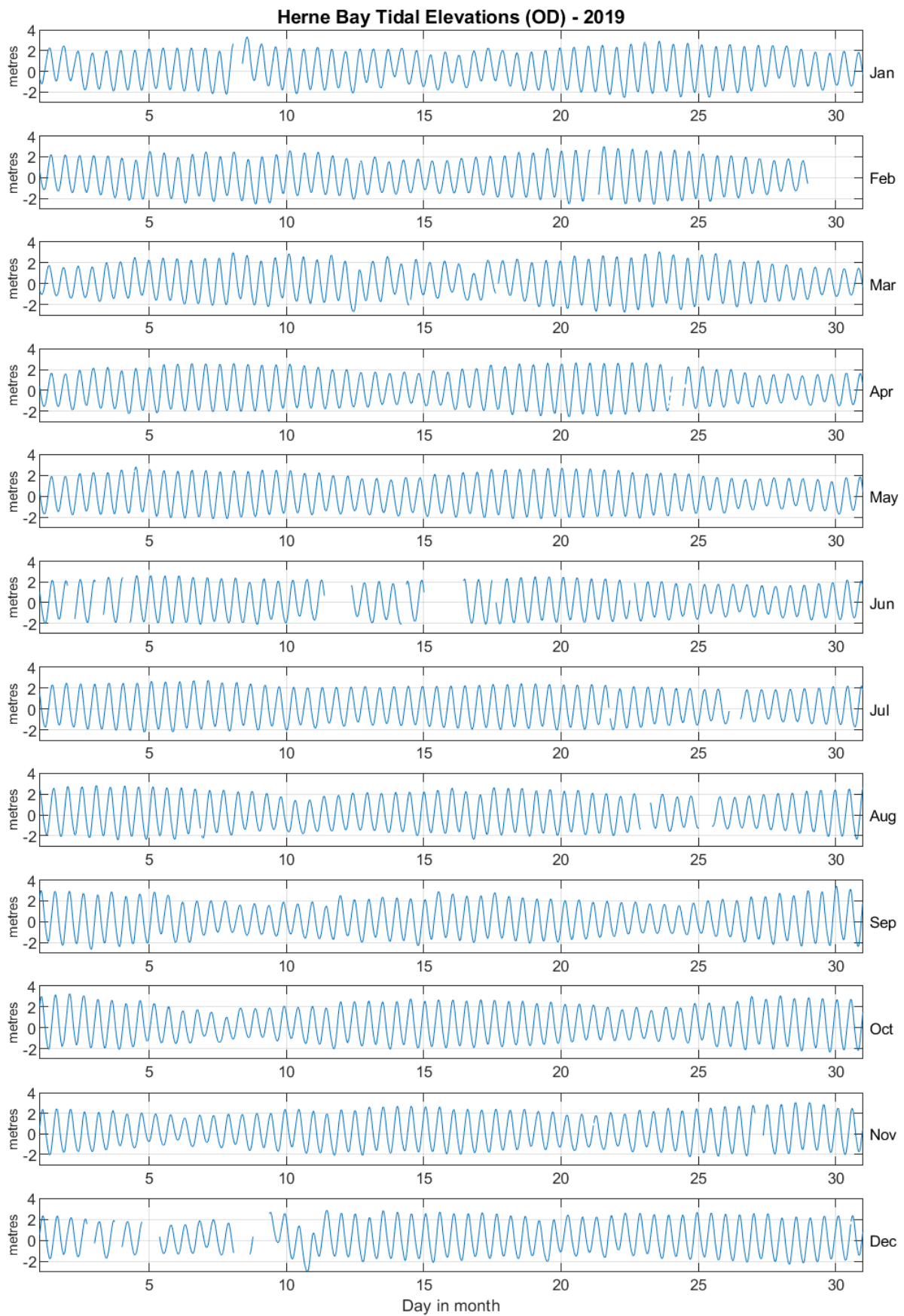
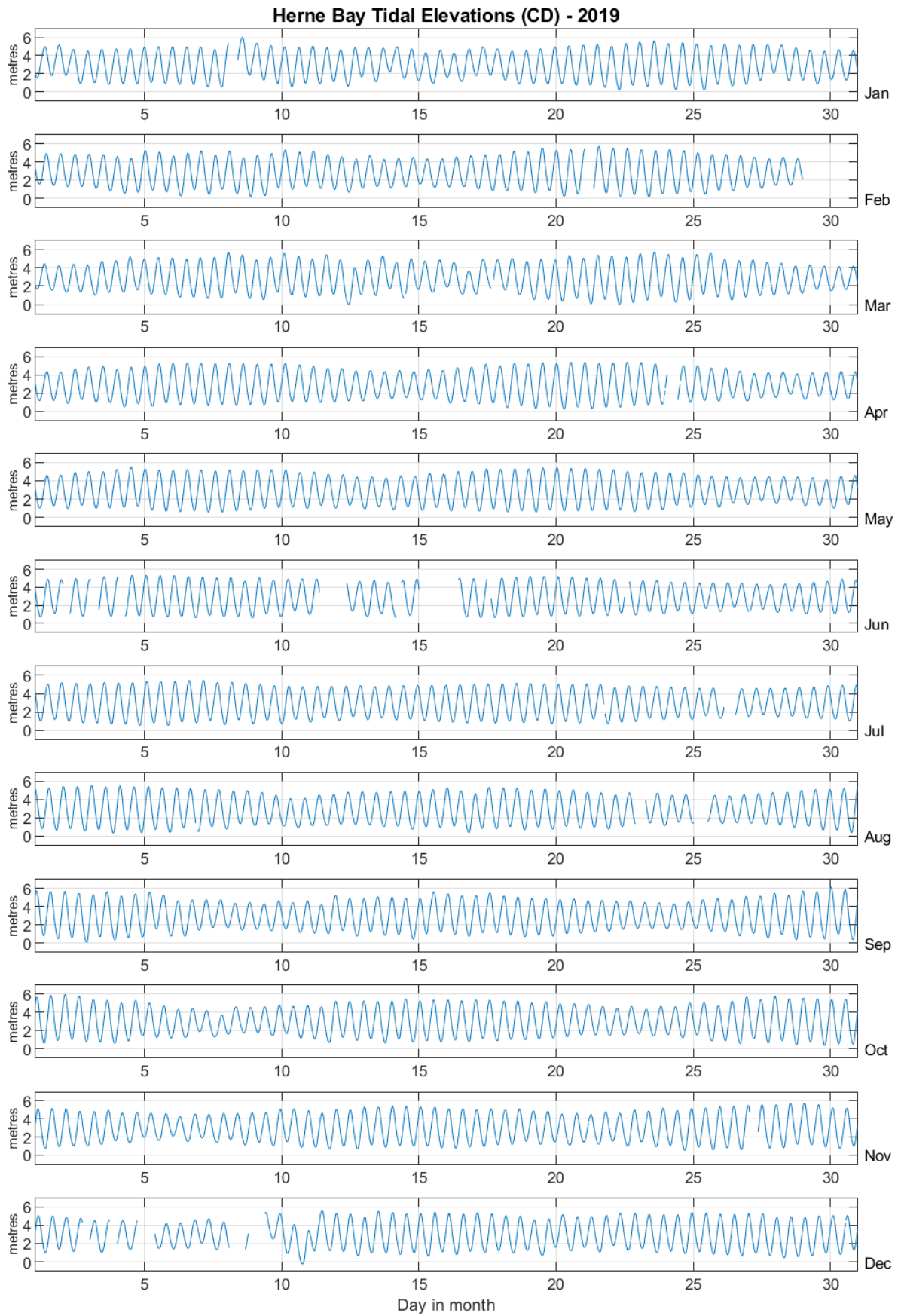


Figure 1: Herne Bay residuals for 2019



**Figure 2:** Herne Bay tidal elevations for 2019 relative to Ordnance Datum





**Figure 3:** Herne Bay tidal elevations for 2019 relative to Chart Datum