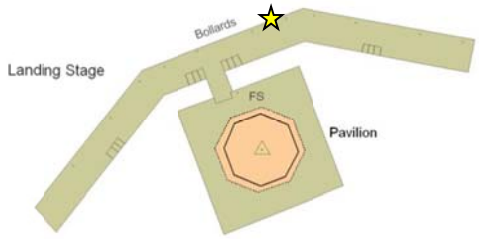
Herne Bay Tide Gauge

Location

OS: 616895E 169377N
WGS84: *Latitude:* 51° 22.919196' N *Longitude:* 01° 6.9335907' E

Instrument Type

Etrometa Step Gauge



Benchmarks

Benchmark		*Description*
TGBM = 5.524m above Ordnance Datum Newlyn	616894.912E 169376.689N	Steel pin
TGZ = -3.510m above Ordnance Datum Newlyn		
TGZ = -0.790m above Chart Datum		
TGZ = 9.034m 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
95	10 minutes

Service history

The step gauge became operational on 24 April 1996. No re-calibration of the gauge is necessary. It was last serviced in November 2011.

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 2.56Hz, 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	2.79	06-Jan-2011 13:30	-2.47	23-Jan-2011 08:40
February	2.74	20-Feb-2011 13:40	-2.88	04-Feb-2011 07:30
March	2.80	22-Mar-2011 01:40	-2.69	20-Mar-2011 06:40
April	2.81	20-Apr-2011 01:20	-2.52	19-Apr-2011 07:00
May	2.77	19-May-2011 01:00	-2.36	16-May-2011 05:00
June	2.65	18-Jun-2011 01:30	-2.11	13-Jun-2011 04:00
July	2.58	15-Jul-2011 00:00	-2.36	31-Jul-2011 19:10
August	2.87	30-Aug-2011 00:40	-2.50	02-Aug-2011 20:30
September	2.85	30-Sep-2011 14:00	-2.52	27-Sep-2011 18:30
October	2.95	28-Oct-2011 12:50	-2.41	25-Oct-2011 17:10
November	3.28	28-Nov-2011 01:20	-2.56	25-Nov-2011 05:50
December	3.20	09-Dec-2011 11:10	-2.76	28-Dec-2011 09:20

Month	Surge maxima		Surge minima	
	Value (m)	Date/Time	Value (m)	Date/Time
January	0.75	11-Jan-2011 23:20	-0.53	15-Jan-2011 16:20
February	0.90	04-Feb-2011 20:40	-0.83	04-Feb-2011 07:30
March	0.33	11-Mar-2011 02:20	-0.53	02-Mar-2011 09:30
April	0.33	07-Apr-2011 13:00	-0.39	01-Apr-2011 21:00
May	0.92	24-May-2011 13:00	-0.80	24-May-2011 01:40
June	0.46	04-Jun-2011 22:20	-0.47	13-Jun-2011 05:40
July	0.87	24-Jul-2011 02:20	-0.38	07-Jul-2011 13:10
August	0.58	29-Aug-2011 20:40	-0.54	10-Aug-2011 17:50
September	0.41	07-Sep-2011 12:20	-1.08	06-Sep-2011 14:40
October	0.72	19-Oct-2011 12:30	-0.64	22-Oct-2011 16:30
November	1.77	27-Nov-2011 21:30	-0.68	25-Nov-2011 06:50
December	1.26	02-Dec-2011 01:00	-1.68	08-Dec-2011 19:40

Month	Mean Level	
	No. of days	Elevation (OD)
January	29	0.119
February	28	0.041
March	29	0.018
April	30	0.107
May	31	0.093
June	30	0.137
July	31	0.175
August	31	0.184
September	30	0.154
October	31	0.161
November	30	0.188
December	31	0.232

Highest values in 2011			
Extreme		**Surge**	
Elevation (OD) *(Surge component)*	Date/Time	Value (m)	Date/Time
3.28 *(0.88)*	28-Nov-2011 01:20	1.77	27-Nov-2011 21:30
3.20 *(1.09)*	09-Dec-2011 11:10	1.64	27-Nov-2011 20:50
3.06 *(0.42)*	25-Nov-2011 11:50	1.26	02-Dec-2011 01:00
3.05 *(0.55)*	26-Nov-2011 00:00	1.15	01-Dec-2011 23:50
2.95 *(0.16)*	28-Oct-2011 12:50	1.12	09-Dec-2011 10:10
2.95 *(0.35)*	27-Dec-2011 13:50	1.09	26-Dec-2011 09:10
2.87 *(0.15)*	30-Aug-2011 00:40	1.07	26-Dec-2011 09:20
2.85 *(0.04)*	30-Sep-2011 14:00	1.00	29-Dec-2011 10:50
2.84 *(0.00)*	29-Sep-2011 13:10	0.93	03-Dec-2011 16:40
2.84 *(0.04)*	31-Aug-2011 13:40	0.92	24-May-2011 13:00

Year	Annual extreme maxima		Annual surge maxima		Z_0 (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%

Tidal levels		
Observation period	May 1996 to December 2011	
Tide Level	Elevation (OD)	Elevation (CD)
HAT	3.00	5.72
MHWS	2.46	5.18
MHWN	1.43	4.15
MSL	0.14	2.86
MLWN	-1.15	1.57
MLWS	-2.18	0.54
LAT	-2.65	0.07

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.

Acknowledgement

Tidal predictions were produced using the TASK2000 software, kindly provided by the Permanent Service for Mean Sea Level (PSMSL), Proudman Oceanographic Laboratory. Tide levels were produced by EMU Limited.

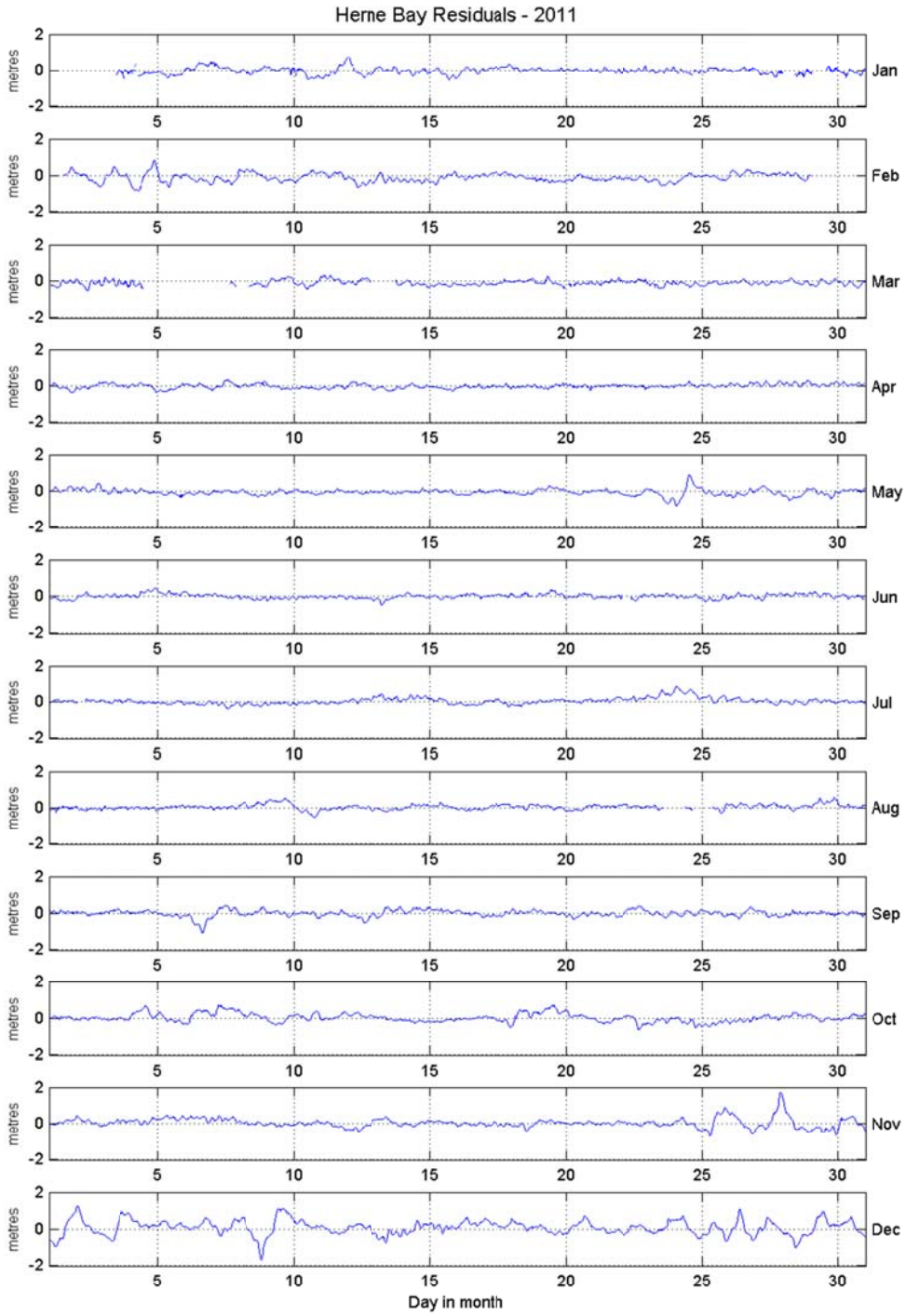


Figure 1: HerneBay residuals for 2011

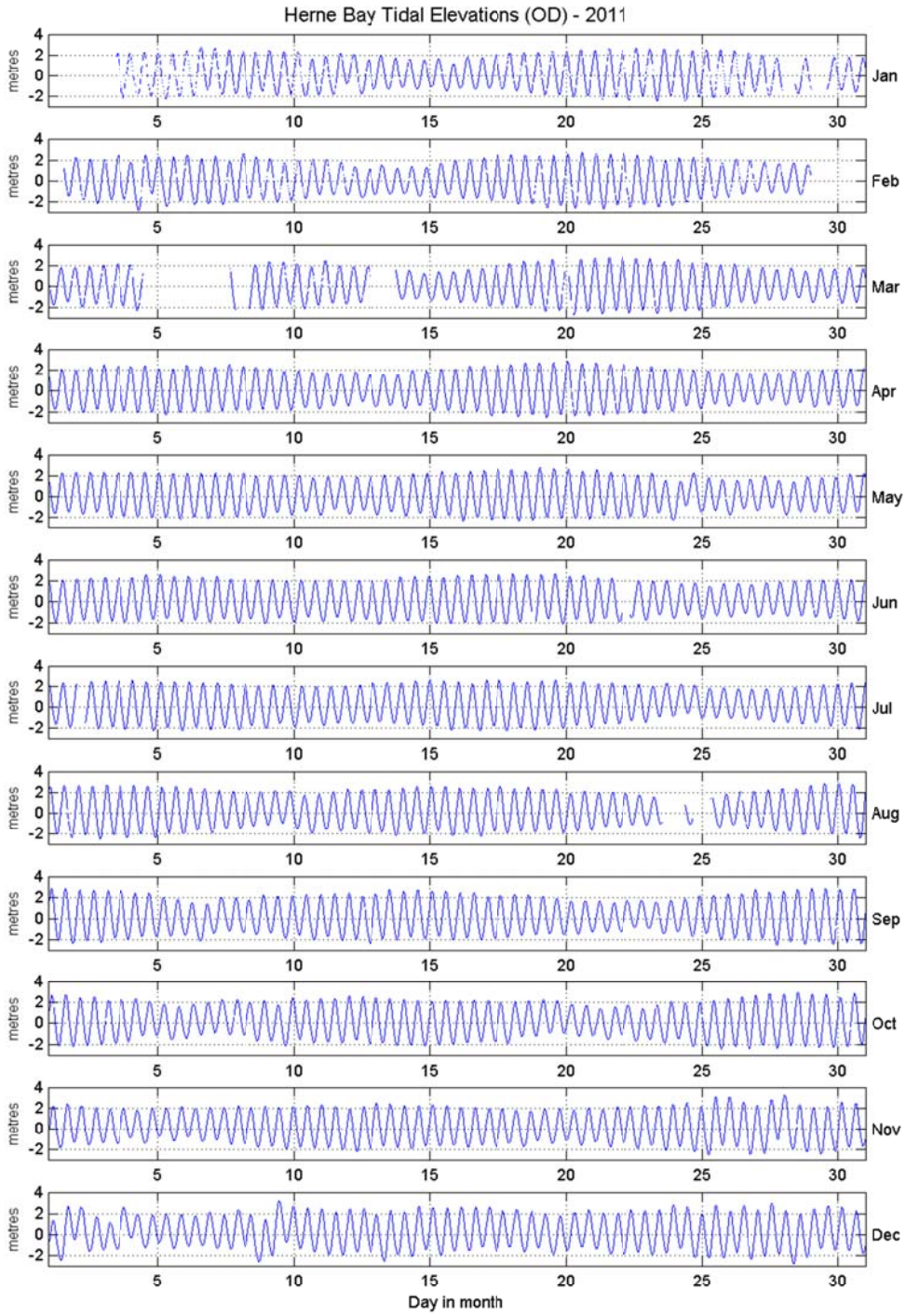


Figure 2: Herne Bay tidal elevations for 2011 relative to Ordnance Datum

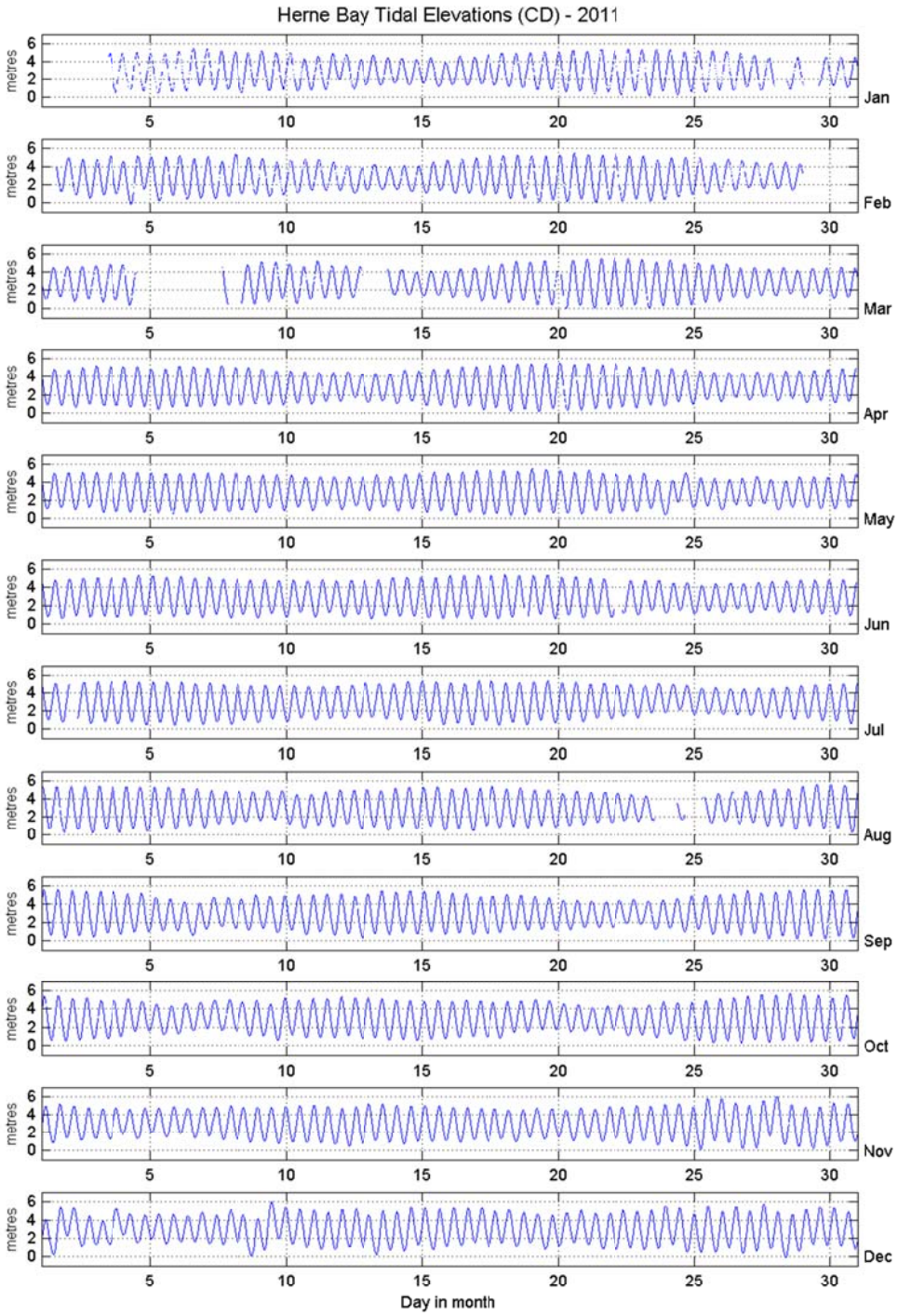


Figure 3: Herne Bay tidal elevations for 2011 relative to Chart Datum