Swanage Pier Tide Gauge

Location

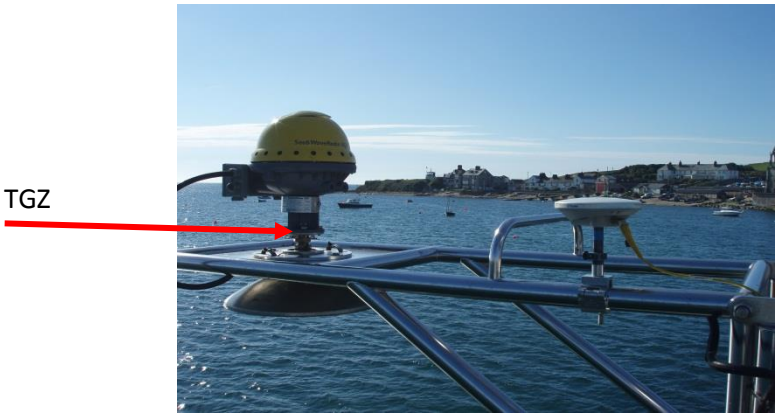
OS: 403692E 78849N

WGS84: *Latitude:* 50° 36.5598' N *Longitude:* 01° 56.9510' W

Seaward end of Swanage Pier

Instrument

Rosemount WaveRadar REX



Benchmarks

Benchmark	*Description*
TGBM = 6.262 m above Ordnance Datum Newlyn	Top of S/S horizontal frame
TGZ = 6.337 m above Ordnance Datum Newlyn	
TGZ = 7.737 m above Chart Datum	
TGZ = 0.075 m above TGBM	

Datum

All data are to Ordnance Datum Newlyn. The height of Chart Datum relative to Ordnance Datum at Swanage is -1.40m (Admiralty Tide Tables, Supplementary Table III).

Survey information

The site was surveyed on 29 May 2008.

Site characteristics

The Pier is on open coast with no nearby estuaries, but leeward of a headland. Spring tidal range is approx. 1.1m.

Data quality

Recovery rate (%)	Sample interval
96	10 minutes

Service history

The radar was first deployed on 07 March 2007 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. It should be noted that, given the small tidal range and double High Waters, tidal predictions are particularly difficult at this site, both for elevation and especially for timing. Accordingly, there may be instances of apparent tidal surge and/or periodicity in the surge which are, in reality, an artefact of the predictions.

Statistics

All times GMT

Month	Extreme maxima		Extreme minima	
	Elevation (OD)	Date/Time	Elevation (OD)	Date/Time
January	1.11	12-Jan-2017 07:30	-1.03	13-Jan-2017 16:00
February	1.19	28-Feb-2017 09:40	-1.13	12-Feb-2017 16:30
March	1.19	01-Mar-2017 10:30	-1.09	29-Mar-2017 16:20
April	1.08	28-Apr-2017 09:40	-1.07	27-Apr-2017 16:00
May	1.10	27-May-2017 09:30	-1.02	28-May-2017 04:50
June	1.13	26-Jun-2017 22:30	-0.93	26-Jun-2017 04:40
July	1.10	25-Jul-2017 22:10	-1.04	25-Jul-2017 04:30
August	1.13	22-Aug-2017 21:20	-0.95	22-Aug-2017 03:40
September	1.22	08-Sep-2017 22:10	-0.92	22-Sep-2017 04:30
October	1.29	19-Oct-2017 20:00	-1.02	07-Oct-2017 04:00
November	1.14	05-Nov-2017 09:10	-0.97	06-Nov-2017 16:40
December	1.24	10-Dec-2017 05:40	-1.12	05-Dec-2017 16:20

Month	Surge maxima		Surge minima	
	Value (m)	Date/Time	Value (m)	Date/Time
January	0.38	14-Jan-2017 01:20	-0.36	18-Jan-2017 15:10
February	0.70	02-Feb-2017 19:50	-0.35	13-Feb-2017 01:00
March	0.41	01-Mar-2017 18:00	-0.30	25-Mar-2017 21:50
April	0.29	30-Apr-2017 12:40	-0.29	20-Apr-2017 03:50
May	0.33	11-May-2017 13:30	-0.25	24-May-2017 12:50
June	0.35	05-Jun-2017 23:10	-0.22	17-Jun-2017 07:00
July	0.25	21-Jul-2017 10:00	-0.25	16-Jul-2017 06:30
August	0.32	02-Aug-2017 14:10	-0.18	11-Aug-2017 03:10
September	0.41	12-Sep-2017 20:40	-0.20	20-Sep-2017 04:40
October	0.65	29-Oct-2017 13:10	-0.33	22-Oct-2017 02:10
November	0.38	22-Nov-2017 18:20	-0.39	14-Nov-2017 08:20
December	0.57	10-Dec-2017 07:40	-0.43	18-Dec-2017 23:40

Month	Mean Level	
	No. of days	Elevation (OD)
January	31	0.215
February	28	0.262
March	31	0.232
April	30	0.178
May	31	0.278
June	30	0.294
July	31	0.308
August	31	0.296
September	30	0.341
October	31	0.326
November	30	0.321
December	31	0.299

Highest values in 2017			
Extreme		**Surge**	
Elevation (OD) *(Surge component)*	Date/Time	Value (m)	Date/Time
1.29 *(0.39)*	19-Oct-2017 20:00	0.70	02-Feb-2017 19:50
1.26 *(0.32)*	21-Oct-2017 09:20	0.67	02-Feb-2017 20:20
1.24 *(0.52)*	10-Dec-2017 05:40	0.65	29-Oct-2017 13:10
1.22 *(0.19)*	08-Sep-2017 22:10	0.60	16-Oct-2017 11:50
1.19 *(0.20)*	01-Mar-2017 10:30	0.57	10-Dec-2017 07:40
1.19 *(0.19)*	28-Feb-2017 09:40	0.51	29-Dec-2017 08:00
1.16 *(0.23)*	27-Feb-2017 08:50	0.50	31-Dec-2017 02:10
1.15 *(0.05)*	07-Oct-2017 22:00	0.50	26-Dec-2017 18:00
1.14 *(0.03)*	05-Nov-2017 09:10	0.50	31-Dec-2017 02:30
1.13 *(0.33)*	31-Dec-2017 06:50	0.48	02-Feb-2017 07:30

Year	Annual extreme maxima		Annual surge maxima		Z_0 (OD)	Annual recovery rate
	Elevation (OD) *(Surge)*	Date/Time	Value (m)	Date/Time		
2008	1.66 *(0.64)*	10-Mar-2008 10:10	0.91	10-Mar-2008 05:40	-	94%
2009	1.33 *(0.53)*	09-Feb-2009 20:50	0.80	19-Jan-2009 05:20	0.242	90%
2010	1.34 *(0.43)*	30-Mar-2010 08:20	0.65	12-Nov-2010 16:00	0.263	96%
2011	1.14 *(-0.04)*	30-Aug-2011 21:20	0.39	07-Jan-2011 14:30		97%
2012	1.53 *(0.39)*	14-Dec-2012 09:00	0.64	25-Apr-2012 16:40	-	96%
2013	1.32 *(0.26)*	04-Nov-2013 08:30	0.67	27-Oct-2013 23:40	-	98%
2014	1.39 *(0.48)*	08-Oct-2014 21:00	0.91	14-Feb-2014 18:10	-	97%
2015	1.38 *(0.38)*	29-Oct-2015 09:40	0.62	15-Jan-2015 02:50	-	97%
2016	1.34 *(0.39)*	12-Feb-2016 11:20	0.88	20-Nov-2016 02:30	-	98%
2017	1.29 *(0.39)*	19-Oct-2017 20:00	0.70	02-Feb-2017 19:50	-	96%

Tidal levels		
Observation period	January 2008 to December 2012	
Tide Level	Elevation (OD)	Elevation (CD)
HAT	1.22	2.62
MHWS	0.81	2.21
MHWN	0.44	1.84
MSL	0.26	1.66
MLWN	0.08	1.48
MLWS	-0.29	1.11
LAT	-1.34	0.06

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 levels were produced by Fugro GB Marine Limited. The REX is installed on Swanage Pier by kind permission of Swanage Pier Trust.

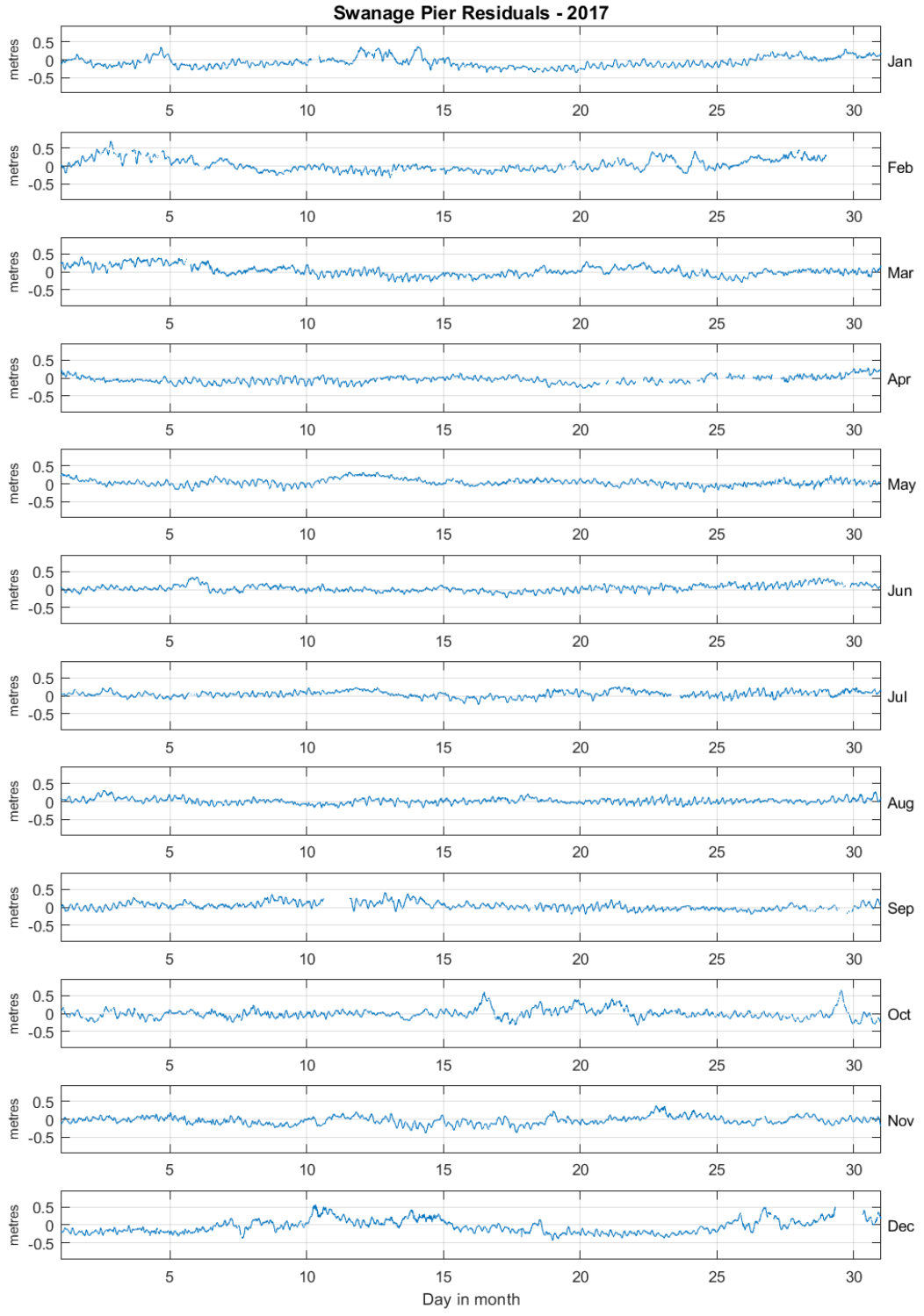


Figure 1: Swanage Pier residuals for 2017

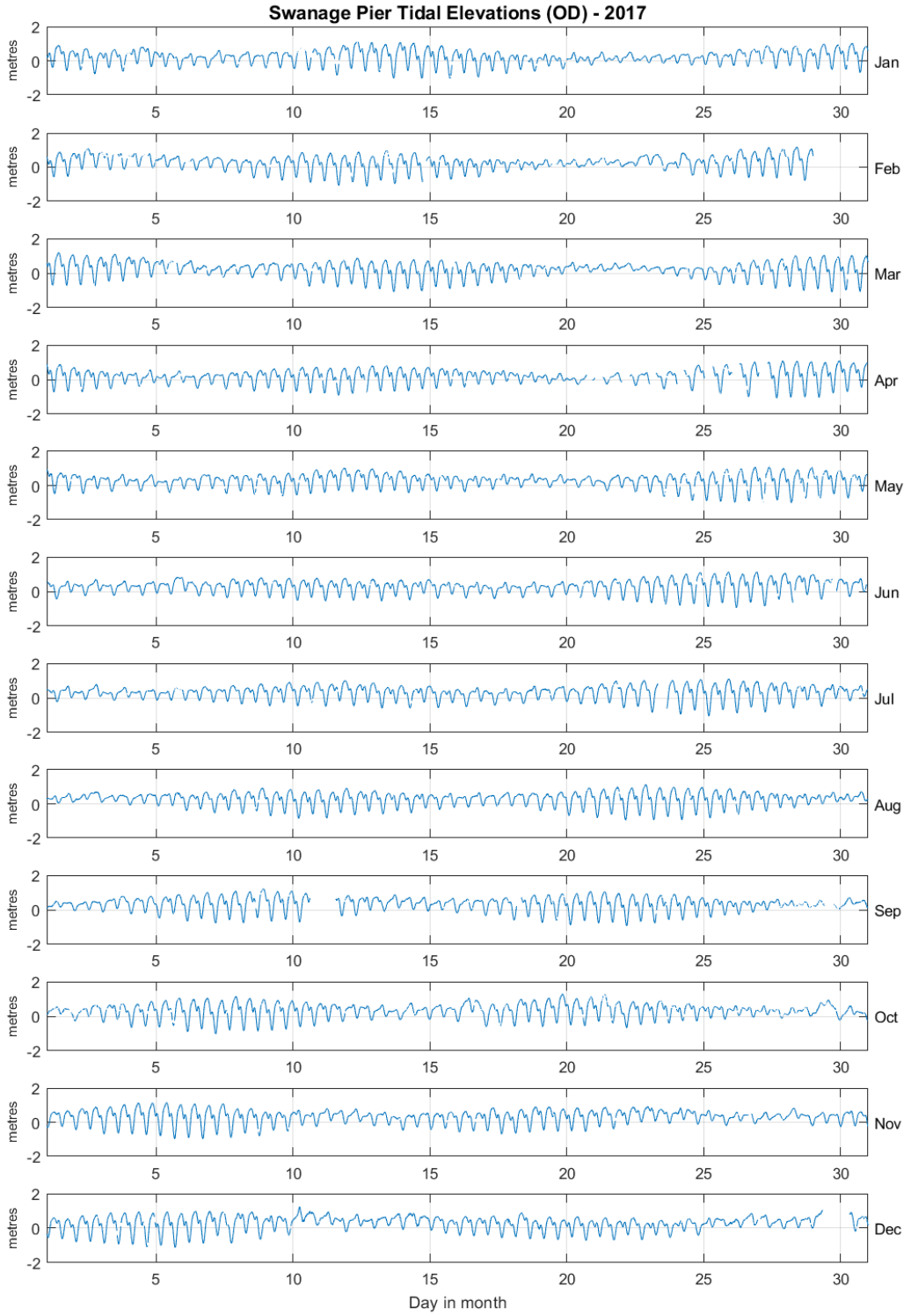


Figure 2: Swanage Pier tidal elevations for 2017 relative to Ordnance Datum

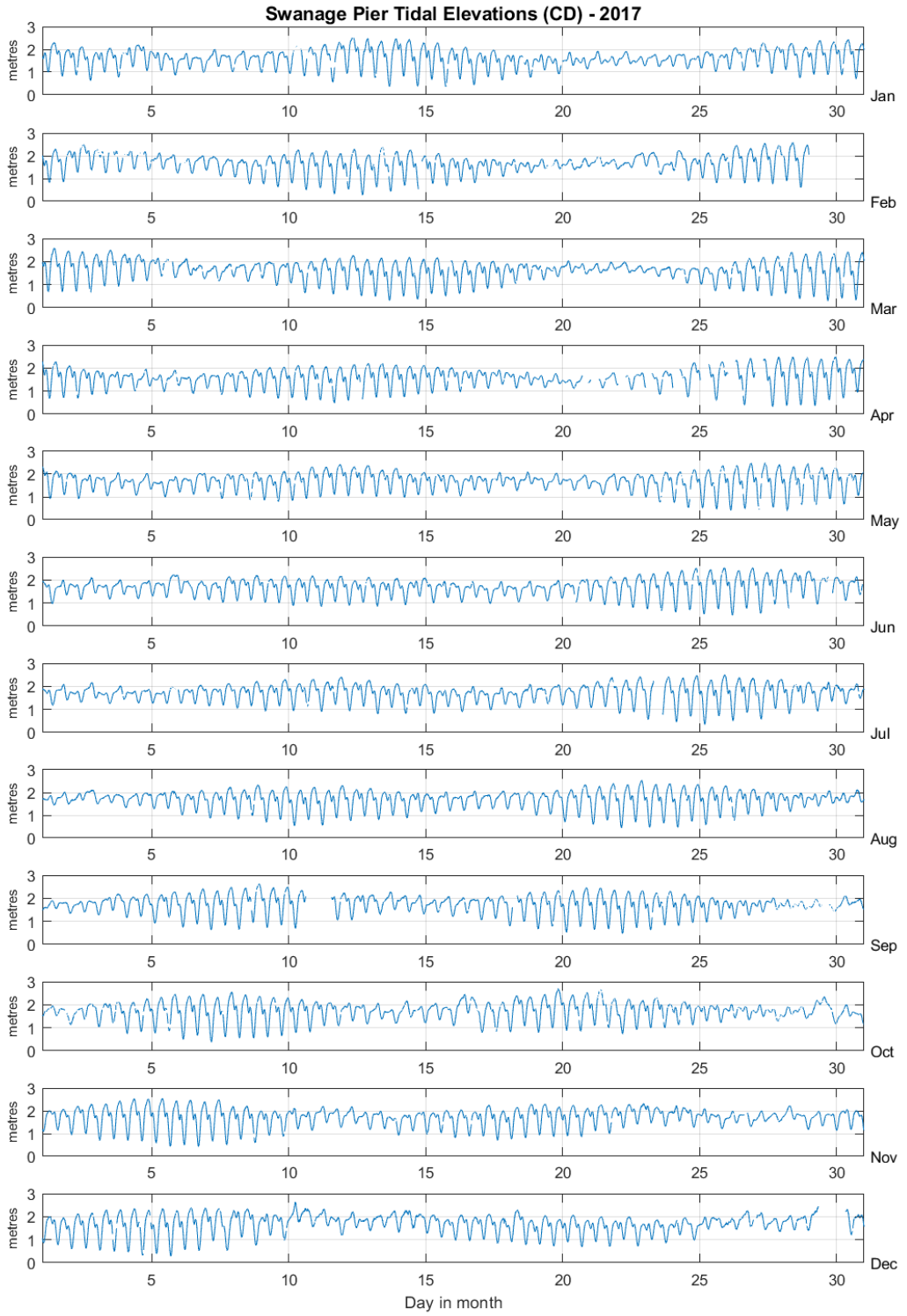


Figure 3: Swanage Pier tidal elevations for 2017 relative to Chart Datum