

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

TGZ



Benchmarks

Benchmark

TGBM = 6.262 m above Ordnance Datum Newlyn

TGZ = 6.337 m above Ordnance Datum Newlyn

TGZ = 7.737 m above Chart Datum

TGZ = 0.075 m above TGBM

Description

Top of S/S horizontal frame

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 |
|-------------------|-----------------|
| 98 | 10 minutes |

Service history

The radar was first deployed on 07 March 2007 and is serviced at 9-monthly intervals. No recalibration 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 | 1.28 | 11-Jan-2016 09:10 | -0.83 | 24-Jan-2016 15:50 |
| February | 1.34 | 12-Feb-2016 11:20 | -0.89 | 24-Feb-2016 16:40 |
| March | 1.22 | 09-Mar-2016 08:20 | -1.41 | 10-Mar-2016 16:20 |
| April | 1.21 | 09-Apr-2016 09:50 | -1.16 | 08-Apr-2016 16:10 |
| May | 1.16 | 08-May-2016 22:30 | -0.95 | 08-May-2016 04:00 |
| June | 1.02 | 05-Jun-2016 21:10 | -1.00 | 07-Jun-2016 04:40 |
| July | 1.00 | 05-Jul-2016 21:20 | -0.94 | 06-Jul-2016 04:20 |
| August | 1.27 | 19-Aug-2016 21:10 | -0.93 | 21-Aug-2016 05:00 |
| September | 1.19 | 17-Sep-2016 20:50 | -1.09 | 18-Sep-2016 04:00 |
| October | 1.23 | 16-Oct-2016 20:20 | -1.07 | 18-Oct-2016 16:40 |
| November | 1.29 | 17-Nov-2016 10:10 | -1.08 | 14-Nov-2016 15:00 |
| December | 1.18 | 15-Dec-2016 09:20 | -1.01 | 17-Dec-2016 18:00 |

| Month | Surge maxima | | Surge minima | |
|-----------|--------------|-------------------|--------------|-------------------|
| | Value (m) | Date/Time | Value (m) | Date/Time |
| January | 0.62 | 09-Jan-2016 21:30 | -0.21 | 27-Jan-2016 01:20 |
| February | 0.64 | 06-Feb-2016 19:00 | -0.29 | 28-Feb-2016 18:50 |
| March | 0.78 | 28-Mar-2016 03:40 | -0.40 | 14-Mar-2016 03:00 |
| April | 0.36 | 02-Apr-2016 19:40 | -0.32 | 20-Apr-2016 22:40 |
| May | 0.31 | 11-May-2016 00:10 | -0.26 | 05-May-2016 00:30 |
| June | 0.30 | 16-Jun-2016 02:50 | -0.21 | 19-Jun-2016 14:50 |
| July | 0.20 | 01-Jul-2016 02:00 | -0.29 | 16-Jul-2016 12:10 |
| August | 0.44 | 20-Aug-2016 04:40 | -0.25 | 11-Aug-2016 08:50 |
| September | 0.40 | 13-Sep-2016 09:20 | -0.22 | 27-Sep-2016 22:20 |
| October | 0.40 | 16-Oct-2016 05:00 | -0.24 | 05-Oct-2016 17:00 |
| November | 0.88 | 20-Nov-2016 02:30 | -0.37 | 28-Nov-2016 22:50 |
| December | 0.35 | 24-Dec-2016 14:50 | -0.51 | 27-Dec-2016 22:40 |

| Month | Mean Level | |
|-----------|-------------|----------------|
| | No. of days | Elevation (OD) |
| January | 30 | 0.408 |
| February | 29 | 0.318 |
| March | 29 | 0.195 |
| April | 30 | 0.284 |
| May | 30 | 0.282 |
| June | 30 | 0.276 |
| July | 30 | 0.257 |
| August | 31 | 0.272 |
| September | 30 | 0.317 |
| October | 30 | 0.284 |
| November | 30 | 0.337 |
| December | 30 | 0.251 |

| Highest values in 2016 | | | |
|-------------------------------------|-------------------|-----------|-------------------|
| Extreme | | Surge | |
| Elevation (OD) (Surge component) | Date/Time | Value (m) | Date/Time |
| 1.34 (0.39) | 12-Feb-2016 11:20 | 0.88 | 20-Nov-2016 02:30 |
| 1.30 (0.24) | 11-Feb-2016 10:30 | 0.78 | 28-Mar-2016 03:40 |
| 1.29 (0.31) | 17-Nov-2016 10:10 | 0.64 | 06-Feb-2016 19:00 |
| 1.29 (0.21) | 10-Feb-2016 09:50 | 0.62 | 09-Jan-2016 21:30 |
| 1.28 (0.29) | 09-Feb-2016 08:50 | 0.61 | 01-Jan-2016 21:50 |
| 1.28 (0.44) | 08-Feb-2016 07:50 | 0.61 | 08-Feb-2016 15:50 |
| 1.28 (0.29) | 11-Jan-2016 09:10 | 0.57 | 09-Mar-2016 04:00 |
| 1.27 (0.27) | 19-Aug-2016 21:10 | 0.56 | 06-Feb-2016 14:40 |
| 1.24 (0.46) | 13-Feb-2016 11:40 | 0.56 | 01-Jan-2016 18:00 |
| 1.23 (0.20) | 16-Oct-2016 20:20 | 0.56 | 21-Nov-2016 12:00 |

| Year | Annual extreme maxima | | Annual surge maxima | | Z ₀ (OD) | Annual recovery rate |
|------|---------------------------|-------------------|---------------------|-------------------|------------------------|----------------------|
| | Elevation (OD) (Surge) | Date/Time | Value (m) | Date/Time | | |
| 2008 | 1.66 (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% |

| 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 Z₀ 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 EMU Limited. The REX is installed on Swanage Pier by kind permission of Swanage Pier Trust.

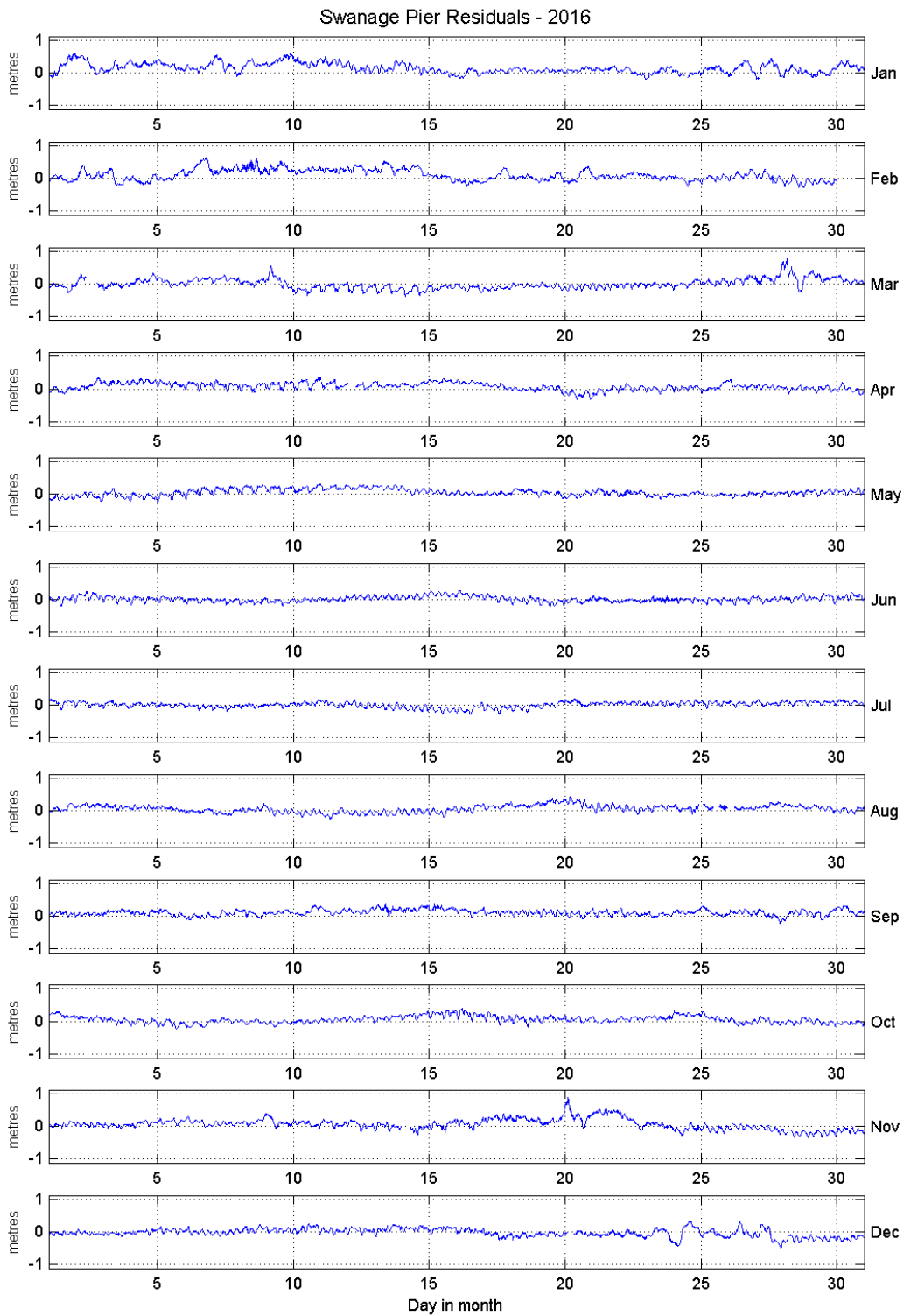


Figure 1: Swanage Pier residuals for 2016

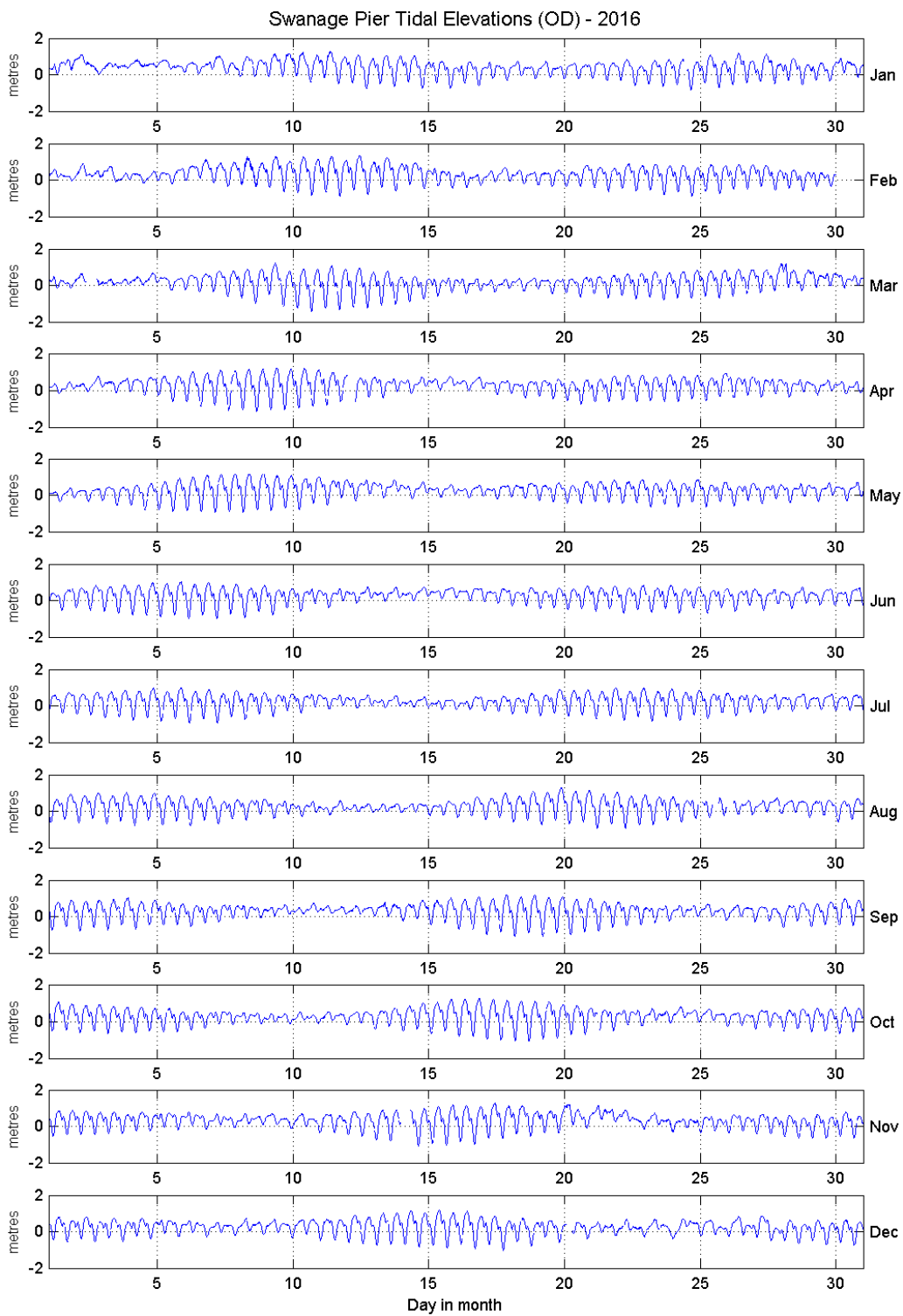


Figure 2: Swanage Pier tidal elevations for 2016 relative to Ordnance Datum

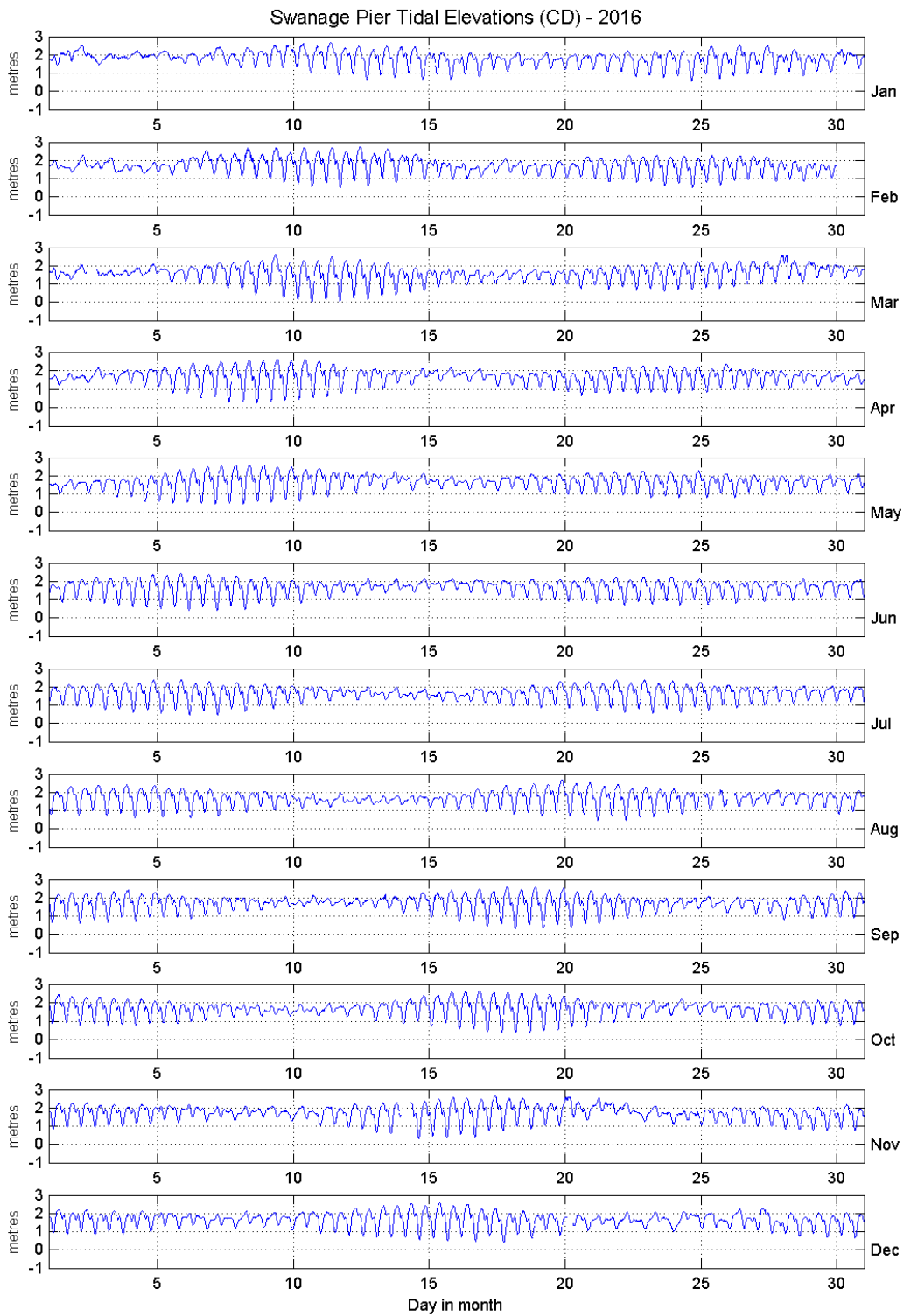


Figure 3: Swanage Pier tidal elevations for 2016 relative to Chart Datum