

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 Type

Rosemount WaveRadar REX

TGZ



Benchmarks

Benchmark

TGBM = 6.262m above Ordnance Datum Newlyn

TGZ = 6.337m above Ordnance Datum Newlyn

TGZ = 7.737m above Chart Datum

TGZ = 0.075m 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 |
|-------------------|-----------------|
| 96 | 10 minutes |

Service history

The radar was last serviced in October 2012. 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 | 1.01 | 24-Jan-2012 09:10 | -1.03 | 11-Jan-2012 17:00 |
| February | 0.82 | 23-Feb-2012 09:40 | -1.34 | 10-Feb-2012 17:10 |
| March | 0.92 | 10-Mar-2012 09:40 | -1.37 | 10-Mar-2012 16:50 |
| April | 1.27 | 09-Apr-2012 22:40 | -1.13 | 08-Apr-2012 16:30 |
| May | 1.12 | 06-May-2012 20:40 | -0.95 | 07-May-2012 03:50 |
| June | 1.32 | 07-Jun-2012 23:00 | -0.95 | 05-Jun-2012 03:30 |
| July | 1.09 | 05-Jul-2012 21:50 | -0.92 | 22-Jul-2012 05:10 |
| August | 1.13 | 03-Aug-2012 21:20 | -0.87 | 21-Aug-2012 05:20 |
| September | 1.13 | 17-Sep-2012 21:10 | -0.98 | 01-Sep-2012 03:40 |
| October | 1.52 | 17-Oct-2012 09:20 | -0.80 | 16-Oct-2012 15:30 |
| November | 1.16 | 16-Nov-2012 10:00 | -0.97 | 15-Nov-2012 16:00 |
| December | 1.53 | 14-Dec-2012 09:00 | -0.74 | 13-Dec-2012 15:00 |

| Month | Surge maxima | | Surge minima | |
|-----------|--------------|-------------------|--------------|-------------------|
| | Value (m) | Date/Time | Value (m) | Date/Time |
| January | 0.38 | 04-Jan-2012 08:20 | -0.39 | 10-Jan-2012 12:10 |
| February | 0.15 | 19-Feb-2012 12:00 | -0.48 | 05-Feb-2012 08:50 |
| March | 0.19 | 07-Mar-2012 23:20 | -0.38 | 11-Mar-2012 13:30 |
| April | 0.64 | 25-Apr-2012 16:40 | -0.21 | 16-Apr-2012 19:30 |
| May | 0.30 | 10-May-2012 00:20 | -0.36 | 12-May-2012 16:00 |
| June | 0.59 | 07-Jun-2012 16:40 | -0.23 | 27-Jun-2012 07:00 |
| July | 0.29 | 07-Jul-2012 17:20 | -0.28 | 23-Jul-2012 03:50 |
| August | 0.41 | 15-Aug-2012 16:00 | -0.26 | 31-Aug-2012 16:50 |
| September | 0.41 | 23-Sep-2012 19:20 | -0.27 | 01-Sep-2012 05:00 |
| October | 0.58 | 17-Oct-2012 03:50 | -0.30 | 28-Oct-2012 03:40 |
| November | 0.43 | 25-Nov-2012 00:00 | -0.39 | 23-Nov-2012 07:00 |
| December | 0.53 | 25-Dec-2012 09:00 | -0.36 | 08-Dec-2012 09:50 |

| Month | Mean Level | |
|-----------|-------------|----------------|
| | No. of days | Elevation (OD) |
| January | 30 | 0.189 |
| February | 29 | 0.019 |
| March | 26 | 0.063 |
| April | 30 | 0.306 |
| May | 30 | 0.230 |
| June | 30 | 0.284 |
| July | 30 | 0.277 |
| August | 31 | 0.328 |
| September | 30 | 0.293 |
| October | 30 | 0.405 |
| November | 30 | 0.390 |
| December | 30 | 0.359 |

| Highest values in 2012 | | | |
|-------------------------------------|-------------------|-----------|-------------------|
| Extreme | | Surge | |
| Elevation (OD) (Surge component) | Date/Time | Value (m) | Date/Time |
| 1.53 (0.39) | 14-Dec-2012 09:00 | 0.64 | 25-Apr-2012 16:40 |
| 1.50 (0.38) | 17-Oct-2012 09:20 | 0.59 | 07-Jun-2012 16:40 |
| 1.30 (0.26) | 17-Oct-2012 22:00 | 0.58 | 17-Oct-2012 03:50 |
| 1.30 (0.41) | 07-Jun-2012 23:00 | 0.56 | 18-Apr-2012 07:50 |
| 1.31 (0.19) | 18-Oct-2012 10:00 | 0.53 | 25-Dec-2012 09:00 |
| 1.28 (0.30) | 14-Dec-2012 21:30 | 0.49 | 25-Apr-2012 05:40 |
| 1.27 (0.13) | 15-Dec-2012 09:50 | 0.46 | 17-Oct-2012 12:50 |
| 1.27 (0.33) | 09-Apr-2012 22:40 | 0.46 | 08-Jun-2012 00:10 |
| 1.26 (0.22) | 15-Oct-2012 20:40 | 0.45 | 31-Oct-2012 17:10 |
| 1.24 (0.14) | 16-Oct-2012 08:50 | 0.45 | 14-Dec-2012 13:30 |

| 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% |

| 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.

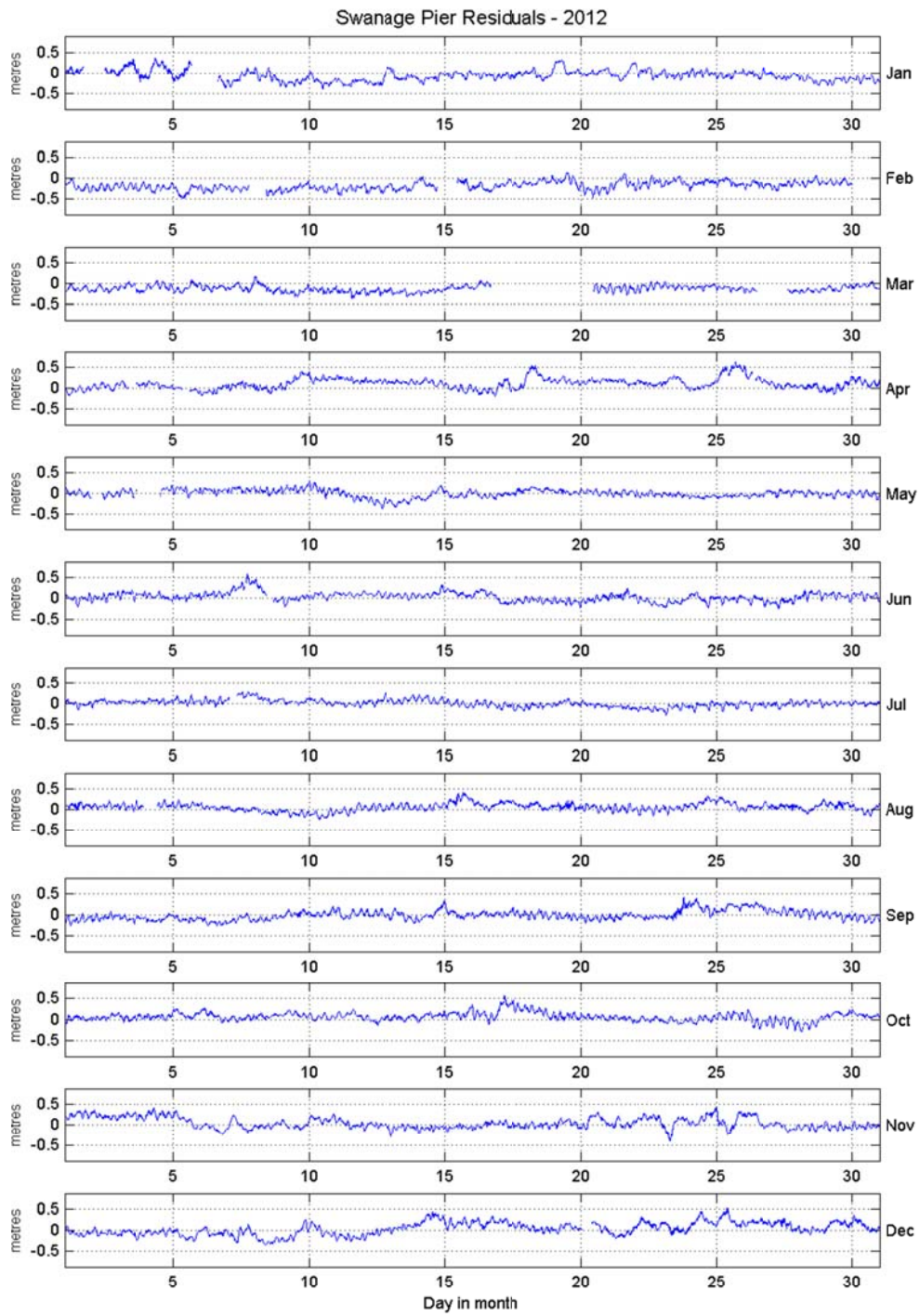


Figure 1: Swanage Pier residuals for 2012

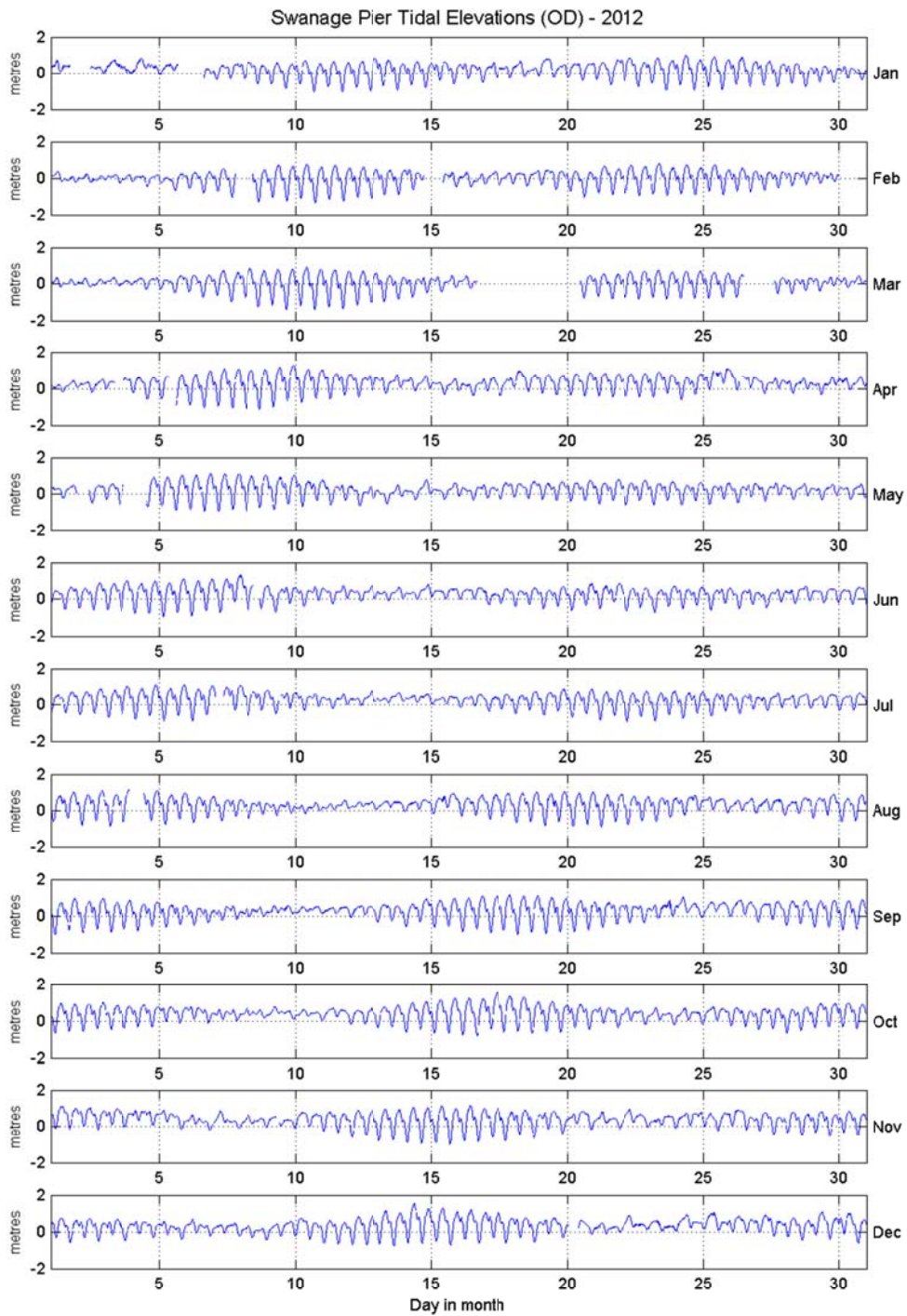


Figure 2: Swanage Pier tidal elevations for 2012 relative to Ordnance Datum

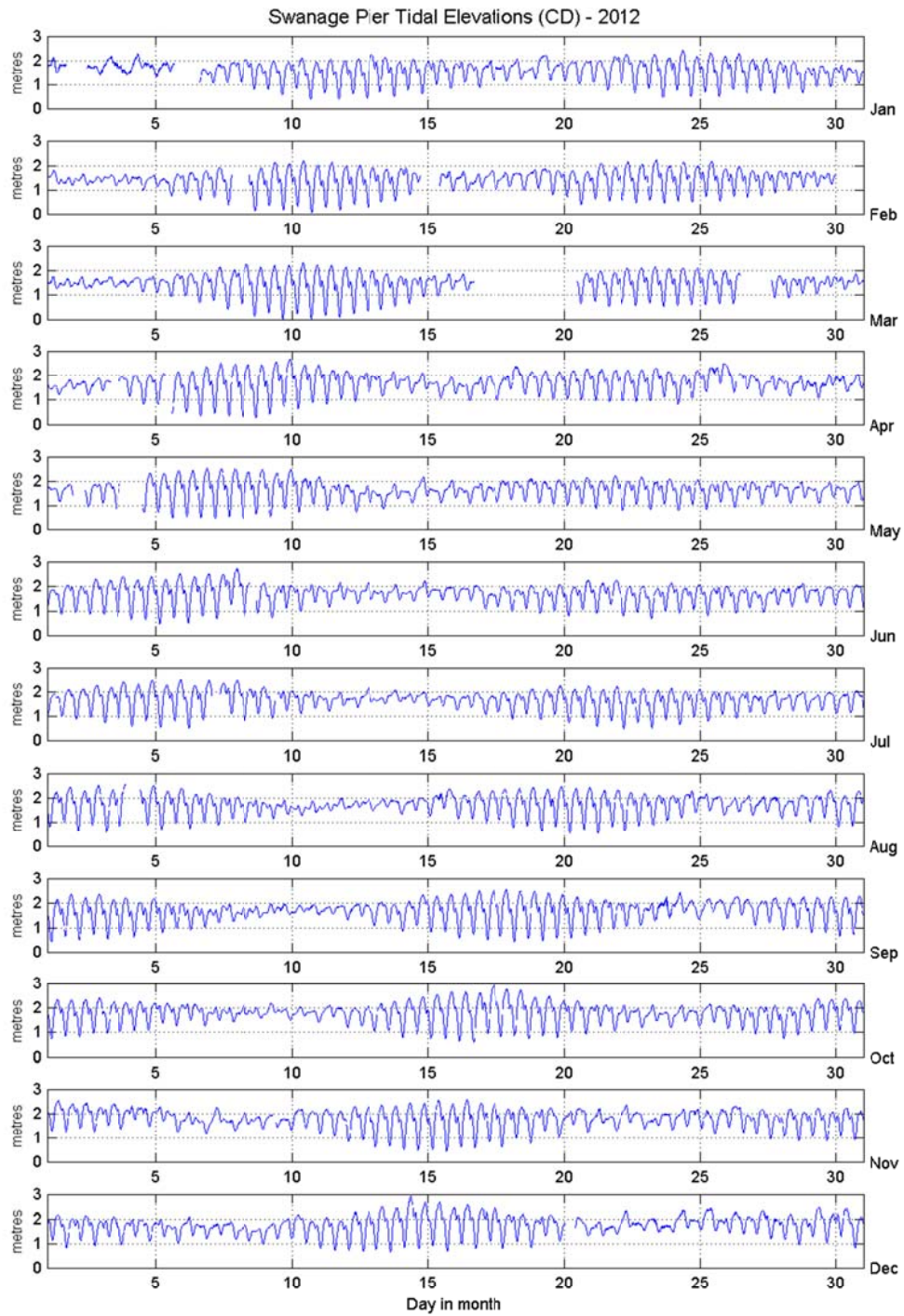


Figure 3: Swanage Pier tidal elevations for 2012 relative to Chart Datum