

## Port Isaac Tide Gauge

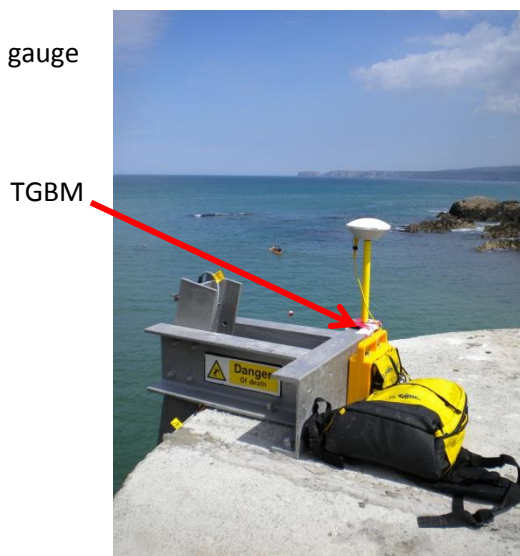
### Location

OS: 199490E 80998N

WGS84: Latitude: 50° 35' 39.083" N Longitude: 04° 50' 03.881" W

### Instrument

Etrometa step gauge



### Benchmarks

#### Benchmark

TGBM = 7.715 m above Ordnance Datum Newlyn

TGZ = -3.970 m above Ordnance Datum Newlyn

TGZ = -0.170 m above Chart Datum

TGZ = 11.685 m below TGBM

#### Description

Top of galvanised horizontal frame

### Datum

All data are to Ordnance Datum Newlyn. The height of Chart Datum relative to Ordnance Datum at Port Isaac is -3.80m (Admiralty Tide Tables, Supplementary Table III).

### Survey information

The site was first surveyed on 29 June 2010, using a ~25 hour occupation to account for tidal loading.

### Site characteristics

The breakwater is on open coast, although sheltered from the southwest by a headland. Some wave reflection from the breakwater can occur. There are no nearby estuaries. Spring tidal range is approx. 6.6m.

### Data quality

Recovery rate (%)	Sample interval
99	10 minutes

## Service history

The step gauge became operational on 26 July 2010 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.

## Statistics

*All times GMT*

Month	Extreme maxima		Extreme minima	
	Elevation (OD)	Date/Time	Elevation (OD)	Date/Time
January	4.13	14-Jan-2017 06:20	-3.37	14-Jan-2017 00:30
February	4.31	28-Feb-2017 06:20	-3.41	12-Feb-2017 12:40
March	4.39	30-Mar-2017 06:40	-3.59	29-Mar-2017 12:20
April	4.33	28-Apr-2017 06:30	-3.72	27-Apr-2017 12:00
May	4.27	27-May-2017 06:10	-3.47	26-May-2017 11:40
June	4.22	25-Jun-2017 18:20	-3.32	26-Jun-2017 00:40
July	4.14	25-Jul-2017 18:50	-3.44	25-Jul-2017 00:30
August	4.22	22-Aug-2017 17:50	-3.30	23-Aug-2017 00:10
September	4.24	08-Sep-2017 18:40	-3.24	22-Sep-2017 00:30
October	4.18	07-Oct-2017 18:20	-3.44	08-Oct-2017 00:40
November	4.30	04-Nov-2017 17:10	-3.60	06-Nov-2017 00:20
December	4.06	06-Dec-2017 06:50	-3.56	05-Dec-2017 00:00

Month	Surge maxima		Surge minima	
	Value (m)	Date/Time	Value (m)	Date/Time
January	0.35	26-Jan-2017 23:00	-0.36	16-Jan-2017 18:10
February	0.86	02-Feb-2017 14:10	-0.26	11-Feb-2017 21:50
March	0.54	05-Mar-2017 07:10	-0.33	13-Mar-2017 09:20
April	0.40	30-Apr-2017 06:20	-0.28	20-Apr-2017 01:50
May	0.36	12-May-2017 03:00	-0.19	24-May-2017 17:10
June	0.38	05-Jun-2017 21:00	-0.21	16-Jun-2017 05:30
July	0.30	11-Jul-2017 15:40	-0.16	14-Jul-2017 16:00
August	0.33	03-Aug-2017 01:30	-0.19	10-Aug-2017 11:00
September	0.44	12-Sep-2017 20:20	-0.23	29-Sep-2017 14:00
October	0.69	16-Oct-2017 13:00	-0.35	22-Oct-2017 06:30
November	0.40	23-Nov-2017 00:50	-0.36	16-Nov-2017 15:20
December	1.05	29-Dec-2017 06:30	-0.36	21-Dec-2017 08:10

Month	Mean Level	
	No. of days	Elevation (OD)
January	31	0.263
February	28	0.360
March	31	0.311
April	30	0.201
May	31	0.344
June	30	0.347
July	31	0.338
August	31	0.340
September	30	0.394
October	31	0.379
November	30	0.357
December	31	0.383

Highest values in 2017			
Extreme		Surge	
Elevation (OD) (Surge component)	Date/Time	Value (m)	Date/Time
4.39 (0.10)	30-Mar-2017 06:40	1.05	29-Dec-2017 06:30
4.33 (0.21)	31-Mar-2017 07:30	0.86	02-Feb-2017 14:10
4.33 (0.03)	28-Apr-2017 06:30	0.70	29-Dec-2017 10:10
4.33 (0.22)	01-Mar-2017 07:00	0.69	16-Oct-2017 13:00
4.32 (0.06)	29-Mar-2017 06:00	0.67	02-Feb-2017 18:00
4.31 (0.23)	28-Feb-2017 06:20	0.67	10-Dec-2017 05:10
4.30 (0.00)	04-Nov-2017 17:10	0.65	16-Oct-2017 08:10
4.27 (0.10)	27-May-2017 06:10	0.56	31-Dec-2017 11:10
4.27 (-0.02)	27-Apr-2017 05:40	0.56	21-Oct-2017 11:20
4.24 (0.15)	29-Apr-2017 07:00	0.55	23-Feb-2017 05:30

Year	Annual extreme maxima		Annual surge maxima		Z <sub>0</sub> (OD)	Annual recovery rate
	Elevation (OD) (Surge)	Date/Time	Value (m)	Date/Time		
2010	4.66 (-)	08-Oct-2010 17:40	-	-	-	44%
2011	4.59 (0.09)	21-Feb-2011 07:20	0.70	13-Dec-2011 02:30	0.304	99%
2012	4.76 (0.53)	17-Oct-2012 18:30	0.77	17-Oct-2012 11:10	0.311	99%
2013	4.48 (0.06)	24-Jul-2013 18:30	1.12	27-Dec-2013 06:50	0.318	99%
2014	4.80 (0.46)	03-Jan-2014 06:50	1.09	12-Feb-2014 11:20	-	96%
2015	4.74 (0.17)	28-Oct-2015 17:50	0.84	14-Jan-2015 23:20	-	98%
2016	4.65 (0.15)	16-Oct-2016 17:20	1.01	08-Feb-2016 07:30	-	96%
2017	4.39 (0.10)	30-Mar-2017 06:40	1.05	29-Dec-2017 06:30	-	99%

Tidal levels		
Observation period	August 2010 to December 2012	
Tide Level	Elevation (OD)	Elevation (CD)
HAT	4.73	8.53
MHWS	3.64	7.44
MHWN	1.88	5.68
MSL	0.31	4.11
MLWN	-1.27	2.53
MLWS	-3.03	0.77
LAT	-4.01	-0.21

## 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<sub>0</sub> 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

The step gauge is mounted on Port Isaac breakwater by kind permission of the Port Isaac Harbour Commissioners and the shore station is kindly hosted by Port Isaac Aquarium. Tidal predictions and tide levels were produced by Fugro GB Marine Limited.

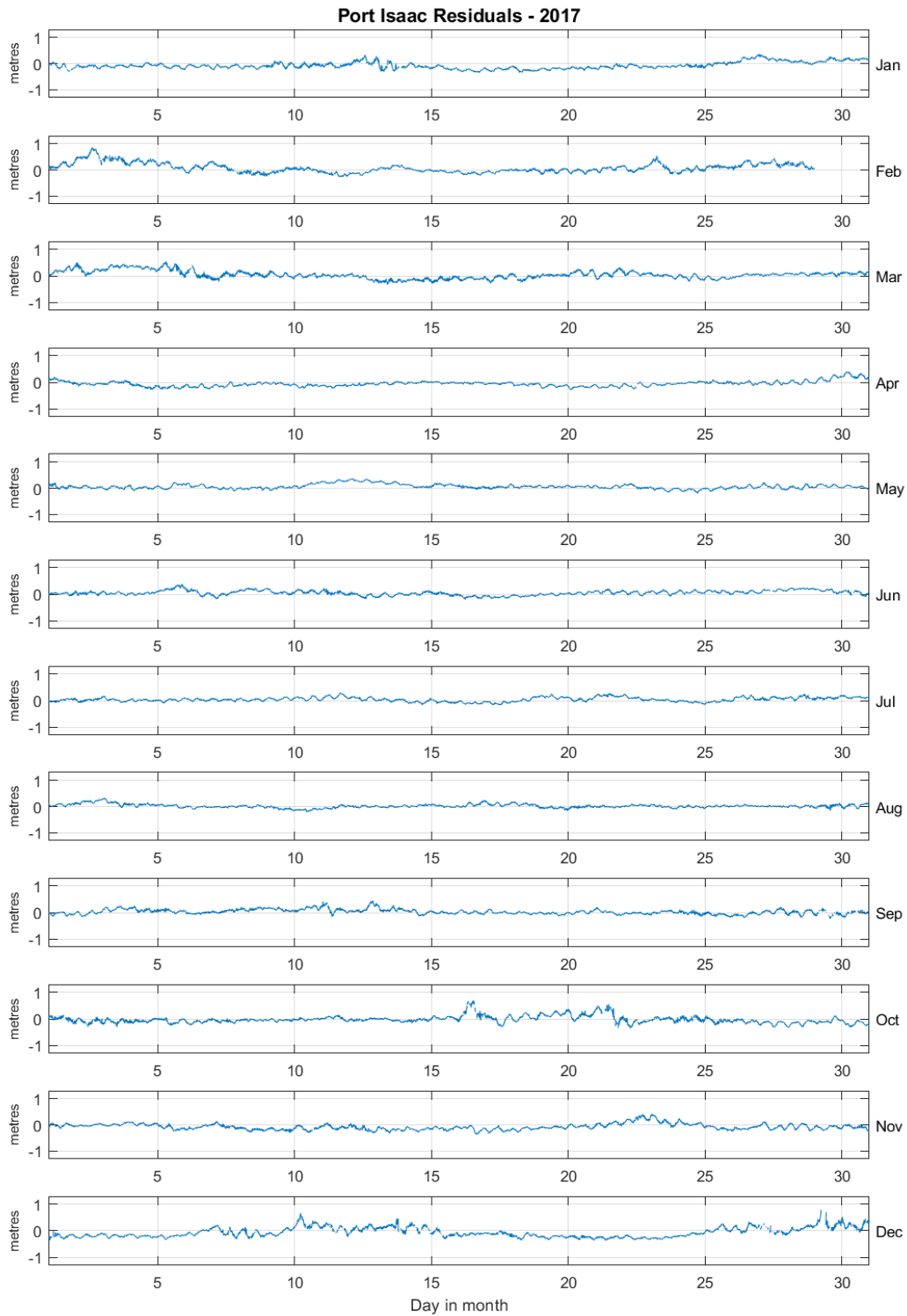


Figure 1: Port Isaac residuals for 2017

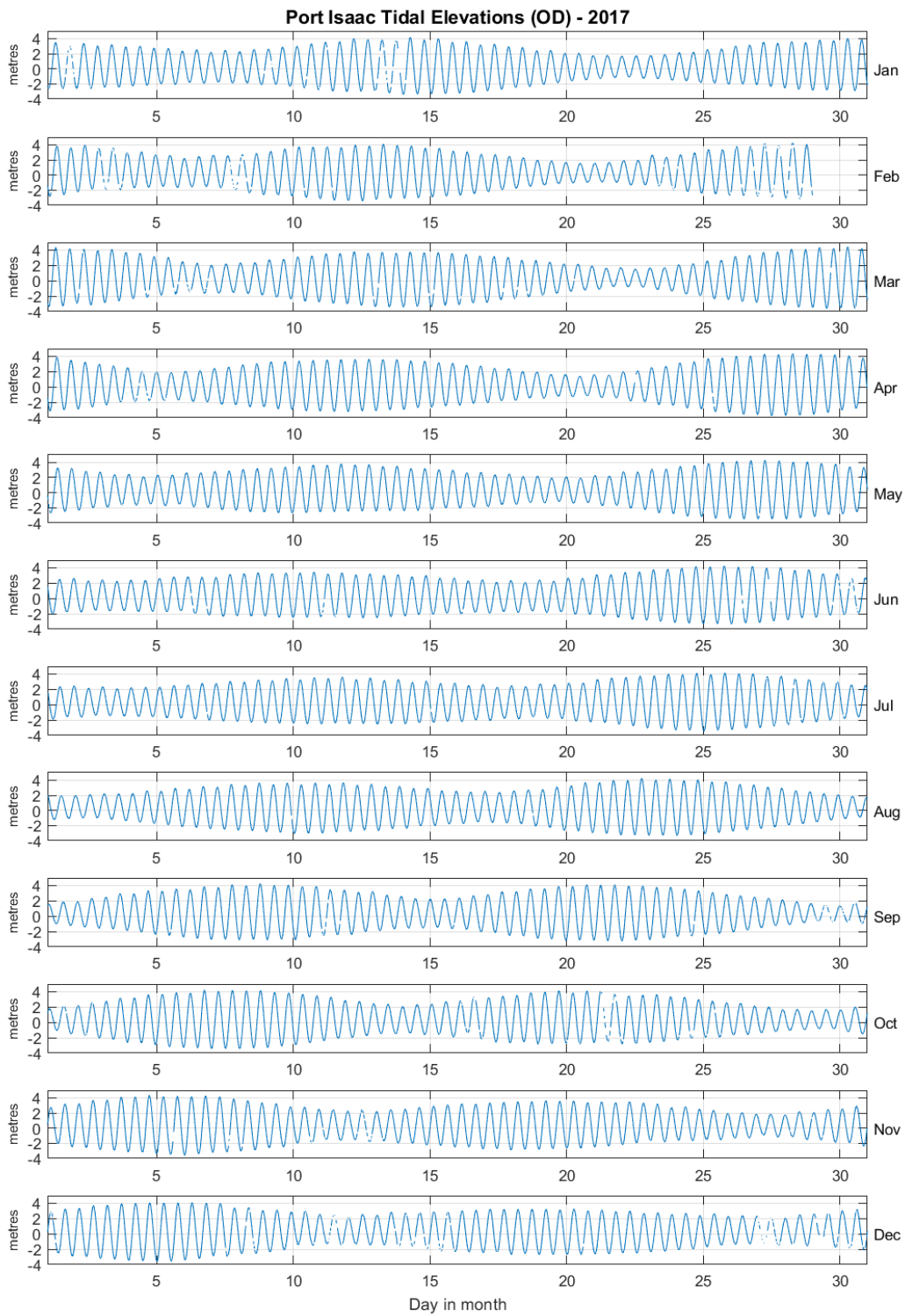
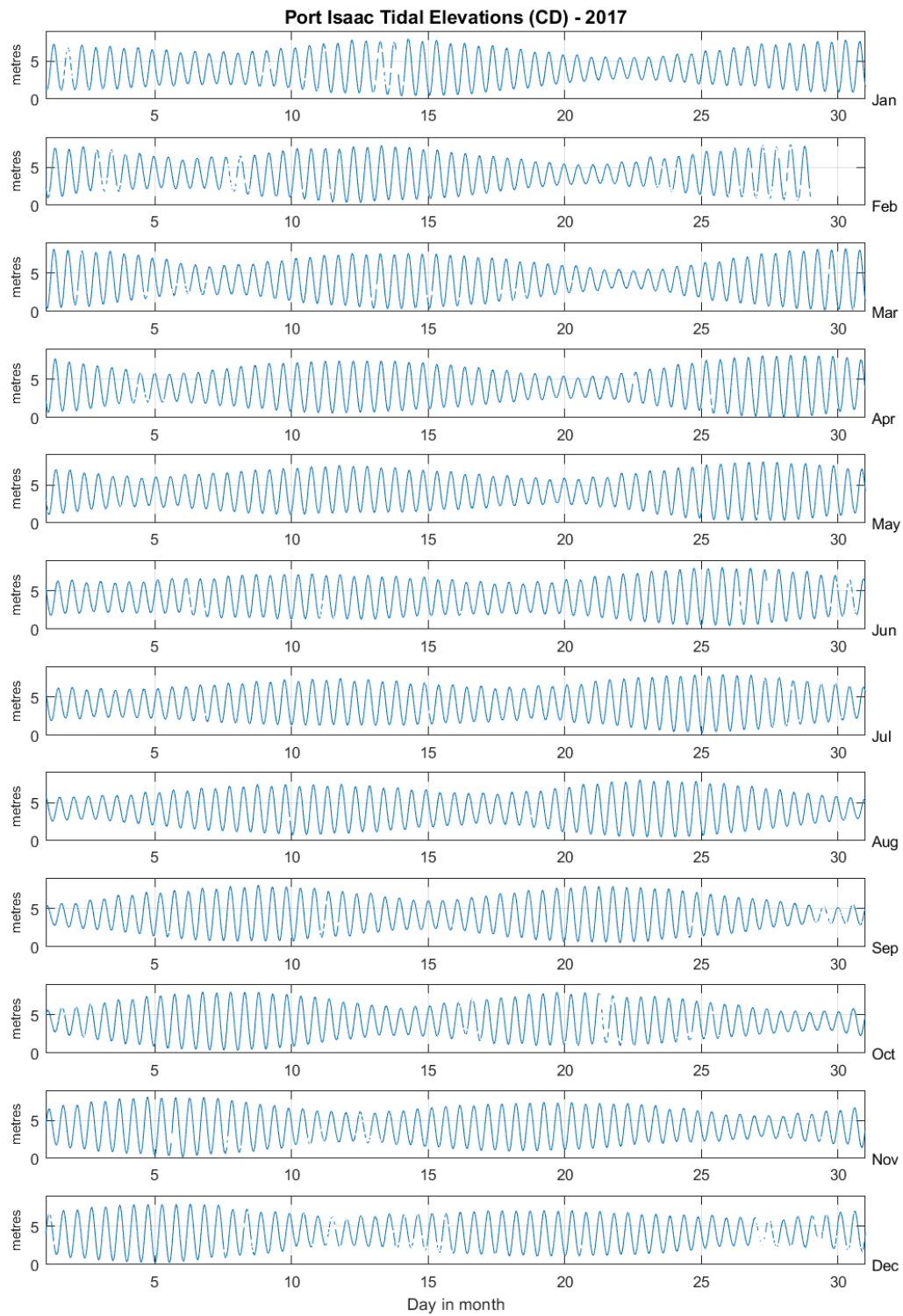


Figure 2: Port Isaac tidal elevations for 2017 relative to Ordnance Datum



**Figure 3: Port Isaac tidal elevations for 2017 relative to Chart Datum**