Porthleven Directional Waverider Buoy

Location			
OS	163395 E 23270 N		
WGS84	*Latitude:* 50° 03.74' N *Longitude:* 05° 18.44' W		
Instrument type			
Datawell Directional Waverider Mk III			
Water depth	~15m CD	Buoy in situ off Porthleven. Photo courtesy of Fugro EMU Limited	Location of buoy (Google mapping)

Data Quality

Recovery rate (%)	Sample interval
98	30 minutes

Monthly Averages - 2015

All times are GMT

Month	H_s (m)	T_p (s)	T_z (s)	Dir. (°)	SST (°C)	No. of days
January	1.94	10.5	5.9	238	10.4	30
February	1.28	12.1	6.0	237	9.3	27
March	1.37	11.8	6.2	240	9.4	31
April	0.83	10.8	5.3	237	10.5	29
May	1.19	9.0	4.9	237	11.9	30
June	0.76	9.2	4.7	232	13.7	29
July	1.07	8.9	5.0	236	15.4	31
August	0.96	8.9	5.1	234	15.3	31
September	0.74	9.8	4.6	219	15.5	30
October	1.00	10.8	5.6	226	14.7	31
November	1.86	9.9	5.6	238	13.6	30
December	2.99	11.1	6.5	231	12.2	31

Monthly Averages - All Years (October 2011 – December 2015)

Month	H_s (m)	T_p (s)	T_z (s)	Dir. (°)	SST (°C)
January	1.87	11.2	6.0	237	10.3
February	1.23	11.9	6.0	238	9.3
March	1.17	11.6	6.0	236	9.3
April	1.09	10.6	5.5	236	10.0
May	0.93	9.2	4.9	234	11.7
June	0.95	9.1	4.9	231	13.7
July	0.80	8.6	4.7	232	15.6
August	1.00	8.8	4.9	234	15.9
September	0.72	10.0	5.1	230	15.7
October	1.33	10.0	5.5	231	14.8
November	1.54	10.6	6.0	237	13.0
December	2.15	10.7	5.9	236	11.5

Storm Analysis

Date/Time	H_s (m)	T_p (s)	T_z (s)	Dir. (º)	Water level elevation* (OD)	Tidal stage (hours re. HW)	Tidal range (m)	Tidal surge* (m)	Max. surge* (m)
30-Dec-2015 08:00	7.13	12.5	9.0	226	2.62	HW +1	4.1	0.46	0.54
15-Jan-2015 01:00	6.08	10.5	8.3	229	1.24	HW +1	2.3	0.41	0.56
30-Dec-2015 19:30	5.73	15.4	9.7	238	2.00	HW	3.5	0.17	0.41
31-Dec-2015 05:30	5.68	12.5	8.3	232	0.33	HW -3	3.6	0.03	0.43

Annual Statistics

Year	Annual H_s exceedance* (m)						Annual Maximum H_s	
	0.05%	0.5%	1%	2%	5%	10%	Date	A_{max} (m)
2011	-	-	-	3.98	3.40	2.83	13-Dec-2011 06:00	4.84
2012	5.52	4.3	3.79	3.35	2.78	2.19	15-08-2012 18:30	5.95+
2013	5.82	4.61	4.20	3.81	3.18	2.56	23-Dec-2013 21:30	6.43+
2014	6.57	4.83	4.28	3.54	2.93	2.39	03-Jan-2014 18:30	6.99+ **
2015	5.89	4.76	4.22	3.71	3.20	2.69	30-Dec-2015 08:00	7.13+

** i.e. 5 % of the H_s values measured in 2011 exceeded 3.40 m*

+Note that waves were breaking at the buoy for several hours during this storm; where breaking waves were clearly present in the measured time series, the parameters have been omitted. Accordingly, there may have been short periods where measured significant wave heights exceeded this value.

*** The buoy was badly damaged at the height of the storms in early February 2014 and accordingly may have missed even higher wave conditions later that month.*

** Tidal information is obtained from the nearest recording tide gauge (the National Network gauge at Newlyn). The surge shown is the residual at the time of the highest Hs. The maximum tidal surge is the largest positive surge during the storm event.*

Distribution plots

The distribution of wave parameters are shown in the accompanying graphs of:

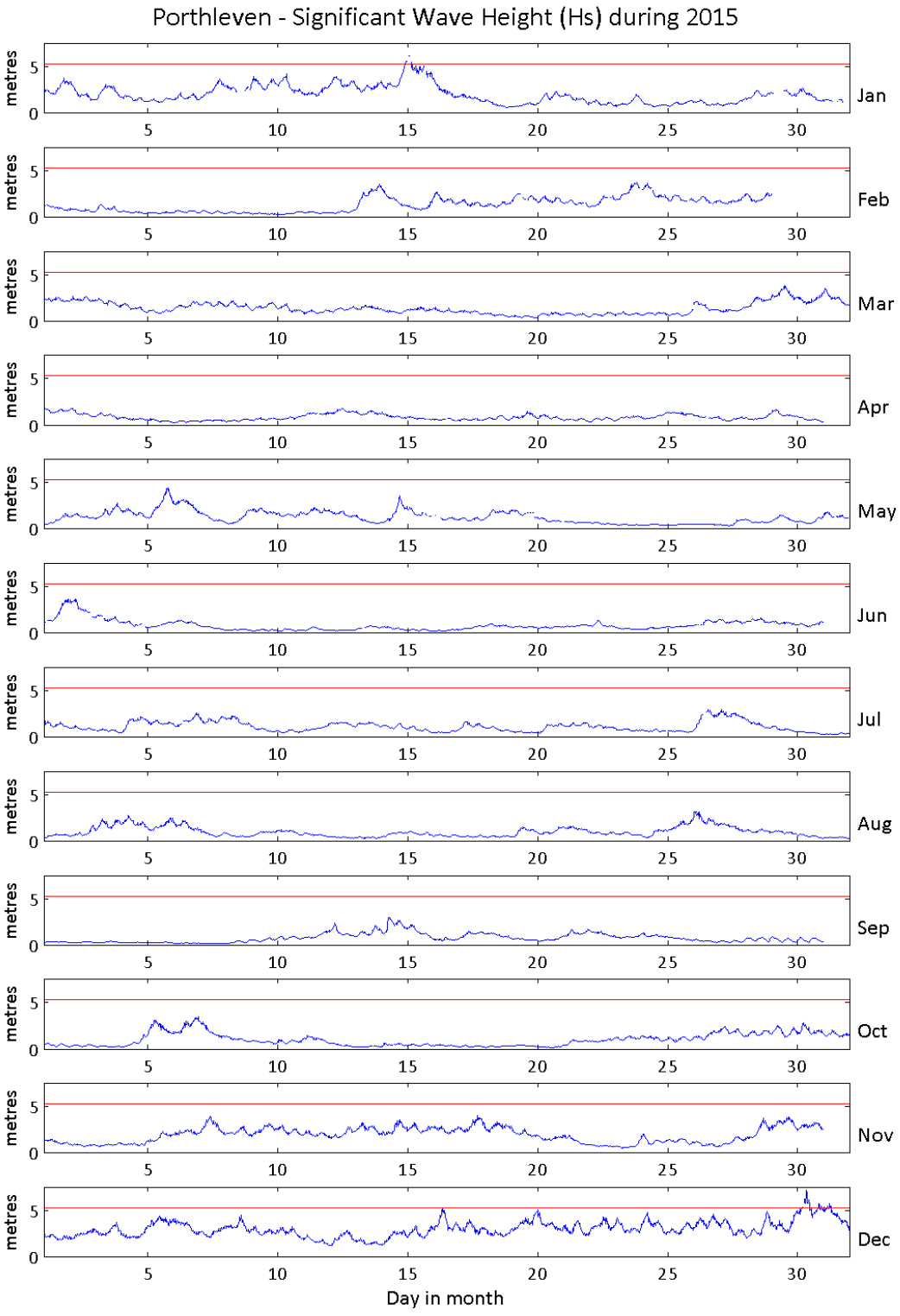
- Annual time series of H_s (red line is 5.25 m storm threshold)
- Incidence of storm waves for 2015. Storm events are defined using the Peaks-over-Threshold method. The highest H_s of each storm event is shown
- Wave height exceedance each year since deployment
- Percentage of occurrence of H_s, T_p, T_z and Direction for 2015
- Joint distribution of all parameters for all measured data, given as percentage of occurrence
- Wave rose (percentage of occurrence of direction vs. H_s) for all measured data

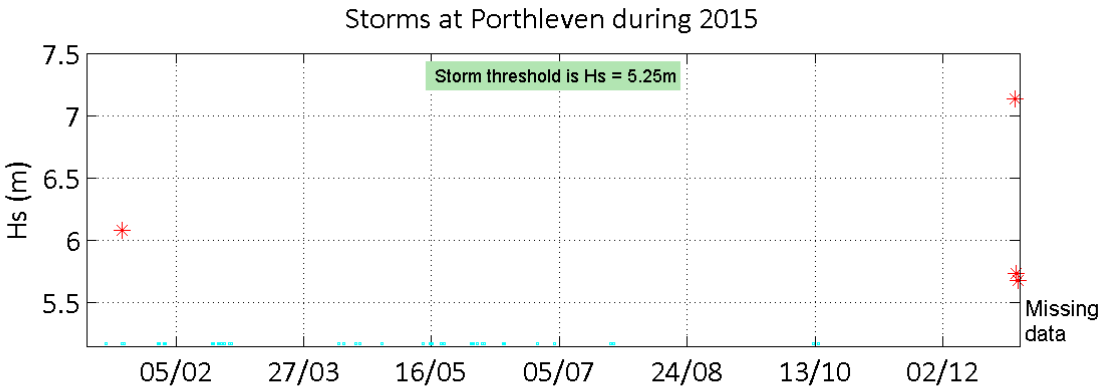
General

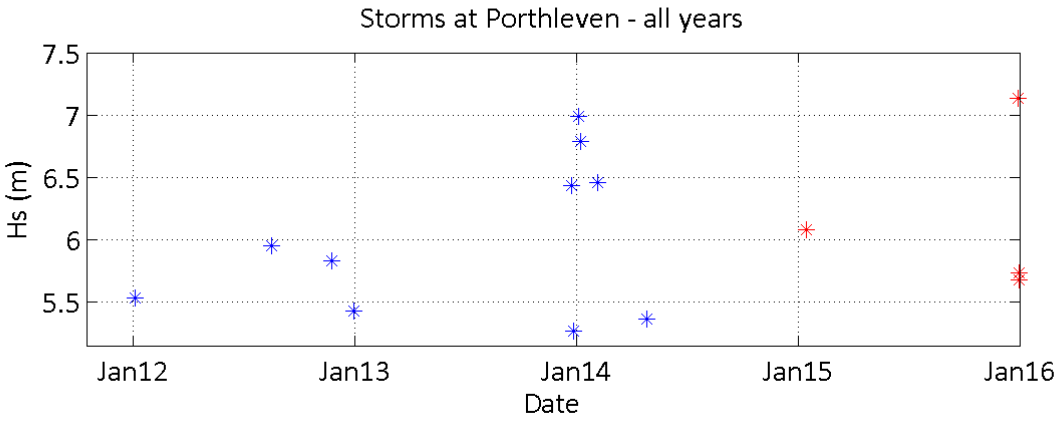
The buoy was first deployed on 17 October 2011, at which time the magnetic declination at the site was 3.2° west, changing by 0.15° east per year.

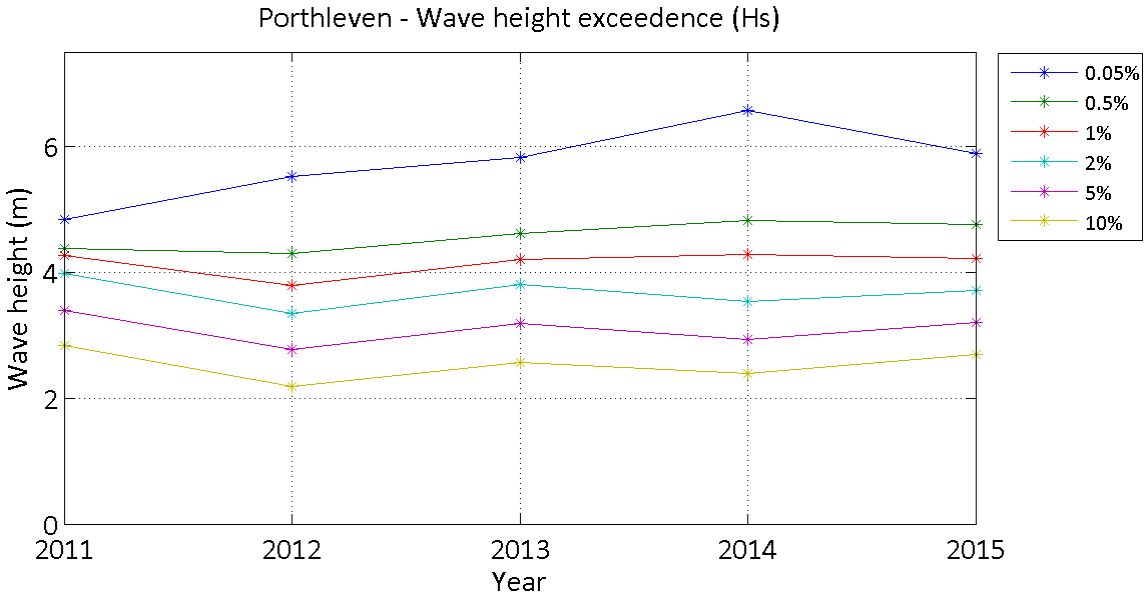
Acknowledgements

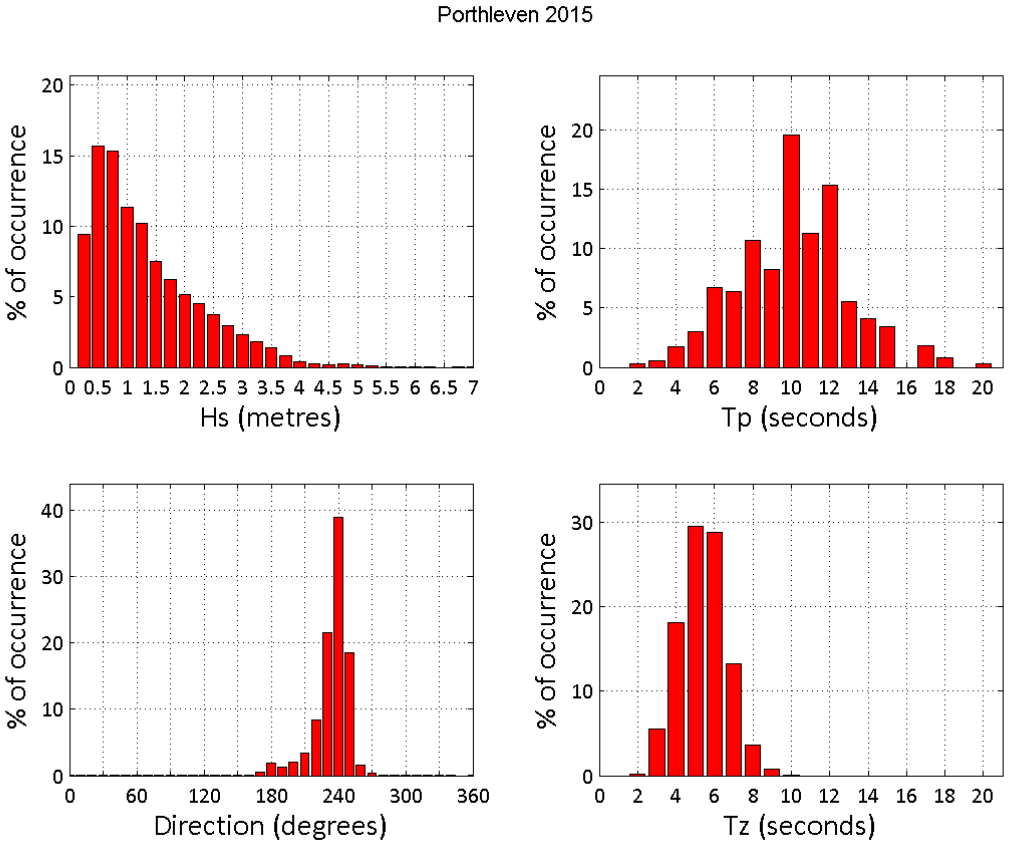
Tidal data were supplied by the British Oceanographic Data Centre as part of the function of the National Tidal and Sea Level Facility, hosted by the Proudman Oceanographic Laboratory and funded by DEFRA and the Natural Environment Research Council.

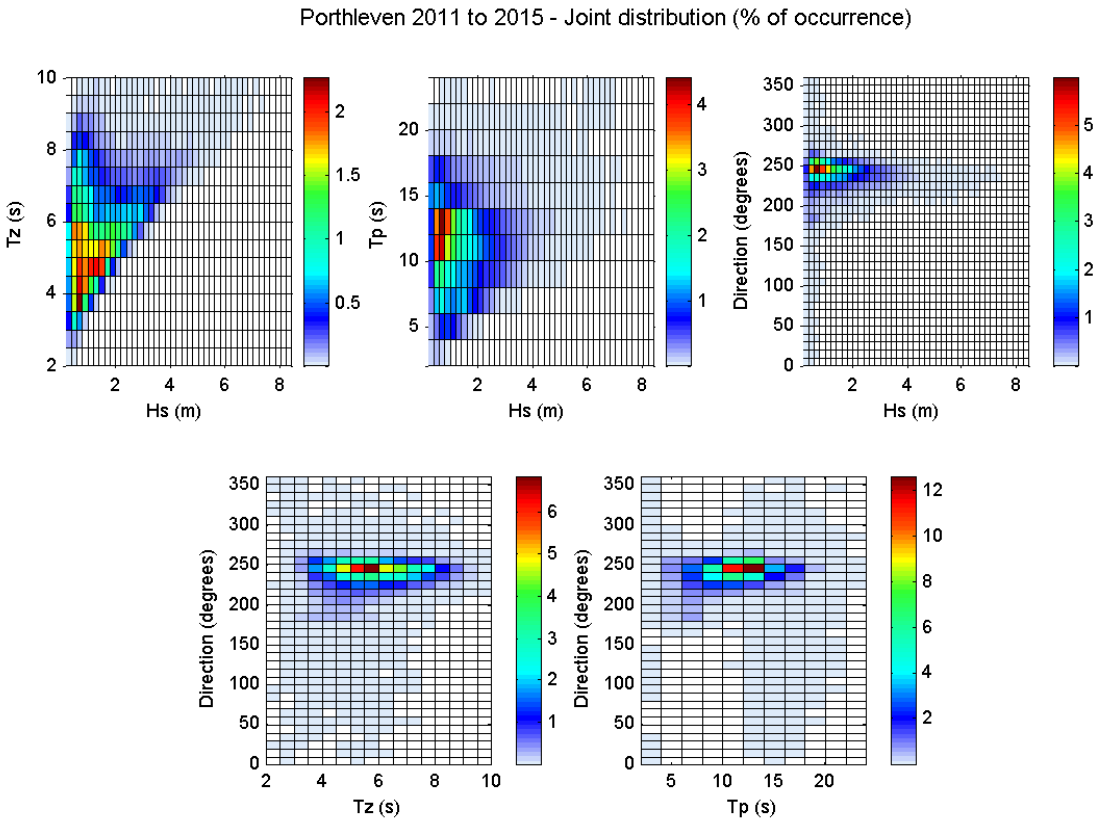

Porthleven - Significant Wave Height (Hs) during 2015
metres
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
0
5
10
15
20
25
30
Day in month


Storms at Porthleven during 2015
Storm threshold is Hs = 5.25m
Hs (m)
7.5
7
6.5
6
5.5
Missing data
05/02
27/03
16/05
05/07
24/08
13/10
02/12


Storms at Porthleven - all years
Hs (m)
7.5
7
6.5
6
5.5
Jan12
Jan13
Jan14
Jan15
Jan16
Date


Porthleven - Wave height exceedence (Hs)
Wave height (m)
0
2
4
6
2011
2012
2013
2014
2015
Year
0.05%
0.5%
1%
2%
5%
10%


Porthleven 2015
% of occurrence
Hs (metres)
Tp (seconds)
Direction (degrees)
Tz (seconds)


Porthleven 2011 to 2015 - Joint distribution (% of occurrence)
Tz (s)
Hs (m)
Tp (s)
Direction (degrees)

Offshore Wave Hs (m)

Porthleven WB : 17/10/2011 - 31/12/2015