



Tor Bay Directional Waverider Buoy

Location			
OS	292219 E 60408 N		
WGS84	Latitude: 50° 26.01' N Longitude: 03° 31.14' W		
Instrument type			
Datawell Directional Waverider Mk III			
Water depth	~11m CD	Buoy in situ in Tor Bay. Photo courtesy of Fugro EMU Limited	Location of buoy (Google mapping)

Data Quality

Recovery rate (%)	Sample interval
96	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	0.36	5.7	3.3	165	7.6	31
February	0.49	7.5	3.7	127	5.5	28
March	0.41	6.0	3.3	146	6.2	31
April	0.43	5.5	3.4	133	9.3	30
May	0.35	4.9	3.1	157	12.0	31
June	0.35	5.5	3.3	142	14.2	30
July	0.29	4.5	3.1	154	15.7	31
August	0.27	5.1	3.2	128	16.7	31
September	0.51	5.0	3.4	138	16.4	30
October	0.61	6.2	3.7	116	15.0	31
November	0.39	4.8	3.2	169	14.0	28
December	0.64	6.5	3.4	145	12.2	20

Monthly Averages - All Years (June 2008 – December 2015)

Month	H _s (m)	T _p (s)	T _z (s)	Dir. (°)	SST (°C)
January	0.54	6.7	3.7	134	8.7
February	0.55	7.3	3.7	132	7.6
March	0.52	6.2	3.6	128	8.0
April	0.43	6.1	3.5	126	9.8
May	0.32	5.1	3.2	156	11.6
June	0.32	5.1	3.3	136	14.4
July	0.26	4.7	3.1	146	15.9
August	0.25	4.6	3.1	149	16.4
September	0.41	5.1	3.3	135	16.2
October	0.49	5.8	3.5	131	15.1
November	0.52	5.8	3.6	139	12.9
December	0.50	6.7	3.6	139	10.3

Storm Analysis

Date/Time	H _s (m)	T _p (s)	T _z (s)	Dir. (°)	Water level elevation* (OD)	Tidal stage (hours re. HW)	Tidal range (m)	Tidal surge* (m)	Max. surge* (m)
18-Apr-2015 14:30	2.43	7.1	5.8	108	-	HW -3	~4.7	-	-
06-Feb-2015 17:30	2.37	8.3	5.9	107	-	HW -3	~3.6	-	-
07-Feb-2015 04:30	2.35	8.3	6.1	111	-	HW -3	~3.7	-	-
30-Sep-2015 04:30	2.14	7.7	5.1	117	-	HW -1	~3.5	-	-

Annual Statistics

Year	Annual H _s exceedance* (m)						Annual Maximum H _s	
	0.05%	0.5%	1%	2%	5%	10%	Date	A _{max} (m)
2008	-	2.20	2.10	2.01	1.22	0.88	28-Dec-2008 04:00	2.60
2009	2.56	1.79	1.60	1.43	1.10	0.84	12-May-2009 05:00	2.88
2010	2.50	1.96	1.85	1.67	1.40	1.10	12-Jan-2010 22:30	2.70
2011	2.39	1.84	1.63	1.39	1.06	0.78	24-Oct-2011 16:30	2.63
2012	2.86	2.18	2.00	1.71	1.31	0.93	29-Apr-2012 12:30	3.06
2013	3.21	2.56	2.32	1.93	1.48	1.10	11-Mar-2013 15:00	3.73
2014	2.33	1.88	1.65	1.39	1.11	0.85	28-Nov-2014 07:00	2.63
2015	2.27	1.88	1.70	1.49	1.16	0.85	18-Apr-2015 14:30	2.43

* i.e. 5 % of the H_s values measured in 2008 exceeded 1.22 m

Distribution plots

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

- Annual time series of H_s (red line is 2.1 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

* Tidal information used to be obtained from the WaveRadar REX on Teignmouth Pier but this was put out of action on 03 Feb 2014 by damage to the pier. Accordingly, the tidal stage and range are estimated from the predicted tide levels.

Significant wave height return periods

Return periods for significant wave height can be calculated since the buoy has been deployed for more than 5 years. The return periods are based on 3-hourly records and are calculated for periods up to 10 times the record length, using a Weibull distribution.

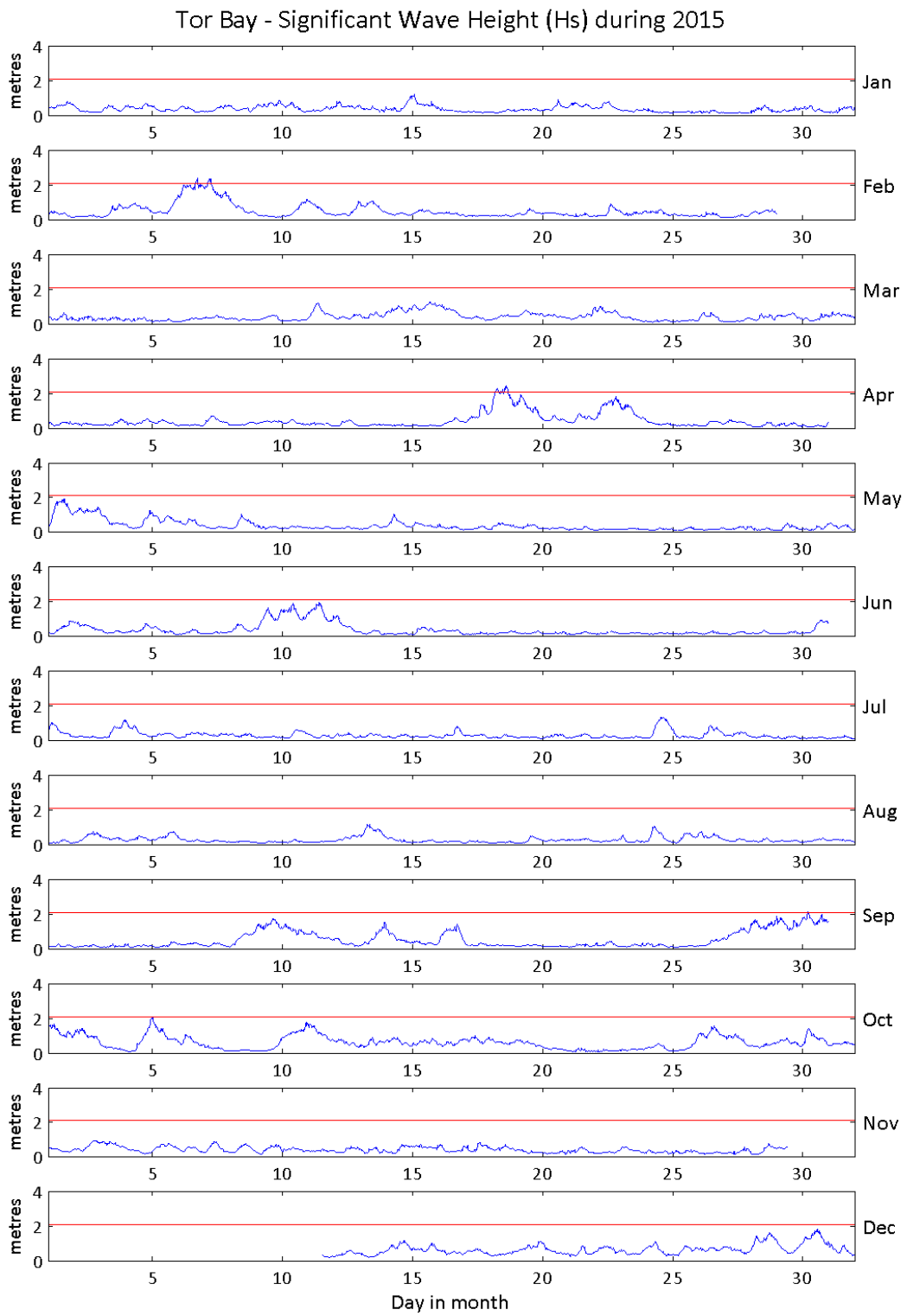
Return period (years)	Significant wave height (m)	Comments
1	3.1	No depth limitation
2	3.3	
5	3.6	
10	3.8	
20	4.0	
50	4.2	

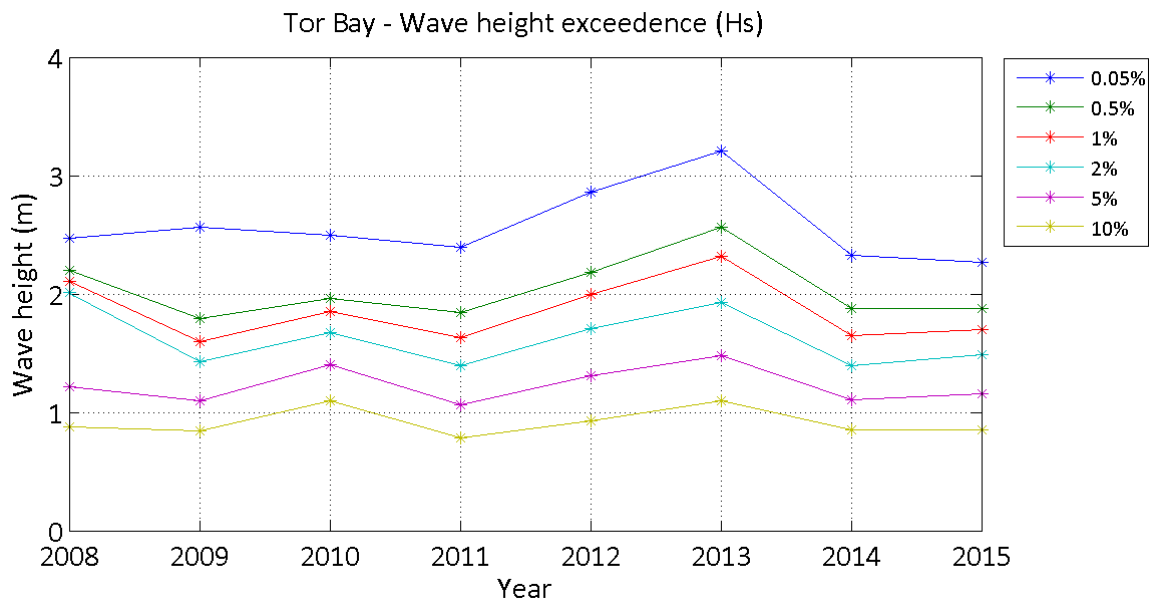
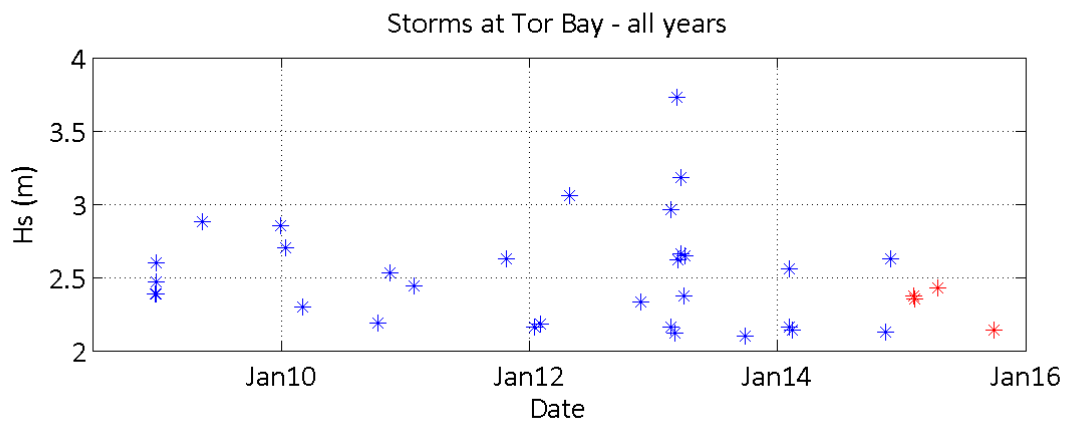
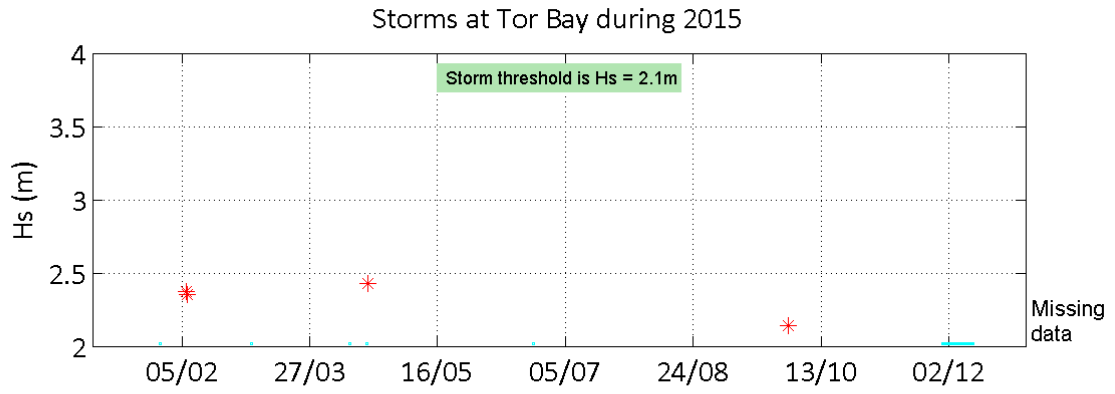
General

The buoy was first deployed on 4 July 2008, at which time the magnetic declination at the site was 3.0° west, changing by 0.15° east per year.

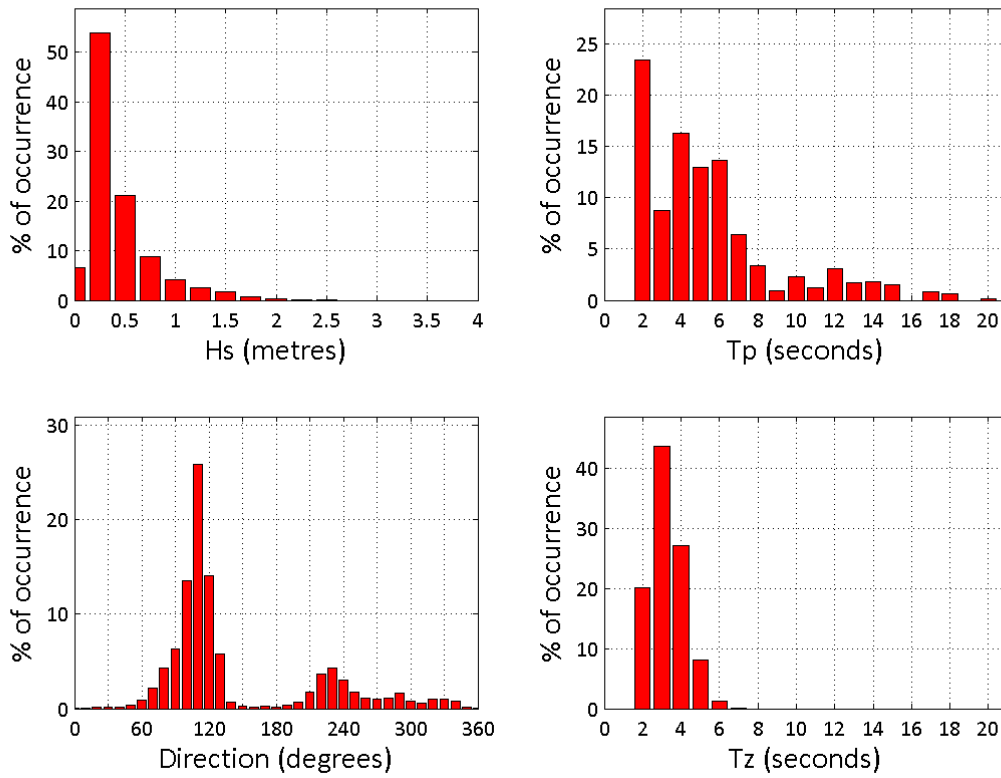
Acknowledgements

The shore station is kindly hosted by Tor Bay Harbourmaster.

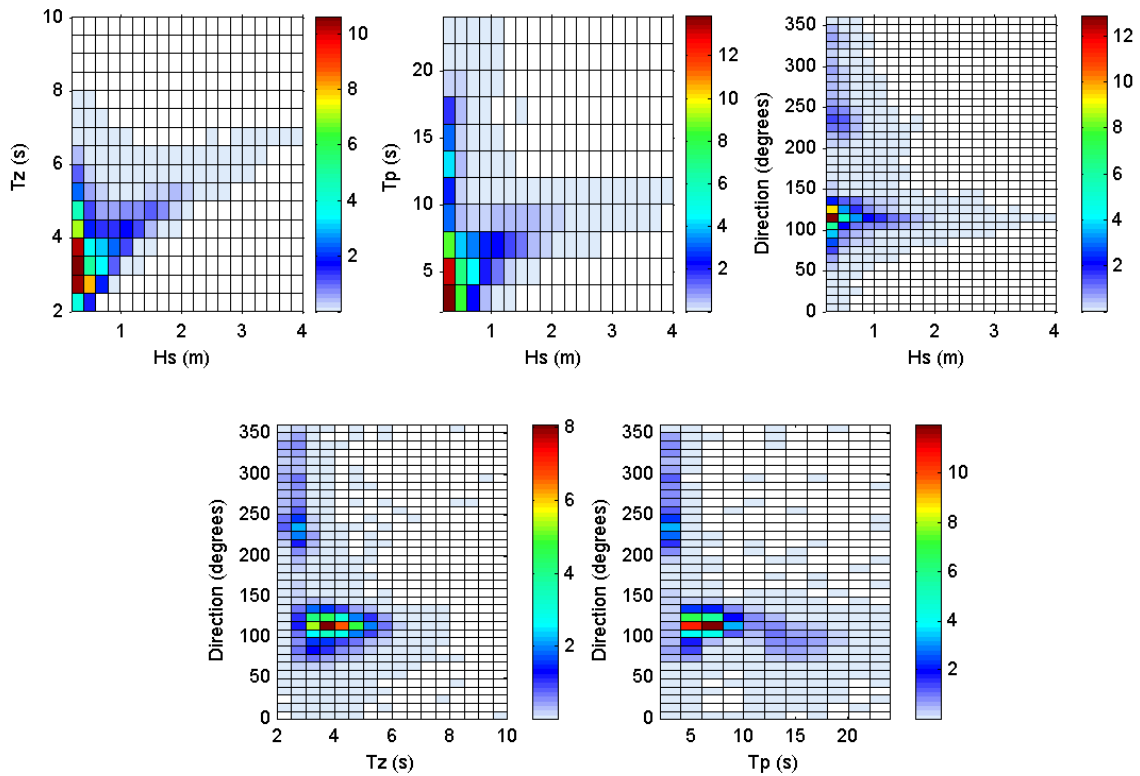




Tor Bay 2015



Tor Bay 2008 to 2015 - Joint distribution (% of occurrence)



Offshore Wave Hs (m)

Tor Bay WB : 04/07/2008 - 31/12/2015

