



Minehead Directional Waverider Buoy

Location			
OS	297517 E 148580 N		
WGS84	Latitude: 51° 13.63' N Longitude: 03° 28.14' W		
Instrument type			
Datawell Directional Waverider Mk III			
Water depth	~10m CD	Buoy in situ off Minehead beach. Photo courtesy of Fugro EMU Limited	Location of buoy (Google mapping, image ©2016 Getmapping plc)

Data Quality

Recovery rate (%)	Sample interval
95	30 minutes

Monthly Averages - 2016

All times are GMT

Month	H _s (m)	T _p (s)	T _z (s)	Dir. (°)	SST (°C)	Bimodal seas (%)	No. of days
January	0.76	8.0	4.5	287	9.2	4	31
February	0.78	7.5	4.3	262	8.1	2	29
March	0.61	6.7	3.9	246	7.7	1	27
April	0.52	4.8	3.4	244	9.6	0	19
May	0.36	5.7	3.6	234	12.0	0	31
June	0.43	6.4	3.9	283	15.5	0	30
July	0.53	5.9	4.0	307	17.4	0	30
August	0.54	6.0	3.9	283	18.4	1	29
September	0.52	7.3	4.3	302	18.1	0	30
October	0.51	5.8	3.6	186	14.9	0	31
November	0.67	5.3	3.6	217	11.5	0	30
December	0.47	9.1	4.5	272	9.2	0	31

Monthly Averages - All Years (December 2006 – December 2015)

Month	H _s (m)	T _p (s)	T _z (s)	Dir. (°)	SST (°C)	Bimodal seas (%)
January	0.69	7.3	4.3	272	7.6	2
February	0.58	7.5	4.2	258	6.9	1
March	0.56	6.9	4.0	252	7.7	0
April	0.43	6.9	3.9	250	9.8	0
May	0.53	5.8	3.8	258	12.2	0
June	0.43	6.0	3.7	256	15.1	0
July	0.48	5.9	3.9	276	17.4	0
August	0.48	6.0	3.9	279	18.1	0
September	0.53	5.8	3.7	252	17.0	0
October	0.56	6.5	4.0	255	14.9	0
November	0.68	7.0	4.2	267	12.1	1
December	0.73	7.2	4.3	269	9.1	2

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)
02-Mar-2016 11:00	2.69	10.5	5.3	319	2.8	HW	5.3	-	-
09-Feb-2016 22:00	2.56	8.3	7.0	300	-0.1	HW +3	9.9	-	-
08-Feb-2016 15:00	2.50	10.0	5.3	322	0.1	HW -3	9.4	-	-
12-Jan-2016 15:30	2.24	8.3	4.7	312	-2.1	HW -4	9.3	-	-

* Tidal information is estimated from the predicted tide levels (Admiralty Total Tide).

Annual Statistics

Year	Annual H _s exceedance** (m)						Annual Maximum H _s	
	0.05%	0.5%	1%	2%	5%	10%	Date	A _{max} (m)
2007	2.36	2.00	1.84	1.67	1.38	1.09	02-Dec-2007 21:00	2.55
2008	2.70	2.17	2.01	1.78	1.50	1.27	10-Mar-2008 23:00	2.77
2009	2.13	1.81	1.65	1.50	1.23	1.02	14-Nov-2009 16:30	2.53
2010	2.36	1.66	1.47	1.29	1.03	0.84	31-Mar-2010 10:00	2.68
2011	2.33	1.98	1.85	1.66	1.36	1.12	15-Dec-2011 04:30	2.51
2012	2.49	2.00	1.77	1.52	1.24	1.01	05-Jan-2012 06:00	2.67
2013	2.23	1.80	1.70	1.51	1.21	1.01	02-Nov-2013 20:00	2.97
2014	2.26	1.94	1.77	1.53	1.20	0.98	21-Oct-2014 07:30	2.55
2015	2.41	1.95	1.77	1.61	1.35	1.11	30-Jan-2015 05:00	2.72
2016	2.39	1.96	1.82	1.53	1.24	1.02	02-Mar-2016 11:00	2.69

** i.e. 5 % of the H_s values measured in 2007 exceeded 1.38 m

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 0.5-hourly and 3-hourly records and are calculated for periods up to 10 times the record length, using a Weibull distribution.

0.5-hourly records December 2006 – December 2016		
Return period (years)	Significant wave height (m)	Comments
1	2.9	No depth limitation
2	2.9	
5	3.0	
10	3.1	
20	3.2	
50	3.3	
100	3.3	

3-hourly records December 2006 – December 2016		
Return period (years)	Significant wave height (m)	Comments
1	2.5	No depth limitation
2	2.6	
5	2.8	
10	2.9	
20	3.0	
50	3.1	
100	3.1	

Distribution plots

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

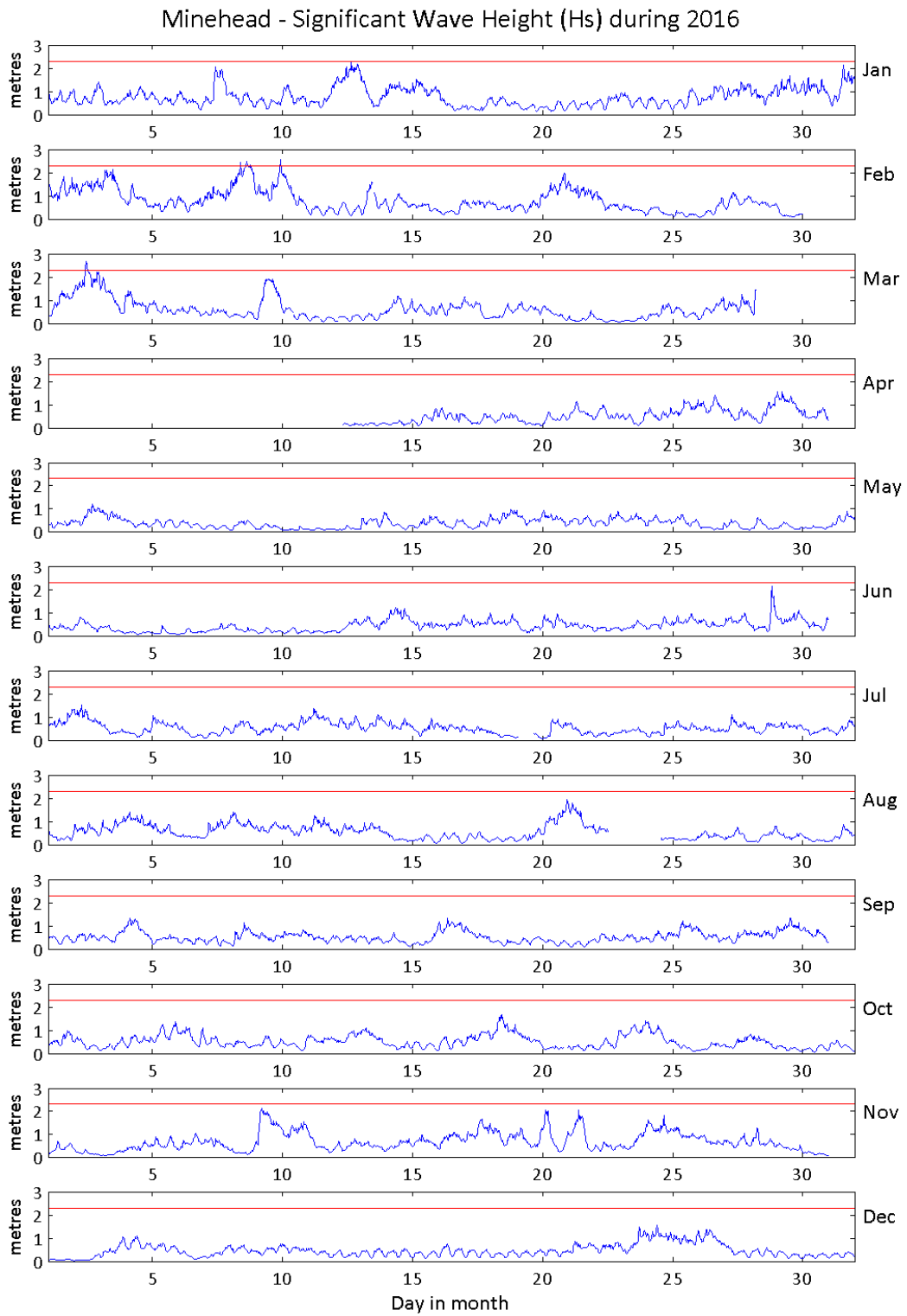
- Annual time series of H_s (red line is 2.3 m storm threshold)
- Incidence of storm waves for 2016. Storm events are defined using the Peaks-over-Threshold method. The highest H_s of each storm event is shown
- Wave height exceedance each year since deployment
- Percentage of occurrence of H_s , T_p , T_z and Direction for 2016
- 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

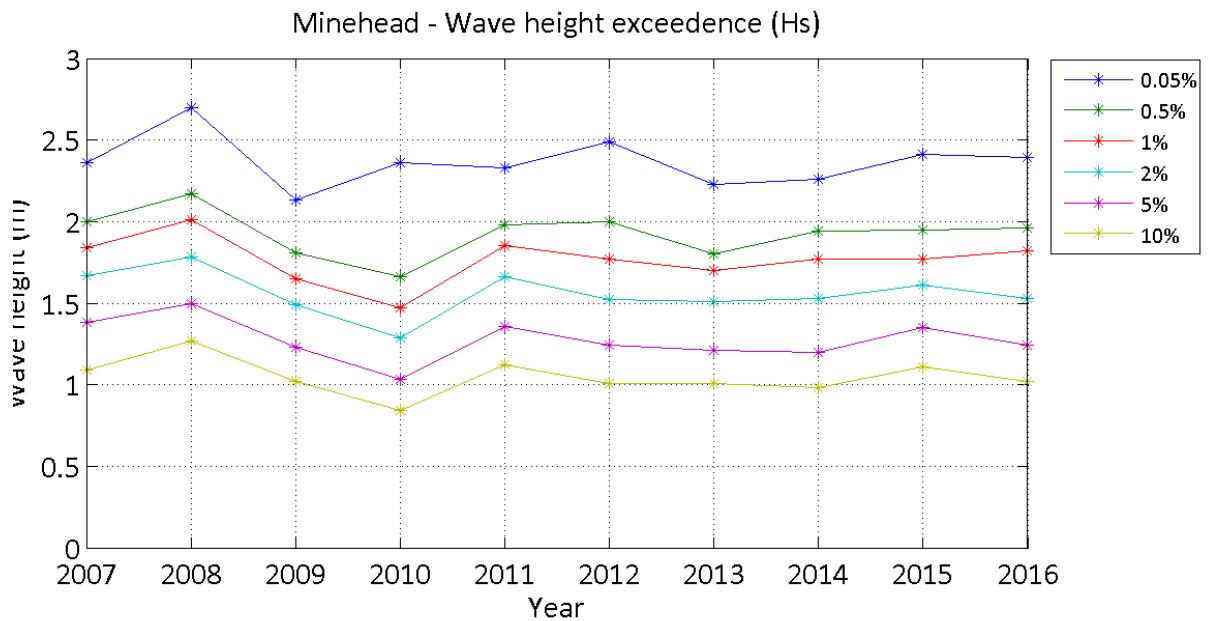
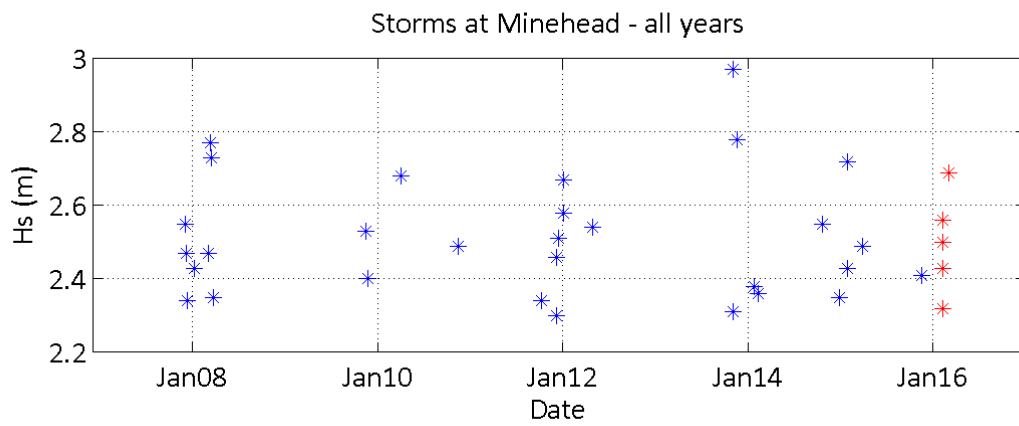
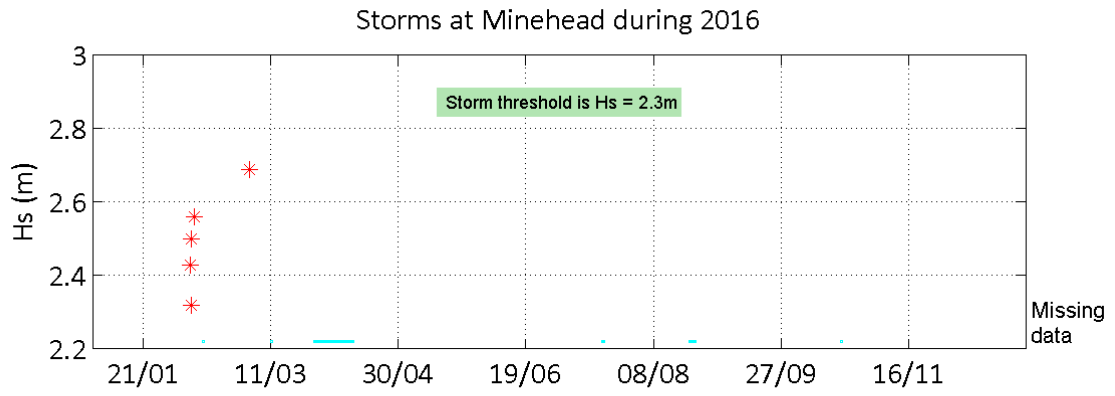
General

The buoy, owned by Teignbridge District Council, was first deployed on 19 December 2006, at which time the magnetic declination at the site was 3.4° west, changing by 0.15° east per year.

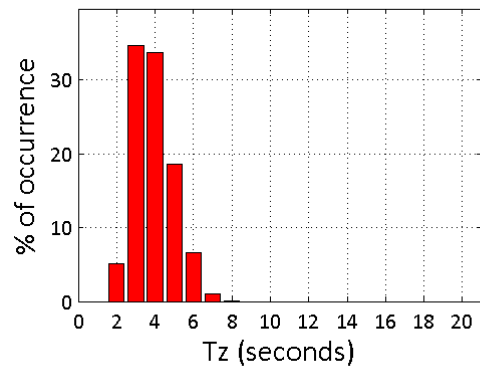
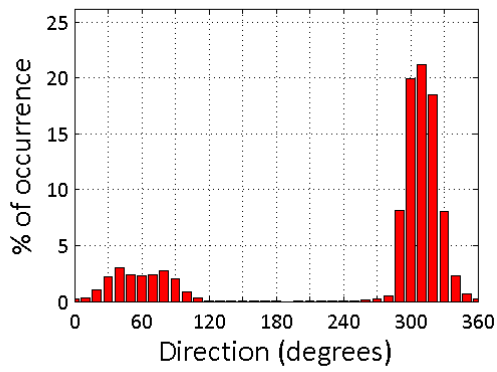
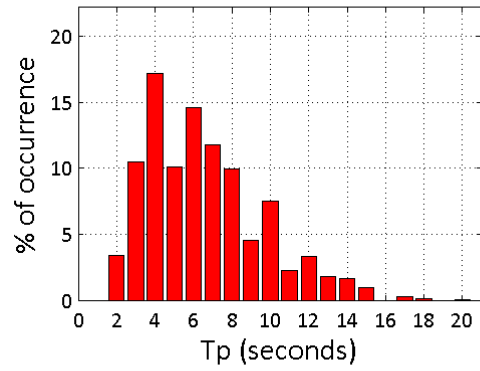
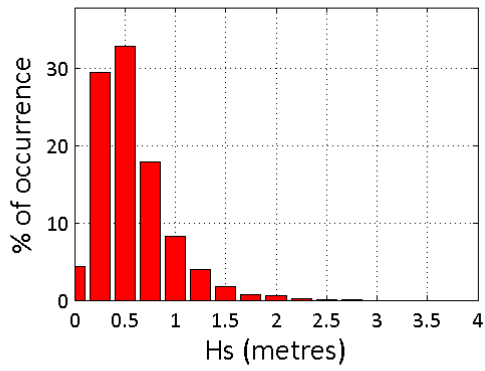
Acknowledgements

The shore station is kindly hosted by Minehead Harbourmaster.





Minehead 2016



Minehead 2006 to 2016 - Joint distribution (% of occurrence)

