



Start Bay Directional Waverider Buoy

Location			
OS	284976 E 44777 N		
WGS84	Latitude: 50° 17.50' N Longitude: 03° 36.97' W		
Instrument type			
Datawell Directional Waverider Mk III			
Water depth	~10m CD	Buoy in situ in Start Bay. Photo courtesy of Fugro EMU Limited	Location of buoy (Google mapping, image ©2016 Getmapping plc)

Data Quality

Recovery rate (%)	Sample interval
100	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	1.22	9.5	5.3	172	10.9	13	31
February	1.06	9.9	5.0	163	9.9	9	29
March	0.82	9.0	4.6	156	9.2	4	31
April	0.68	9.1	4.5	159	10.0	3	30
May	0.44	7.0	3.9	146	11.6	0	31
June	0.38	8.0	4.2	165	13.8	0	30
July	0.34	7.3	3.8	168	15.1	0	31
August	0.46	7.3	4.0	162	16.6	1	31
September	0.54	8.5	4.2	173	17.3	2	30
October	0.94	7.1	4.2	131	15.7	0	31
November	0.89	7.1	4.6	136	13.5	1	30
December	0.82	9.8	4.8	165	11.6	8	31

Monthly Averages - All Years (April 2007 – December 2015)

Month	H _s (m)	T _p (s)	T _z (s)	Dir. (°)	SST (°C)	Bimodal seas (%)
January	0.99	9.5	5.0	164	9.6	9
February	0.92	9.8	4.9	162	8.6	8
March	0.75	8.9	4.5	156	8.6	3
April	0.64	8.6	4.4	155	9.9	2
May	0.55	7.5	4.0	153	11.6	1
June	0.50	7.5	4.0	156	13.8	1
July	0.45	6.9	3.9	161	15.3	1
August	0.48	7.0	4.0	163	16.2	1
September	0.56	7.4	4.0	151	16.4	1
October	0.78	7.9	4.3	157	15.4	4
November	0.87	8.4	4.6	159	13.4	6
December	0.98	9.1	4.9	163	11.1	9

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)
01-Jan-2016 23:30	3.89	8.3	6.5	141	1.79	HW +2	2.52	0.67	0.76
20-Nov-2016 01:00	3.47	8.3	6.3	146	-0.25	HW +3	3.1	-	-
05-Oct-2016 20:30	3.44	9.1	6.3	98	1.82	HW	3.69	-0.11	0.00
10-Apr-2016 19:30	3.40	7.7	6.1	101	2.65	HW	5.25	0.22	0.33
23-Oct-2016 21:30	3.32	8.3	6.0	97	0.94	HW -2	2.31	0.13	0.21
06-Feb-2016 17:00	3.23	10.5	6.3	180	2.09	HW +1	3.71	0.43	0.54
28-Mar-2016 03:00	3.18	10.5	6.3	174	-1.59	HW -5	3.89	0.23	0.36
18-Jan-2016 09:30	3.17	8.3	6.1	148	1.08	HW -2	2.87	0.17	0.28

* Tidal information is obtained from the National Network gauge at Devonport and/or estimated from the predicted tide levels (Admiralty Total Tide). The surge shown is the residual at the time of the highest H_s. The maximum tidal surge is the largest surge during the storm event.

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	-	-	1.93	1.71	1.43	1.15	17-Dec-2007 23:30	3.41
2008	3.60	2.98	2.66	2.34	1.78	1.38	17-Apr-2008 20:30	3.94
2009	3.19	2.67	2.44	2.21	1.83	1.47	01-Feb-2009 09:00	3.36
2010	3.53	2.5	2.21	2.05	1.72	1.43	16-Jan-2010 05:30	3.73
2011	2.87	2.36	2.17	1.94	1.61	1.29	24-Oct-2011 15:30	3.27
2012	3.84	2.64	2.36	2.1	1.65	1.32	30-Apr-2012 03:00	4.36
2013	3.58	2.95	2.67	2.38	1.90	1.57	11-Mar-2013 14:00	3.78
2014	4.57	2.95	2.60	2.27	1.80	1.40	14-Feb-2014 21:30	5.25
2015	3.22	2.44	2.22	2.00	1.69	1.43	30-Dec-2015 09:30	3.63
2016	3.55	2.97	2.60	2.31	1.89	1.46	01-Jan-2016 23:30	3.89

** i.e. 5 % of the H_s values measured in 2007 exceeded 1.43 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 April 2007 – December 2016		
Return period (years)	Significant wave height (m)	Comments
1	4.6	Depth-limited at MLWS
2	4.9	
5	5.2	
10	5.5	
20	5.7	
50	6.1	Depth-limited at MHWS
100	6.3	

3-hourly records April 2007 – December 2016		
Return period (years)	Significant wave height (m)	Comments
1	3.9	No depth limitation
2	4.2	
5	4.5	Depth-limited at MLWS
10	4.7	
20	5.0	
50	5.3	
100	5.5	

Distribution plots

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

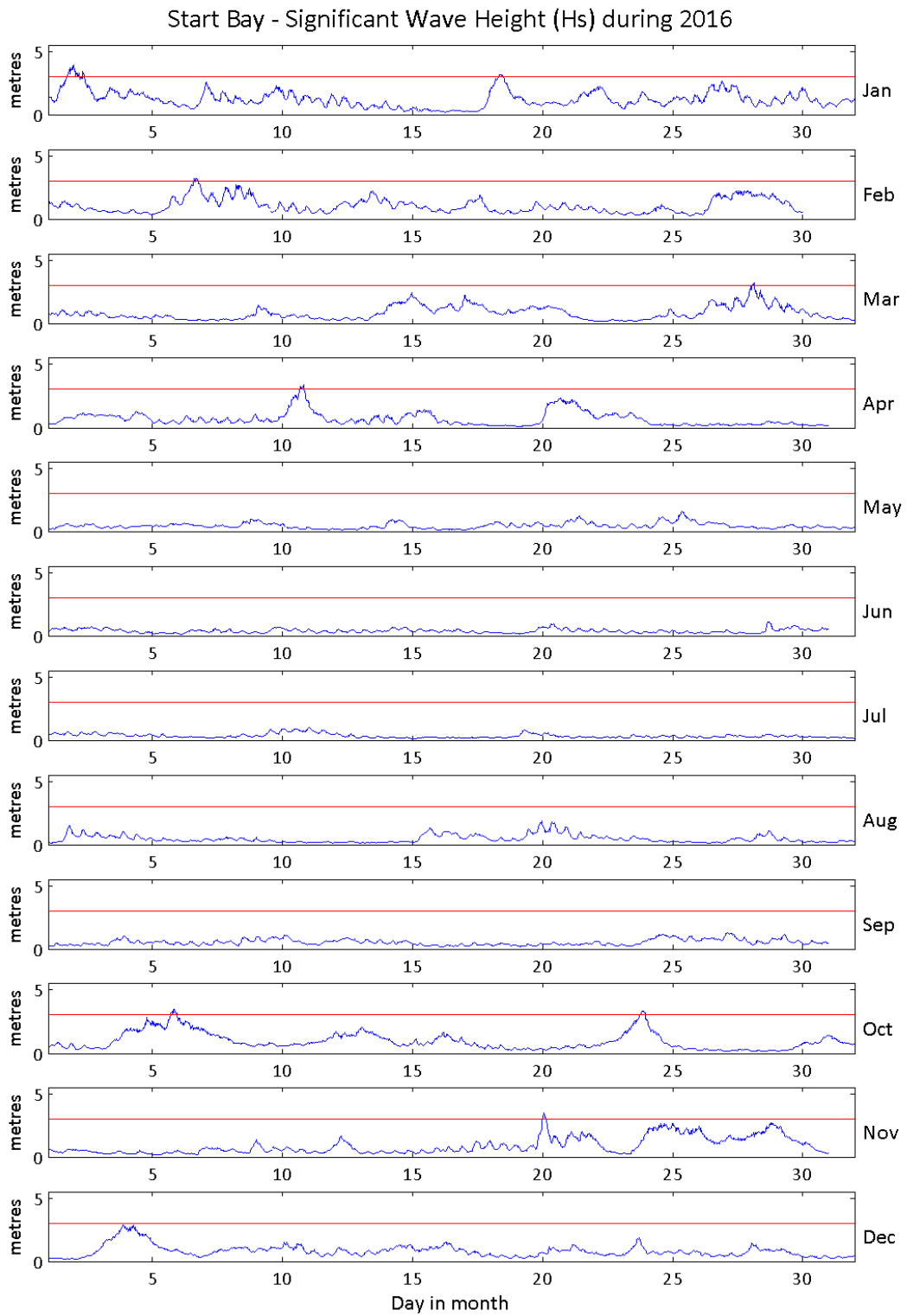
- Annual time series of H_s (red line is 3.0 m storm threshold)
- Incidence of storm waves for 2016. Storm events are defined using the Peaks-over-Threshold method. The highest H_s of each storm event is shown
- Wave height exceedance each year since deployment
- Percentage of occurrence of H_s , T_p , 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

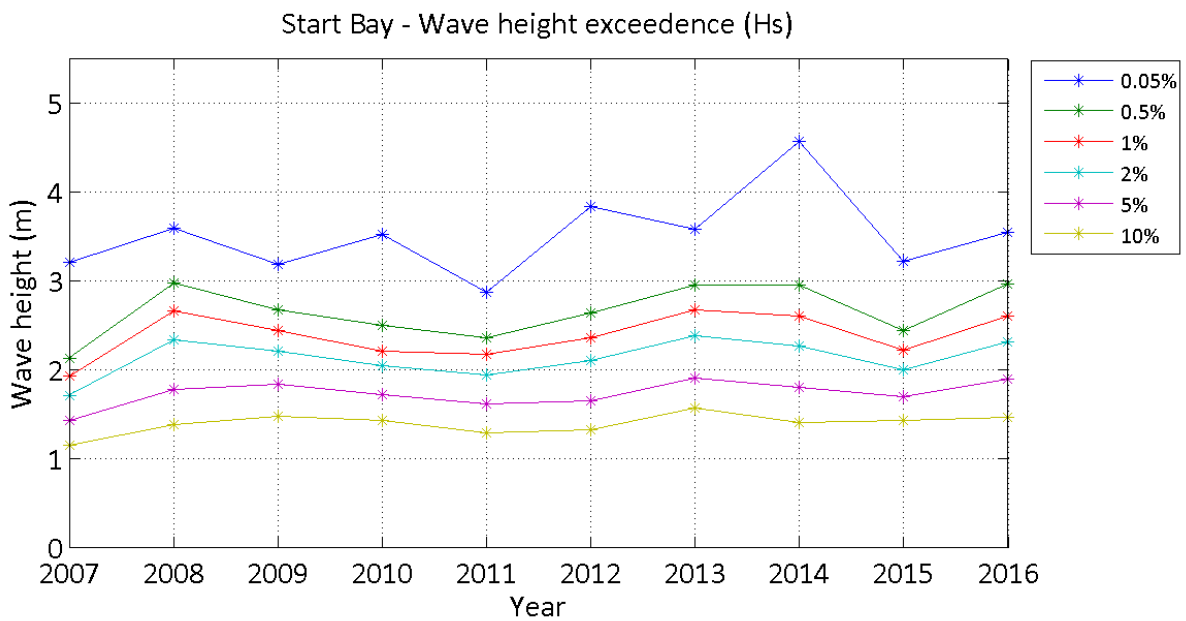
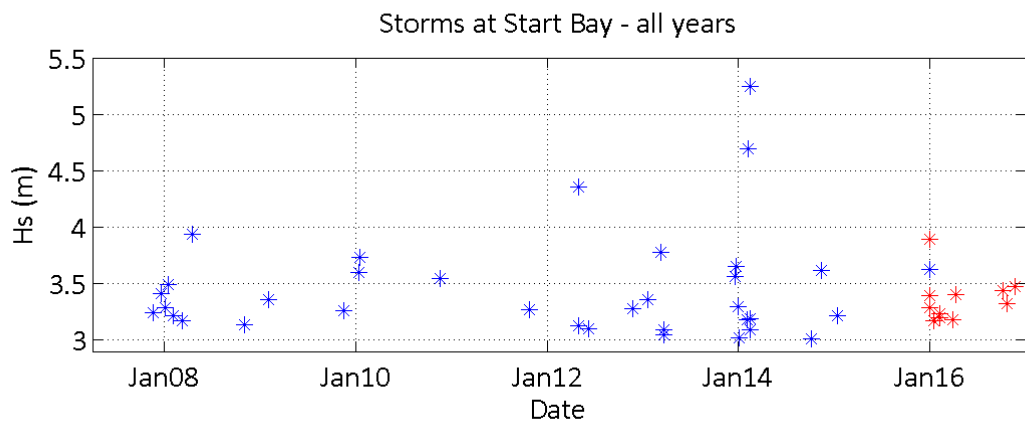
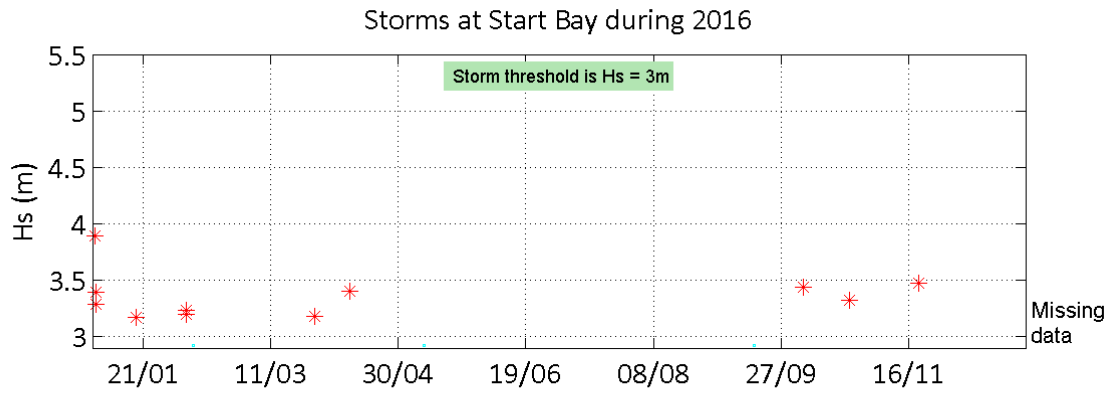
General

The buoy, owned by Teignbridge District Council, was first deployed on 5 April 2007, at which time the magnetic declination at the site was 3.2° west, changing by 0.15° east per year.

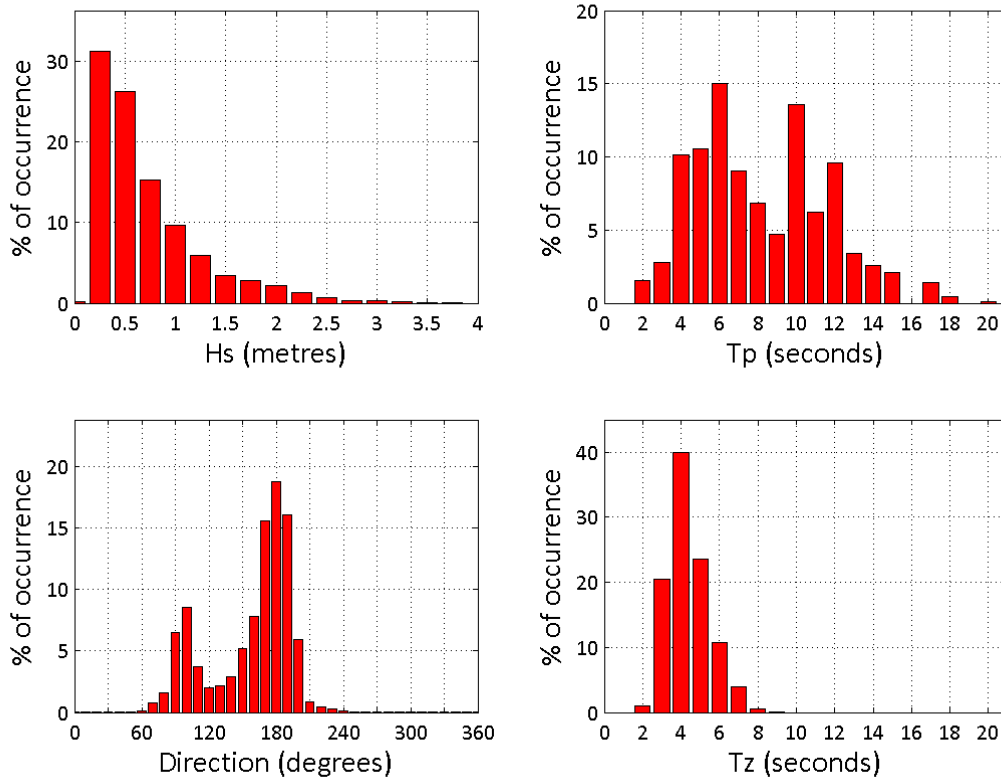
Acknowledgements

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Start Bay 2016



Start Bay 2007 to 2016 - Joint distribution (% of occurrence)

