

## Bideford Bay Directional Waverider Buoy

### Location

OS: 240622E 131187N

WGS84: Latitude: 51° 03.471' N Longitude: 04° 16.537' W

### Water Depth

~10 m CD

### Instrument Type

Datawell Directional Waverider Mk III

### Data Quality

Recovery rate (%)	Sample interval
92	30 minutes

### Statistics - 2012

All times are GMT

Month	H <sub>s</sub> (m)	T <sub>p</sub> (s)	T <sub>z</sub> (s)	Dir. (°)	SST (°C)	No. of days
January	1.65	10.8	5.9	283	9.6	30
February	1.09	10.7	6.2	285	8.5	29
March	1.04	11.5	6.8	285	9.4	31
April	1.06	9.8	4.9	277	10.0	30
May	0.53	8.2	4.5	276	11.9	31
June	1.03	9.0	5.2	277	14.1	30
July	0.85	7.9	4.6	282	16.0	31
August	0.99	8.9	5.3	276	17.3	29
September	0.98	8.4	4.5	285	16.7	30
October	1.10	9.8	5.6	280	14.5	31
November	1.36	9.0	5.3	284	12.4	14
December	2.12	12.2	6.9	280	9.7	20

### Storm Analysis

Date/Time	H <sub>s</sub> (m)	T <sub>p</sub> (s)	T <sub>z</sub> (s)	Dir. (°)	Water level elevation* (OD)	Tidal stage (hours re. HW)	Tidal range (m)	Tidal surge* (m)	Max. surge* (m)
04-Jan-2012 23:00	5.82	10.5	9.3	278	-0.12	HW -4	3.6	0.21	0.56
17-Oct-2012 15:00	4.98	12.5	9.1	274	-1.68	HW -4	7.2	0.41	0.66
03-Jan-2012 10:30	4.96	12.5	8.5	276	1.09	HW -3	1.2	0.22	0.72
08-Jun-2012 05:00	4.63	10.0	7.7	278	-0.61	HW -3	5.0	0.58	0.59
29-Dec-2012 02:00	4.46	10.5	8.2	276	-1.48	HW -4	7.1	0.40	0.50

\* Tidal information is obtained from the nearest recording tide gauge (the National Network gauge at Ilfracombe). The surge shown is the residual at the time of the highest H<sub>s</sub>. 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)
2009	-	-	3.86	3.55	3.09	2.56	22-Nov-2009 15:30	5.16 <sup>+</sup>
2010	4.55	3.04	2.75	2.43	2.02	1.65	11-Nov-2010 17:30	5.52 <sup>+</sup>
2011	4.78	4.05	3.77	3.46	2.90	2.43	15-Dec-2011 07:30	5.14 <sup>+</sup>
2012	5.02	4.1	3.66	3.16	2.56	2.05	04-Jan-2012 23:00	5.82 <sup>+</sup>

\* i.e. 5 % of the  $H_s$  values measured in 2009 exceeded 3.09 m

<sup>+</sup> 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.

## Distribution plots

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

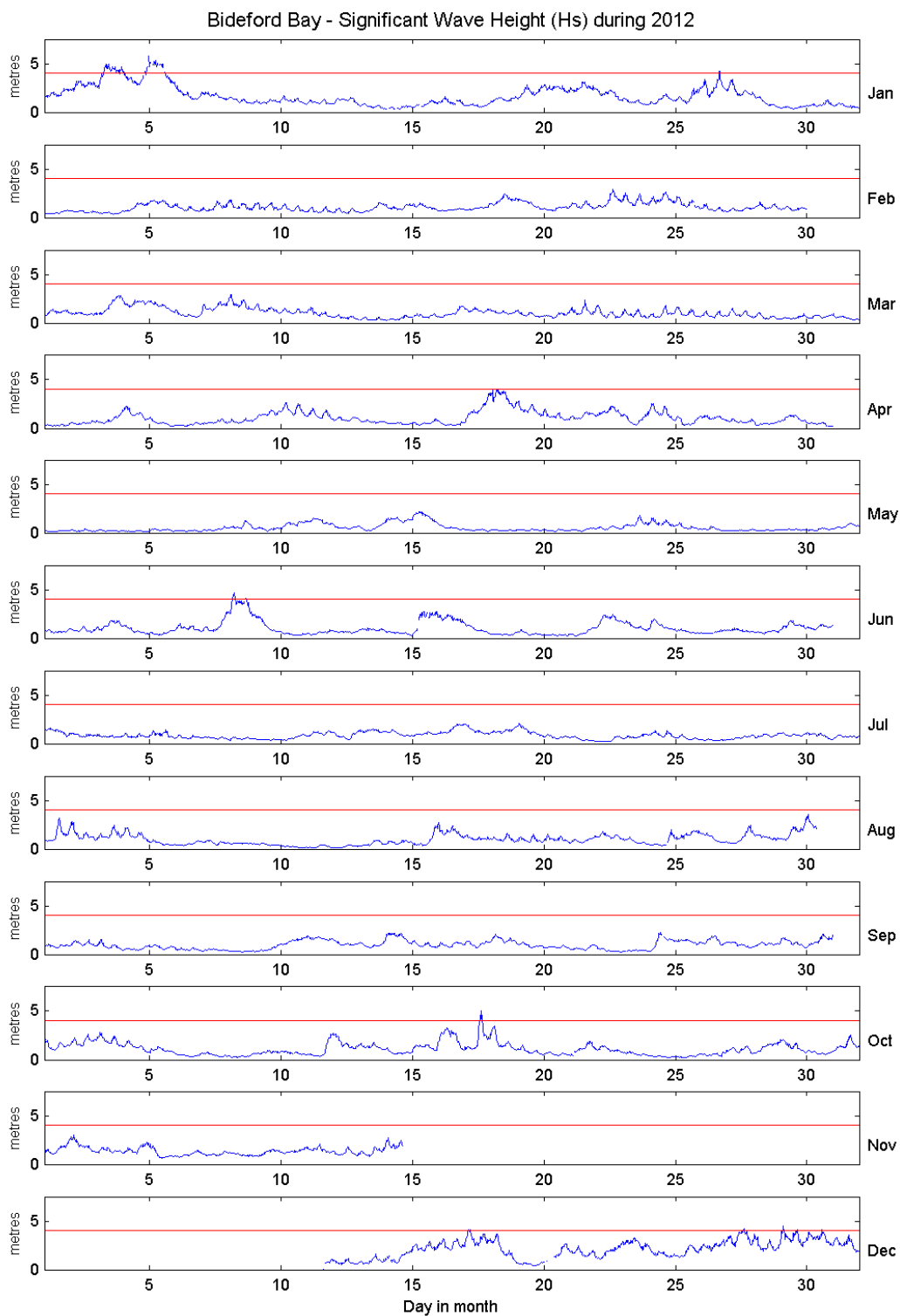
- Annual time series of  $H_s$  (red line is 4.0 m storm threshold)
- Wave roses (Direction vs.  $H_s$  and vs.  $T_p$ ) for all measured data
- Percentage of occurrence of  $H_s$ ,  $T_p$ ,  $T_z$  and Direction for 2012
- Incidence of storm waves for 2012. Storm events are defined using the Peaks-over-Threshold method. The highest  $H_s$  of each storm event is shown
- Joint distribution of all parameters for all measured data, given as percentage of occurrence

## General

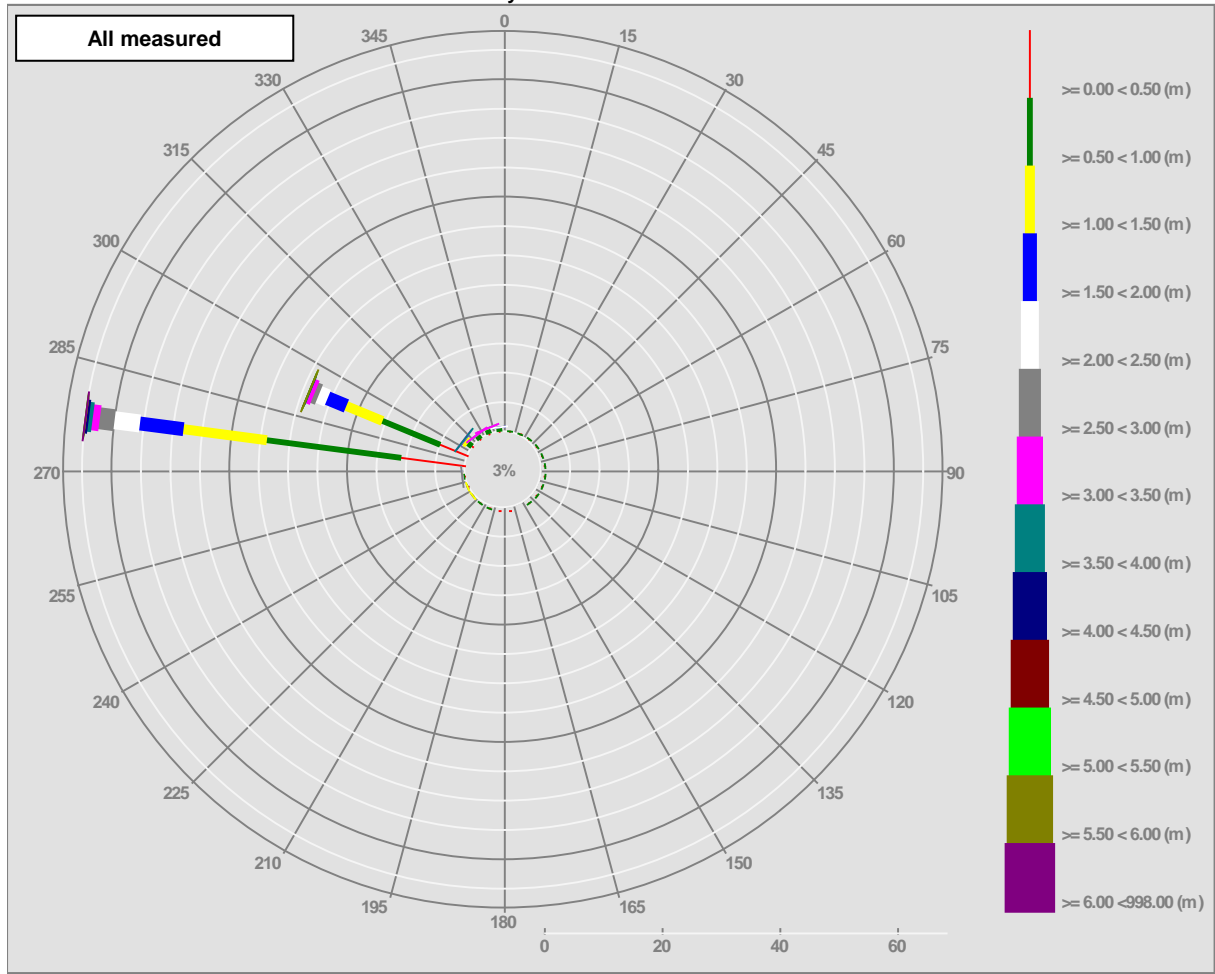
The buoy, owned by the Environment Agency (Southwest Region), was first deployed on 17 June 2009, at which time the magnetic declination at the site was 3.3° west, changing by 0.15° east per year.

## Acknowledgements

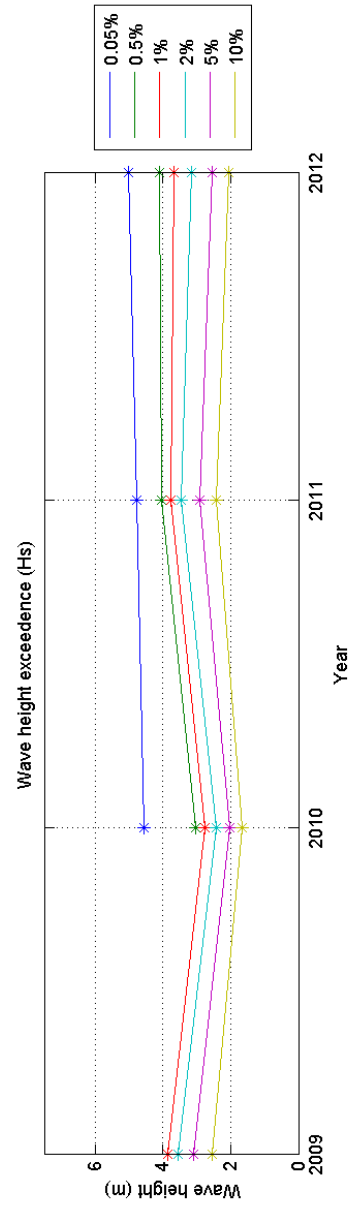
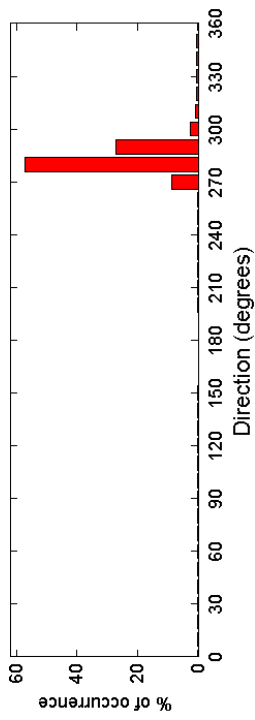
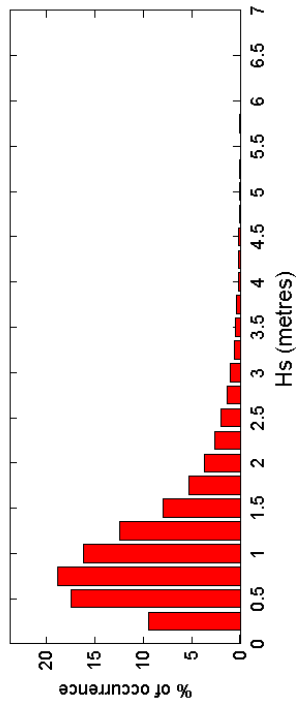
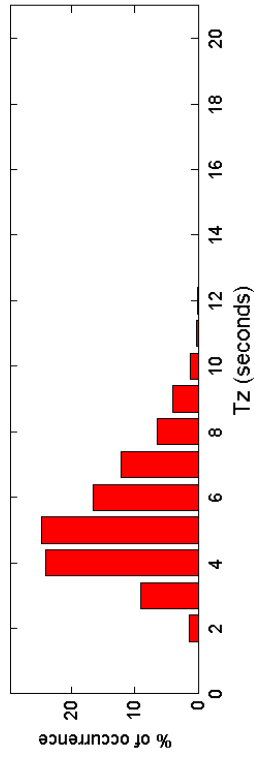
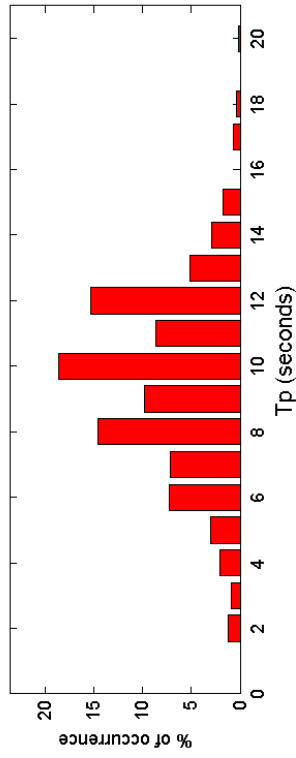
Until August 2012, the shore station was sited at Braddick's Holiday Park, by kind permission of Mr Braddick. The shore station is now kindly hosted by Appledore Lifeboat Station. Tidal data were supplied by the British Oceanographic Data Centre as part of the function of the National Tidal and Sea Level Facility, hosted by the Proudman Oceanographic Laboratory and funded by DEFRA and the Natural Environment Research Council.

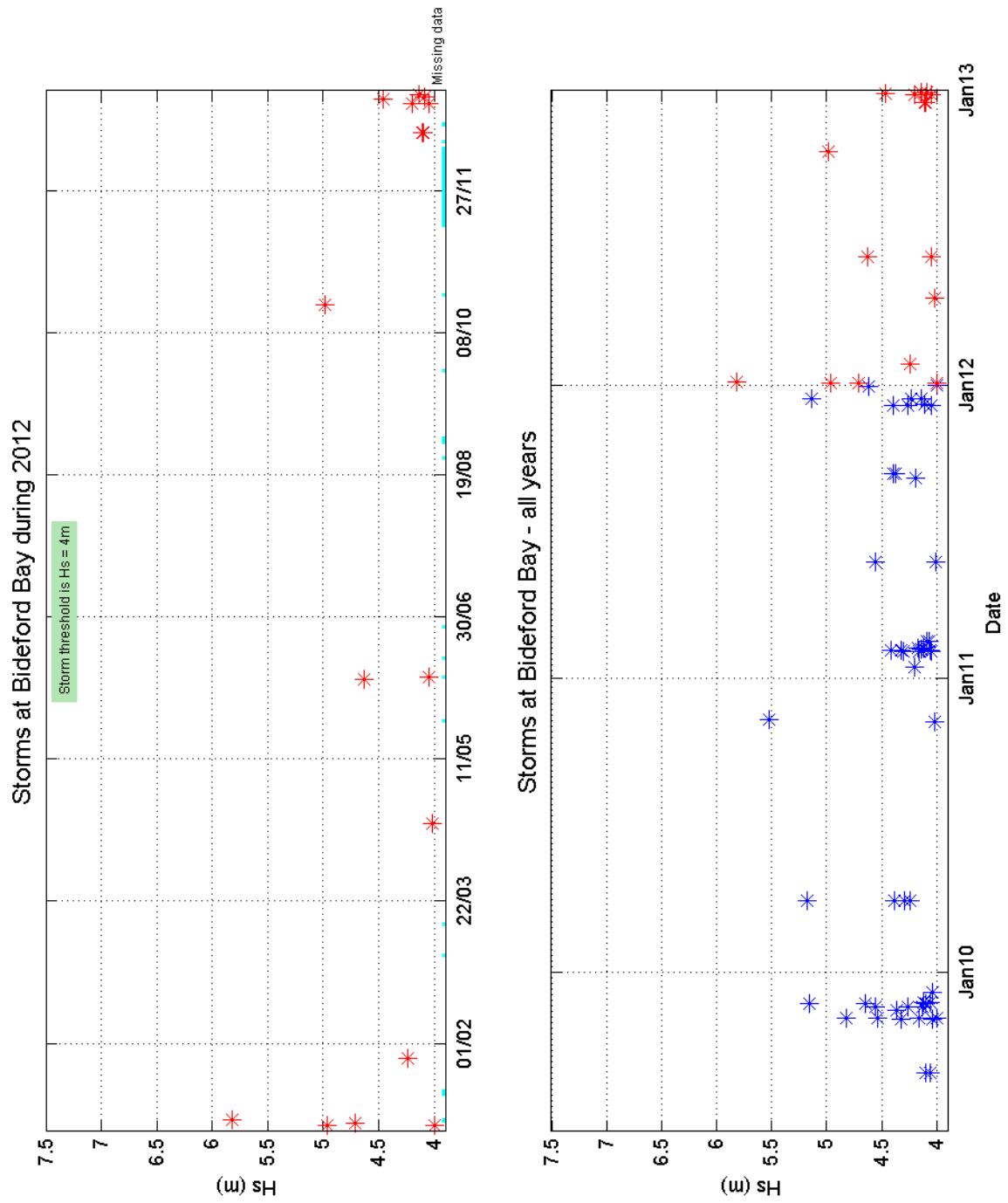


### Offshore Wave Hs (m) Bideford Bay WB : 17/06/2009 - 31/12/2012



Bideford Bay 2012





Bideford Bay 2009 to 2012 - Joint distribution (% of occurrence)

