

## Chesil Directional Waverider Buoy

### Location

OS: 363033E 78457N

WGS84: Latitude: 50° 36.279' N Longitude: 02° 31.424' W

### Water Depth

10-12 m CD

### Instrument Type

Datawell Directional Waverider Mk III

### Data Quality

Recovery rate (%)	Sample interval
100	30 minutes

### Statistics - 2011

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	0.97	9.4	5.3	208	7.0	31
February	1.39	11.3	5.6	219	7.4	28
March	0.55	9.0	5.0	200	8.2	31
April	0.57	10.1	5.3	207	10.2	30
May	0.87	6.5	4.1	219	12.3	31
June	0.92	6.9	4.3	222	14.3	30
July	0.66	7.1	4.2	226	16.0	31
August	0.72	6.6	4.1	223	17.2	31
September	1.16	7.2	4.5	223	16.7	30
October	1.07	7.4	4.4	222	15.6	31
November	1.20	9.2	5.1	221	13.4	30
December	1.72	7.8	4.8	227	10.7	31

### 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)
12-Dec-2011 23:30	5.53	10.0	7.4	222	0.27	HW +4	1.6	0.39	0.50
08-Jan-2011 11:00	4.45	12.5	8.3	217	0.85	HW +2	1.9	0.03	0.21

\* Tidal information is obtained from the nearest recording tide gauge (the National Network gauge at Weymouth). The surge shown is the residual at the time of the highest H<sub>s</sub>. The maximum tidal surge is the largest positive 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	4.48	3.55	3.3	3.04	2.47	1.91	02-Dec-2007 11:00	4.87
2008	4.84	3.76	3.43	3.03	2.57	2.06	10-Mar-2008 13:00	5.37
2009	5.50	4.00	3.55	3.13	2.54	2.02	14-Nov-2009 14:30	6.50 <sup>+</sup>
2010	3.97	3.14	2.83	2.46	1.94	1.56	11-Nov-2010 09:30	4.40
2011	4.41	3.45	3.03	2.66	2.23	1.85	12-Dec-2011 23:30	5.53

\* i.e. 5 % of the  $H_s$  values measured in 2007 exceeded 2.47 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 4.5 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 2011
- Incidence of storm waves for 2011. 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

## 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.

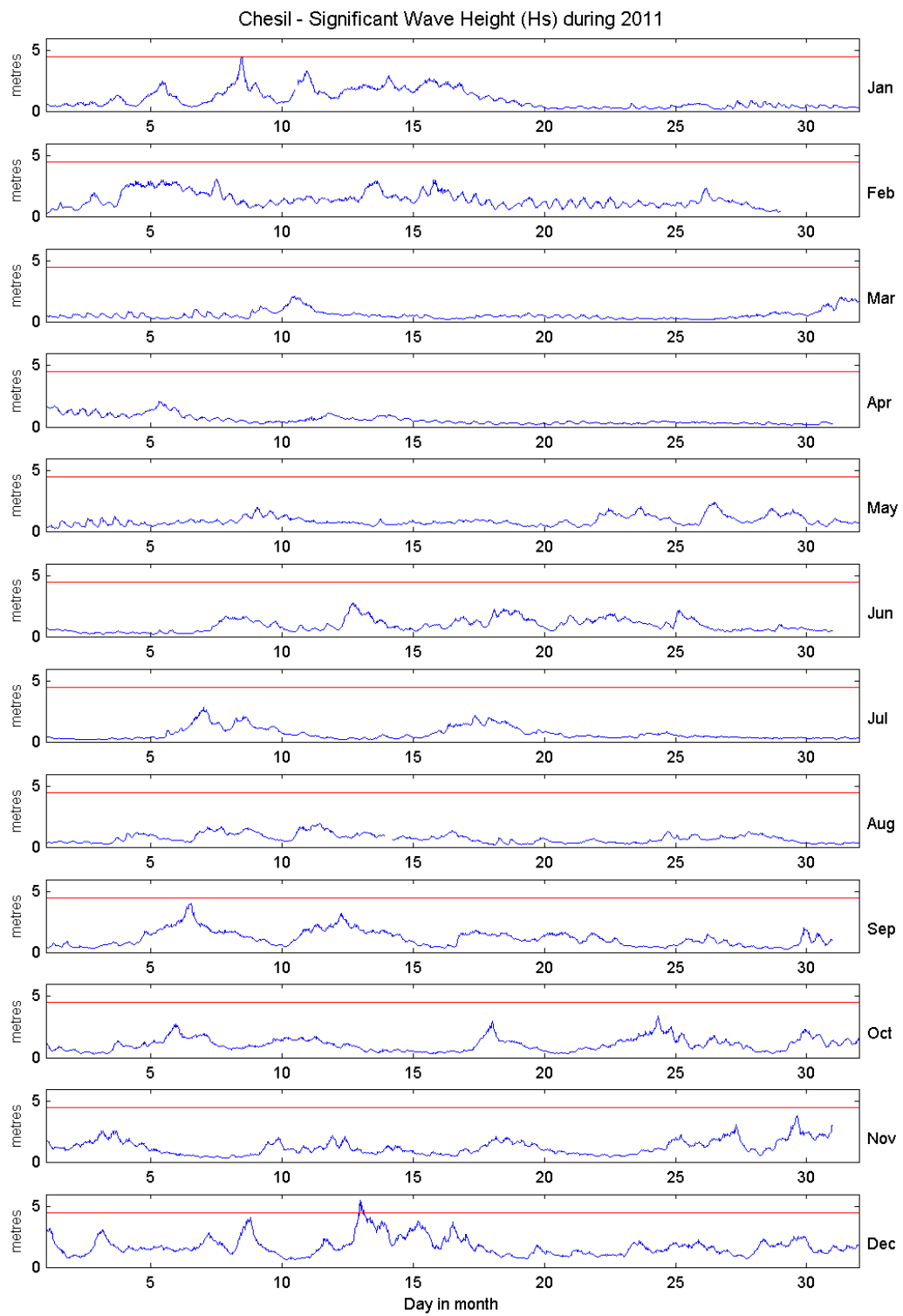
Return period (years)	Significant wave height (m)	Comments
1	5.16	Depth-limited at MLWS
2	5.46	
5	5.86	
10	6.15	Depth-limited at MHWS
20	6.43	Depth-limited at HAT
50	6.80	

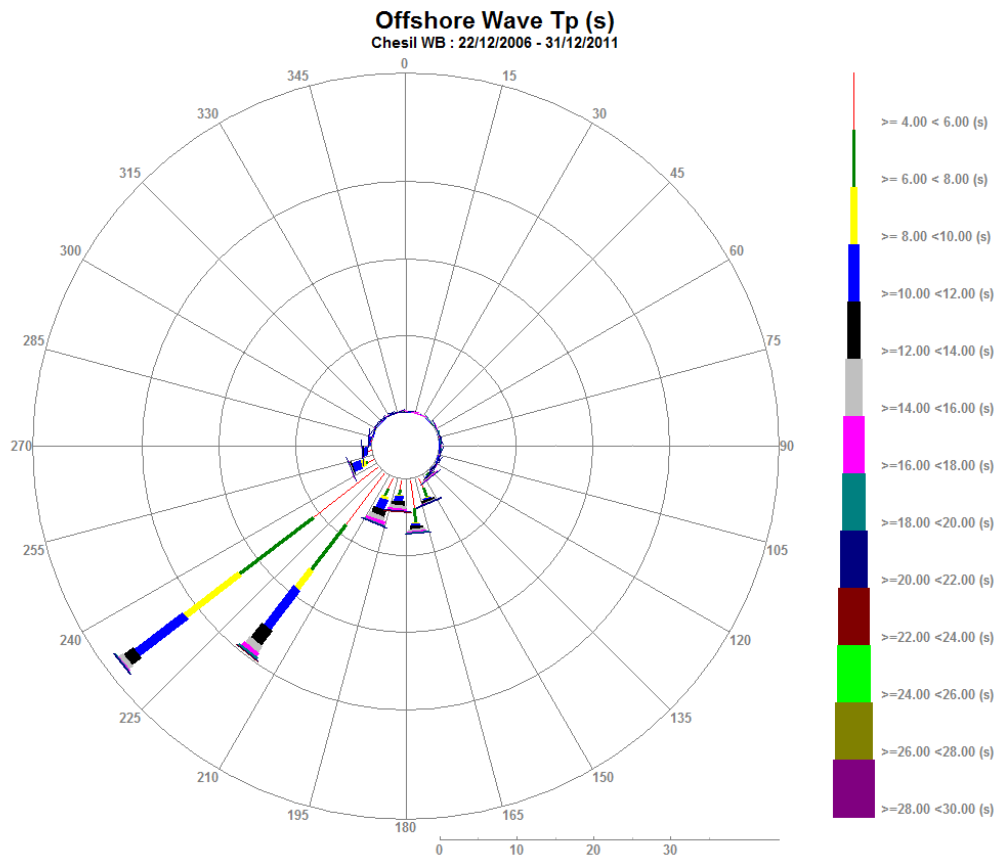
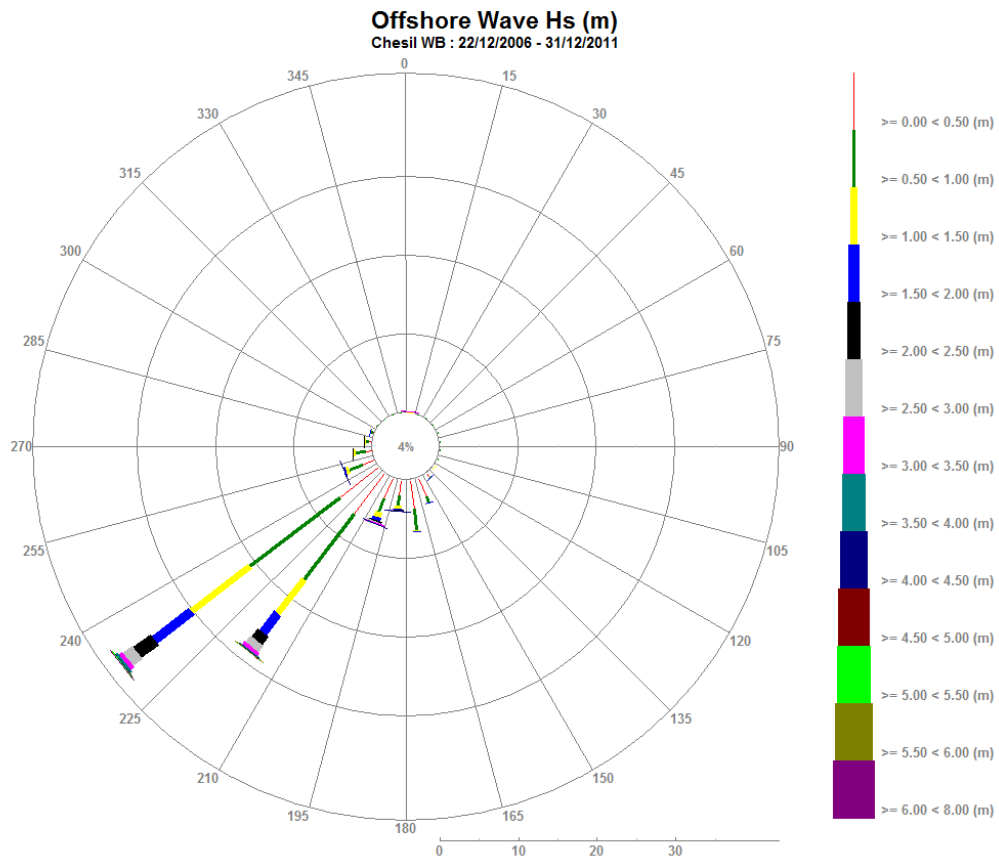
## General

The wave buoy at Chesil was deployed on 22 December 2006.

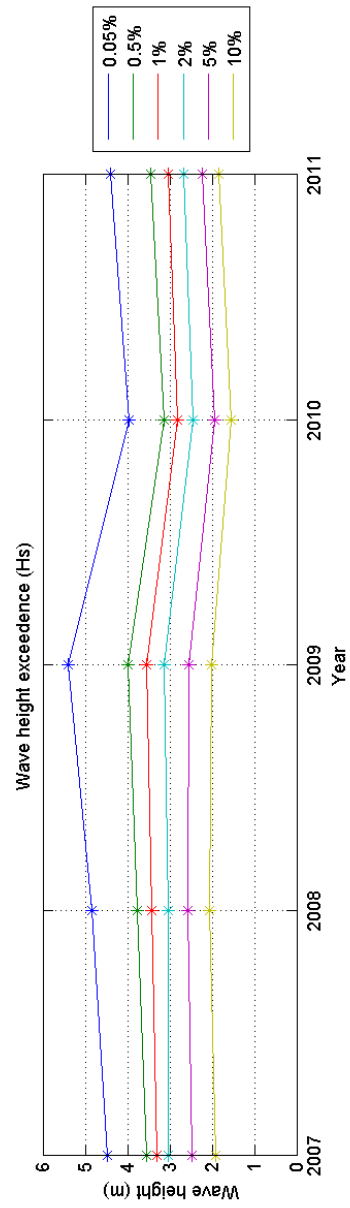
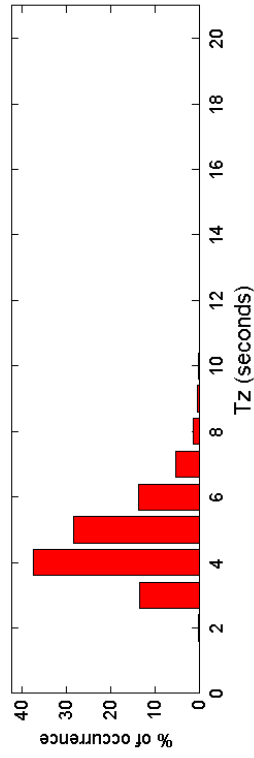
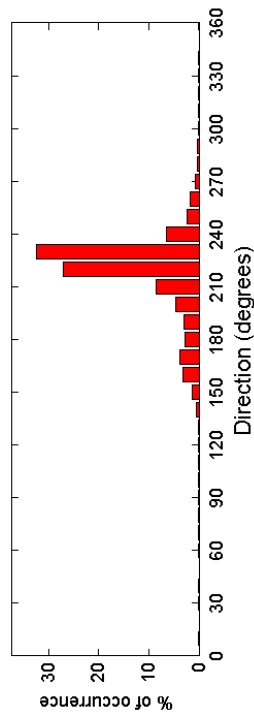
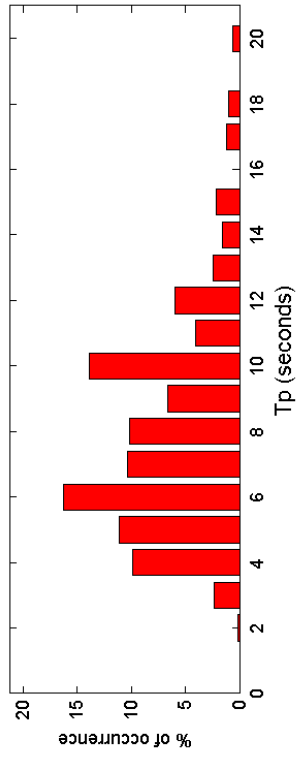
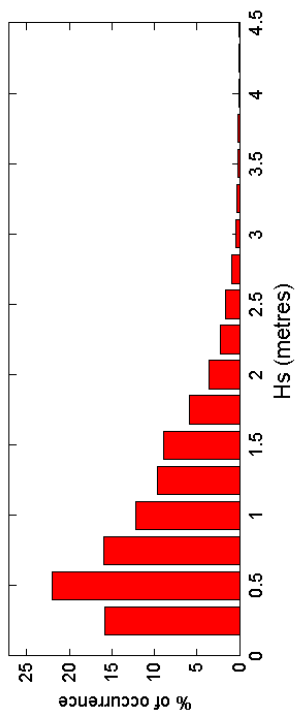
## Acknowledgements

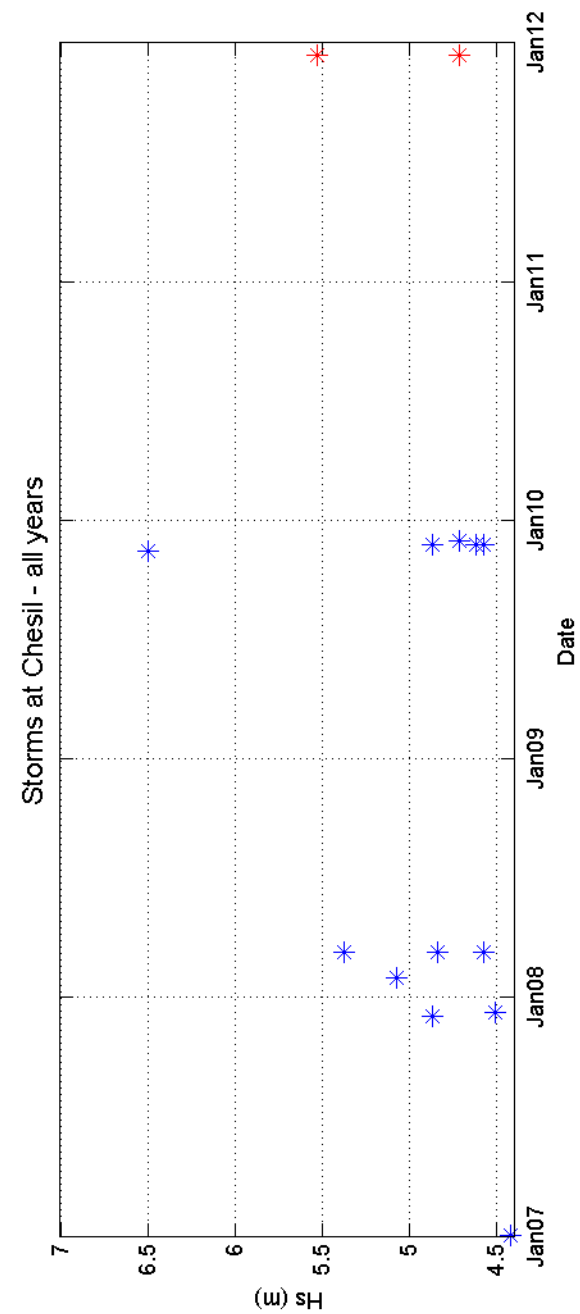
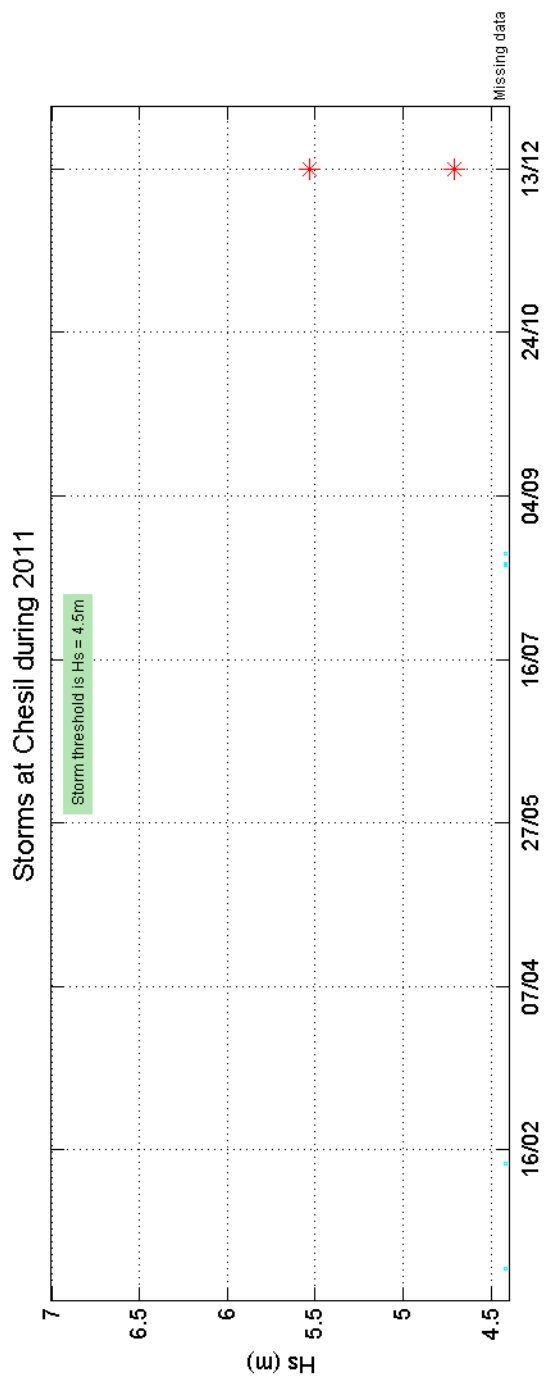
The shore station is kindly hosted by the Weymouth & Portland National Sailing Academy. Tidal data were supplied by the British Oceanographic Data Centre as part of the function of the National Tidal and Sea Level Facility, hosted by the Proudman Oceanographic Laboratory and funded by DEFRA and the Natural Environment Research Council.





Chesil 2011





Chesil 2007 to 2011 - Joint distribution (% of occurrence)

