

## Weymouth Directional Waverider Buoy

### Location

OS: 370833 E 80423 N  
 WGS84: Latitude: 50° 37.366' N Longitude: 002° 24.819' W

### Water Depth

Approx. 10m CD

### Instrument Type

Datowell Directional WaveRider Buoy Mk III

### Data Quality

| C1 (%) | Sample interval |
|--------|-----------------|
| 98     | 30 minutes      |

### Monthly Means

All times GMT

| Month     | H <sub>s</sub> | T <sub>p</sub> | T <sub>z</sub> | Direction | SST  | No. of days |
|-----------|----------------|----------------|----------------|-----------|------|-------------|
|           | (m)            | (s)            | (s)            | (°)       | (°C) |             |
| January   | 0.55           | 7.2            | 4.4            | 144       | 7.2  | 31          |
| February  | 0.51           | 8.1            | 4.2            | 151       | 6.4  | 28          |
| March     | 0.52           | 6.3            | 3.9            | 148       | 6.7  | 31          |
| April     | 0.37           | 6.3            | 3.8            | 148       | 8.9  | 29          |
| May       | 0.30           | 5.6            | 3.8            | 146       | 11.1 | 31          |
| June      | 0.28           | 6.3            | 3.7            | 150       | 14.3 | 27          |
| July      | 0.33           | 5.3            | 3.5            | 166       | 16.9 | 31          |
| August    | 0.34           | 5.2            | 3.6            | 163       | 17.3 | 30          |
| September | 0.42           | 5.9            | 3.7            | 157       | 16.9 | 30          |
| October   | 0.57           | 5.9            | 4.0            | 151       | 15.1 | 31          |
| November  | 0.57           | 7.1            | 4.1            | 151       | 12.5 | 30          |
| December  | 0.45           | 6.2            | 4.2            | 142       | 8.4  | 31          |

Tables and plots of these values, together with the minimum and maximum values and the standard deviation are available on the website.

| Highest storm events in 2010 |                |                |                |      |                             |                            |                 |                  |                 |
|------------------------------|----------------|----------------|----------------|------|-----------------------------|----------------------------|-----------------|------------------|-----------------|
| Date/Time                    | H <sub>s</sub> | T <sub>p</sub> | T <sub>z</sub> | Dir. | Water level elevation* (OD) | Tidal stage (hours re. HW) | Tidal range (m) | Tidal surge* (m) | Max. surge* (m) |
| 17-Nov-2010<br>10:00         | 2.81           | 7.1            | 5.7            | 142  | 0.52                        | HW +4                      | 0.60            | 0.31             | 0.36            |
| 16-Jan-2010<br>07:00         | 2.54           | 7.1            | 5.4            | 155  | 1.46                        | HW                         | 1.93            | 0.25             | 0.36            |
| 12-Jan-2010<br>16:30         | 2.36           | 6.7            | 5.1            | 139  | 0.88                        | HW -1                      | 0.98            | 0.21             | 0.27            |

\* 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.

| Year | Annual $H_s$ exceedance* (m) |      |      |      |      |      | Annual Maximum $H_s$ |               |
|------|------------------------------|------|------|------|------|------|----------------------|---------------|
|      | 0.05%                        | 0.5% | 1%   | 2%   | 5%   | 10%  | Date                 | $A_{max}$ (m) |
| 2007 | 2.29                         | 1.72 | 1.43 | 1.24 | 1.03 | 0.85 | 18-Nov-2007 13:30    | 2.56          |
| 2008 | 2.57                         | 1.95 | 1.75 | 1.46 | 1.1  | 0.89 | 03-Feb-2008 13:00    | 2.74          |
| 2009 | 2.17                         | 1.75 | 1.63 | 1.48 | 1.18 | 0.90 | 13-Nov-2009 23:30    | 2.62          |
| 2010 | 2.54                         | 1.84 | 1.54 | 1.29 | 1.00 | 0.81 | 17-Nov-2010 10:00    | 2.81          |

\* i.e. 5 % of the  $H_s$  values measured in 2007 exceeded 1.03m

### Distribution plots

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

- Percentage of occurrence of  $H_s$ ,  $T_p$ ,  $T_z$  and Direction for 2010
- Percentage wave height exceedance (all recorded years)
- Joint distribution of all parameters for 2010, given both as number of observations and as percentage of occurrence
- Cumulative joint distribution of parameters from start of records (percentage of occurrence only)
- Waves roses (Direction vs.  $H_s$  and vs.  $T_p$ ) for all measured data
- Incidence of storms during 2010 and for all previous years. Storm events are defined using the Peaks-over-Threshold method. The highest  $H_s$  of each storm event is shown.
- Annual time series of  $H_s$  (red line is storm threshold)

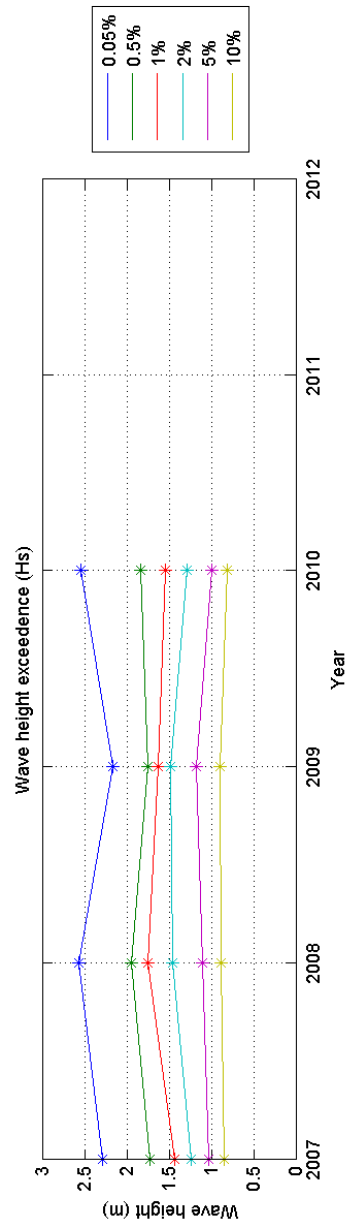
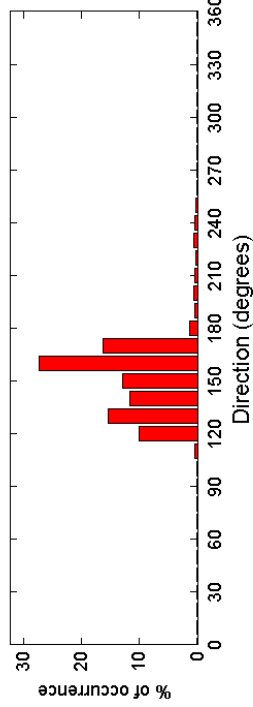
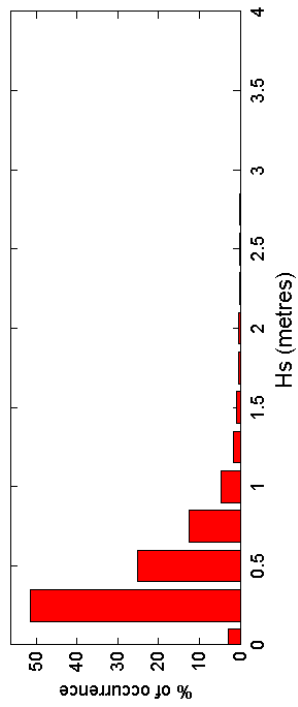
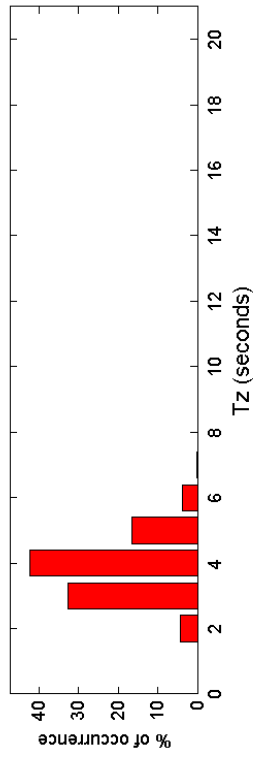
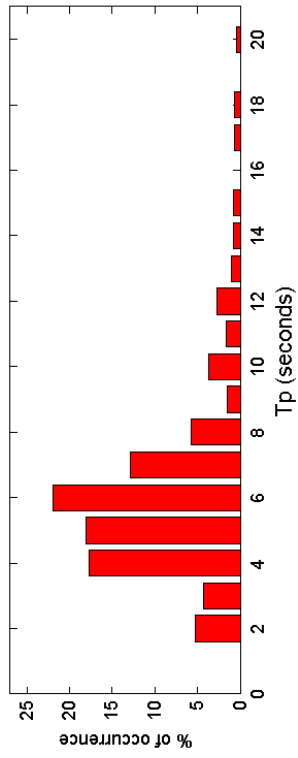
### General

The Waverider buoy was first deployed on 18 December 2006.

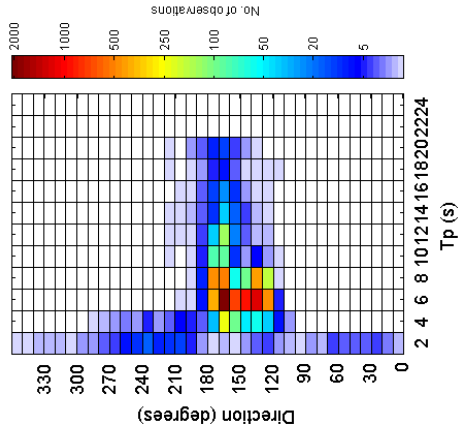
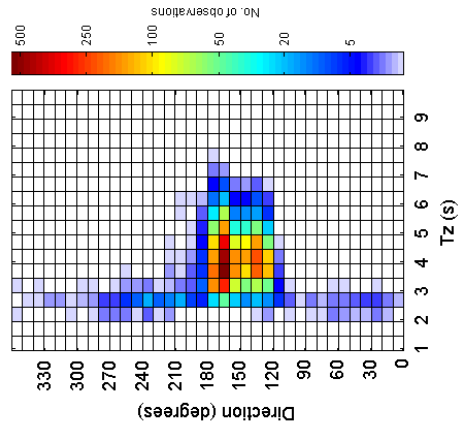
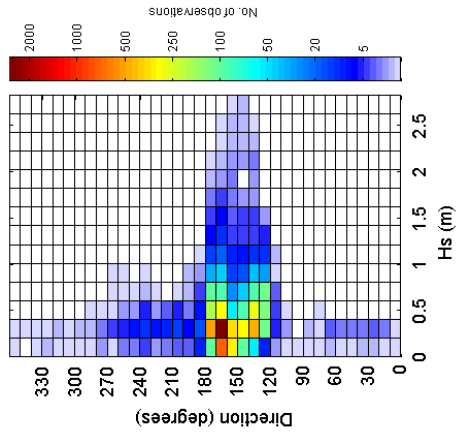
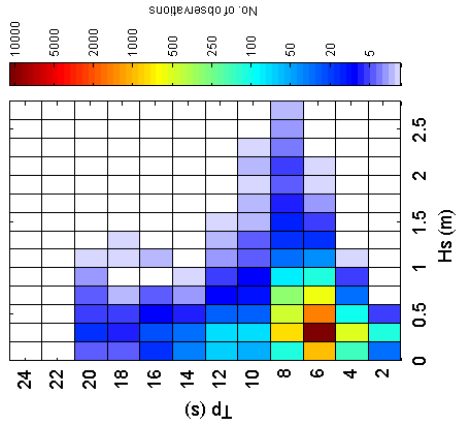
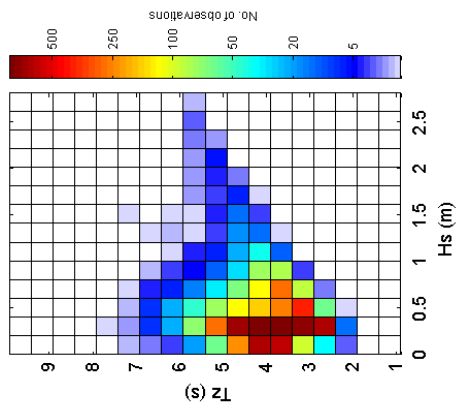
### Acknowledgements

The shore station is kindly hosted by the Weymouth and 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.

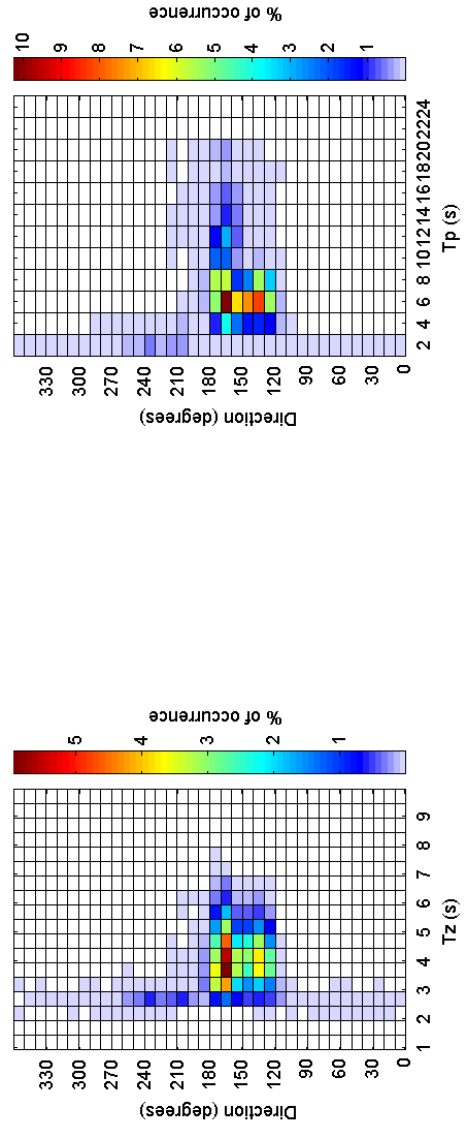
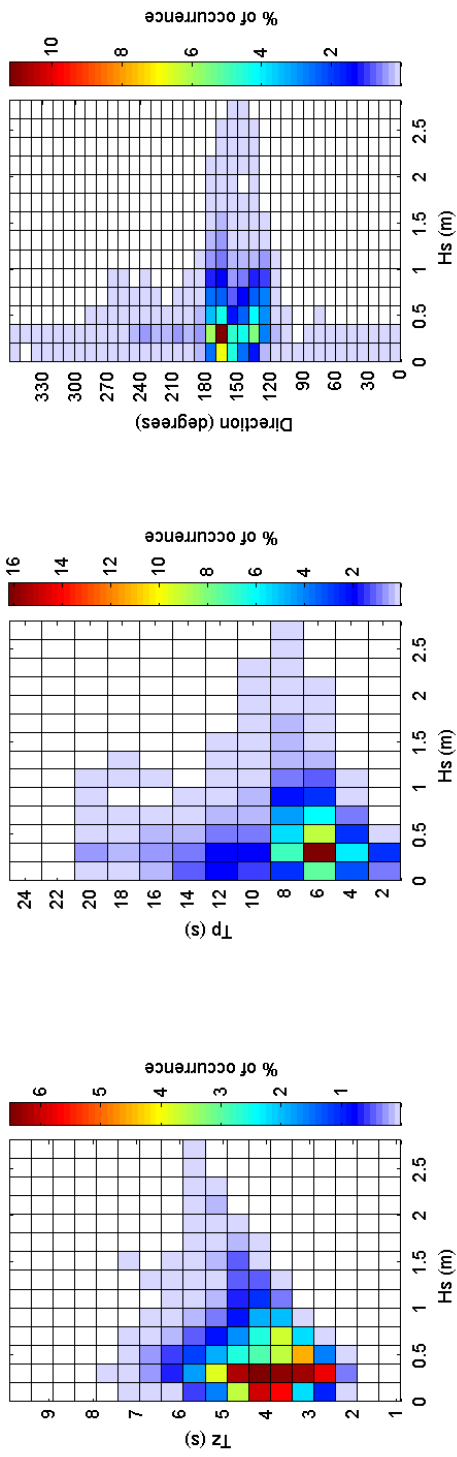
Weymouth 2010



Weymouth 2010 - Joint distribution



Weymouth 2010 - Joint distribution (% of occurrence)



Weymouth 2006 to 2010 - Joint distribution (% of occurrence)

