

Rhyl Flats Directional Waverider Buoy

Location

OS: 293579E 388411N

WGS84: Latitude: 53° 22.909' N Longitude: 03° 36.083' W

Water Depth

~10 m CD

Instrument Type

Datawell Directional Waverider Mk III

Data Quality

Recovery rate (%)	Sample interval
99	30 minutes

Statistics - 2012

All times are GMT

Month	H _s (m)	T _p (s)	T _z (s)	Dir. (°)	SST (°C)	No. of days
January	1.04	4.8	3.6	252	7.5	31
February	0.66	4.2	3.2	255	5.7	29
March	0.46	4.6	3.1	265	7.5	30
April	0.77	4.3	3.3	237	9.0	30
May	0.49	4.0	3.0	225	11.1	30
June	0.53	4.0	3.0	210	13.8	30
July	0.53	3.8	3.0	259	15.6	31
August	0.43	4.1	2.9	231	16.7	31
September	0.86	4.6	3.4	280	15.5	30
October	0.69	4.6	3.2	239	12.6	30
November	0.81	4.5	3.3	267	9.5	30
December	0.92	4.8	3.5	260	7.2	31

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)
05-Jan-2012 12:00	3.47	9.1	6.2	315	-0.44	HW +4	4.1	-0.02	0.81
03-Jan-2012 22:30	3.43	10.0	6.3	312	-0.63	HW +4	3.4	-0.03	1.30
03-Apr-2012 21:30	3.31	7.7	5.7	0	1.77	HW +1	5.2	-0.54	0.19
26-Nov-2012 21:30	3.24	7.7	5.6	352	2.54	HW	5.4	-0.65	-0.39

* Tidal information is obtained from the nearest recording tide gauge (the National Network gauge at Llandudno). 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	3.55	2.78	2.48	2.24	1.87	1.53	08-Nov-2007 21:00	3.66
2008	3.61	3.11	2.79	2.41	1.82	1.49	01-Mar-2008 06:00	3.97
2009	2.80	2.39	2.17	1.97	1.60	1.31	24-Mar-2009 00:30	2.97
2010	3.90	2.28	2.02	1.76	1.43	1.15	31-Mar-2010 10:00	4.22
2011	3.21	2.62	2.40	2.15	1.78	1.39	07-Dec-2011 09:30	3.47
2012	3.32	2.76	2.42	2.07	1.67	1.35	05-Jan-2012 12:00	3.47

* i.e. 5 % of the H_s values measured in 2007 exceeded 1.87 m

Distribution plots

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

- Annual time series of H_s (red line is 2.5 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 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

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	3.8	No depth limitation
2	3.9	Depth-limited at MLWS
5	4.1	
10	4.3	
20	4.4	
50	4.6	

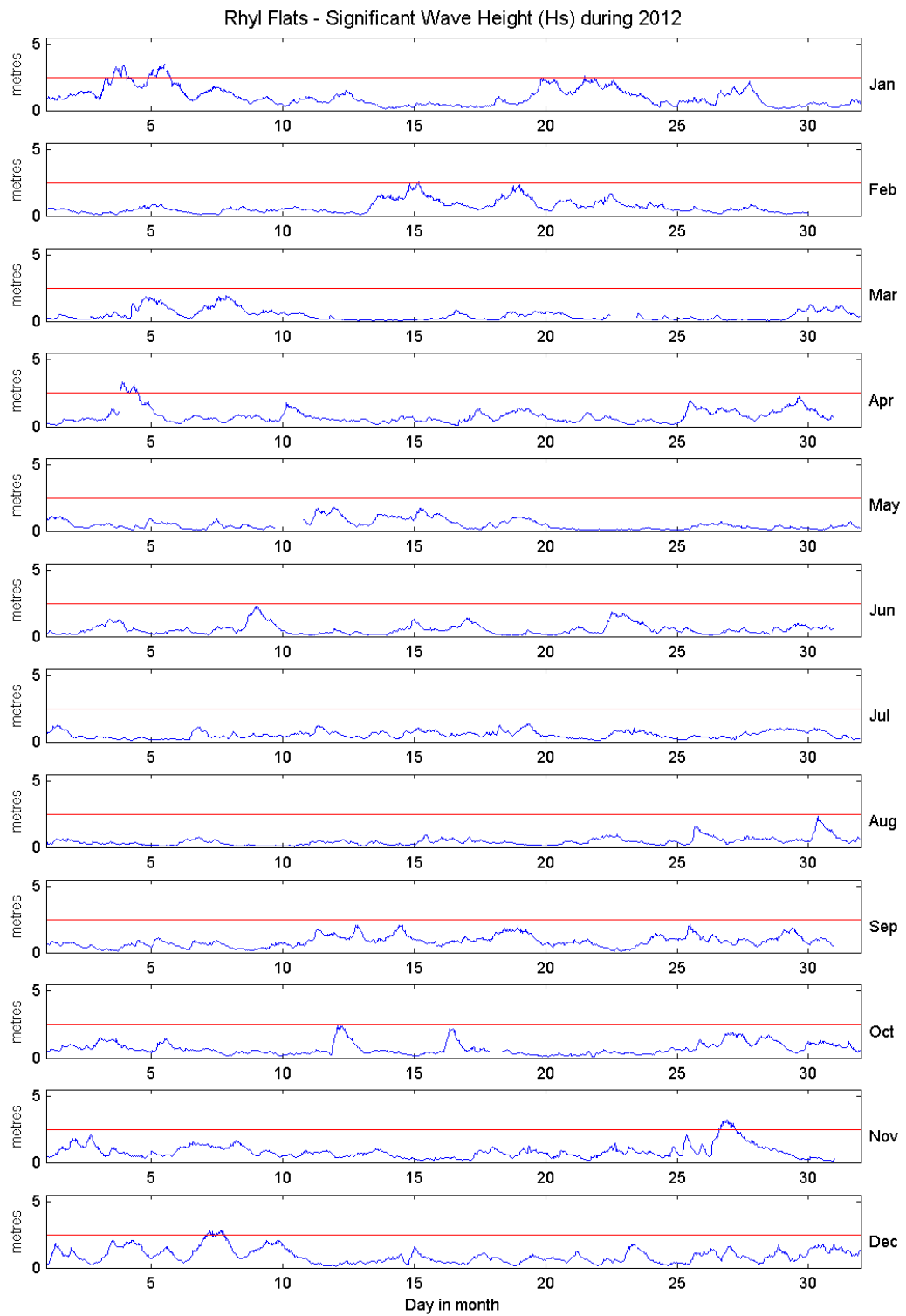
General

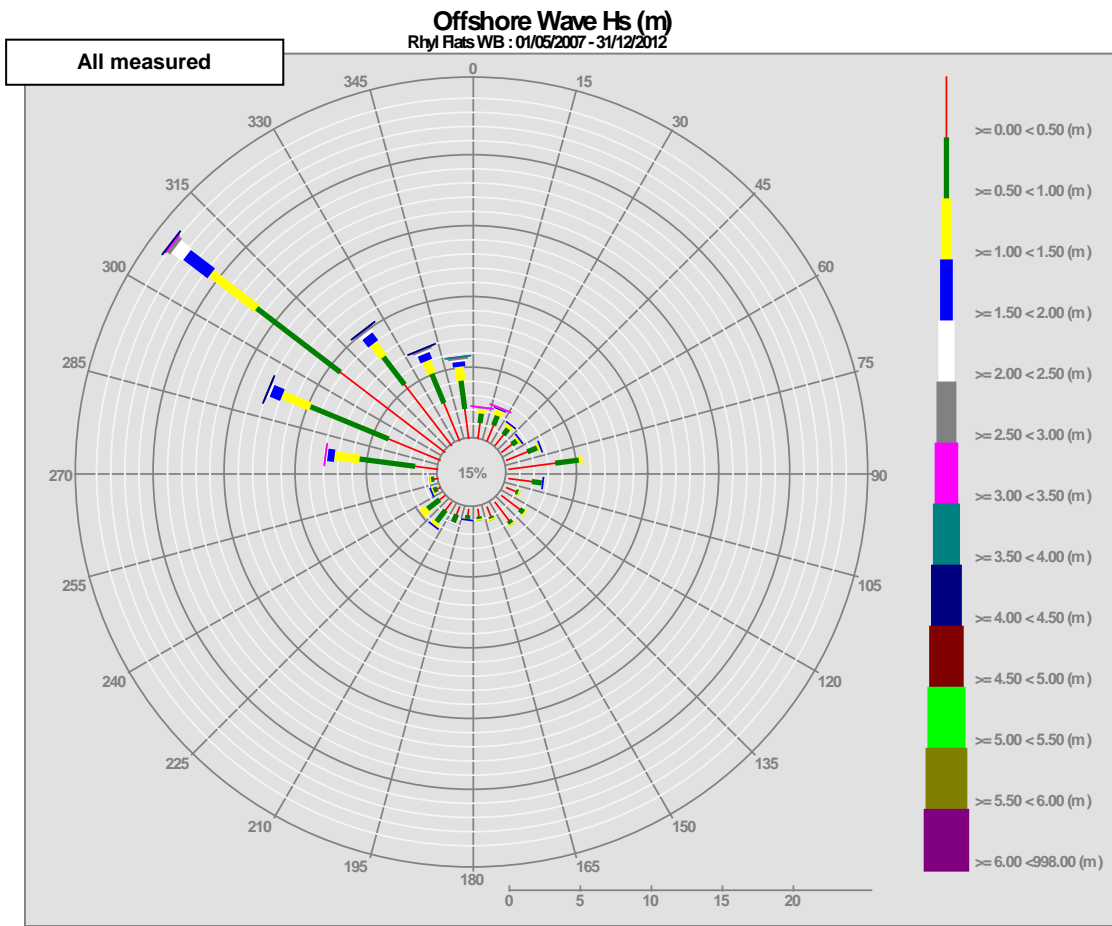
The buoy was first deployed on 01 May 2007, at which time the magnetic declination at the site was 3.4° west, changing by 0.16° east per year.

Acknowledgements

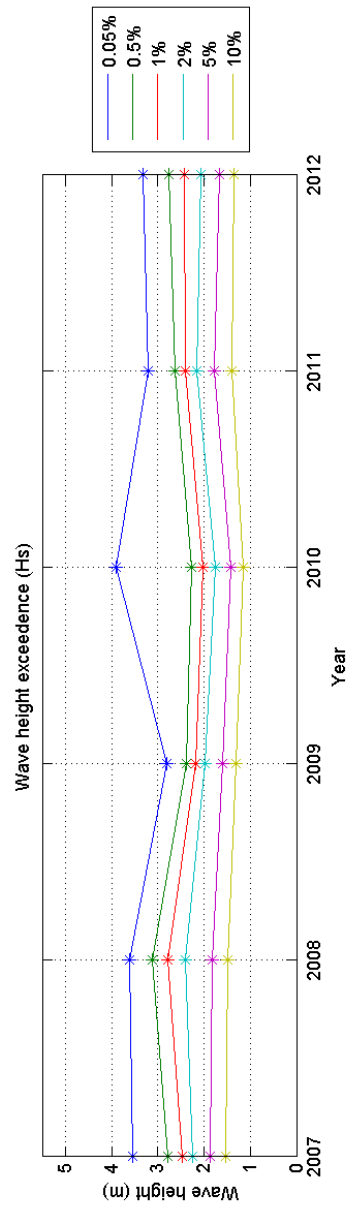
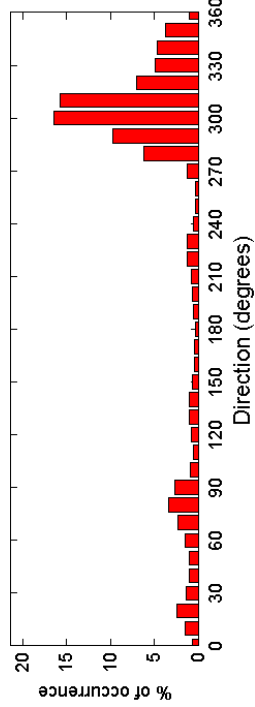
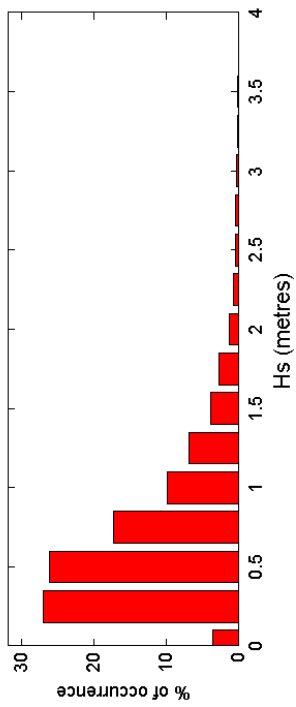
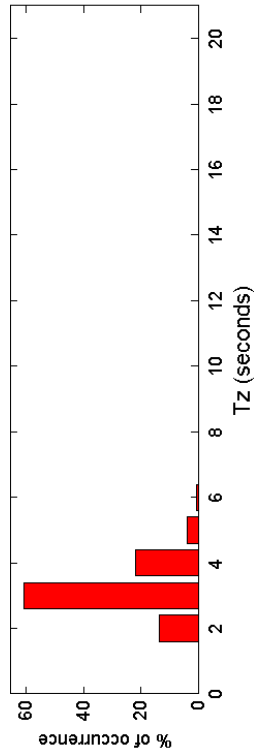
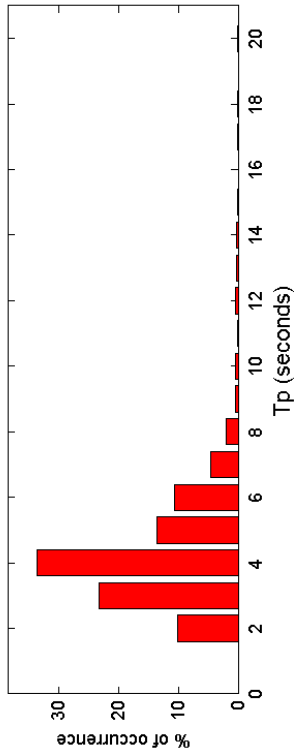
Wave parameters are recorded using a Datawell Directional Waverider Mk III buoy owned by RWE npower renewables, who have kindly agreed to make both real-time and archived data freely available, via the Channel Coastal Observatory website.

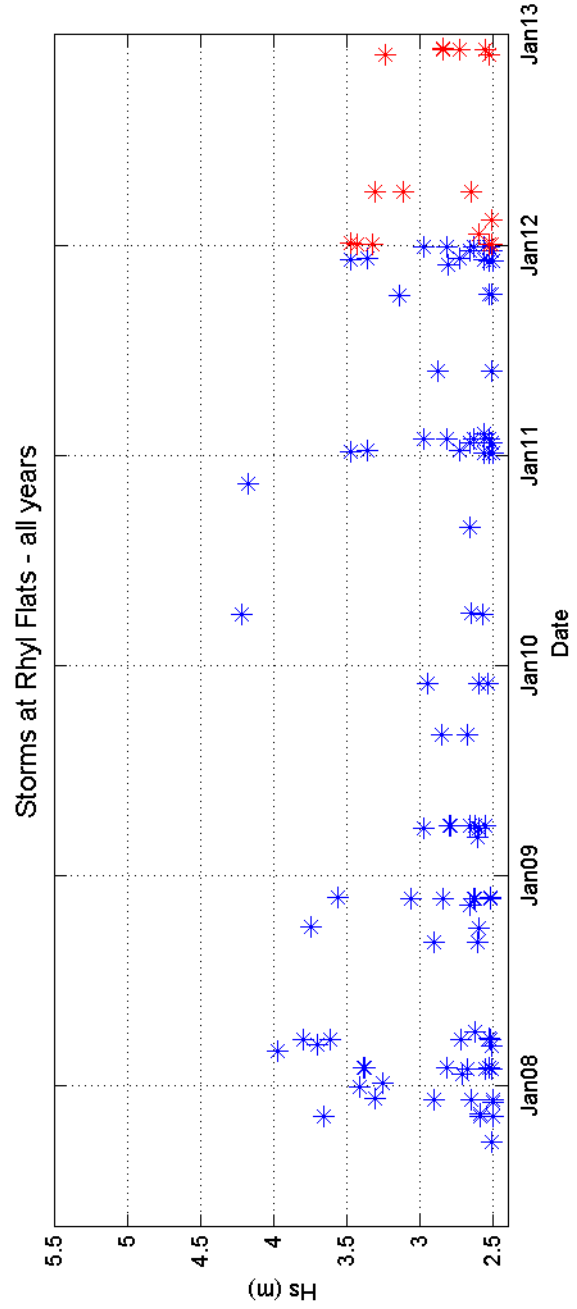
Tidal data were supplied by the British Oceanographic Data Centre as part of the function of the National Tidal and Sea Level Facility, hosted by the Proudman Oceanographic Laboratory and funded by DEFRA and the Natural Environment Research Council.





Rhyl Flats 2012





Rhyl Flats 2007 to 2012 - Joint distribution (% of occurrence)

