

Rustington Directional Waverider Buoy

Location

OS: 506333E 93783N

WGS84: Latitude: 50° 44.036' N Longitude: 00° 29.677' W

Water Depth

~10 m CD

Instrument Type

Datawell Directional Waverider Mk III

Data Quality

| Recovery rate (%) | Sample interval |
|-------------------|-----------------|
| 95 | 30 minutes |

Statistics - 2011

All times are GMT

| Month | H _s (m) | T _p (s) | T _z (s) | Dir. (°) | SST (°C) | No. of days |
|-----------|-----------------------|-----------------------|-----------------------|-------------|-------------|----------------|
| January | 0.90 | 7.5 | 3.9 | 181 | 7.0 | 31 |
| February | 1.06 | 10.6 | 4.5 | 205 | 7.1 | 27 |
| March | 0.56 | 6.5 | 3.5 | 161 | 7.3 | 30 |
| April | 0.49 | 8.2 | 3.9 | 183 | 11.0 | 29 |
| May | 0.76 | 5.8 | 3.6 | 205 | 13.4 | 30 |
| June | 0.80 | 5.3 | 3.6 | 203 | 15.1 | 29 |
| July | 0.59 | 5.5 | 3.4 | 198 | 17.4 | 30 |
| August | 0.62 | 5.1 | 3.4 | 201 | 18.1 | 30 |
| September | 0.93 | 6.2 | 3.9 | 204 | 17.1 | 29 |
| October | 0.97 | 6.1 | 3.9 | 201 | 15.7 | 30 |
| November | 1.07 | 7.3 | 4.0 | 178 | 13.8 | 27 |
| December | 1.26 | 7.6 | 4.4 | 218 | 9.8 | 23 |

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) |
|----------------------|-----------------------|-----------------------|-----------------------|-------------|-----------------------------------|-------------------------------------|-----------------------|------------------------|-----------------------|
| 13-Dec-2011 00:30 | 4.55 | 8.3 | 6.9 | 200 | 2.94 | HW | 4.7 | 0.38 | 0.56 |

* Tidal information is obtained from the nearest recording tide gauge (the tide gauge on Arun Platform). The surge shown is the residual at the time of the highest H_s. 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) |
| 2003 | - | 2.76 | 2.47 | 2.27 | 1.85 | 1.45 | 29-Nov-2003 13:00 | 3.34 |
| 2004 | 3.83 | 2.82 | 2.62 | 2.38 | 2.03 | 1.65 | 08-Jan-2004 11:30 | 4.17 |
| 2005 | 3.64 | 3.01 | 2.56 | 2.19 | 1.79 | 1.42 | 02-Dec-2005 19:00 | 3.84 |
| 2006 | 3.78 | 3.01 | 2.75 | 2.44 | 2.05 | 1.67 | 03-Dec-2006 08:00 | 4.81 |
| 2007 | 3.89 | 2.98 | 2.70 | 2.41 | 2.03 | 1.69 | 18-Jan-2007 10:00 | 4.32 |
| 2008 | 3.70 | 3.02 | 2.74 | 2.46 | 2.05 | 1.70 | 13-Dec-2008 12:00 | 4.01 |
| 2009 | 3.72 | 3.09 | 2.87 | 2.47 | 2.01 | 1.66 | 14-Nov-2009 13:00 | 3.91 |
| 2010 | 3.53 | 2.78 | 2.38 | 1.98 | 1.62 | 1.30 | 08-Nov-2010 11:00 | 3.86 |
| 2011 | 3.43 | 2.61 | 2.39 | 2.15 | 1.81 | 1.54 | 13-Dec-2011 00:30 | 4.55 ⁺ |

* i.e. 5 % of the H_s values measured in 2003 exceeded 1.85 m

⁺ 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 3.5 m storm threshold)
- Wave roses (Direction vs. H_s and vs. T_p) for all measured data from 01 April 2004
- 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.

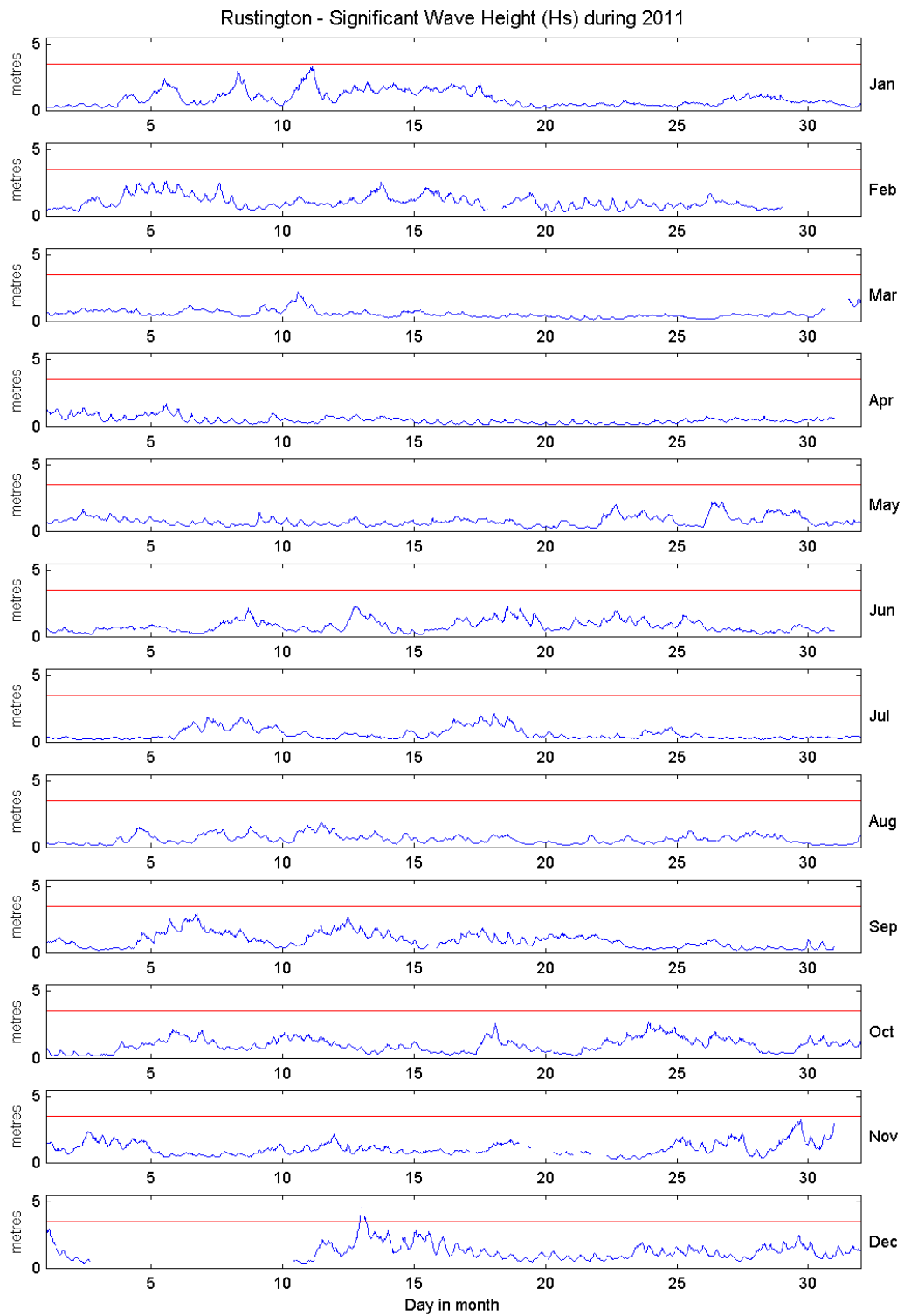
| Return period (years) | Significant wave height (m) | Comments |
|-----------------------|-----------------------------|-----------------------|
| 1 | 3.98 | No depth limitation |
| 2 | 4.16 | |
| 5 | 4.40 | |
| 10 | 4.57 | Depth-limited at MLWS |
| 20 | 4.73 | |
| 50 | 4.94 | |

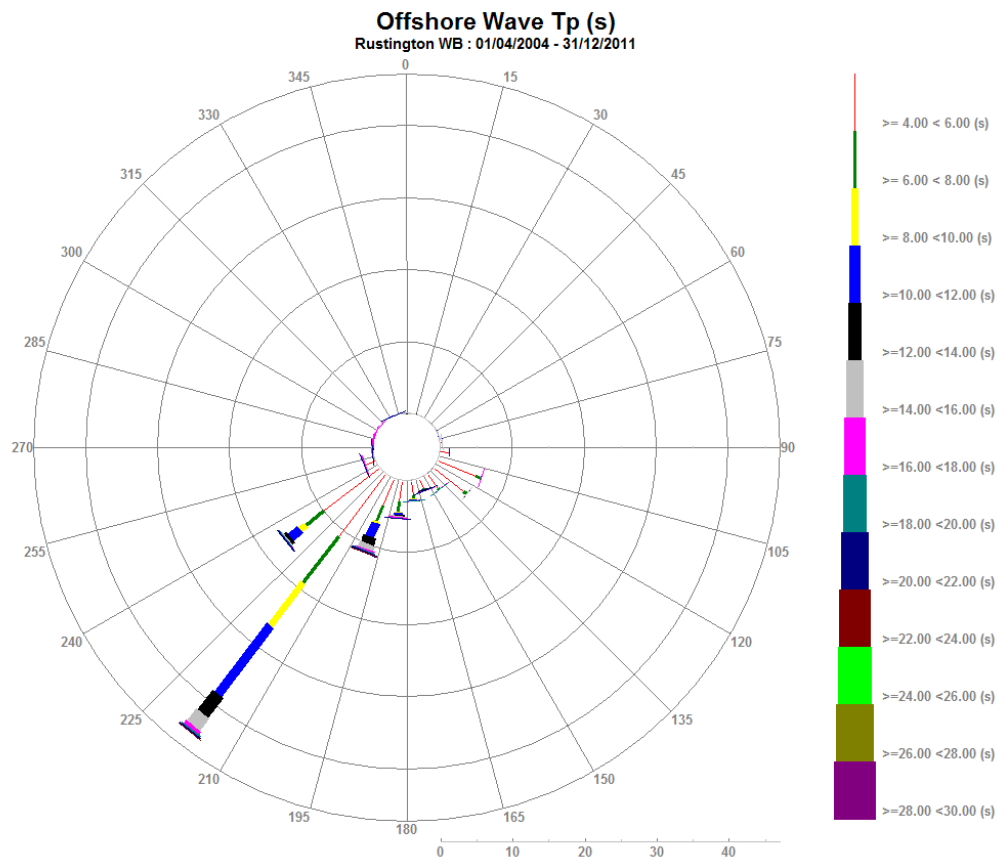
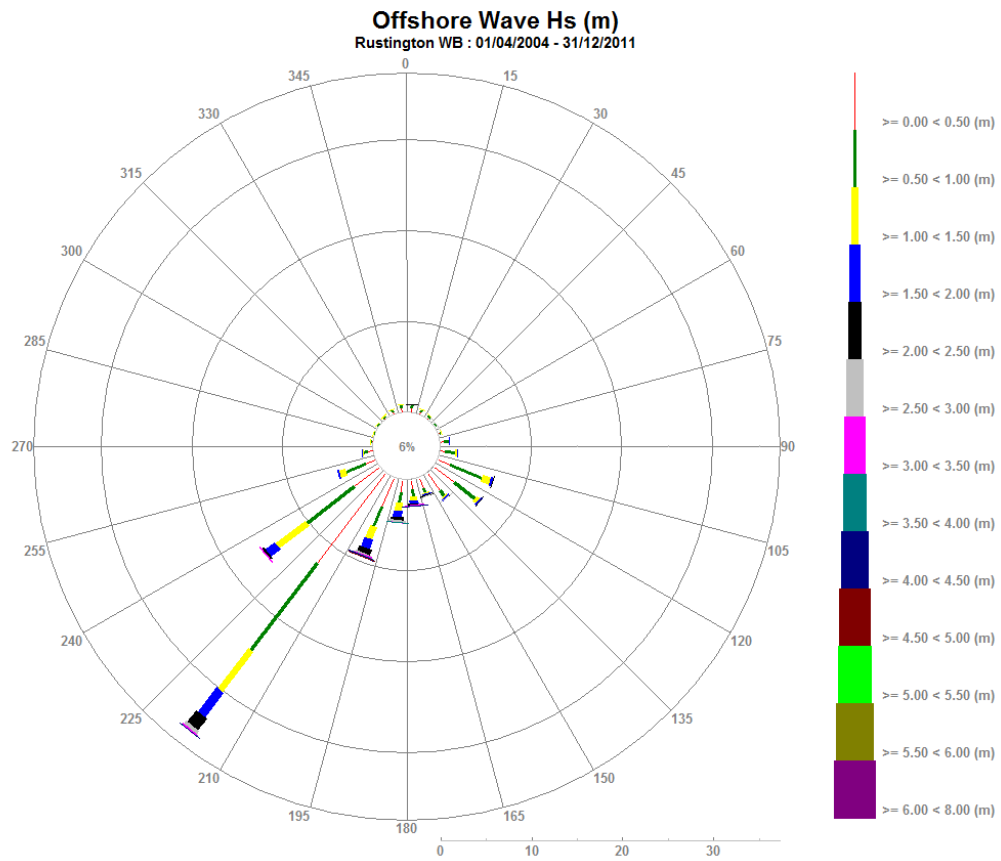
General

The buoy was first deployed on 15 July 2003.

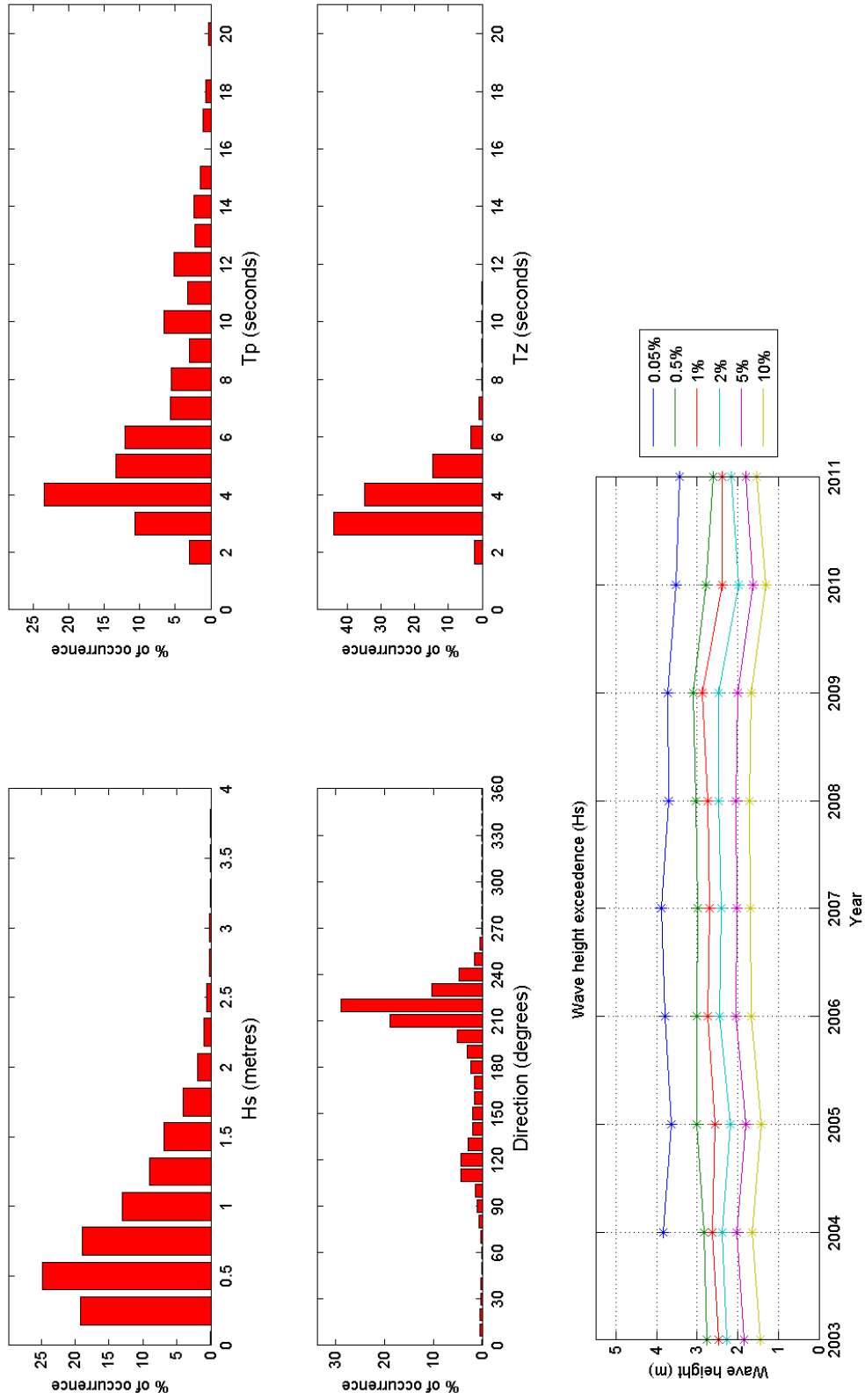
Acknowledgements

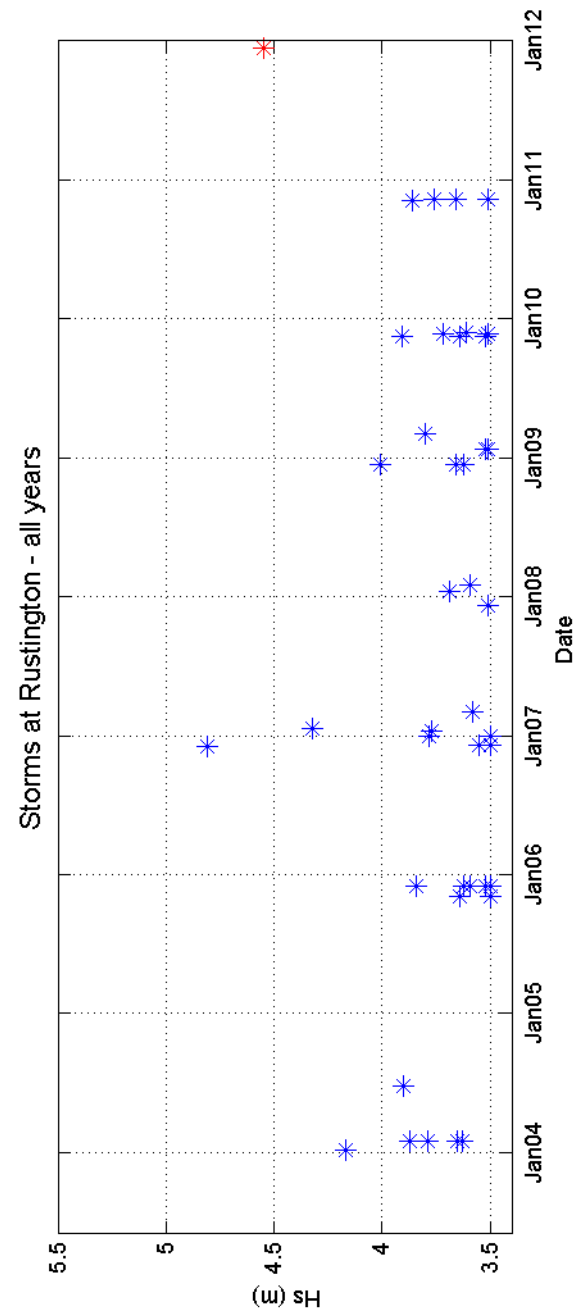
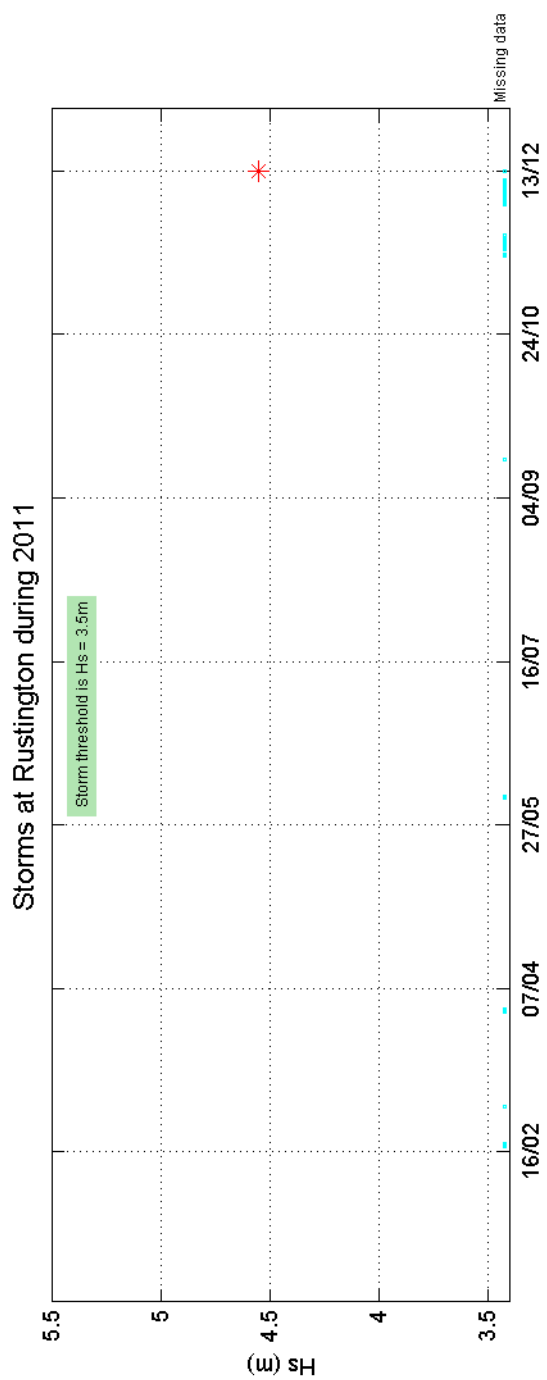
TASK2000 tidal prediction software was kindly provided by the Permanent Service for Mean Sea Level, Proudman Oceanographic Laboratory.





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Rustington 2003 to 2011 - Joint distribution (% of occurrence)

