



## Newbiggin Directional Waverider Buoy

Location			
OS	433318 E 588000 N		
WGS84	Latitude: 55° 11.11' N Longitude: 01° 28.70' W		
Instrument type		Buoy in situ off Newbiggin-by-the-Sea. Photo courtesy of Fugro GB Marine Limited	Location of buoy (Google mapping, image ©2016 Getmapping plc)
Datawell Directional Waverider Mk III			
Water depth	~18m CD		

## Data Quality

Recovery rate (%)	Sample interval
99	30 minutes

## Monthly Averages - 2016

All times are GMT

Month	H <sub>s</sub> (m)	T <sub>p</sub> (s)	T <sub>z</sub> (s)	Dir. (°)	SST (°C)	Bimodal seas (%)	No. of days
January	1.73	8.4	5.2	93	7.8	3	27
February	1.13	9.8	5.1	68	6.7	8	29
March	0.92	7.0	4.8	74	6.2	1	31
April	1.06	7.6	4.8	58	7.0	7	30
May	0.95	6.8	4.4	68	9.0	5	31
June	0.88	7.0	4.6	59	11.2	2	30
July	0.39	6.2	3.8	97	12.9	0	31
August	0.64	6.8	4.3	81	13.5	4	31
September	0.62	5.4	3.8	102	13.2	0	30
October	1.37	8.4	5.3	66	12.0	7	31
November	1.18	8.3	5.0	66	9.9	3	30
December	0.69	9.9	4.5	84	8.8	2	31

## Monthly Averages - All Years (June 2013 – December 2015)

Month	H <sub>s</sub> (m)	T <sub>p</sub> (s)	T <sub>z</sub> (s)	Dir. (°)	SST (°C)	Bimodal seas (%)
January	1.23	9.5	5.0	88	7.2	5
February	1.15	8.6	4.8	93	6.3	6
March	0.90	7.9	4.4	91	6.5	4
April	0.77	7.9	4.4	69	7.6	5
May	0.81	7.1	4.4	71	9.2	4
June	0.72	6.6	4.5	67	11.7	1
July	0.62	5.9	4.0	79	13.0	1
August	0.67	6.1	4.1	90	13.3	1
September	0.78	6.9	4.4	72	13.2	0
October	1.15	7.4	4.7	91	12.2	4
November	1.07	8.5	4.9	81	10.5	5
December	1.02	8.6	4.7	92	8.8	6

## 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)
03-Jan-2016 10:30	5.46	11.8	8.0	82	1.05	HW +1	1.84	-0.29	-0.26
22-Nov-2016 00:00	5.27	10.0	7.4	68	0.2	HW +3	2.8	-	-

\* Tidal information is obtained from the National Network gauge at North Shields and/or estimated from the predicted tide levels (Admiralty Total Tide). 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 <sub>s</sub> exceedance** (m)						Annual Maximum H <sub>s</sub>	
	0.05%	0.5%	1%	2%	5%	10%	Date	A <sub>max</sub> (m)
2013	-	3.26	3.04	2.71	2.27	1.88	10-Oct-2013 18:30	4.15
2014	3.76	3.27	3.01	2.73	2.24	1.86	19-Jan-2014 20:00	4.22
2015	3.90	2.90	2.66	2.37	1.97	1.61	21-Nov-2015 04:30	4.74
2016	5.04	4.47	3.97	3.08	2.22	1.82	03-Jan-2016 10:30	5.46

\*\* i.e. 5 % of the H<sub>s</sub> values measured in 2013 exceeded 2.27 m

## Distribution plots

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

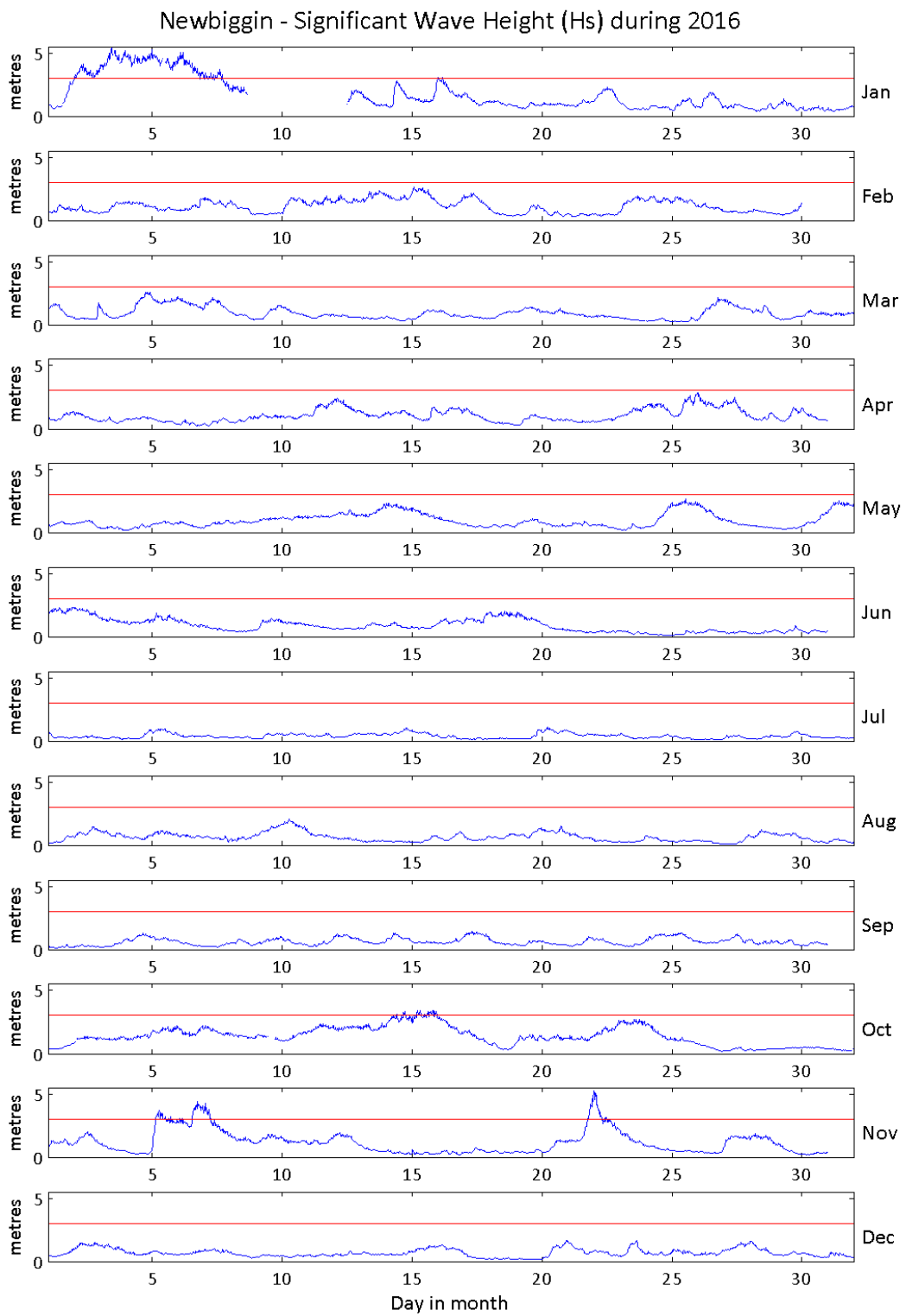
- Annual time series of  $H_s$  (red line is 3.0 m storm threshold)
- Wave rose (percentage of occurrence of Direction vs.  $H_s$ ) for all measured data
- Percentage of occurrence of  $H_s$ ,  $T_p$ ,  $T_z$  and Direction for 2016
- Incidence of storm waves for 2016. Storm events are defined using 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

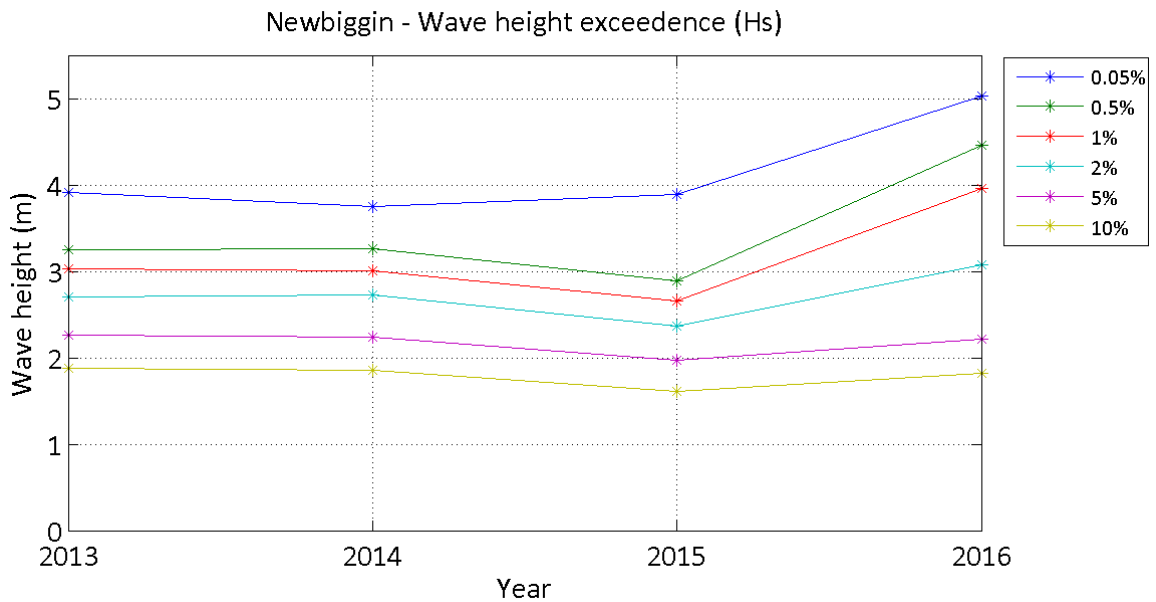
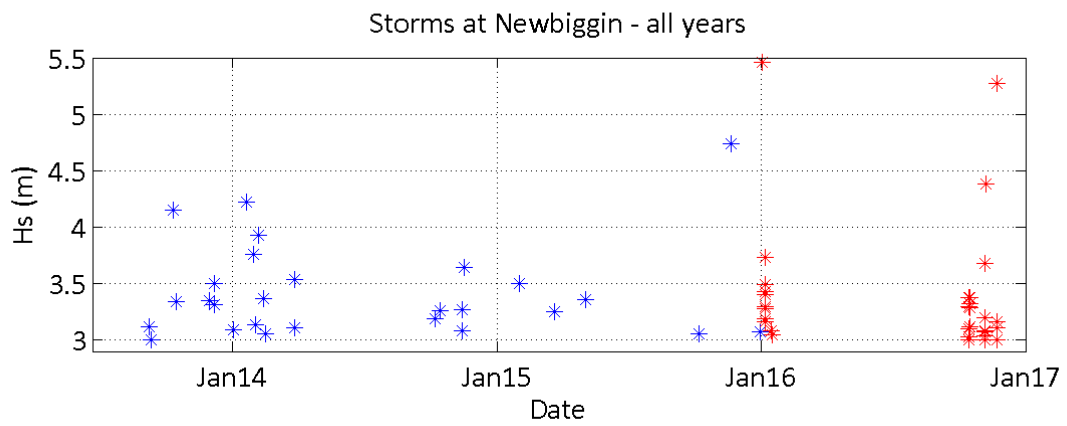
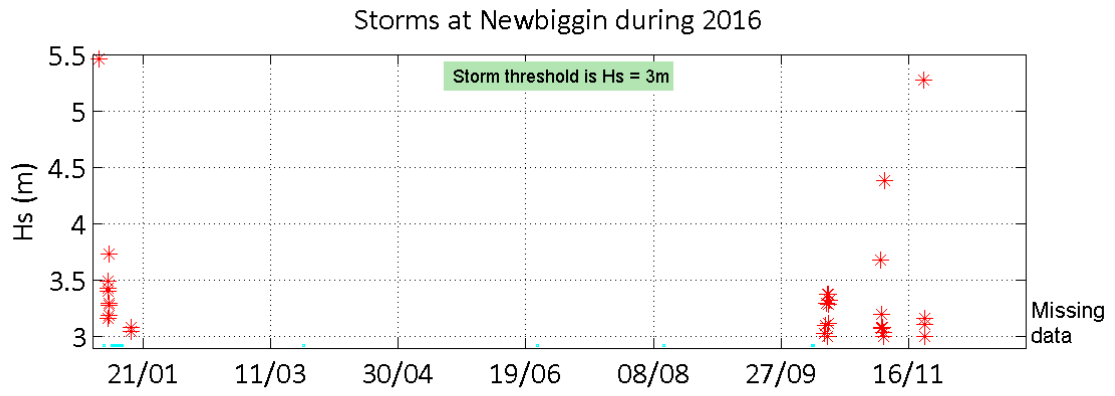
## General

The buoy, owned by Scarborough Borough Council, was deployed on 21 June 2013, at which time the magnetic declination at the site was 2.2° west, changing by 0.18° east per year. A DWR had previously been deployed at this location from 20 May 2010 to 04 February 2011.

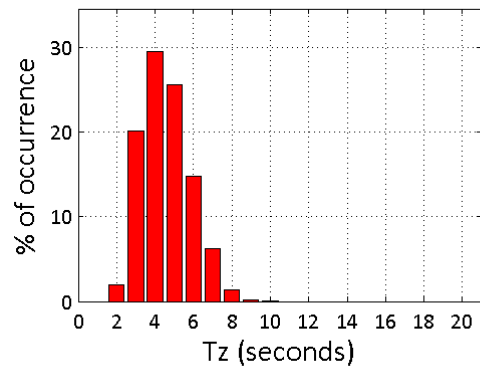
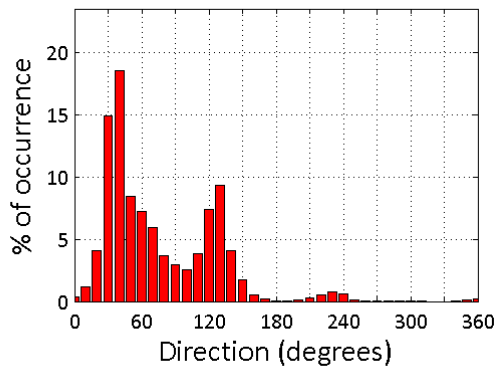
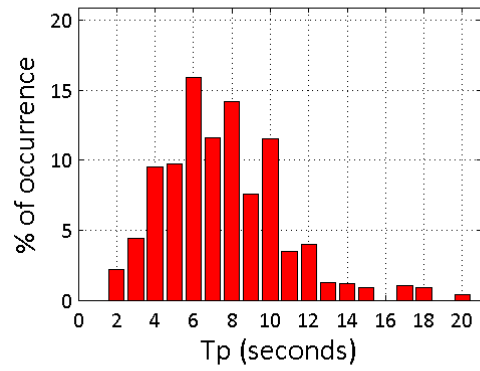
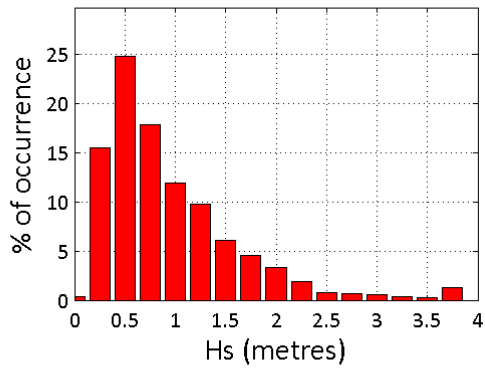
## Acknowledgements

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.





Newbiggin 2016



Newbiggin 2013 to 2016 - Joint distribution (% of occurrence)

