



## Wave Hub Directional Waverider Buoy

|  |   |  |   |
|--|---|--|---|
| <b>Location</b>                          |   |  |  |
| OS                                       | 142988 E 55955 N                                  |  |   |
| WGS84                                    | Latitude: 50° 20.84' N<br>Longitude: 05° 36.84' W |  |   |
| <b>Instrument type</b>                   |   |  |   |
| Datawell<br>Directional Waverider Mk III |   |  |   |
| <b>Water depth</b>                       | ~50m CD   | Example buoy in situ. Photo courtesy of Fugro GB Marine Limited                    | Location of buoy (Google mapping, image ©2016 DigitalGlobe)                         |

## Data Quality

| Recovery rate (%) | Sample interval |
|-------------------|-----------------|
| 97                | 30 minutes      |

## Monthly averages - 2017

*All times are**GMT*

| Month     | H <sub>s</sub><br>(m) | T <sub>p</sub><br>(s) | T <sub>z</sub><br>(s) | Dir.<br>(°) | SST<br>(°C) | Bimodal<br>seas (%) | No. of<br>days |
|-----------|-----------------------|-----------------------|-----------------------|-------------|-------------|---------------------|----------------|
| January   | 2.01                  | 10.7                  | 6.0                   | 262         | 11.0        | 25                  | 30             |
| February  | 2.81                  | 12.0                  | 6.7                   | 254         | 10.3        | 21                  | 27             |
| March     | 2.61                  | 11.4                  | 6.7                   | 261         | 10.1        | 22                  | 31             |
| April     | 1.24                  | 9.2                   | 5.1                   | 264         | 11.1        | 9                   | 27             |
| May       | 1.34                  | 9.4                   | 5.4                   | 247         | 12.0        | 7                   | 30             |
| June      | 1.92                  | 9.4                   | 6.2                   | 279         | 14.0        | 8                   | 30             |
| July      | 1.46                  | 8.5                   | 5.4                   | 276         | 14.8        | 6                   | 27             |
| August    | 1.42                  | 8.2                   | 5.3                   | 269         | 15.2        | 7                   | 31             |
| September | 2.15                  | 9.9                   | 6.0                   | 277         | 14.8        | 13                  | 30             |
| October   | 2.26                  | 10.6                  | 6.2                   | 276         | 14.1        | 17                  | 31             |
| November  | 2.06                  | 9.6                   | 5.7                   | 284         | 13.3        | 23                  | 30             |
| December  | 2.74                  | 10.1                  | 6.2                   | 275         | 11.5        | 23                  | 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) |
|-------------------|--------------------|--------------------|--------------------|----------|-----------------------------|----------------------------|-----------------|------------------|-----------------|
| 16-Oct-2017 14:30 | 8.44               | 14.3               | 9.8                | 260      | 3.29                        | HW                         | 5.50            | 0.25             | 0.32            |
| 21-Oct-2017 15:30 | 8.23               | 14.3               | 9.1                | 269      | 1.22                        | HW -2                      | 6.19            | 0.40             | 0.47            |
| 02-Feb-2017 20:30 | 7.16               | 13.3               | 9.3                | 255      | 3.44                        | HW                         | 5.40            | 0.47             | 0.80            |
| 05-Mar-2017 19:00 | 6.75               | 11.8               | 8.3                | 283      | -0.45                       | HW -4                      | 4.29            | 0.13             | 0.42            |
| 13-Dec-2017 21:00 | 6.35               | 10.0               | 8.3                | 294      | -1.62                       | HW -5                      | 4.40            | 0.06             | 0.19            |

\* Tidal information is obtained from the step gauge at Port Isaac. 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) |
| 2015 | -                                      | -    | -    | 5.26 | 4.54 | 4.01 | 29-Nov-2015 17:30             | 6.58                 |
| 2016 | 9.11                                   | 6.10 | 5.53 | 5.02 | 4.29 | 3.65 | 08-Feb-2016 10:30             | 10.12                |
| 2017 | 7.94                                   | 6.06 | 5.54 | 5.04 | 4.12 | 3.44 | 16-Oct-2017 14:30             | 8.44                 |

\*\* i.e. 5% of the H<sub>s</sub> values measured in 2015 exceeded 4.54 m

## Distribution plots

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

- Annual time series of H<sub>s</sub> (red line is 6.72 m storm alert threshold)
- Incidence of storm waves for 2017. Storm events are defined using the Peaks-over-Threshold method. The highest H<sub>s</sub> of each storm event is shown
- Wave height exceedance each year since deployment
- Percentage of occurrence of H<sub>s</sub>, T<sub>p</sub>, T<sub>z</sub> and Direction for 2017
- Wave rose (percentage of occurrence of direction vs. H<sub>s</sub>) for all measured data
- Joint distribution of all parameters for all measured data, given as percentage of occurrence

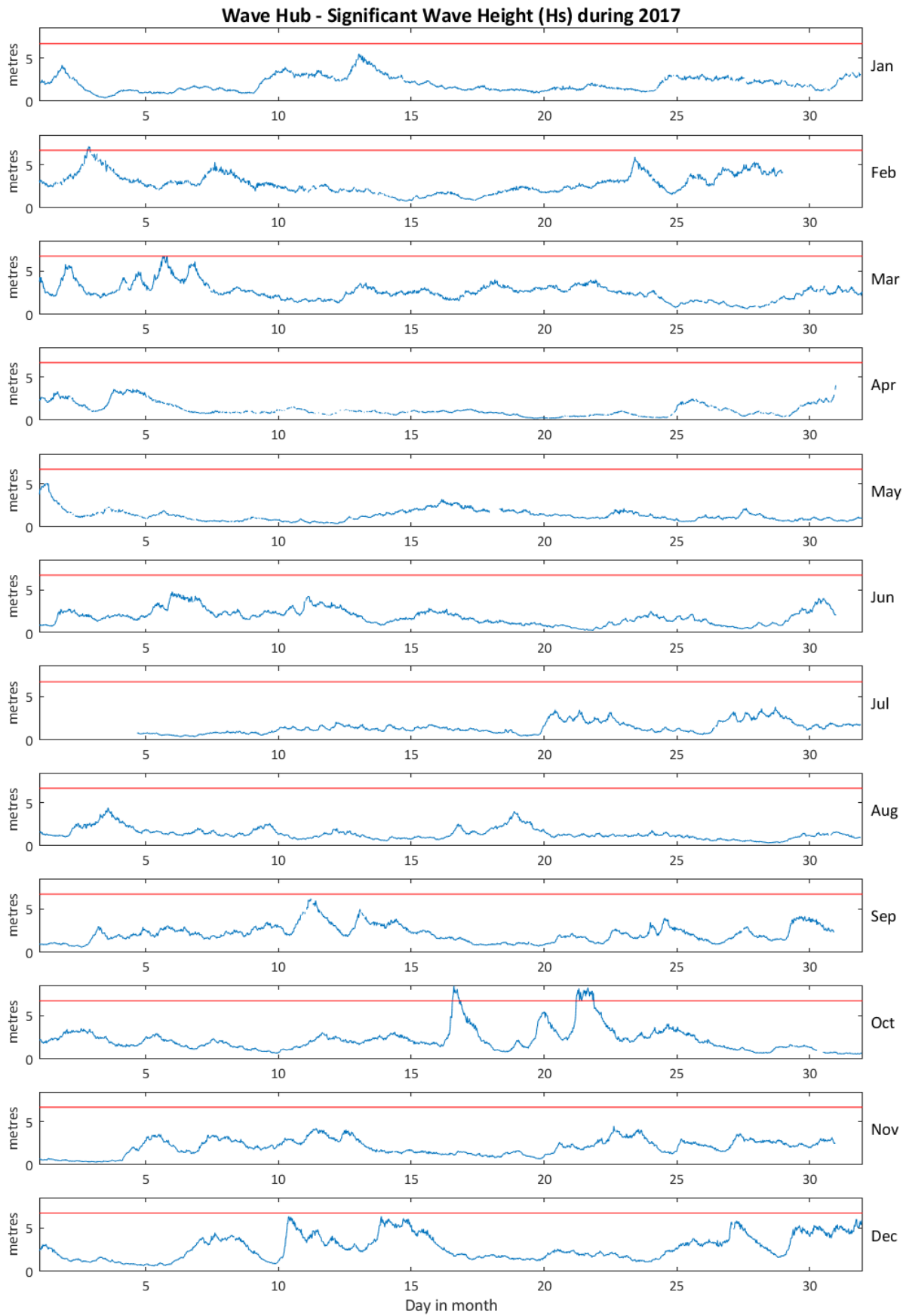
## General

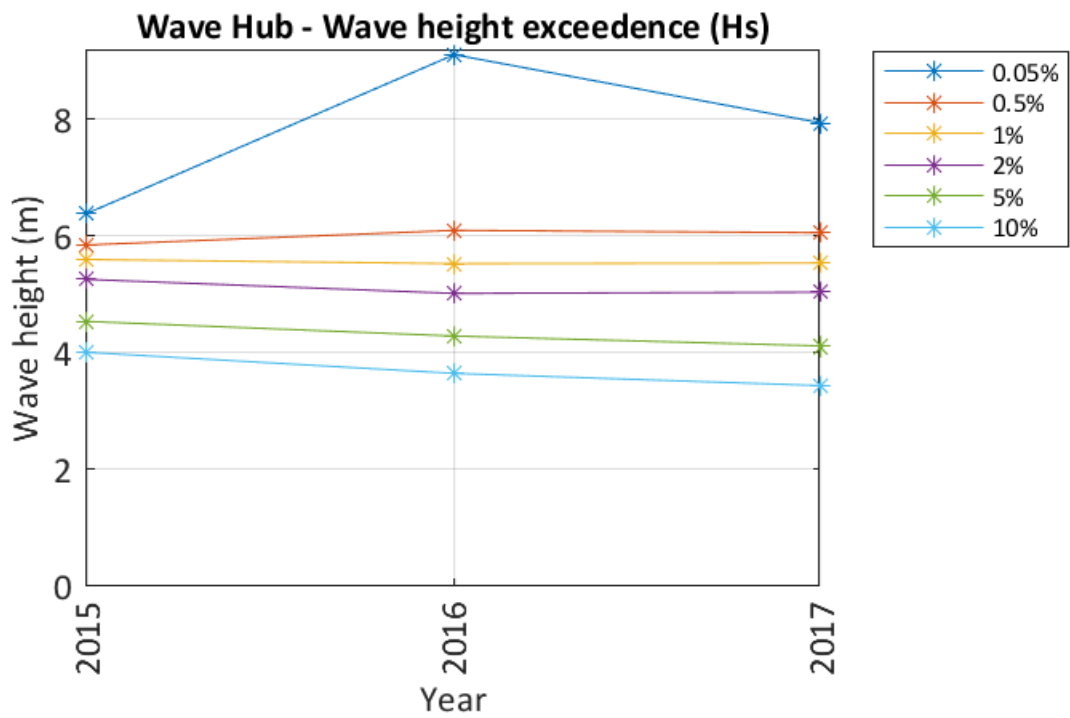
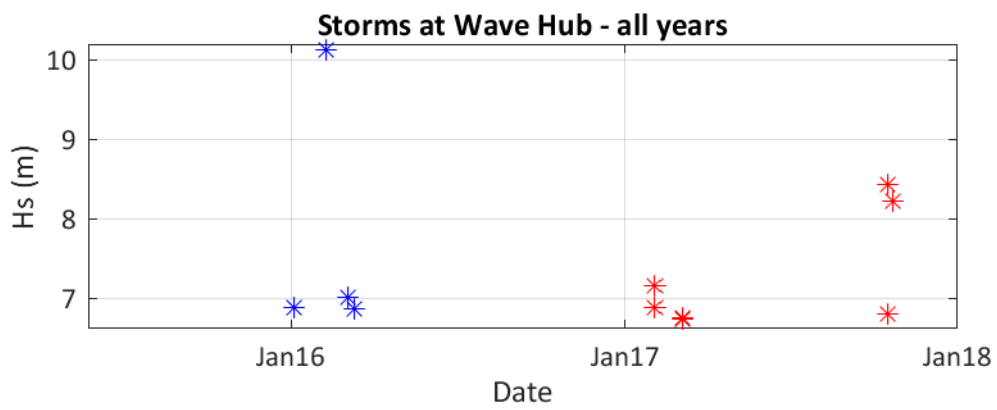
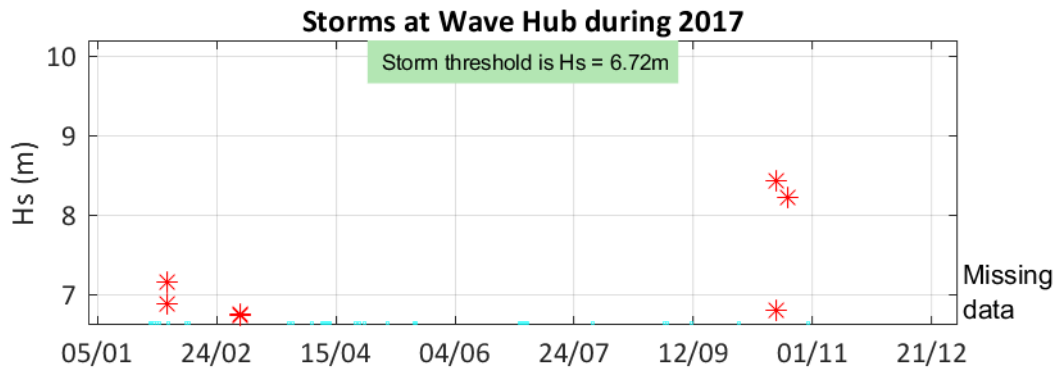
The buoy was first deployed on 22 May 2015, at which time the magnetic declination at the site was 2.65° west, changing by 0.15° east per year.

## Acknowledgements

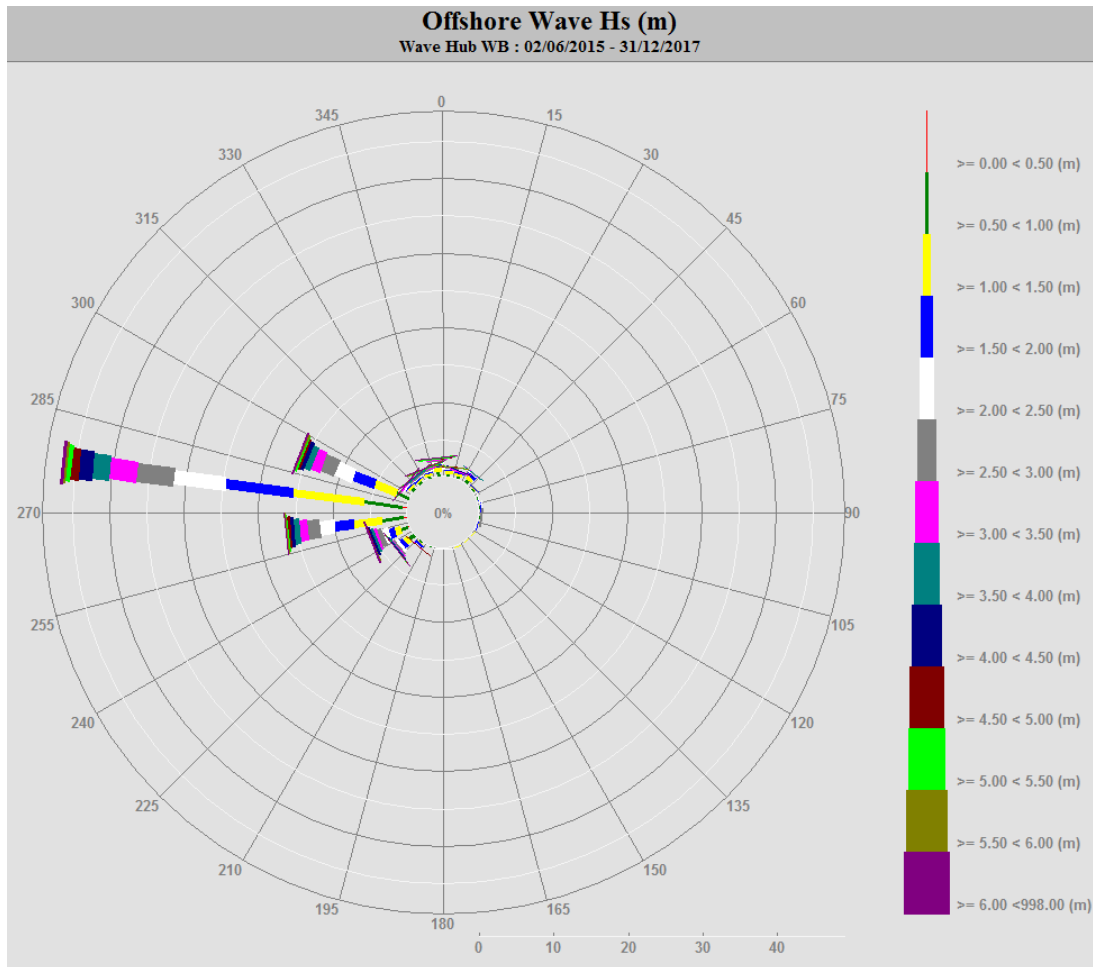
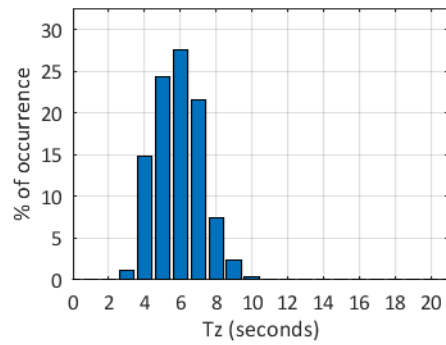
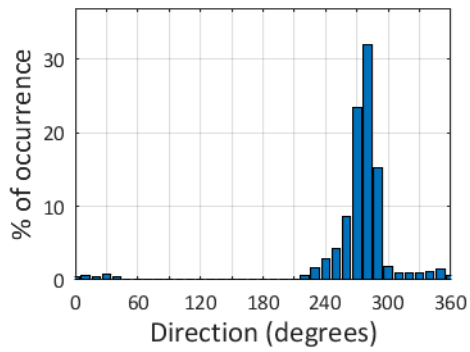
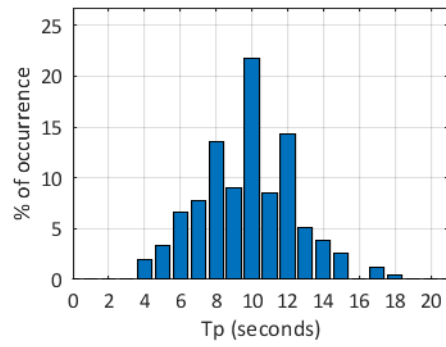
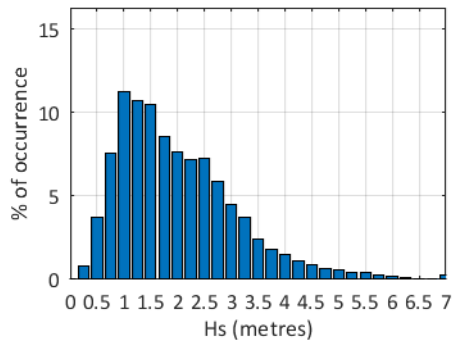
The wave buoy is owned by Wave Hub Limited, who have kindly agreed to make both real-time and archived data freely available under the Open Government Licence, via the Channel Coastal Observatory website.

A reserve shore station is kindly hosted by Perranporth Youth Hostel. Tidal predictions were supplied by Fugro GB Marine Limited.





### Wave Hub 2017



Wave Hub 2015 to 2017 - Joint distribution (% of occurrence)

