

# Wave Climate Assessment For Mara seaweed

**20<sup>TH</sup> FEBRUARY 2022**

## Summary

The data in this document has been sourced from the Cefas WaveNet and was generated by the Firth of Forth WaveRider Buoy which is located approximately 23km SSE of the proposed site position.

Over a 13.5 year period from August 2008 to February 2022:

- A Maximum Wave Height of 17m has been recorded in 2013.
- A Significant Wave Height of 6m (Maximum Wave Height of 12m) or more has occurred in 7 out of the 13.5 years.
- A Significant Wave Height of 4m (Maximum Wave Height of 8m) or more has occurred every year.
- The dominant direction of the largest Significant Waves and Wave Period is from the North East, while the most common peak direction is from the South East.
- The Firth of Forth WaveRider buoy has come adrift on 2 occasions in April 2011 and September 2021.

## Operational Information for Firth of Forth WaveRider Buoy

<b>Wave buoy location</b>	56°11'.28N 002°30'.23W
<b>WMO code</b>	6201045
<b>Approximate water depth</b>	65m CD
<b>Approximate mean spring tidal range</b>	5.1-6.0 m
<b>Storm alert threshold</b>	4.40 m

Data collection commenced 19 August 2008 and is due to end 25 February 2023

The wave conditions at 56°11'.28N 002°30'.23W in 65m water depth are currently recorded using a Directional Waverider MkIII in conjunction with [Scottish Environment Protection Agency](#).

All directions are Magnetic.

At Firth of Forth site, Magnetic North is approximately 3° 40' W (2008) changing 0° 9' E/year.

Note (26/09/21):

The mooring was adrift from 04:00 18/09/2021, it was redeployed 08:00 26/09/2021.

Note (06/02/20):

The Directional Waverider buoy (serial number: 30897) was deployed on 6 February 2020.

Note (30/01/19):

The Directional Waverider buoy (serial number: 30664) was deployed on 30 January 2019.

Note (03/02/18):

The Directional Waverider buoy (serial number: 30954) was deployed on 2 February 2018.

Note (15/11/16):

The Directional Waverider buoy (serial number: 30655) was deployed on 14 November 2016.

Note (04/08/15):

The Directional Waverider buoy (serial number: 30724) was deployed on 3 August 2015.

Note (13/05/14):

The Directional Waverider buoy (serial number: 30921) was deployed on 12 May 2014.

Note (05/02/13):

The Directional Waverider buoy (serial number: 30896) was deployed on 5 February 2013.

Note (30/06/11):

The Directional Waverider buoy (serial number: 30592) was re-deployed on 29 June 2011.

Note (06/05/11):

The Directional Waverider buoy (serial number: 30592) was re-deployed on 5 May 2011.

Note (15/04/11):

The Directional Waverider buoy broke free of its mooring at approximately 13:30 GMT 14 April 2011.

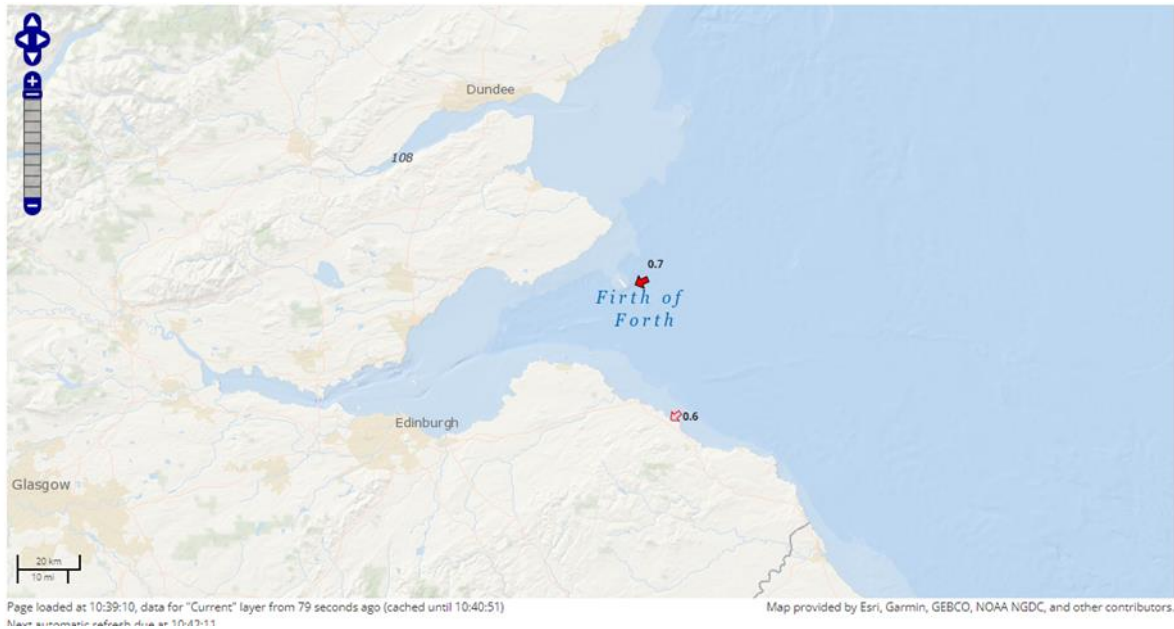
Note (22/07/10):

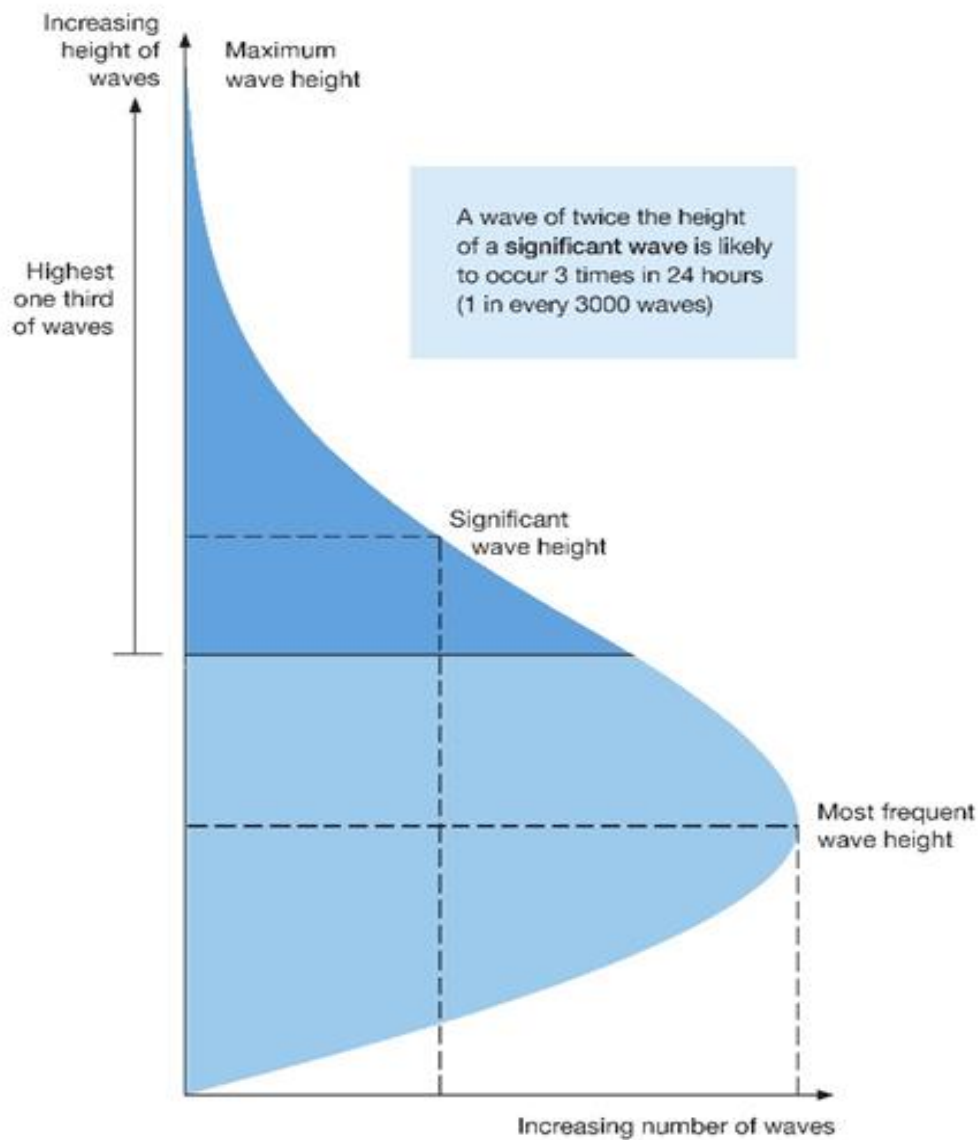
The Directional Waverider buoy (serial number: 30592) was deployed on 20 July 2010.

Note (23/08/08):

The Directional Waverider buoy (serial number: 30636) was deployed on 19 August 2008.

Location of Firth of Forth WaveRider Buoy is shown below:





### Wave height considerations

Waves are random and will vary in height from one to the next.

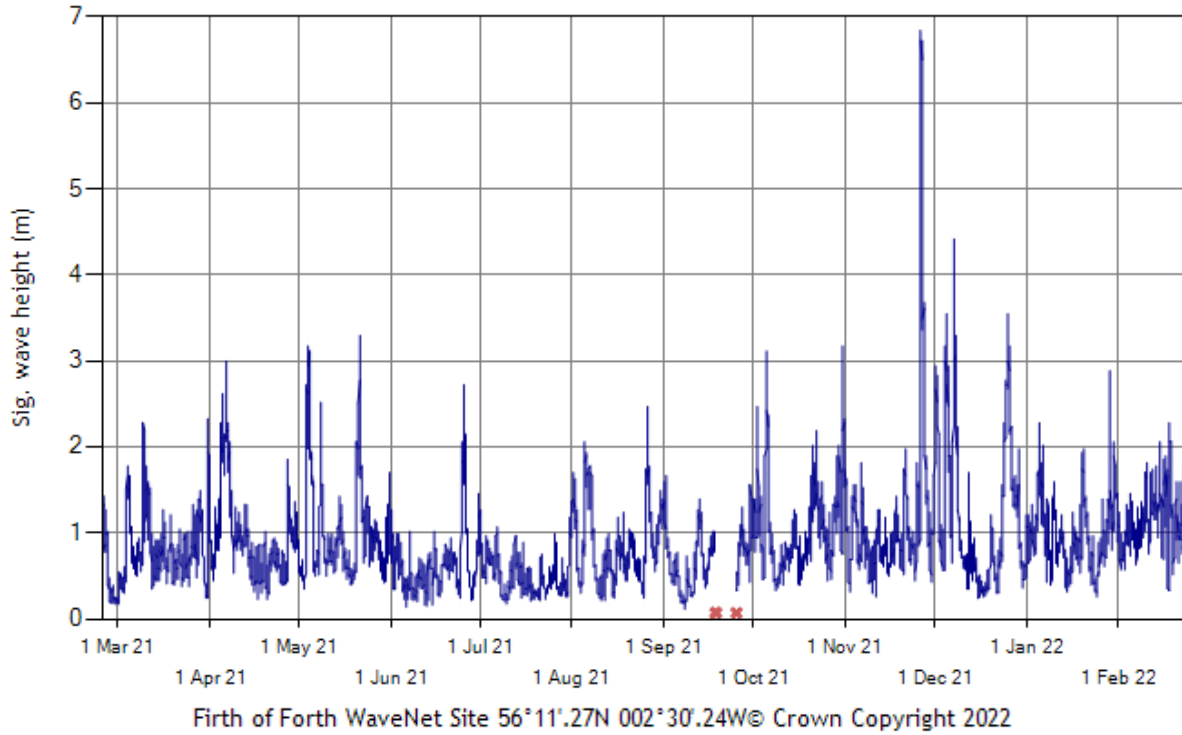
The most frequent wave height will be about half the height of the significant wave.

About 14% of waves will be higher than the significant wave height which will be about 1 in every 7 waves.

It is normal to expect a wave of twice the height of the significant wave height about 3 times every 24 hours.

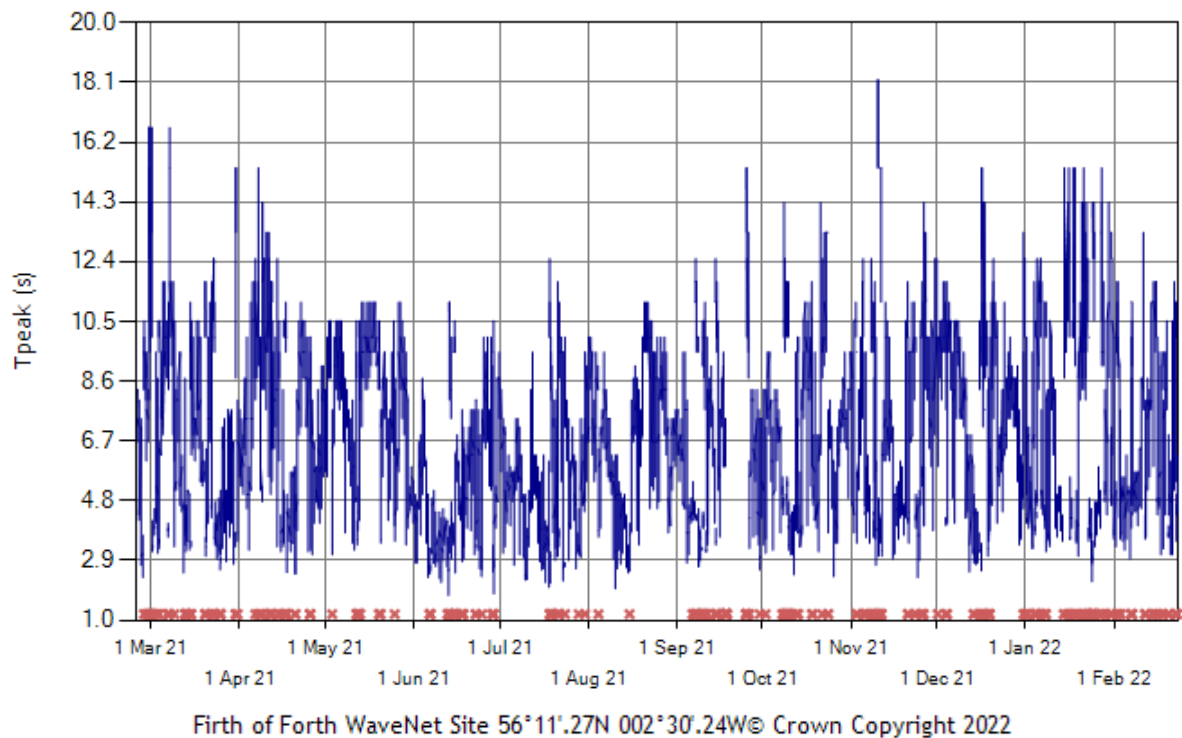
## 12 Month Recorded Data – 23rd February 2021 to 22nd February 2022

### Significant Wave Height



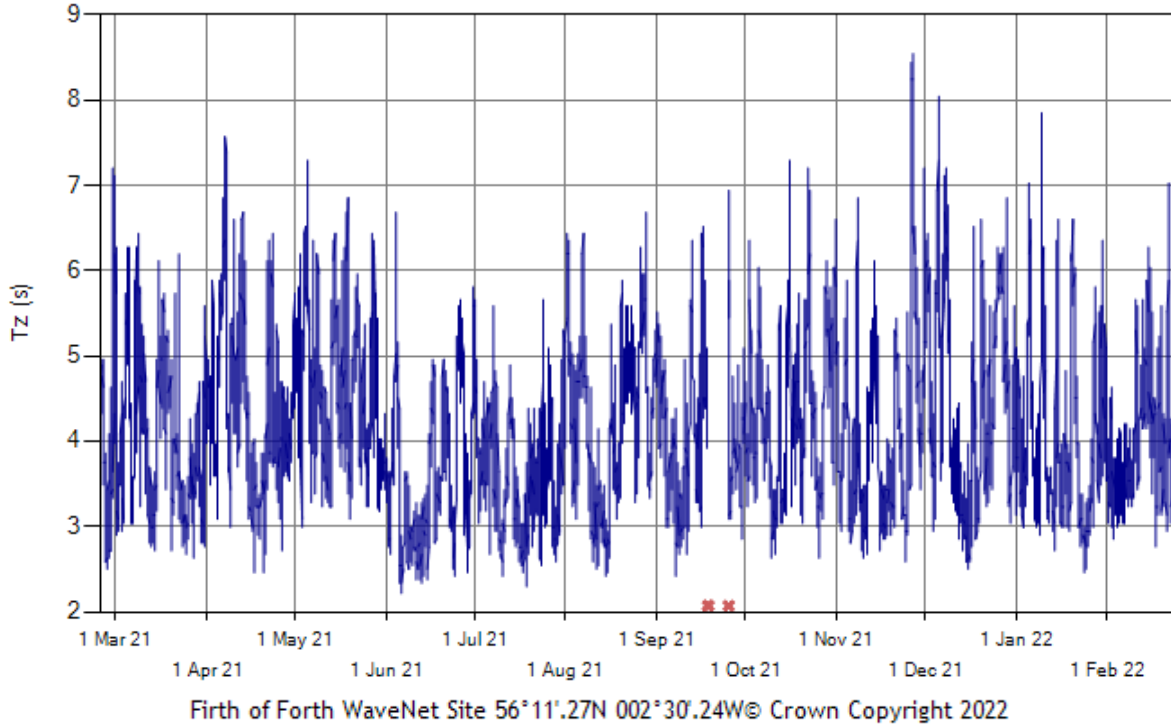
## 12 Month Recorded Data – 23rd February 2021 to 22nd February 2022

### T peak



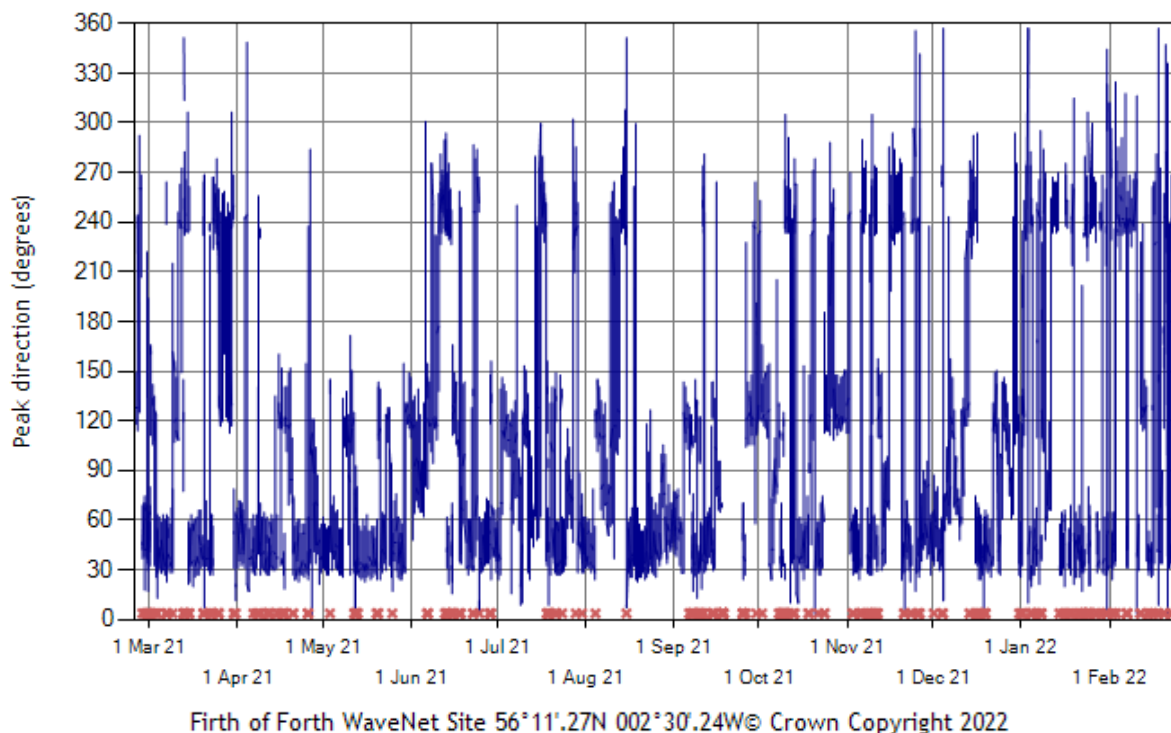
## 12 Month Recorded Data – 23rd February 2021 to 22nd February 2022

Tz



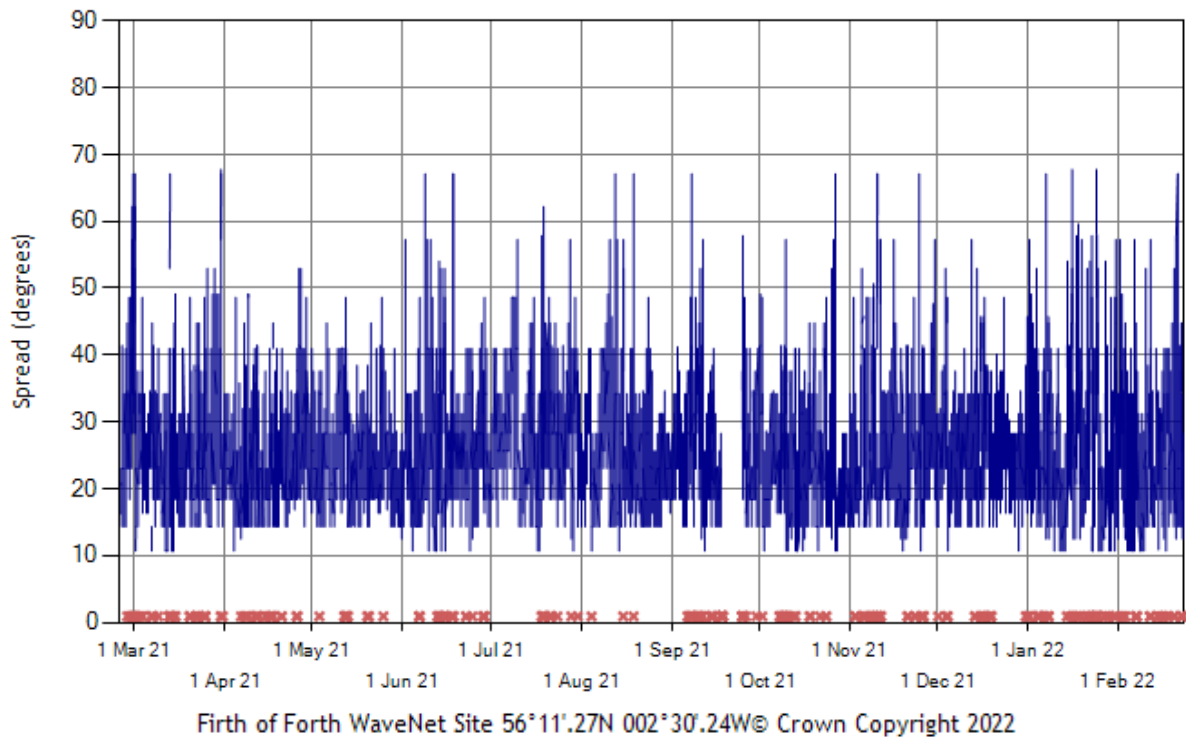
## 12 Month Recorded Data – 23rd February 2021 to 22nd February 2022

Peak direction



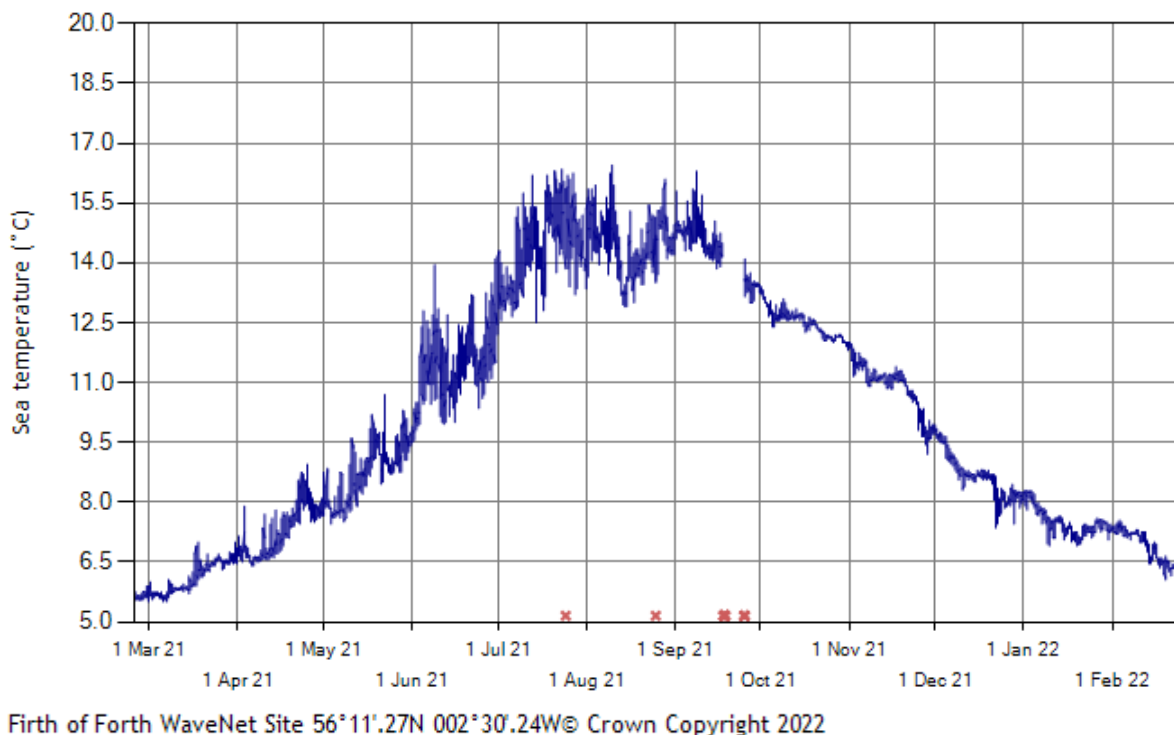
## 12 Month Recorded Data – 23rd February 2021 to 22nd February 2022

### Spread



## 12 Month Recorded Data – 23rd February 2021 to 22nd February 2022

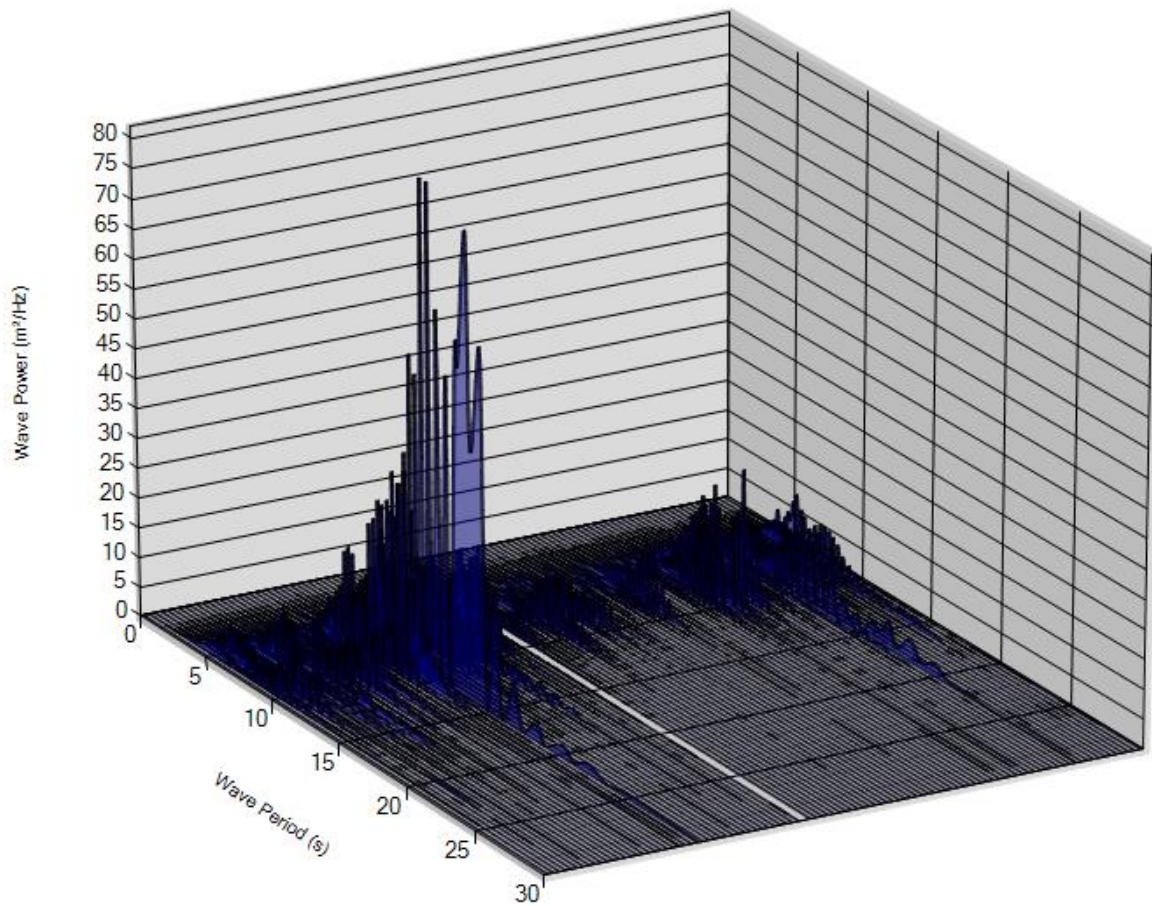
### Sea temperature





12 Month Recorded Data – 23rd February 2021 to 22nd February 2022

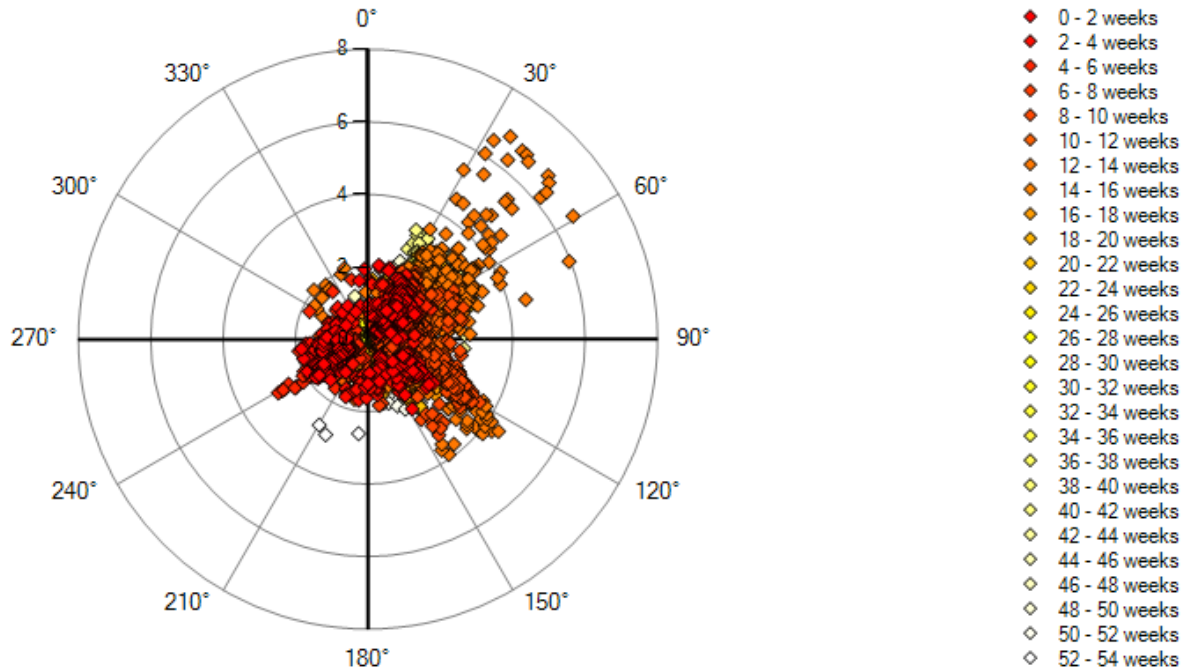
Compressed Wave Spectra



Firth of Forth WaveNet Site 56°11'.27N 002°30'.24W© Crown Copyright 2022

## 12 Month Recorded Data – 23rd February 2021 to 22nd February 2022

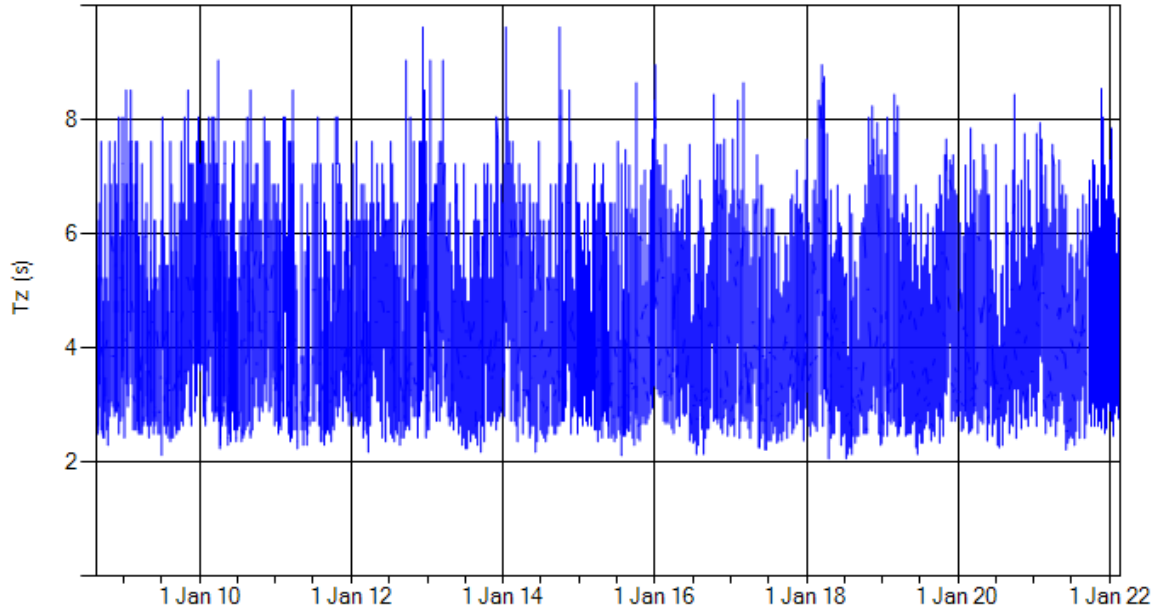
Peak direction (degrees from) vs. Significant Wave Height (m) vs. Age



Firth of Forth WaveNet Site 56°11'.27N 002°30'.24W© Crown Copyright 2022

## 13.5 Year Recorded Data – 19<sup>th</sup> August 2008 to 22<sup>nd</sup> February 2022

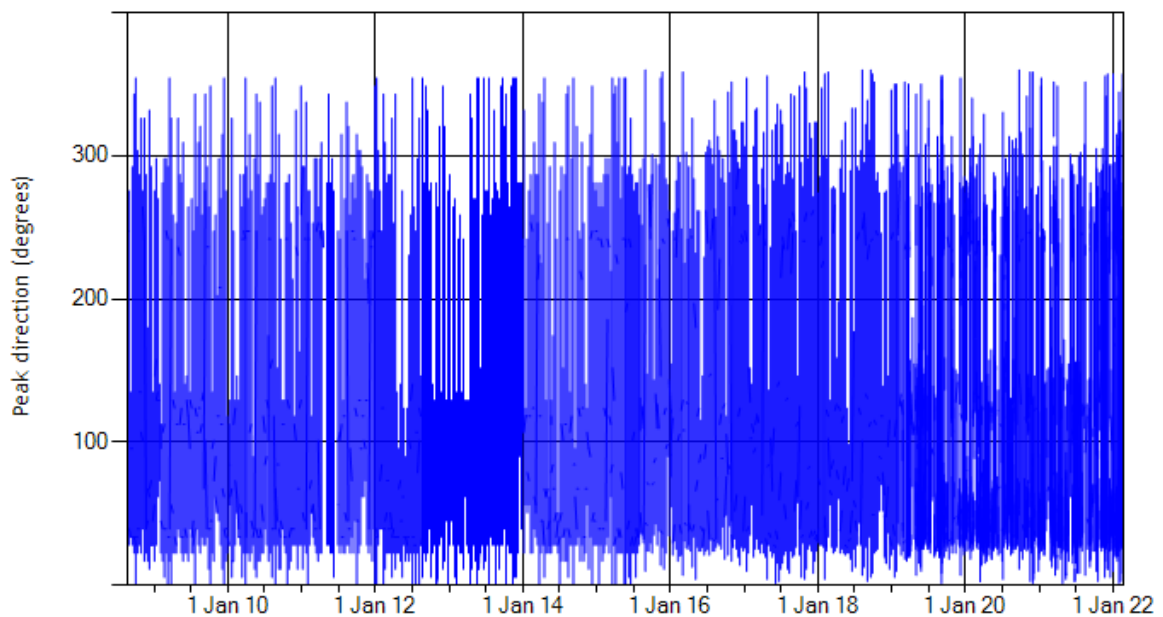
### Average (zero crossing) wave period



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## 13.5 Year Recorded Data – 19<sup>th</sup> August 2008 to 22<sup>nd</sup> February 2022

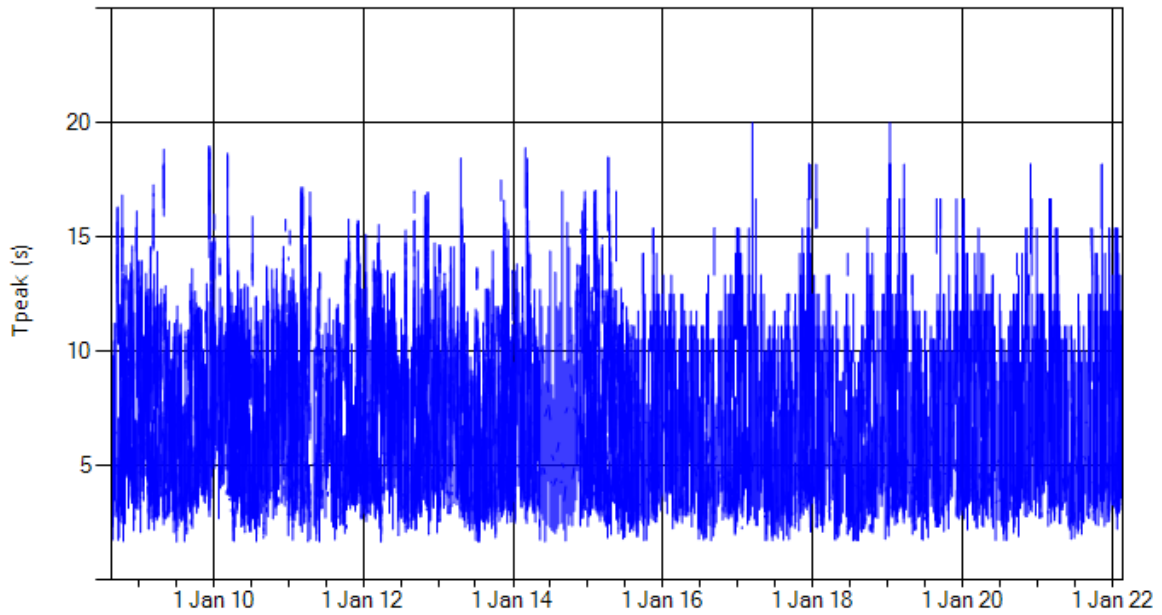
### Dominant (peak) wave direction



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## 13.5 Year Recorded Data – 19<sup>th</sup> August 2008 to 22<sup>nd</sup> February 2022

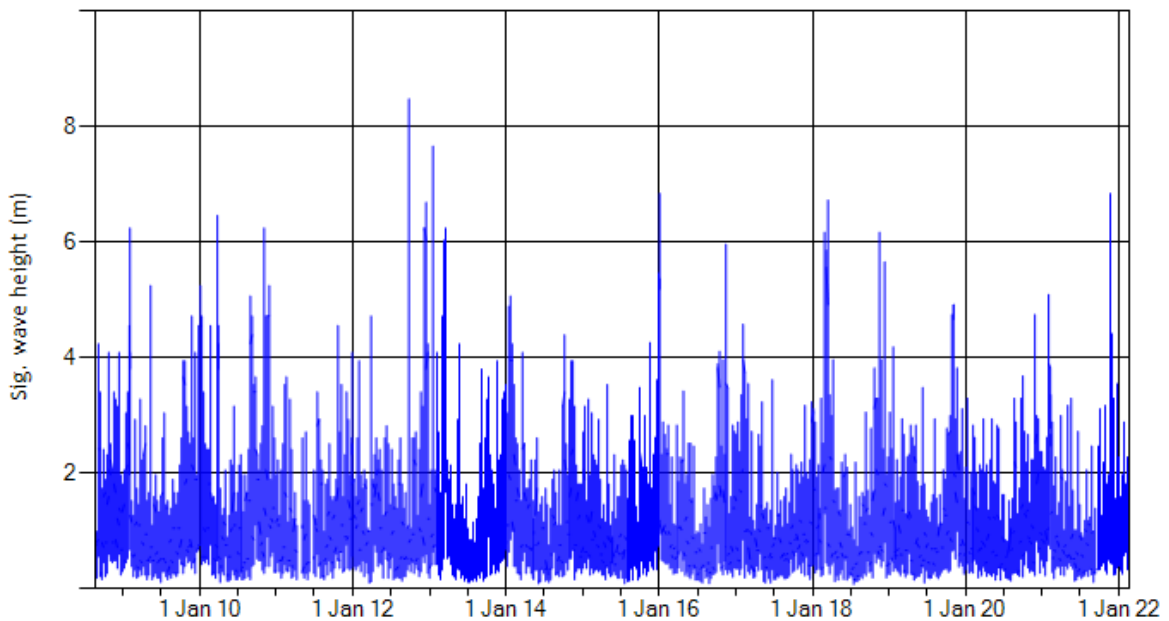
### Dominant (peak) wave period



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## 13.5 Year Recorded Data – 19<sup>th</sup> August 2008 to 22<sup>nd</sup> February 2022

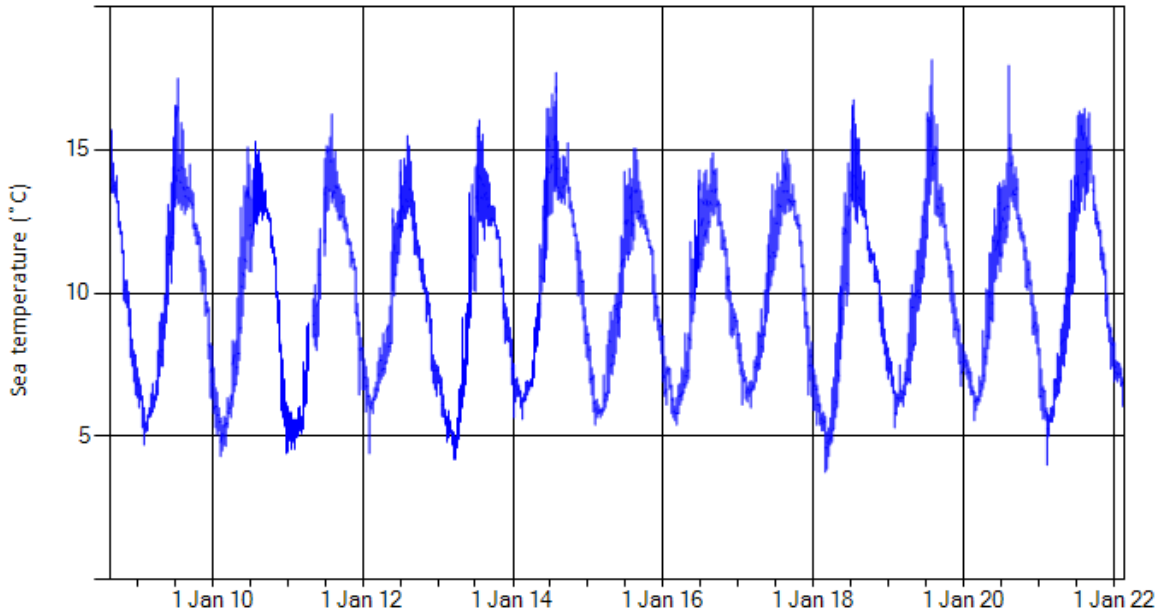
### Significant Wave Height



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## 13.5 Year Recorded Data – 19<sup>th</sup> August 2008 to 22<sup>nd</sup> February 2022

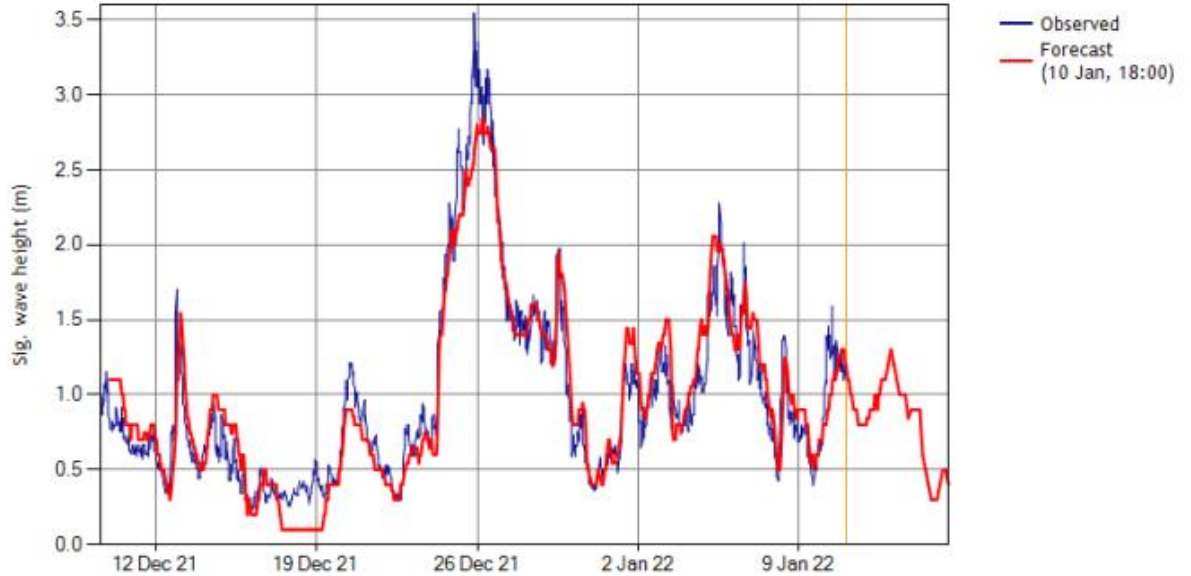
### Sea Temperature



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### 30 Day Recorded Data – 9<sup>th</sup> December 2021 to 9<sup>th</sup> January 2022

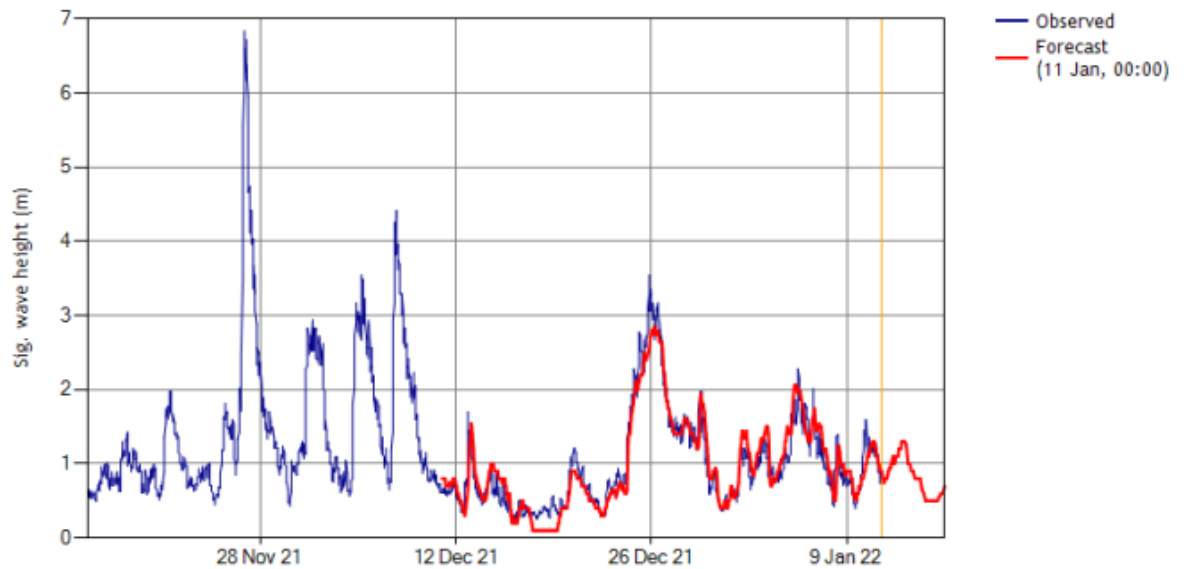
#### Significant Wave Height - Highlighting storm 'Barra' on 26<sup>th</sup> December 2021



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### 63 Day Recorded Data – 14<sup>th</sup> November 2021 to 15<sup>th</sup> January 2022

#### Significant Wave Height - Highlighting storm 'Barra' & storm 'Arwen' on 26<sup>th</sup> November 2021



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