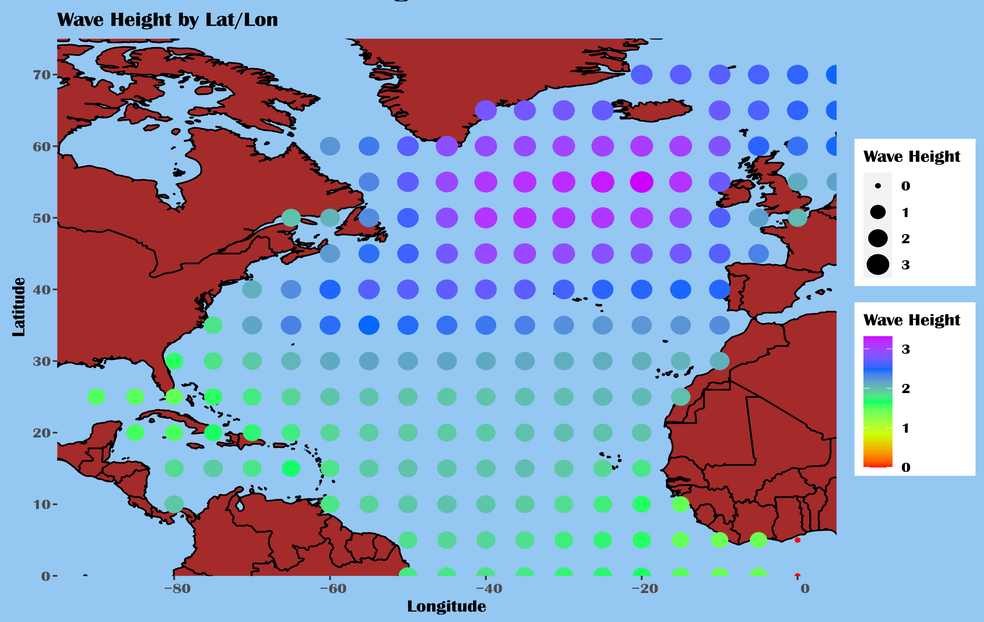
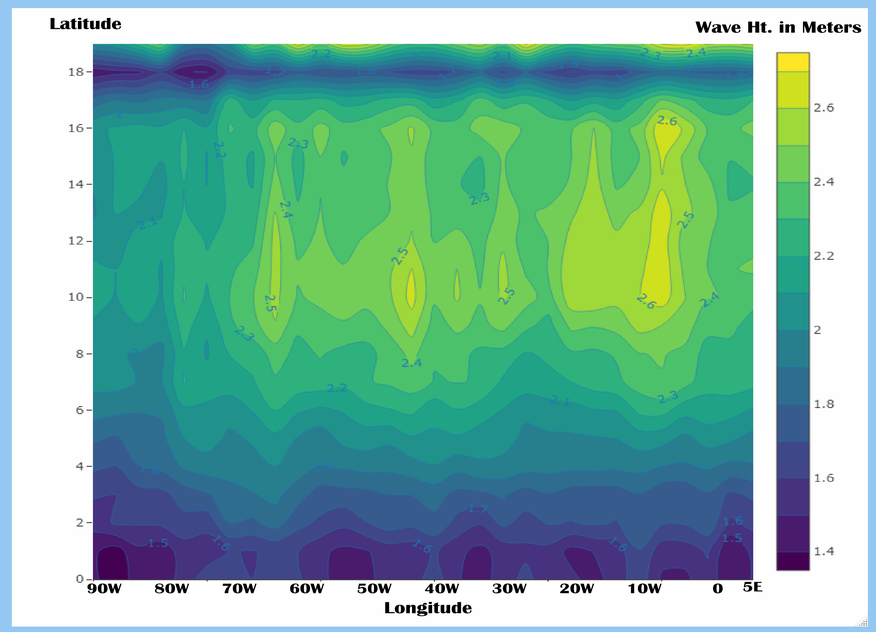
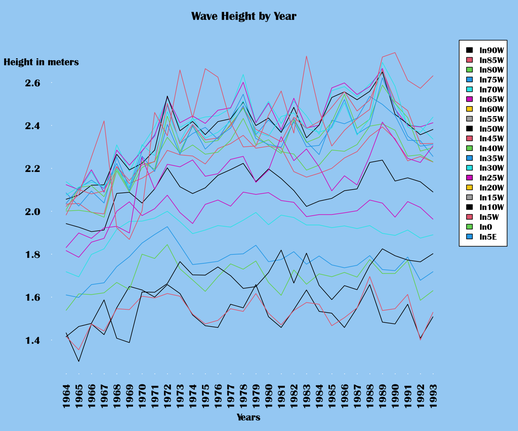
Catch a Wave

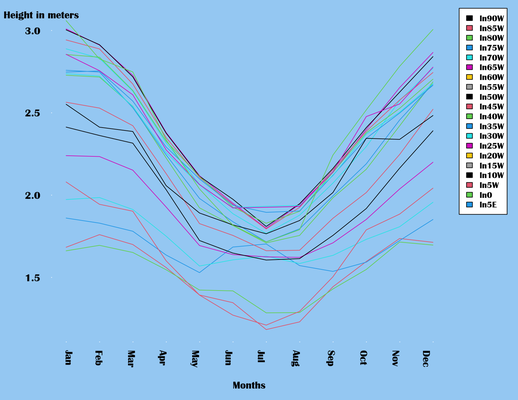
Examining the wave height trends over the 30-year study reveals a steady to slightly increasing trend in wave height. The consistency in the observed data which supports long term investment in wave energy generation.

Waves impact commerce, produce energy and change to landscape of our coast-lines. What is the profile of Atlantic waves? How does it compare to coastal data? What can long-term studies tell us about the future of wave patterns?

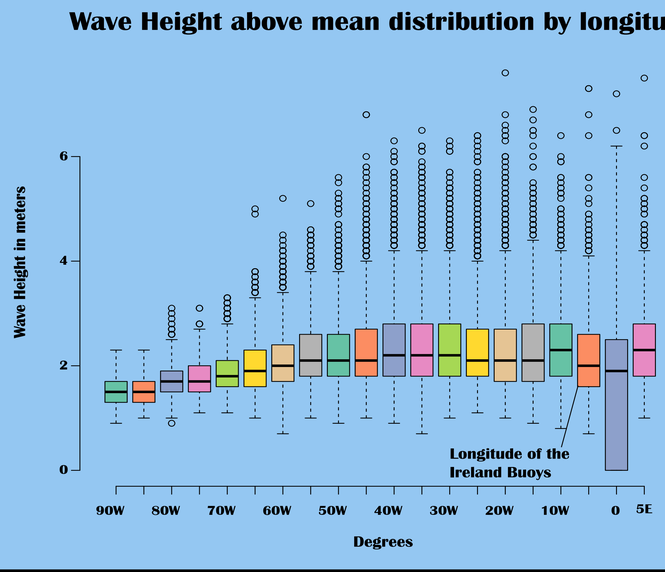






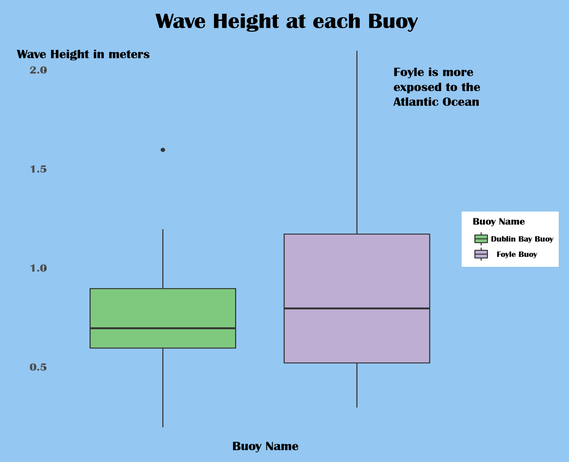


Higher mean wave heights are found in the North and East regions of the Atlantic. Areas where there is less consistent solar energy

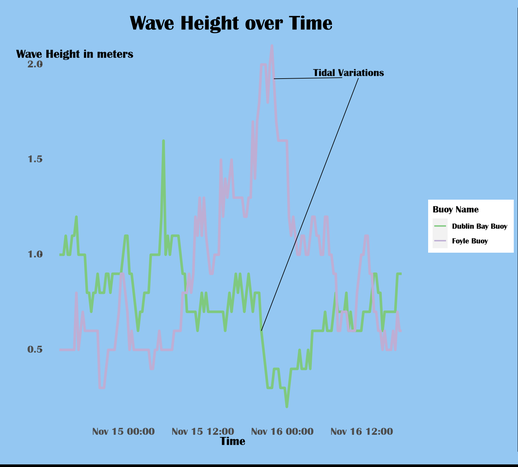


Mean wave height at 5W is 2.1m. Exceeds the mean reported at the buoys of 0.8m and 0.3m for the Foyle and Dublin Bay buoys respectively, but is close to the upper limit and less the highest observed height at the Foyle Buoy. Buoys are protected from the open Atlantic.

The mean drops along longitude 5W, the coastline of the United Kingdom. The value is equivalent to data found at 65W longitude, approximately 100 miles off the coast of the United States



Wave heights are highest during the months in which energy for solar would be at its lowest availability. Periodicity of wave heights over time is likely due to tidal patterns and should be factored into energy generation schemes.



About the data

Data Set 1 contains values of significant wave height, computed as higher of sea and swell in meters with tenth. for each individual month from January 1964 to December 1993 at 5-degree grid in 21 longitudinal by 16 latitudinal grid points. The northwest corner is 75N, 95W. The southeast corner of the data area is 0, 5E. All land areas are indicated with a -9999 mask in CSV format. Data Set Score: (21 Columns*4) x (6119 Rows/100) = 128499

Data Set 2 contains values of significant wave height off the Irish Coast 11/12/202 - 11/14/202 from 9 bouys in JSON format

The focus of the study was to identify both challenges and opportunities presented by North Atlantic wave conditions and to examine trends over time. While the data can contribute to larger environmental studies, the intent was to focus on more specific impacts of ocean waves.

John Christman - IST 719 Final Project

Data Source:Gulev, S. K., V. Grigorieva, and A. Sterl. 1998. Global and North Atlantic Atlas of Monthly Ocean Waves. https://doi.org/10.5065/DTJJ-HZ16. Accessed: 18 OCT 2020.