Teleconnections and Extreme Ocean States in the Northeast Atlantic Ocean

Emily Gleeson (1), Sarah Gallagher (1), Colm Clancy (1), Laura Zubiate (1), Jelena Janjic (2), and Frederic Dias (2)

(1) Met Éireann, Research, Environment and Applications, Dublin 9, Ireland (emily.gleeson@met.ie), (2) School of Mathematics and Statistics, University College Dublin, Ireland

Teleconnections and Extreme Ocean States in the Northeast Atlantic Ocean

Emily Gleeson(1), Sarah Gallagher(1), Colm Clancy(1), Laura Zubiate(1), Jelena Janjic(2), Frederic Dias(2,3)

1. Met Éireann, Research, Environment and Applications, Dublin 9, Ireland
2. School of Mathematics and Statistics, University College Dublin, Ireland
3. CMLA, ENS Cachan, CNRS, Université Paris-Saclay, 94235 Cachan, France

The Northeast Atlantic possesses an energetic and variable wind and wave climate which has a large potential for renewable energy extraction; for example along the western seaboards off Ireland. The role of surface winds in the generation of ocean waves means that global atmospheric circulation patterns and wave climate characteristics are inherently connected. In quantifying how the wave and wind climate of this region may change towards the end of the century due to climate change, it is useful to investigate the influence of large scale atmospheric oscillations using indices such as the North Atlantic Oscillation (NAO), the East Atlantic pattern (EA) and the Scandinavian pattern (SCA). In this study a statistical analysis of these teleconnections was carried out using an ensemble of EC-Earth global climate simulations run under the RCP4.5 and RCP8.5 forcing scenarios, where EC-Earth is a European-developed atmosphere ocean sea-ice coupled climate model. In addition, EC-Earth model fields were used to drive the WaveWatch III wave model over the North Atlantic basin to create the highest resolution wave projection dataset currently available for Ireland. Using this dataset we analysed the correlations between teleconnections and a range of wave parameters with a particular focus on extreme ocean states using a range of statistical methods.