ONE Planet
Doctoral Training Partnership

Natural Environment Research Council

Project title: Quantifying the impacts and consequences of future super-storm events

Ref: OP2473

Keywords: Consequence forecasting, infrastructure, climate change

One Planet Research Theme:

Climate & Climate Change ☒ | Earth System Processes ☒ | Anthropocene ☐ | Environmental Informatics ☐

Lead Supervisor:

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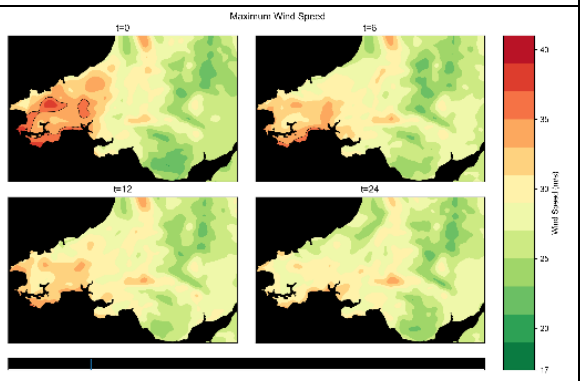
Key Research Gaps and Questions:

Which future climate hazards will be the most disruptive to society?

How do climate hazards combine to produce super-storm events?

What are the likely future damages and disruptions that we can expect to see in society from these super-events?

What measures must we take to maintain resilience?



Project Description:

There is a lot of anecdotal evidence that some storms are particularly damaging. For example, for Storm Arwen it has been said that it was particularly bad because the wind came from the North and for Storm Eunice because the storm contained a sting-jet. What makes a storm particularly damaging? And can we predict what damage and disruption is likely to occur when these storms make landfall? This project will use the latest generation of convection-permitting climate models to try and answer these questions. It will do so by extending a forecasting methodology developed at Newcastle University (known as Consequence Forecasting) so that it can provide projections of future climate impacts and the associated societal consequences for super-storm events that combine different climate hazards. This will be achieved by first using Artificial Intelligence to understand how different climate hazards combine to make super-events and then developing relationships between different compound climate hazards and damage. These relationships will then be implemented in a consequence forecasting tool that can be used to make impact and consequence forecasts for approaching storms or impact projections for future climate events and therefore provide a proof of concept for climate impact quantification.

Prerequisites:

GIS proficiency including writing scripts, statistics.
Desirable skills include working with large data sets, understanding of climate models.
For more information, please contact Dr Sean Wilkinson (sean.wilkinson@ncl.ac.uk).

Newcastle University

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