The effects of storminess on coastal ecosystem services and wellbeing

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Background

Coastal ecosystems are subject to multiple use pressures and are consequently some of the most threatened natural systems on the planet (Barber et al., 2011). Saltmarshes and sand dunes provide a range of ecosystem services from coastal protection and carbon sequestration, to tourism and recreation. Psychological benefits, key to health and wellbeing, are also likely to be provided by coastal environments, although these have received far less attention. Critically, these ecosystems are threatened by climate change, notably projected changes in the frequency and magnitude of storm events. Investigation of the relationship between storminess, coastal ecosystem services and wellbeing is vital to support effective mitigation, adaptation and resilience in a changing climate.

Aims and objectives

This research will examine the historical and contemporary effects of storms on saltmarsh and sand dune ecosystems, and also investigate the impacts of storms on the psychological benefits gained from these environments.

Several key objectives have been identified:

- To establish a record of storminess over the last 150 years.
- To measure the contemporary impacts of storm events on sand dunes and salt marshes.
- To assess impacts of storms on the ecosystem services afforded by saltmarshes and sand dunes, focusing on psychological benefits and aesthetic preferences.
- To investigate how attitudes towards, and relationships with the coastal landscape vary according to key geographical and socio-psychological characteristics.

Methods

- Sediment coring and analysis of geochemistry, particle size and pollen to assess ecosystem change in response to historical storm events.
- Qualitative interviews will assess current levels of understanding of environmental and social responses to storm events at the three field sites.
- Quantitative surveys will test specific hypotheses, investigating how risk perception and resilience varies with degree of exposure to storms, be it direct or indirect.

Outputs

GIS will be used as an effective and accessible tool to combine environmental and social data and ascertain the effects of storms on vulnerable coastal ecosystems. Data will have direct relevance to shoreline management plans, to prioritise ecosystem services management in the coastal zone.

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