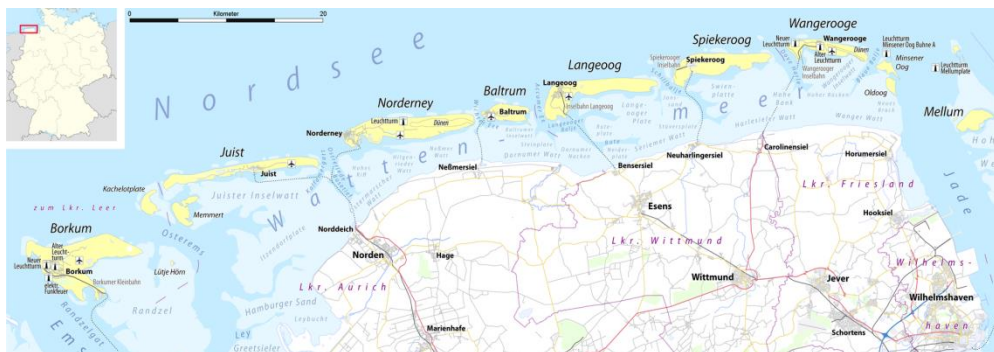


Case Study 2: East Frisian Islands: Existing measures and future challenges of climate change adaptation and resilience

The Frisian barrier Islands form a chain from the Netherlands in the west along the German North Sea coast to Denmark in the North-East. The region is heavily used by the natural gas, oil, shipping, fishing and renewable energy industries. The renewable energy field has targeted the area as a prime location for wind energy installations. A wildlife nature reserve coordinated by bordering countries encompasses a large area. The East Frisian islands extend 3-10 km offshore and span 90 km from west to east between the Ems and Weser rivers. The islands are bordering the highly productive mud flats of the Wadden sea, and large sections of the area are designated a National park and UNESCO World Heritage Site.



Map:
Maximilian
Dörrbecker
CC

The primary research objective of this case study is to investigate existing adaptation measures and future challenges for climate change adaptation, vulnerabilities, and risks on the East Frisian Islands. The islands and the adjacent North Sea coast is especially prone to an increase in external environmental pressure, as they host a variety of coastal systems in a small distinct area. The islands are physically exposed to meteorological and hydrodynamic forcing and have a long term experience with perturbations of different kind, in particular storm surges. According to the currently available projections, the global mean sea level is expected to rise by about 0.26 m to 0.98 m until the end of the century (IPCC, 2013). In addition, the North Sea region may be affected by future changes in the intensity and frequency of storm surges, which may in turn amplify the effects of the global mean sea-level rise (e.g. Woth et al., 2006, Gaslikova et al. 2013).

These areas are economically relevant in terms of human use (settlement, tourism, renewable energy), of political importance as they form the base line for the definition of national sea borders, as part of the national park and World Heritage Site, and they are of prominent societal interest for their function as a coastal protection (barrier) for the Wadden Sea and the low lying main land. In general, small islands are particularly affected by adaptation strategies and maritime planning such

as spatial planning, flood risk management, and renewable energy installations. For example, evidence suggests that islands are often targeted as ideal locations for renewable energy installations (Stuart 2006). Islands can serve as excellent model systems for the evaluation and implementation of ecosystem approach to adaptive management which takes into account ecosystem knowledge considering multiple external influences and balancing societal objectives.

Further research is needed on current climate-proofing strategies for key economic sectors and services in comparatively small territorial units such as islands. The East Frisian islands are less well researched than their West and North Frisian siblings, yet there is a number of existing reports on specific aspects, and there is a general plan for the protection of the islands from the regional ministry (NLWKN 2010).

The case study will first document and assess established climate change adaptation measures in three key arenas of particular relevance to the East Frisian Islands: spatial planning, flood management, and renewable energy development. Secondly, we will examine stakeholder participation and communication pathways as citizen perceptions on the local level are crucially important to assess governance performance and to prepare for future challenges in climate change adaptation.

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