



## Aims

Our main aim is to reconstruct the evolution of the Holocene-age coastal landscapes in the Wadden sea area and to establish the relative importance of the various controls, namely climate, hydrology and sedimentary processes. The synthesis of the collected data will provide detailed information on the environmental development of the palaeo-landscapes which controlled the settlement patterns of the prehistoric cultures which inhabited the region.

Individually, our aims include ...

- analysing the internal stratigraphy of the Wadden Sea sediments
- reconstructing palaeo-landscapes
- analysing human-environment interactions and prehistoric settlement patterns during the Holocene
- using predictive modelling to identify areas of high potential for human habitation

WASA is supported by



## Project partners

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## Funding



**Niedersächsisches Ministerium für Wissenschaft und Kultur**



**Niedersächsisches Institut für historische Küstenforschung**

**SENCKENBERG**  
world of biodiversity



**Niedersächsischer Landesbetrieb für Wasserwirtschaft, Küsten- und Naturschutz**



**Universität Bremen\***





## What is WASA?

The interdisciplinary research project WASA (Wadden Sea Archive) integrates **sedimentology, hydroacoustics, geochemistry, palaeoecology and archaeology** in a multiproxy approach involving exploration, analysis and predictive modelling. WASA's focus is to identify and investigate coastal archives in order to reconstruct the development of the Quaternary palaeo-landscapes and to model the various environments where humans were living in the Wadden Sea region over the last 11,600 years (i.e. since the last glaciation).

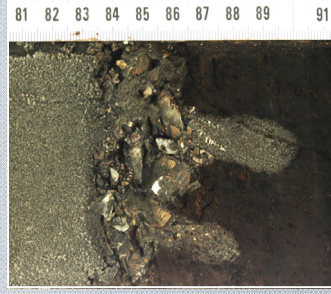
## The Wadden Sea as a natural archive

Depositional processes along the North Sea coast during the period of Holocene sea-level rise resulted in the burial of nearshore soils and corresponding biocoenoses leading to their preservation through to the present day. These submerged and buried sediment layers of the North Sea region provide an excellent archive, including both plant and animal micro- and macrofossils as well as human artefacts. This material will enable us to reconstruct the postglacial vegetation and landscape development, sedimentary processes, sea level and climate changes as well as prehistoric human settlement strategies.

## Drowned landscapes

The Wadden Sea coast experienced several stages of coastal evolution, as a result of the temperature increase at the end of the last ice age. The sea-level rise was gradual, with several stages of transgression and regression being recorded. These resulted in the drowning of terrestrial Pleistocene landscapes and their replacement by marine ecosystems. As a result of the sea-level changes, the coastline shifted repeatedly both landward and seaward. Thus, peat deposits - relicts of extensive coastal fens - can be found both in direct contact with terrestrial Pleistocene sands and intercalated with brackish-lagoonal or marine sediments.

During this period of coastal evolution former landscapes were buried by sediments, thus preserving traces of "drowned life" for millennia. Numerous archaeological finds provide evidence of human presence of the area during prehistoric times.



**Core detail:** erosive contact between peat at the bottom and overlying marine sediments.  
The finger-shaped pits are sediment filled dwelling burrows of the bivalve *Petricolaria pholadiformis*.

## What we do

Around 120 sediment cores up to 6 m long are planned in the tidal flats and offshore of the East Frisian Islands of Norderney and Spiekeroog. Hydroacoustic measurements will allow to the point-based information derived from the core analysis to be spatially extended across the entire region. Specialists from a range of different disciplines will analyse the stratigraphy, the sediments as well as macro- and microfossils. All data will be integrated into a GIS database, in order to provide a detailed reconstruction of the palaeo-landscape and to identify areas of potential human settlement.



Elevation model of a test region at the mainland (river Ems, East Frisia) as a base for predictive modelling. The distribution of archaeological sites of different ages (coloured dots) reveals a concentration of settlements along the natural levee of the river Ems.