Interreg North Sea Region Building with Nature
European Regional Development Fund
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Policy Brief
Lower Saxony Water Management, Coastal Protection and Nature Conservation Agency

An ecosystem-based element of coastal protection

A coastal oriented Policy Brief from the Interreg North Sea Region Building with Nature project by the Lower Saxony Water Management, Coastal Protection and Nature Conservation Agency, Germany

Key messages

- The implementation of Building with Nature (BwN) solutions for coastal protection is an important prerequisite for a sustainable development of the coastal area and can create multiple benefits.
- BwN solutions require site specific approaches that take physical and socio-economical boundary conditions based on strategic management and stakeholder acceptance into account.
- Climate change will cause additional demands of natural resources such as sand and clay for implementing BwN solutions. An availability of material has to be guaranteed by a technical and legal framework.
- Substantial cooperation at the level of the affected states forms an essential, basis for the further development of BwN measures.

Sense of Urgency

Coasts of Lower Saxony are at risk for flooding and suffer in parts from erosion. Climate change will intensify these risks caused by accelerated sea level rise, higher hydrodynamic impacts and increased erosion. Long-term and sustainable planning based on an adaption strategy and sustainable measures can ensure the use and protection of this important living, economic and natural area.

Building with Nature project

- Partners from the Netherlands, Belgium, Germany, Denmark, Sweden, Scotland and Norway work together.
- The project demonstrates BwN solutions at 7 coastal sites and at 6 catchment scale sites.
- The project is part of the Interreg VB North Sea Region programme.
- Project period: 2015 – 2020.

A solution:

The protection of spatially defined coastal areas against the risk of flooding and erosion is statutory task in the federal state of Lower Saxony. On the sandy coasts of East Frisian Islands, beaches and dunes form a legally defined public coastal protection system. The mainland coast and the southern sides of the islands are mainly protected by dikes and forelands. The coastal protection strategy is defined by the Master Plan Coastal Risk Management Lower Saxony for the islands and the mainland coast covering 97 km of designated coastal protection dunes and 638 km primary dikes.

For dune coasts with coastal protection function, a coastal protection zone is defined in which other uses are not permitted. Thus, as long as the functionality of the dunes as a largely natural coastal protection element is ensured a limited dynamic of the coastline can be permitted. The development is continuously investigated by targeted monitoring and the status is assessed by regular safety assessments.

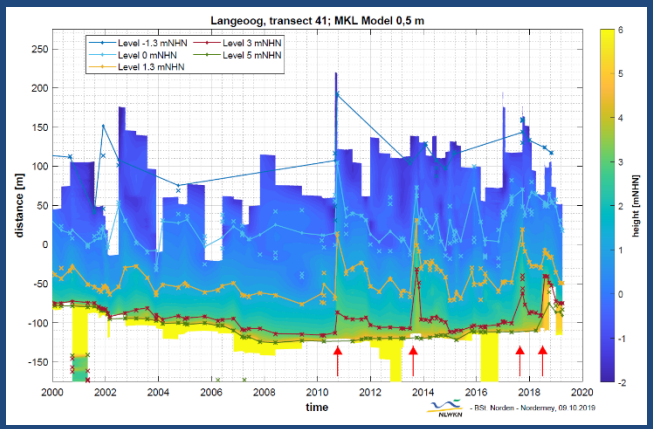
If the functionality is endangered, where possible and effective, preferably building with nature measures such as compensation of sediment deficits by sand nourishment, strengthening of dunes by additional sand and natural shaping, as well as engineer-biological measures are carried out. In addition, the understanding of the relevant processes and the optimization of measures is constantly being improved through further development of technical expertise and scientific research.

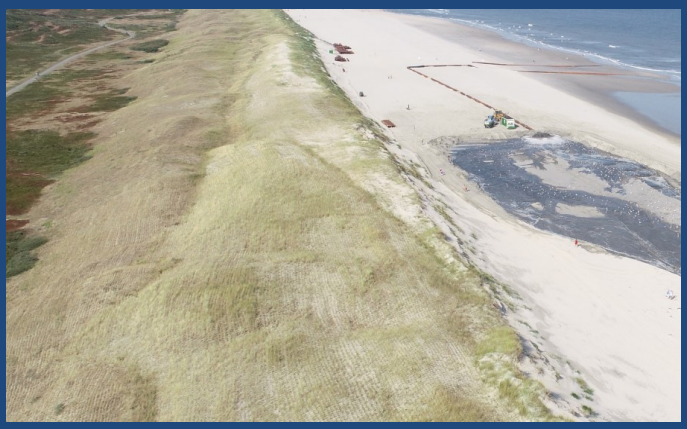
By applying this dynamic management strategy, flood and erosion control can be ensured and the natural character of the dune coasts and their great importance for tourism and nature conservation can be preserved.

Due to the high importance of sandy coasts for tourism und nature conservation, municipalities, tourism management, nature conservation agencies and NGO´s are involved at an early planning stage. This leads to a high acceptance of BwN measures that are regularly carried out at the seven east Friesian islands.

Combined BwN solutions

The coastal protection dunes at the north-western part of Langeoog are a main element of coastal risk management. Due to ongoing sediment deficits at the beaches and foreshore a dynamic preservation of the coastal protection dunes in order to guarantee their function over the last decades is applied by using BwN solutions. A combination of naturally shaped dune strengthening with beach and foreshore nourishments was applied, based on enhanced analyses and planning methods facilitated by the Interreg BwN project.





Lessons learned from the Interreg BwN Project

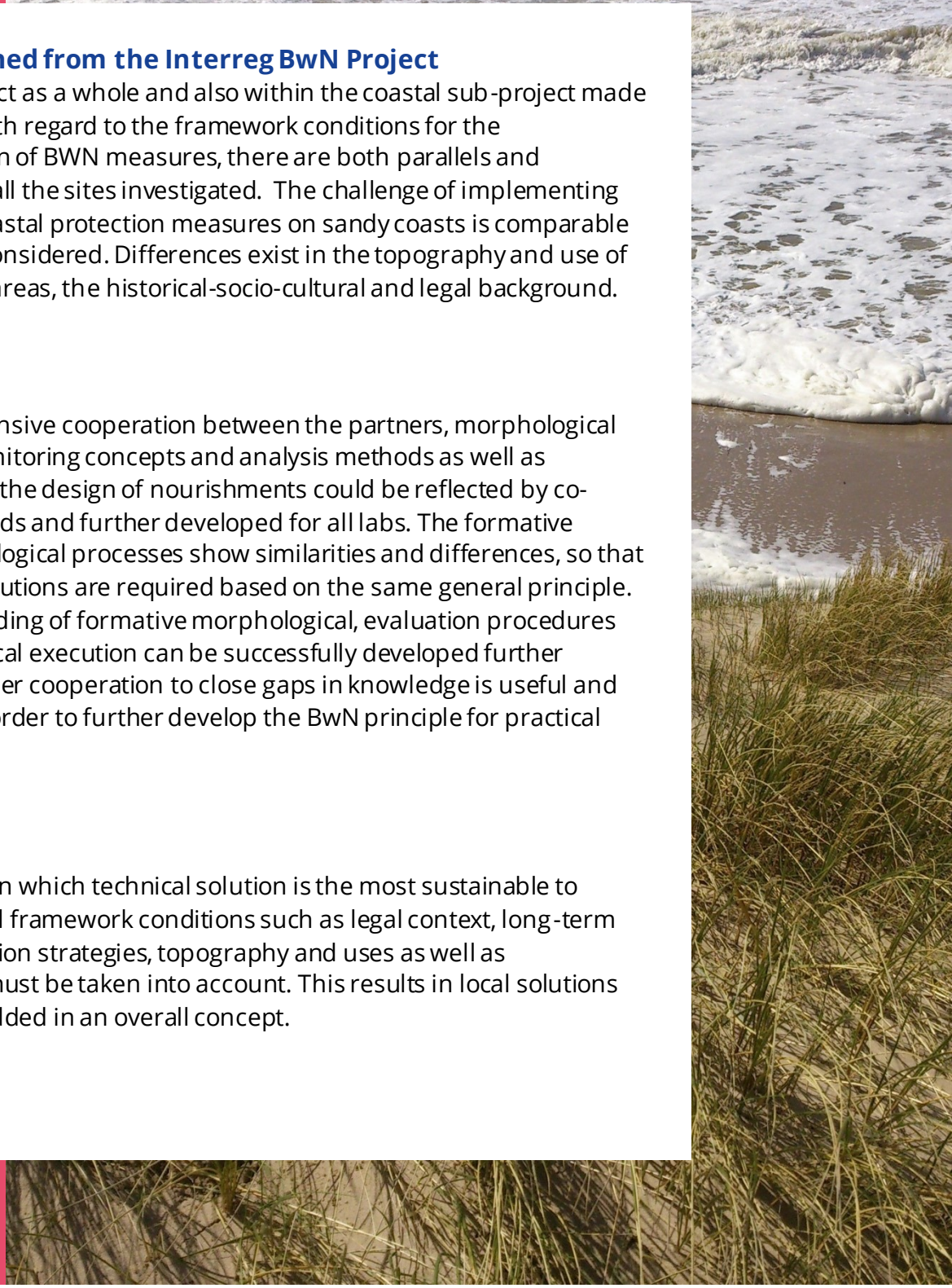
The BwN project as a whole and also within the coastal sub-project made it clear that, with regard to the framework conditions for the implementation of BWN measures, there are both parallels and differences at all the sites investigated. The challenge of implementing sustainable coastal protection measures on sandy coasts is comparable for all coasts considered. Differences exist in the topography and use of the protected areas, the historical-socio-cultural and legal background.

Lesson 1:

Due to the intensive cooperation between the partners, morphological processes, monitoring concepts and analysis methods as well as techniques for the design of nourishments could be reflected by co-analysis methods and further developed for all labs. The formative hydro-morphological processes show similarities and differences, so that site specific solutions are required based on the same general principle. The understanding of formative morphological, evaluation procedures and the technical execution can be successfully developed further together. Further cooperation to close gaps in knowledge is useful and purposeful in order to further develop the BwN principle for practical application.

Lesson 2:

For decisions on which technical solution is the most sustainable to reduce risks, all framework conditions such as legal context, long-term coastal protection strategies, topography and uses as well as stakeholders must be taken into account. This results in local solutions that are embedded in an overall concept.



Challenges

a. The morphological processes on sandy coasts are very complex and vary depending on the respective influencing factors. The knowledge of these processes and the behaviour of BwN measures must be further investigated in order to develop optimal solutions.
b. Climate change will increase coastal erosion. The demand for sand and other natural materials for BwN solutions will increase. Based on a sound knowledge base, it must be investigated what material requirements can be expected in the future and up to what extent BwN measures can be implemented.
c. An important question is which material requirements exist, especially for sand, for the implementation of BwN measures and whether these can be fulfilled in the long term.

Policy recommendations

I. Substantial cooperation at the level of the affected states forms an essential, viable technical basis for the further development of BwN measures. The different historical developments and socio-economic conditions in the countries bordering the North Sea require specific taylor-made solutions based on a common understanding of relevant processes.
II. Challenge of climate change: Sea level rise and changes will cause a huger demand of sand in order to adapt sandy coasts and additional planning. The extraction of sediment outside the system in the coastal forefield requires long-term sustainable strategies and concepts due to expected conflicts of use, which must be secured by a robust legal basis and spatial management plans.
III. The implementation of BwN measures within the framework of coastal risk management policies requires a viable legal framework and societal acceptance.

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