MEETING DOCUMENT

Wadden Sea Board (WSB 45)

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Common Wadden Sea Secretariat

Agenda Item:	**5.3 Mitigate and adapt to climate change (paras 38-43)**
Subject:	**Revised Climate Change Adaptation Strategy**
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Submitted by:	**CWSS, EG-C**

In 2014, the trilateral Climate Change Adaptation Strategy (CCAS) for the Wadden Sea was adopted, annexed to the Tønder Declaration. It aims to increase the resilience of the Wadden Sea to the impacts of climate change.

In line with the Wilhelmshaven Declaration as well as with the Single Integrated Management Plan (SIMP) for ONE Wadden Sea World Heritage (CWSS, 2023), the trilateral Expert Group Climate Change Adaptation (EG-C) has reviewed and updated the strategy.

This document contains the revised trilateral Climate Change Adaptation Strategy (draft). Revisions are mainly aimed at aligning the content with the latest developments and readability. The strategy has been reduced in size and an updated list of key activities on the trilateral level is included.

Proposal: The meeting is invited to **discuss** and **adopt** the revised strategy and to consider it as annex to the future Esbjerg Declaration 2026.

Trilateral Climate Change Adaptation Strategy

Introduction

The Wadden Sea is an exceptional coastal ecosystem of Outstanding Universal Value (OUV), recognized by UNESCO as a transboundary, natural World Heritage site. The three Wadden Sea States share the responsibility to preserve and enhance the OUV for future generations, also in times of global change.

The Trilateral Wadden Sea Cooperation (TWSC) follows the guiding principle "to achieve a natural and sustainable ecosystem in which natural processes proceed in an undisturbed way" (2010 Joint Declaration). The principle aims at:

- maintenance of the natural structures and functions,
- conservation of the characteristic biodiversity,
- maintenance of the scenic qualities of the landscape.

Climate change threatens the Wadden Sea´s structures, functions and the characteristic biodiversity, and the livelihoods of local communities. Recognising its cross-cutting character, climate change has been repeatedly addressed at the Trilateral Governmental Conferences, the Ministerial Declarations, the Wadden Sea Plan 2010 and the Single Integrated Management Plan (SIMP) for ONE Wadden Sea World Heritage (2023).

Management approaches for World Heritage properties should be proactive rather than reactive to allow them to better address the cumulative nature of multiple impacts.

The Aim

The trilateral climate change adaptation strategy aims to strengthen policies and measures that **reduce the vulnerability and increase the resilience of the Wadden Sea to impacts of climate change**. It covers the Wadden Sea and adjacent offshore and mainland areas essential for its implementation.

The Challenge

The most important aspects of climate change in the Wadden Sea region are:

1. **Temperature rise and increase of extreme heat events:** Mean annual temperature projections in the Wadden Sea region indicate a rise of 1.2–3.7°C by 2100. Increasing water temperatures are already causing and will continue to cause geographical shifts of species and habitats.

2. **Sea level rise and storm surges**: Projections on global mean sea level rise vary between 0.4 and 0.8 m by the year 2100 relative to the 1995-2014 average. After the year 2100 sea levels may further rise, up to several meters depending on the global emissions of greenhouse gasses. Studies on the future development of storm surges estimate a small to insignificant increase towards the end of this century. Higher sea levels require additional measures for flood safety, will raise groundwater levels, can reduce freshwater availability on islands and will increase salt intrusion to the hinterland. Human interventions may further restrict inland water connections.

3. **Change in precipitation patterns**: Due to projected lower summer and higher winter precipitation, freshwater discharge into the Wadden Sea may become more fluctuating. This could reduce freshwater availability and alter salinity gradients, significantly impacting the ecosystem.

The high uncertainty surrounding climate change, combined with complex geophysical, biological, and social interactions, makes predicting their impact a major scientific challenge. Nevertheless, the changes are likely to threaten the Wadden Sea World Heritage site. Further research, pilot measures, and assessment of their upscaling potential is therefore required.
One key concern is that rising sea levels may outpace the adaptive capacity of the intertidal system, potentially leading to the Wadden Sea's gradual transition from an intertidal to a lagoon ecosystem. This shift could reduce its function as a vital feeding ground for migratory birds. The timing and regional variations of impacts remain unclear and uncertain, but ultimately the ecosystem may lose resilience and evolve into a new state.

Rising sea levels will also accelerate coastal retreat of barrier islands, shrinking tidal basins and increasing flood risks for both island and mainland communities. Proper sediment management could help maintain the natural dynamics of the Wadden Sea and improve flood safety.

Integrating climate adaptation into trilateral cooperation remains challenging due to uncertainties, yet precautionary (no-regret) measures should be implemented. Most current strategies primarily consider sea level rise until 2050 or 2100, but projections suggest higher increases beyond this period. Long term strategies are needed and existing strategies have to be continuously updated. Additionally, past and present interventions, such as dike construction, have long-term impacts on the region's natural dynamics.

Strategic Objectives and Principles

With guaranteed safety for inhabitants, resilience to climate change and implementation of climate mitigation and adaptation in the Wadden Sea region rely on seven basic elements: Natural dynamics, Interconnectivity, Integration, Flexibility, Long-term approach, Site specific approach and Participation. Each element outlines key priorities to enhance resilience.

1) Natural dynamics: protect, restore and enhance the natural resilience of the Wadden Sea

The Wadden Sea ecosystem is more than 5,000 years old and has already endured periods of stronger sea level rise and more frequent and severe storms. In a natural state, sediment redistribution maintains a dynamic equilibrium that makes the Wadden Sea quite resilient to external changes. Thus, allowing and restoring natural dynamics increases the resilience of the Wadden Sea to climate change.

Priorities for natural dynamics

- Evaluate the effects of different measures (e.g., for coastal risk and sediment management) on natural dynamics and elucidate the effects of measures, policies, other human activities and the climate change factors on the natural system and its dynamics.
- Promote and support management measures that consider, allow and/or support and restore natural dynamics, e.g., by restoring spaces to increase system resilience and to prevent the loss of habitats.
- Consider sediment management with the aim to enable the Wadden Sea to grow with accelerated sea level rise, focusing on the natural capacity of the system to adapt to sea level rise
- Limit additional pressures on the morphological and ecosystem as far as possible.

2) Good ecological status and interconnectivity: support habitats and species to adapt

A good ecological status of the trilateral Wadden Sea helps to reduce vulnerability and to boost adaptive capacity to climate change impacts. Among nature-based solutions and adaptive management approaches, robust habitat restoration and management play a central role in keeping up and enhancing ecosystem

services and biodiversity under climate change. The trilateral Wadden Sea also forms a central element within the European Green Infrastructure (COM/2013/0249 final) along the south-western North-Sea Coast. It provides the necessary interconnectivity of habitats to allow species and communities to follow shifts of climatic conditions, hereby preventing species extinction and securing adaptation of characteristic biodiversity far beyond its original borders.

Priorities for interconnectivity and good ecological status:

- Provide sufficient space for establishment and restoration of habitats endangered by climate change.
- Restore habitat types and habitats for species most severely affected by climate change and/or with high carbon sequestration potential.
- Reduce additional stress on the ecosystem by eutrophication and adverse impacts of fishing, extraction and other human activities.
- Exchange and communicate scientific and practical field experience with restoration measures.
- Secure and enhance the interconnectivity of habitats, both aquatic (limnic and marine) as well as terrestrial, and reduce artificial barriers to species migration
- Activities to provide insight into free movement among key habitats, species, and species communities.

3) Integration: Continue to cooperate across borders and disciplines to harmonize human activities and biodiversity goals

Climate change is a cross-cutting theme and requires an integrated and precautionary approach across borders and disciplines. The integration task is to include maintaining natural structures and dynamic geological and ecological functions, conserve characteristic biodiversity and scenic qualities of the landscape. Therefore, dealing with impacts of climate change requires an integrative approach across borders, disciplines, sectors and administrative layers.

Continued integration of coastal flood defence and protection and water management with nature conservation goals is of particular importance. For measures that may have a negative impact on the outstanding universal value across national borders, for example dike strengthening and large-scale sand extraction and suppletion, trilateral cooperation and coordination is a necessity.

Priorities for integration

- Promote and support trilateral pilot projects on integration of disciplines and sectors, including administrative layers.
- Promote and support activities that demonstrate how nature-based solutions can integrate coastal flood defence and protection with nature conservation goals, and enhance the Wadden Sea's natural resilience
- Highlight and include direct or indirect options for actions aiming for reducing additional pressures of the system following the precautionary principle to foster resilience, such as reducing eutrophication (EU Framework Directives).
- Continue and further strengthen EG-C activities, including exchange of best practices.

4) Flexibility: deal with uncertainty and take no-regret actions

A flexible and adaptive management approach is essential to address uncertainty in climate change projections, such as varying sea level rise projections. Close collaboration with scientists and policy measures based on these data are key.

"No-regret-measures" – actions beneficial to ecosystems and livelihoods regardless of future climate impacts- should guide Wadden Sea management. 'No regret' should also be applied concerning the natural values and the integrity of the Wadden Sea World Heritage.

Flexible approaches allow adequate timely responses to new information on observed and projected changes in drivers and impacts (adaptive management). Continuous inclusion of new insights is crucial to shape long-term resilience planning.

Priorities for flexibility

- Develop policy guidance for adaptive management for maintaining natural structures and dynamic geological and ecological functions, conserve characteristic biodiversity and scenic qualities of the landscape under different climate change scenarios, focused on each tidal basin of the Wadden Sea.
- Recommend assessment framework and inclusion of Trilateral Monitoring and Assessment Program (TMAP) data on climate change and its effects into national INSPIRE- infrastructures.
- Support trilateral scientific and planning cooperation on climate change adaptation (drivers, impacts and no-regret measures) as part of adaptive management.
- Evaluate to what extent existing national or EU environmental or spatial planning legislation may constrain climate change adaptation management.

5) Long-term approach: consider future scenarios

Climate change adaptation requires a long-term management approach. Measures, such as infrastructural works and ecosystem engineering demand long-term planning and have long lasting impacts.

Adaptation measures may challenge traditional coastal flood defence and protection or water management policies and thus may raise public concern. Changing traditional views and feelings probably requires at least one generation of communication and dialogue.

Long-term policies and strategies should remain flexible and need to be evaluated, allowing periodic updates to integrate new knowledge, new climate change scenarios and natural and cultural developments.

Priorities for a long-term approach

- Promote the inclusion of climate change adaptation management as a central issue in long-term spatial planning and relevant policies and legislation.
- Promote a priority to make an inventory of potential long term effects of climate and design relevant policies and measures to mitigate the effects.
- Investigate the implementation of benchmarks for action with respect to future developments in long-term planning.
- Support the option to promptly enhance long-term policies as appropriate.
- Provide advice on the implementation of the Wadden Sea Plan and the Single Integrated Management Plan (SIMP) regarding these priorities.

6) Site specific approach: consider the local conditions and perspectives

Climate challenges and adaptation needs vary across the Wadden Sea region. For instance, a northward shift in storm wind direction may lead to higher storm surges in the Netherlands and Lower-Saxony, but lower in Denmark and Schleswig-Holstein. Historical and cultural differences also shape local responses.

To enhance resilience, adaptation measures should be based on common and shared knowledge, but tailored to local geo- hydro- morphological conditions. Continuous evaluation ensures their effectiveness over time.

Priorities for local adaptation

- Promote, support the development of a common knowledge base that can be drawn upon locally and communicate these solutions broadly for eventual application at other sites.
- Promote and support the development of site-specific "tailor-made" solutions and evaluate site-specific solutions from the trilateral perspective (i.e. upscaling potential of pilot nature based measures and possible relevance for larger integration).
- Promote developing measures or practices to buffer negative climate change impacts in specific areas.

7) Participatory approach: involve people and raise awareness

Successful climate adaptation in the Wadden Sea requires active involvement of a wide range of stakeholders. Stakeholder participation should provide information and secure active involvement for the successful introduction of adaptation measures. Open communication fosters awareness, acceptance, and a sense of shared responsibility ("common ownership"). Given the region's traditions and long-term planning needs, inclusive strategies are essential to address both societal and environmental challenges and to safeguard the World Heritage site.

Priorities for participation

- Include climate change adaptation in the overall trilateral communication strategy.
- Support the International Wadden Sea School in developing relevant education material.