

TRILATERAL RESEARCH PRIORITIES and First Call Proposal (2021 – 2026)

Trilateral Research Priorities

In 2020, the Trilateral Programming Committee Wadden Sea Research (TPC-WSR) was installed and commissioned to develop a “Joint Trilateral Research Programme” to bring the Trilateral Research Agenda to life. TPC-WSR decided to define it as **Trilateral Research Priorities**, in order to underline that no further comprehensive programme is planned at this point, while reiterating that the focus is on the most urgent research needs from the perspective of the Trilateral Cooperation for the Protection of the Wadden Sea.

According to the TPC-WSR these trilateral research priorities

- have a focus on a restricted number of prioritised specific research questions aiming to safeguard the **Guiding Principle** (Joint Declaration, 2010) and the **Outstanding Universal Value** (OUV) of the UNESCO World Natural Heritage Site.
- promote (preferably combined) fundamental and applied research projects, that serve the Trilateral Cooperation for the Protection of the Wadden Sea answering the needs of institutions that are responsible for the Wadden Sea and World Heritage and where the user/stakeholder is engaged.
- “Trilateral Research Priorities” is a living document; priorities are formulated in call proposals which are evaluated and redefined every four to five years.

PART I

Introduction and Framework

1. The Wadden Sea

The Wadden Sea, stretching for over 500 km along the North Sea coast of Denmark, Germany, and the Netherlands, has evolved over the past 8,000 years and is therefore a very young ecosystem in geomorphological and evolutionary terms. It represents an outstanding example of development of a temperate climate sandy barrier coast under conditions of rising sea level in the Holocene. The Wadden Sea is unique in that it consists entirely of a sandy-muddy tidal system with only minor river influences on morphodynamics. The Wadden Sea ecosystem is characterised by tidal flats and a barrier island system with extensive salt marshes. It is the only tidal flat and barrier island depositional system of this scale and diversity in the world. For that reason, major parts of the Wadden Sea Conservation Area have inscribed on the UNESCO World Heritage List. Additional to the acknowledged achievements of the Trilateral Wadden

Sea Cooperation over 40 years on protection, management, authenticity and integrity of properties, the Wadden Sea meets three out of UNESCO's ten selection criteria to be inscribed on the list: Geological processes (Criterion viii); Ecological and biological processes (Criterion ix) and Biodiversity (Criterion x).

The Wadden Sea is extremely rich in environmental gradients and transitional zones, offering many different (micro) habitats that form the basis for ecological specialisation under extreme conditions. The ecosystem is characterised by enormously productive marine biota and linkages far beyond its narrow geographical boundaries. Its tidal flats account for 60 % of all tidal areas in Europe and North Africa. The tidal flats and the salt marshes form the largest coherent habitat of this type in Europe and constitute an essential element to the Wadden Sea ecosystem, which is a biologically highly productive ecosystem of great natural, scientific, economic and social importance. The rich and diverse habitats are important for many species of migratory birds. A severe deterioration of the Wadden Sea would imply a biodiversity loss on a worldwide scale. Due to its unique morphology, sea level rise will be an important factor for the entire ecosystem and direct or indirect consequences of climate change has been discovered as key issues with the need of further elaboration.

The Wadden Sea Region is an area where many people live, work and enjoy recreation. About 3.7 million people live along the Wadden Sea coast, and some 75,000 live inside the Wadden Sea Area. Over the last 2500 years, large wetland areas have been converted from bogs and pastures into arable land behind dikes, which has led to a common maritime culture. More recently, the islands and to a lesser extent also the mainland coast, developed into a recreational region with a considerable number of visitors. The Wadden Sea Region is economically very heterogeneous characterised by strong regional differences. These locational aspects interact with sectoral dynamics in tourism, agriculture, maritime industries, and external trends, as well as with employment, education, and population development. An economically sustainable Wadden Sea Region has to make use of local and regional assets, services, and products embedded in attractive, healthy ecosystems. Several of the services originally provided by the Wadden Sea Region (e.g., food, water quality, coastal protection, recreation) are in transition and many economic opportunities for coastal people have been lost. The rural areas are suffering from population decline and aging due to selective out-migration of especially young people moving to urban areas with institutes of higher education. Global warming, relative sea level rise, economic transitions and demographic change will have important consequences for the heterogeneity in economic and societal outcomes in the Wadden Sea Region. To mitigate this, new innovative economic activities, must be developed where the users/stakeholders are actively involved where balancing urgent natural, societal and economic needs is central to the activities. This requires adequate governmental structures and institutions to mobilise the economic assets in combination with adequate skills for the stock of human and social capital. The Wadden Sea Region can only be understood and properly valued by acknowledging the long-standing, and still on-going, close interaction between nature and humans. The Trilateral Wadden Sea Plan (2010) acknowledges this by stating that sustainable human use will continue and have to be continuously balanced in a harmonious relationship between the needs of society and ecological integrity.

2. The Trilateral Research Agenda

The Trilateral Ministers meetings in 2010 and 2014 between the Netherlands, Germany and Denmark were followed by intergovernmental conferences, which took the initiative to develop a common research agenda for the Wadden Sea Region. At the Trilateral Governmental Conference in Leeuwarden (May 2018) the Ministers confirmed the initiative, and instructed the Wadden Sea Board “to continue to strengthen its cooperation with the scientific community by installing a trilateral programming committee in order to establish a joint programme on research issues relevant to the Wadden Sea World Heritage, taking into account the Trilateral Research Agenda (TRA) and instruct the Wadden Sea Board to encourage the scientific community to develop a trilateral research platform and to promote pilot studies on nature restoration”. The

three countries have been actively collaborating on management, monitoring, and protection of the Wadden Sea for 40 years, with the aim of achieving, as far as possible, a natural and sustainable ecosystem in which natural processes can take place undisturbed. The TRA, developed by the joint scientific community from Denmark, Germany, and the Netherlands in 2018, covers the entire Wadden Sea Region and should create a basis for safeguarding the '**Guiding Principle**' of the Trilateral Wadden Sea Cooperation and the '**Outstanding Universal Value**' (OUV) of the World Heritage. The **purpose of the agenda is to stimulate state-of-the art research relevant for maintaining natural and cultural values**, and to develop a shared knowledge base, which would help authorities and local communities to find a sustainable course for protecting and/or improving natural habitats and societal developments in the face of climate change and the interaction between humans and nature.

The Trilateral Programming Committee Wadden Sea Research (TPC-WSR) aims with the **Trilateral Research Priorities** to initiate the cooperation by implementing a specific selection process leading to a **Common Joint Call** for research projects in the period 2021-2026. For the implementation of the **Trilateral Research Priorities**, periodic call proposals will be issued with the aim of identifying projects with the potential of answering leading questions for the trilateral cooperation. The period will be set from four to five years. This procedure will allow research sectors not considered in a recent call to potentially apply in a future round and should also guarantee that the **Trilateral Research Priorities** will not be misunderstood as a constant. The TPC-WSR has determined the research areas within the general framework developed in the TRA, while meeting the highest priority for policies being relevant to the Wadden Sea World Heritage. To make the TRA operational, concrete areas of research are selected and prioritised along clear criteria in a transparent process. The TPC-WSR asks in call proposals for applications in line with the three main interdisciplinary challenges and four thematic lines formulated on basis of the TRA as a starting point (see below). Applications must be relevant for the development of a shared knowledge base, which would help authorities and local communities to find a sustainable course for protecting and/or improving natural habitats and societal developments within the Wadden Sea World Heritage region.

The resulting **Trilateral Research Priorities** shall use existing and well-tested modalities and processes that are regularly being implemented in European trans-national science funding programmes such as European Research Area Nets (ERA-nets), joint calls by Joint Programming Initiatives (JPI's) and others. Within these programmes, applicants are usually required to assemble international consortia which include at least 2 countries. The involved countries fund their own scientists and research activities undertaken by their national research organisations. In other words, each international consortium receives funding from the countries involved. Scientists as well as science funders are very well-acquainted with this model, also known as the 'virtual common pot' model of international science funding. The application of such a strategy should be in line with the default procedures by the targeted funding agencies. The call proposal will be an open competition of applications for the selected three main interdisciplinary challenges and thematic lines of research, submitted, ideally, by trilateral consortia which will initially be evaluated and prioritised by the TPC-WSR on the basis of an external scientific evaluation. Consortia must include at least one public, semi-public, and/or private active partner. In the application process, it must be credibly demonstrated why and how the user needs the required research results and how these should then be put into practice.

The TPC-WSR will only prioritise projects that aim to safeguard the **Guiding Principle** (Joint Declaration, 2010) and the **Outstanding Universal Value** (OUV) of the UNESCO World Natural Heritage Site. TPC-WSR promotes (preferably combined) fundamental and applied research projects, that serve the Trilateral Cooperation for the Protection of the Wadden Sea answering the needs of institutions that are responsible for the Wadden Sea and World Heritage Designation and where the user/stakeholder is engaged.

The call proposal prioritises challenges of the TRA identified as those with highest priority for policy. Three major, broadly inter-disciplinary, challenges for the future have been identified by the research community. All of them are complex by nature and call for multi-, inter- and transdisciplinary approaches. Evidently, answers to those challenges require a sound disciplinary basis, as well as continued monitoring of relevant

natural and socio-economic variables. The TRA gives a comprehensive overall picture on three common future challenges and opportunities:

1. The Wadden Sea Region as living lab for human-nature interactions.
2. The Wadden Sea Region coping with climate change and relative sea level rise.
3. The Wadden Sea Region as a sustainable maritime region.

Against this background, multidisciplinary research approaches, in due consideration of the Wadden Sea World Heritage conservation responsibility with its socio-ecological connectivity into the world, are in demand. In order to achieve an operational call, original formulations from the TRA have been chosen as basis and starting point.

The original thematic lines lined out in the TRA are:

- Climate, water, sediment and subsurface
- Ecology, biodiversity and spatial processes
- Cultural heritage, identity and history
- Economy, society and sustainable development

In order to narrow down these thematic lines to specific areas of research and finally to concrete projects, the TPC-WSR has defined a criteria-based procedure that is appropriate for selecting, from the multitude of potential applications, those with highest priority and urgency for the preservation and development of the UNESCO Wadden Sea World Heritage (see Part II).

Within the TRA it is noted that this approach has a precedent in the successful bilateral German-Dutch Wadden Sea call 'bio-risks' and 'geo-risks' in which Dutch Research Council (NWO) and Bundesministerium für Bildung und Forschung, German Federal Ministry of Education and Research (BMBF) cooperated. An international audit committee evaluated this research programme and characterised it as a game changer within Wadden Sea research.

PART II

First Call Proposal (2022 – 2026)

1. Suggested procedure

The first call proposal prioritises three main interdisciplinary challenges of the TRA identified as those with highest priority for policy. The TRA gives a comprehensive overall picture on three common future challenges and opportunities. Against this background, multidisciplinary research approaches, in due consideration of the Wadden Sea World Heritage conservation responsibility with its socio-ecological connectivity into the world, are in demand.

Examples of potentially relevant research topics are:

- The Wadden Sea is increasingly affected by global pressures such as warmer temperatures, a rising sea level, and high numbers of species introductions, but also by ongoing regional human impacts. Of particular importance are the interactions between these factors and their cumulative effects on ecosystem and social processes and corresponding transitions. For example, higher temperatures favour bio invasions with consequences on food-chains, species interactions (predation, parasite-

host relationships) and ecosystem functioning, but also affect regional fishery and tourism. Higher water levels and increased coastal protection measures have a strong impact on transition zones and their habitats such as seagrass beds, salt marshes, and beaches and dunes, including their associated communities (e.g. fish, birds, and plants), but also cause changes in the benefits for the local population and their perception and use of the environment.

- Research projects with the aim of achieving a better understanding of the sediment/geomorphological response of the Wadden Sea to the expected future rising sea level i.e. how the Wadden Sea sediment system reacts in terms of spatial distribution and path ways of sand and mud, sediment budget and morphologic changes, natural upward growth of tidal flats and salt marshes. It is of special interest in this context, to investigate the reaction of the ebb tidal deltas, as they are vital for the coastal stability of the Wadden Sea islands.
- The Wadden Sea Region provides a suite of ecosystem services, including food provisioning, energy production, harbour facilities and enjoyment of nature attractions for millions of visitors. The Wadden Sea Region has entered a phase of major transition owing to a complex interplay between processes such as climate change, energy transition and demographic changes. Safeguarding the Outstanding Universal Value of the Wadden Sea World Heritage Site and, at the same time, offering residents attractive social and economic opportunities poses demanding future challenges. Climate change may be threatening these services, but also offers opportunities (e.g., more local visitors) and may lead to changes in the population distribution, and cultural heritage in the form of buildings and landscape (dikes, marshland) and birds and plants. This may affect the traditional corner stones of identity and the structure of the regional economy, but may also create new ones. We need evidence-based policies, measures and incentives to allow both the ecosystem and the socio-economic structures to develop throughout the transformation process. An economically sustainable Wadden Sea Region has to make use of regional assets, services and products alongside an attractive, healthy ecosystems. Radically new and creative concepts with respect for nature conservation, active-ageing, sustainable tourism, agriculture and fisheries with local products should be stimulated in order to make the Wadden Sea Region a true 'living lab' for socio-economic transitions. These processes will guide transitions with regard to e.g. energy, food and sea level rise towards a more sustainable Wadden Sea and Wadden Sea Region.
- Climate change will also increase the potential conflicts on the use of marine spaces, and the adjoining coastal areas. The Wadden Sea Region, its ecology, dynamics and management are mentioned in numerous national and international treaties that are part of general governance instruments such as Marine Spatial Planning (MSP), EU Directives (Water Framework Directive, Marine Strategy Framework Directive, Habitats Directive, Birds Directive), and Natura2000. While concise land-use planning has been enacted for decades in all countries, the marine space as an area for planning is still new. Research based in planning disciplines, and social and political science can be applied to follow the process and analyse and compare the implementation of and the effects of climate change across the Wadden Sea Region.

As formulated in the TRA, comprehensive mapping and documentation activities(GIS), and sound monitoring and data handling, with the necessary level of harmonisation, is of paramount importance. Applications for applied research projects for the further development of these topics are welcomed by the TPC-WSR.

The above should NOT be interpreted as pre-defined urgent priorities that will be funded automatically but serve as examples. Applicants must state explicitly why their research questions have urgent policy relevance

or answers gaps in the existing body of knowledge that need urgently to be addressed for safeguarding the OUV in the long term and with strong stakeholder support.

The TPC-WSR defines a criteria-based procedure that is suitable for selecting, from the multitude of potential applications, those with highest priority and urgency for the preservation and development of the UNESCO Wadden Sea World Heritage Site. To prepare a successful proposal under the ultimate responsibilities of the ministries, and the related funding organisation in the three Wadden Sea countries, it is an important task for this panel to negotiate the funding arrangements for a four-year period with all potential donor organisations. The Wadden Sea World Heritage Foundation (WSWHF) can also play a role as a potential source for providing trilateral funding. The TPC-WSR shall responsibly coordinate the financial arrangements, taking into account other initiatives and calls for Wadden Sea related research to avoid overlap and competition.

Currently, a total budget of up to approximately € 5 million, for the first targeted funding period (2022-2026), might be realistic for the Netherlands and Germany respectively. Since the trilateral initiative aims at a **Joint Common Call**, Denmark should be encouraged to participate on a comparable scale. As a result, projects in the order of a total of approximately € 15 million could then be funded in the first four-year period. The shared approach would be a good further step towards a shared responsibility of the three states for their common World Heritage Site. The national funding organisations have formulated the **Joint Common Call** based on this proposal from the Trilateral Cooperation. The **Joint Common Call** is published by these organisations as their own responsibility and policy. The **Joint Common Call** is aimed predominantly at consortia, which may submit proposals with a maximum total budget up to 1,500,000 euros. Consortia must include partners from at least two Wadden Sea countries. However, trilateral consortia from all three countries will receive preferential treatment. Preference will also be given for interdisciplinary approaches that address the three main interdisciplinary challenges, and link the thematic lines stated above. Consortia must include at least one active partner from the public, semi-public, and/or private sector (i.e. stakeholder/end-user). In the application process, it must be credibly demonstrated that research results are required for the user, and how these are planned to be put into practice. Stakeholders/end-users who indicate their interest through co-financing are particularly welcome. All participants must play an active role in the formulation of the research questions, their design, and the realisation of the project. The implementation period of the call will be allowed to extend to over three to four years to also allow the completion of PhD projects within the cycle.

Submitting a pre-proposal of max. 3-4 pages is compulsory. Preceding the deadline of pre-proposals, TPC-WSR will be authorised by the national funding organisations to interlink researchers and potential collaboration partners.

TPC-WSR (or a subgroup) assesses the pre-proposals according to the selection criteria and, based on this assessment, it will rank the pre-proposals. Applicants of a restricted number of high potential pre-proposals will then be invited to submit a full proposal. Applicants of the other pre-proposals will be advised against submitting a full proposal. This advice is not binding. Full proposals will be evaluated by peer reviewers, after which applicants have the opportunity to submit a rebuttal. TPC-WSR then assesses and ranks the applications based on the referee reports, the written rebuttal and an interview. With this assessment/ranking, the call proposal-activities, under the umbrella of the TPC-WSR, will come to an end. The result of the process is passed on to the responsible funding institutions as advice from the trilateral TPC-WSR. The Executive Board of the funding organisations takes all further steps, especially the final decision about granting or rejecting the full proposals, usually following the advice of the TPC-WSR. The default procedures by the funding agencies shall be considered carefully (e.g. applying an additional independent external scientific evaluation).

After launching the first call, further calls can be prepared, including exploring options for EU funding.

2. Prioritization and theme selection

As described in Part I, the "Trilateral Research Priorities" are based on the three main interdisciplinary challenges and thematic lines of the "Trilateral Research Agenda". TPC-WSR has decided to refer to these interdisciplinary challenges and thematic lines and not to limit the range of potential research priorities by a further specification of topics. This is to avoid a preference for certain research areas or topics and the potential exclusion of others. Instead, the TPC-WSR uses the methodical approach of a criteria-driven selection for the necessary focusing on research topics. Hence, a recommendation for funding within the framework of the "Trilateral Research Priorities" will only be given if at least four main criteria are fully met:

Criterion 1: Scientific research projects must support the implementation of the Guiding Principle (Joint Declaration, 2010) and the integrity of the Outstanding Universal Value (OUV) of the UNESCO World Natural Heritage Site.

Criterion 2: For scientific research projects it must be shown convincingly that they are urgent and relevant for the Trilateral Cooperation for the Protection of the Wadden Sea answering the needs of institutions that are responsible for the Wadden Sea and World Heritage and where the user/stakeholder is "on board". Thus, it is mandatory that the scientific research projects address developments and pressures that may currently have strong impacts on the Wadden Sea region and/or contributes to the fundamental understanding of the system.

Criterion 3: It must be credibly demonstrated that stakeholders/users need the required scientific research results and how these should then be put into practice by e.g. monitoring concepts, management strategies and political decision-making or provides answers to gaps in the existing body of knowledge that need urgently to be addressed for safeguarding the OUV in the long term.

Criterion 4: Quality of the scientific research proposal and quality of the consortium. This criterion assesses to what extent the applicants have the necessary competences and infrastructure to implement the proposed scientific research project.

All four criteria carry approximately the same weighting in the overall assessment.

Additionally, it is advantageous for applications if they

- address the three main interdisciplinary challenges and link the thematic lines from the TRA in interdisciplinary approaches,
- include at least one active partner from the public, semi-public, and/or private sector (i.e. stakeholder/end-user/NGO)
- include young gifted researchers in the project and pay attention to diversity of researchers with regard to e.g. gender and disciplines.