



III. Implementation

1 Monitoring and Assessment

1.1. OBJECTIVE OF THE TMAP

The Trilateral Monitoring and Assessment Program (TMAP) is the common monitoring program for the Wadden Sea carried out by The Netherlands, Germany and Denmark in the framework of the Trilateral Wadden Sea Cooperation.

The general aim of the trilateral Wadden Sea monitoring, assessment and research is basically twofold, namely

- to provide a scientific assessment of the status of the ecosystem; and
- to assess the status of implementation of the Targets of the Wadden Sea Plan.

Both categories of information are essential for the development and evaluation of the trilateral Wadden Sea conservation policies and management in line with the relevant EC directives, the inscription on the World Heritage list and other international obligations.

1.2. STATUS OF THE TMAP

1.2.1. Parameters

An overview of the TMAP parameters is in **Table 3**. It underlines that most of the TMAP parameters are part of existing or planned monitoring programs in the three countries and already cover the requirements of the EC Directives and other international agreements.

TMAP parameters are coordinated trilaterally and a number of parameters have been harmonised (breeding and migratory birds, harbour seals, blue mussels, salt marshes, contaminants in bird eggs). They have proven their value for the Target assessment (QSR 2004, 2009) and for national and international reporting obligations (such as Ramsar, OSPAR, EC Directives).

A detailed description of TMAP parameters is in the TMAP Handbook, which is accessible at the CWSS website (www.waddensea-secretariat.org).

1.2.2. TMAP Data Management

An elementary component of the TMAP is common data handling, which makes monitoring data available for trilateral assessment. For this purpose, identical TMAP Data Units have been installed in each country where the data can be stored in the same way.

The TMAP data handling system aims to exchange monitoring data in a common format so that it can be used directly in the trilateral assessment work on the following tasks:

- preparation of Quality Status Reports entailing most recent data and developments,
- preparation of trilateral reports on specific topics (thematic reports, like breeding birds, migratory birds, seals, contaminants),
- preparation of reports on unforeseeable events (e.g. eider mass mortality),
- safeguarding long-term storage of relevant Wadden Sea data,
- use of trilateral data for national and international programs.

The TMAP data handling system supports reporting obligations (e.g. national status reports, EU reports concerning Natura 2000 and the Water Framework Directive, World Heritage, international reports concerning OSPAR, RAMSAR or other international conventions) by providing up-to-date and harmonised Wadden Sea data (including GIS) from different sources on the national and international level.

1.2.3 Assessment Reports

Assessment reports on the Wadden Sea ecosystem (Quality Status Reports, QSR) are prepared at regular intervals related to the Trilateral Governmental Conferences. The reports

- describe and evaluate the current ecological status of the Wadden Sea,
- identify changes in this status and their possible causes,
- identify issues of concern and indicate possible measures of redress, including evaluation of the likely effectiveness of these measures,
- identify gaps in knowledge.

Assessments are carried out together with experts and relevant national institutions in charge of the national assessment. Additionally, thematic reports are prepared which entail the results of running trilateral monitoring programs, e.g. monitoring of migratory and breeding birds. The reports on selected subjects are prepared by trilateral expert groups.

1.2.4. Ecological Research

The research component is the flexible element of the TMAP. Ecosystem research studies the environment on a broader perspective, and weighs the more detailed species and habitat research work to gain an overall picture of the condition of the ecosystem. The foremost tasks of ecosystem research are to discriminate between natural fluctuations and human impacts to find the causes of changes observed in the ecosystem. A further task is to continuously improve the efficiency of the monitoring program. These tasks are essential for two goals of policy and management: the capability of providing evidence for man-made causes, and the capability of interpreting and predicting the reactions of the ecosystem correctly.

Because research into the cause of observed changes is a prominent task for concomitant investigations of the ecosystem, new or alternative parameters and monitoring methods must be developed in order to adapt to new developments and to increase the efficiency of the program.

So far, only a few trilateral research projects have been carried out, such as the joint seal project (1990–1994), the first pilot project on breeding success (1996–1997) and the assessment of contrasting trends in migratory birds (2009).

1.3. HOW TO PROCEED

1.3.1 Harmonization

A major challenge for the Trilateral Cooperation is fine tuning the alignment between the national monitoring programs, the requirements of the Trilateral Cooperation and the EC Directives and other international developments. This demands a consistency in parameter selection and monitoring methods, as well as assessment procedures and reporting conditions (see Table 3).

The national assessment schemes of the HD (definition of conservation objectives and favourable conservation status) and WFD (reference condition and a classification scheme for good ecological status) have to be linked with the Wadden Sea Plan (§6 SchD, 2005) in order to develop a harmonised assessment scheme for all parameter groups of the TMAP.

Trilaterally harmonised assessment methods, including quantitative values, should be defined, especially for issues which have to be addressed at a broader scale, such as eutrophication, climate change, neobiota, and species and habitats.

On the basis of the Wadden Sea Plan, an overall strategy will be developed on how to harmonize the assessments at national, trilateral and EU level. Thematic experts' workshops will continue to discuss, and if necessary harmonize, assessment criteria and develop quantitative values for Wadden Sea Area.

1.3.2 TMAP Data Handling and Information System

The TMAP data handling is an effective tool and has contributed positively to the QSR work. There is great potential to use the TMAP data for other value-added national and international purposes.

However, there are still some bottlenecks in the data flow from the monitoring institutes to the TMAP data units and the responsible authorities on national and state level need to open these up.

Further investment has to be realized to improve data access for a broader public. An effective TMAP information system should be able to hold complex data like a data warehouse, to be selectively called up and analysed using standard assessment procedures running through Internet browsers. The prototype of such an information system has been set up on basis of the content of the four data units and trilateral GIS data sets from the secretariat. It was presented at the Scientific Symposium in Wilhelmshaven in March 2009 by applying the visualization software 'disy Cadenza'. The system should be further developed by the TDG in the three countries with the aim of establishing an "online-QSR" for trilateral assessments.

1.3.3 Parameters

For some parameter groups, new monitoring strategies have to be developed. This concerns especially monitoring of subtidal habitats and monitoring in the offshore area (up to 12 sm).

Further technical adaptations of TMAP parameters (such as locations, frequencies, methods) have also to be considered, as have their alignment with the HD, WFD and, where appropriate, MSFD assessment schemes which are under development. The main parameters in need concern macrozoobenthos, macrophytes, eutrophication fish and chemical substances. Specifically, the following is needed:

- Development of a trilateral strategy of subtidal monitoring taking into account the existing operational and planned monitoring activities. This has to be tuned with the HD, WFD, and MSFD related activities, especially with regard to assessment and reporting requirements.
- Implementation of a trilateral monitoring strategy for seabird species, in order to harmonize the existing offshore surveys and make the results comparable in a trilateral assessment.
- Investigation into the need for a joint monitoring of harbour porpoise in the framework of the Habitat Directive and, depending on the outcome, integration of such a parameter on the basis of the German monitoring of that species.

1.3.4 Ecological Research

A more comprehensive trilateral research agenda may facilitate ecological research in the Wadden Sea countries, gain synergies and offer an opportunity to apply for funding by EU programs. A Trilateral Research Agenda must be developed in close cooperation with national research institutes and other organizations (such as the Wadden Academy). This can be used to try to secure additional EU funding of trilateral projects (e.g. within the framework of LIFE+).

Table 3: Parameters of the TMAP

TOPIC	Parameter	METHOD	REMARKS
1. TARGETS ON QUALITY OF WATER AND SEDIMENT			
1.1 Eutrophication	<ul style="list-style-type: none"> - nutrient inputs (river, atmosph.) - nutrients in water - chlorophyll a - phytoplankton - macroalgae - macrozoobenthos 	Using OSPAR Common Procedure (see QSR 2004), and WFD guidance	The TMAP parameters cover the existing or planned WFD monitoring programs in the three countries.
1.2 Natural micro-pollutants (metals, PAH)	<ul style="list-style-type: none"> - metals in sediment and biota (mussel, flounder, bird eggs) - PAH (water, sediment, mussel) - Beached (oiled) birds 	Using JAMP guidelines and WFD guidance. Using OSPAR resp. TMAP/TBBS guidelines	WFD priority substances to be monitored in the water column using risk analysis for individual water bodies.
1.3 Man-made substances (xenobiotics)	<ul style="list-style-type: none"> - organochlorines in sediment and biota (mussel, flounder, bird eggs) - TBT (sediment, biota) 	Using JAMP guidelines and WFD guidance	WFD priority substances to be monitored in the water column using risk analysis for individual water bodies.
2. TARGETS ON SALT MARSHES			
	<ul style="list-style-type: none"> - area, - vegetation - selected typical species, - grazing, - drainage 	Vegetation mapping (aerial photographs and ground truth); field surveys (permanent plots or stratified random sampling)	Existing monitoring schemes to be continued. Common TMAP typology can be applied.
3. TARGETS ON TIDAL AREA			
3.1 Geomorphology	<ul style="list-style-type: none"> - area of tidal flats - sediment type distribution, - 	Remote sensing and field sampling	Comparability of methods to be enhanced.
3.2 Macrozoobenthos	<ul style="list-style-type: none"> - species composition - abundance - biomass - age [not mandatory] - 	Field surveys and transects, national WFD guidelines.	
3.3 Biogenic structures			
3.3.a seagrass	<ul style="list-style-type: none"> - area and distribution - coverage 	Mapping of intertidal seagrass beds (aerial mapping and field surveys).	Revised TMAP guidelines prepared by seagrass group in 2006.
3.3.b mussel beds	<ul style="list-style-type: none"> - area and distribution - biomass - coverage 	Mapping of intertidal blue mussel beds (aerial photographs and field surveys)	
3.3.c Sabellaria reefs	<ul style="list-style-type: none"> - area and distribution 	Methods for subtidal habitats under development.	From research projects on subtidal mapping in Niedersachsen, Schleswig-Holstein and The Netherlands.
3.4. Fish			
	<ul style="list-style-type: none"> - distribution and abundance of species in the Wadden Sea 	Existing surveys for demersal fish (IMARES, vTI-SF) and pelagic fish (LKN)	Wadden Sea fish assessment tool in preparation (similar to WFD tool in transitional waters).
	<ul style="list-style-type: none"> - distribution and abundance of species in transitional waters 	Stow net fishery (pelagic fish), 3-4 stations in Ems, Weser, Elbe, Eider	Guidelines developed for WFD monitoring (obligatory)

TOPIC	Parameter	METHOD	REMARKS
4. TARGETS ON BEACHES AND DUNES			
	<ul style="list-style-type: none"> - area - vegetation - selected typical species - nitrogen deposition, - land use 	Vegetation mapping (aerial photographs and ground truth); Field surveys (permanent plots or stratified random sampling)	Existing monitoring schemes to be continued. Common TMAP typology can be applied. Comparability of field survey methods to be enhanced.
5. TARGETS ON OFFSHORE ZONE (from baseline to 3 resp. 12 sm)			
	<ul style="list-style-type: none"> - selected chemicals, - area and location of sand banks and reefs, - selected typical species (birds) - marine mammals 	Using OSPAR guidelines and WFD standards. Methods for subtidal habitats under development in HD. Methods for BD and HD species under development	Research projects on subtidal mapping area carried out in NL and D.
6. TARGETS ON BIRDS			
	<ul style="list-style-type: none"> - number and distribution of breeding birds 	Using JMBB/TMAP guidelines	Existing monitoring schemes to be continued. Adaptation to 6-year reporting cycle.
	<ul style="list-style-type: none"> - breeding success 	JMBB/TMAP Pilot project	Pilot project on "breeding success" started in spring 2009
	<ul style="list-style-type: none"> - number and distribution of migratory birds 	Using JMBB(TMAP guidelines)	Existing monitoring schemes to be continued. Adapted to 6-year reporting cycle. Projects to be initiated to assess Targets (food availability, roosting and moulting areas, natural flight distances.)
7. TARGETS ON MARINE MAMMALS			
	<ul style="list-style-type: none"> - numbers and distribution of harbour seals (adults & pups) 	Using TSEG / TMAP guidelines	Existing monitoring scheme to be continued.
	<ul style="list-style-type: none"> - numbers and distribution of grey seals 	National surveys	Harmonization of existing monitoring (ongoing by TSEG)
	<ul style="list-style-type: none"> - numbers and distribution of harbour porpoise 	National and/or North Sea wide surveys according to national HD obligations	Monitoring strategy to be developed in cooperation with North Sea wide monitoring schemes.
8. HUMAN ACTIVITIES			
	<ul style="list-style-type: none"> - fishery - recreational activities 	Using TMAP guidelines.	Available data on all other human activities relevant for assessment should also be compiled.
9. GENERAL PARAMETERS			
	<ul style="list-style-type: none"> - coastal protection measures - flooding/hydrology - land use - weather conditions 	All relevant available data from existing sources	Compilation in connection with trilateral assessment (QSR)

2 Implementation and Review

2.1 STRUCTURE OF THE TRILATERAL WADDEN SEA COOPERATION

Decision-making within the Trilateral Wadden Sea Cooperation (TWSC) is limited to two levels.

The Trilateral Wadden Sea Governmental Council (see figure) is the politically responsible body (Ministers) for the Cooperation. It establishes and oversees the Cooperation, approves its strategy, gives political leadership, assures international policy development, harmonisation and decision-making between the three governments.

The Wadden Sea Board is the governing body of the Cooperation. It prepares and implements the Strategy, oversees the operational and advisory bodies, and secures relations with key stakeholders.

The decision-making bodies are supported and advised by three types of operational and advisory bodies, namely advisors, including stakeholder representatives (WSF), Task Groups and Triennial conferences.

The Secretariat for the Trilateral Cooperation is the Common Wadden Sea Secretariat (CWSS). CWSS is responsible for support to the Board and the Council, implementation of the CWSS Work Plan, support to scientific networks and projects, communications and financial management.

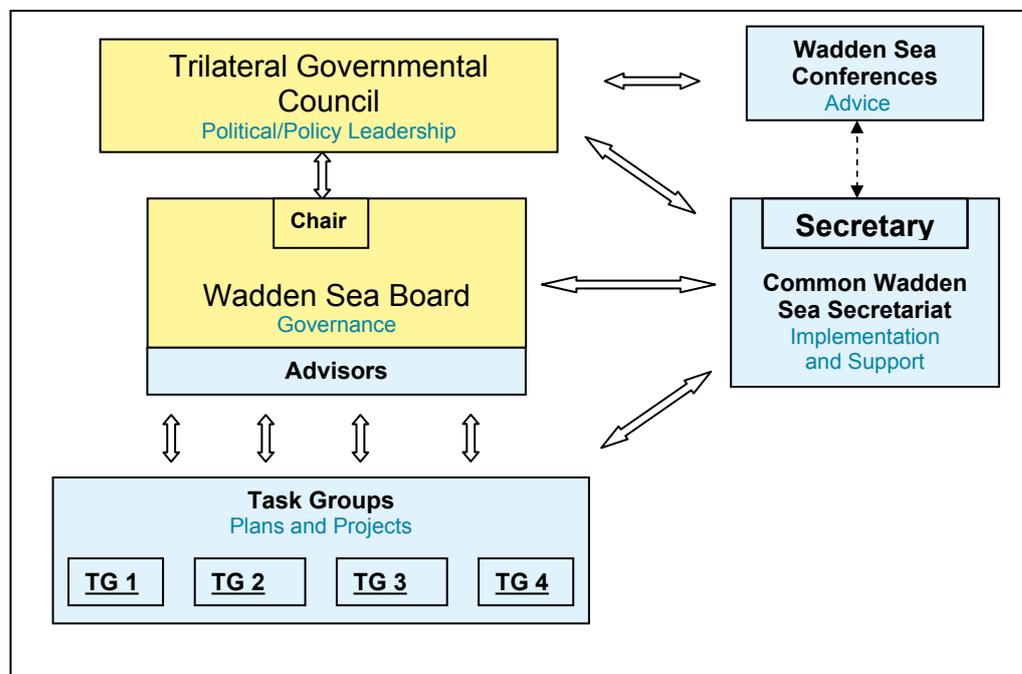


Figure 1: Organizational Structure Trilateral Wadden Sea Cooperation

2.2 IMPLEMENTATION

The Wadden Sea Board is the responsible body for the supervision of the implementation of the Wadden Sea Plan. In addition, the Wadden Sea Board

- Develops, coordinates and implements the Cooperation's policy on major issues (including responses to significant development plans and projects), for approval by the Trilateral Governmental Council.
- Provides advice to Ministers, *inter alia* through annual and triennial reports, the production of Quality Status Reports at regular intervals, and the organisation of International Scientific Wadden Sea Symposia.
- Approves terms of reference for the task groups and monitors their performance.

At the trilateral level, the Trilateral Monitoring and Assessment Program (TMAP) is the main programme for assessing progress in the implementation of the Wadden Sea Plan Targets. The TMAP provides the basis for the overall quality assessment of the Wadden Sea ecosystem (Quality Status Report: QSR) through which feedback to the Wadden Sea Board is arranged. In the framework of the implementation of the TMAP, an expert network has been established which is part of the feedback process of the Wadden Sea Plan implementation and which ensures the involvement of the operational management level in the trilateral process and which informs the regional level.

The Wadden Sea Plan is a joint framework policy and management plan for the Wadden Sea Area, and within that the National Parks the World Heritage Property and the Biosphere Reserves. For the specific purposes of cooperation on landscape and cultural heritage it is also the framework for the cultural entities. The Wadden Sea Plan will be implemented through the responsible authorities in the countries. The close relationship between the regional management of the Wadden Sea Area and the trilateral level is essential to ensure that both levels are well informed and aligned and that issues of common concern throughout the process are discussed and solved in close cooperation.

In order to perform the task of overseeing the implementation and further development of the Wadden Sea Plan, a close connection with the management level in the region is necessary.

2.3 REVIEW

An evaluation of the Wadden Sea Plan with a view to possible revisions takes place at 6 year intervals. Plans and measures launched in the framework of the relevant EC Directives operate within this 6 year timespan. In the framework of the World Heritage Convention, state parties must also report every 6 years on their World Heritage properties. The Wadden Sea Board will supervise the review in particular with regard to

- the status of the implementation of the projects and actions,
- the information from the Quality Status Reports and other assessment reports and scientific findings in relation to the Wadden Sea Plan,
- the ongoing relevance of policies and management measures,
- the consequences for the Wadden Sea Plan of emerging international legislation, in particular from the European Union.

The review will be discussed by the Wadden Sea Board to determine whether and to what extent the Wadden Sea Plan needs revision after the 6 year period.

3 Communication, Information and Education

3.1. WHAT AND WHY TO COMMUNICATE

Trilateral communication will secure public and political support for the protection and integrated management of the Wadden Sea as a shared entity and it will enhance the awareness of the Wadden Sea as a shared heritage.

The Trilateral Cooperation addresses the Wadden Sea as an entity which covers *a.o.* conservation and protection of all habitats and species, policy and management related issues, as well as research, monitoring and assessment. The transboundary and cross-sectoral aspects of such an ecosystem approach and the added value of the trilateral approach in respect to the national and international instruments, such as EU Directives, is the main contents of trilateral communication. The Wadden Sea Plan and Targets are an example of a transboundary management scheme at an ecosystem level which is also unique in a global perspective.

Effective communication of this Plan and the Targets between partners is a prerequisite to securing the active support of relevant authorities, interest groups and local citizens. The close cooperation of politicians, conservationists and scientists, combined with the awareness and enthusiasm of the people living in the region, is key to the successful implementation of the Plan.

The WSP is also the management plan for the World Heritage Property. The ecosystem approach of the Wadden Sea Plan and the Targets should therefore be the focus of trilateral communication.

3.2. TO WHOM AND HOW TO COMMUNICATE

Trilateral communication of the Wadden Sea Plan is focused both on internal and external target groups.

The internal communication ensures that key information has been accurately conveyed to the trilateral working groups (as well as experts groups and workshops), including observer organizations. In addition, the scientific network has been involved since the 1970s in supplying information to support management and monitoring (*e.g.* in scientific projects or on Scientific Wadden Sea Symposia).

External communication of the Wadden Sea Plan and its objectives to other target groups, such as the broad public, press and media, schools and universities, interest groups and international organizations, requires communication strategies tailored to the needs of the various groups.

Trilateral communication is carried out mainly via the CWSS through a website (for internal and external use), an e-mail newsletter (a successor to the printed Wadden Sea Newsletter), leaflets and posters, and thematic workshops and conferences in which the communication of the Wadden Sea Plan and Targets plays a central role.

Comprehensive reports such as the Quality Status Reports and other thematic reports (*e.g.* on bird trends) provide substantial scientific information from the TMAP to experts and the scientific community, including an assessment of the Targets and recommendations for trilateral management.

Network of Information Centers

The overall visitor experience of wildlife, culture and landscape along the Wadden Sea coast has been hugely improved through an extended net of small and large information

centers, visitor information systems, print and digital information and an increasing number of professional guides. This has been beneficial to people and nature.

From data supplied by Schleswig-Holstein, it can be extrapolated, that more than 3 million people a year receive information on the Wadden Sea through visiting centres or participating in guided tours. Thus, the flow of information and communication on all Wadden Sea matters has increased very well over the past ten years. Nevertheless, there is still a gap on coordinated information about the Trilateral Cooperation and the Wadden Sea Plan, *i.e.* the Wadden Sea as a crossborder protected nature area of global importance.

Websites

Extensive information on the Wadden Sea for the broad public is also available electronically. The common link to all aspects of trilateral Wadden Sea matters is the website of the Common Wadden Sea Secretariat (www.waddensea-secretariat.org).

The Dutch link to the Wadden Sea is via "Interwad". This organization develops and operates the website www.waddensee.nl. This website is a focal point for information, questions, answers and opinions related to the Wadden Sea. The objectives are to inform people, to raise awareness and to feed the discussion on all Wadden Sea-related topics.

The German link is via the national park web site www.nationalpark-wattenmeer.de. This official website includes information on practically all aspects related to the protection and management of the German Wadden Sea and the activities of the national park authorities.

In Denmark, the website www.vadehav.dk is based on a cooperation between all the information and education centers in the Wadden Sea area (Vadehavets Formidlerforum). The objectives are, among others, to stimulate the cooperation between Wadden Sea related institutions, to stimulate the awareness and to improve and extend the communication on nature and culture in the Wadden Sea region – with a special effort in relation to children. Vadehav.dk also keeps site visitors informed of the latest news and public events in the Wadden Sea.

Specific information on the Wadden Sea World Heritage Property can be found on www.waddensea-worldheritage.org

International Wadden Sea School

At present, 10 of the environmental education centres in The Netherlands, Germany and in Denmark work together in the International Wadden Sea School (IWSS) network (www.IWSS.org). The IWSS is a cross-border educational project for school classes and other groups of young people from the Wadden Sea countries initiated by the Wadden Sea Cooperation, running from 2003–2010. The aim of the IWSS is to enhance the awareness of the Wadden Sea Area as a shared natural heritage and to create an understanding among young people of the need to protect and sustainably manage the Wadden Sea region as a whole.

The Wadden Sea Forum

The involvement of stakeholders at the trilateral level is carried out via the Wadden Sea Forum (WSF). WSF has been consulted in the preparation of the WSP and is involved in several projects, relevant for the implementation of the WSP.

WSF is represented in the Wadden Sea Board as advisor, guaranteeing the interaction between the WSF members and the TWSC about the implementation of the WSP.

3.3. HOW TO PROCEED

1. Following the recommendation of an External Evaluation of the Trilateral Cooperation in 2007, existing means of communication such as the website and the newsletter will be given a wider audience through improved linking and distribution. We should also make full use of the attention generated by the positive results of the designation of the Dutch-German parts of the Wadden Sea Area as a World Nature Heritage Property, and capitalize on projects like Lancewad.

2. The CWSS will also continue its work to compile and disseminate all relevant scientific information on the Wadden Sea through web-based media, symposiums, workshops and reports, as well as through meetings with other relevant organizations and institutions.
3. The results of the TMAP and assessment of the WSP Targets will be made available for relevant authorities, interest groups and local citizens.
4. The external communication and public promotion of the Wadden Sea Plan will be undertaken by circulating it via existing successful communication networks and by cooperation with external partners and relevant stakeholders such as the Wadden Sea Forum.
5. The International Wadden Sea School (IWSS) has developed specific communication activities to promote the ideas of the Trilateral Cooperation for environmental education for school children, so effectively linking the educational network in the three countries. This experience should be used to strengthen public outreach and to communicate the Wadden Sea Plan to a broader public.

