TRILATERAL MONITORING AND ASSESSMENT PROGRAMME

**Introduction**

The Trilateral Monitoring and Assessment Programme (TMAP) is one of the cornerstones of the TWSC and a prerequisite for the inscription on the World Heritage list. The TMAP covers the entire Wadden Sea cooperation Area and spans a broad range from physiological processes over population developments to changes in landscape and morphology. The TMAP common package was implemented based on a decision at the Ministerial Conference in Stade 1997 and further developed to fulfil the needs of various national and international reporting obligations, in particular those from the EU Habitats, Birds and Water Framework Directives.

Due to the further development of the reporting under these directives, Germany aims to foster the adjustment of the TMAP to today’s obligations and to guarantee a future proof approach with the necessary synergies with existing monitoring programmes. Focus is also on increasing the visibility and outreach of TMAP and the advantage as a sound basis for reporting through the QSRs.

At the 13th Trilateral Governmental Conference (Leeuwarden, 2018) the ministers shared the view to

1. Instructthe Wadden Sea Board to oversee the further implementation of the Trilateral Monitoring and Assessment Programme Strategy;
2. Agreeto increase the value of the Trilateral Monitoring and Assessment Programme to users and to a wider range of stakeholders, including the availability of data and presentation of information resulting from those data;

A long-term common **TMAP strategy** was adopted by the ministers during the Ministerial Conference in Tønder in 2014, as the basis for the further development of the TMAP in close connection with the scientific community, also with the aim to further increase its value in implementing EU Directives. It should provide information for a wider range of stakeholders through the implenantation of an information system guaranteeing improved data access. The strategy included also the long-term **TMAP vision**:

*“A harmonised and effective monitoring and assessment programme, based on sound scientific evidence, that serves the needs of policy making at all levels, the commitments ensuing from relevant Directives and conventions, as well as the World Heritage status and that supports the management of the Wadden Sea as an ecological entity”*

TMAP strategy and vision had been developed as a result of an external evaluation of the Trilateral Wadden Sea Cooperation in 2007, followed by a High Level Review of EC Directives for Collaboration and Harmonisation (HLR) in early 2009. As conclusions from this process, it was noted that TMAP provides significant added value for the Trilateral Wadden Sea Cooperation (TWSC) as it:

1. Provides an important and scientifically sound evidence base for decision making and policy development at all levels
2. Provides essential contextual information to support the management of the Wadden Sea as a single ecological entity
3. Supports reporting against EU Directives and the World Heritage status
4. Enables integrated assessment to be undertaken which is an essential prerequisite for the application of the ecosystem approach
5. Provides information about progress towards trilateral targets and facilitates the discussion about the priorities for the period ahead.

**Objectives**

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

* to provide a scientific assessment of the status of the ecosystem,
* to assess the status of implementation of the Ecological Targets of the Wadden Sea Plan,
* use ecological monitoring and assessment to fulfil the UNESCO obligations for the World Heritage status and support the implementation of the World Heritage Management Plan.

All three categories are essential for the development and evaluation of trilateral Wadden Sea conservation policies and management. Since the WH status resulted from the efforts of the trilateral cooperation over decades, this additional regulatory framework is reflected within the existing strategies and processes to some extent, but certainly adds further obligations and opportunities. The enhanced world-wide recognition and the role-model function for other marine cross border cooperation attempts could be used to further stabilize the existing programme and foster the necessary adjustments. The main technical purpose of monitoring the ecosystem and human activities is to collect data necessary for a scientific evaluation of the status of the ecosystem and the intensity and impact of human use and its implications to the system.

This scientific assessment is an important basis for the formulation of policies and measures. Scientific knowledge is a prerequisite for the development of appropriate monitoring, application of assessment criteria and the formulation of policy goals for the protection of the ecosystem. The TMAP combines a comprehensive set of physical, chemical, biological and socio-economical parameters with concomitant ecosystem research. This research looks for causes of observed changes, its environmental significance and the need and possibilities for management measures. Furthermore, it gives a foundation for the selection of parameters and measuring strategies of the monitoring part, thus adapting it to current needs and knowledge. All parts of the monitoring programme have been integrated in a common structure for the collection, processing and exchange of data.

The integrated assessment across the major European Directives (HD, BD, WFD, MSFD) and WH consists of two main elements:

The first element is integrated reporting, aiming at optimising the trilateral reporting requirements, in particular the **Quality Status Reports (QSR)** at regular intervals, with those under the various EU Directives and the World Heritage. An important aspect of integrated reporting is the tuning of the timing of the various reporting events. Integrated reporting furthermore adds integrated ecosystem information to national reports under the EU Directives, thereby putting the latter type of information in a broader perspective.

The second element is the integration of assessment through the harmonisation of monitoring and assessment methodologies. Several steps into this direction have already been made, through, amongst others, the monitoring of contaminants in bird eggs monitoring and the harmonisation of salt marsh and mussel bed monitoring methodologies.

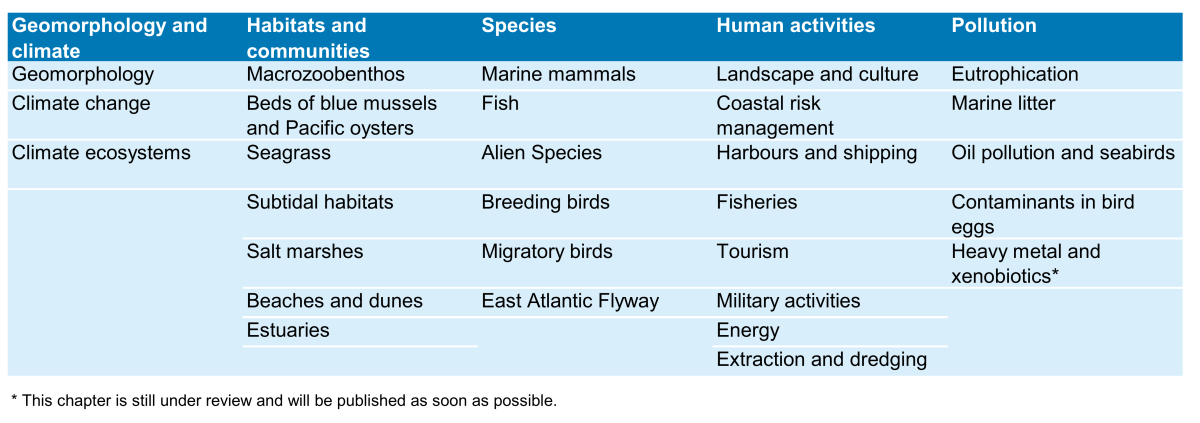
In the coming years efforts to harmonise monitoring and assessment methodologies will be continued and possibilities for integrated ecosystem assessment and reporting further explored and tested.

To foster the implementation of the objectives and to tackle the existing and arising challenges to further streamline and vitalize the trilateral data handling, it was decided to install the **Task Group Monitoring and Assessment (TG-MA)** for the period of the German presidency. The installation of this dedicated is aiming to reflect on the importance and value of TMAP.

**Assessment - Quality Status Report**

Since 1999, the Trilateral Wadden Sea Cooperation (TWSC) between Denmark, Germany and the Netherlands has periodically produced Wadden Sea Quality Status Reports (QSR) describing and evaluating the current ecological status of the Wadden Sea. The QSRs identify changes in this status and their possible causes, classify issues of concern and indicate possible measures of amelioration, including evaluation of the likely effectiveness of these measures. They also indicate gaps in our knowledge. The QSRs are based upon the Trilateral Monitoring and Assessment Programme (TMAP). The programme and the reports were key elements in achieving the inscription of major parts of the cooperation area on the list of UNESCO World Heritage Sites.

The 2017 Quality Status Report was written by over 100 scientists and edited by the QSR Editorial Board in cooperation with CWSS. Like its predecessors it comprises reports covering the parameters as defined on basis of the TMAP Common Package (see Table 1).

*Table 1. List of reports of the 2017 QSR by sections.*

The QSR thematic reports are foreseen to be updated in regular intervals based on data availability, trilateral events or emerging issues. A QSR Synthesis will combine the findings from the Thematic Reports and will be issued in the forerun of the Ministerial Conferences every four years to provide condensed overview on the status of the ecosystem with relevant information for management and decision making. Reference are the Thematic Reports with extended information on a more scientific level. The CWSS is coordinating the QSR process with support by TG-MA.

**Challenges and Outlook**

TMAP assessment and adjustment:

In the coming years new requirements to the TMAP will emerge, related to (new) trilateral policies with regard to, *inter alia*

* Impacts of climate change (see climate adaptation strategy)
* Invasive Alien Species (see trilateral IAS Strategy, upcoming EU Directive on Alien Species)
* HD (Habitat types with unknown status, especially sublittoral), MSFD (Wadden Sea relevant descriptors), WHS
* Sustainable human use, e.g. shipping
* Marine litter
* New pollutants (e.g. antibiotics)

Proposal for new or amended parameters and methodologies will be coordinated by TG-MA in close cooperation with the trilateral expert and task groups and in a series of meetings and workshops, also considering input from relevant research and monitoring projects.

Generally, the following procedure will be applied when adapting the TMAP:

1. Investigate to what extent relevant information regarding the future challenges can be collected through the existing TMAP parameters;
2. Investigate the integration of additional measuring needs in existing and optimised measuring methodologies and practices (for example combining the screening for alien species with running mussel bed monitoring)
3. Investigate the application of intelligent methodologies for data evaluation, such as modelling and the application of tidal basins comparisons.
4. Investigate the necessity and feasibility of introducing new parameters, including organisational and financial arrangements. This must include investigating the application of technologies such as remote sensing.
5. Assess the parameter suite regarding the criteria and key values defining the Outstanding Universal Value (OUV).

This will be done in close cooperation with the scientific community amongst others by organising International Scientific Wadden Sea Symposia (ISWSS) at regular intervals.

Trilateral data handling and presentation:

The TMAP data units used so far were designed to delivering harmonized raw TMAP data for scientists and the QSR. In order to increase the value of the TMAP for a wider audience a modern and central information system should be installed. This interface should guarantee information supply on expert level for QSR activities but also condensed information an appealing format. The information system will allow users to work with the data in different ways. Scientists will have more selection, processing and presentation possibilities than the public. A more simplified and understandable TMAP data presentations will attract public, students and persons, who are not that familiar with the Wadden Sea.

The data-handling aspect will be reviewed also in order to cooperate and look for the best synergy to contribute to international reporting as well as publication obligations, f. e. from the Directive 2007/2/EC establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) or the Directive 2003/4/EC on public access to environmental information. Data of the four TMAP databases in the countries will be collected in a centralized data warehouse, where state-of the-art software allows selection, processing and presentation of TMAP data. The potential of existing programmes and data portals in the three countries as additional data and information sources will be explored for an effective approach.

Ein Bild, das Screenshot enthält.

Automatisch generierte Beschreibung

**Figure 1.** The TMAP and QSR.