LIFE Nature

DEMOWAD

Demonstration of the Preparation and Implementation of an Extensive Integrated Monitoring Program with the Wadden Sea Ecosystem as a Model -
LIFE95/D/A22/EU/00087 -

Contract No.: B4-3200/95/844

April 1995 - June 1998

Final Report June 1998

Common Wadden Sea Secretariat (CWSS)
Wilhelmshaven (Germany)

CONTENTS

EXECUTIVE SUMMARY

This summary entails the main results of the DEMOWAD Project in accordance with Article 5 of the contract.

The DEMOWAD Project entails the development of a harmonized monitoring program for the Wadden Sea ecosystem including common assessment criteria and a trilateral data handling system as a prerequisite for common management measures for the Dutch-German-Danish Wadden Sea.

The main results of the DEMOWAD Project are:

- a **TMAP Manual** with common monitoring guidelines and a data management system;
- a functioning prototype of the data management system , the **DEMOWAD Unit**, installed in all three Wadden Sea countries; including a „News System“;
- an **Implementation Plan** with different implementation scenarios and the associated financial and organizational efforts;
- a „**Common Package**“ of monitoring parameters adopted at the Trilateral Governmental Conference in Stade in October 1997;
- a trilateral harmonized set of digitized **Wadden Sea maps**.

Through the DEMOWAD Project, considerable progress has been made regarding the establishment of a common Wadden Sea monitoring including the establishment of an associated data management. The monitoring program, developed by the DEMOWAD Project, is also an important instrument for the Wadden Sea Plan in evaluating the progress made in implementing the common targets and with regard to deciding on appropriate management measures.

Another important result is that the DEMOWAD Project has laid the foundation for further cooperation in monitoring and data management between the three countries, and that the situation has been improved substantially in comparison to the situation which existed before the project was initiated.

The DEMOWAD Project has also created the preconditions for the further development of the monitoring program. Recently, in all countries, activities are ongoing to implement the „Common Package“ monitoring parameters as agreed at the Stade Conference in October 1997. In several cases, progress has been made in implementing the TMAP parameters into the national monitoring program.

An evaluation of the experiences with this common package will be carried out at the next Wadden Sea Conference in 2001.

1. INTRODUCTION

The project called “DEMOWAD” (Demonstration of the Preparation and Implementation of an Extensive Integrated Monitoring Program with the Wadden Sea Ecosystem as a Model) ran from 1 April 1995 to 30 June 1998 and was co-financed by the European Commission under the LIFE-NATURE program. Initially the project duration was planned to be from 1 April 1995 to 30 March 1998 and later extended, within the budget applied for, with 3 months until 30 June 1998.

It was carried out by several institutes in The Netherlands, Germany and Denmark, which are in charge of the organization and implementation of the trilateral decisions into the national monitoring programs, and by the Common Wadden Sea Secretariat (CWSS) (Annex 1). The coordination of the project was carried out by the Trilateral Monitoring and Assessment Group (TMAG) and the CWSS.

2. AIMS AND OBJECTIVES OF THE DEMOWAD PROJECT

The project aimed at

- developing and implementing an integrated monitoring program for the Wadden Sea as a prerequisite for the development of common management measures.

- elaborating and implementing a trilaterally harmonized set of physical, chemical, biological and human-use monitoring parameters, priorities for concomitant research, harmonized assessment criteria for the common ecological quality objectives, and at a harmonized data processing and data exchange system.

- elaborating proposals for an integration of the common management plan (Wadden Sea Plan) and the monitoring program.

- elaborating proposals for the implementation and further development of the DEMOWAD Project on the national and trilateral level, especially with regard to an early warning system and the reporting requirements mentioned in Article 17 of the Directive 92/43/EWG

- enhancing the cooperation between Denmark, Germany and The Netherlands in the framework of the trilateral Wadden Sea cooperation in order to develop common measures and activities for the protection of the entire Wadden Sea and its sustainable use of this area as part of the NATURA 2000 network.

3. MAIN RESULTS

The main product of the project is the TMAP Manual which entails the monitoring guidelines and the data management system. The project also elaborated an Implementation Plan, in which priorities for the implementation of the monitoring parameters are given and the associated costs estimated. This report was considered during the preparation of the Trilateral Governmental Conference (TGC) in Stade in October 1997, where the ministers decided on the implementation of the DEMOWAD products.

In Table 1, on overview about the main results of the DEMOWAD Project is given.

Table 1: DEMOWAD Project result

	Project tasks	No. in Contract	Main Result
1.	Elaboration of a harmonized monitoring program	1, 2	• TMAP Manual: TMAP Monitoring Guidelines
2.	Elaboration of a data management system	1,2	• TMAP Manual: Data management system • DEMOWAD Prototype
3.	Elaboration of an Implementation Plan for the monitoring program	3	• Implementation Plan of the TMAP, Final Report of the TMAG, Decembe 1997
4.	Implementation of the DEMOWAD Project results	4	• Implementation of TMAP Guidelines into national monitoring programs • DEMOWAD Units in national data centers
5*	Digitized Wadden Sea Maps	5	• Trilateral GIS • Stade Declaration (October 1997)
6.*	DEMOWAD News System	6	• On-line-system (see Annex 2)

* finalized during project prolongation April - June 1998

3.1 Harmonized Monitoring Program

As a main product of the DEMOWAD Project, a TMAP Manual has been published, which entails a comprehensive overview of the concept and the principles of the program, trilateral guidelines of priority parameters and a detailed description of the DEMOWAD data management system. The TMAP Manual has been submitted to all monitoring institutions in a printed version and is also available via the Internet. The TMAP Manual will be updated regularly by the CWSS.

The TMAP guidelines have been discussed with all relevant national monitoring institutions, however, several technical aspects are still under discussion. Proposals for improvement or amendment of the guidelines are being made and have to be considered during the regular updating procedure of the manual. Furthermore, the developments within the OSPAR monitoring program (JAMP) have to be considered during the refinement of the TMAP guidelines.

3.2 Data Management System

The project defined and developed the trilateral data management system of the TMAP and has already implemented two parameter groups of the Common Package.

The main components of the data management system (data storage, data catalogue/retrieval and networking) have been installed as so-called DEMOWAD Units at the participating national databases. The prototype test with two A-parameters has successfully proven the functionality of the trilateral data exchange system (RL: *http://cwss.www.de/Demowad*). At this point, the users are able to search and specify data, download the selected information on local computers and use it in standard text or spread sheet programs.

Based on the DEMOWAD Unit, in all Wadden Sea countries structures are currently being set up to maintain and further develop this prototype. In Germany, four persons have been employed in a project financed by the Federal Environmental Agency since spring 1998 until the end of 1999 to implement and further develop the DEMOWAD Unit at the regional data centers in Niedersachsen and Schleswig-Holstein.

3.3 Implementation Plan

The final version of the Implementation Plan of the Trilateral Monitoring and Assessment Program (TMAP) is another important result of the project. It covers the following main items:

- the proposed priority parameters,
- the information quality of the priority parameters regarding monitoring and management
- the estimated costs,
- the proposed implementation scenarios.

The report also contains proposals regarding the implementation of the trilateral data management system. The necessary personnel and technical prerequisites have been identified to guarantee the TMAP data handling after the DEMOWAD Project which includes also an estimation of the expected costs and efforts on the national and trilateral level.

Furthermore, the report entailed proposals regarding trilateral research projects and the future organizational structure of the TMAP.

The Implementation Plan, in a draft version (version April 1997, see Interim Report June 1997), was submitted for further consultations to the Senior Officials meeting in June 1997 in the preparation of the 8th Trilateral Governmental Conference (TGC) in Stade in October 1997.

As a result of the negotiations, a proposal for the implementation of a „Common Package“ of TMAP parameters was elaborated based on the minimum proposal of

the TMAG, stated in its report (the so-called “A-minus-scenario”), and presented to the Stade Conference.

At the Stade Conference, the ministers expressed their appreciation of the work exercised by the DEMOWAD Project and the TMAG in elaborating the report. They agreed to implement the Common Package of Parameters as in Annex 2 of the Ministerial Declaration and, to this end, establish, as soon as possible, the necessary financial and organizational preconditions for its implementation including the associated data management (Stade Declaration §§ 20 - 21). The ministers also agreed to an evaluation of experiences with this common package at the next Wadden Sea Conference (Stade Declaration § 22).

3.4 Implementation of the Project Results

The common package of monitoring parameters and the associated data handling will be implemented in the three countries as adopted by the ministers at the Stade Conference. During the DEMOWAD Project, a prototype of the data management system has been installed in all countries. Additionally, selected TMAP parameter groups could be established in the national monitoring programs. In the future, all parameters of the common package will be implemented as proposed by the DEMOWAD Project.

3.5 Digitized Maps

A set of digitized maps has been successfully harmonized and compiled. A presentation system including a basic geographical information system (GIS) database (ArcInfo) of geographical Wadden Sea data has been established which allows the production of high quality Wadden Sea maps with different scales. The current available trilateral maps are published in the Stade Declaration and cover the following themes (see Annex 2):

- Trilateral Wadden Sea Area and the Trilateral Conservation Area
- Habitats in the Wadden Sea Area
- Special Protection Areas (SPA) according to the EC Bird Directive
- Ramsar Areas as wetland of international importance according to the Ramsar Convention

Additionally, several other thematic maps have been compiled which will be the basis for the presentation of monitoring results, e.g. regarding distribution of mussel beds, macroalgae, seagrass, salt marshes, human uses, and other relevant geographical data. As an example, thematic maps concerning „Salt marsh grazing intensity“, „Mud flat walking“ and „Coastal protection“ have been attached to this report in Annex 2. The maps will be available for trilateral users as hardcopies, as well as, in standard formats (Adobe Illustrator, various pixel formats).

3.6. DEMOWAD News System

As a supplement to the DEMOWAD Unit, a „News System“ was developed to facilitate the information transfer regarding the current status of the TMAP data itself (Annex 3). The main purpose of the system is to provide the user with the most recent news, exchange information about new TMAP data and their processing status and to get information on the progress of the Quality Status Report (QSR) of the Wadden Sea.

4. EVALUATION OF THE RESULTS

At the Stade Conference, the ministers expressed their appreciation of the work exercised by the TMAG and the DEMOWAD Project in preparing the TMAP implementation report. It was considered a sound basis for discussion and decision making during the preparation of the Trilateral Governmental Conference (TGC) in Stade in October 1997. The report was fundamental to the process of adopting a common package of parameters at the TGC by defining priority parameter groups and developing implementation scenarios in connection with the estimated implementation effort. These scenarios also clearly showed the advantages and limitations of the TMAP if only selected parameter groups would implemented.

The decisions of the Stade Conference on Wadden Sea monitoring can be regarded as a significant step towards an integrated Wadden Sea ecosystem monitoring:

- A common package of TMAP parameters adopted by the ministers will be implemented together with the associated data management as laid down in the implementation report by the DEMOWAD Project. Although not all proposed parameters were endorsed by the conference, the decision on the common package is an important element in the further implementation of the program. Several parameters which were monitored only in one or two countries in regular programs will now be monitored in all three countries using common guidelines. Furthermore, the parameter ‘Contaminants in Bird Eggs’ will be implemented as a completely new parameter for all three Wadden Sea countries.

- A TMAP Manual with common trilateral guidelines of priority parameter groups has been adopted which establishes, for the first time, a harmonized basis for the common monitoring program. Modifications were agreed regarding the TMAP guidelines which, in most cases, are minor changes to the draft guidelines proposed by the DEMOWAD Project. Activities already started to implement these guidelines and the associated data management into the national monitoring programs, and to organize the coordinated assessment of the derived monitoring data.

Considerable progress was has been made by installing a data handling system which, for the first time, allows directly a TMAP data selection, extraction and downloading for trilateral users in a common exchange format. The prototype of a TMAP data management system developed by the DEMOWAD Project was installed in each country and has successfully demonstrated the functionality of the system. In all Wadden Sea countries structures will be set up to maintain and further develop

the DEMOWAD Unit. This is a substantial improvement compared to the previous situation. The claims, set up in the definition phase of the data handling sub-project, have been achieved.

At the Trilateral Governmental Conference in Stade in October 1997, a management plan, the Trilateral Wadden Sea Plan, was adopted. The plan aims at implementing the common ecological targets and targets on cultural and historical aspects. The plan is structured according to the target categories. For each target category, a trilateral policy and a common management strategy have been adopted, as well as, trilateral projects and actions, necessary for the implementation of the targets.

The TMAP, as developed by the DEMOWAD Project, is an important instrument of the Wadden Sea Plan when evaluating the progress made in implementing the common targets. Based on the common package of the TMAP, basic information about the status of most of the targets will be obtained because the targets were the major criteria for the selection of the parameter groups of the common package. Common monitoring strategies and assessment procedures, as well as, a modern data exchange system will make the required information faster and easier available for assessment and management decisions than in the past.

5. PRESENT STATUS OF THE IMPLEMENTATION OF THE PROJECT RESULTS

Activities to establish the financial and organizational prerequisites for the implementation of the Common Package of the TMAP on the national level, as proposed by the DEMOWAD Project, already started in mid 1997.

The Netherlands
Parameters of the common package will be implemented in 1998 in the framework of the national monitoring program. For almost all parameter groups, the basic organizational and financial matters have already been solved. Regarding the new parameter „pollutants in bird eggs“, monitoring at 4 sampling locations started in the spring 1998.
It is planned to finance one person for the DEMOWAD unit in 1998, however, the final decisions have not yet been taken. Presently, an apprentice/trainee with a four-month contract is working on technical details of the system (in cooperation with the CWSS).

Germany
The implementation of the common package is under way in Niedersachsen and in Schleswig-Holstein. No major problems are anticipated. Meetings with all monitoring institutions were held in which the work program for the implementation were adopted. Technical details of the guidelines will be discussed in bilateral consultations during the second half of 1998.
A German data handling project for trilateral purposes started in May 1998 (running until the end of 1999, financed by the Federal Environmental Agency, Berlin). Two TMAP data handling centers will be established (Tönning/GKSS and Wilhelmshaven). At each center, two data handling experts have been employed since spring 1998. The development of TMAP database structures will be carried out in

close cooperation with the CWSS and the data centers in Denmark and the Netherlands.

Denmark

Initiatives to set up a work program for the implementation of the common package and the associated data handling started in spring 1998. Only parameters are currently implemented which are part of the new national monitoring program. This entails mainly chemical parameters.

CWSS

As a result of the DEMOWAD Project and the decisions at the TGC in Stade, the employment of the monitoring coordinator at the CWSS was continued on a permanent basis.

The employment of the data handling coordinator at the CWSS will be continued, as a first step, on a time-limited basis as of July 1998, a long-term solution is striven for. This will enable the CWSS to further establish the results of the DEMOWAD Project and to update and refine the monitoring program and the data management system in the future.

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Trilateral Wadden Sea Maps

The following maps have been compiled with GIS tools during the DEMOWAD project:

1 Administrative Features

- Wadden Sea Area and Trilateral Conservation Area *(attached)*
- Wadden Sea Habitats *(attached)*
- Special Protection Areas (SPA) accoring to the EC Bird Directive *(attached)*
- Ramsar Areas *(attached)*
- Adminstrative Boundaries
- The Ems Dollard Border Area

2. Biological Features

- Seals
- Harbor Porpoise sightings
- Seegrass field
- Sabellaria reefs

3 Human Activites

- Costal protection *(attached)*
- Salt marsh grazing intensity *(attached)*
- Flat walking routes *(attached)*
- Mussel fishery
- Shipping lanes
- Oil and gas exploration
- Dumping sites of dredged spoil
- Hunting areas

The DEMOWAD News System

Introduction

As a part of the DEMOWAD data handling system, the "News System" provides the trilateral users with additional up-to-date information. Contrary to the DEMOWAD data catalogue system, which is open to the public, the access to the News System is restricted to only registered users (through user identification and password control). The registered users are mainly those experts, who deal with the assessment of, e.g., the Quality Status Report (QSR), and the persons responsible for delivering and processing of data.

The reason for creating the News System as an independent unit and not as a part of the data catalogue systems database is the requirement to have an information system which can immediately be updated and which enables a non-structured data exchange of TMAP information.
Thus the main purpose of the DEMOWAD News System is to provide the persons involved in the trilateral Wadden Sea co-operation with a way

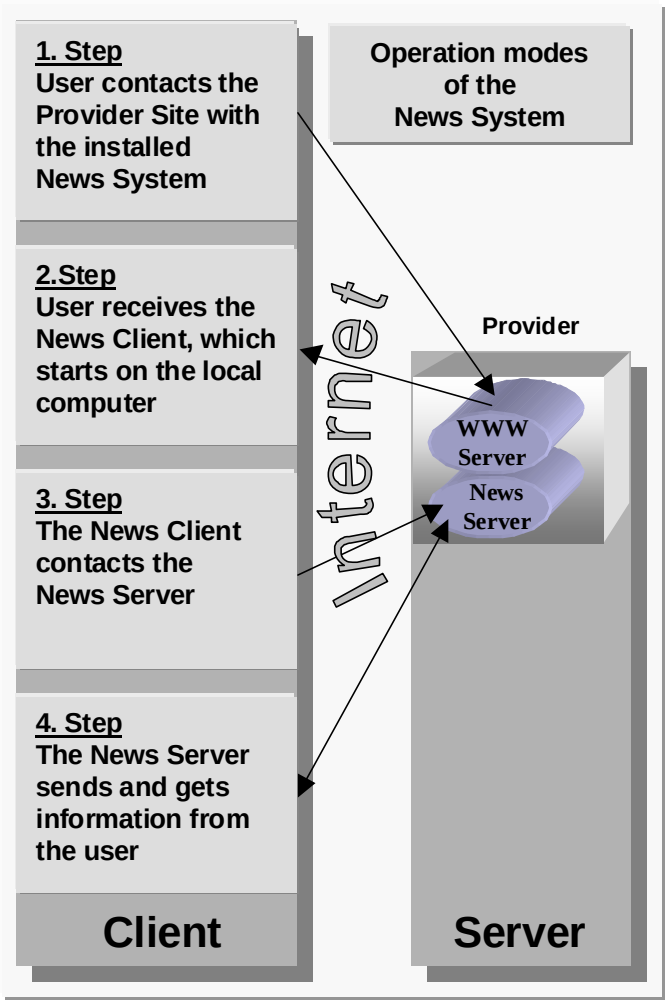
- to get the most recent News,
- to exchange information about new data,
- to obtain the processing status of TMAP data and
- to get information on the progress of the QSR.

Technical background of the server/client News System

The developed "News System" is a typical Java based server/client system.

The News Server is constantly running at the provider side and is always accessible with the News Client via the Internet. The server application is programmed in Java and therefore portable to most common operating system platforms without additional efforts. The server is responsible for the storage, delivery and maintenance of the information in the News System.

The News Client is also a Java program, which the user gets from the WWW server. It is part of the homepage of the News System and works within an Internet browser. After starting the client on the local machine, it gets in contact



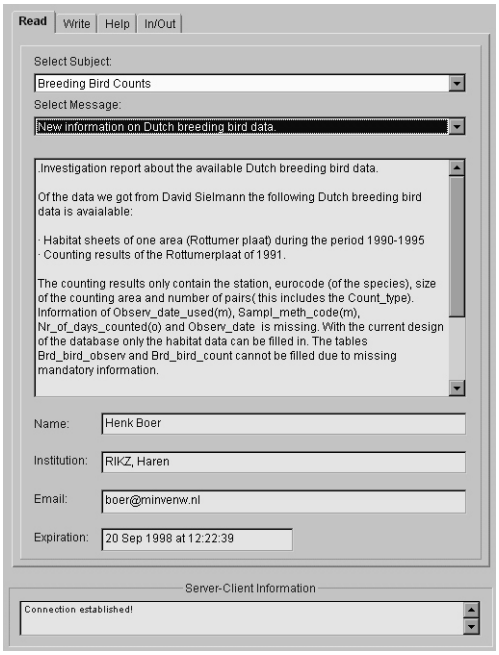
with the server and the user can read all available messages or can write a new message.
During the session, the user gets status information from the interaction between News Server and Client. This messages are used for error tracking and error treatment.

Usage of the News System

The News System is a Java applet, which offers the user four panels with different functionality.

The In/Out panel

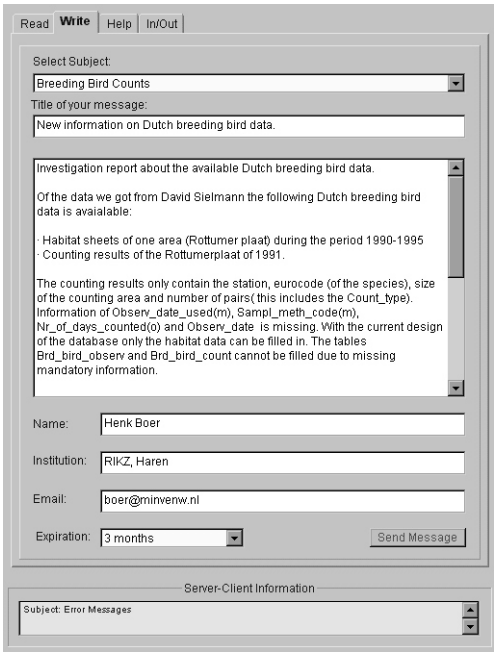
The In/Out panel is responsible for entering and leaving the News System.
To enter the News System, the trilateral user has to fill in the username and the appropriate password. With the Exit button the user leaves the News System.
In the Server-Client information window, data on the interaction status between server and client are available.



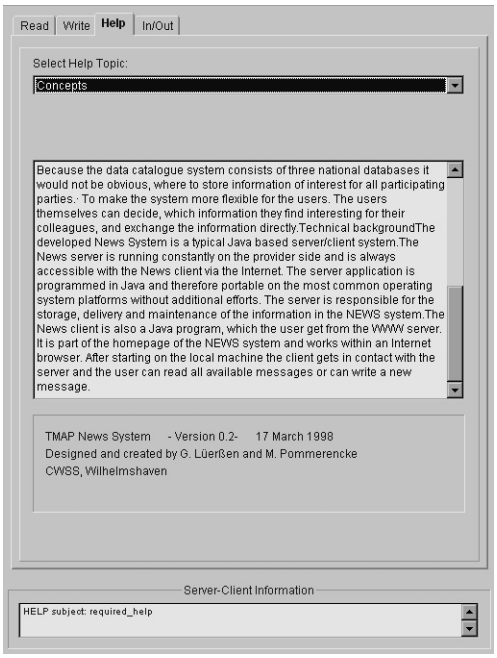
The Read panel

The Read panel allows the user to select and read a message.
At first, the user has to select a subject, which is a subject or one of the main parameter groups in the DEMOWAD Unit. In the "Select Message" pull-down menu, all titles of the available messages for this subject are presented. The user has to select one message and then gets the message itself with the information of the author, the institution and the e-mail address of the author from the News Server. The expiration date indicates the time when the message will be removed from the system.

The Write panel



This panel allows to send messages to the News Server.
When the user wants to write a message, at first, the concerned subject has to be selected. The message needs a name or title and the user can fill in his News. To fill in the name, institution and e-mail is mandatory. The expiration date has to be selected in a menu. The "Send Message" button checks the completeness of the message and sends it to the News Server.



The Help panel

This panel gives the user information on how to work with the News System.