

ANNEX 2

Contractor's Tender

**OPEN CALL FOR TENDERS
MARE/2008/03**

**Preparatory Actions for
European Marine
Observation and Data
Network**

**ANNEX 2
TENDER FORMS**

ANNEX 2 TO THE CALL FOR TENDERS MARE/2008/03
"PREPARATORY ACTIONS FOR EUROPEAN MARINE OBSERVATION AND DATA
NETWORK"

LOT No: 4 – TITLE BIOLOGICAL DATA

TECHNICAL TENDER FORM

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Objectives

"The EMODNET biological portal will be an end-to-end, integrated and inter-operable network of systems of European marine observations and data communications, management and delivery systems, supported by a comprehensive user-oriented toolkit to enable implementation of the Integrated Maritime Policy for Europe".

Adopted from the Marine Board - EuroGOOS perspective on the European Marine Observation and Data Network.

A large number of marine biological data are already assembled and archived in large data management systems located across the EU. The members of the project consortium are responsible for safeguarding and disseminating marine biological observations and data collected by the most relevant European research networks and major government institutions in Europe and internationally. However, there is currently a lack of coordination between these systems. In a fragmented landscape it is difficult to organise a coordinated approach to properly manage and set priorities in monitoring Europe's marine biodiversity. With this project we will have framework for collaboration and we will establish an interoperable network of systems, in order to create and maximise access to marine biological data for any type of user on a marine basin- or region-wide basis through EMODNET.

As such, the EMODNET biological portal will be built upon and integrate existing European observation systems into a single network, hereby harmonising different methodologies and strategies for data management under common protocols, data formats and quality control (by adopting the EU-INSPIRE principles), and ensure that data can be consistently distributed for user applications including regional data interpretation, environmental assessments and modelling.

A number of distinct actions will be necessary to build and sustain an effective EMODNET, these include:

- Complete the inventory of existing holdings of marine data in collaboration with the consortium partners, representing national and regional marine data centres, such as MarBEF, SeaDataNet, ICES, WCD-MARE/PANGAEA, GBIF and OBIS
- Performance of gap analyses to determine the shortcomings in data quality (accuracy and precision) and geographical and taxonomical coverage. Expert members of the consortium will review data and report on this topic in the final report
- Building on existing systems and national networks, this coordinated and joint investment towards a common data management approach will lead into a sustainable and efficient observing system
- A data policy built on the philosophy of open access to data within a partnership approach will help to overcome the impediments to exchange and effective access to data
- Propose a strategy plan on the sustainability of the EMODNET biological portal, which should assist in implementing collaboration and governance arrangements to ensure long term investments.

The EMODNET biological portal will become a data warehouse with 'raw', but coherent data sets of marine observations for all types of users to discover, view and retrieve.

Data will include data on annual, seasonal, and spatial distribution of species composition, abundance and biomass in the water column and on the seabed. Target species will be selected for the follow groups: phytoplankton, zooplankton, angiosperms, macro-algae, invertebrate bottom fauna, bird communities, sea mammals and reptiles.

The project will focus to collate data for the Greater North Sea, including the Kattegat and the English Channel and also cover the Bay of Biscay and the Iberian Coast. However, the research networks represented in this project are spread across Europe and offer data from all European Seas and beyond, so this tender will not limit itself to the geographical scope listed here.

Besides the raw data, the data catalogue will contain all the metadata, describing the data collections (who, what, where, why and how).

Data collected and processed via the EMODNET biological portal will be used to contribute to the multidimensional mapping of Member State waters (through the sister preparatory action "European Broad Scale Marine Habitats Map") and to the production of a European Atlas of the Seas, outlined as a priority in the Action Plan of the European Integrated Maritime Policy. In order to meet the deadline for the first edition of the Atlas and the schedule of this sister preparatory action, we will deliver preliminary data in September (or 9 months after the start of the project) and we are prepared to deliver further updated data later as the project progresses.

EMODNET will be a significant observation and monitoring data conduit for the part of the Water Information System for Europe (WISE) that will be developed for dealing with marine information (WISE-Marine) and supporting the data and indicator needs for the initial assessments required by member States in 2012 by the Marine Strategy Framework Directive.

This project involves the Black Sea marine biology network, and could link to the European Environmental Monitoring in the Black Sea, initiated by the Commission.

This project strongly collaborates with FP6-I3 SeaDataNet in the use of common metadata standards. The SeaDataNet steering committee has also adopted a working strategy in which the two portals (EurOBIS and SeaDataNet) will be linked and in which the National Oceanographic Data Centres will use the EurOBIS data infrastructure as the central hub for biological data.

The EMODNET biological portal will become an everyday and essential supporting infrastructure for the marine sciences, monitoring and environmental management. It will be a standard based, quality controlled, expert validated, open-access infrastructure for research, education, and data and resource management.

Added Value

This project will deliver an online data portal for European marine biological data. The portal will be built on the existing MarBEF data systems, including the European Ocean Biogeographic Information System (EurOBIS). EurOBIS is the largest online queryable public source of European marine biological data. The EurOBIS portal allows searching multiple datasets containing biogeographic information on marine organisms simultaneously. EurOBIS has been developed within the MarBEF Network of Excellence and acts as the European node of OBIS. It is a distributed system that integrates individual datasets on marine organisms into one large consolidated database. The ultimate goal of EurOBIS is to provide the end-user with a fully searchable biogeographic database, focused on three main parameters of a distribution record: taxonomy, temporal and geographical cover.

Not starting the development from zero, but building further on a system that is already in use and generally accepted by the international marine scientific community, ensures that the biological component of the EMODNET data portal will be broadly supported. EMODNET can directly benefit from over 3,6 million species distribution records that already are in the collection. Furthermore, the support EurOBIS has received in the past 4 years, from the more than 54 European research institutes contributing their data to the system, can expect continuation under EMODNET. Being online for over 4 years now, it is safe to say that both from a technical and functional perspective, the EurOBIS system has outgrown its testing phase. Taking into account these advantages, the development of the biological EMODNET portal could take a head start, thus allowing us to guarantee that the portal can become operational on a very short term.

Since this project will further develop and upgrade existing services, the added value to these existing services is clear. All added values will mutually be beneficial to EurOBIS and the EMODNET biological pilot. Added value will be realized at different levels:

Providing more data

EurOBIS already provides access to biological data coming from various ongoing and completed projects or monitoring programmes like the MarBEF (FP6), the ICES North Sea Benthos Survey, Continuous Plankton Recorder (CPR) data from the Sir Alister Hardy Foundation for Ocean Science (SAHFOS), PANGAEA-Publishing Network for Geoscientific & Environmental Data and several national monitoring programmes.

A full list of the currently included data sources in EurOBIS is available in appendix 1, and described in the chapter on data coverage.

This project creates a framework for making more data publicly accessible. Additional data sources will be integrated into the distributed system. New data sources to be included will be identified after consultation with the consortium of project partners. The

involved partner institutes represent national and regional marine data centres and scientific institutes holding European marine biological data.

A general inventory of the data that can be contributed by each of the partners can be found in the chapter on data coverage and contains among others:

- SeaDataNet data: SeaDataNet partners will adopt EurOBIS as a module in the SeaDataNet infrastructure and will undertake action to submit entries to EurOBIS and to encourage other institutes in their countries to participate in EurOBIS. The total amount and coverage of the data to be submitted remains presently unclear, but will be determined after an extensive inventorisation phase which is part of this project
- ICES data (International Council for the Exploration of the Sea): Zooplankton, zoobenthos, phytoplankton and phytobenthos from 1979 till the current year
- IFREMER data (L'Institut Français de Recherche pour l'Exploitation de la Mer): Continuous monitoring of zooplankton and phytoplankton conducted all around the French coast for thirty years up to now
- WDC-MARE / PANGAEA data: Plankton, micro-, meio- and macrobenthos, marine mammals and birds
- OBIS-SEAMAP data: data on (not only European) marine mammals, birds and reptiles
- Data collections from IBSS-NASU covering measurements of phytoplankton, zooplankton, angiosperms, macro-algae and invertebrate fauna from the Black Sea
- And several more.

This project will add value by allowing the current EurOBIS system to grow into a larger-scaled, more complete and more broadly based data portal. At the same time, all contributing parties will benefit, while the portal is providing them with a dynamic platform to make their data publicly available.

More interoperable data

The presented project has interoperability high on the agenda. An important work package involves standardization of data and sampling technique related metadata. Extensive deliberation with the experts of the project consortium will allow agreeing on good data management practices, standards and data exchange protocols.

Another work package deals with the technical development of the data infrastructure itself. The system will be made more interoperable by making it compliant to OGC and by ensuring compatibility with the INSPIRE Implementation Rules on Metadata, Viewing Services and Downloading Services.

Where appropriate, the portal will be linked to other systems providing marine data. In order to link up with the SeaDataNet infrastructure, discovery metadata on the incorporated datasets will be exchanged, facilitating easier and more direct access to biological data from within SeaDataNet. Where appropriate common vocabularies will be used to ensure a maximum of interoperability.

This project aims to deliver a true portal, which creates an important added value to the user of the system. The user, in search of a specific type of data, can simultaneously search through several different data sources.

Higher quality data

The EurOBIS system uses the European Register of Marine Species (ERMS) as a standard vocabulary for taxonomic names. ERMS is an authoritative taxonomic list of species occurring in the European marine environment. The register is under revision and daily updated in the framework of the FP6 MarBEF EU Network of Excellence and FP7 Pan-European Species-directories Infrastructure (PESI), by a board of taxonomic editors, which are world experts on the taxonomy of their relevant taxa. The used taxonomic names will be matched with the ERMS, hereby performing an important quality control on the contributed datasets.

The close link between the SeadataNet Infrastructure and this portal will insure the use of all relevant standards developed within the SeadataNet project. Additional quality control can be exerted using the European Marine Gazetteer and the Maritime Boundaries Geodatabase that includes the shape files of all the Exclusive Economic Zones (EEZs) of the World. Built in geographical checks on the georeferenced data will improve the quality of that data.

During analysis workshops, the data providers will perform statistical analyses on the integrated data, on a much larger scale, which would not have been possible on an individual basis. Effectively using, analysing and comparing data will be an important quality control exercise.

The quality control that is part of this project will enhance both the quality of the individual source dataset as the quality of the integrated data. The added value to the user of the data is obvious. The user, confronted with higher quality data can make more reliable analyses, conclusions and decisions based on these data. Analysis workshops, to be organized in the final phase of the project, can lead to scientific publications based on these conclusions. Similar events, like the Macroben analysis workshops within MarBEF, analysing newly integrated datasets, have proven to be very successful in generating new science and a better understanding of global biodiversity patterns.

More precise data

Where EurOBIS currently mainly focuses on storing species distribution records, the future focus will shift towards distributing quantitative information. The amount of available species abundance and biomass data will be further increased. The increased availability of more precise data will allow for more extensive analyses, like calculations of biodiversity indices and modeling of spatial and temporal species distribution for indicator species. This will be especially useful for the EMODNET biological portal, since it is expected to contribute to the multidimensional mapping of Member State

waters (through the sister preparatory action “European Broad Scale Marine Habitats Map”) and to the production of a European Atlas of the Seas, outlined as a priority in the Action Plan of the European Integrated Maritime Policy.

More sustainable infrastructure

It is important to stress that this tender does not just intend to compile some more historical data. This project will do more than making historical data available, it will integrate current observations and data collected via existing, long-term research networks, and will therefore offer a continuous flow of high quality data towards EMODNET, and available to the Commission. Involving the members of the project consortium, who are already responsible for safeguarding and disseminating marine biological observations and data collected by the most relevant European research networks and major government institutions in Europe and internationally, this project will form a basis for a long-term sustainable infrastructure.

Data coverage

Introduction

A large number of marine biological data that are already assembled and archived are readily available in large data management systems located across the EU. Among them, the members of the project consortium, forming the coordination board, are already responsible for safeguarding and disseminating marine biological observations and data collected by the most relevant European research networks and major government institutions in Europe and internationally. The members of the project consortium will facilitate or promote the delivery of data to the EMODNET biological portal. The role of the coordinating partners and the network is outlined in the Methodology section.

The historical data stored at the different institutions will form an important baseline in the new EMODNET portal. However, this tender will do more than making historical data available, it will integrate future observations and data collected via existing, long-term research networks, and will therefore offer a continuous flow of high quality data towards EMODNET.

Because the focus of the call is limited in geographical and taxonomic scope, we will put more effort in connecting the networks and collecting data from the defined areas. However, since the research networks represented by the project consortium are spread across Europe and offer data from all European Seas and beyond, the scope of this tender will not limit itself to the scope set in the tender specifications.

Background data

MarBEF has built the world's largest databases on macrobenthos, meiobenthos and pelagic marine species. All these data are integrated and archived at the Flanders Marine Institute (VLIZ). A list of all the datasets is provided in appendix 1. The table includes a unique persistent ID number (that identifies the metadata record in the Integrated Marine Information System (IMIS), hosted by VLIZ); the title; the number of records, species and stations covered; time-scale; region and geographical area; habitat, availability in EurOBIS, access constraints and the availability of abundance-, biomass- and abiotic data.

In total MarBEF has collected:

- +4.4 million distribution records,
- on +17,000 number of species,
- from 221 datasets, of which 181 (82%) hold abundance and 20 (9%) have biomass data,
- from 94 institutions in 17 countries (figure 1).

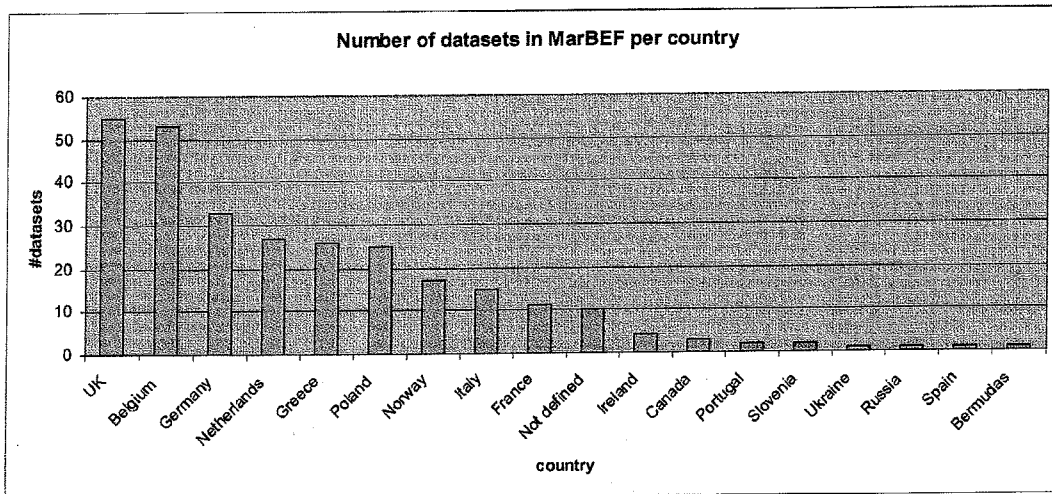


Fig 1. Number of datasets delivered to the MarBEF data system per country, calculated on the basis of the institutional affiliations of the persons involved in each dataset.

In addition to the integrated and thematic databases, VLIZ has set up several more data and information systems that constitute important contributions to the major global biodiversity initiatives. The European node of the international Ocean Biogeographic Information System (EurOBIS) is a freely accessible online atlas providing species distribution records. Among the 14 regional OBIS nodes, the European one has the most data. Currently 119 of the 221 datasets mentioned above (in total 3,6 million records) are contributed to EurOBIS (figure 2). Within MarBEF, the data providers are currently performing analysis on the integrated databases and it is expected that most of the remaining datasets will become available to EurOBIS when the scientific papers resulting from the analyses are published.

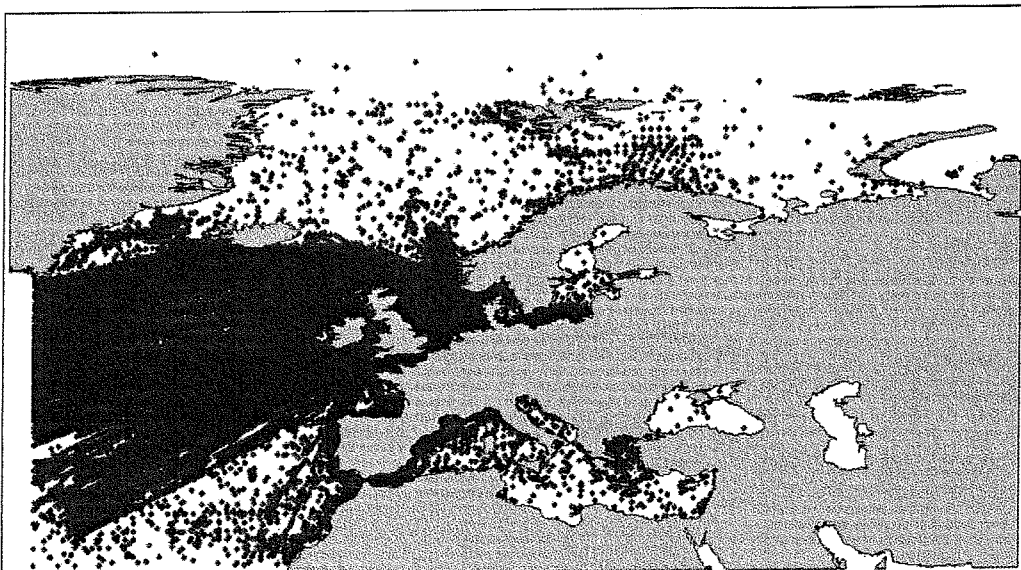


Fig 2. Overview of the localities holding distribution records in EurOBIS.

The European Register of Marine Species (ERMS), funded in 1998-2000 by the EU-FP5, has been revived in MarBEF. More than 31,000 names of European species were stored in a new database, a higher classification was added and over 100 taxonomists received online access to update the register. ERMS now serves as a basis for the creation of a World Register of Marine Species (WoRMS), also hosted at VLIZ. Inaugurated during the Marine Taxonomy Workshop that took place in Oostende last June, WoRMS now has over 128,000 valid species names and is over half-way to completion. It will be the first expert-validated register of names of all marine species known to science. Many international biodiversity programmes, a.o. CoML/OBIS, GBIF, EoL, Species2000, ICZN/ZooBank and UNESCO/IOC, need a register of valid names and have agreed to use WoRMS for their purposes.

IFREMER is coordinator or principal investigator of several marine data management structures and presently coordinates the SeaDataNet integrated infrastructure initiative (I3) project. The SeaDataNet V1 infrastructure comprises the network of 40 interconnected data centres (NODCs) and a central SeaDataNet portal. This provides not only background information about SeaDataNet, but also a unified and transparent overview of the metadata and controlled access to the large collections of data sets, that are managed at these data centres. MARIS is the technical coordinator of SeaDataNet and together with IFREMER will coordinate the planned bridging between EurOBIS and SeaDataNet.

IFREMER is also in charge of disseminating most of the results from continuous monitoring which have been conducted all around the French coast for thirty years up to now. That includes: South of the English Channel from the Belgian border to South of the Bay of Biscay up to the Spanish Border. Species which are continuously recorded are mainly zooplankton and phytoplankton (species which cause blooms and/or coloured waters), including the 3 groups *Dinophysis*, *Alexandrium* and *Pseudo-nitzschia* which can cause health problems due to toxins: DSP, PSP and ASP. IFREMER also has commercial and some non commercial mollusc growth measurement data (weight, size, development); data on benthic species (important health indicators), including (macro-)algae, invertebrates and fish. In addition, IFREMER can provide data on deep sea fauna from the Celtic sea and the Bay of Biscay (which are mainly already recorded in EurOBIS). Most of these observations are conducted for the application in France of the "Water Framework Directive".

The International Council for the Exploration of the Sea (ICES) is an international community of over 1,600 marine scientists from 20 member countries. The dedicated ICES Data Centre has some of the largest collections of time-series datasets related to chemical and biological marine data. The Data Centre has acted as the virtual data centre for HELCOM and OSPAR conventions over a number of years and more recently acts as the marine data coordinator for the European Topic Centre for Water (EEA funded).

ICES can provide data for biological communities, biological effects and fish disease as well as detailed parameters on zooplankton, zoobenthos, phytoplankton and

phytobenthos. The time range of data is from 1979-current year and the geographical coverage encompasses OSPAR and HELCOM regions (North Sea, Kattegat and Baltic seas). The ICES Databases are already compatible with the European Register of Marine Species. The size and range of the dataset is expected to grow over the next year as we bring all of our data holdings into a new online relational system. Extensive graphing and querying of the data is now available through the ICES online portal and it could be beneficial to re-use some of these components in the proposed portal for EMODNET. Within this project, ICES plans to make this data available through the EurOBIS portal, thus achieving greater data visibility. The Data Centre has a number of well established de facto standards for working with biological data and this could be a good platform to progress the interoperability of biological data through EMODNET.

Biological data in the ICES Databases is quality checked for validity before entering the system. Once in the system, further range and outlier checks are performed and ultimately all the data is provided to working groups that are tasked with assessing the quality of the data for the OSPAR and HELCOM assessments. The results of this are fed back to data contributors and data records are continually updated to ensure the quality is constantly improved.

WDC-MARE / PANGAEA® is operated as a permanent facility by the Centre for Marine Environmental Sciences (MARUM) at University Bremen and by the Alfred Wegener Institute for Polar and Marine Research (AWI) in Bremerhaven, Germany. Essential services supplied by WDC-MARE / PANGAEA® are project data management, data publication, and the distribution of visualisation and analysis software (freeware products). Data management includes quality control, development of ontologies and vocabularies, publication of data, and the dissemination of data and metadata according to international protocols and standards. The system is operated in the sense of the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities which is a follow up to the Budapest Open Access Initiative. Some ongoing projects are under moratorium and access to data may be restricted, but metadata is always freely accessible. Metadata are extensive and each dataset can be cited by using a Digital Object Identifier (DOI).

WDC-MARE / PANGAEA® is involved in project and data management of over 50 national, European, and international projects, including European research programmes such as EPOCA (European Project on Ocean Acidification; 27 research institutes in 9 European countries), SESAME (Southern European Seas: Assessing and Modelling Ecosystem Changes; 47 research institutes in 21 European countries), CARBOOCEAN (Marine Carbon Sources and Sinks Assessment; 47 research institutes in 14 countries) and CoralFISH (Ecosystem based Management of Corals, Fish and Fisheries; 16 research institutes in 10 European countries), and European Networks of Excellence such as EUROCEANS (Ocean Ecosystems Analysis; 66 research institutes in 25 countries) and ESONET (European Seas Observatory Network). Other relevant projects include IMAGES (International Marine Global Change Study), IODP/SEDIS (International Ocean Drilling Project), and JGOFS (Joint Global Ocean Flux Study). Biodiversity data that are generated by these programmes and archived at WDC-MARE / PANGAEA®, will become available to EMODNET, within the limits of each programme's data policy,

e.g. respecting moratoria on public access to data. More specifically, WDC-MARE / PANGAEA® can provide data on plankton (including viruses, bacteria, autotrophic and heterotrophic protists, crustaceans and jellyfish), micro-, meio- and macrobenthos, marine mammals and birds. In addition to contemporary observations they offer a very extensive paleobiogeographic record from marine sediments. Biological data include key biodiversity parameters such as abundance and biomass, and also a very extensive range of parameters describing the life history of marine life, including size, weight, development stages, sex, chemical constituents (e.g. isotopes and pigments), metabolic rates (e.g. growth, feeding, respiration, primary production, reproduction), displacements, etc. In addition to its contribution as data provider of key biodiversity data, WDC-MARE / PANGAEA® will contribute to archive/network and disseminate life history data that relate to biodiversity.

The European Network of Excellence for Ocean Ecosystems Analysis (FP7-NoE-EUR-OCEANS) has funded an extensive effort to rescue historical plankton data from all European Seas and the World Oceans, including Arctic & Nordic Seas, European North-Atlantic Shelves, and upwelling systems along the Iberian coast. The data were rescued by 16 institutes from 11 different countries and are currently being archived at WDC-MARE / PANGAEA®.

The Global Biodiversity Information Facility (GBIF) is an inter-governmental organisation, originally initiated through the OECD but now open to any country or body that establishes a memorandum of understanding with GBIF and complies with its conditions, in particular, to make biodiversity data available. The current (Sept 2008) membership of GBIF stands at 49 countries and 39 international organisations which together, through 259 data providers, make available 7,481 datasets that include over 147 million records, including many marine, that are searchable and available for download via the GBIF data portal.

The international OBIS secretariat (iOBIS) is hosted by the Rutgers University Institute for Marine and Coastal Sciences (IMCS). iOBIS acts as the hub of the OBIS network, and makes all OBIS data available through its portal. Currently it brings online over 14 million georeferenced data from 437 datasets. EurOBIS is the largest OBIS node, and serves most of the European data to OBIS; European distribution records in OBIS that originated from sources other than EurOBIS are made available to EurOBIS, so that end-users find a one-stop shop for European biogeographical information. Data from OBIS is shared with the Global Biodiversity Information Facility; OBIS is recognized as the Marine thematic sub-network of GBIF, and is one of the largest providers of data to GBIF. The international OBIS secretariat is responsible for communication within the OBIS network, and to maintain the international portal, and to maintain and further develop the data exchange and quality control standards within the OBIS network.

OBIS-SEAMAP acts as a thematic OBIS portal and integrates the data on (not only European) marine mammals, birds and reptiles. OBIS-SEAMAP data are sent to the international OBIS portal. In this way, for example, the data from the "Small Cetacean Abundance in the North Sea and Adjacent waters" (SCANS) surveys (started in July

1994) are available through OBIS. The CODA 2007 offshore survey data are still being analysed but will be added by the end of 2008. CODA is an international effort to survey offshore waters of the European Atlantic to collect data on distribution and abundance of common dolphins, sperm whales, beaked whales and other cetaceans.

IBSS NASU is the largest Ukrainian marine research centre, which conducts investigations into the biology, ecology and protection of the sea, multiple aspects of marine ecosystem biodiversity and dynamics, and new biotechnologies and methods for integrated coastal zone management. IBSS NASU is currently setting up the Black Sea marine biology network, which includes 12 research institutions from Former Soviet Union countries (8 from Ukraine, 3 from Russia, and 1 from Georgia) and several others from Bulgaria, Romania, and Turkey.

Within the Black Sea marine biology network, IBSS NASU has measurements of phytoplankton, zooplankton, angiosperms, macro-algae and invertebrate fauna. Karadag Natural Reserve can provide data on seabirds and the Brema Laboratory on marine mammals. IBSS NASU is leading this network and is willing to provide data on annual, seasonal, and spatial distribution of species composition, abundance and biomass in the water column and on the seabed. However, in many cases the historical data still need to be digitized.

Selection of target species

The datasets in MarBEF holds distribution data on more than half of the species that are reported for Europe (the ERMS registers 31,000 species occurring in Europe). Most of the monitoring activities in Europe are not restricted to a particular taxon. According to the list of MarBEF datasets (appendix 1), the number of species per dataset ranges from 1 to 10,153 (with a median of 1,684 species). According to the tender specifications, we should select at least three species or groups of species for each of the eight categories (phytoplankton, zooplankton, angiosperms, macro-algae, invertebrate bottom fauna, bird communities, sea mammals and reptiles). The choice of species or groups of species selected will reflect the completeness of the monitoring programme, the diversity within each of the eight categories and the usefulness for describing ecosystem function or state.

Within this project we will continue integrating all of the monitoring data, including all the species reported. However, species with a particular status (e.g. most common, protected, endangered, invasive or ecologically important) will receive special attention on the portal and will serve as key examples.

However, making such a selection out of the thousands of species is not easy and should be critically examined before making a firm decision. We recommend that the selection of target species will be done in the first year of the project by involving experts on particular taxonomic groups and in close consultation with the EMODNET expert panel. The first step in this process will be setting the preconditions which is species should meet. It should answer questions like: how far back in time do we need data in order to

set a reference point? How much data of a species or species group (very common species are not always monitored) do we need? Should the species be easily recognizable? Should the species be an indicator of the quality status of the environment (e.g. is the species vulnerable to a particular pollution or anthropogenic activity)? Should the species be important in the food chain? Etc... The experts will review and report on existing information on the ecological quality indicator species. The technical board at VLIZ will provide information on the species occurrence data to the experts.

A list of the most abundant species in the three thematic databases of MarBEF is available in appendix 2. It provides the ten most observed species per phylum according to their habitat (pelagic, soft-bottom and hard-bottom). Species with less than 100 observations are omitted. Because the thematic databases in MarBEF are the largest in its domain, this exercise gives a fairly reliable indication of the most common species in Europe.

This kind of analysis can easily be repeated for every marine basin and time period and will be more reliable when additional monitoring data are available in the EMODNET portal.

Methodology

Introduction

This project will realise an online data portal for European marine biological data. The portal will be built on the data systems that were built by VLIZ for the MarBEF project, including the existing European Ocean Biogeographic Information System (EurOBIS) online at <http://www.marbef.org/data/eurobis.php>.

Evaluating the EurOBIS system based on the data portal specifications described by the call for tenders 'No MARE/2008/03', it is clear that EurOBIS already complies with a large number of the required functionalities. EurOBIS provides the user with the possibility to:

- browse a catalogue of the available data
- view the position and magnitude of data as well as geographical information system layers. This includes an online viewer allowing layer-selection, attribute queries, panning, zooming and downloading of the data
- conduct online queries for data of interest
- download GIS layers, monitoring and contiguous data.

Not starting the development from zero, but building further on a system that is already in use and generally accepted by the international marine scientific community, ensures that the biological component of the EMODNET data portal will not turn out to be an empty box. EMODNET can directly benefit from over 3,6 million species distribution records that already are in the collection. Furthermore, the support EurOBIS has received in the past 4 years, from the more than 54 European research institutes contributing their data to the system, can expect continuation under EMODNET. Being online for over 4 years now, it is safe to say that both from a technical and functional perspective, the EurOBIS system has outgrown its testing phase. Taking into account these advantages, the development of the EMODNET biological portal could take a head start, thus allowing us to guarantee that the portal can become operational on a very short term.

Despite the fact that a great deal of the described portal specifications match with what EurOBIS can immediately deliver, there are certain aspects to the existing system that need further elaboration.

On the one hand, there is some work related to a technical upgrade of the system allowing it to support functionalities like OGC compliancy, ensuring compatibility with the INSPIRE View Service Implementation Rule and INSPIRE Metadata Implementing Rule and providing links towards other related websites. Also the user feedback possibilities should be improved. The expertise necessary for these developments is already available at VLIZ.

Secondly, EurOBIS needs further elaboration content-wise. Currently, EurOBIS mainly focuses on storing species distribution records. However, the used OBIS-scheme already supports the storage of species abundance, biomass and species composition information. The amount of available species abundance and biomass data is to be further increased. With the future focus shifting towards distributing quantitative information, additional sampling method related information should be gathered.

The success of a data portal is largely determined by the involvement of its data providers. Therefore, a large part of this project concerns setting up the communication between the data portal and the data providers. First of all, a data policy document will be developed and put into practice. Secondly, the data needs standardization. A data management training workshop will be held with the data providers, in which good data management practices, standards and data exchange protocols will be handled. An initial set of data from a well-considered number of data providers will be transferred using the developed protocol. A small budget for each of the data providers should allow them to organize their data and to implement the agreed protocol locally. The generated data stream will be maintained throughout the project. Finally, the scientists providing the data to the data portal will also be involved in an integrated analysis of the compiled datasets. Analysis will focus on presenting diversity indices and related derived products for the areas covered. On the one hand this joint analysis stimulates data delivery, on the other hand this implies an important quality control to the data in the portal. This approach has proven to be very successful during the MarBEF project.

This project aims to be an intensively coordinated project with explicit links and strong interactions between the project leader, the coordination and advisory board and the data providers.

Members of the coordination board represent the following organizations and networks:

Project leader

- VLIZ (also representing EurOBIS, FP7 PESI, ERMS, WoRMS).

Partners

- MarBEF, represented by NIOO-CEME
- SEADATANET, represented by IFREMER and MARIS
- ICES
- WDC-MARE/PANGAEA, represented by University of Bremen
- GBIF
- OBIS, represented by Rutgers University-IMCS
- Black Sea marine biology network, represented by IBSS.

Advisory board members

- ESF-Marine Board
- UNESCO/IOC/IODE
- Project coordinators of the other EMODNET pilot projects will be invited.

This tender is supported by the ESF/Marine Board, UNESCO/IOC/IODE and the MARS Network (letters of support in appendix 3).

The identity and description of the partners is available as a separate section of this tender.

Workplan

The activities of the EMODNET biological portal are divided in 4 work packages (WP):

- WP1 Project Management
- WP2 Technical Development
- WP3 Data Digitisation, Standardisation, Analysis & Delivery
- WP4 Data Management, QC/QA & Integration.

The development of the portal will follow four consecutive phases:

1. Development: months 1-12
2. Test and monitor: months 13-18
3. Upgrade: months 19-24
4. Maintenance: months 25-36.

A gantt chart (next page) shows the progress of the planned project activities and the involvement of the members of the consortium.

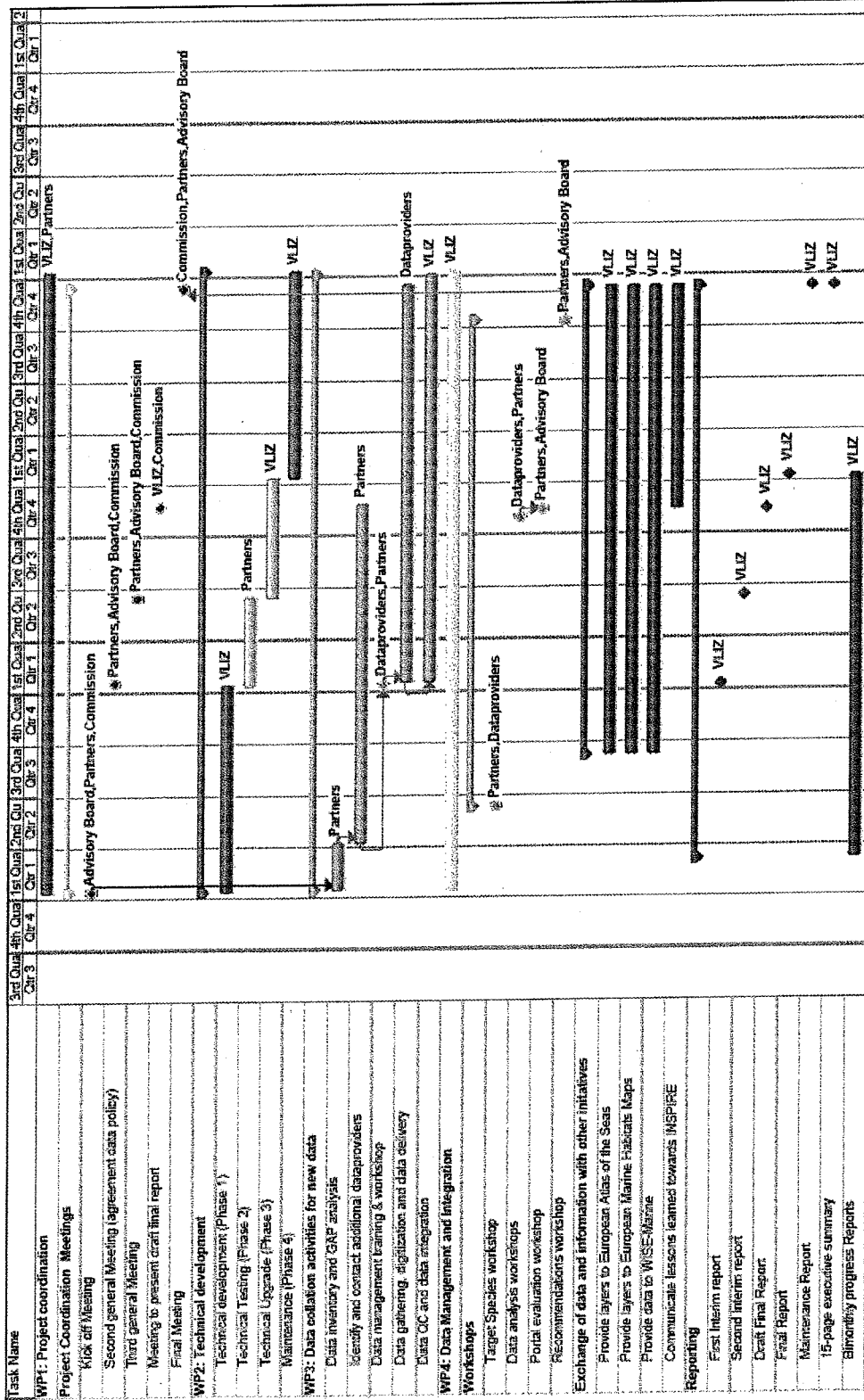
Budget

The budget of the EMODNET biological portal is divided as follows:

Tasks	EUR
Project Management	180,000
Technical Development	100,000
Data Collation, Standardisation, Analysis & Delivery	370,000
Data Management, QC/QA & Integration	100,000
Workshops	100,000
Total	850,000

The partners of the coordination board will receive a budget to cover the cost of several man-months plus the costs to attend the general meetings. The budget for data digitisation, standardisation, analysis and delivery will be provided to the data providers according to the agreements set at the data inventory and gap analysis workshop. The

Gantt chart



WP1 Project Management

Objectives

- To ensure the best performance of the consortium, timely delivery and high quality of results and products
- To monitor, facilitate and effectively manage the project's technical, scientific and managerial work
- To communicate and provide accurate information to the project members, the Commission and the general public in a highly professional way.

Activities

The project management activities will be performed by the project leader, supported by the coordination board. Project management is a continuous activity during the full project duration (36 months).

Project leader

The Flanders Marine Institute (VLIZ) is the project leader and has the following tasks:

- general project coordination and supervision
- financial management
- responsible for reporting (compilation of progress, interim, final and maintenance reports, executive summary and strategy plan on sustainability)
- responsible for analysis and recommendations of portal
- monitor the effectiveness of the portal
- maintenance of the portal
- organise project meetings and workshops
- communication towards the project partners, the advisory board and the Commission.

Coordination Board

The coordination board will liaise between the project leader and the data providers and network members they represent. Members of the coordination board include all the partners and the project leader. The coordination board has the following tasks:

- act as the representative of their organization or network.
- participate in or provide advice to the writing team to draw up the common data policy
- facilitate and/or promote the delivery of existing data and metadata towards EMODNET
- assist in identifying and prioritising data sets
- test the functionalities of the data portal during the testing phase

- participate in or provide advice to the analysis and quality control of integrated datasets and focus on presenting diversity indices and related derived products for the areas covered
- communicate the project activities and promote the results and outcomes (such as common standards and data policy) towards the members of the organization or network they represent.
- participate in or provide advice to the writing team to draw up a strategy plan for the sustainability of the data provider's network.

Advisory board

The members of the advisory board are invited to the general meetings and will be asked for advice on the project activities and in particular will play a role in forming the strategy plan on the sustainability of the EMODNET biological portal.

Modus operandi and strategy plan on a sustainable EMODNET biological portal

The analysis of the lessons learned during the project can take a leap start by looking at the work done and results of the MarBEF project. This analysis will be made available to the EMODNET expert group during the first meetings.

The project that we outline here is based on these experiences.

The final analysis will be prepared by VLIZ, assisted by the coordinating partners, which represent all levels of the data management flow: from scientists (MarBEF/MARS Network), to collating data centers (ICES/NODCs), to European wide data infrastructures (SeaDataNet/Pangaea) and the specialised integrated databases (EurOBIS/OBIS).

The plan will include the lessons learned, problems encountered and proposal for improvement on the following topics:

- provision of data by the data holders (research projects, monitoring networks)
- interoperability of the data (sampling techniques, identification standards, ...)
- production of contiguous data
- fitness for purpose of the data
- improvement of accuracy, precision and coverage of the data
- performance of the chosen portal technology.

The recommendations for the sustainability of the EMODNET biological portal will also be prepared by the coordinating partners, with the assistance of the advisory board members, during a recommendations workshop. A close collaboration with the other EMODNET pilot projects is desirable.

We believe the sustainability of the EMODNET biological portal is strengthened by the fact that:

- the portal will be built around existing and sustainable data systems (a.o. EurOBIS).
- the responsibilities of the partners is to assist in setting up a durable network

- we have provisioned the necessary funds for financing these networking activities.

The final report will contain as required the necessary recommendations for data flow, maintenance, governance and institutional settings, as well as an indication for the required resources and costs.

Meetings

A number of project meetings are planned and will be organised by the project leader:

- Kick-off meeting at the start of the project with the Commission and all the representatives of the EMODNET pilot projects
- Target species workshop at month 6
- Second general meeting at month 12, to present the first interim report, review progress, present the operational portal
- Data management training workshop at month 12
- Third general meeting at month 18, to represent the second interim report
- Data analysis workshop at month 21
- Portal evaluation workshop at month 22
- Interim meeting at month 22, to present the draft final report to the Commission
- Recommendations workshop at month 34
- Fourth and final general meeting at month 36, to present the final report.

Deliverables

D1.1 bimonthly progress reports will be posted on the project website indicating meetings held, difficulties encountered, and inventories of data made available (starting from month 2 and continue through phases 1 to 3)

D1.2 first interim report after phase 1 to be presented at the second general meeting (month 12)

D1.3 second interim report after phase 2, to be presented at the third general meeting (month 18)

D1.4 draft final report to be presented at the interim meeting (month 22)

D1.5 final report at the end of phase 3 indicating i. what was done in the project, ii. challenges faced, iii. analysis of performance and lessons learned and iv. analysis of sustainability (month 24)

D1.6 maintenance report at the end of phase 4 (month 36)

D1.7 15-page executive summary that can be read by a non-specialist at the end of phase 4 (month 36)

D1.8 layers for the prototype European Atlas of the Seas (starting from month 9)

D1.9 layers to support the broad-scale European Marine Habitats map (starting from month 9)

D1.10 data to WISE-Marine (starting from month 9)

D1.11 Communicate lessons learned in this project towards INSPIRE (month 36).

WP2 Technical Development

Objectives

- To develop and maintain the EMODNET biological portal and services
- To develop and maintain the project website of the EMODNET biological portal

Activities

The development of the portal is the responsibility of VLIZ. There are four steps (development, testing, upgrading and maintenance), which follow the four phases of the workplan.

Development of the portal: Portal components

The EMODNET biological portal will be built upon the MarBEF data systems developed and maintained at VLIZ, including:

- EurOBIS (European Ocean Biogeographic Information System)
 - <http://www.marbef.org/data/eurobis.php>
- IMIS (Integrated Marine Information System)
 - <http://www.vliz.be/imis>
- ERMS (European Register of Marine Species, part of the World Register of Marine species)
 - <http://www.marbef.org/data/erms.php>
 - <http://www.marinespecies.org>
- VLIMAR Marine Gazetteer (contains georeferenced place names)
 - <http://www.vliz.be/vmdcdata/vlimar>
- MARBOUND (Maritime Boundaries Geodatabase, contains the shape files of the World's: EEZ boundaries; oceans and seas and Large Marine Ecosystems)
 - <http://www.vliz.be/vmdcdata/marbound>

These systems are compatible with several international standards insuring compatibility across other data systems and initiatives. The EMODNET biological portal will be compatible with the INSPIRE Implementation Rules, and other required standards: OGC and SEADATANET are already implemented, or are in the process of being developed.

In order to avoid data loss at any time, back-ups of the databases are stored at different locations on physically separated media. The portal aims to be operational 24 hours a day, 7 days a week and support up to 50 simultaneous users at any given time.

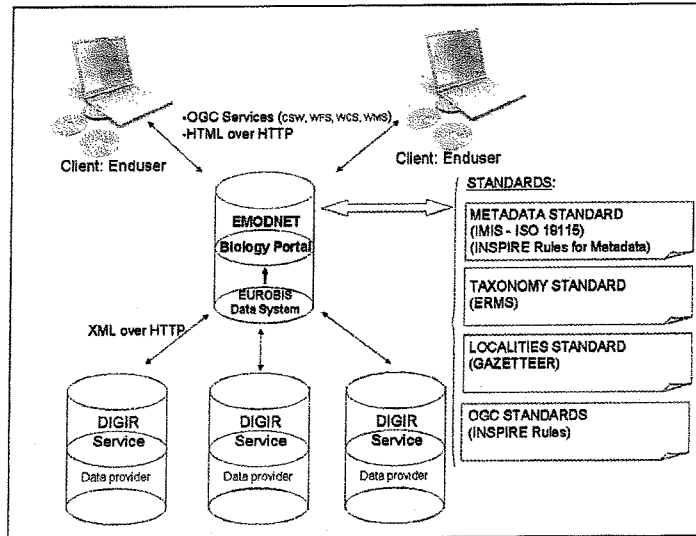


Fig 3. Technical overview of the EMODNET biological portal

European Ocean Biogeographic Information System (EurOBIS)

EurOBIS is a distributed database system that makes use of the Distributed Generic Information Retrieval (DiGIR) protocol and is fully platform independent. It can be installed on any computer that has PHP and a web server running. The DiGIR records are available in a standardized XML format and are transferred via HTTP. As figure 3 shows, multiple providers can contribute to the EMODNET biological portal, which can be accessed by multiple clients. For performance reasons, a central cache of the data will be stored in the data centre of the Flanders Marine Institute (VLIZ).

EuroBIS distribution records

(3,600,000 distribution records; 15,000 species)

You need a **SVG viewer** to work with this map. To install a viewer, go to <http://www.adobe.com/svg/viewer/install/main.html>. The viewer is available for Internet Explorer 5+ only at this time. Use the **right mouse button** to see the SVG menu. To Zoom In press **ctrl** while selecting a region. To Pan press **Alt** while dragging the map. The latitude and longitude are visible in the statusbar.

Map type: SVG (dynamic) Image (static)

Fig 4: Geographic user interface of EurOBIS, showing downloadable GIS layers of four species of the genus *Abra* in the North Sea Basin, Skagerrak, Kattegat and coastal zone of the UK.

Standards

The data scheme of EurOBIS is based on the Darwin Core standard that is used by the Global Biodiversity Information Facility (GBIF) and the Ocean Biogeographic Information System (OBIS). This biogeographic data scheme is able to handle information and data of annual, seasonal, and spatial distribution of species composition, abundance and biomass in the water column and on the sea-bed. EurOBIS makes use of the Distributed Generic Information Retrieval (DiGIR) protocol. The EurOBIS data scheme will be compliant to the geographic standards developed by INSPIRE and will be OGC compliant through GEOSERVER.

The interoperability between EurOBIS and the SeadataNet Infrastructure will be insured by expanding the functionality of the SeaDataNet MIKADO editing tool with the option to prepare EurOBIS data entries via the Darwin Core XML Schema. This would ensure that data centres make use of one standardised tool for populating the SeaDataNet metadatabases and the associated EurOBIS database. The integration of these biological data with physical-oceanographic and bio-chemical (species independent) data in the water column, that are managed by the SeaDataNet data centres (National Oceanographic Data Centres), will enhance the total availability and richness of data and data services to users. Furthermore the cross-fertilization will lead to additional standards and procedures for the biological domain and it will ensure a common basis for interoperability.

Integrated Marine Information System (IMIS)

The Integrated Marine Information System (IMIS) will serve as the metadata database to develop the data catalogue. The IMIS system is also used in MarBEF as the register of resources. This relational information database documents datasets, including contact details and institutional affiliations of data collectors, publications and projects. IMIS currently holds information on 9,133 people; 4,633 institutes; 95,643 publications; 1,986 projects and 1,144 datasets. The portal website will include an interface to discover, browse and query the metadata.

Metadata will include:

- Metadata, information about the available datasets. This information will include the spatial and temporal cover, keywords and information on the identification, classification, the quality and constraints, conditions of use, parameters measured, dataset responsible parties, coverage, precision and resolution of the data and how the data was collected
- Information on people, the institute and their expertise. An extensive assessment of the contact information of data owners and data providers has already been performed as part of the MarBEF project. The database of people and organisations can also serve as a register of contacts for outreach
- Publications and literature. Publications relevant to the submitted datasets; A1 papers as well as grey literature and research reports can be added
- Projects. Information of the project under which the dataset was collected.

Standards

IMIS is compliant with the ISO 19115 standard and the metadata elements will be compliant with the INSPIRE Implementing rules for metadata of spatial datasets, spatial dataset series and spatial data services. IMIS implements the SeadataNet vocabulary in order to create EDMED and CDI entries for the EurOBIS data, so that the data sets and

the EurOBIS data facility can be identified via the SeaDataNet - European Directory of Marine Environmental Datasets service (EDMED) and its data sets accessed via the SeaDataNet - Common Data Index service (CDI). The IMIS publication module is also compliant with the Open Archive Initiative (OAI).

European Register of Marine Species (ERMS)

The European Register of Marine Species (ERMS) is an authoritative taxonomic list of species occurring in the European marine environment, and will serve as the taxonomic backbone of the EMODNET biological portal. ERMS was funded in 1998-2000 by the EU-FP5, and revived in EU-FP6 MarBEF and now receives further funding through EU-FP7 PESI. In MarBEF, more than 31,000 names of European species were stored in a new database, a higher classification was added and over 100 taxonomists received online access to update the register. ERMS now serves as a basis for the creation of a World Register of Marine Species (WoRMS), also hosted at VLIZ. Inaugurated during the Marine Taxonomy Workshop that took place in Oostende last June, WoRMS now has over 128,000 valid species names and is over half-way to completion. It will be the first expert-validated register of names of all marine species known to science. Many international biodiversity programmes, a.o. CoML/OBIS, GBIF, EoL, Species2000, ICZN/ZooBank and UNESCO/IOC, need a register of valid names and have agreed to use WoRMS for their purposes.

A standardised taxonomic list as a taxonomic backbone of the EMODNET biological portal will allow the user to:

- detect and filter out spelling mistakes of species names occurring in the contributing datasets. A fuzzy matching tool will automatically detect common spelling mistakes
- solve issues or ambiguities related to the nomenclature of a species. The ERMS list contains invalid synonyms
- search and browse data for aggregated groups (lump data to a higher taxon rank, e.g. genus, family, order, phylum,...), thanks to the taxonomic classification in ERMS.

Standards

ERMS will become compatible with the EDIT and PESI data infrastructure (when these standards are stable). Collaborations are set up to interface ERMS with the Encyclopedia of Life (EoL; a US based initiative to provide one webpage of each species on earth). Several taxon web services are developed at VLIZ, and are based on the Simple Object Access Protocol (SOAP). This web service is appreciated and intensively used by the marine data management community.

VLIMAR Marine Gazetteer

While ERMS will serve as the taxonomic backbone of the EMODNET biological portal, the VLIMAR Marine Gazetteer (a geographical dictionary), developed and maintained at VLIZ can be seen as the geographical backbone. The VLIMAR Marine Gazetteer currently holds information on 20,130 localities. The gazetteer will be connected to the other databases.

A place name in the gazetteer consists of:

- the name (in several languages)
- placetype (e.g. port, bay, sandbank, sea, basin, ocean, ...)
- the minimum and maximum latitude and longitude
- precision (defined as the radius of the circle corresponding to the geographic shapefile)
- sources of information
- the relationships (e.g. parent-child, adjacent to, streams through, rises and flows out) with other place names
- links with available shapefiles.

This relational structure allows for browsing through a hierarchical tree – comparable to browsing through the taxonomic classification of the European Register of Marine Species (ERMS) – and enables the user to list all places located in a particular area. Important sources of information are: the International Hydrogeographic Organisation (IHO) Limits of Oceans and Seas, the IHO-IOC GEBCO (International Hydrogeographic Organisation – International Oceanographic Commission General Bathymetric Chart of the Oceans) Gazetteer of undersea feature names, the Exclusive Economic Zones, the Large Marine Ecosystems of the World, the FAO Fishing Areas and the ASFA Codes.

A standardised gazetteer as a geographical backbone of the EMDONET biological portal will allow the user to:

- search for all datasets holding data on a specific area, and subsequently find the people and the institutes that are actively doing research in that region. The fact that the place names are related to each other makes it possible to automatically display all the information of the underlying sub-areas.

Maritime Boundaries Geodatabase (MARBOUND)

VLIZ has developed an online Maritime Boundaries Geodatabase that includes the shapefiles of all the Exclusive Economic Zones (EEZs) and the world's seas and oceans as well as the Large Marine Ecosystems (LME), composed by the National Oceanic and Atmospheric Administration (NOAA). By adding this layer on top of the species distribution data in the EMDONET Portal, we will be able for example to create national and regional species check-lists.

Standards

The MARBOUND system is OGC compliant, served through MAPSERVER, soon through GEOSERVER.

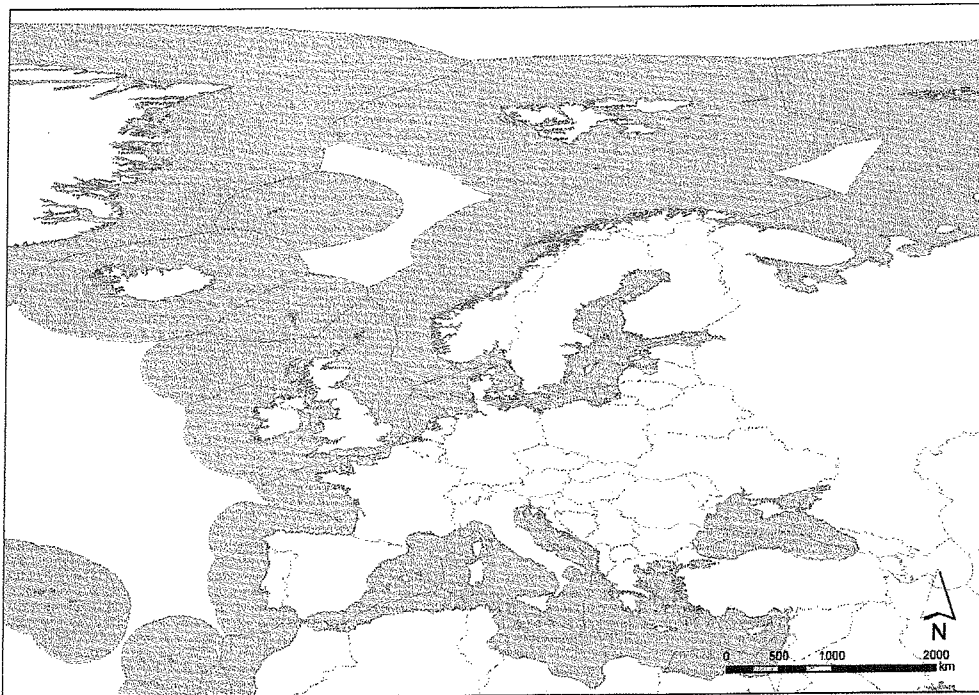


Fig 5. Snapshot of the Exclusive Economic Zone's (EEZs) of European countries; from the Maritime Boundaries Geodatabase (MARBOUND), developed by VLIZ.



Fig 6. Snapshot of the seas bordering the European countries; from the Maritime Boundaries Geodatabase (MARBOUND), based on the IHO Limits of Oceans and Seas Atlas, developed by VLIZ.

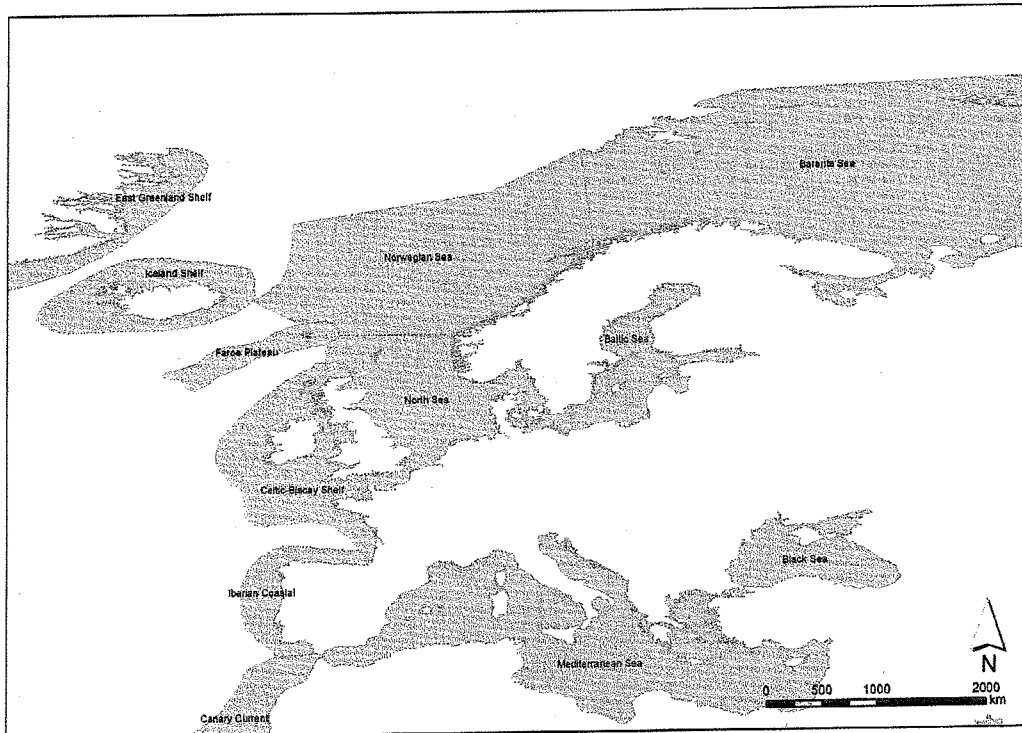


Fig 7. Snapshot of the shapefile of Large Marine Ecosystems in European marine waters (composed by NOAA); from the Maritime Boundaries Geodatabase (MARBOUND), developed by VLIZ.

Development of the portal: Querying, Viewing and Downloading Services

The EMODNET biological portal will include a user interface for data querying. Not only spatial, temporal, and taxonomic queries can be performed but the information system behind the portal will allow to query complete datasets or to search for data on specific parameters or data providers. The spatial queries will be made possible by entering exact coordinates or by selecting a region on a geographic map. Taxonomic queries can be done at any level of the taxonomical classification (e.g. a search on a family will also return the records of the underlying generic and (infra)species rank). It can also include records linked to invalid taxonomic synonyms.

The result of the spatial queries will be returned and plotted on a geographical interface, creating GIS layers. By creating multiple queries, the user can superimpose the different GIS layers and compare the distribution information of different taxa on the map or compare the same taxa with different temporal and geographical parameters. Users will be able to zoom, pan and select the different GIS layers.

Selected data can be downloaded by the user, selecting different file formats (tab delimited file, XML file, Excel file, HTML file, KMZ file, GML file). A data request form will ask for the purpose for downloading. All data requests will be monitored and analysed.

The data from the EMODNET biological portal will also be made available through several OGC Web Services. These services will create an interface of the EMODNET

biological portal allowing requests for geographic “resources” across the web using platform-independent calls. Besides the Catalogue Service of the Web (CSW), three other OGC Web Services will be implemented:

- Web Feature Service (WFS). This service allows requests for geographic features across the Web. As such, the vector data of the portal can be transferred using this service.
- Web Coverage Service (WCS). This service allows requests for grid data across the web. As such, raster data of the portal can be transferred using this service.
- Web Map Service (WMS). This service allows requests for maps across the web. As such, GIS maps of the portal can be transferred using this service.

Besides the OGC services, the viewing service of the portal will be in accordance with Article 11 (1)(b) of the INSPIRE Directive stating that the services should make it possible, as a minimum, to display, navigate, zoom in/out, pan or overlay viewable spatial datasets and to display legend information and metadata.

The downloading service of the portal will be in accordance with Article 11 (1)(c) of the INSPIRE Directive stating that the service will enable to make copies of part of the spatial datasets, be downloadable and directly accessible.

Development of the portal: Online instructions

The EMODNET biological portal will contain online instructions that guide the user to:

- search the data catalogue looking for specific data
- query the data
- create and view selected GIS layers
- download the data and
- request data using the OGC Web Services.

There will be an online manual available on the portal website and a paper copy can be delivered upon request.

Guidance and assistance on how to use the portal can be requested by email or phone during business hours.

Development of the portal: Link to other relevant websites

The IMIS metadata database will include extensive information and links on relevant projects, institutes, data providers and publications. The EMODNET biological portal will also include a separate section with links to most relevant and similar data portal initiatives (e.g. other lots of EMODNET) and information about standards for biological data.

Testing and upgrading of the portal

In order to provide the most useful instrument for the users of EMODNET, the portal will:

- Monitor the unique visitors (on the basis of IP address), country of visitors, number of visits and number of requested pages. This allows us to discriminate between unique and regular visitors. The web statistics also give an indication how the visitors were directed to the EMODNET biological portal (i.e. directly or through search engines like Google)
- Monitor the number of downloads and the size of data downloaded. Through the data request form, we will be able to monitor the reason why the data was downloaded
- Web driven questionnaires will be organised to assess the experience of users
- During the portal evaluation and other workshops, user feedback will be collected and analysed, including the feedback from the coordinating partners. A key task of the coordinating partners will be testing of the functionalities of the data portal during the testing phase

We provision in the project the necessary time for developing improvements that are the result of these analyses.

Maintenance of the portal

We will maintain the portal operational during the requested period, and provide all documentation needed by the Commission. However, since the portal will be built upon existing data systems, for which VLIZ is committed to maintain in long-term, we can also guarantee that the EDMONET biological portal will continue to be maintained for as long as the Commission requires.

Deliverables

D2.1 Proto-type of the portal (month 12)

D2.2 Fully operational portal, after testing and upgrading (month 24).

WP3 Data Collation, Standardisation, Analysis & Delivery

Objectives

- To ensure a continuous and high quality data delivery to the EMODNET biological portal.

Activities

The success of the data portal is largely determined by the involvement of its data providers. Therefore, this work package concerns setting up the communication between the data portal and the data providers. The activities of this work package will cover the entire duration of the project and all the partners are involved.

Firstly a detailed inventory of existing holdings of marine data will be created (linked to WP4), in collaboration with the consortium partners, representing national and regional marine data centres, such as MarBEF, SeaDataNet, ICES, WCD-MARE/PANGAEA, GBIF and OBIS.

To select target species, a workshop will be organised (month 6) involving experts on particular taxonomic groups and in close consultation with the EMODNET expert panel. The first step in this process will be setting the preconditions that the species should meet. It should answer questions like: how far back in time do we need data in order to set a reference point? How much data of a species or species group (very common species are not always monitored) do we need? Should the species be easily recognizable? Should the species be an indicator of the quality status of the environment (e.g. is the species vulnerable to a particular pollution or anthropogenic activity)? Should the species be important in the food chain? The experts will review and report on existing information on ecological quality indicator species. The technical board at VLIZ will provide information on the species occurrence data to the experts.

The partners will perform a gap analyses to determine the shortcomings in data quality (accuracy and precision) and geographical and taxonomical coverage. Expert members of the consortium will review data and report on this topic in the interim and final reports.

After the gap analysis, the project partners will identify and contact other potential data providers.

Data delivery from data providers is often based on trust. The data policy document, based on the philosophy of open access to data within a partnership approach will help to overcome the impediments to exchange and effective access to data.

The data portal will be a distributed system, connecting remotely maintained data systems. Before data can be delivered to the portal, the data need standardisation. A data management training & workshop will be held to discuss and adopt existing standards, data schemes and data exchange protocols.

An initial set of data from a well-considered number of data providers will be transferred using the developed protocol. A large part of the overall budget is foreseen to allow the data providers to organise their data and to implement the agreed protocol locally.

The generated data stream will be maintained throughout the project.

The scientists providing the data to the data portal will be invited to participate in a workshop to do an integrated analysis of the compiled dataset. Analysis will focus on presenting diversity indices and related derived products for the areas covered. On the one hand this joint analysis stimulates data delivery; on the other hand this implies an important quality control to the data in the portal.

Deliverables

- D3.1 Report on gaps in coverage and quality of existing data (month 4)
- D3.2 Workshop report on the selected target species (month 6)
- D3.3 Report on the identity of potential new data providers (month 12)
- D3.4 Common agreed data policy (month 12)
- D3.5 Workshop report on data management, including information on standards and protocols (month 12)
- D3.6 Workshop report on the analysis of the integrated data (month 22).

WP4 Data Management, QC/QA & Integration

Objectives

- To ensure that all data retrieved are properly described and archived
- Promote and apply quality assurance through a standard based, authoritative infrastructure for taxonomy and geography
- Integrate data from prioritized datasets into the EMODNET biological portal.

Activities

The data management, QC/QA and integration are the responsibility of VLIZ and will start from phase 2 (month 12).

New data sets submitted to the EMODNET biological portal will be:

- described in the IMIS database (with the fields described in WP2) and integrated with information from existing sources (a.o. the MarBEF Register of Resources)
- species names will be matched against the European Register of Marine Species (ERMS), and added if they should be missing (after being checked by taxonomic experts associated to ERMS)
- geographical locations will be matched to the VLIMAR Marine Gazetteer, checked and added if they should be missing

The data will be integrated and made available through the EMODNET biological portal, as described in WP2.


Deliverables

D4.1 Inventory of all the datasets, fully described and compliant with ISO 19115 and INSPIRE (month 36)

D4.2 Report on the quality of taxonomic and geographical information (month 36)

D4.3 A species check-list of each marine basin (month 36).

Milestone: All data integrated and available through the EMODNET biological portal (month 36).

<p> 3-10-2008 Jan Vlier Directie VIT</p>	<p>VLAAMS INSTITUUT VOOR DE ZEE VZW (VLIZ) FLANDERS MARINE INSTITUTE Wandelaarkaai 7 B-8400 Oostende, Belgium Tel: +32(0)59/34 21 20 Fax: +32(0)59/34 21 31 e-mail: info@vliz.be http://www.vliz.be</p>
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**ANNEX 2 TO THE CALL FOR TENDERS MARE/2008/03
 "PREPARATORY ACTIONS FOR EUROPEAN MARINE OBSERVATION AND DATA NETWORK"**

LOT No: 4 – TITLE BIOLOGICAL DATA

FINANCIAL TENDER FORM

Vlaams Instituut voor de Zee/Flanders Marine Institute (VLIZ)	+32-(0)59-34 21 30
Wandelaarkaai 7, 8400 Oostende Belgium	Francisco.hernandez@vliz.be

A. Development Costs Costs incurred for phases 1-3 of project (see section 2.4 of specifications)	€850000,00
B. Maintenance Costs Costs incurred for phase 4 of project (see section 2.4 of specifications)	€0,00
TOTAL COST (A+B)	€850000,00

 Jan Aken Directeur VIT 3-10-2008	VLAAMS INSTITUUT VOOR DE ZEE VZW (VLIZ) FLANDERS MARINE INSTITUTE Wandelaarkaai 7 B-8400 Oostende, Belgium Tel: +32(0)59/34 21 30 Fax: +32(0)59/34 21 31 e-mail: info@vliz.be http://www.vliz.be
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