

**Design document central EMODnet Portal, to visualize and  
provide access to the thematic data products**

**Objectives and  
Technical description**

**Initial draft prepared by the Flanders Marine Institute**

## Background Proposal

The Flemish Government approved on 23 December 2011 to enlarge the International Cooperation of the Flanders Marine Institute, by supporting the European Marine Observation and Data Network (EMODNET). Flanders proposed to host the EMODNET Secretariat Office operating for International Institutions or Bodies at the InnovOcean site in Oostende, Belgium, next to the European Marine Board of the European Science Foundation, the UNESCO/IOC Office for IODE and the Flanders Marine Institute (VLIZ). The offer includes besides the installation of offices, the technical and scientific support to (1) construct and operate a single EMODnet Portal to visualize and provide access to the thematic data products, that are being build and managed in the individual thematic EMODnet projects and to (2) organize user services to facilitate and increase access and usage of the EMODnet portal.

This proposal has been accepted by the European Commission, Directorate General for Maritime Affairs and Fisheries on 18 October 2012. A meeting was organised on 23 November 2012 between the European Commission, the coordinators of the different EMODnet lots and the Flanders Marine Institute to discuss the design of the central EMODnet Portal. It was decided that a draft design document would be drafted by the Flanders Marine Institute as discussion note and distributed amongst the EMODnet coordinators and presented to the MODEG group.

This document is the design document for a central EMODnet Portal and describes the technical setup and main functionalities of the central EMODnet Portal. This document is open for comments, suggestions and modifications.

### 1. GENERAL OBJECTIVE

The overall objective of the central EMODnet Portal is to provide the user with an accessible and user friendly web interface providing intelligent access to the data products and links to the data that were used to compile these data products and area available in the different thematic portals. The central EMODnet Portal needs to have high performance, providing fast access to chemical, physical, geological, biological, habitat and bathymetric data products at sea basin scale, produced within the different EMODnet lots. The central EMODnet Portal will also provide general information on all EMODnet projects, promoting the project as one integrated network.

In order to achieve this, we propose to construct i) a robust IT infrastructure to store the thematic data products ii) build a GIS-based web portal providing access to the different thematic data portals and iii) create and populate a website to disseminate the EMODnet, using also different social media.

### 2. CONSTRUCTION IT INFRASTRUCTURE

In order to provide the highest availability and performance of the central EMODnet Portal, we propose to use one common robust IT infrastructure (fig 1), to be used by the different EMODnet portals to store the thematic data products. This approach will allow high performance by setting up multiple server arrays to increase the performance of the geographic queries and will allow to perform spatial queries on multiple data products simultaneously. It is by sharing the same infrastructure that complex spatial queries on combined data products will be made possible. The thematic coordinators will have a direct access to the IT infrastructure and are able to manage the data product directly on the infrastructure.

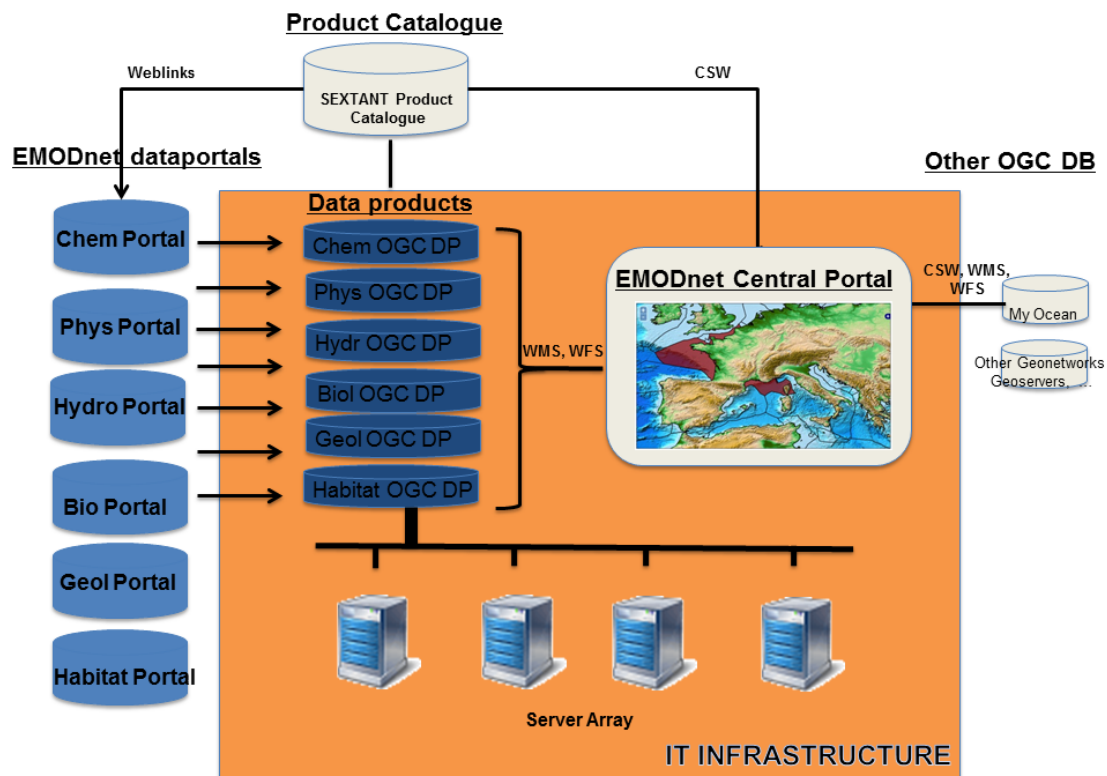


Fig 1: IT infrastructure of central EMODnet Portal and links with thematic portals

## 2.1 Interaction with EMODnet thematic portals & product catalogues

The hosting and development of the thematic EMODnet data portals are managed by the different EMODnet lots. Data management, data access and data downloading will be performed through the thematic portals. The links between the data products, hosted on the central IT infrastructure and the data that were used to compile these products will be made through the SEXTANT product catalogue, providing detailed information about the data product, and links to more information about the product within the thematic portals. The links between the data products and the data (CDI records) that were used to compile these products will be made within the thematic portals. The development and maintenance of the data product catalogue will be managed by EMODNET partner Ifremer. The detailed metadata information about the data products will be accessible from the central EMODnet Portal through CSW. By using common standards for geospatial information, the portal will be able to communicate with other OGC compliant data and metadata (ICES geonetwork, VLIZ geonetwork) portals through WMS, WFS, CSW.

## 3. CONSTRUCTION EMODNET PORTAL

### 3.1 EMODnet Portal

The central EMODnet Portal will provide a user-friendly web interface providing intelligent access to the data products that are compiled by the different thematic portals. The user should be able to search for the different thematic data products, by geographic location, and by geographic region, should be able to visualise the different layers, download the layers and should

be linked back to the data and information that was used to compile the layers. The portal will allow to retrieve compiled information from a specific geographic location or region on the system, provided through the different data products.

## **3.2 Functionalities EMODnet Portal**

The EMODnet central portal will allow the user to perform a spatial query on different data products simultaneously. The user will be able to retrieve bathymetric, geological, seabed habitat, physical, chemical and biological information from a location or an area, at a specific moment in time if relevant. The portal will compile this information and make it downloadable, and provide links to data product catalogues with more information about the individual data products, how they have been created and where on how the original data can be retrieved within the individual portals. This will forward the user to the different thematic data portals. The data products will be visualised through a GIS, based on an open source Javascript Module, allowing to visualise and manipulate the different data products. Since the central EMODnet portal is fully OGC compliant, different data product servers and metadata catalogue servers will be able to communicate with the portal.

### **3.2.1 Data querying and selection**

The user will be able to perform a spatial query on the different data products that are available on the central IT infrastructure. This spatial query can be of the form, 'give me the bathymetry, seabed substrate, seabed habitat type, benthic diversity or nitrate concentration on a specific moment in time from a specific position, or positions or from a specific georeferenced marine regions (an EEZ, a Sea Region, a specific sandbank system). The spatial query will initially focus on a few mature data products from each lot. The spatial querying system allows also to search for data products information from a specific buffer around an area, for example to render all data within 20 miles from the coastline. The querying interface will be constructed to make this selection procedure as intuitive as possible. It will also be possible to search and retrieve meta information from the EMODNET product data catalogue from all data products available in the different lots of EMODNET.

### **3.2.2 Data visualization**

The selected data products will be visualized through a GIS web interface, based on an open source Javascript Module, allowing to manipulate the different data products. The selected geographic location will be visualized (being a region, a coordinate, coordinates or a specific bounding box. The visualized resolution of the data product, will depend on the resolution of the product. It will be possible to provide animations on data products, with a temporal component.

### **3.2.3 Data downloading**

The thematic data products will be available for download. The products can be downloaded as different WMS (gif, geotiff, jpg, pdf, kml, svg, georss) or WFS(gml, shapfile, csv) formats. After performing a spatial, temporal and or thematic query, the data from the selected data products will be aggregated and the information will be made downloadable in a compiled data file. . When selecting an geographic area, information from the data products will be aggregated into specific grid cells with size of the cells controlled by the resolution of the product and if possible also by the users' choice. All downloads will be monitored.

### 3.3 Standards

The Central EMODnet Portal will implement the geospatial standards defined by the OGC (Open Geospatial Consortium). The portal will implement the Web Map Server (WMS) specification, defining a standard protocol for generating cartographic maps over the web and the Web Feature Server (WFS), defining a standard protocol for querying and retrieving vector features over the web. The services are compliant with the INSPIRE view and downloading services. The product metadata catalogue Sextant is also based on the standards of the Open Geospatial Consortium (OGC) and ISO TC211 standards and implements the Catalogue Service for the Web (CSW). This service is compliant with the INSPIRE discovery services and by applying this protocol, Sextant allows access and dissemination of standardized geospatial metadata.

### 3.4 Web services

By adopting geospatial standards (WMS, WFS, CSW) , the EMODnet portal will provide several web services which allow the user for example to have direct access to the geographic data, maps and metadata from a GIS desktop or for online applications. Additional web services will be developed allowing to upload your file with geographic coordinates and the system will add information derived from the data products to the uploaded file. This will be made possible by implementation of the platform-independent SOAP/WSDL standard.

## 4. CONSTRUCTION EMODNET WEBSITE

An EMODnet website will be set up and populated with information on the overall EMODnet initiative. The website will contain detailed information and links to the different thematic portals and will give an overview of the European Marine Observation and Data Network, and its partner institutes. The website will also make use of social media (Facebook, Twitter, LinkedIn) to announce news and disseminate information. The website will embed the Central EMODnet Portal and will be available from <http://www.emodnet.eu>. All web statistics will be monitored .