Identification Common use cases used as a roadmap for

developing the Central EMODnet Portal

Discussion document

prepared by the Flanders Marine Institute

Background Proposal

The design document for the Central EMODnet Portal was drafted by VLIZ, as an incentive to start discussions on the design of the central Portal. The documents was open for comments and suggestions and communicated to the different portal coordinators and MODEG. The feedback can be summarized as follows:

1. **Identify common use cases as a roadmap for developing the Portal. These use cases should be targeting different EMODnet end-users, highlighting the added value of common analysis amongst different thematic data products.**

2. It was highlighted that different existing thematic data product portals have different tools, should be maintained and cannot be replaced by one central portal

3. There is a need for a strong central portal, which attracts more end-users to EMODnet and EMODnet portals (including the use of different social media…)

4. The central Portal should give clear overview of available products

5. The central portal webpage should include a section on different vocabularies used within the different thematic portals and should include a section on the data policies of EMODnet and its subcomponent data systems.

6. The Central Portal should be user friendly.

7. The central portals should include a section or a use case dealing with Coastal data

1. USE CASES INTRODUCTION

Use Cases represent the conceptual interactions between the Users and the Portal. In EMODnet we will put together a few use cases using data from different lots and highlight the added value of bringing thematic data together. By generating the functional requirements of the Portal, these use cases will be used as a blueprint for the actual technical development.

This documents proposes three different use cases. Each of the different use cases frames within a different policy context, makes use of data and data products of at least two thematic portals and functions as a driver for the development of a specific set of functionalities at the central portal.

1.1   Use case 1: Combined output from different data products

<table>
<tr><td colspan="7" align="center">Query EMODnet data products simultaneously</td></tr>
<tr><td>What it is</td><td colspan="6">Retrieve data from multiple data products via one single interface</td></tr>
<tr><td>In what context</td><td colspan="6">For providing Fisheries Authorities with information relevant to perform fisheries assessments</td></tr>
<tr><td>What the output will be</td><td colspan="6">The output is a list of values for a given coordinate point or list of points. For a given coordinate (e.g. current position of a vessel), the system will return a list of the required parameters (depth, seabed substrate, seabed habitat, mean temperature/salinity for a given time interval or depth, fishing zone, national jurisdiction, protected area etc).</td></tr>
<tr><td>What are the technical specifications</td><td colspan="6">This functionality will make use and integrate geographic webservices provided by the different thematic lots. It will provide the user with a tool that easily integrates the output from the different thematic products. The tool will be based upon OGC complaint webservices – and requires more specifically operational Web Feature Service (WFS) and Enhanced Web Map Service (WMS) that support the "GetFeatureInfo". Once the tool is operational, new OGC compliant data products, developed within the context of EMODnet can be added to this tool</td></tr>
<tr><td rowspan="8">What data layers we need – what feature – in what format– assess the status</td><td>Source</td><td>WMS layer Name</td><td>*</td><td>Status WMS/WFS</td><td>What is needed?</td><td>Min. Required Fields</td></tr>
<tr><td>Hydrography</td><td>emodnet:mean_multicolour</td><td>yes</td><td>Provides RGB colour instead of depth value</td><td>Depth values</td><td>Latitude, longitude, depth</td></tr>
<tr><td>Geology</td><td>EMODNET-Geology Seabed substrate</td><td>yes</td><td>OK</td><td></td><td>Latitude, longitude, substrate</td></tr>
<tr><td>Biology</td><td>Emodnet: Species Group uniquespecies</td><td>yes</td><td>Data grouped in 3x3 degrees grid referring to one month</td><td>Species occurrence / abundance queryable by date in finer resolution</td><td>Latitude, longitude, species name, abundance /presence, date</td></tr>
<tr><td>Physics</td><td>stazioni</td><td></td><td>Only name of station, no data</td><td>Data per coordinate point</td><td>Latitude, longitude, date, depth, value</td></tr>
<tr><td>Seabed Habitats</td><td>Predicted Habitats Seamap</td><td>yes</td><td>OK</td><td></td><td>Latitude, longitude, value</td></tr>
<tr><td>Chemistry</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Marineregions.org**</td><td>EEZ, FAO Fishing Area Ices, Statistical Area, Natura2000</td><td>yes</td><td>OK</td><td></td><td>Latitude, longitude, value</td></tr>
</table>

Output Example:

Coordinate	Average Depth (m)	Seabed Substrate	Seabed Habitat	Cod mean abundan	Nitrates (5m -µmol/L)	ICES Statitical Area	EEZ
2,5461 51,7123	23,0	mud to sandy mud	Infralittoral mixed	0,37	16,1	XIIb	French EEZ
3,7461 54,7123	27,4	mud	Circalittoral sandy	0,45	34,1	VIIa	Dutch EEZ
6,5461 55,7123	87,5	course-grained sedi	Circalittoral muddy	1,89	27,1	VIb	Danish EEZ

* **Supports Identify feature (click to view info)**

**: is not EMODnet portal, but can be added as it is OGC complaint and provides relevant information in this context

1.2 Use case 2: Benthic Index Calculation (BEQI)

<table>
<tr><td colspan="2" align="center">**Run online calculations on EMODnet data products**</td></tr>
<tr>
<td>What it is</td>
<td>The Benthos Ecosystem Quality Index (BEQI) is a biological index that is used to assess the state of soft-sediment benthic habitats. The index can be calculated at ecosystem, habitat and community level and primarily aims at providing a signal that is capable of showing significant deviations from a defined reference state.</td>
</tr>
<tr>
<td>In what context</td>
<td>The Benthos Ecosystem Quality Index (BEQI) is a biological index that is used to report on the state of soft-sediment benthic habitats of marine, coastal and transitional waters for the Marine Strategy Framework Directive and the Water Framework Directive.</td>
</tr>
<tr>
<td>What the output will be</td>
<td>A tool providing the user the possibility to assess the state of ecosystems, habitats and communities for different European seabasins by comparing their data with an reference condition derived from observation data collected within EMODnet. The aim is to provide the possibility to assess the status of habitats at sea basin level.</td>
</tr>
<tr>
<td>What are the technical specifications</td>
<td>Users will be able to run calculations on the data and data products produced by the different lots. The BEQI index will be used as an example, but the functional developments can be reused to calculate other indices on EMODnet data and data products as a lot of different member states defined those type of indices under the MSFD and WFD.</td>
</tr>
</table>

	Source	WMS layer Name	Min. Required Fields	*	Status WMS	What is needed?
What data layers we need – what feature – in what format– assess the status	Seabed Habitats	Predicted Habitats Seamap	Latitude, Longitude, value	yes	OK	
	Geology	EMODNET-Geology Seabed substrate	Latitude, longitude, substrate	yes	OK	
	Biology		Latitude, Longitude, Taxonomic data Density (biomass is optional)			Biological reference datasets for seabed habitat at European sea level containing density, biomass and taxonomic data
	Human activities				no	Data layers on different pressures on the marine environments, to link the indices with human pressures

Output Example:

Habitat	Reference surface area (m² or ha)	Assessment surface area (m² or ha)	Level 2 EQR score	Calculate
Mussel bank	45	2	**BAD** (0.036)	Add Row
Biogenic Reef	35	17	**MODERATE** (0.485714)	Delete Row
Infralittoral rock	25	23	**HIGH** (0.92)	Delete Row

>> Download comma separated file (.csv)

Reset

* **Supports Identify feature**

1.3 Use case 3: Coastal data

<table>
<tr>
<td colspan="7" align="center">Implement spatial filters on data products</td>
</tr>
<tr>
<td>What it is</td>
<td colspan="6">The EMODnet Central Portal will allow the user to browse and select for coastal data processed by different thematic lots. This will require the possibility to browse for data measured along the national baseline or coastline.</td>
</tr>
<tr>
<td>In what context</td>
<td colspan="6">A key challenge for good implementation of Coastal Management Plans is the availability and accessibility of good quality coastal data. The terms of reference of the thematic EMODnet projects highlight in this context the importance to focus also on specific coastal data.</td>
</tr>
<tr>
<td>What the output will be</td>
<td colspan="6">Specific coastal dataproducts will be developed under phase 2: rates of sedimentation and erosion, coastal typology, high resolution bathymetry. The central portal should be able to combine these dataproducts, and provide the functionality to select these data, as measured from a distance from the national baseline or coastline</td>
</tr>
<tr>
<td>How to implement this – what the functionalities will be</td>
<td colspan="6">This functionality will allow to perform complex spatial queries on dataproducts. Essential for this is to have spatial information on the coastline and on national baseline.</td>
</tr>
<tr>
<td rowspan="7">What data layers we need – what feature – in what format– assess the status</td>
<td>Source</td>
<td>WMS layer Name</td>
<td>Min. Required Fields</td>
<td>*</td>
<td>Status WMS</td>
<td>What is needed?</td>
</tr>
<tr>
<td>Hydrography</td>
<td></td>
<td>Latitude, longitude, high resolution depth at coast</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geology</td>
<td>EMODNET-Geology</td>
<td>Latitude, longitude, sedimentation, erosion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biology</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coastal data layer</td>
</tr>
<tr>
<td>Chemistry</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coastal data layer</td>
</tr>
<tr>
<td>EEA**</td>
<td></td>
<td>European Coastline</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marineregions.org**</td>
<td>Marineregions.org</td>
<td>National baseline</td>
<td>yes</td>
<td>OK</td>
<td></td>
</tr>
<tr>
<td colspan="7">Possible Output

</td>
</tr>
</table>
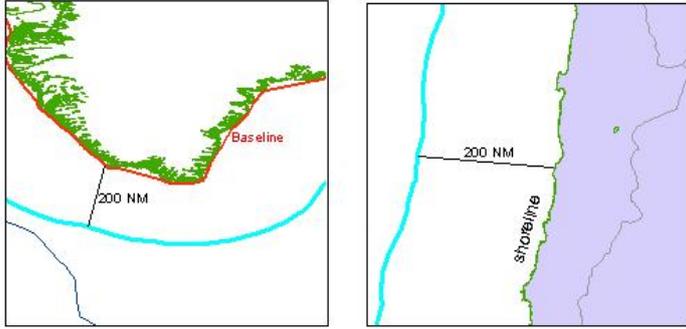
*Supports Identify feature (click to view info)
**: is not EMODnet portal, but contains critical data to develop functionality

2. REQUIREMENTS FROM PROJECTS

The EMODnet Central Portal will only be able to combine data if the web services are working properly. Thus, each lot must be able to supply the EMODnet central portal with fully functional, OGC-compliant, Web Services (WMS and/or WFS). In order to achieve this, lots products and services should be tested and rated following directives agreed upon in advance. Bellow, we describe possible options.

2.1 Overview of available Web Services

The table below gives an overview of the currently available WMS links. An OGC-compliant WMS link has a standardised structure:
http://hostname/path?SERVICE=WMS&REQUEST=GetCapabilities&VERSION=1.3.0
However, EMODnet's links are not as standardised, different lots have different servers and different parameters. This is not a problem per se, as the links can be stored in a structured way (standardising the links) but there are some fundamental parameters that should be in place: Data per coordinate point – GetFeatureInfo ; Map – GetMap ; Metadata – metadataURL linking to the metadata. Having maps/data transmitted via web from a server to a desktop does not necessarily mean the service is OGC compliant, and even if it is, the data that is being transmitted must be relevant.

Overview: different EMODnet WMS links

Hydrography	http://admin.n4m5.eu/geoserver/wms?Request=getCapabilities&
Geology	http://geomaps2.gtk.fi/ArcGIS/services/EMODNET-Geology/MapServer/WMSServer?language=eng&
Chemistry	http://gher-diva.phys.ulg.ac.be/emodnet/Python/web/plots?
Seabed habitats	http://213.122.160.71/scripts/mapserv.exe?map=D:\Websites\EUSeamap\map\ExternalEUSeamapWMS.map&
Biology	http://geo.vliz.be/geoserver/Emodnet/wms?Request=getCapabilities&
Physics	http://151.1.25.219:8080/gisclient/services/ows.php?project=ett&map=stazioni&request=getcapabilities&service=WMS&

2.2 WMS/WFS Testing

Testing: http://cite.opengeospatial.org/teamengine/
The test available from the link above provides an online testing facility as part of the OGC Compliance Program, it is meant for those seeking OGC certification, but it can be used by EMODnet as a platform to ensure that the Web Services are up to a minimum required level of operation.

2.3 WMS/WFS Rating

After an assessment of the OGC services, we should identify and implement the steps to have at least a three star rating – definition of the Star Ratings inspired in OneGeology – where we have the GetFeatureInfo parameter, meaning the WMS is "queryable" and data products can be combined – but aiming to go for an operational WFS (four star) with metadata links. Below an explanations of the OGC certification.

Star Rating	Level of service attained	Technical and service parameters to be met	EMODnet products
One star	Basic Web Map Service (WMS)	Web Map Service (WMS) supporting "GetCapabilities" and "GetMap" requests to deliver map images.	●
Two star	Upgraded Web Map Service (WMS)	▪ One Star requirements met. ▪ Map legend provided. ▪ Minimum metadata available (contact information, abstract, access constraints, cataloguing keywords).	▪
Three star	Enhanced Web Map Service (WMS)	▪ Two Star requirements met. ▪ "GetFeatureInfo" (at least text/html format) request supported. ▪ Web Map Service (WMS) v. 1.3.0 supported. ▪ Additional keywords to make GetCapabilities response ISO19115 core compliant ▪ Clear statement of use relating to data, including licence and charging details (where appropriate). ▪ Access to data must be transparent, simple and fair to all.	▪
Four star	Web Feature Service (WFS)	▪ Three Star requirements met. ▪ "MetadataURL" for each WMS layer and WFS feature type should point to a metadata record conforming at least to the metadata profile. ▪ Web Feature Service (WFS) at a minimum v. 1.1.0.	▪