Central EMODnet Portal
Process, design, development use-cases & services

EMODnet
European Marine Observation and Data Network

EMODnet

1. Recap and updates from the entry portal since last meeting

Process: design document, feedback and follow up

2. Landing page
3. Entry portal requirements - development of uses cases
4. EMODnet webservices

EMODnet

EMODnet Portal:

Part 1 – Process

EMODnet

Trajectory & Timeline

23 November 2012: A **meeting** was organised 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 a discussion note and distributed amongst the EMODnet coordinators and presented to the MODEG group.

EMODnet

Trajectory & Timeline

07 March 2013:	Proposal presented and discussed at MODEG meeting
31 May 2013:	Feedback from all coordinators received
5 July 2013:	First draft of the Website presented to MODEG & DIKE

EMODnet

Design document central EMODnet portal

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**.

EMODnet

General Objective

The overall objective of the central EMODnet Portal is to **provide the user with an accessible and user friendly web interface providing access to the data products and links to the data that were used to compile these data products and are 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**.

7

EMODnet

EMODnet

General Objective

In order to achieve this, we proposed to:

i) create and populate a website to disseminate the EMODnet, using also different social media.

ii) build a GIS-based web portal providing access to the different thematic data products and

iii) host a robust IT infrastructure to store the thematic data products (web services)

8

EMODnet

EMODnet

Feedback received

- ✓ EMODnet Geology
- ✓ EMODnet Seabed Habitats
- ✓ EMODnet Chemistry
- ✓ EMODnet Bathymetry
- ✓ EMODnet Physics
- ✓ EMODnet Biology

9

EMODnet

EMODnet

Feedback received

- ✓ 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.
- ✓ It was highlighted that different existing thematic data product portals have different tools, should be maintained and cannot be replaced by one central portal
- ✓ 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…)
- ✓ The central Portal should give clear overview of available products
- ✓ 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.

10

EMODnet

EMODnet

Feedback received

- ✓ The Central Portal should be user friendly.
- ✓ The central portals should include a section or a use case dealing with Coastal data

EMODnet

EMODnet Portal:

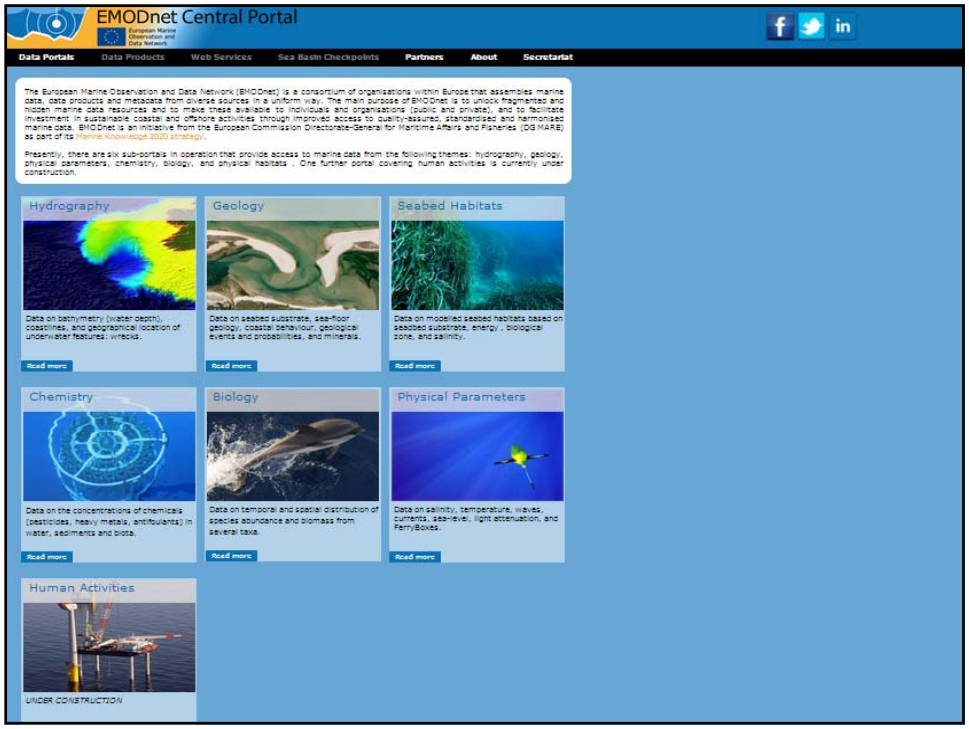
Part 2 – Landing page

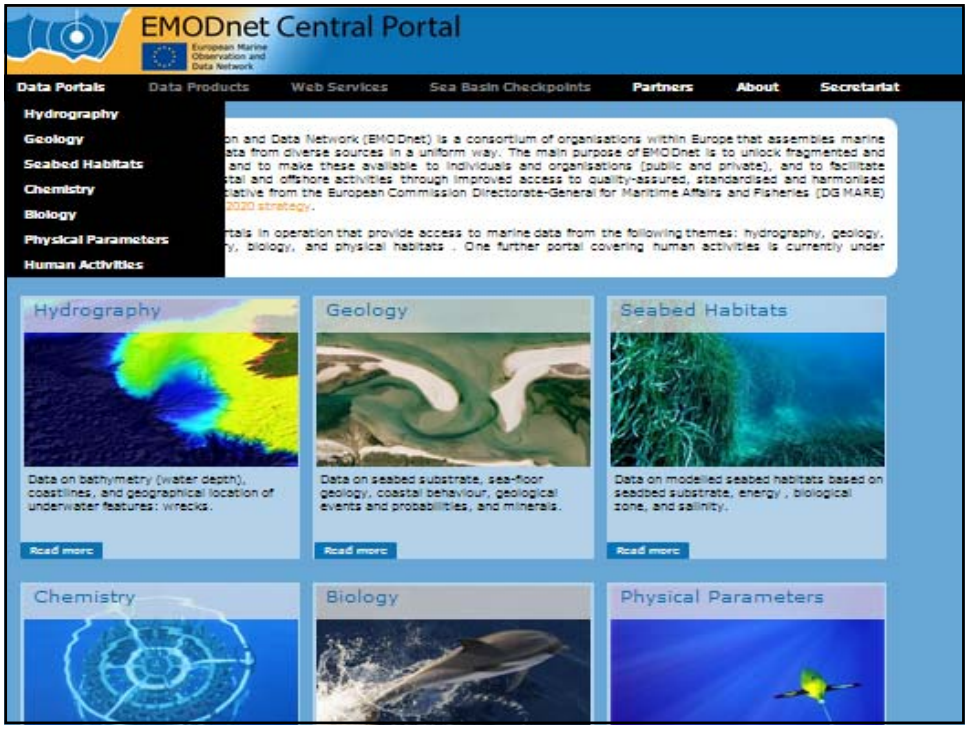
EMODnet

Construction EMODnet Central Portal

EMODnet website: currently under development

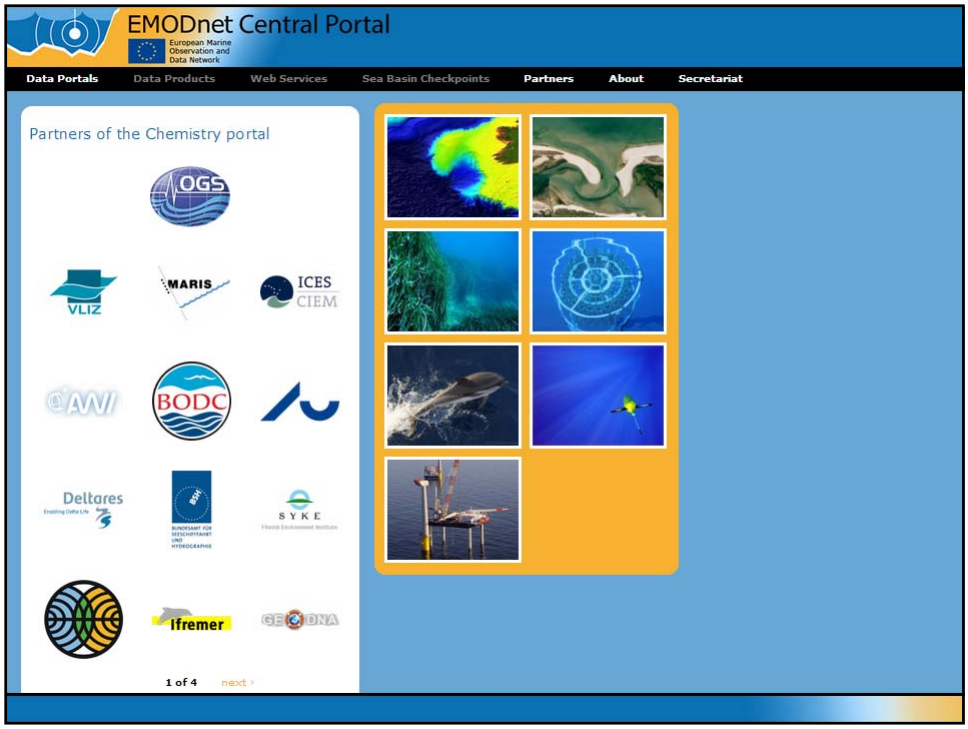
- website will be set up and populated with information on the overall EMODnet initiative.
- The website will contain detailed information and links to the different thematic portals and will give an overview of the European Marine Observation and Data Network, and its partner institutes.
- The website 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

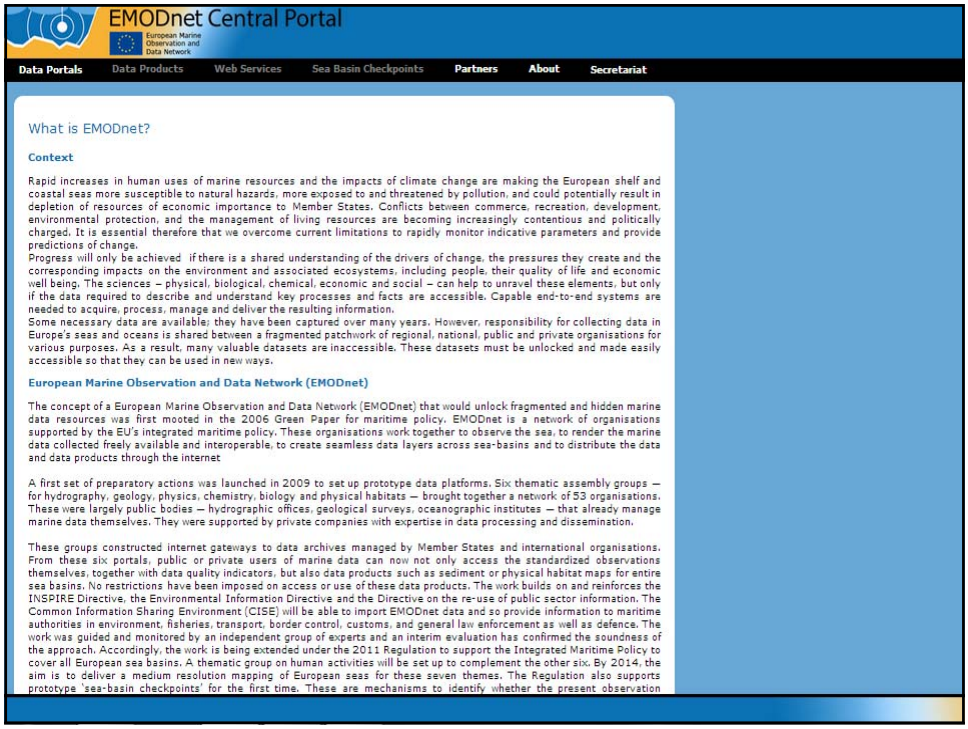


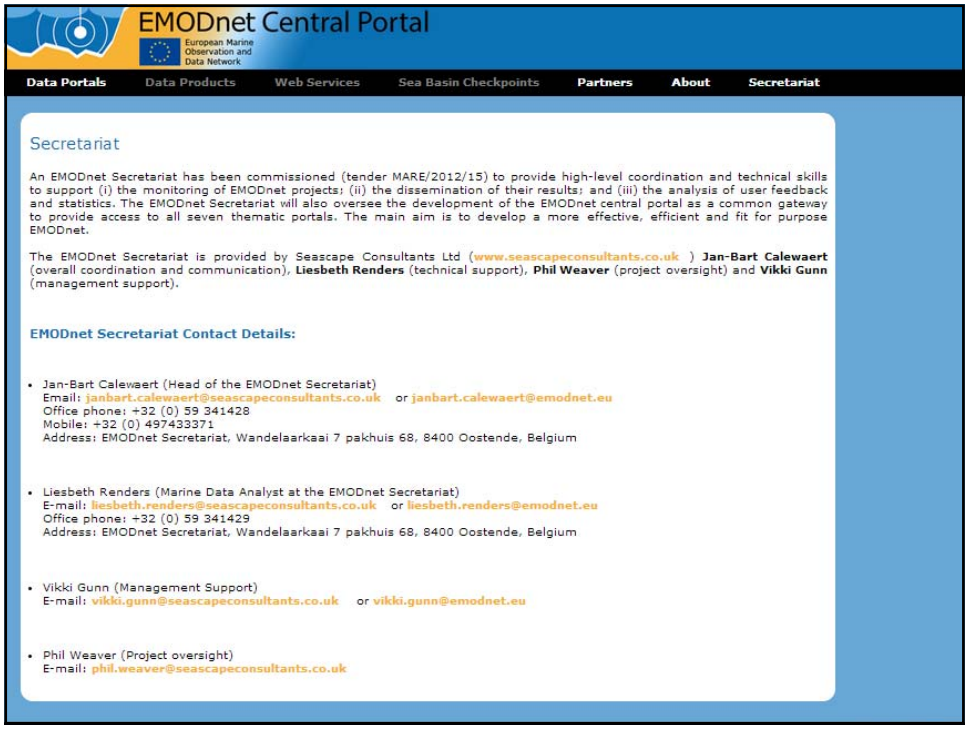

EMODnet Central Portal
European Marine Observation and Data Network
Data Portals
Data Products
Web Services
Sea Basin Checkpoints
Partners
About
Secretariat
Hydrography
Geology
Seabed Habitats
Chemistry
Biology
Physical Parameters
Human Activities
Hydrography
Data on bathymetry (water depth), coastlines, and geographical location of underwater features: wrecks.
Read more
Geology
Data on seabed substrate, sea-floor geology, coastal behaviour, geological events and probabilities, and minerals.
Read more
Seabed Habitats
Data on modelled seabed habitats based on seabed substrate, energy, biological zone, and salinity.
Read more
Chemistry
Biology
Physical Parameters

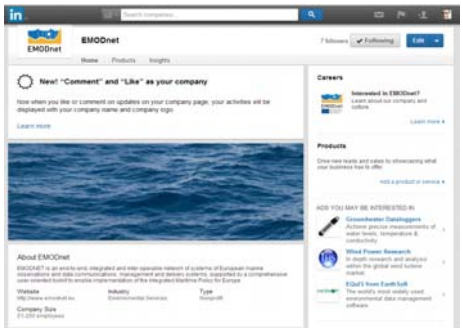
EMODnet Central Portal
European Marine Observation and Data Network
Data Portals
Data Products
Web Services
Partners
About
Help
ACCESS THE SEABED HABITATS PORTAL
Seabed Habitats
Objectives
The general objective of the EUSeaMap 2 project is to create a homogeneous seabed habitat map covering all European seas. The main component is to extend the EUNIS (European Nature Information System) broadscale seabed habitat map developed under the EUSeaMap project for the Preparatory action for EMODnet to cover all European basins, with enhanced validation, and to complement this with the collation of any survey habitat maps available from Member States, their translation into EUNIS, and their storage in an attractive portal designed to meet users' needs fully and effectively.
see the specific Objectives
Data Sources & Methodology
Classification
The prerequisite to embarking on work on any of the basins under consideration is to assess their suitability with regard to EUNIS classification. Experience has shown that as EUNIS was initially born in the North and Celtic Seas that are entirely maritime in character, its extension to other Atlantic basins could be achieved merely by adding a few local classes.
read more
Primary data and intermediate layers
The expansion of EUSeaMap to cover the remaining basins will be undertaken by mobilising data capture from various sources. There are various strands of work detailed as follows. Broad-scale map is about the collation of primary data layers. These primary data layers may either be used directly as model input, or to produce intermediate layers, as is the case with bathymetry, the derivatives of which can provide deep sea zone depth boundaries. The Project also intends to collate historic detailed habitat maps among the Partnership and priority habitats seagrass beds of Posidonia and Cymodocea.
read more about the primary layers
Broad-scale map
Broad-scale map is about the collation of primary data layers. These primary data layers may either be used directly as model input, or to produce intermediate layers, as is the case with bathymetry, the derivatives of which can provide deep sea zone depth boundaries. As has been stated earlier, for the broad-scale strand of work, the Project relies heavily on timely delivery by the other Lots, so keeping in close contact with all Lots and monitoring timelines is of paramount importance. However, data products from the other lots are still being developed, therefore, we propose relying on default solutions to ensure timely delivery of a preliminary version. Later, in Year 2
Leading Partner
Ifremer
Total no. of Partners
13
Data available
Input layers
Seabed Substrate
Biological zones
Energy
Salinity
Raw data
Light
Bathymetry
Confidence
Boundaries
Data sources
Budget
Phase I €800 000
Phase II €1 390 000
More Info

EMODnet Central Portal
European Marine Observation and Data Network
Data Portals
Data Products
Web Services
Sea Basin Checkpoints
Partners
About
Secretariat
Per Country
Per Portal
Partners from FRANCE
Ifremer
French Research Institute for Exploitation of the Sea
View the EDMO record
SHOM
Service Hydrographique et Océanographique de la Marine
View the EDMO record
brgm
French Geological Survey
No EDMO record available
17
France
EMODnet


EMODnet Central Portal
European Marine Observation and Data Network
Data Portals
Data Products
Web Services
Sea Basin Checkpoints
Partners
About
Secretariat
Partners of the Chemistry portal
OGS
VLIZ
MARIS
ICES CIEM
AWI
BODC
Deltares
SYKE
Ifremer
GEOMAR
1 of 4
next ›


EMODnet Central Portal
European Marine Observation and Data Network
Data Portals
Data Products
Web Services
Sea Basin Checkpoints
Partners
About
Secretariat
What is EMODnet?
Context
Rapid increases in human uses of marine resources and the impacts of climate change are making the European shelf and coastal seas more susceptible to natural hazards, more exposed to and threatened by pollution, and could potentially result in depletion of resources of economic importance to Member States. Conflicts between commerce, recreation, development, environmental protection, and the management of living resources are becoming increasingly contentious and politically charged. It is essential therefore that we overcome current limitations to rapidly monitor indicative parameters and provide predictions of change.
Progress will only be achieved if there is a shared understanding of the drivers of change, the pressures they create and the corresponding impacts on the environment and associated ecosystems, including people, their quality of life and economic well being. The sciences – physical, biological, chemical, economic and social – can help to unravel these elements, but only if the data required to describe and understand key processes and facts are accessible. Capable end-to-end systems are needed to acquire, process, manage and deliver the resulting information.
Some necessary data are available; they have been captured over many years. However, responsibility for collecting data in Europe's seas and oceans is shared between a fragmented patchwork of regional, national, public and private organisations for various purposes. As a result, many valuable datasets are inaccessible. These datasets must be unlocked and made easily accessible so that they can be used in new ways.
European Marine Observation and Data Network (EMODnet)
The concept of a European Marine Observation and Data Network (EMODnet) that would unlock fragmented and hidden marine data resources was first mooted in the 2006 Green Paper for maritime policy. EMODnet is a network of organisations supported by the EU's integrated maritime policy. These organisations work together to observe the sea, to render the marine data collected freely available and interoperable, to create seamless data layers across sea-basins and to distribute the data and data products through the internet
A first set of preparatory actions was launched in 2009 to set up prototype data platforms. Six thematic assembly groups — for hydrography, geology, physics, chemistry, biology and physical habitats — brought together a network of 53 organisations. These were largely public bodies — hydrographic offices, geological surveys, oceanographic institutes — that already manage marine data themselves. They were supported by private companies with expertise in data processing and dissemination.
These groups constructed internet gateways to data archives managed by Member States and international organisations. From these six portals, public or private users of marine data can now not only access the standardized observations themselves, together with data quality indicators, but also data products such as sediment or physical habitat maps for entire sea basins. No restrictions have been imposed on access or use of these data products. The work builds on and reinforces the INSPIRE Directive, the Environmental Information Directive and the Directive on the re-use of public sector information. The Common Information Sharing Environment (CISE) will be able to import EMODnet data and so provide information to maritime authorities in environment, fisheries, transport, border control, customs, and general law enforcement as well as defence. The work was guided and monitored by an independent group of experts and an interim evaluation has confirmed the soundness of the approach. Accordingly, the work is being extended under the 2011 Regulation to support the Integrated Maritime Policy to cover all European sea basins. A thematic group on human activities will be set up to complement the other six. By 2014, the aim is to deliver a medium resolution mapping of European seas for these seven themes. The Regulation also supports prototype 'sea-basin checkpoints' for the first time. These are mechanisms to identify whether the present observation


EMODnet Central Portal
European Marine Observation and Data Network
Data Portals
Data Products
Web Services
Sea Basin Checkpoints
Partners
About
Secretariat
Secretariat
An EMODnet Secretariat has been commissioned (tender MARE/2012/15) to provide high-level coordination and technical skills to support (i) the monitoring of EMODnet projects; (ii) the dissemination of their results; and (iii) the analysis of user feedback and statistics. The EMODnet Secretariat will also oversee the development of the EMODnet central portal as a common gateway to provide access to all seven thematic portals. The main aim is to develop a more effective, efficient and fit for purpose EMODnet.
The EMODnet Secretariat is provided by Seascape Consultants Ltd (www.seascapeconsultants.co.uk) Jan-Bart Calewaert (overall coordination and communication), Liesbeth Renders (technical support), Phil Weaver (project oversight) and Vikki Gunn (management support).
EMODnet Secretariat Contact Details:
Jan-Bart Calewaert (Head of the EMODnet Secretariat)
Email: janbart.calewaert@seascapeconsultants.co.uk or janbart.calewaert@emodnet.eu
Office phone: +32 (0) 59 341428
Mobile: +32 (0) 497433371
Address: EMODnet Secretariat, Wandelaarkaai 7 pakhuis 68, 8400 Oostende, Belgium
Liesbeth Renders (Marine Data Analyst at the EMODnet Secretariat)
E-mail: liesbeth.renders@seascapeconsultants.co.uk or liesbeth.renders@emodnet.eu
Office phone: +32 (0) 59 341429
Address: EMODnet Secretariat, Wandelaarkaai 7 pakhuis 68, 8400 Oostende, Belgium
Vikki Gunn (Management Support)
E-mail: vikki.gunn@seascapeconsultants.co.uk or vikki.gunn@emodnet.eu
Phil Weaver (Project oversight)
E-mail: phil.weaver@seascapeconsultants.co.uk



EMODnet

EMODnet Portal:

Part 3 – Use case

EMODnet

Possible Uses Cases

- Use Cases will be used as a roadmap for developing the Portal
- Highlight added value of bringing thematic data together
- Generate functional requirements of portal
- Possible link with seabasin checkpoints?
- Scientific – or user need driven
- Through working group with coordinators of the different lots and the Secretariat

EMODnet

Uses Case I

- Combined output from different data products: **Query EMODnet data products simultaneously**
- What it is: Retrieve data from multiple data products via one single interface
- In what context: For providing Fisheries Authorities with information relevant to perform fisheries assessments
- What the output will be 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).

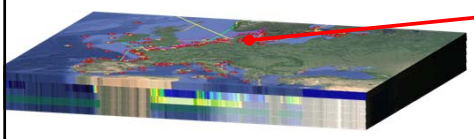
EMODnet

Uses Case I

- 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

EMODnet

Use Case I: Query products simultanuously



Retrieve Data from specified coordinates at a given time or for a time interval

Physical Parameters (temperature, salinity)

Bathymetry

Seabed Substrate

Marine Region (ICES, Protected Area)

Species Abundance

Coordinate	Average Depth (m)	Seabed Substrate	Seabed Habitat	Cod mean abunda	Nitrates (5m -µmol/L)	ICES Statitical Area	EEZ
2,546151,7123	29,0	mud to sandy mud	Infralittoral mixed	0,37	16,1	XIIb	French EEZ
3,746154,7123	27,4	mud	Circalittoral sandy t	0,45	34,1	VIIa	Dutch EEZ
6,546133,7123	87,5	coarse-grained sedi	Circalittoral muddy	1,89	27,1	VIb	Danish EEZ

EMODnet

Uses Case 2: Benthic Index Calculation (BEQI)

- **Run online calculations on EMODnet data products**

- **What it is** 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.
- **In what context** 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.

27

EMODnet

EMODnet

Uses Case 2: Benthic Index Calculation (BEQI)

- What the output will be: 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.
- What are the technical specifications: 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.

28

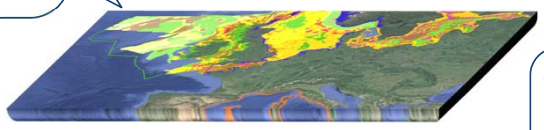
EMODnet

EMODnet

Use Case II: Run online calculations on EMODnet data products

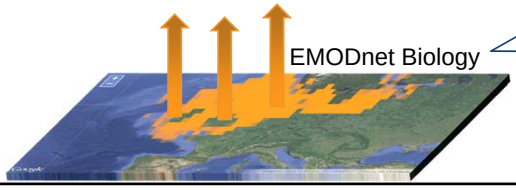
Seabed Substrate
Biological Zones
Energy
Salinity
Light
Bathymetry

EMODnet Modelled Seabed Habitats



Calculation of BEQI index for specific modelled seabed habitats at sea basin scale

EMODnet Biology



29

EMODnet

EMODnet

Uses Case 3: Coastal data

- **Implement spatial filters on data products**

- What it is: 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.
- In what context: 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.

30

EMODnet

EMODnet

Uses Case 3: Coastal data

- What the output will be 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
- How to implement this – what the functionalities will be: This functionality will allow to perform complex spatial queries on dataproducts. Essential for this is to implement spatial indexes on the EMODnet dataproducts.

31

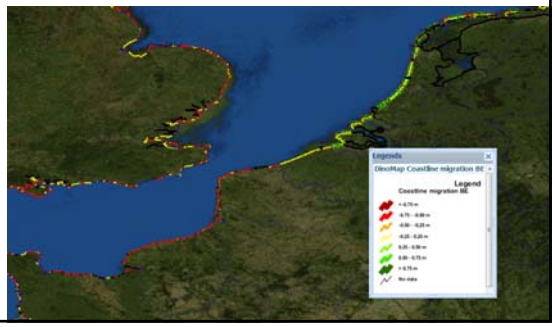
EMODnet

EMODnet

Use Case II: Coastal data

supporting the assessment of coastal status and trends

- EEA European coastline
- EMODnet Bathymetry (depth)
- EMODnet Geology
  - Coastline Migration, Sediment Accumulation rate, Seabed Substrate
- EMODnet Physics
  - Tides, Waves, wind
- Marine regions



32

EMODnet

EMODnet

EMODnet Portal:

Part 4 – EMODnet webservices

EMODnet

Web Map Service (WMS)

- The OpenGIS® Web Map Service Interface Standard (WMS) provides a simple HTTP interface for requesting geo-registered map images from one or more distributed geospatial databases.
- A WMS request defines the geographic layer(s) and area of interest to be processed. The response to the request is one or more geo-registered map images (returned as JPEG, PNG, etc) that can be displayed in a browser application.
- The interface also supports the ability to specify whether the returned images should be transparent so that layers from multiple servers can be combined or not.

EMODnet

Web Map Service & Web Feature Service Operations

- **GetCapabilities**

to obtain service metadata, which is a machine-readable (and human-readable) description of the server's information content and acceptable request parameter values.

- **GetMap**

The GetMap operation returns a map. Upon receiving a GetMap request, a WMS shall either satisfy the request or issue a service exception.

EMODnet

Web Map Service vs Web Feature Service

- **GetFeatureInfo (Web Map Service)**

The GetFeatureInfo operation is designed to provide clients of a WMS with more information about features in the pictures of maps that were returned by previous Map requests. The canonical use case for GetFeatureInfo is that a user sees the response of a Map request and chooses a point (I,J) on that map for which to obtain more information.

- **GetFeature (Web Feature Service)**

A web feature service must be able to service a request to retrieve feature instances. In addition, the client should be able to specify which feature properties to fetch and should be able to constrain the query spatially and non-spatially.

EMODnet

Web Map Service vs Web Feature Service

Example of an output of a **WMS** from Biology
GetFeatureInfo – Layer is queryable
Output is a list of all data defined in the WMS for the considered area– C6

Annual mean abundance of North Atlantic/North Sea CPR standard areas for dinoflagellates 1958-2006

	Attributes		
Properties	CPR Area	Year	Annual mean abundance (individuals/3m³)
	C6	1963	15472.9904296
	C6	1964	2538.02910053
	C6	1967	7285.61145957
	C6	1992	24656.8039798
	C6	1993	103121.761241

EMODnet

Web Map Service vs Web Feature Service

Example of an output of an hypothetical **WFS** from Biology
GetFeature – Layer is queryable and Data are queryable
Output is a value per coordinate point.
EMODnet Central Portal is able to: **1.** define what attributes to receive **2.** define a filter
These properties are only possible using **WFS!**

Annual mean abundance of North Atlantic/North Sea CPR standard areas for dinoflagellates 1958-2006

	Attributes		
Entries	CPR Area	Year	Annual mean abundance (individuals/3m³)
	C6	1963	
	C6	1964	
	C6	1992	
	C6	1993	

EMODnet

Existing WMS URLs - GetCapabilities Overview

Lot	URL	
Hydrography	http://admin.n4m5.eu/geoserver/wms?Request=getCapabilities&	☑
Geology	http://geomaps2.gtk.fi/ArcGIS/services/EMODNET-Geology/MapServer/WMSSERVER?Request=getCapabilities&	☑
Chemistry	http://gher-diva.phys.ulg.ac.be/emodnet/Python/web/plots?request=GetCapabilities&service=WMS&version=1.3.0	☑
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&	☑

Web Service Viewer: http://portal.onegeology.org/

EMODnet

WMS - GetMap Overview

Lot	Status	
Hydrography	All maps shown in the Portal are visible via WMS	☑
Geology	All maps shown in the Portal are visible via WMS	☑
Chemistry	All maps shown in the Portal are visible via WMS	☑
Seabed habitats	All maps shown in the Portal are visible via WMS	☑
Biology	Specific data products derived from data available at the portal (e.g. Number of unique species of fish on a 3x3 degrees grid for the European Marine Waters, based on EurOBIS data (september 2009)	☑
Physics	Majority of maps shown in the Portal are visible via WMS	☑

EMODnet

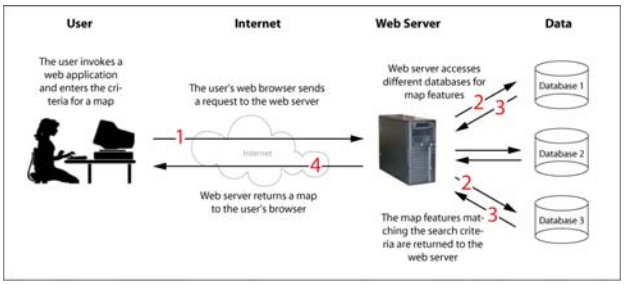
WMS - GetFeatureInfo Overview

Lot	Click to Identify function (queryable WMS)	
Hydrography	Available (but no bathymetry data)	☑
Geology	Available	☑
Chemistry	Unavailable	✖
Seabed habitats	Some layers available	☑
Biology	Available	☑
Physics	Unavailable	✖

EMODnet

EMODnet Central Portal

- Be able to get access to the data via WFS (GetFeature)
- Perform queries over WFS
- Return output in different formats (list of features per coordinate point, list of points or area, Indexes etc.)



EMODnet

Multiple Servers = Multiple Requests

- EMODnet central portal will need to set up a data base with all the URLs for each of the web service. OR
- All the Lots adopt the same server type and use the same attributes

All the web services must provide data per coordinate point.

URL Structure	Description
http://host[:port]/path[?{name[=value]&}]	URL prefix of service operation. [ ] denotes 0 or 1 occurrence of an optional part; {} denotes 0 or more occurrences.
name=value&	One or more standard request parameter name/value pairs as defined for each operation by this International Standard.

id	name	type	url	mapfile	layer	thema	thema_english	imisdasID	description	source	filter	style

EMODnet

Minimum data requirements for the Web Services

	Data (attributes) per Coordinate point
Hydrography	Latitude, Longitude, value (depth)
Geology	Latitude, Longitude, value (seabed substrate, lithology, sediment accumulation rate, stratigraphy, etc.)
Chemistry	Latitude, longitude, value (concentration), date, depth,
Seabed habitats	Latitude, Longitude, value (seabed habitat)
Biology	Latitude, longitude, value (abundance, biomass), species, date
Physics	Latitude, longitude, value (temperature, salinity), depth, date,

EMODnet

Towards operationality of web services

- OCG testing facility
- Rating system similar to OneGeology (aiming at 4* rating)

Star Rating	Level of service attained	Technical and service parameters to be met
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. • Clear statement of use relating to data, including license 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. • Filter Property

EMODnet

Provisional Rating

Lot	Rating	Problem description
Hydrography		Legend available but irrelevant, GetfeatureInfo returns colour instead of depth
Geology		Metadata link, no WFS capabilities
Chemistry		Under development
Seabed habitats		Some layers do not support GetFeatureInfo
Biology		Metadata link, no WFS capabilities
Physics		No Legend, only data available is the Stations Names