



EMODnet



European Marine
Observation and
Data Network

EMODnet Open Conference:

Consolidating the Foundations, Building the Future

20 October 2015, De Grote Post, Oostende (Belgium)

Compilation of abstracts:

Poster contributions

EMODnet marine geology data and its compilation: Harmonisation challenges of an off-shore jigsaw puzzle

K. Asch⁽¹⁾, A. Müller⁽²⁾

⁽¹⁾ Federal Institute for Geosciences and Natural Resources (BGR), Stilleweg 2, 30655 Hannover, Kristine.Asch@bgr.de

⁽²⁾ Federal Institute for Geosciences and Natural Resources (BGR), Stilleweg 2, 30655 Hannover, Alexander.Mirko.Mueller@bgr.de

EMODnet, Europe, Geology, Harmonisation

ABSTRACT

Each geological survey in Europe (and across the world) has, over two centuries, developed its own national way to map, describe and portray their geological map units in its on-shore but also its off-shore regions. In addition, in the last 20 - 30 years also numerous different methods of modelling and describing the digital data have been developed.

The European Commission - and many users- require consistent geological data which does NOT change its attributes or portrayal as it crosses political boundaries. The first geological dataset which realised that not only for on-shore but also off-shore data of Europe is the International Geological Map of Europe and Adjacent Areas (IGME 5000, 2005). The EMODNET geology lot uses this data as a base to compile a much more detailed harmonised and interoperable dataset of Europe's geology- an essential prerequisite required for e.g. any cross-boundary off-shore project.

EMODnet 2s Workpackage 4 (Sea-floor geology, compilation and harmonisation) employs the EC INSPIRE Directive data model and term dictionaries to develop user-friendly guidelines and data collection procedures tables for the EMODnet 2 partners to progress semantic data harmonisation and lay a fundament to solve geometric harmonisation issues. However, harmonisation takes time and effort. Thus, notwithstanding the use of the above material, several challenges remain to be overcome which include the coping with differing scales of the original source data, existence of completely different descriptions of the same geologic unit, dealing with discontinuity of geologic units and structures across political boundaries etc.

This poster will present a selection of WP 4 examples of harmonisation to-date and approaches to tackle the multiple challenges.

The PrimeFish project, developing innovative toolbox to strengthen the sustainability and competitiveness of European seafood

R. Chapela⁽¹⁾, J.L. Santiago⁽¹⁾, M. Fernández⁽¹⁾, V.N. Gunnlaugsson⁽²⁾, G. Stefánsson⁽²⁾

⁽¹⁾ CETMAR, Eduardo Cabello s/n Vigo (Spain), rchapela@cetmar.org

⁽²⁾ Matis, Vínlandsleið 12, 113 Reykjavík (Iceland), gudmundur.stefansson@matis.is

Fisheries, Aquaculture, Seafood market, Prediction tool, Stakeholder participation.

ABSTRACT

The overall aim of PrimeFish project is to improve the economic sustainability of European fisheries and aquaculture sectors. PrimeFish will gather data from individual production companies, industry and sales organisations, consumers and public sources. The data will be related to the competitiveness and economic performance of companies in the sector; this includes data on price development, supply chain relations, markets, consumer behaviour and successful product innovation. The large industry reference group will facilitate access to data on specific case studies. A data repository will be created, and PrimeFish will join the H2020 Open Research Data Pilot to ensure future open access to the data, including the collaboration with other initiatives like EMODnet. The effectiveness of demand stimulation through health, label and certification claims will be evaluated and compared with actual consumer behaviour. PrimeFish will assess the non-market value associated with aquaculture and captured fisheries as well as the effectiveness of regulatory systems and thereby provide the basis for improved societal decision making in the future. The collected data will be used to verify models and develop prediction algorithms that will be implemented into a computerized decision support system (PrimeDSS). The PrimeDSS, together with the underlying data, models, algorithms, assumptions and accompanying user instructions will form the PrimeFish Decision Support Framework (PrimeDSF). The lead users, typically fishermen, aquaculture producers and production companies, will be able to use the PrimeDSF to improve understanding of the functioning of their markets and in setting strategic plans for future production and innovation which in turn will strengthen the long term viability of the European fisheries and aquaculture sectors. This will also benefit consumers, leading to more diversified European seafood products, enhanced added value, novel products and improved information on origin, certification and health claims.

EurOBIS as biogeographic data system for the European Marine Observation and Data Network (EMODnet)

S. Claus⁽¹⁾, F. Souza Dias⁽¹⁾, L. Vandepitte⁽¹⁾, K. Deneudt⁽¹⁾, F. Hernandez⁽¹⁾

⁽¹⁾ Flanders Marine Institute, InnovOcean site, Wandelaarkaai 7, 8400 Oostende, Belgium

geo-referenced environmental data, data portal, data management, long-term sustainability

ABSTRACT

Assembling marine biodiversity data is essential to measure and study the ecosystem health of maritime basins. However, these data are often collected with limited spatial and temporal scope and are scattered over different organizations in small datasets for a specific species group or habitat. Therefore there is a continuous need to assemble these individual datasets, and process them into interoperable biological data products for assessing the environmental state of overall ecosystems and complete sea basins. The biology component of EMODnet dealing with biodiversity data is built upon the international Ocean Biogeographic information System (OBIS). OBIS mission is to facilitate free and open access to, and application of, biodiversity and biogeographic data and information on marine life.

As both initiatives have partly overlapping motivation and objectives, the European Ocean Biogeographic Information System – EurOBIS – was used as the data engine for the biological component of the EMODnet system. This methodology has multiple advantages: i) the technology developed within the framework of EurOBIS could be reused for the development of the EMODnet biology dataportal and vice versa, ii) data collected within the framework of EMODnet biology is directly accessible for users of the EurOBIS database and vice versa, iii) the user communities of both initiatives merge, increasing the overall impact of the system and iv) the overall strategy is cost efficient avoiding duplication of effort. All data go through a number of quality control procedures before they are made available online, assuring a minimum level of quality necessary to put the data to good use. For example, all the taxonomic information is matched with the World Register of Marine Species (WoRMS) and all marine geographic information is checked against the Marine Regions database. At this moment EurOBIS also invests in the development of relevant analysis tools and applications that can run on the EurOBIS data system, while EMODnet biology develops new data products and services illustrating the temporal and geographic variability of occurrences and abundances of European marine protected and indicator species of high relevance for environmental directives and legislations. At this moment the database contains 20,185,551 distribution records from 673 datasets or data providers of which 17,574,221 records are quality controlled. Data are available at <http://www.emodnet-biology.eu/portal> at www.eurobis.org and at www.iobis.org.

Improving quality of heterogeneous data with IndexMed consortium, a challenge for data mining in Mediterranean ecology that can supply EMODnet

R. David⁽¹⁾, J.-P. Féral⁽¹⁾, A.S. Archambeau⁽²⁾, L. Bernard⁽³⁾, C. Blanpain⁽⁴⁾, A. Dias⁽⁴⁾, S. Gachet⁽¹⁾, K.Gilbert⁽⁵⁾, J. Lecubin⁽⁴⁾, M. Leydet⁽¹⁾, I. Mougénot⁽⁶⁾, C. Surace⁽⁷⁾ et la communauté IndexMed

⁽¹⁾ Institut Méditerranéen de Biodiversité et d'Écologie marine et continentale (IMBE), CNRS, IRD, Aix Marseille Université and Université d'Avignon, Station Marine d'Endoume, Chemin de la Batterie des Lions, 13007 Marseille, France, romain.david@imbe.fr, jean-pierre.feral@imbe.fr, alrick.dias@imbe.fr, sophie.gachet@imbe.fr, michelle.leydet@imbe.fr

⁽²⁾ GBIF-France, MNHN, CP48, 43 rue Buffon, 75005 Paris, France, archambeau@gbif.fr, gbif@gbif.fr

⁽³⁾ UMR ArchiMedE, UFR des Sciences Historiques, Palais Universitaire, 9 Place de l'Université, 67084 Strasbourg Cedex, France, loup.bernard@unistra.fr

⁽⁴⁾ Service informatique (SIP), OSU Pythéas, CNRS, Aix Marseille Université, 13007 Marseille, France cyrille.blanpain@osupytheas.fr, julien.lecubin@osupytheas.fr

⁽⁵⁾ Department of Statistics and Operations Research, Universitat Politècnica de Catalunya, Barcelona, Spain, karina.gibert@upc.edu

⁽⁶⁾ Espace-Dev UM, Rue Jean-François Breton, 34000 Montpellier, France, isabelle.mougenot@umontpellier.fr

⁽⁷⁾ Laboratoire d'Astrophysique de Marseille (LAM), CNRS, Aix Marseille Université, rue Frédéric Joliot-Curie, 13013 Marseille, France, christian.surace@lam.fr

Data qualification, standards, data dictionary, thesaurus, ontology, inter-calibration, decentralized information systems, Mediterranean ecology

ABSTRACT

In a production framework of multi-source data in ecology, the equivalence of observation systems problematics and inter-calibration of observers become crucial. Increasingly, the need for integrative multi- or trans-disciplinary approaches becomes necessary, in the study of systems where data output in each discipline is discontinuous, somewhat imprecise and often badly distributed. Yet all the variables of these systems interact in time and at each spatial scale (biotic, abiotic variables, anthropogenic and natural pressures, perceived and rendered services, societal perception, etc.).

Scientific barriers related to data quality are complicated by: (i) their volume and the dynamics of their update, update repositories and standards that can administering the data, (ii) their intrinsic heterogeneity and complexity, especially related to cross biodiversity data and contextual variables, and (iii) the heterogeneity of users, networks of producers actors and their motivations to maintain and supply their information systems.

Work on data quality and their equivalence is a project of IndexMed consortium (<http://www.indexmed.eu>). It involves first the analysis and description of the common elements of each piece of information, and what differentiates them (fields name, formats, update rate, precision, observers or sensors, etc.). These descriptions are added to the data and form a body of criteria used for data mining. Secondly, it is intended to give the equivalence of data, based on data dictionaries and thesaurus. Some database conjunctions allow to deduce others, using first own ontology in each domain and multidisciplinary. From all of these logical relationships, we can deduce new qualifiers that are either new data quality or a way to find common qualifier to heterogeneous data that can serve as an additional descriptor participating to data mining.

KüNO & IOWMETA - Two approaches for building links to national and international data portals

S. Feistel⁽¹⁾, S. Jürgensmann⁽²⁾, N. Koldrack⁽³⁾, N. Schmidt⁽⁴⁾

⁽¹⁾ Leibniz Institute for Baltic Sea Research Warnemünde, Seestraße 15, 18119 Rostock, Germany, susanne.feistel@io-warnemuende.de

⁽²⁾ Leibniz Institute for Baltic Sea Research Warnemünde, Seestraße 15, 18119 Rostock, Germany, susanne.juergensmann@io-warnemuende.de

⁽³⁾ University of Rostock, Chair of Geodesy and Geoinformatics, 18051 Rostock, Germany, nils.koldrack@uni-rostock.de

⁽⁴⁾ Leibniz Institute for Baltic Sea Research Warnemünde, Seestraße 15, 18119 Rostock, Germany, nicole.schmidt@io-warnemuende.de

coastal research, marine research, geo-referenced environmental data, metadata, data portal, data management, long-term sustainability

ABSTRACT

In natural sciences, universities, non-university research institutions as well as state authorities carry out research focused on distinct geographical areas delineated by legal or ecological definitions and are geared at mapping or monitoring of the ecological state. In consequence research data is of very heterogeneous nature. Accessing data and data products is difficult and often times not standardized. KüNO and IOWMETA represent two approaches to facilitate data management and dissemination.

The purpose of the metadata information system IOWMETA is to provide a comprehensive catalogue and central infrastructure node for all kinds of research data at the Leibniz Institute of Baltic Sea Research Warnemünde (IOW). Metadata, describing heterogeneous data, can be standardized and thereby facilitate an international exchange of data and metadata. IOWMETA is based on the ISO 19115 standard and incorporates the Open Source Platform GeoNetwork.

The umbrella project "Coastal Research in the North and Baltic Sea" (KüNO) and its data portal at <http://coastal-research.eu/data.html> aim to integrate and disseminate the scientific outcome of the individual KüNO projects and partner institutions including IOW. Furthermore data and metadata of other projects such as MDI-DE and COSYNA can be harvested via the data portal.

Our poster illustrates the different objectives of both systems in data collection as well as their potential for interaction with each other and partners on a national or international basis, e.g. EMODnet or MDI-DE. KüNO and IOWMETA offer user-friendly tools to gather, provide and access metadata for scientists of varying backgrounds.

OpenEarth Services for EMODnet-Chemistry Data Products

G. Hendriksen⁽¹⁾, G. Santinelli⁽²⁾

⁽¹⁾ Deltares, Boussinesqweg 1, 2629 HV Delft (NL), Gerrit.Hendriksen@deltares.nl

⁽²⁾ Deltares, Boussinesqweg 1, 2629 HV Delft (NL), Giorgio.Santinelli@deltares.nl

Dynamic Visualization, Web Services, EMODnet Chemistry, ODV

ABSTRACT

EMODnet chemistry provides users with all kinds of products covering a variety of chemical data, data products and metadata. In order to enrich the present collection and services, Deltares implemented various dynamic plotting services using internationally accepted standards for information and data exchange (i.e. the OGC services WMS, WFS and WPS). To this end, data products from regional leaders were transformed into a database.

Over 152 Million observations from Baltic Sea, North Sea, Mediterrean, Black Sea and part of the Atlantic region have been entered into a geodatabase stored in the cloud, and consequently being instantly available from the OceanBrowser EMODnet portal.

Furthermore, Deltares implemented Web Processing Services (WPS) that provide dynamic interaction between OceanBrowser and data in the cloud geodatabase, enabling visualisation services for the aggregated and validated data collections.

Methodology, cloud hosting, implementation of the OGC services and information exchange in order to create visualisations are commonly used in the OpenEarth way of working (<http://www.openearth.eu>). Via this methodology, the generation of server-side plots of timeseries, profiles, timeprofiles and maps of selected parameters from data sets of selected stations is enabled for EMODnet-Chemistry.

The spatial resolution in time and the intensity of data availability for selected parameters is shown using Web Service requests via the OceanBrowser EMODnet Web portal. Thanks to the services provided, OceanBrowser is able to link selected locations with additional metadata as hypertext links for further data shopping and download.

Seabed substrates of the European Seas – EMODnet Geology

AM. Kaskela⁽¹⁾, AT. Kotilainen⁽¹⁾, U. Alanen⁽¹⁾, A. Stevenson⁽²⁾, EMODnet-Geology partners

⁽¹⁾ Geological Survey of Finland (GTK), Betonimiehenkuja 4, 02151 Espoo, Finland, anu.kaskela@gtk.fi

⁽²⁾ British Geological Survey (BGS), West Mains Road, Edinburgh, EH9 3LA, UK, agst@bgs.ac.uk

EMODnet, sediment, seabed substrate, sedimentation rate, harmonization

ABSTRACT

The EU's Marine Strategy Framework Directive targets the achievement of Good Environmental Status (GES) of the EU's marine waters by 2020. However, it has been acknowledged that poor access to data from the marine environment was a handicap to government decision-making, and a barrier to scientific understanding and development of the economy of the marine sector. The effective management of broad marine areas requires spatial datasets covering all of Europe's regional seas. As a consequence the EC adopted the European Marine Observation and Data Network (EMODnet) in 2009 to combine dispersed marine data into publicly available datasets.

The 2nd phase of the EMODnet-Geology project started in 2013 with 36 marine organizations from 30 countries. The partners, mainly from the geological surveys of Europe, aim to assemble marine geological information at a scale of 1:250,000 from all European sea areas.

The project includes compiling and harmonizing national seabed substrate maps for the European Seas, as well as data showing sedimentation rates at the seabed. The data will be essential not only for geologists, but also for others interested in marine sediments such as marine managers. A 1:250,000 GIS layer on seabed substrates is shown in the portal, in addition to an updated 1:1 million map layer from the previous phase of the project (2009-2012). A confidence assessment will be applied to all areas to identify the information that underpins the geological interpretations.

Further information about the EMODnet-Geology project is available on the webpage: (<http://www.emodnet-geology.eu/>).

EMODnet-Geology Phase II WP7 - Mapping Mineral Occurrences

C. McKeon⁽¹⁾, M. Judge⁽²⁾, G. O'Shea⁽³⁾

⁽¹⁾ Geological Survey of Ireland, Dublin Ireland, charise.mckeon@gsi.ie

⁽²⁾ Geological Survey of Ireland, Dublin Ireland, maria.judge@gsi.ie

⁽³⁾ Geological Survey of Ireland, Dublin Ireland, Grainne.NiShe@gsi.ie

Mineral, Occurrences, Deposits, Mapping, Marine, Seabed, European, INSPIRE

ABSTRACT

As EMODnet Geology phase 2, WP7 Minerals leaders the Geological Survey of Ireland (GSI) will compile, collate and present each partners information on marine mineral deposits, using a standardised INSPIRE compliant format; thus harmonising multiple typologies within multiple datasets. Mineral deposits are naturally occurring materials of economic interest; they are finite resources, used as raw materials and relied upon for building, technology, infrastructure, industry, electricity and heating worldwide This compilation will produce map layers that reflect specified mineral deposit types and the known extent of their occurrence, within the EMODnet geographic area.

The EMODnet area comprises EMODnet participant states' EEZ. In order to identify and map areas of marine mineral deposits in each of the participating states EEZ, each partner must provide available information on marine mineral deposits. The types of mineral deposits that occur on and/or beneath the seafloor, to be included in EMODnet work package 7 are: aggregates, hydrocarbons, gas hydrates, marine placer deposits, phosphorite deposits, evaporate deposits, polymetallic sulphides, polymetallic nodules and cobalt rich ferromanganese crust. All available information on marine mineral deposits will include publicly available third-party data and information.

Having successfully developed an INSPIRE compatible spatial data infrastructure, displaying the spatial distribution of mapped marine mineral deposits, all partners will be able to see and share their national seabed mineral information and knowledge in a European context. We hope this platform can be developed and used in future to find, view and acquire standardised and harmonised georesource information and related data. We believe this compilation will be essential in informing sustainable use of marine resources, form the basis for decision makers in European government and industry as well as provide baseline information for educators and researchers.

Developing the Marine and Coastal Sector in Wales – Seacams 2 Environmental Knowledge Systems Hub

D. Mills⁽¹⁾, G. Worley⁽²⁾, C. Jago⁽²⁾

⁽¹⁾ Cefas, Lowestoft, UK. david.mills@cefas.co.uk

⁽²⁾ Bangor University, School of Ocean Sciences, Menai Bridge, UK, g.worley@bangor.ac.uk; c.f.jago@bangor.ac.uk

Environmental informatics, coastal observatories, numerical modelling, marine renewables

ABSTRACT

Seacams2 is a European Regional Development Fund (ERDF) supported programme that plans to provide marine businesses in the Welsh convergence zone with the best available knowledge based on improved research focussed on their clearly defined needs. It will do this through deployment of re-locatable coastal observatories using state of the art data acquisition techniques coupled with advanced numerical models that together provide the specific knowledge required by industry to make better and more robust decisions.

A key element within the proposed work will be to develop the Environmental Knowledge Systems Hub (ENVOHK). This will provide the infrastructure that manages data and enables the development and delivery of products and services engineered to meet clearly defined needs of known commercial end-users. ENVOKH will sit at the heart of SEACAMS2 creating the networks between business, research and government to co-produce the new knowledge and the best evidence required for better decisions and effective actions.

Toward real time monitoring in situ of chemical and biological compounds in the marine environment

G. Palleschi⁽¹⁾

⁽¹⁾ Università degli Studi di Roma Tor Vergata, Via della Ricerca Scientifica, Roma, Italy, giuseppe.palleschi@uniroma2.it

Marine, ocean, chemistry, biology, data, biosensors, monitoring

ABSTRACT

SMS promotes a novel design, makes significant use of nanotechnology for enhancing both the detection limits and sensitivity of biosensors for hazardous compounds found in seawater and proposes ways to make such devices more economical to produce. The result will be a device deployed on the field, with the main box situated on a floating platform and/or on a buoy that also hosts an analysis module and a sampling module. With the wireless transmission capability for real-time data, as well as remote access to collected data and remote management of biosensors, it will be possible to realize an automated water quality monitoring and an alarm system that will be fairly easy to deploy.

The SMS project consortium brings together key skills from industry and academia. The partners, the technology development and test cases create a multi-sectorial team of experts interacting with end-users and marine water stakeholders, demonstrating that ICT, biotechnology and nanotechnology can increase the potential of biosensors for marine applications. SMS will positively affect socio-economic aspects related to maritime activities and will enable early detection and more effective monitoring of the marine environment. Also, the project will bring a valuable input for the implementation of appropriate management actions relevant in the framework of the Marine Strategy Framework Directive (MSFD). It will provide competitive advantages and a leadership to Europe and industry within the fields of biotechnology, sensor development, diagnostic technologies and nanotechnology. And so as EMODnet, SMS aims at making marine data collection, sharing and understanding freely and easily available.

GLOBE : a software for Geosciences data processing. Application to the EMODnet Bathymetry lot

C. Poncelet⁽¹⁾, J.M. Siquin⁽²⁾, B. Loubrieu⁽³⁾

⁽¹⁾ Ifremer, Plouzané (Fr), cyrille.poncelet@ifremer.fr

⁽²⁾ Ifremer, Plouzané (Fr), jean.marc.siquin@ifremer.fr

⁽³⁾ Ifremer, Plouzané (Fr), benoit.loubrieu@ifremer.fr

Acoustic data processing, Scientific software

ABSTRACT

GLOBE (Global Oceanographic Bathymetry Explorer) is an innovative and generic software developed by Ifremer. It combines functionalities for collecting, linking, processing and display of scientific data acquired during sea cruises. The last releases are mainly dedicated to acoustic data processing. Specific tools have been developed to visualize and analyse water column acoustic data and to process bathymetry data. However, the software is also designed to accept further functionalities such as image or video.

Technically, the concept of the software relies on Eclipse RCP framework, Java and Nasa Word Wind API for the 3D views.

The EMODnet Bathymetry lot consortium has elaborated a common processing flow for gridding bathymetry data and for generating harmonized digital terrain model (DTM). Main characteristics of these DTMs are (1) the specification of a set of layers which enrich the basic depth layer and (2) the permanent link to the data sources thanks to an identifier associated to metadata. The processing flow includes also specific steps requiring appropriate functions for merging DTMs. The challenge was then to have the appropriate tools to produce the DTMs. Globe software has been upgraded to provide the required tools for applying this methodology and the software is offered to the project partners. It could be also offered to any other contributor.

Producing broad-scale EUNIS seabed habitat maps for European Seas

J. Populus⁽¹⁾, on behalf of the EMODnet Seabed Habitats Consortium

⁽¹⁾ Ifremer, BP 70, 29280 PLOUZANE, France, jpopulus@ifremer.fr

Mapping, Seabed habitats, EUNIS, GIS

ABSTRACT

The general approach used to produce the map is based on principles described in Cameron and Askew, 2012. Data processing and modelling was carried out in ArcGIS Model Builder™ by creating a toolset that is divided into 3 main modules, the Combined Energy, the Biological zone and the Habitat mapping tools. The Habitat Map tool combines the outputs of the Biozone and Combined Energy tools with the Substrate layer to obtain a model code per habitat type. Model codes are joined to a EUNIS habitat codes table. All raster layers are in WGS84 coordinates, have a resolution of 0.0021 degrees and share the same grid obtained from the EMODnet Bathymetry Mosaic layer. The second phase has just completed the full European coverage by producing the maps for the Adriatic, Eastern Mediterranean, Black and Norwegian Seas as well as the Canary Islands in Macaronesia. Where there was no substrate information in deeper waters (e.g. parts of Norway, Biscay, etc.), the maps just show the biological zones. As EUNIS habitats still lack harmonisation between basins due to changing biogeography, the unique map caption shown here is that of the Atlantic Area which does not fully applies to other basins and hence should be regarded as indicative only.

GEBCO and EMODnet-Bathymetry hand in hand: Improving global and regional bathymetric models of European waters

T. Schmitt⁽¹⁾, P. Weatherall⁽²⁾

⁽¹⁾ Service Hydrographique et Océanographique de la Marine, 13 rue du Chatelier, 29228, Brest, France , thierry.schmitt@shom.fr

⁽²⁾ British Oceanographic Data Centre, Joseph Proudman Building, 6 Brownlow Street, Liverpool, L3 5DA, U. K., paw@bodc.ac.uk

Bathymetry, global, General Bathymetric Chart of the Ocean

ABSTRACT

GEBCO (www.gebco.net) provides a unique global Digital Terrain Model (DTM) at 30 arc-second intervals (~1km horizontal resolution). Recognising the importance of regional expertise, GEBCO is collaborating with regional groups to help to continually improve its global model.

Thanks to the European initiative EMODnet (www.emodnet-hydrography.eu), data providers from more than 30 organisations are working to build a regional DTM at 1/8th arc-minute (~ 250 meters resolution) for European waters; from the Norwegian and Icelandic Seas, through the Baltic, Celtic and North Seas to the Black Sea and Mediterranean Sea.

With the aim of producing harmonised products and to prevent any duplication of effort, GEBCO and EMODnet are working together to build an authoritative DTM for European waters.

This consists of the following steps:

1. The Emodnet group has generated a Digital terrain model (2013 version) for European waters, with gaps between data sources.
2. The EMODnet (2013) DTM has been used to update GEBCO's global grid using the remove-restore procedure involving the generation of a difference grid between the EMODnet 2013 and the initial GEBCO grids, which is then added on top of the initial GEBCO grid.

When compiling a new 2014 version of the EMODnet DTM, data gaps are filled with the new GEBCO grid.

As a result of this collaboration and the process described above, the latest (2015) versions of both grids show a marked improvement in their precision and continuity.

Repeating this procedure for the future releases of EMODnet and GEBCO bathymetric grids will help improve knowledge of the bathymetry of European waters while providing a fit-for-purpose and consistent grid to users.

The size, nature and dynamics of the blue economy

I. Shepherd⁽¹⁾

⁽¹⁾ European Commission, DG Maritime Affairs and Fisheries, iain.shepherd@ec.europa.eu

marine, economics, employment, GDP, shipping, petroleum, fishing, shipbuilding, tourism, renewable

ABSTRACT

The blue economy is the part of the market economy that benefits from the resources of the sea. Currently the main benefits provided are food, energy, transport and leisure. The industries that deliver these benefits – fishing, aquaculture, petroleum extraction, offshore wind, shipping, shipbuilding and coastal tourism currently employ about 5 million people in the EU with about half of these in the coastal tourism sector. This assumes all oil and gas exploration and exploitation is offshore, takes into account fish processing, transport to and from tourism destinations and sectors such as insurance that provide goods and services to the main sectors. But it does not include tourism trips without an overnight stay, construction or trading of second homes, wholesaling and retailing of fish and shellfish or non-market activities such as marine research, coastal protection or defence. Neither does it include niche or emerging sectors such as the laying of communication cables which, although strategic to the EU, are smaller in size than uncertainties in the size of the main industries.

The analysis provides an overview of the blue economy for each Member State, as well as the EU as a whole. It largely uses numbers provided by EU Member States and a number of neighbouring states to the EU's statistical office, Eurostat, through structural business statistics, the Labour Force Survey and tourism surveys. Additional information comes from the Data Collection Framework for fisheries and the European Wind Energy Association.

Since 2008, employment in the coastal tourism sector has grown slightly and that in shipbuilding fallen. But by far the fastest growth has come from offshore wind which has grown from almost nothing in 2008 to an industry that now employs 75,000 people, about half as many as fishing.

The focus so far has been on employment because the primary objective of the EU's blue growth policy is to find new opportunities for Europe's unemployed and underemployed. However, work is also ongoing to determine the contribution of this sector to the EU's Gross Domestic Product. Initial estimates suggest about 3% or €400 billion in total, largely from the shipping, petroleum and coastal tourism sectors.

Connection of Dutch Offshore Licencing Monitoring to EMODnet Biology using OpenEarth

W. Stolte⁽¹⁾, K. Borst⁽²⁾, J. Staeb⁽³⁾

⁽¹⁾ Deltares, P.O. box 177, 2600 MH Delft, willem.stolte@deltares.nl

⁽²⁾ Rijkswaterstaat, Ministry of Infrastructure and Environment, Zuiderwagenplein 2, 8224 AD Lelystad, kees.borst@rws.nl

⁽³⁾ Information House Marine, Ministry of Infrastructure and Environment, Postbus 2232, 3500 GE Utrecht, joan.staeb@rws.nl

Offshore licencing, Project monitoring, Biological data, Data management, OpenEarth, EMODnet Biology, The Netherlands, North Sea

ABSTRACT

In the licencing process of offshore wind farms, an Environmental Impact Assessment (AEIA) has to be performed prior to the building and a Monitoring and Evaluation Programme is performed during the building and operation of the farms. Since 2015, all monitoring in the framework of licencing is coordinated by the Dutch government (Rijkswaterstaat). This also implies that governmental open data policy is applied to such monitoring programmes to secure the data, and implement data management for on-line availability and reuse of the data after the project. Normally, several parties are involved in data acquisition and practical data management. Deltares has developed a generic open source methodology and work flow (www.openearth.eu) to secure raw data in a version controlled repository, transformation to a relational database, and publication of data via web services. Reuse of the data is facilitated by web services either directly from the data source, via the Data Distribution Layer of the Dutch Government, or via the reporting data stream managed by Information House Marine. Historical ecological data for one of the Dutch monitoring programmes, related to licencing of the Rotterdam Harbour Extension is connected to EMODnet Biology during EMODnet phase II. Experiences from this process are helpful for connection of other and new licencing monitoring data to EMODnet in the future.

EMODnet regional gridded abundance products: a tool to facilitate ecosystem assessments

L. Tyberghein⁽¹⁾, O. Beauchard⁽²⁾, S. Claus⁽¹⁾, P. Herman⁽²⁾, J.M. Beckers⁽³⁾, F. Hernandez⁽¹⁾

⁽¹⁾ Flanders Marine Institute (VLIZ), InnovOcean site, Wandelaarkaai 7, B-8400 Oostende, Belgium

⁽²⁾ Royal Netherlands Institute for Sea Research, Korringaweg 7, 4401 NT Yerseke, Netherlands

⁽³⁾ GeoHydrodynamics and Environment Research, University of Liège, Sart Tilman B5a, 4000, Liège, Belgium

Marine species abundance, geospatial modelling, geo-referenced environmental data, data portal

ABSTRACT

Within the EMODnet Biology project a set of gridded map layers is being produced showing the average abundance of different species of different trophic levels per species group for different time windows (seasonal, annual or multi-annual as appropriate) using geospatial modelling. The spatial modelling tool used to calculate the gridded abundance maps is based on DIVA. DIVA (Data-Interpolating Variational Analysis) is a tool to create gridded data sets from discrete point measurements of the ocean. The interpolation is based on a given correlation length scale and signal-to-noise ratio of the observations.

It was decided to select a number of well-known and published cases from diverse data sources to test the methodology. The selection was based on data availability within the EurOBIS database, reference to existing literature and relevance to the project. Currently data products are available for more than 40 species from the North Sea, Baltic Sea and North East Atlantic. The products are currently made for different species groups, such as benthos, zoo- and phytoplankton, birds, fish and mammals. The availability of zeroes (i.e. explicit knowledge of the sites where a species was looked for but was absent) is essential for the gridding procedure using DIVA. Since most databases only record presences, the reconstruction of zeroes is a requirement for the mapping. A list of datasets for which zeroes can be reconstructed in a consistent way must be made before gridding can be automated with EMODnet biological data. It will be used to determine further goals for the (semi-)automatic data gridding to be applied to many biological data.

These gridded map layers showing the abundance for copepod species most frequently recorded from the North Atlantic CPR dataset will be delivered as operational oceanographic products and services (OOPS), to support the integrated ecosystem assessments (IEAs), recently undertaken by ICES.

The gridded data products showing the abundance of different European marine species are freely available at: <http://www.emodnet-biology.eu/data-products>

Coastal erosion and accretion: translating incomplete data and information into vulnerability assessments

S. van Heteren⁽¹⁾, C. Moses⁽²⁾, T. van de Ven⁽¹⁾

⁽¹⁾ TNO – Geological Survey of the Netherlands, PO Box 80015, NL-3508 TA Utrecht, The Netherlands, sytze.vanheteren@tno.nl

⁽²⁾ University of Sussex, Centre for Coastal Research, University of Sussex, Falmer, Brighton, BN1 9RH United Kingdom

EMODnet-Geology, vulnerability index, cliffs, bluffs, soft-sediment coasts, EUROSION

ABSTRACT

Building on the results of EUROSION, an EU-project completed some ten years ago, the partners of EMODnet-Geology have been compiling coastal erosion and sedimentation data and information for all European shorelines. As part of this process, coverage is being expanded, and data and information are being updated. The main challenges faced during this compilation phase are posed by a) differences between parameters used as indicators of shoreline migration, b) restricted access to third-party data, and c) data gaps. There are many indicators of coastal behaviour, with inherent incompatibilities. High- and low-water lines of barriers, for example, migrate land- and seaward in different ways. The behaviour of cliff tops and bases shows even less correspondence, with tops moving exclusively landward whilst bases can move seaward. Regionally, low data availability and limited access result in poor coverage. With increasing volumes of satellite data expected to become available, especially from the Sentinel programme, it is high time to invest in automated methods to derive coastal-erosion data from satellite monitoring at a regional level. It needs to be emphasized that consistency of data and derived information on coastal erosion and accretion does not necessarily translate into usability in pan-European coastal-zone management. Indicators of shoreline change need to be assessed and weighted regionally in light of other parameters (physical and socio-economic) and be converted into indicators of coastal vulnerability. Studies published so far demonstrate that there is no single way to portray coastal vulnerability for all of Europe in a meaningful way. A common legend, however attractive intuitively, results in data products that work well for one region but show insufficient or excessive detail elsewhere. For decision making, uniform products are often not very helpful. The ability to zoom in on different spatial levels is not a solution either. It is better to compile and visualize coastal-vulnerability studies with different legends, and to provide each map with a confidence assessment and other relevant metadata.

Methodology for broad-scale mapping of seabed habitat map

M. Vasquez⁽¹⁾, on behalf of the EMODnet Seabed Habitats Consortium

⁽¹⁾ Ifremer, ZI Pointe du Diable, 29280 PLOUZANE, France, mickael.vasquez@ifremer.fr

Mapping, Seabed habitats, GIS

ABSTRACT

The objective of the EMODnet Seabed Habitats is to provide a 250m pixel size full-coverage cartography of seabed habitats for all the European basins. The approach draws extensively on that developed in the framework of past European projects (MESH, ur-EMODnet Seabed Habitats), which proposes overlaying mapped physical variables using a geographic information system (GIS) to produce an integrated map of the physical characteristics of the seafloor.

The poster illustrates the methodology with the example of the Black Sea basin. Grid layers are compiled for fundamental physical parameters in the basin, including (i) bathymetry (provided by EMODnet Bathymetry), (ii) seabed light energy, (iii) seabed temperature, and (iv) densities. Based on statistical analyses of relevant biological occurrences, significant thresholds are fine-tuned for each of these abiotic layer. Those cut-off values are later used in multi-criteria raster algebra for the classification of the layers of physical parameters into two ecologically-relevant categorical layers, namely the biological zones (infralittoral, coastal circalittoral, deep circalittoral, bathyal, abyssal) and the oxygen regimes (oxic, suboxic, anoxic). The overlay of those categorical layers with a layer of seabed substrate type (provided by EMODnet Geology) is eventually performed, the result of which is the broad-scale seabed habitat map for the Black Sea basin.