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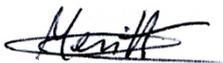
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1. Introduction

This is progress report 2 for the EMODnet North Sea Basin Checkpoint (NSCP) covering the period up to 31st October 2014.

This period of the project has focussed on delivering the literature review, setting up the website and initiating the data gathering and quality assessment for the first four challenges. The progress during this reporting period is summarised below, and further detail is provided in the remaining sections.

The literature review was undertaken to provide a contextual view on the blue economy and data gaps that are limiting its development. The first data quality report which outlined the results of the literature review was completed in August 2014. The assessment was supported by the free web-based tool Mendeley as a collaborative area to share and comment on papers between project partners.

The data registry model developed to record data quality assessments for each challenge was used to record and appraise the resources used to inform the literature review.

The oil platform leak challenge has been set up and a rehearsal was successfully undertaken in August 2014. The marine protected areas, climate and coastal protection and wind farm siting challenges are all completing their data gathering and data quality assessment phase as they start to map the data. Fisheries management, river inputs and marine environment are not timetabled for activity to commence yet. This is discussed further in Section 3.

In order to communicate the outputs from the NSCP in a consistent way with other EMODnet activities, the NSCP has agreed with the EMODnet secretariat to use the existing EMODnet content management system as a service platform. A introductory webpages have been published and discussion is in progress with the Secretariat on the best way to host the remaining pages. The proposed structure is described in Appendix A. The EMODnet secretariat are currently analysing the NSCP requirements for the website, web services and data repository as it could have implications for the other challenge websites. Once the website is running and the format for the metadata portal has been agreed with DG MARE and the EMODnet secretariat, the data registry containing quality assessments of the data used on each of the challenges will be made available as a searchable database online.

2. Literature Review

The literature Review was completed in August 2014 and was reported on in detail in the first data Adequacy report. The review identified the following key points:

- The documentation collated for the purpose of the literature review was mostly freely available, but in some cases difficult to find. Gaining access to technical reports sometimes required registration to website, while other documents were linked to websites which were no longer active.
- Fitness for purpose of documentation gathered for the review varied, with technical reports providing the richest source of information on data gaps, while academic reports required a high level of effort to identify useful information.
- The provision of data for the North Sea is supported by a complex network of data initiatives which enable access to data and metadata via online portals. The reports describing the development of these

portals and associated data harmonisation provide a valuable resource for documented gaps in marine data and challenges in making it accessible to end-users.

- The lessons learnt from bringing marine data together via data portals such as EMODnet and SeaDataNet should be considered in conjunction with the needs of end-users to gain a full appreciation of the next stages in making marine data available. The (1) ongoing management of feedback facilities and (2) improving access to technical reports via the portals themselves will be key to improving our understanding of user requirements, facilitate the reporting of information gaps and quality issues and in turn enable them to gain a greater understanding of the data they use.

3. Challenges

3.1. Introduction

The challenges which are currently underway are mostly completing their data gathering and appraisal phase of work, with much of the data analysis and reporting due to be undertaken in 2015. Those now completing the data gathering phase are the wind farm siting, climate and coast protection, and marine protected area challenges. The oil platform leak challenge has undertaken its rehearsal and received feedback from DG MARE. All of these challenges have been appraising their data using the data registry.

Quality assessment of datasets for each of the challenges is an ongoing process as each stage of the challenge will inevitably reveal new information about data gaps and usability. Therefore, the information recorded in the registry will continue to develop beyond the data gathering and quality assessment stage and through to the analysis phase of each challenge.

Each dataset is allocated a flag according to how it scores for a particular challenge. These flags are shown below in Tables 3.1 and 3.2:

Table 3.1: Data Assessment States

Value	Description
Null	No value score.
Ruled In/Out	An initial assessment, largely based on the value score for “contribution”. If a dataset contains information likely to be useful for a challenge it is ‘ruled in’ else it is ‘ruled out’.
Considered Yes/No	Datasets that are ‘ruled In’ for a challenge are further assessed according to the other value criteria outlined in Table 3.2 below.
Suitable Yes/No	Datasets that pass all the value criteria for a challenge are considered ‘suitable’ else they are ‘not suitable’ for the challenge. The narrative for each value score gives the reason for the score.
Used Yes/No	This indicates of all the suitable datasets, which was actually used on the challenge. In practice any suitable dataset could be used so the choice may be arbitrary, e.g. experience of using that dataset before.

Table 3.2: Value Criteria

Value Criteria	Description
Contribution - <i>What impact the data have on solving the problem.</i>	Fundamentally the data must contain the required parameter or phenomena to be of value. This is clear for single variables, but has more meaning when applied to groups of data such as total suspended matter, hydrodynamic conditions, rainfall etc. For example, total suspended matter alone may have less contribution to solving a problem than a combination of water quality and hydrodynamic parameters.
Location - <i>Where the measurements have been taken and at what time.</i>	The spatial and temporal distributions of the data are critical as most data are required for a particular site and/or time frame.
Commercial- <i>What the data costs.</i>	Any data will have to be selected within the constraints of what the data costs and the allocated budget. For end-customers data costs need to be set against benefit realised. Previous studies have shown organisations do not object to paying for data, but pricing needs to be clear so they can budget for it. Commercial terms are also a factor as this may dictate what can be done with the data.
Attributes - <i>Fitness for purpose.</i>	This covers a number of factors about the data such as accuracy, precision and spatial and temporal resolution. In addition, it also embraces quality control parameters such as metadata and the traceability of processing applied to the data.
Delivery - <i>Can the data be supplied in time.</i>	Delivery is important in time critical applications. This is particularly the case in emergency operations such as monitoring oil spills, and in areas where the data have a short shelf life e.g. weather forecasts. This may also encompass the continuity issues of data, i.e. can the data be supplied on an on-going basis.
Usability - <i>How easy is it to use the data</i>	This covers such factors as the ease of visual presentation or ease of extraction to provide input to a numerical model or software package. Clearly, the demand will be greater for data that can be readily consumed by the customer.

3.2. Core Data Sources

For each challenge, EMODNET and Copernicus represents a core data source that is assessed for each. These data sources are well known. In addition we also used the SeaZone Hydrospatial product as a core data source. Hydrospatial is an establish marine map product based on licenced material from hydrographic offices. It is interesting and appropriate to consider such commercially licenced data alongside openly licenced data as the future of marine data supply is likely to include a mixture of business models (i.e. tax payer funded v user funded).

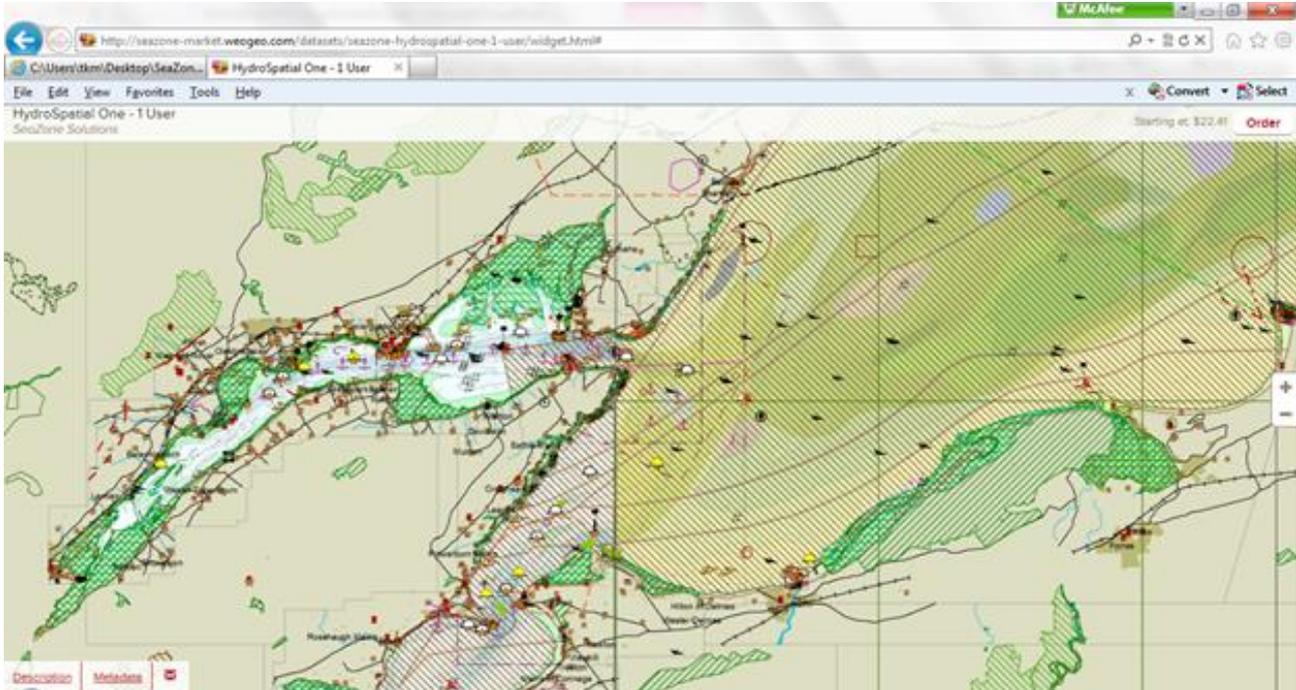


Figure 3.1: Image of Hydrospatial One

Source: www.seazonedirect.com

3.3. Wind farm Siting

This challenge is being undertaken from the perspective of a wind farm operator appraising suitability for offshore wind sites. As such it takes into consideration factors that affect generating capacity, factors that affect construction and maintenance, factors in which the windfarm may impact the environment and avoiding conflict with other marine users.

A broad range of data has been collated and appraised for the wind farm siting challenge. Appraisal of data is a continuous process throughout each challenge. Some initial observations have been made from gaining access to and downloading data for the wind farm siting.

Core data has been sourced from (1) EU funded websites (EMODnet portals, Atlas of the sea, EEA), (2) Government funded resources (BODC, NOC resources), (3) Commercial spatial data products (SeaZone Hydrospatial Base) and (4) Industrial websites (4COffshore, FINO).

Some resources were only available as a pdf, kml or as a static image, while others are provided in a format allowing it to be put straight into a dynamic map with no pre-processing required. Much of the biological, chemical and physical datasets are provided in underived formats as they contain sampling results. Some users require the data to be maintained in its original format to enable applications such as time series modelling. This however makes the data more difficult to access for non-experts in these fields who may be looking for interpreted data such as characterisations or density maps.

Quality assessment of data is ongoing and currently being based on assessing accessibility of data, costs, relevance, usability and usefulness via the data gathering and mapping stages of the challenge. All of these criteria vary a great deal between datasets.

During the identification of possible data sources, it was found that there were many overlaps between websites in the data provided with different websites providing the same sourced data and different websites supplying data from different sources. Interconnection between websites and availability of datasets via more than one website raised questions regarding whether there were differences between the versions available and which might be the definitive version. Where data was available from more than one source, data was downloaded in duplicate to ensure that the most up-to-date version was used. Data from multiple sources will be grouped by data type and appraised to identify resources best suited to meeting the challenge. Gaps and overlaps will be reported on.

The ease of use of EMODnet portals was found to vary with the nature of data and access requirements. Portals containing links to download of zip files such as the seabed habitat portal and the human activities portal were easy to use and enabled fast access to the data. A fuller assessment will be presented in the data adequacy report for the challenge.

3.4. Marine Protected Areas

Data is being collected for the NSCP basin area, which includes data from the UK, France, the Netherlands, Denmark, Belgium, Sweden, Germany and Norway.

The first stage was to identify all relevant Marine Protected Areas (MPAs) that have been designated in the NSCP basin area, which should facilitate the identification of each data category. This process is taking a significant amount of time as MPAs are designated and presented at an international and national level and multiple websites have to be searched for the relevant data. For example, the IUCN's World Database on Protected Areas provides an online interface for users to access the most comprehensive global database and dataset on terrestrial and marine protected areas. However, nationally, there may be different designations that have not been included or are more up-to-date. Therefore, all potential sources of data must be searched in order to provide (as accurately as possible) the project with an official list of designated MPAs. There is no way of ensuring that all existing versions of MPA lists have been identified.

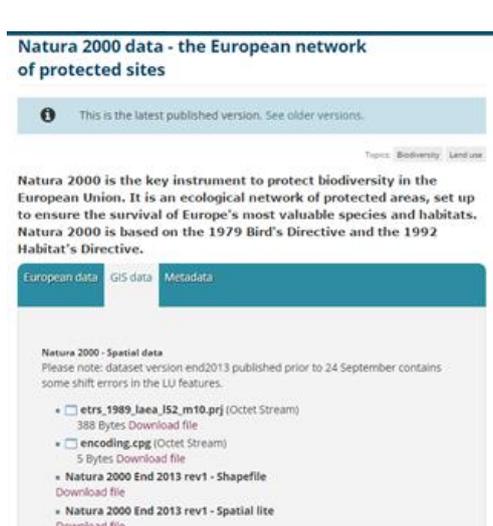


Figure 3.2: EEA Natura 2000 data download page

Source: EEA website

This process is still ongoing, with the data collected being inputted to the challenge spreadsheet and subsequently assessed for quality and usability.

The European Environment Agency's website and Natura 2000 section has provided most of the data so far. Natura 2000 is an EU-wide network of nature protection areas established under the 1992 Habitats Directive where all human activities are excluded under various legislative instruments. Currently 34 separate datasets have been accessed, which may all have potential use for the challenge.

Although much of the data has been considered suitable for solving the challenge, it will need sorting/filtering for the appropriate MPA data (Natura 2000 sites include terrestrial sites) or will need to be used in conjunction with other data sets (latitude and longitude database tables for sites will need to be joined to the names of sites).

Initial results from the gathering and mapping of data suggests that most data is freely available and downloadable in a usable format (GIS or database files) or viewable via

interactive maps. In some cases, there has been a requirement to register and accept end user agreements before downloading certain GIS files. This occurred for Scottish and English GIS data and MPA information from the IUCN WDPA. Most GIS and database datasets were accompanied by Metadata.

There are considerable overlaps between designated MPAs. This had been reported on whereby just for the UK, Ramsar sites overlapped significantly with other designated MPAs. On an international level, this will be a greater issue. Cross-checking of information on the GIS database will be a solution. It was also found that much of the Natura data was for 2013 so may not be fully representative of the network.

The first GIS map output from the challenge will be a visual representation of the currently designated MPAs in the NSCP basin area that will be created using the most definitive and up-to-date data the team can find by February 2015. The map will look very similar to the interactive MPA maps that are already available online. The data forming the maps will include the names, locations, sizes, species and habitats and management associated with each designated MPA.

The second map output will represent the connectivity aspect of the challenge (larval dispersal potential over the NSCP basin between MPAs) using the locations and boundaries of the MPAs and the biological larval dispersal data available. The physical factors influencing larval dispersal between these MPAs will need to be discussed and agreed between HR Wallingford and DG MARE. Potential data could include current, surface wind or frontal data. MyOcean may be a good source for this.

3.5. Oil Platform Leak

IMARES has successfully completed the rehearsal of Challenge 3 Oil Platform Leak at the end of July, using available information. The rehearsal demonstrated the preparedness of the team to respond to the challenge. DG Mare have provided positive feedback, questions and some suggested improvements on the rehearsal response which IMARES are addressing.

The response team used the EU's Copernicus marine service forecasting system for wind and current forecasts, the satellite communication company GlobalMarineNet for wind forecasts and NOAA's GNOME system for tracking the spill.

Feedback provided as part of the rehearsal response to DG Mare noted that (1) oil spill response is dependent on MyOcean.eu and GlobalMarineNet websites being updated on time. (2) The time limits on available forecasts of currents from MyOcean limit the length of time the simulation of an oil spill can be projected into the future. (3) The lack of data on location of fishing activity restricted the assessment of potential impact of an oil spill on the fishing industry.

An assessment of the data used for the oil spill challenge has been made using the data registry. The method, outcome and data quality assessment for this challenge will be reported in detail in the subsequent data adequacy report once the final oil spill scenario has been completed.

3.6. Climate Change

Data for the climate change challenge has been gathered and assessed. The data quality register was used to record and review the data for the climate change challenge. 45 datasets have been identified and evaluated so far:

- 42.2% are point data
- 8.8% are north sea maps

- 4.4% are reports
- 2.2% are Metadata
- 42.2% were not considered.

About 60% of data was downloaded. No mapping has been done at this stage.

An initial assessment of the data gathered highlighted the following:

1. Point data from the IFREMER oceanographic network and the North-West Shelf Operational Oceanographic System was slow to download as each point had to be downloaded individually as there was no option to download all of them at the same time.
2. The resolution of many of the data downloaded was found to be less than a 7 km grid. No better resolution was found except for the Gebco and SeaZone bathymetry which is a 1 km grid or greater.
3. Suitable sediment dataset was available via the EMODnet One Geology website but only downloadable as a kml file. BGS sediment data is available via SeaZone Hydrospatial for UK waters. There may be scope for deriving simple sediment data from habitat maps such as EUSeaMap.
4. Tide gauge data for the past 50 and 100 years was difficult to find. Further work is being undertaken to identify suitable sources of data.

4. Management and Dissemination

Communication between project team members continues to be undertaken regularly via Mendeley, email and by phone. A web seminar was conducted by HR Wallingford for project team members to introduce them to the data register and train them in its use.

The background webpages for the project are under development. It was agreed that the project website would sit alongside other projects in the EMODnet family. HR Wallingford have been granted access to edit and publish pages under a top level “emodnet/northsea” domain. A link to the NSCP website is now present on the EMODnet central portal, maintaining the branding and styling from the main EMODnet page.

The webpages will contain background information on each of the challenges and links to the outputs of the project to date. A suggested layout and initial contents is provided in Appendix A.

5. Next steps

Mapping and analysis of data is now in progress for beginning for the marine protected areas, climate and coastal protection and wind farm challenges. The data registers will continue to be updated as the challenges progress. The inputs from each challenge will be used to populate a quality assessment database which is currently being built by SeaZone to provide the basis for the metadata portal which will be accessible via the NSCP website.

The marine protected areas, climate and coastal protection and wind farm challenges are due to be completed in time to be fully reported on in the next data adequacy report, due in May 2015, along with the initial results of data gathering and quality assessment for data for the remaining challenges. Full reporting of the oil spill challenge will depend on the timing of the next and final call for an emergency response.

Appendix

A. Draft Website Design

This appendix presents the content proposed for the NSCP website and screen dumps of the web interface to the data screen tool. This document has formed the basis between the NSCP project and the EMODNET Secretariat. We have used pages from the existing SeaZone website simply to convey the look and feel we are looking to deliver. The final website will use EMODNET branding.

A.1. Website structure

L1.1: Home (<http://www.emodnet.net/northsea>)

Content: Top sliding banner; tools for filtering data [resolving to L1.3.2.X]

L1.2: Challenge (<http://www.emodnet.net/northsea/challenge>)

Content: 8 images of challenges with mouse over text

L1.2.2.1: Literature Review (<http://www.emodnet.net/northsea/challenge/literature>)

Content: Text / Image

Downloads: Links to reports and data

Links: 'Find data for challenge' – resolving to L1.2.2.3

L1.2.2.2: Windfarm Siting (<http://www.emodnet.net/northsea/challenge/windfarm>)

As above

L1.2.2.3: Marine Protected Areas (<http://www.emodnet.net/northsea/challenge/mpa>)

As above

L1.2.2.4: Oil Platform Leaks (<http://www.emodnet.net/northsea/challenge/oil>)

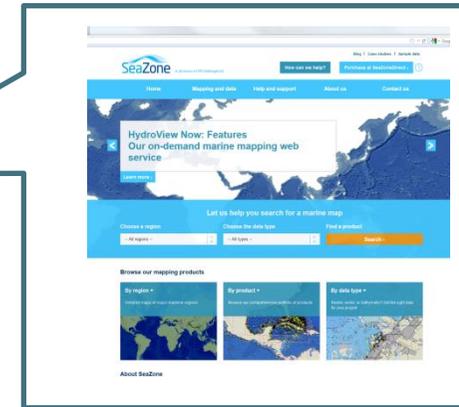
As above

L1.2.2.5: Climate and Coastal Protection (<http://www.emodnet.net/northsea/challenge/climate>)

As above

L1.2.2.6: Fisheries Management (<http://www.emodnet.net/northsea/challenge/fisheries>)

As above



L1.2.2.7: Marine Environment (<http://www.emodnet.net/northsea/challenge/environment>)

As above

L1.2.2.8: River Inputs (<http://www.emodnet.net/northsea/challenge/river>)

As above



L1.3: Data (<http://www.emodnet.net/northsea/data>)

Content: Filtered lists of data from catalogue according to the views below

L1.3.2.1: Data set record per challenge [database query]

L1.3.2.2: Data set all challenges [database query]

L1.3.2.3: Challenge, all data [database query]

L1.3.2.4: How we value data [static text]

L1.4: Outputs (<http://www.emodnet.net/northsea/outputs>)

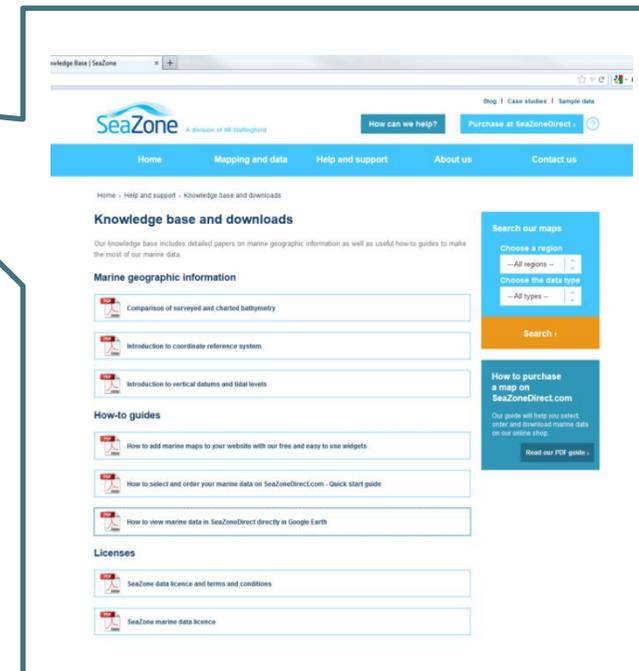
Content: Text/Images and file downloads

L1.5: About (<http://www.emodnet.net/northsea/about>)

Content: Text/Image

L1.2:Challenge(<http://www.emodnet.net/northsea/challenge>)

Below is the text for the following L2 pages for 'Challenge'



A.2. Indicative Content

A.2.1. Literature Review

Objectives

The purpose of this challenge is to summarise the findings of existing studies relating to the adequacy and data available for the North Sea basin. The rationale for the project is to examine gaps in data supply and gaps in knowledge, this is tested on each of the challenges and the literature review acts as a wider context for this analysis.

Background

This challenge reviews and analyses website, grey literature and papers to investigate what is currently known about the adequacy of data to support policy and the blue economy in the North Sea Basin. It considers formal analysis of initiatives such as EMODNET and Copernicus, scientific papers and reports that indirectly reviewed the adequacy of data as part of their investigation. In addition to the content of these documents, we also looked at how easy it was to discover the documents, using both general purpose search engines and scholarly catalogues. Our aim was to put ourself in the position of an actor in the Blue Economy to see how easy it was for them to find relevant information on data to suit their needs.

In undertaking this challenge we deliberately avoided undertaking analysis specific to a challenge, however any data sources identified in the literature review would form an input to each of the challenges.

A.2.2. Windfarm siting

Objectives

The objective of this challenge is to determine the suitability of sites for wind farm development along national marine boundaries in the North Sea Basin, where:

- Norwegian, UK, Danish, German and Dutch waters meet
- UK, Dutch and Belgian waters meet
- UK, Belgian and French waters meet.

It includes consideration of all factors used for wind farm siting, even if one of those factors makes the site unsuitable for development.

Background

The key site selection criteria for an offshore wind farm include wind resource at the site (as well as tidal and wave data), shipping routes, environmental sensitivities (e.g. Marine Protected Areas, bird migration routes) geology/seabed conditions (to inform marine engineering design), connection with the grid administration boundaries (different legislative regimes may apply across boundaries) and visual impact. Increasing the distance from the shore will minimise visual impacts from land; however the distance should not be too large to cause a significant increase in infrastructure costs to connect the wind farm to the grid and electrical energy losses. A valuable source of data for this challenge will be the SeaZone Solutions Hydrospatial product, which has full coverage for the North Sea basin for a number of the data sources identified above.

A.2.3. Marine Protected Areas

Objectives

The aim of this challenge is to analyse the existing European network of marine protected areas (national and international sites) and determine whether the network constitutes a representative and coherent network as described in Article 13 in the Marine Strategy Framework Directive.

Background

European Union countries are currently implementing a network of Marine Protected Areas (MPA's) both in territorial and international waters. The network is the combined result of ad hoc designation of protected areas for specific conservation requirements and a more structured effort in line with international, EU and national obligations. International obligations include establishing a representative network of MPA's by 2012 (World Summit on Sustainable Development and Convention on Biological Diversity (CBD)) and an agreement between HELCOM and OSPAR to create a joint network, ecologically coherent with the Natura 2000 network by 2012 (original deadline was 2010). The EU has a number of directives including the habitat directive, birds directive and marine strategy framework directive that require the designation of MPA's in line with the 2012 CBD commitments.

This challenge is concerned principally with the term 'ecologically coherent' which is a principle also used in the habitat directive, bird directive and OSPAR literature, although it has not been officially defined it is a principle that is now often used in MPA policy³. Increased focus has recently been directed at defining ecological coherence and developing methods to test it within MPA networks.

A.2.4. Oil Platform Leak

Objectives

The aim of this challenge is to determine the likely trajectory of the slick resulting from a (simulated) leak at an oil platform and the statistical likelihood that sensitive coastal habitats or species or tourist beaches will be affected. Specifically it will provide a preliminary assessment of the likely impact of the oil within 24 and 72 hours of the start of the challenge.

Background

The challenge will serve as a case study for the availability of data, the required response time for a preliminary (within 24 hrs) and complete impact assessment (within 72 hours) and to aid in identifying possible gaps. The European Commission will ensure the participation of the European Maritime Safety Agency.

A.2.5. Climate and Coastal Change

Objectives

The aim of this challenge is to assess the data available for abiotic (non-living chemical and physical factors in the environment) factors relating to the marine climate and the coast, in particular temperature, sea level rise and sediment balance. Data is to be present as both 2D map plots and ID time series.

Background

This challenge aims to produce spatial data layers and time plots for selected climate and coastal parameters for the North Sea study area. This is carried out using existing data in order to assess whether the availability, consistency and resolution of the data are sufficient. This challenge has been split into two objectives; a) to produce spatial data layers for the past 10, 50 and 100 years; and b) to produce time plots for the whole sea basin of selected climate and coastal process parameters.

The spatial data layers will be produced for:

- Average annual change in temperature at surface, midwater and sea-bottom
- Average annual sea-level rise at the coast (absolute and relative to the land)
- Sediment mass balance at the coast.

The time plots will be produced for:

- Average annual sea temperature over sea-basin at surface, mid-water column and bottom.
- Average annual changes in internal energy of sea
- Average annual sea-level rise relative to the land for each NUTS3 region along North Sea coast
- Annual sediment balance along North Sea coast for each NUTS3 region along North Sea coast.

A.2.6. Fisheries Management

Objectives

The aim of this challenge is to produce information about fish stocks and fish catches in the North Sea basin. The precise requirements of the challenge are to deliver tables of

- mass and number of landings of fish by species and year
- mass and number of discards and bycatch (of fish, mammals, reptiles and seabirds) by species and year.

These tables should include data from before and after the Data Collection Regulation came into force. The time-series should be as long as possible. Its length will clearly vary from species to species. In addition the aim is to produce data layers (gridded) showing the extent of fisheries impact on the sea floor, including:

- areas where bottom habitat has been disturbed by bottom trawling (number of disturbances per month)
- change in level of disturbance over past ten years.

Background

Data from fishing fleets in Europe has traditionally been collected by the state where the fish is landed and depending on the state various data collection programmes have been in place for many years. Over the last 20 years the EC have been working to bring these data collection programmes into a standardised format. This process culminated in the establishment of the Data Collection Framework (DCF) in 2009.

The DCF was developed to standardise fisheries data across the EU and ensure that member states operate fisheries data collection programmes that will meet the objectives of the common fisheries policy (CFP).

Member states are now required to compile a wide range of biological and ecological data:

- Fleet size and fishing effort broken down by time, fleet, stock and area
- Biological data for landings by area and species and stock related data from sampling programmes
- Economic data on fish processing and aquaculture

- Research surveys at sea
- Data to evaluate the environmental impacts of fishing activity.

The standardisation of fisheries related data on an international level is overseen by the Coordinating Working Party in Fisheries Statistics (FAO) and also by ICES who have been publishing fishing statistics for the north east Atlantic since 1904. ICES along with EUROSTAT still hold fisheries data for the North Sea basin which follow the regulations of the DCF.

A.2.7. Marine Environment

Objectives

The aim of this challenge is to produce information on the seasonal and chronic variation of the marine environment. Specially the requirement is to produce 2D gridded data layers for the North Sea Basin showing:

- Seasonal averages of eutrophications in the basin for past ten years
- Change in eutrophication over past ten years (i.e. where eutrophication has reduced and where it has increased).

Background

For the purposes of this study, eutrophication is defined as Descriptor 5 of the Marine Strategy Framework Directive, which is defined as a process driven by enrichment of water by nutrients, especially compounds of nitrogen and phosphorus, leading to increased growth, primary production and biomass of algae; changes in the balance of organisms and water quality degradation. Nutrients naturally present in the sea include compounds of silicon (Si), nitrogen (N) and phosphorus (P). Nitrogen and phosphorus inputs from river inflows exaggerate the naturally seasonal cycle of nutrients, causing nutrient enrichment and greater primary production of organic material and an increase of algae. Management of eutrophication focuses on undesirable disturbance of the natural nutrient cycle as a result of anthropogenic influences. There are several established methods of eutrophication assessment, all of which include Chlorophyll a (Chl a) as an indicator of phytoplankton biomass, which in turn is an indicator for eutrophication. Some methods also use additional biological and physio-chemical indicators.

Eutrophication varies on a spatial and temporal scale. Spatial variations in eutrophication are driven by bathymetry and hydrodynamics, which influence the vertical and horizontal mixing of nutrients and growth and spread of algae. The extent of shallow areas, stratified river plumes, water residence times and upwelling all affect the vulnerability of waters to eutrophication. Due to the wide extent of eutrophic zones in some places, the use of remote sensing of surface chlorophyll content is an important source of data, to be complimented by ground-truth monitoring and modelling. Temporal variations in eutrophication are influenced by season, with the exception of waters that are permanently stratified. Eutrophication occurs most commonly in late spring and in summer and any assessment of eutrophication must take into account this seasonality.

A.2.8. River Inputs

Objectives

The aim of this challenge is to look at discharges into the North Sea for each river bordering the basin. Specially the challenge requires time series of annual inputs as wells as monthly averages, maxima and minima for the following parameters over the past ten years:

- water
- sediment
- total nitrogen
- phosphates
- salmon
- eels.

Background

Major rivers that flow into the North Sea include the Seine, Thames, Scheldt, Rhine, Ems, Weser, Elbe, Forth, Humber, Meuse, Spey, Tay and the Tyne. Information on the inputs from these rivers and smaller rivers is important for sustainable environmental management of the North Sea. River inputs data is needed, for example, for biophysical models that assess the impact of changes in inputs on the North Sea.

Information on water inflows identifies how much freshwater is discharging into the North Sea basin. The seasonal and annual variation of discharges to the basin influences the mixing of saline water with freshwater as well as the volume of sediment and nutrient inputs to the basin. Information on sediment identifies the concentration and quantity of bed material load and wash load that is transported to the sea. The parameters nitrogen and phosphorus are the main nutrients that discharge to the sea and are of significance to the environment as changes to the nutrient balance of the sea can lead to imbalances in the ecosystem and problems such as eutrophication. Salmon numbers entering the sea from rivers provides an indication of the health of the fish populations. The salmon life cycle includes phases in the sea and in rivers and changes in either of these environments may impact fish populations.

A.3. Web Interface to Data Advisor

A web-based database and associated user interface has been established for the data screen tool spreadsheet. Discussion are in progress with the Secretariat on the best approach to host this tool, both for long term hosting, but also to maximise its re-use by other check-point projects.

The diagrams below show the prototype interface. This prototype has been set up to show functionality and not styling. The final version can be styled in any manner required by the user.

The interface allows the user to do the following:

- Search for datasets associated with a particular challenge or challenges at a particular level of valuation. For example, “Find all datasets considered suitable for challenge X”.
- Search the which challenge a dataset has been valued for, for example “For dataset X, find all challenges where the dataset was considered”.
- View the scoring metrics for each dataset. This allows the user to view which value criteria the dataset passed or failed and the associated reason.

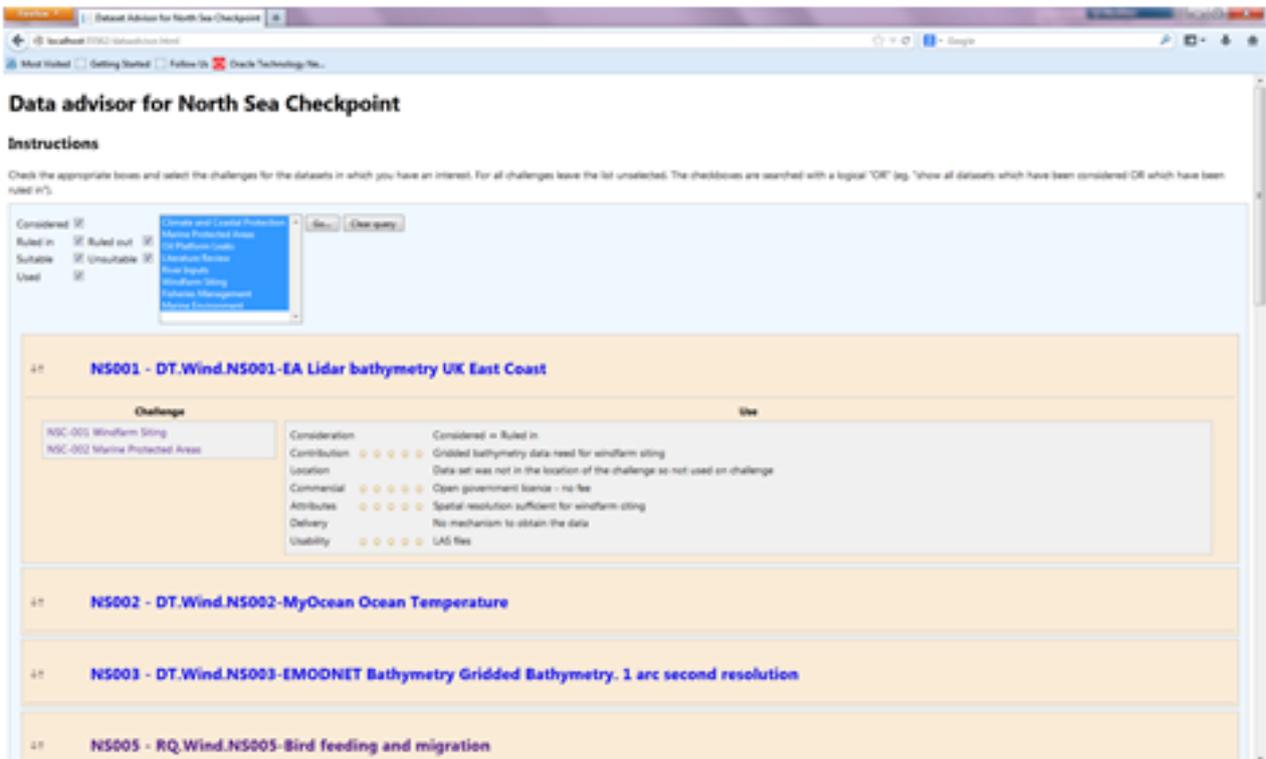


Figure A.1: Data Advisor User Interface

Note: Selection showing all data across all challenges. User can expand and collapse the view to read the value scores, or click on the data set to be taken to a URI for that dataset.

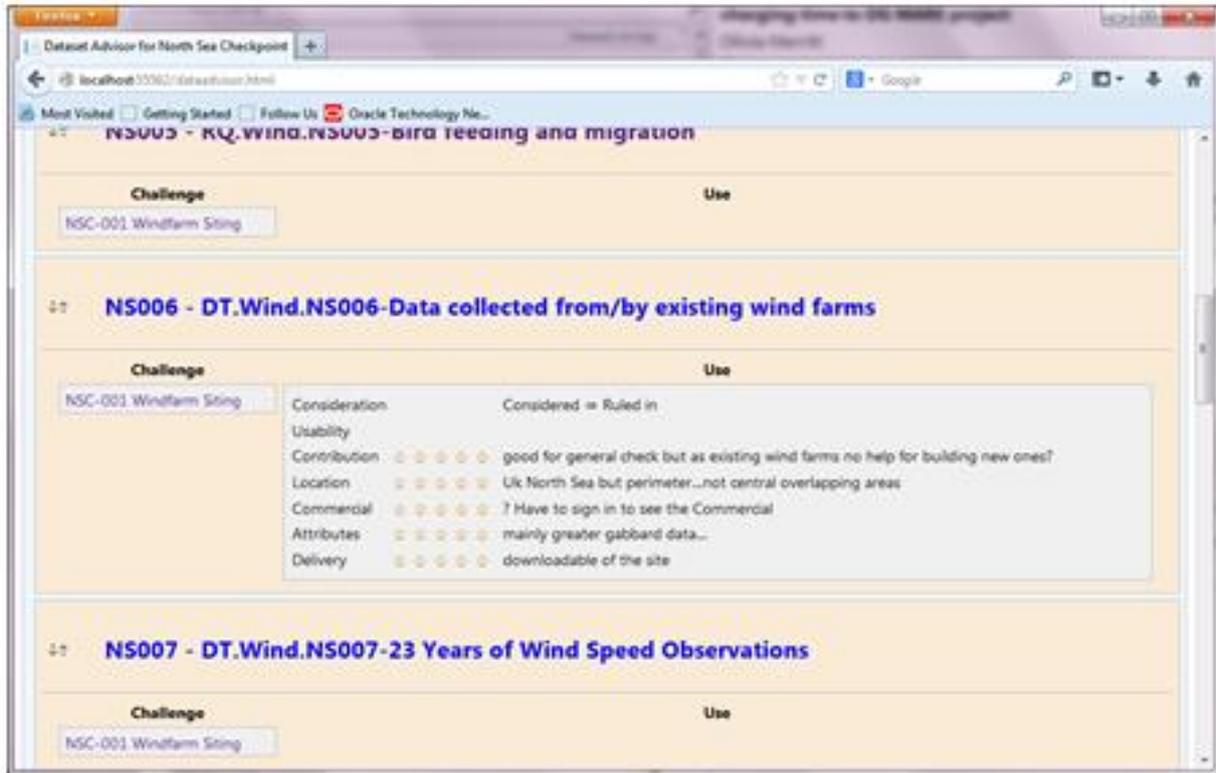


Figure A.2: Data Advisor User Interface

Note: Detail of a value score for a dataset. We are currently determining the best approach to present the scoring information.



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