EMODnet Stakeholder Conference & Sea-basin Workshops

14-15 February 2017

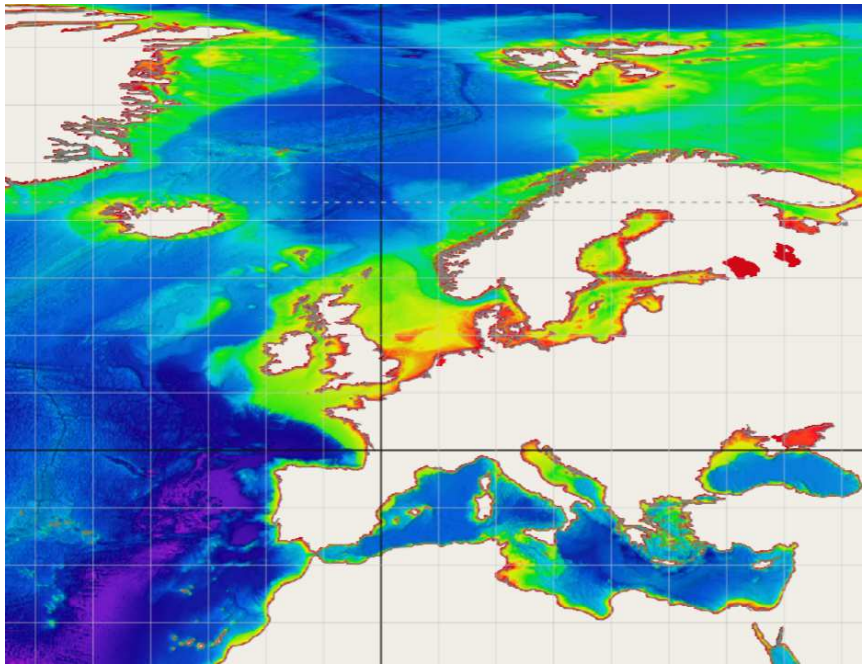
Bathymetry

Arctic checkpoint – Belinda Kater
On behalf of all Checkpoints

Bathymetry?

Bathymetry is the study of the "beds" or "floors" of water bodies, including the ocean, rivers, streams, and lakes. (NOAA)

= Underwater Topography



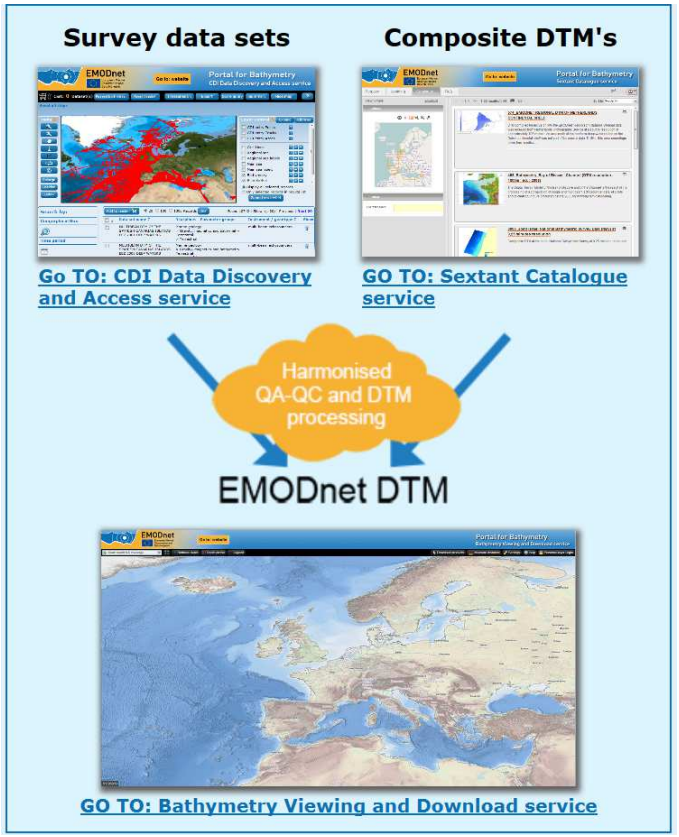
Bathymetry and EMODnet

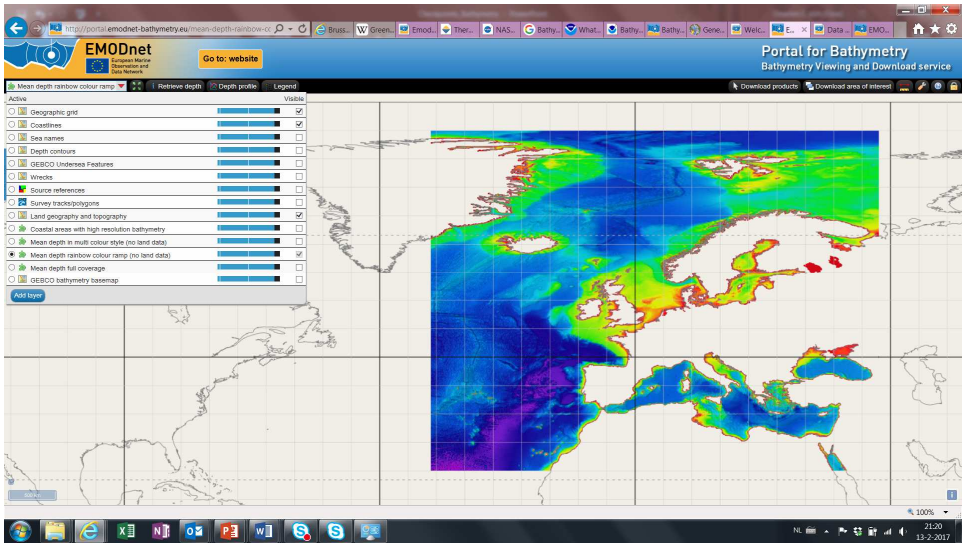
The EMODNet Bathyemtry portal provides a range of services and functionalities to users for viewing and downloading bathymetry data products and for identifying and requesting access to the survey data sets that are used as basis input for the DTM. Currently the following key services and functionality are provided for users:

- **1.Data Discovery and Access service: provides functionality to search and obtain survey data sets;**
- **2.Composite Products Discovery and Access service: provides functionality to search and view metadata of composite DTM;**
- **3.Bathymetry Viewing and Download service: provides functionality to view, browse and download digital bathymetry as DTM and obtain information about the underlying data sets used to compile the DTM.**

http://www.emodnet.eu/bathymetry

Bathymetry and EMODnet





http://portal.emodnet-bathymetry.eu/mean-depth-rainbow-colour-ramp-no-land-data

http://www.emodnet-hydrography.eu/

But why is Bathymetry important?

- **Safe ocean navigation**

- **planning marine installations and infrastructure:**
  - Wind turbines
  - Coastal defenses
  - Oil platforms
  - Pipelines
  - Etc.

- **Ecology**

Checkpoint Results - General

Which challenges require bathymetric data?

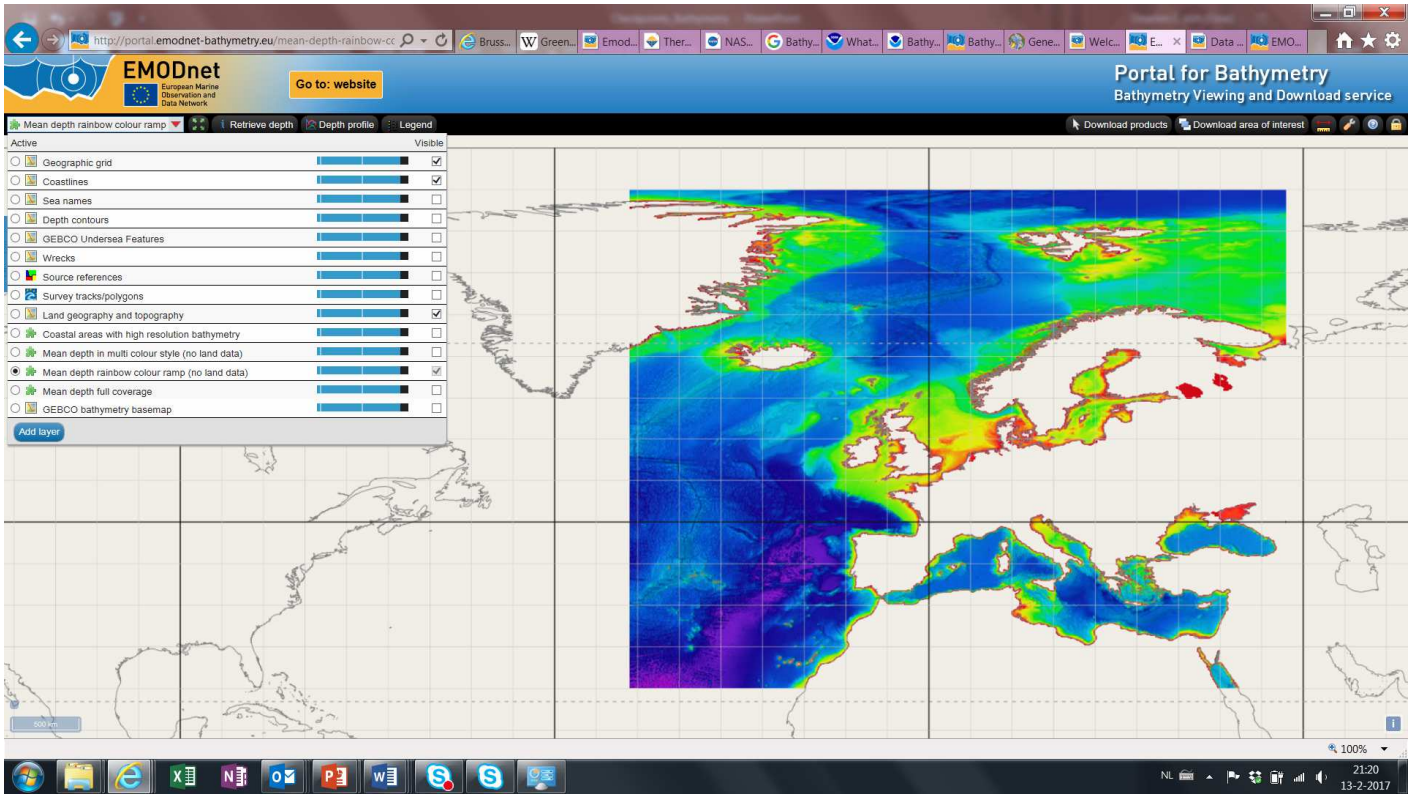
- **Bathymetry (Yes, Really)**
- **Windfarm Siting**
- **Oil Leak Platform**

Less important but could be useful:

- **Fisheries impact**
- **Coast**
- **MPA**
- **Alien Species**

Checkpoint Results

- **All basins: EMODnet provides a pan-European broadscale bathymetry map**
  - But wait!! What happened to the rest of the Arctic? And the Atlantic?



Checkpoint Results

Arctic

- The quality of the bathymetric data in the Barents Sea and Norwegian Sea is good enough to use the available data to determine where suitable water depths occur that are compatible with either a fixed or a floating offshore wind turbine.
- Bathymetry data for the complete Arctic Ocean are available from EMODnet portals; SeaDataNet; Copernicus marine service; ACCESS; ICES; NOAA National Geophysical Data Center; Marine Cadastre; Geographic Information Network of Alaska; Bureau of Ocean Energy Management; USGS Alaska Geospatial Data Committee; US Coast Guard; National Weather Service. But the **datasets are extremely large**. These datasets provide information on where water depth information exists for the study area, and where information is as of yet not available. While sufficient for general research and interest, the **data is insufficiently granular to be used for navigation.**

Checkpoint Results

Atlantic

- Bathymetry data products overall scored **very high availability**. However **visibility of the data is not optimal**.
- Some **restrictions** were found with EMODnet bathymetry "background datasets" data policy. In the North Atlantic a high proportion of 88% of the 10,000 survey data occurrences were obtained by negotiation. Part of these restrictions are due to national or international legal constraints (defense, mining law, UNCLOS, ...). It should be noted that **'by negotiation' does not mean that the data are not available but it clearly slows down the data access process.**
- The literature survey indicates that **higher DTM resolution than 250m is required** for many applications (e.g. 50m to 100m for applications such as wind farms, sea level estimates or hydrodynamic modeling).
- Another request is for **metadata completeness** (e.g. soundings timestamp)

Checkpoint Results

- **Baltic**
  - data are available from BSHC Baltic Sea Bathymetry Database (BSBD) and EMODnet, in 500m resolution;
  - due to **national regulations, data availability varies greatly with countries**. In Lithuanian and Russian waters, BSBD uses data from GEBCO 30" bathymetry data. Sweden and Finland have restrictions on the resolution of released bathymetry, i.e., 500m, while other countries e.g., Denmark and Germany release data up to 4m resolution;
  - the existence of good quality bathymetric data sets is gradually improving but **bathymetric surveys are expensive and time consuming operations**. In a substantial area of the Baltic Sea the quality of available bathymetry is still low. This seems to be especially the case for shallower waters that are not of interest for commercial shipping.

Checkpoint Results

Black Sea

- The availability indicators for bathymetric data are mostly **Yellow and Red.**
- There are **no clear data policy and pricing information**.
- The **datasets do not provide a full EU Inspire catalogue service**.
- **Visibility of data policy is not enough**.

Mediterranean

- The availability indicators for this theme are dominantly **GREEN**. Only 6 data sets were used for the evaluation.
- The **appropriateness indicators are RED for temporal coverage and temporal validity** (last time the data set was updated).

Checkpoint Results

- **North Sea**
  - The wind farm siting challenge found that **resolution of bathymetry varies with territorial waters**, so comparison of boundary areas ended up with variable resolution. Less processing of data was required by using the SeaZone product (as against that from the bathymetry portal) which was preferred for this challenge.

Conclusion

- **For all Checkpoints data is available, BUT**
  - Resolution is not always high enough;
  - Not all data is open-source;
  - Data can be scattered and hard to connect;
  - Not all areas have been monitored.