

EMODnet Bathymetry - Coastal developments

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The main aim of EMODnet Bathymetry is to produce the best Digital Terrain Model (DTM) for the European seas. This is done by gathering bathymetry surveys and composite DTMs from an increasing number of European data providers, involving national hydrographic services, marine research institutes, governmental services, and private companies. Recently, the latest version of the EMODnet DTM has been released, incorporating more than 9.000 data sets, and having a grid resolution of circa 115 * 115 meters. However, the transition zone between land and sea is considered as a challenge due to a lack of survey data sets and because of higher resolution requirements, combined with tidal dynamics.

For that purpose, EMODnet Bathymetry has undertaken in the last years several activities for improving the availability of bathymetry data for the coastal and transition zone:

- Gathering and publishing **High-Resolution-DTMs**, which are generated and documented by data providers using the same tools and methods as used for the overall DTM. The HR-DTM files are focused on the coastal zone and on interesting underwater features and made available by means of a separate layer in the EMODnet Bathymetry map viewer and for public downloading. It is a multi-resolution layer which allows to view, zoom in, interrogate for metadata, and download of a collection of higher resolution composite DTMs (HR-DTMs) for selected areas. The resolution of HR-DTMs varies between 1/32 and 1/512 arc minutes, depending on local data policy of data providers. Currently, there are more than 100 HR-DTMs available and gathering is continuing.

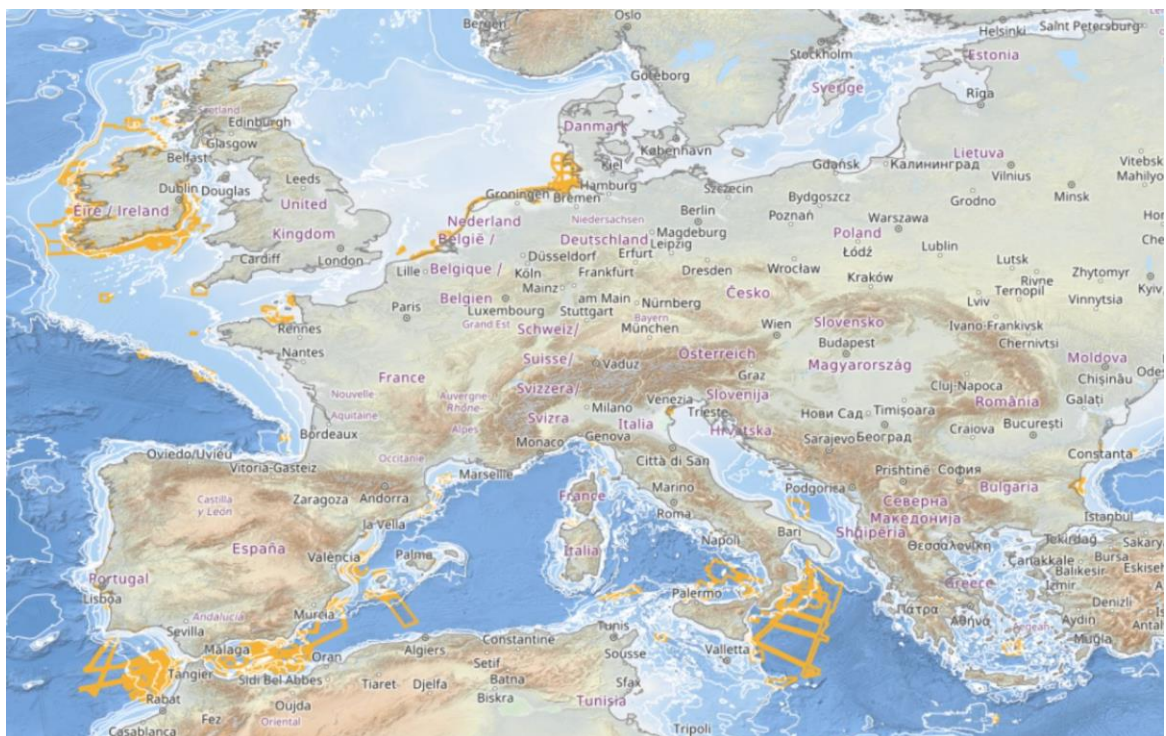


Figure: Overview of locations with HR-DTM files



Figure: HR-DTM data near coast of Ireland

- Making use of Satellite Derived Bathymetry: in 2016 EMODnet Bathymetry has taken the initiative to make use of Satellite Derived Bathymetry (SDB), where feasible, for filling gaps in coastal and near shore areas. Partner EOMAP, expert in SDB, has joined the consortium and in the meantime has generated 28 DSB data sets for coastal areas of Spain, Greece, Croatia, Denmark, Cyprus, Italy, and Libya, based upon satellite images from Landsat-8 and Sentinel-2. EOMAP makes use of optical satellite data.

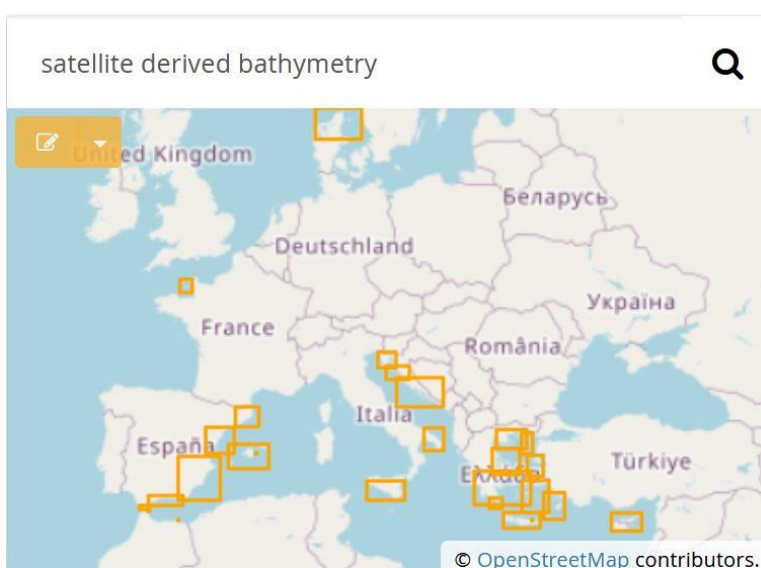


Figure: Locations of SDB data products, produced by EOMAP

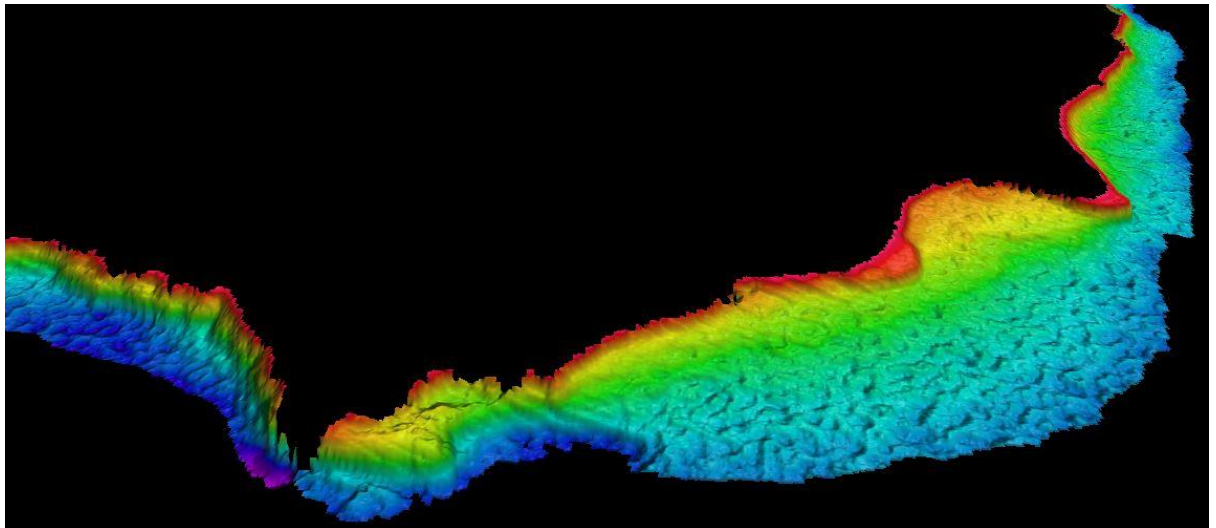


Figure: SDB data product for North East of Denmark, produced by EOMAP

- Determining **best-estimate coastlines** from satellite data (typically Sentinel-2 and Landsat-8) and in combination with the Global Tide Surge Model (GTSM) processed into digital coastlines for the European seas at LAT (Lowest Astronomical Tide), MSL (Mean-Sea-Level), and MHW (Mean-High-Water). The level of detail is bound to the resolution of the satellite sensor (e.g. 10m for Sentinel-2). A first release was made by Deltares in 2018, while an update with improvement of methodology and also adding Northern areas was released in December 2020. The latest version now covers the entire coastline of Europe. These satellite derived coastlines can be viewed as extra layer and can be downloaded as shapefiles from the Viewing service, while a [report](#) gives background information.

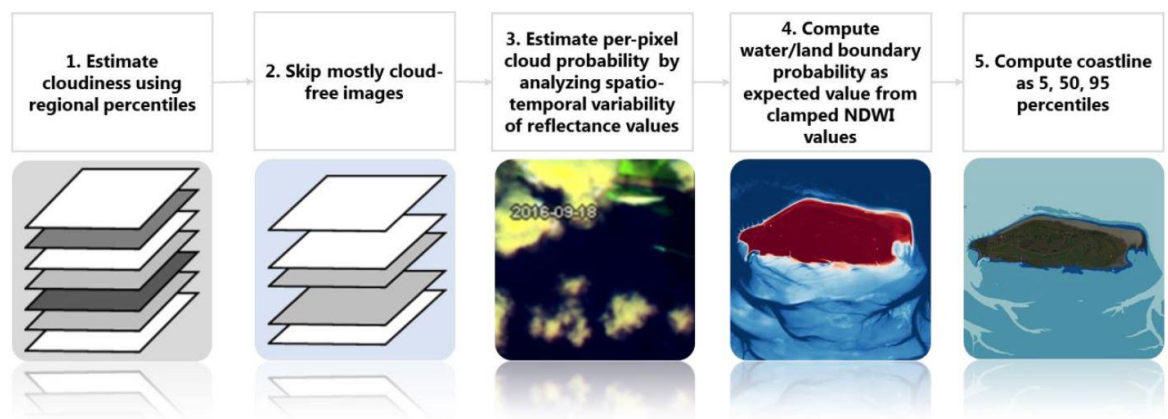


Figure: Processing pipeline for coastline detection from optical satellite images, capturing intertidal water level changes, prepared by Deltares

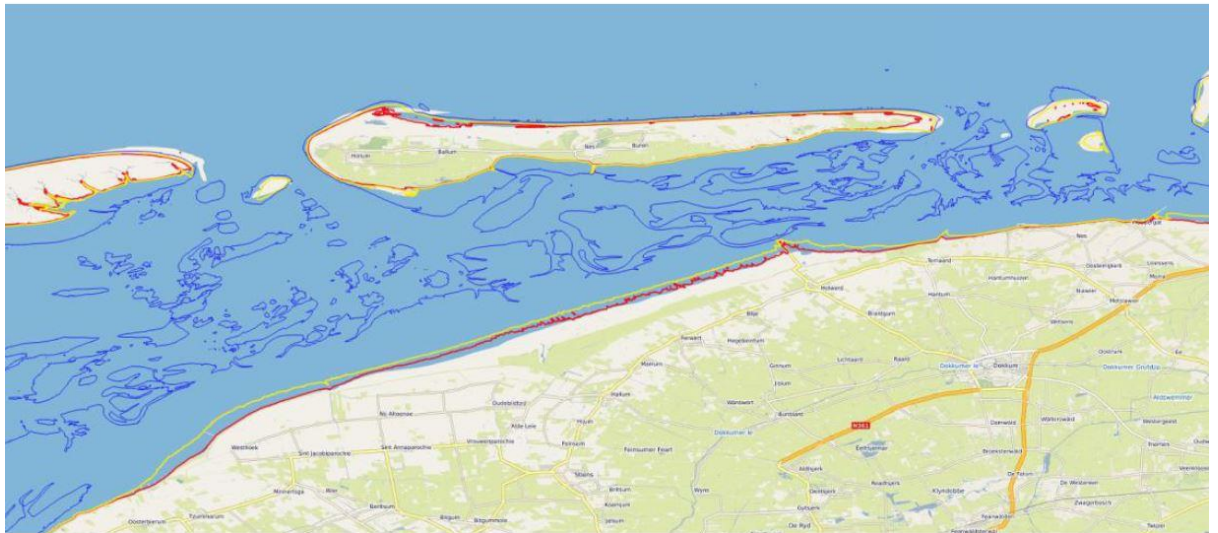


Figure: Plotted coastline as poly-line format (Final product delivered) – Wadden Sea area