

A pilot study to provide large-volume, user oriented marine spatial data of a federal institution online

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Data of federal institutions may offer a valuable source for scientific or commercial applications. Unfortunately, these data are not always well known or easily accessible. Therefore the German Federal Ministry of Transport and Digital Infrastructure (Bundesministerium für Verkehr und digitale Infrastruktur, BMVI) funded the mobility research initiative (mFUND). Within this initiative the Federal Waterways Engineering and Research Institute (Bundesanstalt für Wasserbau, BAW) created the EasyGSH-DB project to provide user-oriented, synoptic reference data for the thematic fields of geomorphology, sedimentology and hydrodynamics. These data cover a large area, the German Bight, and a large time span (years 1996 to 2015). The purpose is to provide 20 years of consistently generated marine data in a high temporal and spatial resolution for the German Bight, which can be visualized and openly shared. To obtain a high degree of user orientation, possible applications for the data have been identified in a structured stakeholder involvement.

A web-based presentation is chosen and the portal for EasyGSH-DB was designed with a focus on the following four main goals:

- discovering and sharing of project related data and information
- providing technical documentation e. g a model validation and metadata
- free download of data
- quick and visually appealing visualisation

Figure 1 shows the structure of the website which covers information about the project, an interactive viewer for visualization and exploration of data, access to data as services and download.

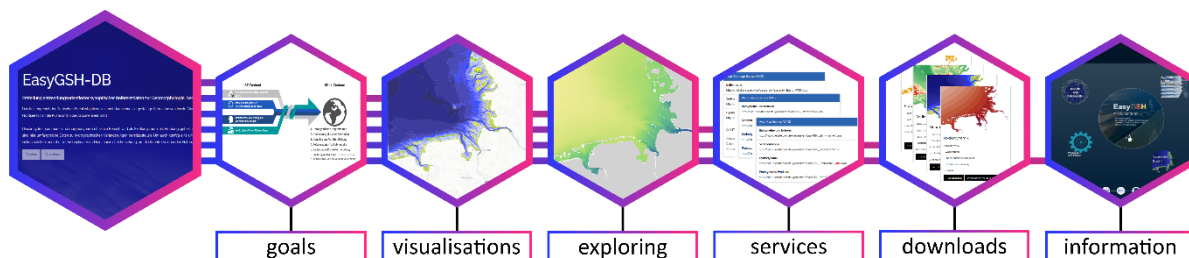


Figure 1: Short presentation of website content.

The technical set-up was chosen in a way to obtain a sustainable platform with the opportunity for easy updates, maintenance and use by stakeholders.

The data products are highly complex with different spatial resolutions and data formats e. g. resolution of bathymetry (10x10 m), hydrodynamic analyses (100x100 m) and numerical model output (1x1 km, 20 minute time steps) with vector, raster or NetCDF data formats. The contents of data and metadata for one year are highly diverse in complexity and this multiplied by temporal data coverage of twenty years, required separated data storage, services and visualisation.

Rasterized model data from the North Sea model is stored in a THREDDS Server (Thematic Real-time Environmental Distributed Data Services). From there data and metadata can be queried as Web-Map-Services (WMS) or Web-Coverage-Service (WCS) and used from web clients for viewers to support key features such as data comparison or animation.

For the three main topics geomorphology, sedimentology and hydrodynamics, data is stored in two databases depending on the data format. The databases are divided in vector and raster data. They share the same metadata with specification on their format, process steps and lineage. A Geoserver is used to generate the WMS, Web-Feature-Services (WFS) and WCS, which are published on the website and used from the Terrajs Viewer, where users may request, discover or directly download the data according to their field of research.

Using a Catalog Service for the Web (CSW) directly from the metadata repository and having all UUIDs, links or other connections partly automatically updated allows publishing of all metadata separately or together with the data. Through CSW harvesting, metadata information systems like the mCloud, govdata or GDI-DE have access to the data information and download.

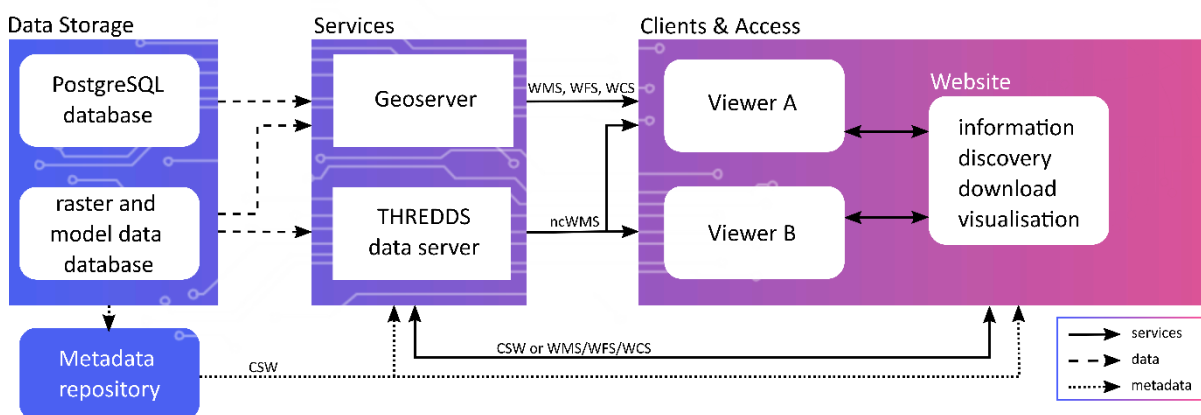


Figure 2: Basic overview about the technical infrastructure implemented from EasyGSH-DB with service, data and metadata flows.

Various tools and software were used to determine the best-practice for building a website to present the different kinds of data. The key features which are:

- easy to find downloads with different data formats,
- download of time-series for a location,
- query results for metadata with the possibility of a separate download,
- visualisation over a free and easy to use viewer,
- animation of model data and
- technical documentations for e.g. the North Sea model, validation and project status.

As a result, the EasyGSH-DB website joins the requirements from stakeholder interviews with the infrastructure of a project and offers a variety of services and visualisation tools with different features. The incorporation of different stakeholder interests, topics and features in an intuitive website is not a simple task. Maybe EasyGSH-DB can be used as an example for projects and how to overcome these challenges in the future.