



# SHEBA

## Sustainable Shipping and Environment of the Baltic Sea region

---

BONUS Research Project

Call2014-41

### Deliverable 6.4, type OT

#### Report on data portal

Due date of deliverable: project month 18

Actual submission date: project month 18

Start date of project: 1 April 2015

Duration:

36 months



**BONUS**  
SCIENCE FOR A BETTER FUTURE OF THE BALTIC SEA REGION



Itic Earth  
SCIENCE FOR A BETTER FUTURE OF THE BALTIC SEA REGION



## Name of the Deliverable

Organisation name of lead contractor for this deliverable:

HZG

Scientist(s) responsible for this deliverable:

G. Breitbach

Authors (name-affiliation):

G. Breitbach (HZG)

Other contributors (name-affiliation):

Organisation name/names responsible for revision:

Finnish Meteorological Institute

Scientist(s) responsible for the review:

Jukka-Pekka Jalkanen

Revision: [0]

# Report on data portal

---

SHEBA stands for "Sustainable Shipping and Environment of the Baltic Sea region". The impact of shipping on the environment will be investigated for air pollutants in WP2, for water pollutants in WP3, and for noise in WP4. Different shipping scenarios will be the result of WP1. These WPs will produce data, which should be disseminated through the SHEBA data portal.

In addition the data portal has the duty to function as platform for sharing internal SHEBA data.

To fulfil the task of dissemination of SHEBA project results the data portal should reflect the working package structure of SHEBA. The data output of public interest from SHEBA, will be imbedded into netCDF files. These netCDF files can be visualised using the THREDDS Data Server (TDS). TDS is used as tool to build the SHEBA data portal. Beside the working package structure of SHEBA the structure of the SHEBA data portal should also reflect selected scenarios.

To compare the various SHEBA scenarios an additional tool must be developed. This tool will be based on a HZG development already done within the HZG project COSYNA.

## 1 Concept of the portal

### 1.1 Goal of the portal

Main goal of the SHEBA data portal is the dissemination of results from the project to the public. A public user of the portal should be able to download all project output of public interest as files.

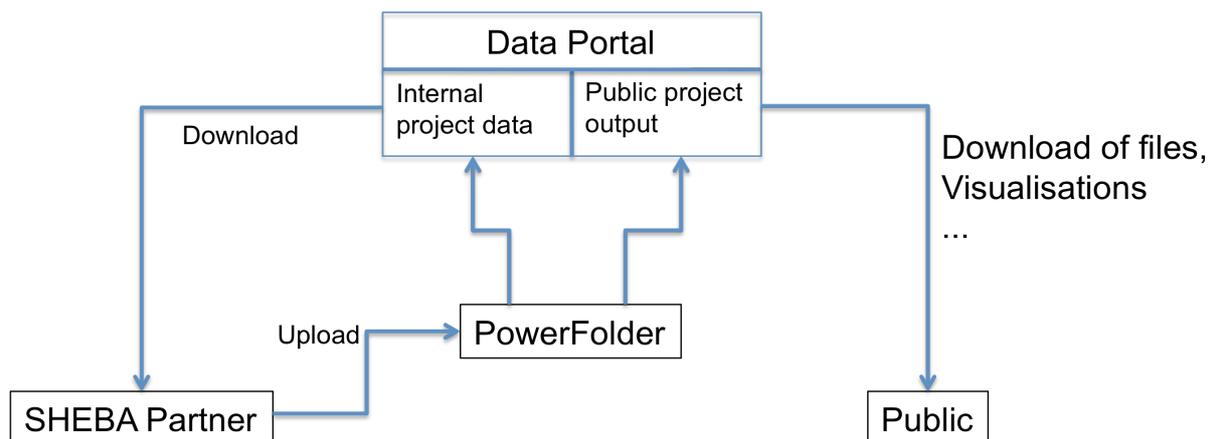


Figure 1: Schematic view on the SHEBA data portal.

In addition the visualisation of project's public results should be made possible through the portal. Therefore visualisations of all public accessible files should be realised.

In SHEBA it is planned to have different scenarios for ship traffic and emissions. The portal should be enabled to visualise differences between these scenarios. This goal can be reached using techniques to synchronise the visualisations of one parameter from different sources as already developed in reference [1].

Another goal of the portal is it to function as internal data sharing portal. Beside the public data portal an internal access should be possible for the project partners.

### 1.2 Data format

The data format in the portal should be netCDF. This was agreed during the kick-off meeting. All public accessible data results be integrated into netCDF files. The timescale of the output should be a monthly scale. For every scenario in all WPs netCDF files covering the 12 month of one year should be created including the parameters deduced from the WPs work.

### 1.3 Metadata

Metadata should be included into the netCDF files as global attributes. The netCDF files should be CF-convention [2] compliant. A negotiated set of additional metadata is described in the file [SHEBA\\_CF-convention.docx](#)<sup>1</sup>.

## 2 Implementation

### 2.1 THREDDS as main tool to implement the SHEBA data portal

THREDDS stands for "Thematic Realtime Environmental Distributed Data Services". The THREDDS Data Server<sup>2</sup> (TDS) in the Version 4.6 was selected as tool to disseminate all public available data from SHEBA. This tool comprises the OPeNDAP service for downloading netCDF files with the ncWMS service to visualise data from netCDF files as time-series of maps and a HTTP service for downloading files generally. Visualisations are created using the Godiva2 tool from ncWMS. Such a visualisation for the concentration of a passive tracer emitted from ships is shown in figure 1.

---

<sup>1</sup> [http://sheba.hzg.de/thredds/catalog/publicAll/catalog.html?dataset=publicDatasetScan/SHEBA\\_CF-convention.docx](http://sheba.hzg.de/thredds/catalog/publicAll/catalog.html?dataset=publicDatasetScan/SHEBA_CF-convention.docx)

<sup>2</sup> <http://doi.org/10.5065/D6N014KG>

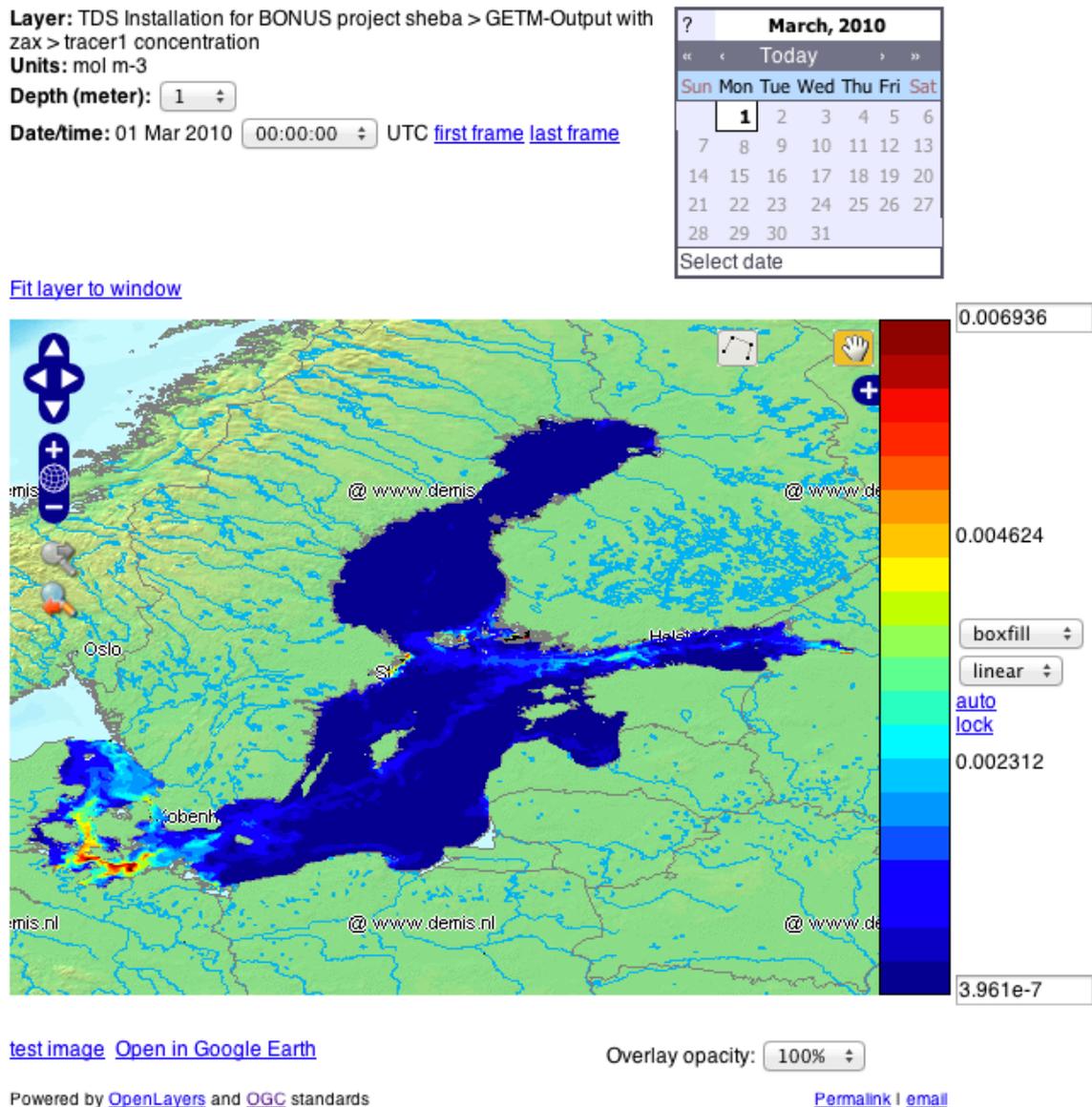


Figure 2: Test data for tracer concentrations emitted from ships and circulated through the Baltic (data from TTU).

It is an advantage of TDS that visualisations for netCDF files and downloads for all files are offered by default. The tools for displaying netCDF files like the "NetCDF-Java ToolsUI" or the "Integrated Data Viewer" are not operating due to the installation of TDS on an internal HZG server behind a proxy service. This kind of installation was used to be able to secure the SHEBA data portal,

### 2.2 Portal structure to represent Scenarios

The public visible directory structure of the SHEBA data portal is shown in figure 2. There is a directory for every working package, which will offer data to the public.

Dataset	Size	Last Modified
sheba		--
WP4-Noise/		--
WP3-Water/		--
WP2-Air/		--
WP1-Emissions/		--
SHEBA_CF-convention.docx	18.57 Kbytes	2016-07-05T13:08:05Z

TDS Installation for BONUS project sheba at HZG see Info  
THREDDS Data Server [Version 4.6.3 - 2015-08-31T15:28:06-0600] Documentation

Fig. 1: Directory structure of the public part of the SHEBA data portal (<http://sheba.hzg.de/thredds/catalog/publicAll/catalog.html>).

Inside these working packages there are directories for every scenario. For WP4-Noise this is shown in figure 3.

Dataset	Size	Last Modified
WP4-Noise		--
Scenario4/		--
Scenario3/		--
Scenario2/		--
Scenario1/		--

TDS Installation for BONUS project sheba at HZG see Info  
THREDDS Data Server [Version 4.6.3 - 2015-08-31T15:28:06-0600] Documentation

Fig. 2: Directory structure inside a working package (<http://sheba.hzg.de/thredds/catalog/publicAll/WP4-Noise/catalog.html>).

### 2.3 File sharing between SHEBA partners

The SHEBA data portal can also be used as an internal file sharing tool between SHEBA partners. All files with should be shared are uploaded to the HZG PowerFolder created for SHEBA<sup>3</sup>. To be able to upload files a personal account in PowerFolder is build for every partner who wants to use this procedure. The uploaded files are transferred to the internal folder of the SHEBA data portal as shown in figure 4 and 5.

Dataset	Size	Last Modified
sheba/		--
internal/		--
CMAQ file aggregation		--

TDS Installation for BONUS project sheba at HZG see Info  
THREDDS Data Server [Version 4.6.3 - 2015-08-31T15:28:06-0600] Documentation

Fig. 3: Entry view of the SHEBA data portal.

<sup>3</sup> <https://powerfolder.hzg.de/filestable/MjZVSG5SV1hjMndzRVIWY1BaMkdq>

The current content of this internal folder is shown in figure 5.

SHEBA  Catalog <a href="http://sheba.hzg.de/thredds/catalog/restrictedAccess/catalog.html">http://sheba.hzg.de/thredds/catalog/restrictedAccess/catalog.html</a>		
Dataset	Size	Last Modified
 <a href="#">internal</a>		--
<a href="#">vesselSpecificOutput_anonymous_2014.xlsx</a>	17.25 Mbytes	2016-05-13T11:35:41Z
<a href="#">flagstates_CO2_netcdf.nc</a>	17.92 Mbytes	2016-05-13T11:35:40Z
<a href="#">dl2dataset_part1.zip</a>	9.556 Mbytes	2016-05-13T11:35:40Z
<a href="#">baltic2011_netCDF.zip</a>	3.222 Gbytes	2016-05-13T11:22:43Z
<a href="#">baltic2011_netCDF</a>	358.7 Mbytes	2016-06-13T15:40:00Z
<a href="#">allPollutants_netcdf.nc</a>	40.08 Mbytes	2016-05-13T11:35:40Z
<a href="#">STS_netcdf.nc</a>	73.47 Mbytes	2016-05-13T11:35:39Z
 <a href="#">FMI-STEAM/</a>		--

**TDS Installation for BONUS project sheba at HZG see [Info](#)**  
**THREDDS Data Server [Version 4.6.3 - 2015-08-31T15:28:06-0600] [Documentation](#)**

Fig. 4: Content of the internal folder.

## 2.4 Additional Tool to Visualise SHEBA Scenarios

Main output of SHEBA will be different results for ship emissions depending on the scenario for ship traffic. It is a challenge for a data portal to visualise such a comparison. In reference [1] a tool is described which is able to visualise and compare three results for currents in the North Sea. This tool will be the base of a similar tool, which can compare the results of the four SHEBA scenarios for selected key parameters. Such a tool will be developed in SHEBA.

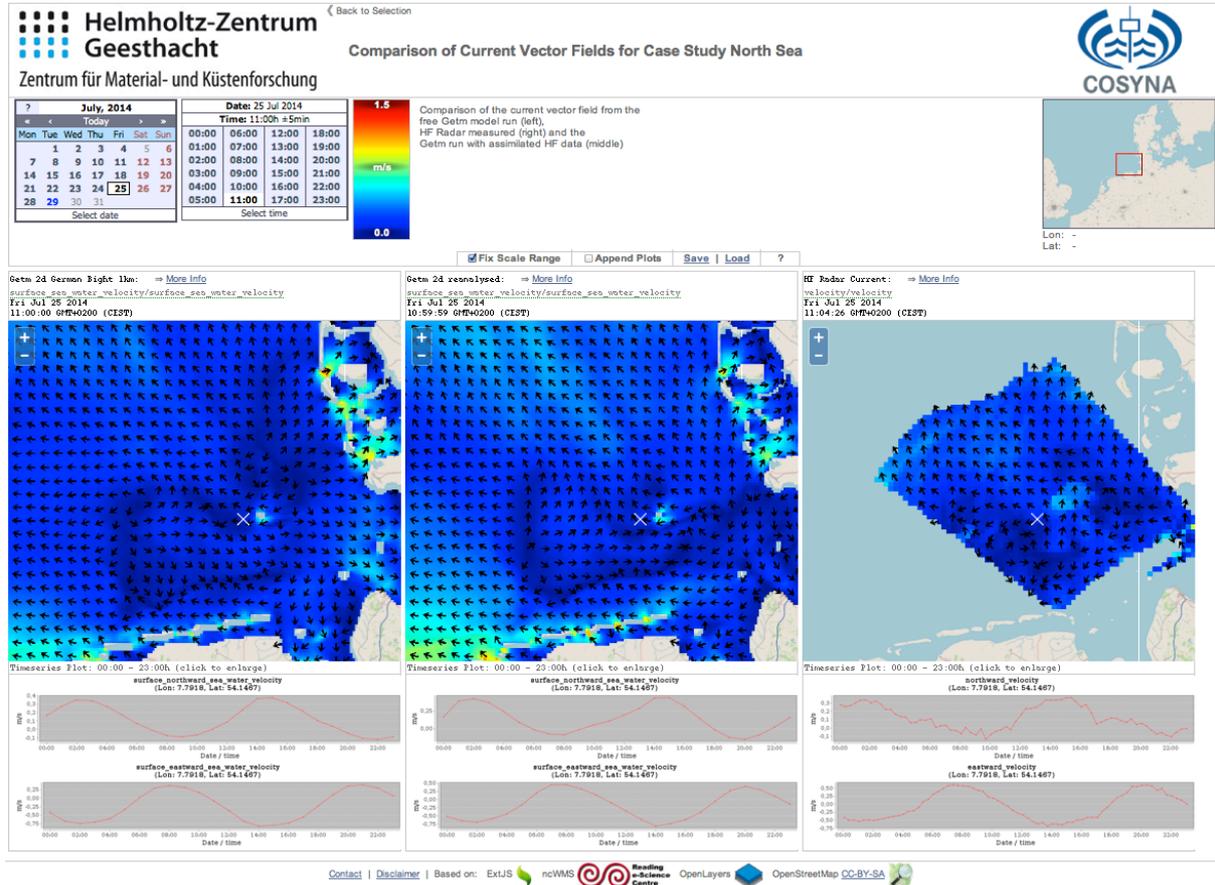


Figure 3 This tool will be adapted to the SHEBA data portal.

References:

- [1] Gisbert Breitbach, Hajo Krasemann, Daniel Behr, Steffen Beringer, Uwe Lange, Nhan Vo, and Friedhelm Schroeder (2016): Accessing diverse data comprehensively – CODM, the COSYNA data portal in Ocean Science, 12, 4, 909-923, DOI: 10.5194/os-2016-6
- [2] Eaton, Gregory, Drach, Taylor, Hankin (2010): netCDF Climate and Forecast (CF) Metadata Conventions, Version 1.6 <http://cf-pcmdi.llnl.gov/documents/cf-conventions/cf-conventions-version-1.6/cf-conventions.pdf>