Baltic LINes

Coherent Linear Infrastructures in Baltic Maritime Spatial Plans

Data needs and availability

Deliverable 3.1 by HELCOM

UPDATED WITH GERMAN AND SWEDISH LINKS

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HELCOM

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Summary

In this update we added new wind farms and cables WFS links from Germany; from Sweden National MPA and high voltage cables WMS.

See overview figure 3 in page 8. The links to access the services are on page 10 onwards.

Baltic LINes project aims at proposing planning solutions for linear infrastructure (cables and pipelines), fixed installations such as wind farms and shipping lanes. Maritime Spatial planners need data in order to elaborate those proposals. The aim of Work Package 3, led by HELCOM, is to provide data and build a prototype Baltic Marine Spatial Data Infrastructure (MSDI) which will access open standard datasets.

The first step towards designing this prototype MSDI is to evaluate what kind of data planners need and what is actually available in each country. This task was started by the HELCOM-VASAB MSP Data Expert Sub-Group in 2016 by designing a list of datasets available. HELCOM have continued the work by improving it an adding more details to have a better understanding of the data needs and availability.

This report summarizes the dataset list and gives an overview of what data is missing. Unfortunately, most countries still do not have available data in open standard format. The INSPIRE Directive is forcing countries to publish and comply with standards but the deadlines are not aligned with the project, especially regarding the data on fixed installations and cables.

This report has been written by Manuel Frias, Florent Nicolas and Joni Kaitaranta from HELCOM. Henning Sten Hansen and Lise Schrøder from Aalborg University and Lena Hallin-Pihlatie from SYKE (Finnish Environment Institute) provided feedback. It is part of a deliverable for WP 3.1 and is planned to be constantly updated working document providing up-to-date overview of publicly available relevant MSP datasets in the Baltic Sea.

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1. Coherent linear infrastructure

Shipping is the most traditional and transnational use of marine space. The Baltic Sea area consists of highly and increasingly frequented waterways used by very different kinds of vessels. Size, quantity and draught of ships is expected to increase in the coming years with consequences for the environment as well as navigation safety.

However, despite being entitled to free navigation, shipping in the Baltic Sea is coming increasingly under pressure from other activities. In particular it is effected by the increasing number and size of areas with fixed installations at sea due to offshore wind energy production and transmission (cables, grids and pipelines).

Already now, available space is scarce and infrastructure needs to be designated very carefully. It is therefore necessary to take a pan-Baltic and also cross-sectoral perspective as all sectors are affected by each other.

Moreover, the energy and port infrastructures and their related planning cycles are long lasting. Consequently, the MSPs to be developed by 2021 do not only have to regulate among current uses, but have to take a long-term perspective in order to ensure that suitable space is available for future developments such as a transnational/pan-Baltic offshore grid.

All these issues are raised by the Baltic LINes project. Baltic LINes aims to develop and propose transnationally coherent planning solutions for linear energy infrastructures (for example, define priority areas) and shipping lanes (for example, defining space to be kept free). These planning solutions will be in line with the ecosystem based approach. They will also be integrated into the national cross-sectoral Maritime Spatial Plans to be created/revised by Baltic Sea Region countries by 2021.

Thereby Baltic LINes will help to develop the most appropriate framework conditions for Blue Growth activities such as maritime transportation, offshore energy exploitation and coastal tourism for the coming 10-15 years increasing investors' security.

A project divided in 5 Work Packages

Baltic LINes will achieve its aims thanks to a consortium of 15 partners led by the Federal Maritime and Hydrographic Agency of Germany. The project is divided in 5 Work Packages (WP) including WP 1 for the project management and administration. This report focuses on WP3, led by HELCOM.

Objective: monitor the implementation of the project in relation to the work plan and the obligations towards the Baltic Sea Region Programme Secretariat.

Objective: increase the understanding of maritime spatial planners on the future sectoral developments and to anticipate spatial uses for the Baltic Sea. The results will be used to develop future scenarios to highlight cross-border mismatches and discuss potential gates for shipping corridors and power cables within other WPs.

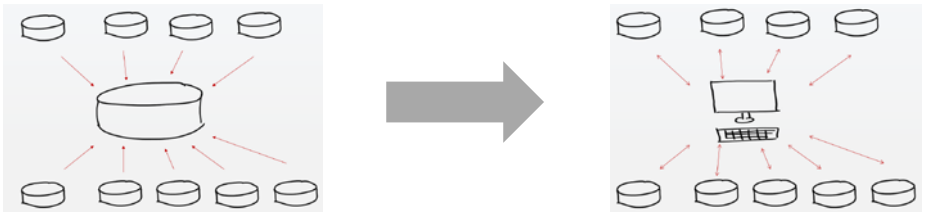
Objective: develop a prototype pan-Baltic data infrastructure for Maritime Spatial Planners. This report will explain the results of the first step of this project: data needs and availability.

Objective: develop and propose transnationally coherent planning solutions for linear energy infrastructures and shipping corridors which are in line with the ecosystem approach.

Objective: ensure that the project activities and results are shared among project partners and relevant stakeholders. It is important to safeguard the main outputs for implementation after the finalization of the project.

Towards a decentralized system with the Work Package 3

WP 3 aims at developing a Marine Spatial Data Infrastructure (MSDI) prototype to provide data to the planners who carry out the planning proposals. This infrastructure will allow MSP practitioners to access MSP data in a decentralized system.



In a centralized system data is sent to a database from the original source.

In a decentralized system data is not sent anywhere. A system access it from the original source.

This decentralized system allows the users to have access to the most update datasets hosted by the countries. The first step to build this tool is to identify data needed for doing coherent MSP across border. This document identifies the data needs for planners as well as the availability of the datasets.

MSP planners need data

This document is intended to assess the data needs and availability of the project partners. HELCOM, together with Aalborg University, carried out interviews during the fall 2016 among Maritime Spatial Planners and project partners to identify the data needs for this prototype MSDI. The main issues identified in these interviews were the lack of harmonized datasets around the border areas and also the availability of the datasets. It is well-known that the lack of data harmonization may cause incompatibilities and inefficiencies in planning processes compromising the blue growth losses and the protection of the environment.

Planners need to know where and how to access the data they need in the MSP process. Because MSP is per definition a cross-sectoral approach, the datasets can be made available via different sources in different formats and not all are updated at the same time. This document will support the project partners and Maritime Spatial Planners to find the most accurate datasets.

2. INSPIRE can help us

The INSPIRE Directive

The Baltic LINes project follows closely the development of the INSPIRE Directive which aims at making data harmonized across all EU countries.

In 2007, the INSPIRE Directive entered into force to achieve that purpose. There are 34 spatial themes (for example, protected sites or hydrography) covered to support data delivery needed for environmental policies and these themes are divided into three Annexes. The Directive is currently implemented in various stages aiming for a full implementation by the end of 2020. The Directive concerns data components such as metadata, view services, download services, etc. The deadlines for having Annex II and III datasets fully implemented are long after the end of the project:

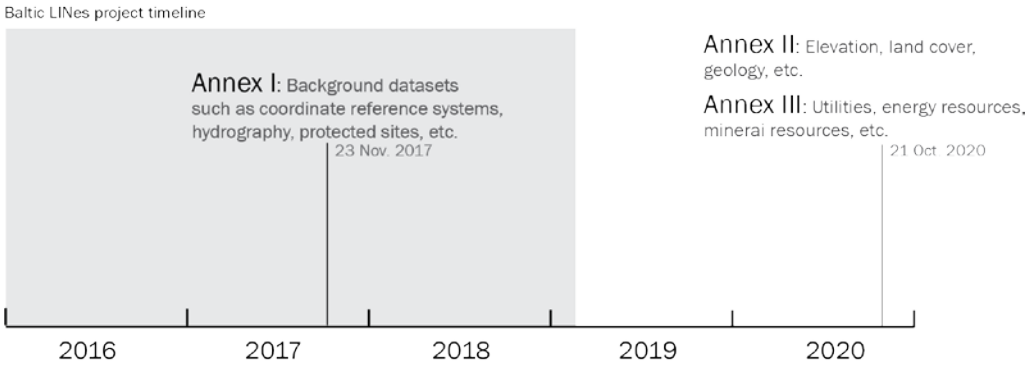


Figure 1 Dates for full implementation of INSPIRE. The deadlines for Annex II and III ar far beyond the end of the project

To build the MSDI as planned by the WP 3, the most relevant compliant online services (called network services in INSPIRE) are:

- Web Feature Service (WFS)
- Web Map Services (WMS).

WFS is the most advanced of these two services: the user can query the data, and in some cases the user can be allowed to add or update features, etc. The WMS is a simple query of data to view maps.

The INSPIRE Directive puts performance (for example, response time limits), capacity, availability requirements on the network services, such as WFS and WMS. For instance, the INSPIRE network services shall be available 99% of the time.

Additionally, the Directive requires that INSPIRE compliant network services support certain operations, such as the Get Download Service Metadata –operation for

WFS and WMS. Such operations are not always required by regular (non-INSPIRE) WFS and WMS services.

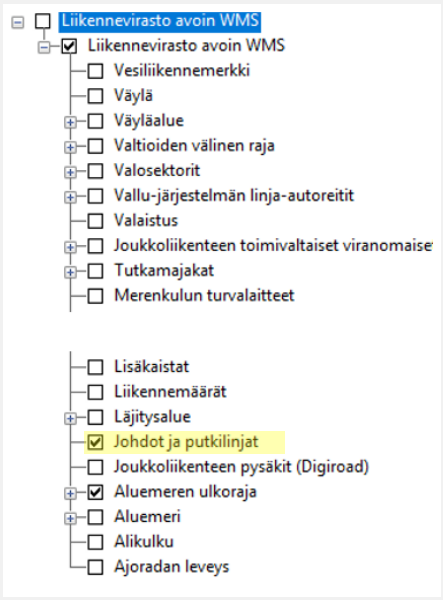
At the moment data providers face a double fold challenge: to both transform their national datasets into INSPIRE data models (application schemas) and to publish these harmonized datasets to meet the INSPIRE-specific WFS and WMS requirements.

General problems

WMS services are usually published as a link to a group of layers: it is now not possible to get a link to individual layers.

For example, the Finnish Traffic Agency publishes a WMS with all datasets:

https://extranet.liikennevirasto.fi/inspirepalvelu/avoin/wms?



There is no way to access only the layer with cables and pipelines. Plus, the layers are usually in national language. In this case you would need to know that "Johdot ja putkilinjat" means "cables and pipelines".

This is an issue that has to be resolved when the prototype of the MSDI is built. The link or the layer id of the feature should be highlighted in the application. The countries providing the dataset will have to assist us to find the relevant layers names since it is usually in national languages. However, if the WMS service contains INSPIRE datasets, they have to follow the naming conventions specified for each INSPIRE theme, by the end of 2017 or 2020, depending on INSPIRE theme so the situation will improve with time.

A second issue is that client support for the use of INSPIRE compliant datasets, where the data is provided as GML, is not yet very mature. It is therefore foreseen that there may be issues with direct usage of these datasets. As part of the application development, the usability aspects of direct download and use should be further investigated.

Another issue is the project timeline and the full implementation of the INSPIRE Directive. The European Union Member States are currently producing INSPIRE compliant datasets but all of the datasets are not yet available, at least not in an INSPIRE compliant way, since the date of full implementation of the Directive is planned for the end of 2020.

The Directive sets two main deadlines—one for the datasets under Annex I and another one for the datasets under Annex II and III

- Annex I datasets should be compliant by the end of 2017. 11 datasets of our table should be available by then:
    - Administrative borders: National, Regional, Local, Territorial water, EEZ
    - Maritime transport routes and traffic flows: IMO-Routes, AIS
    - Nature and species conservation sites and protected areas: N2000, Porpoise distribution, Important Bird Areas (wintering and breeding)
    - Underwater cultural heritage

  HELCOM has recently updated some of the Annex I datasets mentioned and they can be provided in shapefile format.

- Annex III includes most of the datasets that are more relevant for this project, like fixed infrastructures. The deadline for these datasets to be INSPIRE compliant is end of 2020.

Future possibilities

The availability of data can improve in the future thanks to the initiatives of, for example, the Baltic Sea - North Sea Marine Spatial Data Infrastructure (MSDI) Working Group. The aim of this working group, organized by the Hydrographic Commissions of both sea areas, is to analyze how the maritime authorities can share their data.

During the last meeting in December 2016 they proposed to carry out a pilot project to let hydrographical offices share their data via ArcGIS Online web interface.

This can be very useful because Baltic LINes could access their data directly from the online service.

3. Datasets availability—a summary

As HELCOM-VASAB MSP principle number 6 states "Maritime Spatial Planning should be based on best available and up to date comprehensive information of high quality that [...] should be shared by all".

Therefore, the HELCOM-VASAB Data Group, formally called HELCOM-VASAB Baltic Sea Region MSP Data Expert Sub-Group, was established to support data, information and evidence availability for MSP processes at the regional scale.

In 2016 the HELCOM-VASAB Data Group members defined datasets that were necessary when working on the transboundary component of MSP plans. They created a table (open access) showing all data and formats available reported by each HELCOM Contracting Party.

This table was the starting point of Baltic LINes WP3. In a meeting in Helsinki in September 2016, the project members selected 27 datasets from that table that they considered to be most relevant for MSP. HELCOM, together with Aalborg University and the Finnish Environment Institute, started to improve it and added more information as, for example, INSPIRE deadlines.

The summary table (internal document, password needed) makes possible the comparison of the datasets availability. These datasets are sorted in nine categories which contains 27 datasets in total:

Category	Number of datasets in each category
Administrative borders	5
Fishing areas	2
Installations and infrastructures	3
Maritime transport routes and traffic flows	2
Nature and species conservation sites and protected areas	6
Military training areas	2
Raw material extraction areas	3
Submarine cable and pipeline routes	3
Underwater cultural heritage	1
Total	27

Figure 2 There are 9 categories which contain in total 27 datasets that are considered to be important for MSP according to the planners.

The most important at this stage of the project is to check the availability and the format of each dataset. The next table shows which one can be already downloadable as shapefile from the HELCOM Map and Data Service; which one are in standard OGC format and when EU countries are expected to deliver INPIRE compliant dataset:

Section	Category	Dataset	Available from HELCOM map service	WMS Countries with data in OGC WMS	WFS Countries with data in OGC WFS	Inspire Annex I: INSPIRE compliant end of 2017 III: INSPIRE compliant end of 2020
3.1	Administrative borders	National	X	5 DE, DK, EE, FI, PL	4 DE, DK, EE, FI	I
		Regional	X	4 DE, DK, EE, PL	3 DE, DK, EE	I
		Local		5 DE, DK, EE, FI, PL	4 DE, DK, EE, FI	I
		Territorial waters	X	5 DE, DK, EE, FI, SE	3 DK, EE, FI	I
		EEZ	X	4 DE, DK, EE, FI	2 EE, FI	I
3.2	Fishing areas	Fishery area (where BSA	X	0	0	III
		Spawning and nursery areas	Only cod	0	0	III
3.3	Installations and infrastructures	Offshore wind farms	X	1 DE	1 DE	III
		Safety Zones / Construction		0	0	III
		Platforms		1 DE	1 DE	III
3.4	Maritime transport routes and traffic flows	IMO-Routes	X	3 DE, FI, EE	2 DE, FI	I
		AIS	X	2 DE, DK	0	I
3.5	Nature and species conservation sites and protected areas	N2000	X	4 DK, FI, PL, SE	3 DK, FI. PL	I
		National MPA	X	1 SE	0	I or III
		Important Bird Areas		0	0	I
		Porpoise distribution		0	0	I
		Bird migration routes		0	0	III
		Bird wintering grounds	X	0	0	III
3.6	Military training areas	Military Exercise Areas		1 DE	0	III
		Radar areas / military		0	0	
3.7	Raw material extraction areas	Sand and Gravel	X	3 DE, DK, EE	1 DK	III
		Natural Gas		0	0	III
		Oil	X	0	0	III
3.8	Submarine cable and pipeline routes	Telecommunication/Data	X	2 DE, FI	2 DE, FI	III
		High Voltage Cables	X	5 DE, EE, DK, FI, SE	3 DE, DK, FI	III
		Pipelines	X	4 DE, DK, EE, FI	3 DE, DK, FI	III
3.9	Underwater cultural heritage	Underwater cultural		2 EE, FI	0	I

Figure 3 Full summary table with datasets available and formats

The table shows that, unfortunately, most countries do not have yet data available in WMS or WFS. We will next break down each category to give a detailed overview of the availability of each dataset.

Only the countries with datasets available in September 2017 are listed in the following sections. We included a link to the WMS and WFS services. In some cases countries have informed about the availability of the services but the link is still missing.

In September 2017, the first version of the prototype tool was shown to the project partners. It was named BASEMAPS for "Baltic Sea Maps". More data will be added to the tool as well as functionalities before to be published online.

3.1 Administrative borders

NOTE for Danish data: Services from Kortforsyningen are open but require user account. Click on "Opret ny burger" to create a new user (unfortunately only in Danish).

Section	Category	Dataset	Available from HELCOM map service	WMS Countries with data in OGC WMS	WFS Countries with data in OGC WFS	Inspire Annex I: INSPIRE compliant end of 2017 III: INSPIRE compliant end of 2020
3.1	Administrative borders	National	X	5 DE, DK, EE, FI, PL	4 DE, DK, EE, FI	I
		Regional	X	4 DE, DK, EE, PL	3 DE, DK, EE	I
		Local		5 DE, DK, EE, FI, PL	4 DE, DK, EE, FI	I
		Territorial waters	X	5 DE, DK, EE, FI, SE	3 DK, EE, FI	I
		EEZ	X	4 DE, DK, EE, FI	2 EE, FI	I

National

Border of each state on land.

Available from HELCOM Map and Data Service: Open metadata and download file. HELCOM plans to cross-check the dataset with national data and update the dataset during BalticLines project.

Availability as OGC service:

Country	Link
Germany	WMS, WFS
Denmark	WMS from Kortforsyningen, WMS from Geological Survey
Estonia	WMS (link to a group of layers), WFS
Finland	WMS (link to a group of layers), WFS
Poland	WMS (link to a group of layers), WMTS

Regional

Border of any regional jurisdiction.

Available from HELCOM Map and Data Service: Open metadata and download file. It is an old dataset that HELCOM plans to update during the BalticLines project.

Availability as OGC service:

Country	Link
Germany	WMS, WFS
Denmark	WMS, WFS
Estonia	WMS (link to a group of layers), WFS
Poland	WMS (link to a group of layers), WMTS

Local

Not available from HELCOM Map and Data Service and not planned to be included.

Availability as OGC service:

Country	Link
Germany	WMS, WFS
Denmark	WMS, WFS (requires authorization)
Estonia	WMS, WFS
Finland	WMS (link to a group of layers), WFS
Poland	WMS (link to a group of layers), WMTS

Territorial waters

Coastal waters extending at most 12 nautical miles from the baseline.

Available from HELCOM Map and Data Service: Open metadata and download file. HELCOM plans to cross-check the dataset with national data and update the dataset during BalticLines project.

Availability as OGC service:

Country	Link
Germany	WMS (link to a group of layers)
Denmark	WMS, WFS (requires authorization)
Estonia	WMS (link to a group of layers), WFS
Finland	WMS (link to a group of layers), WFS
Sweden	WMS

Exclusive Economic Zone (EEZ)

Sea zone, from the baseline out to 200 nautical miles, over which a state has special right.

Available from HELCOM Map and Data Service: Open metadata and download file. HELCOM plans to cross-check the dataset with national data and update the dataset during BalticLines project.

Availability as OGC service:

Country	Link
Germany	WMS (link to a group of layers)
Denmark	WMS
Estonia	WMS (link to a group of layers), WFS
Finland	WMS (link to a group of layers), WFS

3.2 Fishing areas

Category	Dataset	Available from HELCOM map service	WMS Countries with data in OGC WMS	WFS Countries with data in OGC WFS	Inspire Annex I: INSPIRE compliant end of 2017 III: INSPIRE compliant end of 2020
Fishing areas	Fishery area (where BSA nation fish)	X	0	0	III
	Spawning and nursery areas	Only cod	0	0	III

Fishery area

Available from HELCOM Map and Data Service

HELCOM obtained VMS data from the fisheries authorities of coastal countries via data collection initiatives like the joint ICES/HELCOM/OSPAR data call of 2009-16, as well as recent VMS data calls initiated by ICES. The ICES WORKING GROUP has processed the collected data confidentially for Spatial Fisheries (WGSFD) under contracts paid for by HELCOM, OSPAR as well as the EU Commission.

Maps with the fisheries activities in the Baltic Sea 2013 were published in the HELCOM Map and Data Service in autumn 2015. The maps and shapefiles of fishing intensity and effort were calculated for bottom contact gear and mid-water trawl and longline for each quarter of 2013.

Availability as OGC service: No country delivers national data in OGC format for this category.

Spawning and nursery area

Available from HELCOM Map and Data Service: There are three layers:

- Cod spawning areas (HOLAS2)
- Perch recruitment areas (HOLAS2)
- Pikeperch recruitment areas (HOLAS2)
- Offshore spawning areas fish pelagic eggs (BRISK)
- Shallow inlets and bays (BRISK)

Availability as OGC service: No country delivers national data in OGC format for this category.

3.3 Installations and infrastructures

Section	Category	Dataset	Available from HELCOM map service	WMS Countries with data in OGC WMS	WFS Countries with data in OGC WFS	Inspire Annex I: INSPIRE compliant end of 2017 III: INSPIRE compliant end of 2020
3.3	Installations and infrastructures	Offshore wind farms	X	1 DE	1 DE	III
		Safety Zones / Construction		0	0	III
		Platforms		1 DE	1 DE	III

Offshore wind farms

Locations of current or planned offshore wind farms.

Available from HELCOM Map and Data Service: Open metadata and download file

Availability as OGC service:

Country	Link
Germany	WMS (link to a group of layers), WFS

Safety Zones / Construction Fields

Locations of safety zones or constructions fields of fixed installations.

Not available from HELCOM Map and Data Service.

Availability as OGC service: No country delivers data in OGC format for this dataset.

Platforms

Locations of current or planned platforms.

Not available from HELCOM Map and Data Service.

Availability as OGC service:

Country	Link
Germany	WMS (link to a group of layers), WFS

3.4 Maritime transport routes and traffic flows

Section	Category	Dataset	Available from HELCOM map service	WMS Countries with data in OGC WMS	WFS Countries with data in OGC WFS	Inspire Annex I: INSPIRE compliant end of 2017 III: INSPIRE compliant end of 2020
3.4	Maritime transport routes and traffic flows	IMO-Routes	X	3 DE, FI, EE	2 DE, FI	I
		AIS	X	2 DE, DK	0	I

IMO routes

Available from HELCOM Map and Data Service: there are three datasets:

- Deep water navigation areas
- Deep water navigation lines
- IMO ships routing guide

These datasets are from 2008 but they will be compared with latest version and updated during BalticLines project.

Availability as OGC service:

Country	Link
Germany	WMS (link to a group of layers), WFS
Estonia	WMS
Finland	WMS (link to a group of layers), WFS

AIS

Shipping traffic density maps

Available from HELCOM Map and Data Service: Not yet but they are ready and HELCOM is planning to share them during BalticLines project.

Availability as OGC service:

Country	Link
Germany	By month and year. Ship types: Fisheries, Passenger, Cargo and Tanker. WMS (2014), WMS (2013), WMS (2012)
Denmark	WMS: Cargo, Passenger, Fishing, Pleasure, Tankers, High speed crafts

3.5 Nature and species conservation sites and protected areas

Section	Category	Dataset	Available from HELCOM map service	WMS Countries with data in OGC WMS	WFS Countries with data in OGC WFS	Inspire Annex I: INSPIRE compliant end of 2017 III: INSPIRE compliant end of 2020
3.5	Nature and species conservation sites and protected areas	N2000	X	4 DK, FI, PL, SE	3 DK, FI. PL	I
		National MPA	X	1 SE	0	I or III
		Important Bird Areas		0	0	I
		Porpoise distribution		0	0	I
		Bird migration routes		0	0	III
		Bird wintering grounds	X	0	0	III

Natura 2000

Available from HELCOM Map and Data Service: Open metadata and download file.

Availability as OGC service:

Country	Link
Denmark	N2000 (WMS, WFS), N2000 bird protection areas (WMS, WFS)
Finland	WMS (link to a group of layers), WFS
Poland	WMS (link to a group of layers. In Polish), WFS
Sweden	WMS

National Marine Protected Areas

Available from HELCOM Map and Data Service (areas nominated as HELCOM Marine Protected Areas (HELCOM MPAs): Open metadata and download file.

Availability as OGC service:

Country	Link
Sweden	WMS

Important bird areas

Not available from HELCOM Map and Data Service.

Availability as OGC service: No country delivers data in OGC format for this dataset.

Porpoise distribution

Not available from HELCOM Map and Data Service. The data from SAMBAH project will be published in September 2017:

- SAMBAH summer management border for the Baltic Proper population of harbour porpoises
- SAMBAH probability of detection of harbour porpoises May – Oct
- SAMBAH probability of detection of harbour porpoises, Nov – Apr

Availability as OGC service: No country delivers data in OGC format for this dataset.

Bird migration routes

Not available from HELCOM Map and Data Service.

Availability as OGC service: No country delivers data in OGC format for this dataset.

Bird wintering grounds

Available from HELCOM Map and Data Service:

- Wintering areas for birds
- Breeding areas for birds

Availability as OGC service: No country delivers data in OGC format for this dataset.

3.6 Military training areas

Category	Dataset	Available from HELCOM map service	WMS Countries with data in OGC WMS	WFS Countries with data in OGC WFS	Inspire Annex I: INSPIRE compliant end of 2017 III: INSPIRE compliant end of 2020
Military training areas	Military Exercise Areas		1 DE	0	III
	Radar areas / military observation areas		0	0	

Military exercise areas

Not available from HELCOM Map and Data Service. A layer was downloaded from OpenStreetMaps but it's not been published.

Availability as OGC service:

Country	Link
Germany	WMS (link to a group of layers)

Radar areas / military observation areas

Available from HELCOM Map and Data Service: HELCOM is not planning to add this dataset to the Map Service

Availability as OGC service: No country delivers data in OGC format for this dataset.

3.7 Raw material extraction areas

Category	Dataset	Available from HELCOM map service	WMS Countries with data in OGC WMS	WFS Countries with data in OGC WFS	Inspire Annex I: INSPIRE compliant end of 2017 III: INSPIRE compliant end of 2020
Raw material extraction areas	Sand and Gravel	X	3 DE, DK, EE	1 DK	III
	Natural Gas		0	0	III
	Oil	X	0	0	III

Sand and gravel

Available from HELCOM Map and Data Service: Open metadata and download file.

Availability as OGC service:

Country	Link
Germany	WMS (link to a group of layers)
Estonia	WMS (link to a group of layers)
Denmark	WMS, WFS

Natural gas

Not available from HELCOM Map and Data Service.

Availability as OGC service: No country delivers data in OGC format for this dataset.

Oil

Available from HELCOM Map and Data Service: Open metadata and download file.

Availability as OGC service: No country delivers data in OGC format for this dataset.

3.8 Submarine cable and pipeline routes

Section	Category	Dataset	Available from HELCOM map service	WMS Countries with data in OGC WMS	WFS Countries with data in OGC WFS	Inspire Annex I: INSPIRE compliant end of 2017 III: INSPIRE compliant end of 2020
3.8	Submarine cable and pipeline routes	Telecommunication/Data	X	2 DE, FI	2 DE, FI	III
		High Voltage Cables	X	5 DE, EE, DK, FI, SE	3 DE, DK, FI	III
		Pipelines	X	4 DE, DK, EE, FI	3 DE, DK, FI	III
3.9	Underwater cultural heritage	Underwater cultural		2 EE, FI	0	I

Telecommunication/Data cables

Available from HELCOM Map and Data Service: Open metadata and download file.

Availability as OGC service:

Country	Link
Germany	WMS (link to a group of layers), WFS
Finland	WMS (link to a group of layers. In Finnish. The layer is called "Johdot ja putkilinjat"), WFS

High Voltage Cables

Available from HELCOM Map and Data Service: Open metadata and download file.

Availability as OGC service:

Country	Link
Germany	WMS (link to a group of layers) , WFS
Estonia	WMS (link to a group of layers)
Denmark (Services from Kortforsyningen are open but require user account. Click on "Opret ny burger")	WMS, WFS; Kortforsyning (WMS)
Finland	WMS (link to a group of layers. In Finnish. The layer is called "Johdot ja putkilinjat"), WFS
Sweden	WMS

Pipelines

Available from HELCOM Map and Data Service: Open metadata and download file.

Availability as OGC service:

Country	Link
Germany	WMS (link to a group of layers) , WFS
Estonia	WMS (link to a group of layers)
Denmark	WMS, WFS Oil and gas pipelines (simplified): WMS, WFS
Finland	WMS (link to a group of layers. In Finnish. The layer is called "Johdot ja putkilinjat"), WFS

3.9 Underwater cultural heritage

Category	Dataset	Available from HELCOM map service	WMS Countries with data in OGC WMS	WFS Countries with data in OGC WFS	Inspire Annex I: INSPIRE compliant end of 2017 III: INSPIRE compliant end of 2020
Underwater cultural heritage	Underwater cultural heritage		2 EE, FI	0	I

Underwater cultural heritage

HELCOM is not planning to add this dataset to the Map Service

Availability as OGC service:

Country	Link
Estonia	WMS (link to a group of layers)
Finland	WMS (link to a group of layers. In Finnish)

4. Conclusion

This report shows that most countries still do not have comprehensive set of spatial datasets relevant to MSP available as open standard web service necessary for implementing a MSDI. There is not even one single dataset covered by all countries in the Baltic. This observations highlights the need for development of an online solution accessing data from both distributed data as services, when available, as well as spatial data as files from data repository.

Regarding availability of services, WMS services are available in more countries than WFS since the latter is much more difficult to implement and complete support in commercial products is still lacking. However, WMS service by definition delivers only image of the spatial data and feature info availability may differ between service providers. In some planning use cases where comparison of spatial extents is of interest, WMS service can provide suitable functionality for planners. In cases of more detailed data needs such as specific attributes, WFS functionalities is required. Therefore the data tools for planning should aim for utilizing both service types and data containing attributes.

The availability of data on linear infrastructures, fixed installations and shipping lanes open format datasets, the focus of this project, is not optimal but in general more available than for environmental data. According to INSPIRE implementation schedule, Installations and infrastructures (3.3) datasets should be ready and made available in each EU country by the end of 2020 since they belong to INSPIRE Annex III. This is long after the end of the project and thus alternative ways in making data available for public access should be investigated. However, HELCOM can provide several datasets collated to the State of the Baltic Sea report published in July 2017. The same applies to the category Submarine cables and pipeline routes (3.8) and Maritime transport routes and traffic flows (3.4). HELCOM can already provide shipping traffic density maps (based on 10 years of raw AIS data for the entire Baltic Sea) since they were the focus of a previous project (Baltic Scope) and will be part of HELCOM Maritime Assessment to be published during 2017. The availability of data related to nature and species conservation was limited to only nature protection areas, other datasets were available only from international sources/projects.

The next step would be to keep following closely the data availability in each country and international developments (for example in HELCOM-VASAB MSP Data Group meetings) and projects/activities producing relevant datasets to support MSP. Meanwhile, project partners can work with the best publicly available data provided by HELCOM and what is currently available from national sources. The project will also explore possibilities on creating services based on GIS data available from Countries as shapefiles or other file formats.

We hope and expect that this report and this project motivates countries to elaborate and publish datasets in open format to make possible cross-border planning based on

publicly available data and also to achieve the aim of this WP3. The future Baltic MSDI prototype will be the first step towards a system with decentralized and high quality data beneficial for MSP and for all Baltic Sea countries.

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