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## Background

This document contains information on how the ecosystem component maps describing benthic maps were prepared for the State of the Baltic Sea report 2018.

State & Conservation 2-2015 meeting recognized ([Outcome](#), para 6J.3) the urgent need to develop georeferenced distribution maps of benthic habitats, biotopes and species, to be decided, by mid-2016 for the purpose of use in the upcoming 2nd HELCOM holistic assessment as well as for future for assessments of MPAs, Red List assessments, MSP purposes and more.

The metadata on national biotope maps was compiled to State & Conservation 3-2015 meeting ([Document 6J-1](#)). The Meeting proposed to make use of available landscape maps for the Baltic Sea, currently being updated by EUSeaMap, and for EU Member States to provide maps on the habitats as defined in Annex 1 of the Habitats Directive, and 'predominant habitats' according to the MSFD, i.e. at EUNIS level 2. The meeting proposed to develop maps for selected species, as a starting point for the species listed in the BSAP (*Fucus* spp., *Zostera marina*, *Mytilus* spp., *Furcellaria lumbricalis* and Charales) and complement the list as needed and feasible. The Meeting invited the Contracting Parties to inform to the Secretariat on availability of data and existing maps (shapefiles). The Meeting took note that the Secretariat will make a call for relevant data and existing national maps in late 2015 or early 2016. ([Outcome](#), paras 6J.3-4).

HELCOM Secretariat made a data call requesting data on ecosystem components (for benthic species and natura habitats). The maps were reviewed and published for the 1<sup>st</sup> version of HOLAS2 in 2017. For 2018 updated version, some minor corrections were made to ecosystem components.

This document contains listing of the ecosystem component maps on benthic species, broadscale habitats and natura habitats, links to metadata descriptions and lineage section of each map (Annex 1).

## Action requested

The Meeting is invited to:

- take note of the information on existing ecosystem component maps

## Background

One of the purposes of creating ecosystem component maps was to be able to have best available coverage of ecosystem components for the Baltic Sea Impact Index (BSII) analysis which was one of the key elements of the State of the Baltic sea report. As the BSII is a spatial analysis carried out for the whole Baltic Sea in best available and feasible resolution (1 x 1 km grid cells), the requirement for spatially detailed data on habitats is considerable.

Since the BSII analysis combines various datasets and data types, compromises on data resolution are inevitable since each dataset has specific limitations (e.g. VMS data is available on C-square grid cell whereas data on linear infrastructures is typically very accurate). For BSII, the best available spatial resolution was used for input data on human activities. Ecosystem component layers and Pressure layers resulting from human activities were both applied in 1 x 1 grid resolution for the BSII analysis. However, for most of the ecosystem component maps, actual effective resolution was 5 x 5 km grid presence/absence. For detailed description of BSII, see [Thematic assessment of cumulative impacts 2011–2016](#).

One of the shortcomings of current ecosystem component maps is the heterogenic data sources from different Contracting Parties (CPs): From some CPs modeling data is available which increase the resolution whereas for some CPs only inventory data was available for the maps. This creates a coverage bias for these Baltic-wide datasets.

## Procedure for collecting the underlying data for ecosystem component maps

1. The collection of the ecosystem component map data was initiated in State & Conservation 2-2015. According to summaris on available metadata, State & Conservation 3-2015 suggested following data request/data collection activities:
  - a. Benthic species: (Fucus spp., Zostera marina, Mytilus spp., Furcellaria lumbricalis and Charales): Data request was submitted to CPs
  - b. Broadscale habitats: Extracting data from EuSeaMap is to be applied.
  - c. Natura 2000 habitats: Data request was submitted to CPs
2. The data request/collection the data was carried out during 2016. Summary of submitted data was made to State & Conservation 4-2016. [Link to summary](#).
3. The maps were collated from the received/collected data during 2016-2017 with support from TAPAS and SPICE projects (co-financed by the EU).
4. The maps were verified, corrected as needed and approved for publication by CPs using the dedicated workspace during first half of 2017.

## Ecosystem component maps

The set of maps prepared is described below per ecosystem component type (note that the list is not exhaustive list of all ecosystem component maps in BSII: mammal, fish and bird maps are excluded). Lineage of source data from Contracting Parties per each map is specified in Annex 1.

### Benthic species

For benthic species, national data request was carried out. Resulting data was heterogenic between CPs in terms of geometry types of provided data (point vs. polygon) and methods: Mapping has not been exhaustive and sampling density varied between the countries. From some CPs modeling data was available which increases the resolution and coverage whereas for some CPs only inventory data was available for the maps.

The provided data was gridded to 5 x 5 km grid (Baltic implementation of the EEA grid) and applied to presence/absence per grid cell. For BSII purposes, 5 x 5 km grid was applied to 1 x 1 km grid resolution.

### Broadscale habitats

For broadscale habitats, State & Conservation 3-2015 suggested using EuSeaMap habitat distribution maps. This data was obtained and processed for Baltic by the SPICE and TAPAS projects. During the data verification process, some CPs provided more detailed data for their national waters. Therefore the maps are not harmonized across the Baltic Sea in terms of source data. The metadata notes that the maps describe the habitat distribution on a regional/large scale and that the maps do not describe local scale variation in habitat distribution. Also the scale of the underlying substrate data varies (1: 250 000 to 1: 1 000 000).

The obtained data was rasterized to 1 x 1 km resolution.

### Natura habitats

For natura habitats maps, the underlying data was requested from CPs. For Russian waters, available distribution from RED LIST assessment were used. Data quality and habitat definitions vary between countries. Underlying is often based on modelling and ground-truthing has not always taken place. The provided data was gridded to 1 x 1 km grid.

### Pelagic habitats

For BSII, two “pelagic habitats” maps were developed:

- Productive surface waters (Chl-a)
- Availability of deep water habitat, based on occurrence of H<sub>2</sub>S

“Availability of deep water habitat, based on occurrence of H<sub>2</sub>S” layer describes the suitability of the bottom areas for the Baltic Sea biota, with regard to oxygen conditions of the near bottom waters by defining areas without H<sub>2</sub>S occurrence as available habitat for benthic fauna. The data used to produce the layer was received from Leibniz-Institut für Ostseeforschung Warnemünde (IOW): areas (polygons) with hydrogen sulfide (H<sub>2</sub>S) based on point measurements and modelling. Five time periods / year, for years 2011-2016 (altogether 30 layers).

Table 1. Ecosystem component (EC) maps on benthic species, broadscale habitats and natura habitats.

EC group	EC map	Metadata
Benthic species	Charophyte distribution	<a href="http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/822ddec9-d96a-4036-9ad8-c4b599776eca">http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/822ddec9-d96a-4036-9ad8-c4b599776eca</a>

Benthic species	Fucus distribution	<a href="http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/264ed572-403c-43bd-9707-345de8b9503c">http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/264ed572-403c-43bd-9707-345de8b9503c</a>
Benthic species	Furcellaria lumbricalis distribution	<a href="http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/363cb353-46da-43f4-9906-7324738fe2c3">http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/363cb353-46da-43f4-9906-7324738fe2c3</a>
Benthic species	Mytilus distribution	<a href="http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/f9cc7b2c-4080-4b19-8c38-cac87955cb91">http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/f9cc7b2c-4080-4b19-8c38-cac87955cb91</a>
Benthic species	Zostera marina distribution	<a href="http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/ca327bb1-d3cb-46c2-8316-f5f62f889090">http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/ca327bb1-d3cb-46c2-8316-f5f62f889090</a>
Broadscale habitats	Circalittoral hard substrate	<a href="http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/5a6e7d7b-47d1-44fe-a70b-c0717bbd8566">http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/5a6e7d7b-47d1-44fe-a70b-c0717bbd8566</a>
Broadscale habitats	Circalittoral mixed substrate	<a href="http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/345a9bb8-33ea-4b23-b601-04d5e3257f59">http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/345a9bb8-33ea-4b23-b601-04d5e3257f59</a>
Broadscale habitats	Circalittoral mud	<a href="http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/ef4a4440-d067-447f-84e5-83d443dbc7ed">http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/ef4a4440-d067-447f-84e5-83d443dbc7ed</a>
Broadscale habitats	Circalittoral sand	<a href="http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/74880890-bdd8-46e7-8fec-dab0e877ccf0">http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/74880890-bdd8-46e7-8fec-dab0e877ccf0</a>
Broadscale habitats	Infralittoral hard substrate	<a href="http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/1b20cb37-b365-4e82-9217-94fc776e964c">http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/1b20cb37-b365-4e82-9217-94fc776e964c</a>
Broadscale habitats	Infralittoral mixed substrate	<a href="http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/ca6796fb-54e9-475b-9dcc-53a41d366940">http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/ca6796fb-54e9-475b-9dcc-53a41d366940</a>
Broadscale habitats	Infralittoral mud	<a href="http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/a72559f4-bc2d-4882-bb1f-e0f005c4362b">http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/a72559f4-bc2d-4882-bb1f-e0f005c4362b</a>
Broadscale habitats	Infralittoral sand	<a href="http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/6c68decf-3fb1-4138-9102-96d10495be64">http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/6c68decf-3fb1-4138-9102-96d10495be64</a>
Natura habitats	Sandbanks (1110)	<a href="http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/0820935a-5fde-4976-82e5-1392d631d535">http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/0820935a-5fde-4976-82e5-1392d631d535</a>
Natura habitats	Estuaries (1130)	<a href="http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/d027c58b-aceb-4b51-940d-73ea7c531251">http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/d027c58b-aceb-4b51-940d-73ea7c531251</a>
Natura habitats	Mudflats and sandflats (1140)	<a href="http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/13cbc477-d23e-41a9-995f-817b6d7e9f48">http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/13cbc477-d23e-41a9-995f-817b6d7e9f48</a>
Natura habitats	Coastal lagoons (1150)	<a href="http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/6aaa6eaf-e7f5-4a56-9533-16bc94901a7c">http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/6aaa6eaf-e7f5-4a56-9533-16bc94901a7c</a>
Natura habitats	Large shallow inlets and bays (1160)	<a href="http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/738c72ce-3a67-43c7-9bda-0bff8fdd0303">http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/738c72ce-3a67-43c7-9bda-0bff8fdd0303</a>

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Natura habitats	Reefs (1170)	<a href="http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/7a7509de-53d5-4472-a1e9-f5857316d034">http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/7a7509de-53d5-4472-a1e9-f5857316d034</a>
Natura habitats	Baltic Esker islands (1610)	<a href="http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/67437eff-8382-493f-83cc-66356a834f39">http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/67437eff-8382-493f-83cc-66356a834f39</a>
Natura habitats	Submarine structures made by leaking gas (1180)	<a href="http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/3cef63ee-9a44-481f-8869-ea9b977df747">http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/3cef63ee-9a44-481f-8869-ea9b977df747</a>
Natura habitats	Boreal Baltic islets and small islands (1620)	<a href="http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/9329cf81-0d78-4ed7-b04b-297add9672ed">http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/9329cf81-0d78-4ed7-b04b-297add9672ed</a>
Pelagic habitats	Availability of deep water habitat, based on occurrence of H <sub>2</sub> S	<a href="http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/bd227931-7f33-419a-a84b-ae6c543a1cbb">http://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/metadata/bd227931-7f33-419a-a84b-ae6c543a1cbb</a>

Annex 1. Detailed lineage of each map.

Map	Metadata_Lineage
Charophyte distribution	<p>Denmark: Point data from national monitoring along transects (dive and video), data from 2005-2015. Data is available through Miljøportalen</p> <p>Estonia: Modelled distribution of Charophytes based on observations from national monitoring (dive and drop video) during 2005-2014</p> <p>Finland: Point data gathered during the national marine mapping programme VELMU (2004-2015) and inventories from Åland Islands.</p> <p>Germany: Point data originally collated for monitoring and research purposes (video, photos, dive, wading, snorkeling), data from 2010-2015.</p> <p>Latvia: No reported occurrences of Charophytes</p> <p>Lithuania: No reported occurrences of Charophytes.</p> <p>Poland: Polygon data digitized based on Polish Marine Atlas <a href="http://www.iopan.gda.pl/hm/atlas/Atlas_all.pdf">http://www.iopan.gda.pl/hm/atlas/Atlas_all.pdf</a> .</p> <p>Russia: No reported occurrences of Charophytes.</p> <p>Sweden: Point data from national monitoring and mapping surveys (1995 -2015) extracted from SMHI SHARK database.</p> <p>References:            Brzeska, P. Wozniczka, A., Pelechaty, M., Blindow, I. 2015. New records of <i>Chara connivens</i> P. Salzmann ex A. Braun 1835 – an extremely rare and protected species in Polish brackish waters. <i>Acta Societatis Botanicorum Poloniae</i>. 84(1):143–146.            Sinkevièienė, Z. 2004. Charophyta of the Curonian lagoon. <i>Botanica Lithuanica</i> 10(1):33-57.</p> <p>2018 updates: Updated data from Sweden and Finland were included. The grid of the raster was changed to match with other benthic habitat layers used in HOLAS II.</p>
Fucus distribution	<p>Data source:</p> <p>Denmark: Point data from national monitoring along (dive and video, points and transects), data from 2007-2015. Data is available through Miljøportalen</p> <p>Estonia: Modelled distribution of <i>Fucus vesiculosus</i> and <i>Fucus radicans</i> based on observations from national monitoring (dive and drop video), 2005-2014.</p> <p>Finland: Point data gathered during the national marine mapping programme VELMU (2004-2016) and inventories from Åland Islands.</p> <p>Germany: Point data originally gathered for monitoring and research purposes (video, photos, dive, wading, snorkeling), data from 2010-2015.</p> <p>Latvia: Point data of from national monitoring (dive and drop video) campaigns during 2006-2013.</p> <p>Lithuania: No reported occurrences of <i>Fucus</i>.</p> <p>Poland: No reported occurrences of <i>Fucus</i>.</p> <p>Russia: Data used in the previous HELCOM RED LIST assessment have been used for Russian marine areas.</p> <p>Sweden: Point data from national monitoring and mapping surveys (1995 -2015) extracted from SMHI SHARK database.</p> <p>2018 updates: Updated data from Sweden and Finland and new data from Russia were included.</p>

	<p>Data quality: Mapping is not exhaustive and sampling density varies between the countries.</p> <p>Attribute information: Raster value representing presence (1) or absence (0)</p> <p>Spatial resolution: 1 km x 1 km grid (originally 5 x 5 km).</p>
Furcellaria lumbricalis distribution	<p>Data source: Denmark: Point data from national monitoring along (dive and video, points and transects), data from 2007-2015. Data is available through Miljøportalen Estonia: Modelled distribution of Furcellaria lumbricalis based on observations from national monitoring (dive and drop video), 2005-2014. Finland: Point data gathered during the national marine mapping programme VELMU (2004-2015) and inventories from Åland Islands. Germany: Point data originally gathered for monitoring and research purposes (video, photos, dive, wading, snorkeling), data from 2010-2015. Latvia: Point data of from national monitoring (dive and drop video) campaigns during 2006-2013. Lithuania: Polygon data on the distribution of Furcellaria. Poland: Point data digitized based on Polish Marine Atlas and corrected using expert opinion. Russia: No GIS data reported. Furcellaria occurs in the Kaliningrad region, although not presented on the map. Sweden: Point data from national monitoring and mapping surveys (1995 -2015) extracted from SMHI SHARK database.</p> <p>2018 updates: Updated data from Sweden and Finland and new data from Russia were included.</p> <p>Data quality: Mapping is not exhaustive and sampling density varies between the countries.</p> <p>Attribute information: Raster value representing presence (1) or absence (0)</p> <p>Spatial resolution: 1 km x 1 km grid (originally 5 x 5 km).</p>
Mytilus distribution	<p>Data source: Denmark: Point data from national monitoring along transects (dive and video), data from 2005-2015. Data is available through Miljøportalen Estonia: Modelled distribution of Mytilus spp. based on observations from national monitoring (dive and drop video) during 2005-2014 Finland: Point data gathered during the national marine mapping programme VELMU (2004-2015) and inventories from Åland Islands Germany: Point data originally collated for monitoring and research purposes (video, photos, dive, wading, snorkeling), data from 2010-2015, complemented by a Mytilus model published in: Darr, A., Gogina, M., Zettler, M., 2014. Detecting hot-spots of bivalve biomass in the south-western Baltic Sea. Journal of Marine Systems 134:69-80. Latvia: Point data of from national monitoring (dive and drop video) campaigns during 2006-2013. Lithuania: A delineation of reefs was used as a proxy for Mytilus occurrence</p>

	<p>Poland: Point data digitized based on Polish Marine Atlas <a href="http://www.iopan.gda.pl/hm/atlas/Atlas_all.pdf">http://www.iopan.gda.pl/hm/atlas/Atlas_all.pdf</a> .</p> <p>Russia: No GIS data reported. <i>Mytilus</i> occurs in the Kaliningrad region, although not presented on the map.</p> <p>Sweden: Point data from national monitoring and mapping surveys (1995 -2015) extracted from SMHI SHARK database.</p> <p>The dataset was approved by all HELCOM Contracting Parties in the HOLAS II Ecosystem component data review process during first quarter of 2017 after corrections from Germany, Poland and Sweden.</p> <p>2018 updates: Updated data from Sweden and Finland were included. The grid of the raster was changed to match with other benthic habitat layers used in HOLAS II.</p> <p>Data quality: Mapping is not exhaustive and sampling density varies between the countries. No reported data from the Russian coastal waters.</p> <p>Attribute information: Raster value representing presence (1) or absence (0) of <i>Mytilus</i>.</p> <p>Spatial resolution: 1 km x 1 km grid (originally 5 x 5 km).</p>
<p>Zostera marina distribution</p>	<p>Data source:</p> <p>Denmark: Point data from national monitoring along transects (dive and video), data from 2007-2015. Data is available through Miljøportalen</p> <p>Estonia:</p> <p>Finland: Point data gathered during the national marine mapping programme VELMU (2004-2015) and inventories from Åland Islands.</p> <p>Germany: Point data originally collated for monitoring and research purposes (video, photos, dive, wading, snorkeling), data from 2010-2015.</p> <p>Latvia: No reported occurrences of eelgrass.</p> <p>Lithuania: No reported occurrences of eelgrass.</p> <p>Poland: Polygon data digitized based on Polish Marine Atlas <a href="http://www.iopan.gda.pl/hm/atlas/Atlas_all.pdf">http://www.iopan.gda.pl/hm/atlas/Atlas_all.pdf</a> . Expert consultation.</p> <p>Russia: Data used in the previous HELCOM RED LIST assessment have been used for Russian marine areas.</p> <p>Sweden: Point data from national monitoring and mapping surveys (1995 -2015) extracted from SMHI SHARK database.</p> <p>2018 updates: Updated data from Sweden and Finland and new data from Russia were included.</p> <p>Data quality: Mapping is not exhaustive and sampling density varies between the countries.</p> <p>Attribute information: Raster value representing presence (1) or absence (0) of <i>Zostera marina</i>.</p> <p>Spatial resolution: 1 km x 1 km grid (originally 5 x 5 km).</p>



<p>Circalittoral hard substrate</p>	<p>Data source: Broad-scale habitat map produced in EUSeaMap project (<a href="http://www.emodnet-seabedhabitats.eu/">http://www.emodnet-seabedhabitats.eu/</a>). National datasets were used for Germany and Estonia.</p> <p>Data quality: Broad-scale habitats describe the habitat distribution on a regional/large scale. They do not describe local scale variation in habitat distribution. Also the scale of the underlying substrate data varies (1: 250 000 to 1: 1 000 000).</p> <p>The dataset was approved by all HELCOM Contracting Parties in the HOLAS II Ecosystem component data review process during first quarter of 2017 after corrections from Germany and Estonia.</p>
<p>Circalittoral mixed substrate</p>	<p>Data source: Broad-scale habitat map produced in EUSeaMap project (<a href="http://www.emodnet-seabedhabitats.eu/">http://www.emodnet-seabedhabitats.eu/</a>). National datasets were used for Germany and Estonia.</p> <p>Data quality: Broad-scale habitats describe the habitat distribution on a regional/large scale. They do not describe local scale variation in habitat distribution. Also the scale of the underlying substrate data varies (1: 250 000 to 1: 1 000 000).</p> <p>The dataset was approved by all HELCOM Contracting Parties in the HOLAS II Ecosystem component data review process during first quarter of 2017 after corrections from Germany and Estonia.</p>
<p>Circalittoral mud</p>	<p>Data source: Broad-scale habitat map produced in EUSeaMap project (<a href="http://www.emodnet-seabedhabitats.eu/">http://www.emodnet-seabedhabitats.eu/</a>). National datasets were used for Germany and Estonia.</p> <p>Data quality: Broad-scale habitats describe the habitat distribution on a regional/large scale. They do not describe local scale variation in habitat distribution. Also the scale of the underlying substrate data varies (1: 250 000 to 1: 1 000 000).</p> <p>The dataset was approved by all HELCOM Contracting Parties in the HOLAS II Ecosystem component data review process during first quarter of 2017 after corrections from Germany and Estonia.</p>
<p>Circalittoral sand</p>	<p>Data source: Broad-scale habitat map produced in EUSeaMap project (<a href="http://www.emodnet-seabedhabitats.eu/">http://www.emodnet-seabedhabitats.eu/</a>). For Germany and Estonia national data was used.</p> <p>Data quality: Broad-scale habitats describe the habitat distribution on a regional/large scale. They do not describe local scale variation in habitat distribution. Also the scale of the underlying substrate data varies (1: 250 000 to 1: 1 000 000).</p> <p>The dataset was approved by all HELCOM Contracting Parties in the HOLAS II Ecosystem component data review process during first quarter of 2017 after corrections from Germany and Estonia.</p>

	<p>Spatial resolution: The original data as polygons. Here generalized to 1 km x 1km grid cells.</p>
Infralittoral hard substrate	<p>Data source: Broad-scale habitat map produced in EUSeaMap project (<a href="http://www.emodnet-seabedhabitats.eu/">http://www.emodnet-seabedhabitats.eu/</a>). National data was used for Germany and Estonia.</p> <p>Data quality: Broad-scale habitats describe the habitat distribution on a regional/large scale. They do not describe local scale variation in habitat distribution. Also the scale of the underlying substrate data varies (1: 250 000 to 1: 1 000 000).</p> <p>The dataset was approved by all HELCOM Contracting Parties in the HOLAS II Ecosystem component data review process during first quarter of 2017 after corrections from Germany and Estonia.</p> <p>Spatial resolution: The original data as polygons. Here generalized to 1 km x 1km grid cells.</p>
Infralittoral mixed substrate	<p>Data source: Broad-scale habitat map produced in EUSeaMap project (<a href="http://www.emodnet-seabedhabitats.eu/">http://www.emodnet-seabedhabitats.eu/</a>). For Germany and Estonia national datasets were used.</p> <p>Data quality: Broad-scale habitats describe the habitat distribution on a regional/large scale. They do not describe local scale variation in habitat distribution. Also the scale of the underlying substrate data varies (1: 250 000 to 1: 1 000 000).</p> <p>The dataset was approved by all HELCOM Contracting Parties in the HOLAS II Ecosystem component data review process during first quarter of 2017 after corrections from Germany and Estonia.</p> <p>Spatial resolution: The original data as polygons. Here generalized to 1 km x 1km grid cells.</p>
Infralittoral mud	<p>Data source: Broad-scale habitat map produced in EUSeaMap project (<a href="http://www.emodnet-seabedhabitats.eu/">http://www.emodnet-seabedhabitats.eu/</a>). For Germany and Estonia national datasets were used.</p> <p>Data quality: Broad-scale habitats describe the habitat distribution on a regional/large scale. They do not describe local scale variation in habitat distribution. Also the scale of the underlying substrate data varies (1: 250 000 to 1: 1 000 000).</p> <p>The dataset was approved by all HELCOM Contracting Parties in the HOLAS II Ecosystem component data review process during first quarter of 2017 after corrections from Germany and Estonia.</p> <p>Spatial resolution: The original data as polygons. Here generalized to 1 km x 1km grid cells.</p>

<p>Infralittoral sand</p>	<p>Data source: Broad-scale habitat map produced in EUSeaMap project (<a href="http://www.emodnet-seabedhabitats.eu/">http://www.emodnet-seabedhabitats.eu/</a>). For Germany and Estonia national datasets were used.</p> <p>Data quality: Broad-scale habitats describe the habitat distribution on a regional/large scale. They do not describe local scale variation in habitat distribution. Also the scale of the underlying substrate data varies (1: 250 000 to 1: 1 000 000).</p> <p>The dataset was approved by all HELCOM Contracting Parties in the HOLAS II Ecosystem component data review process during first quarter of 2017 after corrections from Germany and Estonia.</p> <p>Spatial resolution: The original data as polygons. Here generalized to 1 km x 1km grid cells.</p>
<p>Sandbanks (1110)</p>	<p>Data source: Denmark: Polygon data on sandbanks found within Natura 2000 sites. Source: Danish Nature Agency. Estonia: Modelled distribution of sandbanks based on observations from national monitoring and inventories. Source: Estonian Marine Institute. Finland: Modelled distribution of potential sandbanks. Source: Finnish Environment Institute. Germany: Polygon data on sandbank distribution. Sources: Landesamt für Landwirtschaft, Umwelt und ländliche Räume Schleswig-Holstein and Landesamt für Umwelt, Naturschutz und Geologie Mecklenburg-Vorpommern. Latvia: No reported sandbanks. Lithuania: No reported sandbanks. Poland: Polygon data on distribution of sandbanks from surveys carried out for the marine Natura 2000 site protection plans in Gulf of Gdansk and Western Pomerania, source Maritime Offices in Gdynia and Szczecin. 10km grid data from rest of the coastline according to Habitats Directive Art. 17 Report (2007-2012). Source: General Directorate for Environmental Protection. Russia: Habitats Directive not implemented. Sweden: Polygon data on potential distribution of sandbanks, including also offshore sandbanks. Does not cover the whole Swedish marine area (covers Västernorrland, Södermanland, Östergötland, Blekinge and Skåne counties). Source: Swedish Agency for Marine and Water Management (HaV).</p> <p>Data quality: Data quality and habitat definitions vary between countries. Data is often based on modelling and ground-truthing has not always taken place. The dataset was approved by all HELCOM Contracting Parties in the HOLAS II Ecosystem component data review process during first quarter of 2017 after corrections from Germany and Poland.</p> <p>Attribute information: Raster value representing presence (1) or absence (0) of sandbanks.</p>

<p>Estuaries (1130)</p>	<p>Data source:  Denmark: Polygon data on estuaries found within Natura 2000 sites. Source: Danish Nature Agency.  Estonia: Modelled distribution of estuaries based on observations from national monitoring and inventories. Source: Estonian Marine Institute.  Finland: Distribution of estuaries obtained using GIS analysis and aerial photos. Source: Finnish Environment Institute.  Germany: Polygon data on distribution of estuaries. Source: Landesamt für Umwelt, Naturschutz und Geologie Mecklenburg-Vorpommern.  Latvia: No reported estuaries.  Lithuania: No reported estuaries  Poland: Polygon data on distribution of estuaries from surveys carried out for the marine Natura 2000 site protection plans in Gulf of Gdansk and Western Pomerania, source Maritime Offices in Gdynia and Szczecin. 10km grid data from rest of the coastline according to Habitats Directive Art. 17 Report (2007-2012). Source: General Directorate for Environmental Protection.  Russia: Habitats Directive not implemented.  Sweden: Polygons of Natura 2000 habitats 1130 Estuaries based on GIS-analysis in the SAKU-projekt and modified in 2010 by METRIA. Polygon data on estuaries also from BALANCE project. Source: Swedish Agency for Marine and Water Management (HaV).</p> <p>Data quality:  Data quality and habitat definitions vary between countries. Data is often based on modelling and ground-truthing has not always taken place.  The dataset was approved by all HELCOM Contracting Parties in the HOLAS II Ecosystem component data review process during first quarter of 2017 after corrections from Germany and Poland.</p> <p>Attribute information: Raster value representing presence (1) or absence (0) of estuaries.</p>
<p>Mudflats and sandflats (1140)</p>	<p>Data source:  Denmark: Polygon data on mudflats and sandflats found within Natura 2000 sites. Source: Danish Nature Agency.  Estonia: Modelled distribution of mudflats and sandflats based on observations from national monitoring and inventories. Source: Estonian Marine Institute.  Finland: No reported mudflats or sandflats.  Germany: Polygon data on distribution of mudflats and sandflats. Source: Landesamt für Umwelt, Naturschutz und Geologie Mecklenburg-Vorpommern.  Latvia: No reported mudflats or sandflats.  Lithuania: No reported mudflats or sandflats.  Poland: No reported mudflats or sandflats.  Russia: Habitats Directive not implemented.  Sweden: No reported mudflats or sandflats.</p> <p>Data quality:  Data quality and habitat definitions vary between countries. Data is often based on modelling and ground-truthing has not always taken</p>

	<p>place. The dataset was approved by all HELCOM Contracting Parties in the HOLAS II Ecosystem component data review process during first quarter of 2017 after corrections from Germany.</p> <p>Attribute information: Raster value representing presence (1) or absence (0) of mudflats and sandflats.</p>
Coastal lagoons (1150)	<p>Data source: Denmark: Polygon data on coastal lagoons found within Natura 2000 sites. Source: Danish Nature Agency. Estonia: Modelled distribution of coastal lagoons based on observations from national monitoring and inventories. Source: Estonian Marine Institute. Finland: Distribution of coastal lagoons obtained using GIS analysis. Source: Finnish Environment Institute. Germany: Polygon data on distribution of coastal lagoons. Source: Landesamt für Umwelt, Naturschutz und Geologie Mecklenburg-Vorpommern. Latvia: No reported coastal lagoons. Lithuania: Only Curonian lagoon reported as a coastal lagoon. Poland: Polygon data on distribution of coastal lagoons from surveys carried out for the marine Natura 2000 site protection plans in Gulf of Gdansk and Western Pomerania, source Maritime Offices in Gdynia and Szczecin. 10km grid data from rest of the coastline according to Habitats Directive Art. 17 Report (2007-2012). Source: General Directorate for Environmental Protection. Russia: Habitats Directive not implemented. Sweden: Polygons of Natura 2000 habitats 1150 Coastal lagoons based on GIS-analysis in the SAKU-projekt and modified in 2010 by METRIA. Polygon data on estuaries also from BALANCE project. Source: Swedish Agency for Marine and Water Management (HaV).</p> <p>Data quality: Data quality and habitat definitions vary between countries. Data is often based on modelling and ground-truthing has not always taken place. The dataset was approved by all HELCOM Contracting Parties in the HOLAS II Ecosystem component data review process during first quarter of 2017 after corrections from Germany and Poland.</p> <p>Attribute information: Raster value representing presence (1) or absence (0) of coastal lagoons.</p>
Large shallow inlets and bays (1160)	<p>Data source: Denmark: Polygon data on large bays found within Natura 2000 sites. Source: Danish Nature Agency. Estonia: Modelled distribution of large bays based on observations from national monitoring and inventories. Source: Estonian Marine Institute. Finland: Modelled distribution of large bays. Source: Finnish Environment Institute. Germany: Polygon data on large bays. Sources: Landesamt für Landwirtschaft, Umwelt und ländliche Räume Schleswig-Holstein and Landesamt für Umwelt, Naturschutz und Geologie Mecklenburg-Vorpommern. Latvia: No reported large bays. Lithuania: No reported large bays. Poland: Distribution of large bays based on surveys carried out for the marine Natura 2000 site protection plans in Gulf of Gdansk and</p>

	<p>Western Pomerania, source Maritime Offices in Gdynia and Szczecin.  Russia: Habitats Directive not implemented.  Sweden: Polygons of large bays based on GIS-analysis in the SAKU-projekt and modified in 2010 by Metria. Source: Swedish Agency for Marine and Water Management (HaV).</p> <p>Data quality:  Data quality and habitat definitions vary between countries. Data is often based on modelling and ground-truthing has not always taken place.  The dataset was approved by all HELCOM Contracting Parties in the HOLAS II Ecosystem component data review process during first quarter of 2017 after corrections from Germany and Poland.</p> <p>Attribute information: Raster value representing presence (1) or absence (0) of large shallow inlets and bays.</p>
Reefs (1170)	<p>Data source:  Denmark: Polygon data on reefs found within Natura 2000 sites. Source: Danish Nature Agency.  Estonia: Modelled distribution of reefs based on observations from national monitoring and inventories. Source: Estonian Marine Institute.  Finland: Modelled distribution of potential reefs. Source: Finnish Environment Institute.  Germany: Polygon data on reef distribution. Sources: Landesamt für Landwirtschaft, Umwelt und ländliche Räume Schleswig-Holstein and Landesamt für Umwelt, Naturschutz und Geologie Mecklenburg-Vorpommern.  Latvia: Modelled distribution of reefs, substrate not confirmed. Source: Latvian Institute of Aquatic Ecology  Lithuania: Distribution of reefs defined based on Mytilus distribution. Source: Klaipeda University  Poland: Distribution of reefs according to Habitats Directive Art. 17 Report (2007-2012). 10km grid cells. Source: General Directorate for Environmental Protection.  Russia: Habitats Directive not implemented.  Sweden: Polygon data on reefs, including also reefs of biogenic origin. Does not cover the whole Swedish marine area (covers Västernorrland, Södermanland, Östergötland, Blekinge and Skåne counties). Source: Swedish Agency for Marine and Water Management (HaV).</p> <p>Data quality:  Data quality and habitat definitions vary between countries. Data is often based on modelling and ground-truthing has not always taken place.  The dataset was approved by all HELCOM Contracting Parties in the HOLAS II Ecosystem component data review process during first quarter of 2017 after corrections from Germany and Poland.</p> <p>Attribute information: Raster value representing presence (1) or absence (0) of reefs.</p>
Baltic Esker islands (1610)	<p>Data source:  Denmark: No reported esker islands.  Estonia: No reported esker islands.</p>

	<p>Finland: Distribution of esker islands (uw parts) obtained using GIS analysis. Source: Finnish Environment Institute.  Germany: No reported esker islands.  Latvia: No reported esker islands.  Lithuania: No reported esker islands.  Poland: No reported esker islands.  Russia: Habitats Directive not implemented.  Sweden: Polygon data of distribution of 1610 Baltic esker islands. Modelling based on depth contours. Source: Swedish Agency for Marine and Water Management (HaV)</p> <p>Data quality:  Data quality and habitat definitions vary between countries. Data is often based on modelling and ground-truthing has not always taken place.</p> <p>The dataset was approved by all HELCOM Contracting Parties in the HOLAS II Ecosystem component data review process during first quarter of 2017.</p> <p>Attribute information: Raster value representing presence (1) or absence (0) of uw parts of esker islands.</p>
Submarine structures made by leaking gas (1180)	<p>Data source:  Denmark: Polygon and point data on the distribution of submarine structures made by leaking gases. Source: Danish Nature Agency.  Estonia: No reported submarine structures made by leaking gases.  Finland: No reported submarine structures made by leaking gases.  Germany: No reported submarine structures made by leaking gases.  Latvia: No reported submarine structures made by leaking gases.  Lithuania: No reported submarine structures made by leaking gases.  Poland: No reported submarine structures made by leaking gases.  Russia: Habitats Directive not implemented.  Sweden: Polygon data of potential pockmarks based on bathymetric data. Source: Swedish Agency for Marine and Water Management (HaV)</p> <p>Data quality:  Data quality and habitat definitions vary between countries. Data is often based on modelling and ground-truthing has not always taken place.</p> <p>The dataset was approved by all HELCOM Contracting Parties in the HOLAS II Ecosystem component data review process during first quarter of 2017 after corrections from Denmark.</p> <p>Attribute information: Raster value representing presence (1) or absence (0) of submarine structures made by leaking gas.</p>
Boreal Baltic islets and	<p>Data source:  Denmark: No reported occurrences of boreal Baltic islets and small islands.</p>

<p>small islands (1620)</p>	<p>Estonia: No reported occurrences of boreal Baltic islets and small islands.  Finland: Polygon data on potential distribution of boreal Baltic islets and small islands (underwater parts), modelled based on depth and substrate data. Source: Finnish Environment Institute.  Germany: No reported occurrences of boreal Baltic islets and small islands.  Latvia: No reported occurrences of boreal Baltic islets and small islands.  Lithuania: No reported occurrences of boreal Baltic islets and small islands.  Poland: No reported occurrences of boreal Baltic islets and small islands.  Russia: Habitats Directive not implemented.  Sweden: Polygon data of distribution of boreal Baltic islets and small islands based on depth contours derived from high-resolution depth maps along with information about the surface substrate. Source: Swedish Agency for Marine and Water Management (HaV).</p> <p>Data quality:  Data quality and habitat definitions vary between countries. Data is often based on modelling and ground-truthing has not always taken place.  The dataset was approved by all HELCOM Contracting Parties in the HOLAS II Ecosystem component data review process during first quarter of 2017.</p> <p>Attribute information: Raster value representing presence (1) or absence (0) of uw parts of Boreal Baltic islets and small islands.</p>
<p>Availability of deep water habitat, based on occurrence of H2S</p>	<p>Data source:  Polygon data on sulfidic areas kindly provided by Leibniz-Institut für Ostseeforschung Warnemünde (IOW). Separate maps can be viewed at <a href="http://www.io-warnemuende.de/msr-2016-0100.html">http://www.io-warnemuende.de/msr-2016-0100.html</a>.  Reference:  Feistel, S., Feistel, R., Nehring, D., Matthäus, W., Nausch, G., Nauman n, M., 2016: Hypoxic and anoxic regions in the Baltic Sea, 1969-2015. Meereswiss. Ber, Warnemünde, 100. doi:10.12754/msr-2016-0100</p> <p>in 2018 Availability of deep water habitat, based on occurrence of H2S layer has been updated with IOW data from 2016.</p> <p>Data quality: The data is based on monitoring data and modelling.</p> <p>Attribute information: Raster value representing an index value for oxygen. 0 value represents the lowest value for BS bottom communities, 1 the highest value.</p>