Template for Submission of Information, including Traditional Knowledge,
to Describe Areas Meeting Scientific Criteria for
Ecologically or Biologically Significant Marine Areas

ARCHIPELAGO SEA

Abstract

The Archipelago Sea, located in south-west Finland, the northern Baltic Sea, is the most complex archipelago in the World. It is characterized by tens of thousands of small islands and skerries, hundreds of coastal lagoons and boreal narrow inlets, as well as a specific geomorphology, with clear signs from the last glaciation. Due to the low salinity (0 to 7 psu), the species composition is a mixture of freshwater and marine organisms, and especially diversity of aquatic vascular plants and charophytes is high. The area has a rich birdlife and supports important populations of the ringed seal (*Pusa hispida botnica*). The gray seal (*Halichoerus grypus*) inhabits the area permanently and harbor porpoise (*Phocoena phocoena*) visits the area regularly. A large part of the outer archipelago area is uninhabited and has a low degree of human disturbance during most of the year.

Introduction to the area

The proposed area (Fig. 1 & 2) is situated in south-west Finland, in the northern Baltic Sea, which is the largest brackish water area in the world.

The archipelago ranges from sheltered inner archipelago with lagoons, shallow bays and boreal inlets, through middle archipelago, with few large islands, to wave-exposed outer archipelago consisting of small islands and skerries facing the Northern Baltic Proper. The surface salinity in the open sea varies from 6 to 7 psu, but may in the inner archipelago estuaries be close to zero. Water depth is relatively low (mean depth 27 m) in the inner archipelago (0 to 30 m, sometimes up to 80 m) and increases in the outer archipelago, where there are several elongated channels that are 80 – 120 m deep (Fig. 7). The proposed area is bordered in the west to the Åland Sea, an open sea area between Finland and Sweden, which has the second deepest area in the Baltic Sea, 290 m.

The Archipelago Sea is geologically one of the most diverse seafloor environments of the Baltic Sea (Kaskela et al., 2012; Kaskela & Kotilainen, 2017). The Precambrian crystalline bedrock and fault tectonics together with glacial erosion and deposition as well as post glacial processes have formed a complex landscape with a mosaic of structures and substrates. Submarine geological features typical to the area include e.g. till, various moraines, eskers, Salpausselkä formations, postglacial clays and relict river valley continuations (Kaskela et al 2012 and references therein). The Precambrian basement rocks have suffered glacial scouring and over-deepening of pre-existing drainage channels and at present, the most resistant materials stand out as elevated structures forming e.g. rocky reefs. The elongated deep-sea troughs characteristic of the area partly coincide with fault lines and thrust zones, and serve as important water passages connecting the Baltic Proper with the Gulf of Bothnia (Winterhalter et al. 1981; Koistinen et al. 1996). The sediments are very varied, containing granite, rocky bottoms, moraine, gravel, sand and mud (Fig. 6 & 7).

Regular monitoring of the ecological state of the sea takes place in the area. The Finnish Inventory Programme for the Underwater Marine Environment (VELMU) has conducted extensive biodiversity inventories in the area. The inventories done in 2004-2017 have included dive lines and drop videos, benthic sampling, fish larvae sampling, and echosoundings. Observation data for hundreds of species is available. Also, species distribution models (SDMs) have been made for many species (below referred to as “VELMU data”; viewable in https://paikkatieto.ymparisto.fi/velmu). Spatial data on birdlife and seals also exist.

Location

Archipelago Sea, the Baltic Sea. Finland.

The proposed area is situated south-west of Finnish mainland, in the northern part of the Baltic Sea. The area is ca. 200 km in width and 100 km high (in W-E and N-S direction, respectively) (Fig. 1). The total coverage of the proposed area is 7151 km^2 and its sea area is 6517 km^2.

The area is within Finnish national jurisdiction.

Feature description of the proposed area

Several important marine habitat types of the EU Habitats directive exist in the area: estuaries (1130), coastal lagoons (1150), large shallow inlets and bays (1160), boreal Baltic narrow inlets (1650), underwater sandbanks (1110), reefs (1170), and Baltic esker islands with sublittoral vegetation (1610) (Fig. 3 & 4). A large number of EU Natura 2000 sites exist in the area, and the outer archipelago islands belong to the Archipelago Sea National Park.

Due to the low salinity (0 to 6 psu, depending on area and proximity of estuaries) (Fig. 8), the species composition is a mixture of freshwater and marine organisms. Therefore the combined biodiversity of macroalgae and aquatic vascular plants is high (Fig. 20 & 21). Charophytes (some species classified as NT or VU) form large meadows in sheltered lagoons and bays (Fig. 22 & 30). Water mosses (Bryophyta), which normally are freshwater species, are found in some inner inlets and bays.

Many marine species, including keystone and habitat-forming species such as bladderwrack (*Fucus vesiculosus*) and blue mussel (*Mytilus trossulus*), occur abundantly in the area, especially in the outer and middle archipelago (Fig. 25 & 26). The area is the northernmost area in the Baltic Sea where the eelgrass (*Zostera marina*) forms dense beds (Boström et al. 2014); certain underwater sand banks host the largest eelgrass meadows in Finland (Fig. 27). The biomass of benthic invertebrates is the highest in the Baltic Sea (Fig. 24), which secures an abundant food supply for benthic feeding fish and birdlife.

Rare charophytes, such as *Nitellopsis obtusa* (NT) and *Chara braunii* (VU) occur in the area (Fig. 17).

Macroplea pubipennis (VU/DD), a leaf beetle species of the subfamily Donaciinae that is endemic to Finland, occurs in several inlets and bays in the area. In the world, the species is only found in Finland, Sweden and China (Saari 2007; Fauna Europaea).

The area is an important area for many originally freshwater fish species (Fig. 32-38), including pike, perch and pikeperch. The boreal narrow inlets and large shallow bays in the area form some of the most important breeding areas of pikeperch in the northern Baltic Sea. Also marine species, such as Baltic herring and sprat are common in the area, while flounder, cod and turbot occur in the area more or less regularly.

There are several important bird areas, especially in the coastal lagoons and boreal narrow inlets, and in the open sea. The eastern part of the area is a major migration route for arctic birds (Fig. 14). Many of the islands and skerries are important nesting sites for waterfowl and shallow waters provide feeding grounds for many bird species. For example, common eider (*Somateria mollissima*) inhabits the outer archipelago where shallow rocky reefs provide feeding grounds with high densities of blue mussel (*Mytilus trossulus*). Gulls, terns and eiders are abundant in middle and outer archipelago areas. The outer archipelago is also an important breeding and feeding area for colonial alcids, such as razorbill (*Alca torda*) and black guillemot (*Cepphus grylle*). In other sea areas they typically breed on cliffs, but in the Archipelago Sea they colonize shallow rocky islets in the extremities of the archipelago. The outer part of the archipelago is also an important wintering area for purple sandpipers (*Calidris maritima*), at least partially originating from Svalbard (Bioforsk).

The area supports a population of the ringed seal (*Pusa hispida botnica*) (Fig. 13). Although the ringed seals are only classified as near-threatened in the Baltic Sea (Liukko et al 2015), the population in the Archipelago Sea needs special protection due to its small size (200-300 individuals) (MMM, 2007; Ahola & Nordström, 2017). The ringed seal is threatened by climate change, because its pups need crested sea ice for hiding places as they grow. Gray seals (*Halichoerus grypus*) are common in the outer and middle archipelagoes.

Table 1. Number of species in different sea areas listed by HELCOM (HELCOM 2012). The total number of species in the Baltic Sea is 2730 of which 1898 species are invertebrates. Total number of species in the table excludes bird species.

	Gulf of Finland	Archipelago Sea	Kvarken Archipelago	Bothnian Sea
Macrophytes	187	68	162	116
Benthic invertebrates	482	122	96	132
Fish & lamprey	87	68	51	48
Marine mammals	3	3	2	2
Total number of species	759	261	311	298
Share of species in the Baltic Sea	27.8 %	9.6 %	11.4 %	10.9 %

Feature condition and future outlook of the proposed area

The area, especially its outer archipelago area, has a high naturalness, and biodiversity is high for a brackish water sea area. While there are a lot of smaller buildings and summer cottages in the inner archipelago, the outer archipelago is almost completely uninhabited and unbuilt (Fig. 40).

The ecological status of the water in the inner archipelago is presently not good, mainly because of anthropogenic nutrient loading. The water in the inner archipelago is turbid, especially in late summer, and anoxia is common in sheltered sea areas with poor water exchange. The exposed outer archipelago areas facing the northern Baltic Sea is in better condition, albeit blue-green algal blooms may occasionally make the water turbid during late summer. EU Marine Strategy Framework Directive (2008/56/EC), and the HELCOM Baltic Sea Action Plan (HELCOM 2007), oblige Finland to improve the state of the marine environment by 2020 and 2021, respectively, e.g. by decreasing the amount of nutrient loading from land, so the water quality in Archipelago Sea will probably gradually start improving.

In addition to the national biodiversity inventories (VELMU), a monitoring of the ecological status of the sea is annually conducted in the area, and reported to EU at regular intervals.

Assessment of the area against CBD EBSA Criteria

CBD EBSA Criteria (Annex I to decision IX/20)	Description (Annex I to decision IX/20)	Ranking of criterion relevance (please mark one column with an X)			
		No information	**Low**	**Medium**	**High**
Uniqueness or rarity	Area contains either (i) unique ("the only one of its kind"), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features.				X

HIGH. The area is the most complex archipelago area in the world, with tens of thousands of islands and skerries, and a myriad of different types of waters, from enclosed lagoons to larger open sea areas. The area has unique geomorphological and habitat characteristics, with features formed by the last glaciation. The area is important for the life cycles of many species, and harbours a peculiar mix of marine and freshwater organisms, and rare species.

General aspects

- The most complex archipelago area in the world.
- EU Habitat directive Annex I habitats Boreal Baltic narrow inlets (1650), Coastal lagoons (1150) and large shallow inlets and bays (1160) are typical to inner archipelago. (Fig. 3 & 4).
- Salinity varies from nearly zero to 7 permilles (Fig. 8), which results in a unique combination of marine, brackishwater and freshwater species.
- Certain species live on the edge of their salinity distribution limits and at the margins of their physiological tolerance. This includes key species like seagrass *Zostera marina* (Fig. 27).
- Ice cover affects the ecosystems (Fig. 10). Climate change threatens the ice-associated organisms.
- Plenty of rare species exist in the area (Fig. 16).

Plants

- Many charophyte species exist especially in coastal lagoons where they can form large meadows. (Fig. 22 & 30)
- Eelgrass (*Zostera marina*), which is a habitat forming key species, lives on the edge of its geographic distribution due to low salinity (Fig. 27).
- Some algae species classified as sporadic or rare, such as *Chorda tomentosa* and *Callithammion roseum*, have been found in the area (VELMU data, not visible in map service).

Invertebrates

- The blue mussel species in the area is nowadays described as *Mytilus trossulus* x *M. edulis* hybrid swarm, or simply *M. trossulus*. The Baltic blue mussel is genetically distinct from both Atlantic *Mytilus edulis* and Atlantic/Pacific *Mytilus trossulus*, and probably has rapidly evolved to a new local taxon, as an adaptation to the peculiar Baltic Sea environment (Väinölä & Strelkov 2011).
- *Macroplea pubipennis* (VU/DD), a leaf beetle species of the subfamily Donaciinae that is endemic to Finland, has viable populations in the area (VELMU data, not visible in Map Service).

Fish

- Important reproduction areas and juvenile fish areas for many fish species, including pike (*Esox lucius*), perch (*Perca fluviatilis*), pikeperch (*Sander lucioperca*), Baltic herring (*Clupea harengus membras*), roach (*Rutilus rutilus*), smelt (*Osmerus eperlanus*) and gobies (*Gobiidae*) (Fig. 32-38).

Birds

- High diversity of bird species (Fig.18; Finnish Bird Atlas).
- Migration routes of birds cross the area (Fig. 12; Birdlife Finland).
- Sheltered bays and lagoons are important bird areas with high species diversities.
- Includes 11 IBAs (Fig. 11).

Mammals

- A population of ringed seal (*Pusa hispida botnica*) lives in the area (Fig. 13); their existence relies on good ice winters (Meier et al. 2004). Gray seals are abundant in the area.

- Harbour porpoise (*Phocoena phocoena*) visits southern part of the outer archipelago regularly (Fig. 15). The harbor porpoise population of the Baltic Sea is critically endangered (CR) (HELCOM, 2013).

Geology

- Rocky seafloor is typical; thousands of rocky reefs exist in the area (Fig. 3, 5 & 6).
- Large areas of sand banks (Fig. 3).
- Several deep (70 to 120 m) trenches exist in the area. Due to relatively strong currents they are oxygen-rich (unlike the deep Baltic basins, which are anoxic).

Special importance for life-history stages of species	Areas that are required for a population to survive and thrive.				X

HIGH. The area is very important for several life history stages of a large number of taxa, including mammals, birds and fish:

Mammals

- A population of ringed seal (*Pusa hispida botnica*) lives in the area (Fig. 15) and the existence relies on good ice winters (Meier et al. 2004).

Birds

- High diversity of breeding birds inhabits their specific habitats, from lagoons in the inner archipelago to the treeless granite skerries in the outer archipelago (Fig. 18)
- Marine birds that nest in the area include common eider (*Somateria mollissima*), long-tailed duck (*Clangula hyemalis*), greylag goose (*Anser anser*), common tern (*Sterna hirundo*) and Arctic tern (*Sterna paradisea*).
- Feeding grounds and resting areas for waterfowl (marked as IBAs; Fig. 11)

Fish

- Important reproduction area for many fish species, including pike (*Esox lucius*), perch (*Perca fluviatilis*), pikeperch (*Sander fluviatilis*), Baltic herring (*Clupea harengus membras*), roach (*Rutilus rutilus*) and smelt (*Osmerus eperlanus*) (Fig. 32-38). Many of them breed in the bays and inlets but live in the whole area as adults.

Importance for threatened, endangered or declining species and/or habitats	Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.			X	

MEDIUM. Near threatened (NT) or vulnerable (VU) species exist in the area, such as:

Plants

- Important area for many key species that are threatened by eutrophication. Especially bladder wrack (*Fucus vesiculosus*) has declined in the area (Vahteri & Vuorinen 2016).
- A key area for eelgrass (*Zostera marina*) in the northern Baltic Sea (Boström et al. 2014)

Fish

- *Coregonus lavaretus* f. *lavaretus* (EN), *Coregonus lavaretus* f. *pallasi* (VU), *Salmo salar* (VU), *Anguilla anguilla* (EN), *Salmo trutta* (CR) occur in the area.

Mammals

- Ringed seal reproduction relies on sea ice (Ice cover: Fig. 10; Meier et al. 2004)

<table>
<tr><td>Vulnerability, fragility, sensitivity, or slow recovery</td><td>Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.</td><td></td><td></td><td>X</td><td></td></tr>
<tr><td colspan="6">MEDIUM. The boreal Baltic narrow inlets, coastal lagoons and large shallow inlets and bays inhabit a rich bird fauna and are nursery areas for fish. Such areas are vulnerable for human disturbance, e.g. high nutrient loads, dredging, overfishing and excess boat traffic. The sea ice is vulnerable for anthropogenic climate change.

Many key species, e.g. Fucus vesiculosus and Mytilus trossulus, are sensitive to eutrophication and climate change
Many aquatic vascular plants and charophytes are sensitive to sedimentation and destruction of a habitat due to dredging and deposit of sediments
Many of the rare species recover slowly. These species include, e.g., ringed seal, waterfowl and other birds and charophytes
</td></tr>
<tr><td>Biological productivity</td><td>Area containing species, populations or communities with comparatively higher natural biological productivity.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">HIGH. The area has a high biological productivity. Especially the lagoons, inlets and bays have a high waterfowl and fish production. Marine birds, especially sea ducks nest in the outer archipelago.

Important reproduction area for many fish species, including pike, perch, pikeperch, Baltic herring, roach and smelt (Fig. 32-38)
The highest biomass of benthic invertebrates in the Baltic Sea (Gogina et al. 2016; Fig. 24) including high densities of blue mussel Mytilus trossulus (Fig. 26) and infaunal bivalves like Macoma balthica, Mya arenaria and Cerastoderma glaucum (Fig. 31).
Macroalgae and aquatic vascular plants can cover large areas (Fig. 28 & 29)
</td></tr>
<tr><td>Biological diversity</td><td>Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.</td><td></td><td></td><td>X</td><td></td></tr>
<tr><td colspan="6">MEDIUM. The area has a high biodiversity for a brackish-water ecosystem. This is because both marine and freshwater organisms thrive in the area, and because of high diversity of birdlife.

Birds

High species richness (Fig. 18; Finnish Bird Atlas).

Plants

The area has high species richness of macroalgae compared to its salinity range (Fig. 21).
The species richness of both aquatic vascular plants and charophytes is high (Fig. 20 & 22).
Also the diversity of different HELCOM HUB classes is high across the area which shows that high number of different habitats and biotopes exist in the area (Fig. 19).
Fresh water species, especially many charophytes and vascular plants are plentiful in inner archipelago (Fig. 28 & 30).

Invertebrates

Benthic invertebrate communities are diverse in some areas (Fig. 23).
</td></tr>
<tr><td>Naturalness</td><td>Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.</td><td></td><td></td><td>X</td><td></td></tr>
<tr><td colspan="6">MEDIUM. The inner archipelago is heavily used by humans, while the outer archipelago is in a relatively natural state (Fig. 39 & 41). The outer archipelago is virtually inhabited, and does not have much human disturbance during most of the year.

The inner archipelago is densely built with summer cottages and other settlements or constructions (Fig.
</td></tr>
</table>

40). Most of the cottages are however mainly used in summer, and during the rest of the year human disturbance is low. • The water is turbid in the inner archipelago (Fig. 9) due to nutrient loads from land, but biodiversity is not much affected (VELMU data).

Sharing experiences and information applying other criteria (Optional)

Other Criteria	**Description**	**Ranking of criterion relevance** (please mark one column with an X)			
		Don't Know	**Low**	**Medium**	**High**
Add relevant criteria					
Explanation for ranking (must be accompanied by relevant sources of scientific articles, reports or documents)					

References
(e.g. relevant documents and publications, including URL where available; relevant data sets, including where these are located; information pertaining to other relevant material, models, etc.)

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Maps and Figures

Figure 1. EBSA proposal for the Archipelago Sea of Finland.

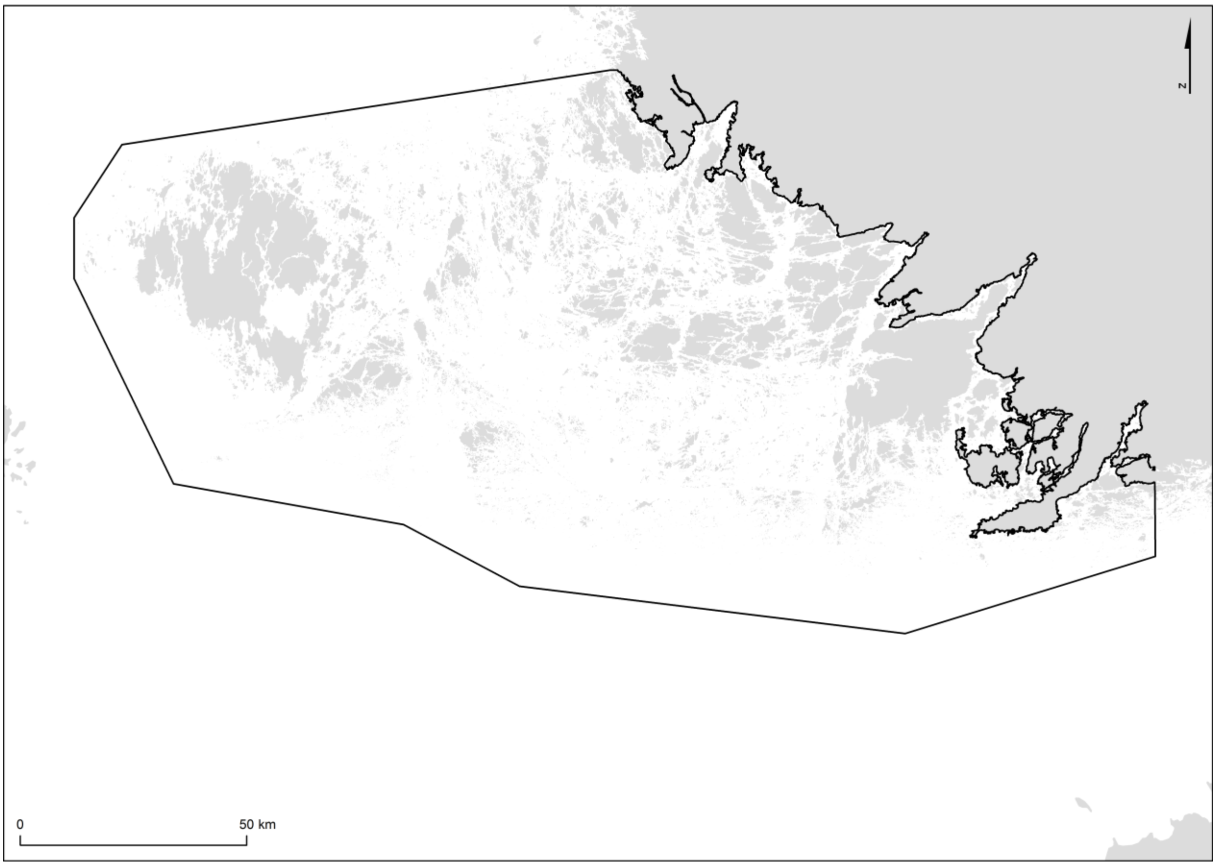

Figure 2. EBSA proposal.

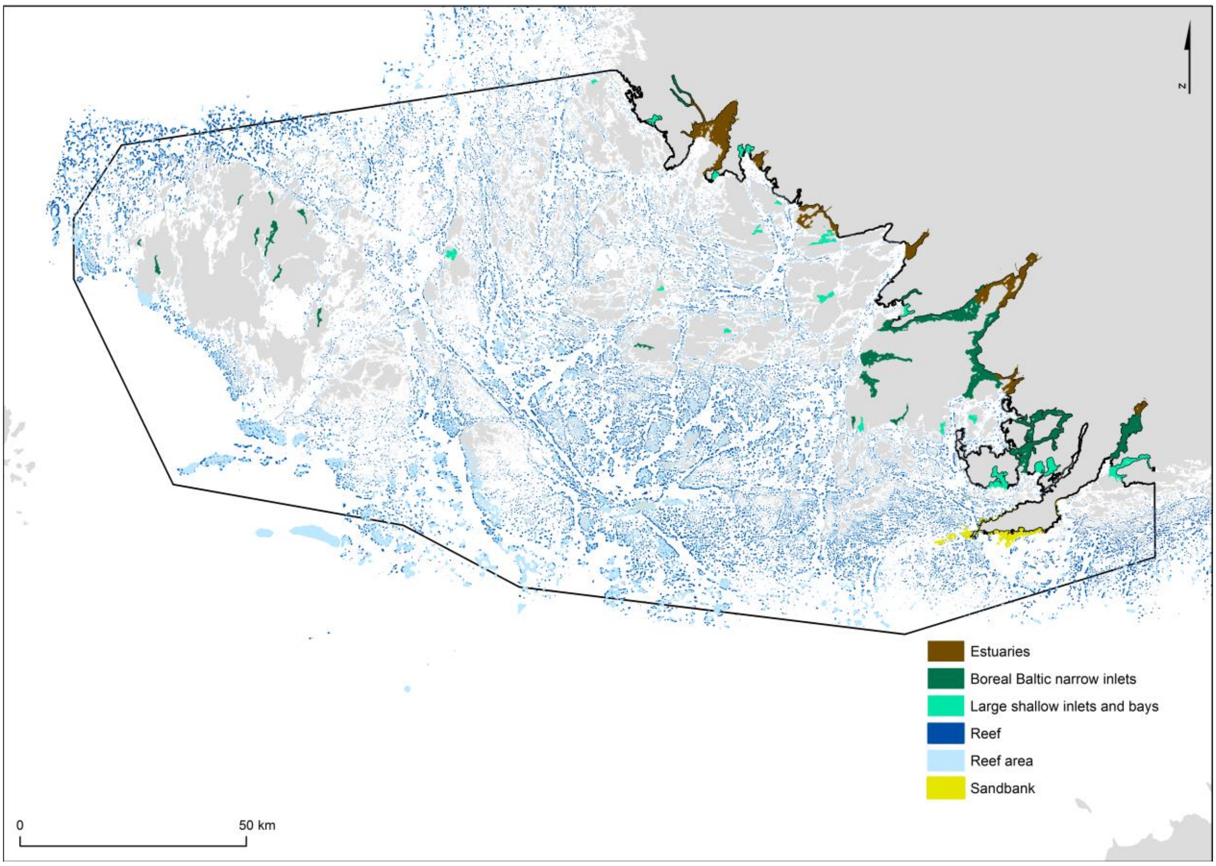

Figure 3. Potential habitats described by EU Habitats directive (92/43/EEC). Finnish Environment Institute & Geological Survey of Finland.

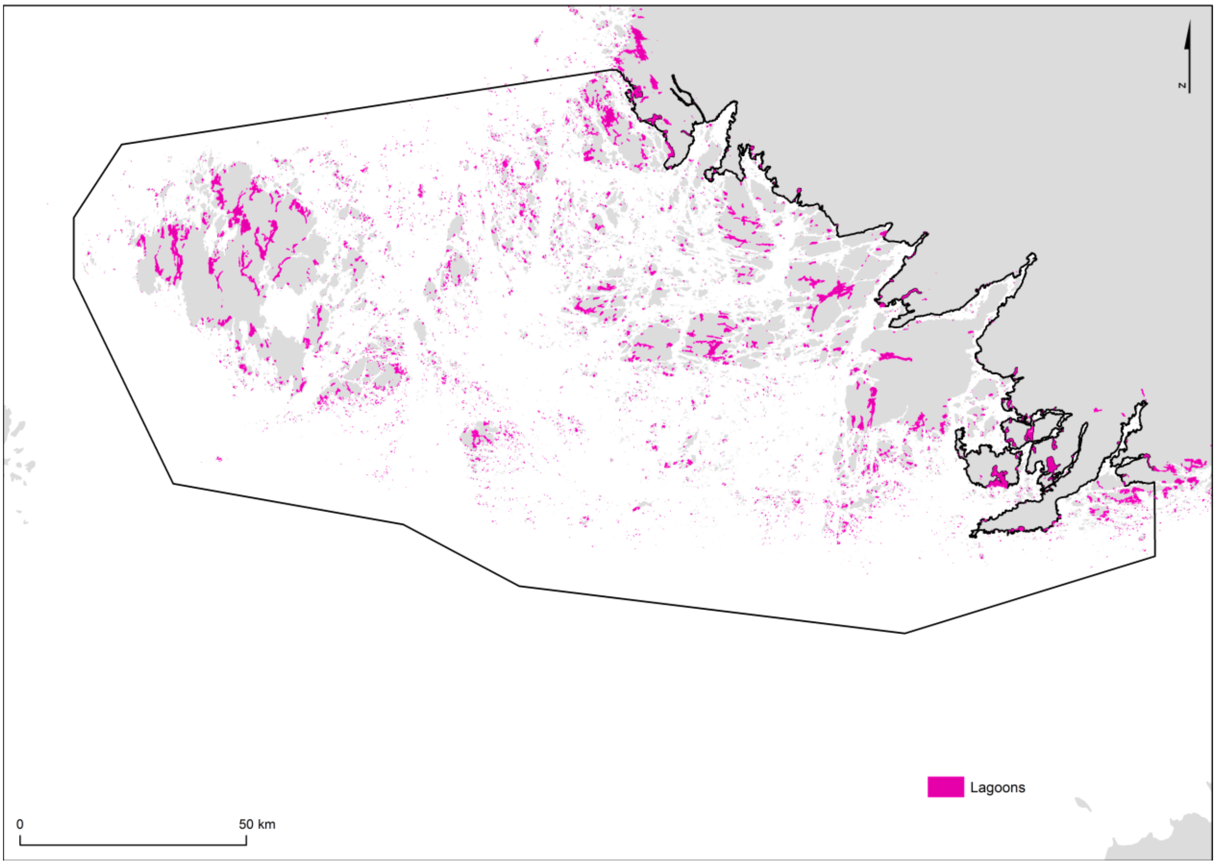

Figure 4. Potential coastal lagoons (1150) described by EU Habitats directive (92/43/EEC). Finnish Environment Institute.

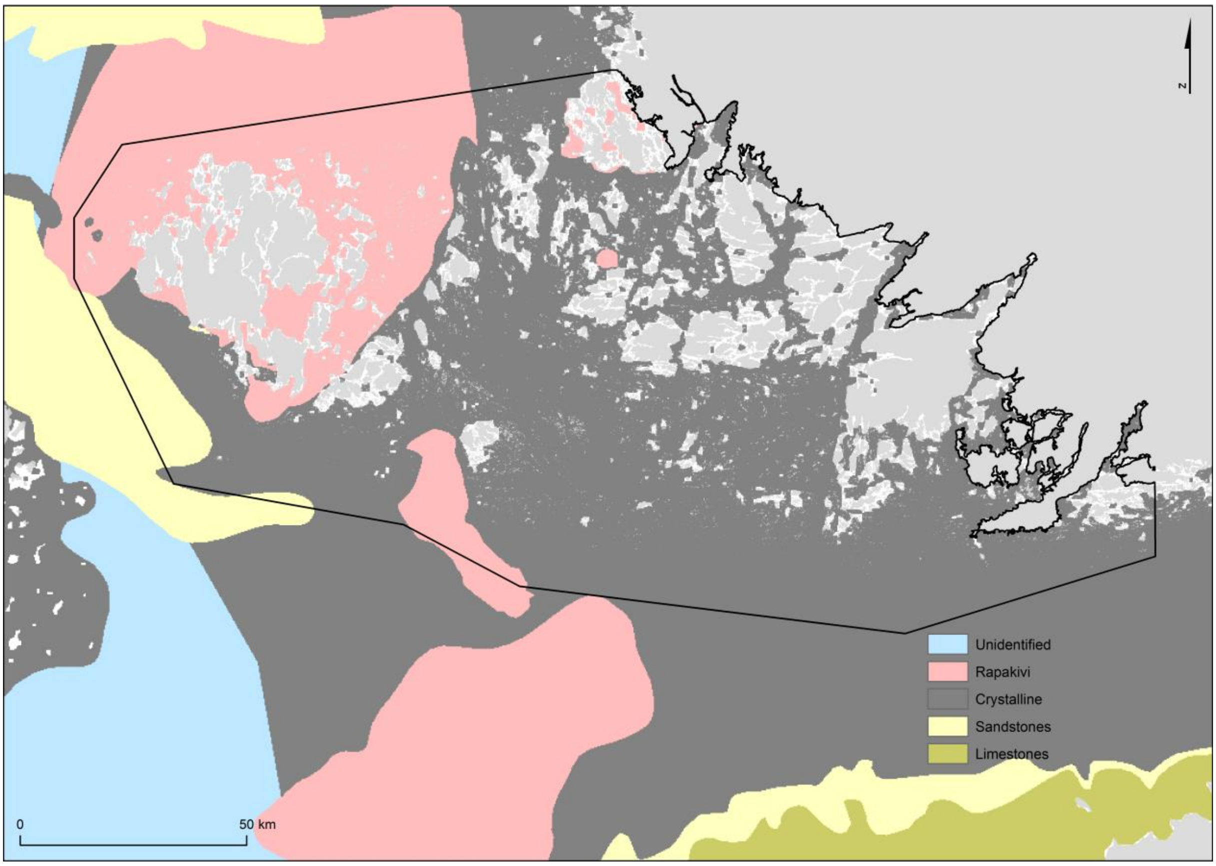

Figure 5. Rock type. Geological Survey of Finland.

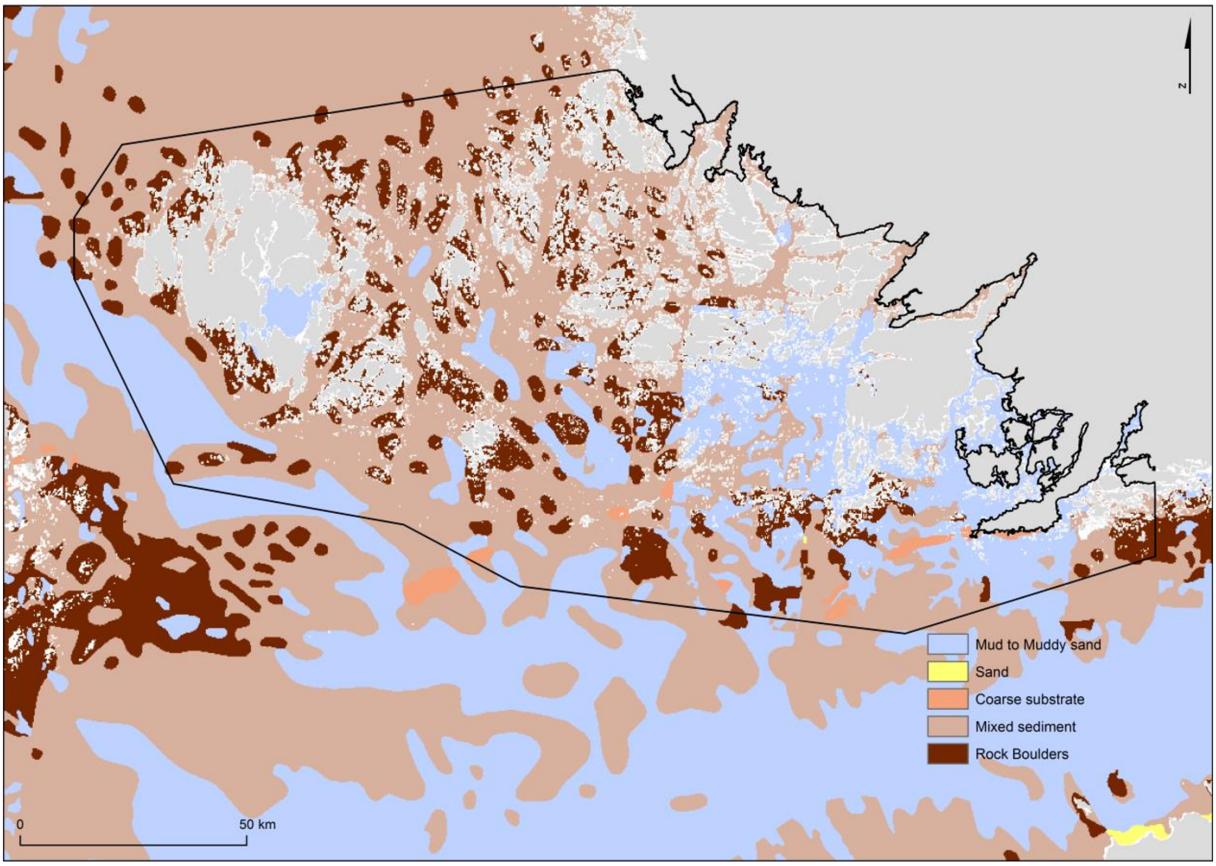

Figure 6. Seabed substrate. Geological Survey of Finland.

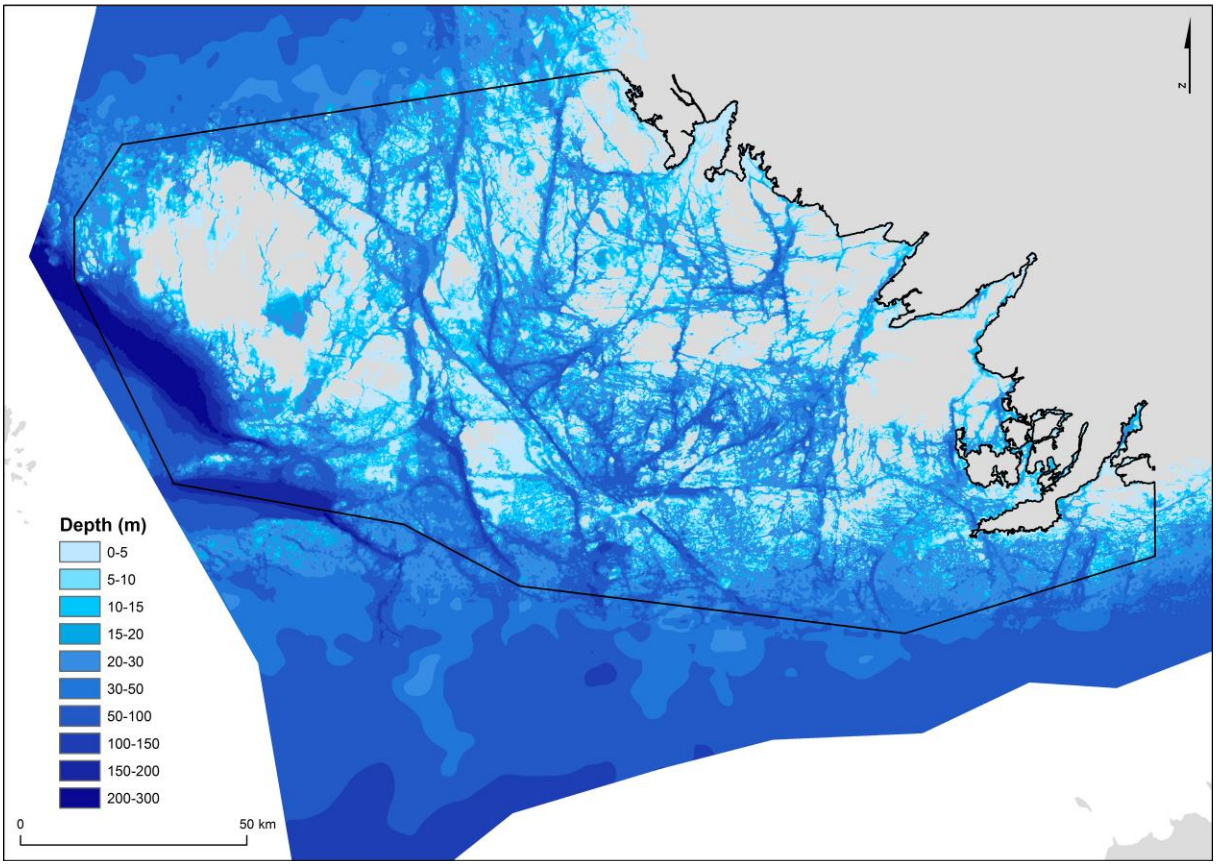

Figure 7. Water depth. VELMU / Finnish Environment Institute.

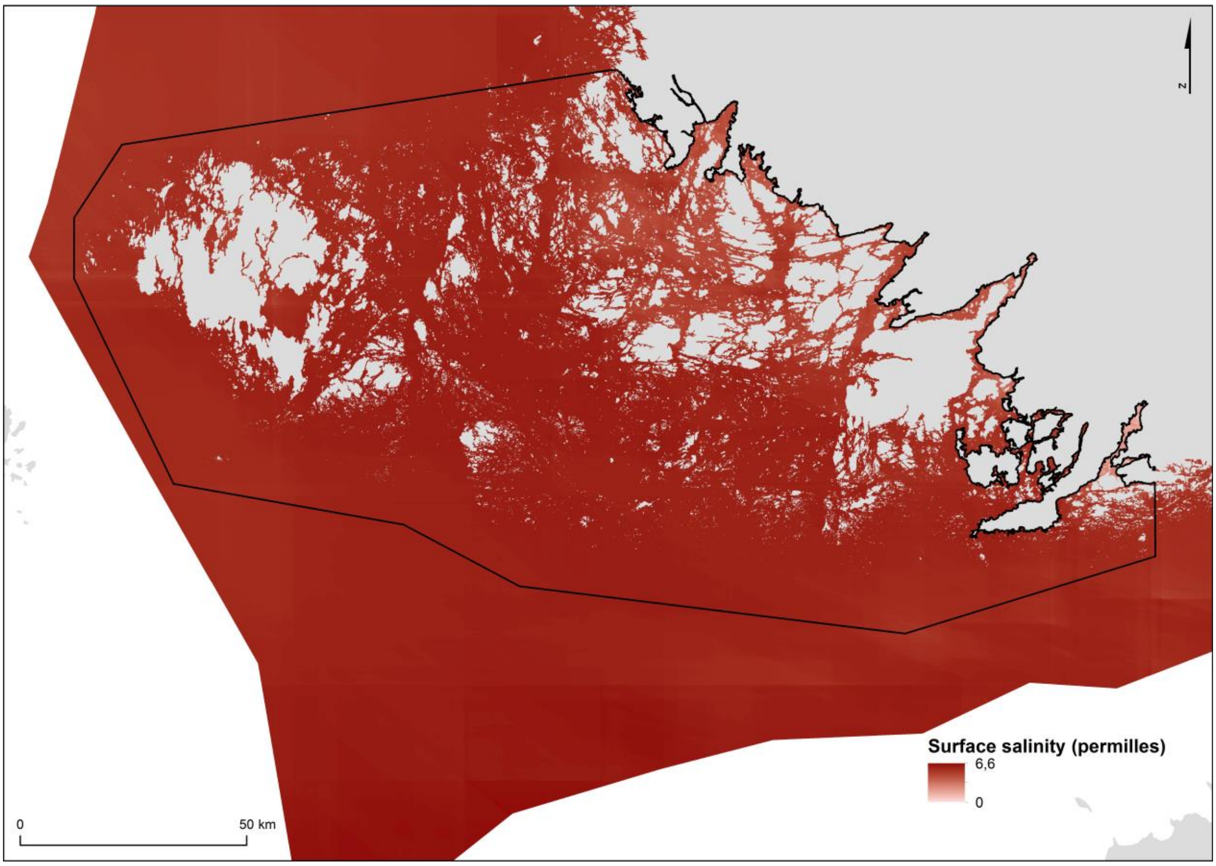

Figure 8. Surface salinity. VELMU / Finnish Environment Institute.

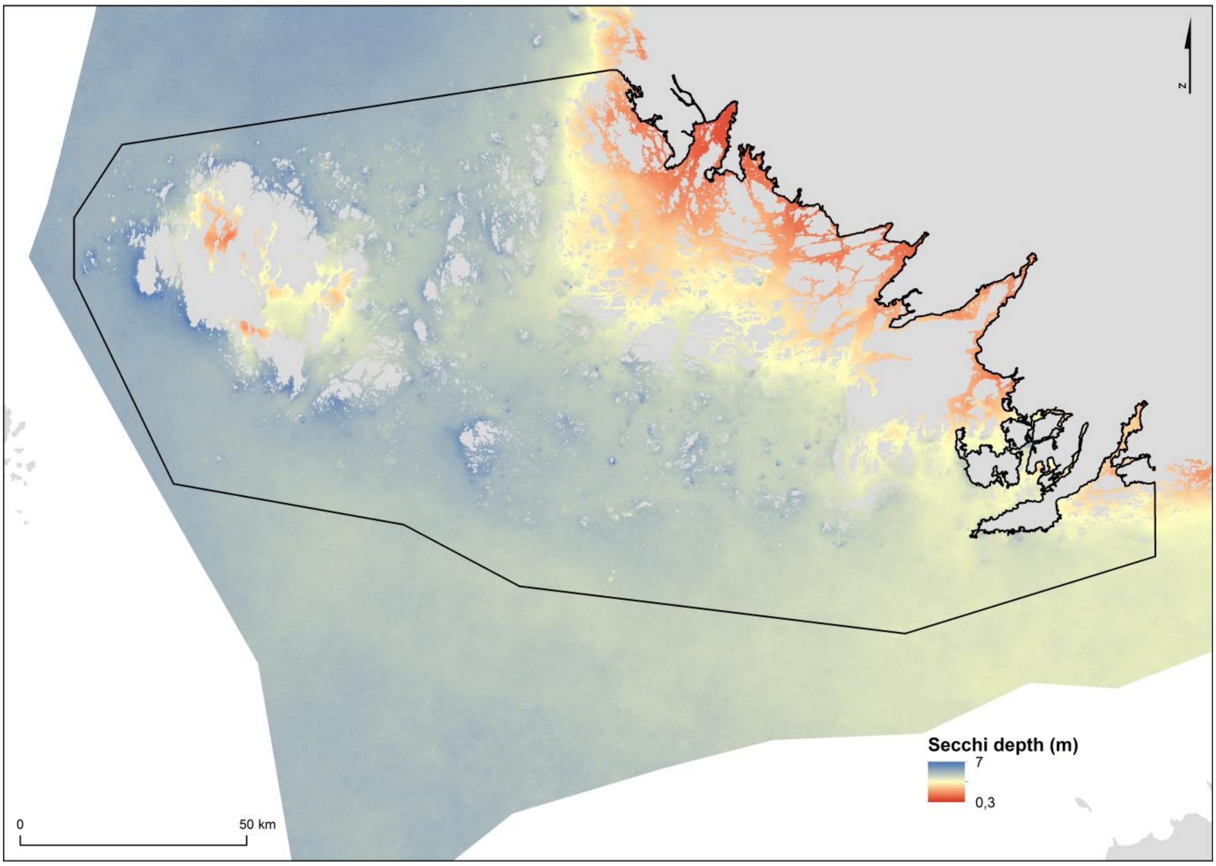

Figure 9. Secchi depth derived from Envisat-1 MERIS satellite images for the summer period 2003-2011. VELMU / Finnish Environment Institute.

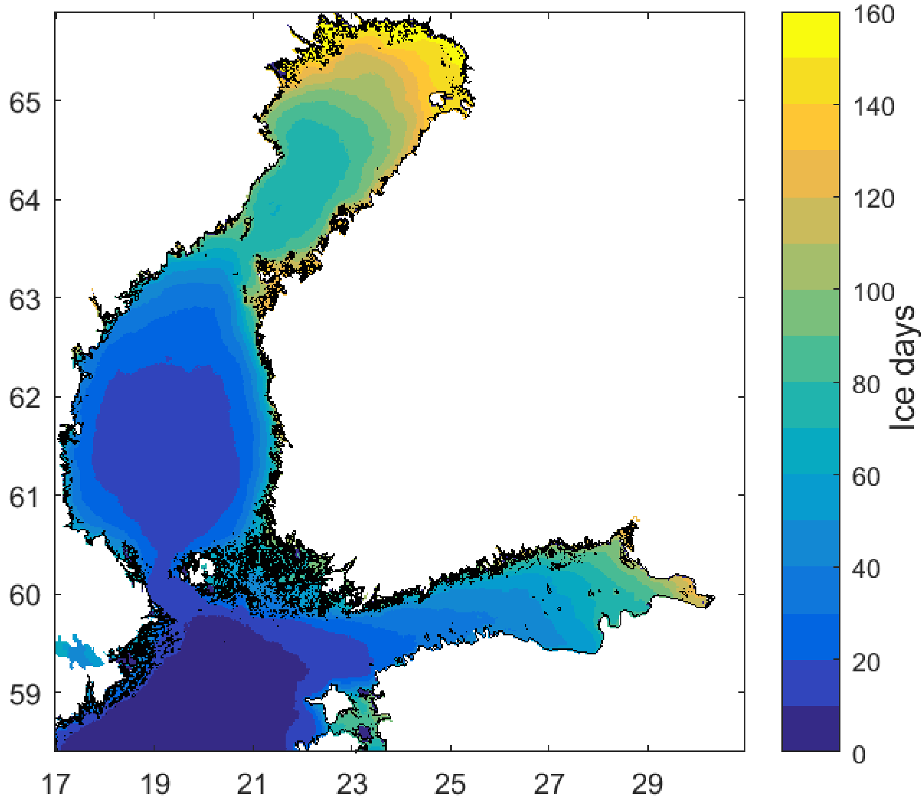

Figure 10. Average number of ice days during winters 2002...2003-2015...2016. Finnish Meteorological Institute.

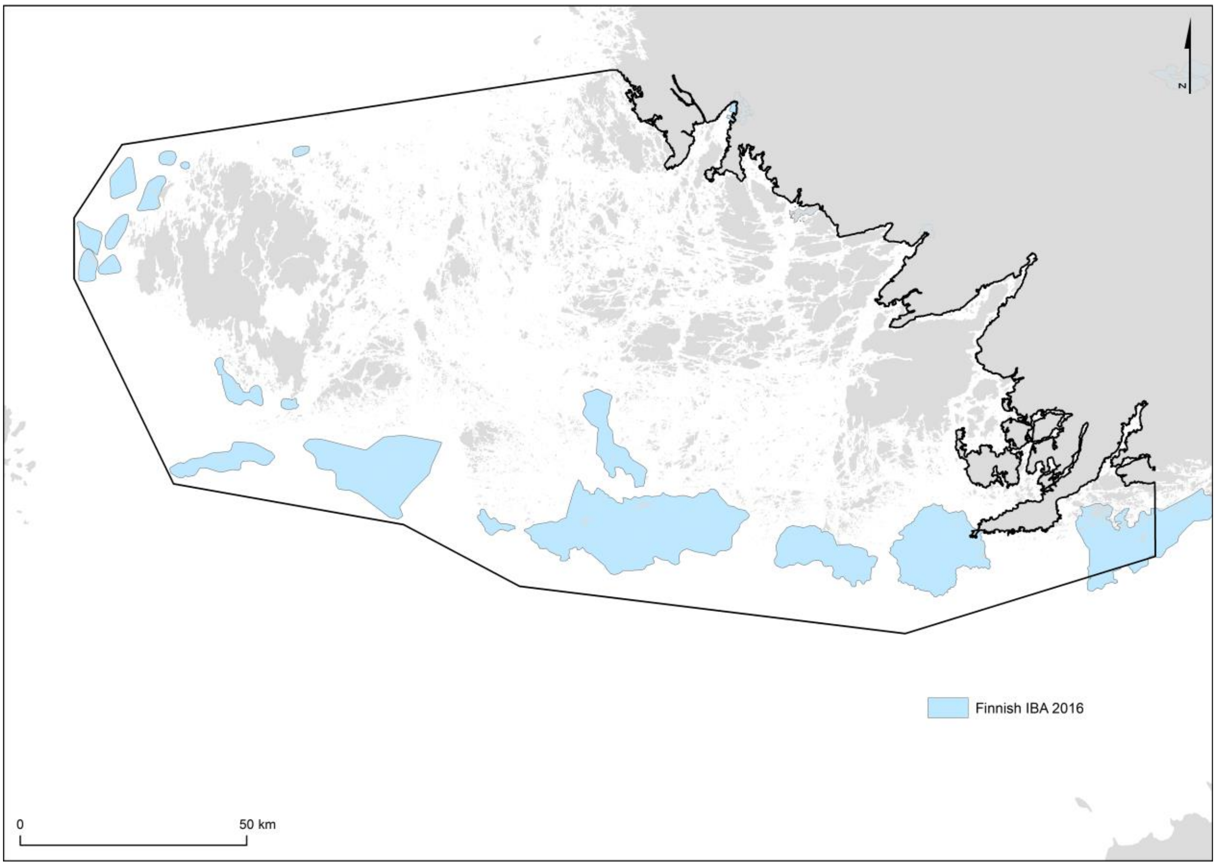

Figure 11. Important Bird and Biodiversity Areas (IBA). BirdLife Finland.

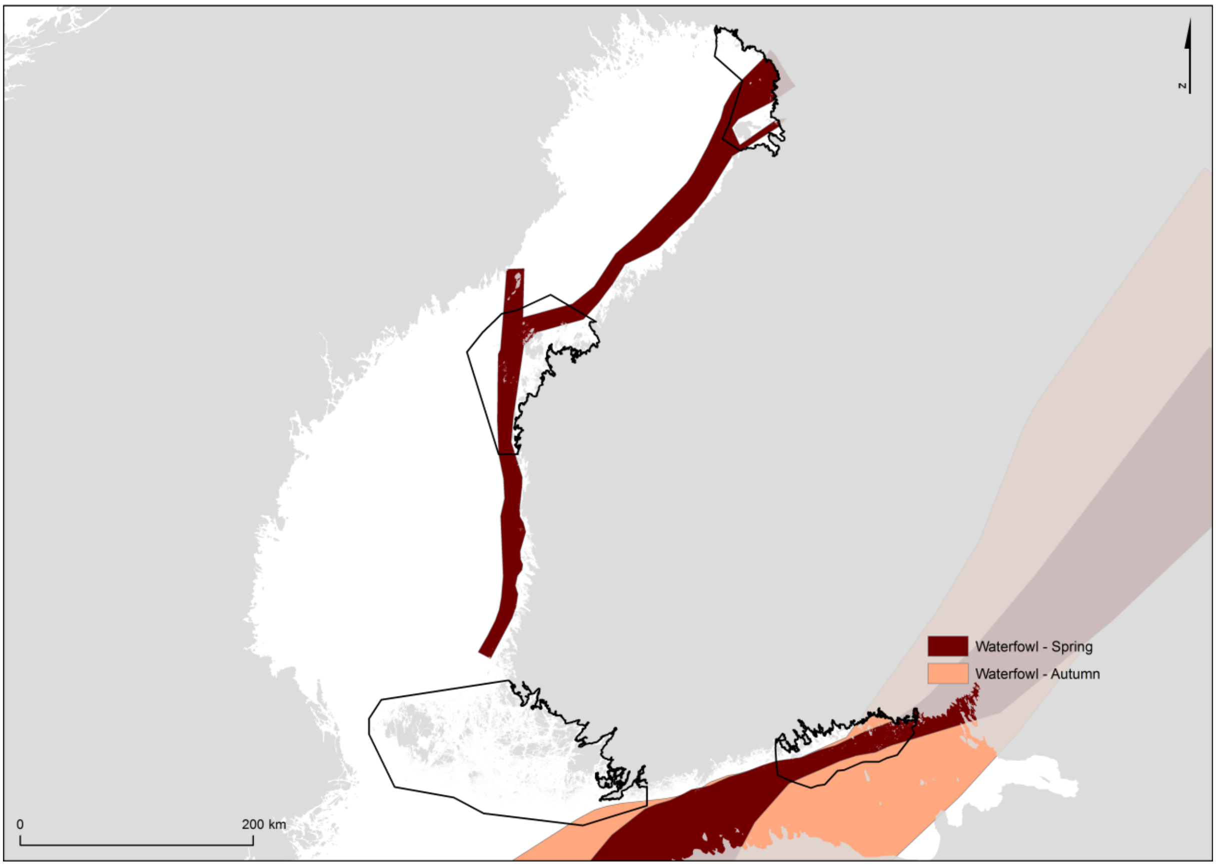

Figure 12. Migration routes of waterfowl. Birdlife Finland.

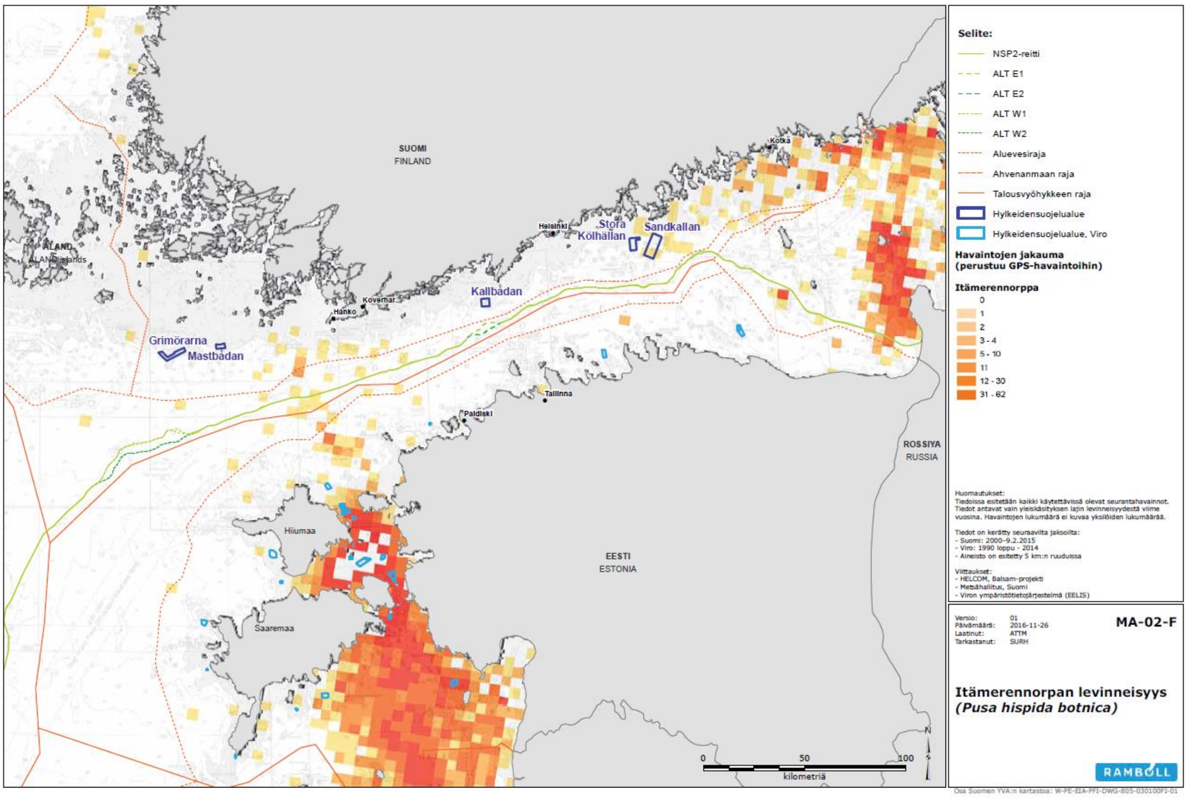

Figure 13. Distribution of ringed seal (*Pusa hispida botnica*). Nord Stream 2, W-PE-EIA-PFI-DWG-805-030100FI-01.

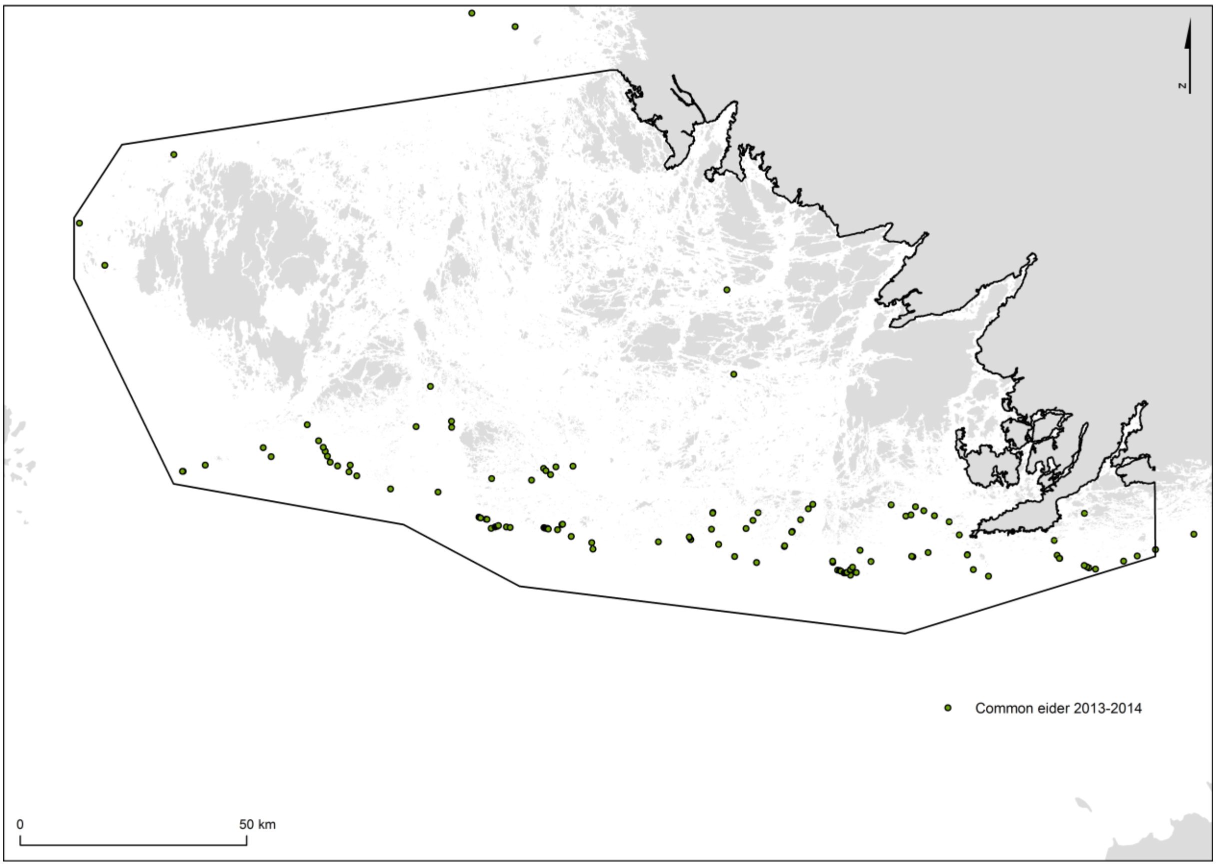

Figure 14. Observations of common eider (*Somateria molissima*) in 2013-2014.

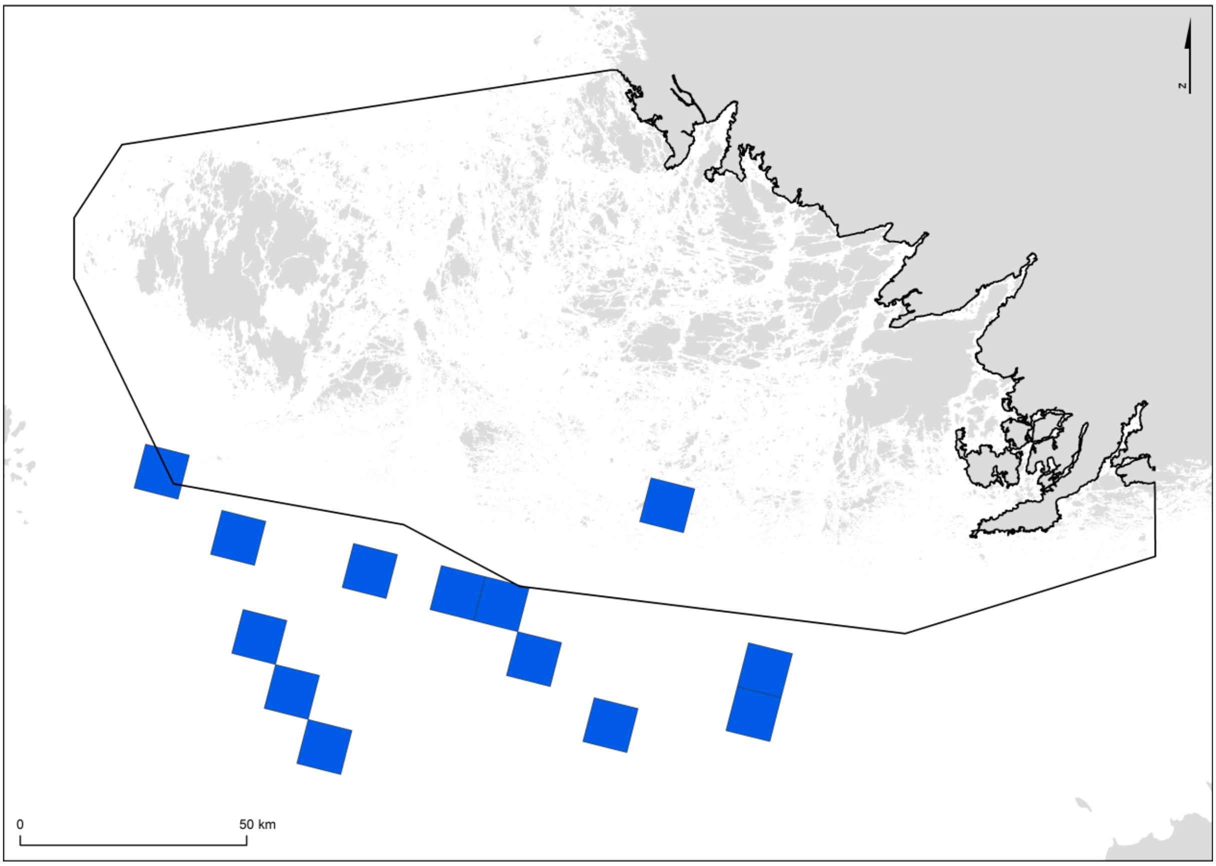

Figure 15. Acoustic observations of harbour porpoise (*Phoecona phoecona*). Turku University of Applied Sciences.

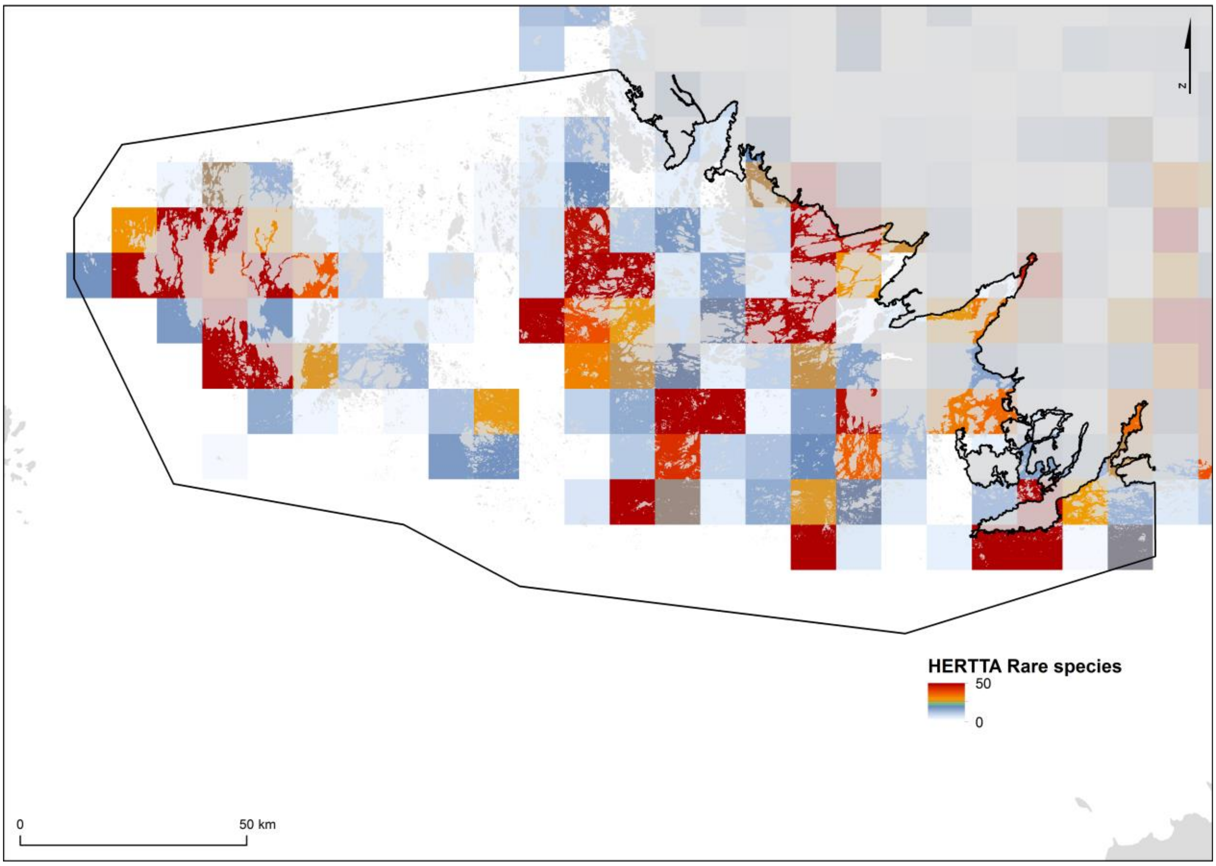

Figure 16. The number of observed rare species (Red list: RE, CR, EN, VU, NT) derived from HERTTA database for the years 1990-2015. Please note that all taxa from HERTTA database are included, also terrestrial species. Finnish Environment Institute.

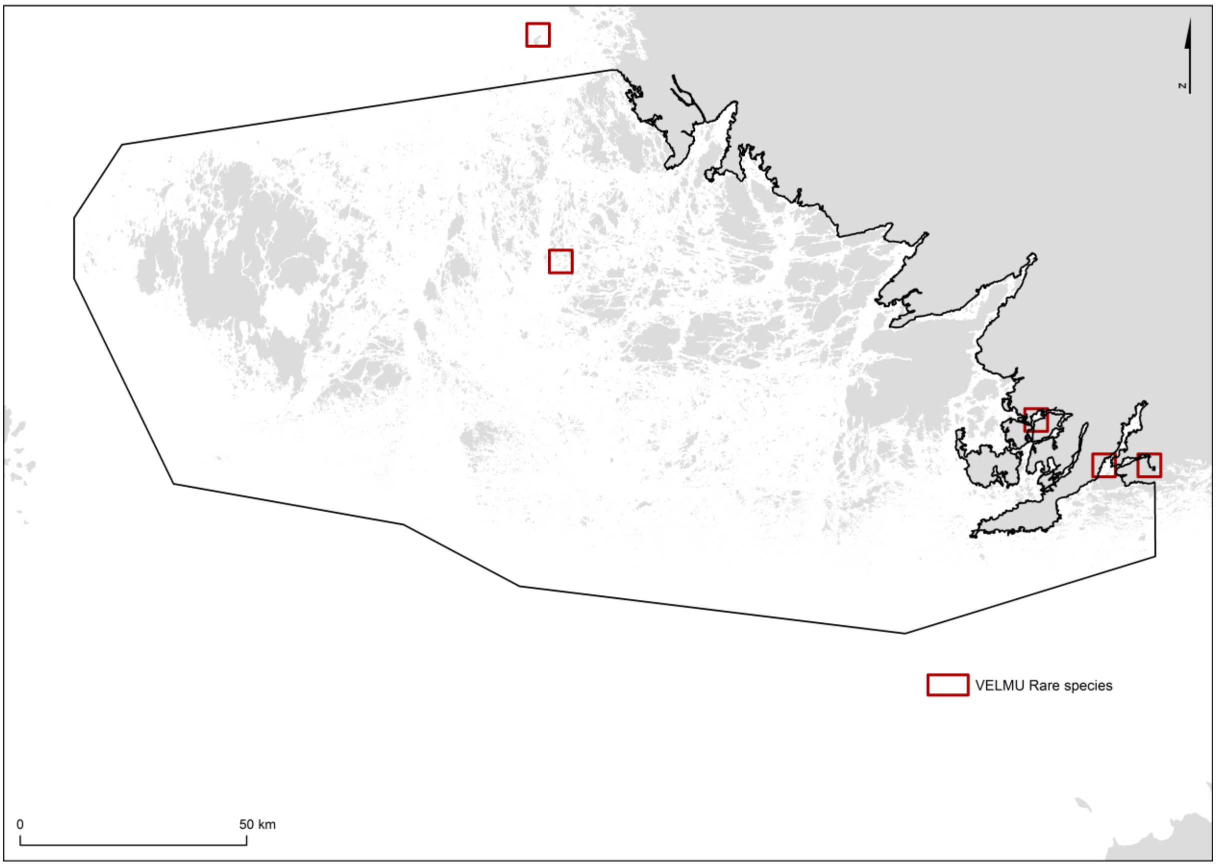

Figure 17. The occurrence of rare aquatic vascular plants and charophytes observed by VELMU programme. VELMU / Finnish Environment Institute.

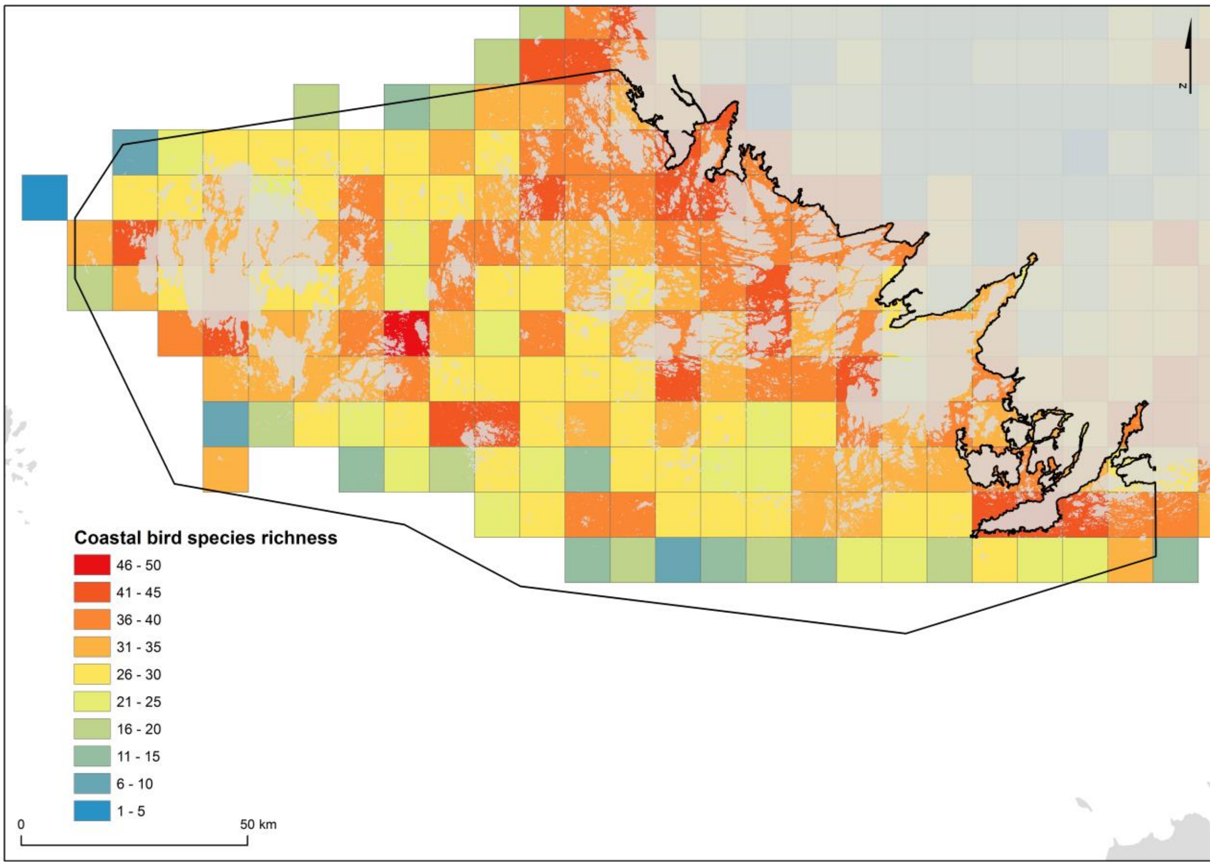

Figure 18. The number of breeding coastal birds. Finnish Bird Atlas & Metsähallitus Parks and Wildlife Finland.

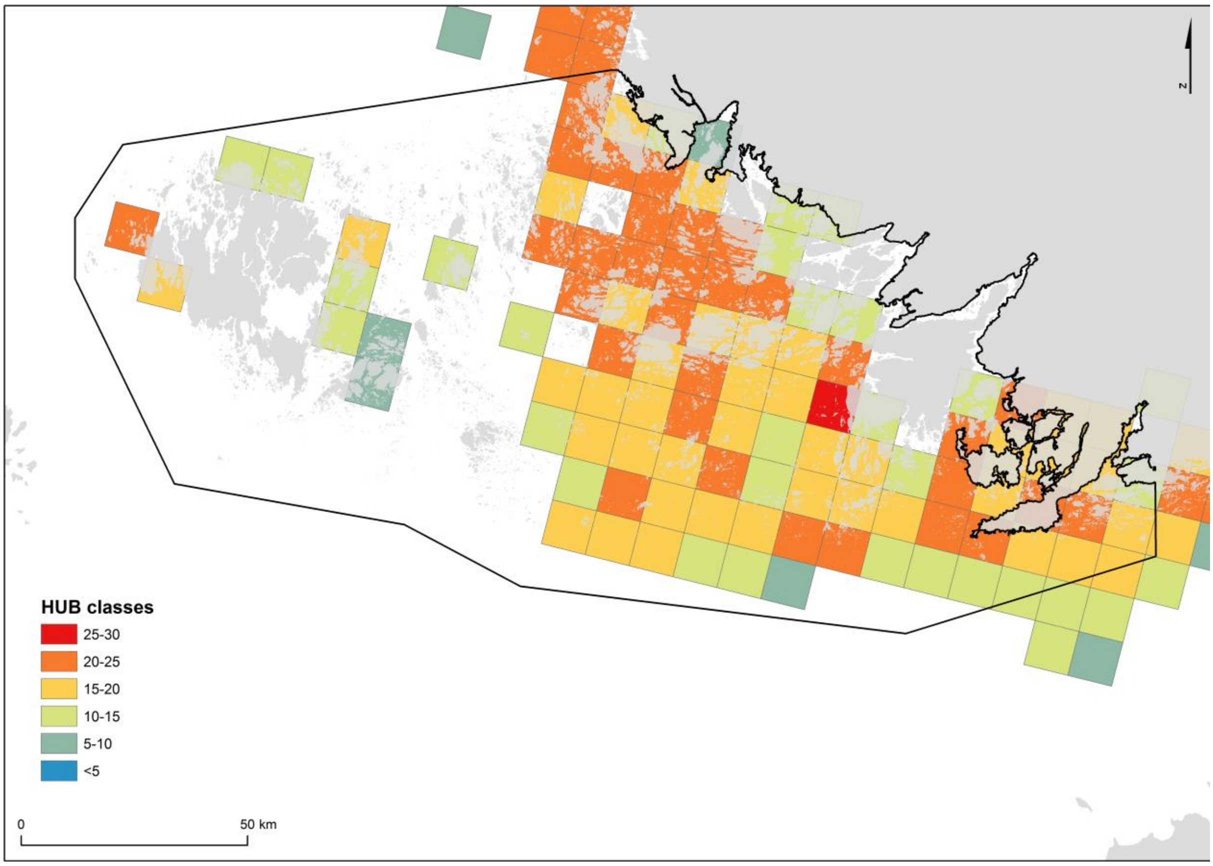

Figure 19. The number of observed HELCOM HUB classes. Based on VELMU inventories 2004-2016. Metsähallitus Parks and Wildlife Finland & Finnish Environment Institute.

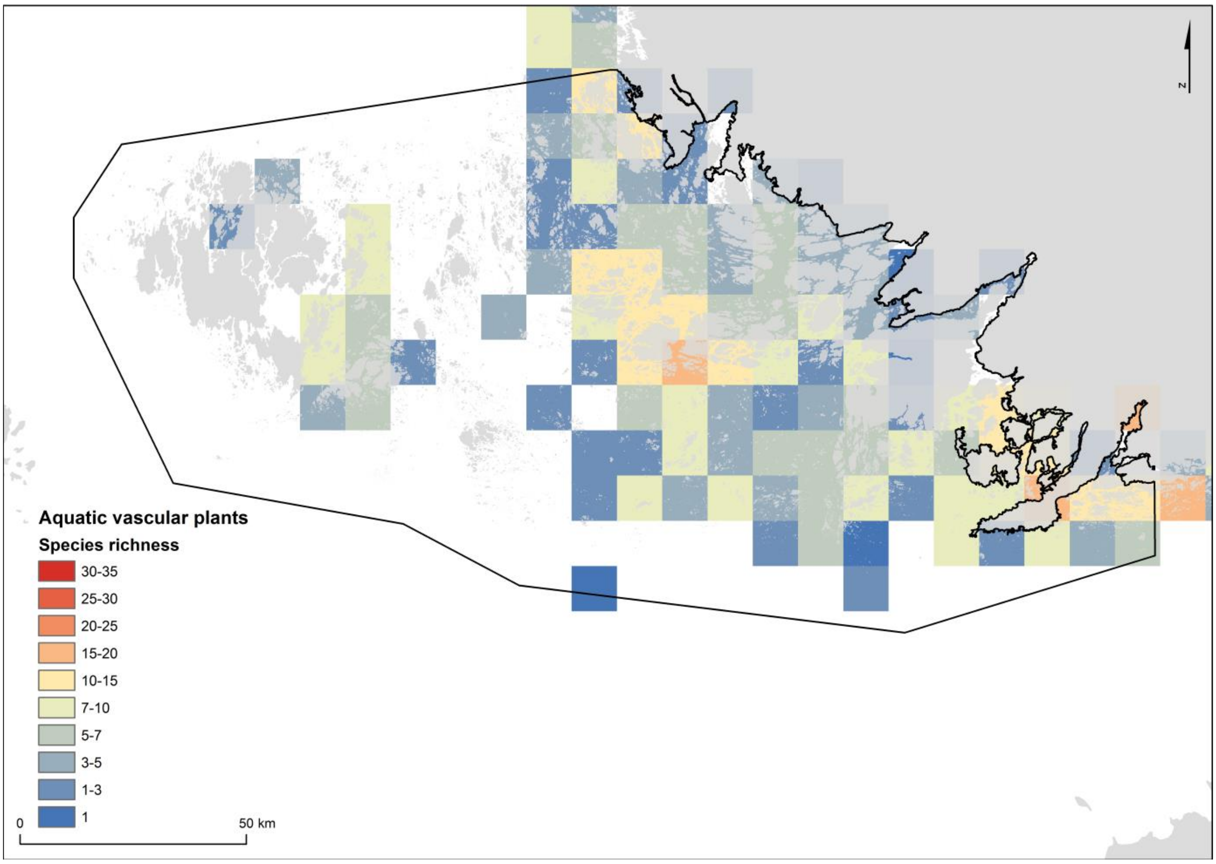

Figure 20. The species richness of aquatic vascular plants. Based on VELMU inventories 2004-2016. VELMU / Finnish Environment Institute.

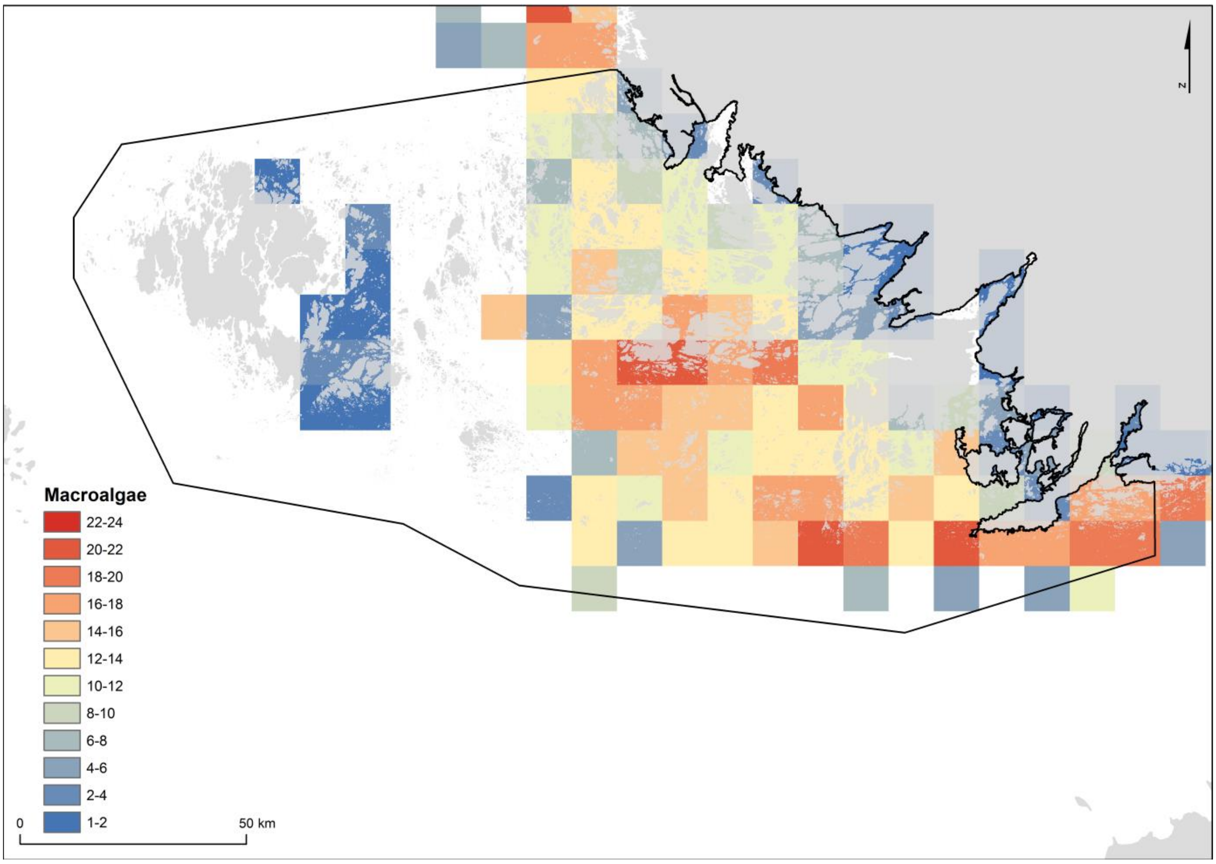

Figure 21. The species richness of macroalgae. Based on VELMU inventories 2004-2016. VELMU / Finnish Environment Institute.

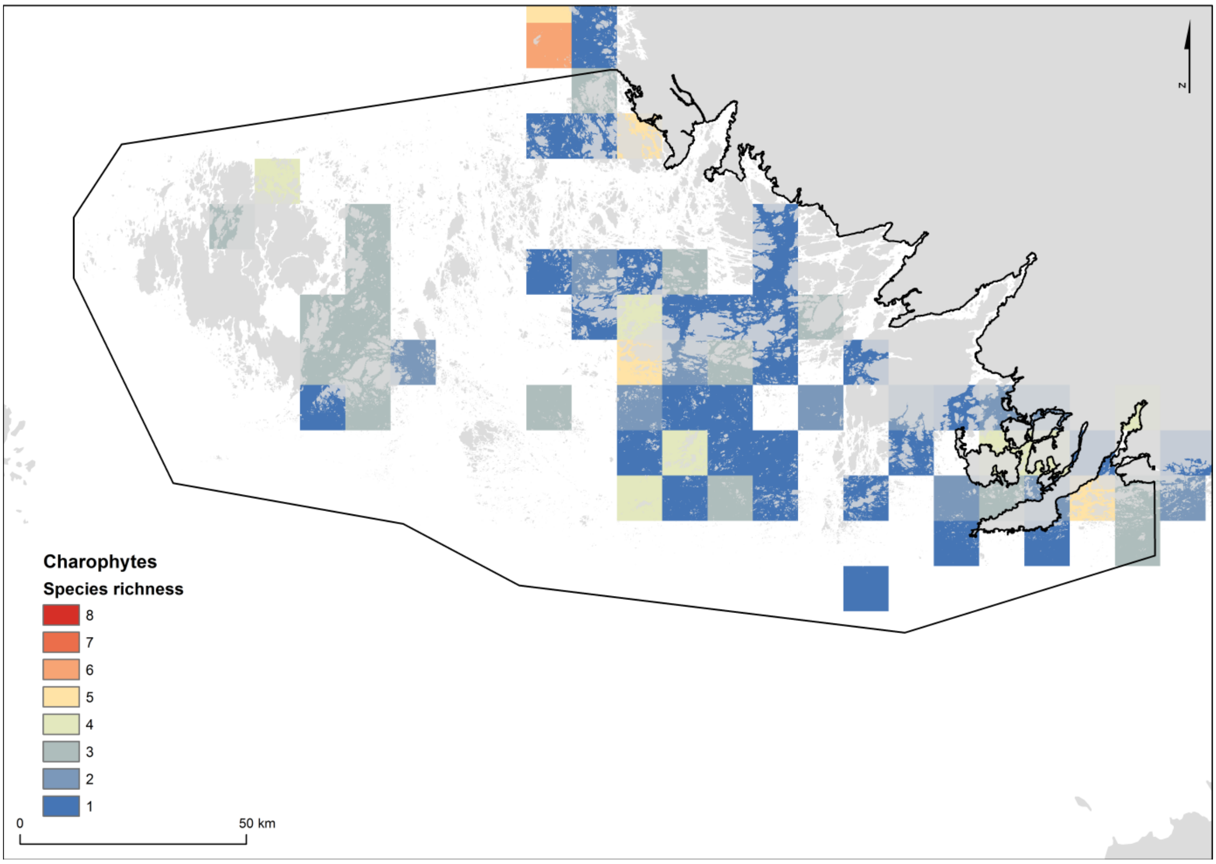

Figure 22. The species richness of charophytes. Based on VELMU inventories 2004-2016. VELMU / Finnish Environment Institute.

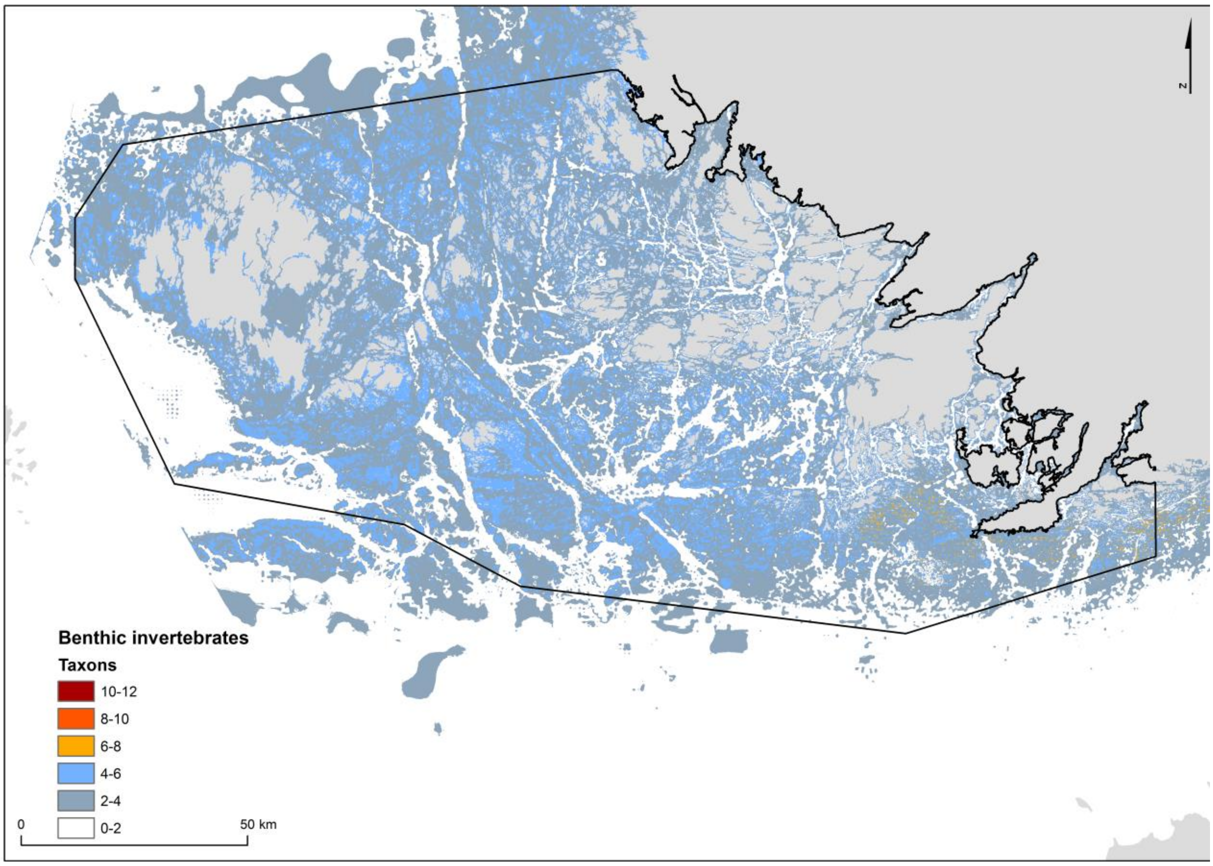

Figure 23. Modelled number of benthic invertebrate taxons. Based on VELMU inventories 2004-2016 and HERTTA Pohje database. Finnish Environment Institute.

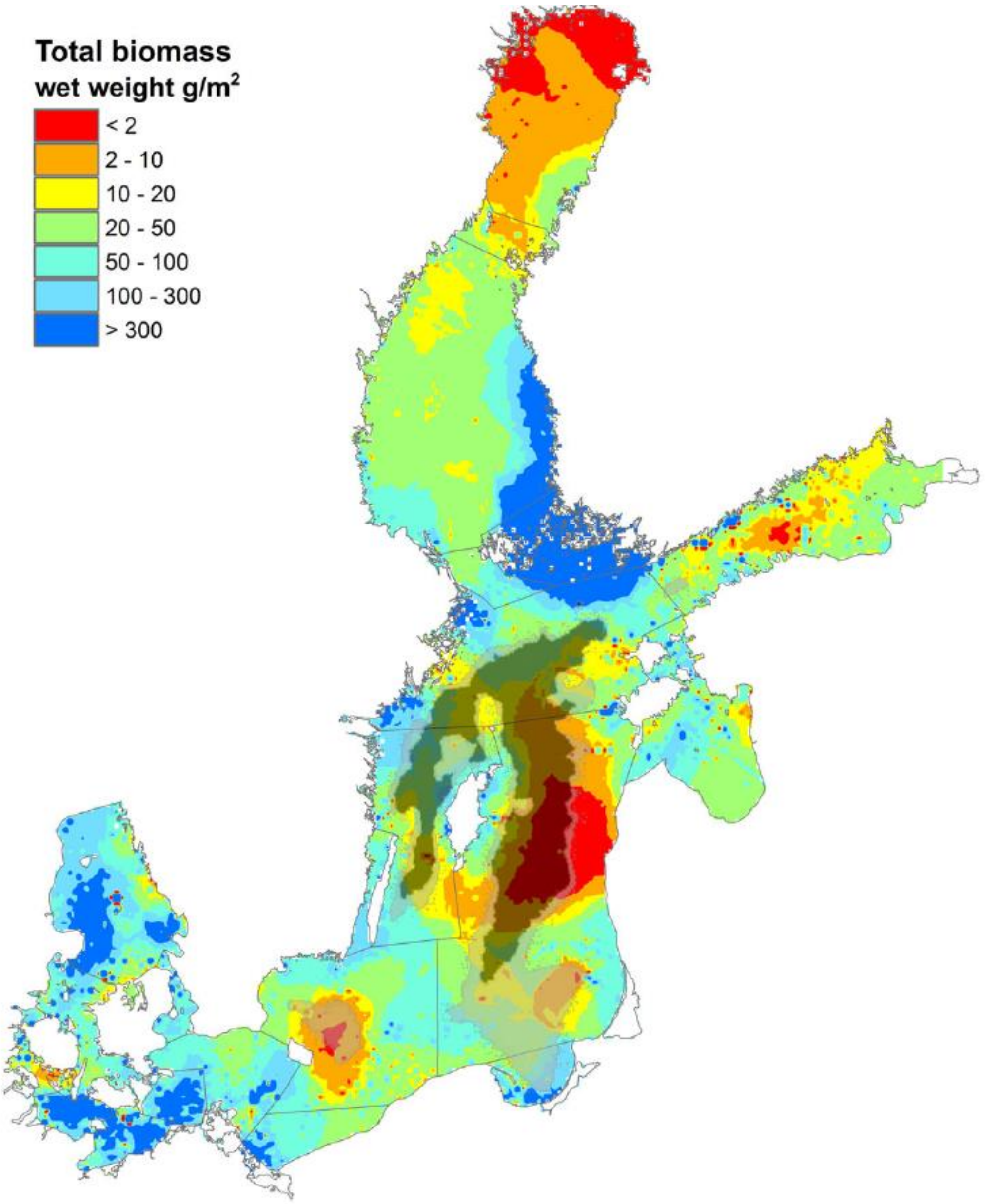

Figure 8. Distribution of interpolated total wet weight biomass, derived using ordinary kriging interpolation of available biomass data averaged per 5 × 5 km grid cell. Transparent light grey and dark grey areas mask out the deep water hypoxic and anoxic oxygen conditions. Note that at the areas where biomass data are lacking interpolation artefacts are evident, for instance, values at the shallow parts of the Eastern Gotland Basin at the west coast off Latvia are presumably too low. This figure is available in black and white in print and in colour at *ICES Journal of Marine Science* online.

Figure 24. Total biomass of benthic invertebrates. Gogina et al. 2016.

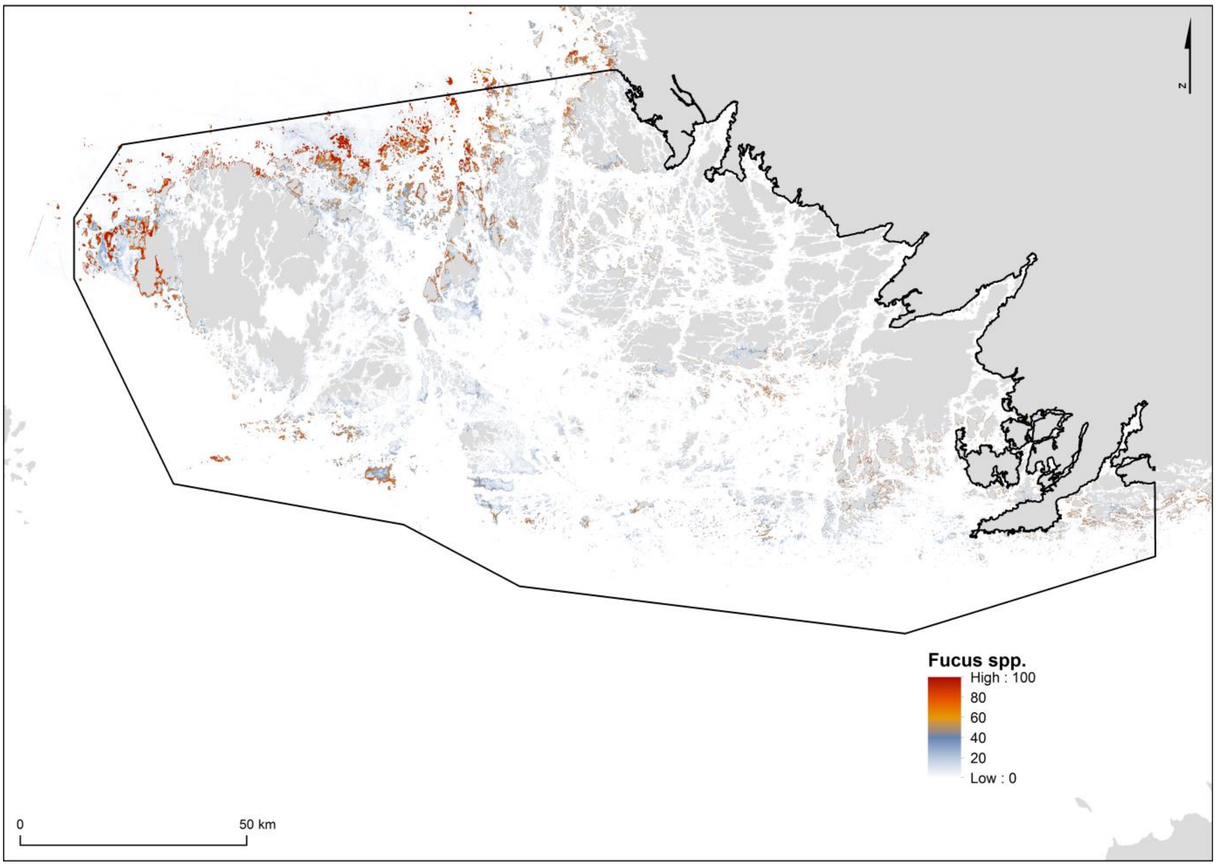

Figure 25. Modelled distribution of bladder wrack (*Fucus* spp.) as probability of occurrence (0-100%). Based on VELMU inventories 2004-2016. Finnish Environment Institute.

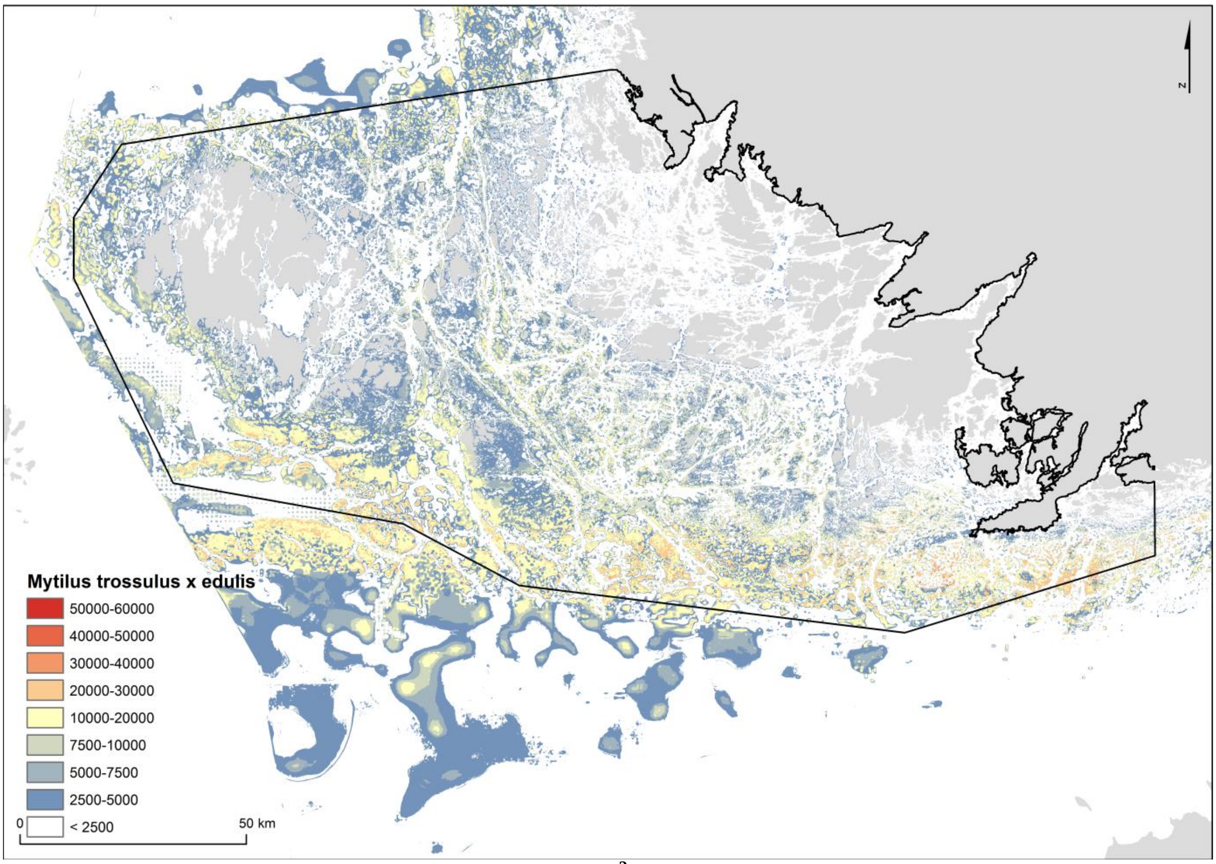

Figure 26. Modelled individual density (individuals m^{-2}) of blue mussel (*Mytilus trossulus)*. Based on VELMU inventories 2004-2016 and HERTTA Pohje database. Finnish Environment Institute.

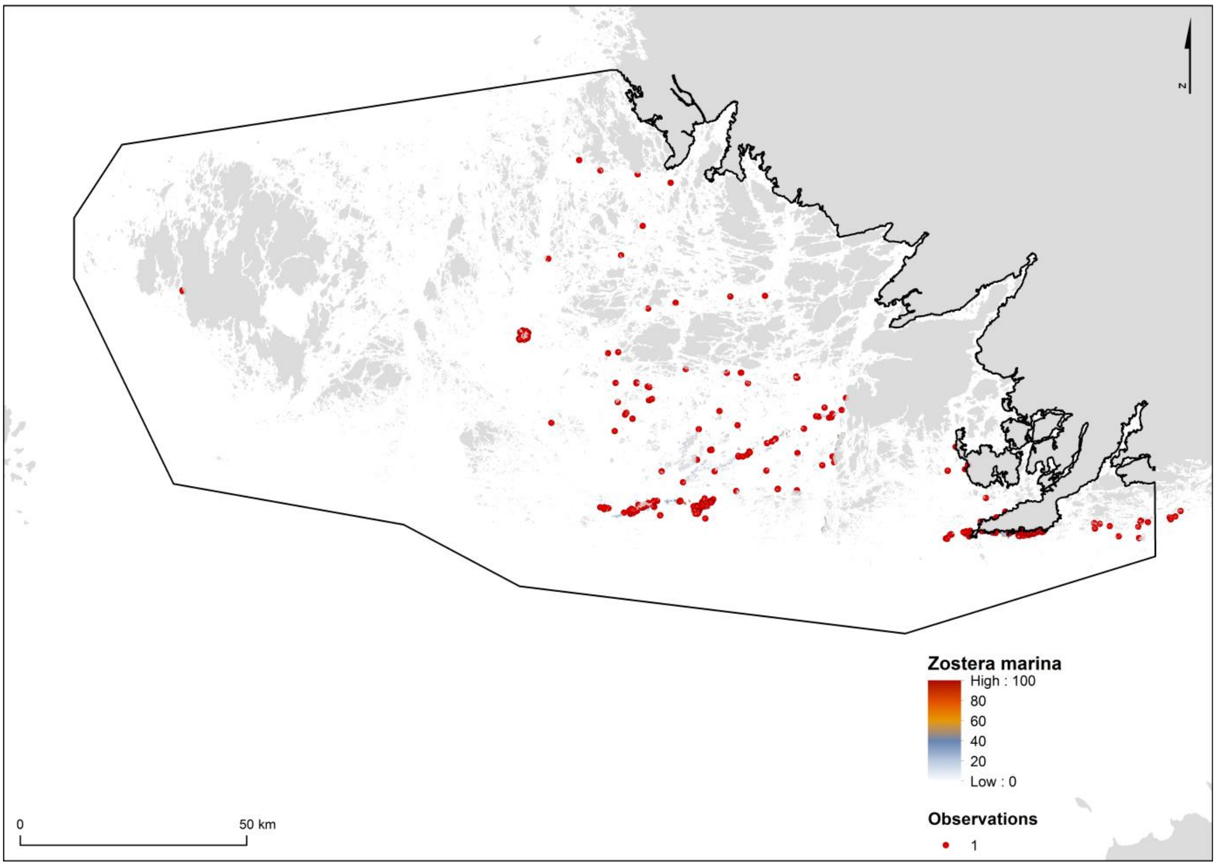

Figure 27. Observations and modelled distribution of seagrass *Zostera marina* as probability of occurrence (0-100%). Based on VELMU inventories 2004-2016. Finnish Environment Institute & VELMU data.

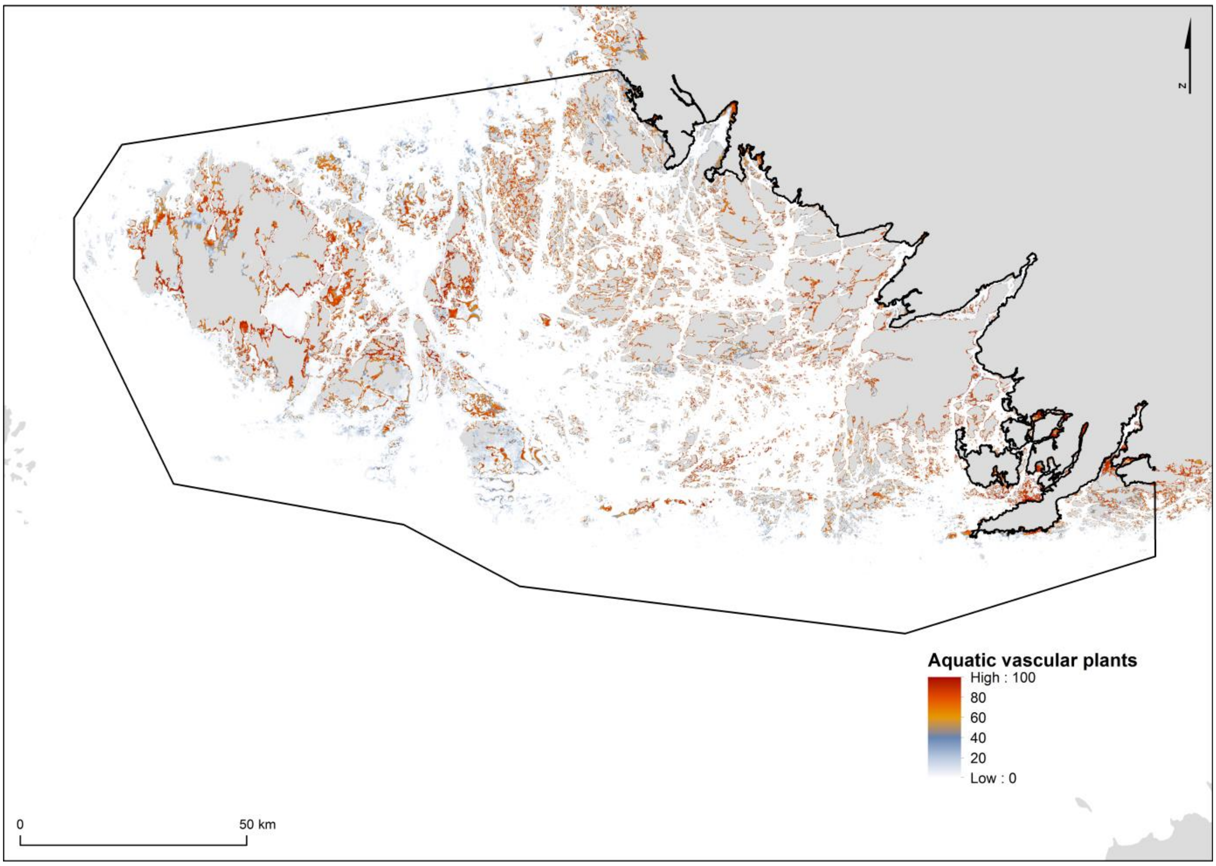

Figure 28. Modelled distribution of aquatic vascular plants as probability of occurrence (0-100%). Based on VELMU inventories 2004-2016. Finnish Environment Institute.

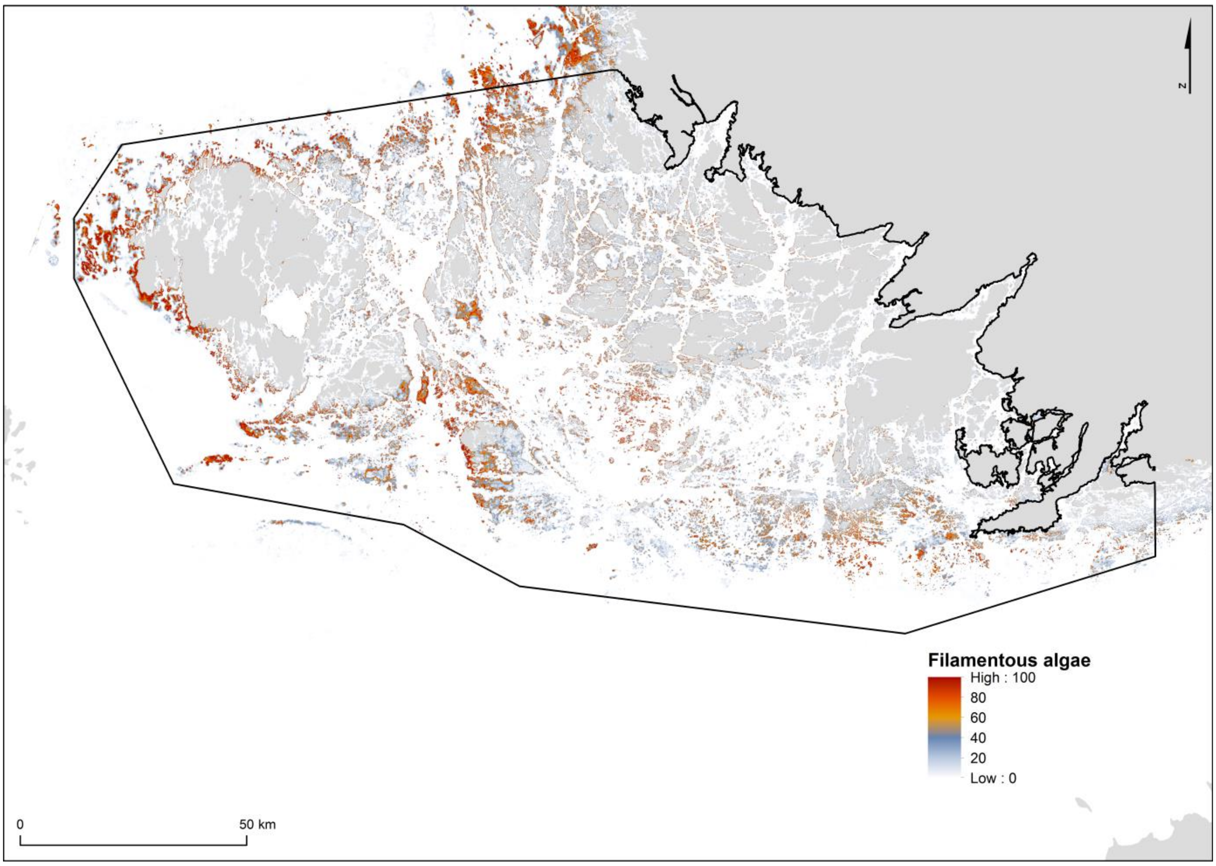

Figure 29. Modelled distribution of filamentous algae as probability of occurrence (0-100%). Based on VELMU inventories 2004-2016. Finnish Environment Institute.

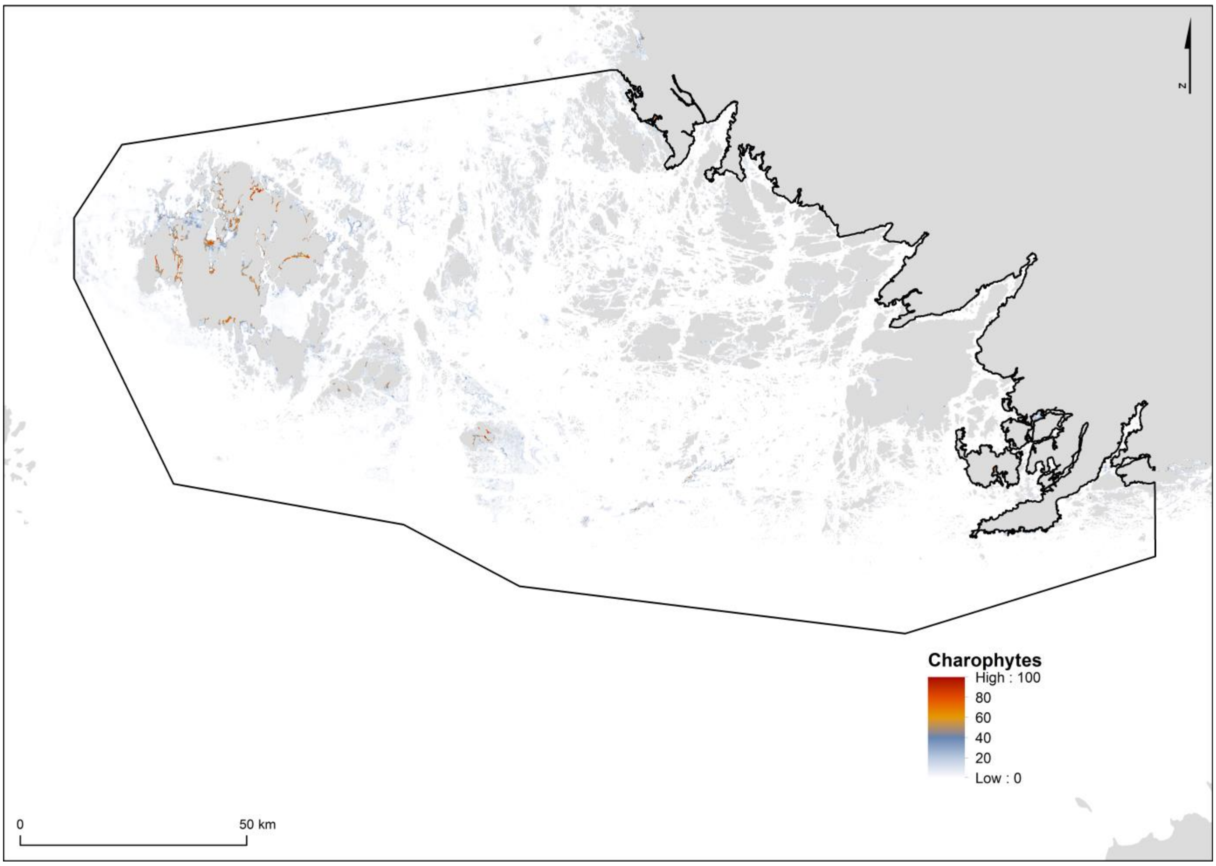

Figure 30. Modelled distribution of charophytes as probability of occurrence (0-100%). Based on VELMU inventories 2004-2016. Finnish Environment Institute.

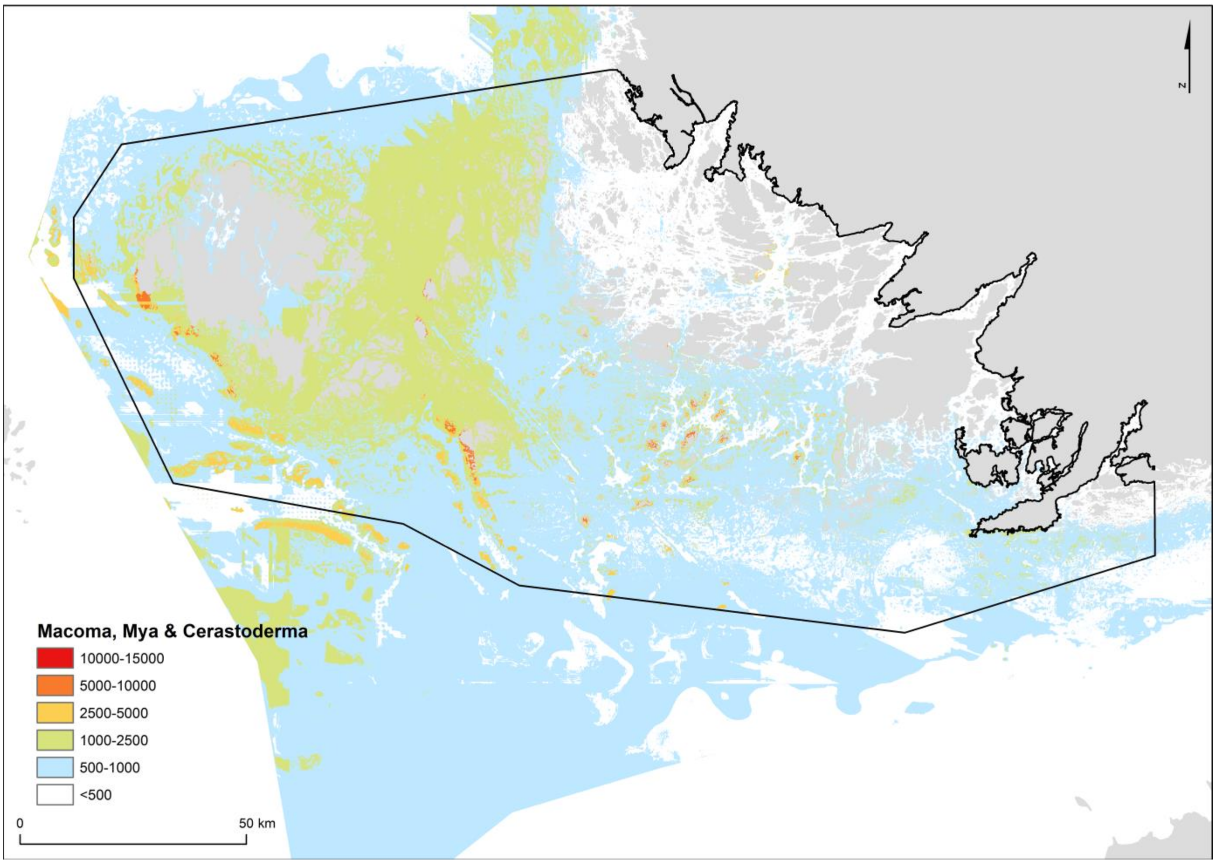

Figure 31. Modelled distribution of infaunal bivalves *Macoma baltica, Mya arenaria* and *Cerastoderma glaucum* as density (individuals m^{-2}). Based on VELMU inventories 2004-2016 and HERTTA Pohje database. Finnish Environment Institute.

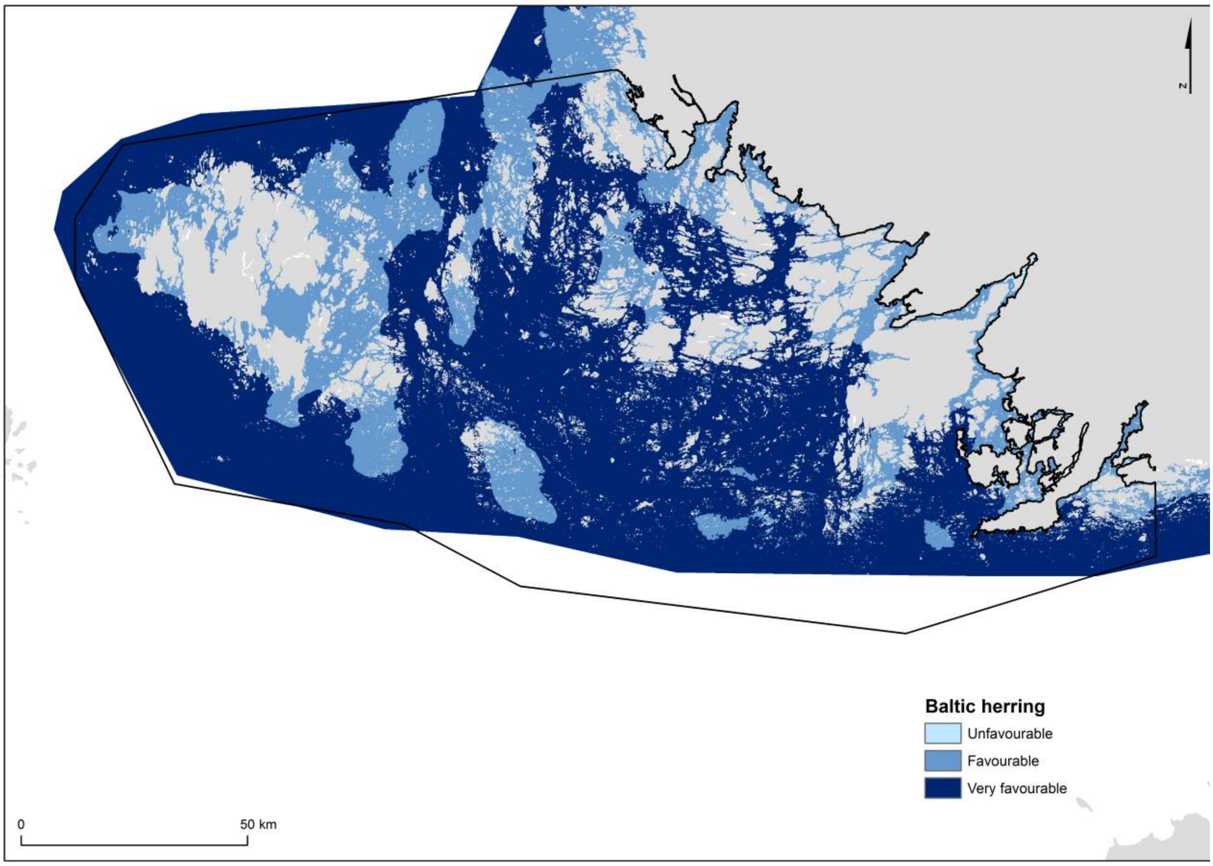

Figure 32. Reproduction area of baltic herring (*Clupea harengus membras*). National Resources Institute Finland & VELMU programme.

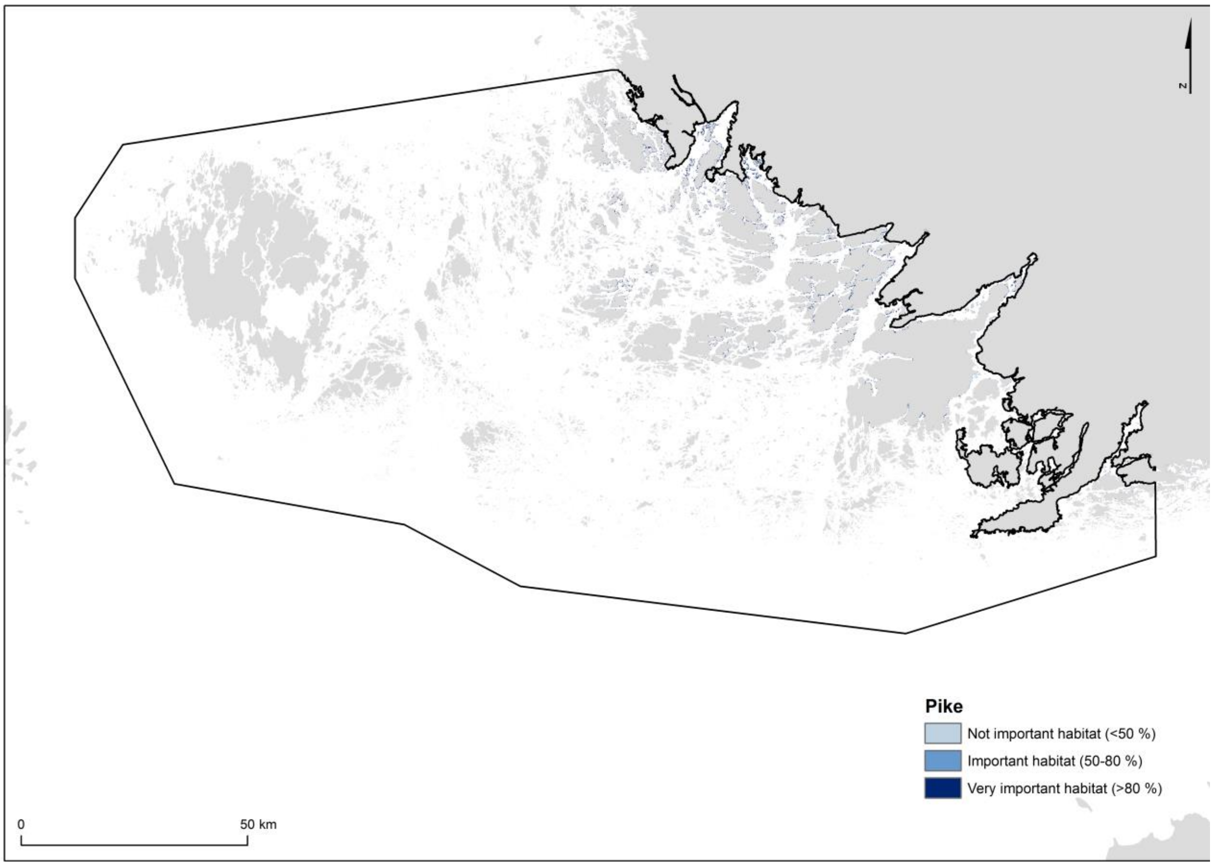

Figure 33. Potential distribution of juvenile pike (*Esox lucius*). National Resources Institute Finland & VELMU programme.

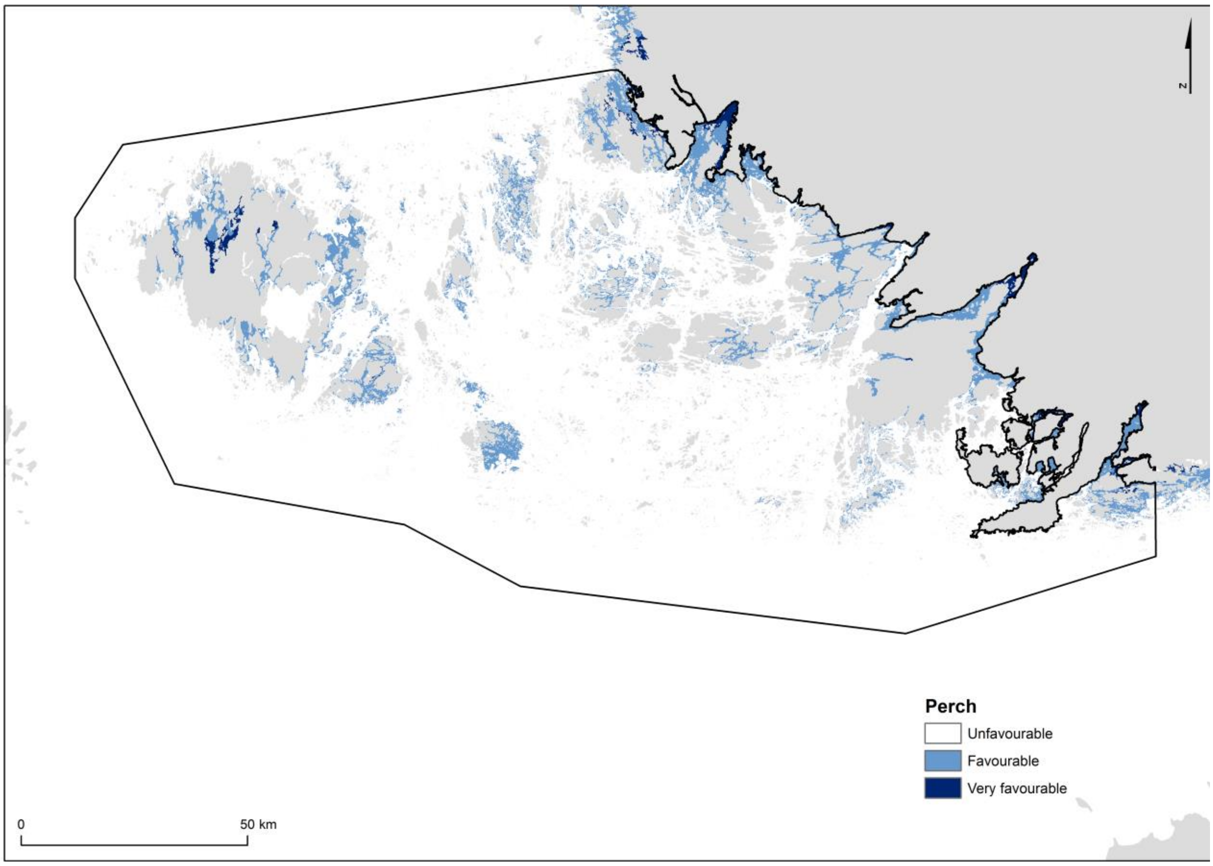

Figure 34. Reproduction area of perch (*Perca fluviatilis*). National Resources Institute Finland & VELMU programme.

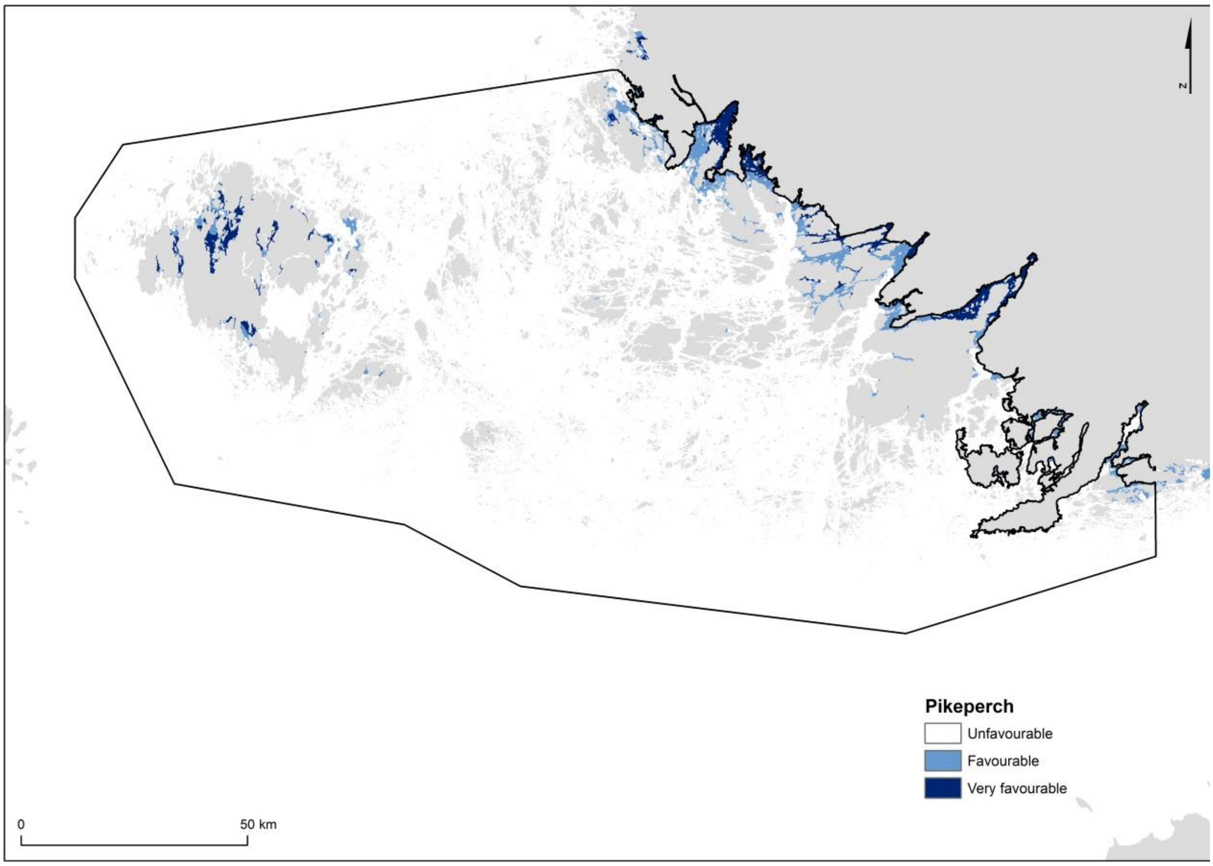

Figure 35. Reproduction area of pikeperch (*Sander lucioperca*). National Resources Institute Finland & VELMU programme.

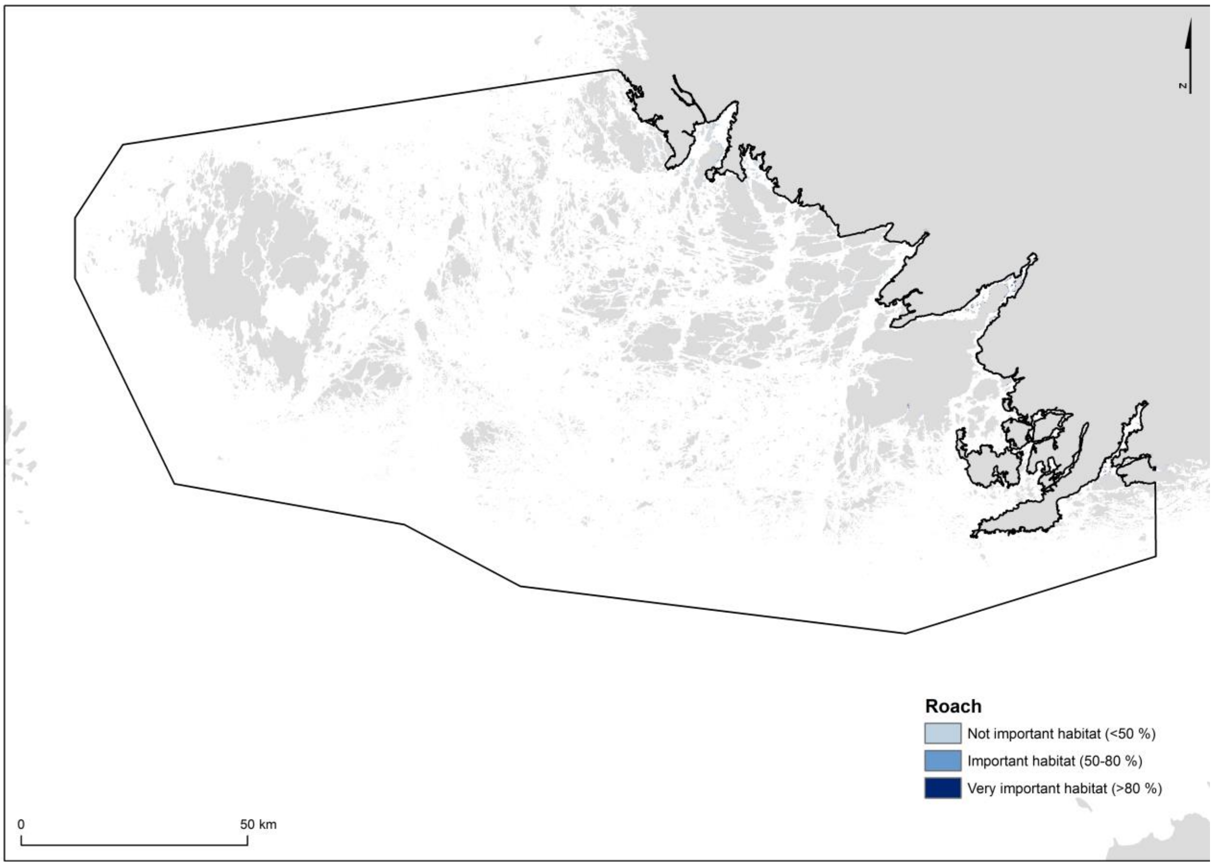

Figure 36. Potential distribution of juvenile roach (*Rutilus rutilus*). National Resources Institute Finland & VELMU programme.

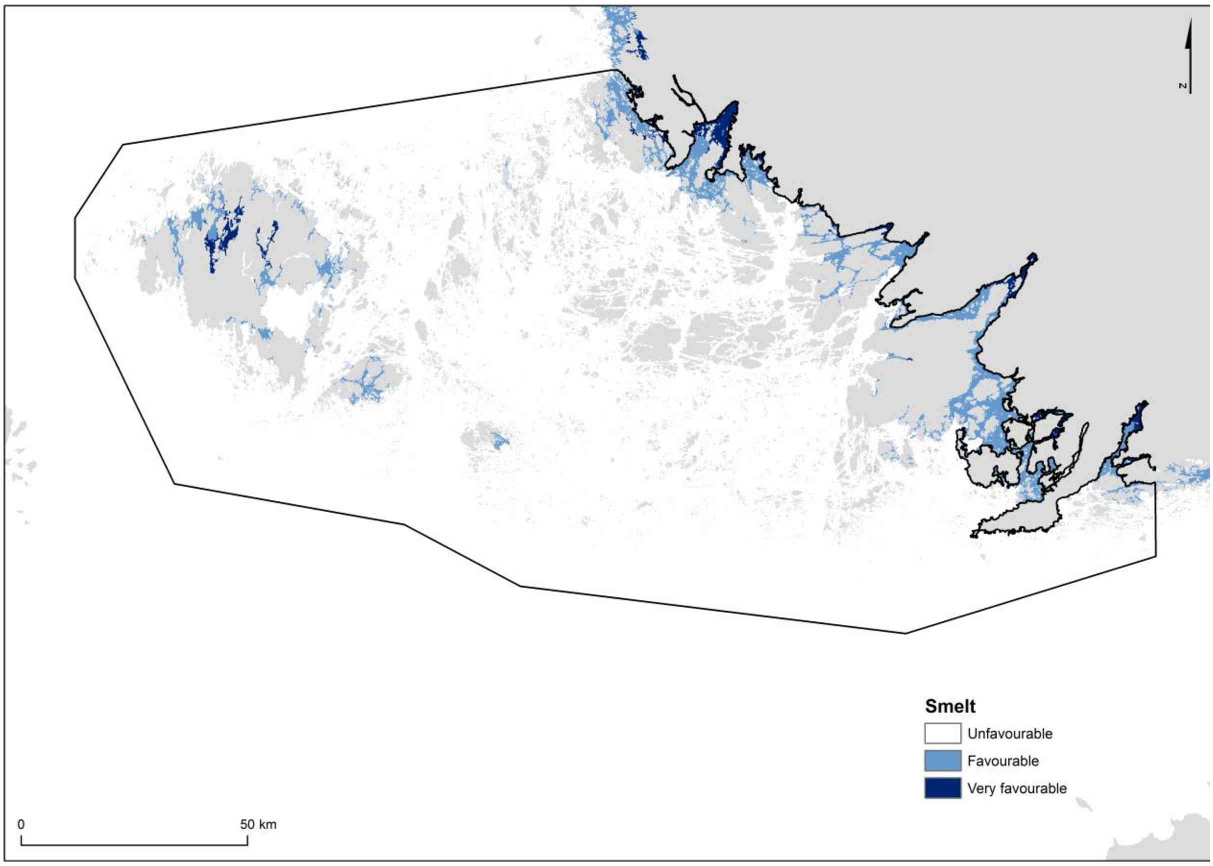

Figure 37. Reproduction area of smelt (*Osmerus eperlanus*). National Resources Institute Finland & VELMU programme.

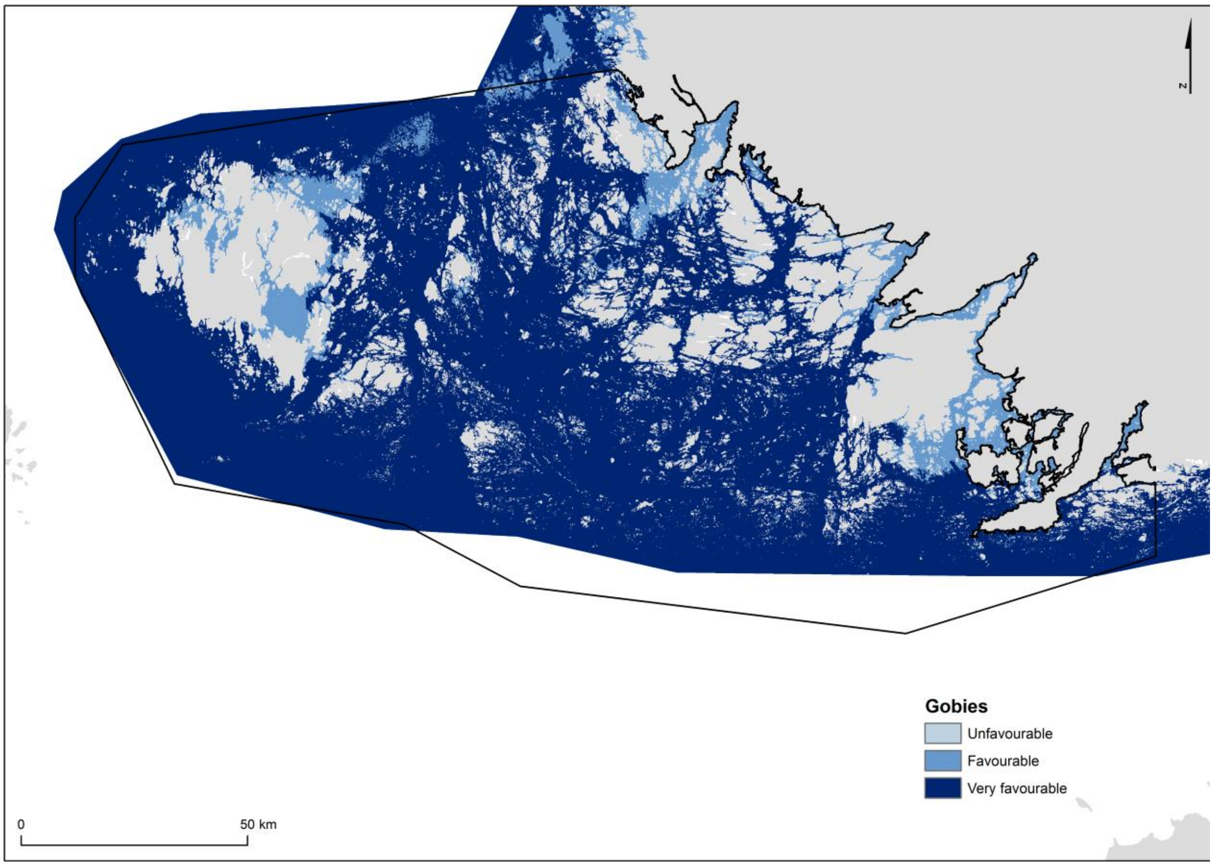

Figure 38. Reproduction area of gobies (*Pomatoschistus* spp.). National Resources Institute Finland & VELMU programme.

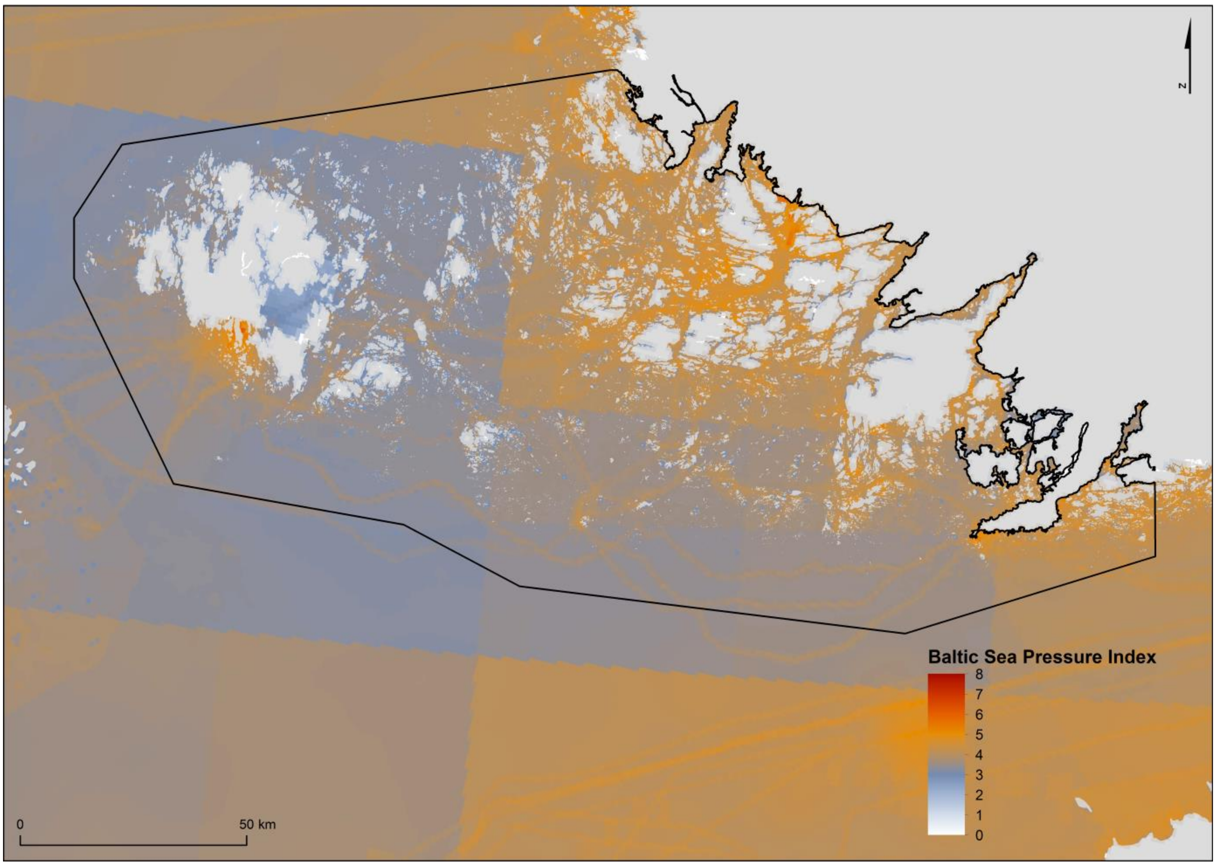

Figure 39. Baltic Sea Pressure Index. HELCOM 2016.

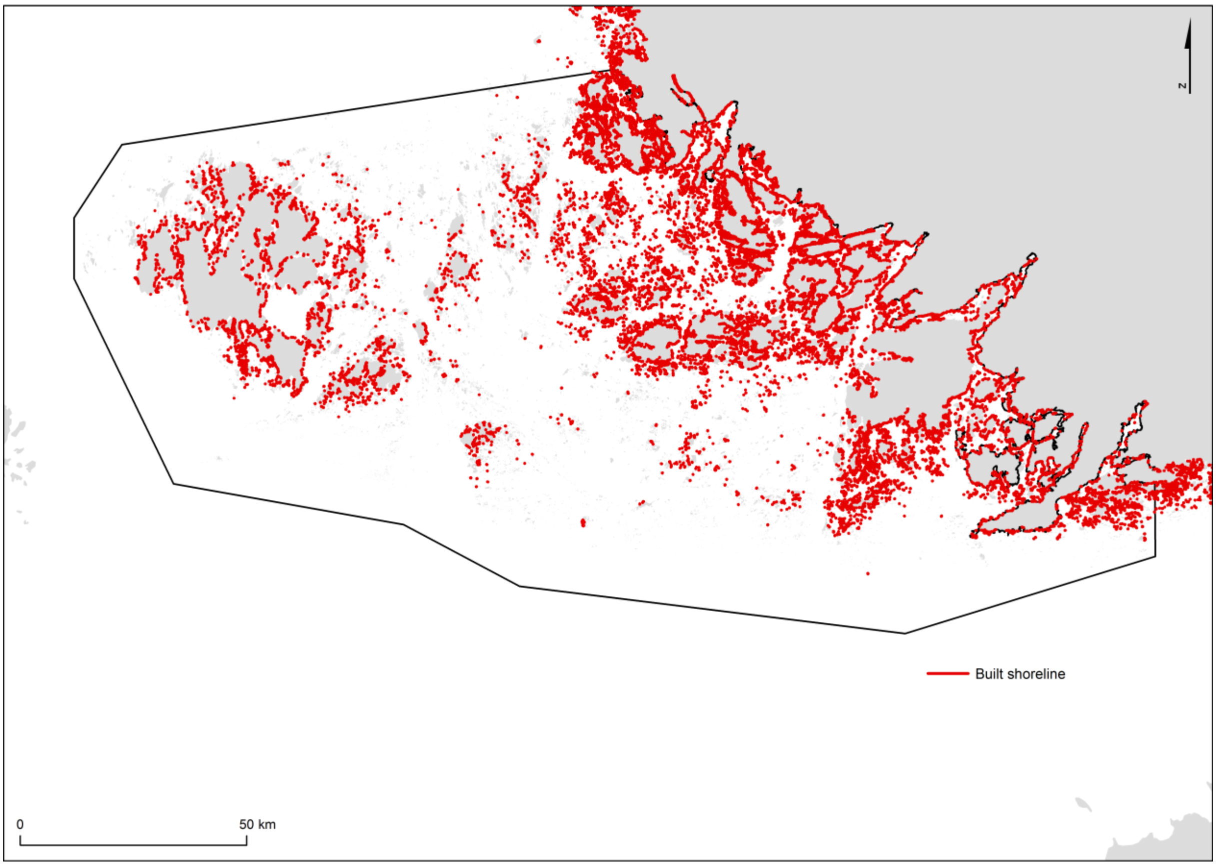

Figure 40. Built shoreline. Data was obtained from Building and Dwelling Register (BDR) by Population Registre Centre. Shoreline having constructions within 100 m buffer zone was classified as built. SYKE 2017.

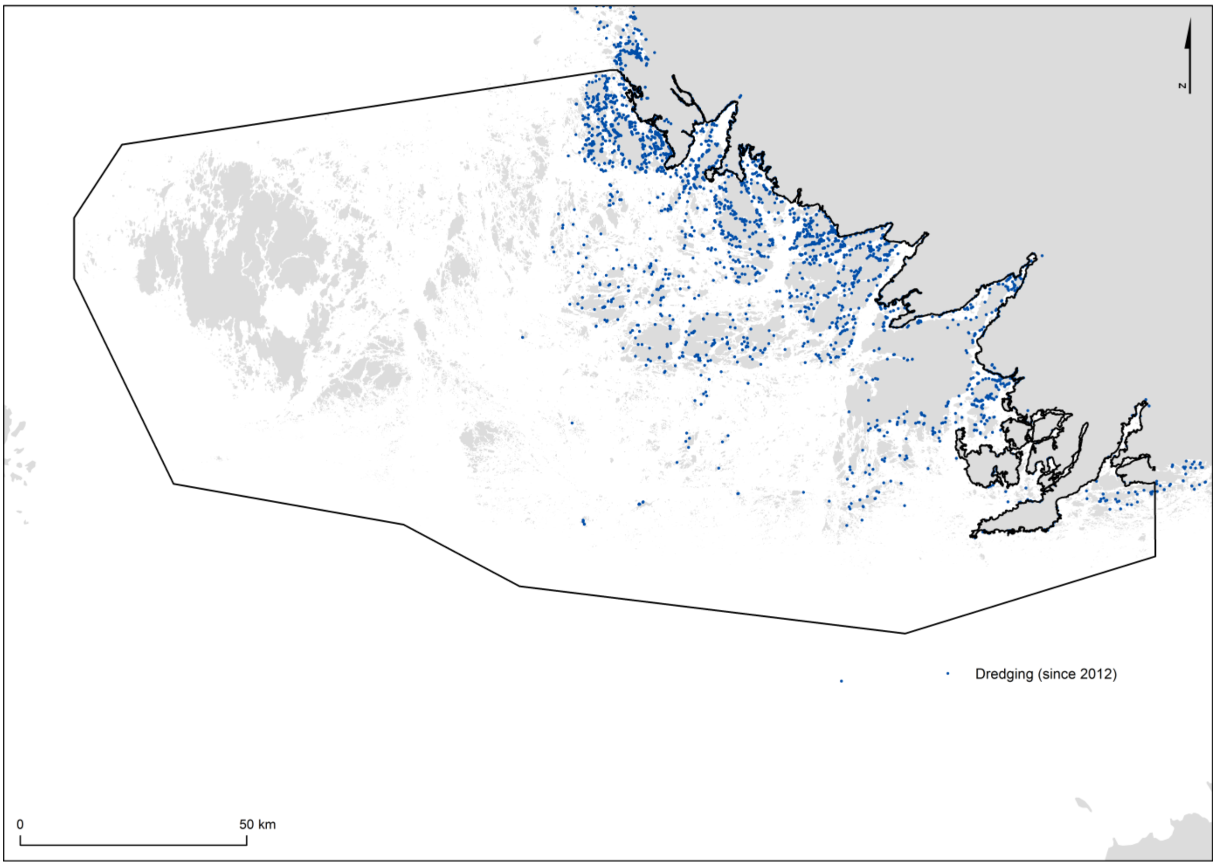

Figure 41. Dredgings since 2012.

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