



Inspire Policy Making with Territorial Evidence

## REGIONAL REPORT //

# Lake Vänern

Inner periphery seeking a new start

Annex to final report // October 2021

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### **Disclaimer**

This document is a interim report.

The information contained herein is subject to change and does not commit the ESPON EGTC and the countries participating in the ESPON 2020 Cooperation Programme.

The final version of the report will be published as soon as approved.



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# Abbreviations

BCE	Before Common Era
CC-BY	Creative Commons Attribution License
COVID	Coronavirus Disease
EAFRD	European Agricultural Fund for Regional development
EMFF	European Maritime and Fisheries Fund
EU	European Union
FLAG	Fisheries Local Action group
GDP	Gross Domestic Product
MWh	Mega Watt hours
NUTS	Common classification of territorial units for statistics
PFAS	Per- and polyfluoroalkyl substances
PFOS	Perfluorooctanesulfonic acid
RBPR	River Basin Management Plan
SEK	Swedish Kroner
TEN	Trans European Network
TWh	Tera Watt hours

# 1 Introduction

Vänern is the largest lake of the European Union, and the third largest lake in Europe with an area of 5,650 km<sup>2</sup>. Its river basin area covers an area of 46,800 km<sup>2</sup> (i.e. more than 10% of Sweden). It is drained into the Kattegat through Göta river, which is 93 km long and includes a dam, canal locks and a hydropower station. The Lake is located approximately 44 meters above sea level.

Lake Vänern belongs to two regions: To the north, the Värmland region of which the capital city, Karlstad, is located right on the lake. Värmland is an inland region, in which the wood and packaging industries have traditionally played a major role, alongside with the steel industry and mechanical engineering. Karlstad is also located on the main axis between Stockholm and Oslo. Strengthening relations with the Oslo metropolitan region is one of the privileged strategic development perspectives. (Region Värmland, 2014)

The southern part of Lake Vänern belongs to the Västra Götaland region, whose capital Gothenburg is located around 1h15 by road from the southern tip of the Lake. Västra Götaland is a coastal region, with a number of globally competitive industries, a well-development R&D&I sector, long traditions in the fields of trade and logistics and a strong maritime cluster. The Trollhättan-Vänern-Uddevalla area, which is one of the four urban core areas of the region, borders the Lake.

Compared to Värmland, Västra Götaland population is 6 times larger (1,7 million inhabitants against 280,000 for Värmland), and GDP 8 times larger (around 80 billion EUR, against just over 10 billion EUR for Värmland).

The south-western shores of the Lake, which belong to the administrative region of Västra Götaland, were historically part of the province of Dalsland. Historical provinces remain an important component of Swedish territorial identities. There are also separate tourism promotion organisations for Dalsland.

The 13 municipalities bordering Lake Vänern established an economic association ("The Väner Cooperation") as a framework for dialogue and cooperation on joint issues and development objectives in 2015. These municipalities have populations that range from 5,300 inhabitants (Gullspång) to 90,000 inhabitants (Karlstad). Population growth between 2011 and 2017 was highest (around 5%) around the cities of Karlstad and Vänern, 3-4% in the towns Lidköping, Åmål and Kristinehamn, 2% in Mariestad in lower in all other municipalities. Statistics Sweden considers that these 13 municipalities belong to 4 different labour market areas, respectively centred on Karlstad (west and north of the Lake), Skövde (east of the Lake), Lidköping (south-east of the Lake) and Trollhättan-Vänern (south-west of the Lake). Two of the labour market centres (Skövde and Trollhättan) are not located directly on the Lake.<sup>1</sup>

The Lake Vänern economy is characterised by:

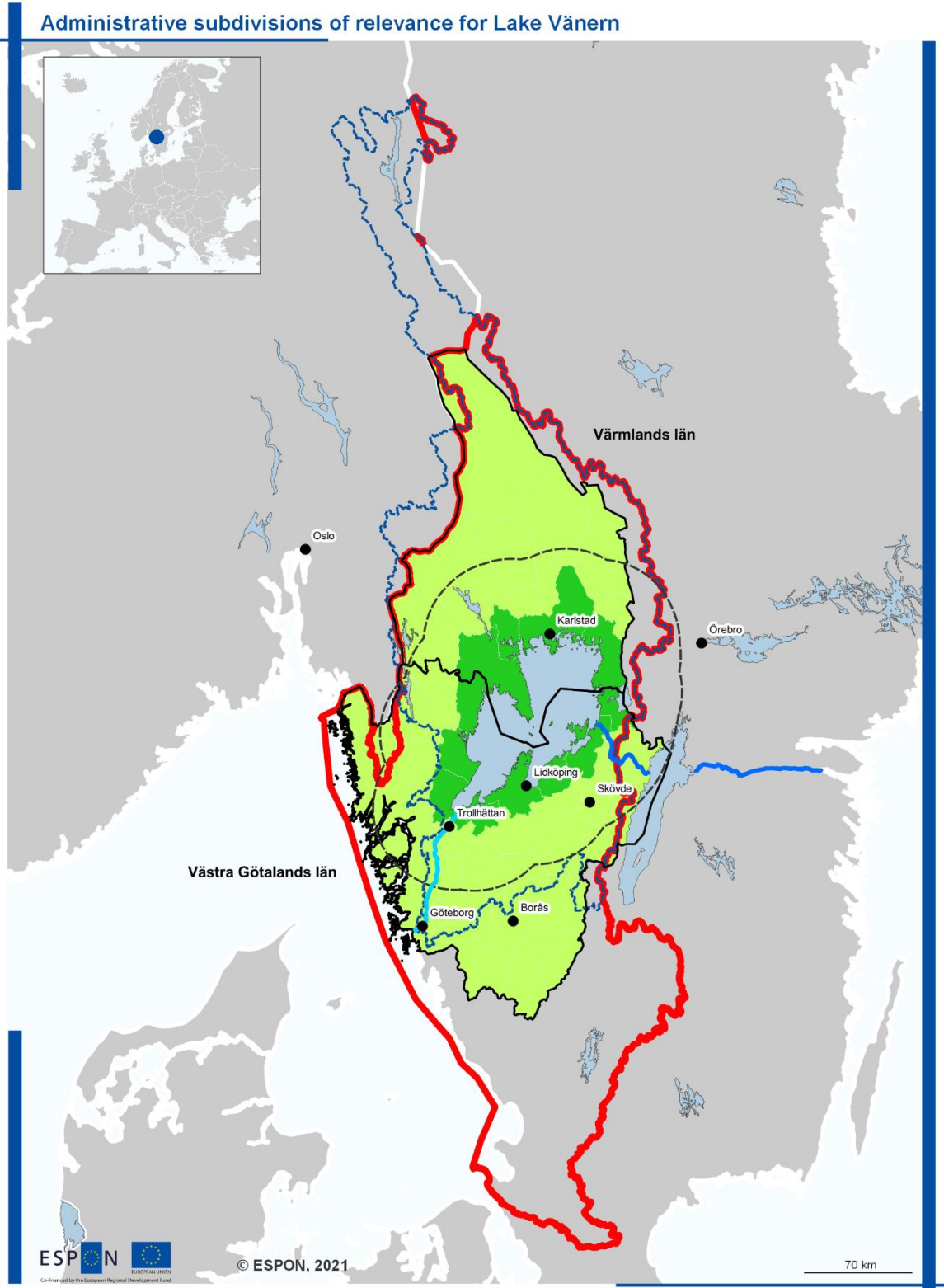
- Significant freight traffic, with between 1.5 and 2 million tons transported on the Lake on a yearly basis<sup>2</sup>.
- A number of tourism and leisure development opportunities. Actors around the Lake currently consider that it is "relatively unknown as a tourism destination within Sweden and Abroad" (Vänernsamarbetet, 2017)
- Significant fisheries activities. The total first resale value of catches in 2019 was around 3,5 million EUR.

<sup>1</sup> <https://www.scb.se/hitta-statistik/statistik-efter-amne/arbetsmarknad/sysselsattning-forvarvsarbete-och-arbetstider/reg-isterbaserad-arbetsmarknadsstatistik-rams/produktrelaterat/Fordjupad-information/lokala-arbetsmarknader-la/>

<sup>2</sup> <https://www.lakevanern.se/livet-vid-vanern/sjofart/>



Map 1 Lake Vänern overview map



**Governmental and organizational delineations around Lake Vänern**

- |                                       |                                   |                           |
|---------------------------------------|-----------------------------------|---------------------------|
| Kattegat and Skagerrak Water District | NUTS 3-compatible operation area  | <b>Hidrography</b>        |
| Vänersamarbetet (Väner Cooperation)   | LAU units of NUTS-compatible area | Göta river                |
| 50 km zone                            |                                   | Göta Canal                |
|                                       |                                   | Lake Vänern drainage area |

Regional level: NUTS 3 (2016); LAU (2018)  
 Source: ESPON Lakes, 2021  
 Origin of data: SMHI, 2021  
 © UMS RIATE for administrative boundaries

The regulation of the water level of Lake Vänern is a key issue, which affect a number of sectors (Eklund et al., 2018) :

- Agriculture: farmers wish to keep fields dry
- Inland waterway traffic is affected by low water levels
- Electricity producers wish to use water reserves to optimise national production (e.g. to meet peak energy demand) on Göta river, downstream from Lake Vänern
- Spatial planning: Extensive housing areas around Lake Vänern are exposed to flooding. A major flood occurred between November 2000 and June 2001, with a peak on 11th January 2001
- Environmental policy: Insufficient variations of water levels lead to bush encroachment and the disappearance of unique biotopes and open landscapes that were until recently characteristic of Lake Vänern.

The “Väner Council” is a network of public and private actors established to better address the complex issue of water level regulation. These actors have signed an agreement to promote cooperation and contribute to exchange of knowledge and experience. They also commit to assess the impact of their current or planned activities on the Väner lake, and to explore how their activities could contribute to a long-term sustainable regulation of the water in Vänern.

## 2 Territorial analysis: the lake and its surroundings

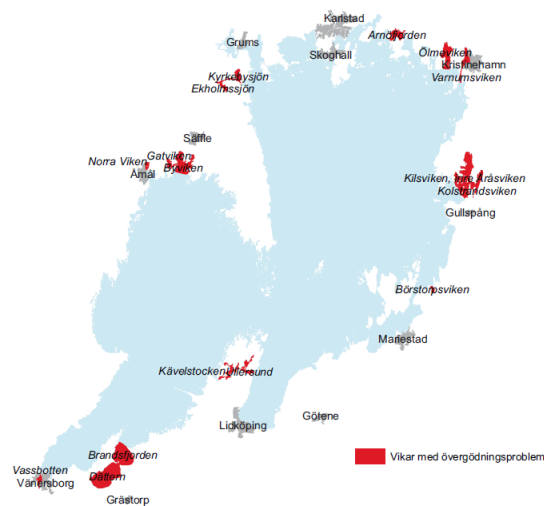
### 2.1 Water quality

Lake Vänern drainage basin extends north and south of the Lake. It includes numerous tributaries: 13 different rivers are surveyed by the Vänern Water management association. Göta river is the only emissary, (see Map 1).

#### Chemical status of the lake

The water quality in Lake Vänern is generally good and has improved significantly since the 1970s. A 2007 report states that drinking water extracted from Lake Vänern would meet most quality criteria without any treatment (Vänern secretariate, 2007). Overfertilization and higher bacteria levels are observed in some shallow, closed bays, for example after abundant rainfalls (see Figure 1). Nitrogen levels are high. While they have not generated major issues in the lake, nitrogen emissions from Lake Vänern and Göta river correspond to 60% of inflows of nitrogen in the Skagerrak sea. It is therefore necessary to reduce nitrogen emissions (Västerhavets vattendistrikt, 2020). Phosphorous levels are low in central parts of the lake, but are an issue in some bays. In these areas, eutrophication, algae blooming and overgrowth of weeds can be an issues (Vänern water management association, 2006). Surveillance of nitrogen, phosphor and organic material levels in tributary rivers showed that concentration of nitrogen increased in 2019, as a result of higher water discharge. However, levels of organic matter in tributary rivers stabilised or decreased after some years of steady increase. (Sonesten, 2019)

Figure 1 Bays with overfertilization issues in Lake Vänern



Source: Vänern water management association (2016)

#### Drinking water quality

Lake Vänern and Göta river supply more than 800,000 persons with drinking water. There are currently 10 water works around the Lake. The air force base in Skaraborg also draws it water from the lake. An additional water work is being built in Trollhätten south of Vänern, drawing water from a pipe stretching into the lake.

This water work is expected to be operational in 2026<sup>3</sup>. In 2016, these water works produced around 62,500 cubic meters of drinking water per day. The risk analysis points out that, as a result of the large volume of water in Lake Vänern, the suitability of extracted drinking water could be affected either by large scale events, or by events in the immediate vicinity of water works. (Peilot, Olsen, et al., 2020; SWECO, 2016).

Drinking water is protected by establishing so called 'Water protection areas. This is done by the County Administrative Board and the concerned municipality, based on guidance by the Swedish Agency for Marine and Water Management. This guidance was updated in 2021 (Swedish Agency for Marine and Water Management, 2021). It emphasizes that each water protection area must take into account preconditions in each area. Contrary to the previous 'handbook on water protection areas' (Swedish environmental protection agency, 2010), there are no general recommendations on the types of provisions to be included. Instead, the guidance focuses on the method and steps to be followed in the process of identification of protection needs, assessment of risks, delineation and definition of regulatory provisions. It also emphasises that procedures to ensure that all provisions are effectively abided by must be clear and realistic. The largest such areas can be found in the vicinity of Karlstad. The 'Kattfjorden' water protection area covers 64 km<sup>2</sup> on land, and 55 km<sup>2</sup> on water. The area is protected is four subzones, with different types of restrictions on activities.

### **Bathing water quality (current status and recent evolution)**

Bathing water quality is mostly good. Out of 3,000 measurements carried out between 2010 and 2020, 88 indicated that the bathing water was of insufficient quality, and 263 led to reinforced controls. Few algae blooming episodes have occurred in bathing areas: 2 in 2018, 3 in 2019 and none in 2020 (Peilot, Larsson, et al., 2020)

### **Ecological status**

The ecological status of Lake Vänern is characterised as 'moderate' in the western part (so-called 'Dalbo Lake'), and unsatisfactory in the eastern part (so-called 'Värmland Lake') (see Map 2). This is mainly a result of the regulation of the water levels, which has a detrimental effect on the hydrological regime. The ecological status is also negatively affected by obstacles to migration of fishes to between different habitats, e.g. for spawning and rearing (i.e. numerous small-scale hydroelectric production areas). In addition, some tributaries and bays are affected by excessive inflows of fertilizers and other organic materials.

Because the large extent and structure of Lake Vänern, the River Basin Management Plan (RBMP) separates it into 27 different water bodies. These are monitored separately, as illustrated in Map 2.

In the Kattegat and Skagerrak Water District (see Map 20 p. 55), 78% of the 2,537 natural surface waters had worse than good ecological status between 2010 and 2016 ("2nd monitoring cycle"). When it comes to lakes and watercourses, physical impact and acidification were the main reason for which good ecological status was not achieved. Comparing the ecological status classifications of water bodies that we monitored in both 2009 and 2014, 770 waterbodies have changed from good to moderate status, while only 69 have changed in the other direction, i.e., from moderate to good ecological status.

Lake Vänern showed similar pattern: while 11 of the 27 water bodies were in good condition between 2004 and 2009 ("1<sup>st</sup> monitoring cycle"), between 2010 and 2016 ("2nd monitoring cycle") and 2017 and 2021 (3<sup>rd</sup> monitoring cycle") all of them showed moderate or poor status (Map 2). This is mostly due to a deterioration of hydromorphological conditions.

A contributing factor to this deterioration in status can be the new assessment criteria for hydromorphology which provides a clearer picture of effects on ecosystems, indicating greater problems than previous assessments. However, 2014 figures were based on a better database, primarily with respect to biological parameters, and the methodology for status classification has also been further developed. Thus, the differences between 2009 and 2014 could rather be an effect of better knowledge and methods than a

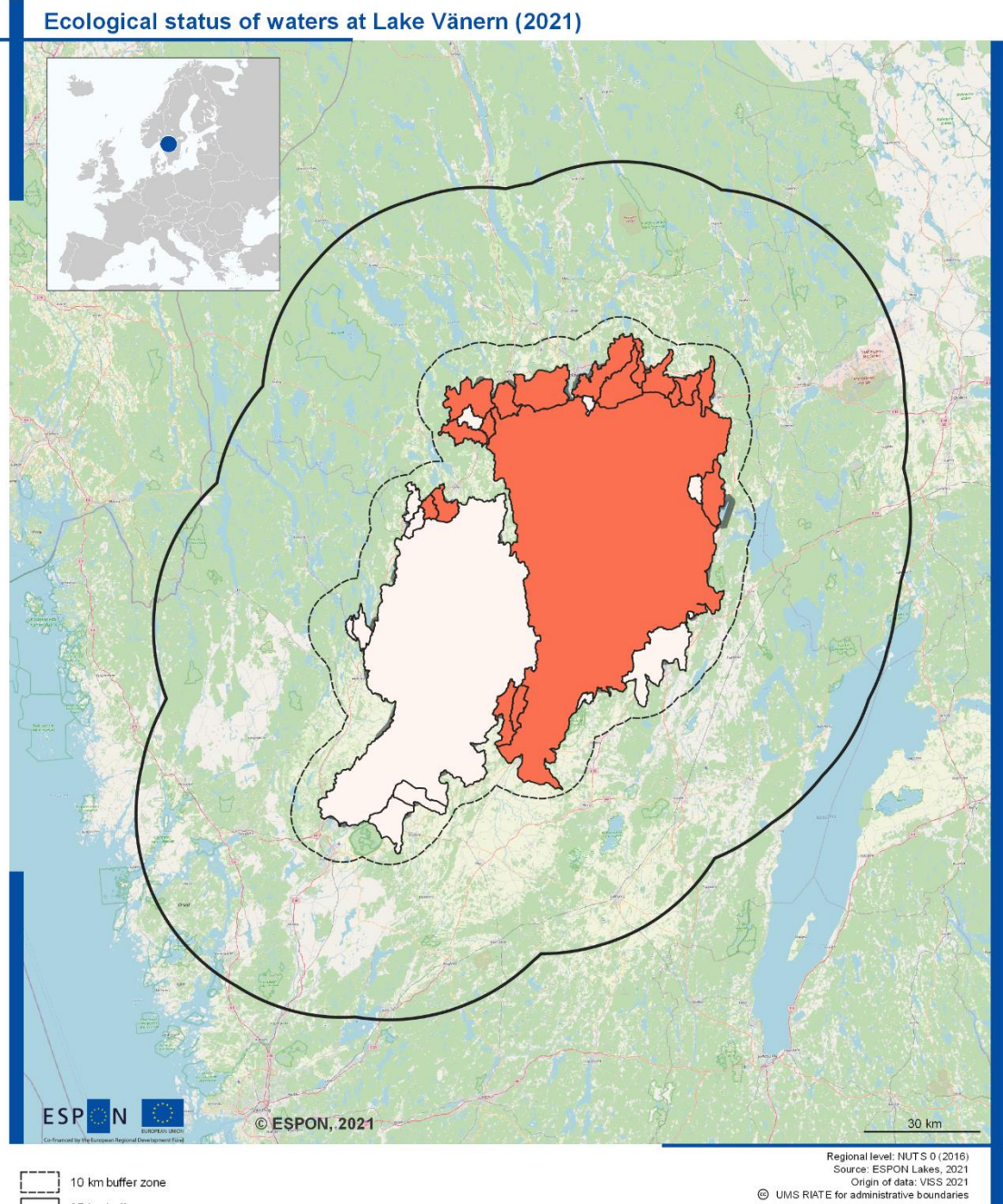
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<sup>3</sup> <https://www.trollhattanenergi.se/projekt/forberedelser-for-ett-nytt-vattenverk-pagar-for-fullt/>



deterioration of the environment. Available data for 2017-2021 (“3rd monitoring cycle”) suggest that not only the hydromorphological elements are deteriorating, but also the biological quality element “fish fauna”.

## Map 2 Ecological status of Lake Vänern sub-areas



## 2.2 Ecosystem and biodiversity protection

### Specific types of ecosystems and landscapes around the lake

Lake Vänern is traditionally surrounded by open, “sea-like” landscapes as a result of variations of lake levels that limited vegetation along the shoreline and on skerries. These open landscapes, with areas that are flooded regularly, host a number of specific biotopes. Shallow parts of the lake during seasonal floods constitute important spawning areas for some fish species.

As a result of stricter regulation of water levels, fewer periods with ice on the lake, changes in permanent meadow maintenance practices (or absence of maintenance), reduce pasture and mowing and excessive use of fertilizers, one observes the following changes:

- Bush encroachment accelerates in shoreline areas, especially in bays;
- Small trees have grown in a number of new areas along the shoreline, especially between 2000 and 2014. The extent of areas affected by this type of growth has stabilised since 2014;
- Trees reach a medium-sized height in a growing number of areas, especially in the immediate vicinity of the lake. However, the number of trees above 5 meters has not changed;
- The extent of heathlands and reeds is decreasing since 2009;
- The extent of areas with entirely unvegetated sand is decreasing.

Many of the approximately 270 threatened species around Vänern, including birds and fishes, are affected by these changes. (Peilot, Larsson, et al., 2020)

### Protected areas

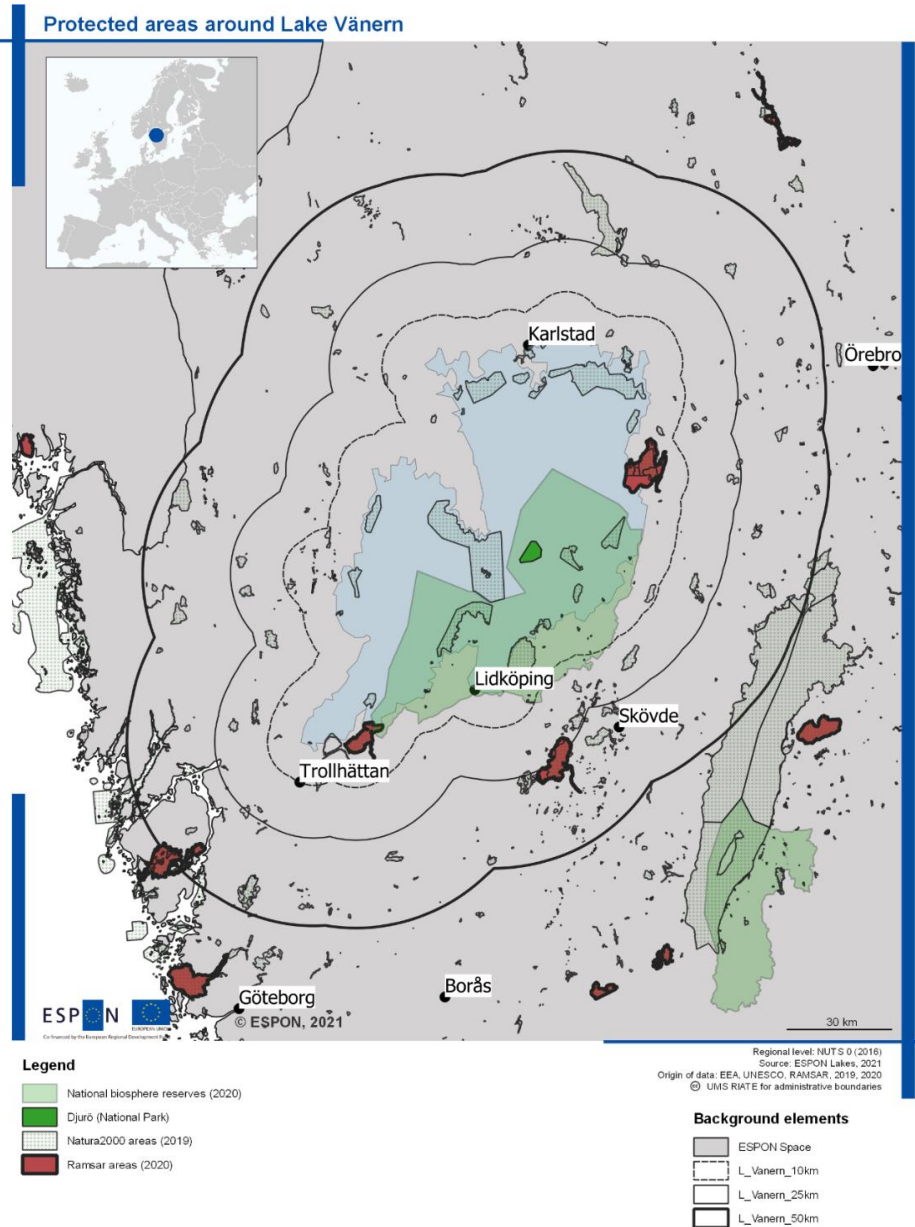
A number of different types of protected areas can be found around Lake Vänern (see Map 3)

- Djurö national park was established in 1991 to preserve a Lake Vänern skerry landscape. It is composed of around 30 islands, with a rich birdlife.
- A number of nature reserves focusing on groups of islets ('skerries'), wetland or islands on the lake. Most of these nature reserves on the lake are also Natura 2000 areas under the EU Birds Directive of 1979 and the EU habitats directive of 1992. A few Natura 2000 areas are notable nature reserves (e.g. the Klarälv river delta close to Kalrstad, the Ölmeviken bay close to Kristinehamn). The number of nature reserves focusing on groups of islets ('skerries'), wetland or islands on the lake has progressively increased over the last 4 decades. However, areas added since 2000 tend to be smaller. One may for example mention:
  - o Lurö skerries (established 1967)
  - o Nötön-Åråsviken (established 1971)
  - o Segerstad Skerries (established 1979)
  - o Värmland skerries (established 1980)
  - o Millesviks skerries (established 1983)
  - o Kalvö skerries (established 1987)
  - o Brommö skerries (established 1987)
  - o Tösse skerries (established 1999)
  - o Vänersnev skerries (established 2004)
  - o Onsö (established 2005)
  - o Dyrön (established 2006)
- Some nature reserves organised around mainland areas around the lake, mainly around Lidköping and Vänerborg e.g.:
  - o Kinnekulle hill (established 1982)
  - o Halle- Hunnebergs plateaus (established 1982)
  - o Varan (established 2013)

- Hindens rev peninsula (established 1986)

Some of these protected areas, e.g. Ölmeviken Natura 2000 area close to Kristinehamn and Åråsviken Nature reserve and Natura 2000 area in Gullspång municipality are concerned by overfertilization. The conservation plans for Ölmeviken makes reference to efforts made to address this issue, e.g. through the “Focus on Nutrients” (“Greppa näringen”) national programme which is a joint venture between the Swedish Board of Agriculture, the County Administration Boards, the Federation of Swedish Farmers and a number of companies in the farming business<sup>4</sup>. (Värmland County Administrative Board, 2015)

### Map 3 Protected areas around lake Vänern



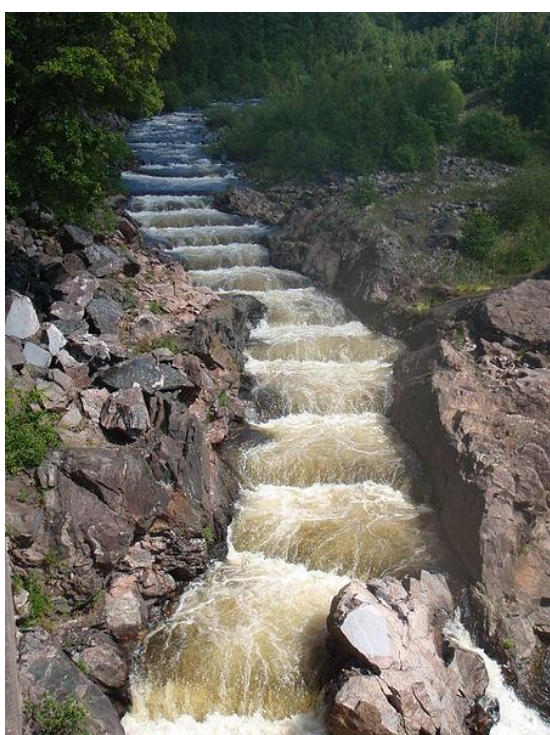
<sup>4</sup> <https://greppa.nu/om-greppa-naringen/in-english>



### Preservation of salmon and trout populations

In addition, a key issue for Lake Vänern is connectivity between habitats. Particular focus has been given to salmon populations. Lake Vänern hosts the two only remaining populations of salmon that do not migrate to saltwater in Europe ('Gullspång salmon' and 'Klarälv salmon'). These salmon historically stem from the Baltic Sea, but postglacial rebound<sup>5</sup> closed migration routes around 7,500-8,000 BCE. These salmon populations have decreased significantly as a result of the construction of hydroelectric dams in the Gullspång and Klarälv rivers. A project was implemented between 2003 and 2008 to address this issue, as a cooperation between the County Administrative Board of Värmland, the electricity producer Fortum, the municipality of Gullspång and the Vänern Lax foundation. This project included a modification of the regulation of the water regime in Gullspång river at the Power Station, so as to increase the water flow in the summer months, with a minimal flow of 3 m<sup>3</sup>/s is the Gullspång waterfall. Furthermore, the Gullspång river nature reserve was created. This reserve stretches from Lake Vänern to the power station dam. Finally, a salmon ladder was built to allow salmon to reach their spawning area more easily. Follow-up measures are foreseen, as the salmon population remains limited.<sup>6</sup>

### Figure 2 Gullspång river salmon ladder



Source: Per Henriksson, Wikimedia Commons (public domain)

The Klarälv salmon population has been supported since the 1930s by trapping it and transporting it by truck 70 km upstream, beyond the dams. Additional measures to improve connectivity between biotopes are needed<sup>7</sup>. A Foundation has been set up by municipalities and county administrative boards around Vänern to improve salmon and trout fishing, e.g. by releasing smolt<sup>8</sup>.

<sup>5</sup> i.e. the rise of landmasses after the removal of the weight of ice sheets that covered parts of Europe during last glacial period (115,000 – 11,700 BCE).

<sup>6</sup> <https://gullspang.se/Gullspangs-kommun/Miljo--avfall/Naturvard/Gullspangslaxen>

<sup>7</sup> <https://www.sverigesvattenmiljo.se/content/klaralvslaxen-unik-men-nastan-bortglomd>

<sup>8</sup> <https://www.laxfondvanern.se/en/>



## Biosphere reserve

Lake Vänern hosts one of Sweden's seven biosphere reserves. The Lake Vänern Biosphere Reserve, known in Swedish as 'Väner skerries and Kinnekulle' covers the southeast part of the lake and extends across the municipalities of Götene, Lidköping and Mariestad. Kinnekulle is a 306 m high hill in the immediate vicinity of the Lake and a well-established tourism destination. Thanks to a calcareous bedrock, it has a particularly rich fauna and flora and has hosted stone quarries since the Middle Ages. The last quarry was closed in 1970, and the cement factory of Hällekis in 1978. They have respectively been transformed into a working life museum and an artificial lake. The biosphere area also includes the skerries of Kålland peninsula and Island ('Kållandsö'), known inter alia for the castle of Näckö and the fishery harbour of Spiken.

## 2.3 Social and economic situation in the lake region

Lake Vänern municipalities have a total population (2019) of 311,000 inhabitants, and an average population density of 41,4 inh./km<sup>2</sup>. Population in the area as a whole has been growing over the last two decades, and this growth seems to accelerate since 2011. Urban polarisation is increasing, as most of the smallest municipalities have a stable or declining population. Population growth is particularly strong in Karlstad (+16,3% between 2001 and 2019). More than half the population lives in settlements of more than 10,000 inhabitants (162,600 inhabitants) and 70% in settlements of more than 2,000 inhabitants, and 80% in settlements of more than 200 inhabitants. A significant share of the population, 20%, therefore lives outside of settlements. These rates of population living outside of settlements of more than 200 inhabitants vary between 46% in Grästorp and 10% in Karlstad.

**Table 1 Key demographic data for Väner municipalities**

Municipality	Population			Population change		Population density 2019 (inh./km <sup>2</sup> )	Total area (km <sup>2</sup> )	Population in settlements > 200 inh.	
	2001	2011	2019	2001-2019	2011-2019			2005	2018
Karlstad	80,748	86,409	93,898	16,3%	8,7%	80,4	1,168,47	89,2%	90,0%
Lidköping	36,808	38,183	40,089	8,9%	5,0%	57,4	698,60	75,4%	76,8%
Vänersborg	36,795	36,962	39,591	7,6%	7,1%	61,5	643,94	79,0%	81,2%
Mariestad	23,725	23,732	24,537	3,4%	3,4%	40,7	602,40	75,6%	77,5%
Kristinehamn	23,969	23,698	24,255	1,2%	2,4%	32,1	755,29	81,8%	83,8%
Hammarö	14,121	14,943	16,568	17,3%	10,9%	278,7	59,45	91,0%	93,3%
Säffle	16,428	15,394	15,455	-5,9%	0,4%	12,7	1,221,34	63,5%	65,1%
Götene	12,970	13,134	13,207	1,8%	0,6%	32,6	404,55	61,0%	63,3%
Åmål	12,770	12,226	12,610	-1,3%	3,1%	26,2	480,98	79,1%	80,0%
Mellerud	9,781	9,068	9,310	-4,8%	2,7%	18,1	513,72	56,4%	59,5%
Grums	9,418	9,017	9,047	-3,9%	0,3%	23,4	386,38	71,9%	72,5%
Grästorp	5,900	5,674	5,693	-3,5%	0,3%	21,5	264,63	50,6%	53,9%
Gullspång	5,866	52,51	5,280	-10%	0,6%	16,7	315,44	63,6%	67,4%
<b>Total</b>	<b>291,300</b>	<b>295702</b>	<b>311559</b>	<b>7,0%</b>	<b>5,4%</b>	<b>41,4</b>	<b>7515,19</b>	<b>78,4%</b>	<b>80,5%</b>

**Table 2 Settlement populations**

Name of settlement	Municipality	Settlement Population (2019)
Karlstad	Karlstad	65,273
Vänernborg	Vänernborg	24,095
Lidköping	Lidköping	23,467
Kristinehamn	Kristinehamn	18,730
Mariestad	Mariestad	16,611
Skoghäll	Hammarö	14,447
Åmål	Åmål	9,439
Säffle	Säffle	9,324
Skåre	Karlstad	5,483
Götene	Götene	5,077
Grums	Grums	5,076
Vargön	Vänernborg	4,999
Lidköping norra	Lidköping	4,208
Mellerud	Mellerud	4,028
Älvåker och Råtorp	Karlstad	3,285
Grästorp	Grästorp	3,086
Vålberg	Karlstad	2,736
<b>Total</b>		<b>219,364</b>

Between 2011 and 2019, population has been mostly stable on the eastern and western shores of the lake. It has been growing by 8,7% in Karlstad and 10,9% in Hammarö, i.e. the peninsula just south of Karlstad. Population growth has been 7,1% in Vänernborg and 5% in Lidköping. Population growth has been more moderate in the smaller towns of Mariestad, Kristinehamn and Åmål. Population levels are mostly stable in all other municipalities between 2011 and 2019, after having experienced population decline between 2001 and 2019. (see Table 1 and Map 6).

Population growth is considerably higher in main urban areas in the wider area around the lake, especially around Göteborg and along the Göta River up to Lilla Edet and around Örebro. Current demographic trends therefore tend to accentuate Lake Vänern as a position of Inner periphery in the wider regional context, and the increasing importance of Karlstad as the urban node on Lake Vänern. (see Map 6)

With respect to age structures, all municipalities that are riparian of the lake except Karlstad and Hammarö (i.e. the peninsula south of Karlstad) have relatively high proportions of seniors. They in this respect display similar patterns to other municipalities that are not close to main metropolitan areas or in particularly attractive locations along the coast. Recent increases (2012-2019) in numbers of seniors are particularly important in municipalities around main towns and cities (e.g. Grästorp and Essunga close to Trollhättan-Vänernborg, Götene close to Lidköping, Hammarö and Kil close to Karlstad). (see Map 7)

During the same period Grästorp and Götene are the two only riparian municipalities in which the number of children has not increased by over 5%. The highest rates of children are found around Trollhättan-Vänernborg and Karlstad. (see Map 8)

In the 2016 assessment of local economic strength produced by the West Sweden Chamber of Commerce, local labour markets around the Lake consistently obtain intermediate scores (see Map 4). The Karlstad and Vänernborg-Trollhättan labour market areas obtain similar scores to Lidköping and Skövde. Some inland labour market areas north and west of the Lake obtain weak scores. Neighbouring areas of Göteborg and Örebro obtain top scores. Lake Vänern labour market areas appear as a relatively weaker area between the stronger economic nodes of Göteborg, Örebro and Oslo in Norway. Areas north of the lake are in a particularly precarious situation.

In terms of commuting patterns and industrial functional zones, the Lake Region is organised around some core areas (Map 5):

- Karlstad is the centre of the northern half of the Lake Region and also of extensive inland areas north of the Lake Region

- To the functional area to the southwest of the lake has a more polycentric structure. It is organised around Vänersborg (bordering the lake), Trollhättan and Uddevalla. These neighbouring agglomerations are jointly designated as 'Trestad', or 'Fyrstad' (jointly with Lysekil)
- To south, a smaller functional area is organised around Lidköping and the considerably smaller town of Götene.
- The remaining eastern parts of the Lake around Mariestad are attracted to Skövde, which is located at equal distance between Vänern and Vättern lakes.

Municipalities around Lake Vänern are primarily specialised in manufacturing and extracting activities (see Table 3). The relative importance of the construction sector is also frequently above national average values. Agriculture and fisheries are another recurring field of economic specialisation. Compared to average values for Sweden, business services are under-represented in all municipalities except Karlstad. Trade and banking are also under-represented in a number of municipalities. Furthermore, none of the Lake Vänern municipalities display a specialisation in tourism activities. Proportions of employment in hotels and restaurants are systematically close to the national average.

In some municipalities, the share of persons working in public service delivery (education, healthcare, civilian authorities and defence) is also higher than the national average. However, with a few exceptions, these deviations are relatively modest.

The city of Karlstad is close to the national average, except for the under-representation of manufacturing and extraction activities. It does not appear to concentrate specialised service activities. The data convey the image of the Lake Vänern region as a predominantly rural and small-town territory where manufacturing and agricultural activities remain pillars of the local economy. Tourism and leisure remain relatively modest. Public service provision is an important field of activity. However, their relative importance does not stand out compared to the national average as may be the case in some more fragile and isolated communities.

**Table 3 Employment per sector in Lake Vänern municipalities: deviations from national average values (2017, in percentage points)**

Industry	Karlstad	Hammarö**	Kristinehamn	Gullspång	Mariestad	Götene*	Lidköping	Grästorp	Vänersborg	Mellerud	Åmål	Säffle	Grums***	Västra Götaland	Värmland	Sweden
Agriculture, forestry and fishing	-1	+2	+1	+5	+2	+3	+1	+8	+1	+9	+2	+5	+2	2	4	2
Manufacturing and extraction	-5	+12	+5	+14	+4	+34	+2	-6	-3	0	+8	+9	+24	14	14	11
Energy and Environment	0	-1	0	0	0	0	0	0	0	-1	0	0	-1	1	1	1
Construction activities	0	0	0	+4	+2	-3	+1	+2	+2	+4	-2	+1	+3	7	8	7
Trade	+1	-2	-1	-7	0	-6	-1	+2	-4	0	-2	-2	-5	12	11	12
Transport	0	-4	+2	-2	-1	0	-1	-2	0	-2	-2	-3	-2	5	4	5
Hotels and restaurants	0	-1	0	-1	+1	0	0	-1	0	-1	-1	-1	0	3	3	3
Information and communication	0	-3	-3	-4	-3	-3	-3	-2	-4	-4	-3	-3	-4	3	2	4
Credit institutions and insurance companies	-1	-2	-2	-2	-1	-2	-1	-1	0	-1	-2	-2	-2	1	1	2
Real estate activities	0	-1	0	-1	-1	-1	0	-1	-1	+1	0	-1	-1	2	2	2
Business services	+1	-7	-4	-9	-7	-8	-2	-7	-6	-7	-6	-6	-9	12	9	12
Civilian authorities and the defense	+2	-3	0	-3	+5	-5	+2	-6	+4	-4	-1	-1	-2	5	6	6
Education and Training	-1	+6	0	+1	+1	-3	-1	0	+2	0	+3	+1	-3	11	11	11
Health and social care	+1	+2	+2	+4	0	-6	+2	+11	+6	+5	+1	0	0	17	19	17
Personal and cultural services, etc.	0	0	-1	-1	0	-1	0	0	+1	+1	+1	0	-1	4	4	4
Unknown industry	0	0	+1	+1	0	+2	0	+3	0	+2	+3	+1	+2	1	2	1

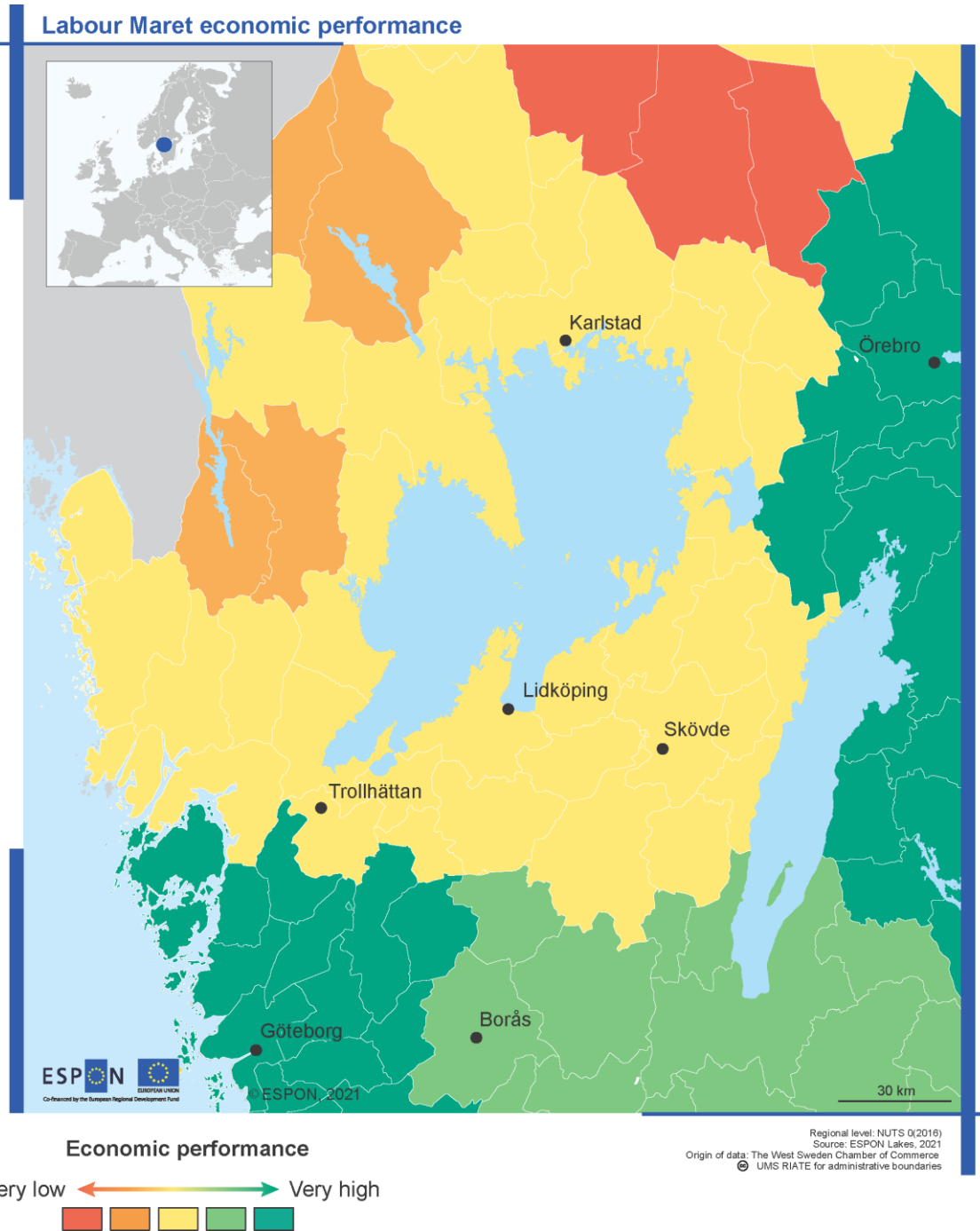
\* 2012

\*\* 2010

\*\*\* 2016

Source: Statistics Sweden, Kommunfakta  
Municipalities are sorted geographically,  
clockwise from Karlstad around Lake Vänern .

**Map 4 Ranking of labour market areas in Sweden (2016)**

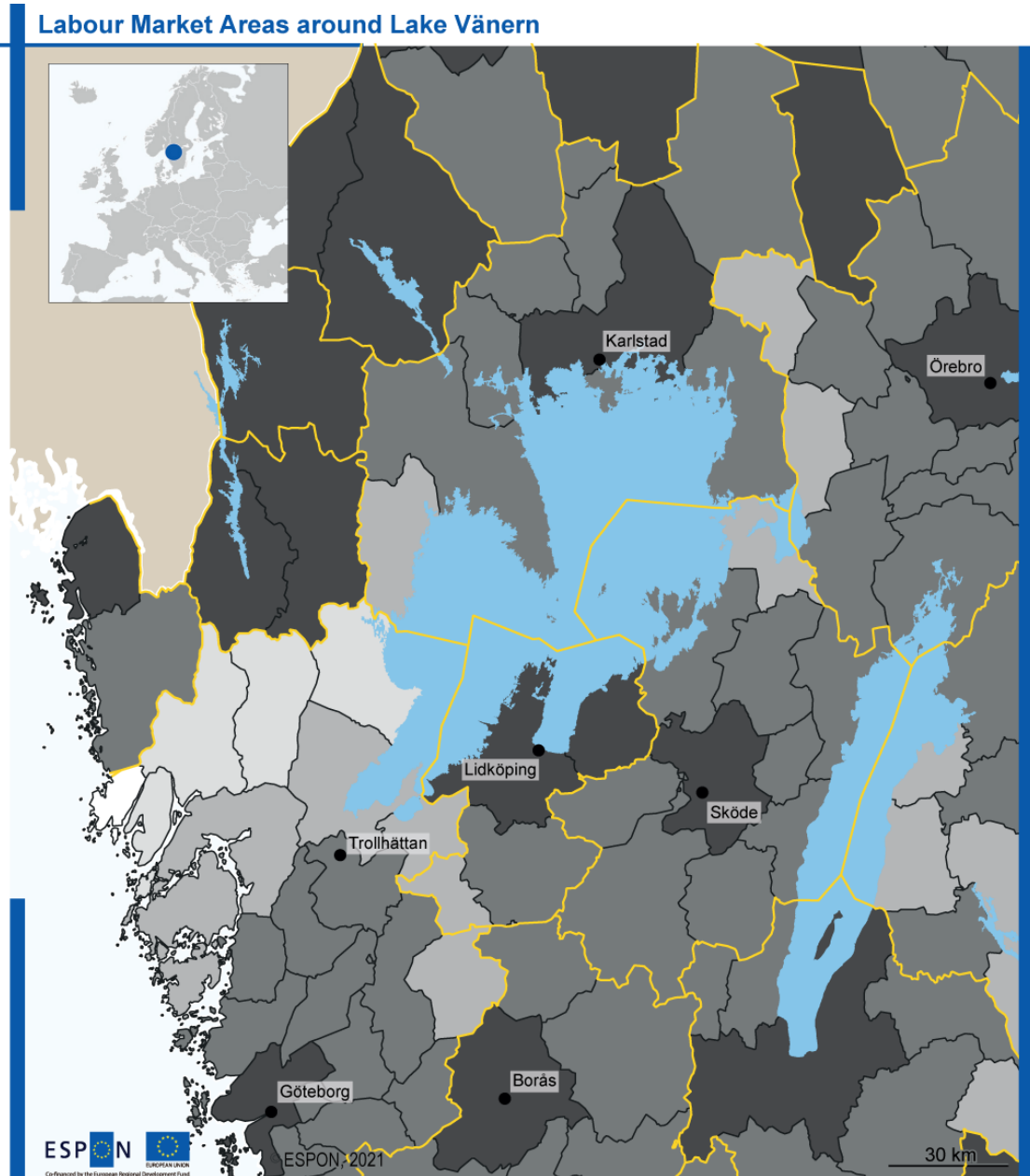


*Based on a combined score of entrepreneurship, employment in private sector, wage levels, education levels and health (number of days of absence linked to health)*

*Areas are grouped in categories from red (lowest to score) to dark green (best scores)*






*Source : West Sweden Chamber of Commerce(2016)*

Map 5 Labour Market Areas around Lake Vänern



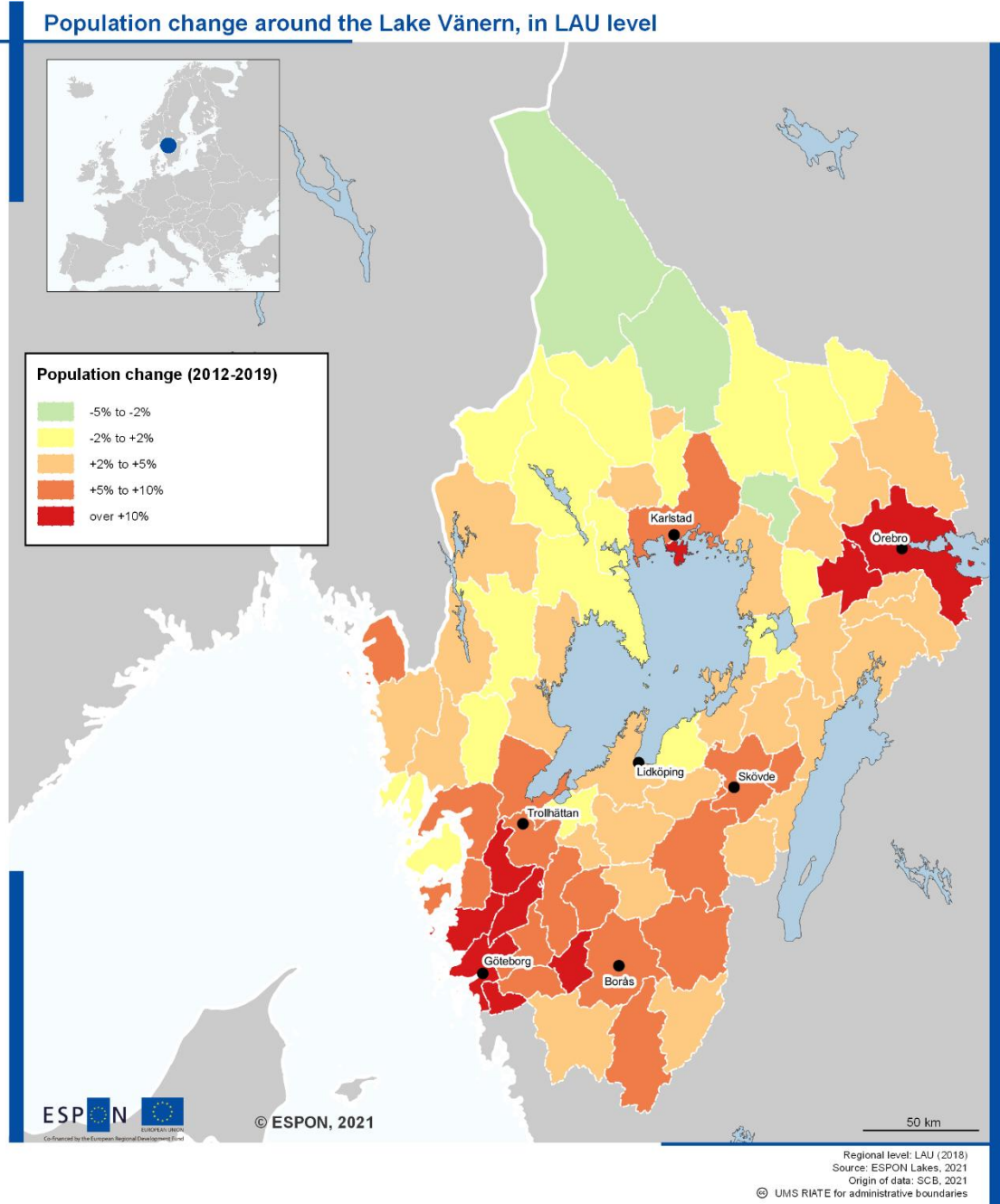
 Borders between labour market areas

**Labour Market categories**

-  Centre, mainly in-commuting flows
-  Type 1 periphery, mainly out-commuting to centre municipality
-  Type 2 periphery, mainly out-commuting to Type 1 municipality
-  Type 3 periphery, mainly put-commuting to Type 2 municipality
-  Type 4 periphery, mainly out-commuting to Type 3 municipality

Regional level: NUTS 0 (2016)  
 Source: ESPON Lakes, 2021  
 Origin of data: Statistics Sweden, 2019  
 © UMS FIATE for administrative boundaries

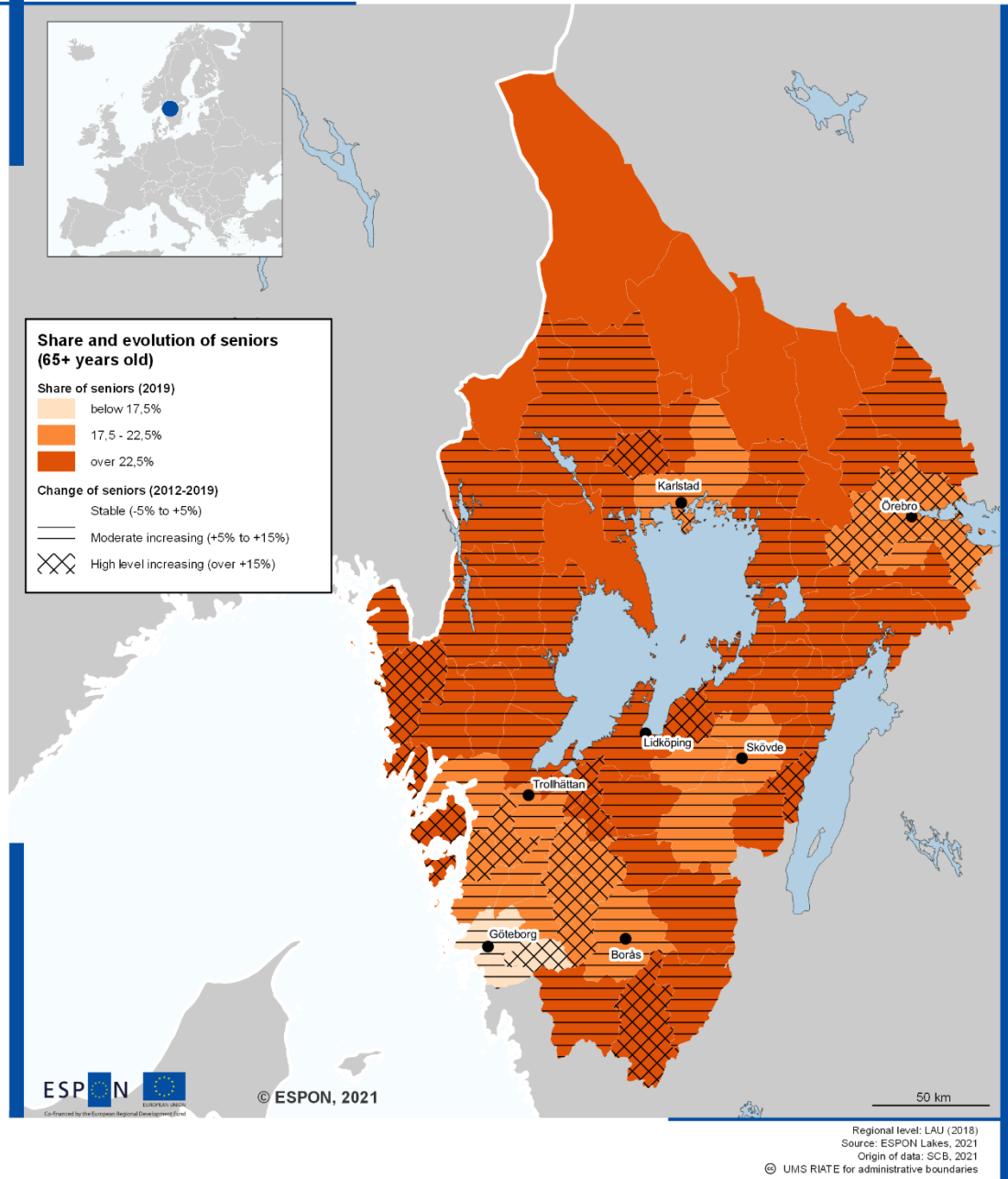
### Map 6 Population change around Lake Vänern





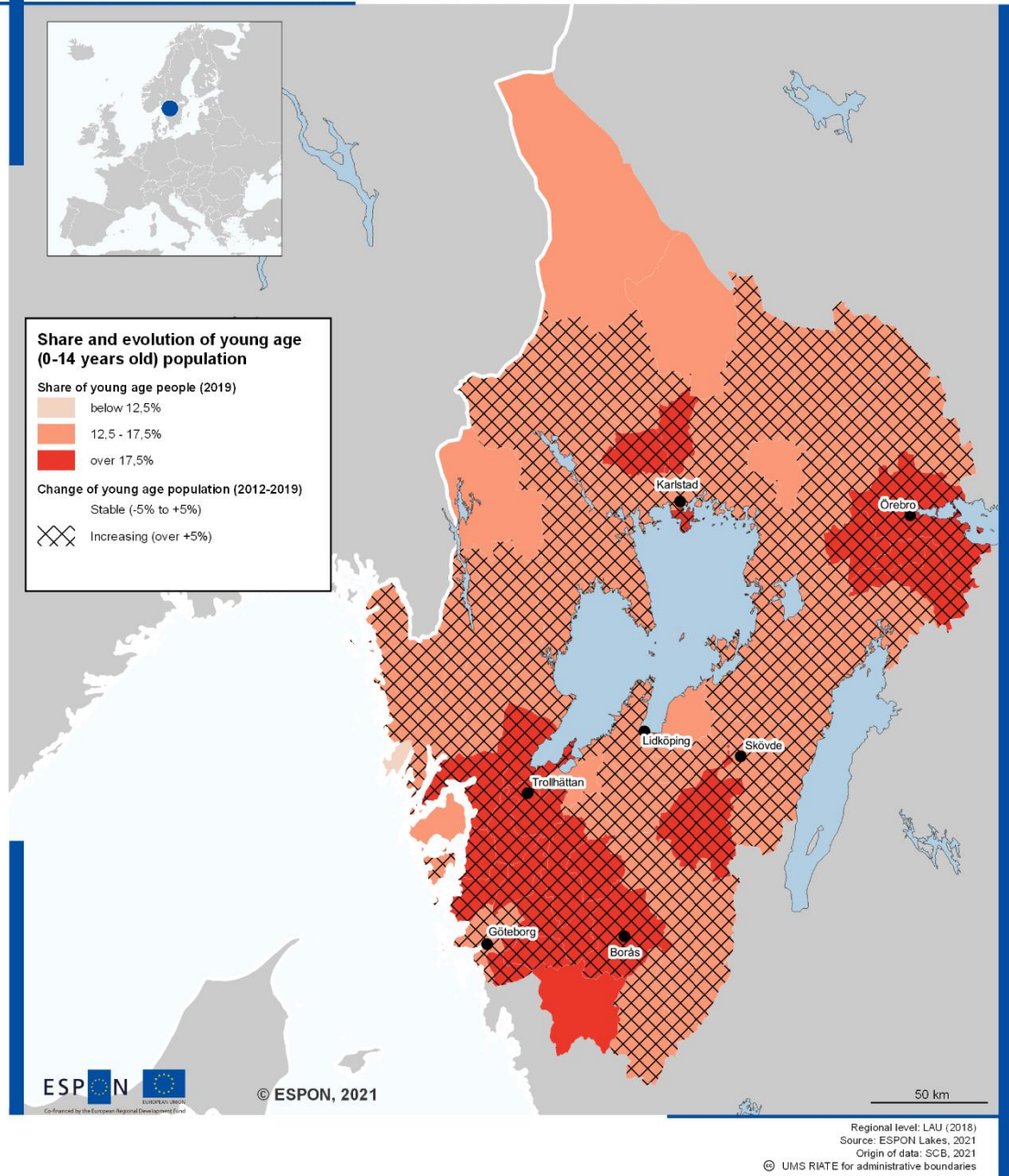
### Map 7 Seniors and population change around Lake Vänern

Seniors around the Lake Vänern, in LAU level



## Map 8 Young peoples and population change around Lake Vänern

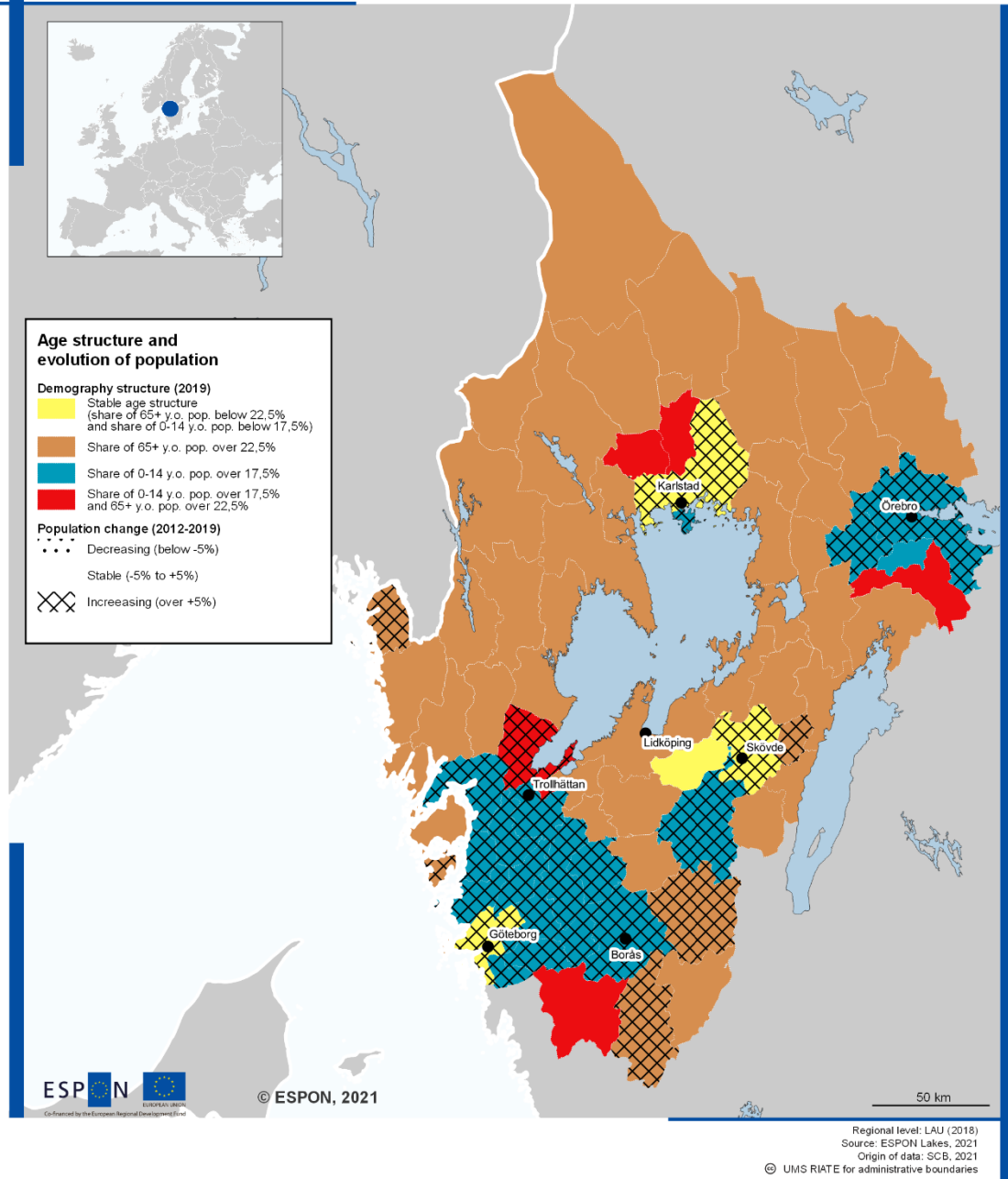
Young age population around the Lake Vänern, in LAU level



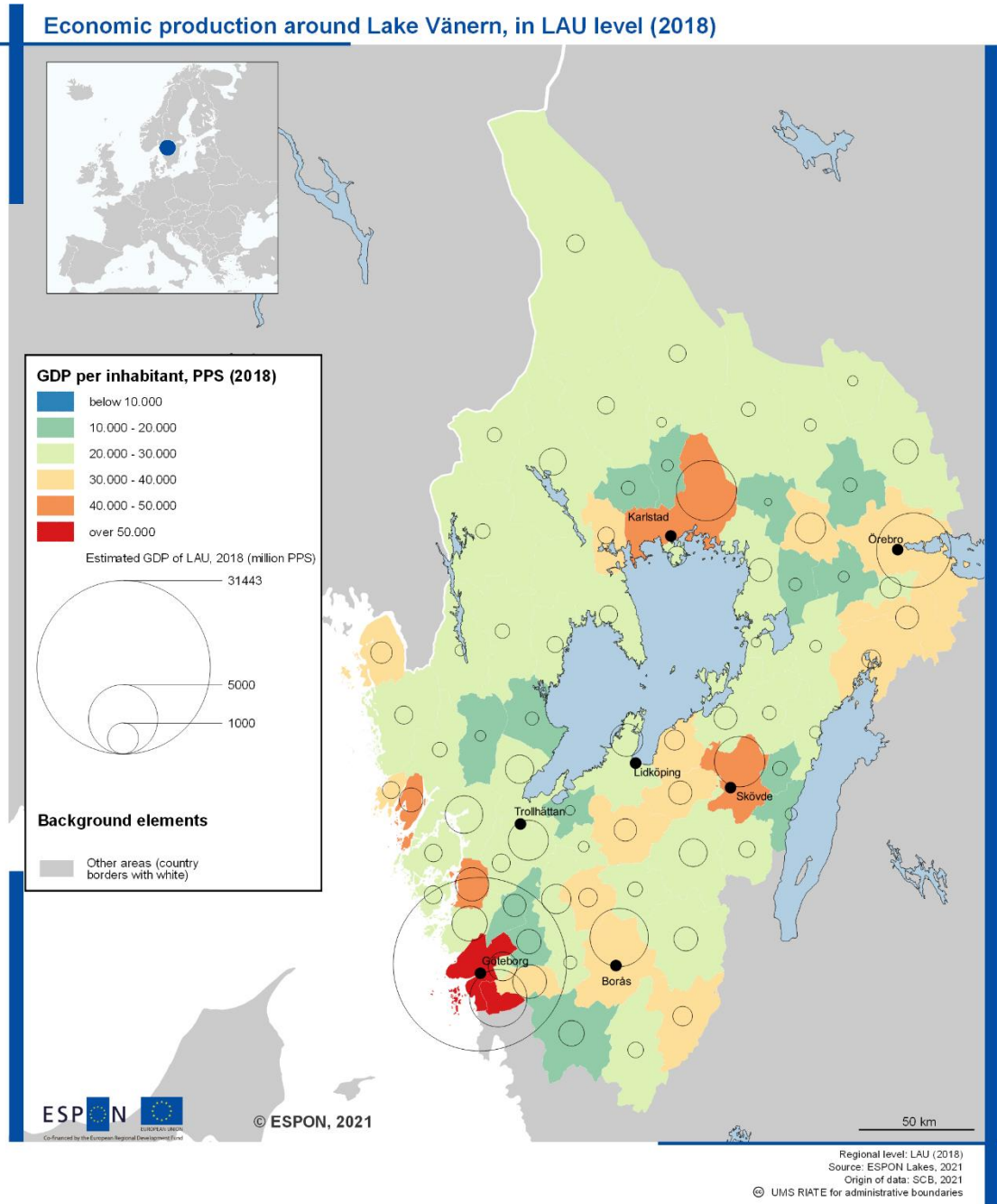


### Map 9 Synthesis of age structures and population change around Lake Vänern

Demographic situation around the Lake Vänern, in LAU level



### Map 10 Municipal gross product around Lake Vänern



## 2.4 Tourism and cultural / natural heritage

Lake Vänern is generally described as underexploited in terms of tourism. The project plan for “Lake Vänern Grand Tour” elaborated by the Lake Vänern cooperation in 2017” (Vänersamarbetet, 2017) points out that:

*Lake Vänern is [...] relatively unknown as a destination in Sweden and abroad. There is no clear awareness of what one can experience at sea or on land around Lake Vänern. Lake Vänern is difficult to access, both physically and mentally. During the last decade, a number of positive punctual initiatives have been carried out, and several local development plans exist. However, these do not form a whole. There is also no exchange between different types of tourism and different activities.*

Data on numbers of guest nights per municipality in Värmland and Västra Götaland counties confirm the limited development of the tourism sector. If one excepts the city of Karlstad, which is *inter alia* an established destination for conference tourism, municipalities surrounding the lake generally have fewer guest nights than those located in e.g. inner parts of Värmland (along the Norwegian border) and along the coast of Västra Götaland. One may observe that municipalities located close to Göta Canal to the south-east of Lake Vänern have experienced a more limited decline in guest nights between 2019 and 2020, as a number of Swedes decided to visit it in a context with extensive restrictions on international travel due to the COVID epidemic. Encouraging a larger proportion of boat tourists on Göta Canal to visit leisure harbours around Lake Vänern is an important development perspective.

Göta Canal and Dalsland Canal are important components of the cultural heritage around Lake Vänern. Among the other components of the cultural heritage, one may mention Läckö Castle on Kållandsö island (municipality of Lidköping), inherited industrial areas and railway of Kinnekulle, the Rörstrand centre in the previous porcelain factory in Lidköping, Alster manor in Karlstad and the historical centres of Karlstad, Åmål, Lidköping and Mariestad. However, tourism promotion around Lake Vänern tends to focus on natural assets:

- Adventure and sports tourism, e.g. canoeing, kayaking and exploration of the multiple protected areas on and around the lake;
- Boat tourism: Lake Vänern includes 16-17 leisure harbours catering for the needs of boat tourists. One of the strengths to be capitalised on is the connection to multiple canals (Göta canal, Trollhätte canal, Dalsland canal). An obstacle to be overcome is that the Swedish Maritime Administration sells passes to circulate on the canals, but these passes do not include stops at the Vänern leisure harbours. As a result, visitors tend to sail through Lake Vänern without stopping<sup>9</sup>
- Fishing tourism: The 2016 strategy for Lake Vänern fishing area identified 10 tourism companies focusing on fishing activities (FLAG Vänern, 2016)
- Urban tourism, e.g. focusing on the heritage in Karlstad and Lidköping<sup>10</sup>

**Figure 3 Lakes and canals connecting the Baltic Sea to the Kattegat Sea**

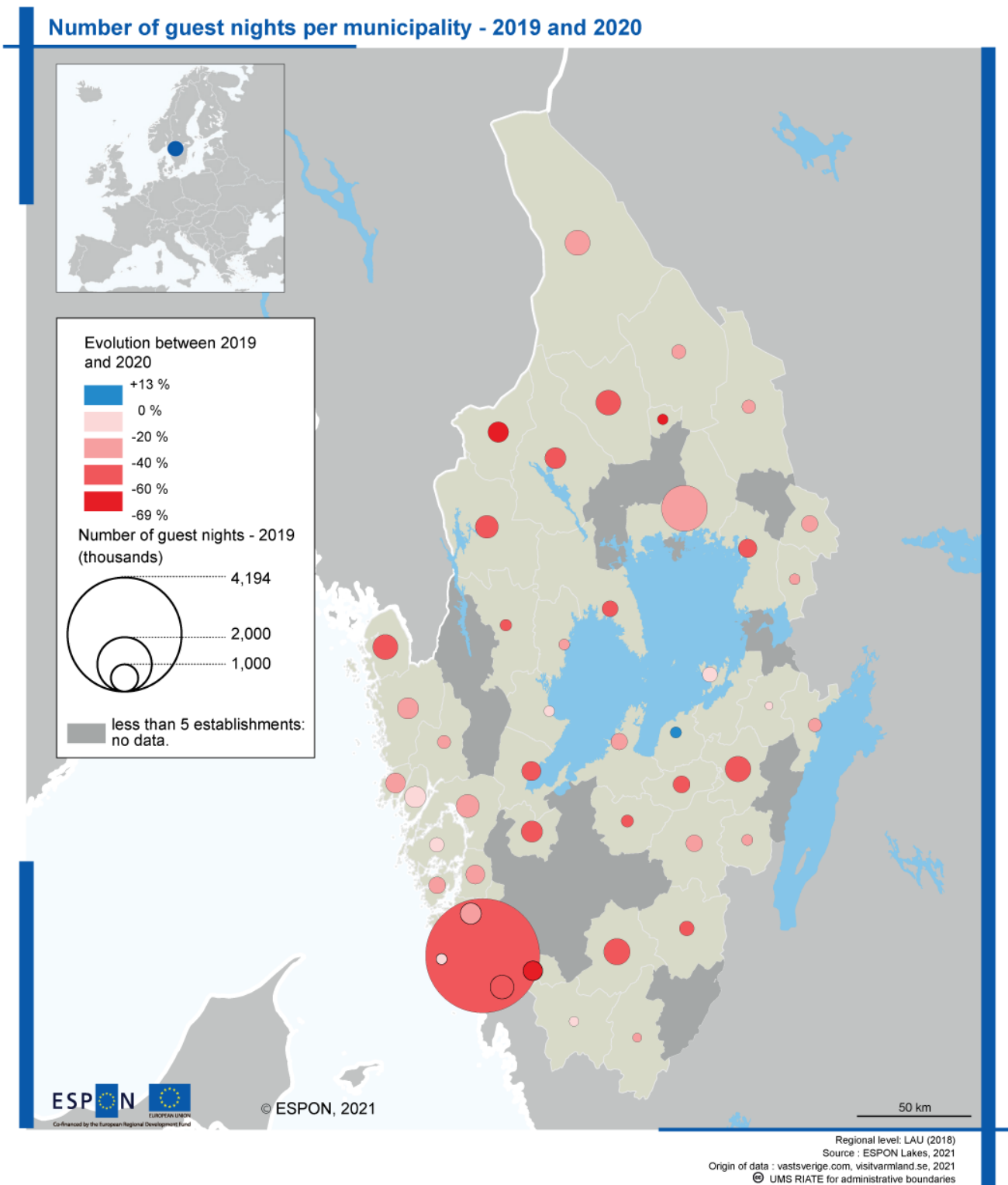


Source Accountalive (2011) Wikimedia Commons.

<sup>9</sup> Interview with Laila Gibson

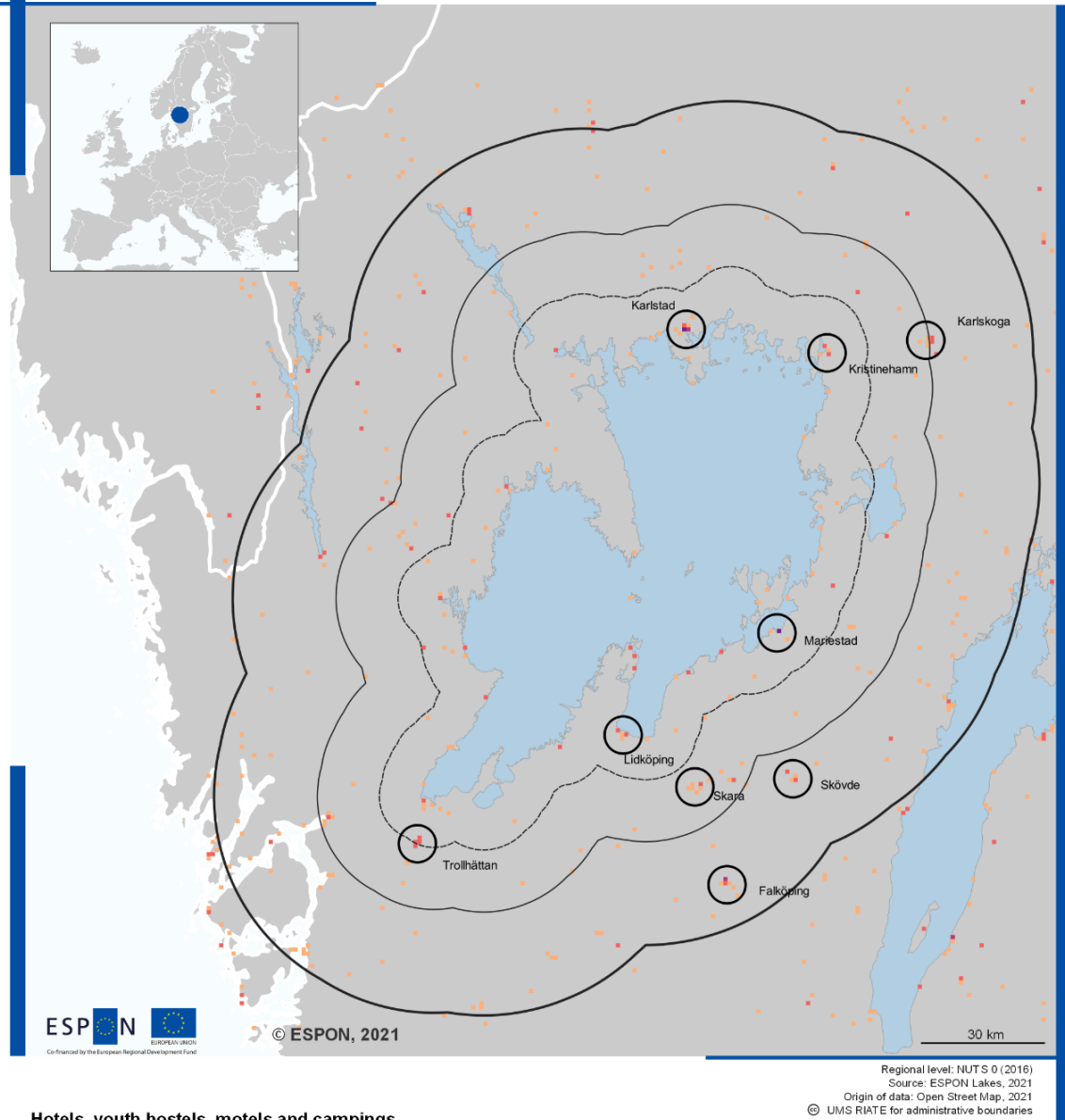
<sup>10</sup> <http://www.vanernsdag.se/stader-att-besoka/>

**Map 11 Number of guest nights per municipality – 2019 and 2020**



## Map 12 Touristic accommodations around Lake Vänern

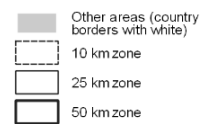
GRID map of touristic accommodations around Lake Vänern



**Hotels, youth hostels, motels and campings**



**Background elements**



## 2.5 Agriculture, fisheries and food production

Agriculture is mainly mentioned in relation to Lake Vänern in connection to risks of flooding of fields and meadows. Farmers are therefore one of stakeholder groups in relation to the regulation of water levels in Vänern.

In June 2020, 50 Lake Vänern professional fishers have an active license, which is a reduction of 30% compared to 2015. Their number have decreased over a long time, but volumes of catches have remained constant. This is a result of technical improvements in fishing equipment and methods. (FLAG Vänern, 2016). They are concentrated around Spiken fish harbour at the tip of the Kållandsö peninsula, but are otherwise spread around the lake. Only 3 out of 13 Vänern municipalities have no registered fishermen. (Ringsby et al., 2020)

The average age of fishermen is high, with a very low number of young fishermen is very small. In the absence of proactive measures to support the entry of new, younger actors, the fishery may therefore disappear. This could include measures to facilitate investments in new fishery equipment, the creation of training programmes preparing for the fishing profession and an improved gender balance in the profession. There is currently only one female fisher in Lake Vänern. In many cases, fisheries provide an extra income besides a retirement pension. The number of authorisations and exams required to be a fisher, some of which need to be renewed regularly and can be costly, are also an obstacle to the establishment of new fishers.

Monitoring of fish resources is carried out in cooperation between the County administrative boards and the coastal guard. It is currently considered insufficient, as it does not allow for a sufficiently flexible allocation of new licences to fishermen. A restrictive policy is implemented as a cautionary measure as knowledge of fish stocks is insufficient. Between 2015 and 2020, the Swedish Agency for Marine and Water Management has rejected 5 out of 8 fisher license applications, in spite of the fact that they were all supported by the concerned County administrative board.

There are 35-40 fish species in the lake. Over the last decades, total volumes of fish caught has remained relatively stable, fluctuating between 517 and 646 tons. Between 40 and 50% corresponds to Vendace, of which only the roe has a market value (i.e. 5-7% of the mass of caught fishes). This is a seasonal activity, concentrated in the late autumn, with highly variable catches from year to year. The creation of a "Väner vendace roe" brand has contributed to the commercial success of this activity. The processing of the roe is carried out directly by the fishermen, who have established a so-called 'economic association'.

Pikeperch is the other major source of income. Commercial demand for Pikeperch has increased in recent years, and this has contributed to increased catches (+25% between 2007 and 2017) and sales (+30% in the same period).

Whitefish used to be one of the major fish species caught in Lake Vänern. However, in 2012 one observed that levels of dioxins in these whitefish exceeded EU threshold levels. As a result, the County administrative board decided that it would be forbidden to sell whitefish, unless dioxin measurements on the specific catch indicated that dioxin levels were below threshold levels. Some worry that increased stocks of whitefish as a result of low catches may lead to an ecological imbalance in Lake Vänern.

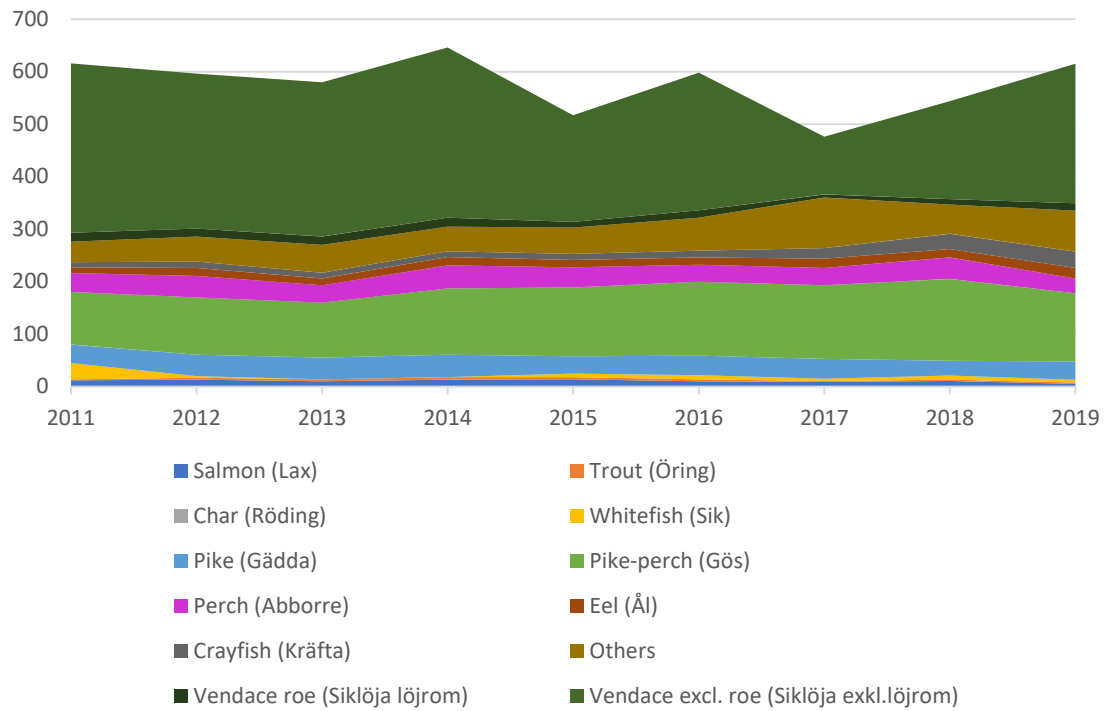
Quantities of fished salmon and trout have decreased significantly, from 54 tons in 2001 to 8 tons in 2019. As the naturally occurring salmon populations of Lake Vänern are threatened (see section 2.2), one may only fish salmon bred from hatchery reared smolts.

Crayfish is an increasingly important source of income. Stocks have increased especially in eastern parts of Lake Vänern ("Dalbo Lake"). However, these are North American crayfish, as the original population of European crayfish is extinct. It is classified as an invasive species by the European Union<sup>11</sup>, no measures

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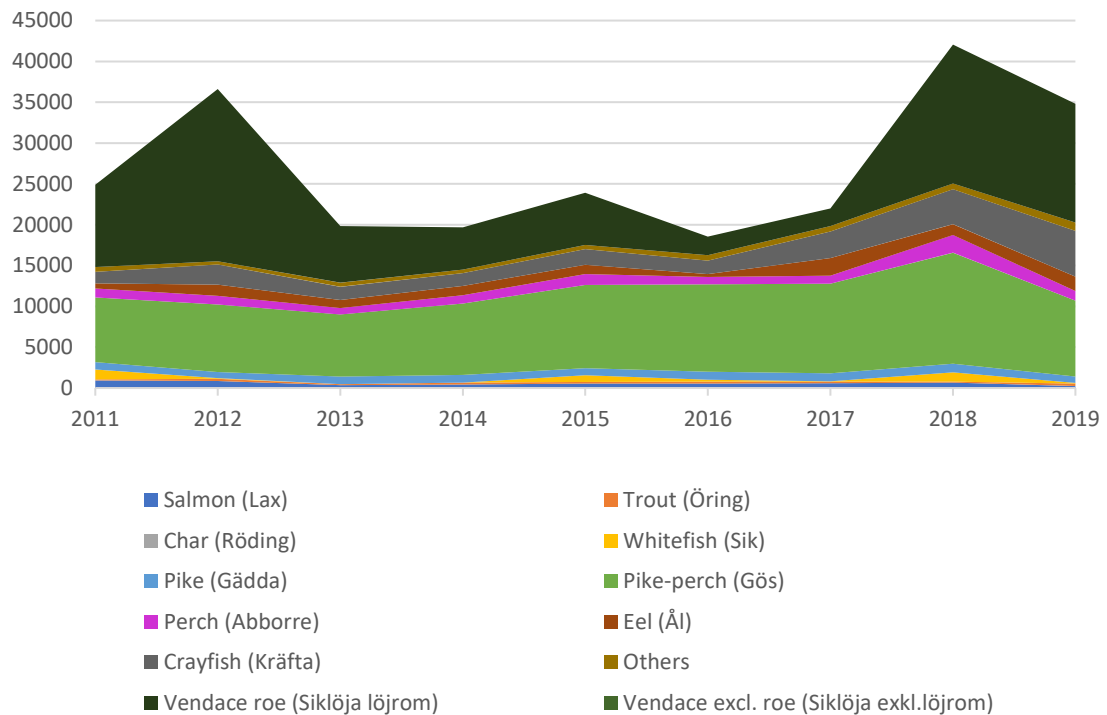
<sup>11</sup> [https://ec.europa.eu/environment/nature/invasivealien/list/index\\_en.htm](https://ec.europa.eu/environment/nature/invasivealien/list/index_en.htm)

**Figure 4 Volume of fish caught in Lake Vänern between 2011 and 2019, by species, in metric tons**



Source: own elaboration from Swedish Agency for Marine and Water Management

**Figure 5 Value of first sale of fish caught in Lake Vänern by species - 2011-2019, in thousand SEK**



Source: own elaboration from Swedish Agency for Marine and Water Management



are implemented to promote its development. Many fishers consider crayfish as a potentially promising resource.

Fish catches are mainly sold at the Fish Auction in Göteborg. Smaller quantities are sold directly to wholesalers, or at the Fish Auction in Stockholm. In 2020, the County administrative board has supported the transformation of bream caught in the lake into mince in cooperation with the association of inland fishermen and Stockholm Fish Auction in order to transform fish from Vänern in Stockholm. The reason for which it is not done locally in the Vänern region is that the volume of fish is insufficient to make this activity profitable<sup>12</sup>. Fishermen of the Lake have also recently started using social media solutions to commercialise their catches locally (so-called REKO-ring). Experiences are positive<sup>13</sup>.

Other initiatives to make the fishery activities more sustainable have been coordinated by the fishermen organisations themselves. This includes the promotion of secondary education for fishermen and the possibility of obtaining licences after a successfully completed an apprenticeship<sup>14</sup>.

## 2.6 Energy production

Electricity is produced from hydropower and wind around Lake Vänern. Small scale hydropower production occurs in the tributaries of the Lake. Larger production plants are located in Göta River, downstream from the lake, with a yearly production of approximately 1,8 TWh (total for Sweden: 65 TWh). There are a total of 16 power stations downstream from Lake Vänern. (Göta Älvs Vattenvårdförbund, 2015)

There is a concentration of wind power stations in the vicinity of Lake Vänern. In Värmland county, 63% of the calculated yearly wind power comes from turbines located in Vänern municipalities corresponds. The corresponding figure for Västra Götaland county is 25%. This is a high proportion, considering that Västra Götaland includes extensive coastal areas with particularly favourable conditions for the production of wind power.

One wind park is located directly on the lake, at Gässlingegrund outside Karlstad, in an area where the lake is between 3 and 13 meters deep. This was the first major wind power initiative on a large lake. This wind park was launched in 2010 by an economic association with a total of 1,100 members. As a result of technical problems, bankruptcy of the company that installed the windmills and falling electricity prices, this initiative generated substantial losses for involved municipalities and ended in bankruptcy<sup>15</sup>. The windmills were bought by the French company Innovent in 2020<sup>16</sup>. An application to build another wind park with 20 turbines further south on the lake at 'Stenkalles Grund' was submitted by the private companies Rewind offshores and ÅF in 2011. Authorisation was granted by the Land and Environment Court in 2013, but complex legal procedures involving the Swedish Environmental Protection Agency followed until 2015. The wind park has not yet been built.

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<sup>12</sup> <http://www.skargarden.se/fars-gjord-pa-braxen-kan-lanseras-till-hosten/>

<sup>13</sup> <https://www.visitkristinehamn.se/sv/gora/reko-ring-i-kristinehamn-81676>

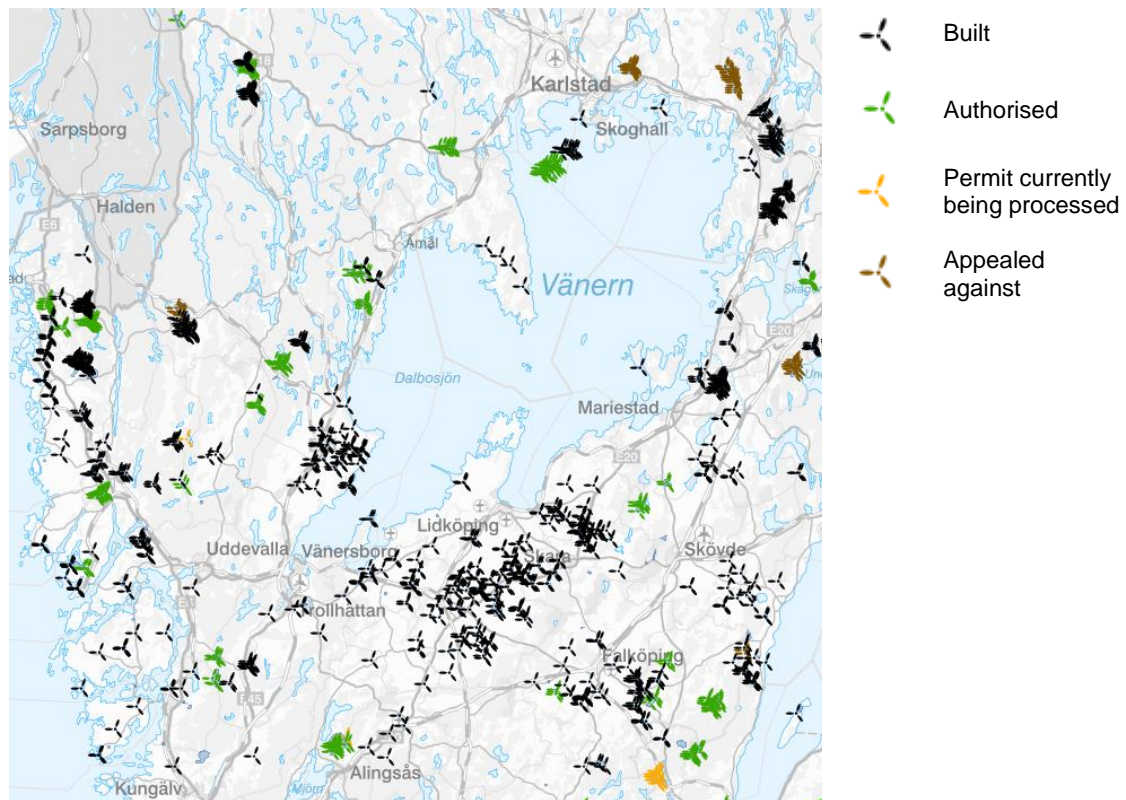
<sup>14</sup> Interview Jonas S. Andersson – Värmland county administrative board

<sup>15</sup> <http://vindkraftgasslingen.se/nyheter-2/>

<sup>16</sup> <https://www.lendosphere.com/les-projets/financez-le-developpement-international-d-innovent>



Figure 6 Wind energy in and around Lake Vänern



Source: vbk.lansstyrelsen.se

Table 4 Wind power production

Region/municipality	Total maximum output (MW)	Total calculated yearly production (GWh)
<b>Värmland county</b>	<b>204,68</b>	<b>561,16</b>
Grums	0	0
Hammarö	0,5	0,6
Karlstad	34,83	78,6
Kristinehamn	167,62	478,55
Säffle	1,73	3,41
<b>Västra Götaland county</b>	<b>250,38</b>	<b>668,66</b>
Åmål	5,25	11,07
Götene	36	81,13
Grästorp	21,01	53,23
Gullspång	7,5	18
Lidköping	33,23	80,17
Mariestad	59,94	178,8
Mellerud	79,92	228,06
Vänersborg	7,53	18,2
<b>Total</b>	<b>455,06</b>	<b>1229,82</b>

Source: vbk.lansstyrelsen.se

## 2.7 Spatial planning and development of transport

### Land use

A main characteristic feature of the Lake Vänern Region compared to the rest of inland south Sweden is the extent of arable lands (Map 17) and the relatively lower proportion of forested areas (Map 16). These are particularly large and continuous south-east of the lake, in the so-called West Göta Plain ('Västgötaslätten'), as well as south-west of the lake, in parts of Dalsland historical province comprised between Vänersborg and Mellerud. However, arable lands can also be found in most areas surrounding the lake. They are usually separated from the lake by a forest 'corridor' of variable width or by wetlands (see Map 13).

Main cities and towns around Lake Vänern tend to be located directly close to the lake, but with a centre that is at some distance from the shoreline to avoid flooding risks. In Karlstad, Kristinehamn and Lidköping, for example, many of the areas closest to the lake in the core urban area are occupied by industrial activities. In smaller towns and rural areas outside of these agglomerations, there is also no particular concentration of population along the shoreline.

Additional built-up areas identified by comparing Corine Landcover data for 2012 and 2018 are relatively limited around Lake Vänern. A limited number of grid cells concerned by such changes are identified around the largest towns and cities (see Map 15). However, zoom-ins on selected cities around Lake Vänern confirm that settlement areas have extended since 1990. The attractiveness of areas along the lake is particularly obvious around Kristinehamn, whose urban settlement areas has developed along the attractive Vålösundet waterway and its shoreline promenade<sup>17</sup>. Similarly, in the municipality of Hammarö, located on the peninsula just south of Karlstad, the shoreline areas of Tye and Rud/Lindenäs have experienced extensive urbanisation in recent years (see Map 14).

### Shoreline protection

Shorelines have benefited from protection in Sweden since the early 1950s. Initially, the objective was to preserve access to areas for bathing and enjoyment of natural environments. Provisions were tightened in 1975, in response to the increasing number of secondary houses. From 1994, the purpose of the protection of shorelines was expanded to include also the protection of natural biotopes. Current regulations were adopted in 2009. They specify that exemptions from shoreline regulation principles may only be given in individual cases, and not for categories of areas as was previously the case (Enquiry on the revision of the shoreline protection regulation, 2020). This protection normally concerns the areas within 100 meters from the shoreline, but can also be extended to areas within 300 meters from the shoreline when this is needed to uphold the pursued objectives. Decisions on the extent of the protected area are made by the County administrative boards.

Some flexibility has been introduced in shoreline protection around large lakes, as compared to most maritime shorelines of southern Sweden (Swedish environmental protection agency and Swedish National Board of Housing, Building and Planning, 2010: 15). As a result, municipalities around Lake Vänern may, as part of their planning process, designate "areas for rural development in areas close to the shoreline"<sup>18</sup>. These are primarily areas with good access to the shoreline, where some construction is possible without limiting the access of the public to the shoreline and without negative impacts on the fauna and flora. National regulations contain specific provisions on the required characteristics of such areas when they are bordering large lakes such as Lake Vänern. A 2020 review of such designations in the County of Värmland showed that such designations were under elaboration in Karlstad, and had been adopted in 2013 in Säffle (Carlson, 2020). In Västra Götaland county, such plans are under elaboration in some municipalities (e.g. Åmål), and adopted in others (e.g. Gullspång). Overall, regulations on the protection of areas close to shorelines are

<sup>17</sup> <https://www.visitkristinehamn.se/sv/gora/strandpromenad-langs-valosundet-32302>

<sup>18</sup> "Landsbygdsutveckling i strandnära lägen (LIS)"

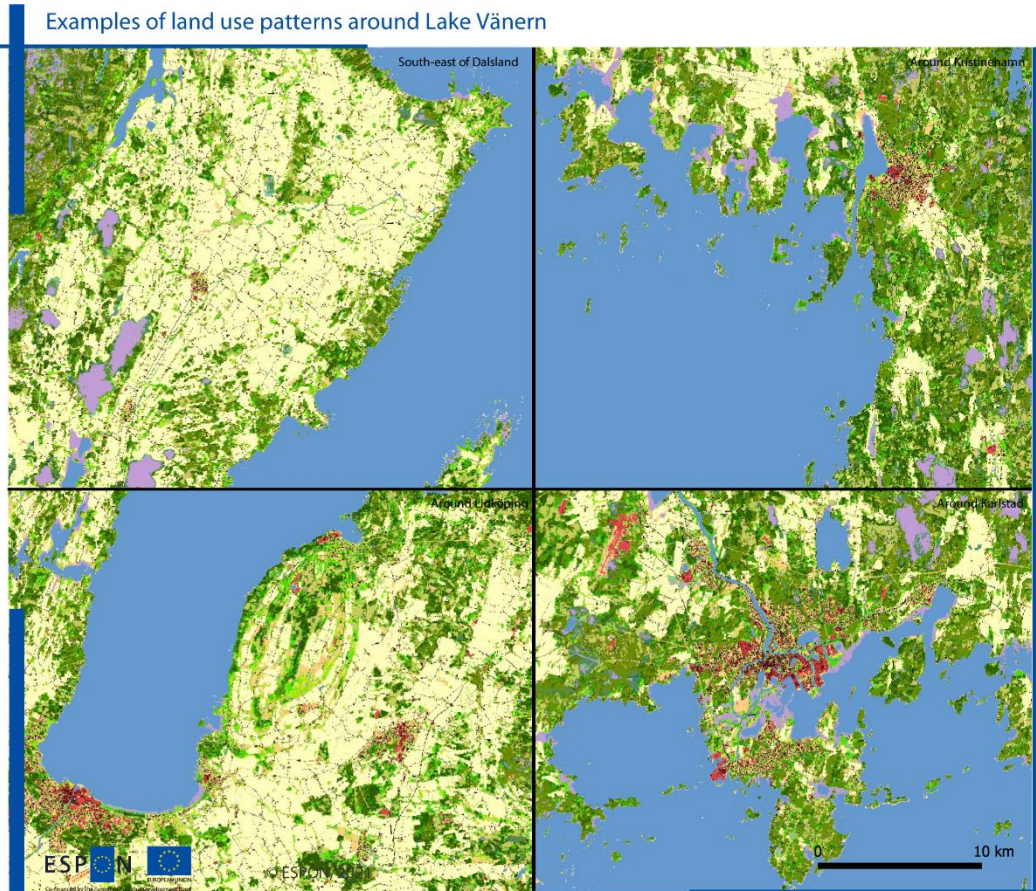
intensely debated in Sweden, and the possibility of reducing constraints on development in these areas are currently considered at the governmental level (Enquiry on the revision of the shoreline protection regulation, 2020).

### **Flood protection**

Another main spatial planning issue in relation to the Lake has been to protect settlements, infrastructure and businesses against flooding and to limit exposure to flooding risks. The previously mentioned major flood of 2000-2001, during which the Lake reached a level of 45,67 m above sea level, generated a wide range of damages (Blumenthal, 2010):

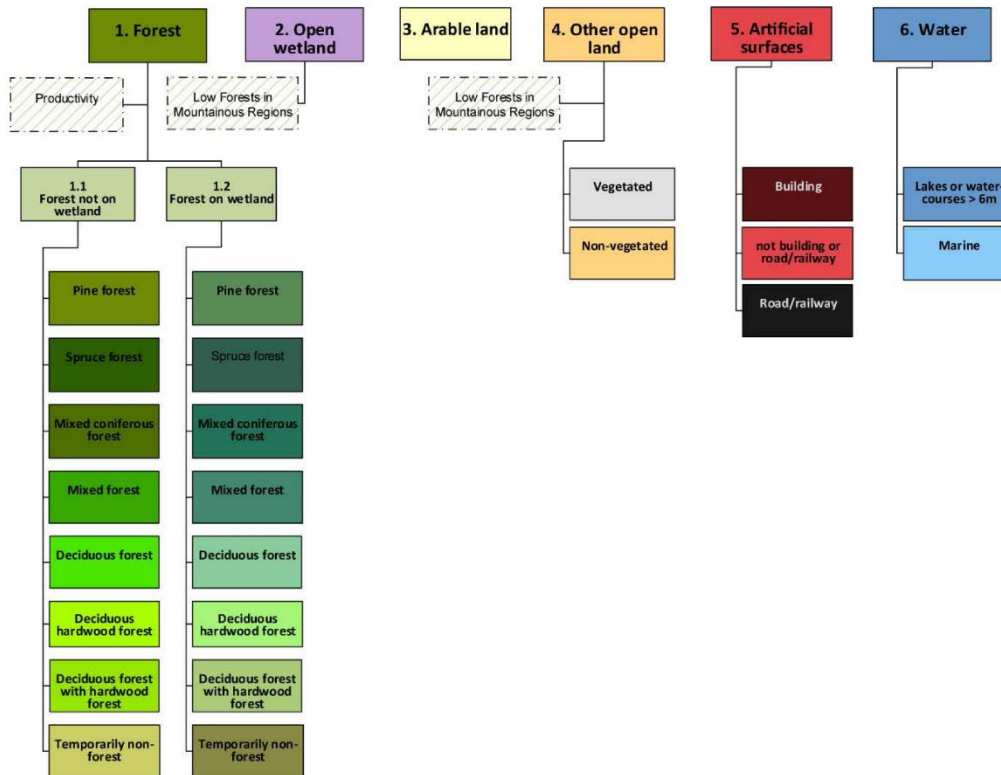
- 2,000 hectares of agricultural land was flooded. In addition, extensive areas could not put to use in the spring, as they had not been sufficiently drained;
- Damages estimated at around 2 million euros on infrastructure for fisheries
- Major damages on e.g. municipal water treatment facilities, leisure harbours, camping areas and walking and cycling paths along the lake.

## Map 13 Examples of land use patterns around Lake Vänern



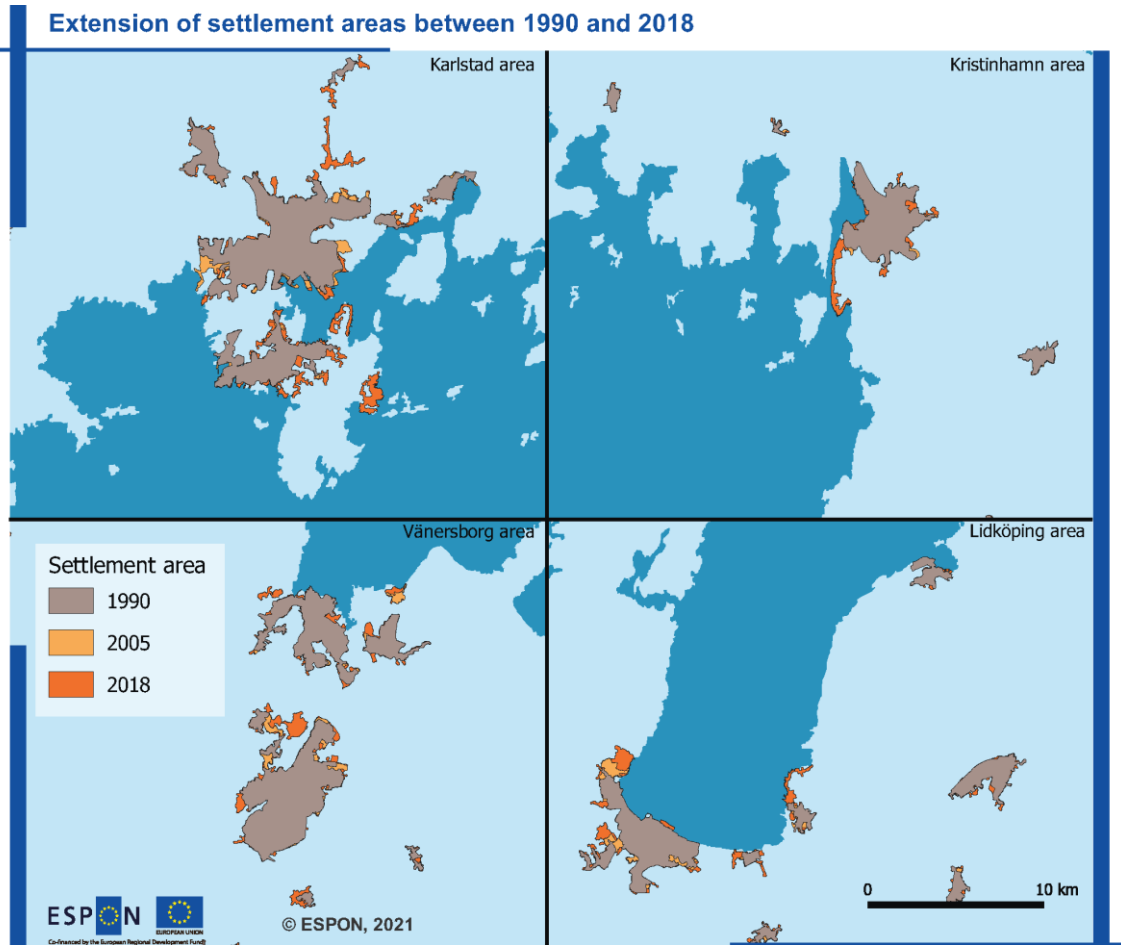
Local administrative units  
 Source: ESPON LAKES, 2021  
 Origin of data: Statistics Sweden  
 Data collected from national statistical institutes  
 Eurogeographics Europoundary (v6.2) for administrative boundaries

### Legend



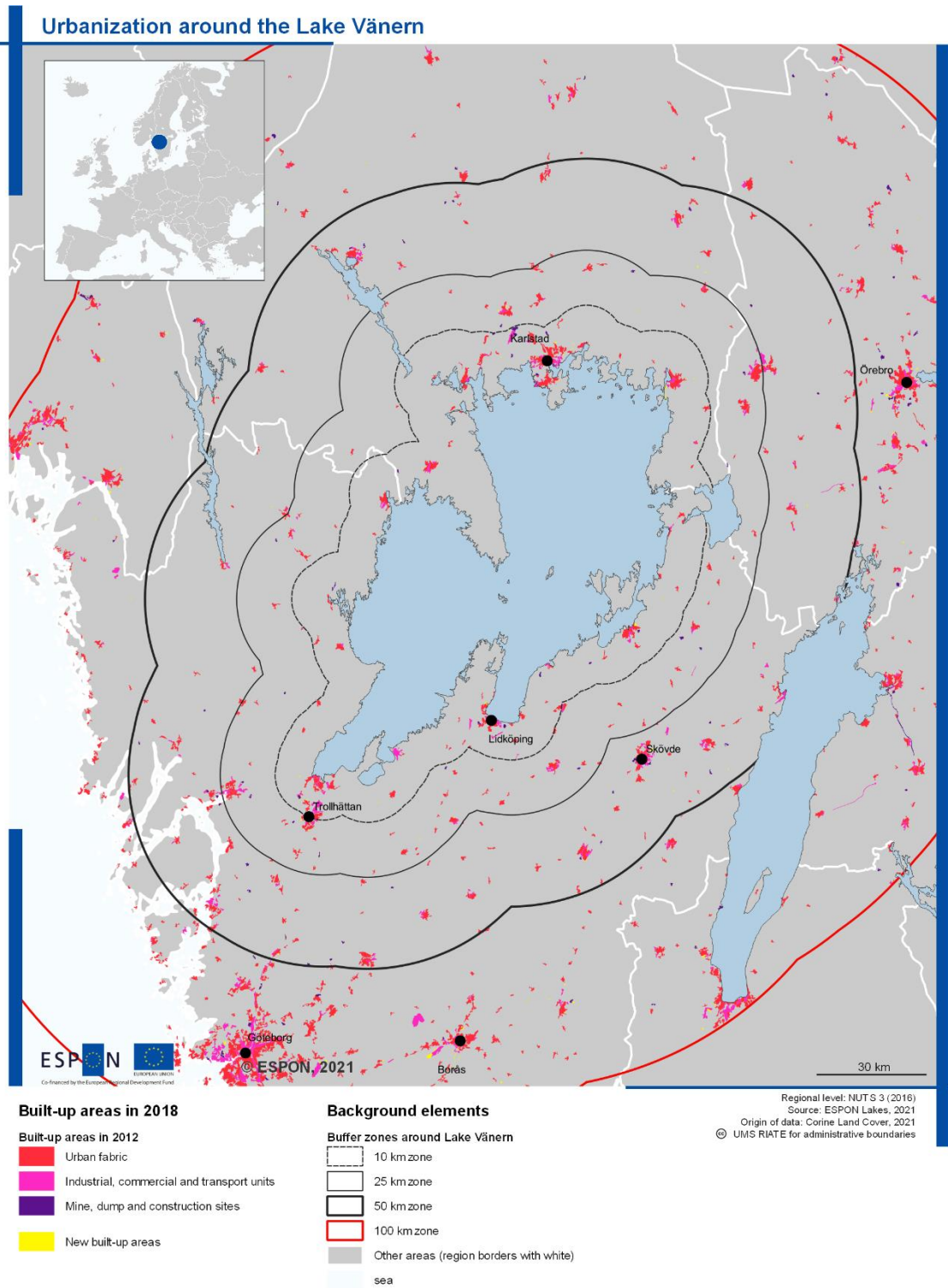


### Map 14 Extension of settlement areas between 1990 and 2018



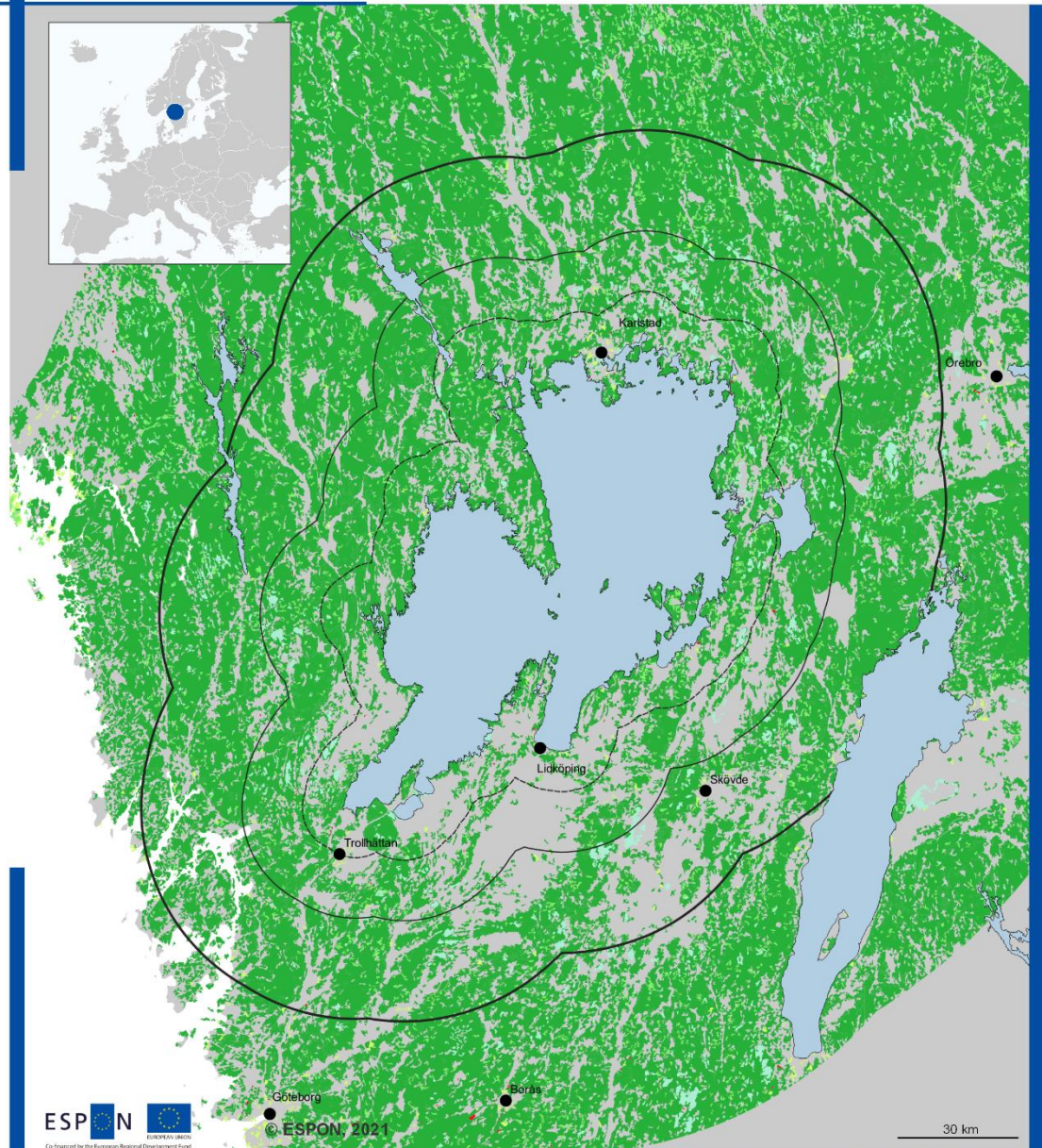
Local administrative units  
 Source: ESPON LAKES, 2021  
 Origin of data: Statistics Sweden  
 Data collected from national statistical institutes  
 Eurogeographics Europoundary (v6.2) for administrative boundaries

Map 15 Urbanisation around Lake Vänern



## Map 16 Naturally vegetated areas and green urban areas around Lake Vänern

### Green-space areas around the Lake Vänern



#### Green-space areas in 2018

##### Green-space areas in 2018 (CLC categories)

- Green urban areas, sport, leisure facilities
- Forests
- Other vegetated areas
- Inland wetlands

##### Change of CLC categories (2012-2018)

- Loss of green-space areas

#### Background elements

##### Buffer zones around the lake

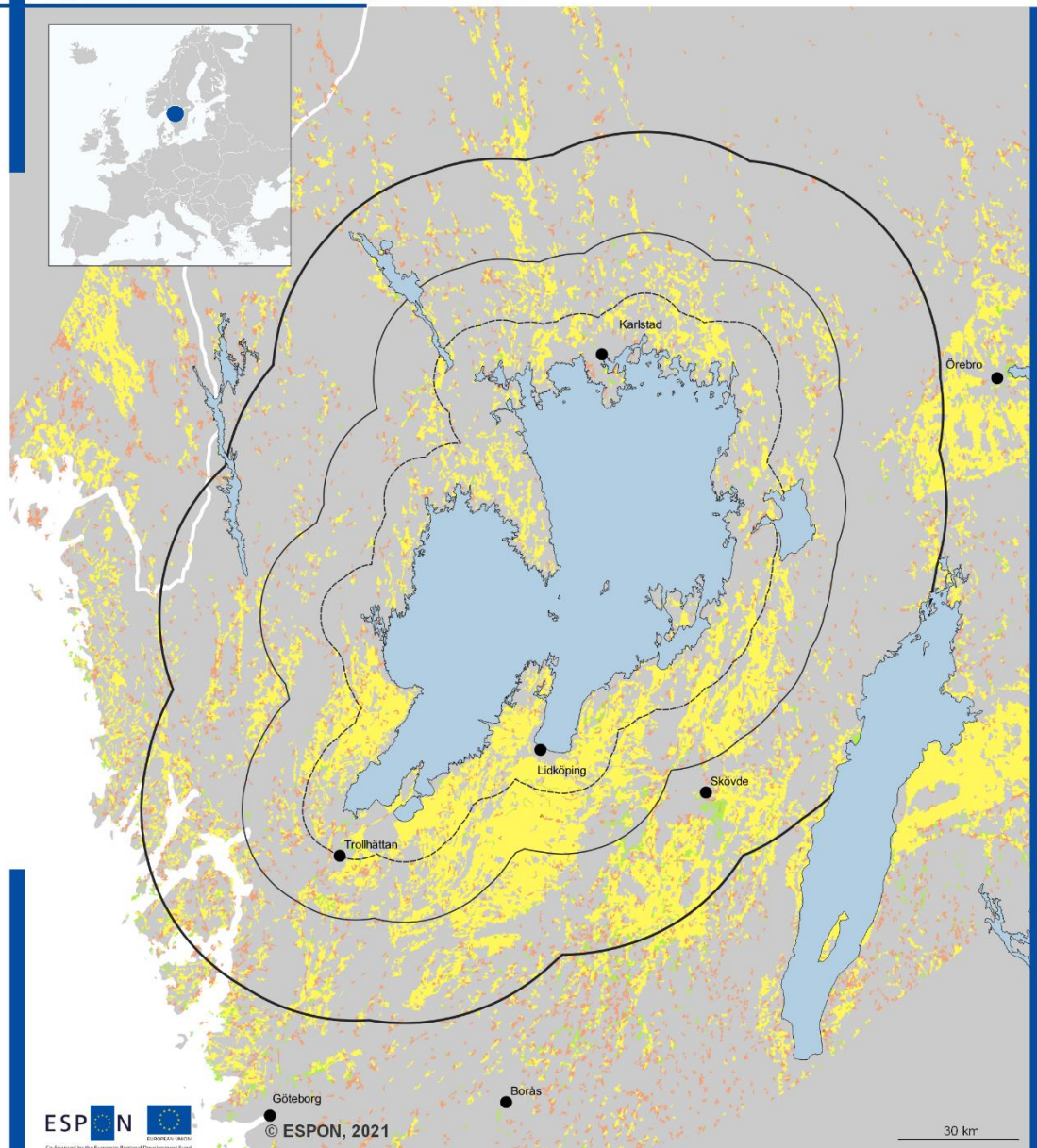
- 10 km zone
- 25 km zone
- 50 km zone
- Other areas

Regional level: NUTS 0 (2016)  
 Source: ESPON Lakes, 2021  
 Origin of data: Corine Land Cover, 2021  
 © UMS RIATE for administrative boundaries



## Map 17 Agricultural areas around lake Vänern

Agricultural areas around the Lake Vänern



### Agricultural areas in 2018

- Arable lands
- Fruit trees and berry plantations
- Pastures
- Other agricultural lands

Regional level: NUTS 0 (2016)  
 Source: ESPON Lakes, 2021  
 Origin of data: Corine Land Cover, 2021  
 © UMS RIATE for administrative boundaries

### Background elements

Buffer zones around the lake

10 km zone

25 km zone

50 km zone

Other areas (country borders with white)



## Freight transport

Current maritime freight traffic is estimated at between, 1,5 and 2 million tons per year. This freight traffic mainly concerns:

- Wood to paper mills and processing industries around Karlstad;
- Mining products out of the lake;
- Cereals out of lake;
- Fertilizers into lake area;
- Some piece goods<sup>19</sup>.

The Lake and Göta river are components of Ten-T core inland waterways. However, freight volumes handled in the port of Gothenburg are more than 20 times larger than those handled in entire Lake Vänern (see Map 19). Lake Vänern ports also need to overcome the challenge of piloting fees along Göta River and its multiple locks<sup>20</sup>.

There is currently no container traffic. The creation of a container boat operating a regular connection between Vänern and Gothenburg was envisaged in 2018, but abandoned (Schmidt, 2018). However, a first such connection between Stockholm and Västerås on Lake Mälaren is expected to start operating in April 2021 (Eriksson, 2021). This is made possible by a so-called 'ecological bonus' for maritime transport replace road transport (Ministry of infrastructure, 2020). The container terminal in the freight harbour of Karlstad exists since 2010<sup>21</sup>.

Maritime freight transport in Vänern is different multiple issues:

- The construction of a new bridge in Gothenburg ('Hissingebron') with a height of 13 meters only, as compared to 18,3 meters for the current bridge ('Götaälvbron'). The limited periods during which this new bridge may be opened (avoiding rush hours in the morning and evening) is expected to generate constrains for maritime traffic.
- Particularly high maritime pilot fees, as a result of the large extent of areas where such piloting is required.
- Taxation of inland maritime traffic<sup>22</sup> increased significantly in 2016-2017. Effects of this increase has been assessed by the Swedish Maritime Administration (see Text Box 2 p. 51), which emphasizes that "*it does not have a mandate to pursue regional policy*" and suggests that continued exemptions of traffic on Lake Vänern from such taxes could be in contradiction with EU State Aid rules.

It is foreseen to build new water locks along the canals, as the current ones are more than 100 years. The objectives are to develop both freight and tourism<sup>23</sup>.

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<sup>19</sup> Interview Johan Källsson, Väner Business Council

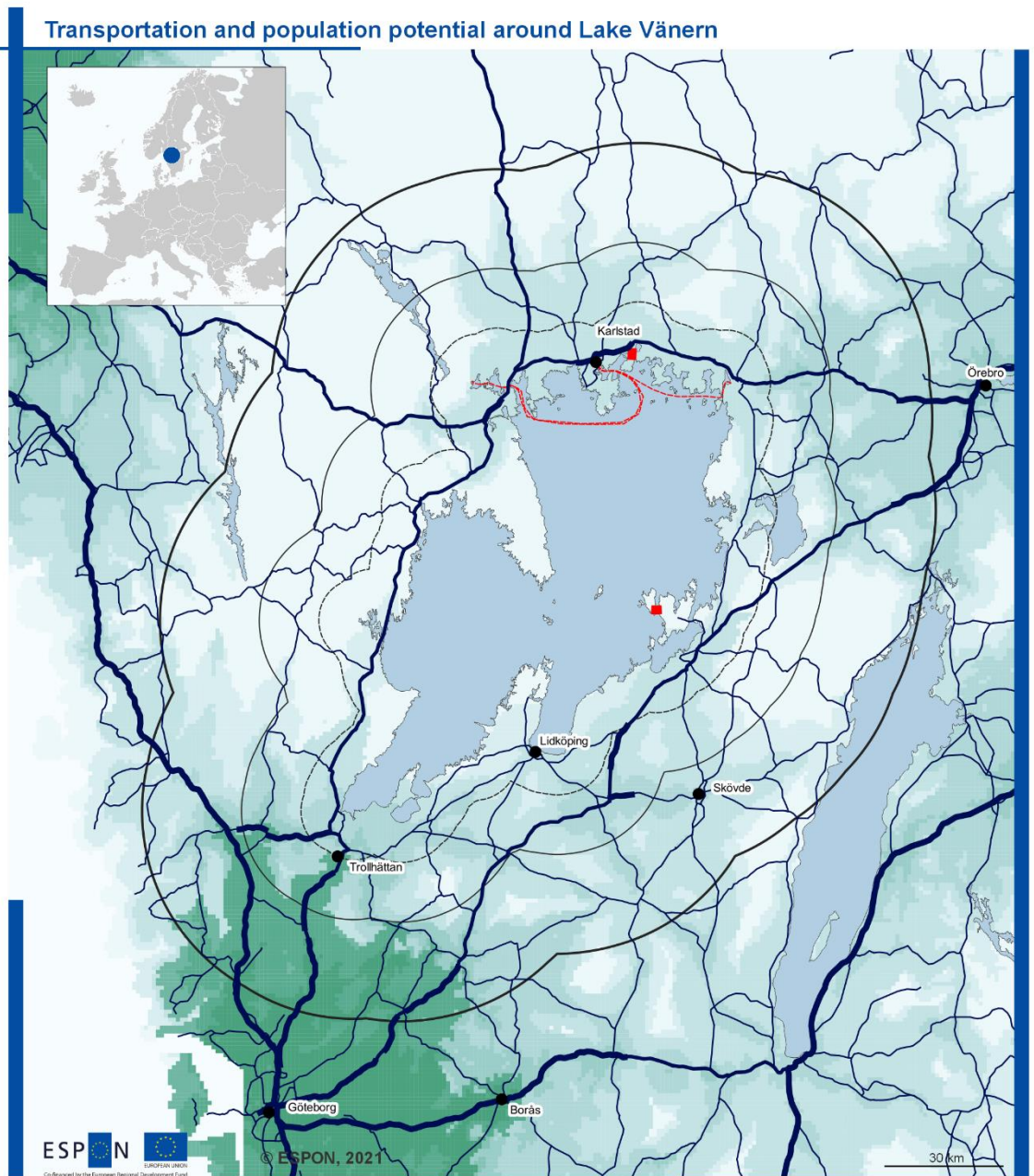
<sup>20</sup> Interview Johan Källsson, Väner Business Council

<sup>21</sup> <https://www.vanerhamn.se/sv/godshantering>

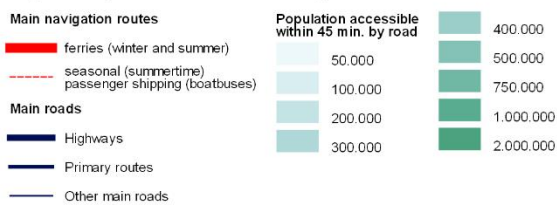
<sup>22</sup> <https://www.sjofartsverket.se/sv/Om-oss/Ekonomi/Farledsavgifter/>

<sup>23</sup> <https://www.trafikverket.se/nara-dig/Vastra-gotaland/vi-bygger-och-forbattrar/slussar-i-trollhatte-kanal/>

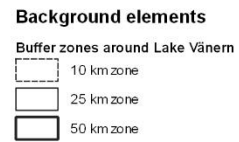
## Map 18 Transportation axes in Lake Vänern Region



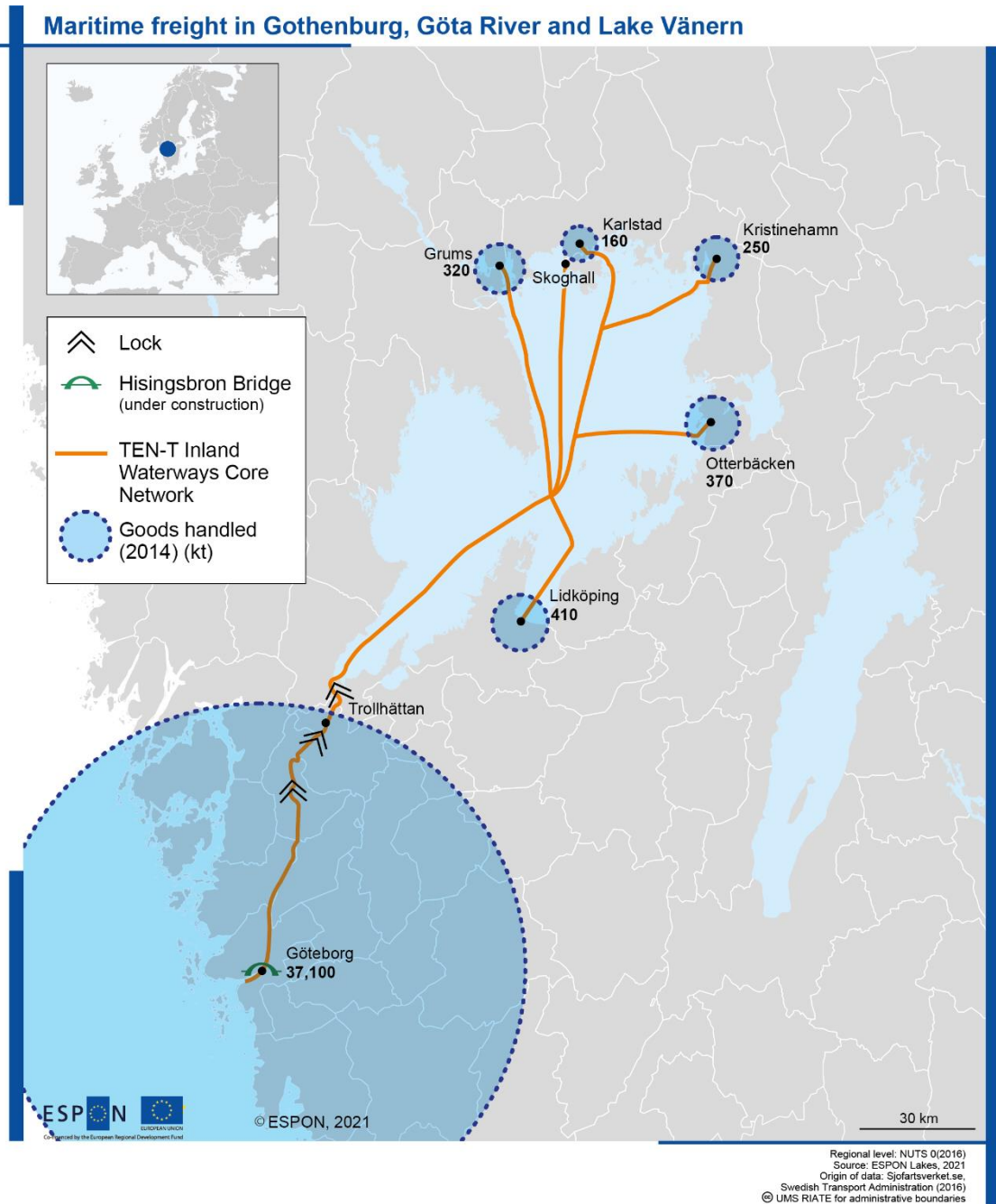
**Population potential and main transportation routes in and around Lake Vänern**



Regional level: -  
 Source: ESPON Lakes, 2021  
 Origin of data: ESPON GEOSPECS  
 Open Street Map, Diva-GIS, 2021  
 © UMS RIATE for administrative boundaries



Map 19 Ten-T core inland waterways and freight traffic on Vänern and Göta river



Source: TENtec Interactive Map Viewer, extracted February 2021, disseminated under CC BY 4.0 licence.

## 3 Governance in the lake region

### 3.1 Actors involved in lake-based governance

#### 3.1.1 Main levels of governance in Sweden

##### Municipal level

Swedish municipalities enjoy a wide range freedom of action. The principle of municipal autonomy was introduced in 1862 and is enshrined in the constitution since 1974. This implies that they are responsible for the delivery of many welfare services and carry out a number of regulatory functions. This can be a challenge for smaller municipalities, e.g. when it comes to waste water treatment, rescue services, enforcement of environmental regulations, strategic and physical planning and local development<sup>24</sup>.

Municipal autonomy also implies that each municipality decides on taxation levels for its inhabitants, and levies these taxes. A national income redistribution system helps municipalities across Sweden to live up to the legal requirements in terms of service delivery. This income redistribution system is primarily funded by national authorities.

The Västra Götaland region is subdivided in five 'intermunicipal associations' ('kommunalförbund'), two of each border Lake Vänern (Skaraborg and Fyrbodal). They constitute platforms for cooperation on issues such as local and regional development, sustainability, knowledge acquisition and welfare. There are no equivalent associations in Värmland region. While these intermunicipal associations played an active role when the first Väner cooperation initiative was launched in 2009 (see section 3.1.2 below), their involvement in the current intermunicipal Väner cooperation is limited<sup>25</sup>.

##### Regional level

In the Swedish context, the term 'regions' is used to designate NUTS3 administrative units between municipal and national levels with expanded competences compared to historical 'landsting' (also NUTS3), which had been established in 1862<sup>26</sup>. Planning and regional development are the key additional competences of 'regions'. Also in this respect, Västra Götaland and Värmland are quite different: Västra Götaland was one of two 'test regions' that were established in 1999, through the merger of the previous 'landsting' of Älvsborg, Skaraborg<sup>27</sup>, Göteborg and Bohuslän<sup>28</sup>. Värmland was one of the last seven 'landsting' that were formally transformed into regions 20 years later, in 2019. This is the result of the merger of the 'landsting' with the 'Värmland Region intermunicipal association' and the public transportation operators Värmlandstrafik and Karlstadbuss. Before 2019, the term 'Värmland Region' was used to designate the intermunicipal association. This association for example coordinated the elaboration of region development plans for 2009-2013 and 2014-2020.

All Swedish NUTS3 regions elaborate regional development plans that are coordinate with European Union programming periods. The regional development plan for Västra Götaland for 2021-2030 was adopted on 16<sup>th</sup> February 2021<sup>29</sup>, while the corresponding strategy for Värmland is expected to be adopted on 2<sup>nd</sup> June 2021. Extensive consultations are organised as part of the strategy elaboration process.

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<sup>24</sup> [https://www.riksdagen.se/sv/webb-tv/video/motion/kommunerna-och-valfarden\\_GX02K277](https://www.riksdagen.se/sv/webb-tv/video/motion/kommunerna-och-valfarden_GX02K277)

<sup>25</sup> Interview with Laila Gibson, coordinator of the Väner cooperation

<sup>26</sup> Swedish NUTS 2 regions are mainly used for

<sup>27</sup> Except municipalities of Mullsjö and Habo

<sup>28</sup> <https://www.vgregion.se/politik/sa-bildades-vgr/regionbildningen-sammanfattning/>

<sup>29</sup> <https://www.vgregion.se/aktuellt/press/beslut-i-regionfullmaktige/regionfullmaktige-16-februari-2021/>



## National level

Compared to other EU Member States, public sectoral agencies play a particularly important role in the Swedish governance model. Ministries play a less prominent role in policy design, implementation and monitoring compared to other Member States. The subsections below detail positions of these sectoral agencies from different perspectives. Lake Vänern actors observe that the involvement of these agencies in lake-related issues is variable. They do not necessarily engage in a dialogue on the holistic approach to territorial development around the Lake. The most central national public agencies are:

- Swedish Agency for Marine and Water Management ('Havs och Vattenmyndigheten');
- Swedish Maritime Administration ('Sjöfartsverket');
- Swedish Transport Administration ('Trafikverket');
- Swedish Environmental Protection Agency ('Naturvårdsverket').

### 3.1.2 Cooperation organisations and networks focusing on Lake Vänern

Cooperation around lake Vänern is organised by multiple parallel organisations and networks. Each of them focus on a specific set of themes and issues. Some are not-for-profit associations (e.g. Vänern Water Management association, Lake Vänern Archipelago Biosphere Reserve), others are so-called 'economic associations' (e.g. Vänern Cooperation, Leisure Harbours of Lake Vänern) or informal networks with no legal personality (e.g. Vänern Council, Vänern Business Council).

The Vänern Cooperation, driven by the 13 Vänern municipalities, is the key potential proponent of an integrated development perspectives. However, decisions on such a more integrated approach remain to be made. Lessons have been learnt from a regionally driven attempt to launch a wide cooperation process around Lake Vänern, which did not quite live up to expectations. In 2009, the Västra Götaland region initiated the elaboration of a strategy for the development of the Vänern Region as a maritime region. A preparatory study was published (Västra Götaland region et al., 2009). During the following years, cooperation efforts were centred around five axes: (1) Creative environments for inhabitants, visitors and companies; (2) maritime traffic; (3) Maritime tourism and leisure activities and fisheries; (4) renewable energy production along the shoreline; and (5) education, research and capacity-building. However, these reflections did not lead to major concrete initiatives. In 2015, Vänern municipalities decided that a maturing process was needed, which they would be best suited to lead. Instead of attempting to elaborate an integrated strategy upfront, concrete fields within which the added-value and feasibility of cooperation could be most easily established were focused on. Projects focusing on these "low hanging fruits" gave municipal authorities and elected representatives the opportunity to get to know each other better and strengthen cooperation at the level of the lake region. It also made it possible to establish tighter networks among a wide range of actors around the lake and to increase the visibility of the lake region among national actors. In parallel to these project activities, efforts were pursued to increase the visibility and awareness of the lake region (e.g. through the organisation of the yearly 'Vänern week' and 'Vänern assembly').

#### **Vänern cooperation**

Vänern cooperation ('Vänersamarbetet') is an economic association established by the 13 Lake Vänern municipalities in 2015, coordinated by an employee of this association. Since it was created, this association focused on concrete initiatives within specific fields, where consensus between cooperation partners could be easily reached:

- Lake Vänern Grand Tour project (2018-2021), which seeks to promote the Vänern region as an integrated tourism destination. This is done through online communication and signposting around the lake. The creation of a continuous cycling path is the backbone of the integrated plan. The tourism offer also includes paddling, boat trips and hiking. Measures are also taken to upgrade leisure boat harbours and enhance their visibility. The project is funded by the Swedish Board of Agriculture, the regions of Värmland and Västra Götaland, riparian municipalities and the European agricultural fund for rural development (EAFRD). The official launch of the cycle path is expected for the summer of 2022.

- The creation of the Lake Vänern Brand in 2018, with an associated brand platform and visual identity.<sup>30</sup>
- Taking over responsibility for the annual 'Väner week' and 'Väner assembly' events. The Väner week is implemented by the Väner museum.

In parallel, the Väner cooperation has actively worked to organise discussions on e.g. the development of above-mentioned regional development strategies, on the regulation of Lake Vänern water levels, on maritime traffic on the Lake, on tourism and on fisheries. Whenever possible, joint replies to consultation processes have been elaborated and submitted. The Väner cooperation has also organised event on e.g. issues of inland maritime traffic at the national 'Almedalen week' event, which is an important component of national policy debates in Sweden.

Discussions on the establishment of a more perennial cooperation framework, with more stable resources and more wide ranging cross-sectoral integrative ambitions have been initiated. However, they are still in an early phase. One of the possibilities that are envisaged is the creation of a Lake Vänern foundation, based on the model of foundations that have previously been established for the Stockholm Archipelago and the Swedish West Coast. Currently, the Väner Cooperation functions with a limited budget of around 160,000 euros per year, which covers the salary of a part-time (50%) coordinator, public relations and marketing costs, meetings costs and costs related to the organisation of the 'Väner week' (25 000 euros per year). (Väner Cooperation, n.d.)

### **Väner Council**

Väner Council ('Vänerrådet') is a network of actors having signed a common agreement drawn up in 2009, coordinated by the County administrative boards of Värmland and Västra Götaland. This network primarily focuses on the important and complex issue of regulation of the water level. This regulation is effectively carried out by the electricity producer 'Vattenfall'.

The objective is to establish a secure water regulation strategy making it possible to preserve ecosystems as well as social and economic interests. This is a dynamic process, as many changes affect the lake: new measures to prevent landslides along Göta river, construction on new locks on Göta river, strengthening of the security of dams at Lilla Edet and Vargön along Göta river just south of the lake, protection against flooding in Gothenburg and dredging in the port of Gothenburg. In addition, climate change makes episodes with high and low water levels more frequent.

The first meeting of the Väner Council was organised on 25th April 2019. The Action Plan for 2019-2023 was approved (see Text Box 1). The action plan focuses on shared knowledge building, improved communication between stakeholders and dissemination of information on Lake Vänern regulation issues and initiatives.

### **Vänern water management association**

Vänern water management association ('Vänerns vattenvårdsförbund') is a not-for-profit association without legal personality created in 1997, whose members are public and private organisations whose activities have a significant impact on Lake Vänern waters. This association has been integrated in the national environmental monitoring system by being given the status of 'water Council'. Water Councils from areas around Lake Vänern, and belonging to the same water catchment areas, are supporting members of Vänern Water Management Association

The Lake Vänern water management association also supports municipalities and other members by providing the evidence-base for the implementation of action plans for the preservation of the lake waters and of terrestrial environments in the vicinity of the Lake. The Lake Vänern water management association also supports the design and implementation of measures to preserve biotopes and landscapes (e.g. measures

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<sup>30</sup> [https://www.lakevanern.se/wp-content/uploads/2020/05/vanern-varumarkesplattform-och-visuell-identitet-180129\\_low.pdf](https://www.lakevanern.se/wp-content/uploads/2020/05/vanern-varumarkesplattform-och-visuell-identitet-180129_low.pdf)

to locally remove vegetation that developed on beaches and skerries as a result of insufficient variations of water levels).

### ***Joint management of Lake Vänern Water Management***

Joint management of Lake Vänern Water Management ('Samförvaltning fiske i Vänern') is a project sorting under the Vänern water management association, with its own steering group. It started as project of the Västra Götaland County administrative board in 2010, which included the creation of two 'cooperation groups' with stakeholders. These cooperation groups were transformed into a permanent group in 2012 (County administrative board for Västra Götaland, 2014). This group is the recipient of national funding to organise cooperation activities since 2017.<sup>31</sup>

### ***Salmon foundation for Lake Vänern***

Salmon foundation for Lake Vänern ('Laxfond Vänern'): foundation created in 1988 and formed by the 13 municipalities and county administrative boards around the lake. It is currently led by a steering group composed of the county administrative board of Västra Götaland, Region Värmland and the intermunicipal associations of Skaraborg and Fyrbodal (including all municipalities of Västra Götaland region bordering the Lake). The purpose of this foundation is to contribute to the viability of salmon and trout populations around the lake.

### ***Väner Region Business Council***

Väner Region Business Council ('Vänerregionens näringslivsråd') is an informal network of companies and other organisations with a direct or indirect interest in the development of maritime freight transport on Lake Vänern. The network includes shipping companies and companies using freight services, many of which are part of major corporations such as 'Stora Enso', one of world's largest forestry corporation and the cooperative that is owned by 25,000 Swedish farmers. This strategic alliance makes it possible for shipping companies to have more weight in exchanges with national authorities. The Väner Business Council network includes different working groups, focusing on issues such as 'regulation', 'economic development' and 'infrastructure'. These working groups monitor changes in framework conditions for maritime transport on Lake Vänern and formulate proposals for joint positions of the network.

### ***Biosphere reserve***

The Lake Vänern Archipelago Biosphere Reserve covers around one third of the surface of the Lake Vänern region. The Götene, Lidköping and Mariestad municipalities started exploring the possibility of establishing a biosphere in 2004, in order to preserve the natural and cultural heritage of the area and to better capitalise on existing local participative processes. An application was submitted to the Swedish 'Man and biosphere' Committee, and approved in 2006 and the area was inaugurated in 2010. The 'Man and biosphere' committee is led by the Swedish Environmental Protection Agency since 2010. As part of its coordinating role, the Agency provides support to established biosphere areas and to candidate areas. Since 2016, the Swedish Agency for Marine and Water Management also provides support to biosphere areas.

Activities the Lake Vänern Archipelago Biosphere Reserve are coordinated by a biosphere office located in Mariestad municipality. The biosphere area currently has the status of not-for-profit association. Some Regional and national actors are involved in its operations, e.g. the County administrative board of Västra Götaland and the Swedish Forest Agency. The Swedish Environmental Protection Agency provides 32% of the funding, the remaining 68% being funded by the municipalities. The 2020 yearly budget, primarily covering the functioning of the secretariat, was 114,986 EUR (Lake Vänern Archipelago Biosphere Reserve, 2020).

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<sup>31</sup> Interview Jonas S. Andersson – Värmland county administrative board

In 2021, activities include:

- Branding of the area, which companies located in the area can use if they operate on the basis of principles of sustainable development
- Tourism promotion, led by 'Destination Läckö Kinnekulle', but with involvement of the three biosphere municipalities
- Designation and training of 'biosphere ambassadors'
- Coordination of the 'Off Season Art Gardening' EU co-funded cooperation project with the organization Sense of Place in the Netherlands and the Municipality of Ukmerge in Lithuania and the University of Skövde, whose objective is "to join artists in the fields: land art, landscape architecture and garden design. It is also to work with audiences in peripheral urban and rural communities to develop cross cultural competence".<sup>32</sup>
- Travelling exhibition 'My place in the biosphere' in cooperation with the Väner Museum, and based on results from the research project 'Cultural environments and cultural heritage as components of sustainable landscape management'. This project was carried out by the Universities of Göteborg and Gävle.<sup>33</sup>

An evaluation of the biosphere area was submitted to UNESCO in 2020, in accordance with provisions of the Statutory Framework of the World Network of Biosphere Reserves.

### ***Leisure Harbours of Lake Vänern,***

Leisure Harbours of Lake Vänern ('Gästhamnar i Vänern') is the economic association of the 17 leisure harbours around Vänern and municipalities.

### ***Väner Museum ('Vänermuseet')***

The Väner Museum ('Vänermuseet') belongs to Lidköping municipality, organises the yearly event 'Lake Vänern week' for the Väner cooperation association

### ***Perspective for integration between existing organisations***

Reflections on how better to coordinate and possibly integrate these different organisations and networks are current ongoing. The Väner cooperation association is an important driving force in this process. The creation of the website 'lakevanern.se', which was launched in October 2019, is in an important step. Currently, the following organisations appear on the website:

- Väner cooperation
- Väner Council
- Väner Region Business Council
- Leisure Harbours of Lake Vänern

Discussions are ongoing on possibly adding Vänern water management association on this web page. The web page is also an instrument for the branding and tourism promotion of the Lake and dissemination of information on the lake and its neighbouring areas.

Discussions on possible next steps have been slowed down by the COVID-19 crisis. However, both riparian regions are in the process of finalising new development strategies, with time horizons of respectively 2040

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<sup>32</sup> <http://offseasonartgardening.com/about-the-project/>

<sup>33</sup> <https://conservation.gu.se/aktuellt/Nyheter/Nyheter+Detalj//min-plats-i-biosfaren-ny-popularvetenskaplig-skrift.cid1656667>



for Värmland<sup>34</sup> and 2030 for Västra Götaland<sup>35</sup>. These are finally adopted during 2021 (in February for Västra Götaland, and expected in June for Värmland). These strategies contribute to set the scene for the elaboration of strategies for the Lake Vänern area. Discussions on a possible more integrated approach to development of the Lake region are therefore expected to accelerate in the fall of 2021 / winter 2021-2022.

## 3.2 Governance of major lake-related issues

The main issues addressed around Lake Vänern are regulation of lake water level, tourism, water management and fisheries.

### 3.2.1 Regulation of lake water level

Regulation of water levels is, as previously noted, a key issue for Lake Vänern, involving stakeholders from multiple sectors, including nature protection, agriculture, fisheries, transport, energy production, planning, transport, risk and emergency management (Eklund et al., 2018). It is closely linked to climate change, as changes in water regimes make it necessary to adapt the regulation strategy. While possible regulation principles are discussed with a long-term perspective, rapid interventions can also be needed when water levels are abnormally high or low.

Until 1937, water levels were not regulated. Water levels varied significantly, and floods were frequent. However, the fauna and flora had adapted to these varying water levels. In 1937, principles for the regulation of water levels were adopted through judgment by a specialised jurisdiction ('Västerbygdens vattendomstol'). It implied that water levels would be comprised between two maximum and minimum thresholds. In practice, this proved difficult to implement<sup>36</sup>. The major flood of 2000-2001 illustrated these limitations.

The Väner Council was established to address this issue. It is a cooperation group, whose members have signed an agreement to promote cooperation and contribute to exchange of knowledge and experience. They also commit to assess the impact of their current or planned activities on the Väner lake, and to explore how their activities could contribute to a long-term sustainable regulation of the water in Vänern. Members include:

- National authorities: Swedish Maritime Administration, Swedish Transport Administration, Swedish Transport Administration, Swedish Civil Contingencies Agency
- Västra Götaland Region
- Visit Värmland regional tourism board;
- Local authorities: the Väner cooperation (i.e. the 13 Väner municipalities), but also a number of municipalities located along the Göta river downstream from Lake Vänern: Gothenburg, Trollhättan, Lilla Edet, Ale, Kungsälv.
- The private company Vattenfall, which as operator of the Vargön hydroelectric station is effectively entrusted with the responsibility of regulating water level.
- Water Management Associations<sup>37</sup> for Lake Vänern and Göta River
- Interest organisations, e.g. Swedish Landowners' Association, the Federation of Swedish Farmers, Association of Väner Fishers, Swedish Anglers' Association.

<sup>34</sup> <https://varmlandsstrategin.se/>

<sup>35</sup> <https://www.vgregion.se/regional-utveckling/sa-styrs-regional-utveckling/regional-utvecklingsstrategi-for-vastra-gotaland-2021-2030/remissforfarande-for-nasta-regionala-utvecklingsstrategi>

<sup>36</sup> [https://www.riksdagen.se/sv/dokument-lagar/dokument/motion/om-andrad-reglering-av-vattenavrinningen-ur-vanern\\_G002121](https://www.riksdagen.se/sv/dokument-lagar/dokument/motion/om-andrad-reglering-av-vattenavrinningen-ur-vanern_G002121)

<sup>37</sup> See subsection 3.3.3 below for further description of the role of Water Management Associations

## Text Box 1 Action Plan for the Väner Council 2019-2023

### 1. Water regulation

a) Review the previous proposals for water level regulation strategy. Define what we mean by safe and nature-adapted water level regulation strategy. Is it possible to make gradual changes? Investigate the adaptation to high water levels by municipalities and other actors.

b) Analysis of water judgment based on the proposal for a new water level regulation strategy. Compare the proposals with the current water judgments, taking into account issues such as such as dam safety and landslide protection.

### 2. Knowledge building

a) Common calendar of activities - Establish a shared overview of various planned initiatives with consequences for the area. What initiatives, projects, investments should be included? Based on the activity calendar, identify synergy effects and coordination or obstacles to this, of major works / projects such as lock construction, landslide protection, dredging, flood measures, etc. Inform each other and work based on a holistic approach.

b) Data cubes - Granted project with the Swedish Space Agency. Develop tools for measuring over time, following up on consequences of measures, inventory, etc.

c) Educational tools - digitally visualize and illustrate that shows the water distribution and other consequences of different water levels.

### 3. Communication and information

a) General information - Continuously tell the public about the Vänerrådet and its activities.

b) Targeted communication - dialogues with different target groups, which remain to be precisely identified. Monitoring and lobbying of national authorities, including government.

A temporary water regulation strategy has been applied since 2008, in view of limiting the highest water levels and reducing the risk of floods. Dialogues between stakeholders have been maintained to assess implications of this strategy. An exemption was made in May 2020, as Lake Vänern water levels had fallen by about 40 cm between March and May. This implied that water regulation functioned according to the 1937 water judgment between May and September 2020<sup>38</sup>.

The adjusted water regulation strategy has otherwise succeeded in maintaining water levels at a relatively stable level. These stable levels have led to bush encroachment along the shorelines of the lake, which is a serious to biodiversity in and around the lake (Väner Council, 2020). A working group has been established within the Väner Council to elaborate a new water level regulation strategy. This working group includes representatives from the Väner municipalities, the Väner cooperation, the County administrative boards of Värmland and Västra Götaland, the city of Gothenburg, the Swedish Transport Administration, the Swedish Maritime Administration and the Water management association of Lake Vänern. The foreseen activities of this working group also include an inventory of flood prevention measures taken by lake Vänern municipalities.

Testing of alternative water regulation approaches elaborated by this group will start in 2022. The water judgment of 1937 is foreseen to be revised in 2033, as a part of a revision process for all water judgments across Sweden. The participative process within the Väner Council may, if successful, prepare the ground for a water judgment that addresses the interests and needs of the wide range of involved stakeholders in the best way possible.<sup>39</sup>

<sup>38</sup> <https://www.lakevanern.se/nyheter/ny-tappningsstrategi-vanern-testas/>

<sup>39</sup> Interview with Gunnar Lagerkvist (Värmland County Administrative Board) and Håkan Alexandersson (Västra Götaland Administrative Board)

### 3.2.2 Maritime transport

There are five different freight harbours around Lake Vänern (Karlstad, Kristinehamn, Otterbäcken, Lidköping and Vänersborg). They are all owned by the limited company 'Vänerhamn', which was created in 1994 based on recommendations from a national enquiry on how to increase the competitiveness of maritime traffic on the lake. Since 1998, Vänerhamn is also a co-owner of the Vänerepressen company, which offers combined rail and road freight solutions between Gothenburg harbour and the Lake Vänern region. This joint ownership could facilitate the development of multimodal (sea, rail, road) freight solutions.

As mentioned in section 2.7, inland waterway transport is confronted to a number of issues, e.g. high pilot fees, increased taxation, ageing infrastructure (e.g. water locks on Göta River). The Väner Business Council considers that the position of national authorities is inconsistent: On the one hand, they argue in favour of a modal shift from road and rail to inland sea transport. On the other hand, they implement a taxation policy which makes this transportation mode less competitive<sup>40</sup>. The Swedish Maritime Administration points out that it does not have a mandate to pursue regional policy.

#### Text Box 2 Swedish Maritime Administration's assessment of the effect of the 2016 increase in taxes on inland maritime traffic

The Swedish Maritime Administration is aware that the fee increases entail greater costs for certain traffic in certain regions. Regarding traffic in Lake Vänern and Lake Mälaren, the Swedish Maritime Administration has commissioned VTI to assess in more detail the goods' price sensitivity, which was carried out in 2020.

There are no clear signs that there has been a transfer of goods from sea to land transport and it is of course impossible to reliably determine from available statistics whether a volume of goods has moved from shipping to land-based transport. In Lake Mälaren, loaded and unloaded volumes with shipping increased during the period 2016 to 2019.

In Lake Vänern, both loaded and unloaded freight volumes fell between 2017 and 2018, which could be an effect of the change in the toll system, but volumes rose again between 2018 and 2019. In recent years, unloaded freight weight in Lake Vänern has been around 400,000 tonnes per year. Volumes have fallen a lot since 2010 when the volume was around 500,000 tonnes per year. Loaded volumes have remained relatively stable over the period 2010 to 2018, around 350,000 tonnes per year, even though the product mix has changed somewhat.

Transported goods weight by truck has grown sharply during the period 2015 to 2018, but there is no difference in the growth rate between the years. Transported volumes by truck within Västra Götaland and between Västra Götaland and Värmland increased significantly between 2017 and 2018, but it is impossible to say whether these are volumes that previously went on Lake Vänern. **It is also important to point out that the Swedish Maritime Administration does not have the mandate pursue regional policy and that such decisions could potentially contravene EU state aid rules.**

In 2018, a national coordinator for inland maritime traffic and short sea shipping was appointed<sup>41</sup>. The main objectives were to promote more energy efficient and competitive inland transport with limited emissions of greenhouse gases and pollutants. This is done on the basis of dialogue between actors and dissemination of knowledge.

The Väner Business Council regrets that EU regulation on inland waterways is only partially implemented in Sweden. This limits its competitiveness, as specificities compared to other types of maritime transport are not sufficiently taken into account<sup>42</sup>.

<sup>40</sup> Interview with Johan Källsson, coordinator of Lake Vänern Business Council and Managing Director of Erik Thun AB

<sup>41</sup> <https://www.regeringen.se/regeringsuppdrag/2018/08/uppdrag-att-inratta-en-nationell-samordnare-for-inrikes-sjofart-och-narsjofart/>

<sup>42</sup> Interview with Johan Källsson

Preconditions for cooperation with regional authorities and bodies on the promotion of inland waterway transport are different. While Värmland Chamber of Commerce is fully aligned on the positions of Vänern Business Council, there are a number of conflicts of interest with the West Sweden Chamber of Commerce and Västra Götaland Region. For example, the interests of the harbour of Gothenburg are not necessarily aligned on those of Lake Vänern harbours and shipping companies. There have also been conflicts over the construction of a new bridge over Göta River in Gothenburg ('Hissingebrom').

### 3.2.3 Tourism

As noted above, around Lake Vänern is currently underdeveloped. It is promoted by a number of different organisations: Guest harbour of Vänern (Gästhamnar i Vänern), Visit Värmland (association of public and private stakeholders), Dalsland Turism (owned by the six municipalities of the historical province of Dalsland), Tourism council of Western Sweden (Turistrådet Västsverige) (owned by Region Västra Götaland) and a number of local tourism development companies, such as the previously mentioned 'Destination Kinnekulle-Läckö'. This multiplicity of actors is explained by the size of the lake and by the fact that it borders two administrative regions and three historical provinces. The challenge is to bring these actors together, and to promote Vänern as one destination. Tourism promotion of Götene and Lidköping municipalities is coordinated under the brand 'Läckö Kinnekulle'.<sup>43</sup>

The 'Lake Vänern Grand Tour' project is the central component of tourism-related cooperation. Its objective is to create a continuous, safe and clearly signposted cycle path around the Lake. The total length of the cycle path will be 629 km, subdivided in four parts. Local teams have been created in each of the 13 municipalities around the lake. The Swedish Transport Agency has been involved to check road safety for cyclists on the different roads. The objective of the proponents of the cycle path is to get it approved as a "national cycle path" by the Transport Agency. The application is formally submitted by the Väner Cooperation. Maintenance of the road sections used remains the responsibility of different operators/owners. The Väner Cooperation therefore needs to monitor this maintenance and report to the Transport Agency on a yearly basis. The objective is to inaugurate the cycle path in 2021. The Väner cooperation will promote the path, targeting both national and international audiences.

### 3.2.4 Water management

Environmental monitoring of large lakes was intensified in the 1970s, under the leadership of the Swedish Environmental Protection Agency. In the 1990s, responsibility for this monitoring was transferred to the regional level. However, it was then transferred back to the national level. It is in this context that the Vänern Water Management Association was established in 1997. It is currently coordinated by the Swedish Agency for Marine and Water Management. Local associations are established to organise their realisation. These associations can take two forms:

- Water associations have legal personality.
- Water management associations (as in the case of Vänern) are volunteer organisations without legal personality.

In parallel, Sweden was subdivided in five 'Water Districts' in 2004, as part of the implementation of the EU Water Directive (see Map 20). Within each water district, one of the County Administrative boards is designated as 'water authority'. Lake Vänern sorts under 'Skagerrak/Kattegat Water District' ('Västerhavets Vattendistrikt'), of which the water authority is the County Administrative board of Västra Götaland, with its seat in Gothenburg. The water authority is responsible for the implementation of the EU Water Directive. This includes the elaboration of water management plans, the definition of environmental norms and the elaboration of action programs. These three types of contributions are coordinated and revised in six-year cycles. Proposals for revisions are submitted to public consultations over 6 month periods. The consultation for the forthcoming water management plan is carried out between 1st November 2020 and 30th April 2021.

Water Management association are integrated in the national environmental monitoring system by being given the status of "Water Councils". These Water Councils cover the entire territory around Lake Vänern,

<sup>43</sup> <https://www.vastsverige.com/lackokinnekulle/kinnekulle/>

and do not overlap. Water Councils from areas around Lake Vänern, and belonging to the same water catchment areas, are supporting members of Vänern Water Management Association

All organisations that have an impact on the lake become members. Cost reduction is a main incentive to become member. Membership makes it less expensive to comply with environmental impact monitoring rules. For example, the association funds reference measuring stations, to which measurements located in the immediate vicinity of the potential polluting activity may be compared.

The Vänern Water Management Association currently has 38 members, including:

- 13 riparian municipalities;
- Both riparian regions;
- Industries with emissions into the lake;
- Swedish Armed forces (as an air force base is located next to Lake Vänern);
- Swedish Maritime Administration (for water transport);
- Lake harbours;
- Lake fishermen organisation;
- Vattenfall, as regulator of the water levels in Lake Vänern.

In addition, there are 38 supporting organisations, including interest organisations. Management association members pay a limited yearly membership fee (50 EUR) and additional “measuring fees” that are proportional to their size.

Vänern Water Management Association elaborates a multiannual Lake Water Management Plan. The current plan for 2016-2021 period focuses on:

- Drinking water quality
- Lake bays
- Prevention against invasive species
- Fight against toxic substances in the lake
- Limiting vegetation on beaches and skerries

The plan is currently being revised. A draft version will be submitted to public consultation in the fall of 2021. The next programming period will be 6 or 8 years. These plans at Lake level are coordinate with the wider scale Action programme for the ‘Skagerrak/Kattegat Water District’ (‘Västerhavets Vattendistrikt’). From the perspective of the municipalities, the Lake action programme is a component of the pursuit of Agenda 2030 objectives.

Currently addressed issues include:

- Insufficiently precise monitoring of some fish species, making it difficult to allocate new fishing licenses
- Early identification of new invasive species: a specific budget has been allocated to lake Vänern Management Association to address this issue, by the Swedish Agency for Marine and Water Management under the so-called ‘LOVA’ mechanism<sup>44</sup>
- Tracking of toxic and environmentally damaging substances:
  - o Per- and polyfluoroalkyl substances (PFASs), and in particular Perfluorooctanesulfonic acid (PFOS)
  - o Traces of drugs, eg. hormones (estrogen)

These analyses have been carried out by the Swedish University of Agricultural Sciences (SLU) on behalf of the Vänern water management associations, jointly with equivalent organisations for Vättern and Mälaren Lakes<sup>45</sup>.

<sup>44</sup> <https://www.havochvatten.se/anslag-bidrag-och-utlysningar/havs--och-vattenmiljoanslaget/lova.html>

<sup>45</sup> <https://www.slu.se/ew-nyheter/2021/2/risk-for-forhojda-halter-av-hormoner-och-pfos-i-vara-stora-sjoar/>

The dialogue with Municipal planning agencies is described as “well-functioning”<sup>46</sup>. Some of the issues addressed are:

- The importance of avoiding constructions of buildings and infrastructure in the immediate vicinity of the lake;
- Risks associated with flooding of known polluted land areas, which may significantly affect the quality of Lake Vänern Water.

A number of other, tributary rivers feed into Lake Vänern from the north, west, east and south. These are managed by separate water management associations, in dialogue with Lake Vänern Water Management Association. Issues such as over-fertilisation from agriculture area addressed around some of the rivers.

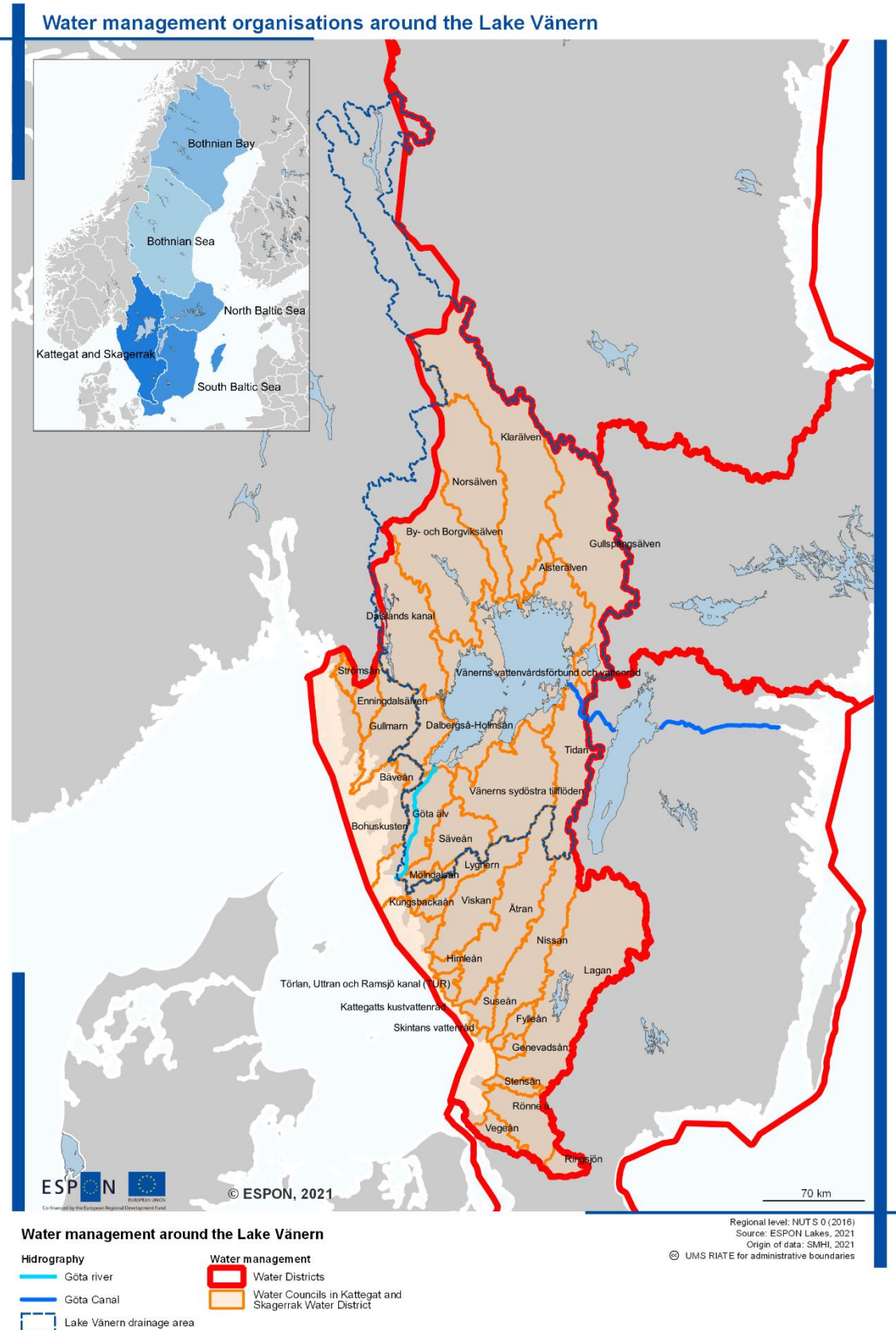
The management of the longest tributary river of Lake Vänern, Klarälven, involves cross-border cooperation. Klarälven connects Lake Vänern to Lake Femunden in Norway. Under the name ‘Trysilelva’ on the Norwegian side of the border, this stream is in total 460 km long. The Femunden lake is at an altitude of 664 meters above sea level and covers 200 km<sup>2</sup>. Regulation concerning this river and lake on the Norwegian side of the border prohibit the construction of dams and hydropower stations. A 2015 cross-border report on the ecological status of the river, including an action programme, focused on the challenge of salmon migration. (County administrative board for Värmland and County governor Hedmark, 2015)

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<sup>46</sup> Interview with Sara Peilot – head of the Väner Secretariate and coordinator of the Vänern Water Management Association



Map 20 'Water Districts' and 'Water management associations'



Source: <https://www.lansstyrelsen.se/vastra-gotaland/miljo-och-vatten/vattenverksamhet/vattenorganisationer-och-luftvardsforbund.html>

### 3.2.5 Fisheries

A “Joint management” approach of fisheries was initiated by the Swedish government in June 2004. The national fishery authority tested it in six pilot areas, of which two were inland areas (Lake Vättern and river Vindelälven). “Joint management” implies that multiple authorities and stakeholders of a given fishing area are actively involved. A formal framework is elaborated for this governance arrangement by national authorities. They also contribute with capacity building measures and ensure that local and regional actors have sufficient resources to carry out the missions assigned to them. European funds from the EMFF can be mobilised for this purpose. (Swedish National Board of Fisheries, 2006)

Until 2014, fisheries management in Lake Vänern continued to be organised in a top-down way, under the responsibility of the Swedish Agency for Marine and Water Management. In 2014, the county administrative boards of Västra Götaland and Värmland initiated a change in governance models, inspired by experience from the neighbouring Lake Vättern. The county administrative boards observed that numerous organisations and authorities were involved in fish-related issues, but that coordination between them was “far from optimal”. (County administrative board for Västra Götaland, 2014). It also noted that the Lake Vänern water management association (see section 3.3.3) was supportive of the idea of joint management. This led to the publication of fisheries management plan (County administrative board for Västra Götaland, 2014). A joint fisheries management discussion forum was established as part of the preparation of this plan, in 2013.

The Joint management group sorts under the Lake Vänern Water Management Association, whose secretariat is located at the County Administrative Board of Västra Götaland. However, the coordinator is based at the County administrative board of Värmland.

Between 2014 and 2017, the joint management group operated without dedicated funding. From 2017 national funding became available. This for example made it possible to organise thematic days for professional fishermen. More recently working group on regulatory matters has been established this group discuss is proposals for new regulation which on then submitted to the County administrative board for opinions and then two national authorities.

In parallel, a Fisheries local action group (FLAG) for Lake Vänern was established for the 2014-2020 EU programming period. The FLAG developed a development strategy for the fisheries area (FLAG Vänern, 2016) and funded a number of projects within the fields of product development, fish processing, promotion of fisheries products, protection of fish stocks, environmental measures, knowledge building, dissemination and cooperation.<sup>47</sup>

The 2020 report of Fisheries Local Action Groups (Ringsby et al., 2020) advocates the following measures to make Lake Vänern fisheries more sustainable:

- Reduce obstacles for persons who wish to establish themselves as fishers, i.e. administrative procedures, authorisations, access to knowledge and know-how;
- More systematic indications of origin of fish offered for sale, strengthening the Väner Lake product brand and working within the framework of the national Swedish strategy for foodstuff with a 2030 horizon<sup>48</sup>;
- Make the general public and decision makers more aware of the advantages of small scale inland fisheries, as compared to intensive high sea fisheries, with respect to their sustainability and impact on ecosystems;
- Improve measurements on fish stocks, so that informed decisions can be made on the allocation of new fishing licenses;
- More flexible solutions regarding fishing licenses, e.g. making it possible for senior fishers who wish to retire to “phase out” their activity, at the same time as younger fishers may “phase in”;
- Create arrangements for transfers of knowledge between experienced fishers and young fishers who wish to learn the trade;

<sup>47</sup> <https://fiskeomradevanern.se/pagaende-projekt/>

<sup>48</sup> <https://tillvaxtverket.se/arnesomraden/affarsutveckling/livsmedelsstrategi.html>



- Improve dialogues between authorities and fishers, e.g. by better separating control and supervision functions from support and guidance to fishers;
- Remain open to the development of new products and innovation. Vendace roe is an example of a current major fishing product from Lake Vänern which was unexploited until the beginning of the 20<sup>th</sup> century.

A separate initiative to support salmon and trout resources in Lake Vänern has operated since 1988. The Vänern Lake Salmon Fund was established by the County administrative boards and the 13 riparian municipalities. Its objectives are:

- to acquire and release high-quality salmon and trout smolt of Väner origin
- to fund long-term sustainable activities through fundraising and business activities
- to contribute to good access to breeding fish of Väner origin
- to contribute to the follow-up and development of the fisheries conservation activities in Lake Vänern

The Fund has a capital of approximately 23 million SEK (2,3 million EUR). The return on capital is mainly used to release smolt. Around 750,000 SEK (75,000 EUR) are spent every year on smolt release. The initiative is led by a board, of which the members are appointed by the county administrative boards of Västra Götaland and Värmland, the intermunicipal associations Skaraborg and Fyrbodal.

### 3.3 Cross-sectoral and Multi-level interplay

#### Cross-sectoral interplay

The extension and deepening of cross-sectoral interplay is one of the main envisaged options for cooperation around lake Vänern for the years to come. Currently, the main arenas of cross-sectoral cooperation are:

- The Väner Council, as the regulation of the water level involves stakeholders from a wide range of sectors;
- The lake Vänern website ('lakevanern.se'), which includes organisations with different sectoral focus.
- The Väner brand, which has been designed to be used by actors belonging to different sectors.

#### Relations with the regional level

Coordination and multi-level interplay is influenced by the fact that the border between Värmland and Västra Götaland regions runs through Lake Vänern:

- Värmland is an inland region, for which Vänern is a link to the outside world (through freight traffic), that could become more important in years to come. The functional and political centre of Värmland (Karlstad) is located on the lake.
- Västra Götaland is a coastal region, for which Vänern is more of an inner periphery and a possible extension of its maritime (blue growth) development strategy. The functional and political centre of Västra Götaland is located at the mouth of Göta river, about one hour by road from the lake. There are potential or effective conflicts of interest between Lake Vänern and Göteborg metropolitan area: potentially, interests regarding water level regulation may be different, as high water levels around Lake Vänern could be part of the solution to protect the Gothenburg region; effectively, the city of Gothenburg has chosen a solution for a new bridge over Göta river that does not take fully into account the needs of boats navigating to and from Lake Vänern.

As noted in the introduction, Västra Götaland region also has 6 times the population and 8 times the GDP of Värmland region.

Furthermore:

- Västra Götaland region offers a permanent 'contact point' for the Väner cooperation, i.e. the Maritime Cluster of West Sweden<sup>49</sup>. However, the Väner cooperation is not actively involved in the elaboration of regional development plans.
- The Värmland region has no permanent 'contact point' for the Väner cooperation.

The regions of Västra Götaland and Värmland have recently finalised regional development strategies for the coming years. Inputs elaborate by the Väner cooperation as part of consultations organised for the elaboration of these strategies provide:

- In relation to the Värmland strategy, the Väner Cooperation suggested to put more emphasis on the potential contribution of maritime traffic on Lake Vänern to the promotion of sustainable mode of transport and on other assets linked to the lake: as living environment, as area for outdoor activities and the preservation of good health, as tourism destination and as provider of ecosystem services. Furthermore, the Väner cooperation notes that the Värmland strategy focuses on bioeconomy, but that no 'blue economy'<sup>50</sup> targets are formulated within this field. It is suggested to focus more on maritime transport of bioeconomy products. It is also emphasized that the Väner cooperation can contribute to the implementation of the strategy by bringing together actors from different sectors, municipalities and regions. A selected number of key challenges are highlighted<sup>51</sup>:
  - o Increase maritime freight traffic on Lake Vänern;
  - o Sustainable tourism development, including adequate infrastructure endowment;
  - o Coordinated communication on Väner-related issues
  - o Sustainable regulation of water levels;
  - o More coordinated perspectives on the development of place attractiveness;
  - o Sustainable fisheries;
  - o Improved ecological status of the lake.
- In response to the draft regional development strategy for Västra Götaland 2021-2030, the Väner Cooperation regretted that the maritime dimension had been toned down. They consider that blue economy potentials could have been emphasized more. This could have been done by focusing on blue economy R&D&I potentials, and by more precise perspectives on how nature and natural environments can become economic development assets. In terms of transport, the Västra Götaland strategy makes no reference to inland waterways and to the modal shift from road to maritime transport that could become possible as the century-old locks on Göta River are rebuilt, and as efforts are made to develop barge transport and container traffic. As for the Värmland strategy, the Väner cooperation emphasizes that it could be instrumental in the implementation and success of the Västra regional development strategy.

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<sup>49</sup> <https://www.maritimaklustret.se/en/about-us/>

<sup>50</sup> [https://ec.europa.eu/maritimeaffairs/policy/blue\\_growth\\_en](https://ec.europa.eu/maritimeaffairs/policy/blue_growth_en)

<sup>51</sup> <https://varmlandsstrategin.se/remissvar/>

### Relations with the national level

Regarding interactions with the national level, the Swedish government has shown limited interest in cooperation around Lake Vänern<sup>52</sup>. However, the County administrative boards of Västra Götaland and Värmland, which represent the government in the regions, have played a proactive role in strengthening cooperation, especially as coordinators of the Väner Council.

### 3.4 Main trends in adaptive capacity, resilience, learning

The key resilience issue in the Lake Vänern region is linked to the regulation of the water level. For municipalities, the major flood of 2000-2001 primarily had an impact on water provision and treatment facilities, roads, leisure infrastructure. The most affected economic sectors of activity were agriculture and fisheries.

The national 'Climate and Vulnerability inquiry' of 2007 (Climate and Vulnerability inquiry, 2007) produced an interim report focusing on 'Risks and measures for Lakes Mälaren, Hjälmaren and Vänern' (Climate and Vulnerability inquiry, 2006), in which costs of a '100 year flood' at 46,5 m were estimated at around 1 billion euros. The 'design flood' is the level which is advocated as a 'worst case scenario' that may be used as a basis for planning. Economic impacts would be particularly high on buildings, water treatment facilities, industries, roads and electricity production facilities (see

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<sup>52</sup> Interviews with Laila Gibson (coordinator of Lake Vänern Cooperation) and with Gunnar Lagerkvist (Värmland County Administrative Board) and Håkan Alexandersson (Västra Götaland Administrative Board)

Table 5). In addition to measurable economic effects, a flood can have a major impact on ecosystems and biodiversity, as pollutants accumulated in contaminated land areas are spread in the lake.

A 2008 thesis reviewed municipal measures around Lake Vänern and Göta river to address the risk of flooding in the fields of planning and construction works observes that the protection of existing settlements remains a major challenge. New dwellings are built so as not to be exposed to flooding risks. The study concludes that Lake Vänern municipalities are not well-prepared to the risk of flooding. However, some municipalities such as Karlstad and Mariestad are more advanced than others (Blomqvist et al., 2008).

The County Administrative Boards of Värmland and Västra Götaland jointly produced a handbook for physical planning in flood-exposed areas. (Ivarsson et al., 2011) This handbook includes:

- A planning model, describing the different steps in the flood hazard mitigating planning process,
- Descriptions of existing regulations
- Explanations on the characteristics and implication of different types of floods (along rivers, around lakes, close to the sea), on the delineation of flooding zones and their integration in individual municipal plans
- Examples of possible measures

In order to ensure that municipal planning is based on latest research results and updated figures, a separate "Fact sheet" is annexed to the handbook and updated regularly (see e.g. County administrative boards of Västra Götaland and Värmland (2017)).

In a 2018 op-ed, the technical manager of Mariestad municipality argues that "most of the damaged observed in 2000-2001 would not occur again in the event of a new high water level episode", as "the risk preparedness and as instruments to analyse weather forecasts now function well". Furthermore, he argued that "a large share of damages that occurred in the countryside were due to insufficient maintenance of protective levees. This, he argues, was corrected after 2001.

**Table 5 Estimated costs of a '100 year flood' and 'design flood' (million euros, 2007)**

	100 year flood (+46,5 m)	Design flood (+47,4 m)
Maritime traffic	35	45
Roads	90	190
Railways	16	56
Buildings	570	1140
Agriculture	6,5	8,9
Forestry	0,3	3,5
Fisheries	0,7	0,7
Water treatment facilities, pipes and sewage systems	110	310
Electricity production	66	93
Industries	150	360
<b>Total</b>	<b>1,045</b>	<b>2,238</b>

Source: Climate and Vulnerability inquiry (2006)

This challenge is expected to accentuate with the climate change. It is expected that water inflow from the tributaries of Lake Vänern can reach 3,500 m<sup>3</sup> per second, while the capacity of Göta river, the only emissary of Göta river, has a maximum capacity of 1,030 m<sup>3</sup> per second. Excessive flows of water into Göta river generate a high risk of landslides and flooding in the areas around Göta river, including the metropolitan region of Gothenburg. This risk is accentuated by rising sea levels. (County administrative Board of Västra Götaland et al., 2018).

The Swedish Meteorological and Hydrological Institute initiated and funded a project to compile knowledge about lakes Vänern, Mälaren and Hjälmaren between 2016 and 2018. As part of the elaboration of this report, a reference group was established with representatives from the County administrative boards, some municipalities, farmers' associations, the Swedish Maritime Administration, the Swedish Transport Administration, the Swedish Geotechnical Institute, the Vänern cooperation and the Göta Canal company (Eklund et al., 2018). The Vänern Council pursues further efforts in this regard, e.g. data cubes with remote sensing data from the EU Copernicus programme. (Vänern Council, 2019)

## 4 Status quo in a nutshell

Lake Vänern region can generally be described as an inner periphery between the metropolitan regions of Gothenburg, Stockholm and Oslo. The Gothenburg metropolitan area provides a major neighbouring potential market for proximity leisure and tourism around Lake Vänern. Karlstad and southern parts of Värmland region can capitalise on its position on the main transportation axis between Oslo and Stockholm. Lake Vänern could therefore capitalise on a strengthening of “proximity tourism”, e.g. as a result of restrictions on air travel and of the COVID-19 epidemic. Adjacent Göta canal is a high profile tourism destination in Sweden, which has managed to maintain or even increase numbers of visitors also during the COVID-19 lockdown in 2020. The inauguration of a cycle path around the lake in 2022 is expected help to improve the external visibility of the lake. At the same time, this structuring piece of infrastructure may contribute to the emergence of a more coherent tourism offer around the lake.

At the same time, water level regulation is a major challenge. Risks of flooding (around Lake Vänern and along Göta river) and of landslides (along Göta river) are a major concern. Inadequate water level regulation may also limit freight traffic, lead to bush encroachment along the shores of the lake, lower the ecological status of the lake and limit the capacity of hydropower stations along Göta river to produce electricity. It proves challenging to elaborate a water regulation strategy that preserves this wide range of interests, especially as climate change enhances the variability of rainfalls and affluent river discharges.

The preservation of biotopes in and around the lake is another key concern. Migrations of fish species between different habitats, e.g. for spawning and rearing, is limited by small-scale hydroelectric production. Furthermore, over 60 percent of the nitrogen supply from Swedish sources to the Skagerrak comes from Lake Vänern and the Göta River. This is one of the reasons for which measures need to be implemented to reduce nitrogen levels in Lake Vänern<sup>53</sup>.

Maritime freight transport can be further developed on Göta river and Lake Vänern with appropriate regulatory and fiscal framework condition and with upgrades / reconstructions of current locks. The construction of a new bridge across Göta river in Gothenburg city could become a limiting factor. However, establishing a regular container connection between Vänern and Gothenburg could contribute to a functional integration between the port of Gothenburg and ports of Lake Vänern.

Fisheries are as previously noted concentrated around Spiken fish harbour at the tip of the Kållandsö peninsula. Exported fish catches are traditionally mainly commercialised in Gothenburg. More recently, cooperation has been initiated with Stockholm fish auction. Small scale direct sale to consumers in the Lake Vänern Region is being developed.

Different cooperation instances have been identified. Municipalities around the lake apply step-by-step approach. Tourism development is used as a lever to bring actors together, strengthen lake Vänern identity and collectively explore whether a more integrated approach to Lake Region development would be called for. This dialogue and cooperation have recently been slowed down by the COVID epidemic. However, the creation of the 'lakevanern.se' website, to which other cooperation initiatives such as the Lake Vänern Council, the Lake Vänern Business Council and the Lake Vänern Leisure Harbours have been associated, pays testimony to a shared wish of actors around the lake to join forces,

Among challenges to be overcome, one may mention the variable interest of regional and national authorities in Lake Vänern issues and opportunities. Some progress has been made in this respect, e.g. with the appointment of a national coordinator for inland maritime traffic and short sea shipping in 2018. However, lake actors observe that the Swedish Agency for Marine and Water Management does not actively support the emergence of more integrated development in large Lake regions. The creating of a Lake Vänern foundation, based on models from the Stockholm Archipelago and the Swedish West Coast, could help to strengthen the capacity of Lake Vänern actors to cooperation and weigh in on national and regional policy debates.

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<sup>53</sup> <http://extra.lansstyrelsen.se/vanern/Sv/fakta-om-vanern/vanerfragor/Pages/kvavehalten.aspx>



Figure 7 SWOT of Lake Vänern, summarising the findings from previous sections

Strengths	Weaknesses
<p><b><u>Governance</u></b></p> <p>A well-established dialogue and cooperation between municipal actors</p> <p>A shared understanding of how cooperation may be further developed</p> <p>Well-established, regular events (e.g. Lake Vänern week and assembly)</p> <p>A joint website bringing together key actors</p> <p>Strengthening of 'Lake Vänern' identity in recent years</p> <p><b><u>Regional analysis</u></b></p> <p>Proximity to major metropolitan areas (Gothenburg, Stockholm, Oslo)</p> <p>Some dynamic towns and cities along lake shores with higher education and research institutions</p> <p>Extensive underexploited tourism and leisure potentials, both in terms of natural and cultural heritage</p> <p>Bathing and drinking waters are of good quality</p> <p>Fisheries resources, e.g. vendace roe</p>	<p><b><u>Governance</u></b></p> <p>Two riparian regions that relate to the lake region in different ways</p> <p>Multiple instances of cooperation dialogue with incomplete coordination</p> <p>Insufficient commitment of municipal and regional actors to provide stable and sufficient resources for coordination activities.</p> <p>Lack of interest on key national authorities in Lake region cooperation (e.g. Swedish Agency for Marine and Water Management)</p> <p><b><u>Regional analysis</u></b></p> <p>Weak brand, assets of Lake Vänern are not well known.</p> <p>Economically, the area is "in the shadow" of Gothenburg, Örebro and Oslo.</p> <p>'Old sins' in terms of water pollution remain an issue, e.g. for fisheries</p> <p>Achieving good ecological status is challenging, due to hydropower dams</p>
Opportunities	Threats
<p><b><u>Governance</u></b></p> <p>Possibility of creating a Lake Vänern foundation (based on models from Stockholm Archipelago and Swedish West Coast)</p> <p>Capitalise on the being the "Centre of Värmland"</p> <p><b><u>Regional analysis</u></b></p> <p>A trend in favour of "proximity tourism" could benefit Lake Vänern</p> <p>The 'Lake Vänern Grand Tour' bicycle path could generate a new dynamic.</p> <p>Lake Vänern maritime transport has a role to play in the transition to more sustainable freight transport.</p> <p>Promote short food supply chains for fisheries and agricultural products</p>	<p><b><u>Governance</u></b></p> <p>Loss of momentum and institutional learning if one does not manage to ensure a continuity between projects</p> <p>Conflicts of interest within Västra Götaland region (e.g. inland waterways, water regulation)</p> <p>Pressures to maximise electricity provision from Göta river may lead to prioritise down the interests of the Lake Region (in terms of water regulation)</p> <p><b><u>Regional analysis</u></b></p> <p>Climate change may make water level regulation more challenging. Risk of flooding.</p> <p>Floods may release pollutants from contaminated land areas into the lake.</p> <p>Urban-rural polarisation is increasing</p> <p>Landscapes may change as a result of strict water regulation</p> <p>Fisheries may decline as a result of insufficient recruitment of young fishers</p>

## 5 Participatory process: Towards integrated development

### 5.1 Starting points for participatory process

The Lake Vänern Region is characterised by:

- Weak planning: there is no planning at the level of the Lake Region as a whole. Regional strategic documents tend to ignore the lake. Integrated regional planning is emerging, with the recent adoption of regional development strategies. National shoreline regulations (which are a main framework for physical planning around the lake) are applied differently in the two regional subcomponents of the Lake. Municipal planning has relatively good, albeit variable, provisions for flooding.
- Sectoral planning is:
  - o Relatively well-established for water management and fisheries,
  - o Only emerging for inland waterway transport, with the appointment of a national coordinator,
  - o Only emerging for tourism, with a dialogue started in recent month.
- Cross-sectoral planning and integrated spatial planning do not occur.

### 5.2 Methodological framework

The participatory process was subdivided in two components:

- A web survey
- A focus group meeting

Both activities were designed and implemented in close cooperation with representatives of the Väner cooperation. Particular care was taken not to negatively impact ongoing discussions between actors of the Lake Region.

The processes and outputs of each participatory process component are described in the sections below.

### 5.3 Results of the web survey

A survey was sent to local and regional stakeholders around Lake Vänern, with questions developed in close cooperation with the Lake Vänern cooperation focusing on four dimensions:

- Current state of the Lake Region,
- Current cooperation and cooperation needs,
- Integrative perspectives for Municipal urban planning practices around Lake Vänern,
- Sustainable maritime development potentials and perspectives,
- Internal and external branding of Lake Vänern.

The survey was sent to approximately 200 people who were free to share it with other interested stakeholders. It was open for four weeks. In total, 70 responses were received. A majority of respondents (42) work for municipal authorities in different capacities. 6 belong to a private company or an organisation representing the interests of multiple private companies.

**Table 6 Number of survey respondents by category**

Category of organisation	Number of respondents
Municipality	42
Private company	6
Region	4
Research organisation	3
Tourism promotion	3
Territorial cooperation initiative	3
County governor's office	3
Not-for-profit organisation	3
National agency	3
<b>Total</b>	<b>70</b>

Results of the survey are synthesised in the subsections below.

### 5.3.1 Strengths, weaknesses, threats and opportunities of Lake Vänern

The main strengths are tourism, fisheries, inland waterway transport, living environments, landscapes and opportunities for open air leisure activities

The main weaknesses identified are the difficulties at regulating the water level, the lack of a clear identity and brand, pollutants left by previous industrial activities, the lack of maintenance of harbours and water locks, the insufficient tourism infrastructure and the lack of cooperation between actors.

Opportunities mentioned are very similar to strengths, reflecting a difficulty at identifying new development possibilities. Respondents mention the possibility of developing tourism, leisure activities, inland waterway transport and fisheries. Energy production is the only possible “new” field of development. The previous analysis has shown that wind energy is a source of conflicts.

A threat that has not been identified in the expert analysis, but that is mentioned by some respondents, derives from shoreline protection regulations. This is partly due to the fact that these national regulations are not interpreted in the same way by County governor offices for Värmland and Västra Götaland, which leads to frustration among local actors.

Other identified threats are the lack of cooperation between actors, pollution from microplastics, invasive species, climate change, flooding, excessive regulation of water levels leading to bush encroachment.

### 5.3.2 Current cooperation and cooperation needs around Lake Vänern

A majority of survey respondents state that water management and environmental monitoring are well coordinated, while communication, branding and tourism should be better coordinated.

Eight respondents consider that the tourism industry is not a target group for any cooperation organisation.

There are mixed views on the quality of coordination for:

- Water level regulation,
- Freight transport,
- Consultation responses,
- Fishing.

To the question “Is it clear to you which organisation or association is working on which issues?”, an equal number of respondents reply respectively ‘yes’, ‘no’ and ‘I don't know’. Among persons working for municipalities, there is a greater proportion of negative answers (40%), and less than 30% positive answers. However, 60% of representatives of private companies consider that they have a clear perception of which organisations or associations are working on which issues. Two thirds of respondents representing territorial cooperation initiatives and tourism promotion offices do not consider this clear.

It therefore appears that a significant number of respondents do not feel familiar with Lake Vänern cooperation, in spite of being located in the area and/or working with lake-related issues. More information is therefore needed. Among those that are familiar with Väner cooperation, around half think that divisions of tasks and responsibilities could be clearer.

In response to the question: "How do you want development issues related to Lake Vänern to be addressed in the regional development strategies and in the work of the regions?":

- 12 respondents refer to the visibility of Lake Vänern in the Regional Development Strategies.
- 13 respondents mention the importance of interregional coordination, on specific issues or in general.

Only a few respondents would like to formalise the "Lake Vänern Region" as a geographic context for statutory planning or territorial development policies. Most respondents are in favour of soft cooperation approaches.

### **5.3.3 Sustainable maritime development potentials and perspectives around Lake Vänern**

Most respondents believe in the potential for development in tourism and maritime transport, to a lesser extent in marine services (marinas, ports) and marine food (e.g. seafood) and to a limited extent in maritime manufacturing and technology. It therefore appears that respondents have little faith in the possibility of developing new activities around Lake Vänern.

A large proportion of respondents believe that closer cooperation between stakeholders can help to promote sustainable maritime development. This cooperation can be inter-municipal, inter-regional or vertical (e.g. with national and European authorities).

Many stakeholders also stress the need for policies or regulations focusing on specific issues, such as active industrial policy, climate-friendly technologies, noise regulation, control of emissions of harmful substances, environmental policy, management of marinas, fuels and boat engines, promotion of freight transport, new water level management strategy, water quality regulation, promotion of electric engines.

### **5.3.4 Integrative perspectives for Municipal urban planning practices around Lake Vänern**

In Sweden, integrated planning primarily occurs at municipal level. Tentative regional physical planning has been initiated in 2019, but only concern the regions of Scania (Malmö) and Stockholm, i.e. not the Lake Region.

Respondents were asked which component of municipal integrated planning "could be worked on in a more comprehensive way around Lake Vänern?" and given the possibility of selecting multiple issues. Answers confirm that the focus is on issues that are already the object of most cooperation: tourism, water regulation, maritime transport, resource management.

**Table 7 Answers to the question “municipal planning issues that could be worked on in a more comprehensive way around Lake Vänern”**

	Total
Sustainable tourism, management systems and nodes	44
Water regulation, flooding, climate adaptation	41
Maritime transport and ports, increased cargo at sea, handling of dangerous goods, etc.	37
Lake Vänern as a resource in general, attractiveness	36
Consensus in planning, shoreline protection	33
Knowledge transfer, information, lobbying	27
Fishing	18
Public transport	17
Lighthouses and other important cultural sites	17
Other	7

### 5.3.5 Internal and external branding of Lake Vänern

Current branding for visitors is given mostly intermediate score (3-4 out of 7). It is lower with respect to branding for new residents and current residents, and even lower for investors.

Most respondents consider that the focus should be on continued efforts to market Lake Vänern as a tourism destination.

## 5.4 Results from the focus group

A Focus Group meeting with key local and regional stakeholders of development in Lake Vänern region was organised on 22<sup>nd</sup> June 2021. The objective of the meeting was to critically assess outputs from the survey, and collectively reflect on objectives, resources, instruments and cooperation frameworks for sustainable development in the Lake Vänern Region. One key topic was how lake issues and opportunities could be addressed within the framework of the new Regional Development Strategies for Värmland and Västra Götaland, which had been adopted shortly before the meeting.

Ten stakeholders accepted the invitation to participate in the meeting (see Table 8)

**Table 8 Participants in focus group meeting**

Erik Gløersen	Spatial Foresight, Facilitator
Anders Nilsson	ESPON LAKES stakeholder
Laila Gibson	Coordinator of Lake Vänern cooperation
Madeleine Norum	Coordinator of Lake Vänern Grand Tour project
Dag Rogne	Säffle municipality
Maria Frisk	Region Värmland
Linda Janliden Resare	Region Värmland
Bjarne Olsson	Member of Värmland Regional Council, previously chair of Lake Vänern cooperation
Karolina von Mentzer	Region Västra Götaland
Marie Fors	Region Västra Götaland
Pernilla Schedin	Region Västra Götaland

The Focus group meeting confirmed that representatives from the regional level are interested in engaging in Väner-related issues, but that exchanges are still at an early stage. This implies that it was not possible to specify how a more integrated perspective could be promoted. The meeting led to an agreement on



continued informal exchanges on how more attention could be paid to Lake Vänern and its surroundings in the implementation of the recently adopted regional development strategies (“RUS”) for Värmland and Västra Götaland. This could help to orient some of the funding that will be made available for this implementation in direction of lake Vänern.

Some sectoral issue emerged in the discussion, e.g. public transportation. Regional involvement would for example be called for the establishment of a more consistent public transportation system for visitors and inhabitants. One of the options mentioned was the creation of a ferry between Källandsö and Ekenäs that would bring Lidköping and Säffle much closer together.

Further discussions are needed to allow local actors to access regional funding. However, it was stated that the visions of the regional development strategies that have been adopted would function as a framework for measures targeting Lake Vänern.

It was mentioned that part of the challenge for integrated regional approaches is that Västra Götaland and Värmland belong to different ESIF support areas.

The Västra Götaland region pointed out that one of the arenas for more integrated approaches is the Landscape observatory, which functions as a platform for dialogue<sup>54</sup>. It follows the ratification of the European Landscape Convention.

The Lake Vänern Grand Tour cycle path will be inaugurated in 2022, and functions as a backbone for cooperation around new integrated tourism products. Dialogues to set up this cooperation have progressed significantly, but roles and responsibilities still need to be defined.

The Lake Vänern region is currently in a critical phase of its development:

- Having set up a well-functioning municipal cooperation, that led to the creation of a major new infrastructure.
- In the process of establishing a dialogue with the regional level.
- With some significant developments at the national level, e.g. with respect to inland waterway transport (investments in new waterlocks, preparing for the revision of the water judgment in 2033, which will set new principles for the regulation of water levels).

The capacity to capitalise on these favourable preconditions will require:

- A more stable commitment of municipal actors to cooperation around the Lake,
- The capacity to mobilise regional funding, e.g. for transport infrastructure investments and new connections.

Overall, involved actors agree on the usefulness of advancing on all four aspects mentioned. They have a limited capacity to reply on how this could be achieved.

Regarding water level regulation, a meeting between the County Governors gave a key impetus for more integrated action in the framework of the Väner Council. One of the options mentioned is to organise a similar meeting with focus on more integrated Lake development. The other option mentioned is to organise a meeting between civil servants to explore how best to access existing funding instruments.

National support to the Lake Vänern bicycle path, to reconstruction of century-old river locks and to a possible revision of regulations for inland waterway regulations provide a positive context for a wide range of such regional investments.

The participatory process therefore suggests that the integrative perspective Lake Vänern still lacks a clear focus, and remains open to a wide range of options. Spatially integrated perspectives are not yet high on the agenda. The focus is rather on concrete issues and opportunities, in the fields of

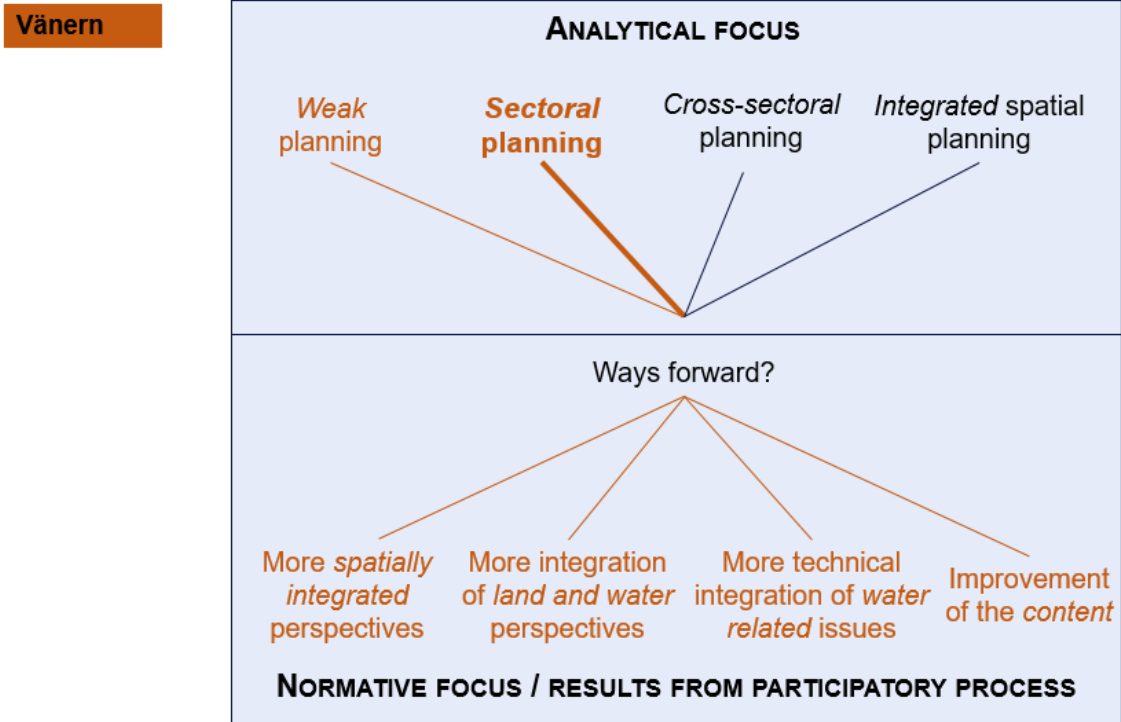
- water-related issues, and in particular regulation of water levels

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<sup>54</sup> <https://lovq.se/>

- more integrated land and water perspectives, especially with respects to tourism and planning (regulation of building permits along shorelines)
- general improvements of content, e.g. with respect to sustainable economic development and attention paid to lakes in regional development strategies.

**Figure 8 Results of the Lake Vänern case study in a nutshell**



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# Annex 1 Syntheses of Regional strategies from 2021 onwards for Västra Götaland and Värmland

## Regional strategy for Västra Götaland

The Regional Development Strategy for Västra Götaland (see section 3.1.1) ambitions to develop a more environmentally friendly transport sector seems particularly relevant for Lake Vänern. A modern and competitive inland waterway transportation sector may offer an environment friendly alternative to road transport and complement rail transport. However, a precondition for such a development is that adapted regulatory and fiscal framework conditions are established. This is the ambition of the national coordinator for inland maritime traffic and short sea shipping (see section 4.3.2), who will submit proposals in the coming year.

Some of the ‘cross sectoral powerhouses’ of the Regional strategy for Västra Götaland may also be related to ambitions for the Lake:

- “Digitalisation in public, private and third sector” is, at the level of the Lake Region, particularly relevant for the development of the tourism sector and the emergence of integrated tourism products as a result of the momentum created by ‘Lake Vänern Grand Tour’ project.
- “Electrification of industry and of the transport sector” is an objective that encourages actors around the Lake to optimise the production of electricity from renewable sources (hydropower, wind, biomass), and to consider electrification of maritime transport (e.g. electric ferries and barges)
- “Circular business models” may encourage closer consideration of functional integration between the major urban regions of Västra Götaland, on the one hand, and rural areas and towns located around Lake Vänern, on the other.

Värmland regional strategy 2014-2020 primarily describes the Vänern Lake as freight transport axis, source of drinking water, leisure area. The possibility of developed public transportation on the water is also mentioned, as well as the need to limit the risk of flooding. (Region Värmland, 2014) The critical importance of freight transport on Vänern is confirmed by the current proposal for a strategy for Värmland between 2021 and 2040, which also mentions its importance as a living environment, factor of in-migration and tourism development (Region Värmland, 2020). ‘

## Regional strategy for Värmland

The Regional Strategy for Värmland after 2021 is still in the process of being finalised. The version published as part of the public consultation process contains multiple provisions of relevance for sustainable development at the level of the Lake Region. The first focus area is “building preparedness”. Discussion on water level regulation, and on preparations for future climate change, may be related to this focus area. It provides a wider framework for these discussions, by emphasizing the importance of building resilient communities and economies in the face of increasing uncertainty. The Värmland regional strategy identifies the following main factors of preparedness: good health and welfare, social cohesion and interaction, innovation capacity and robust systems for the provision of water, energy, foodstuffs and welfare services. The Lake Vänern region can be a relevant level for the contributions to these objectives:

- The lake provides important leisure and outdoor recreation areas for the preservation of good health;
- The strengthening of ‘Lake Vänern’ identity, and awareness of the need for joint action to preserve the lake, contributes to social cohesion and interaction;
- Innovative solutions will need to be elaborated to ensure the sustainable development of tourism and transport activities around the lake;



- Sustainable fisheries and farming around the lake contribute to robust provision of foodstuffs. The development of short food supply chains around the lake can increase income for producers, and quality and robustness of supply for consumers.
- Renewable energy production solutions on and around the lake can be further explored in dialogue between concerned stakeholders, in order to minimise negative externalities of their development.

Another focus area is the development of “attractive and accessible places”, with emphasis on living environments, culture, sustainable transport and digital connectivity. Lake Vänern helps to put emphasis on proximity to water as a factor of quality of life and attractiveness, and on the measures needed to preserve these assets. This includes limiting bush encroachment along the shoreline, ensuring the quality of leisure harbours for boat tourism, preserving and valorising heritage around the lake (e.g. industrial heritage). Maritime transport can be a component of sustainable transport.

Finally, the Värmland strategy focuses on strengthening its competitiveness and innovation capacity, with the ambition of transitioning into a “circular biobased economy”. The focus is on forestry and wood industry, tourism and food production. In all these respects, the Lake region can play a significant role. Maritime transport can make flows of production inputs and outputs more sustainable. It is surrounded by arable land and is a major asset for tourism development.





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