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Regulation of Lake Vänern – a challenge for the Göta Älv and Gothenburg.

IMMERSE 1st Transnational Exchange Lab 12 June 2019 Gothenburg, Sweden













Montycke



The catchment area constitutes about 10% of Sweden's area.







VÃNERN







The Göta Älv Sweden's longest watercourse.

Klarälven – Lake Vänern - Göta River total length 756 km

The Göta Älv - Sweden's largest river

Göta River 93 km long.Average water flow570 m3 / sec.Max flow1 030 m3 / sec.Min. Flow115 m3 / sec











FLOWS AND REGULATION



Small drop between Lilla Edet and the sea means that the water does not run away, regardless of whether you increase the flow in the upper part of the river



FLOWS AND REGULATION



Lake Vänern – risk of flooding

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FLOWS AND REGULATION



Climate change-higher sea level

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COMPLEX SYSTEM – MAJOR RISKS – DIFFICULT CONSEQUENCES

- High water flow, high sea level with flooding as a result.
- Low water level in Lake Vänern
- Water regulation with dam safety issues
- Ship traffic, waterway with locks
- Landslides and ground collapse
- Natural interests, overgrowing
- Watersupply





OVERGROWING



Brommö, oktober 2000

Natural interests are currently threatened.

The current regulation strategy does not allow for major variations in the water level of Vänern.



Brommö, augusti 2012



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THIS HAPPENS IN THE GÖTA ÄLV:

Reservoir guide curve

Agreement since 2008 between the county Administrative Board Västra Götaland and Vattenfall AB extended until 2019

The regulation strategy secures against flooding but contributes to overgrowing.

Green strategy?





THIS HAPPENS IN THE GÖTA ÄLV : Dam safety-enhancing measures on hydro powerplant at Vargön and in Lilla Edet







Critical levels in Lake Vänern



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THIS HAPPENS IN THE GÖTA ÄLV : New locks in the waterway.

- Swedish Maritime Administration waterway holder
- Swedish Transport Agency build designer
- Organization is set
- Construction start no earlier than 2026
- Several alternative routes



Foto: Markus Lundkvist.



THIS HAPPENS IN THE GÖTA ÄLV : Secure against landslides along the river

Swedish Geotechnical Institute:

Mission to develop a plan for continuous stability improvement along the river.

Coordinate actions and support preventing landslides and ground collapse

Landslide in Göta 1957





THIS HAPPENS IN THE GÖTA ÄLV : Dredging in the port of Gothenburg

Gothenburg will be the first port at the new navigation of the Arctic



Lengthen the quay and widen the turning basin and dredge to be able to bring in loaded oceangoing vessels. Build start 2026? Affects the flow in the river and the **salt water wedge**



THIS HAPPENS IN THE GÖTA ÄLV : Flood protection in Gothenburg

Barrier to the sea influences the outflow from the River.







THIS HAPPENS IN THE GÖTA ÄLV : Flood protection in Gothenburg





THIS HAPPENS IN THE GÖTA ÄLV : Climate change – New levels in Lake Vänern



In the Future:

- Higher levels.
- More common with low levels.
- More common with low water flow.
- Rising sea levels.



MANY STAKEHOLDERS – NO COORDINATION

Hydropower Company,
Swedish Maritime Administration
The Transport Administration,
Swedish Geotechnical Institute
Swedish Civil Contingencies Agency
Swedish Environmental Protection Agency
2 County Administrative Boards

Fisheries, shipping, agriculture, industry, tourism, water conservation associations

18 municipalities 15 000 landowners



VERY INVESTIGATIVE – LESS ACTION 10 years of "temporary" regulating strategy



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The Lake Väner Council-a big step for the future of Vänern

The aim is to establish a safe and environmentally adapted regulation strategy for Lake Vänern, which takes the interest of both Natural values and societal interests

Concentrate with increased collaboration and coordination

Collaboration Group

- not a decision-making body

Typical Swedish consensus model





