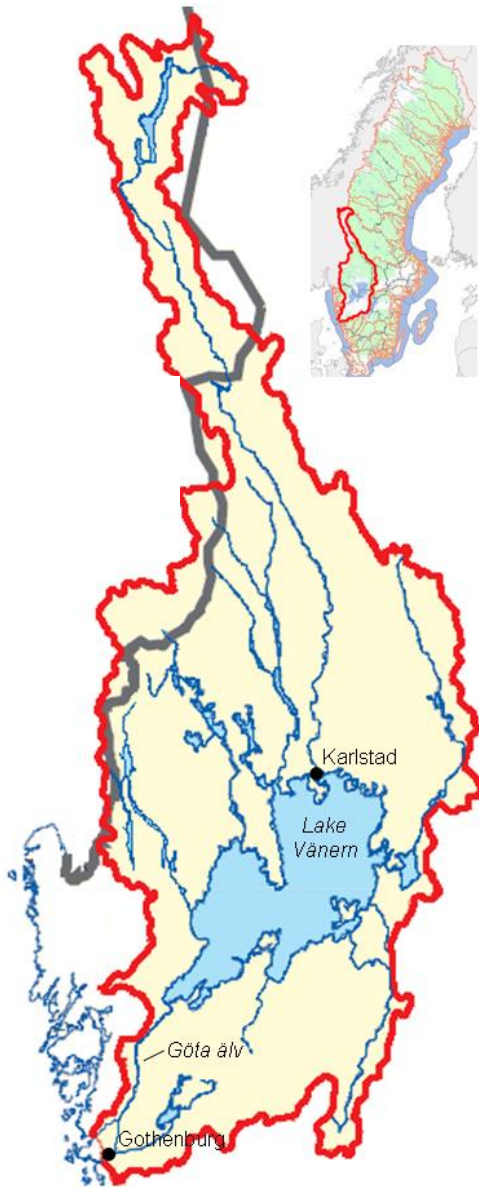


Sustainability Aspects of Water Regulation and Flood Risk Reduction in Lake Vänern



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Lake Vänern



- 50,200 km² catchment
- Lake area 5,600 km²
- Flood risk in the lake and most tributaries
- Flood 2000/2001
- Landslide risks along Göta älv and Klarälven
- Hydropower dams
- Heavy industry/Polluted soil
- Drinking water supply



Europe's largest natural lakes	Area (km²)
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1. Ladoga (Russia)	17 670
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2. Onega (Russia)	9 670
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3. Vänern (Sweden)	5 648
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4. Saimaa (Finland)	4 400
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5. Peipus (Estonia/Russia)	3 555
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6. Vättern (Sweden)	1 893
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7. Vygozero (Russia)	1 285
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8. Mälaren (Sweden)	1 122
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9. Ilmen (Russia)	1 120
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10. Beloje (Russia)	1 119
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Lake Vänern risk topics

- Flood risks
- Discharge limitations
 - Landslide risks Göta älv
- Regulation regime
 - Landscape and ecosystem effects
- Protection of cities
 - Existing settlements
 - New developments



Water level 1850-2013

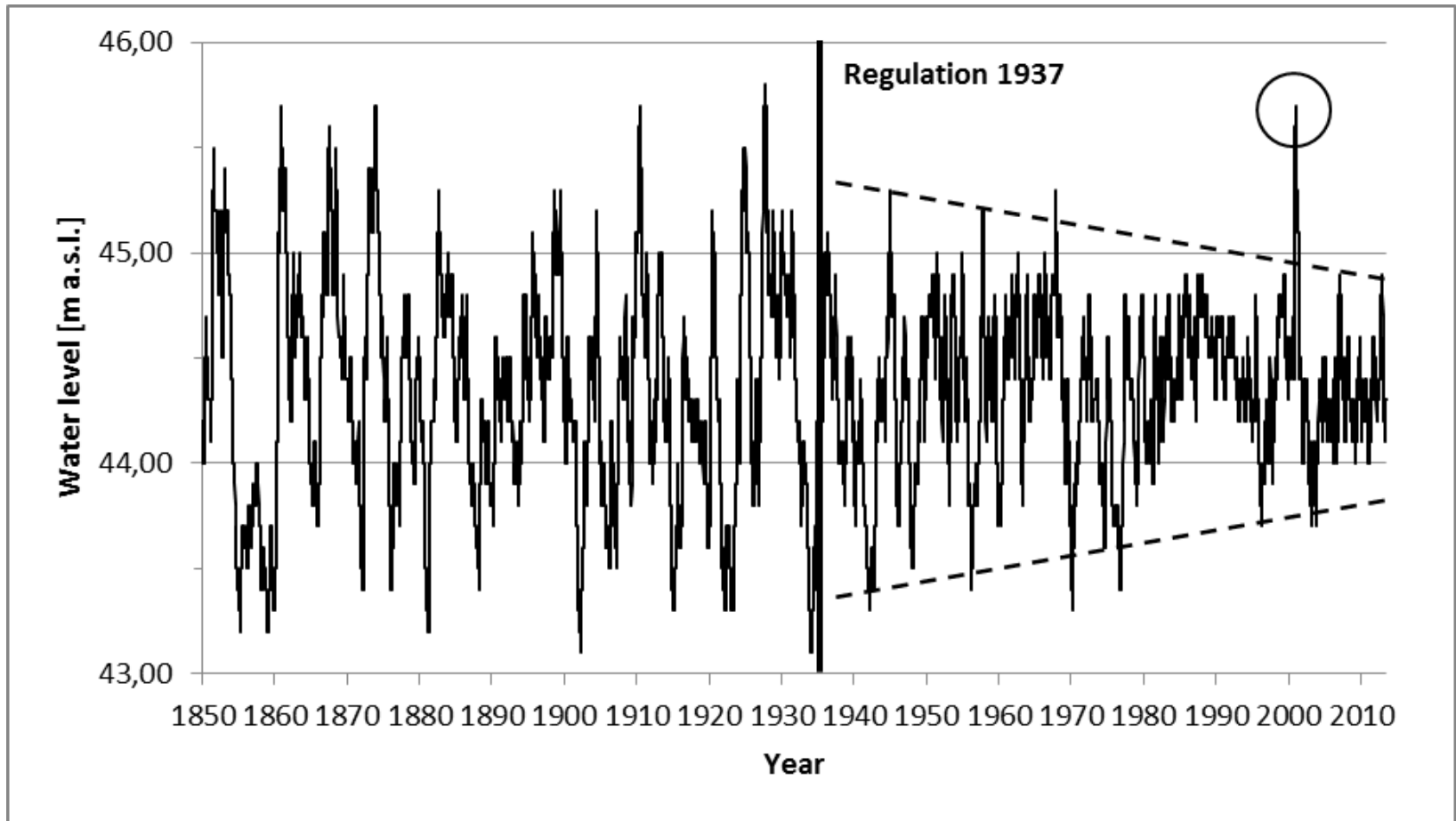




Photo: Länsstyrelsen

Values and interests

<u>Ecology och landscape</u>	<u>Economic values</u>
Landscape	Hydropower
Unique habitats and species	Fishery
Recipient	Agriculture
	Shipping
<u>Social values</u>	Tourism
Life quality in 13 municipalities	Critical infrastructure
Recreation	Industry
Drinking water	

Nyberg L, Evers M, Dahlström M, Pettersson A. 2014. Sustainability aspects of water regulation and flood risk reduction in Lake Vänern. *Journal of Aquatic Ecosystem Health and Management*.



Values and interests	Flood consequences	Conseq. of lowered water level
<u>Ecology and landscape</u>		
Landscape: e.g. 2000 km coastline, 22000 islands	+ -	-
Unique habitats and species: e.g. fish, bird habitats	+	-
Recipient: industries, cities	-	+

Values and interests	Flood consequences	Conseq. of lowered water level
<u>Social values</u>		
Life quality in 13 municip.	—	+
Recreation: fishing, boat life, swimming, summer houses	—	—
Drinking water for 800,000 people	—	+ —

Values and interests	Flood consequences	Conseq. of lowered water level
<u>Economic values</u>		
Hydropower	—	+ —
Fishery	—	+ —
Agriculture	—	+
Shipping	—	+ —
Tourism	—	+ —
Critical infrastructure	—	+
Industry	—	+

Conflicting interests

Interest

Flood protection



Low level and low amplitude

Hydropower,
shipping



Average level and low amplitude

Nature and
landscape protection



Larger amplitudes and seasonal variation



Thanks for your attention!

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