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Water management on the local level

Is it possible to recreate functional aquatic environments in a city?

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City of Stockholm

Environment and Health Administration

What is the value of achieving good water status in Stockholm?

Water related ecosystem services are key factors for a living and sustainable city

- Drinking water of good quality
- Clean water for swimming
- Beautiful shorelines
- Sustainable boat-life
- Rich biological diversity
- Unique angling

- The cost for reaching good water status is roughly estimated to 100 million €.
- The value of good status is estimated to 250-280 million €

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From regional management to local action plans

Classification of status, analysis of pressures, and physical measures

Water district management plan and PoM:s

Action plan for good water status

Local programmes of measures with information about were, how, when, by whom and to what cost

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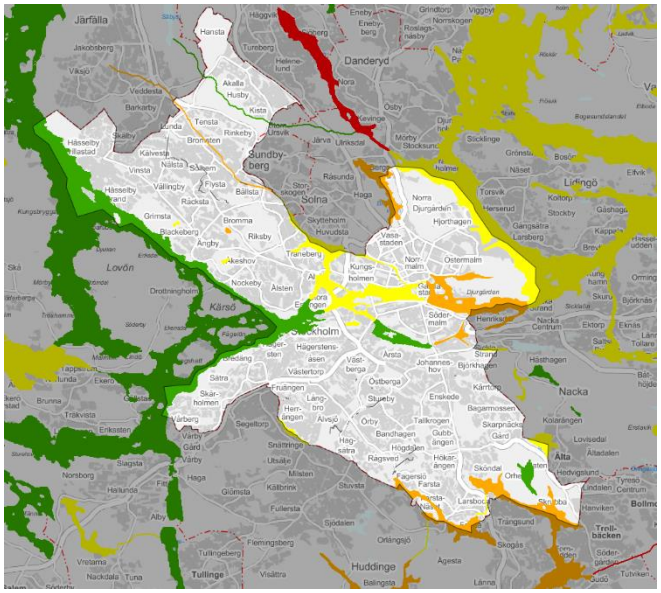
The lakes and streams of Stockholm

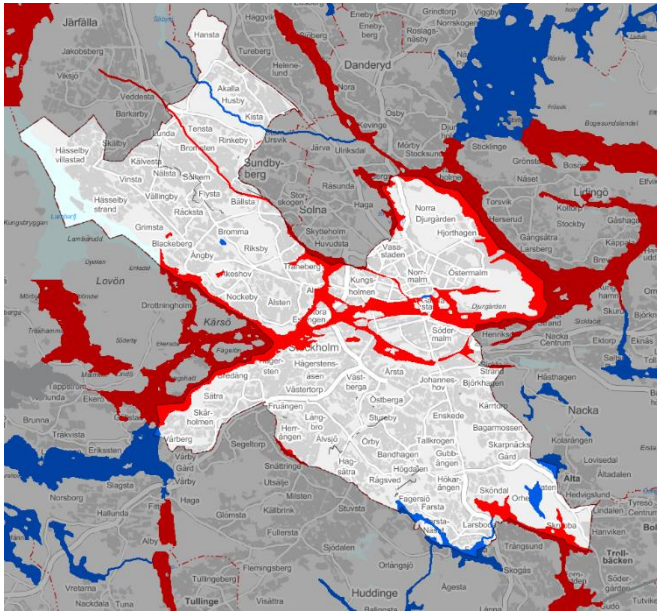
Major environmental impacts:

- Eutrophication, hazardous substances and altered habitats.

Major sources of pressure:

- Contaminated stormwater from industrial and urban land use, roads and constructions.
- Untreated wastewater from storm overflows and faulty connections in the waste- and stormwater system.
- Old legacies – untreated urban wastewater, industrial wastewater and land use.
- Migration barriers and morphological alterations due to exploitation in water and near the shoreline.





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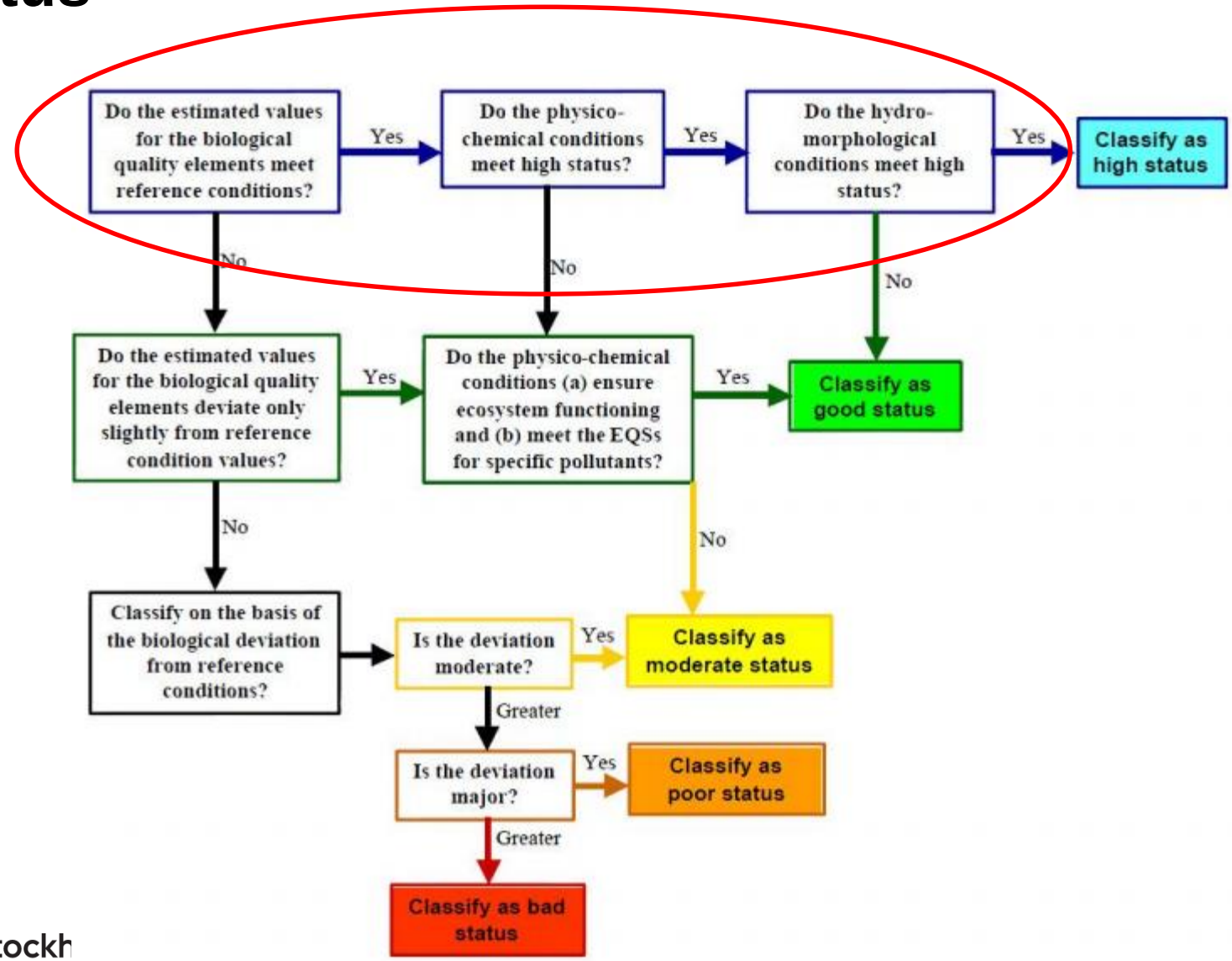
The system for classification of ecological status



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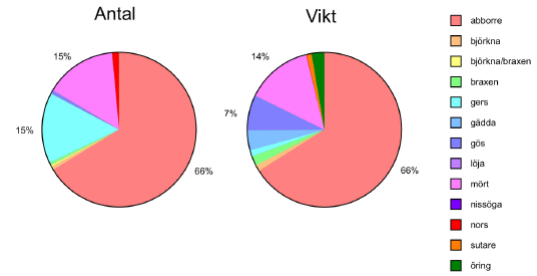
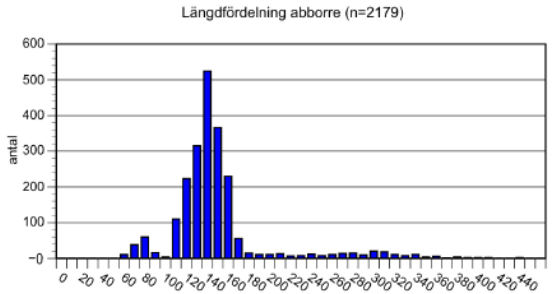
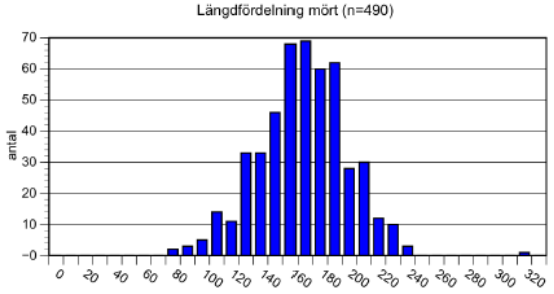
The population of fish in the city of Stockholm



Figur 3. Artsammansättning i antal och vikt vid provfiske i Riddarfjärden september 2017.



Figur 4. Abborrens längdfördelning vid provfiske i Riddarfjärden 2017.



Figur 5. Mörtens längdfördelning vid provfiske i Riddarfjärden 2017.

”Heat map” over the vegetation around the island of Långholmen, in Riddarfjärden during the summer of 2017

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Functional ecosystems in an urban environment – is it possible?

- Test objects: The waterbodies Årstaviken, Ulvsundasjön and Riddarfjärden.
- Mission:
  - To verify and update the classification of the hydromorphological quality elements, including determining reference conditions.
  - Describe the current situation through analysis of maps, plans and by conducting hydrographic surveys.
  - Investigate if it is possible to reach good ecological status regarding the hydromorphological quality elements, and if not;
    - propose measures to enhance the physical habitats so they can sustain viable populations of aquatic organisms.
  - If the urban environment complicates the restoration to natural conditions, technical measures that give similar results shall be proposed.

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Hydromorphological quality elements

The hydromorphological status in lakes, streams and costal water bodies are determined by the following quality elements:

– Connectivity (”migration ability”)
– Hydrological regime (”volume and flow dynamics”)
– Morphology (”appearance and functions”)

Present conditions are compared against reference conditions and the status is determined as a deviation from the reference conditions

Status	Assessment
High	Deviates with at most 5 % from the reference conditions.
Good	Deviates with more than 5 % but at most 15 % from the reference conditions.
Moderate	Deviates with more than 15 % but at most 35 % from the reference conditions.
Bad	Deviates with more than 35 % but at most 75 % from the reference conditions.
Poor	Deviates with more than 75 % from the reference conditions.

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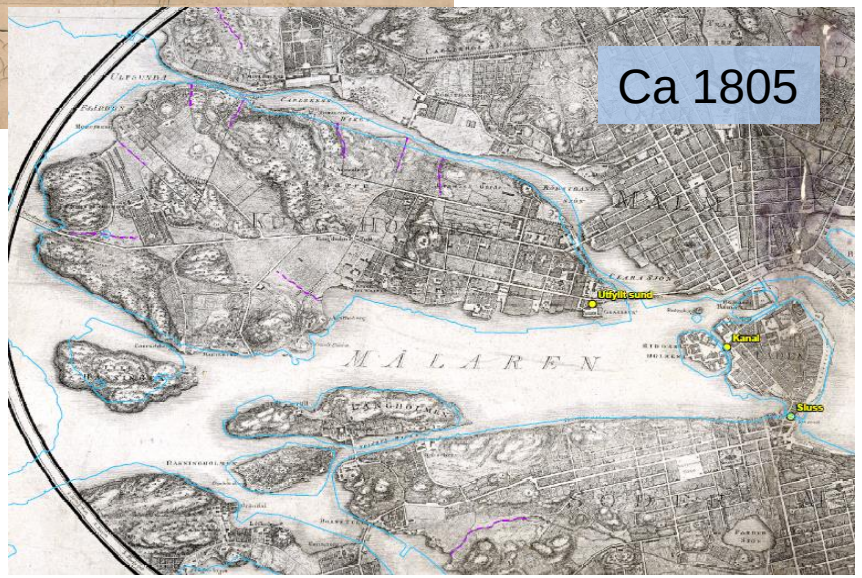
How to determine reference conditions

(If the project budget doesn't cover a mad professor with a rebuilt DeLorean…)



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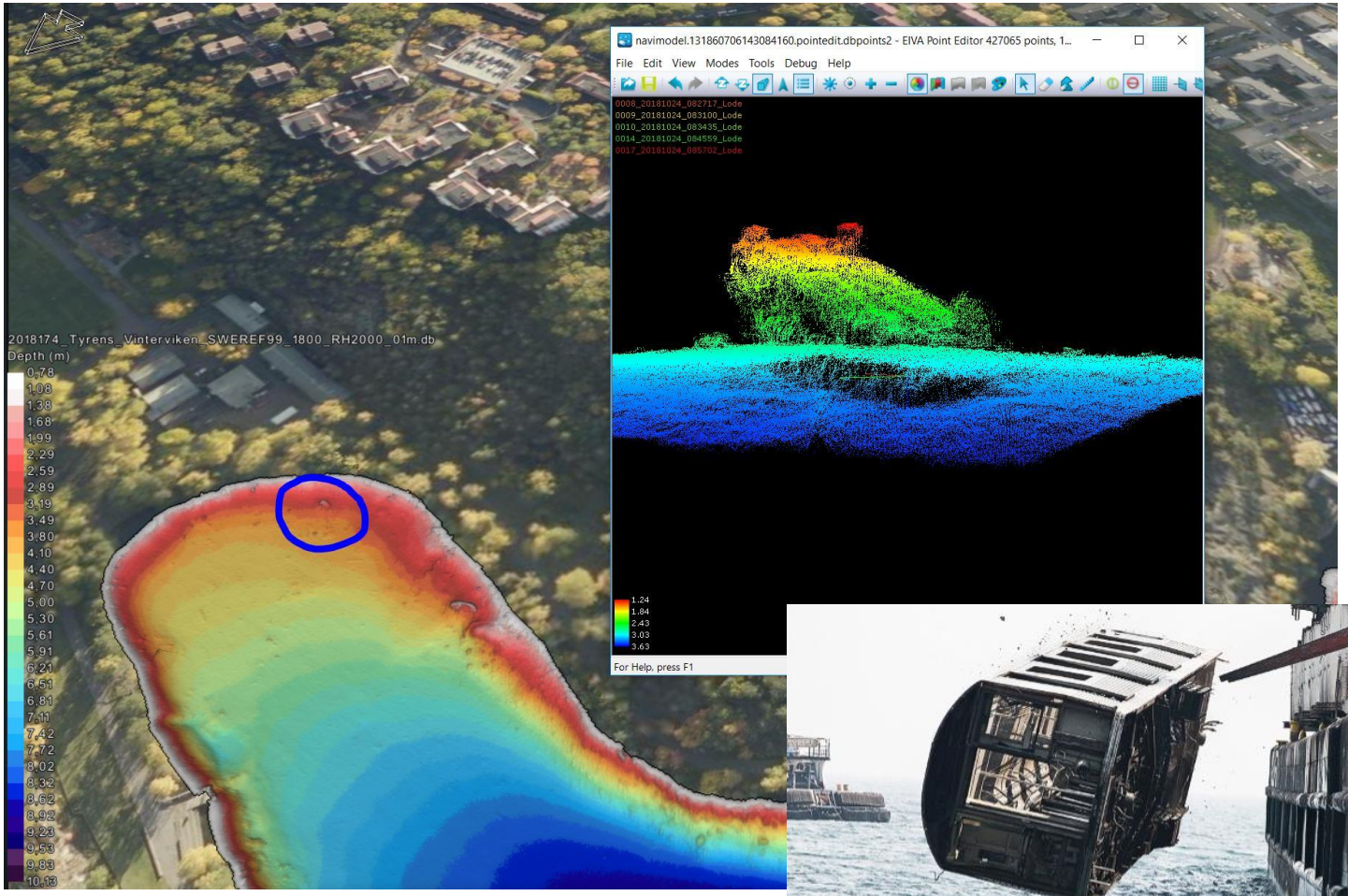
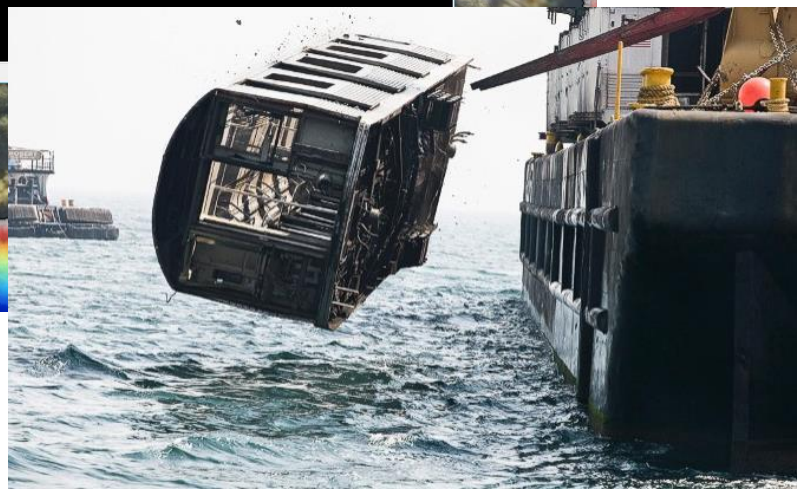
Hydrographic surveys to determine the present conditions beneath the surface





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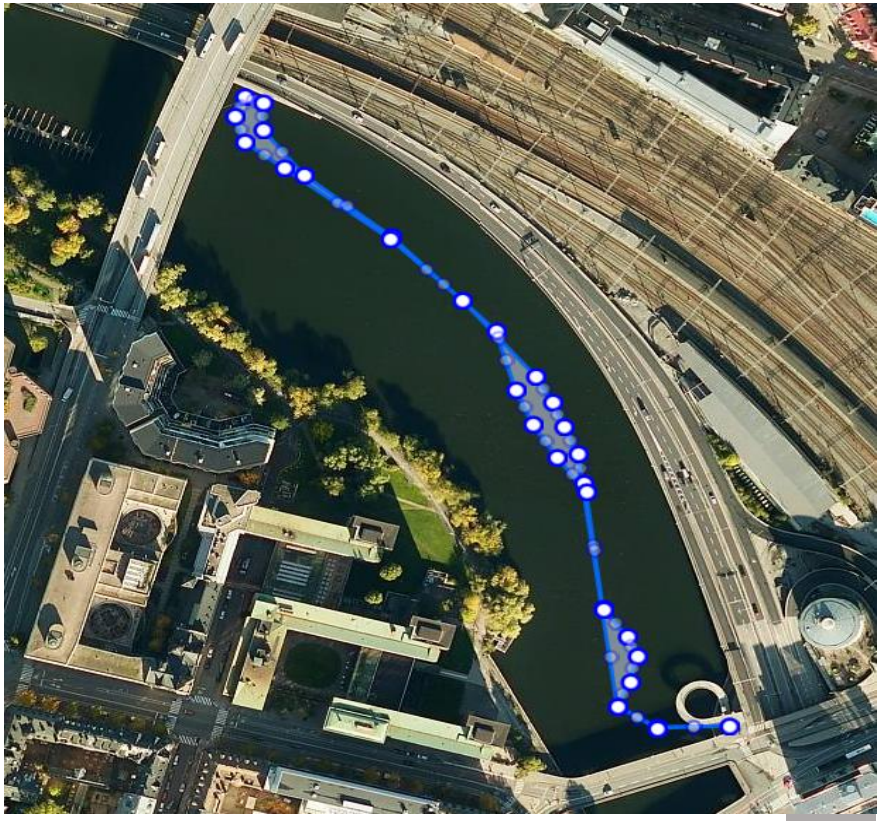
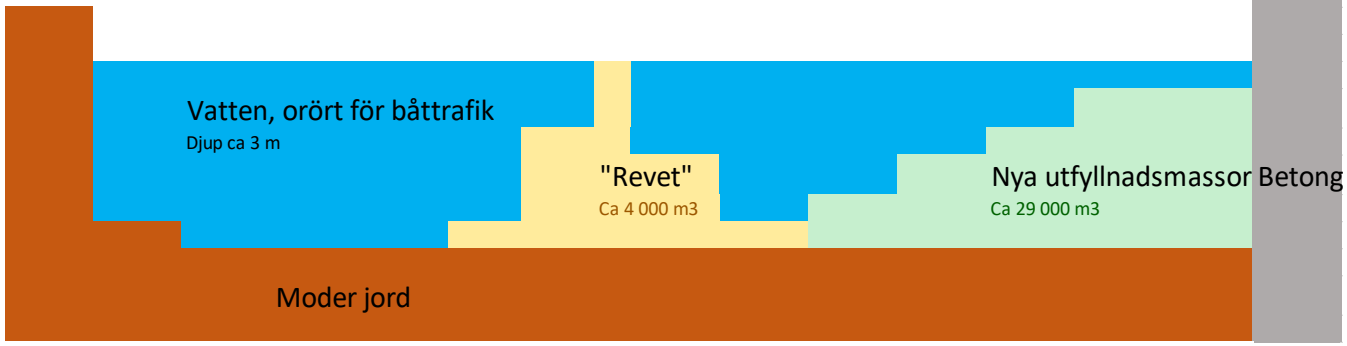
An example of measures for better ecological functions in a highly impacted water body

Proposed measure: Construction of an artificial reef in the central of Stockholm, lake Riddarfjärden.

The structure can be built so that the reef brakes the water surface and forms small islands at several spots.

The waters east of the reef can be filled to a maximum water depth of 1,5 meters with a shallow part against the embankment in order to make it possible for vegetation to grow and thrive.





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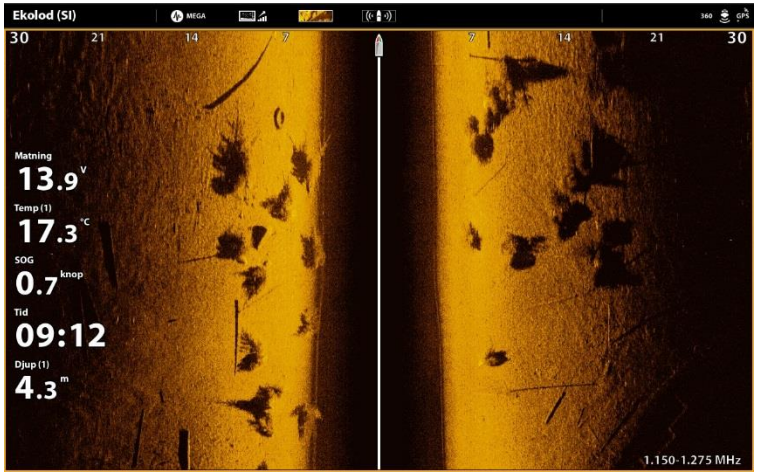
Christmas trees to restore ecological functions in urban waters



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Are we on (the right) target?

- ~~Good water status regarding hydromorphology?~~
- Improve the conditions for ecological functions, viable habitats and strong populations.
- Should urban water bodies be classified as heavily modified or should we use exemptions?

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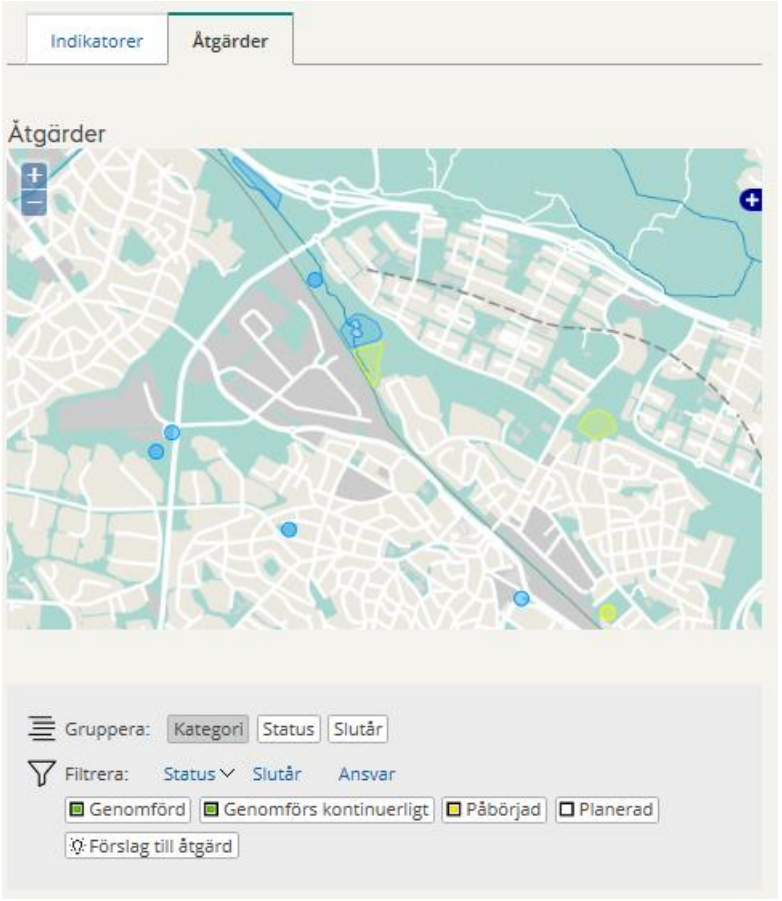
More information on Miljöbarometern

On the website Miljöbarometern you can find targets, indicators, environmental conditions and measures.



Åtgärd	Slutår	Ansvar
Fysiska åtgärder		
Rensning av skräp i och runt Bällstaån 2017	2017	Spånga-Tensta stadsdelsförvaltning
Svackdike, Lunda industriområde	2016	Trafikkontoret
Spåra och åtgärda felkopplingar i avloppsledningsnätet	∞	Stockholm Vatten och Avfall
Dagvattenanläggning, Spångadalen	2020	Exploateringskontoret Stockholm Vatten och Avfall
Tenstadalens dagvattenpark	2020	Spånga-Tensta stadsdelsförvaltning Stockholm Vatten och Avfall
Utjämningsmagasin, Bromstens bollplan	2020	Exploateringskontoret Stockholm Vatten och Avfall
Damm Fagerstagatan/Högforsgränd	2020	Stockholm Vatten och Avfall
Damm, flödesutjämning och rening, Kälvesta grönyta	2020	Stockholm Vatten och Avfall

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www.miljobarometern.stockholm.se/vatten


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Questions?