

# BalticSea2020

Remediation of Björnöfjärden: a eutrophic bay in the Baltic Sea

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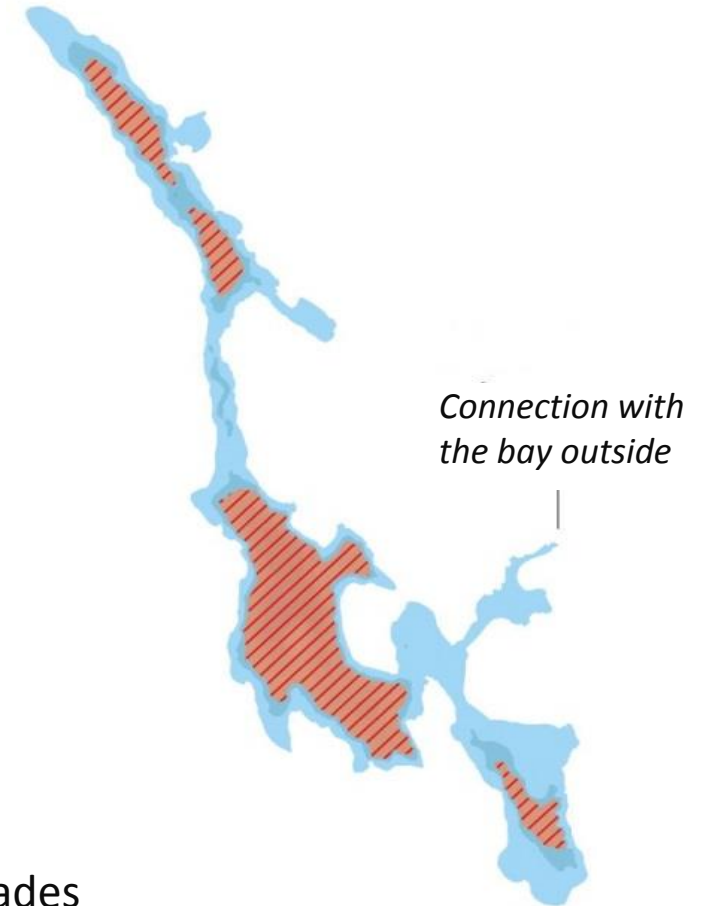
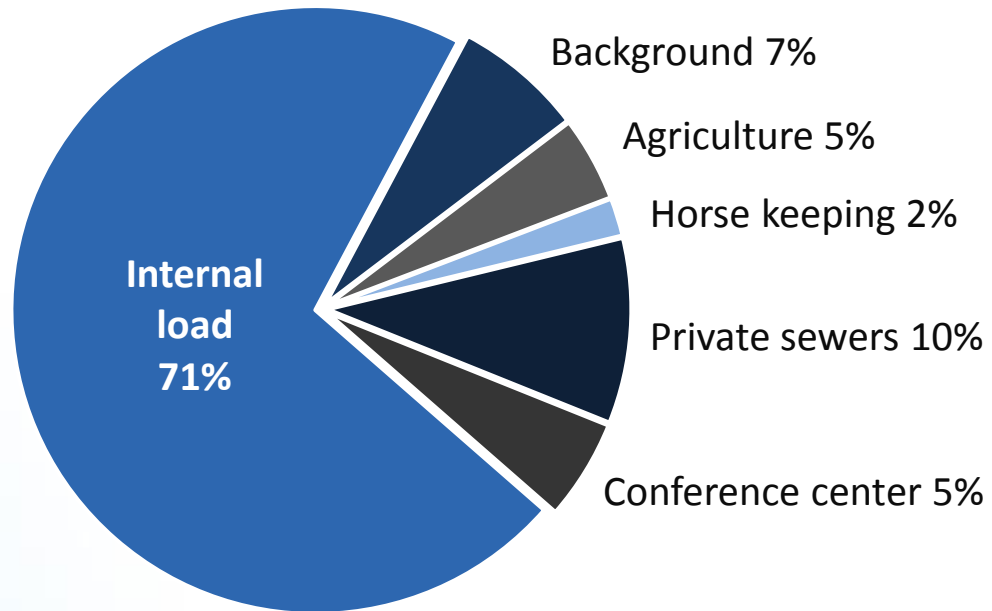


## A remediation project in full scale (2011-2020)

- Is it possible to achieve a good ecological status (WFD) in coastal bays that:
  - suffer from severe eutrophication
  - have vast extension of anoxic sediments
  - have limited water exchange
- We focused on Björnöfjärden in the Stockholm archipelago:
  - measures in the catchment area and in the bay
  - extensive monitoring (reference bay)



## Internal recycling of phosphorus – the main P source



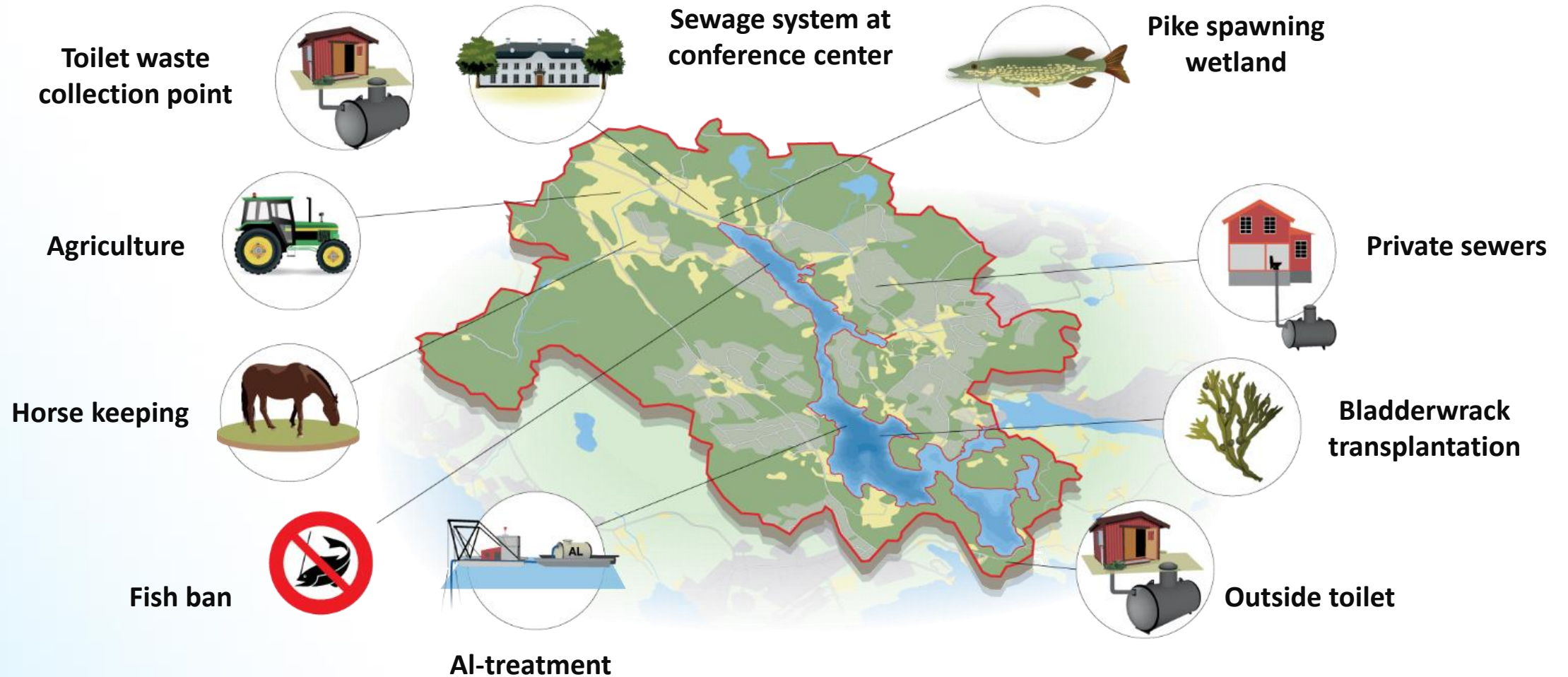
"The old sins" – external load that has accumulated in the sediment over decades which is recycled to the water column

## Measures in and around Björnöfjärden

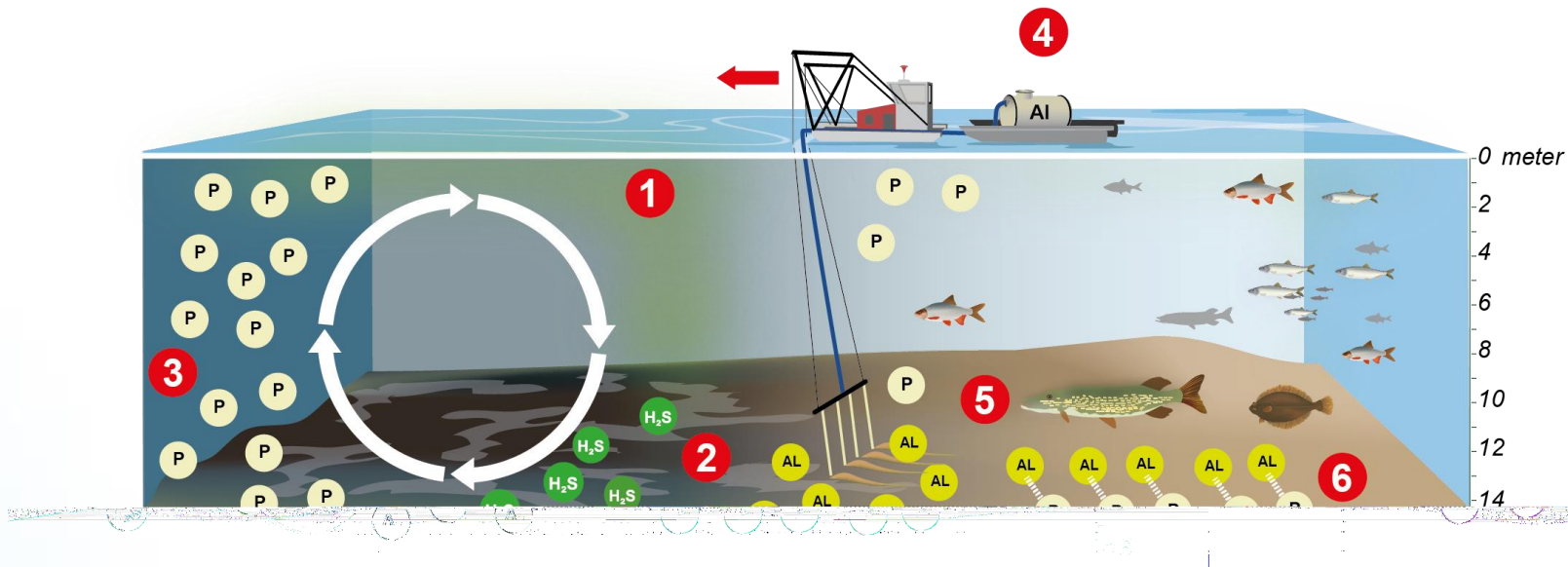
*Drainage basin 15 km<sup>2</sup>*

*Bay area 1.5 km<sup>2</sup>*

*Salinity 5 PSU*



## Al-treatment to stop P-release from anoxic sediments



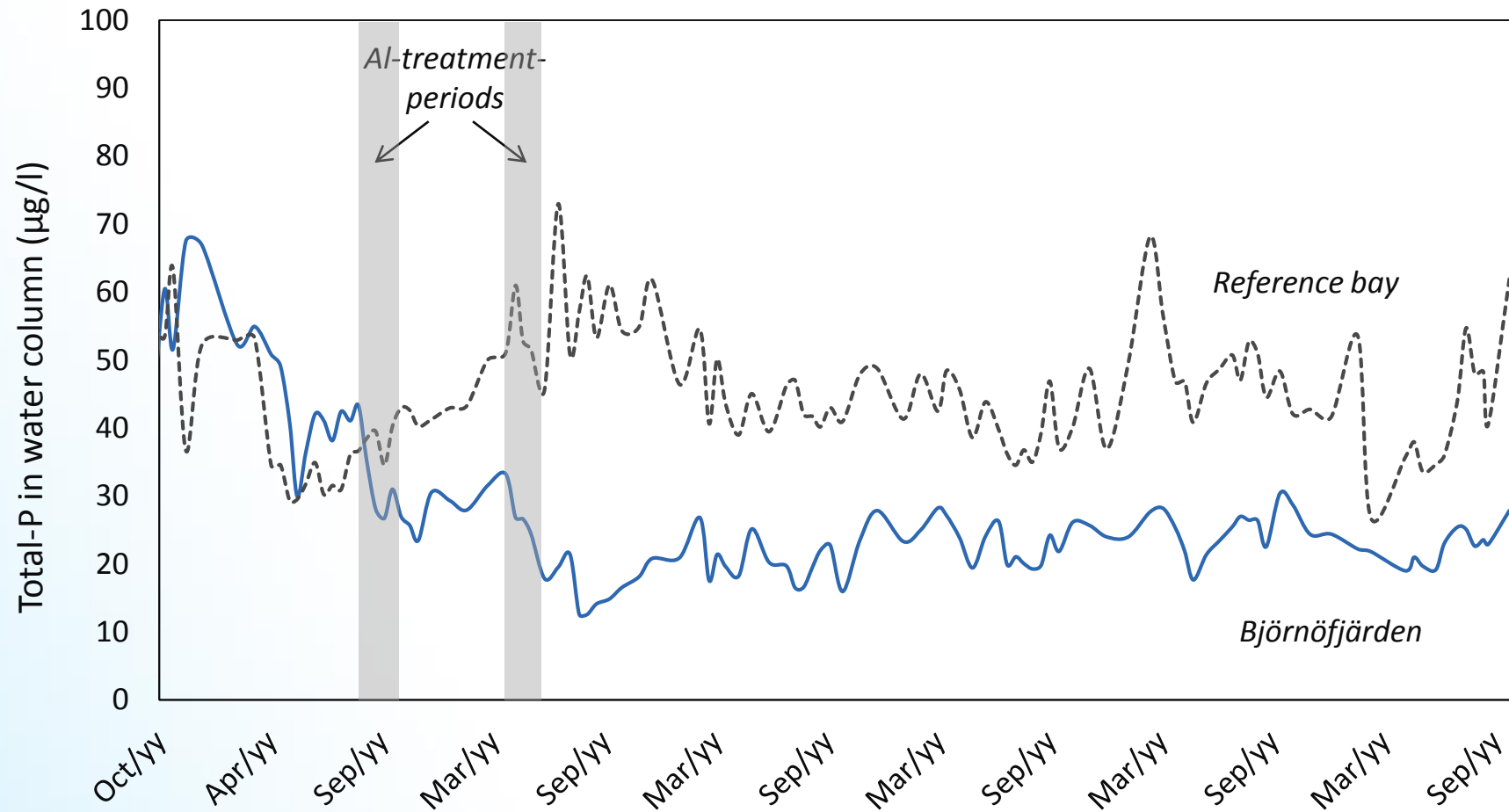
- 50 g Al/m<sup>2</sup>
- 3 ton P

Nutrients cause algal bloom  
Decomposition lead to anoxia  
Anoxia release phosphorus (P)

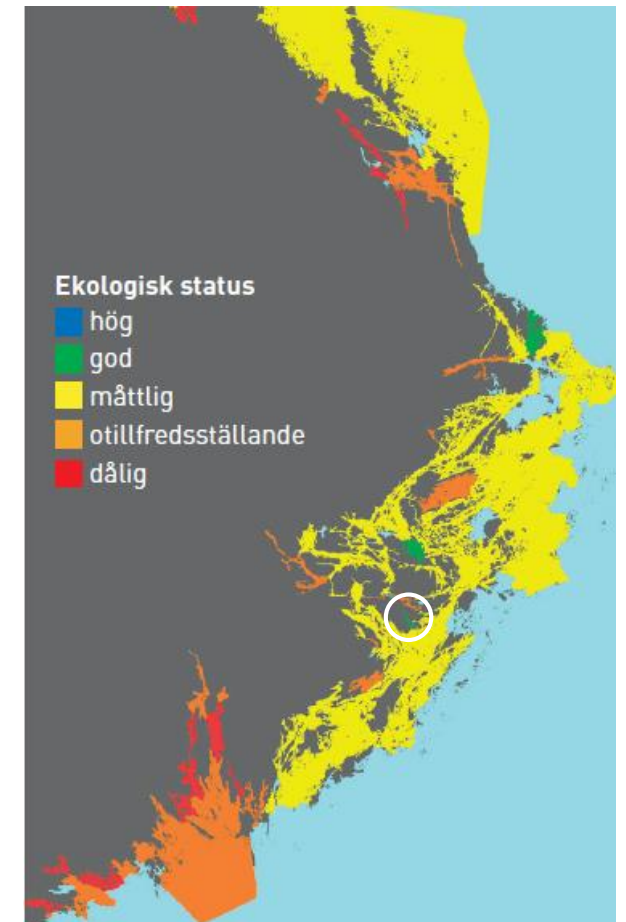
Aluminium (Al) bind phosphorus (P)  
Eutrophication cease  
The P cycle has been stopped



## The status of Björnöfjärden is improving!

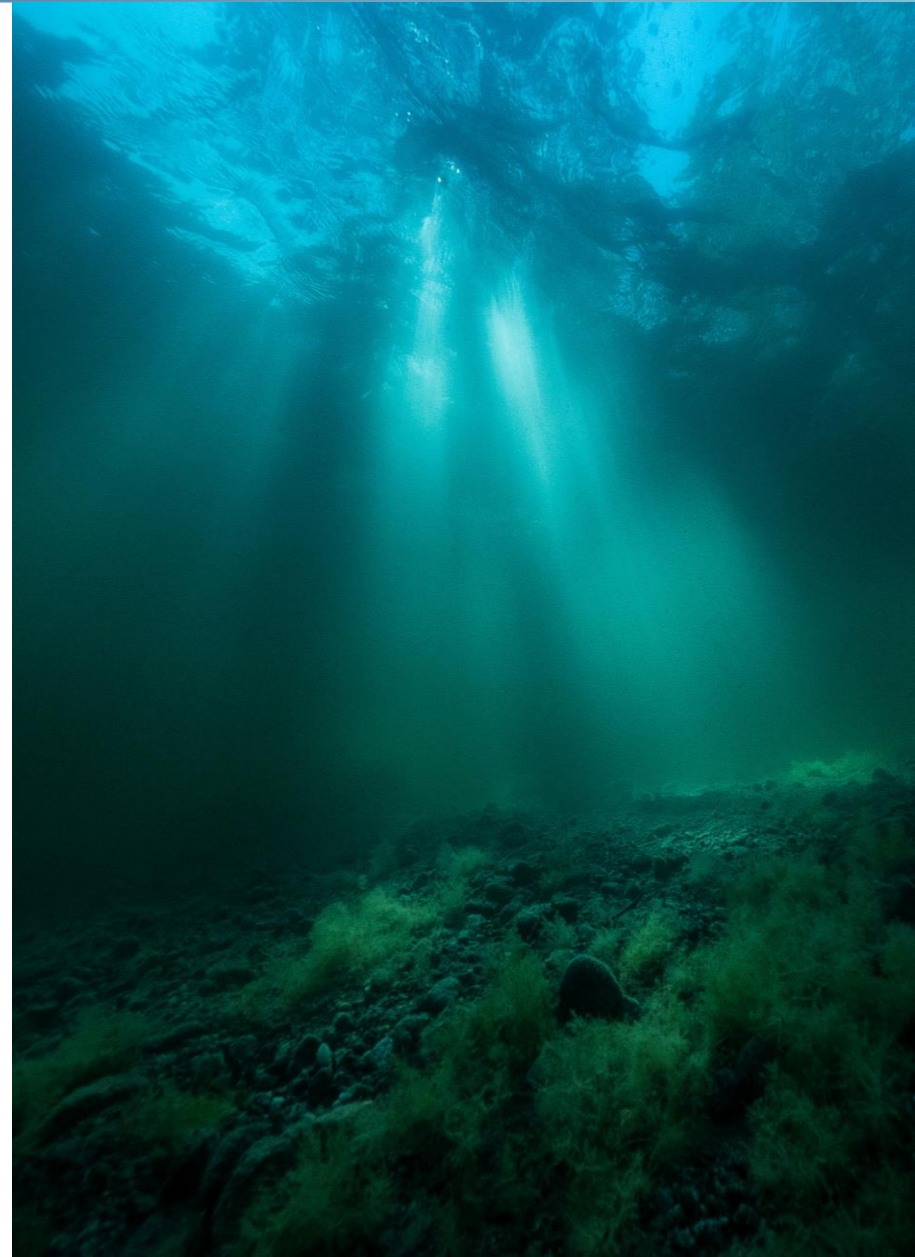


## Ecological status Stockholm archipelago (TP 2012-17)





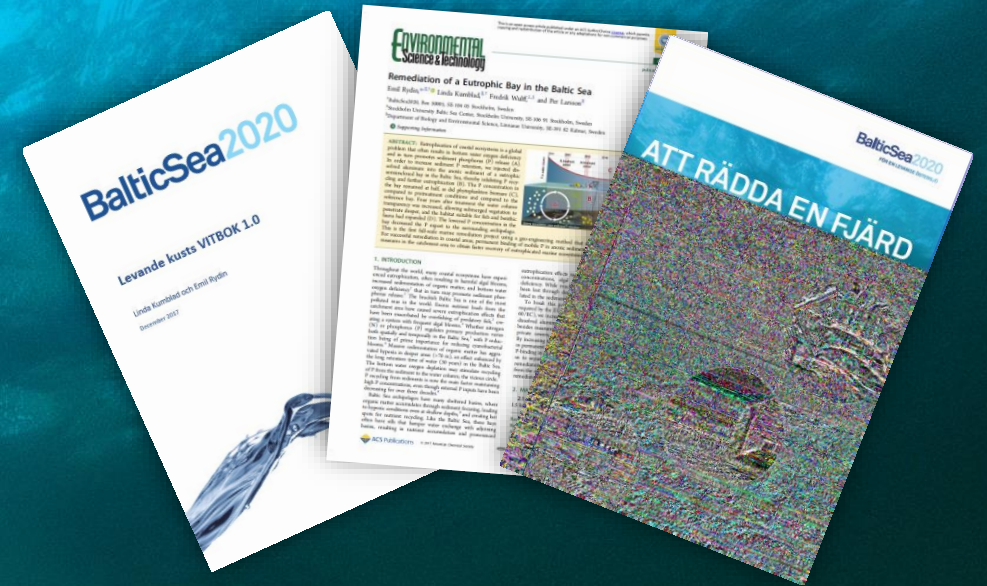
- Phytoplankton biomass reduced by 50 %
- Increased secchi depth
- Increased depth distribution of bottom vegetation
- Improved oxygen conditions
- Recolonization of fish and bottom fauna



## Summary & Conclusions

- Good ecological status in enclosed bays possible!
- Internal load – the largest phosphorus source
- Anoxic sediment bind phosphorus after AI-treatment
- To reduce eutrophication we need to focus both on:
  - internal load (for quick response)
  - external load (for lasting effect)
- Catchment perspective important
- Catchment officers with overview and resources
- Patience and long-term projects





# Thank you!

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[www.balticsea2020.org](http://www.balticsea2020.org)

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