



20.02.2020 SEAmBOTH final seminar, Roosa Mikkola

**What will
the sea look
like in 2120?**

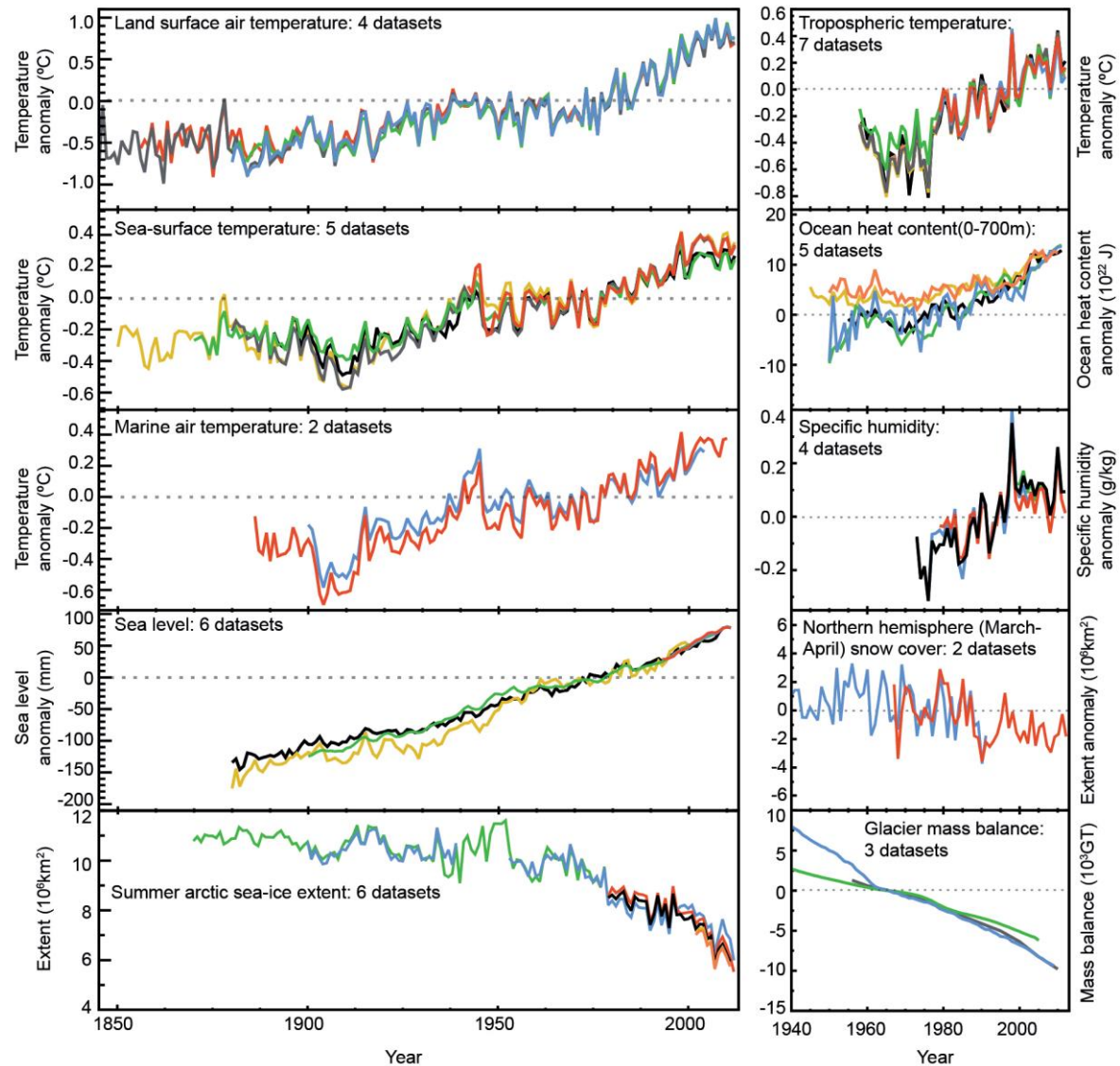
About EConnect

1.6.2018 – 31.5.2021

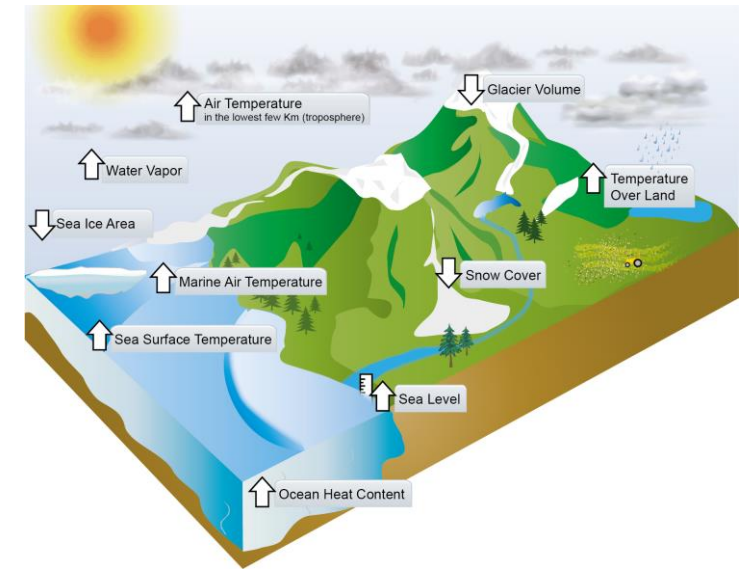
Create a vision of how climate change will modify the coastal and marine environment in the project area.

Offer tools for climate change adaptation and marine protection

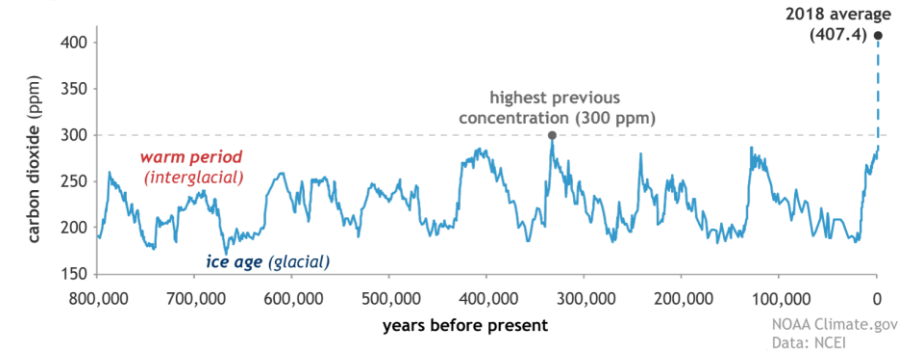




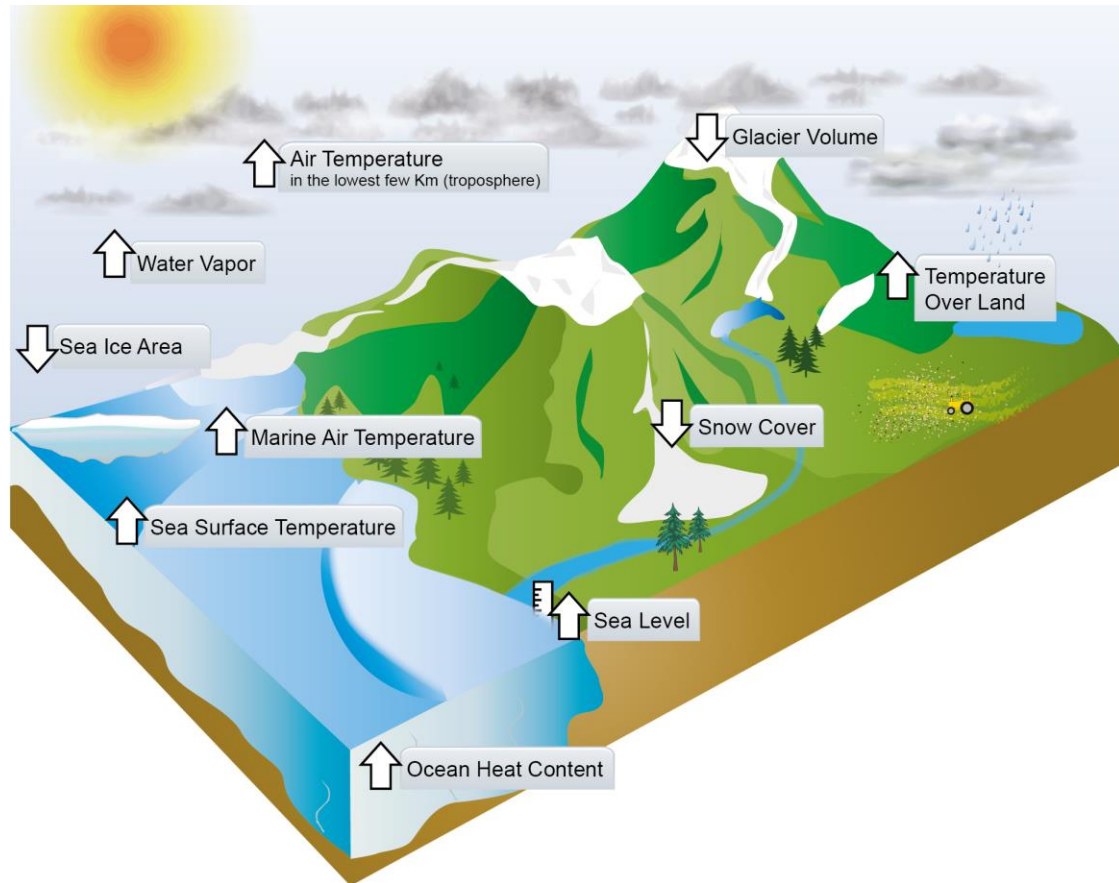
Source: IPCC AR5 WG1



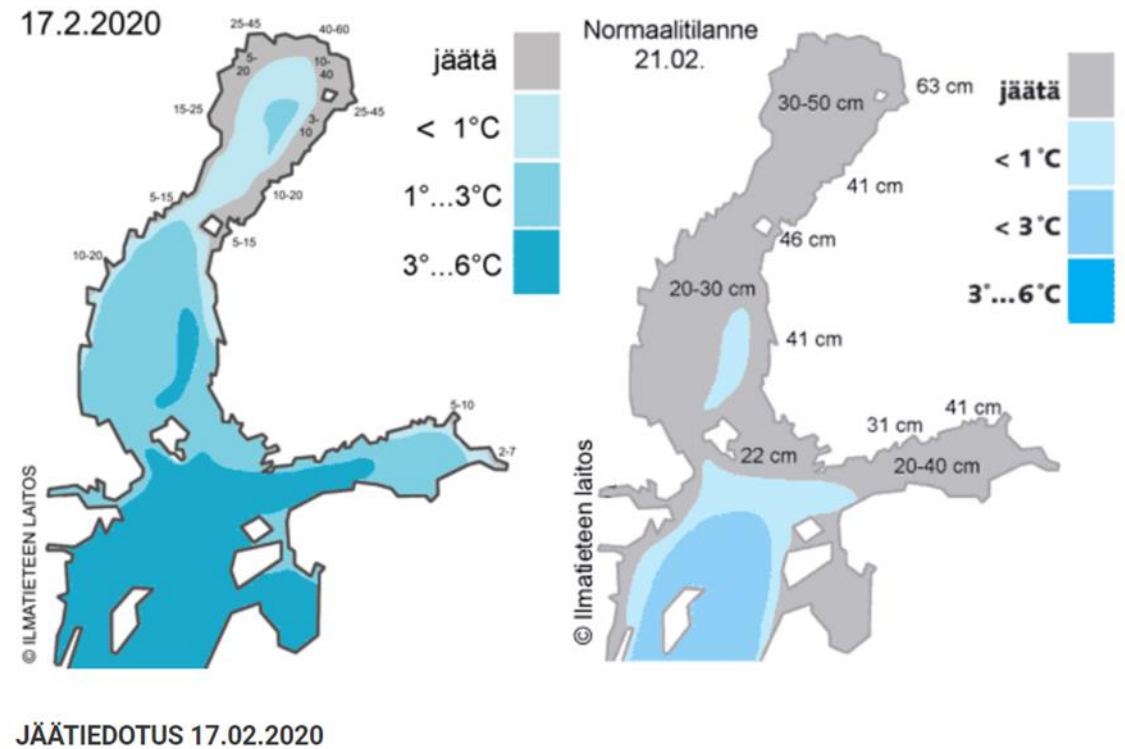
CO₂ during ice ages and warm periods for the past 800,000 years



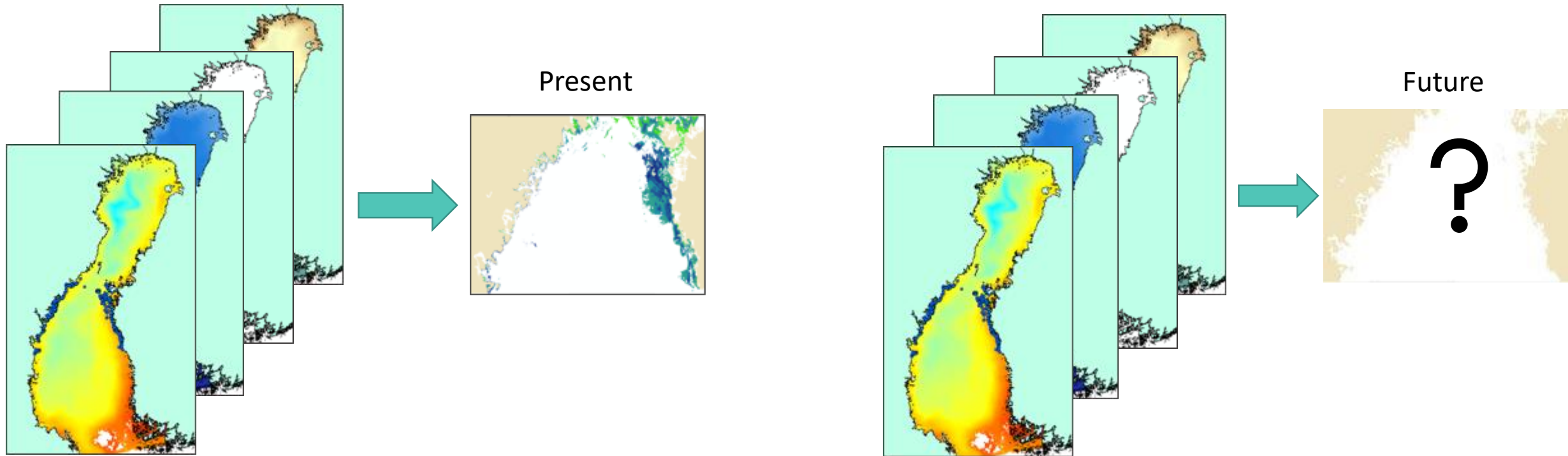
Happened so far ...



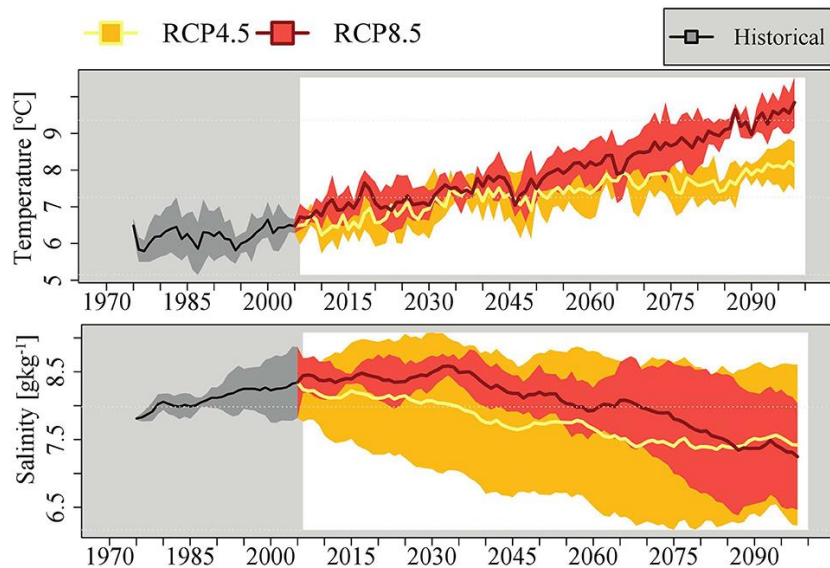
Source: IPCC AR5 WG1



How can we predict the "biological" future?

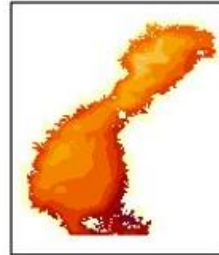


What we can foresee

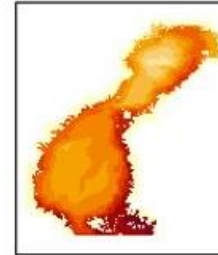


Source: Saraiva et al. 2019 Uncertainties in Projections of the Baltic Sea Ecosystem Driven by an Ensemble of Global Climate Models

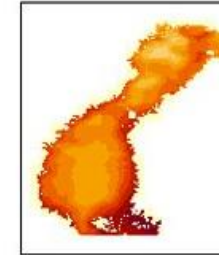
A002 2018 June
Mean temp= 11.5



B002 2018 June
Mean temp= 8.2



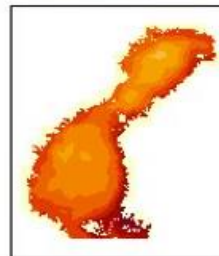
C002 2018 June
Mean temp= 10.2



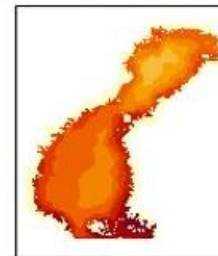
D002 2018 June
Mean temp= 11.5



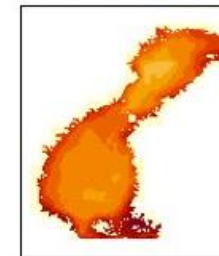
A002 2059 June
Mean temp= 12



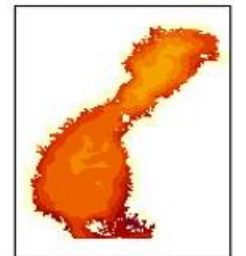
B002 2059 June
Mean temp= 10.8



C002 2059 June
Mean temp= 10.1



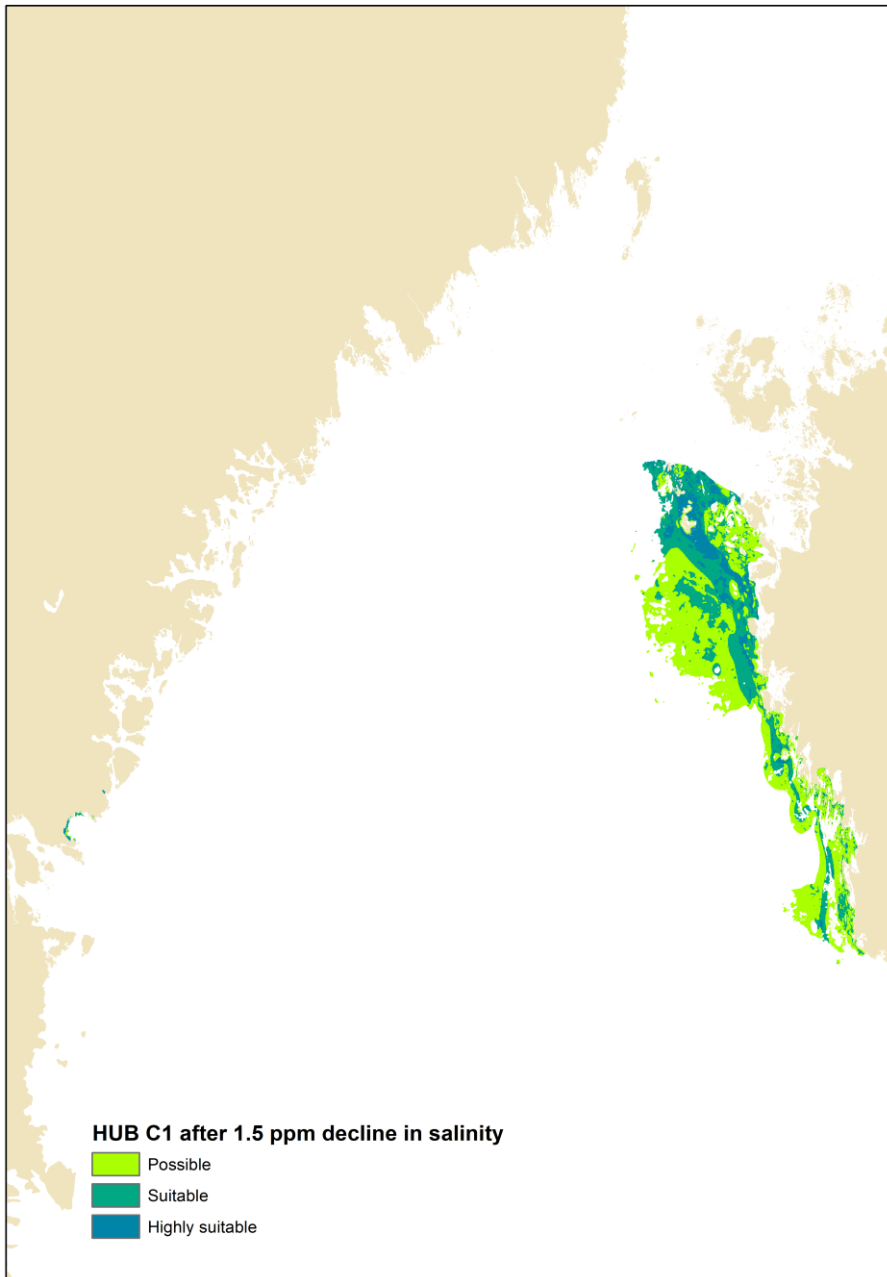
D002 2059 June
Mean temp= 12.9



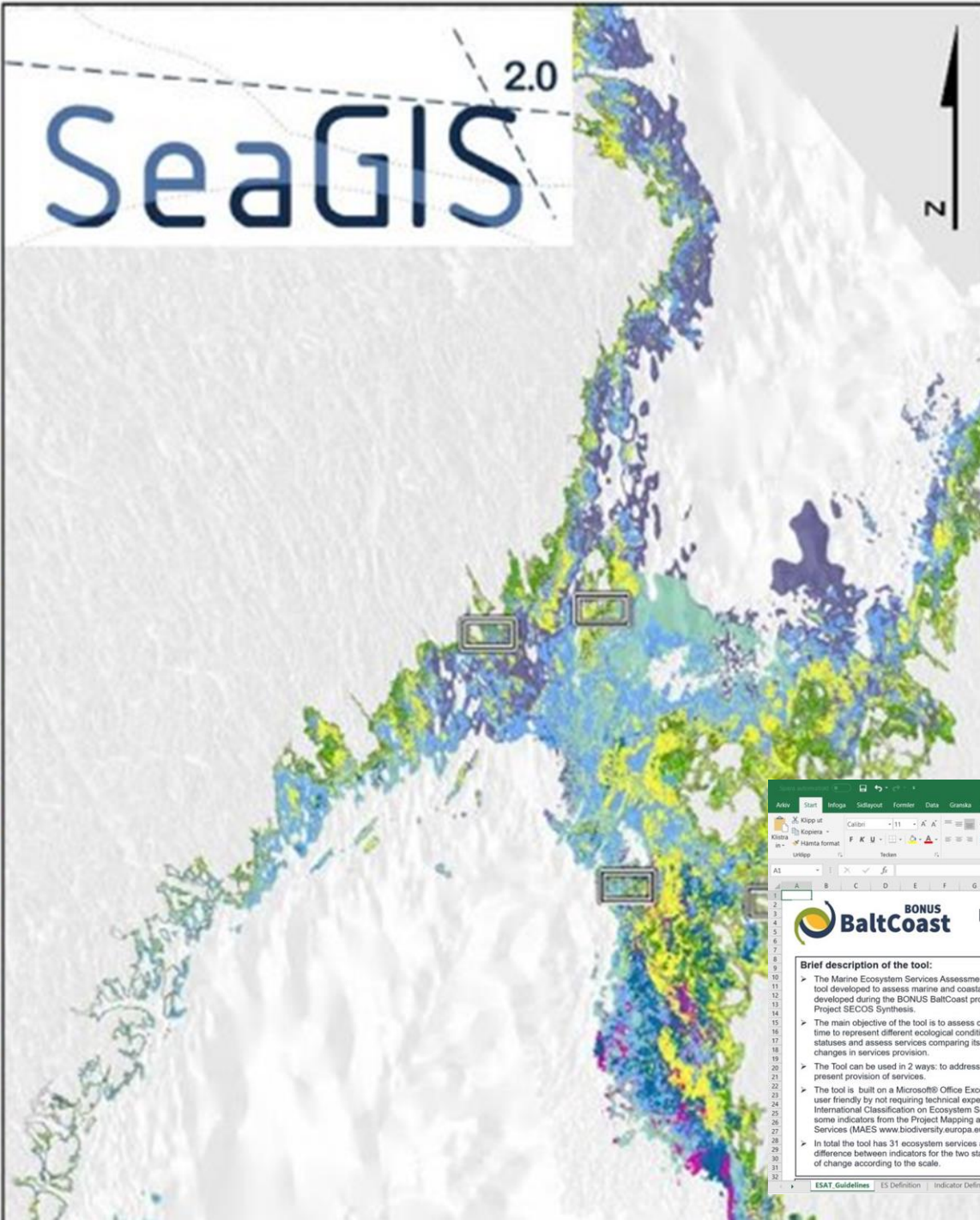
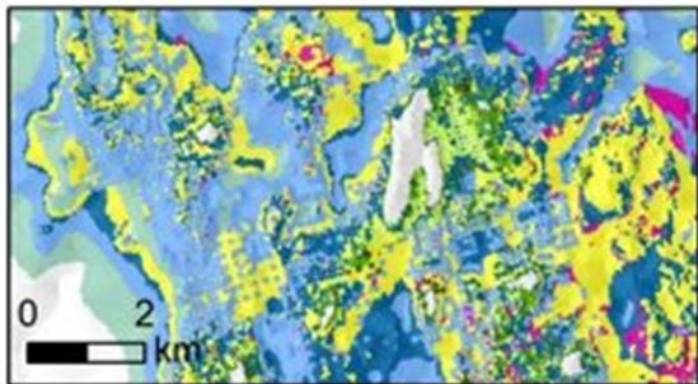
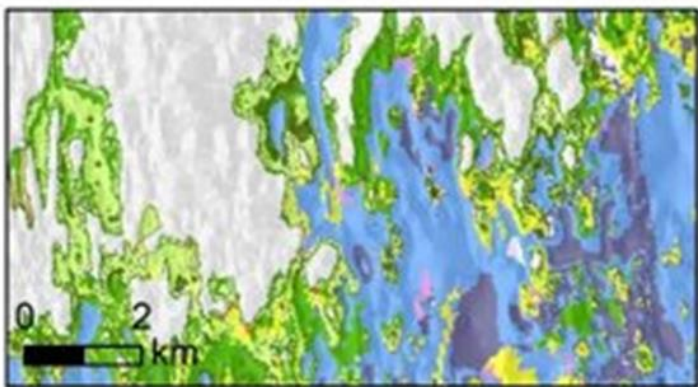
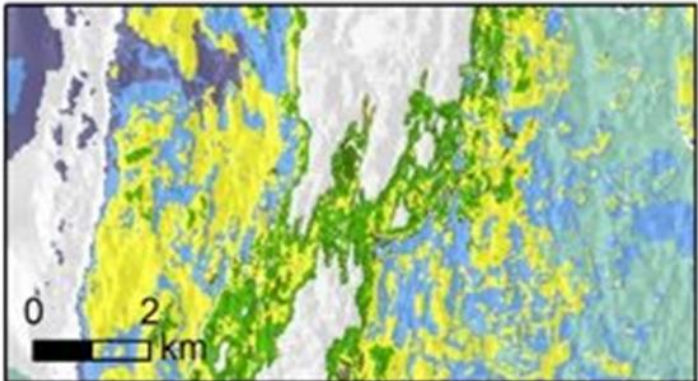
Source: SmartSea project

Impacts of future changes

- 52% decline of suitable areas for HUB C1
- Decrease in ecosystem services such as providing habitats, water filtration, chemical water control recreation

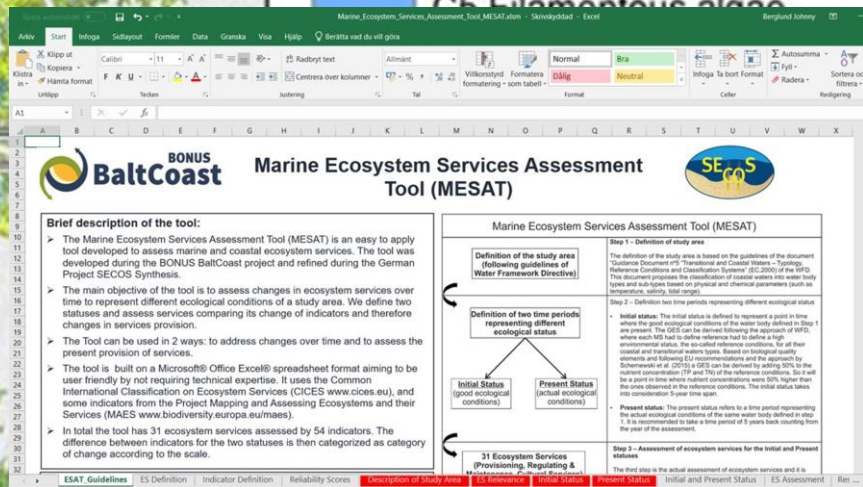




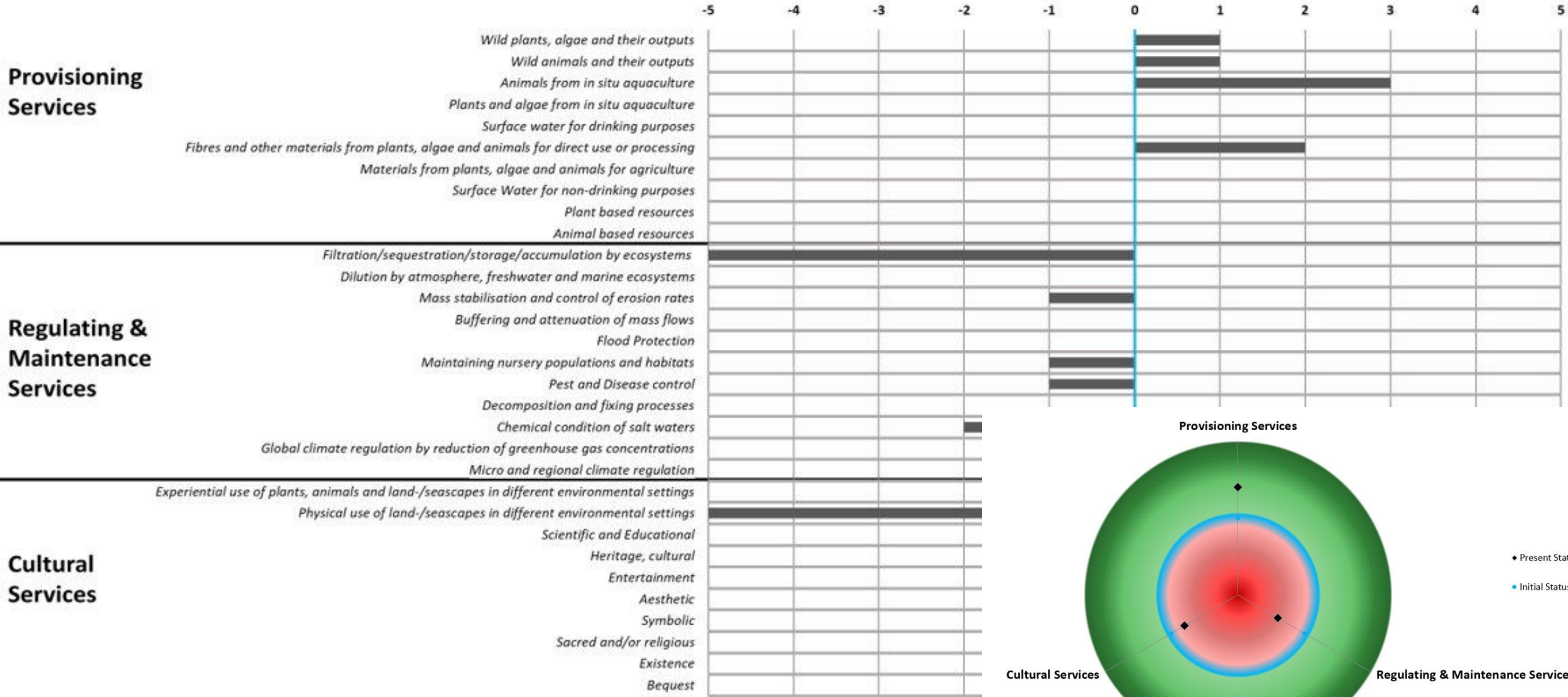


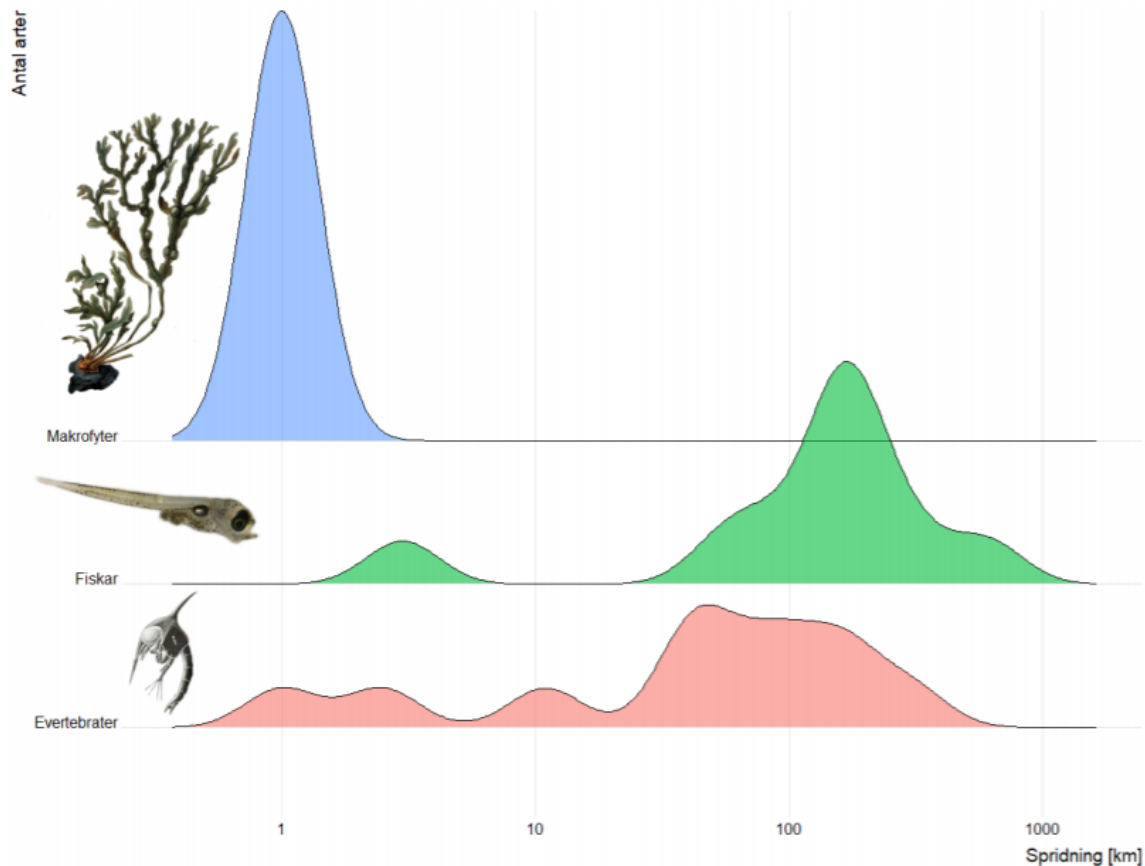
HUB Biotopes

- A1 *Phragmites australis*
- A2 *Cyperaceae*
- B1 *Potamogeton perfoliatus* etc
- B2 *Zostera* etc
- B3 *Myriophyllum*
- B4 *Charales*
- B5 *Najas marina*
- B6 *Ranunculus*
- C1 *Fucus*
- C2 Non-filamentous red algae
- C3 Foliose red algae
- C5 Filamentous algae



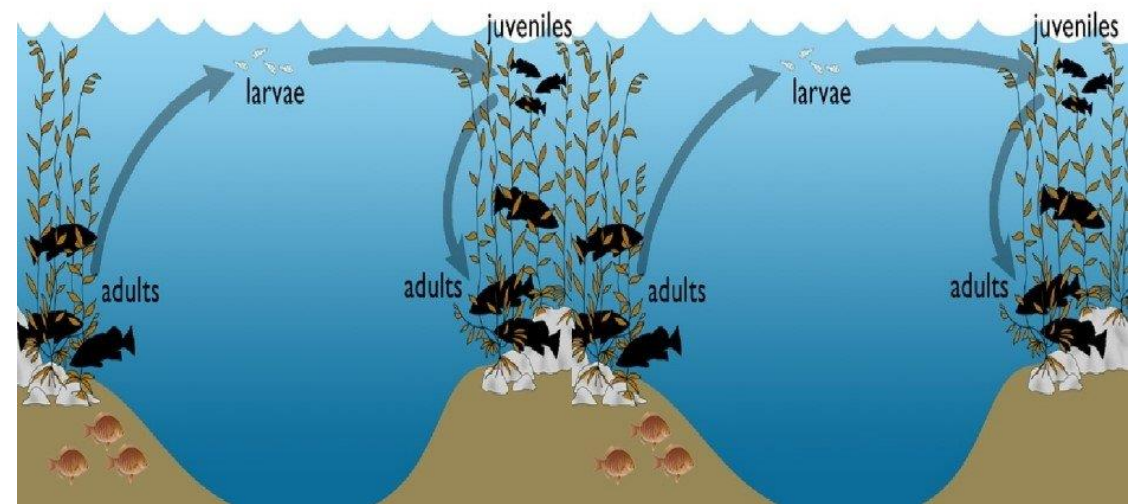
Classes of change for ecosystem services classes





Source: Berkström et al. 2019 Ekologisk konnektivitet i svenska vatten, en kunskapssammanställning.

Connectivity



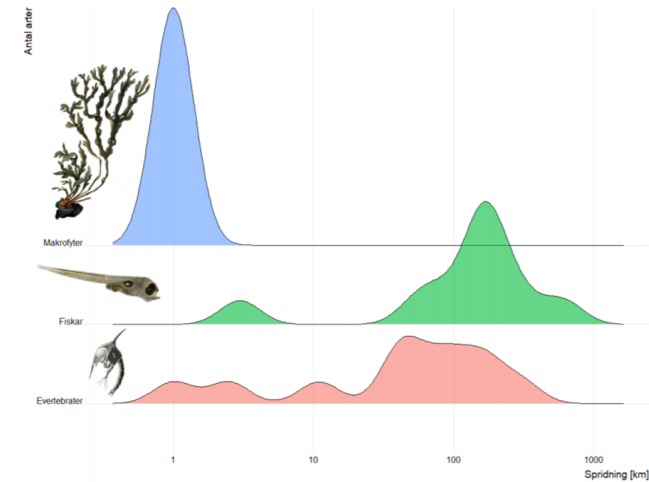
www.middlebury.edu

MPAs nätverk

Sammanhängande areal (ha)

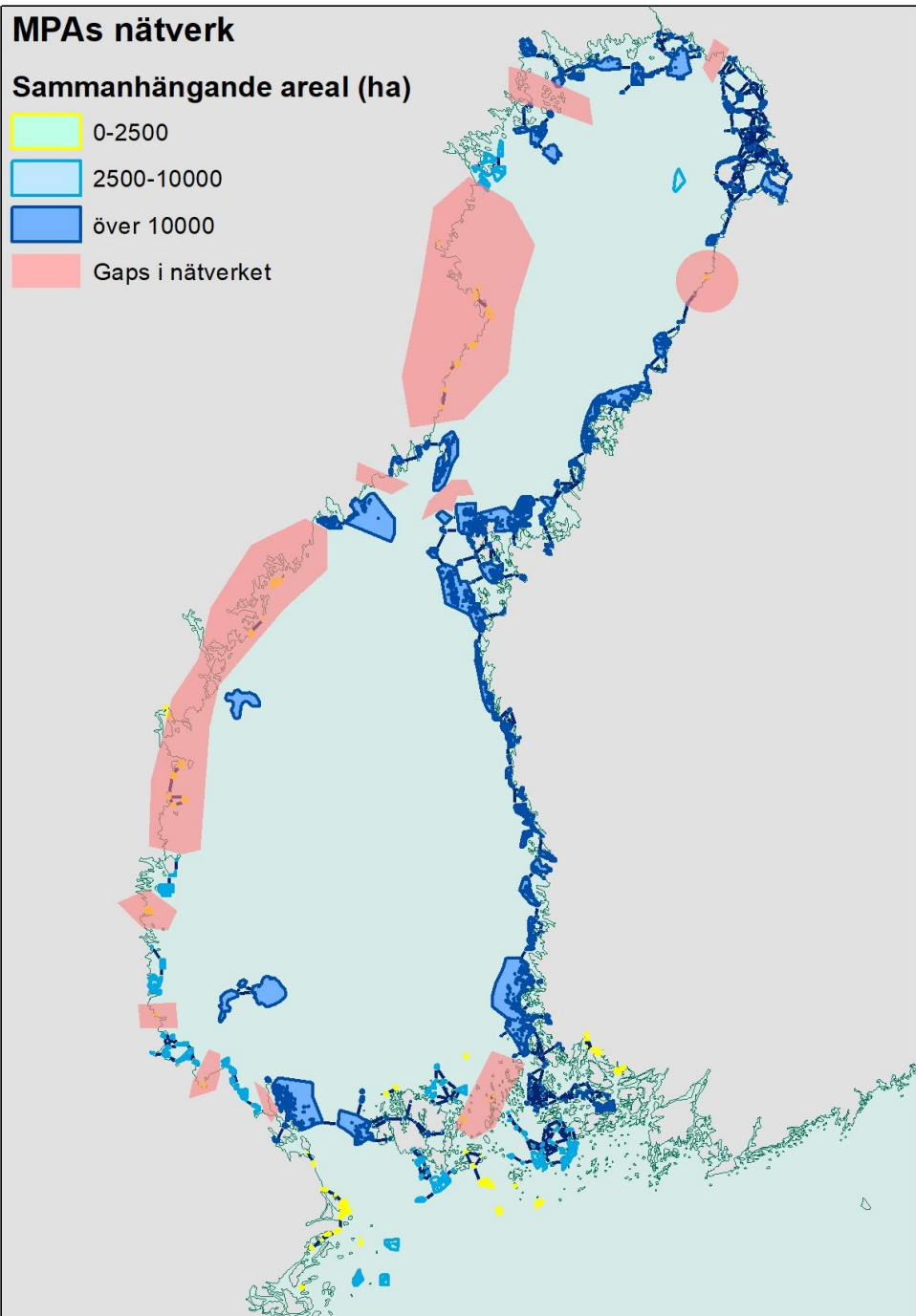


MPAs in a network with 2 km dispersal

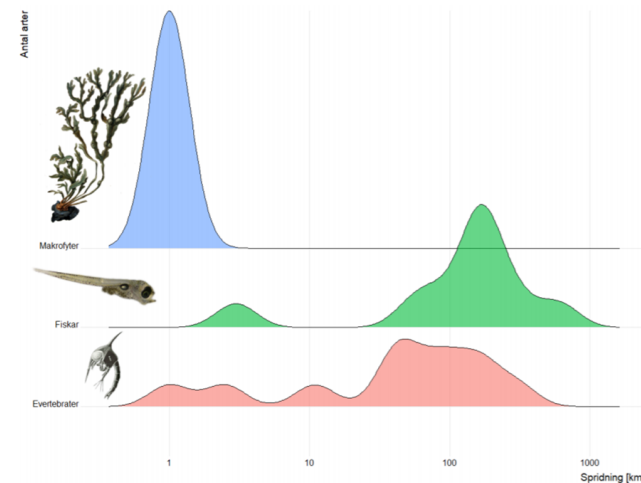


MPAs nätverk

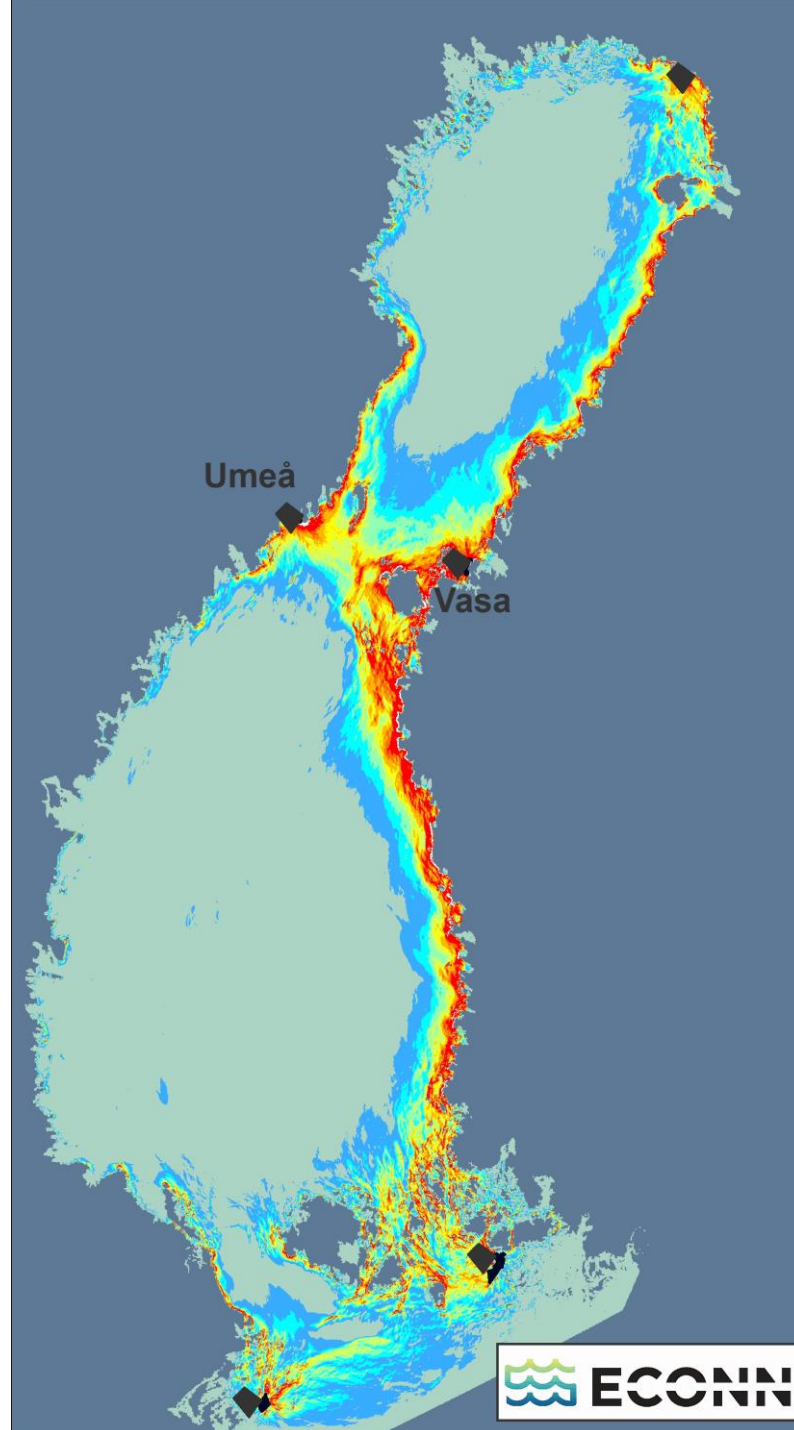
Sammanhängande areal (ha)



MPAs in a network with 10 km dispersal



Circuitscape



Conclusions

- All scenarios are predictions of possible futures
- Sustainable management needs to consider possible outcomes
- Magnitude of change unsure, some can also be seen as positive

