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Goals of the BaltAdapt knowledge base and highlights of the biodiversity impact assessment

presented by Inga Krämer

BaltAdapt partners (WP4)

Authors of the Impact Assessment on Biodiversity: K. Dahl, A. Josefson, C. Göke, J.P.A. Christensen, J. Hansen, S. Markager, M.B. Rasmussen, K. Dromph, T. Tian, Z. Wan, I. Krämer, M. Viitasalo, K. Kostamo, K. Borenäs, J. Bendtsen, G. Springe, E. Bonsdorff



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Purpose/Questions

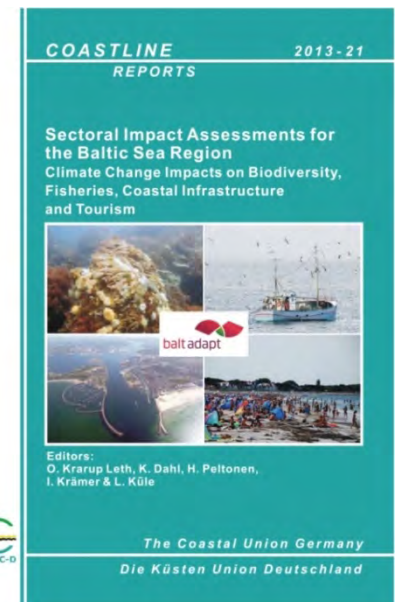
- Review of existing knowledge
- Research gaps
- Raise of further questions:
 - Where is **adaptation** necessary?
 - How can we adapt?
 - Who is capable to adapt?
 - On which level?
- Research oriented to adaptation → some examples with different approaches



Knowledge base - products

- Climate change: fact sheets
- 4 Sectoral reports: Climate change impact on **biodiversity**, fishery, infrastructure & tourism
- Vulnerability assessment
- Gap fit analyses

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Baltic Sea ecosystem

- Large catchment area (e.g., freshwater & nutrient input)
- Limited water exchange
- Salinity gradient
- Stratification
- Low biodiversity
- Geological uplift
- **Eutrophication**



(ESRI, HELCOM)



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Climate Change projections

Direct and indirect effects:

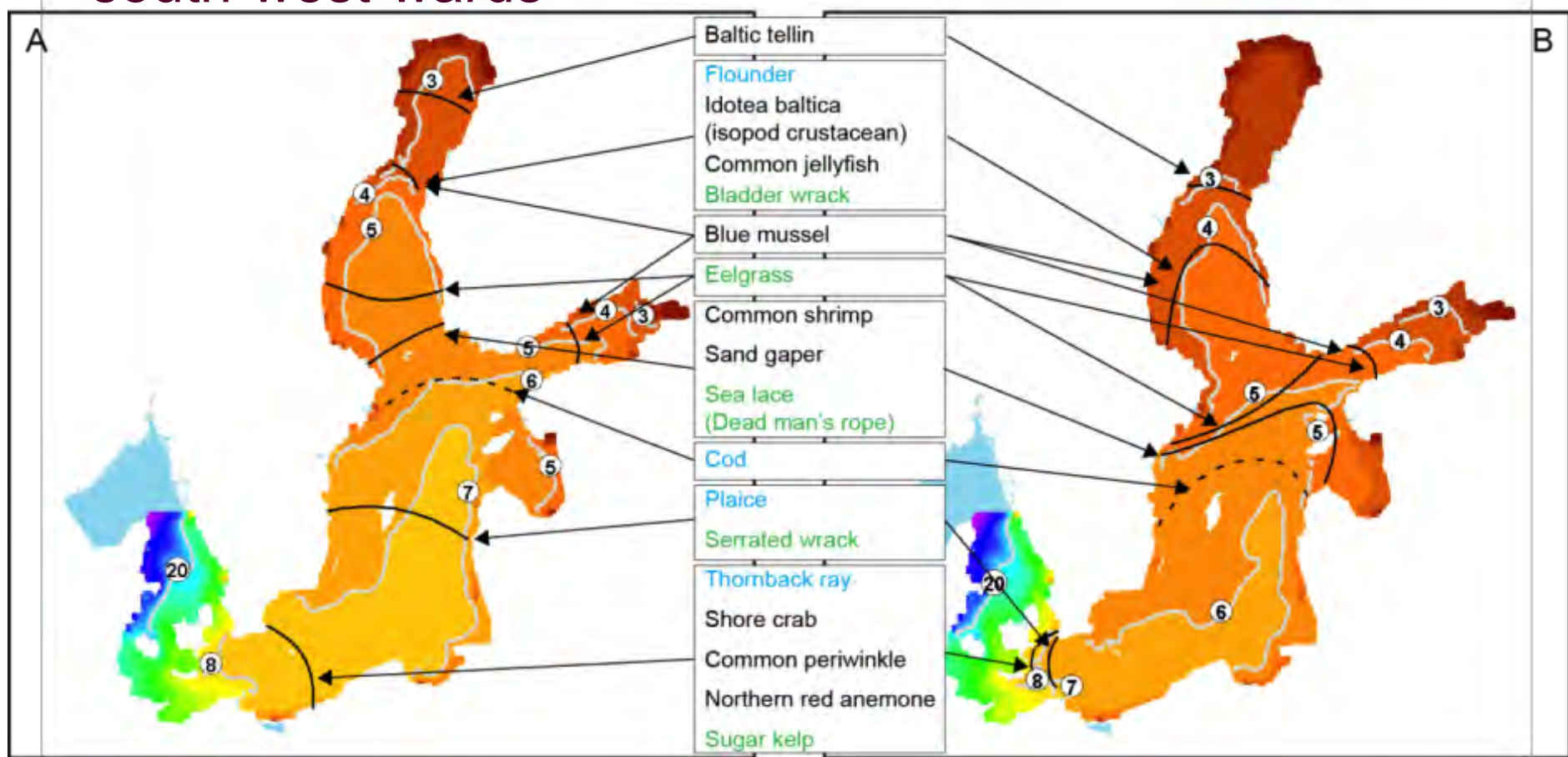
- Increasing air and water temperature, reduced ice cover
 - Sea level rise
 - Precipitation changes – salinity changes
 - Nutrient inputs/eutrophication → *presentation by Jesper*
→ *poster Andersen et al.*
 - Oxygen content
- Large uncertainties in physical conditions, even larger uncertainties for biological changes





Possible future biogeographic species distribution (salinity based)

Until end of this century, marine species might retreat south-west-wards

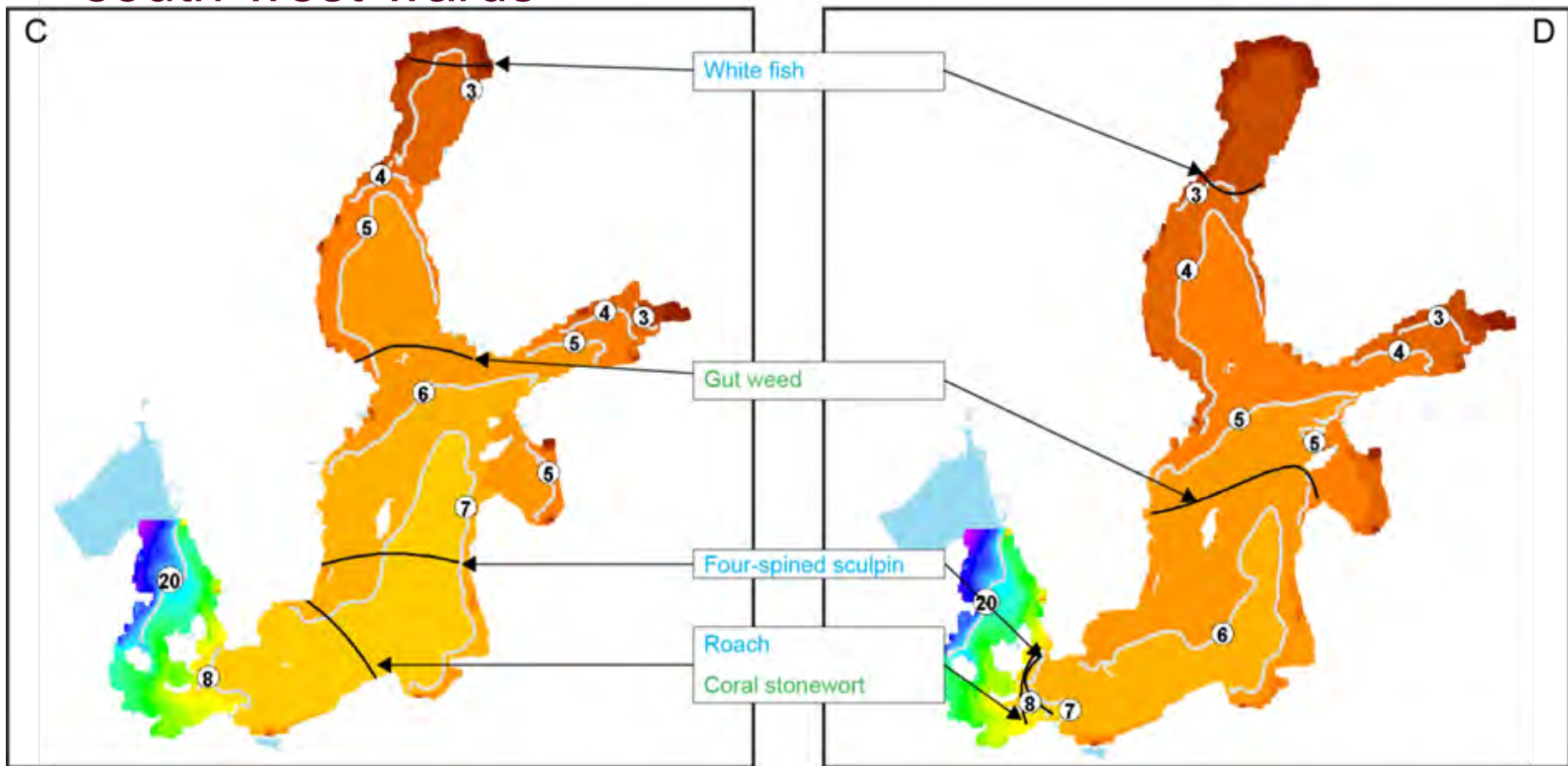


Species distribution (A) based on Bonsdorff 2006; salinity conditions based on Meier et al. 2011



Scenarios of future biogeographic species distribution (salinity based)

Until end of this century, freshwater species could expand south-west-wards



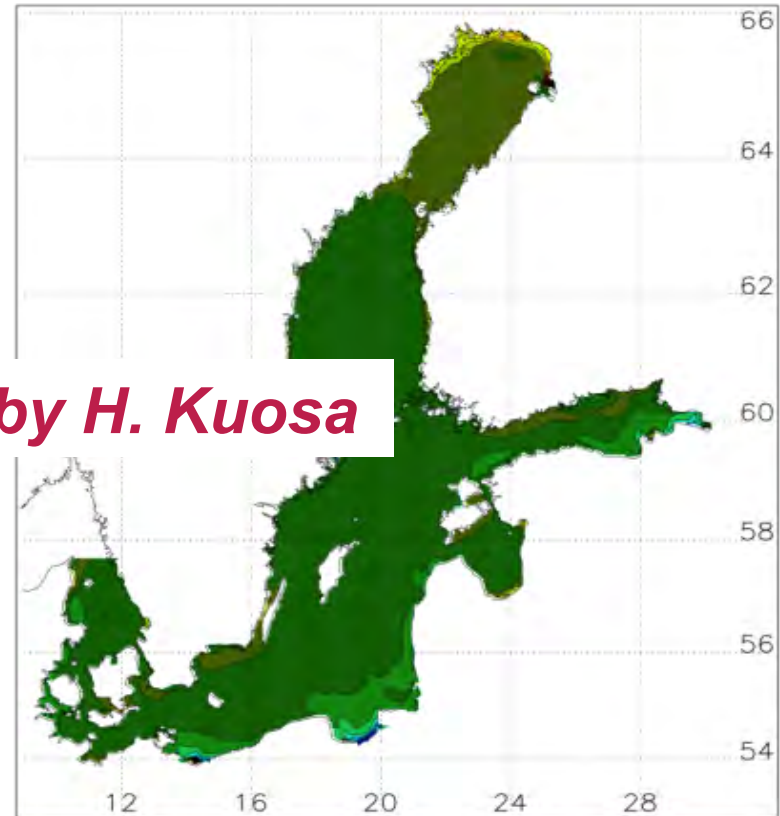
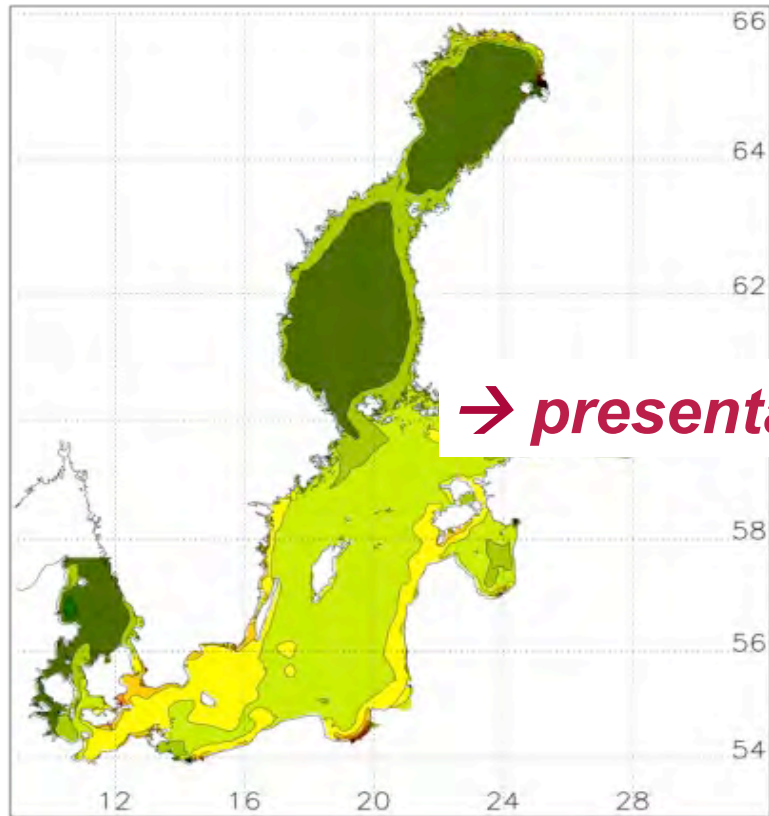
→ poster by A. Josefson



Phytoplankton: changing production (model simulations)

Simulated annual mean phytoplankton production change: 2070-2099 vs. 1969-1998 (g C/m²/year).

Including implementation of the Baltic Sea Action Plan (nutrient reduction)



→ presentation by H. Kuosa



Based on data from Meier et al. 2011

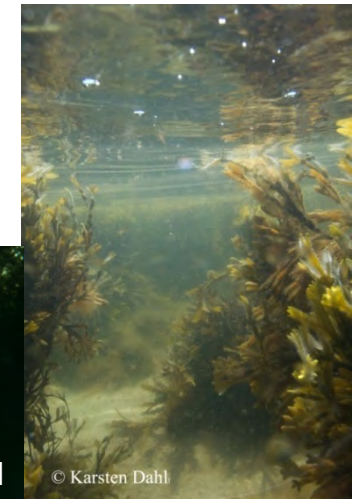
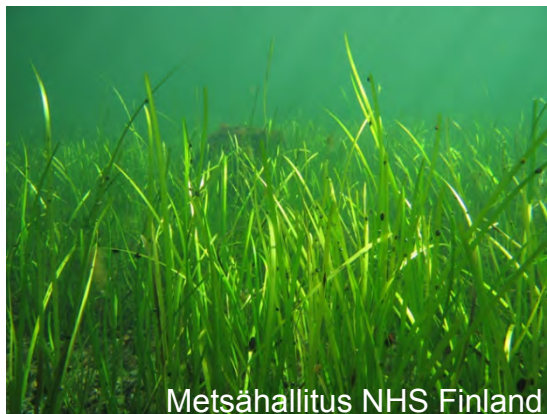


Seaweed forests and eelgrass meadows

- Increasing sea level
- Increase of nutrients
- Few hard substrates left (seaweed habitat)
- Salinity reduction: spatial shift of marine species
- No direct effect of high temperature on macroalgae, but interaction with other factors

→ Multiple effects

→ *poster by Dahl et al.*



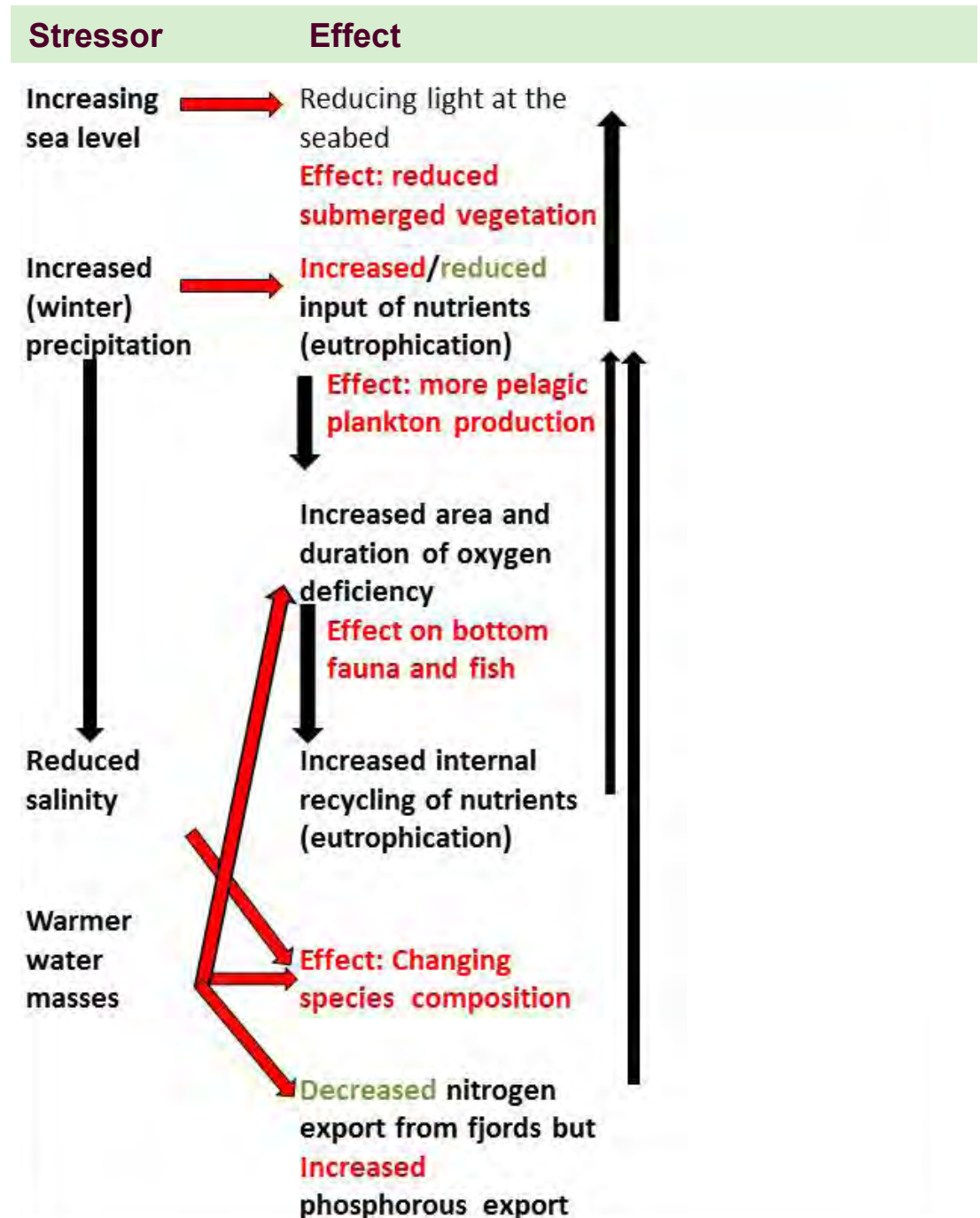


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Climate change impact assessments

→ Projected climate change effects on the ecosystem

→ Feedback mechanisms



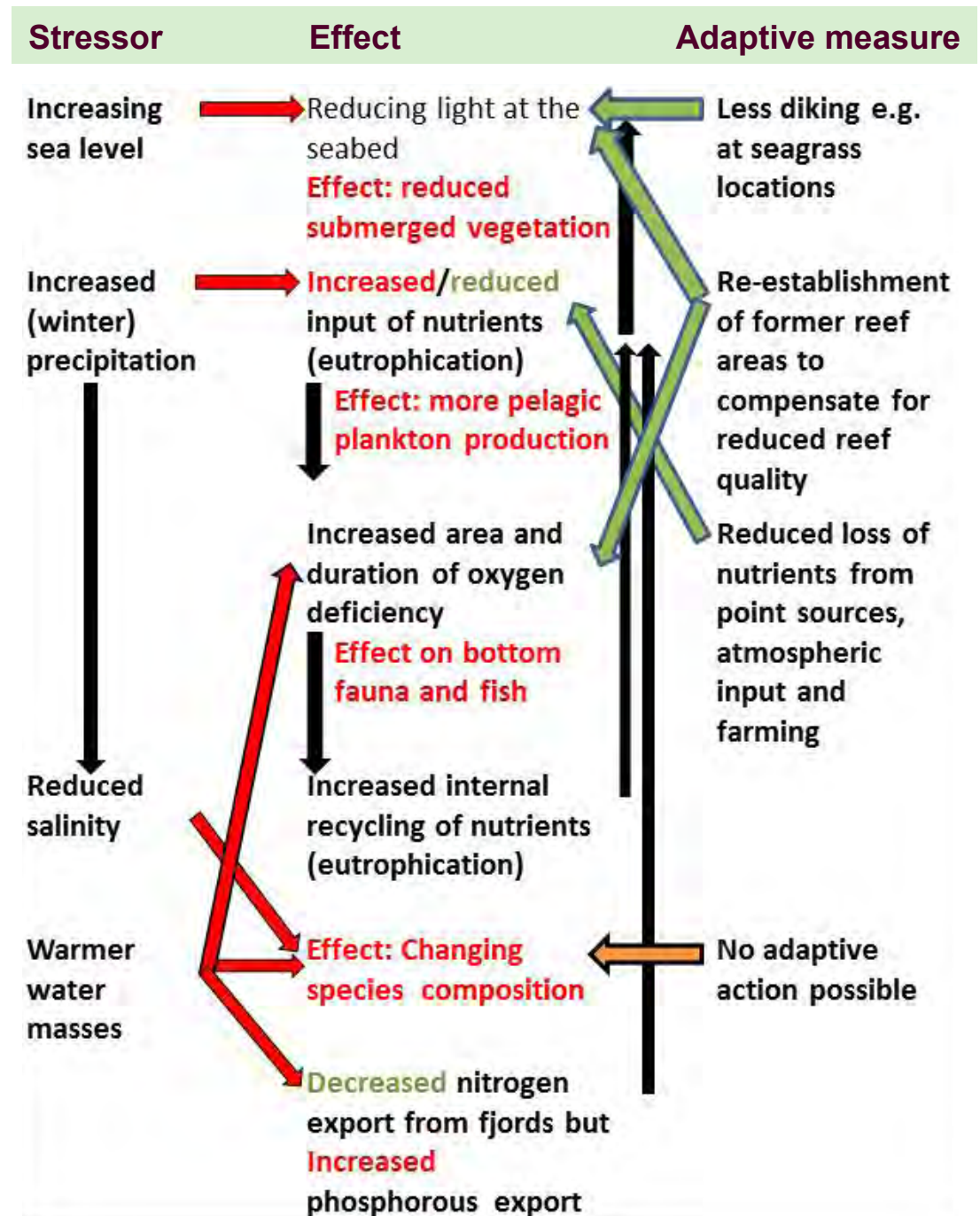


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Climate change impact assessments and ways towards adaptation

→ Projected climate change effects on the ecosystem

→ Feedback mechanisms

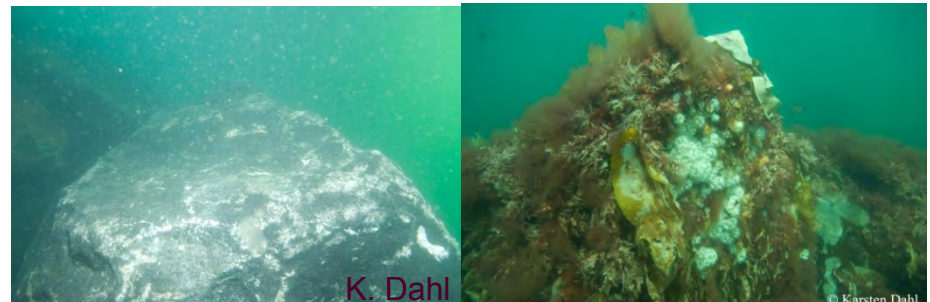


Adaptation options (1)

- Precautionary approach (,no regret measures ‘)
- Decrease of other human pressure (multiple stressors)
- Implementation of agreed strategies (WFD, MSFD, BSAP, Habitats Directive)
 - Step-wise and cycling approach (CC)
 - Considering CC for measures with long-life and high costs
- Connection of processes in the catchment and the Baltic Sea

Adaptation options (2)

- Reduction of nutrient loss from point/diffuse sources
 - Highly effective sewage treatment
 - Changes in agricultural practices (winter crops, restricted use of fertilisers and manure)
 - Buffer strips and filter systems in drained agricultural areas
 - Reestablishment of wetlands and meandering rivers
- Improving resilience of threatened species
 - Habitat restoration (e.g., reestablishment of hard bottom substrates) → ***poster ,throw a stone into the water ‘***
 - Use of spatial planning instruments (protected zones)





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Thank you



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