The Importance of a Healthy Seafloor in the Mitigation of Eutrophication

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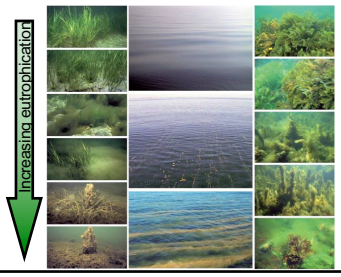
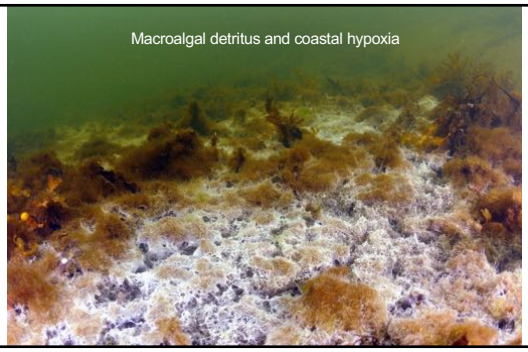
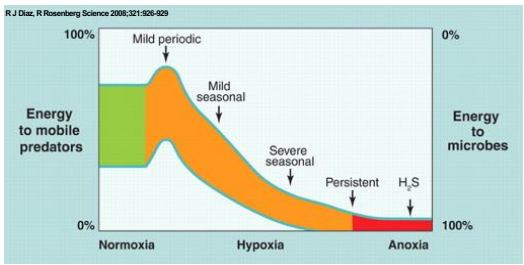
Eutrophication - the major threat to biodiversity and EF in the Baltic Sea

Eutrophication increases ecosystem metabolism and the coastal filter function





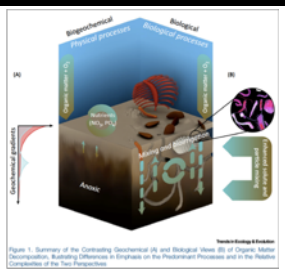
The rise of slime - serious consequences for energy transfer in the food web



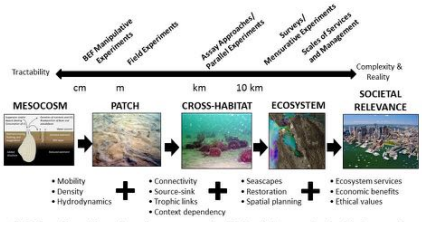
Macrofauna modify organic matter transformation and retention

- Current global models of biogeochemical cycling ignore benthic macrofauna
- Critical for understanding eutrophication and climate change impacts
- Quantification difficult

Snelgrove et al. (2018) Global Carbon Cycling on a Heterogeneous Seafloor. *TREE*



Making biodiversity research matter – from the bucket to the real world



Snelgrove, Thrush & Wall & Norkko (2014). *Real world biodiversity–ecosystem functioning: a seafloor perspective*, Trends in Ecology and Evolution 29: 398-405

Seafloor biodiversity out there really does matter - even in hypoxic conditions BONUS HYPER and BONUS COCOA

Coastal Hypoxia and the Importance of Benthic Macrofauna Communities for Ecosystem Functioning

Johanna Gammal · Joanna Norkko · Conrad A. Pilditch · Alf Norkko

ECOSYSTEMS

Seafloor Ecosystem Function Relationships: In Situ Patterns of Change Across Gradients of Increasing Hypoxic Stress

Joanna Norkko, Johanna Gammal, Judi E. Hewitt, Alf B. Josefson, Jacob Carstensen, and Alf Norkko

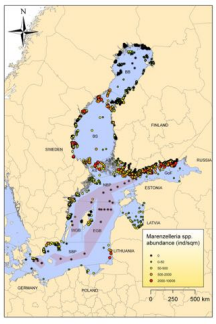
How do they matter?

Invasive species – and changing biodiversity

Polychaete *Marenzelleria* tolerates low oxygen conditions

Large increases in Marenzelleria abundances have coincided with improved near-bottom oxygen conditions

Kauppi, Norkko & Norkko - 2015 (Biological Invasions)



A welcome can of worms? - worms provide important ecosystem service oxygenating sediments and binding nutrients

- Reactive Transport Model shows that *Marenzelleria* bioirrigation increases sediment P retention.
- This effect can be larger than the external P loading in the Stockholm area!

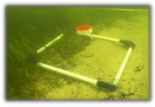
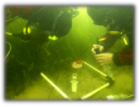
Norkko J & Reed D *et al* (2012). *Global Change Biology*, 18: 422–434.

BONUS COCOA – the coast as a nutrient filter

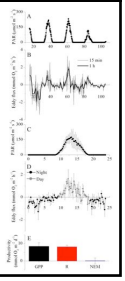
Quantifying the role of benthic fauna for coastal nutrient cycling: a cross-system comparison

Exploring the contribution of seafloor biodiversity to the coastal filter - biodiversity and environmental context important




Quantifying the Breathing Seascape with AEC



"The breathing seascape: resolving ecosystem metabolism and habitat-function relationships across coastal habitats"
(Academy of Finland 2016-2020; FIN, DEN, SWE, NZ)