

Schleswig-Holstein

Der echte Norden

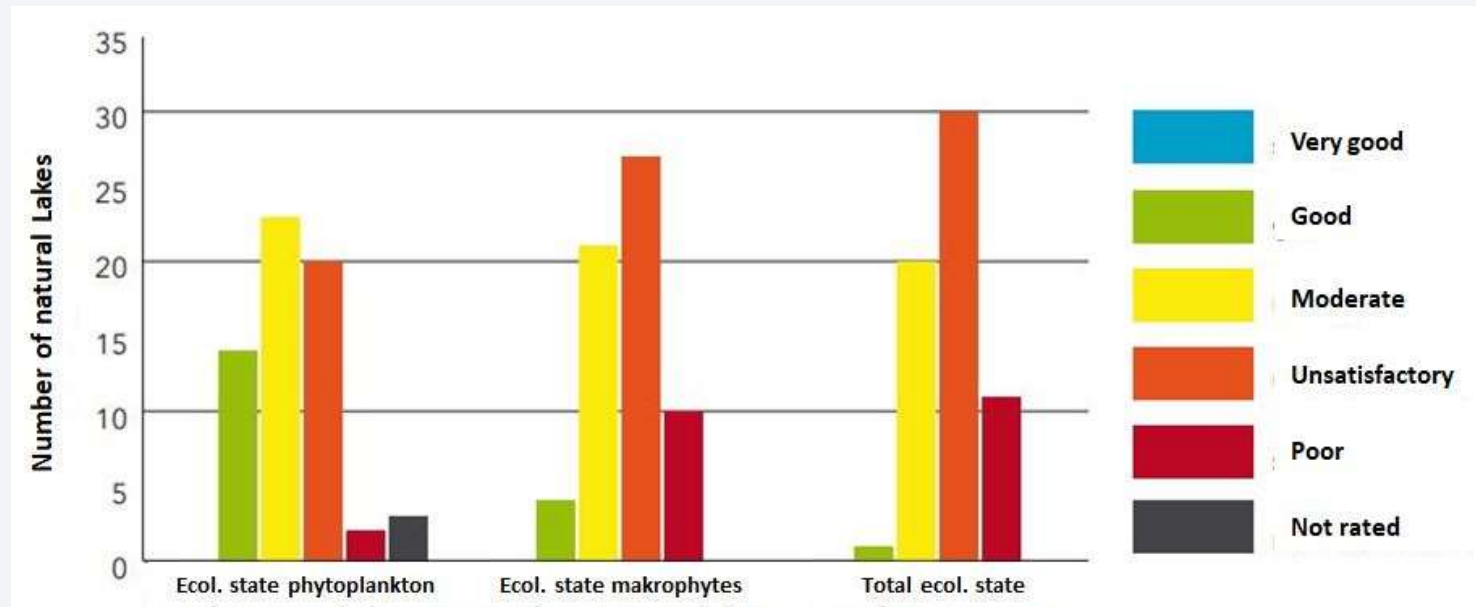
Microalgae harvest from eutrophic natural waterbodies as an ecosystem service to counteract eutrophication

BB4V opening conference
12.03.2020 Rostock
M.Sc. Jannik Faustmann



Why is such an ecosystem service needed?

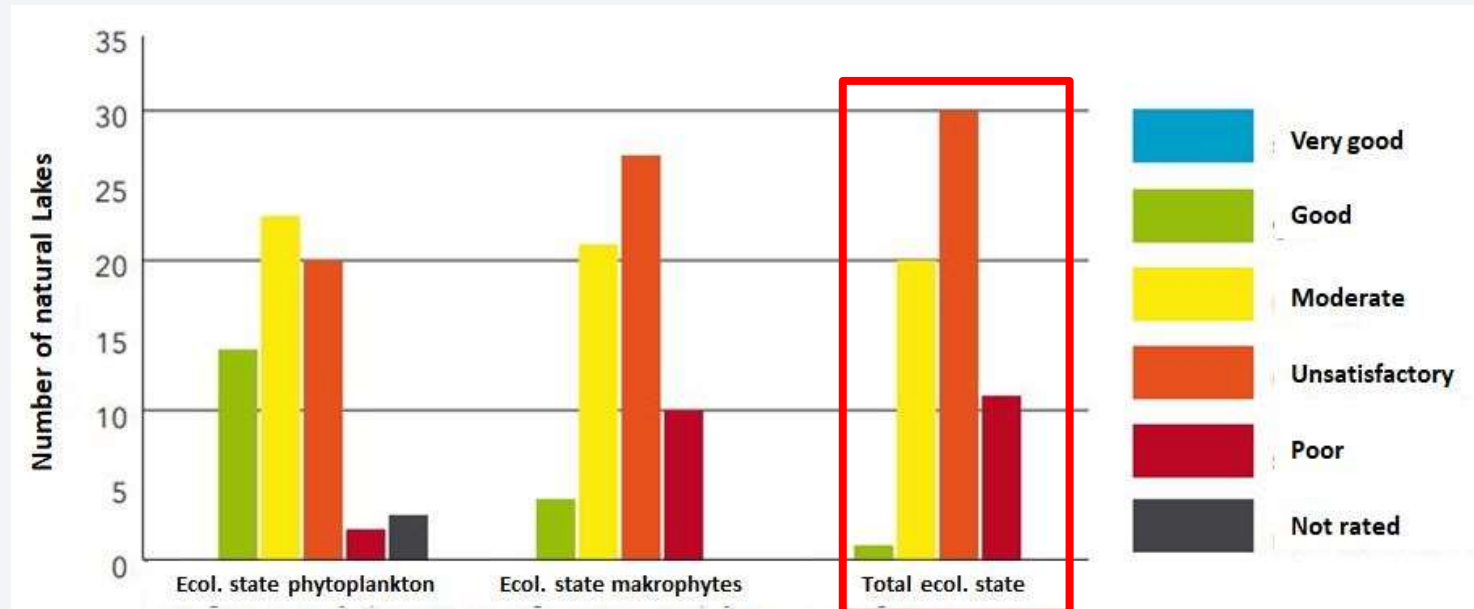
Current state of natural waterbodies



Ecological state of lakes > 50ha, n=62 (MELUND 2016, information letter on the european WFD)

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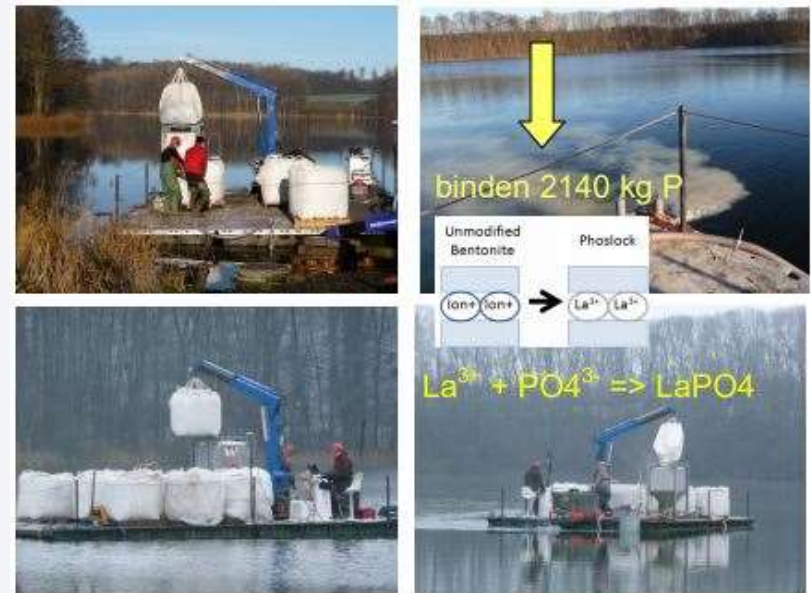
Reason for the poor ecol. state: High nutrient input
→ Not compatible with the european WFD

Measures for the regeneration of water bodies

- Reduction of the nutrient input by structural measures
- Dredging nutrient rich sediment
- Chemical phosphate precipitation



Thomas Oberdorfer (Neue Presse 2018)

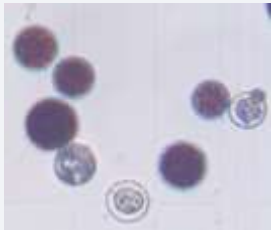


LLUR (2015): Entwicklung des Behlendorfer Sees nach einer internen Phosphatfällung mit Bentophos®

Microalgae?



Chlorella vulgaris



Haematococcus sp.



Spirulina platensis

- Unicellular (2 – approx. 200µm)
- Possibility to do photosynthesis
- Aquatic organisms
- Ubiquitous occurrence
- > 1 mio. species worldwide

Harvesting microalgae biomass as a measure to remove nutrients



Microalgae bloom in the lake Borgdorf 2012 (kn-online.de 04.03.2020)

N & P content of microalgae biomass

N:3-12%dw

P:0.03-3%dw

(R. Whitton et al 2016)

Per kg dry microalgae biomass

30-120g N

0.3-30g P

are removed

Harvesting techniques

Requirements

1. Mobility
2. Low power consumption



Harvesting techniques

Skimmer



Gravity belt filter



Hydrocyclon



The business case

Key Resources



- Mobile harvesting Systems
- „Know-How“

Key Activities



- Deployment/Movement/Operation of harvesting systems
- Collection and analyses of the biomass
- Pre-processing of the biomass

Key Partners



- Equipment constructors
- National and local authorities
- Commercial buyers of the biomass
 - Cosmetics industry } ?
 - Animal feed industry } ?
 - Operators of biogas plants

Cost Structure/Revenue Streams



- High investment costs
- Staff costs
- Operational costs
- Revenues from ecosystem services
- Gains from selling harvested biomass
- (Consulting for microalgae harvesting techniques)

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Thanks for your attention!

