

Should we compensate for ecosystem services?

- The policy perspective on the SUBMARINER „New Marine Uses“



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The main policy objective is the achievement of good environmental status

Water Framework Directive (WFD), Marine Strategy Framework Directive (MSFD) and HELCOM Baltic Sea Action Plan strive to achieve a good status of the marine environment

WFD river basin management planning cycle



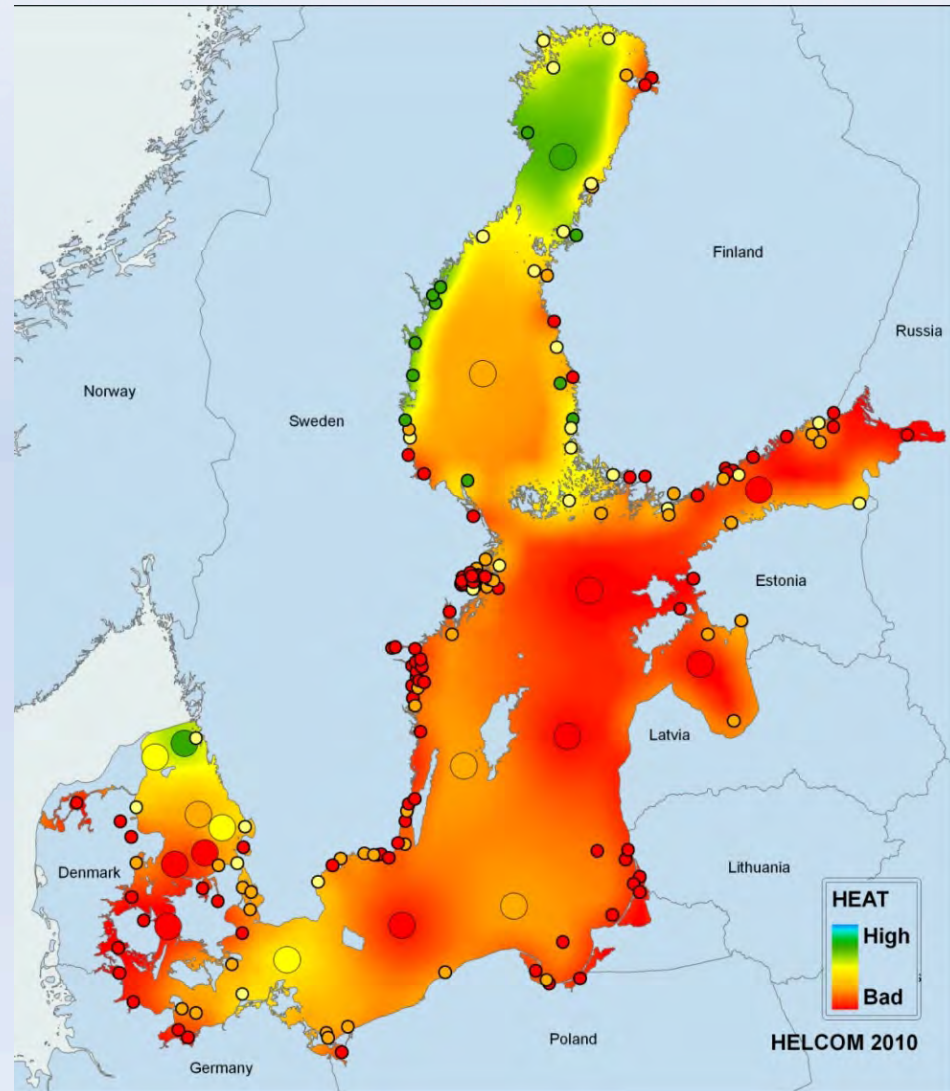
MSFD management cycle



The Baltic Sea is currently not in a good status, leading to undesired environmental effects and a reduction in ecosystem services provided

The Baltic Sea fails to achieve good eutrophication status

HELCOM Eutrophication Assessment (1997-2003)



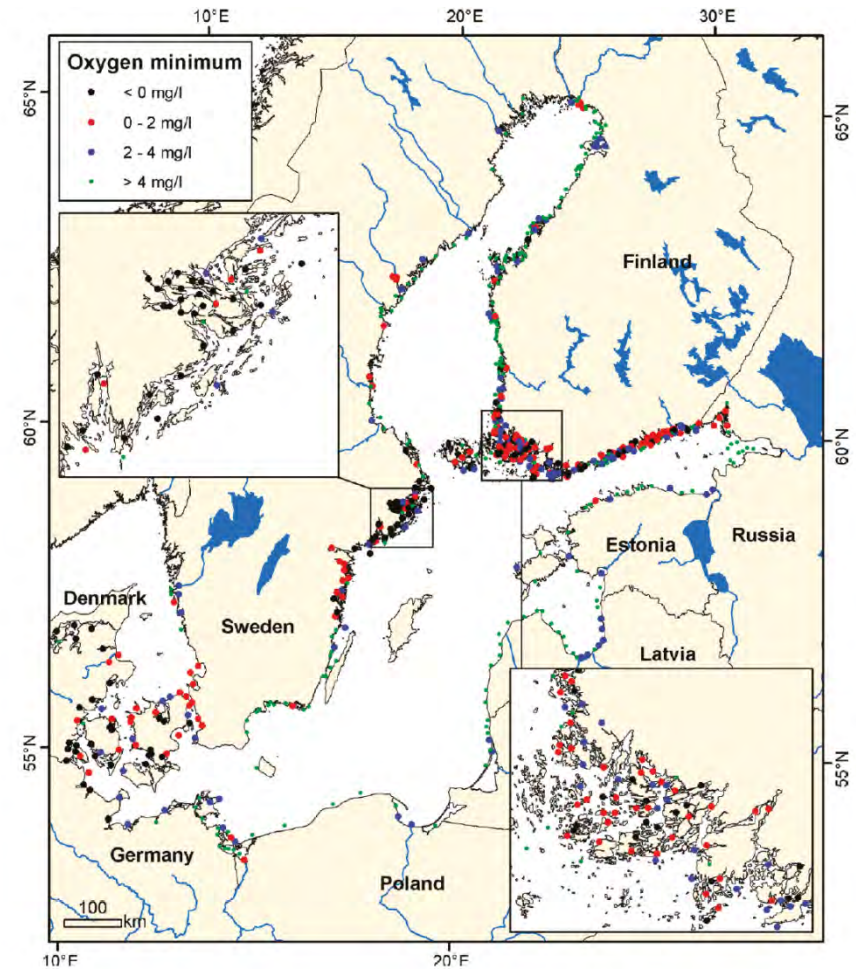
Eutrophication causes undesired effects that reduce ecosystem services



Carpet of blue-green algae in July 2010 covering almost 90% of the Baltic Sea
Source: ESA



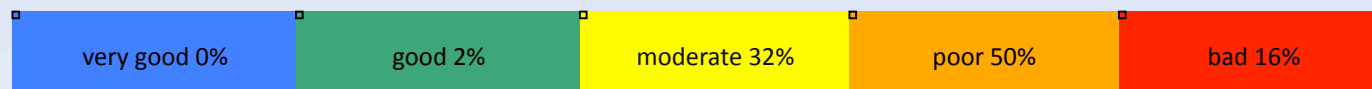
Algae mats on Baltic Sea Beach, Foto: W.Leujak



Hypoxia in Baltic Sea coastal waters
Conely et al. 2011

The German Baltic Sea fails to achieve good ecological status according to the WFD

Ecological Status of German coastal waters
under the WFD (2008 assessment)



The Baltic Sea fails to achieve good status according to the MSFD Initial Assessment 2012

Descriptor	DE	DK	EE	FI	LV	LT	PO	SE
D1								
D2								
D3								
D4								
D5								
D6								
D7								
D8								
D9								
D10								
D11								

GES reached	GES reached in general except in some coastal areas	GES not reached in general	Status not known	No information on the status presented/available
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Source: HELCOM GEAR Report

Most of the „new marine uses“ identified by SUBMARINER have some negative environmental impacts and often intervene in complex ecological processes that are insufficiently understood

Environmental impacts of „new marine uses“



Example: mussel farming

- Mussels play a key role in aquatic ecosystems (regulation of phytoplankton populations by filter-feeding, nutrient cycling, major component of the structural matrix)
- Excretion of faeces and pseudofaeces leads to fast nutrient recycling that promotes phytoplankton growth
- Well-oxygenated sediments are a prerequisite for positive ecosystem effects
- Any biomanipulation must be exercised with great care

Environmental impacts of „new marine uses“

Example: aquaculture within wind farms

- Depending on the cultivated species effects on water column and benthos
- Potential safety risk of increased traffic and maintenance operations
- Loss of the potential for wind farm areas to become relatively undisturbed „no-take“ zones
- Unlikely that displaced fishermen will become aquaculturists

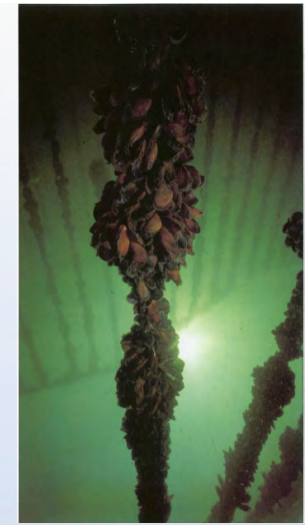
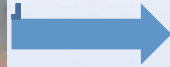


To achieve good status we need to use the sea less and not more, hence the SUBMARINER „new uses“ should replace traditional less-sustainable uses rather than adding to these

Reduction of uses with negative environmental impacts is required to achieve good status of the Baltic Sea according to MSFD, WFD, BSAP

- We need to reconcile the increasing utilisation demands of the „Blue Economy“ with the protection of the marine environment
- „Blue growth“ needs to be underpinned by ecological boundary conditions
- New, more environmentally friendly uses of the Baltic Sea should be viewed as an alternative to traditional uses, not as an addition to existing uses (e.g. integrated multi-trophic aquaculture instead of traditional aquaculture)

The SUBMARINER „new marine uses“ are often „end of pipe solutions“ for environmental problems that can still be remediated at source, compensating for these ecosystem services creates the wrong incentives



Excessive nutrient input

Ecosystem effects

Nutrient removal

- Precautionary approach: If possible **combat nutrients at source** or as close to the source as possible
- Agriculture should be obliged to take measures to prevent excessive nutrient inputs
- There is still ample scope for effective measures to prevent nutrient from entering the marine environment
- However: small-scale localised solutions are sometimes required; environmental impacts need to be considered carefully (e.g. Zebra mussel cultivation to combat internal nutrient loading in the Szczecin lagoon)

Additional costs of marine uses that provide ecosystem services can be financed by a variety of instruments

Mechanisms to promote more environmentally friendly uses over traditional uses



- Policies that require producers to internalise environmental costs (fertiliser tax, polluter pays fees ect.) would lead to higher costs for less environmentally friendly products
- In the context of necessary localised remediation approaches „new uses“ could be regarded as measures in the context of the WFD, MSFD, BSAP and could be paid for as such
- Certification of “premium” products from sustainable production (e.g. products from sustainable integrated aquaculture production)

A final comment on nutrient trading schemes

- Nutrient trading becomes an increasingly popular tool in a market-based economy since and is assumed to be more cost efficient than command and control approaches
- Operational trading schemes: US acid rain programme, EU CO₂ trading scheme
- Trading schemes for water pollutants mostly located in the US but limited success (high transaction costs)
- Nutrients not uniformly mixed- danger of pollution hotspots (trade restrictions required that restrict the size of the market and increase transaction costs)
- Mussel and macroalgae cultivation where it is cheapest and environmental conditions are favourable
- Could counteract reduction efforts at source

Conclusions

- Ecosystem services generated by SUBMARINER „new marine uses“ arise due to insufficient control of pollution at source and cannot be regarded as „real“ ecosystem services
- They should therefore not be compensated for but should be promoted as more environmentally friendly and sustainable ways of using the marine environment
- Negative environmental impacts of „new marine uses“ need to be carefully evaluated in their respective contexts
- „New marine uses“ might have an important role as remediation measures for localised specific problems that cannot be combated at source
- **The potential palette of measures that can be taken at source is on a broad scale still sufficient to achieve good environmental status**

Thank you for listening