

# WATER QUALITY IMPROVEMENT BY MUSSEL CULTIVATION – CASE STUDY SZCZECIN LAGOON, BALTIC SEA

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The German-Polish Szczecin (Oder-) Lagoon in the southern Baltic Sea is highly eutrophic coastal water that is affected by algae blooms during summer. To reach a good ecological status, as demanded by the EU Water Framework Directive, nutrient reductions in the river basin alone will not result in a sufficiently improved water quality. Several supporting internal measures are possible in theory to combat eutrophication, to remove nutrients, and to improve ecosystem quality: a) dredging or capping of sediment, b) enlarged reed belts and extended submersed macrophyte areas, c) algae farms, and finally d) enlarged natural mussel beds and mussel cultivation. Mussel cultivation seems to be a promising supporting internal measure to improve the ecosystem function of the shallow, oligohaline lagoon. Especially zebra mussels, *Dreissena polymorpha*, a species currently inhabiting the whole lagoon, help to clarify the water by high filtration rates. But presumably a lack of appropriate substrate has led to a decrease of the zebra mussel population during the last decades.

The cultivation of zebra mussels on lines or nets in combination with periodical harvest could reduce the turbidity and the nutrient content in the Szczecin Lagoon.

Accompanying researches as well as discussions with stakeholders are necessary to analyse pros and cons of internal measures and possibilities for implementation. Some of the criteria that have to be fulfilled, are:

- The measure must be ecologically justifiable. The ecosystem should not be disturbed or negatively changed by introducing invasive alien species for example. The Szczecin Lagoon is an important area for migrating birds and fish spawning. Large areas of the lagoon are FFH and NATURA 2000 sites. The measure has to be in agreement with the requirements of an environmental impact assessment.
- The measure must be socially acceptable. It is desirable to create jobs in this region with a high unemployment rate (>20%).
- The measure must follow the regional spatial plan. The lagoon is characterized by different uses such as fishery, shipping, and nature conservation. The measure should not compete with other traditional uses such as gillnet fisheries locating in the shallow areas of the lagoon. Economic loss must be prevented.
- The measure must be legally feasible. Numerous provisions like the Federal Building Code and laws of the state of Mecklenburg-Western Pomerania, Planning Law, Building Regulations, Environmental Protection Law, Water Law and Waterway Law must be applicable.

The presentation will give an overview about the findings of our case study analysis. It will show detailed results of the legislative analysis as well as how an improved water quality can stimulate the demand for tourism on both sides of the lagoon (Poland and Germany).