



Popular science summary of the PhD thesis

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Title of the PhD thesis	Mitigation Culture of Mussels: Production and Ecological Impacts
PhD school/Department	DTU Aqua

Science summary

Many coastal waters and estuaries are impacted by nutrient enrichment from human activities, leading to eutrophication. Enhancement of coastal ecosystems is a globally recognized objective and a key part of the EU Water Framework Directive. Eutrophic environments experience ecological instability, requiring multiple concerted mitigative mechanisms for nutrient reduction that are economically tenable. Mussel aquaculture has been advocated as a means to mitigate eutrophic conditions through top-down biofiltration control of organic matter. Cultivation techniques maximizing nutrient extraction exhibit potential for remediating coastal water quality and provision of high quality protein.

From extensive field and modeling studies over three years, a number of advancements were accomplished for optimizing nutrient extractive potential as well as understanding environmental interactions of mussel farming designed for mitigating the effects of eutrophication. Increased productivity was achieved by modifying conventional farming practices and adoption of newer technologies, meaning more nutrients can be extracted in less space. The intensive filtration of particles by mussels in these farms was shown to dramatically increase water clarity, which is an important ecosystem service. Impacts of deposition of organic matter to the sea floor were observed to be relatively minor, especially in relation to the total nutrient extraction potential of harvesting mussels. Overall, this form of mussel farming, mitigation mussel cultivation, can return large quantities of nutrients back to land while providing several ecosystem services which can facilitate enhanced ecological conditions of coastal waters.