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Workshop:

Mussel & Farm Size Matter: Elucidating Science Facts and Finding Ways Forward Together

Date: Wednesday, November 15th, 2023

Theme: Aquaculture

Speakers: Nardine Stybel (EUCC-DE, Germany); Anne Stald Møllmann (Ocean Havhoest, Denmark); Marie Maar & Andreas Holbach (Aarhus University); Peter Krost (Coastal Research & Management, Germany)

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How do we use marine space and how do we assess production efficiency in farming? How do we compare social, economic and environmental implications over scale?

Consequently, how can we increase mussel production and meet Mission Ocean targets by 2030, needs clear evidence to enable both proper maritime spatial planning (MSP), increase social license to operate and finally de-risk investments?

The aim of the workshop was to analyse state of play in the Western Baltic of mussel farming, a form of low trophic aquaculture, analysing impacts and system capacities to scale up farming, concerning environmental and socio-economic dimensions. During the workshop, we developed relevant targets for Mission Ocean 2030, and suggest concrete actions for mission deployment, including recommendations for R&D needs for mussel production.

Mussels are a known biological marine water cleaning device and also an excellent biomass source of animal protein in food, feed and other product market applications. Farming mussels has a good potential to scale up in the Baltic Sea for food and non-food applications, however the dimensions of both harvested mussels but also the size of farms especially in coastal settings, have been points of discussion and dispute, especially in Denmark. In this workshop we invited five key experts from Denmark and Germany addressing environmental, economic, market perspectives, and social acceptance perspectives of mussel farming sizing and siting in Western and Central Baltic.

Session 1: Social acceptance and to how to improve it

Nardine Stybel (EUCC-DE) presented her published paper on "Mussel farm location in the Baltic sea – Community acceptance or distrust". The work presented was on social acceptance of mussel farming, based on interviews with 450 residents in total in two coastal towns in Germany and Denmark. About 10 years ago, environmental NGOs were positive about mussel farming, but it was criticised that negative attitude started because of coupling of mussel farming to fish farming in multitrophic regimes.

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Anne Stald Møllmann (Ocean Havhoest, Denmark) presented their ground-breaking work in Denmark in the last 3 years where they are engaging and coordinating dozens of small local coastal communities in Denmark that developing small regenerative farms of mussels and seaweed. In this way, citizens develop a sense of community around mussels, mussel farming, and the coast, and they produce in their community sea gardens and harvest blue food products.

Session 2: Basin scale modelling of ecosystem services and impacts by suspended mussel culture

Marie Maar (Aarhus University) presented their scientific published work on ecosystem service benefits from mussel farming along with the trade-offs applied in two sea-basins in Denmark in Limfjord canal and in Horsens Fjord. Marie showed important finding that are in direct contrast to dominating public opinion that oxygen is depleted under a Baltic mussel farm. Furthermore, they showed some results on Nitrogen fluxes at sea-basin level that demonstrate that mussel farming net removed nitrogen from a eutrophicated system, thus highlighting that we miss out and we don't see the full picture if we only look below the farm.

Session 3: On the feasibility of mussel meal production for pet feed in the Baltic Sea

Peter Krost (Coastal Research & Management, Germany) presented their work under Baltic MUPPETS project, where the entrepreneur's perspective was scoped, by assessing the socio-economic and market needs in regard to mussels for pet-food markets and ecosystem service applications. In his presentation Peter presented business models with cost break down & prices for both Western and Central Baltic, where harvest and down-stream market applications differ. Results have shown that while in the Western Baltic additional income can be generated by marketing undersized mussels, the scale needs to be large to be able to market. In Central Baltic case presented, where 100% mussel harvest is under-sized, farmers have to organize to be able to make profit.

Session 4: Mussel mitigation farming: scalability and nutrient removal capacity under different placement scenarios

Andreas Holbach (Aarhus University) presented their published results from MUMIPRO and BONUS OPTIMUS on optimal siting and scaling up of mussel "mitigation" farms, considering environmental and technical and social capacities. A mussel mitigation farm is as a specific type of farm, designed mainly for reducing the nutrient load in the Western Baltic, and not for production of food for human consumption. Environmental and planning authorities, entrepreneurs (farmers, other users), and local society often have interest perspectives, and proper planning is needed to develop optimal siting and allow multiple uses of sea.