Demonstrating mussel farming in the Baltic Sea - Baltic Blue Growth project

Efthalia Arvaniti, PhD
Programme manager SUBMARINER Network

www.balticbluegrowth.eu  #BalticBlueGrowth
Since its founding in 2014, the SUBMARINER Network family has been continuously growing. It currently has 24 network members, representing all Baltic Sea Region countries. The network includes both public and private sector organisations and reaches out to many more actors both within and beyond our project partnerships.

ROADMAP 2013
Roadmap setting out vision and defining necessary actions to reach this vision.

COMPENDIUM 2012
Compendium assessing potential for innovative and sustainable uses of marine resources in the Baltic Sea.

NETWORK 2014
Foundation of the SUBMARINER Network for Blue Growth EEIG

2016 ROADMAP STATUS REPORT

2017 SUBNET CONFERENCE DECLARATION
The 2nd SUBMARINER Conference ‘Better off Blue’, hosted in Berlin on 27th-28th September 2017, marks another milestone.

OUR VISION 2030
The Baltic Sea Region – a biobased innovation showcase

THE IDEA 2010
The project SUBMARINER (2010–2013) assessed, for the first time, the potential for innovative and sustainable uses of Baltic marine resources. It developed the idea for the network.
The SUBMARINER Network

- EU Strategy for the Baltic Sea Region (BSR)
  - Priority Area Innovation
  - Umbrella flagship: numerous actions and initiatives
- Expanding number of members from the BSR!
- Rationale: **Reaching the critical mass for action** – which not available in one country alone
Current SUBMARINER Network projects

- **Baltic Blue Biotechnology Alliance**
  - Advancing marine biobased product development

- **Baltic Blue Growth**
  - Initiating full scale mussel farming in the Baltic Sea

- **SmartBlue REGIONS**
  - Smart Specialisation and Blue Growth in the Baltic Sea Region

- **InnoAquaTech**
  - Cross-border development and transfer of innovative and sustainable aquaculture technologies

- **MUSES**
  - Multi-Uses in European Seas
#BalticBlueGrowth project

- May 2016 – March 2019
- € 4.7 million
- 18 project partners from SE DK DE LV PO EE

balticbluegrowth.eu | #BalticBlueGrowth
Objective

Advance mussel farming in the Baltic Sea from experimental to full scale to improve the water quality and create blue growth in the feed industry.
Introduction to mussel farming

- Blue mussels are farmed and enjoyed as fresh seafood in many European countries.
- Until now, mussels have only been cultivated in the **Western Baltic Sea Region** for human consumption.
- In **Eastern Baltic Sea** farms are set up to find out whether mussels can be farmed for other purposes, e.g. animal feed.
Benefit:
Mussels for closing the nutrient loop

“Closing the nutrient loop” by recycling nutrients through mussel farming

Farming mussels can improve the Baltic Sea water quality by
- reducing eutrophication
- increase transparency
- improve water hygiene
Baltic Blue Growth pilot farms

- **St. Anna archipelago (SE)**
  - 75 tonnes harvest from 0,5 ha farm

- **Kalmarsund (SE)**
  - 35 tonnes harvest from 1 ha submerged farm

- **Musholm (DK)**
  - 120 tonnes harvest with different farming techniques on 1 ha

- **Vormsi island (EE)**
  - 40m² test units

- **Coast of Kurzeme (LV)**
  - Testing a submerged farm on 1 ha

- **Kiel Bay (DE)**
  - 5 tonnes harvest from 0,32 ha test units, in addition to a commercial farm

balticbluegrowth.eu  |  #BalticBlueGrowth
Benefit: modelled nutrient removal by farmed mussels

- Mussel farming in the Baltic Sea can remove significant amounts of nitrogen and phosphorus.
- German mussel farm nutrient uptake:
  - 0.82 tonnes N / ha and 0.054 tonnes P / ha water area
Opportunity: finding a cost-effective mix of nutrient reduction measures

<table>
<thead>
<tr>
<th>Measure in the Baltic Sea Region</th>
<th>Reported N removal costs in €/kg N</th>
<th>Reported P removal costs in €/kg P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mussel farming without sales</td>
<td>10 – 64</td>
<td>150 – 900</td>
</tr>
<tr>
<td>Agricultural measures</td>
<td>0 – 150</td>
<td>0 – 10,200</td>
</tr>
<tr>
<td>Livestock reductions</td>
<td>6 – 842</td>
<td>112 – 5,895</td>
</tr>
<tr>
<td>Wastewater treatment upgrades</td>
<td>11 – 136</td>
<td>39 – 600</td>
</tr>
<tr>
<td>Wetlands</td>
<td>2 – 93</td>
<td>396 – 1,518</td>
</tr>
</tbody>
</table>

Opportunity: new blue growth opportunities for the feed industry

- Mussels from Eastern Baltics often too small and fragile for human consumption
- Successful trials of producing mussel meal as animal feed
  - New possibilities: mussels as organic substrate for insects larvae as protein source in animal feed
Take home messages from Baltic mussels
#BalticBlueGrowth

- Mussels grow naturally in the Baltic sea without extra feed or fertiliser and can be combined with other types of aquaculture (e.g. IMTA)
- Production methods have now been adapted to local conditions
- Environmental impacts of mussel cultivation are close to zero
- Mussels provide important ecosystem services by
  - increasing water transparency and decreasing nutrient content in the water
- Provided environmental services can be monetized 0.1 €/kg mussel (from 2 €/ kg N) and be partly paid by compensation schemes
- Mussel farming does NOT collide with or substitute any attempts to reduce nutrient influx from land
- Mussel farming is driving blue growth, by providing private business opportunities based on
  - Mussels are suitable for fish feed and human consumption
  - Positive impacts on tourism, contribution to circular economy and job creation
Contact

Submariner Network program manager: Efthalia Arvaniti, PhD
ea@submariner-network.eu

Baltic Blue Growth communications manager: Annika Steele
as@submariner-network.eu

www.balticbluegrowth.eu
#BalticBlueGrowth