BlueBioSites: Finding the right locations for a thriving blue bioeconomy in the Baltic Sea Region

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What is the Blue Bioeconomy?

Conversion and commercial use of living aquatic resources into a wide variety of **products and services**

Benefits:

- New sustainable biomass for multiple products
- New jobs / opportunities also in remote coastal areas
- CO2 uptake
- Nutrient uptake
- Clean Beaches
- Water Treatment
- New Habitats
- Restocking of natural populations







But: the Blue Bioeconomy

- one piece of the Blue Economy cake
- one piece of the Bioeconomy cake



WHAT IS THE BLUE

ECONOMY?

ESTABLISHED SECTORS

MERGING SECTORS

SUBMARINER Report on the State of Play of the Blue Bioeconomy in <u>the Baltic Sea Region</u>

No longer only research

Proof of Concepts

=> 650 companies earmarked => more and more products on the market

=> mussels, algae can be cultivated

- => better knowledge on floating structures, beach wrack, biogas
- => cost-effective nutrient removal, where needed
- => RAS, aquaponics, IMTA
- => negative environmental impacts limited



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- Little biomass production: => Demonstrators slow moving
- Legal Barriers / long licensing, if at all possible: => lagging behind actual positive developments
 - => aquaculture behind agriculture





Area	Salinity	Meat dry matter %	% Soft tissue	Soft tissue fat %	N (% soft tissue dry weight)	P (% soft tissue dry weight)
Western Baltic	High	15.1 a	58 a	9.5 a	9.5 a	1.41 a
Central Baltic	Moderate	14.2 a	52 b	10.3 a	10.3 a	1.48 a
Eastern Baltic	Low	13.7 a	41 c	9.7 a	9.7 a	1.33 a





Figure 4. Nitrogen uptake per harvested ton.





Location, location, location

- Food availability
- Temperature
- Water Movement
- Predators, e.g. Eider ducks, starfish
- Wild mussels ?

- Sheltered area
- Logistical costs
- Marginal Costs of other measures



Mussels

Estonian Draft MSP



Spatial layout 5.3.2.1 Natural growth potential of algae





Guidelines:

production

- 1. Encourage the balanced development of shellfish and algae cultivation in naturally suitable areas and outside the excluded areas (see spatial layout above).
- 2. In the case of shellfish and algae cultivation overlapping with water traffic areas, it is advisable to favor areas outside the water traffic areas for development. Cooperation with the Maritime Administration is required to use up-to-date water traffic data.
- 3. Aquaculture supports "cluster solutions": combining a nutrient adding fish farm at sea with the nutrient-removing algae and/or shellfish farming. However, it is also possible to develop algae and/or shell farming spatially separately from fish farming. In addition, wider cluster solutions through land-sea interactions (e.g., shared labor, use of common infrastructure, joint vessels, etc.) are favored. It is important to involve fishermen and other marine users in the maintenance of aquaculture facilities in order to alleviate the seasonal nature of sea-based employment.
- 4. Shellfish and/or algae cultivation in wind energy development areas is preferred to achieve a positive synergy through the spatially combined use of the sea area (located in the same sea space), if possible the use of common infrastructure etc.
- 5. The use/production of renewable energy for the farm's own use is preferred in shellfish and algae farms, except wind energy development/production.

Does the blue bioeconomy have 'space' allocated or foreseen?

	Denmark	Estonia	Finland	Germany	Latvia	Lithuania	Poland	Sweden
Specifically allocated area	Х							
Priority area		Х	Х					
Area of general use				(X)	Х	Х		(X)
Multi-use							Х	
Territorial waters	Х	Х	Х		Х	Х		Х
EEZ	Х	Х	Х	Х		Х	Х	Х





Is it clear how to find the 'space' for blue bioeconomy?

	Mussels	Algae	Fish AC	Beach cast	Floating islands
Site selection criteria	Х	Х	Х		
Decision support tool	Х	Х	Х		
Experience & available data				Х	Х
Coordinated monitoring of sites					

 Decision support tools – ODSS, Baltic Explorer, MYTIGATE, PlanWISE4Blue, models of Luke and SYKE, models of DTU Aqua.





Action: Get pilots to the next level

- Establish large scale demonstration farms / plants
- Collect and assess common parameters
- Develop comprehensive regional plans
- Foster cooperation among single actors to achieve critical biomass for industry
- Introduce ecosystem service payments





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Identification & monitoring of sites

- Collect minimum set of joint parameters at operational farms in central platform (i.e. ODSS) to validate environmental benefits, alleviate risks, assess harvest results as well as socio-economic benefits
- Establish Baltic Sea wide system to identify optimal blue bio sites depending on purpose
- Agree on most effective monitoring technology
- Use existing offshore structures & activities (OWFs; Ships; Fishery) to provide also environmental data

Organise national / regional roundtables

- between industry, R&D and regulators to remove legal barriers; i.e. waste and zero pollution definitions; novel food regulation; single / multi-use sector licenses
- establish ecosystem payment pilots schemes
- agree on suitable demonstration sites; incl. specific multi-use areas
- Develop comprehensive regional development and marketing plans: Biodiversity; ZeroPollution, Carbon reduction, Circular and Regional Economy

Encourage and coordinate new cooperative structures

- Share costs for joint equipment & knowledge
- Secure joint larger contracts / foster direct interaction with relevant larger companies
- Develop business plans to show how many and where farms / biomass harvest are needed to provide critical mass to industry

How can get this organised? Who is on board? Join the BlueBioSites project!

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