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Macroalgae sector in Estonia: past, present and future perspectives

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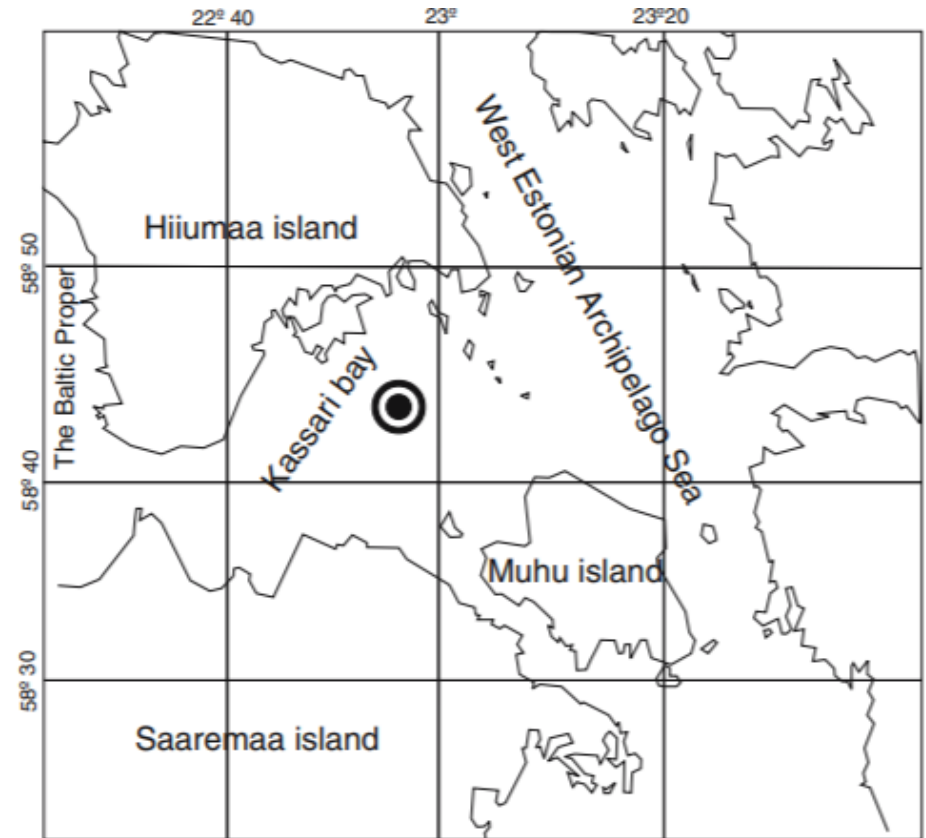
Macroalgae historical uses:

BEACH CAST



People have used beach cast (mostly bladder wrack) as fertilizer in their gardens and aquaculture

Long tradition of harvest of macroalgae:



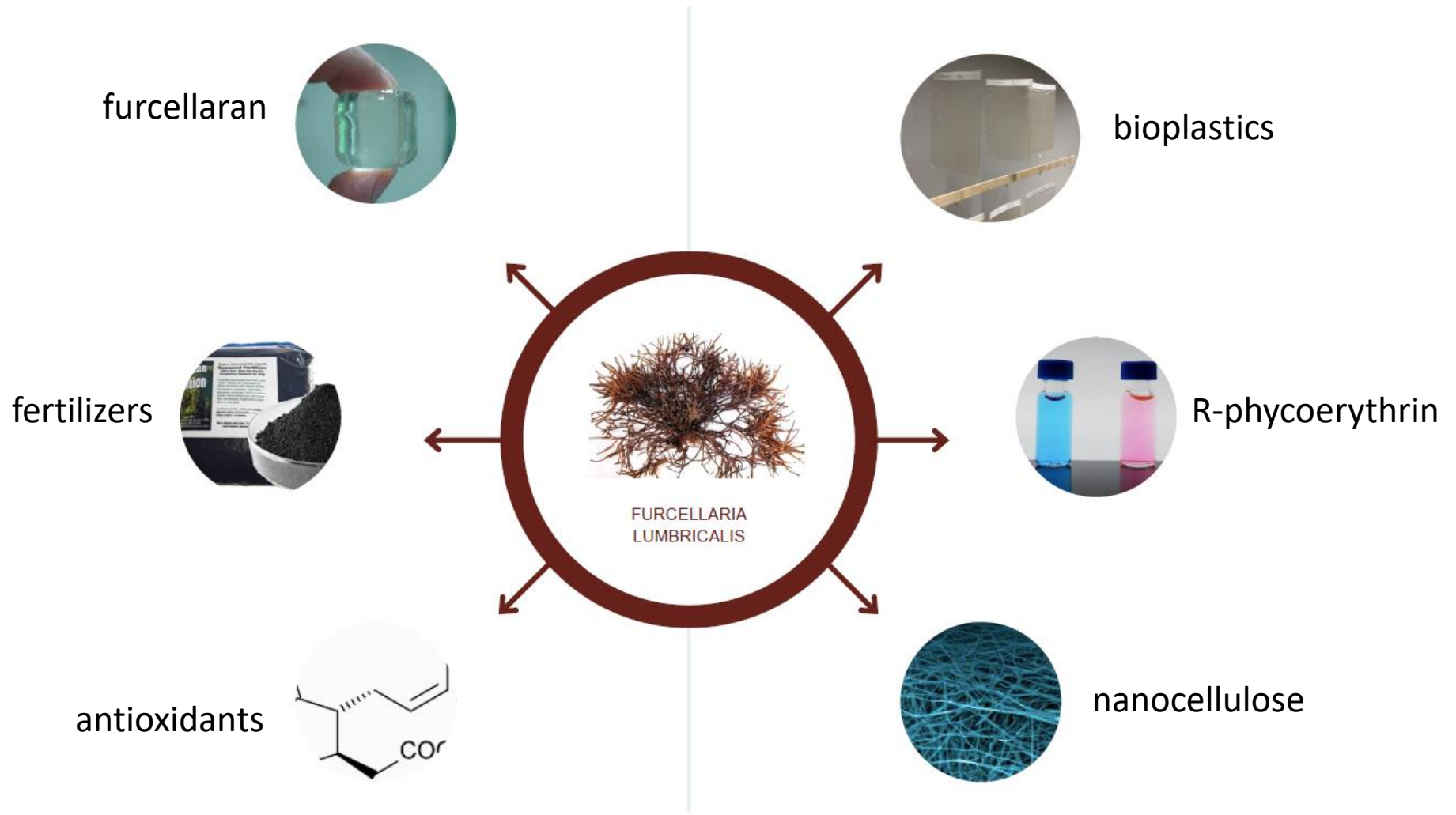
Long tradition of harvest of macroalgae:

Harvesting *Furcellaria lumbricalis* in Kassari Bay.

Used as raw material for
'agar' (furcellaran)
production already from
1966



Uses and products:



Companies working with macroalgae

There are only two companies who are allowed to harvest the seaweed stock of *Furcellaria lumbricalis* in Estonian waters:

EstAgar AS

Only producer of the unique texturant – **furcellaran** from the red seaweed *Furcellaria lumbricalis* in the world.

Est-Agar AS main business areas are:

- Production and sale of gelling agent furcellaran
- Trawling, gathering, buying up, processing and sale of red seaweed *Furcellaria lumbricalis*.

<http://estagar.ee/>



Tinurek OÜ / Vetik OÜ

Tinurek OÜ: harvesting *F. lumbricalis*

Vetik OÜ:

- production of a natural (marine algae based) red colorant (extraction of phycoerythrin) which has potentially skin rejuvenating properties.
- valorization of the whole biomass of the seaweed for cosmetics and other industries e.g producing different seaweed extracts.

<https://vetik.eu/>



Uses and products:

FURCELLARAN

Can be used as stabilizing, thickening and gelling agent in the food



PHYCOERYTHRIN



Prototypes (dilutions exhibit colors from dark red to pink)

Licensing procedure and difficulties:

Well defined harvesting legislation of “aquatic plants” (*F. lumbricalis*) in the Fishing Act: areas, frequency, gears, and quantities.

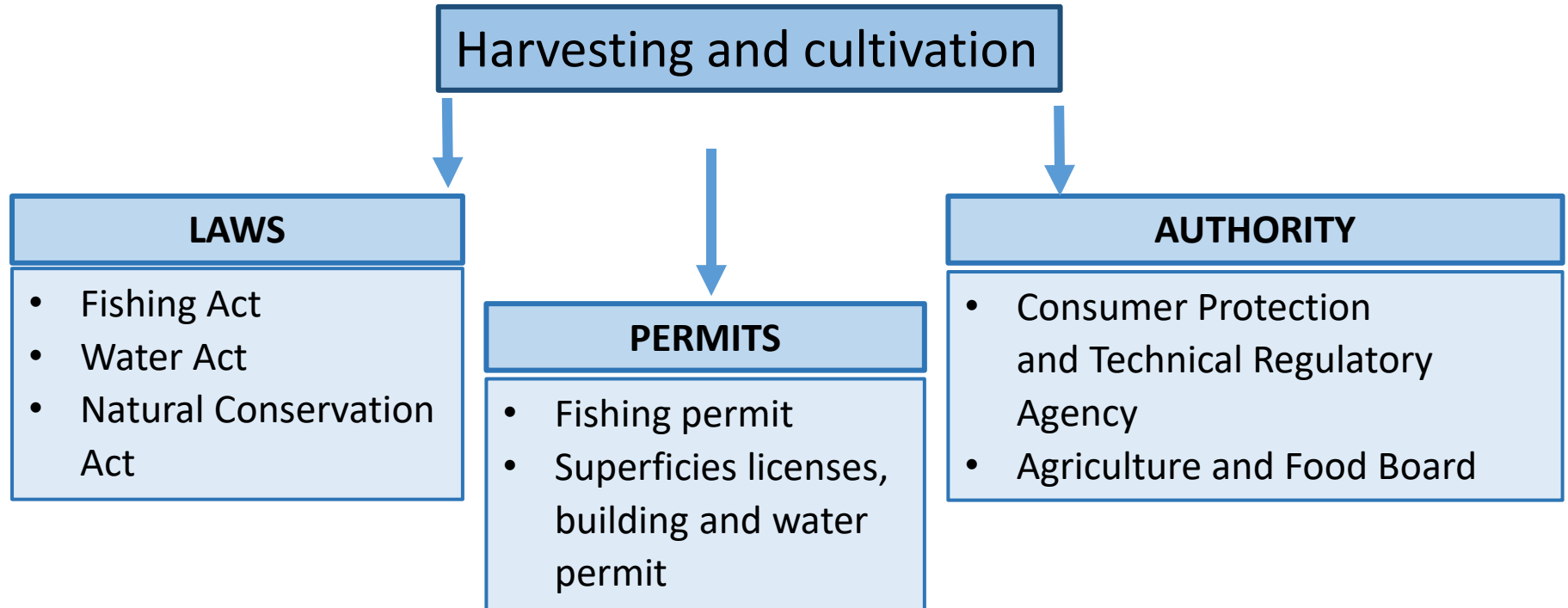
No specific macroalgae license.
Fishing license for harvesting (Tinurek OÜ and Est-Agar AS) in the last 30 years.
No more licenses are granted for natural stock preservation.

License granted for 1 year.

The biomass collected must be reported to the authorities: macroalgae is in the ownership of the state.

The market is limited and not profitable, only Est-Agar buys the raw biomass.

National macroalgae-related laws, permits and authorities



This process is changing and under the development to make it quicker than it is currently

Macroalgae mentioned as part of aquaculture

MSP

In process of adopting* - Estimated time of entry into force 2022

SEAWEED CULTIVATION

*Potential aquaculture activity.
Includes natural growth potential and suitable cultivation sites. Potential Cluster-solutions: combining fish and algae farms

MARINE STRATEGIES

Agriculture and Fisheries development plan until 2030 *

*Seaweed as an aquaculture activity



RAHANDUSMINISTEERIUM



EESTI MEREALA PLANEERING

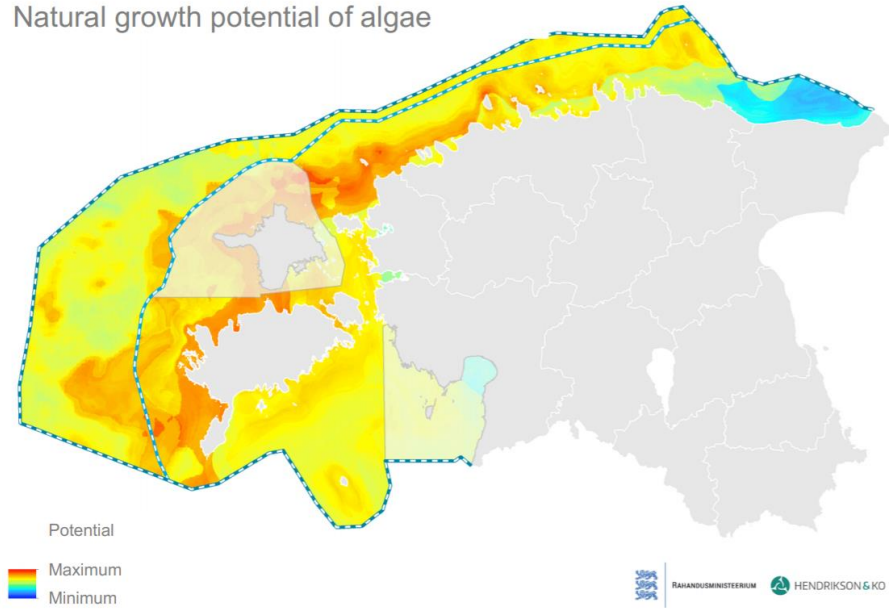
Mereala ruumiline planeerimine on vahend merekasutuse pikaajaliseks kavandamiseks, et tagada nii mereressursside kasutamisest saadav majanduslik kasu kui ka mere ja rannikuala väärtus sotsiaalselt ja kultuuriliselt olulise alana

Mereala planeerimisel peetakse iga tegevuse kavandamisel silmas, et mistahes inimtegevuse aluseks on merekeskkonna hea seisundi saavutamine ja säilitamine



Production potential and exclusion zones in MSP

Natural growth potential of algae

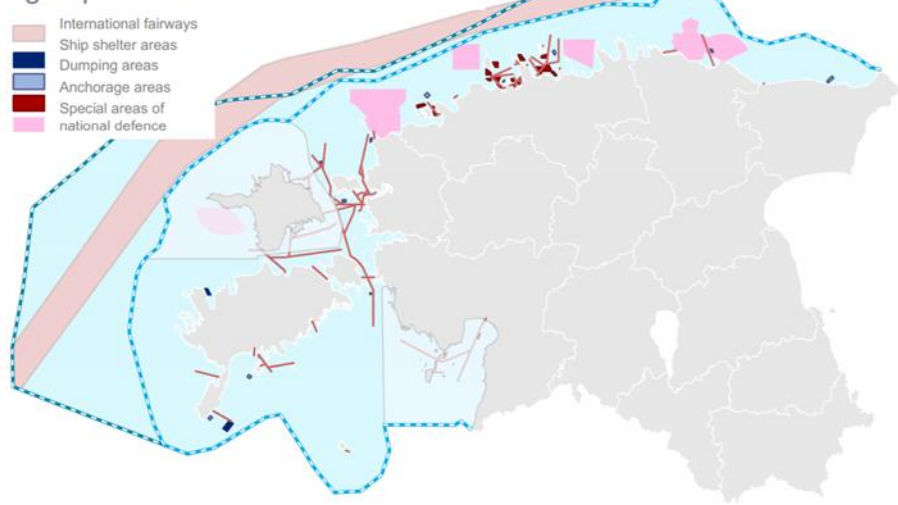


Aquaculture supports “cluster solutions”

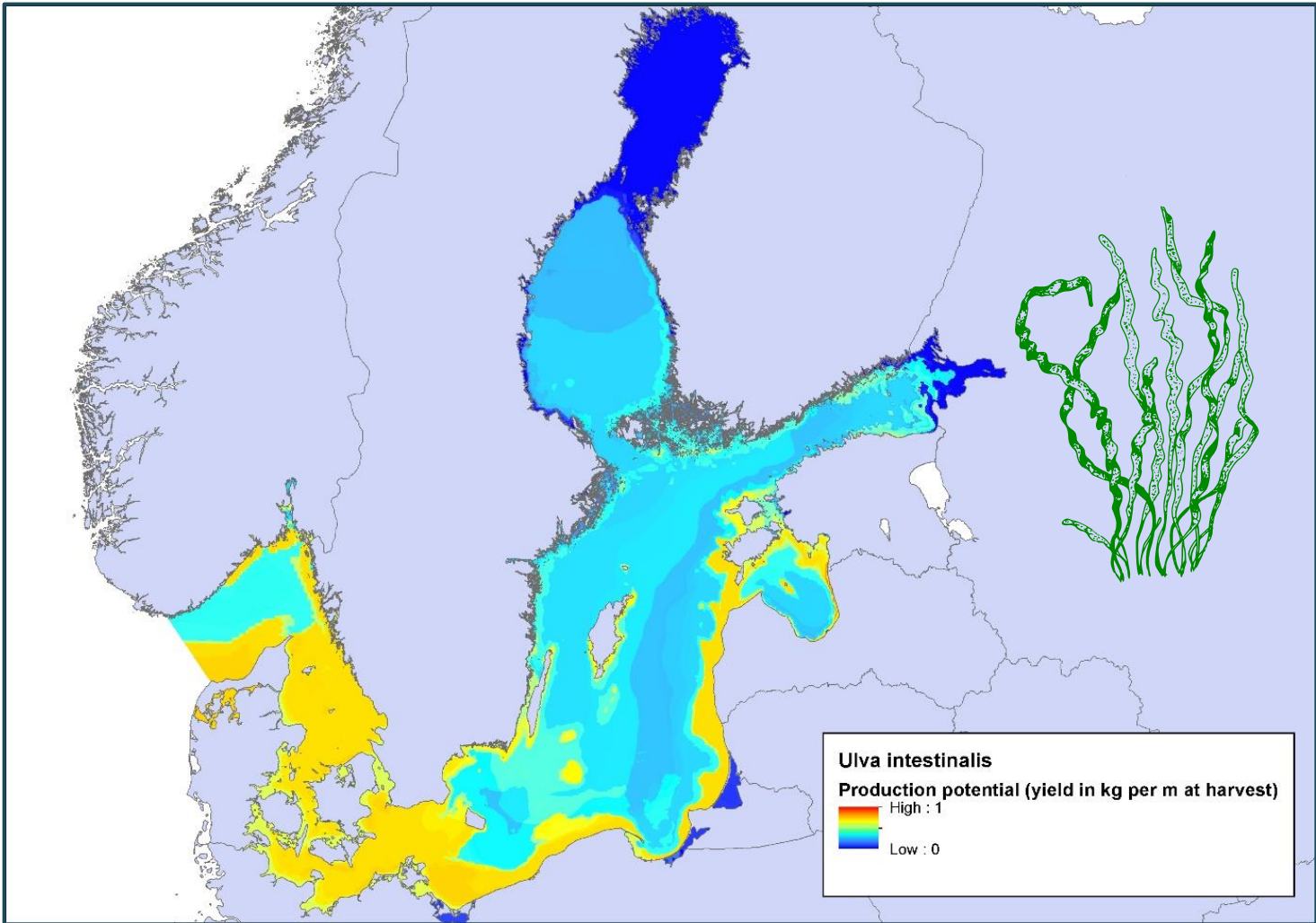
Marine area planning maps the natural growth potential of algae farming.

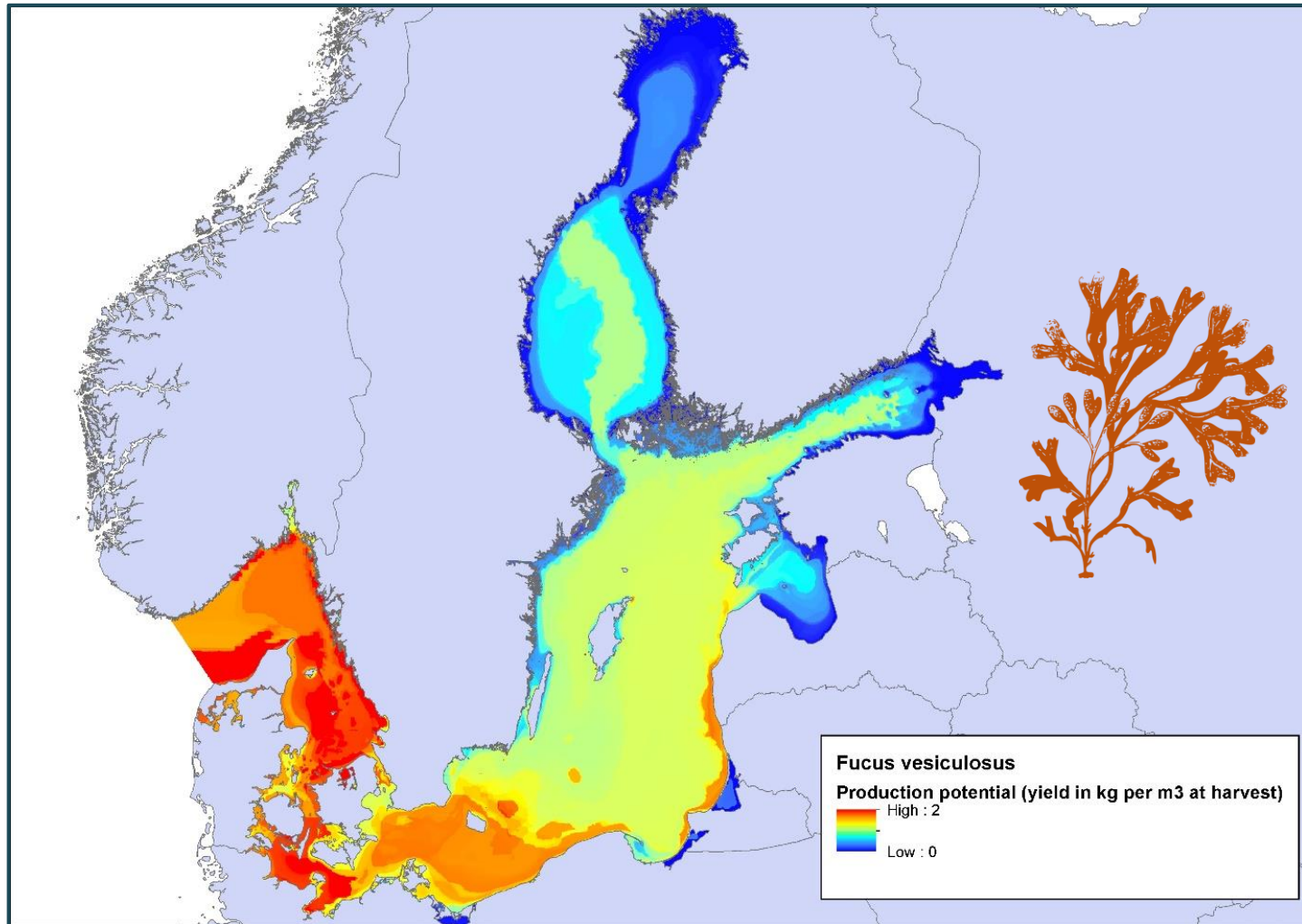
The development of algae farming is possible outside areas of high and moderate potential but may not be feasible there due to unfavorable growing conditions.

Exclusion zones for shellfish and algae production



Areas unsuitable for shellfish and seaweed cultivation are outlined in the following spatial layout.





Potential new species for harvest and cultivation

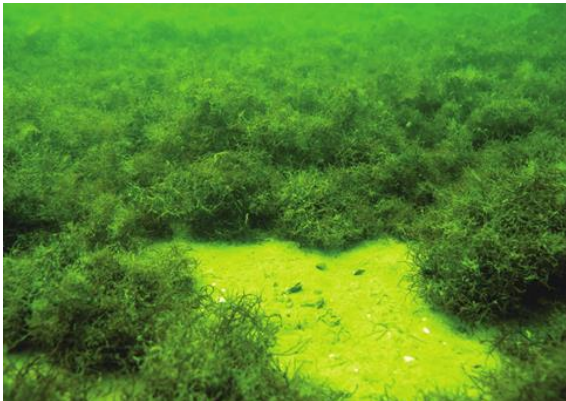
Fucus vesiculosus



Ulva intestinalis



Furcellaria lumbricalis



Ceramium tenuicorne



ODSS – Operational Decision Support System

BBG
GRASS Menu ▾



Interreg
Baltic Sea Region
Baltic Blue Growth



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Initiating full scale mussel farming in the Baltic Sea
Baltic Blue Growth establishes fully operational mussel farms to counteract eutrophication and create new blue growth opportunities.

Operational Decision Support System (ODSS)

The application for the Baltic blue mussel and macroalgal farming - a platform enabling upload, analysis and sharing of information



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Baltic Blue Growth



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GRASS: Growing Algae Sustainably in the Baltic Sea



Helps different end-users to **make effective decisions about algal and mussel farming in the Baltic Sea**

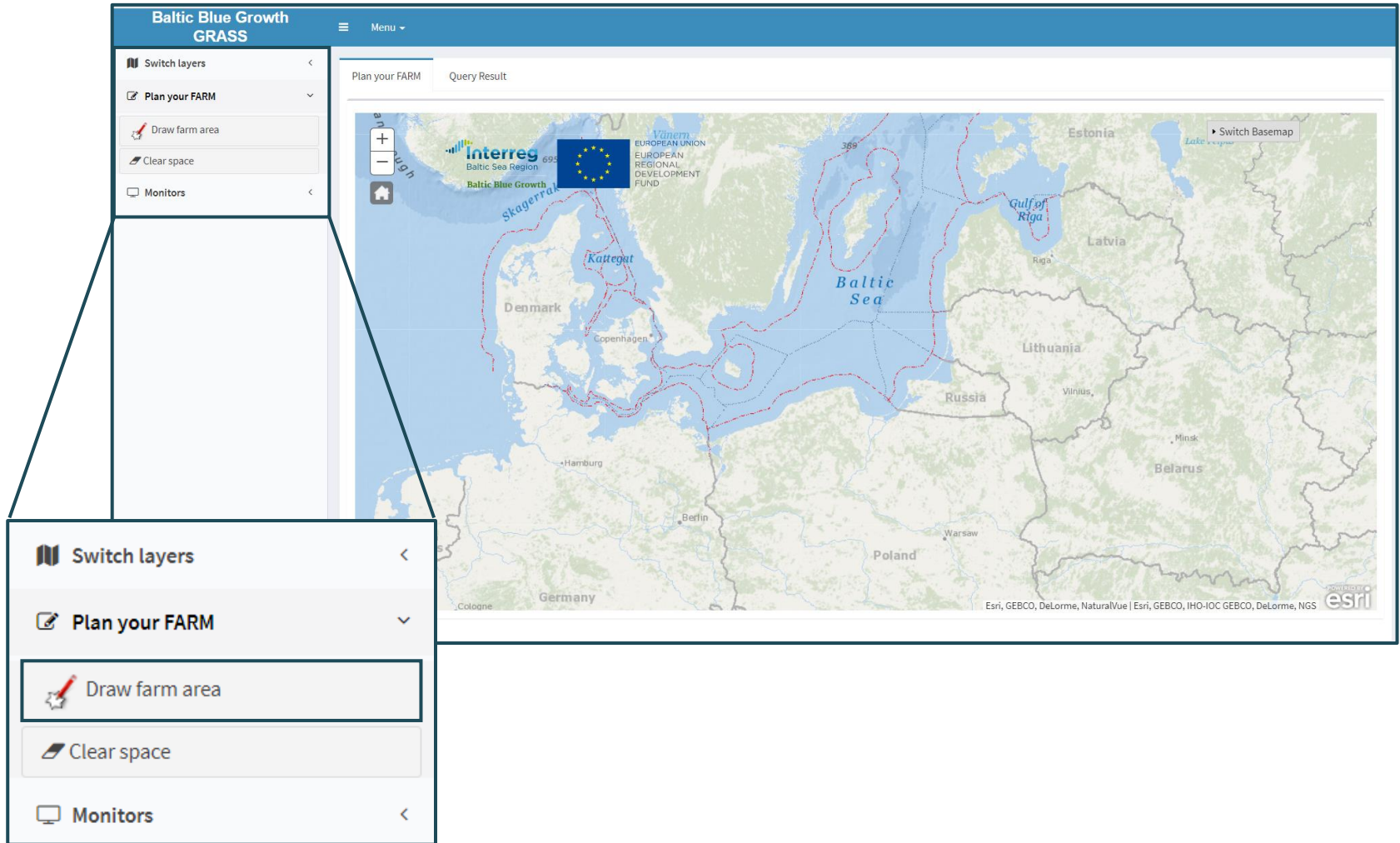


These decisions are **based on the best monitoring and modelling data**



Raises the capacity of end-users, stakeholders and government/county level officials to **achieve objectives along the environmental, economic and socio-economic dimensions of farming**

Draw the area of the farm using the integrated tool



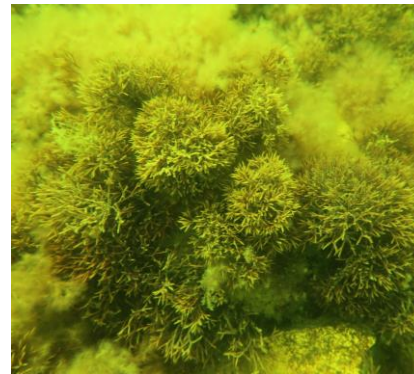
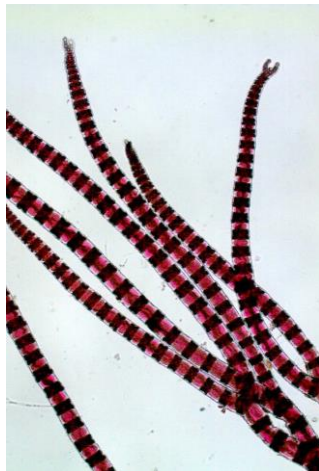
INNOVATION PROJECTS IN ESTONIAN MARINE INSTITUTE

Development of cultivation technology for *Ceramium tenuicorne* to obtain biomass suitable for extraction of red pigment phycoerythrin of analytical grade purity

Development, testing and evaluation of intensive cultivation technology for production of unattached form of *Furcellaria lumbricalis* -> already ended

Land-based cultivation technology of green algae *Ulva intestinalis* in the fresh- and brackish waters

Development of cultivation technology of edible green algae *Ulva intestinalis* suitable for the Baltic Sea environment





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Thank you!

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