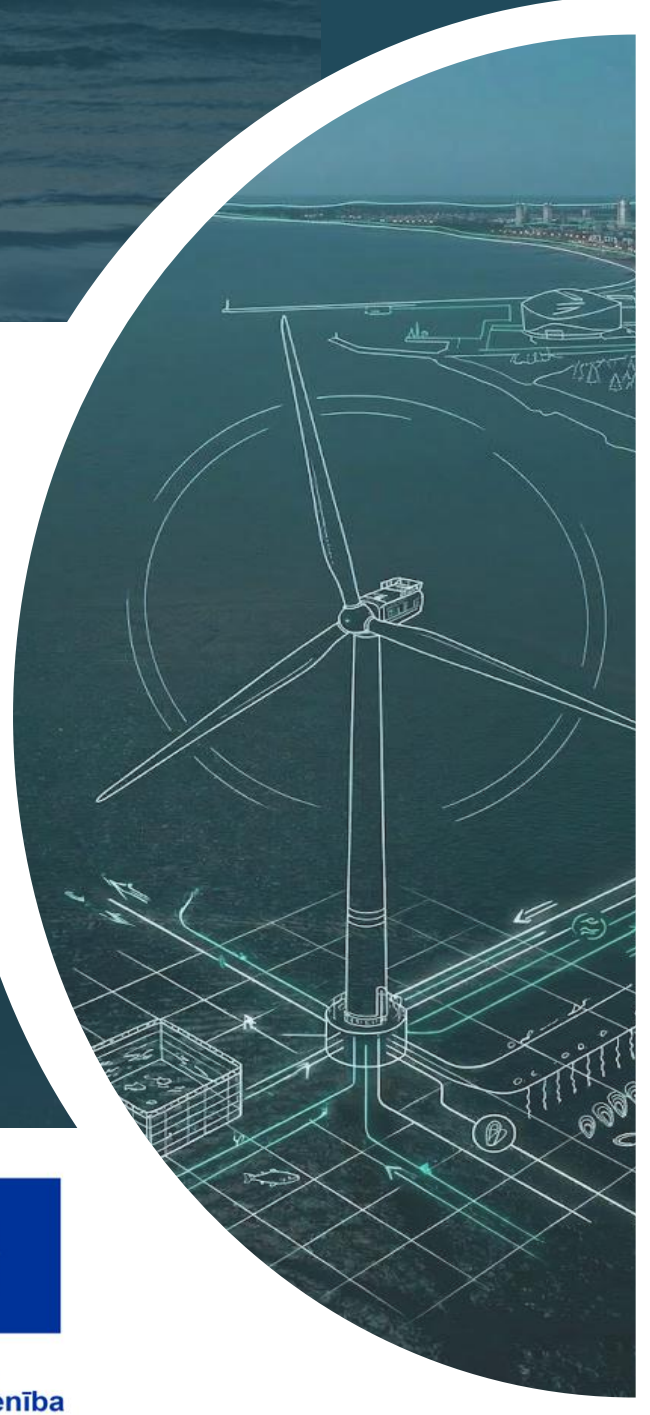
JŪRAS SINERĢIJAS FORUMS



BJÖRKSKÄR: DAUDZFUNKCIONĀLA PIEEJA BIOLOĢISKAJAI DAUDZVEIDĪBAI UN BIOEKONOMIKAI BALTIJAS JŪRĀ

Joel Lindholm

Jūras biologs un pētnieks ar specializāciju ekosistēmās SIA "Under Ytan" izpilddirektors projekta "Björkskär" līdzdibinātājs (Ālandu salas)

FARMS ULT

KURZEMES PLĀNOŠANAS REĢIONS

1862 RTU LIEPĀJA

LATVIJAS HIDROEKOLOĢIJAS INSTITŪTS

Finansē Eiropas Savienība


UNDER

Introduction

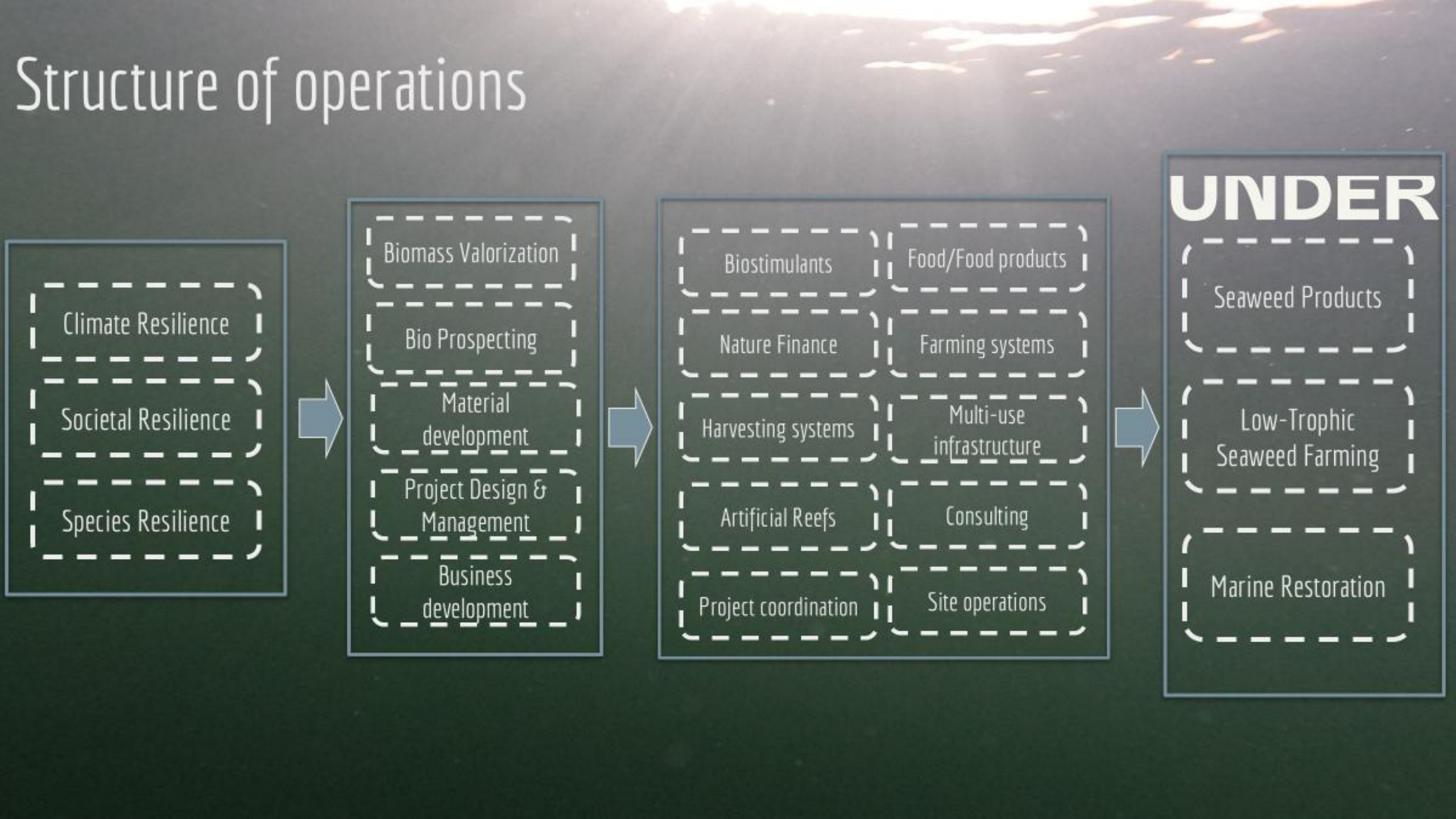
- Joel Lindholm
- CEO and Co-founder of Under Ytan
- Co-founder of Projekt Björkskär Ab
- Vice chairman in Society for Ecological Restoration Europe (SERE)s Marine Restoration Working Group (MRWG)
- Co-Founder of The Nordic Nature Market Initiative (NNMI) together with Martin Pilstjärna and Lisa Wärn
- Former chairman on the ENGO Natur och Miljö
- Co-Founder of the green political party Hållbart Initiativ on the Åland Islands.

Under Ytan wants the Baltic Sea to thrive.

By increasing biodiversity, we create better conditions for flora and fauna in our seas. We are a start-up company focusing on the cultivation and farming techniques of macroalgae from the Baltic Sea, and its uses as food and other products. The company works according to a regenerative business model, which means that we restore more than we consume. We strengthen ecosystems and reduce eutrophication in the Baltic Sea by cultivating macroalgae and using macroalgae, mussels and other species as a restoration method to strengthen habitats.

UNDER

Structure of operations

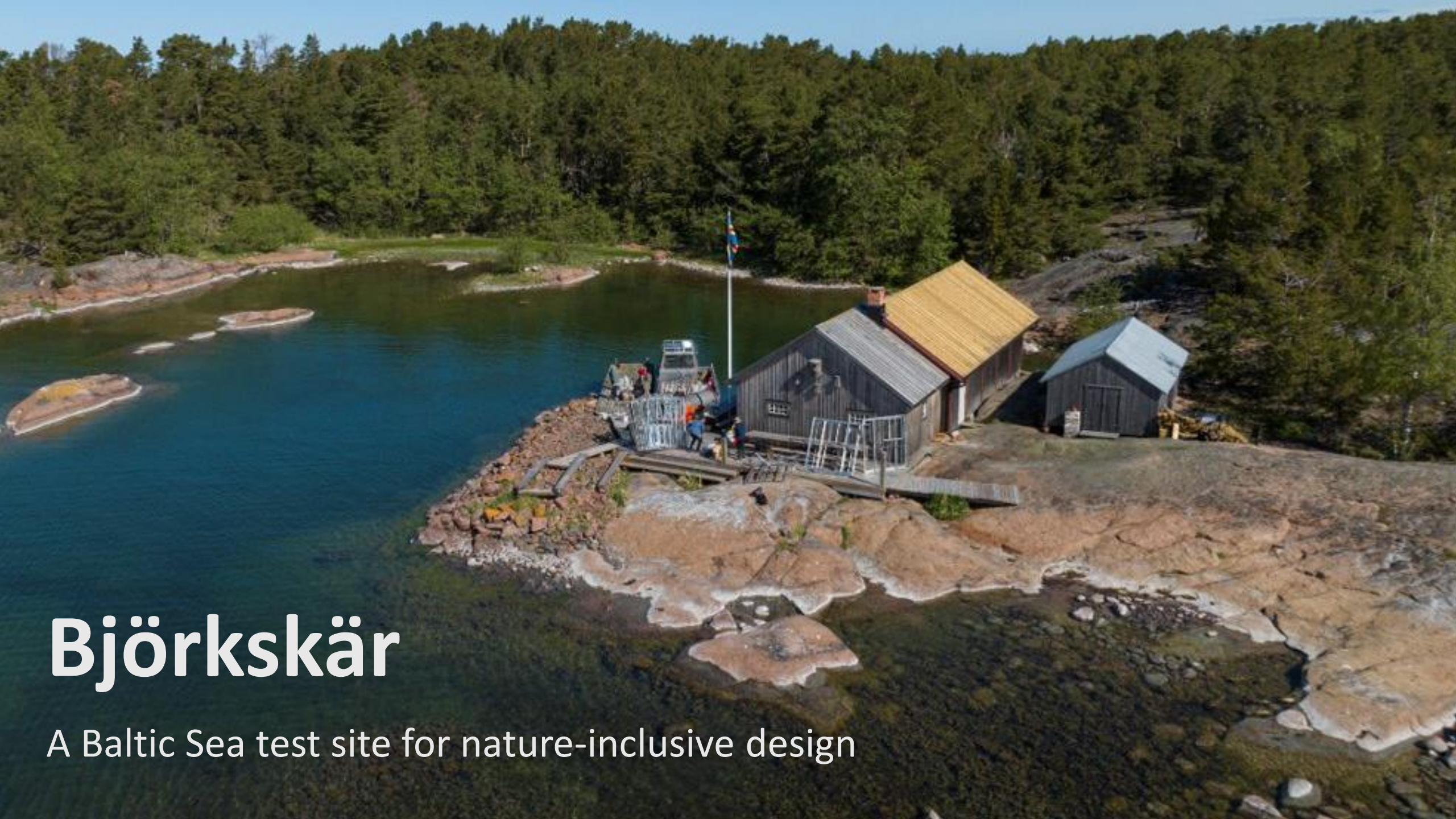


Projects

- Project Björkskär Ab
- Project BioBuz (2024-2025)
- Baltic Biostimulants
- IMTA pilot study with the fish farmers association
- Marina Vattenvägar
- Mussels for the Baltic Sea
- Eider Duck Buffets
- Project Tångkusten (2023-2025)
- Project BioWave

"About 90 structures deployed and in trials"

- LowTIDE
- BalticBrownAlgae Farming
- BalticBrownAlgae Restoration
- Nordic Nature Market Initiative
- Cladophora for material development
- Coastal Value Chains Nature Fund
- Nordic Nature Credit Accelerator



Björkskär

A Baltic Sea test site for nature-inclusive design

Restoration of the Baltic Sea - we know what works.

Björkskär is a full-scale test site for nature-inclusive marine design in the Baltic Sea. We offer companies and researchers a unique opportunity to test, validate and showcase solutions that enhance marine biodiversity under real marine conditions.

Project Björkskär

- From pioneer to market leader in marine restoration

2023

The first large-scale biodiversity field trials, with nearly 50 pilots deployed in the water in the very first year

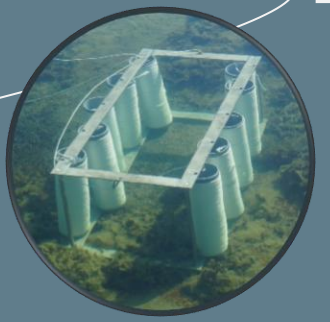
Wind turbine foundations and erosion protection are tested as reefs, co-designed by biologists and engineers

Björkskär on stage across the Nordics and Europe, with a presence in Brussels, Riga, Amsterdam, and Almedalen

2024

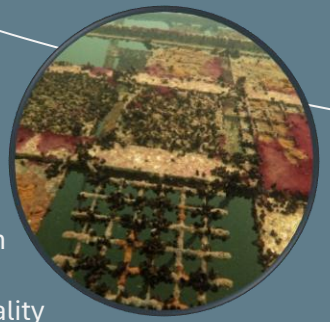
Event-based research and an open test site, with study visits, dialogue, and algae as part of the experience

Launch of Nordic BioBuz – where biodiversity meets business, with a focus on biodiversity credits and business models for offshore wind, together with RISE and SLU



Methods for the propagation of algae and mussels, with juvenile bladderwrack grown on rope spools and propagation carried out both in the field and in the lab

2025



70+ active pilots and long-term data series, with uniquely long datasets and verified functionality

Biodiversity becomes a business, from mussel mats to frameworks for marine biodiversity credits

LifePin launched – a scalable foundation concept in the form of a 12-metre steel tube

2026

Piloting Process

2023-2024

Beds, fish hotel, erosion protection on Björkskär

2025-2026

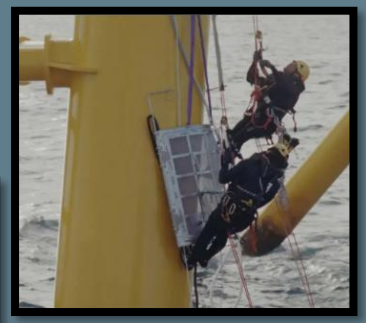
Foundation test at Björkskär (10-20 m)

2027-2028

Foundation test in the Noatun offshore area (30-40 m)

2028

Structures on foundations in manufacturing



2031-2036

Measures applied after installation

Onwards

Monitoring and follow-up

Extending the concept to other offshore installations

What we have demonstrated at Björkskär

After three years of testing and more than 70 pilots at Björkskär (surfaces, structures, materials, algae production and mussel farming), we have demonstrated that:

- Technical solutions work in the Baltic Sea.
- Biodiversity can be measurably increased.
- The methods are scalable and applicable to other marine infrastructure and environments beyond offshore wind
- The market for biodiversity credits and ecosystem restoration is rapidly growing in the EU and globally.

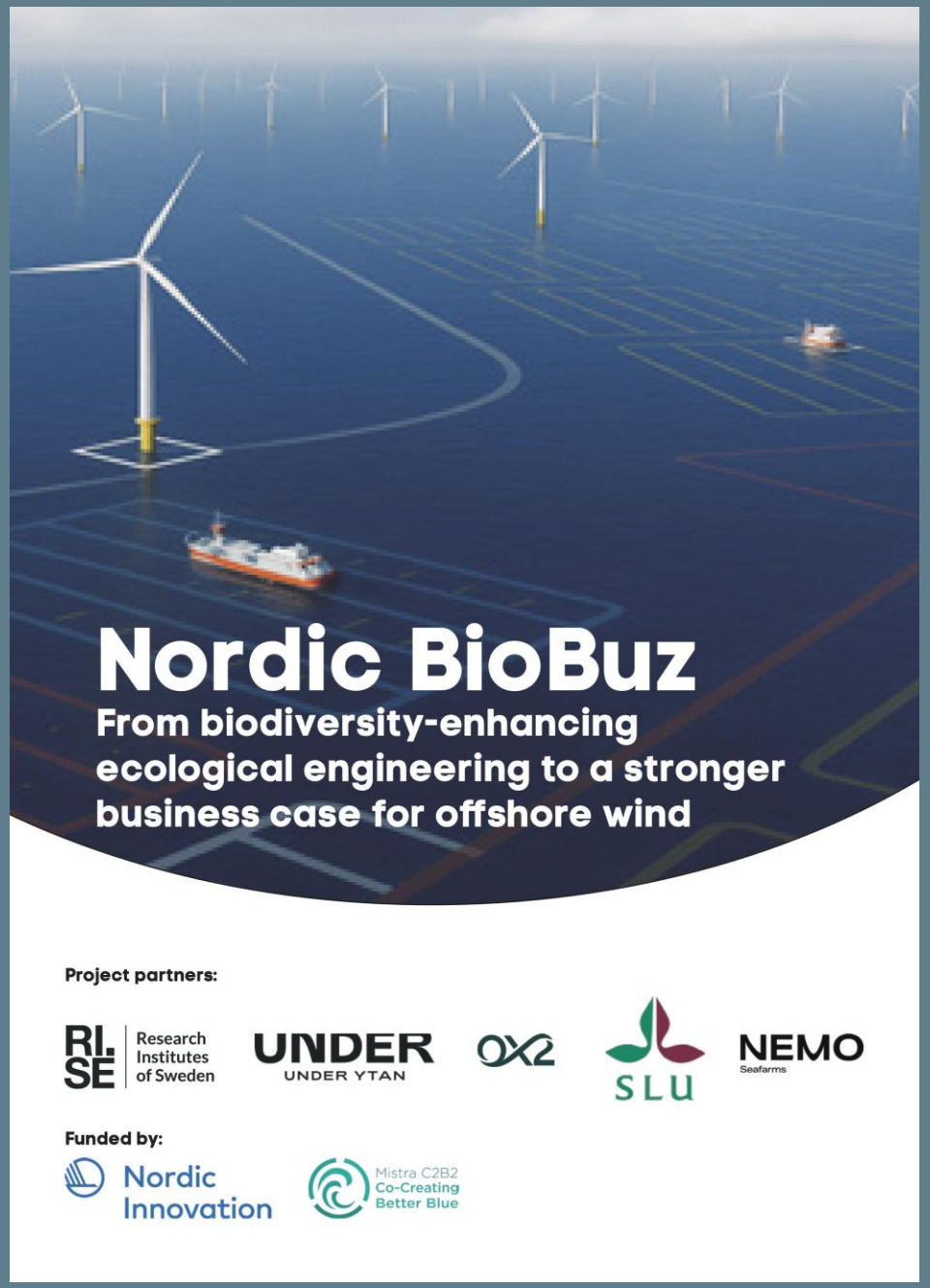
According to the World Economic Forum (2023), demand for biodiversity credits and restoration solutions is expected to grow rapidly this decade, with multi-billion-euro market potential by 2030.

Nordic BioBuz

Increased or New Revenue Streams we discovered within the project

- “Dark green” renewable electricity
- Biodiversity credits
- Low-trophic aquaculture

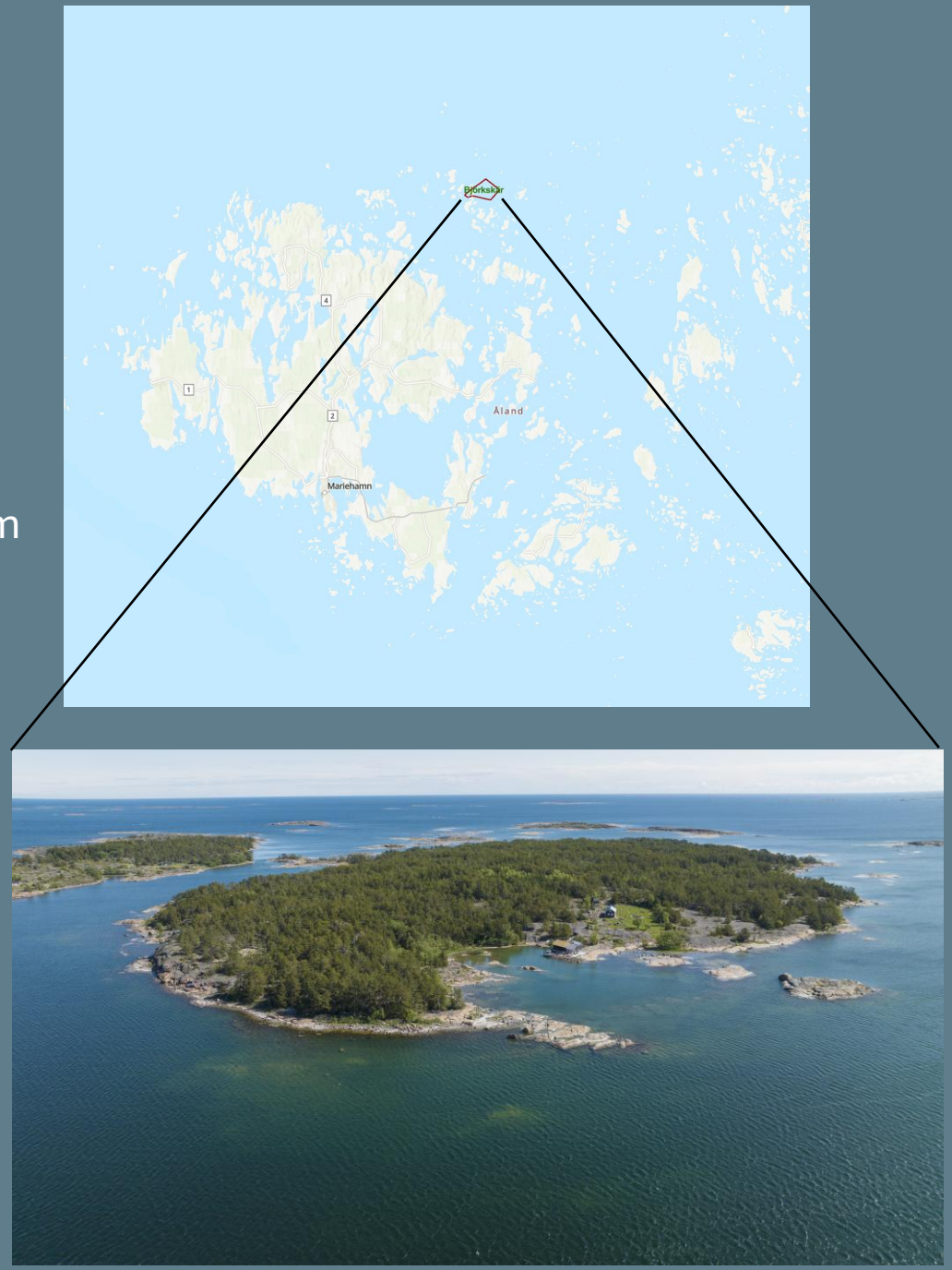
The Nordic BioBuz project demonstrates that regenerative and multifunctional approaches to marine development are not only ecologically necessary but increasingly economically viable. By integrating offshore wind energy with low-trophic aquaculture and biodiversity-enhancing design, the project provides tangible evidence that nature-positive outcomes can reinforce, rather than compete with, commercial objectives.



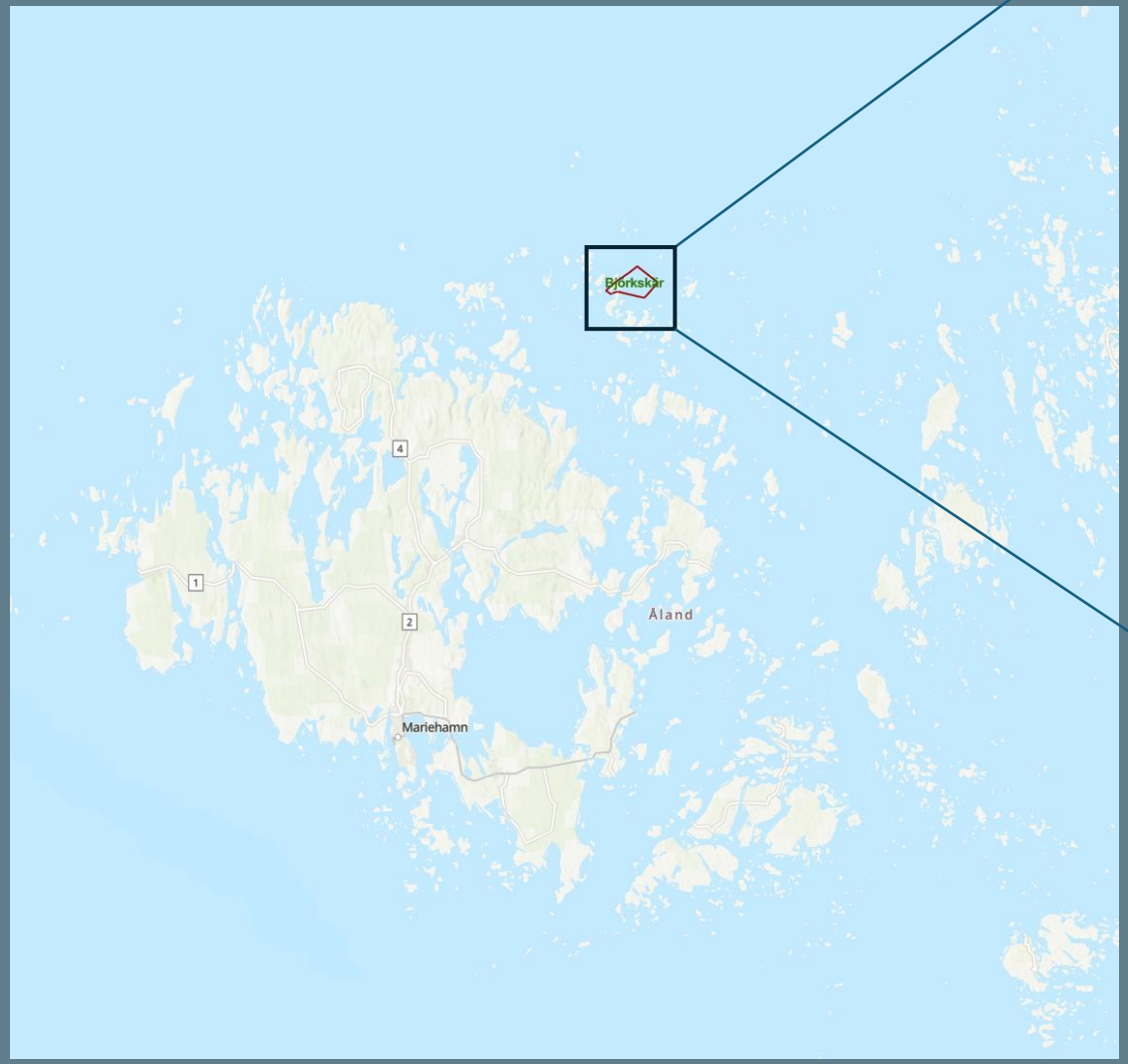
The island of Björkskär: A test platform

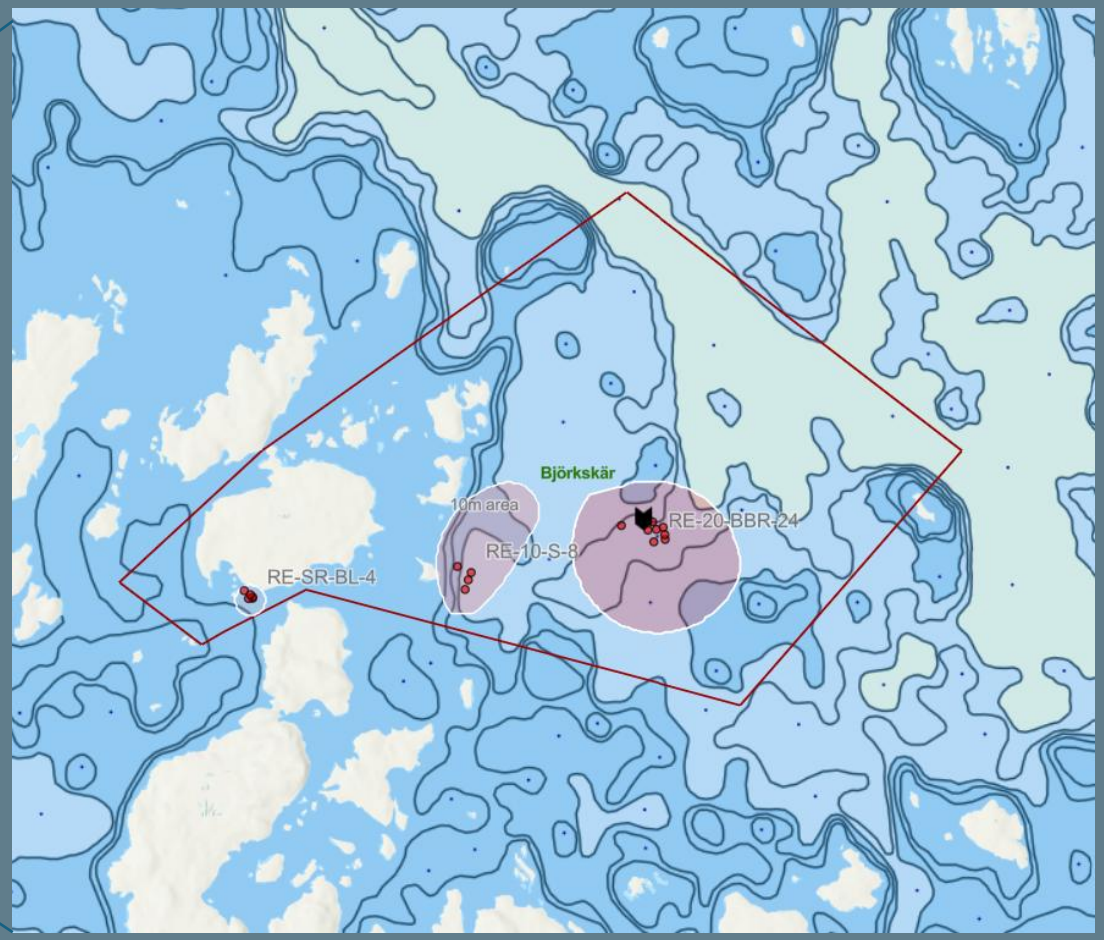
- Strategic semi-offshore location between mainland Åland and offshore environment, safer and more accessible than full offshore testing
- Allows for marine testing under controlled yet realistic Baltic Sea conditions
- Available water areas with depths from 0 to ~20 m, ranging from flat sand bottoms to rocky boulders

The Björkskär team:
Magnus Hanstén, Lotta Nummelin and Joel Lindholm



Björkskär test site – bathymetry overview





This map provides an indicative overview of depth variation within the test site. Detailed bathymetry will be provided as part of project-specific planning.

How a test project works at Björkskär

Testing at Björkskär is a collaborative process. We work closely with our partners to tailor test design, installation and monitoring to each specific solution and project.

1. Dialogue & test design
Joint definition of objectives, test setup, site conditions and time frame.

2. Permits & preparation
Permits, logistics, transport planning and practical preparations.

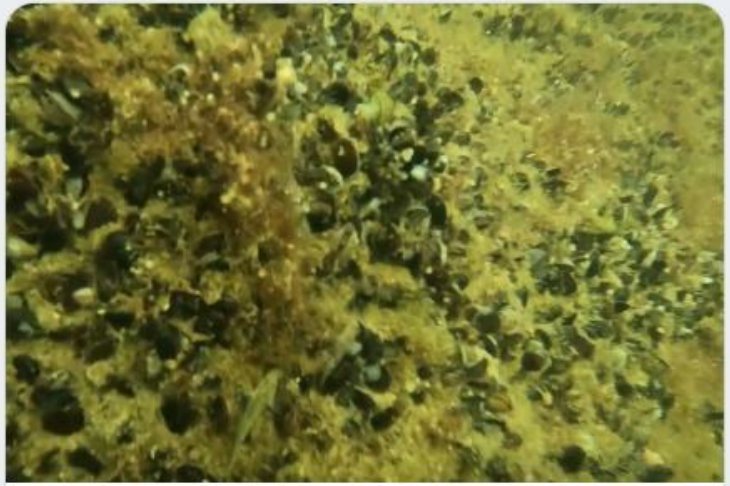
3. Installation & testing
Deployment at the test site, maintenance and exposure to real-world Baltic Sea conditions over time.

4. Monitoring & results
Visual documentation, follow-up and delivery of results and learnings.

Developed and tested at Björkskär

Testbeds for marine biodiversity

Experimental structures where different materials, depths and sunlight orientations are tested to understand how biological communities establish on marine infrastructure.



Targeted mussel colonization

Methods for establishing blue mussels on new marine structures through natural colonization and controlled deployment. The solution can accelerate development of functional habitats in marine environments.

Targeted establishment of habitat-forming algae

Development and testing of solutions to establish habitat-forming algae on marine structures. By adapting design and placement, we can influence how biological communities develop over time.

Bjorkskar.ax

What we provide at the Björkskär test site

Björkskär offers a complete, hands-on framework for running marine test projects under real Baltic Sea conditions.

Test site & infrastructure
Access to defined marine test areas with varying depths, substrates and exposure.

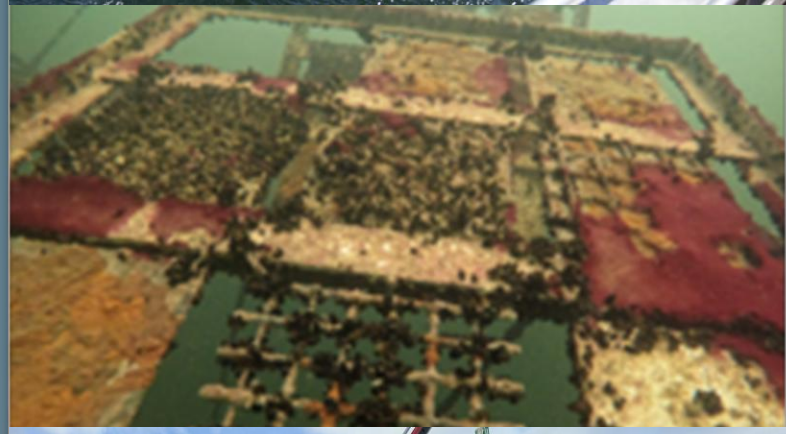
Permits & coordination
Management of permits and coordination with relevant authorities.

Marine operations & logistics
Boat transport, deployment, maintenance and decommissioning of test installations.

Monitoring & documentation
Visual monitoring using ROVs, freediving and underwater cameras, delivered as images and video.

Project support
Continuous dialogue, adaptive solutions and practical problem-solving throughout the test period.

Site visits & collaboration
Partners are welcome to visit Björkskär during the test period. Site visits can be arranged for project teams and invited guests to support dialogue, learning and joint evaluation.



Contact

Lotta Nummelin

lotta.nummelin@bjorkska

+358 40 584 6498

Magnus Hanstén

magnus@nemo-seafarms.com

+358 40 769 3052

Joel Lindholm

joel.lindholm@underytan.fi

+358 50 564 8005