

## Mini-ecosystems help reveal the role of animals and plants in a warming climate

Creating controlled mini-ecosystems, called mesocosms, is one way for researchers to study factors that influence processes in the sea. This summer, a large experiment of this kind was conducted at the Askö Laboratory south of Stockholm, to investigate how animal communities in the water and sediment and the global warming is affecting the emissions of greenhouse gases from shallow coastal bays.

In total 24 mesocosms were created (plus one extra for control), where some contained grazing animals, some contained animals living in the sediment and some lacked animals. Half of those mini-ecosystems were heated 3 degrees, whereas half had the normal water temperature in the Askö Bay.

During the experiment, the PhD students Sara Westerström and Moritz Nusser measured greenhouse gas emissions and several water quality parameters. At the end, they also examined the plants, animals, and sediment inside each mesocosm.

Preliminary results suggest that animals living in the sediment increased methane emissions, and that the different conditions influenced the growth of sago pondweed, but further lab work and data analysis are needed to examine the results in more detail.

[Want to know more? Read the Baltic Sea Centre news item!](#)

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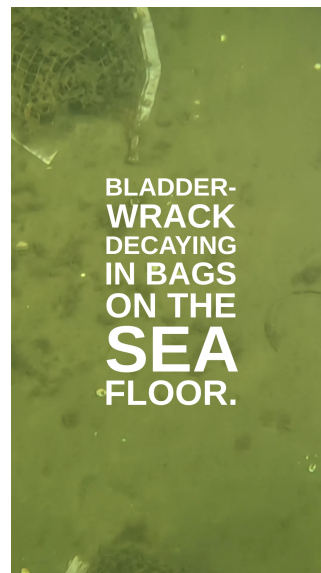
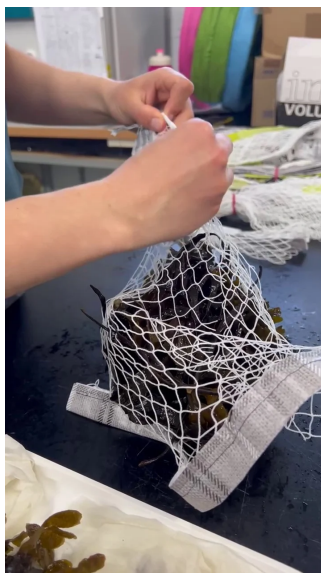
## New floating laboratory connects air and sea to unlock coastal climate secrets

A unique floating laboratory at Askö Island in Sweden is giving researchers an unprecedented window into the hidden exchanges between air, sea, and coast and their role in the climate system. One of its most important features is the ability to make continuous, long-term measurements in different coastal environments. This makes it a valuable addition to CoastClims's research infrastructure, says scientist Matthew Salter who is responsible for the floating laboratory.

[Interesting for your research? Find more information about this floating interacting air-sea laboratory!](#)

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## Two years of monitoring the fate of bladderwrack on the Baltic seafloor

210 bags filled with bladderwrack were in 2023 deployed over a depth gradient of 5 to 40 meters on the Baltic seafloor close to Tvärminne Zoological Station. The aim was to quantify how quickly carbon re-enters the environment during the journey from the sunlit shallow reefs to the dark deep Baltic.

### Preliminary results in short:

- At some shallow sites (5 m) which receive sunlight and strong water flow bladderwrack remained intact, some still with the capacity to photosynthesize, even after 24 months!
- In contrast, bladderwrack at deeper sites, with very little light, decayed more rapidly. The algal detritus attracted many invertebrates, coming to feed on it, and we found enrichment of carbon in the sediment below the decaying bladderwrack.

The scientific team is currently waiting for isotope analysis and DNA sequencing results to confirm the local carbon enrichment originates from bladderwrack and to describe the microbial communities associated with the decay process.

The novel degradation rates measured are important for parametrising models of macroalgal carbon export and building a local carbon budget for bladderwrack.



## The next generation of marine scientists

The specialised *Functional Coastal Ecology* course for upper secondary schools was for the second time successfully run at Tvärminne Zoological Station in September. Thirteen enthusiastic students from six regional schools conducted different field studies during a week with the objective to understand the importance of global change on marine biodiversity and the consequences for marine ecosystem functioning, with an emphasis on carbon cycling. [Get a view into the course in a video](#) published by YLE (in Swedish).

The in-depth optional course is organized as a collaboration between Tvärminne Zoological Station, CoastClim and the region's upper secondary schools. External financial support by the foundations Bergsråddinnan Sophie von Julins stiftelse, Brita Maria Renlunds minne sr., and Hangö Sparbanksstiftelse sr made this possible.



### Open now: Transnational Access call of IRISSC

The Integrated Research Infrastructure Services for Climate Change Risks ([IRISSC](#)) has opened

its second transnational access call.

Tvärminne Zoological Station is one of the partners offering access to, for example, the facilities that CoastClim is utilizing. This includes access to coastal ecosystems, several research vessels, sampling equipment, diving facilities, aquarium rooms, laboratories and long-term databases. Check out the RI services offered across Europe and specifically at Tvärminne.

**Apply before 28.11.2025.**

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## Short news at a glance

- **CoastClim researchers in news and public programs:**

Johan Eklöf about heating experiment at Askö ([SVT, in Swedish](#))

Alf Norkko about warming of the Baltic Sea ([DN, in Swedish](#))

Alf Norkko in the popular science program *Kvanthopp* ([YLE, in Swedish](#))

Sofia Wikström in a popular science program *Klotet* ([SR, in Swedish](#))

- **The Baltic Sea Day engaged our members on both sides of the Baltic**

**Sea:** Gun Rudquist och Charles Berkow contributed to a seminar *Baltic Sea Solutions* ([watch a video in Swedish](#)). The Baltic Sea Centre in Stockholm also organised a Baltic Breakfast on “[Science Diplomacy in times of crises](#)”. Alf Norkko shared his expertise about the state of the Baltic Sea for a panel discussion and [event](#) with Minister of Climate and the Environment Sari Multala, and the Member of European Parliament Ville Niinistö. Listen to them discussing current issues [YLE Vega Slaget 28.8](#) (in Swedish).

- **Researchers have engaged in art and science collaborations.** At the conference [Voices of the Baltic Sea: science, art and action](#), Alf Norkko and Åsa Nilsson Austin were invited speakers. Researcher Camilla Gustafsson hosted artists LOCUS / Thale Blix Fastvold & Tanja Thorjussen in the world of Eelgrass while they realized their art installation about Eelgrass displayed at the *Helsinki Biennial 2025*, [watch a video about the making of the art](#), funded by the John Nurminen Foundation.



## NEW COASTCLIM PUBLICATIONS:

- **White and Norkko:** A path towards appropriate degradation experiments for assessing carbon sequestration potential of macroalgae.
- **Lammerant et al.:** Environmental gradients strongly affect functional composition and biomass C stocks within aquatic plant meadows.
- **Uth & Wiethase et al.:** Effects of phytoplankton species distribution on particulate organic carbon dynamics along a coastal gradient.
- **Zhou et al.:** Shoreline wave breaking strongly enhances the coastal sea spray aerosol population: Climate and air quality implications.  
Read a news article about the findings.
- **Manca et al.:** Node taxonomic resolution affects the robustness of marine macrophyte–epifauna networks.

[Check out all our publications on the CoastClim webpage >>](#)



Who are we?

**Meet a CoastClim researcher:**

### ***Who are you?***

I am Tom Jilbert, an environmental geochemist at University of Helsinki. I try to understand the cycles of chemical elements in the environment, especially in aquatic systems with a big human impact, like the Baltic Sea.

### ***What are you doing in CoastClim and why?***

In CoastClim my team is studying how seafloor sediments act as both sinks and reactors for carbon. Carbon from marine and terrestrial organisms ends up at the seafloor and can be buried for thousands of years or longer, thus acting as a sink for CO<sub>2</sub>. On the other hand, sediments are full of microbes that can process part of this carbon and release it as CO<sub>2</sub> or methane. To understand the coastal carbon cycle, we need to know the balance of these processes, i.e. how much carbon is buried and how much comes back from the sediments. This can vary a lot between locations, because the carbon sources are different, and so are the conditions at the seafloor. For example shallow areas are much warmer in summer and this can supercharge the sediment microbes to produce more methane.

### ***My recommendation to you...***

My recommendation is not to feel helpless when you hear bad news about the environment. There are many small ways to make a positive change, and the world needs optimistic people to make those happen.

[Meet the CoastClim team >>](#)

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**CoastClim**

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