



## The unknown role of reed beds in a changing climate

Reed beds have increased in coastal environments of Finland and around the world. We have a strong interest in understanding how these ecosystems store carbon and emit greenhouse gases (GHGs) so that they can be properly accounted for in blue carbon budgets to combat climate change and managed as sustainably as possible.

Margo Williamson has been measuring GHGs, such as carbon dioxide and methane, emissions in reed beds by Tvärminne Zoological Station regularly over the course of the last year.



Developing a way to measure GHGs in reed beds is challenging as reeds can grow to over 2 m tall and the sediment in reed beds contains standing water and deep, sinky mud.

Simply walking through the mud and water can kick up GHGs, so Margo and colleagues at Tvärminne installed a floating platform that could remain in place year-round to enable them to walk through the reed bed without disturbing the sediment in order to measure GHG fluxes as accurately as possible.

They also built a flexible chamber that could be placed over the top of the reeds and unfolded over them to seal to the ground and measure GHG fluxes within. Field work for the project was just completed in November 2025 and Margo plans to present the project's findings in 2026.

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## Swedish meteorite crater bay – a perfect natural laboratory

The Swedish bay Tvären, situated around 100 kilometres south of Stockholm, functions as a perfect "natural laboratory", according to CoastClim researchers who just finished a seasonal campaign in the area, measuring methane fluxes, among other things.



Tvären is assumed to have been created by a meteorite impact 450 million years ago. Now, it is a fairly enclosed basin with limited exchange with the open sea, which allows the researchers to follow clear seasonal trends. There are also strong vertical differences in oxygen, temperature and salinity, which helps separate the different factors that control methane dynamics in this area.



*"Tvären gives us a chance to study important processes in a setting that is both realistic and fairly easy to interpret",*  
says oceanographer Christian Stranne.

With successful sampling campaigns in May, August, and November now completed, the next survey is scheduled for March 2026.

## Thank you for this year!

Over the past year, CoastClim researchers in Finland and Sweden have made significant scientific progress through both field- and laboratory based research. In 2026, we will continue to share our new knowledge in a changing world. We hope you will continue to follow our journey!

## **Doctoral dissertation: The role of phytoplankton biodiversity for coastal carbon cycling**

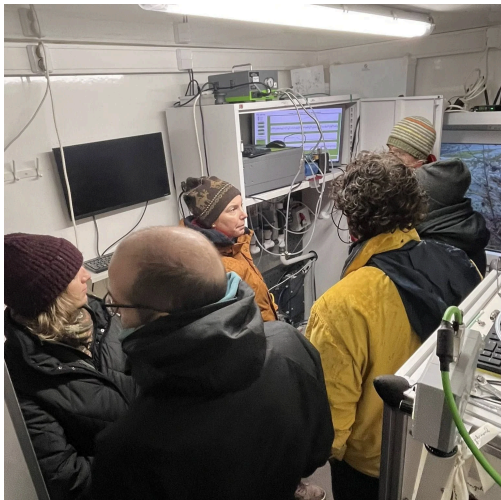
Catharina Uth's research examines the impact of phytoplankton biodiversity on coastal carbon dynamics, using observational and experimental approaches, as well as combining ecology and biogeochemistry.



Catharina will defend her doctoral dissertation on Friday the 19<sup>th</sup> of December at 13:00 EET at Tvärminne Zoological Station.

[Follow the defence online here.](#)

*We wish you all the best Catharina!*



## **The atmospheric observatory is up and running in Tvärminne!**

A publication describing the atmospheric measurement capacity at the Tvärminne Zoological Station supersite is out now. Roseline Thakur and the CoastClim atmospheric researchers at University of Helsinki present the equipment and the first results from Tvärminne.

The main goal with the atmospheric observatory is to gain long-term comprehensive and continuous measurements of both atmospheric variables and from the surrounding sea. This will increase our understanding of the relationships between coastal ecosystems and the atmosphere.

Initial results indicate that the sea-air exchange of aerosol precursor gases, VOCs and CO<sub>2</sub> at the coast are highly dynamic, influenced by meteorological and biological conditions.

### **ICOS 10<sup>th</sup> anniversary - Celebration in Helsinki and excursion to Tvärminne**

The ICOS network, a consortium for greenhouse gas monitoring in Europe celebrated its 10-year anniversary with a large event in Helsinki, 25-27 November. During the event the participants had an opportunity to visit the atmospheric observatory in Tvärminne, as it is an official coastal ICOS Ecosystem station. Nicolas-Xavier Geilfus and Alf Norkko presented the measurement capacity at Tvärminne for the visitors. Photos: Janne-Markus Rintala



### **Imaging Flow Cytobot to the floating platform at Askö**

*The new equipment can quantify and identify microorganisms in the water. This biological information can then be linked to the air-sea interaction processes.*

The so-called Imaging Flow Cytobot (IFCB) is an optical system optimized for high-resolution imaging of particles from <10 to 150  $\mu$ m. It will be used to quantify and, after it has been trained to do so, identify microorganisms in the water.

The data will be linked to findings from the SeaLab project, where microorganisms are identified and their activity is analysed through meta-omics methods. This information will then be connected to results from the air-sea interaction measurements at the floating platform, currently located next to the Askö Laboratory, where greenhouse gases and volatile organic compounds are measured.

In the photo, team members learn how to use the alignment tube to get images perfectly in focus. Photo: Michaela Lundell

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## Short news at a glance

- **Policy update:** In Sweden a political discussion regarding increasing fertilisation of forests to increase the production has risen, [read comments by the Baltic Sea Centre researchers on how this may affect the Baltic Sea](#), and [watch a Baltic Breakfast seminar on the topic](#) (in Swedish).
- **Next Baltic Breakfast**, 28 January 2026. CoastClim researchers will present: [Microbes in the Baltic Sea – more important than we think](#).

### NEW COASTCLIM PUBLICATIONS:

- **Thakur et al.:** [Coastal-SMEAR – introduction to infrastructure and capacity of the atmospheric observatory in Tvärminne, Finland](#)
- **Manca et al.:** [Macrophyte–epifauna associations form structured ecological networks in the Baltic Sea](#).
- **Rodil et al.:** [Benthic assemblage responses to different sources of macrophyte detritus using contrasting methodological approaches](#).
- **Serrana et al.:** [Microbial hydrocarbon degradation potential of the Baltic Sea ecosystem](#).
- **Venetz et al.:** [Long-Term euxinia restricts microbial methane removal in eutrophic coastal basins](#).

- **Ropella et al.:** Impact of mussel farming on CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions in a coastal area.

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



Who are we?

## Meet a CoastClim researcher:

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

I am Johan Eklöf, a marine biologist and ecologist at Stockholm University. In my work I try to understand the role of biota, biodiversity and trophic interactions for ecosystem functioning and nature's benefits to society, and how we can use this knowledge to better manage ecosystems in a rapidly changing world.

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

In CoastClim, me and my collaborators are studying to what extent variability in fish, invertebrate and macrophyte communities over time and space are driven by environmental conditions and human impacts (e.g. fisheries), and if, how and to what extent this variability influences carbon cycling (including greenhouse gas fluxes from shallow sea beds) and carbon sequestration in coastal sediments. We use large-scale comparative

field surveys combined with causal statistical modelling, analyses of time-series data from environmental monitoring programs, and small-scale experiments in the lab and the field, to link patterns to processes.

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

...is to early on work on and learn one study system really well (e.g. seagrass beds, the open pelagic zone), and at the same time to read the literature very broadly (both marine, limnic and terrestrial studies, applied as well as fundamental). This will help you understand other fields, enrich you own work, and to stay curious throughout your worklife.

[Meet the CoastClim team >>](#)

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