

From field work to crunching numbers

Three years into the CoastClim collaboration, the extensive infrastructure developments, field campaigns and experiments have turned into a phase of crunching numbers and publishing scientific articles. In conclusion we are closer to reaching the interdisciplinary understanding we are aiming for.

For example, new findings reveal how seasonal changes in primary producers (phytoplankton, vegetation) and consumers (seafloor animals) within different habitats affect carbon stocks, cycling, and transport. We have observed

unusually high water temperatures and heatwaves in our coastal waters. Our experiments indicate that increasing temperatures change animal behaviour and intensify carbon and nutrient cycling. We found increasing evidence that methane hotspots exist along the Baltic coasts. Ebullition (bubbles escaping from the seafloor) was identified as the main source of methane to surface waters in shallow areas, some of which risk to escape to the atmosphere.

Combining all these results will reveal a lot of new discoveries and knowledge during the coming year. We are encouraged by the fact that this knowledge is being increasingly sought after by many stakeholders working with environmental management.

We thus have an exciting year 2025 ahead of us. We hope you will remain with us on the journey!

Defense: Effects of marine heatwaves on benthic functioning and communities

Norman Göbeler will defend his doctoral dissertation on Wednesday the 4th of December at 13:00 Finnish time at Tvärminne Zoological Station.

[Follow the defense online here.](#)

We wish you all the best Norman!



Effects of bottom trawling on carbon dynamics

In October, an extensive expedition, including CoastClim researchers, took a closer look at how bottom trawling affects carbon dynamics in the seafloor and the water column. By following a fishing vessel outside Askö island, the team measured the suspension and dispersion of particles, dissolved substances and gases over several days, using several methods such

tracing of gases from the seafloor.

as water samples, acoustics and real time

How do animals affect methane release from the seafloor?

In September, an R/V Electra sampling campaign, led by Moritz Nusser, PhD student in marine biology, set out to the Tvären Basin in the Baltic Proper, a site known for its high natural methane ebullition.

Sediment and animals were collected for microcosm experiments, examining how various seafloor animals affect methane release. At sea the natural ebullition was recorded with echosounders, which provides valuable field observations to compare with the lab results.

Methane ebullition from coastal seas is increasingly recognized as a greenhouse gas source, yet it is still not fully understood how sediment-living animals impact these emissions, for instance by burrowing.

The project is a collaboration within the new [CoastClim research school at Stockholm University](#).



New EU Commission in place

It's done - we have a new European Commission in place to start work on 1 December. That's after the world's most difficult job interviews have been completed. For some Commissioners-designate, the hearings went smoothly, while others were heavily criticised. Following the vote, we now have a line-up

of both newcomers and more experienced Commissioners to take forward important environmental, marine and climate processes.

[Here are the Commissioners who will be responsible for these issues.](#)

International collaborations

New Zealand January 2025

A team of CoastClim researchers from both Finland and Sweden are preparing for a field campaign in New Zealand. They will collaborate with researchers from the [University of Auckland](#) with the aim to further reveal the coastal carbon cycling in healthy and degraded environments.

Stay tuned for real-time action updates on our social media channels in mid-January!



Using echosounders to track greenhouse gases in the Arctic

This summer, PhD student Vicent Doñate Felip joined a team of 80 scientists on the [KANG-GLAC](#) expedition, heading for the Kangerlussuaq fjord system in southeast Greenland. In these previously uncharted areas, his team used acoustic methods to track stratification and gases in the water column. During the expedition, they discovered several gas plumes, whose bubbles seem to differ a lot in size and dynamics from the ones typically found in

the Baltic Sea. What lies behind this? Well, that is a question that Vicent will explore further in his methane flux research in the Baltic Sea.

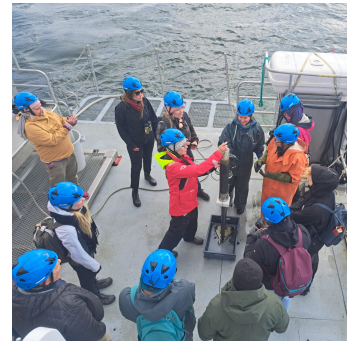
Investigating new waters in Greenland

The [North of Greenland 2024 expedition](#) went further into the Lincoln Sea, Greenland, than any ship has ever gone before. On board were CoastClim scientists responsible for water sampling, with instruments specifically designed to measure greenhouse gas fluxes between the ocean and the atmosphere. In these uncharted waters, higher than expected levels of methane were found in the surface



water, and researcher Christian Stranne and colleagues are now investigating why.

CoastClim outreach



Visit by decision makers – save the marine environments!

Researchers and different decision makers met at Tvärminne Zoological Station to discuss the state of the Baltic Sea in relation to the biodiversity and climate crisis. The program included lectures and updates on recent research findings by experts, hands-on field sampling onboard r/v Augusta and engaging discussions.

The event was organized as a collaboration between TZS-CoastClim and the Baltic Sea Action Group.

Inspiring the next generation of scientists

For the future of our economy, environment, and society, it's critical that the next generation of talented people embrace a career in science. The first Functional Coastal Ecology course for upper secondary school students was held at Tvärminne in September.



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 Bergsrådinnan Sophie von Julins stiftelse and Brita Maria Renlunds minne sr. made this possible.

Short news at a glance

- **Watch the latest Baltic Breakfast** on new methods for environmental monitoring.
- **Interesting reading:** Ehrnsten et al. (2024) shows how the decreased nutrient loading measures around the Baltic Sea has indeed helped us avoid a disaster, even if the response times are long. Read a news article and watch a video (in Swedish).



Who are we?

Meet a CoastClim researcher:

Who are you?

My name is Martijn Hermans, and I am a postdoctoral researcher at the Baltic Sea Centre, Stockholm University. My expertise lies in aquatic biogeochemistry, environmental sciences, and geomicrobiology. During my time in Stockholm, my research has primarily focused on the biogeochemical cycling of greenhouse gases, nutrients, and trace metals in both the water column and seafloor of freshwater and coastal ecosystems within the Baltic Sea catchment area.

What are you doing in CoastClim and why?

My role within CoastClim is to explore all facets of methane dynamics in contrasting coastal environments of the Baltic Sea out of a desire to gain a deeper understanding of the factors that ultimately govern methane emissions in those regions. These factors encompass a range of variables such as bottom water redox conditions, stratification, salinity, temperature, organic matter input, and vegetation cover. To accomplish this goal, I am utilising a combination of biogeochemical, microbial, and physical field data, complemented by reactive transport modelling. My research allows to better predict how methane dynamics will respond to internal changes in potential future scenarios.

My recommendation to you...

View data from different angles to uncover new insights. Challenge yourself to think creatively and out the box. There are untold stories waiting to be discovered.

[Meet the CoastClim team >>](#)

Open position

PhD Position in Carbon Cycling and Climate Change in Coastal Environments

The Centre for Coastal Ecosystem and Climate Change Research ([CoastClim](#)), at the [Tvärminne Zoological Station \(TZS\)](#), Faculty of Biological and Environmental Sciences at the University of Helsinki (Finland), is seeking an enthusiastic PhD candidate with an interest in global change and more specifically in marine (pelagic) biogeochemistry.

Within CoastClim, the successful candidate will explore the connections between biodiversity and carbon cycling in coastal habitats and assess their impacts on greenhouse gas (GHG) dynamics including CO₂ and CH₄. Fieldwork and in-situ experiments will focus on: i) investigating the importance of temporal variability, including seasonal ecosystem successions, on the intensity of sea-air GHG exchanges in coastal ecosystems, ii) identifying GHG hotspots in coastal environments by examining contrasting seafloor habitats and quantifying their GHG release into the water column, and iii) assessing the impacts of heatwaves on local biodiversity and GHG dynamics.

For more information: coastclim.org/news

Apply before 31 January 2025



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