Coast Clim
Coastal Ecosystem and Climate Research

Greenhouse gas emissions detected from degraded ecosystems in NZ

Exploration of greenhouse gas (GHG) dynamics across coastal ecosystems in the Auckland region was on the agenda when CoastClim researchers from Sweden and Finland conducted a field campaign in New Zealand in the beginning of the year.

This project brought a unique set of instrumentation and skills to conduct direct online measurements across environmental gradients. The first preliminary results suggest significant emissions of GHGs, both carbon

dioxide and methane, in impacted areas suggesting that as coastal ecosystems and biodiversity degrade, atmospheric feedbacks of GHGs into the atmosphere increases. This highlights the importance of focusing on the role of coastal ecosystems in climate change mitigation!

The project was part of a collaboration between our Centre and Prof Simon Thrush at the Institute of Marine Science, University of Auckland. The main aim was to explore links between coastal ecosystem health and atmospheric feedbacks, by conducting measurements in coastal ecosystems with various levels of human pressures.

Listen to an interview (Swedish) with the researchers and read news articles about the expedition, YLE (Swedish), The Conversation (English), HU (English), SU (English).

CoastClim Phd defense:

Functional perspective on the role of macrophytes in the coastal carbon cycle across different temporal and spatial scales

Roel Lammerant will defend his doctoral dissertation on Friday 4 April at 13:00 Finnish time at Tvärminne Zoological Station.

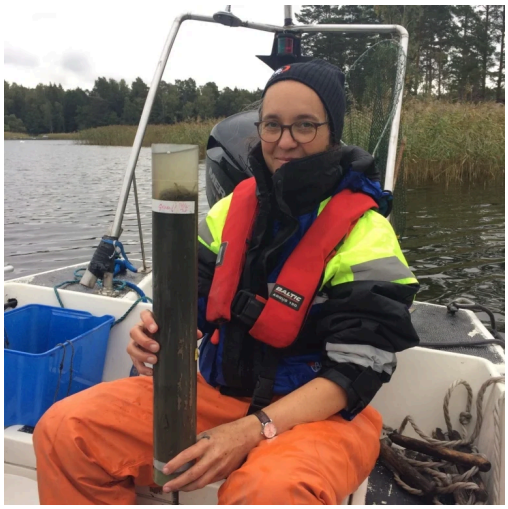
Follow the defense online here.

Roel is the first defending PhD student that started his journey at the starting point of CoastClim.

We wish you all the best Roel!

Sheltered bays are significant carbon sinks in the Baltic Sea

A new study by researchers from the Baltic Sea Centre, Stockholm University shows that the sediments of sheltered bays in the Baltic Sea can sequester and store significant amounts of carbon and nutrients.



“We see that these areas play a similar role to seagrass meadows in other marine areas”

Sofia Wikström, marine ecologist at the Baltic Sea Centre and lead author of the study.

Ecosystems and habitats that help reduce carbon dioxide in both the ocean and the atmosphere are receiving increasing attention when discussing climate action and nature restoration.

Read the scientific publication and a news article about the findings.

Adding new skills in isotope analysis

In February, PhD student Antonia Schell joined a South Korean workshop on silicate weathering and carbon cycles.

During a lab visit at Pukyong National University, Antonia learned new techniques in non-traditional
isotope analysis that are valuable in her studies of weathering processes and carbon storage in Baltic Sea sediments.

Check out the inspiring documentary (Swedish) by Kati Grönholm at YLE, about the important work Joanna & Alf Norkko are doing for our oceans!

Ice diving course in Kilpisjärvi

The Finnish Scientific Diving Academy at Tvärminne Zoological Station was teaching essential skills for ice-diving expeditions for the second time.

Read news articles to see how it went, BBC (English), YLE (Swedish)!

If you are interested in the Polar diving course 2026, contact edward.stockdale@helsinki.fi to apply for next year's course! The dates are 21 Feb–2 Mar 2026.

Short news at a glance

- **Watch Prof Alf Norkko's talk** about the rapid changes in the state of the Baltic Sea (in Swedish) from an event organised by the scientific society Societas pro Fauna et Flora Fennica earlier in March.
- **Watch short clips of our PhD students**, where they explain their research. The videos were produced in collaboration with Baltic Sea Action Group.
- **New publication** by Göbeler et al. (2025) Marine heatwaves amplify benthic community metabolism and solute flux in a seafloor heating experiment.
- **New publication** by Fonseca et al. (2025) Large filamentous bacteria isolated from sulphidic sediments reveal novel species and distinct energy and defence mechanisms for survival.
- **New publication** by Gammal et al. (2025) Seasonal variation in the role of benthic macrofauna communities for ecosystem functioning in shallow coastal soft-sediment habitats.
- **New publication** by collaboration, Gillis et al. (2025) The role of lag phases between real-term marine heatwaves in the trait responses of two macrophyte species.
- **Watch the latest Baltic Breakfast** seminar by the Baltic Sea Centre about PFAS regulations.

Calendar

4/4 Doctoral defense at 13:00 Finnish time, Roel Lammerant, Tvärminne Zoological Station, follow online here.

22/4 Anna Villnäs & Alf Norkko present at the ACCC Impact Week in Helsinki, see program and register via the link.

7-8/5 CoastClim Spring Meeting at Tvärminne Zoological Station.

26-30/5 Baltic Sea Science Congress in Sopot, Poland.

9-13/6 Third UN Ocean Conference in Nice, France.

Current policy affairs

UN Ocean Conference in June

France and Costa Rica are hosting the next UN Ocean Conference. The meeting will take place in Nice from 9-13 June and will be flanked by pre-meetings on different themes, including the One Ocean Science Conference from 3-8 June. The Global Ocean Conferences began in 2017 in New York on the initiative of Sweden and others. It was followed up in Lisbon in 2022 and now it's time again. While the first conference focused on the state of the oceans, the Lisbon meeting was more about what to do, and in Nice the focus will be on how to initiate action in collaboration with all stakeholders in society.

There are three priorities for the Nice conference:

- Work towards the successful conclusion of ocean-related multilateral processes to raise the level of ambition for ocean protection
- Mobilize funding to conserve and sustainably use the oceans, seas and marine resources for sustainable development goal (SDG14) and support the development of a sustainable blue economy
- Strengthen and better disseminate marine science knowledge for better policy-making

It is still possible to apply to organise off-site side events during the conference, i.e. side events that will not be under the official UN flag or

directly on the conference site. The deadline for applications to organise these types of seminars and similar events is 21 April. Read more here.

Over the past year, there have been various opportunities to provide input on what the conference should discuss and how, by responding to a number of open consultations. Stockholm University's Baltic Sea Centre, BSC, has submitted comments. Last week, BSC participated in Blue Talks at the French Embassy in Stockholm, where the upcoming ocean conference was discussed. The Swedish Agency for Marine and Water Management is organising a consultation meeting on the conference in a few weeks.

At EU level, important strategy work is underway, which of course also plays a role in the UN conference. The new Commissioner for Fisheries and Oceans, Costas Kadis, has announced that an **Ocean Pact** will be developed to provide a framework for ocean work. In early 2025, the European Commission asked for ideas and feedback through an open consultation. The input from BSC can be found here. In early March, the European Commission organised a week of meetings to discuss the content of the upcoming ocean strategy, the so-called European Ocean Days.

It remains to be seen how the views of different stakeholders will be taken into account. The Nice Ocean Action Plan, consisting of a political declaration and a list of voluntary commitments from stakeholders and numerous coalitions, will be adopted at the end of the international discussions at the conference.

Gun Rudquist, Head of Policy at BSC, Stockholm University

Who are we?

Meet a CoastClim researcher:

Who are you?

I am Nicolas-Xavier Geilfus, originally from Belgium, but I moved to Finland 3 years ago from Canada where I spent 8 years working in the Arctic, investigating the importance of sea ice on the carbon cycle and air-sea exchange of CO_2.

What are you doing in CoastClim and why?

My research focuses on understanding and quantifying the role of coastal marine environments as sinks or sources of greenhouse gases (GHGs), including CO_2, CH_4, and N_2O, to the atmosphere. By examining the dynamics of gas exchange within these highly diverse and biologically rich ecosystems, I aim to assess the scale and drivers of change in GHG concentrations. Coastal ecosystems, with their complex biogeochemical processes and unique habitats, play a pivotal role in regulating these exchanges. There are many questions, e.g. What are the key contributors to GHG fluxes in these environments? How will these exchanges shift in the face of environmental and climatic changes?

My recommendation to you...

Take time to notice and enjoy all the changes in nature during spring, and take care of each other!

Meet the CoastClim team >>

CoastClim

coastclim.org