

The international expert community on sea ice biogeochemical processes at sea-ice interfaces (BEPSII) had another productive meeting in conjunction with the international IGS sea-ice symposium in Winnipeg.

1. Task group 1 which is currently SCOR WG152 ECVice reported on several successful intercomparison projects (PP and light) at the Saroma-ka lagoon in Japan and the upcoming intercomparison projects at the sea-ice chamber (University of East Anglia) and in Cambridge Bay (Canada, 2021). Several historical compilations are in progress, results from the CO₂ flux measurements over sea-ice using chamber techniques were presented. Several discussions were held on sampling, data collation and other projects and challenges, such as processes in ice cores. An extension request for one year will be submitted to SCOR.

2. Task group 2 on Technology and Data collection highlighted the various data collations in progress (DIC, nutrients, Primary production for Arctic and Antarctic in sea ice). Ideas for new variables were highlighted, e.g. O₁₈, POC and a methane synthesis. The group also had a brainstorming session on a coordinated international workshop on in-situ sampling platforms and novel sensor technologies with respect to the observation and measurement of sea-ice related processes.

3. Task group 3 on Modelling and Observational process summarized the progress in current model intercomparisons an (1-d, in final stages, 3-D submitted with new effort for future projections in planning). Several papers have been published and are in preparation reporting progress in modelling biogeochemical processes in sea ice. A small lead team has been selected to start looking at evaluating CMIP 6 models with focus on sea-ice biogeochemical processes. This is appropriate since CMIP6 has much higher resolution, both temporally and spatially which will allow much clearer analysis of BEPSII processes or environmental variables affecting BEPSII processes. Discussions will also include to assess what analyses should be done to support the ecosystem services paper and Antarctic position analysis (see below). Observational process studies are very much focused on the upcoming MOSAIC drift experiment (many BEPSII researchers are involved). But looking forward a discussion session was held on a potential BEPSII focused cruise in the Antarctic.

4. For TG 4 on Synthesis, a few minor items have been finalized for the BEPSII position analysis on changes in sea-ice biogeochemical processes in the Arctic. This paper will be submitted to Nature Climate Change within the next few weeks. A respective position analysis is planned for the Antarctic and will be a focus of the next BEPSII meeting (to be held in conjunction with the SCAR open science meeting in Hobart in July 2020).

Small group and plenary discussions were held to draft an extended outline for a BEPSII community paper on sea-ice ecosystem services. The Paper will cover both Arctic and Antarctic and will highlight ecologically and biologically significant components of the sea-ice ecosystem and what services the system provides to the human society.

Several other integrative projects are in the planning stage, including to build a better/closer link with the atmospheric chemistry community CATCH and to revisit the sea-ice carbon pump due to many new discoveries and insights in recent years.

5. TG5 on outreach has been very active and a lot of information is available from the regularly updated website. BEPSII is also an active tweeter, but the team is asking for more input from the BEPSII community to highlight cool things. Efforts are on the way to contribute to Frontiers young minds with an issue on biology in sea-ice for kids and youth. It is planned to create educational videos for sea-ice methodologies to be posted on BEPSII's new methods website. Some of those will be created during field experiments and method intercomparison projects as well as during the planned BEPSII field school in 2021 in Cambridge Bay. A BEPSII overview video will also be created. Discussions continued to finalize the planning and details for the field school, the next year will heavily focus on applying for funding to various organisations.

Key scientific highlights:

- i. BEPSII prepared a community paper/position analysis summarizing "The future of Arctic sea-ice biogeochemistry and ice-associated ecosystems" which will be submitted to Nature Climate Change shortly.
- ii. BEPSII will be preparing a community paper on sea-ice ecosystem services. The Paper will cover both Arctic and Antarctic and will highlight ecologically and biologically significant components of the sea-ice ecosystem and what services the system provides to the human society.
- iii. BEPSII/ECV-ice successfully performed intercomparison projects (PP and light) at the Saroma-ka Lagoon in Japan and the is preparing upcoming intercomparison projects on sea-ice CO₂ flux measurements and primary production at the sea-ice chamber (University of East Anglia) and in Cambridge Bay (Canada, 2021).
- iv. Details of taskgroup activities have been updated and can be found in the updated Appendix of BEPSII's 5-year plan <https://sites.google.com/site/bepsiiwg140/documentation>
- v. BEPSII chaired a session at the IGS sea-ice symposium in addition to two other biology related session, which greatly enhanced the focus on biogeochemical processes in the sea-ice region, compared to earlier IGS sea-ice symposia