

The SCOR-WG 140 – Biogeochemical exchange processes at Sea Ice Interfaces BEPSII had their first official meeting on March 16 in Ventura, California, following the Gordon Research Conference on Polar Marine Sciences. Several side meetings were held already during the GRC in preparation for the full day meeting. BEPSII has three task groups, each of which met individually and in concert with the other TGs, to discuss progress plans and timelines.

**TG1 on Methodologies and Intercomparisons (leads Lisa Miller, Lynn Russell)** has three primary goals 1. Methodological review; 2. Intercomparisons and intercalibration projects; and 3. Guide of Best Practices. The methodological review paper is well underway, submission is anticipated by the end of summer likely in the new online journal *Elementa*. For the Intercomparison exercises Several dedicated projects are needed, because method intercomparisons are incompatible with multi-disciplinary process studies. Three options are explored: 1. Bringing back multiple ice cores that are milled together to create homogeneous samples for distribution between labs (e.g. EPS analyses). A comparable control experiment for chl-a has already been done by the Belgium group. 2. Ice camps are needed for doing direct melting experiments for biological parameters and processes. This requires field-camp operations where all interested groups can directly participate. Potential locations and intercomparison variables are currently investigated. 3. Laboratories can be used for controlled physico-chemical experiments, like gas exchange experiments, but not for biological measurements. For the Manual of Best Practice it was decided that to producing a manual on our own is not feasible for the near future. As an alternative it was discussed to add a biogeochemistry section to the next edition of Hajo Eicken's book, which is currently in discussion. It was also suggested to publish the manual on-line as a wiki or other type of living document.

**TG2 on Data (Leads: Klaus Meiners and Martin Vancoppenolle)** has two primary goals: 1. Produce new data inventories and datasets by collation of existing data; 2. Provide recommendations for standardized protocols and databases. The first dataset on chlorophyll-a from the Antarctic has been published (Meiners et al., GRL 2012) within ASPeCt as a strong overlap to BEPSII and is a contribution to the BEPSII goals. For the Antarctic data base, Klaus will continue collecting data on POC, DOC and nutrients. For the Arctic, Christine Michel and Michel Gosselin have agreed to lead, also starting with chl-a. Collection and motivation of collaborators will follow the example of the Antarctic. Quality control is essential and inclusion of a flagging system was suggested. Some details including a data base location still need to be sorted out. Data collection is anticipated to be set up and most data collected by year 1. By year 2 all data should be collected and an Arctic draft paper ready. The Experience within ASPeCt and the new chla database will be used to provide recommendations for standardized data-collection protocols, an overview will be added into the review paper under TG1.

**TG3 on Modeling (leads Nadja Steiner and Clara Deal)** has four components: 1. Recommendations from modelers to observationalists, 2. Review papers on major biogeochemical processes 3. Intercomparison of 1D models and publication of a review, 4. Application in regional models with links to global & regional climate modeling. For 1.) the aim is to create a short paper/report aiding observationalists in understanding what kind of data and variables modelers need and why and how they are useful. The format of this is not clear and will be further discussed. For 2.) It was decided that no big overview paper is needed but rather a set of papers focusing on specific processes of interest to the community. The idea is not only to describe how the process works, but also how to parameterize them in a model. Potential topics are: a) DIC/Alk separation during the freezing process, b) release and transfer of iron and other minerals c) Parameterization of light transfer in sea ice, d) processes of ice algal release into the water, e) link to atmospheric chemistry, f) review of parameterizations for turbulent mixing in Arctic Ocean models. Leads and potential contacts were identified for most topics. The need to remember our task of linking/bridging of scales - identify important processes in process scale models – simplify for application in regional and potentially global scale models was pointed out. Four different 1-D model intercomparison exercises were identified: A. General ice-phytoplankton

models. This effort is lead by Letizia Tedesco and has already been initiated, potential contributors are identified and potential datasets discussed, B. DMS (lead Clara Deal), C. Physical: convective mixing (EoS), ice thermodynamics, advection processes (lead Elena Golubeva) D. (Atmosphere-ice). It was recommended to get observationalists involved in these reviews.

The link to regional modeling and global earth system models is strongly connected with AOMIP/FAMOS. This component will deal with the applicability and relevance of small-scale processes and model parameterizations in 1-D models to the larger scale models. Some ideas have been discussed, including redefinition of biochemical provinces in the Arctic, down scaling and future predictions of the Arctic ecosystems under IPCC emission scenarios, ocean-atmosphere exchange of pCO<sub>2</sub> in the models and its verification against new data sets, primary production of the ice-covered areas and its contribution to the pan-Arctic estimates, shelf-basin exchange of nutrients as a control mechanism for Arctic Primary production. Discussions will be continued at the next AOMIP/FAMOS meeting in Woods Hole in October 2013.

The final components of the meeting were discussions of some overarching issues including potential locations/conferences for the next meeting (IGS, Hobart, March 2014; Ocean Sciences, Honolulu, Feb. 2014, EGU, Vienna, April 2014, IMBER-OSC, Bergen Jun 2014), outreach: website, Facebook page, potential connection to APECS, potential involvement of high school students in intercomparison projects.

Cross links to the following projects or working groups have been discussed and established: ART, PICES, SOLAS, ASPeCt, PAGES-SIP, AOMIP/FAMOS, OASIS, MOSAIC, Arctic Science Partnership, Antarctic Fast ice Network BEPSII has representatives of most of these groups as part of their members.