Minutes from the SAS-workshop in Gothenburg 28-29 September 2016

Workshop participants. Back row: Kumiko Asetzu-Scott, Leif Anderson, Vidar Lien, Peter Schlosser, Jim Swift, Øyvind Paasche, Are Olsen, Sebastian Gerland, Yiming Luo, Takashi Kikuchi, Kyoung Ho Cho. Front row: Motoyo Itoh, Karen Edelvang, Carin Ashjian, Lise Lotte Sörensen, Jens Hölemann and Andrey Ye Novikhin.

A two-day workshop convened at the University of Gothenburg and organized by Prof. Leif Anderson addressed the development of the Synoptic Arctic Survey (SAS) Science Plan (SP). The workshop was held at the Ågrenska House with 17 participants coming from South-Korea, Japan, Canada, US, Germany, Russia, Sweden, Denmark and Norway.

DAY1. During the 1st day, Vidar Lien, Øyvind Paasche, Kumiko Asetzu-Scott, Are Olsen, Carin Ashjian and Peter Schlosser, gave presentations. Time was spent on both plenary and group discussions, where the latter was divided into three disciplinary groups 1) Physical Oceanography, 2) Carbon cycle and biogeochemistry and 3) Ecosystems. Unifying themes and science questions were discussed.

DAY2. During the second day the draft of the Science Plan (1.0) was discussed in more detail and a revised structure was agreed upon. Nine key research questions, three per disciplinary group, were identified and drafted, and in order to secure progress responsible persons for the different writing groups were identified: Intro (ØP), Physical Oceanography (VL), Carbon Cycle and Biogeochemistry (AO) and Ecosystems (CA).

The main science question for SAS is «*What is the present state of the Arctic marine system and what are the major ongoing transformations?*»

In order to properly address the main science question the following nine interrelated questions have been identified and drafted:

Physical Oceanography:

Q1. How are Arctic Ocean water masses and circulation responding to changes in sea ice properties, and atmospheric, advective and freshwater forcing?

Q2. What are the states of, and changes in, heat and freshwater budgets in the Arctic regions?

Q3. What are the changes in water mass sources, sinks and transformations.

Carbon cycle and biogeochemistry:

Q4. What is the contribution of the Arctic to maintaining global ocean carbon uptake and how will it change in the future?

Q5. What are the magnitude, drivers, and impacts of Ocean Acidification in the different regions of the Arctic?

Q6. What is the input and fate of terrestrial and subsea carbon in the Arctic Ocean?

Ecosystems:

Q7. How does the carbon flow through the ecosystem vary regionally across the Arctic?

Q8. Does northward range expansion of subarctic species vary regionally and are any species likely to establish permanent populations in Arctic regions?

Q9. How does PP and associated availability of nutrients vary between pan-arctic regions?

Version 2.0 of the Science Plan is to be sent out to the group prior to December 1st. Shortly thereafter a workshop will be held at the AGU Fall Meeting (probably Tuesday 13th of December), where the current version of the SP will be reviewed. An effort will be made to arrange meetings with representatives from NSF, ONR and NOAA present at the AGU meeting. An updated version of the SP will be sent out to selected scientists for additional comments before Christmas.

Leif, Øyvind and Are will continue to explore the possibility for a smaller workshop in China early 2017. The new Science Plan will be presented on

ASSW2017 in Prague (31 March – 7 April). A side event at EGU General Meeting in Vienna 23-28 April 2017 is considered.