Project information

Keywords
Arctic, sea ice, progress report

Project title
Developing Modelling Tools to Understand the Role of Solar Radiation to Sea Ice Mass Balance in a Seasonally Ice Covered Arctic (SOLICE)

Year
2015

Project leader
Mats Granskog

Participants

Mats Granskog (NPI), project lead

Tore Hatterman (Akvaplan-niva)

Anthony Doulgeris (UiT)

Keguang Wang (MET.no)

Caixin Wang, Alexey Pavlov, Sebastian Gerland (NPI)

Flagship
Arctic Ocean

Funding Source

In total 1 000 000 NOK Fram Centre funding in 2015. Thus mainly covering personell costs for the participants.

Substantial in-kind contributions through personnel time through partner institutions, and data through instruments deployed through external projects (NFR and EU). Salary for C. Wang (NPI) also funded through external project.

Another Fram Centre project (ModIOE) contributes significantly to the progress of this project through development and model runs of the CICE-ROMS coupled model.

Summary of Results

The following task were planned to be carried out in 2015 according to the project plan. Most of these have proceeded as planned, and are to be completed by the end of the year.

Task 1.1. In the second-year phase of the project, according to the project plan, examine existing autonomous observations from the high-Arctic has been continued. The work led to one manuscript about the influence of atmospheric conditions in the central Arctic in 2012 and 2013 (Wang et al., 2015) has been submitted to JGR-Atmosphere. At the present stage a revised manuscript, after favorable reviews has been submitted..

To collect new data, the hired researcher Caixin Wang joined the N-ICE 2015 Arctic expedition for collecting sea ice mass balance data.

Task 1.2. Existing parameterization schemes have been collected. Verification of the existing parameterization schemes is ongoing, which includes verification of the parameterization schemes with observational data and with 1D HIGHTSI and CICE models.

One paper relevant to SOLICE has been published in Polar Research. It investigated the formation of snow ice and superimposed ice (two types of ice formed at the snow/ice interface) in Kongsfjorden Svalbard and how the albedo scheme of Flato and Brown (1996) influenced the sea ice mass balance during the melt season using 1D HIGHTSI model.

Task 2.1 Development new parameterization schemes for partition of solar radiation is in progress, and one manuscript is in preparation.

Task 2.2 The validation of the new parameterization using 1D model is initiated and is the main task in the rest time of 2015.

Task 3.1 To validate CICE-ROMS coupled model, the new parameterization scheme will be started to implement into the CICE-ROMS at the end of 2015.

For the Management

n/a

Published Results/Planned Publications

Manuscript published;

Wang, C., B. Cheng, K. Wang, S. Gerland, and O. Pavlova (2015), Modelling snow ice and superimposed ice on landfast sea ice in Kongsfjorden, Svalbard, Polar Res., **34**, 20828, http://dx.doi.org/10.3402/polar.v34.20828.

Manuscript submitted;
WANG, Caixin et al. Atmospheric conditions in the central Arctic Ocean through the melt seasons of 2012 and 2013: Impact of surface conditions and solar energy deposition into the ice-ocean system. Revision Submitted to Journal of Geophysical Research-Atmosphere. Nov 2015.

Communicated Results

One poster of “Analysis of ice mass balance buoys and radiative fluxes in summers 2012 and 2013 in the central Arctic Ocean” written by Wang, Caixin et al. has been presented on Arctic Frontier, 18-23 January 2015, Tromsø, Norway.

One poster about the published paper of “Modelling snow ice and superimposed ice on landfast sea ice in Kongsfjorden, Svalbard” will be presented on the Ny-Ålesund seminar, 23-25 September, Tromsø, Norway.

A news item about the published paper of “Modelling snow ice and superimposed ice on landfast sea ice in Kongsfjorden, Svalbard” was in the September social media http://instagram.com/oceanseaicenpi

Interdisciplinary Cooperation

n/a

Budget in accordance to results

This is the second year of the project, and the work has progressed according to the the project plan. A researcher was hired to work for the project at NPI (8 person-months for Dr. Caixin Wang in 2014 and 10 p*m in 2015). External funds must have have been used to finance a full year, thus part of work time has been in other projects, which are nevertheless relevant for the work in SOLICE.

Could results from the project be subject for any commercial utilization

No

Conclusions

Progress in 2015 has been more less as planned.