

Project information

Keywords

sea ice, ecosystem, Kongsfjorden, Svalbard, remote sensing, in situ observations, climate

Project title

Mapping Sea Ice Characteristics relevant for Arctic Coastal Ecosystems

Year

2017

Project leader

Sebastian Gerland

Geographical localization of the research project in decimal degrees (max 5 per project, ex. 70,662°N and 23,707°E)

78.9 N 12.3 E

Participants

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Flagship

Fjord and Coast

Funding Source

The funding of this project consists of the funding provided through the Fram Centre Flagship Fjord and Coast, funding and infrastructures by home institutions of partners (Norwegian Polar Institute, UiT The Arctic University of Norway, Norut, MET), and the centre for research-driven innovation, CIRFA SFI (NFR).

Summary of Results

Sea ice in coastal systems of Svalbard is characterized by its seasonal cycle. Beyond that, long-term trends and interannual variability contribute to varying conditions from year to year. Coastal sea ice at Svalbard is highly relevant for the ecosystem, it has socio-economic implications, and knowledge about sea ice status and changes is important for modern ecosystem-based management. The project consists of four WPs, dealing with in situ observations of Svalbard sea ice, remote sensing from satellites and remotely piloted aircraft systems, and with synthesizing the results for use by ecosystem scientists and management. Project partners are NPI, UiT, MET and Norut.

The Overall objective of the project is to have an efficient method for retrieval of important fjord ice parameters from remote sensing data. Thus, the project will be the base for a future study of time series of historical satellite data to investigate changes in coastal sea ice in Svalbard and the relation to the eco-system.

In 2017, In situ and UAV sea ice fieldwork was conducted in May in Kongsfjorden, Svalbard. Resulting data is processed to some extent, along with processing of remote sensing products for Kongsfjorden. Freezer lab work on ice samples from 2016 and 2017 fieldwork is ongoing. Work with two scientific publications (see below) has been going on, including data processing and interpretation. One of the publications listed is accepted and in press. The planning of a 2nd open seminar 4.12.17 in Tromsø is in progress.

Master and PhD-students involved in the project

There are no master- or PhD students directly involved in the project, but one postdoc researcher (Jean Negrel) is involved. He is financed by the CIRFA SFI (NFR).

For the Management

Information on Svalbard sea ice in fjords is of relevance for management and stakeholders. The improvement of detection and analysis methods helps for improved management of the actual areas, and will consolidate the foundations for a planned, long term fjord ice monitoring system. With the second seminar to be on 4th December 2017, we reach out also to management and socio-economic communities.

Published Results/Planned Publications

Negrel, J., Gerland, S., Doulgeris, A.P., Lauknes, T.R., and Rouyet, L. (in press): On the potential of hand-held GPS tracking of fjord ice features for remote-sensing validation. *Annals of Glaciology*.

Pavlova, O., S. Gerland and H, Hop (subm., under revision): Changes in sea-ice extent and thickness in Kongsfjorden, Svalbard, and related ecological implications. *Advances in Polar Ecology*.

Communicated Results

Presentations where project results were included were presented so far in 2017 at the following conferences: Arctic Frontiers (Tromsø, Norway), (AC)³ Conference (Bremen, Germany), Arctic Science Summit Week (Praha, Czech Rep.), IGS Polar Ice Symposium in Boulder, USA (August 2017). In addition results were communicated to non-scientists (Gerland, S.: Talk in UNIS/Forskningsparken “brown bag” lunch seminar: Changing Arctic sea ice: implications for climate, ecosystems and society Forskningsparken, Longyearbyen, Svalbard, Norway. May 2017; and Gerland, S.: Radio interview on Svalbard sea ice monitoring and fieldwork by SRF radio (Swiss radio), June 2017). An Open seminar is planned to be in Tromsø 4th December 2017.

Interdisciplinary Cooperation

The project includes interdisciplinary work between physicists and biologists. Ecosystem aspects are included in the manuscript by Pavlova et al. (subm.), see above.

Scientists from several disciplines will contribute to the open seminar in December 2017.

Budget in accordance to results

The funding granted for 2017 is used according to the plans that were detailed in the revised version of the project description.

Could results from the project be subject for any commercial utilization

No

Conclusions

The project enables us to do important interdisciplinary work, linking scientists working with the physical system in coastal Arctic waters with scientists working with the ecosystem. A proposal for continuation of the project into a third, final year 2018 was submitted by the deadline 1 November 2017.