

Project information

Project title

Information systems in the Arctic Ocean: Drivers, architecture, and effects on the development of marine economic activities (ArcticInfo)

Year

2016-2018

Project leader

Maaïke Knol (UiT)

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

Participants

UiT Norges arktiske universitet: Maaïke Knol, Peter Arbo

Norsk Polarinsittutt: Sebastian Gerland, Stein Tronstad, Olga Pavlova

Meteorologisk Institutt: Hanneke Luijting (2016), Anders Doksæter Sivle (2017-2018)

Wageningen Universitet, Nederland: Machiel Lamers

Flagship

Arctic Ocean

Funding Source

Fram Centre

Summary of Results

Background: The main objective of this project is to analyze the development of weather and sea ice information systems in the Arctic and how they affect economic decision-making. The project has the following sub-objectives, which are linked to three thematic work packages.

1. To investigate the development of Arctic information systems as socio-technical infrastructures (WP1);
2. To understand the complexities and challenges in the user-producer interface in Arctic information systems (WP2);
3. To explore how Arctic information systems affect economic decision-making and alters the Arctic as a zone of risk (WP3).

The project has resulted in a **number of peer-reviewed publications, reports and Master theses** (see publications and communicated results). It has furthermore been presented at various conferences, workshops and other events.

August 2018: The project was presented and promoted at the NorFishing event in Trondheim.

January 2018: A special session was organized (by Maaïke Knol and Machiel Lamers) at Arctic Frontiers 2018 on "user engagement" in the context of the Year of Polar Prediction. Here, results from the project were presented "Co-production and user engagement in weather and sea ice forecasting for the European Arctic marine areas which is currently being developed into an (invited) publication for a special issue on user engagement in Polar Geography (submission deadline 1 March 2019).

April 2018: ArcticInfo was presented during a workshop at European Polar Board in the Netherlands

December 2017: The project was presented at a workshop organized by another Fram Centre flagship to establish cross-linkages (Mapping Arctic Sea Ice)

August 2017: We organized a project workshop to which we invited external contributors (representing BarentsWatch, PolarView and KSAT) to discuss information platforms, contact with users, and efforts towards increased interoperability of Arctic information systems. The insights we achieved from this day were incorporated into a paper now published in Polar Geography (see publications)

June 2017: ArcticInfo participants organized a special session on user engagement with reference to weather and sea ice services in polar areas at the ICASS (International Congress of Arctic Social Sciences) conference in Umeå.

October 2016: Full day interdisciplinary project workshop to bridge the gap between social and natural sciences and create a common understanding of weather and sea ice services in the Arctic

April 2016: Full day interdisciplinary project workshop to bridge the gap between social and natural sciences and create a common understanding of weather and sea ice services in the Arctic

Spring 2016: The project was officially endorsed by the Year of Polar Prediction (YOPP) under the World Meteorological Organization. This strongly increases the visibility of the project as well as the Fram Centre work on the project themes, and provides us with further networking options

Other results:

- Several members of the project collaborated on a research application to the Polar Program within the Research Council of Norway (September 2017). This application was meant to connect to, and follow up, the ArcticInfo project and covers similar themes. Connections were established to new Canadian and Icelandic partners. The application did not receive funding, but received a good evaluation and the intention is to develop this further and submit it again when a relevant call comes up.
- New research proposals have been submitted autumn 2019 for follow up projects (Fram Centre and NordForsk), which will draw on the knowledge generated in ArcticInfo.

Master and PhD-students involved in the project

2019 - Alexandra Stocker, Master student in Coastal and Marine Management, University Centre of the Westfjords, Akureyri University, Iceland, wrote her master thesis connected to the project, entitled: Sea Ice Variability: Implications for the Development of Maritime Activities Around Svalbard. Finished summer 2019.

2018 - Sarah Pötter, Master student in Polar Law, University of Akureyri, wrote her thesis at UiT and in connection to this project (WP3). The thesis is about the use of, and need for, weather and sea ice information among fishers and cruise operators. (see under results). <https://skemman.is/handle/1946/31903>

2016 - Paula Duske, Master student at Wageningen University, was hired by UiT as project assistant for two months during the summer of 2016. She wrote a report for the project (see under results, WP1) that has been used as a basis for our 2018 publication in Polar Geography. She also co-authored another project publication (WP3) in Polar Geography (Lamers et al 2018).

For the Management

Three of the project partners (UiT, MET and Wageningen University) are now cooperating in a new project funded through the ERA4CS Joint Planning Initiative, together with Umeå University and the Danish Meteorological Institute. The project started 15 Sept 2017. The project is entitled SALIENSEAS: Enhancing the Saliency of Climate Services for marine mobility sectors in the European Arctic Seas. There are very strong links between SALIENSEAS and ArcticInfo.

Published Results/Planned Publications

WP1 To investigate the development of Arctic information systems as socio-technical infrastructures

1. Knol, M., P. Arbo, P. Duske, S. Gerland, M. Lamers, O. Pavlova, A. Doksæter Sivle, S. Tronstad. 2018. Making the Arctic predictable: The changing information infrastructure of Arctic weather and sea ice services. *Polar Geography*, vol. 41, nr 4 <https://doi.org/10.1080/1088937X.2018.1522382>
2. Knol, M., P. Arbo, S. Gerland, M. Lamers, O. Pavlova, A. Doksæter Sivle, S. Tronstad (2018). Arctic weather and sea ice information infrastructures: dynamics and drivers. *Fram Forum*, 2018, p. 50-53
3. Duske, P. 2016. Geophysical Information Providers in the Arctic - Dynamics and Developments. Report, 40 pages. UiT The Arctic University of Norway. Available at <http://site.uit.no/arcticinfo/files/2018/08/Duske-2016-Internship-Report-Information-providers-in-the-Arctic.pdf>

WP2 To understand the complexities and challenges in the user-producer interface in Arctic information systems

1. Lamers, M., Knol, M., Ljubicic, G. (2017). Exploring the user-producer interface of weather and sea ice information for Arctic marine mobilities: a dedicated session at the Ninth International Congress on Arctic Social Sciences (ICASS). *The Polar Journal* 2017 ;Volum 7.(2) s. 434-436
2. Thoman, R Jr., J. Dawson, D. Liggett, M. Lamers, E. Stewart, G. Ljubicic, **M.Knol**, W. Hoke. 2017. Understanding the creation and use of polar weather and climate information. *Bulletin of the American Meteorological Society*: 98, p. 3-5
3. Knol, M., J. Jeuring, A.D. Sivle (2019). Toward valuable weather and sea ice services for the marine Arctic: Exploring user-producer interfaces of the Norwegian Meteorological Institute. *Polar Geography* doi.org/10.1080/1088937X.2019.1679270

WP3 To explore how Arctic information systems affect economic decision-making and alters the Arctic as a zone of risk

1. Lamers, M., P. Duske, L. van Bets (2018). Understanding user needs: a practice-based approach to exploring the role of weather and sea ice services in European Arctic expedition cruising. *Polar Geography* DOI: 10.1080/1088937X.2018.1513959
2. Pötter, S. (2018) Meteorological and sea ice services in the Arctic: How fisheries and cruise actors address risk in their decisions. Master Thesis in Polar Law, Faculty of Law, School of Humanities and Social Sciences, University of Akureyri
3. Stocker, A. (2019) Sea Ice Variability: Implications for the Development of Maritime Activities Around Svalbard. Master thesis Akureyri University, Iceland.

Communicated Results

The project has been presented at a variety of events and conferences. We have also used social media (LinkedIn, Twitter, Facebook) to communicate project results. We initiated a project website (<https://site.uit.no/arcticinfo/>) but this has not been regularly updated, as social media outlets seem to work more efficiently for a medium sized project like this.

Presentations at various conferences/workshops:

1. Knol-Kauffman, Maaïke; Jeuring, Jelmer; Doksæter Sivle, Anders. Toward valuable weather and sea ice services for the marine Arctic. MARE People and the Sea X 2019-06-25 - 2019-06-28 2019.
2. Stocker, Alexandra; Renner, Angelika; Knol-Kauffman, Maaïke. Ice edge retreating: influence on maritime activities around Svalbard. Svalbard Science Conference 2019-11-05 - 2019-11-06 2019.
3. Stocker, A., Renner, AHH, Knol-Kauffman, M. (2019). Ice-edge retreating: influence on maritime traffic around Svalbard. *Arctic Frontiers*, Tromsø, January 23 2019.
4. Jelmer Jeuring, Maaïke Knol (2019). Toward salient metocean services for the marine Arctic: exploring metocean perspectives on the user-producer interface. Yopp Arctic Science Workshop 14-16 January 2019, Helsinki, Finland.
5. Jeuring, Jelmer; Knol, Maaïke (2018). Communicating metocean information for Arctic marine tourism: expertise, timeliness and interactions. 27th Nordic Symposium on Tourism and Hospitality Research 2018-09-24 - 2018-09-26 2018
6. Knol, Maaïke. Co-production of weather and sea ice services for the marine Arctic. *Nor-Fishing, Trondheim, 21 August 2018*
7. Knol, Maaïke; Sivle, Anders Doksæter; Lamers, Machiel; Arbo, Peter. User-engagement in weather and sea ice forecasting for the European Arctic marine areas. *24 January 2018, Arctic Frontiers conference, Tromsø.*
8. Knol, Maaïke. Dynamics and drivers of Arctic sea ice information infrastructures. *Fram Centre workshop «Mapping Sea Ice Characteristics Relevant for Arctic Coastal Ecosystems», Tromsø, 4 December 2017*
9. Knol, Maaïke. Weather and sea ice information systems in support of maritime mobilities in the Arctic.

MARE People and the Sea ix, Amsterdam; 5-7 July 2017

10. Lamers, Machiel. Understanding user needs: a practice-based approach to exploring the role of weather and sea ice services in European Arctic expedition cruising. *MARE People and the Sea ix, Amsterdam; 5-7 July 2017*
11. Knol, Maaïke; Arbo, Peter; Doksæter Sivle, Anders; Duske, Paula; Gerland, Sebastian; Lamers, Machiel; Pavlova, Olga; Tronstad, Stein. Information systems for the Arctic marine areas: Drivers, dynamics and paradoxes. *International Congress on Arctic Social Sciences; 8-12 June 2017*

Interdisciplinary Cooperation

The project team is very interdisciplinary, including social scientists, oceanographers and meteorologists who have been working together on several publications, and have co-organized a series of project workshops meant to produce a common understanding.

For data collection, the social scientists in the project (together with a social scientist from Salienseas) have conducted a series of in depth interviews with meteorologists and oceanographers from MET Norway to explore a MET-service perspective on the user-producer interface of weather and sea ice surfaces (WP2). This series of interviews has greatly enhanced **mutual understanding** of social science and meteorologists' perspectives on the theme.

Budget in accordance to results

Budget has been used as planned and in accordance with results.

Could results from the project be subject for any commercial utilization

No

Conclusions

It has been recognized widely that weather and sea ice information systems, their architecture and effects on economic activity, have received little academic attention. This project has contributed to change that and has proven to fill an important gap, as well as provided a bridge between the social and natural science disciplines. It has also uncovered relevant knowledge that will be filled in follow up projects.

The project has resulted in substantial written output (see results/publications) and new collaborations, as well as international visibility and recognition through the Year of Polar Prediction and the Polar Prediction Project (in particular PPP-SERA). In 2018, connections were established to the large Canadian programme "Ocean Frontier Institute".

Apart from new academic connections, the project resulted in collaborations with information platforms (eg BarentsWatch, Polar View, Arctic Web) as well as with user groups (Fiskebåt, AECO, Hurtigruten), which will prove to be very relevant in future projects.

ArcticInfo has turned out to be a very relevant project in the context of the Year of Polar Prediction and many new connections have been established in the past four years that we will draw upon (and have drawn upon) in follow-up applications.