

ArcticInfo

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



<https://www.wur.nl/en/project/Climate-information-systems-in-the-Arctic-Ocean-use-and-implications-.htm>

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Areas of contribution

User-aspects and verification

Outreach

Policy-relevant / cultural aspects

Economic aspects

Societal and/or behavioural aspects

Summary

Large investments are currently made to improve mapping, monitoring, observing and surveying capabilities in the Arctic Ocean. These new technological infrastructures widen the range of available information. This provides a basis for the growth of informed economic activities, thus stretching the boundaries of the accessible Arctic. The information systems thereby seem to play a double role. While making the Arctic more controllable and predictable, they also enlarge the potential risks and hazards associated with increasing activity. The main objective of this project is to analyze the development of information systems in the Arctic and how they affect economic decision-making. In three thematic work packages, we (1) investigate the development of Arctic information systems as socio-technical infrastructures; (2) generate deeper understanding of the complexities and challenges in the user-producer interface in Arctic information systems; (3) and explore how Arctic information systems affect economic decision-making and alters the Arctic as a zone of risk.

Description

Objectives of the project

The main objective of this project is to analyze the development of information systems in the Arctic and how they affect economic decision-making. The project has a specific focus on sea-ice and weather information. Although we look at international systems, the project has a Nordic bias due to the geographical location of participating institutions. 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;
2. To understand the complexities and challenges in the user-producer interface in Arctic information systems;
3. To explore how Arctic information systems affect economic decision-making and alters the Arctic as a zone of risk.

Approaches and methods

We will use qualitative research methods to review developments and dynamics of informational capabilities in the Arctic Ocean regarding sea-ice and weather conditions, at the national and international (pan-Arctic) level. We will scrutinize existing databases to find the information systems with the largest user relevance. We will also interview members of Arctic information networks like YOPP, SAON, Arctic Web and BarentsWatch. In order to find out how these information systems affect decision-making in a variety of practices (e.g. planning, operations, S.A.R.), we will carry out document studies and interviews with relevant business actors (e.g. shipping companies and fishermen) who use the information systems in these various decision-making contexts, as well as the companies and institutions developing and providing the information systems. The project will organize a series of workshops hosted at stakeholder organizations. Through focus group discussions, we will achieve insight into the most important information systems and their uses.

Alignment with YOPP objectives

ArcticInfo contributes to YOPP by providing both an historical narrative and an assessment of current investments and developments in sea-ice and weather prediction and forecasting capabilities, with a focus on the European Arctic. Such an overview contributes to understanding the socioeconomic context and provides critical feedback to the need and implications (including the cost-effectiveness) of YOPP, and other initiatives. Moreover, ArcticInfo directly contributes to the agenda of the PPP-SERA group by enhancing our understanding of the benefits and constraints of using existing prediction information and services in the polar regions, by mapping and analysing information service providers.

Timeline

2016-03-01 - 2018-12-25

User relevant aspects

One sub-objective of the project is to generate understanding of the complexities and challenges in the user-producer interface in Arctic information systems. We will study how information about sea-ice and weather conditions in the Arctic is made available and transferable, and which services are offered to users. What are the decisive factors for user-friendliness, taking into account that there is a large variety of users with varying demands and purposes of information use. It is acknowledged that there is a big challenge to connect with users. How are users involved in the development of information systems, and how can their involvement possibly be enhanced in order to develop more salient information services? The project problematizes and discusses the terms “user” and “producer” and explores the extent to which these dualist notions reflect reality. What feedback mechanisms are built into Arctic information systems, in order to allow for responsiveness between users and producers of information? Do users also produce information? Are they capable to more efficiently co-produce information than the formal information infrastructures allow for today? These are questions that we will explore in more detail through Nordic case studies.

Provider relevant aspects

In one of the work packages, we aim to understand the developments and dynamics of Arctic information systems from a provider perspective. We will approach these information systems as socio-technical infrastructures. Like infrastructures in the conventional sense, these are large-scale installations that facilitate movement and exchange, enabling other activities or services. They extend across time and space and have a network structure with nodes, hubs and connections between them. In information infrastructures, data is collected at a number of stations, these are drawn into calculation centers, where programs and models are used to translate these data into information, before the information is spread out to users. Information systems perform invisible work; they only become visible when they break down. Arctic information systems are a combination of physical artifacts, organizations, knowledge, legislation, protocols and standard operation procedures. They require system builders, acceptance among users, functionality and they are acknowledged as serving societal needs.

We will make an inventory of Arctic information systems with a focus on weather and sea-ice conditions in the Arctic (though with a Nordic bias), through document and literature studies, and a scrutiny of websites from information providers. To generate understanding of developments and dynamics, we will perform interviews among information providers, such as Polar View, Arctic Portal, Arctic Web, BarentsWatch, the Norwegian Meteorological Institute and participants in projects like EfficienSea2. This gives us insight into the drivers behind developments; the type of organizations (public/private, funding structures); at what geographical scale they operate; what types of services or information they provide; their target groups; and issues of restricted versus open access. We also map relevant partnerships and types of collaboration that enable the development of Arctic information systems.

Regional emphasis

Northern hemisphere: Yes

Southern hemisphere: No

Key project deliverables

- 1) 3 peer reviewed academic publications
- 2) 3 popular scientific articles
- 3) presentations at relevant conferences (e.g. ICASS, Arctic Frontiers, Arctic Circle)
- 4) stakeholder meetings

Data management

The project places emphasis on the processes of collecting, storing and processing data, and on how information can be retrieved, re-used and combined. In 2013, the International Arctic Science Committee (IASC) issued a Statement of Principles and Practices for Arctic Data Management, declaring that “results shall be verifiable and reproducible through ethically open access to all data necessary to produce those results. Data shall be preserved, accessible, and used in accordance with scientific norms of fair attribution and use”.

We will adhere to the same principles and to the rules and guidelines of the Research Council of Norway regarding open access and sharing of research data. All personal data will be collected on a voluntarily basis, where each individual stakeholder and enterprise must give their consent to participate.

Data will only be presented on an aggregated level to comply with rules for confidentiality, i.e. the data entries cannot be linked to the personal identity of the study participants. Data will be collected and stored safely according to rules on data security. Personal data will as far as possible be made anonymized, encrypted or pooled together, and the personal data will then be destroyed. The study will fully comply with the rules of the Norwegian Personal Data Act concerning the collection and processing of personal data and the protection of privacy.

All secondary data in our research will originate from a public source or be authorized for use in our project. As the main data in this project will be obtained through open sources, interviews and focus group discussions, primary data will not be formatted and prepared for storage with the Norwegian Social Science Data Service.

All the main findings of the project will be published, including a description of methodology and data. The scientific publications will be subjected to peer review and made available to other researcher, users and the public in general.

Is data provided to WMO Global Telecommunication System

No

Other information

Funding has been obtained for the first year of the project (2016) and will have to be renewed with an updated project plan in subsequent years of the project.