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Minutes of stakeholder dialogue at Arctic Frontiers
Conference

Submission of Deliverable

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Minutes of the side-event Improved safety and environmentally sound operations in the Arctic Ocean - How to move forward?

Date and Venue: The workshop was arranged as a side-event at the Arctic Frontiers 2019 Conference (<http://www.arcticfrontiers.com/>) on January 23, 2019, from 12:30 to 14:00, at the Clarion Hotel the Edge, Tromsø, Norway.

Rapporteur(s): Jon L. Fuglestad (RCN), Dragana Bojovic (BSC), Marta Terrado (BSC)

Organiser(s): The event was organised by the APPLICATE project on behalf of the EU Arctic Cluster with particular contribution of APPLICATE and INTAROS.

Participants: See end of report

1. Executive Summary: Key messages from the workshop

Background

The Arctic is facing rapid changes, with one of the most profound changes being the loss of sea-ice. Less sea-ice makes the Arctic more accessible for business development including expected increased use of Arctic shipping routes. The expected increased shipping in the Arctic Ocean calls for a common set of safety and environmentally sound operations to avoid negative environmental impacts.

Main workshop topics

The three predefined topics for the workshop were:

- Topic 1: How can improved operational weather and ocean (including sea ice) as well as climate forecast support safer operations in the Arctic?
- Topic 2: Is co-developing new services, products and technologies for safe operations and improved joint monitoring in the Arctic Ocean the way forward for improving cooperation between ship operators, research institutions and local communities?
- Topic 3: How can we reduce the overall environmental footprint and prevent negative environmental impacts in the Arctic?

With these topics as the backbone, the discussions concentrated on data collection and sharing as well as outreach and communication issues.

Key messages

One impact of climate change is the increased frequency of extreme weather events with greater force and distribution. Collection, storage of and access to reliable met-ocean data is vital to perform risk assessments and, as such, identify and reduce risks associated with Arctic shipping. Improving sea ice and ocean wave predictions is important to enhance safe and environmentally sound operations in the Arctic. There is a general lack of met-ocean data in the Arctic, although in some areas data are collected but are not easily available for the users. It is a large challenge to increase the data collection, improve data sharing and establish a useful data management system. Although some initiatives have been addressing this issue, a common system is still lacking. A way forward could be the implementation of an Arctic Council's agreement on Arctic scientific cooperation. Access to data is also closely connected to the user needs. Therefore, a common platform containing information about user needs should be developed in parallel. Data collection and sharing is the key to produce forecasts and predictions needed by ship operators to improve safety and avoid environmental impacts in the Arctic.

There are ongoing efforts to streamline the whole system regarding data collection, data sharing, information collection, and data management through the Arctic Data Committee (<https://arcticdc.org/>) and projects such as INTAROS (www.intaros.eu). In addition to know if this is technically feasible, it would be important to define who can put resources into it and bring this task forward.

Communication and outreach are important and should be an integral part of all Arctic research projects. There is good cooperation between some EU projects and some Arctic Council working groups, but the EU projects should seek to improve cooperation and communication with the Arctic Council. Different audiences can be reached through different communication and outreach (C&O) channels. Communication with Arctic indigenous peoples should be both with their organisations as well as directly with the different indigenous communities.

2. Introduction: Main motivation and background for the workshop

The Arctic is facing rapid changes, with one of the most profound changes being the loss of sea-ice. Predictions estimate the Arctic Ocean could be largely free of ice in summer months as early as 2030¹. Less sea-ice makes the Arctic more accessible for business development, including expected increased Arctic shipping. Fishing vessels make up most of Arctic shipping and the fishing fleet is moving further north following the fish stocks. In the Barents Sea, the Atlantic cod stock is moving further north and east due to warmer waters in lower latitudes.

With decreased sea-ice, the Arctic shipping routes between Asia/America/Europe are becoming more attractive due to the much smaller distance between the ports compared the traditional shipping routes. In addition, it can be expected that cruise operators will travel further north. Up until now, the Northern Sea Route (NSR) has been most attractive to commercial shipping and some bulk and container carriers have travelled this route between Asia and Europe. The largest driver for ship traffic in the Northern Sea Route is the Yamal LNG (Liquid Natural Gas) project which started in 2013 and is growing each year. The LNG is exported by ice-breaking tankers year-round going westwards to the European market and eastwards to the Asian market. In the coming decades it is expected that also the North-west passage and trans-Arctic shipping across the North Pole will become attractive sea routes.

There are several factors influencing the ship-owners' choice of sea-routes. Open waters are just one of several factors. The expected increased shipping in the Arctic Ocean calls for a common set of safety and environmentally sound operations to avoid negative environmental impacts.

The workshop organisers invited participants of the Arctic Frontiers 2019 conference at a lunch event to discuss how to move forward in improving safety and environmentally sound operations in the Arctic Ocean.

The workshop concentrated on discussions related to the three predefined topics that were addressed together in the opening talks as well as in the follow-up discussion:

- Topic 1: How can improved operational weather and ocean (including sea ice) as well as climate forecast support safer operations in the Arctic?
- Topic 2: Is co-developing new services, products and technologies for safe operations and improved joint monitoring in the Arctic Ocean the way forward for improving cooperation between ship operators, research institutions and local communities?
- Topic 3: How can we reduce the overall environmental footprint and prevent negative environmental impacts in the Arctic?

¹ AMAP 2017; Snow, Water, Ice and Permafrost in the Arctic (SWIPA) 2017. Arctic Monitoring and Assessment Programme (AMAP), Oslo, Norway. xiv + 269 pp

3. Introductory and overview talks:

3.1 Introductory talks

Facilitators – Introduction to the workshop (objectives and agenda)

Marta Terrado, Barcelona Supercomputing Center and the APPLICATE project, welcomed participants, introduced the workshop topics and presented the three priority areas for EU Policy for the Arctic: 1) Climate change and safeguarding the Arctic environment, 2) Sustainable development in and around the Arctic and 3) International cooperation on Arctic Issues.

There are ten different projects included in the EU Arctic Cluster. More information about the projects can be found at <https://www.eu-polar.net/eu-arctic-cluster/>. The integrated European Union policy for the Arctic states that the EU wants to play a key role in the region and be a major contributor to the Arctic research. The EU will in the period 2014-2020 invest 200 million euros in Arctic research.

Marta Terrado also informed workshop participants that the EU Arctic Cluster has established different task groups for stakeholder engagement, communication, data management and training. The task groups help to organise joint presentations at conferences and stakeholder events on behalf of the cluster projects.

The session was facilitated by Stein Sandven from the Nansen Environmental and Remote Sensing Center and the INTAROS project, who introduced the presentations of the three invited speakers.

3.1.1 Jens Peter Holst Andersen (chair EPPR)

Introduction to topic 1. How can improved operational weather-, ocean- (including sea ice and climate-forecast support safer operations in the Arctic?

Emergency Prevention, Preparedness and Response (EPPR) is one of the six working groups of the Arctic Council. Of the EPPR's responsibilities, emergency prevention is the main topic and priority. The working group has also responsibilities related to rescue, preparedness, and wildfires.

Jens Peter Holst Andersen stressed that it is important to know the risk to prepare for emergency and to foster awareness. To achieve this, EPPR uses overview risk assessments, e.g. Environmental Impact Assessments (EIAs). Consequences of oil spills in different geographical areas and different oil amounts are typical examples where EIAs are used. He underlined that when risk assessments have been performed, we know how to prevent the risks.

EPPR wants to do a full circumpolar marine environmental risk assessment, but that is extremely difficult, and a stepwise approach is necessary. Updated and reliable met-ocean data is necessary to do risk assessment. They would like to provide their own webpage with all these data (a one-stop shop where people are able to see the best ways to deal with risk). EPPR is also working with a circumpolar oil spill viability analysis, i.e. a gap analysis. This is a two-step approach, with phase 1 and 2 that provides science-based decision making related to Arctic oil spill.

3.1.2 Øivin Aarnes (DNV GL)

Introduction to topic 2. Is co-developing new services, products and technologies for safe operations and improved joint monitoring in the Arctic Ocean the way forward for improving cooperation between ship operators, research institutions and local communities?

One impact of climate change is the change in extreme weather events, which are expected to be more frequent and of greater force and distribution. Possible changes in polar lows frequency and patterns are also very important. Ship operators in the Arctic need to consider and adapt to such events in their planning activities to make shipping operations timelier and more efficient. For that, it is important to know what information ship operators use to prepare for extreme weather events and new weather patterns. Researchers should collect, systemize and analyse data in such a way to help ship owners to take precautions and adapt.

Øivin Aarnes informed that DNV GL is working to get as much information as possible from stakeholders and end-users about their needs for data to support collaboration between businesses, authorities, and researchers to co-develop climate services and then disseminate products, such as information about polar lows events.

The International Maritime Organization (IMO) is the UN specialized agency responsible for shipping safety and security as well as pollution prevention. Reducing emissions from shipping is an important task. Vessels operations in the Arctic comprise destination and transitional traffic. Most vessels in the Arctic are fishing vessels, but cruise ships, research ships, tanker traffic through the Northern Sea Route, and other types of vessels are contributing to the total emissions. Sustainable shipping focuses on how the shipping industry can reduce its environmental impact.

Guidance to reduce the environmental impact from shipping is in line with the UN's Sustainable Development Goals (SDGs) and the Paris Agreement. The goals set by IMO are an example of downscaling the SDGs into daily planning by the shipping industry. To act and adapt to an uncertain future, businesses should recognize what their main vulnerabilities are, address the risks, and integrate these into their strategic planning.

3.1.3 Kikki Kleiven (Associate professor University of Bergen and Bjerknes Centre for Climate Research)

Introduction to topic 3. How can we reduce the overall environmental footprint and prevent negative environmental impacts in the Arctic?

Climate change is profound in the Arctic and strongly affects Arctic peoples, the physical and chemical environment and ecosystems. The Arctic is a huge, remote area which makes it difficult and expensive to collect data and observations. This makes it difficult to establish circumpolar baselines because there are few or no data and observations.

There is a lot of competing interest in the Arctic, e.g. between economic and industrial development on the one hand and conservation on the other hand. AMAP studies have shown that most contaminants found in the Arctic ecosystem are long-range transported by air masses from lower latitudes and there are still quite few local Arctic pollution sources. The main ocean currents, which bring warm waters from the Atlantic to the European sector of the Arctic, is also a transport system for pollutants in the ocean, but there are few quantitative data on this transport system. The warm waters transported with the Gulf

Stream make the coastal waters of Northern Norway and most of the Barents Sea ice-free all year round. The Gulf Stream spends approximately 500 days along the Norwegian coast which is much longer than most people expect.

As the sea-ice declines, tourism and other developing businesses will contribute to Arctic pollution (e.g. contaminants and air emissions) and litter production. However, e.g. cruise operators are aware of this problem and have therefore developed guidelines how tourists should behave in the Arctic.

4. Discussions

After the introductory talks, the discussions were facilitated as one common round table discussion. Main issues discussed were around the improvement of three aspects: 1) data collection and sharing, 2) weather and sea ice forecasting and 3) communication and outreach.

4.1 Data collection and data sharing

The main message from this discussion was that data collection and sharing are key to produce forecasts and predictions needed by ship operators to improve safety and avoid environmental impacts in the Arctic. There are still many challenges on how to collect and share important data in the most effective way. Several aspects need to be addressed: i) improve observation technologies to collect data in large areas where there are data gaps today, ii) facilitate use of open source data from all countries collecting data in the Arctic, iii) maintain dialogue with the users about the needs for better observations and forecasting.

Although there are ongoing initiatives related to data sharing, none of them has been fully successful so far in achieving the main goal of providing a common platform for Arctic data.

The Ship Of Opportunity Program (SOOP) has been collecting a lot of data for many years, but in the Arctic this method of data collection has started only recently. Some units are installed on Greenlandic fishing vessels and a Norwegian Ship of Opportunity project is supported by the infrastructure programme under the Research Council of Norway, where the cargo ships sailing from Tromsø to Svalbard collect data regularly (<https://www.niva.no/en/projectweb/norsoop>). Some of the DNV GL's customers collect data as they drive through ice-infested waters.

It was suggested that this system should be developed further to include more Arctic regions. One possibility is to establish a circumpolar, coordinated programme on Ships Of Opportunity (SOO) with funding to operate observing systems over longer time. To successfully move forward with improved SOO network, a cooperation with the ship owners is vital. Ship crews need to be involved and training for them should be offered. In addition, a common understanding between business and science communities is needed.

Data handling and sharing has been discussed at several occasions and all participants agreed that the issue is still a huge challenge. There are lots of data out there, but they are difficult to access.

One possible way forward is to start using the Arctic Council's "Agreement on Enhancing International Arctic Scientific Cooperation", signed by the foreign ministers of the eight Arctic Council member states in

2017. Article 7 of the agreement is about "Access to data" and states that "*The Parties shall facilitate the distribution and sharing of scientific data and metadata...*"

The Sustaining Arctic Observing Networks (SAON) (www.arcticobserving.org/) is an umbrella established under Arctic Council and IASC to organize circumpolar Arctic observing network of monitoring stations with coordinated data handling and information exchange for scientific data, statistics and traditional knowledge and as such could play a role in the implementation of the abovementioned agreement. A common system for sharing and archiving data collected in the Arctic is highly needed. But there are also several obstacles related to sharing of data, such as IPR and cost issues, that need to be resolved.

Every EU project makes its own data management plan and there is no coordination between them, which potentially could be supported by SAON. However, SAON struggles to get enough funding, so improved funding should be assured first if SAON is to take on more responsibilities.

In addition to sharing data, we should also collect and share information about user needs, as there is no common platform to find all this information.

4.2 Weather and sea-ice forecasting

KEPLER is one of the new EU Arctic Cluster projects focusing on environmental monitoring for Polar Regions. The project started in 2019 and is built around the European Ice Services and Copernicus information providers to prepare a roadmap for Copernicus to deliver an improved European capacity for monitoring and forecasting the Polar Regions. Improving sea ice predictions for the Arctic is important to enhance safe and environmentally sound operations in the Arctic.

The workshop participants were encouraged to make their requirements for information from national ice services known to the KEPLER project.

With reduced sea-ice and better weather forecasts for the Arctic, including ocean waves and sea-ice forecasting, more ships will probably travel to the Arctic. The cruise operators want to extend their operations in the Arctic and possibly go further north in ice-free, pristine waters. Increased cruise shipping will increase emissions and discharges. Some participants questioned if this was what we wanted. Besides, the cruise industry brings additional challenges for emergency prevention and safety. We concluded that environmentally sound operations are necessary to reduce the environmental footprint.

It was suggested that the workshop participants should try to coordinate and identify issues that need improvement related to sea ice or climate information needed by the ships. Are there examples of past events about what information was needed to improve the decision-making in a specific case?

Copernicus is the European Union's Earth Observation Programme. It offers information services based on satellite earth observation and in situ (non-space) data. The work is also aimed at improving polar predictions. For the time being there is little information about ocean waves in the ice edge regions, but such information is an important part of the met-ocean forecasts for ships in this region.

Sustained observing networks (e.g. SAON) are important initiatives. There are several such road map activities and they need to be coordinated.

EU PolarNet will deliver information about societal needs for Arctic observing and forecasting during 2019 and is searching for input from researches and stakeholders. EU PolarNet can influence the EU on

research matters and needs therefore updated information on user requirements. (EU-PolarNet contact is Nicole Biebow, Alfred Wegener Institute).

4.3 Communication and outreach

The workshop participants agreed that a single project cannot solve the challenges related to data collection, data handling and storage. Much longer time frames than provided through projects is needed for this. The important task is to build sustainable cooperation and events, such as this workshop, present one step forward towards achieving cooperation between countries, institutions and projects.

Besides, we need better cooperation and communication between national projects, EU projects and global programmes (Global Cryosphere Watch, GEO). The Arctic Council and its working groups (AC WGs) are playing an important role because it is the leading intergovernmental forum for cooperation between the eight Arctic States, and Arctic Council observer countries and organisations. There are 13 observer states to the Arctic Council, 13 intergovernmental organisations and 13 non-governmental organisations, but still there are several countries working in the Arctic which are not observers to the Arctic Council, so it is important to engage other international fora where a wider group of countries can collaborate. EU representatives and scientists have been involved in some of the AC WGs assessments and examples of good cooperation are between AMAP and EU organizations and projects like EEA, JRC and EU PolarNet. Systematic communication and outreach (C&O) from EU to AC WGs annual meetings could be a way forward to improve cooperation.

C&O activities are part of all Arctic projects but more coordinated efforts between the projects would be beneficial both for the scientists and the media. Media attention can be difficult and time consuming, (e.g. the journalists need to find the projects/results interesting, and we are always competing with other news) but due to the very rapid Arctic changes, media has become more interested in Arctic issues.

Communication of research is evolving rapidly. New methods of disseminating knowledge replace the traditional methods. Different target audiences and people of different age use different types of media; from books, newspapers and Facebook to e.g. Instagram and Snapchat. For example, not everybody can be reached via online consultation or social media: broadband and internet connection is not well developed everywhere in the circumpolar Arctic. Project planning and implementation is changing, where stakeholder involvement is becoming more important to show that the research is useful for the society.

5. List of Participants

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