1) Developing collaborative scenarios with the use of Bayesian networks to assess oil spill risks in the Bering Strait, Alaska
2) Governance analysis of Norwegian policy in Barents Sea (mainly oil production)

Potentially:
3) ? Analysis of marine insurances?
4) ? Relevancy analysis of SEADNA outcomes?

“Recommended practice of scenario based risk management for Polar waters”
Helsinki University
The need for collaborative scenarios in risk management and governance

- New participative ways are needed to govern risks in the Arctic. E.g. local communities need to be involved in decision-making processes concerning vessel traffic routes and areas to be avoided. The Arctic Waterways Safety Committee is an example of existing collaborative oil spill risk management including a wide range of stakeholders.

- Collaboration among actors and organisations at different levels can build adaptive capacity, foster shared understanding, increase dialogue and interaction and promote individual and group learning (Armitage et al. 2011)

- How can scenario methods be used for assessing and reducing risks related oil spills?

The aim of study is to develop collaborative scenarios based on Bayesian networks to assess and identify safe vessel traffic routes and areas to be avoided in the Bering Strait, Alaska
Bering Sea region Case Study:
• Bering Sea region is one of the most productive marine ecosystems on the planet
• Increased risk due to lack of response infrastructure and the threat to local livelihoods (subsistence hunters)
• Examples of collaborative risk management in the Bering Strait region exist
• Use of Bayesian risk models could further help in assessing and identifying risks
Previous studies and recommendations

- USCG “Port Access Route Study” for the Bering Strait and Bering Sea: completed in 2017
- Based on the study, IMO accepted the proposition of designated vessel traffic routes and protected areas in the Bering Sea and Bering Strait region (measures took effect December, 2018)
- “Recommendations on the port access route study: In the Chukchi Sea, Bering Strait and Bering Sea” by environmental organisations highlight that the vessel traffic routes overlap important areas used by subsistence hunters
- USCG has launched a new “Port Access Route Study” for Chukchi and Beaufort seas in 2019
Methods: Developing collaborative scenarios

Participative modelling, potentially with the use of Bayesian networks

- Treat uncertainty explicitly i.e in the form of probability distributions
- Can be easily updated as new data becomes accessible
- Combines different sources of knowledges (expert as well as stakeholder beliefs)

Scenario development process. Dashed arrow indicates that scenario development can be an iterative process (Source: Mallampalli et al. 2016)
Contribution to the project

• This is ”The best arctic example”?

• Human aspect – test of risk models and probability distributions: relevancy, understandability, acceptability

• What type of knowledge was needed in the case of “Port Access Route Study”, to make IMO to accept new traffic routes, how much we can cover of these, can we focus the practise guide to be more relevant?

• Evaluating the importance of local knowledge and interests

• Evaluation of the challenges of a well established Arctic shipping route system: example for new potential cases
Maksimal isutbredelse 1984-2013

April

September
Qualitative research methods

- In-depth interviews with the use of visual influence-diagram based mental modelling approach
- The diagrams provide simple yet informative ways of formalizing the nature of the policy problem and for visualizing the different views and priorities, i.e. competing goals and alternative management decisions.
- Questions related to the main threats/impacts of petroleum industry as considered by the participants, the perceived goals of risk governance and the ways these goals could be achieved.
- Questions also on knowledge needs, production and communication.
Results demonstrate:

• the complex nature of risks by demonstrating considerable differences in how the participants frame the problem situation and how they identify different measures to manage risks
• the mismatch between the current governance framework construed by the Norwegian state and the industry itself, and how the risks and measures to reduce those risks are understood and perceived by the different stakeholders

To better cope with diversity of values and different knowledge systems, we propose that there is a need for acknowledging the limits to one's knowledge and to develop and support inclusive participative decision-making processes.

Figure X. Towards collaborative knowledge production and learning where ambiguity resolved by creating a connected frame that represents a shared view on the problem.
Contribution to the project

• Provides views about the complexity of required scientific understanding (variable aims, variable ways to manage = variable knowledge needs)

• General view about governance aspects in oil spill related management: potentially useful in the Practise Guide