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CONNECTING SCIENCE WITH SOCIETY

Deliverable No. 4.14

Completed stakeholder consultations, report on the needs, gaps and opportunities produced

Submission of Deliverable

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1. Executive summary

Altogether EU-PolarNet conducted in 2015-2018 twelve stakeholder events and two online surveys in Work package 1 and Work package 4. Every event focused on one varying theme related to a topical Polar issue and included presentations and/or panel discussions involving different stakeholders (e.g. Industry, policy makers, and Arctic Indigenous Peoples) and researchers. The outcomes of the stakeholder events were used to identify the societal needs and challenges for the development of the Integrated Polar Research Programme and for learning and sharing information on best practices in stakeholder engagement and finally for giving recommendations on successful stakeholder engagement. The last item is presented in more detail in the White Paper on the status of the stakeholder engagement in the polar research (D4.15).

2. Introduction

This deliverable summarizes the work package 4 Task 4.2 which organised and completed stakeholder events and online surveys to initiate, conduct and sustain an on-going dialogue and collaboration between relevant stakeholders including researchers in the Polar Regions. A special emphasis was placed on sharing the best practices on stakeholder engagement and doing transdisciplinary research by conducting sessions focusing on that. Lastly, one of the main outcomes was to bring needs from the society into the Integrated European Polar Research Programme, for which a specific online survey in eight different languages was conducted.

This task followed Task 4.1 which identified potential stakeholders in a “stakeholder map” used widely also in the various EU-PolarNet events, not only related to stakeholder dialogue but also Town Hall meetings and policy briefings organized by WP1. Most of the events were held jointly with work package 1 and the second online survey with work package 2 as it was targeted to be used in the development of the Integrated European Polar Research Programme (Task 2.4).

3. Tools and formats of the conducted stakeholder events

Citizens of Europe are all stakeholders in the European context; however conducting European-wide stakeholder engagement is not possible in the frame of this project, so we engaged with smaller representations and target groups. EU-PolarNet organized sessions in association with different international Arctic and Antarctic conferences, which attracted mostly researchers. Additionally Town Hall Meetings and workshops were organized either back to back with other events or separately. For these events invitations were sent out reaching different stakeholder groups. In addition to face-to-face events, two surveys with different focuses were organized. The first survey was conducted both as an online survey and via forms that were handed out during the EU-PolarNet events for participants to fill in. The second survey was particularly targeted for finding out what the society needs from future research and from the Integrated Polar Research Program developed by the EU-PolarNet. The latter survey was conducted in eight different languages and distributed via various methods including over a thousand individual emails that were sent in different countries. The face-to-face sessions were more specific as their speakers and panellists were invited due to their expertise and knowledge on the topic to be discussed; the audience usually comprised a mix of researchers and different stakeholders.

The purpose of the stakeholder events (online and face-to-face sessions) can be divided into three different issues:

1. To learn from stakeholders what their research needs and gaps of knowledge are, and to find out what are the society's needs and challenges they are currently facing in the Polar Regions. In this respect it became obvious very early on that Arctic communities are more prominent than Antarctic for the simple reason that the Arctic is an inhabited region with both large cities and small rural communities representing both Indigenous and non-Indigenous peoples.

   The outcome is a list of societal needs and gaps of knowledge to be addressed in the Integrated European Polar Research Program led by WP2.

2. To bring different research and scientific disciplines together and share knowledge and discuss the possibilities and benefits of doing multidisciplinary research. Especially in the case of the Arctic, doing transdisciplinary research with the local and Indigenous communities has been an important topic as well.

   The outcomes are shared best practices on the possibilities and challenges in cross-disciplinary research and multi- and transdisciplinary research. Increased meaningful interaction and bridging the gaps between the scientists will increase the holistic understanding of the changes in the Polar Regions.

3. To find out how to best contact and communicate to the stakeholder, and what different tools and forms work and don't work in stakeholder consultations with a variety of different stakeholders.

   The outcome is firstly an understanding of the different stakeholder needs and how best to address those. These results were used for recommendations particularly for researchers, but also for funding agencies, on how to conduct mutually beneficial stakeholder engagement for addressing the societal challenges in the Polar Regions. This will be addressed in more detail in the White paper on status of stakeholder engagement in polar research (D4.15).

4. Completed stakeholder consultations

Two online surveys were targeted to the wider public and all stakeholders in Europe and beyond. The online surveys were published on the EU-PolarNet website, but also announced through Newsletters and targeted emails using the Stakeholder Mapping (Task 4.1).

I) A "**Stakeholder Questionnaire**" was published in April 2017 (Appendix 1) and has been kept online and available until the end of the project. The objectives of this questionnaire are:

a) to identify individuals and organisations with an interest in engaging in polar research projects, in order to involve them in future projects,

b) to find out what motivates stakeholders to engage in polar projects, as well as the extent and the way they would like to get involved,

c) to determine which potential barriers stakeholders have experienced or are expecting to encounter when engaging in polar research projects,

d) to facilitate initial science-stakeholder dialogues, as well as to manage expectations and identify needs from the onset of a partnership.

The results received to the questionnaire between April 2017 to November 2017 were compiled and analysed into a research note "*Tell us how to engage you! Asking polar stakeholders about their engagement preferences*" (see Appendix 2).

II) A "**Consultation on Research Priorities**" was open from 19th of April to 2nd of June 2017. This anonymous survey featured one key question: "What are the most important topics in relation to your work and/or everyday life (either locally, nationally or internationally) in the Polar Regions that should be solved by future research?" With this survey, EU-PolarNet wanted to enable the polar community and stakeholders to identify priority areas for future polar research. Respondents were asked to indicate up to three priorities and to categorize their topics under one of the five overarching themes: People and societal issues; Climate and cryosphere; Sustainable resources and human impact; Polar biology, ecology and biodiversity; and New technology. The overarching topics result from D2.1, the EU-PolarNet Report on prioritized objectives in polar research. The results of this survey formed a fundamental basis for a set of five polar white papers, which in turn are an important step towards the Integrated European Polar Research Programme – one of EU-PolarNet's main deliverables.

5. Organized stakeholder events with their focus and main outcomes

EU-PolarNet organized a set of stakeholder events alone or in collaboration with other EU-projects. The events took place in order 1) to strengthen collaboration with international partners and stakeholders (D1.8, D1.13, D1.17 and D1.21), 2) to discuss compiled research priorities with a wide range of stakeholders (D2.2, D2.4, D2.7 and D2.9) and 3) to organize sector specific workshops (D4.7, D 4.9, D4.11 and D4.14). In the following chapter, we give an overview of all these events, including a session organized by the European Polar Board, held in Hobart (Australia). This session built upon the work of EU-PolarNet, especially upon the sessions organized at the Ninth International Congress of Arctic Social Sciences (ICASS IX).

Our common future under the climate change, Paris, June 2015
Session on "Adapting to Arctic Climate Change" (WP4)
The perspective of the session was on people living in the Arctic and particularly on Indigenous people and what they see as their biggest threats in the future. It came out clearly that climate change as such is not identified as a big threat. Depending on the region where people live, climate change can also be seen as a benefit (easier for reindeer to dig up for lichens for example) or a challenge (coastal erosion in Northern Canada). The biggest problem in many cases is the globalization and land use pressures affecting traditional livelihoods and cultures.

Adaptation Futures, Rotterdam 2016
Session on "Connecting Arctic researchers and industry: a dialogue for societal benefit" (WP4)
The session consisted of presentations and a panel discussion on what would be the research priorities needed to be studied in the future? The session focused on social issues, how business and stakeholders can work together and how to make sure that businesses have a social license to operate. It was noted that a lot of potential exists in social license to operate, however more research is needed for finding the best ways for collaboration. In case of climate change realization, people need concrete examples and occurrences in their own neighborhood, only then are they ready to act. Scientists are failing to transmit the right message to the public and reluctant to predict changes at the local level. Thus, there is a demand to look at the gaps needed for reliable models at the local level.

AMAP/EU-PolarNet Stakeholder Workshop on Arctic Health and Wellness, Fairbanks, March 2016 (D 1.8)

The workshop focused on human health and wellbeing and included several North American speakers from mental health to physical health disciplines, including Indigenous communities. Climate change was considered a serious underlying stressor, affecting the daily life and culture of residents, as well as their physical (e.g. increase in zoonotic diseases, more dangers in transportation) and mental (from loss of traditional lifestyles) health. A new reality under climate change requires a new community health research agenda that will respond in a much more integrated way to the needs and priorities of the Circumpolar North, led by Indigenous peoples and working in strong partnership with local, regional, national, and international stakeholders. Health sovereignty—or the ways in which communities are able to achieve optimal health and wellness, through culturally, environmentally, politically, and historically relevant pathways—will be an essential framework for assessing and evaluating both climate-change-sensitive health impacts and health mitigation and adaptation responses, and for formulating interdisciplinary and multi-sectoral circumpolar research priorities.

Building local capacity and strengths is important and consideration should be given to how to support more capacity building for researchers and health professionals as well as to connect research with education in the North.

Workshop with international partners & stakeholders at SCAR Open Science Conference, Kuala Lumpur, Malaysia, 2016 (D 1.9)

A discussion was focusing on two questions: 1. Could you imagine performing scientific research in the Antarctic, which is driven by societal relevance? 2. What kinds of stakeholders are relevant for Antarctic Research? Would you be interested to work with them to define societally relevant research themes? The outcome of the discussions was that there is some interest to perform societally relevant research and some are already used to it; many research topics for Antarctic Research are relevant to society. The outcome of the second question was a list of possible stakeholders.

AMAP/EU-PolarNet Stakeholder Workshop on Research Needs on Arctic Ecosystems and Ecosystem Services, 2016 Riga, Latvia (D 1.12)

The workshop focused particularly on the seasonal ice zone, where major climate-related changes are anticipated to occur, and the need to investigate physical-biological interactions, ecosystem characteristics including timing and productivity, acidification and contaminants. Sustainable fishing in Arctic waters and use of other marine resources were acknowledged as important for Arctic communities, but there is a lack of data on Arctic marine ecosystems and their living resources to support regulation. It was noted that people who have never visited the Arctic make most decisions affecting the Arctic. Innovation is required to be part of EU-funded projects; proposals need to indicate societal relevance, particularly job creation. In general, there is a greater pressure for scientists to take social scientists into their work.

Town Hall meeting, Brussels, Belgium, September 2016, "*Towards the 1.5°C climate goal – Perspectives from the Polar Regions*" (D 2.2)

The event had a good participation from various stakeholders, both as speakers and in the audience including Indigenous peoples, businesses and policy makers. A major conclusion was that funding programs need to keep people working together in a coordinated way. Better communication is needed e.g. on the changes in high latitudes; the communication has to be two-way and the public needs to be engaged. Lastly, it is important to bring the business community into research proposals.

AMAP/EU-PolarNet Stakeholder Workshop on Research Needs on Climate-related Effects on the Arctic Cryosphere and Adaptation Options, 2017 in Reston, VA, USA (D 1.15)
The workshop had a good discussion on the need to move from single discipline research into multi- and transdisciplinary research to understand and address climate-related changes. The need for an early inclusion of Indigenous people and the use of Indigenous knowledge in scientific studies and the development of climate-adaptation actions in the Arctic is vital. Indigenous people and communities need to be included more closely in the scientific research. Indigenous Knowledge gained over many centuries should be captured now while it still exists so that we can understand and utilize this thousand-year-old knowledge. There is a need for developing priorities on using different kinds of knowledge and understanding; this requires a framework for implementation.
To increase the societal relevance and uptake of Arctic research, knowledge should be obtained on how scientific research is applied in practice and how it feeds back into the trajectory of the multiple systems (e.g., geophysical, ecological) that are the focus of Arctic research. There is a need to engage with the relevant diverse communities (e.g. knowledge holders, scientists, policy-makers, managers) at the outset when formulating research questions and designing research programs. Insights are provided by systems science, and by social and political science.

EU-PolarNet Sessions at ICASS IX, Umeå, Sweden, June 2017
Stakeholder engagement, moving from Quantity to Quality &
Integrating Social Science and Humanities in large EU and other projects (D 4.9)
Two sessions were organized during the ICASS IX conference with the first one focusing on sharing knowledge on good practices in engaging stakeholders and doing research by using participatory methods. The second session focused on how different disciplines could better work together and how multi- and transdisciplinary research projects could be best developed. Key lessons from these sessions are that the dual pillars of the co-production of knowledge and working with stakeholders in mutual respect create benefits for all.

Workshop: Towards the Incorporation of the Humanities and Social Sciences into Large Polar Research Projects, Hobart, July 2017 (Organized by EPB)
Focus was on how social sciences and humanities could work together with other sciences. Transdisciplinary research with stakeholders was not discussed nor were the social sciences seen as a research topic conducted in the Antarctic at a similar level as in the Arctic, but more in a way on how social sciences can support other sciences and communicate their results etc. Thus the Antarctic research and workshop had a different approach compared to Arctic social sciences.

Arctic Sea Ice Prediction Stakeholders Workshop, Arctic Frontiers, Tromsø, January 2018 (D 4.11)
Arctic sea ice prediction was the focus of the workshop, which gathered representation from industries, businesses and researchers. An outcome was a request for a stakeholder-targeted guidance document or roadmap, where sea ice forecasters can draw on the expertise of users (e.g. policy makers, planners, community leaders) to better understand how different stakeholder groups include sea ice forecast information into their decision-making processes. There is need for sea ice forecasters and stakeholder user groups to find more common language and tools for communication. There is potential for more co-production of the products and services needed, and this should ideally be done in an iterative process where the involved actors gain better understanding of the varying needs for sea ice forecasts. Stakeholder groups also have distinct needs for tailored products for their particular industry (e.g. tourism has different needs than fishing) and a 'one size fits all' approach of delivering forecasts is not an optimal approach. While the economic value of sea ice forecasts is difficult to

accurately estimate, it is clear that they directly contribute to the safety and security of the ice-going vessel itself (and the crew) and this can be estimated in millions of Euro if used to avoid serious accidents.

AMAP/EU-PolarNet Stakeholder Workshop on Research Needs on Arctic Biology and Terrestrial Ecosystems, Rovaniemi, Finland, October 2018 (D1.19)
The central theme of this workshop was to identify research needs for a better understanding of Arctic biology and terrestrial ecosystems and the factors that influence their functioning, including the many human uses of this area, in the light of the various changes occurring in the Arctic associated with climate change. Key objectives for future research need to include an evaluation of both socio-economic and biophysical drivers of change. A framework is required to find new approaches that cut across disciplines to advance our ability to tailor research to stakeholder needs and to identify research and monitoring needs for decision-making and stewardship.

6. Stakeholder needs and communication

The most prominent group attending the stakeholder events were researchers, which is understandable since most of the events either took place back to back with or during Polar conferences and events where researchers are the biggest group. It also showed that researchers are keen on participating in events that discuss future research needs and gaps of knowledge, particularly if there is an opportunity to influence future funding schemes and possibilities for research. The format of the events starting with presentations followed by panel discussions is very common among researchers. Whenever industry and business representatives were invited to participate, they accepted the invitations and contributed a great deal to the discussions. Invitations of stakeholders to these sessions were the result of existing relationships between researchers and stakeholders and the acceptance rate was very high. Stakeholder questionnaires were handed out in paper to be filled out by hand during the EU-PolarNet events, including the policy briefings organized in Brussels, which added to the representation of policy makers in the questionnaire. The questionnaire was also sent out to a very broad range of stakeholders, identified in the stakeholder map (D4.5) and through existing polar e-mail lists. Here the response rates were much lower. Most answers came from researchers, hardly any came from Indigenous communities. Apparently, a questionnaire is not the best way to reach out to non-scientific stakeholders and definitely not for reaching out to local and Indigenous communities.
When looking at the results received in 2017 on the stakeholder questionnaire (Figure 1, Appendix 2), it is not surprising that especially NGOs are interested in the dissemination of the results as they contribute to developing their agenda e.g. for preserving biodiversity. In addition, policy makers are interested in the dissemination of the interpretation of results which also calls for researchers to explain the results in a language that is understood also by non-scientists.
Industry and businesses are often looking for ideas for new products utilizing latest scientific knowledge and innovations and would like to be a partner already in the planning phase, which benefits both researchers and businesses. Therefore, it is not surprising that the industry responses highlight their interest in participating already in the project planning (Figure 1).

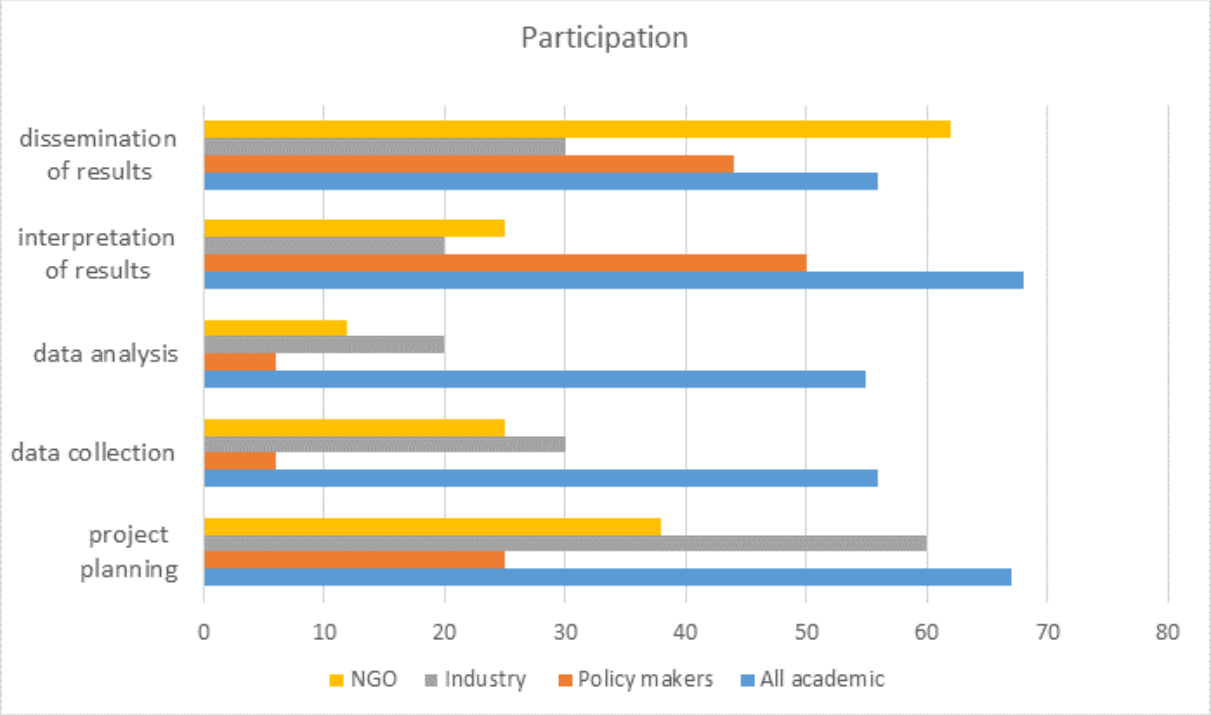


Figure 1. Stage of research project stakeholders were interested in getting involved (Tell us how to engage you! Asking polar stakeholders about their engagement preferences, Kristina C. Baer, Kirsi Latola, Annette J. M. Scheepstra, submitted to Polar Record – revisions made & waiting for the final decision)

To summarize, our results show that different stakeholder groups have different needs and motivations for the planning of and participating in research projects and using the results. Therefore, one set of guidelines for successful stakeholder engagement doesn't work for all, but we have identified certain common recommendations that should be taken into account in all communication. A more detailed list of recommendations is outlined in the EU-PolarNet White paper on status of stakeholder engagement in polar research (D4.15), therefore this report gives only a brief outline about the recommendations.

First and most, building trust and knowing your stakeholders is vital and the starting point of all project planning. There is need for a preparatory assessment on who are the stakeholders, why and what is their role in the project? There are cases where stakeholders should be involved in the planning phase, especially if the project will do research on Indigenous peoples' lands; in other cases it might be enough to inform on the project objectives and the outcomes (NGOs, policy makers). Finding the best way of how to contact and be in contact throughout the duration of the project depends on the stakeholder. Using intermediaries is a good way of engaging local and Indigenous communities; other good practice is to have a designated person in the project who is acting as a contact person with the communities, who knows them and speaks the same language. Secondly, if stakeholders are taking part in a project and using their own time and effort, they should get compensation for their work as usually the time given to the project is keeping them away from their normal economic activities.

Overall, stakeholder engagement in European Polar Research ranges from co-production of knowledge to asking their opinions and experiences in hearings or workshops. Ethical guidelines on health and social sciences research are in use, and guidelines on including Indigenous Knowledge in different regions, particularly in North America and Australia and New Zealand set the working principles. This applies mainly to Arctic research, whereas the main stakeholders in the Antarctic are the states that have signed the Antarctic treaty. This changes the scale of the stakeholder engagement from a small

community to the whole country. Most commonly identified stakeholders in the Antarctic were researchers, states, operators and industry (tourism, fishing and logistics) where states, operators and industry are large-scale actors and much more difficult to work with. Due to that, the engagement of stakeholders from the Antarctic might not be successful and many contacts are often based on already existing connections. “Because I’m head of the Antarctic tourism department, I can access them” stated one of the Antarctic project leaders. This shows again the need to build connections and get to know the stakeholders prior to the project.

It takes money to build the trust and connections between researchers and stakeholders, as travel, meetings, hosting of events and so on are needed. But it is the only way to conduct meaningful stakeholder engagement with mutual benefit. The funding agencies should recognize this in the form of seed money or project preparatory funding. Thus to conclude our work, it is noted that stakeholder engagement with mutual benefit cannot be conducted without joint effort by funders, researchers and different stakeholders.

Appendix 1 Stakeholder Questionnaire

Stakeholder Questionnaire

Objectives of this questionnaire

- The objective of this questionnaire is to identify individuals and organisations with an interest in engaging in polar research projects, in order to involve them in future projects.
- This questionnaire seeks to find out what motivates stakeholders to engage in polar projects, as well as the extent and the way they would like to get involved.
- This questionnaire aims at determining which potential barriers stakeholders have experienced or are expecting to encounter when engaging in polar research projects.
- The results of this questionnaire will facilitate initial science-stakeholder dialogues, as well as to manage expectations and identify needs from the onset of a partnership.

Confidentiality

Any data and information given in this questionnaire will be treated strictly confidential and will not be transferred to any third parties. Participants interested in getting actively engaged in polar research projects are encouraged to fill in their contact details at the end of this questionnaire. We will then be in touch shortly.

Stakeholder Questionnaire

1) Which of the following stakeholder groups do you associate with?

☐ ☐ business and industry

☐ ☐ civil society

☐ ☐ local/indigenous community

☐ ☐ media

☐ ☐ NGOs

☐ ☐ policy

☐ ☐ science

☐ ☑ other

2) On which level do you generally operate?

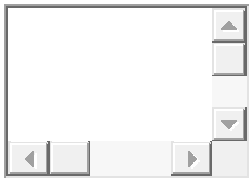
☐ ☐ local

☐ ☐ national

☐ ☐ regional

☐ ☐ international

3) Which polar topic(s) is/are of interest to you?



4) What would your motivation be to get engaged in research projects in the Polar Regions?

☐ ☐ to stay informed about current activities in the Polar Regions

☐ ☐ to obtain up-to-date information for concrete decision-making

☐ ☐ to participate in studies in the Polar Regions

☐ ☐ to define relevant questions and research gaps

☐ ☐ to make research results available to a broader audience

☐ other ☐ other

5) At what stage of a research project would you be most interested to get involved?

☐ ☐ development of the project plan

☐ ☐ data collection

☐ ☐ data analysis

☐ ☐ interpretation of results

☐ ☐ dissemination of results

☐ ☐ other

6) How would you best be involved in a research project?

☐ ☐ regular updates about the project (e.g. through a newsletter)

☐ ☐ annual meetings

☐ ☐ regular workshops

☐ ☐ digital tools: video conferences, shared documents and folders, etc.

☐ ☐ personal dialogues with project individuals

☐ ☐ participating in field work

☐ other☐ other

7) Which barriers do you think you might encounter, if you engaged in a scientific project?

☐ ☐ time constrains

☐ ☐ personnel limitations

☐ ☐ financial limitations

☐ ☐ organisational restrictions

☐ ☐ other

Any other comments?

Personal Details

We would be very happy to cooperate with you in future polar research projects. In order for us to reach out to you and to discuss possible cooperation opportunities, please fill in the details below. We will then be in touch with you shortly.
Please note that your personal details will be treated strictly confidential.

Name

Affiliation

City and Country

E-mail address

Conset*

☐ ☐ Yes, I agree that my data can be used to inform me in irregular intervals about news and events related to EU-PolarNet. I can revoke this consent at any time via mail, telephone, fax or email.

Appendix 2 Submitted manuscript

Polar Records Special Issue "Education, Outreach, and Engagement"

– Research Note submission

Tell us how to engage you!

Asking polar stakeholders about their engagement preferences

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Abstract

The changes the polar regions face are too complex to be tackled by single scientific disciplines and in isolation from societal actors. Therefore, the call for polar research projects that engage with stakeholders outside academia increases. The ideal set-up of these projects is envisioned as an inclusive and action-oriented process that brings scientists and stakeholders together to identify pressing issues of societal and scientific relevance and to develop research projects that produce practical outcomes. However, working across disciplines and knowledge systems can be a challenging task. To better understand stakeholders' motivation for engaging in polar science projects, to learn what stages of a project they are interested in and what their preferred modes of engagement are, the EU funded project EU-PolarNet conducted a stakeholder survey. The results suggest that while most academic survey participants are eager to participate from the problem definition to the dissemination of the results, most non-academic survey participants preferred interaction at stages, which involve the dissemination of results and putting these in use for informed decision-making. The results have their limitations, yet they provide a basis for important future approaches to stakeholder engagement in polar research projects. They showcase that stakeholders prefer to engage at different stages of a research project depending on their specific needs and interests, while also acknowledging that additional support may be required to enable meaningful engagement throughout the research process.

Stakeholder engagement in larger polar research projects

The changes in the polar regions are too complex and their consequences too far reaching to be dealt with by single scientific disciplines and in isolation from those affected by and affecting polar change. It has thus become crucial for academics working in polar research to engage with researchers from other disciplines as well as with non-academic stake- and rights-holders (hereafter inclusively referred to as non-academic stakeholders), including indigenous people, local communities, policy makers, business representatives, NGOs and many more (Tengö et al., 2014). Evengård et al. (2015) indicate that the scientific community today recognizes the importance of complex interrelationships among major drivers of change, but still find it hard to practically move forward, especially in truly cross-disciplinary ways. Stakeholder engagement and participatory approaches are not new phenomena. The former developed in the business realm in the 1980s and the latter has roots within emancipatory theory and practice related to adult education dating back to the 1970s (Macaulay, 2017; Brown & Tandon, 1983). As early as 1969, Arnstein used the image of a ladder – "the ladder of participation" – to differentiate between different qualities of engagement: the higher the level of engagement, that will say the more deliberative and co-productive activities were, the more likely was a research project to come up with desirable outcomes (Arnstein, 1969). Yet, within Arctic research the shift from traditional, discipline-based science (so-called "Mode 1") towards the more participation and application-based form of research that crosses disciplinary boundaries ("Mode 2"), is a more recent trend (Brunet, Hickey, & Humphries, 2016 and 2014). It is out of the scope of this research note to dwell on the origins and variations of research theories dealing with the engagement of non-academic stakeholders. However, in order to demonstrate that – at least European – polar research is rather new to stakeholder engagement, we will briefly touch upon two turning points that are likely to have triggered this paradigm shift: The International Polar Year and the European Commission's Horizon2020 funding programme.

The fourth International Polar Year (IPY) 2007-2008 was not just the largest coordinated research effort in the polar regions, it also marked a shift in research collaboration. For the first time, researchers from the social sciences and humanities, as well as members of local and indigenous communities took an active role in multidisciplinary polar science projects (Krupnik et al., 2011). This, stated Krupnik et al. (2011, p.iii), "sent a powerful message about the societal value of advanced research on rapid environmental change across the Polar Regions". It also demonstrated that the polar research community had become aware of how important it was to integrate different knowledge systems and to share data beyond scientific disciplines, in order to understand polar change and its global implications (Summerhayes, Rachold, & Krupnik, 2011). In evaluating its legacy, the IPY was regarded to have solidified the transition towards more societally-relevant polar science, which included the needs and interests of non-academic stakeholders (Summerhayes et al., 2011).

While the seeds for more engagement-oriented research processes were planted during the IPY, many larger funded polar research projects in Europe have not yet reached a participatory practice compared to, for example local-scale studies conducted in Canada (Brunet et al., 2014). However, European research funding agencies' demand for results that are societally relevant and originate from collaborative research efforts grows. The European Commission is one of the largest investors in polar research, spending around 200 million euro in Arctic-related science projects under the Horizon2020 Programme, which stretches from 2014 to 2020. Horizon2020 is one example for a research funding programme that attaches significant importance to science's contribution to solving societal challenges. The novelty of Horizon2020 is its call for "science with and for society" (EC, 2013), whereas the preceding funding instrument, Framework Programme 7 (FP7), only stated a need for "science in society" (EC, 2006). Horizon2020 puts a stronger emphasis on integrating societal relevance in science and innovation. The multimillion euro funded European polar research projects thus are challenged not only to reach out to and inform non-academic stakeholders but also to actively include them in the research process.

One of these Horizon2020 funded projects is a coordination and support action project called EU-PolarNet. The consortium of this project does not conduct any research itself; rather it has been tasked to co-develop an integrated European polar research programme with international scientific partners and non-academic stakeholders. In this process, the consortium members have reached out to policy makers, indigenous peoples and local communities, business and NGO representatives as well as to researchers of different disciplines in order to learn what they regarded as the most pressing issues in the polar regions that should be addressed by future polar research. Above listed main groups of stakeholders were identified in the project's stakeholder map (EU-PolarNet, 2016). Due to the strategic relevance of EU-PolarNet for the future funding of polar research projects, we also regarded researchers as stakeholders and refer to them as academic stakeholders. In order to gain a better understanding of how to engage with both academic and non-academic stakeholders, the project launched a survey, inquiring about stakeholders' motivation and preferences in the engagement process. The same procedure was used for both academic and non-academic stakeholders. Since this stakeholder engagement process in large EU projects is a relative new topic, we are not only presenting the results of this survey, but also evaluating the effectiveness of a survey like this in engaging with different polar stakeholder groups.

Asking stakeholders about their engagement preferences

Whom we asked

The stakeholder engagement survey was available both as an online and as a printed version. The printed survey was handed out at three events: the EU-PolarNet Town Hall Event 2016 in Brussels, the Arctic Circle 2016 in Reykjavik, and the WOC Sustainable Ocean Summit 2016 in Rotterdam. It was given to all participants who represented organisations with either interest in and/or focus on polar research and activities, including scientists, policy makers, business and NGO representatives as well as indigenous peoples' representatives. Further, the survey was published on the EU-PolarNet website

in April 2017, where it still is available today. The stakeholder engagement survey was promoted alongside a second survey conducted by EU-PolarNet, which asked academic and non-academic stakeholders about their priorities for future polar research. Invitations for the latter were distributed via personalised emails, mailing lists of partner institutions and social media. Survey participants stating an interest to engage further with polar research were also asked to fill in the engagement survey. Most replies to the stakeholder engagement survey (263 out of 302) were received through the online version. In this research note, we present the results based on answers received until November 2017 with a total number of 302.

The majority of the respondents came from the eight Arctic countries (52%), European non-Arctic countries was the second largest group with 41% of the respondents and rest of the answers came from other countries (Asia, south America, Australia). The number of answers from indigenous people and local community representatives were so low that no conclusion could be made and thus we have omitted those from this paper. However, we acknowledge and understand the importance of including indigenous and local people in research projects and collaborating with them in developing research agendas, and we will put a stronger emphasis on this in future engagement processes.

The survey began with multiple-choice profile questions (such as the affiliation), followed by the open question on polar topic(s) of interest to the respondent. Subsequently participants were asked about their motivation for engaging in research projects, at what stage of a research project they would like to get involved and how they would like to be involved in a research project. The type of research project, which stakeholders could engage in, was not specified, except for its relation to the polar regions. These three questions offered multi-choice options, which aimed at covering key areas of motivation (such as staying informed, receiving information for policy making and defining research questions), stages of engagement (from project planning to dissemination) and modes of engagement (such as meetings, workshops and personal dialogues) respectively. The survey was designed to be

easy to answer during an event and thus with relatively short multiple-choice answers, we hoped to get a high response rate. The choices of answer options were based on our past experience as well as assumptions on what motivates stakeholders to be engaged and at what stage they would like to get engaged and how. The answers were analysed through a quantitative analysis of the multiple-choice answers.

As respondents had the option to choose multiple affiliations (for example science and business) stakeholder categories are overlapping (Figure 1). Of all 302 respondents 64 stakeholders stated that they are affiliated with more than one group, the most frequent affiliation combinations are shown in Figure 1. In total 83% (*n*=251) of respondents stated that they are affiliated with science (including multiple affiliations) and 17% (*n*=51) were solely non-academic. The respondents with multiple affiliations including science were merged with scientists into the academic group, as an analysis did not show any difference in the answers between scientists with multiple affiliations (mainly paired with policymaking and NGO) and scientists without any other affiliation.

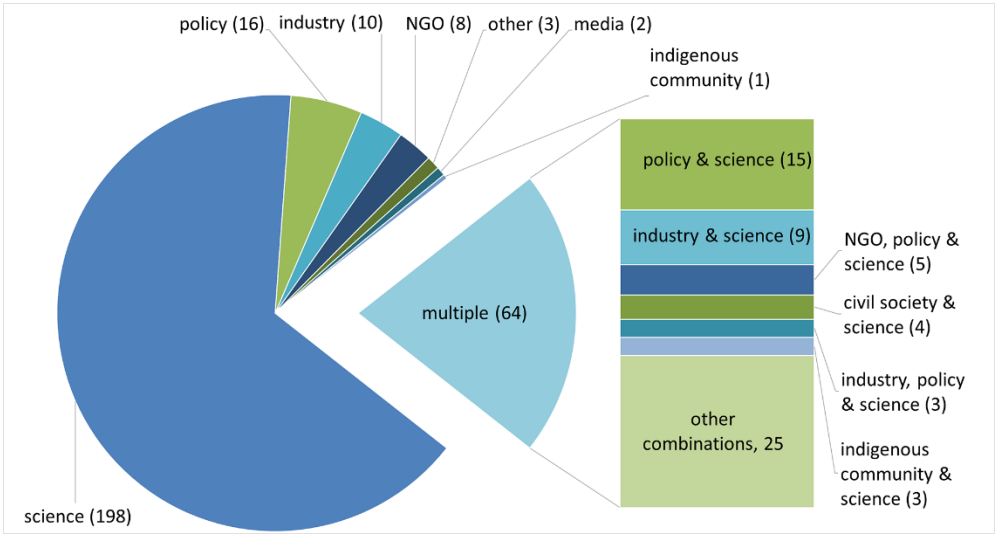

Figure 1. Affiliations of the respondents with breakdown of those respondents who chose multiple affiliations. In the results, multiple affiliations were merged with science into the group 'academics'.

How they answered the survey

"What would your motivation be to get engaged in research projects in the Polar Regions?"

The responses to the first engagement question varied between academic and non-academic survey participants (Figure 2). Academic participants stated a high interest to get engaged in future studies (82%) and to influence the research agenda (define research question, 67%), whereas participants affiliated with industry (10%) and policymaking (12 %) were least interested in defining research questions. Industry (50%) and NGOs (50%) representatives were keen on participating in the research, whereas policy makers were interested in obtaining up-to-date information for concrete decision-making (75%) and to be informed about current activities in the polar regions (67%). Industry representatives equally demonstrated a very high (90%) motivation for staying informed about polar issues. Participants affiliated with NGOs in turn showed an interest in all options and half were interested in being involved in each engagement option.

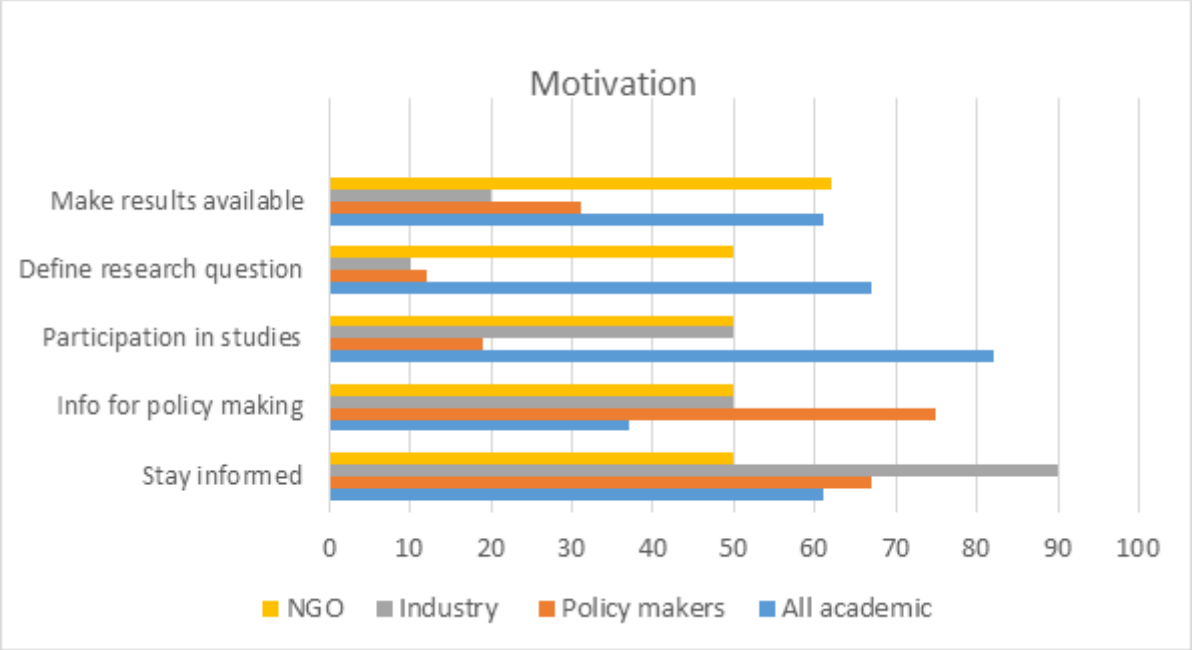

Figure 2. Motivation of the stakeholder engagement.

"At what stage of a research project would you be most interested to get involved?"

Generally speaking, academic survey participants showed an interest in participating in more stages compared to non-academic participants, with the only exception being the dissemination of the results (Figure 3). The majority of academics were interested in participating in all stages during the research process: from project planning (67%) to data analysis (55%) and dissemination of the results (56%). Industry representatives were keen on participating in the project planning (60%), which was least interesting to policy makers (25%) and NGOs (38%). Data collection and data analysis emerged as those stages in a research process in which non-academic stakeholders showed little interest, while the final steps involving the interpretation of the results and their dissemination was of higher interest to NGO representatives (62%) and policy makers (44%).

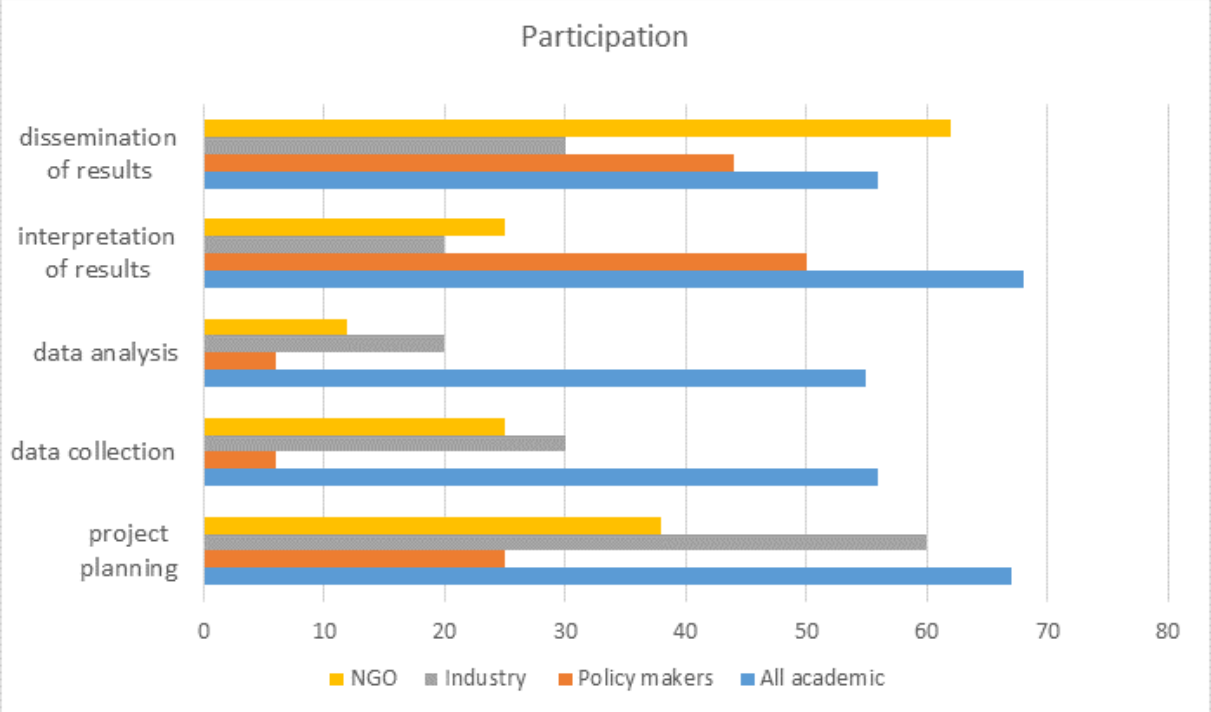

Figure 3. Stage of research project stakeholders were interested in getting involved.

"*How would you best be involved in a research project?*"

The answers showed a general preference towards receiving regular updates via a mailing list (Figure 4). Academic survey participants were not just interested in engaging in different stages of the process,

they also were more interested in various ways of involvement, including more interactive engagement formats such as workshops, personal dialogues and fieldwork. NGO representatives were keen on participating in annual meetings (62%) and receiving regular updates (62%), whereas industry participants were mostly interested in being updated via regular emails and newsletters (80%) and by personal dialogue (50%).

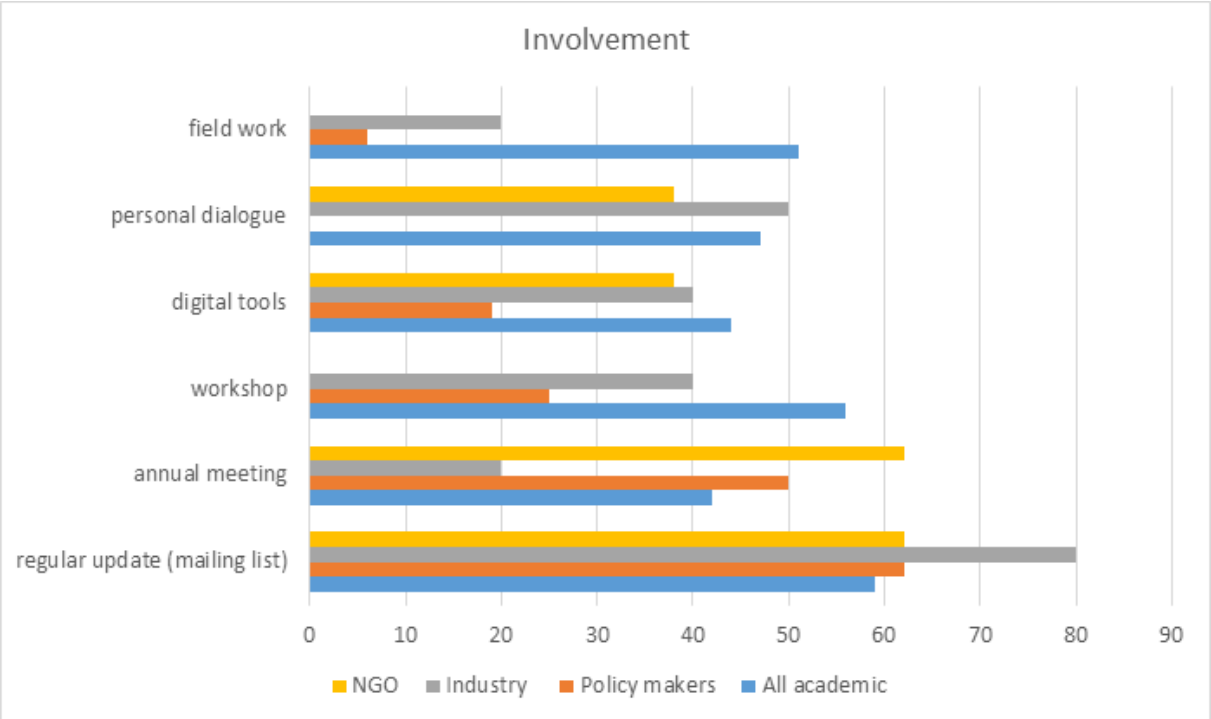

Figure 4. Preferred format on how stakeholders wanted to get involved.

What we can learn from their answers

The answers from non-academic survey participants with their diverse backgrounds were too low in numbers for more detailed statistical tests and major conclusions. Despite this deficit, the results show interesting trends like the observations concluded by Harris and Lyon (2013) stating that enterprises are keen on doing joint research, which would aim for profit and NGOs are looking for knowledge that can be used for highlighting their agenda and putting pressure on public and private sectors. When comparing the answers of the survey respondents based on the stakeholder group they represent, we

can see variations in their motivation, the stages of a research project that are of interest to them and the preferred mode of engagement.

On the contrary to well documented literature, stating that stakeholders should be engaged early on and throughout a research process in order to enable equal partnerships and mutual benefits (Bieluch et al., 2017; Brunet et al., 2016; Groß & Stauffacher, 2014; Klenk & Meehan, 2015; Mauser et al., 2013; Pain, 2004), the majority of non-academic survey participants (representing industry and policy making) did not state an interest in being involved in the initial phases of a project, such as defining the research question. This result does not allow the general conclusion that non-academic stakeholders are generally not interested in engaging from the onset on. Rather it demonstrates two limitations of the survey: Firstly, the low participation of non-academic stakeholders. This likely is due to a combination of reasons, including the lack of non-academic stakeholder participants at the targeted events and the limited response rate to survey invitations sent via email. A second limitation is that participants were not able to state in the survey why they were not interested in specific stages or engagement modes. Rather than being a sign of not being interested, the limiting factor for instance could be a lack of time, personal or financial resources. One risk that collaborative research projects can face is “stakeholder fatigue” or “consultation fatigue” (Ford et al., 2016; Gramberger, Zellmer, Kok, & Metzger, 2015; Jönsson & Swartling, 2014; Arctic Council, 2013; Reed, 2008). This risk does not only arise within one research project but is often seen when same stakeholders are asked to join several research projects, especially when they see no (direct) positive outcome as a result. Furthermore, an online survey could be the wrong tool to obtain feedback from some stakeholder groups and the suggested engagement modes in the survey might not reflect their preferences.

The survey results also suggest that researchers show a larger motivation to engage in more stages of a project and are interested in more diverse engagement modes than non-academic survey participants. This does not come as a surprise. While for most non-academic stakeholders,

engagement in a research project is an additional task to other existing activities and obligations, it belongs to a researcher's job to engage in different stages of a project. Furthermore, researchers are likely to benefit more from the engagement processes and its outcomes than non-academic stakeholders (Brunet et al., 2016). One reason for this is that the engagement process in many cases falls back on academic perspectives, which are not necessarily shared by non-academic stakeholders (Thompson, Owen, Lindsey, Leonard, & Cronin, 2017; Bracken, Bulkeley, & Whitman, 2015). Academic's lack of experience in co-conducting research (Bieluch et al., 2017) and relying on "extended ivory towers, i.e., working with likeminded and similarly socialized actors outside academia" (Lang, Wiek, & van Wehrden, 2017) constrains meaningful co-creation processes between researchers of multiple disciplines and non-academic stakeholders.

This 'top-down' constellation of engagement often implies the empowerment of non-academic stakeholders by scientists, which has been criticised for creating paternalistic relationships (Pain, 2004). Where these power dynamics are left un-managed and stakeholders are restricted in their contributions, meaningful outcomes of the participatory processes are unlikely (Reed et al., 2017). In search of a meaningful cooperation it is therefore important not just to aim at all full inclusion of stakeholders in the research process, but to define and shape their roles according to specific interests, needs and expertise (Jolibert & Wesselink, 2012) – thus putting a focus on the "if and how" of the engagement process. A decentralisation of power, by for example engaging non-academic stakeholders from the proposal phase and funding allocation onwards, could improve the engagement (Brunet et al., 2016). Underlying power structures therefore need to be acknowledged before and during an engagement process, in order to create a space where researchers and stakeholders can interact and contribute on equal terms (O'Brien, Marzano, & White, 2013; Reed et al., 2017). In the Arctic, this power structure is especially evident in the relation to indigenous peoples. The role of indigenous knowledge is acknowledged on an official level, for example in the Joint Statements of the first and second Arctic Science Ministerial, which recognize the importance of both traditional and local

knowledge and scientific and technological information for informed decision-making (ASM, 2016; ASM, 2018). However, there are major obstacles to the integration of traditional knowledge and scientific knowledge. These include skepticism and cultural biases of some scientists as to the value of traditional knowledge, as well as reluctance of policy makers to relinquish control (Evergård et all, 2015, p. 19). In this complex relationship between the indigenous peoples and the research community, one should look for alternative avenues that engage the first group in a familiar and comfortable setting with procedures accepted by all in question. We acknowledge that this power unbalance and bias towards scientific processes also applies to this survey, resulting in most responses coming from academics.

Based on these aspects and taking the limitations of the survey into account, the results suggest that the perceived ideal way of engagement needs to be tested against the actual preferences of stakeholders. Pohl (2011) for example states that stakeholders interested in real world issues would be better approached on how to solve the issues, whereas business, governmental and civil society stakeholders are best involved within thought-style, structured case studies and critical thinking. Despite its stated limitations, survey results show that the participants had different preferences. It remains to be understood what these preferences are based on and if these can be extrapolated for a specific stakeholder group keeping in mind differences within each stakeholder group based on the culture, location and so on.

The way forward

Creating an overview of motivations and engagement preferences of various stakeholder groups doesn't offer a one-size fits guide on how to conduct stakeholder engagement. However, it could be a tool to facilitate planning processes and conducting the first contacts with stakeholders. The differences in preferences and variations among stakeholders are crucial building blocks towards meaningful and sustained stakeholder engagement needed in a true co-design of research projects.

We regard our survey as a first attempt to identify how stakeholders would like to get engaged in larger scale polar projects. The answers suggest that studies on stakeholder engagement preferences could retrieve insightful results and improve future engagement processes. We therefore recommend that variations and differences in stakeholder preferences need to be studied more closely in future including perquisites needed for different stakeholders to get engaged (such as seed money and compensation of their time spent). These insights could improve our crucial understanding of how different non-academic stakeholders want to get involved and what is needed for their engagement. To tackle the issues that the polar areas are facing today, the scientific community needs to work together across disciplines and together with indigenous and local communities, and other stakeholders to increase our understanding of the complexity of change.

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Conflicts of interest

The authors declare no conflicts of interest.

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Figure captions

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