



CAPARDUS - Capacity-building in Arctic standardization development

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Report from second workshop in Svalbard and other activities in 2022-2023

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Authors: Stein Sandven, Lisbeth Iversen, Astrid Stallemo and Hilde Fålun Strøm

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EXECUTIVE SUMMARY

This report describes the work performed in the Svalbard case study during the last 9 months of the project from October 2022 to May 2023.

A number of collaboration and outreach events have taken place in the period where S. Sandven, L. Iversen, and H. Fåln Strøm have participated. Some of them were organised in Longyearbyen, some were online and some were organised in Oslo, Bergen, Reykjavik (Arctic Circle), Vienna (ASSW2023), Tokyo (ISAR-7) and Sapporo. Outcome of these events are documented in workshop reports and presentations given by the participants, which are available at the project website.

Collection of more documents on practices, guidelines and standards have resulted in three groups of documents. The first group includes legal and regulatory documents, where the Svalbard Treaty, the Svalbard Law and the Svalbard Environmental Act are the most important. There are also regulations of ship traffic in Svalbard waters, which extend the international regulations by IMO. In 2023 the Norwegian Environment Agency proposed more regulations of human traffic on Svalbard to protect the environment in response to the growth in tourism in the region. The second group consists of policy and strategy documents, research and assessment reports, and safety plans. The third group consists of practice guidelines, requirements and standards, mainly addressing tourism and how this business should become sustainable in Svalbard.

New proposals were developed to follow up the CAPARDUS work, where one proposal was submitted to the Research Council of Norway under a specific call for research in Svalbard.

A second workshop was organised in Longyearbyen on 7-8 February where representatives from the local community in Longyearbyen met with scientists and tourist operators to discuss how practices, guidelines and standards are developing in Svalbard. The workshop provided some requirements for how an Arctic Practice System (APS) should function. The tourist industry and Svalbard Museum develop their own information systems, which are addressing different aspects of tourist activities. An APS needs to be connected to these information systems because they are bottom-up driven and reflect new requirements to what should be included in the systems.

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1. Introduction

The objectives of the case studies in Svalbard are: 1) continue dialogue and collaboration with actors in Svalbard related to development of guidelines and standards, 2) establish collaboration with Arctic shipping tourist operators related to CBM/CS development, and 3) organise workshops with other projects to discuss the community needs for research-based knowledge in Svalbard. The main challenges in Svalbard is to adapt the community to the effects of climate change and the transition from a mining town to new activities, especially tourism and research. The case study has therefore been searching for and identified documents on guidelines and standards related to the activities in Svalbard and how they are evolving as the society is changing from a mining town to a modern society similar to any small town on the mainland.

This report describes work performed from Sept 2022 until May 2023. It is a follow-up of Deliverable 3.1, where activities in the Svalbard case study until September 2022 were described.



Figure 1. Longyearbyen, Svalbard, Norway. Shutterstock.com

2. Collaboration and outreach activities 2022-2023

2.1 Events in Svalbard

MS Nordstjernen expedition 8 – 12 September 2022. MS Nordstjernen was built for the Coastal Voyage fleet in 1956 and extensively modernised in 2000 for exclusive arctic sailing. Today, she takes explorers on adventures in the waters around Spitsbergen. Lisbeth Iversen took part in the “HEARTS IN THE ICE” Arctic Immersion Expedition in the South Spitsbergen National Park as far south as Hornsund. This 4-day trip onboard the old coastal

steamer ship Nordstjernen was a voyage uniting youth and teachers from Svalbard Folkehøgskole in Longyearbyen with representatives from the local community (e.g. politicians, business people, the Postal service, Store Norske (State property company), Polar Bear International, Hurtigruten Expedition, Visit Svalbard, Visit Oslo and Svalbard Energy). In addition, master students, international researchers, artists/ photographers and designers among others participated. Every day people could sign up for participation in Citizen Science activities (e.g. beach cleaning and flying drones for research projects).



Figure 2. Photo of MS Nordstjernen. Copyright Hurtigruten Expeditions.

Important parts of the voyage were conversations about climate change, adaptation to climate change, citizen science and co-creation pilots to provide for a sustainable future as well as panel discussions. Questions raised were: *What is the value of citizen science? What can observation, indigenous wisdom and immersion into nature teach us about resilience, compassion and care, as we all work to solve the «big problems».* Lisbeth Iversen took part in the preparations for the trip with the goal to facilitate dialogues and a panel discussion with local actors in Longyearbyen on future possibilities, green transition and co-creation of knowledge through collaborative research projects, citizen science and community-based monitoring programmes.

Joint workshop between three cultural heritage projects in Svalbard, 13-15 Sept 2022.

The ongoing projects [ArcticAlpineDecay](#), [CULTCOAST](#), and [PCCH-Arctic](#) organised a joint workshop at UNIS to inform each other about their activities. CAPARDUS was also invited to participate and Stein Sandven attended the public seminar on 14 September. In the ArcticAlpineDecay project (Deterioration and decay of wooden cultural heritage in Arctic and Alpine environments) researchers study how tourists and climate affect our vulnerable cultural heritage on Svalbard and Hardangervidda in Norway. In CULTCOAST the aim is to find methods to monitor, manage and preserve these environmental goods that are exposed to threats from climate change and development pressure. The PCCH-Arctic (Polar Climate and Cultural

Heritage – Preservation and Restoration Management) aims to to create a knowledge base for sustainable safeguarding and future use of cultural heritage in the Arctic under changing demographic and climatic conditions. The coordinator of the PCCH-Arctic, Anatoly Sinitsyn, have authored a report “Development of coastal infrastructure in cold climate. Summary Guideline”

(https://www.sintefbok.no/book/index/1263/development_of_coastal_infrastructure_in_cold_climate_summary_guideline_sfi_samcot_report) .



Figure 3. Cable way timber trestles in Longyearbyen. Photo: Anatoly Sinitsyn, NTNU

Svalbard in the Future: New and old possibilities, 10 October 2022. A dialogue meeting was arranged at the Cultural House in Longyearbyen for tourist operators, researchers, local decision-makers and other inhabitants. Most of the jobs are connected to governmental activities (public services, research) except tourism and satellite services provided by SvalSat. It is a priority to establish more non-governmental jobs, where tourism is the most promising. However, there are a number of problem with the growing tourism, so more regulations have been implemented to limit the tourist traffic. Fishery was discussed, but it is not expected to become a significant business in the foreseeable future. Questions were raised about what challenges and opportunities Svalbard faces in light of the new geopolitical reality and a changing climate. Around 100 people attended and Hilde Fåln Strøm participated from CAPARDUS.

Workshop organised by Balancing Act and Face-it projects – 25 October 2022

The half-day workshop was organised at Funken Lodge in Longyearbyen and Hilde Fåln Strøm participated from CAPARDUS; The question raised was: *How will climate and*

environmental change affect tourism and the use of natural resources on Svalbard? The projects study how the tourism industry on Svalbard can create new and sustainable development opportunities in the face of the new reality with more restrictions for the tourist operators, and adaptation to climate change. This means solutions that ensure that viable local communities are maintained and nature is protected. The aim is to contribute knowledge to the discussion about the future development of Svalbard policy and the national discussion about trade-offs between environmental and climate considerations and local tourism-based value creation. It is of core importance for the projects that knowledge is developed together with the tourism industry and the local community.



Figure 4. Janne Søreide from UNIS presented observed and expected changes in climate and environment in the ocean and coastal areas around Svalbard.



Figure 5. Trine Krystad from Visit Svalbard presented tourism and local community trends in relation to changes in climate and environment.

2.2 Conferences, workshops and other events outside Svalbard

Ocean Best Practices Workshop VI 05 -19 October 2022

The Ocean Best Practice Workshop is an annual event organized under the IOC project (<https://www.oceanbestpractices.org/about/governance/>) to advance ocean observations in support of UN Decade of ocean science (Pearlman et al., 2021). As part of this online workshop

a session was organised by Stein Sandven on 12 October with title: “Capacity sharing in Arctic Community-Based Monitoring”.

The session had focus on presenting selected Community-Based Monitoring (CBM) and Citizen Science (CS) initiatives across the Arctic (Danielsen et al., 2020). The most important topics for CBM programs are fisheries, herding and hunting, forestry, mineral and hydrocarbon extraction, shipping and tourism. A major objective of the CBM/CS systems is to produce specific environmental and climate information to support management of resources, local decision-making and safety of human activities.

The session had the following presentations:

- 1) Lesson learned from developing CBM in Greenland through the PISUNA network and in Russia through collaboration with Indigenous Peoples’ organisations, by Finn Danielsen, NORDECO
- 2) Results from Alaska where coastal communities produce and share information about erosion and permafrost thaw hazards, by Noor Johnson from NSIDC and Olivia Lee from IARC,
- 3) Developing Environmental Community-Based Monitoring Through Collaborative Research and Two-Way Capacity Sharing in Canadian Arctic, by Louise Mercer, Northumbria University

The discussion at the end was centred around what are the models for sustaining CBM programmes and in addition to stable funding, another main challenge identified was the sharing of information and experiences.



Figure 6. From Tuktoyaktuk in the Inuvialuit Settlement Region in Canada. Courtesy Louise Mercer.

Arctic Circle session on 13 October. The workshop *LESS TALK–MORE ACTION: UN GOALS IN THE ARCTIC, TOOLS & GAMES WORKSHOP* was organized by Nordic Marine Think Tank, Denmark; University of Bergen, Norway; SINTEF Ocean, Norway; ARCT/SDGCARDS.NO, Norway in collaboration with Lisbeth Iversen.

The workshop started with a warm-up part on *How to engage on the UN Goals in the*

- *Arctic?* Additional questions raised where among others: *Need for dialogue on the UN Goals How make the Goals relevant for an Arctic setting?*
- *How may the UN goals guide for better co-existence of business, local and Indigenous interests?*

This was followed by introductory presentations and a panel discussion by:

- Anders Oskal, Secretary General of the Association of World Reindeer Herders and the Executive Director of the International Centre for Reindeer Husbandry addressing: *How do Indigenous People and Reindeer Herders view the UN Goals as a tool and path to success?*
- Dr. Dwayne Menezes, Founder and Managing Director, Polar Connections - Polar Research & Policy Initiative was addressing *How the UN 2030 Agenda on Sustainable Development can help address some of the toughest challenges facing polar peoples and places.*
- Lisbeth Iversen, (NERSC/AHO) talked about *Dialogue as a bridge-building tool – a Svalbard example.*
- John Kilbourne, Ph.D. Professor of Movement Science, Grand Valley State University addressed *Early Sami Play & Games for Promoting Sustainability and Peace.*

The workshop continued with round table discussions and testing of the SDG cards, were guided by Karin Berentsen, Anne Gaspers, and supported with closing remarks by Karin Berentsen and Lisbeth Iversen on questions raised around the tables. The participants were engaged in the tools represented by the UN SDG cards, but an important comment was also raised by inuit participants; to be aware of the western values embeded in/ or underpinning the UN SDGs. This was followed up with an important dialogue through lunch with these participants, and the topic will be integrated as an important issue to address in future workshops and seminars with a focus on UN SDGs.

The Norwegian Embassy in Reykjavik organized an event on 13 October during Arctic Circle with HRH Crown Prince Haakon as one of the key speakers. This was also a network building event, where many actors from Svalbard was present. The speakers presented updated information on the situation in the Arctic related to geopolitics and climate change, as well as raised important questions about the safety and wellbeing of the Arctic in the time to come.

On 13 October Lisbeth Iversen also participated in a session on *Booming Arctic Cruise: Safety and Environmental risks*, organized by Icelandic Coast Guard (LHG), Icelandic Arctic

Cooperation Network (IACN), and Icelandic Tourism Research Centre (ITRC). Association of Arctic Expedition Cruise Operators (AECO) was part of the panel.

2.3 Other events with participation from CAPARDUS

- Two workshops on ocean data management, organised by T. Hamre, NERSC, on 01. Nov in Bergen and online on 15-16 Dec.
- Workshop during ASSW23 on standards, guidelines and practices with focus on Arctic Practice System, 23 February, organised by S. Sandven
- Session during ASSW23 on Community-based observing and citizen science – tools for participatory, sustainable development in the Arctic, 24 February. 12 oral presentations.
- ISAR-7 presentation of CAPARDUS in session S20: Toward sustainable Arctic - developing a network of Arctic researchers and other stakeholders, 9 March 2023
- HAI_FES workshop in Sapporo, presentation of CBM/CS activities in collaboration with Arctic shipping and tourist operators, 13 March. In this workshop S. Aandven and H. Sagen were invited to participate because Hokkaido University is partner in CAPARDUS and has a collaboration agreement with NERSC
- Symposium in Oslo: Security and preparedness in the changing north – research perspectives, 23-24 March 2023. NERSC attended the symposium which was organised by the Norwegian Scientific Academy for Polar Research and the Royal Swedish Academy of Sciences. H. Sagen, NERSC, attended the symposium which addressed five different themes: (1) Conditions for livelihoods, health, and ecosystems; (2) Impacts of climate change – effects and actions; (3) Forecasting the changing ice, ocean and weather conditions; (4) Access to infrastructure and data for Arctic research; and (5) Geopolitics (Governance), security and defense.

Reports from the activities described in section 2:

- Two NERSC technical reports from workshop in LYB 29-31 Oct 2021 and from the SSC side-meeting in Oslo 4 November 2021. They are available at <https://capardus.nersc.no/node/56>
- Two reports from Hilde from the events on 10 October and 25 October in Longyearbyen

3 Workshop in Longyearbyen 7 – 8 February 2023

3.1 Background

CAPARDUS uses workshops and dialogue meetings to discuss how the social-environmental systems are changing Arctic communities and how sustainable development can be achieved. Climate change and its consequences in the Arctic lead to new requirements for planning and decision-making based on new knowledge building on scientific and economic data.

The workshop on 7-8 February was a follow-up of the previous workshop in Longyearbyen from 6 – 9 August 2022. In the Svalbard case study a series of meetings and workshops has been organised to identify practices, guidelines and standards in topics of importance for people living and working in the region. The results from this case study will be compared with similar case studies in Greenland, Alaska and Yakutia. The topics addressed in the Svalbard case study include research activities, protection of nature and culture, shipping, tourism, resource exploitation, data sharing and safety of operations. Development of standards involve processes on several levels, ranging from traditions and practices to standards and legislation, as illustrated in Fig. 7.

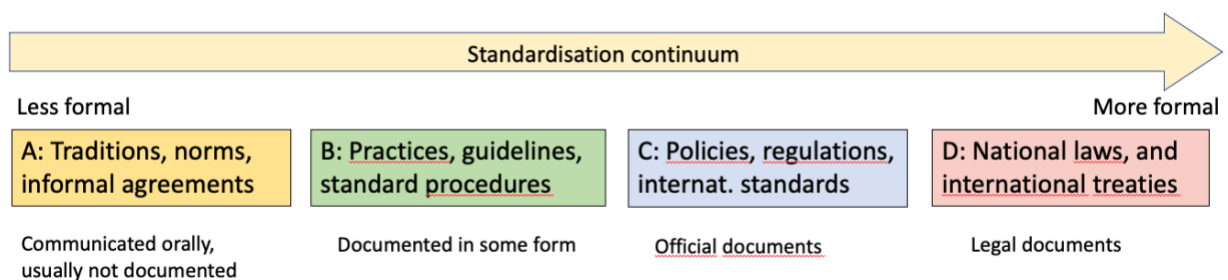


Figure 7. A concept of the standardisation continuum used to analyse groups of documents which are foundational for developing Arctic standards.

3.2 Objectives and scope of the workshop

The objective of the workshop was to meet representatives from the local community in Longyearbyen to discuss how practices, guidelines and standards are developing among the tourist operators in Svalbard. The outcome of the workshop will help to identify the need for an Arctic Practice System (APS), which is planned to be a digital system where practices, guidelines, standards as well as regulations can be uploaded, stored and retrieved (Pearlman et al., 2020). Both providers and users of practices contribute to building up the system over time by including more and more information. The APS concept was described in Deliverable D3.1, and here we attempt to describe a concrete example of how an APS could be designed for the Svalbard community.

An important element of the APS is that is defined in a societal context where the purpose of the system is to develop and document knowledge among actors who work on a specific topic, for example snow avalanche monitoring (Fig. 8). Snow avalanche monitoring is important for the safety of the inhabitants and the tourists travelling around in Svalbard. The APS should contribute to improve knowledge sharing between scientists, the public sector, businesses and governmental bodies. Improvement in knowledge sharing between the involved actors is a key factor for sustainable development in the Arctic.

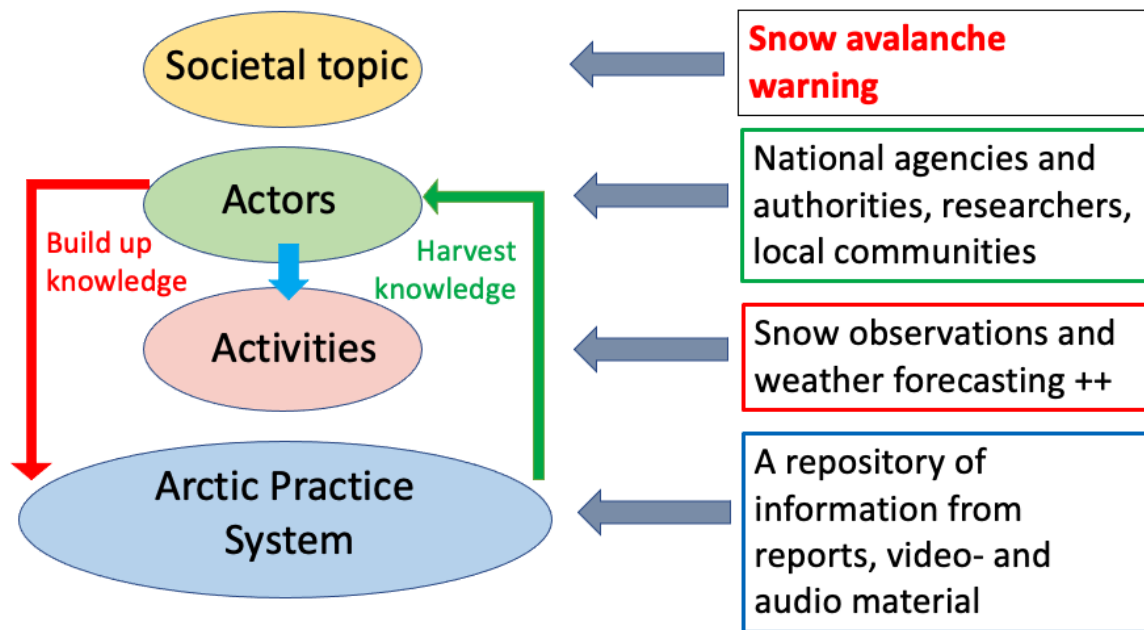


Figure 8. For a given societal topic, such as snow avalanche warning, there are different actors involved such as national agencies with responsibility for monitoring and forecasting services (e.g. Norwegian Water and Energy Directorate and Norwegian Meteorological Institute), local authorities (the Governor), researchers and the local community (Longyearbyen Community Council). The activities represent the documentation of what is done and should be stored in a repository and be available for building up new knowledge. An APS needs to be constantly developed by ingesting new documentation so the users can search for information to harvest evolving knowledge.

A forerunner for the Arctic Practice System is the Ocean Best Practice System (OBPS) established under UNESCO IOC (<https://www.oceanbestpractices.org>), which was presented in deliverable D3.1. A simple definition of OBPS is the following:

“Ocean Best Practice is a method adopted by many people to carry out a task within ocean observation, research, assessment of the environment, etc.”

In APS we do not use the term “Best Practice”, only “Practice” because most of the ongoing activities in the project are to document practices and guidelines within the topics of the projects. As part of CAPARDUS a testbed for the APS has been established under the Ocean Best Practice System (<https://repository.oceanbestpractices.org/handle/11329/1291>). It is called Polar Collaborations where presently 159 documents are registered (March 2023). Many of them are related to the topics of CAPARDUS and inserted by the project members. By searching the repository to given keywords, documents will be identified. Search by “Svalbard tourism” gives 25 hits. By adding “snow avalanche” to the search 6 documents were found. The cover page of some documents in the repository is shown in Fig. 9.

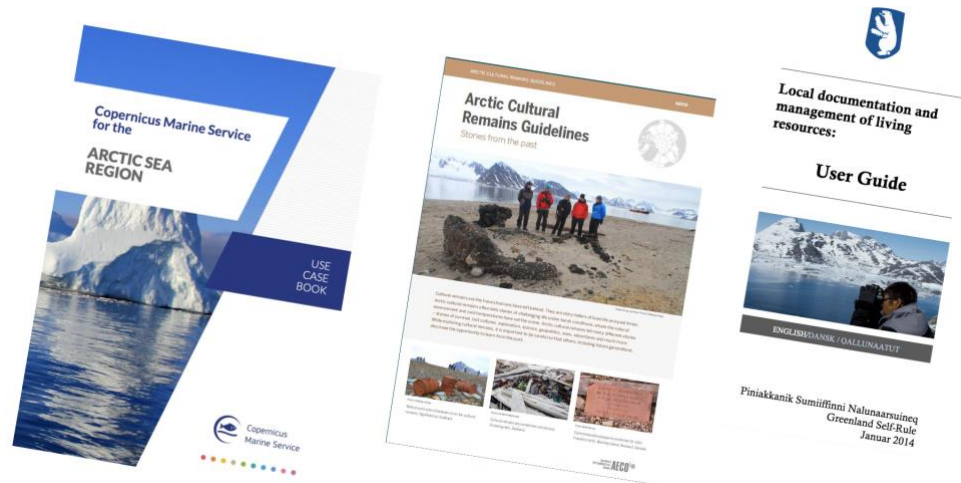


Figure 9. Some documents related to practices, guidelines and standards in the Arctic

3.3 Presentations by the participants

Stein Sandven, NERSC, gave an introduction to the workshop and presented the objectives of the project (section 3.2).

Astrid Stallemo, NERSC, presented ongoing work to develop a framework for Arctic standards using a document analysis tool. The methodology consisted of reviewing selected literature after categorizing into classes in accordance with the topics of the project: Shipping, tourism, resource exploitation, safety of operation, protection of nature and culture, research activities and data sharing. The document analysis tool NVivo is used to identify relations and connections between documents to make a holistic and comprehensive framework for Arctic standards (<https://lumivero.com/products/nvivo/>). A screendump from the NVivo tool is shown in Fig. 10 initial results of the analysis are shown in Fig. 11.

| Name | Files | References | Created on | Created by | Modified on | Modified by |
|------------------------------------|-------|------------|--------------------|------------|--------------------|-------------|
| Code of conduct | 0 | 0 | 1/31/2023 12:36 PM | AS | 1/31/2023 12:36 PM | AS |
| Environments | 0 | 0 | 2/2/2023 10:34 AM | AS | 2/2/2023 10:34 AM | AS |
| Cultural heritage | 0 | 0 | 1/31/2023 12:38 PM | AS | 1/31/2023 12:38 PM | AS |
| Flora and fauna | 0 | 0 | 2/2/2023 10:37 AM | AS | 2/2/2023 10:37 AM | AS |
| Natural environment | 0 | 0 | 1/31/2023 12:38 PM | AS | 1/31/2023 12:38 PM | AS |
| Pollution | 0 | 0 | 1/31/2023 12:38 PM | AS | 1/31/2023 12:38 PM | AS |
| Protected areas | 0 | 0 | 2/2/2023 11:07 AM | AS | 2/2/2023 11:07 AM | AS |
| Personal attributes | 0 | 0 | 2/2/2023 10:34 AM | AS | 2/2/2023 10:34 AM | AS |
| Awareness | 1 | 1 | 2/1/2023 7:50 AM | AS | 2/2/2023 8:52 AM | AS |
| Knowledge | 0 | 0 | 2/1/2023 7:50 AM | AS | 2/1/2023 7:50 AM | AS |
| Respect | 0 | 0 | 2/1/2023 7:50 AM | AS | 2/1/2023 7:50 AM | AS |
| Skills | 0 | 0 | 2/2/2023 10:36 AM | AS | 2/2/2023 10:36 AM | AS |
| Gaps | 0 | 0 | 1/31/2023 12:37 PM | AS | 1/31/2023 12:37 PM | AS |
| Legislation, acts, and regulations | 0 | 0 | 1/31/2023 12:36 PM | AS | 1/31/2023 12:36 PM | AS |
| Planning | 0 | 0 | 1/31/2023 12:37 PM | AS | 2/1/2023 8:15 AM | AS |
| Implementation | 0 | 0 | 1/31/2023 12:43 PM | AS | 1/31/2023 12:43 PM | AS |
| Preparation | 0 | 0 | 1/31/2023 12:42 PM | AS | 2/1/2023 8:15 AM | AS |

Figure 10. Document analysis using the NVivo tool.

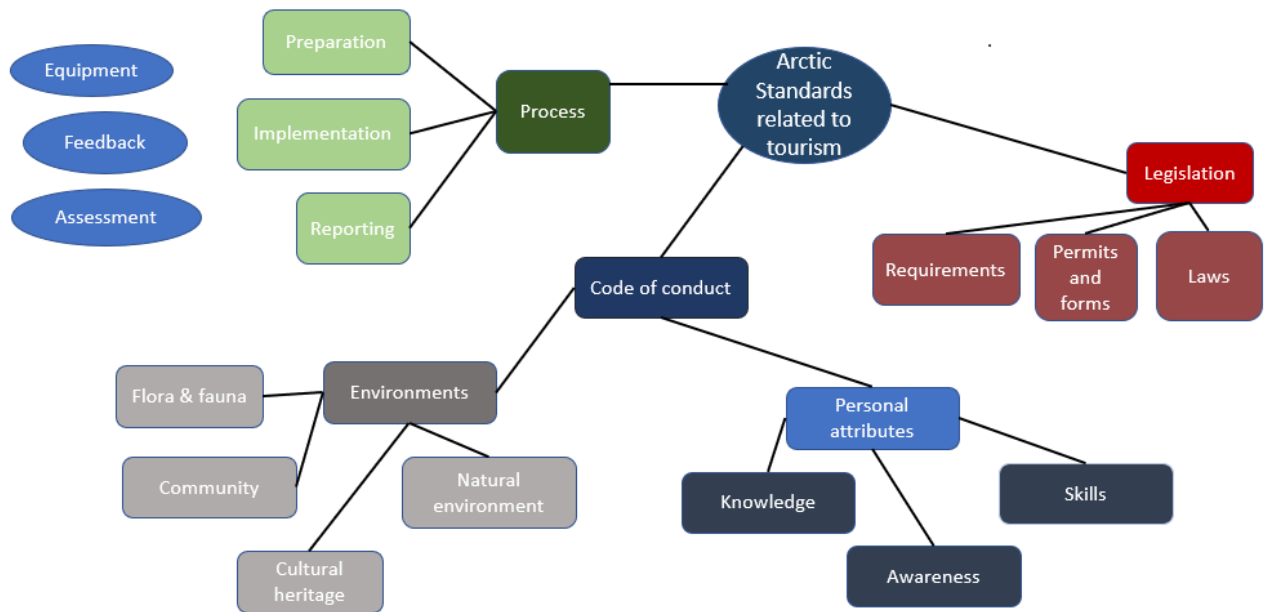


Figure 11. Connections between document types with sub-themes and identified attributes of methods and practices related to tourism.

Ronny Brunvoll, Visit Svalbard: Perspectives on tourist development in Svalbard. He presented the statistics of the tourist traffic by comparing data from the peak year 2019, which was before the pandemic, and 2022, when the tourist traffic was fully opened after the pandemic.

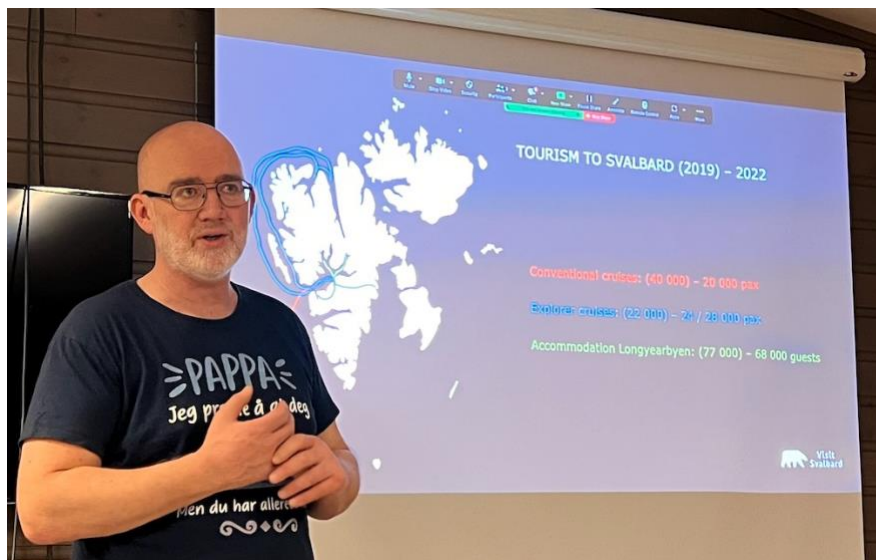


Figure 12. Ronny Brunvoll presenting tourist statistics for Svalbard

In 2022 Longyearbyen had ca. 68000 guest accommodation compared to 77000 in 2019. Conventional cruises had ca. 20000 passengers in 2022 compared to 40000 in 2019. Explorer cruises had up to 28000 passengers in 2022 compared 22000 in 2019 (note the increase in this

category). Another characteristic of the tourist traffic is the longer season, where only November, December and January have low traffic. The policy for further growth in the tourist traffic is to have more visitors in the dark months and not increase the traffic in the peak season. It is also decided to stop further building of new hotels. This will allow better to use of existing hotel capacity and provide more year-round employment of the tourist operators.

Visit Svalbard has strong focus on developing sustainable tourism, which means that the quality in all parts of the industry should be improved and that the value creation for the society should increase. This means that sustainable tourism should

- Be responsible and safe
- Operate the whole year and provide activities for the dark season such as cultural history, and northern light experience
- Length of each visit should be longer, avoiding the short visits
- Reduce climate emission and leave no traces

The Norwegian Environment Agency has implemented stricter regulations of human traffic on Svalbard. This will have major ramifications for the tourism industry, including new limits on marine-based activities and access to sites, increased safety and insurance regulations, and likely more requirements for certified guides. The overall purpose of these regulations is to limit and reduce impacts on the vulnerable environment in Svalbard. Visit Svalbard has made comments to these regulations, where some are problematic for the tourist operators, such as no travel on sea ice and restriction on landing sites for explorer cruises. Others are semi-problematic, and some are no big issue, as shown in Fig. 13.

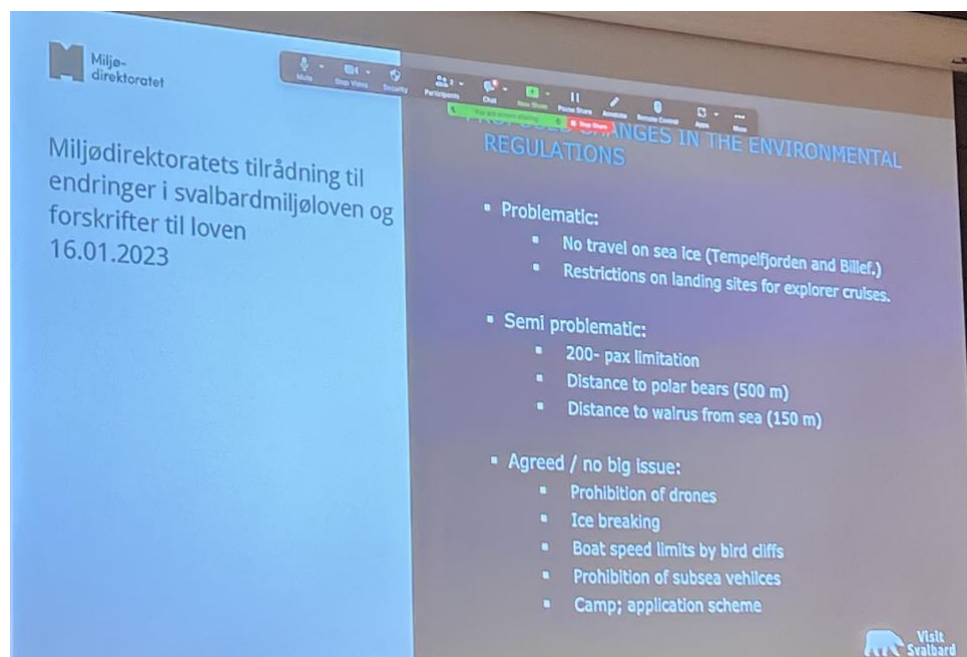


Figure 13. Visit Svalbard has commented on the new regulations of the Svalbard Environmental Act

Michael K. Poulsen, NORDECO. Towards ‘good practice’ in the use of local and scientific knowledge for informing natural resource management. The presentation had focus on lessons learned from the CAPARDUS workshop in Greenland 29 Nov – 1 Dec 2022. The participants in the workshop were fishers and hunters, public decision-makers, natural resource managers, representatives of civil society associations, and social and natural scientists. The main objectives were to review the future to see how local knowledge can contribute to informing decision-making on natural resources, and to explore how the financial and organizational sustainability of Community-Based Monitoring (CBM) programmes can be assured and how CBM and scientific observations can be connected. The workshop was thereby working towards the development of global ‘good practice’ guidelines in community-based monitoring and the management of natural resources (Fig. 14). The workshop resulted in agreements on several topics:

- 1) That pilot initiatives whereby fishers and hunters in Greenland have followed the status and trends of the living resources and shared this knowledge with decision-makers have provided useful experiences.
- 2) That these pilot initiatives should be continued and further organized and scaled up, and that they should be supported by legislation.
- 3) That a systematic approach should be established to connect user knowledge with conventional scientific knowledge to inform decision-making.
- 4) That financial means should be secured for the fishers and hunters who are engaged in this work, and for the organizational framework for their work.

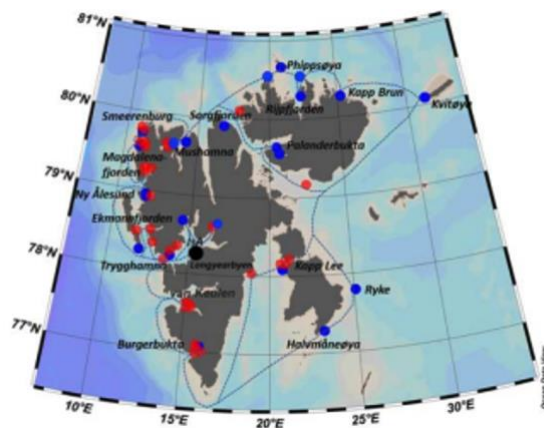


Figure 14. From the workshop in Aasiaat where the person with the microphone is the Minister of Fisheries and Hunting in Greenland, Karl Tobiassen.

Moreover, it was decided at the workshop to set up a working group to support the involvement of user knowledge in resource management in Greenland (“The Working Group for Action on the Involvement of User Knowledge in Resource Management in Greenland”). It was also decided to jointly update the “Manaus Letter: Recommendations for the Participatory Monitoring of Biodiversity” in the coming months. Finally, the conclusions from the workshop were sent to the Secretariat of the Convention on Biological Diversity to inform the discussions on the new global agreement, [the Kunming-Montreal Global Biodiversity Framework](#). All the presentations at the workshop are publicly available at <https://www.uarctic.org/activities/thematic-networks/collaborative-resource-management/> The workshop was funded by the EU’s Horizon 2020 research and innovation programme and by UArctic through the Danish Agency for Science and Higher Education. A follow-up workshop will take place in Nuuk 20-21 May 2023.

Karen O'Brien, cCHANGE. Engaging differently to make a difference: transformations in a changing climate (online). The presentation gave a background about cCHANGE and introduction to the topic for the second day of the workshop. cCHANGE is a research- and values-based non-profit consultancy that supports people and organizations in generating sustainability transformations. The second day consisted of interactive sessions about the complex challenges in Svalbard and how we can create the shifts needed to enable Svalbard to be a place where people and nature can thrive.

Raphaelle Descoteaux – Postdoc at UNIS - Citizen Science work Unis/Hurtigruten Svalbard (online). The presentation gave an overview of citizen science activities at UNIS. The main collaboration is with Hurtigruten's tourist expeditions around Svalbard where sea ice and water samples are collected to support marine biology research in the region. Scientists from UNIS have overall responsibility and lead the work in the field, which has been extended and facilitated for more data collection thanks to the collaboration with Hurtigruten (Fig. 15 A and B).



A: Water sampling sites in trips with Hurtigruten in 2018 (blue points) and 2019 (red points)



B: Hurtigruten's tourist vessel FRAM visiting one of the fjords in Svalbard



C: Bamsebu, where Hilde and Sunniva lived for more than a year and collected data for several citizen science projects



D: Hilde and Sunniva collecting water sample under the ice

Figure 15. Examples of citizen science activities in the Svalbard region. Photos provided by Janne Søreide, UNIS and Hilde Fålnun Strøm.

UNIS has also close collaboration with Hearts In The Ice, where Hilde Fålun Strøm and Sunniva Sorby collected data throughout the year when they overwintered at Bamsebu. (Fig. 15 C and D).

Hege Anita Eilertsen – Svalbard Museum. Hege Anita presented the role of Svalbard Museum as the main institution to inform the public about the natural and cultural history of Svalbard, which goes back 400 years. The museum prepares and disseminates knowledge about Svalbard through objects, photos and texts displayed in modern premises co-located with the Svalbard Science Park (Fig. 16).

The museum disseminates knowledge about the industrial remains, whaling and hunting infrastructure and remains of the early scientific expeditions are key elements of Svalbard's environment. The early mining industry provided accommodation and easier access to the archipelago, paving the way for tourism, which dates to the 1800's and focuses on both natural and cultural environments. Tourism is one of the key economic pillars of developing a sustainable society of the archipelago (Hovelsrud et al., 2021).

The museum is interested in adopting new digital technologies to produce and disseminate information about Svalbard. For the tourist industry it is important that the museum becomes attractive for the visitors, allowing them to stay longer and obtain more knowledge about Svalbard, especially the cultural history. By producing digital information through videos, story-telling, animations, and virtual reality/artificial reality tools the museum can contribute to sustainable tourism as explained by Ronny Brunvoll. The museum could become a more important tourist destination, especially in the dark season. An interesting example of cultural heritage documentation is the restoration of the Svea and Lunckefjell coalmine area, where the mines and the area have been 3-D scanned and made available in digital form. The whole mining community has been removed, but the community will be available as a virtual reality (<https://www.niku.no/prosjekter/digital-dokumentasjon-av-gruvemiljoet-i-svea/>) .

The concept of an Arctic Practice System can be very relevant for the museum if it can be designed according to the specific requirements of the museum. A system where digital object can be uploaded to a repository by knowledge providers can be useful for the museum, which can prepare the uploaded information into useful products for tourists and other users.

The museum has permanent exhibits covering all central topics of importance to understand the past and the present of Svalbard:

- Basis for life in the Arctic
- The discovery of Svalbard
- Exploration of the archipelago
- Hunting/whaling
- Trapper's life
- Geology and mining
- Modern life and research
- Life in the ocean and on the tundra
- The Svalbard Global Seed Vault



Figure 16: From the exhibits in Svalbard Museum

Stein Ove Johannessen – Deputy Major/ Svalbard Adventure Group. He gave a short oral presentation about the precautionary principle, which is mostly used in policy-making. New knowledge is not necessarily taken into account when decisions are taken. Regarding tourism it is important for the local community to have impact on policy-making and regulations. We feel that this has not been done in the recent recommendations by the Norwegian Environment Agency (MD, 2023) for stricter regulations of human traffic on Svalbard.



Figure 17a: Hege Anita Eilertsen, Svalbard Museum



Figure 17b: Stein Ove Johannessen, deputy mayor

Ionut Cristi Nicu - NIKU. The presentation was about projects at NIKU involving cultural heritage in Svalbard. The CULTCOAST project was well presented in the workshop 6 – 9 August 2022. GEOCULT is a follow-up of CULTCOAST. ARCHEPHYSICS develops near-surface and non-invasive geophysical method to image the known and unidentified cultural heritages in selected sites. PERMARICH has focus on thawing permafrost and risks for modern infrastructure and cultural heritage sites. THETIDA is an EU project with focus on underwater and coastal cultural heritage preservation, where Svalbard is one case study. THETIDA aims to provide an enhanced visualisation tool that can provide a simple and easy way to create virtual environments for cultural heritage presentation. The THETIDA project and NIKU in general promote citizen science to actively engage local communities in understanding changes and documenting impacts.

Lise Loktu, NIKU. She is archeologist and senior advisor in NIKU. She worked for 6 years as archaeologist at the Governor's office. While Norwegian Polar Institute has responsibility for management of natural environment, there is no institution with responsibility for cultural heritage management in Svalbard. The Governor is responsible for the cultural heritage sites in Svalbard, but resources for this work is very limited. Archaeological excavation work has been done in a few places and mainly for graves. The erosion, wear and tear from people and decomposition are all contributing to the deterioration of the sites. Better management of cultural heritage sites is needed, and the research projects mentioned above are developing methods which can be used in Svalbard. One approach is to set up information signs, as shown in Fig. 18. This will help to inform tourists and others about cultural heritage and other interesting parts of history and contemporary life in Svalbard.



Figure 18. Information sign in Longyearbyen. Photo by Lise Loktu.

Hilde Fåln Strøm, Hearths in the Ice

Hilde has been living in Svalbard since the 1990a and have experienced the dramatic changes in climate and society in Svalbard over three decades. In collaboration with Sunniva Sorby she has created “*Hearths in the Ice*” as platform that inspires, connects, educates and ignites action on pressing climate change issues (www.heartsintheice.com).

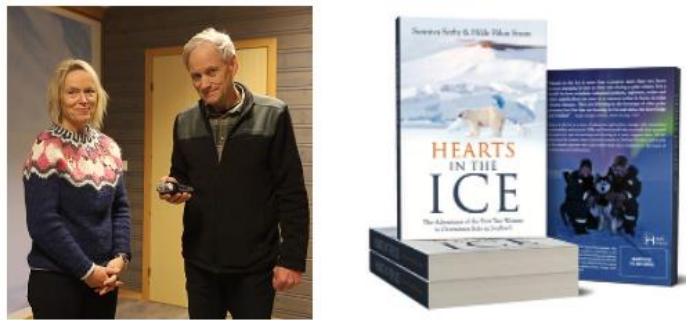


Figure 19. Hilde interview by Stein during the workshop in Polheim and the book about *Hearths in the Ice*

4 Other activities related to the case study

4.1 Proposals to extend the Svalbard case study

Proposals to Svalbard Strategic Grants

Three proposals to support workshops connected to the Svalbard case study were prepared by Lisbeth Iversen and Stein Sandven from 2019 to 2021. All three proposals received funding from the Svalbard Strategic Grant under the Research Council of Norway:

4 November 2019: The project “Svalbard Social Science Initiative - a network of social scientists working in Svalbard” organized a workshop/side meeting in connection with the Svalbard Science Conference in Oslo 2-3 November 2019. A workshop report was prepared and is available at <https://capardus.nersc.no/index.php/node/56>

29 – 31 October 2021: The project “Svalbard in local and global perspective: an interdisciplinary science workshop organized by the Svalbard Social Science Initiative”. The workshop took place

in Longyearbyen and a report was prepared and is available at <https://capardus.nersc.no/index.php/node/56>

4 November 2021: The project “Catalyzing interdisciplinary perspectives across social and natural science on Svalbard” organized a workshop/side meeting in connection with the Svalbard Science Conference in Oslo 5-6 November 2021. A workshop report was prepared and is available at <https://capardus.nersc.no/index.php/node/56>

Proposals to Research Council of Norway

A proposal with title “Technologies for coupling environmental and cultural heritage data in support of regenerative tourism in Svalbard” (CULT-COAST) was prepared during the autumn of 2022. The proposal was not completed and not submitted by the deadline in November.

Since CULT-COAST was not completed, another proposal with title “Human activities and impact on Svalbard culture and nature “(HUMACS) was prepared and submitted in February 2023. This proposal was a direct follow-up of the CAPARDUS workshop in August 2022.

4.2 Documents on regulations, practices, guidelines and standards

The first group of documents are **legal and regulatory documents**, where the most important are the Svalbard Treaty, the Svalbard Law, the Svalbard Environmental Act including a number of regulations managed by the Governor. The regulations deal with nature conservation areas, cultural heritage management, pollution and waste, hunting, trapping and fishing, and land-use management. The regulations are available at <https://www.sysselmesteren.no/en/the-governor-of-svalbard/environmental-protection/> . The Norwegian Cultural Heritage Act (1978) aims to protect archeological and architectural monuments and sites, and cultural environments in all their variety and detail, both as part of our cultural heritage and identity and as an element in the overall environment and resource management (<https://www.regjeringen.no/en/dokumenter/cultural-heritage-act/id173106/>). This Act also applies for Svalbard as stated in the regulations by the Governor.

There are also regulations for the ship traffic in Svalbard waters and arrivals to the port of Longyearbyen (<https://portlongyear.no/terms/>). From 2020 Norwegian Maritime Authority (NMA) has new rules for passenger shipping in Svalbard. The regulations require all vessels to comply with IMO's Polar Code (January 2017 enforced, for polar water shipping) which is mandatory under both SOLAS (Safety of Life at Sea) and MARPOL (Prevention of Pollution from Ships) maritime conventions. NMA's new rules apply to both Norway- and foreign-[flagged](#) vessels navigating in Svalbard's waters. When the Coronavirus crisis started in 2020, border closure and severe travel restrictions were imposed. In 2021, after the Coronavirus restrictions were lifted, the Norwegian government imposed new regulations for ships visiting Svalbard. More information is available at <https://www.cruisemapper.com/ports/svalbard-islands-port-9197> and at <https://www.sdir.no/en/shipping/vessels/vessel-types/passenger-vessels/rules-for-passenger-ships-on-svalbard/> .

In 2023 the Norwegian Environment Agency proposed more regulations of human traffic on Svalbard to protect the environment in response to the growth in tourism in the region. This proposed regulation has been criticized by the tourist operators because it means too much restriction on the business, but the industry is adapting to the regulations as best they can. The regulations will mostly affect the sea-based

traffic and very little for the local inhabitants compared with the existing regulations. More information is available at <https://kommunikasjon.ntb.no/pressemelding/tilrar-strengare-reguleringar-av-ferdsel-pa-svalbard?publisherId=17847187&releaseId=17953018>

The second group consists of **policy and strategy documents, research and assessment reports, safety plans and business plans** for Svalbard, a selection of these are listed in Table 4.1

Table 4.1 Selected documents and links related policy, strategy, assessments and plans in Svalbard

| Document | Comments |
|---|---|
| Svalbard White paper to the Storting 2015-2016, 119 pp | The main policy document on Svalbard by the Norwegian Government. https://www.regjeringen.no/en/dokumenter/meld.-st.-32-20152016/id2499962/ |
| Strategic business plan | The Local Council has ongoing work to develop a business plan for Svalbard. https://www.lokalstyre.no/strategisk-naeringsplan.466971.no.html |
| Climate in Svalbard 2100 – a knowledge base for climate adaptation. | Assessment report to the Norwegian Environment Agency in 2018. https://munin.uit.no/handle/10037/18819 |
| Snow avalanche warning in Svalbard, 2020 | Norwegian Water Resources and Energy Directorate (NVE) has produced a report on snow avalanche warning and risk management in Svalbard, https://publikasjoner.nve.no/rapport/2020/rapport2020_35.pdf |
| Local avalanche warning for Longyearbyen, 2022 | An evaluation of the present warning system, by Øien and Albrechtsen, SINTEF report, https://munin.uit.no/handle/10037/27034 |
| Snow avalanche protection planning in Longyearbyen area | The Local Council in collaboration with Norwegian Water Resources and Energy Directorate (NVE) are planning and implementing several snow avalanche protection measures. A number of documents are available at https://www.lokalstyre.no/skredsikring.486358.no.html |
| Coastal erosion affecting cultural heritage in Svalbard | A research publication led by NIKU assess the danger of coastal erosion damaging cultural heritage sites as a result of climate change. Sustainability 2020, 12, 2306; doi:10.3390/su12062306 |
| State of Environmental Science in Svalbard (SESS report) 2022 | The SESS report is an annual report published by the SIOS Knowledge Centre in Longyearbyen. https://sios-svalbard.org/SESSreport |
| Svalbard in transition: adaptation to cross-scale changes in Longyearbyen | A research publication on changes in Svalbard as a result of increased tourism and climate change impacts. Grete K. Hovelsrud , Bjørn P. Kaltenborn & Julia Olsen (2020): Svalbard in transition: adaptation to cross-scale changes in Longyearbyen, The Polar Journal, DOI: 10.1080/2154896X.2020.1819016 |

The third group documents consists of **practical guidelines and standards** for people living working and travelling in Svalbard, listed in Table 4.2

Table 4.2 Selected documents and links related practical guidelines and standards in Svalbard

| Document | Comments |
|--|---|
| Safety in Svalbard | A booklet published by the Governor about safety in the field. https://www.sysselmesteren.no/en/publications/booklets-and-publications/ |
| Svalbard Guidelines and other information for visitors | A wide range of information for visitors is published by Visit Svalbard about safety, how to travel, how to behave, etc. See: https://en.visitsvalbard.com/visitor-information |
| AECO guidelines for their members and visitors | AECO (Association of Arctic Expedition Cruise Operators) have made an extensive list of guidelines https://www.aeco.no/guidelines/ |

| | |
|--|---|
| Requirements for environmental monitoring and investigation of cultural deposits, 2012 | Norwegian National Standard. The Norwegian Directorate for Cultural Heritage is the authority responsible for cultural heritage management in Svalbard and has overall responsibility in the cultural heritage area. https://repository.oceanbestpractices.org/handle/11329/2064 |
| Summary Guideline for development of coastal infrastructure in cold climate | Report from SINTEF research, SFI SAMCoT report, 2020. https://www.sintef.no/en/publications/publication/1823732/ |

5. Conclusions of the Svalbard case study

What has been obtained regarding documentation of practices, guidelines and standards in the Svalbard case study? Through search and review of documents on topics related to the Svalbard case study it was found that practices and guidelines are developing year by year and they need to be aligned with the laws and regulations. Some guidelines are direct consequence of the regulations, while others evolve with time to become de facto standards as they are adopted by a wide community. Other guidelines are preliminary and will develop further as more research is done. Some of the key documents are listed in Table 4.1 and 4.2.

Tourism is one of the key economic pillars of developing a sustainable society in Svalbard. The recent recommendations by the Norwegian Environment Agency for stricter regulations of human traffic on Svalbard will have major ramifications for the tourism industry, including new limits on marine-based activities and access to sites, increased safety and insurance regulations, and likely more requirements for certified guides. The regulations will mostly affect the sea-based traffic and very little for the local inhabitants compared with the existing regulations. The overall purpose of regulatory strengthening is to limit and reduce impacts to the natural environment and the cultural heritage.



Figure 20. Tourist expedition cruises around Svalbard is one of the most popular tourist activities, and stricter regulations of this traffic will limit what these expeditions can do. Photo: Spitsbergen Travel.

The most important legal and regulatory documents are the Svalbard Treaty, the Svalbard Law and the Svalbard Environmental Act, where regulations are included. These are dealing with nature conservation areas, cultural heritage management, pollution and waste, hunting, trapping and fishing, and land-use management. There are also regulations of ship traffic in Svalbard waters. From 2020 Norwegian

Maritime Authority (NMA) has imposed new rules for passenger shipping in Svalbard. The regulations require all vessels to comply with IMO's Polar Code. When the Coronavirus crisis started in 2020, border closure and severe travel restrictions were imposed. In 2021, after the Coronavirus restrictions were lifted, the Norwegian government imposed new regulations for ships visiting Svalbard.

To develop a thriving and sustainable tourism in the Arctic some of the key points are to (1) engage the community in planning, (2) enhance local business and tourism resources management, including sociocultural resources, (3) consider labour and employment issues, (4) educate travellers about sustainable Arctic ways of living, and (5) commit to sustainable transportation (Rantala et al., 2019).

These recommendations are in agreement with Innovation Norway's 10 principles for sustainable tourism: (1) Cultural wealth, (2) The physical and visual integrity of the landscape, (3) Biological diversity, (4) Clean environment and resource efficiency, (5) Local quality of life and social values, (6) Local control and commitment, (7) Job quality for tourism employees, (8) Guest satisfaction and security; Quality of experience, (9) Economic sustainability and competitive tourist destinations through local value creation, and (10) Economic sustainability and competitive tourism businesses (<https://business.visitnorway.com/no/barekraftig-reiseliv/sustainability-and-tourism-in-innovation-norway/>)

The trend in tourism with impact on Svalbard is that the market looks for cultural experiences more than experiences of nature only. It means that the tourist operators need to offer experience-packages, including cultural heritage and activities in nature, that strengthen the awareness of and tolerance limits of the environment, the local population and its culture

Regenerative tourism: the next step in sustainable tourism. How can we develop guidelines and standards for best practices within research, and how can we improve resource management. And finally: how can we engage communities in planning and implementation of cultural heritage tourism in the Arctic?

Management of cultural heritage sites is high priority important for the society, as express in the recent parliamentary white paper "New goals for Norway's cultural environment policy — Meld. St. 16 (2019–2020)". The document describes the cultural environment as "a common good and a community resource contributing to both environmental, social, and economic sustainability". The importance of cultural heritage is stressed in several international conventions (e.g., UNESCO 1972; Council of Europe 1992) and described as sources of collective memory as well as instruments for historical and scientific study. In the Horizon Europe programme innovative research on the European cultural heritage is one of the priority research areas.

Through the cultural heritage projects presented at the workshops in August 2022 and February 2023, a number of actions are proposed to as practices to protect cultural heritage sites in Svalbard. One of the actions is to extend the methods to document sites by developing citizen science tools where tourist and other can contribute with registration of objects. More collaboration between tourist operators and cultural heritage managers is therefore recommended. Another action is to develop criteria for how to prioritize which sites should be protected, because climate change has dramatic impact on degradation of many objects. This makes it impossible to protect all the sites around Svalbard.

6. References

Danielsen, Finn, Noor Johnson, Olivia Lee, Maryann Fidel, Lisbeth Iversen, Michael K. Poulsen, Hajo Eicken, et al. *Community-Based Monitoring in the Arctic*. University Press of Colorado, 2020. <http://www.jstor.org/stable/j.ctv21fqh1v>.

Hovelsrud Grete K, Bjørn P. Kaltenborn & Julia Olsen (2020): Svalbard in transition: adaptation to cross-scale changes in Longyearbyen, *The Polar Journal*, DOI: 10.1080/2154896X.2020.1819016

Pearlman J, Buttigieg PL, Bushnell M, Delgado C, Hermes J, Heslop E, Hörstmann C, Isensee K, Karstensen J, Lambert A, Lara-Lopez A, Muller-Karger F, Munoz Mas C, Pearlman F, Pissierssens P, Przeslawski R, Simpson P, van Stavel J and Venkatesan R (2021): Evolving and Sustaining Ocean Best Practices to Enable Interoperability in the UN Decade of Ocean Science for Sustainable Development. *Front. Mar. Sci.* 8:619685. doi: 10.3389/fmars.2021.619685

Pearlman Jay, Olivia Lee, Siri Jodha Khalsa, Noor Johnson, Peter Pulsifer, Pauline Simpson, Alice Bradley (2022): The Arctic Practices System - Use and Benefits of Arctic Practices in Observing, Data Management and Applications. White paper submitted to AOS, March 2022. https://arcticchange.org/sites/default/files/2022_017_Pearlman.pdf

Rantala, O., et al., Arctic tourism in times of change: Seasonality. Nordic Council of Ministers, 2019. www.norden.org/nordpub, <https://www.researchgate.net/publication/345455494>, DOI: 10.6027/TN2019-528

Sinitsyn, A. O., I. Depina, Y. Bekel, S. Christensen, D. van Oosterhout: Development of coastal infrastructure in cold climate. Summary Guideline. SFI SAMCoT report, SINTEF Research 70, 2020. https://www.sintefbok.no/book/index/1263/development_of_coastal_infrastructure_in_cold_climate_summary_guideline_sfi_samcot_report

Appendix

List of participants in the workshop 7-8 February 2023 at Polheim, Longyearbyen

| Name | Institution | e-mail |
|-----------------------|----------------------|----------------------------------|
| Beate A. Pedersen | NIKU | Beate.pedersen@niku.no |
| Ionut Crisi Nicu | NIKU | Ionut.cristi.nicu@niku.no |
| Dina Hestad | CCHANGE | Dina.hestad@cchange.no |
| Teresia S. Aarskog | CCHANGE | Teresia.aarskog@cchange.no |
| Hege Anita Eilertsen | Svalbard Museum | Hege.eilertsen@svalbardmuseum.no |
| Lise Loktu | NIKU | Lise.loktu@niku.no |
| Michael Køie Poulsen | NORECO | mkp@nordeco.dk |
| Ronny Brunvoll | Visit Svalbard | ronny@visitsvalbard.com |
| Aud Andersen | UNIS/local community | Aud_andersen@hotmail.com |
| Astrid Stallemo | NERSC | Astrid.stallemo@nersc.no |
| Stein Sandven | NERSC | Stein.sandven@nersc.no |
| Hilde Fålun Strøm | Polheim | Hilde-fs@online.no |
| Sylviann Kårvatn | VARD (day 2) | skarvatn@icloud.com |
| Raphaelle Descouteaux | UNIS | raphaelled@unis.no |
| | | |
| Online: | | |
| Paloma Guzman | NIKU | Paloma.guzman@niku.no |
| Karen O'Brien | CCHANGE | karen.obrien@sosgeo.uio.no |

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| 3 | Ilisimatusarfik | Ilisimatusarfik, Grønlands Universitet, University of Greenland | GL |
| 4 | AWI | Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung | DE |
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