



CAPARDUS - Capacity-building in Arctic standardization development

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EXECUTIVE SUMMARY

This report describes the work performed in the Svalbard case study from the start of the project until October 2022. During the pandemic physical meetings and workshops could not be organised in Svalbard because of travel restrictions. The activities in this period was limited to online meetings with representatives from the local community in Svalbard, literature search and uploading of documents to the Arctic Practice repository under the Ocean Best Practice System. Collaboration with AECO (Arctic Expedition Cruise Operators) continued through online meetings and participation in a digital workshop which was organised in collaboration with CultCoast, a project working with cultural heritage research in Svalbard. The first physical workshop in Longyearbyen was organised in collaboration with Svalbard Social Science Initiative, where the objectives was to build connections between Svalbard-related social science research and the local community in Longyearbyen in the context of climate change and its impact. During the Svalbard Science Conference in Oslo in November 2021, a side-meeting was organised with 30 participants from projects working in Svalbard. In August 2022, a 4-day workshop was organized with the title "Community-based monitoring and Citizen science in the Svalbard area". The objectives of the workshop was to (1) review status of Community-based monitoring and Citizen Science (CBM-CS) systems in Svalbard and other Arctic areas and identify issues in further development of the systems; (2) plan and identify CBM-CS activities in support of cultural heritage research in Svalbard; (3) review guidelines, practices, standards and regulations which are relevant for CBM-CS activities in Svalbard and Arctic in general; and (4) discuss how an Arctic Practice System should be designed to be a useful digital resource for people living and working in Svalbard. The report summarizes the activities and outcome from each of the four days, including the discussions in breakouts with plans for further work on developing CBM/CS systems in Svalbard.

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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 is therefore focused on guidelines and standards related to collecting data and building knowledge to support planning and decision making in Svalbard.

2. Activities, meetings and workshops in 2020-2021

2.1 Online meetings during the pandemic

NERSC has organized and participated in several online meetings and workshops with the Local Council in Longyearbyen, tourist operators in Svalbard, other research projects and members of the Svalbard Social Science Initiative. The meetings with the Local Council discussed the needs for data collection, and environmental monitoring to support the areal planning in the region, in particular areas for building houses and infrastructure versus areas to be protected. The objective of the meetings is to strengthen collaboration across sectors and institutions, build trust and identify topics of concern, needs for data and coordination of data for decision making, and future proposals to take actions. This collaboration with actors in Svalbard started in 2016 as part of the INTAROS project and is now continued under CAPARDUS.

2.2 Review of documents on standards, guidelines and practices

A number of documents have been identified as part of the systematic review of standards for the Svalbard area. A selection of these documents have been registered in the Arctic Practice repository (<https://repository.oceanbestpractices.org/handle/11329/1291>) under the Ocean Best Practice System. The document types range from traditional scientific/technical publications to assessment reports from the Arctic Council and national agencies, reports on status and plans for management of natural hazards, guidelines on data management, tourist guidelines, ethical guidelines, business plans, policy documents as well as legal and regulatory documents. All these documents can contribute to the standardisation continuum in the Arctic. Furthermore, these documents were analyzed in terms of types, themes, subthemes and various attributes to characterize the method or standard described in the documents, as part of the work in WP1.

2.3 Collaboration with Arctic expedition cruise operators (AECO)

Collaboration with expedition cruise operators, including their organization AECO, has been established to strengthen the Arctic observing systems through development of community-based monitoring (CBM) pilots and citizen science (CS) programs. This collaboration was initiated by NORDECO under the INTAROS project. Several such programmes have been initiated where tourists travelling on expeditions are data collectors regarding marine mammals, birds and other environmental data (see Poulsen et al. 2021, poster at EGU).

2.4 Collaboration with cultural heritage research in Svalbard

In March 2021 a workshop was organised in collaboration with the CULTCOAST project where one of the objectives is to monitor, manage and protect sites and landscapes in Svalbard under climate change. The workshop was held online with 10-12 participants with presentations how to strengthen Arctic observing systems through development of community-based monitoring (CBM) and citizen science (CS) programs. The workshop included cruise operators, local guides, representatives for the Governor.

A result of the CAPARDUS/CULTCOAST online workshop was to plan a physical workshop in Longyearbyen in 2022, where plans for further development of CBM and CS projects were discussed. The CAPARDUS/CULTCOAST collaboration has extended the network of projects working on Svalbard, including both natural science and social science projects. The Svalbard Social Science Initiative has been established to as a forum where researchers are in dialogue with different actors in the local community.

2.5 Engagement with Svalbard Social Science Initiative

The Svalbard Social Science Initiative is an association of social science, humanities and arts-based researchers working with a wide range of issues in Svalbard. Since it was established in 2019 the SSSI has organised a number of events in collaboration with NERSC and with support from the Svalbard Strategic Grant, the H2020 INTAROS project and the ongoing CAPARDUS project. The SSSI helps to coordinate research activities and communication with the local community through the website (<https://svalbardsocialscience.com/>) and seminars in Longyearbyen. The members of the SSSI have broad expertise in social science disciplines and are involved in the activities to be organized under the CAPARDUS project.

2.6 Side meeting at Svalbard Science Conference in Oslo in November 2021

A networking project funded by the Svalbard Strategic Grants supported a side meeting to the Svalbard Science Conference in November 2021 in Oslo. The side-meeting had more than 30 participants and the presentation given in plenary at the Svalbard Science Conference 2-3 November 2021. These events were used for networking, where CAPARDUS is a major contributor respond to the need for national and international collaboration, coordination and cooperation in data gathering between natural sciences (cryosphere, biosphere) and social sciences (health, economy, community planning, etc.). Data collection in the Svalbard region is growing as a result of more research projects in the Arctic. Most of the data are collected in natural sciences (climate and ecosystem research), but social science data have started to become more important because the research need to serve the societal needs and improve the living conditions for people living and working in the Arctic.

3. CAPARDUS workshop in Longyearbyen 6 – 9 August 2022

Background and planning

The collaboration between CAPARDUS and CULTCOAST was further developed by planning a joint workshop in Svalbard over four days. The workshop was entitled “Community-based monitoring and Citizen Science in the Svalbard area. The venue was UNIS, the University Centre in Svalbard, where about 30 people were invited to attend. 20 attended in-person, while about 10 participated online (see Appendix).

The CAPARDUS project is working with guidelines, practice and standards of importance for people living and working in the Arctic. The project has particular focus on Community-Based Monitoring (CBM) and Citizen Science (CS) initiatives which are evolving across the Arctic,

providing complementary data to the scientific observing systems. A prerequisite for good planning is access to data and information of relevance to people in the Arctic. CBM/CS systems are initiated by people who need specific environmental and climate information to support management of resources, local decision-making and safety of human activities. Challenges for CBM and CS projects in the Arctic are mainly to (1) bring CBM/CS systems from *ad hoc* initiatives to sustainable observing systems, (2) provide data sharing, including links to scientific data systems, (3) make use of CBM/CS data in decision-making, and (4) establish sustained funding.

The CULTCOAST project has focus on studies of cultural heritage and cultural environments at high latitudes. Cultural heritage values are under serious threat from multiple sources, including inadequate safeguarding, climate change and pressure on land areas. The CULTCOAST project aims to assess the possibilities for the long-term preservation of legally protected archaeological and built cultural heritage sites in the context of geo-hazards caused by changing climate conditions, and to suggest innovative tools for risk assessment, mapping, evaluating, prioritising, mitigation and sustainable management of heritage sites. The project focuses on (1) first, sustainable use and protection of coastal cultural heritage, cultural environments, and cultural landscapes; (2) secondly, on climate change induced geo-hazards; and (3) thirdly, how public management can safeguard cultural history values.

The workshop was planned to address topics of mutual interest for both projects, resulting in a four-day programme, summarized in the next sections.

Day 1: Cultural heritage work in Svalbard

The focus of day 1 was to present cultural heritage research activities in Svalbard, mostly from the CULTCOAST project led by NIKU. The programme was set up in by Vibeke Vandrup Martens who gave presentation together with colleague at NIKU, Anne Cathrine Flyen, who worked at the governor's office on cultural heritage for almost 6 years.

There are more than 2000 sites of cultural heritage on Svalbard. All traces from human activity dating from before 1946 automatically protected by the Svalbard environmental protection act. Svalbard was first discovered in 1596. Longyearbyen was an American-Norwegian mining town from 1906 until 1916. Ny-Ålesund, a coal mining town from 1916, has developed into an international research station today. Hiorthamn, located on the opposite side of the fjord entering Longyearbyen, is an abandoned mining town from 1917. Some buildings are owned by private actors and they are in use as holiday homes.

There are also sites and cultural heritage from the Second World War, but not much of this is registered in a good way. Climate change is affecting Svalbard to a very large degree. Svalbard used to be an arctic desert but this is now no longer the case. More rain and snow is challenging the cultural heritage as well as the built environment. There are no signposts for cultural heritage on Svalbard today, thus the guides are very important for the protection and information about the cultural heritage sites and objects.

The climate change, which is now accelerating in the Arctic, is impacting the cultural remains very quickly. The main degradation parameters are geohazards and biological decays, which are enhanced by the climate change, and human wear and tear caused by increased tourist traffic. The natural and human induced degradation reinforces each other, leading to rapid changes which can be observed from year to year.

Many cultural heritage sources of information about "everyday" people's lives are not recorded in the history books, like many things connected to the mining activity. With the changes in the permafrost layers, information about former activities and sites will be lost. A central question

is how long it helps to preserve the fields/ sites and the objects on the sites. We need to excavate and document the sites and objects, but also to see how we can act in these areas, and how we can be present, without further damaging the cultural heritage.

Vibeke stated that there is a paradigm shift in archaeological management. We need to ask ourselves what is the best ways to document cultural heritage and the history connected to it, is it by keeping them on site and let nature continue its work, or is it by moving objects or documenting them and making digital models, illustrations, movies and storytelling



Figure 3.1 Photos from the Hiorthhamn area Svalbard, where the CULTCOAST project conducts research related to climate change impact on cultural heritage sites.

It is a challenge to manage the cultural heritage because there are contradictory political goals for Svalbard. The growing tourism is creating jobs and economic spin-off, which is wanted because coal mining needs to be replaced by other industries. On the other hand, tourist traffic can cause damage on cultural heritage sites and environment, both are vulnerable to the climate change. It is therefore also a requirement to impose restrictions on the tourism, for example by regulating where the tourists can go and the size of the tourist groups. A recommendation from the CULTCOAST project is to develop a knowledge- based management system for cultural heritage, because only a limited selection of historical sites can be preserved. Most of the sites will be left for degradation by the climate change. A knowledge-based management system will need to collect more data on environmental change and the cultural heritage sites around the Svalbard archipelago.

Joanna Hambly, University of St. Andrews presented the project “Scotlands Heritage at Risk” from 2012 to 2016 where citizen science was introduced as a method to survey the coastal zones. Today this initiative, called SCAPE (Scottish Coastal Archaeology and the Problem of Erosion) is a well-established programme involving the public in detection and registration of archaeological sites (<https://scapetrust.org/>). The SCAPE app has been developed as the main tool for surveying the coastal zones and identify sites at risk (Fig. 3.2). The data collected by the app are quality-controlled by scientists and stored in national archive CANMORE (National Record of the Historic Environment, <https://canmore.org.uk/>). The SCAPE programme includes training and guidance for volunteers who want to participate in detection and registration of new sites. Like in Svalbard many of the archaeological sites in Scotland are exposed to increased erosion due to climate change. Risk assessment of the sites based on data from SCAPE is important for making decision on protection measures.

SCAPE has been used for 20 years involving volunteers to provide information on sites or concerns about cultural heritage. There is now a coastal zone assessment survey of about 35% of the coast of Scotland, and this was conducted in the period from 1996 until 2009. It has documented more than 12,000 sites. They decided to involve people broadly in the work and in 2011 they created tools for participation, and launched a website together with a light version of the app. They had training courses in a “school-setting” in the beginning, but later it has been more important to do the training in the field. They are more out with the volunteers now, and they see that they obtain better training experience and results this way.

The community coastal zone assessment survey in 2022, where volunteers and communities took part at the very heart of the survey, was really improving the former work. This was an important part of the project, and changed both the mindset and technology of the project. Now the colleagues/ volunteers are with them at every step of their work.

Scotland is a rather small country so the field of research and universities are closer to the national organisations and institutions, making it easier to collaborate. There is no recipe for effective public involvement though, it has to do with a generous handful of enjoyment, interest and engagement. There is an evaluation report from 2017 available on the webpage (<https://scapetrust.org/>), describing the value of local knowledge. The quality of data information cannot be overstated, and it is much better when they work with citizens and local communities. So taking actions is important, and the outcome of the services and many small projects on digital documents is amazing. There are some language barriers with two scientific or specialist languages and everyday language, so it's important to work on the language part for proposals, for meaningful engagement. It is also important to manage expectations from the participants, but it is clear that citizen participation has great impact for the “research for society”-aspect. In research proposals, this is now valued up to 30% for projects, so to reach out to society or to help in local decision-making and maintenance are important topics.

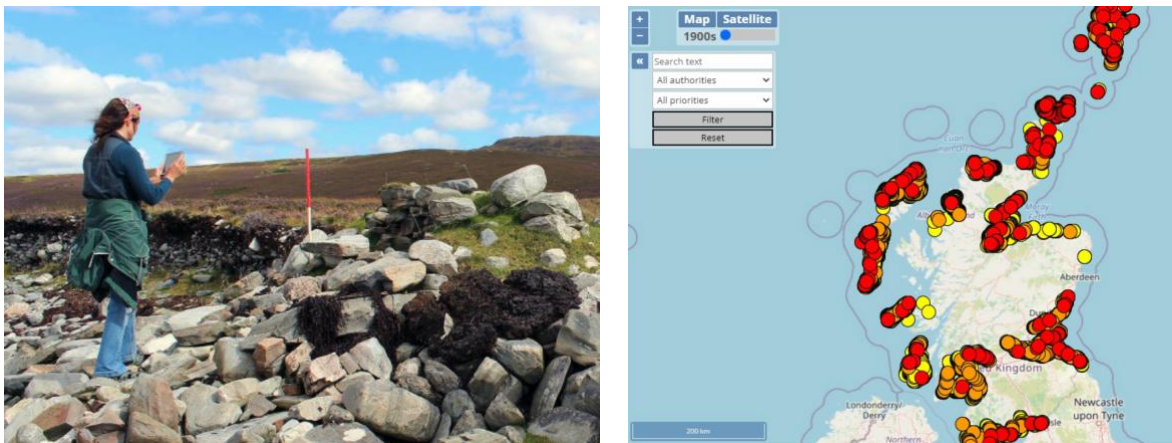


Figure 3.2. Use of the SCAPE app to register an archaeological site in Scotland (left) and a risk map of sites along the coasts of Scotland (courtesy J. Hambly, University of St. Andrews)

Anders Olson, Directorate for Cultural Heritage (Riksantikvaren) presented the role of the directorate and some digital services which are available for Norway in general and for Svalbard in particular. Riksantikvaren develops and operates Askeladden, a nationwide database system for managing cultural heritage monuments and sites. The system uses both database and GIS functionality. The aim is to integrate all data relating to immovable sites and monuments that are protected by the Cultural Heritage Act (except ship wrecks and other marine heritage monuments). Askeladden has about 5000 registered users and about 1000 of these can create content and edit the database. Others have only reading access. Data from Askeladden are available according to Norwegian License for Open Governmental Data, which means that data are shared through GeoNorge cooperation and through own API's. The data can also be used to build new services based on open standards (e.g. Web Feature Service and Web Map Service).

In addition to the official database, Askeladden, the directorate operates a public national website for dissemination of cultural heritage information (Kulturminnesøk, <https://www.kulturminnesok.no/>). The website is designed for both computers and mobile phones, and it allows the public to contribute with their heritage objects, images, comments and links (Fig. 3.3). At present there are about 20000 visitors to the website per month. The directorate continues to improve the interaction with users as contributor to the website. One of the main challenges is the unknown norms and standards for registration of cultural heritage as there are many regional differences in how this is done.

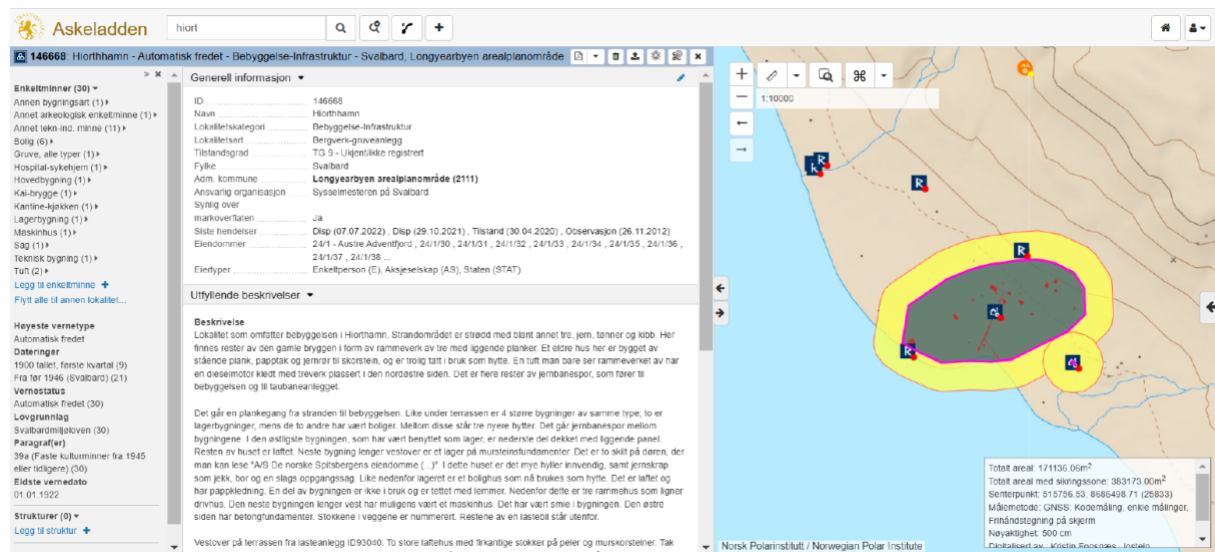


Figure 3.3 Screenshot from Askeladden, showing a map and text describing the Hiorthhamn area, a protected heritage site in Svalbard with many objects from the coal mining period.

Inspired by the coastal heritage work in Scotland, presented by Joanna Hambly and the presentation about Riksantikvaren by Anders Olson, it was suggested to plan a citizen science project where tourists and local community members can discover and register more cultural sites when they travel around Svalbard.

Day 2: Excursion to cultural heritage sites at Hiorthhamn

On Sunday 7 August an excursion to Hiorthhamn was organised in order to show the cultural heritage objects from the coal mining period (Fig. 3.3). The mining town was established in 1917 and operated regularly until 1921, after that only periodically, with the second largest number of listed buildings at a heritage site in Svalbard until 1940.

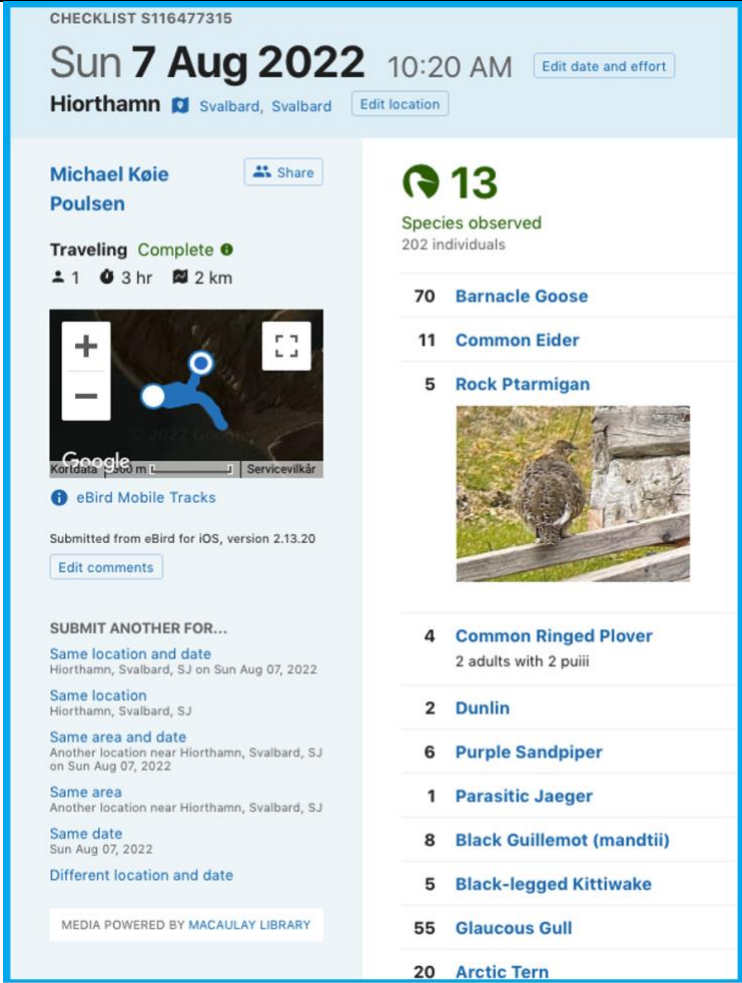


Figure 3.4 Group photo from the excursion to Hiorthhamn

Today, the area is protected, but many of the buildings are maintained by private persons and used as leisure houses. This helps to rescue the buildings and preserve them for the future. The main challenge

is to protect the buildings close to the shore from coastal erosion, in particular the iconic cablecar building which is expected to collapse in the future (Fig. 3.1).

During the excursion Michael Køie Poulsen demonstrated how the *eBird* app works when you are in the field and can register observations of birds with a mobile phone camera (Fig. 3.4). *eBird* is a global observing system for birds, established and operated by Cornell Lab of Ornithology for the last 20 years (<https://ebird.org>). The goal is to gather information from birdwatchers, archive it, and freely share it to power new data-driven approaches to science, conservation and education. *eBird* is among the world's largest biodiversity-related science projects, with more than 100 million bird sightings contributed annually by birdwatchers around the world and an average participation growth rate of approximately 20% year over year. During the excursion it was discussed how to build a citizen science project for cultural heritage sites in Svalbard and elsewhere, building on the experience from SCAPE programme in Scotland.



CHECKLIST S116477315
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Hiorthamn [Svalbard, Svalbard](#) [Edit location](#)

Michael Køie Poulsen [Share](#)

Traveling Complete [1](#) [3 hr](#) [2 km](#)

[eBird Mobile Tracks](#)

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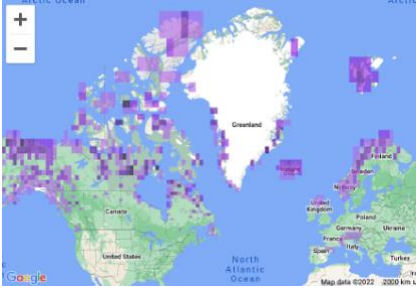
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13 Species observed
202 individuals

- 70 Barnacle Goose
- 11 Common Eider
- 5 Rock Ptarmigan
- 4 Common Ringed Plover
2 adults with 2 puuik
- 2 Dunlin
- 6 Purple Sandpiper
- 1 Parasitic Jaeger
- 8 Black Guillemot (mandtii)
- 5 Black-legged Kittiwake
- 55 Glaucous Gull
- 20 Arctic Tern



Michael Køie Poulsen observing birds in Hiorthamn and registered observations and photos in eBird (left)



[Map of observations of Rock Ptarmigan registered in eBird.](#)

Screenshot of the information eBird about Rock Ptarmigan and other species submitted by Michael Køie Polsen during the Hiorthamn excursion.

Figure 3.4 Example of observation and registration of birds using the *eBird* app during the excursion to Hiorthamn.

Day 3: Citizen Science and Community-based observing systems in the Svalbard region

The programme for day 3 was organised by Lisbeth Iversen and Hilde Fålun Strøm.

Community-based observations (CBM) and Citizen Science (CS) projects play an increasingly important role in environmental and climate data collection. While CBM initiatives are mainly bottom-up initiatives in local communities the CS projects are often driven by scientists and can range from large global-scale projects (e.g. bird watching) to local initiatives on topics of importance in specific areas (e.g. snow avalanche observations). Common for all CBM-CS projects is that they need to be highly relevant and appealing for the public to be successful.

The programme started with a presentation by **Prof. Uffe Jakobsen** on natural hazards in Greenland and how emergency prevention, preparedness and response is organised in this enormous region. Prof. Uffe Jacobsen is employed at Institute of Social Science, Economics & Journalism at University of Greenland (Fig. 3.5). In June 2017 a huge landslide triggered a rare mega-tsunami in West Greenland with severe damage in several communities. The tsunami washed away 11 buildings, damaged the power supply and caused the death of four people. The emergency governance is divided between institutions in Denmark and Greenland, which makes the organisation of response complex with many actors involved. The large distances combined with limited resources makes it challenging to organise responses in case of severe hazards, but after the 2017 event the Greenland authorities have prepared a report on the lessons learned and what needs to be established of warning systems, contingency planning, and other preparedness actions. It is recognized that there is an urgent need to establish guidelines and standards for emergency management to meet future natural hazards. Involving local communities in building observing systems and warning systems is part of this plan, but so far there has only been an invitation to a public meeting. This was more of an informative meeting and not an invitation to participate in any community-based monitoring projects.

In connection with a research project a policy brief draft has been developed, based on the discussion of the consequences of earthquakes, and a better collaboration between Greenland and Canada has been established related to emergency prevention.



Figure 3.5 University of Greenland located in Nuuk, (<https://uk.uni.gl/find-employee/department-of-arctic-social-science-economics/uffe-jakobsen.aspx>) Photo: Lars Maltha Rasmussen.

The presentation by **Gyda Gudmundsdottir** from AECO (Association of Arctic Expedition Cruise Operators) was a very interesting summary of the activities and plans to develop community-based and citizen science activities as part of AECO's expedition programme. AECO was established in 2003 and has now 63 international members and 57 operating vessels. The goal is to develop environmentally friendly, responsible and safe cruise tourism in the Arctic. AECO has therefore produced a number of

guidelines to be used by the tourist guides and the cruise passengers during the expeditions. Gyda is working as a Community Engagement Specialist with AECO since May 1, 2022.

At the annual meetings hosted by AECO both competitive tourist operators and collaborative actors are meeting, discussing possibilities and challenges in this sector of cruise operators. In 2018 Iceland came into this co-operation, and AECO is also working with communities in Greenland. Expedition cruises has to do with **the destination** as the product. They are also involved in search and rescue operations and they have developed 64 guidelines and work with 1500 guides.

Citizen science has become a central part of the expedition cruises, because it has become a demand from the customers. The involvement of tourists in research and data collection gives them direct access to observation of the climate change and thereby a deeper understanding of the environment they are visiting. For the scientists, the expedition cruises offers a way to collect more environmental data from larger areas, compared to what the scientists can do alone. The collaboration between tourists and scientists is of mutual benefit, where the educated tourists become ambassadors for the environment (Fig. 3.6).

On board the ship education is seen as an integrated part off of the expedition, and all AECO members have lectures in different subjects like biology, climate environmental issues et cetera. They have a lot of requests from different research projects and institutions to take part in programmes and projects, but this needs to be valuable and clear when it comes to roles of the participants. AECO has a lot of lesson learned reports to build on, as presented in <https://www.aeco.no/resources-and-tools/>

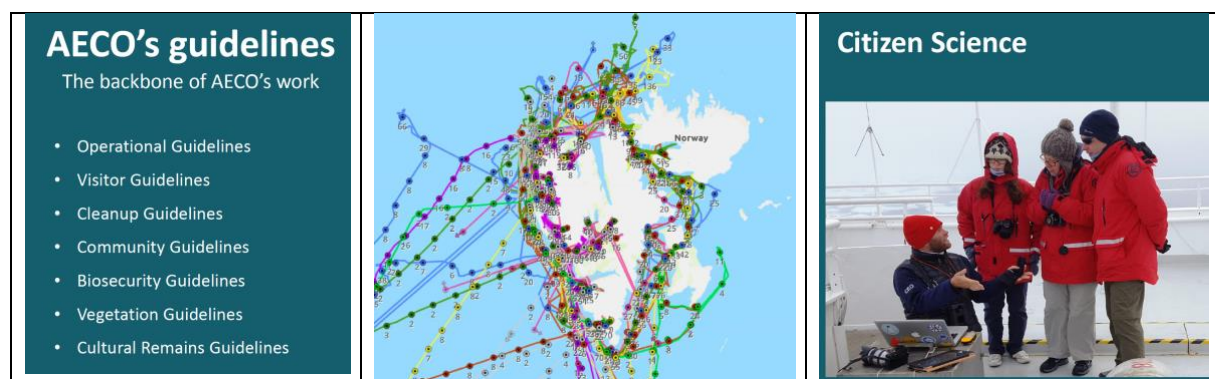


Figure 3.6. The list of guideline documents provided by AECO (left), ship track of cruises around Svalbard organised by AECO (center) and involvement of tourists in Citizen Science activities on the cruises (courtesy Gyda Gudmundsdottir).

Michael K ie Poulsen gave a presentation where he summarized the Citizen Science projects that are most developed and are involved in Arctic data collection. The global projects such as iNaturalist, Happywhale and eBird (Fig. 3.4) have been developed over many years and include data from the Arctic. A group of polar scientists and expedition cruise operators have set up an organisation called the Polar Citizen Science Collective (www.polarcollective.org) which facilitates ship-based citizen science projects on AECO and other vessels. In 2022 there are six projects involved: Aurorasaurus, NASA GLOBE Clouds, Seabird Surveys, Secchi Disk Study, Happywhale and FjordPhyto.

In the last few years there has been increased focus on educating the guides and training the tourists in how to behave when they go ashore at the visiting sites around Svalbard. This includes areas with cultural heritage remains, but it is often difficult to see the remains to avoid stepping on them.

The following presentations were given by a group of people who work and live in Svalbard or have connection to the tourist industry. They have therefore first-hand knowledge about the tourist activities in Svalbard and the climate change impact on the Svalbard society.

Hilde Fålund Strøm has long background in Arctic tourism as expedition leader and is presently leader of Hearts in the Ice (HITI) together with Sunniva Sorby. HITI is promoting engagement in climate change and conducts citizen science work for different projects (<https://www.heartsintheice.com/>). During the overwintering at Bamsebu, Hilde and Sunniva collected data for NASA, UNIS, Norwegian Polar Institute and other research institutions. Such overwinter expeditions provide a unique possibility to collect in situ data in areas and seasons when such data are difficult to obtain.

Hilde also told her story about how she had become interested in the north from childhood, inspired by her father and also by the old trappers. She has been living in Longyearbyen for almost 30 years. December 2015 an avalanche hit the town and demolished her neighbour houses, and some people lost their lives. Then there was another avalanche in 2017. Both these disasters changed her life and mindset, and she wanted to make a difference, and got involved in citizen science through Hearts in the Ice.

Prof. Janne E. Søreide at UNIS presented citizen science projects in the Svalbard area related to marine ecosystem research in collaboration with other scientists, tourists and expedition operators such as Hearts in the Ice. Citizen science activities at UNIS are contributing to data collection in science disciplines such as sea ice, glaciology, permafrost, precipitation/runoff, ecosystems and coastal erosion. In all of these disciplines, climate change has severe impact and the observations are needed for research as well as for natural hazard preparedness and prevention.

Dina Brode-Rogers, PhD candidate at University of Leuven, works with the societal changes in Svalbard in her PhD thesis. She lives in Svalbard and presented some of her work where she conducts interviews with people different background to study the importance of cultural heritage, tourism, research activities and how the Svalbard community should be developed in the future. Dina gave an introduction to her PhD project and presented a case from her PhD Project, the FOSSIL project. In her PhD work she is asking the question: what could she give back to the local society she is living in while working on her PhD ? She is looking at Svalbard through seven lenses in her cultural studies. FOSSIL is a project connected to the reuse of the old power plant in Longyearbyen. It was shut down in 1984. There is a lot of asbestos in the building, which actually saved it from being demolished. In 1992 the Svalbard law/ protection law, decided that all buildings and remains from before 1946 was automatically protected. Dina engaged in focus group interviews with people who had visited the power plant, and the feedback was that FOSSIL needs to be a living part of the town.

Ronny Brudvoll, CEO of Visit Svalbard, the official tourism board for Svalbard and Longyearbyen. Visit Svalbard is a member based organisation and a neutral development and coordinating organ of the local tourism industry. They are also responsible for the tourist information centre, and the official travel portal for Svalbard. He presented the challenges for the tourist operators, who will meet increased regulations which will limit the growth of the industry to make it sustainable.

From 1 January 2020 new regulations for ships around Svalbard were implemented. The regulations banned all ships with more than 750 passengers. There are approximately 130.000-140.000 visitors to Svalbard each year. They are working to extend the tourist season, which has been from March until September. Visit Svalbard wants to work with the season from October to January and develop tourism products and destination development for this dark season. In their work with the Destination Svalbard 2025 Masterplan, Visit Svalbard wanted to have growth in tourism. Now they are more concerned with sustainable development and sustainable destination management according to the Innovation Norway standards for sustainable tourism. They have established a new position with a person working as a sustainability coordinator, and they have a project with Store Norske on cultural heritage called “Optimal Balance”. There is now a capacity problem on Svalbard related to tourism. Everything takes so much time to clarify, and you have to ask permission for all operations and activities. The new national Park Centre project with Svalbard museum is something they want to collaborate on, as well as to further develop and fill with quality all the landbased activities and “things to do” for visitors in Longyearbyen. There are no required courses for guides on Svalbard, but Visit Svalbard is providing training for guides, and there is a possibility to take a one year course for guides at the university of Tromsø.

Karin Strand, CEO of Hurtigruten, gave an online presentation where she highlighted the importance of engaging tourists in science activities on the expeditions. Hurtigruten has been working with Børge Damsgård at UNIS, for several years to develop citizen science, but this activity is really under-utilized. Through citizen science projects the guests can be directly involved with scientists, and almost all of them are interested in participating. People can be ambassadors, but they only invest their time in the engagement if it is for real, or the results make a difference. Within the global marine mammal monitoring there is an increased potential beyond what we are doing today through the guides. Hurtigruten has become a trusted partner, and the guides are more frequently approached by scientists interested in collaboration. The company has hired a number of researchers, and Verena Meraldi has been leading this work for 4 years. At University of Tromsø there is a one-year course for guides, which offers training of ca 30 guides per year (see below).

Hedda Andersen, is guide and scientist onboard MS Fram, one of the Polar expedition cruise vessels of Hurtigruten. She talked about educating tourists on climate change under the title "The irreversible - an appeal for action". Hedda appealed for action to educate visitors, inhabitants and others on climate change and the environment. During the expedition cruises, the guests are included in data collection and research and at the same time they are educated in climate topics. The information given to people should be honest, simple and visually captivating. Svalbard is exposed to the most dramatic climate change with a temperature increase seven times higher than the global mean temperature. We need to get information out and communicate it well, to make it reliable and visible. It is therefore important to connect science and nature experiences, and collaborate on observations, using for example updated photos and historical photos to evaluate the changes.

Sigmund Andersen, University of Tromsø (UiT), presented the Arctic Nature Guide, a 1-year education program for guides to be engaged in future arctic tourism. Sigmund is responsible for the education together with his team of two people, and in collaboration with UNIS and guest lecturers. All education is going on in Svalbard, and one third of the students are non-Norwegians. UiT provides experimental learning in groups, because it's very important with the group dynamics. The group-approach has to do with the ability of working on an "inclusion learning culture" in the group, focusing on the guides role and the responsibility, joy and comfort for the people taking part in expeditions or trips (Fig.3.7).

Challenges for guides in the future of Arctic tourism has to do with a nature in change, the commercial reality and the dilemma of tourism. Climate change, melting glaciers and lack of ice on the fjords and increased amounts of avalanches are parts of the picture. Cultural heritage is also threatened by this. The governor provides a 4 to 5 day course on cultural heritage as part of the education and training. They fill up the study with around 30 students every year. The challenge is that many do not want to work as guides after they have finished the course, because they just want to experience in the Arctic. See the video: https://uit.no/utdanning/program/345066/arctic_nature_guide_-_one_year_programme



Figure 3.7. Activities during the Arctic Nature Guide programme. Courtesy: UiT Arctic Nature Guide.

Helga B Kristiansen and **Maria Antonsen** presented MARFO: The Norwegian Centre Against Marine Litter, under the Ministry of Climate and Environment, which is active in building Citizen science tools for mapping and cleaning up marine litter. Both Helga and Maria are involved in the RYDDE and RENT HAV Projects (<https://www.marfo.no/rent-hav/>). Tourism is part of the pollution problem and littering challenge, but it is important to understand that tourism can also be part of the solution. In the work they have very good communication with several departments many volunteers, beach cleaners and people involved, and it is very important to move forward in these collaborations. They have a website but are also developing an app to make information more accessible and useful to people who want to engage RENT HAV.

Per-Gunnar Hettervik, is senior advisor in Norges Vel (The Royal Norwegian society for development) and manager of the EU-project CraftGo. Norges Vel is a non-profit, independent organisation working with promoting and supporting new industries, entrepreneurship and creating strong local communities. He presented the main trends in the tourist industry and the particular motivations for adventure tourism (Fig. 3.8). Furthermore, he explained the concept of regenerative tourism, which will be the next step in developing sustainable tourism. Regenerative tourism seeks to leave a place in a better condition than before the tourists arrived. It creates robust local communities that care for the visitors and respect biodiversity. It also provides local economic sustainability and supports local ownership. For Svalbard as well as other tourist destinations, regenerative tourism is becoming the new paradigm, which will reframe the scope and role of cultural tourism in the arctic. It can reinvigorate and rebuild relevance for local communities, and the development of proper guidelines and best practice standards can enhance research and resource management.

In his presentation he debated overconsumption and the shift in paradigm in the travel industry, and current trends in tourism as well as research on motivations for travel. The presentation also demonstrated how cultural experiences are valued more than experiences of nature, and how we need to create bookable experience-packages, including cultural heritage and activities in nature, that strengthen the awareness of, and the tolerance limits, of the environment and respects the local population and its culture. One such community is the Économusée movement (NO: Håndlaget), dedicated to preserving and commercializing crafts, and how organizations like these can contribute towards regenerative tourism, and even more significantly how recent technological advances, e.g. beacons and mobile solutions, can engage the public in protecting, reporting and documenting cultural heritage sites.

Segments to look into for tourism is *Sharing and caring, Social immersion and Broadening my cultural horizon*. Both activities, nature- and cultural perspectives are parts of tourism, and his experience is that the tourists generally want to do good. The motivation of the tourist could be about learning to know new areas and get an expanded world view. One way of making sure tourism can be part of the solution is to work with what is called adventure tech or beacons sensor technology, where you can use an app on your cellular phones even if you are in areas without internet connection. He is referring to a project that has been tested out at the University of Bergen together with smart cities Stavanger.

In the last session, Per-Gunnar organised group work on «design thinking» where the participants discussed the following topics:

- (1) The value of cultural heritage in sustainable tourism development
- (2) Regenerative cultural heritage experiences for visitors/local community
- (3) How can we develop guidelines and standards for best practices within research, and how can we improve resource management.
- (4) And finally: how can we engage communities in planning and implementation of cultural heritage tourism in the Arctic?

Design thinking is a non-linear repetitive process that teams use to understand users, challenge guesses, redefine problems and create innovative solutions to prototype and test. This short version was meant

as an introduction to how to use design thinking as a method, in order to better understand the user's needs and motivation and find new creative solutions for CBM (community-based monitoring) as well as CS (citizen science) as a means to monitor cultural Heritage and tourism in the artic. And how this method can be applied in terms of regenerative practices based on motivations for adventure travel (Fig. 3.8). The results of the design thinking are summarized in section 4.



Figure 3.8. The motivating factors for adventure travels, from ATTA, 2021 (Adventure Tour Operator Snapshot Survey), Courtesy Per-Gunnar Hettervik, Norges Vel.

Day 4: Arctic Practice System

Jay Pearlman, Françoise Pearlman, Pauline Simpson and Siri Johda Khalsa organised the programme on day 4.

Jay Pearlman, introduced the Arctic Practice activities in the CAPARDUS project, where one of the goals is to design an Arctic Practices System (APS). The system is envisioned to be a sustained repository for practices related to environmental observations, resource exploitation and other activities in the Arctic. A 'practice' means a documentation in digital form of how things are done for example in observation of a specific ocean phenomenon. What an APS should do will be identified in dialogue with

people living or working in the Arctic with knowledge about practices in their daily work. The APS will cover the whole “value chain” from societal requirements, to data acquisition, products, services and societal benefits (Fig. 3.9).

The APS will be designed from practices and methods of the local communities and other actors who are involved in the project through the workshops and research schools organized by CAPARDUS. A first survey on requirements for an APS was conducted in January-February 2022, as preparation for the CAPARDUS session during Arctic Science Summit Week 2022. Major outcome of this survey was the importance of (1) including indigenous methodologies and practices; (2) accessibility of the contents through several platforms, in particular mobile phone, (3) focus on practices linked to training, and (4) language issues. The latter implies that the APS should have a user-friendly language and facilitate for multilanguage services. A particular challenge is indigenous languages, which is important for inclusion of indigenous knowledge.

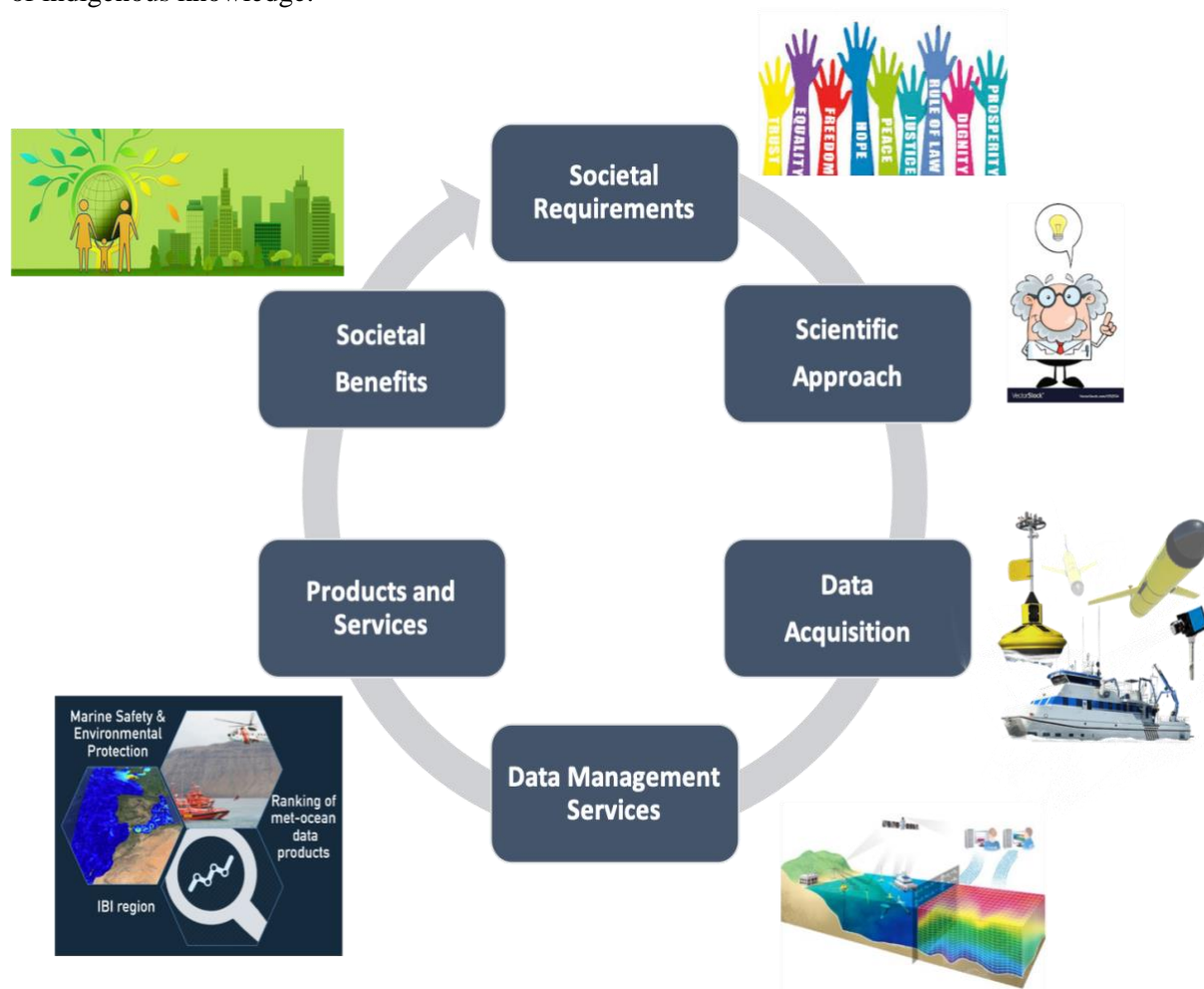


Figure 3.9. Ocean observing value chain from requirements to societal benefits (Pearlman et al., 2019)

Jay stated that words are messy and can have different meanings depending on who you talk to. In CAPARDUS we use the terms Practices, Use Cases, Pilots, Repository, Value chain and Metadata, which can mean different meanings between places, cultures and context. Practices are adopted to culture, use cases could be more of a traditional culture, and then we have stories of experience and talk about what people do. Jay presented the Ocean Best Practice system, which is permanent repository for documents. During the presentation the question of the issue of legal constraints and localities were raised. Jay explained that to create common licenses could be a solution to better secure how for example an article can be used.

Siri Jodha Khalsa, introduced the Arctic Practices survey which was a follow-up of the survey in January-February. The participants responded to a set of questions, and the results will be presented in deliverable D6.1 – Guidance on how to develop an APS.

The Arctic Practices System (APS) will build on the UNESCO/IOC Ocean Best Practices System (OBPS, Fig. 3.10, www.oceanbestpractices.org), which was implemented to address similar challenges in the marine domain, hosting forward-facing best practice management system in tune with standards in global ocean observing. The Ocean Best Practice System (OBPS) was which formally adopted as an IOC project in June 2019 under Decision IOC-XXX/7.2.1 (<https://www.oceanbestpractices.org/>). The OBPS is hosted at the Project Office of IODE of IOC-UNESCO in Oostende, Belgium and managed by a Steering Group representing major Stakeholders: (i) Representatives from IOC Programmes (ii) Invited Experts from the full value chain of the ocean observing community (iii) Representatives of IODE and GOOS Secretariats. The CAPARDUS partners have key roles in OBPS as co-chair (Jay Pearlman), leader of the repository operation (Pauline Simpson), leader of advanced technology and interoperability (Pier-Luigi Buttigieg), and leader of communication and outreach (Francoise Pearlman).

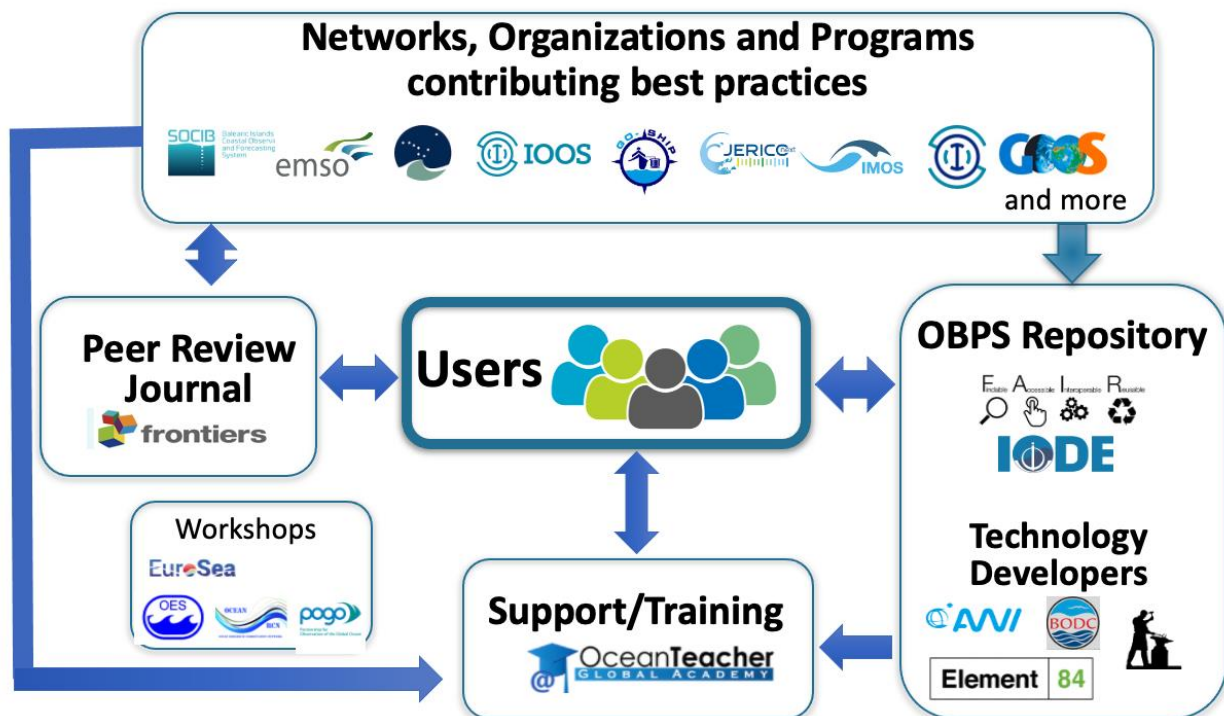


Figure 3.10. Diagram of the components of the Ocean Best Practice System. The Arctic Practice System will involve a wider group networks, organizations and programmes covering the marine, terrestrial and other Arctic specific disciplines as well as CBM systems.

Pauline Simpson had prepared an instruction video about the Ocean Best Practice System repository, where the user can search for best practice documents or submit own documents that contribute to populating the repository (<http://repository.oceanbestpractices.org>). As part of CAPARDUS a testbed for the APS has been established, called Polar Collaborations, where presently 154 documents are registered (October 2022). Many of them are related to the topics of CAPARDUS and inserted by the project members.



Pauline Simpson
Project Manager, IOC Ocean Best Practices System
CAPARDUS WP Team Member

Ocean Best Practices System (OBPS) Repository:

providing a test bed for a CAPARDUS Arctic Practices System

Presented at:

Community-based monitoring and Citizen science in the Svalbard area
Workshop, Longyearbyen, Svalbard, 06 – 09 August 2022

Figure 3.10. Front page of the OBPS instruction video which is about 26 min long and available at <https://www.dropbox.com/home/CAPARDUS-6-10-Aug-2022/Video%20OBPS?preview=OBPS+Intro+and+Demos.mp4>

Ilka Matero from SIOS Knowledge Centre, gave a presentation on data management and practices at Svalbard Integrated Arctic Earth Observation System (SIOS). SIOS is a Norwegian initiated international collaboration to create a regional observing system with focus on the Svalbard region. The SIOS mission is to coordinate, optimise and support the development of distributed research infrastructures owned by the member institutions. SIOS produces the annual State of Environmental Science in Svalbard report, aiming to be an authoritative source of information for the region.

Lisbeth Iversen, Nansen Environmental and Remote Sensing Center (NERSC) and Oslo School of Architecture and Design (AHO) gave a review of previous meetings and workshops as described in section 2. Furthermore, she presented the land-use planning process for the areas where economic activities are foreseen, which are located in the settlement areas in Svalbard. The planning process is balancing between the precautionary principle and the knowledge-based principle. The latter is based on local knowledge combined with the new research results, where the term «co-creation» is used. An example of co-creation of knowledge was the excursion to Hiorthamn where scientists and members from the local community discussed cultural heritage issues and what should be done to meet the challenges caused by the climate change.

Work in breakout groups:

There are several fields where guidelines and best practices are established or in preparation. One example deals with regulations, standards and best practices related to hazards. In the Arctic hazards can be natural hazards, manmade hazards, geopolitical issues like war, crisis responses. An example is the communication cables to Svalbard of which one was broken (and repaired). Best practices or guidelines are developed for evacuation of ships and inhabitants in Longyearbyen. Similar guidelines (or lack of guidelines) was also described in the presentation by Uffe Jakobsen. Guidelines and practices are developed regarding collaboration between the Arctic Safety Centre, UiT and Longyearbyen local council on snow warning. Emergency action plans are also examples of guidelines and best practices, where the Coast Guard, helicopter services, rescue services, cruise vessels, Red Cross and others have specific roles and commitments. There are ongoing efforts to develop best practice/ guidelines by the Arctic Safety Center, Arctic Nature Guides at UiT, AECO and the Governor's office. Dialogues with various stakeholders, workshop discussions and questionnaires are important sources to get in depth information about existing guidelines, best practices, standards etc, or lack of these.

4. Summary of the design-thinking work groups

During the design-thinking work groups the main focus was to discuss the value of cultural heritage, regenerative cultural heritage experiences in tourism, as well as possibilities of developing or sharing guidelines, standards and best practices in this field. There were four break-out groups working on the questions:

1. Value of cultural heritage in sustainable tourism development
2. Regenerative cultural heritage experiences for visitors/local community.
3. Develop guidelines/standards for best practices?

4.1 Value of cultural heritage in sustainable tourism development

Cultural heritage is seen as very important for connection between people and the place and is closely connected to sense of belonging. Many are interested in history and what has happened before in places they live in or visit, and it helps understanding other people, the context of their lives, and often relates to family connections and memories. Loss of cultural heritage is affecting peoples wellbeing, and it is also giving less value for tourists, and the locals. 95% of nature activities are done in areas that have been impacted/shaped by humankind.

An understanding of the cultural heritage of a place/community may influence behaviour, e.g. visitors are more respectful, more engaged, more likely to follow guidance, more likely to choose activities and experiences that relate to cultural heritage and are sustainable. There is an important pre-condition that cultural heritage information is communicated effectively, both before travel and through the intermediaries/ guides who visitors encounter during their visits. Cultural heritage communicated and integrated in a good way in sustainable tourism development is preparing the ground for tourism with low or no impact, but vulnerabilities and threats must be sorted out. Present value seems to be low in at the beginning of a visit, but increases during the stay and experience people have. Tourists seem to be interested and prepared, as they google, read guidelines and talk to guides during field trips and guided tours. Cultural heritage first get a value (personal) when you understand the meaning. Added value has to do with the experience, to see the site or object, that it is local or near. Proximity adds a value, like the culture house, museum and storytelling in various ways, adding on to knowledge and understanding. Expeditions are also bringing people closer to cultural heritage sites, and add value to the whole experience (Fig. 4.1).

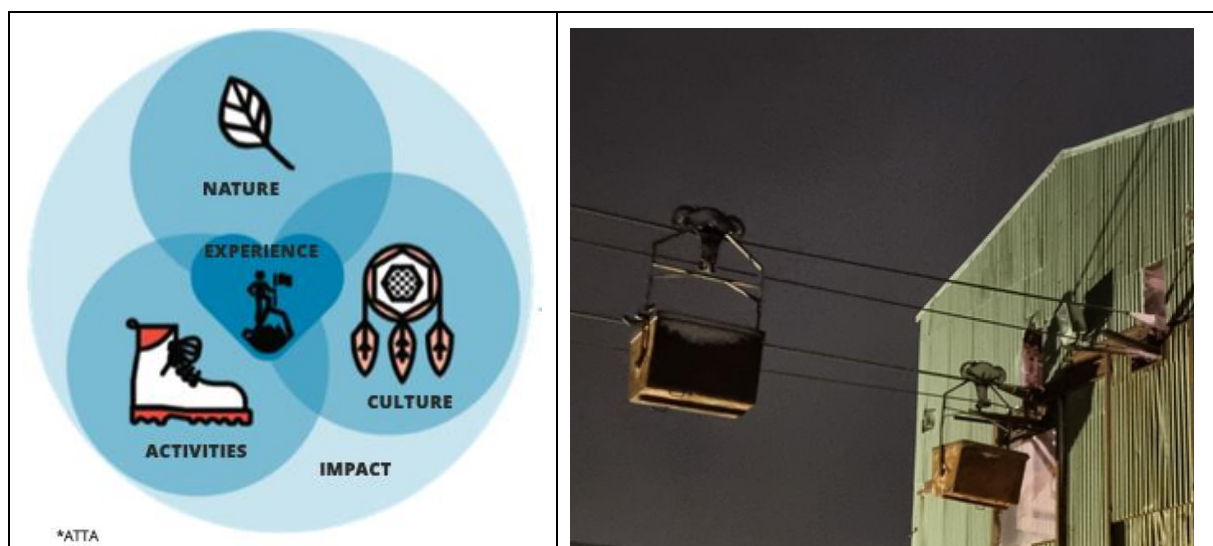


Figure 4.1 Tourists are interested in valuable life experience when they travel. The experience consists of elements from nature, culture and activities. From ATTA, 2021 (Adventure Tour Operator Snapshot Survey), Courtesy Per-Gunnar Hettervik, Norges Vel (left). In Longyearbyen Taubanesentralen (cablecar station) is one of the major cultural heritage sites. Photo by Dina Brode-Roger (right).

Different markets have different needs and different way of seeing cultural heritage as an added value. In Longyearbyen there are many entry points for more knowledge and experience with cultural heritage sites and objects like excursions and local activities (Fig. 4.1). Companies see and explore opportunities to bring guests out in the vicinity of Longyearbyen. Beacons could be used to give more interactive information to the visitors through digital technology in the field. Other examples are Narratives told by persons with long experience, theme nights at Polheim, a new institution in Longyearbyen for sharing information about the Arctic.

4.2 Regenerative cultural heritage experiences for visitors/local community

One of the work groups had a discussion about what regenerative cultural heritage experiences really means, and they came up with some ideas that if not regenerative are at least respectful: Training guides specifically for Cultural Heritage visits, not only about the history, but also on laws and why they were passed, to give reason why it is protected. To address cultural heritage visits locally, based on circular use, already supporting existing related activities like tool-workshop sharing. Example of regenerative cultural heritage experiences for visitors is found in Faroe Islands where they invite visitors to contribute in clean up activities and restoration work during the summer. Projects that have both academics, tourists companies and citizens involved are more likely to be sustainable and even regenerative.

Another work group came up with the idea of arranging « working holidays », based upon conservation of a monument or site, path maintenance, vegetation management, cleaning, repairs or based around participating in archaeological survey, documentation, and excavation. This group also discussed community-based monitoring of archaeological and built heritage assets. This could be valuable for site and monuments in remote and “hard to reach places” where tours regularly visit. However, it comes with a warning that there must be somewhere for the data to go. The involvement of local heritage managers is essential. There are apps that use repeat photos of a subject taken from the same place to track changes, e.g. [CoastSnap](https://www.coastsnap.com/) which uses photos of beaches to track coastline change (<https://www.coastsnap.com/>). The cleaning beaches activities will teach people to understand their own behavior and see what have been caused by “generation of garbage” dumped in the sea. This method could also be applied to monitor the condition of a monument or building, if markers were installed to ensure photos were consistent.

Another important aspect of tourist experiences is involvement in traditional cooking and traditional crafts with tours to local enterprises like breweries, workshops, artists etc. If well planned, this could invigorate or sustain traditional practices and local craftspeople and artists. Yet another way of working could be through «Repatriation of artefacts» to enhance local museum collections. If culturally significant artefacts held in national museums or in museums outside the country were repatriated to their country of origin or place of origin, they could generate more visitor interest in going to those places to see important artefact collections in context. Primarily this is potentially of immense value to Indigenous Arctic communities. However, this is a live issue, not going to be resolved any time soon probably.

Regenerative cultural heritage experiences for visitors/local community could also be obtained by use of beacon technologies, offering tailored information to the visitors via mobile phones (Fig. 4.2). Tourism with a societal and nature- or cultural driven purpose, have the potential to be regenerative. This could be further developed through the use of mobile phone technologies. Audio tools like podcasts and storytelling in a form of edutainment and adventure, would also be important elements, but must be created from the “raw data”, and based on scientific knowledge. Training of guides in Cultural Heritage is very important and should be more in focus, as “nothing beats a good guide!”

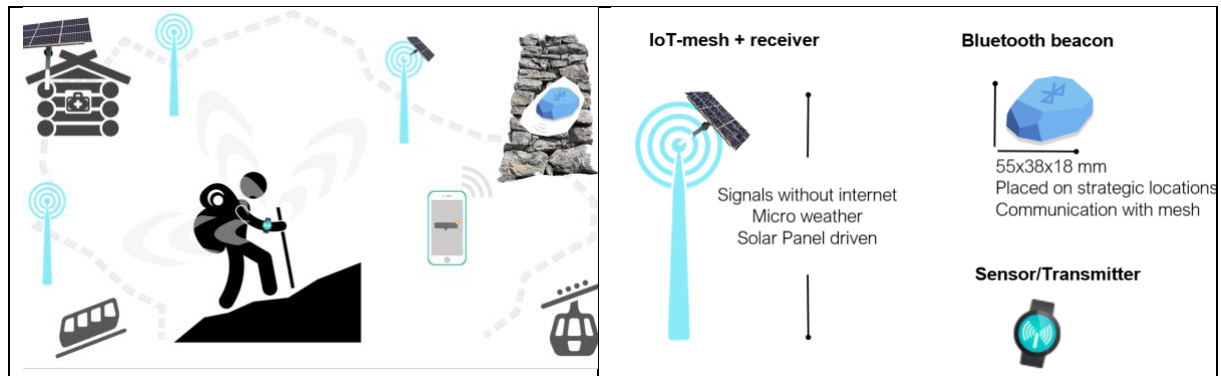


Figure 4.2. Use of beacon technology and mobile phones to inform tourists about cultural heritage, nature experience and other information that tourists need. The beacons contains such information that is transmitted to mobile phones in the area. Figures are provided by Per-Gunnar Hettervik, Norges Vel.

4.3 Develop guidelines/standards for best practices?

Shared knowledge and co-development with archeologists, social scientists, natural scientists, heritage experts etc. is essential for developing good practices and eventually context specific guidelines. Good communication skills combined with respect for local knowledge are important assets to bring into the field of regenerative tourism. In this context citizen science projects can be very useful where repetitive observations and photos are collected to document changes over time. Citizen science projects combined with other monitoring methods can be helpful contributions towards a more sustainable cultural heritage management and thereby supporting a regenerative tourism.

Another method is to use Wikipedia more actively in a community for sharing knowledge. Wikipedia is one of the top 10 websites in the world and is open for all with possibilities to link to other resources that is relevant to a specific article. Several useful tools are provided by Wikipedia (e.g. <https://en.wikipedia.org/wiki/Edit-a-thon>, https://en.wikipedia.org/wiki/Wikipedian_in_residence).

Museum, Riksantikvaren and Arts Council Norway are using Wikipedia services to disseminate cultural information and experience. The same could maybe be done or attempted regarding culture in Svalbard. The basic idea is to develop formal or informal collaboration between residents who share an interest in a site or monument and have a role in its management, interpretation, and protection. If CBM systems are properly set up and the data used, this could help in assessing conservation priorities and act as an early warning system for protection or conservation action to be taken.

Engaging with communities could be also be done by launching a Cultural Heritage year or festival, or events like wooden path to a protected building or site, inviting people to participate in protection of built elements, and management of sites. Topics for such events could be to arrange a railway week, brick week or make a walking trail or « game » with information, markers etc. During the dark season one could make sound- and light shows for both locals and tourists.

Development of guidelines and standards for tourist activities should be done as a collaboration between the governor, experts and locals with knowledge about the practical aspects of tourism. This will help to decide which sites can be visited, how many visitors, how often and which sites should not be visited. To offer employment in cultural heritage tourism like museums, visitor centres, guides etc, would be positive for the Svalbard community. There needs to be to be a process for how to consult and properly involve communities in decision-making around cultural heritage tourism. In a recently inscribed World Heritage Sites (WHS) in Greenland, UNESCO employed a top-down approach in their community communication where meetings were held to give information rather than asking for input. This has undermined local support for the inscription and the WHS has restricted economic activity of fishermen in the area. Elected politicians should be responsive to the needs and interests of their constituents in the

planning and implementation of cultural heritage tourism in the Arctic. Standards and guidelines should reflect your decisions, and the science and engineering sector should provide best practices for preservation etc.

The understanding of what's happening, and the ability to technically act on this and to have resources to make decisions and fulfill them are important aspects. To find the balance of measures or methods to obtain what is needed in relevance to the object or objective is very important. Asking for options, in an open, transparent discussions. Engage community in process, both in planning and implementation. One example related to physical implementation is to involve the community to contribute in building pathways if based on adequate information and guidance. Citizen science and science-based monitoring guidelines could be based on results from INTAROS H2020, suggesting 5 bullet points to address; Practical suggestions, Dissemination, Storytelling, Negotiations and Change.

5. Further work in 2023

A follow-up workshop will be organized in Longyearbyen in spring 2023, to plan new projects which will continue the work of CAPARDUS. New proposals will be prepared to develop a Citizen Science project on cultural heritage in Svalbard, similar to the SCAPE programme in Scotland. A Norwegian funded CAPARDUS extension project has started and will support a research school in June 2023 and a side-meeting to the Svalbard Science Conference in November 2023. In these events further development of standards, guidelines and practices of importance in Svalbard will be discussed. The CAPARDUS extension project will facilitate for further collaboration between natural and social science disciplines, including use of community-based observing and citizen science. The main activities in the CAPARDUS extension project is to organize workshops, research schools and other events to discuss the development of standards, guidelines and practices of importance in Svalbard. The outcome will be new knowledge about the standardization development and improved collaboration between researchers and local community actors. This will help in establishing guidelines and good practices within tourist business, shipping activities, and safety regulations. A closer dialogue between research projects, including both natural and social science, and the local actors will help the scientists to deliver useful results from research projects, and the local community will see more benefits from the research. The requirements for an Arctic Practice System (APS) will be identified, which will include a repository of documents and other digital objects on guidelines and practices in different disciplines. The goal of the APS is become a tool for knowledge production between scientists, local communities and other stakeholder groups. In the long term better collaboration between natural and social science projects will help in planning and developing a sustainable Svalbard community.

6. Appendix

A1: List of meetings, workshops and other events about the Svalbard cases study

Date	Event
19-25 Oct 2021	L. Iversen presented a webinar about collaboration in Longyearbyen at Arctic Innovation Week, The webinar is in Norwegian and lasts 1 hour. It is recorded at https://drive.google.com/file/d/1Ax5o0Xc8VcUiL15kmBT4GtNyH_vKvygZ/view
18 November 2020	L. Iversen presented at session “Effective local measures for inclusive towns“: at the Nordregio Forum. https://nordregioevents.org/programme/
13 January 2021	L. Iversen presented “Localizing and downscaling of the UN SDGs in Arendal -through co-creation and inclusion”. Part of webinar: Planning for equal rights: integrating gender and youth perspectives in SDG work (SDG5, SDG 10) NORDREGIO-Taking the 2030 Agenda to the local level: How to reach the goals and measure success in municipalities and regions? Nordregio Webinar Planning for equal rights: integrating gender and youth perspectives in SDG work (SDG5, SDG 10).
11 March 2021	L. Iversen participated in the Governors hour with members of the Svalbard local community (digital presentation).
24 March 2021	Workshop on Cultural heritage sites in Svalbard, organized by NERSC in collaboration with the NIKU and the CULTCOAST project. Online event with ca. 20 participants. Programme and presentations are available at https://capardus.nersc.no/node/74
25 March 2021	S. Sandven gave an online presentation on CAPARDUS: “Data sharing between Community-based observing systems and scientific observations“, Arctic Science Summit Week, session ID25.
26 March 2021	S. Sandven organized and co-chaired with Noor Johnson the session “Use and Usability of Data and Information within Arctic Community-Driven Research” at Arctic Science Summit Week, session ID85. In this session L. Iversen gave the presentation “Linking top-down and bottom-up initiatives and knowledge: Community-based monitoring and co-creation approaches for sustainable urban development in the Arctic”
27 April 2021	T. Hamre gave the presentation “A Standards-based Data Catalogue integrating scientific, community-based and citizen science data across the Arctic”, at EGU Session ESS13.3: https://doi.org/10.5194/egusphere-egu21-15783
20 Sept 2021	S. Sandven organized a session at the Ocean Best Practice System workshop: “Towards an Arctic Practices System” https://capardus.nersc.no/node/81
29-31 Oct 2021	The first physical workshop after the pandemic was organized by L. Iversen in Longyearbyen in collaboration with the Svalbard Social Science Initiative. Agenda and report is available: https://capardus.nersc.no/node/103
31 March 2022	S. Sandven organized a CAPARDUS session at Arctic Science Summit Week in Tromsø. The session was hybrid. Agenda and presentations are available: https://capardus.nersc.no/node/101
6-9 August 2022	S. Sandven organized the CAPARDUS workshop in Longyearbyen in collaboration with NIKU: "Community-based monitoring and Citizen science" More information in section 3 and in https://capardus.nersc.no/node/95

A2: List of participants in the workshop 6-8 August 2022

Name	Institution	e-mail
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