CAPARDUS - Capacity-building in Arctic standardization development

Coordination and Support Action under EC Horizon2020
Grant Agreement no. 869673

Project coordinator: Nansen Environmental and Remote Sensing Center

Deliverable 8.2

Project website and dissemination material

Type: Other

Start date of project:	01 December 2019	Duration:	36 months
Due date of deliverable:	31 March 2020	Actual submission date:	19 March 2020
		Updated version submitted:	27 Nov 2021
Lead beneficiary for preparing the deliverable:		NERSC	

Authors: Stein Sandven

Version	DATE	CHANGE RECORDS	LEAD AUTHOR
1.0	19/03/2020	Version 1.0	S. Sandven
	19/03/2020	Reviewed by Hanne Sagen	
1.1	27/11/2021	Version 1.1	S. Sandven

Approval	Date: 27 Nov 2021	Sign. Coordinator

DISSEMINATION LEVEL		
PU	Public, fully open	X
CO	Confidential, restricted under conditions set out in Model Grant Agreement	
CI	Classified, information as referred to in Commission Decision 2001/844/EC	

EXECUTIVE SUMMARY

The CAPARDUS public website, (http://capardus.nersc.no), was launched in March 2020. The website is the main method for dissemination of all project relevant information, such as public downloadable products, presentations, news and events related to the project work scope. Dissemination material such as brochure, fact sheets and other information will be posted on the website during the project. Furthermore, the website provides basic information regarding the project beneficiaries, their role and contribution to the project and links to relevant websites.

Table of Contents

1. Introduction

The overall objective of CAPARDUS is to *Establish a comprehensive framework for development, understanding and implementation of Arctic standards with focus on environmental topics. The framework will integrate standards used by communities active in the Arctic including research and services, Indigenous and local communities, commercial operators and governance bodies. This will support sustainable economic development, safe activities, emergency prevention and response, and improved understanding and conservation of the environment.*

The public web portal (http://capardus.nersc.no) will be the main communication and outreach vehicle for CAPARDUS, which aims to connect to many Arctic projects, research communities, local communities and other stakeholders in the pan-Arctic region.

2. The project website

The project web portal is set up to provide general information about the project updated information on ongoing work, deliverables, major events and communication activities. The web portal will follow the EC guidelines to provide open information from the project. The web portal will be a vehicle of promotion of the project to the "external world" as well as to facilitate communication between the partners, the European Commission Services and collaboration institutions and organizations.

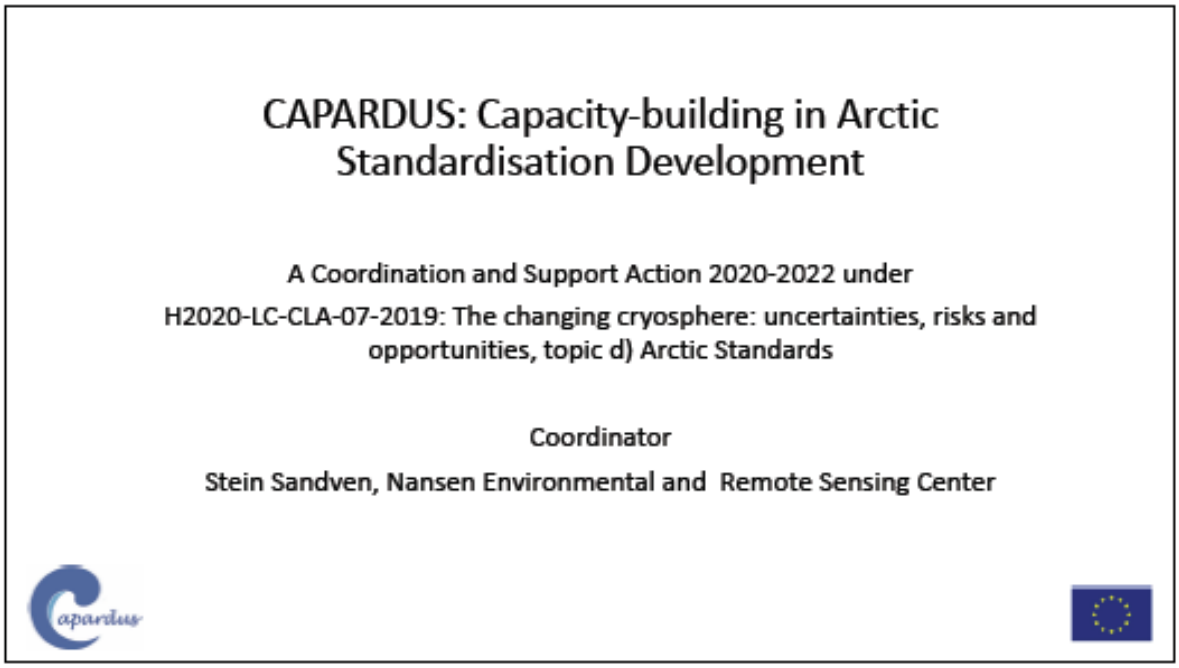
The key elements of the web portal are to:

- Facilitate open and easy access to information about the project, including ongoing work, results, publications, promotion and education material
- Facilitate for dialogue and feedback from external institutions, organizations and local community groups
- Prove useful links to related projects, programmes and organizations working with Arctic SDG goals
- Serve as administrative tool for the project coordinator and the partners, including internal communication and exchange of documents through a password protected area of the portal.

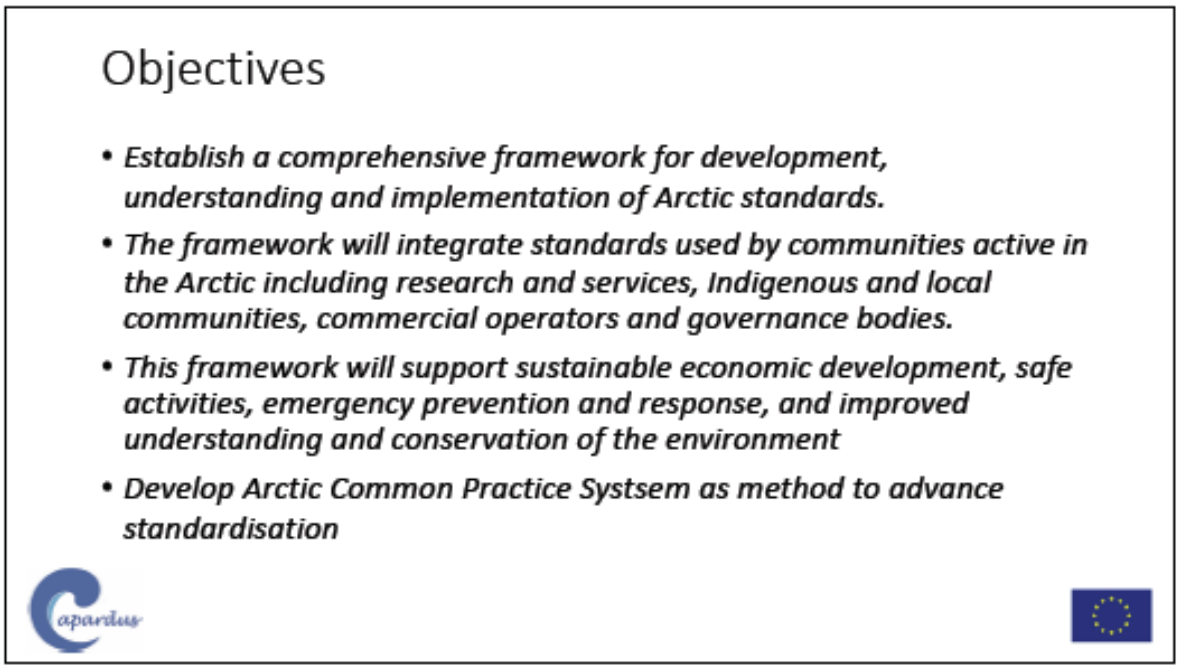
3. Dissemination material

Dissemination material will consist of brochure, fact sheets, posters, presentations, published articles, e-Newsletter and science-policy briefs. These will be posted on the website during the project. A project presentation and a project summary published on CORDIS are presented.

Project presentation



1



2

The three pillars of sustainable development

The three pillars of sustainable development are generally a pre-requisite for the development of a healthy society anywhere in the world. Also in the Arctic the three pillars need to be balanced when human activities are growing as a result of increased ship traffic, oil and gas exploration, tourism and other economic activities.

The UN sustainable development goals challenge the operators in the Arctic to reduce their environmental footprint. The Arctic environment is particularly vulnerable and severe changes are already in progress as a result of the global climate change.
The global industries, also those operating in the Arctic, are under increasing pressure to act upon the Paris Agreement and reduce greenhouse gas (GHG) emissions

Ref. Ø. Endresen, DnV GL

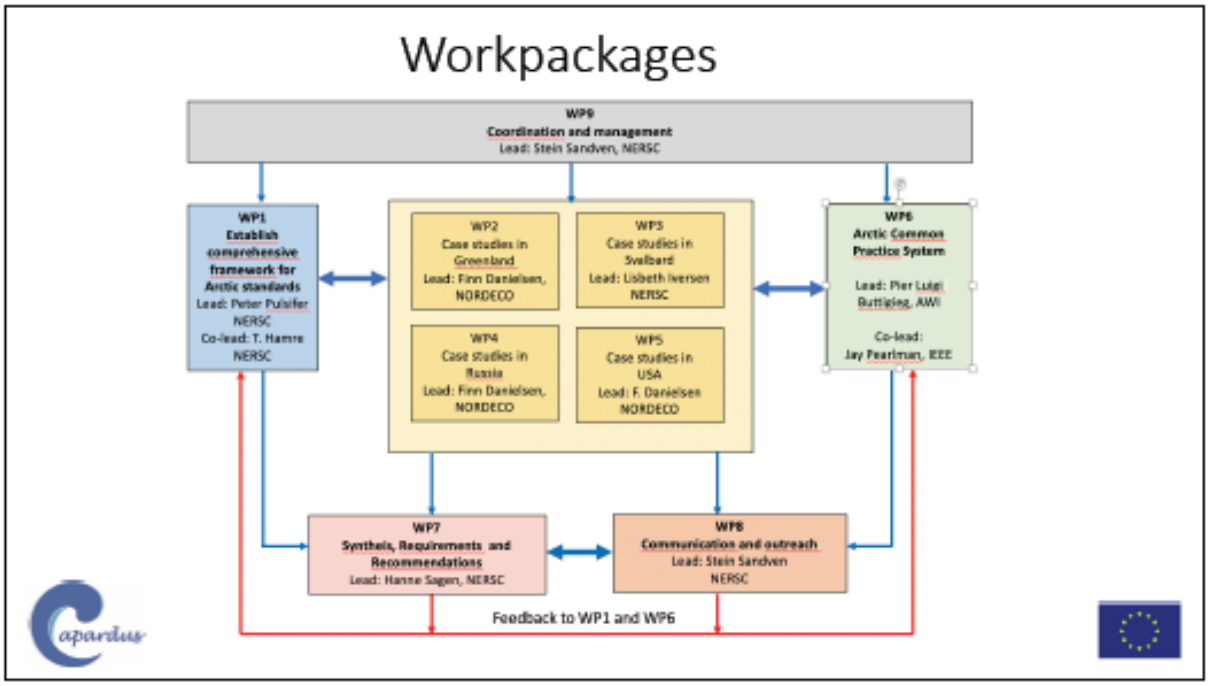
3

The Consortium

Institution	Country
Nansen Environmental and Remote Sensing Center (NERSC) coordinator	Norway
Nordic Agency for Development and Ecology (NORDECO)	Denmark
University of Greenland (UoG)	Greenland
Alfred Wegener Institute for Polar and Marine Research (AWI)	Germany
IEEE France section	France
Norwegian Institute for Nature Research (NINA)	Norway
University of Copenhagen	Denmark
Nansen International Environmental and Remote Sensing Centre (NIERSC)	Russia
University of Hokkaido, Arctic Research Centre	Japan

Sub-contractors	Country
Exchange for Local Observations and Knowledge of the Arctic (ELOKA)	USA
University of Alaska Fairbanks/ International Arctic Research Center (UAF/IARC)	USA
Center for Support of Indigenous Peoples of the North (CSIPN)	Russia
Element 84 (E84)	USA

4


Workpackages
WP9
Coordination and management
Lead: Stein Sandven, NERSC
WP1
Establish comprehensive framework for Arctic standards
Lead: Peter Pulsifer NERSC
Co-lead: T. Hamre NERSC
WP2
Case studies in Greenland
Lead: Finn Danielsen, NORDECO
WP3
Case studies in Svalbard
Lead: Lisbeth Iversen NERSC
WP4
Case studies in Russia
Lead: Finn Danielsen, NORDECO
WP5
Case studies in USA
Lead: F. Danielsen NORDECO
WP6
Arctic Common Practice System
Lead: Pier Luigi Buttigieg, AWI
Co-lead: Jay Pearlman, IEEE
WP7
Synthesis, Requirements and Recommendations
Lead: Hanne Sagen, NERSC
WP8
Communication and outreach
Lead: Stein Sandven NERSC
Feedback to WP1 and WP6

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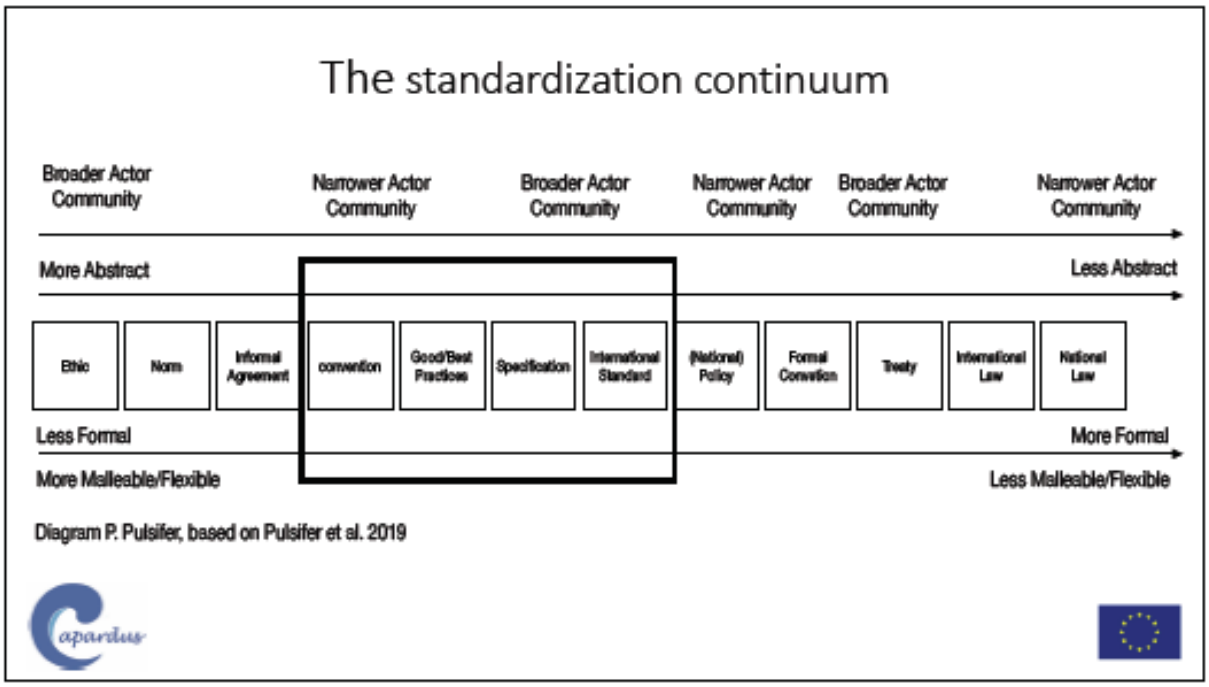
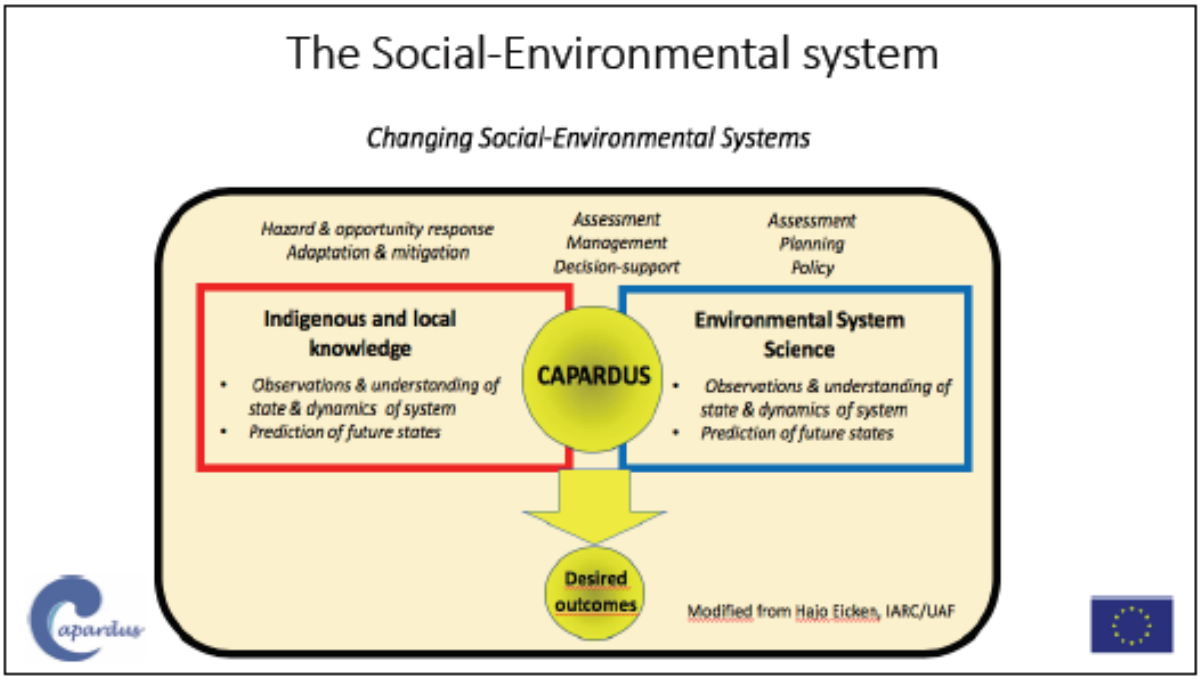

The standardization continuum
Broader Actor Community
Narrower Actor Community
Broader Actor Community
Narrower Actor Community
Broader Actor Community
Narrower Actor Community
More Abstract
Less Abstract
Ethic
Norm
Informal Agreement
convention
Good/Best Practices
Specification
International Standard
(National) Policy
Formal Convention
Treaty
International Law
National Law
Less Formal
More Formal
More Malleable/Flexible
Less Malleable/Flexible
Diagram P. Pulsifer, based on Pulsifer et al. 2019

6


The Social-Environmental system
Changing Social-Environmental Systems
Hazard & opportunity response
Adaptation & mitigation
Assessment
Management
Decision-support
Assessment
Planning
Policy
Indigenous and local knowledge
Observations & understanding of state & dynamics of system
Prediction of future states
CAPARDUS
Environmental System Science
Observations & understanding of state & dynamics of system
Prediction of future states
Desired outcomes
Modified from Hajo Eicken, IARC/UAF

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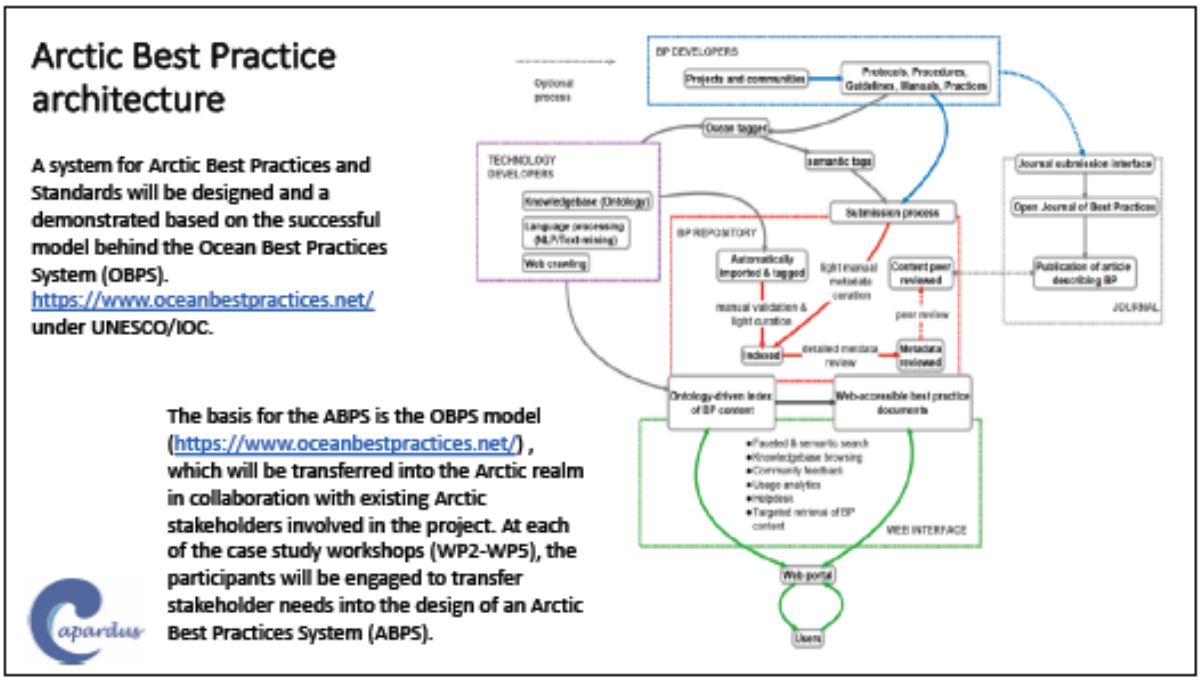

Arctic Best Practice architecture
A system for Arctic Best Practices and Standards will be designed and a demonstrated based on the successful model behind the Ocean Best Practices System (OBPS).
https://www.oceanbestpractices.net/
under UNESCO/IOC.
The basis for the ABPS is the OBPS model (https://www.oceanbestpractices.net/) , which will be transferred into the Arctic realm in collaboration with existing Arctic stakeholders involved in the project. At each of the case study workshops (WP2-WP5), the participants will be engaged to transfer stakeholder needs into the design of an Arctic Best Practices System (ABPS).
BP DEVELOPERS
Projects and communities
Protocols, Procedures, Guidelines, Manuals, Practices
Optional process
Ocean tagger
semantic tags
TECHNOLOGY DEVELOPERS
Knowledgebase (Ontology)
Language processing (NLP/Text-mining)
Web crawling
Submission process
BP REPOSITORY
Automatically imported & tagged
light manual metadata curation
Content peer reviewed
manual validation & light curation
peer review
Indexed
detailed metadata review
Metadata reviewed
Ontology-driven index of BP content
Web-accessible best practice documents
Faceted & semantic search
Knowledgebase browsing
Community feedback
Usage analytics
Helpdesk
Targeted retrieval of BP content
WEB INTERFACE
Web portal
Users
Journal submission interface
Open Journal of Best Practices
Publication of article describing BP
JOURNAL

8

Updated material in November 2021

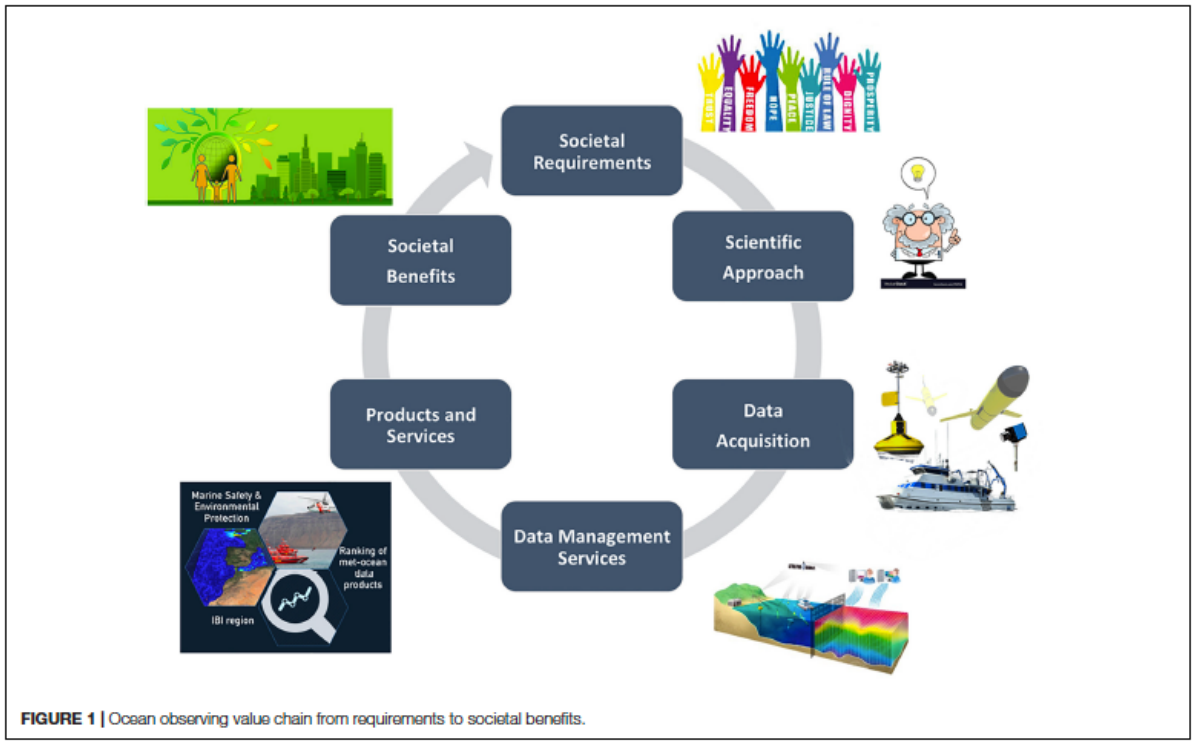
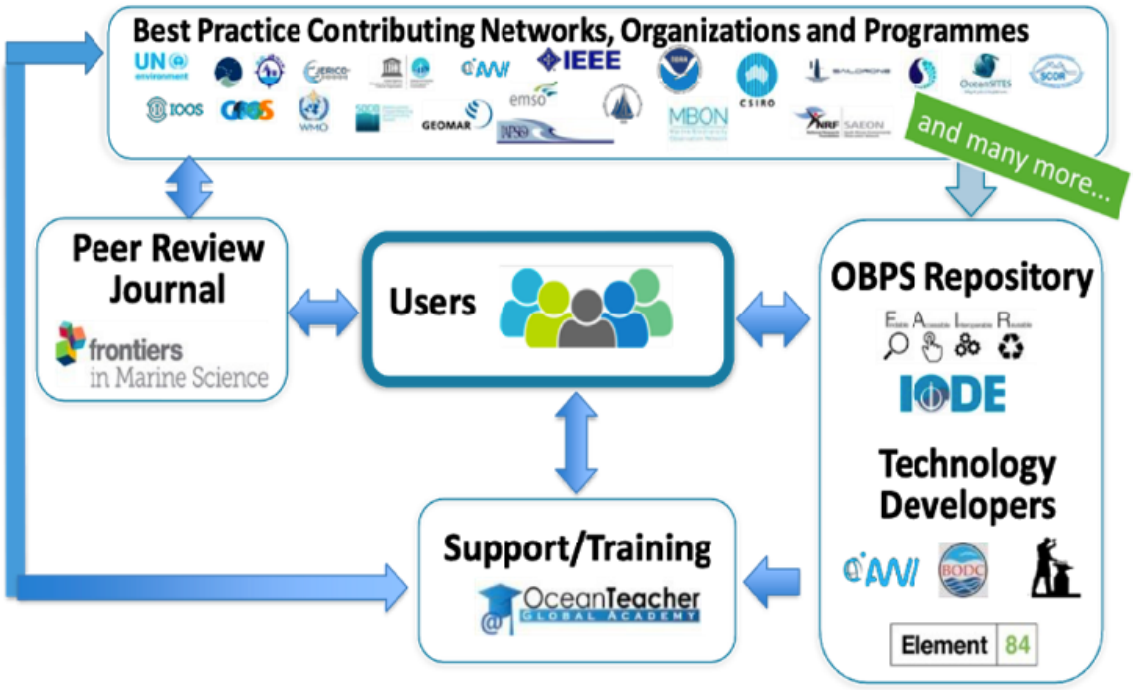
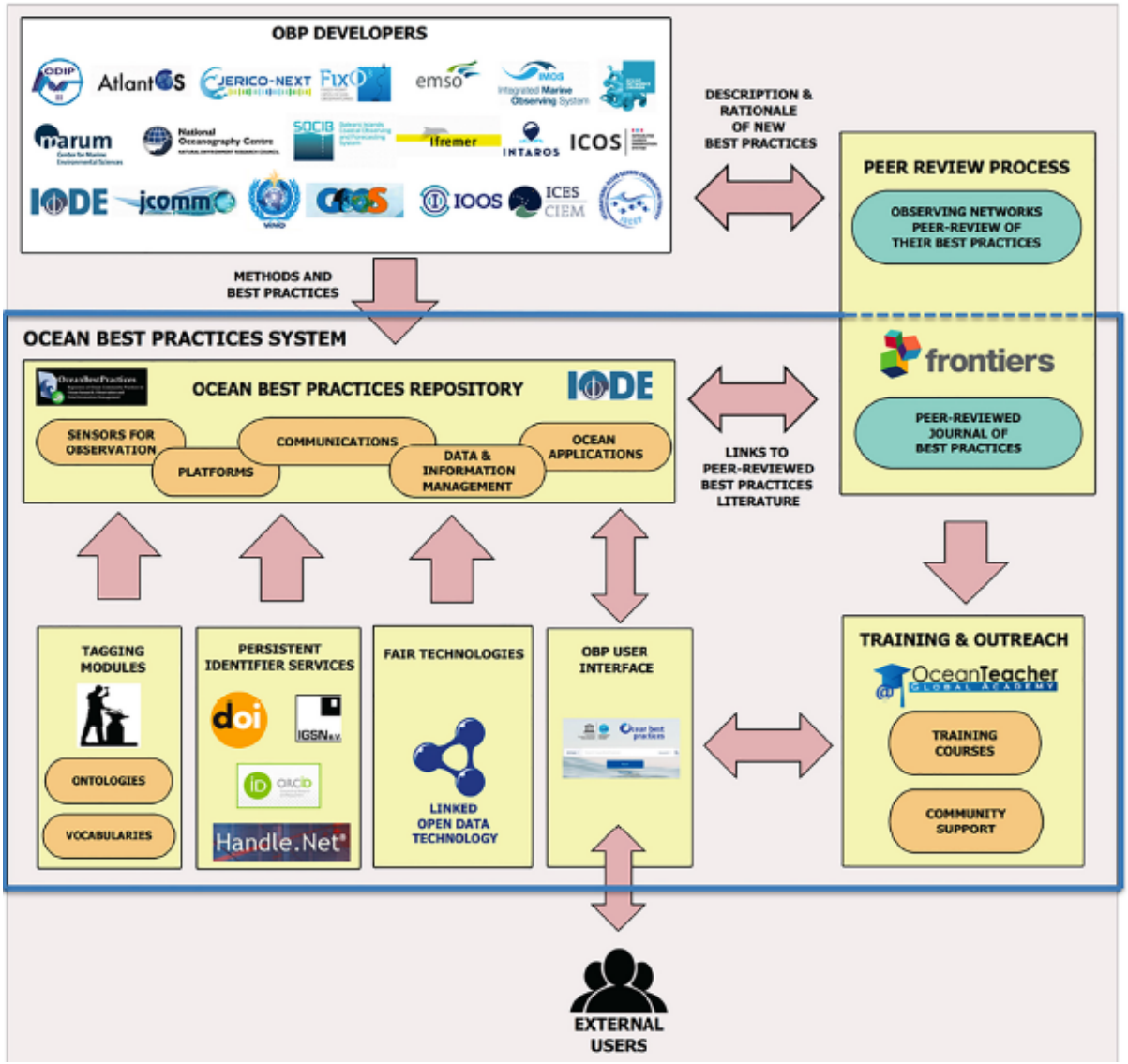


FIGURE 1 | Ocean observing value chain from requirements to societal benefits.

The value chain of ocean observing (Pearlman et al., 2019)



Update diagram of the Ocean Best Practice System (Pearlman, 2021)



OBPS structure (large box across middle of figure), core technologies (along the bottom of the box), and best practice provider organizations (in the box at top). Training is shown at the bottom right.(Pearlman et al., 2021)

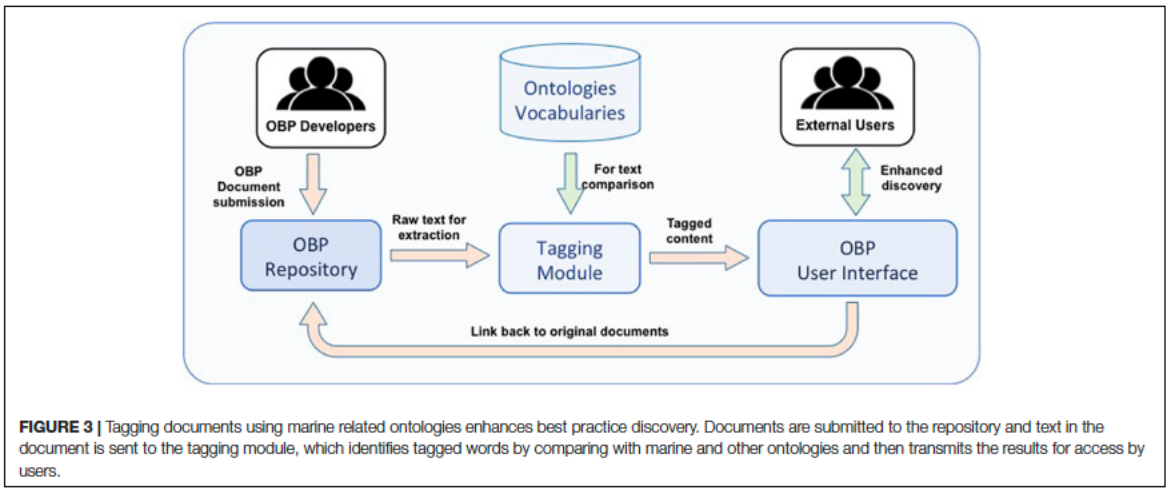


FIGURE 3 | Tagging documents using marine related ontologies enhances best practice discovery. Documents are submitted to the repository and text in the document is sent to the tagging module, which identifies tagged words by comparing with marine and other ontologies and then transmits the results for access by users.

(Pearlman et al., 2021)

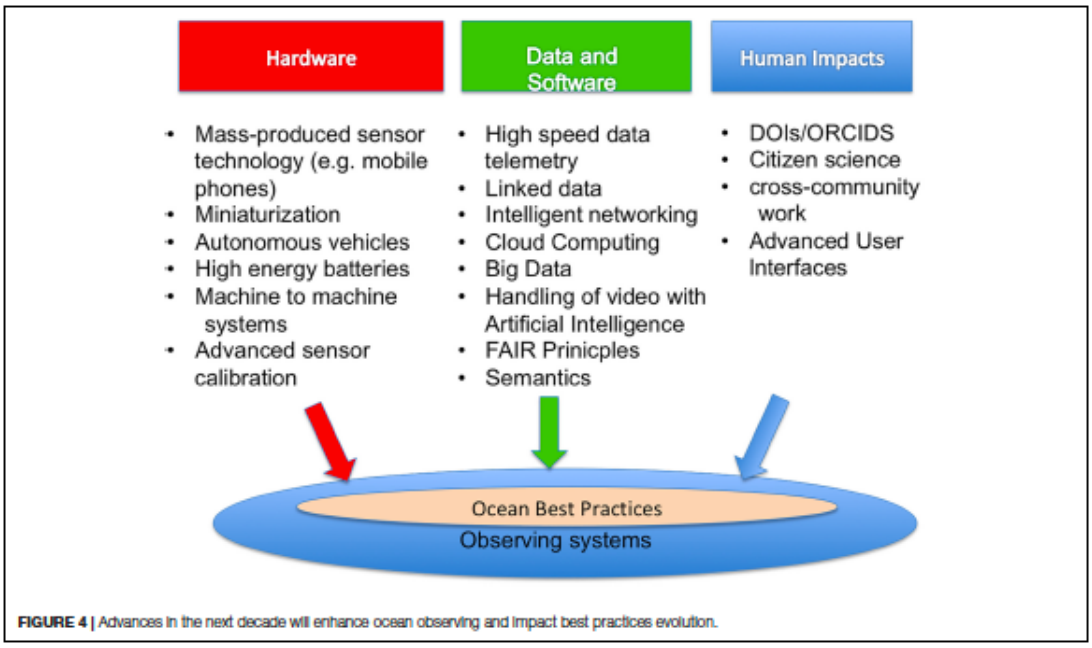
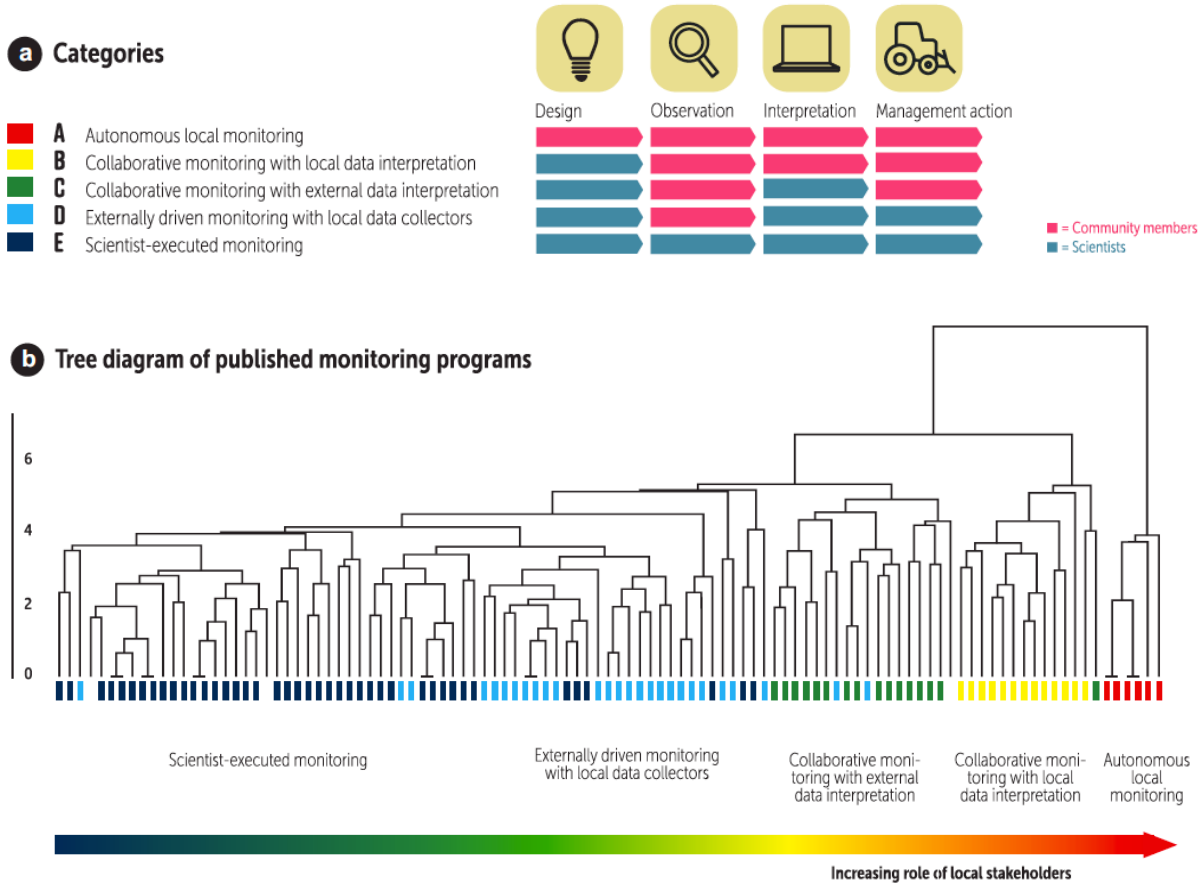


FIGURE 4 | Advances in the next decade will enhance ocean observing and impact best practices evolution.

(Pearlman et al., 2021)

Community-based monitoring



Danielsen et al., 2021 (doi:10.1093/biosci/biaa021)

Poster presentations in 2021

CAPARDUS: Capacity-building in Arctic Standardisation Development

http://capardus.nersc.no

Coordinator: Stein Sandven [1], deputy coordinator: Hanne Sagen [1]

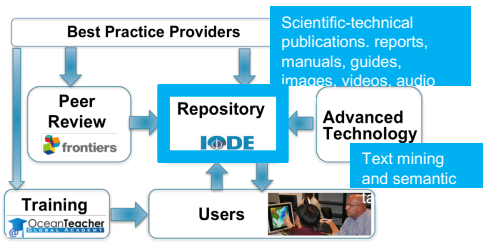
Participants: F. Danielsen [2], M. Enghoff [2], M. K. Poulsen [2], U. Jakobsen [3], B. Poppel [3], P. L. Buttigieg [4], J. Pearlman [5], F. Pearlman [5], R. Garello [5], S. J. Khalsa [5], R. May [6], M. R. Nielsen [7], H. Meilby [7], L. Bobylev [8], S.-I. Saitoh [9], P. Pulsifer [1], T. Hamre [1], L. Iversen [1], N. Johnson [10], O. Lee [11], N. Vronski [12]

A Coordination and Support Action supported by H2020 grant agreement no. 869673

The objectives of CAPARDUS are to:

- *Establish a comprehensive framework for development, understanding and implementation of Arctic standards*
- *Identify and document common practices as basis for development of standardization in the Arctic, building on the Ocean Best Practice System (www.oceanbestpractices.org)*
- *Engage researchers, service providers, Indigenous and local communities, commercial operators and governance bodies, together to design an Arctic Practice System*

Establishing a repository of Arctic practices



Documents are compiled in the Ocean Best Practice system under "Arctic Practices:
https://repository.oceanbestpractices.org/handle/11329/1291

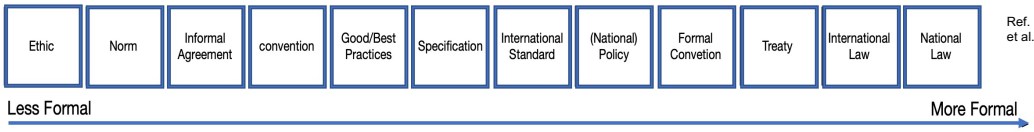
There is no "standard Arctic", only a variety of communities with own culture, practices and standards related to handling data and other information within their fields.

There is no framework for integrating practices, guidelines and standards between local communities, science communities, commercial operators and governance bodies

CAPARDUS documents practices, guidelines and standards among Arctic operators. This will form the basis for a framework for Arctic standards and design of an Arctic Practice System

Standardisation continuum

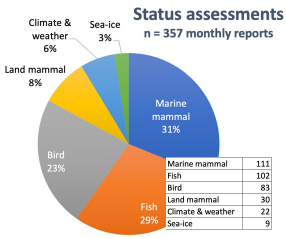
Tradition – culture → Documented practices → Policies - conventions → Legislation



Ref. Pulsifer et al., 2019

CAPARDUS partners analyse existing documents according to the Standardisation Continuum on topics such as natural resource management, tourism, shipping, community planning and decision making in selected Arctic communities

Community Based Monitoring



Left: The communities involved in the resource observations in Northwest Greenland. Centre: Registration of local resources in Disko Bugt (Photo : F. Danielsen). Right: Overview of data from 357 monthly reports on resource observations.

Community-based monitoring (CBM) is a method where indigenous and local communities are directly involved in environmenta data collection. An example is from North-West Greenland where the Qeqertalik Municipality and NORDECO with many partners are developing community observing (figures to the left). Fishermen and hunters routinely observe the environment in their respective communities and report to the observing network PISUNA https://eloka-arctic.org/pisuna-net/en CBM is a useful method to document living resources, promote local discussion and shorten the time from observation to decision.

Partners
[1] Nansen Environmental and Remote Sensing Center (NERSC)
[2] Nordic Agency for Development and Ecology (NORDECO)
[3] Ilisimatusarfik, University of Greenland (UoG)
[4] Alfred-Wegener-Institute Helmholtz Centre for Polar and Marine Research (AWI)
[5] IEEE France Section
[6] Norwegian Institute for Nature Research (NINA)
[7] University of Copenhagen (UCPH)
[8] Nansen International Environmental and Remote Sensing Centre (NIERSC)
[9] Hokkaido University – Arctic Research Center
[10] Exchange for Local Observations and Knowledge of the Arctic (ELOKA)
[11] University of Alaska Fairbanks/International Arctic Research Center (UAF/IARC)
[12] Center for Support of Indigenous Peoples of the North (CSIPN)

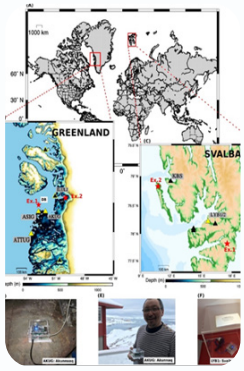
Poster 2021

Benefits of co-creation in planning for safety, equity and sustainability on Svalbard

Lisbeth Iversen
Affiliation: Nansen Environmental and Remote Sensing Center, NERSC and Oslo School of Architecture and Design, AHO

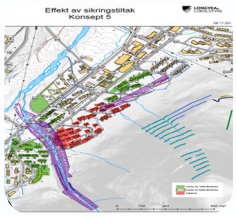
Planning for sustainable development, environmental monitoring and protection of cultural heritage and resources, as well as safety for all citizens, is challenging for local communities to manage, also in the Arctic. This is caused partly by climate change and more frequent extreme weather conditions and disasters. Changes in international relations, demography and economy, are also framing the context of planning and development. Svalbard is experiencing rapid climate change, flux in the population, and uncertainty connected to planning, housing and future jobs.

Linking top-down, governmental initiatives and plans with bottom-up approaches and planning initiatives from the community level, and knowledge from best practice from citizen science and community based monitoring programs (CBM), is not always easy. Co-creation and co-production of kowledge has been addressed over the recent years in public sector and public management. It has not been addressed in the same way connected to planning and coordination of research topics across actors and sectors. Co-creation in planning processes in the Arctic in general, and on Svalbard specifically could provide broad knowledge and help identifying gaps in data and research, required to make more sustainable decisions, enable environmental monitoring, flexibility, innovation as well as rapid and effective responses to sudden incidents.



INTAROS T4.3 Pilot CBM networks Greenland & Svalbard. Improved detection and data support for understanding seismic events. With locals, fishermen and hunters. Led by GEUS and UiB

Longyearbyen Local Council meeting



A participatory and asset based community development approach needs to be built on trust and long term collaboration to strengthen the social capital among the actors. This provides benefits for society and all actors involved. It is important to establish networks and platforms for partnership, coordination and co-creation of knowledge. (UN Goal 17 and 17.17). One example is the Svalbard Social Science Initiative,SSSI, which is building bridges across social and natural science. Field work, workshops, cross institutional seminars and international research project like INTAROS and CAPARDUS have also provided important outcomes of methods and approaches connected to Citizen science and Community Based Monitoring, CBM. Creating engagement through a Penta helix-model and through Placemaking methods have been useful approaches in my ongoing research.

Based on the research and experience from the INTAROS and CAPARDUS projects, and an ogoing Public Sector Phd project at AHO, an attempt has been made to test and map methods and tools of co-creation connected to environmental monitoring, planning and urban development. Participatory planning processes, and co-creation of scientifict knowledge and local knowledge, have provided a framework for more holistic and coordinated place leadership and sustainable management. For results and more reading:

Eicken et al, 2021 2. 3.

2. Dialogue/ workshop: cruise operators, scientists, decision-makers. Longyearbyen March 2019. Report available at: http://www.intaros.eu/media/1635/2019-report-aeco-workshop-v4.pdf

3. In May 2021, the book Community-Based Monitoring in the Arctic was published by University of Alaska Press (https://press.uchicago.edu/ucp/books/book/distributed/C/bo70275667.html)

Monitoring Svalbard's environment and cultural heritage through citizen science by expedition cruises

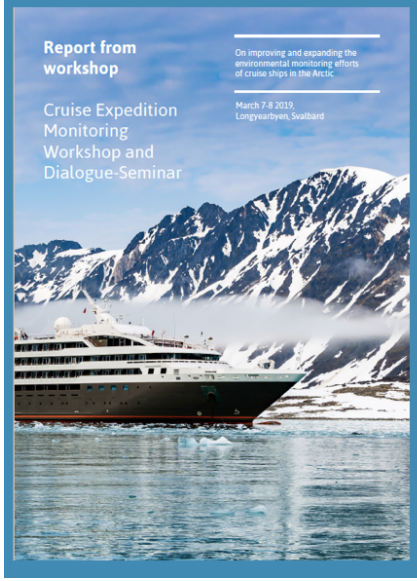
Michael K. Poulsen[1], Lisbeth Iversen[2], Ted Cheeseman[3], Børge Damsgård[4], Verena Meraldi[5], Naja Elisabeth Mikkelsen[6], Zdenka Sokolíčková[7], Kai Sørensen[8], Agnieszka Tatarek[9], Penelope Wagner[10], Stein Sandven[2], and Finn Danielsen[1]

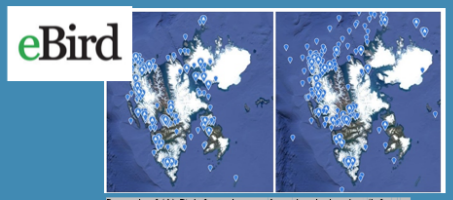
[1]NORDECO, [2]NERSC, [3]Polar Citizen Science Collective, [4]UNIS, [5]Hurtigruten, [6]GEUS, [7]University of Oslo, [8]NIVA, [9]IOPAN, [10]MET Norway

EGU General Assembly 2021
vEGU21: Gather Online | 19-30 April 2021

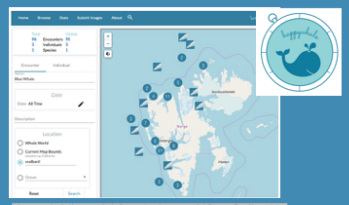
The continuous areas of wilderness and the cultural heritage sites in Svalbard need to be managed based on a solid understanding of the ongoing changes. Expedition cruises regularly reach otherwise rarely visited places. They can gather significant and relevant data on the environment. Observations are often documented with photographs. A workshop for enhancing the environmental monitoring efforts of expedition cruise ships was held in Longyearbyen in March 2019, facilitated by the INTAROS project and the Association of Arctic Expedition Cruise Operators (AECO) (https://intaros.nersc.no/content/cruise-expedition-monitoring-workshop). The participants were representatives of cruise operators, citizen science programs, local government and scientists. They agreed on a pilot assessment of monitoring programs during 2019 looking into some of the citizen science programmes already used by guides and tourists.

Workshop report at http://www.intaros.eu/media/1635/2019-report-aeco-workshop-v4.pdf

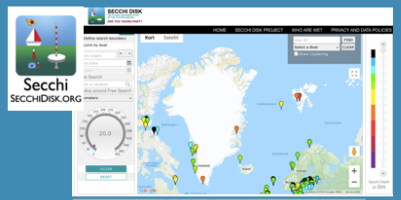




Records of (A) Pink-footed goose *Anser brachyrhynchus* (left: *n* = 583 records) and (B) Atlantic puffin *Fratercula arctica* (right; *n* = 622 records) from Svalbard 2002-2019 in the eBird database.



Happywhale records of marine mammals from Svalbard in 2019 (81 encounters of 13 species).



Location for entries of Secchi depth 2013-2019s. Each marker represents a vessel (or reading).

Extract of global map of positions from where cloud cover records have been obtained by the Cloud Observations program 1995-2019.

A total of 705 checklists with records of birds from Svalbard were during 2019 submitted to eBird by 76 observers. 62 different species were reported and 755 records were documented by photographs. A total of 81 encounters with 13 species of marine mammals from Svalbard were during 2019 reported to Happywhale by 40 observers on board at least 14 different vessels. The Secchi Disk study did not receive any measurements from Svalbard during 2019. GLOBE Cloud Observations received 5 records from 3 different vessels from Svalbard during 2019.

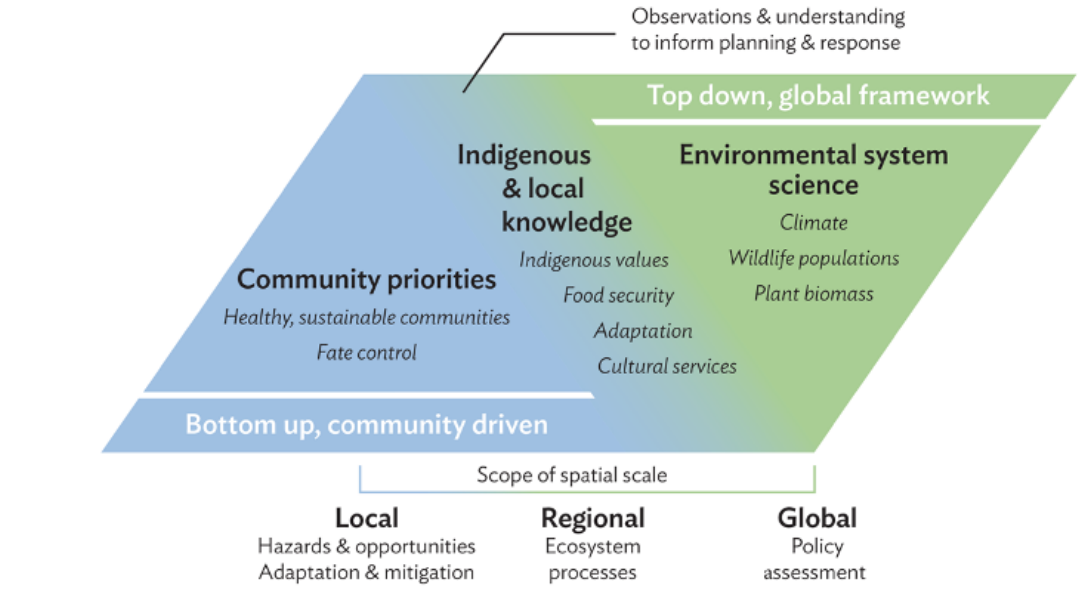
Acknowledgments:
Funding from European Union through the INTAROS project (Integrated Arctic Observing System, grant 727890 and Capardus, grant 869673).

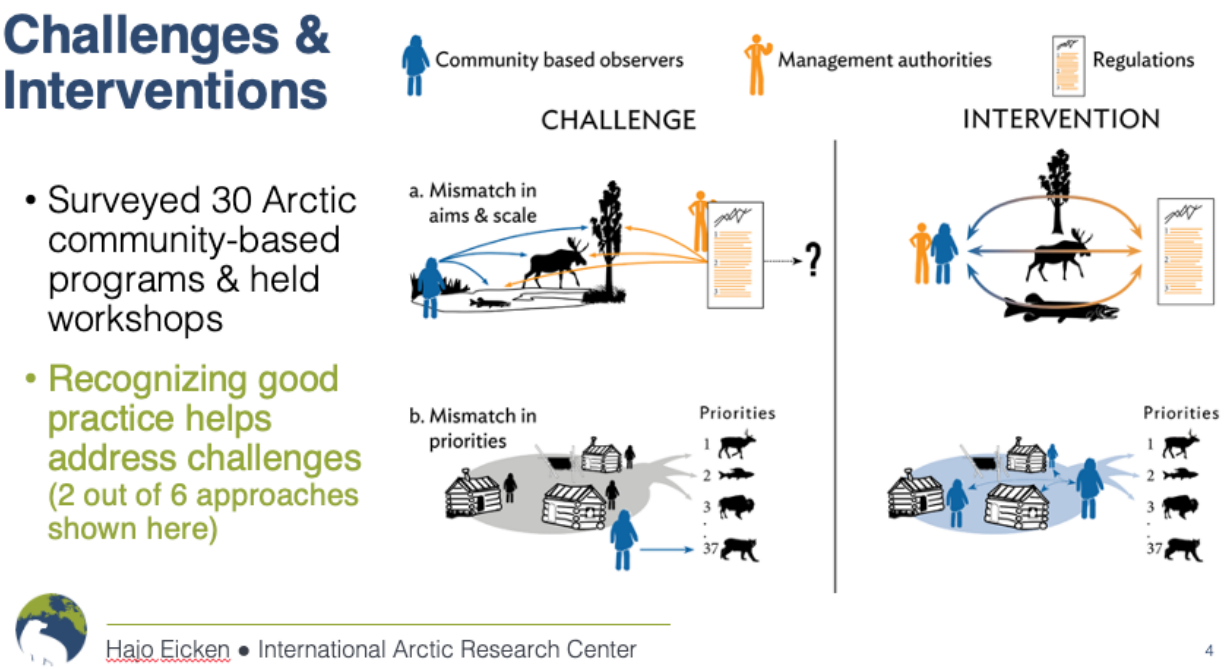
Observations inform responses to rapid Arctic change

1. How to foster better linkages between bottom-up, community-driven and top-down, regional/global-scale observing?
2. Review of 124 sustained observing activities across the globe
3. Workshops & surveys of 30 Arctic community-based monitoring programs

International Arctic Research Center

2





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This report is made under the project

Capacity-building in Arctic standardization development (CAPARDUS)

funded by the European Commission Horizon 2020 program

Grant Agreement no. 869673.

Project partners:

No	Acronym	Participant Legal Name	Country
1	NERSC	STIFTELSEN NANSEN SENTER FOR MILJO OG FJERNMALING	NO
2	NORDECO	NORDISK FOND FOR MILJØ OG UDVIKLING	DK
3	Ilisimatusarfik	Ilisimatusarfik, Grønlands Universitet, University of Greenland	GL
4	AWI	Alfred-Wegener-Institut Helmholtz-Zentrum fur Polar- und Meeresforschung	DE
5	IEEE	IEEE France Section	FR
6	NINA	STIFTELSEN NORSK INSTITUTT FOR NATURFORSKNING NINA	NO
7	UCPH	KOBENHAVNS UNIVERSITET	DK
8	NIERSC	Scientific foundation Nansen International Environmental and Remote Sensing Centre	RU
9	ARC-HU	Arctic Research Centre, Hokkaido University	JP

Subcontractors

	ELOKA	Exchange for Local Observations and Knowledge of the Arctic	USA
	UAF/IARC	University of Alaska Fairbanks/ International Arctic Research Center	USA
	CSIPN	Center for Support of Indigenous Peoples of the North	Russia
	E84	Element 84	USA