Developing Guidelines, Standards and Practices for sustainable development in the Arctic

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[1)] Nansen Environmental and Remote Sensing Center (NERSC)

[2)] IEEE France, Four Bridges

Case studies from Greenland, Alaska, Svalbard and Yakutia with focus on Community-based Monitoring and Citizen Science

Results from work performed under the CAPARDUS project funded by the European Union's Horizon 2020 research and innovation programme under grant agreement No 869673.

Objectives of CAPARDUS

- *Identify and document standards, guidelines and practices within resource management, environmental observations, local community planning, and selected economic activities*
- *Engage researchers, service providers, local communities, commercial operators and governance bodies to design an Arctic Practice System, building on the Ocean Best Practice System*
- *Establish a framework for development, understanding and implementation of Arctic standards*

Fisheries is the most important economic activitiy and food source for local communities in Greenland. Photo by Gerth Nielsen

Buildings in Longyearbyen threatened by thawing permafrost. Photo: L. Iversen, NERSC

CAPARDUS themes

- Observing system and data system
- Community planning & decision making
- Natural resource management
- Shipping, tourism, safety
- Ethics, norms, responsible research
- Other issues such as health, clean food and water

Community-based monitoring and Citizen Science

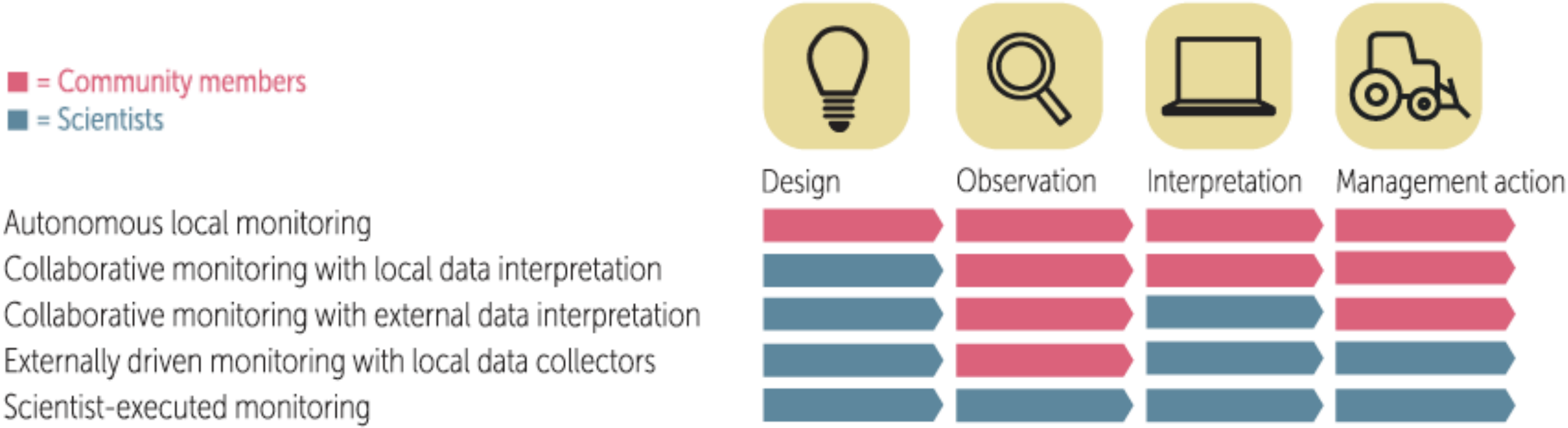
Developing an Arctic Practice System

Socio-ecological system: Developing Bayesian Belief Network for fisheries management

Community-Based Monitoring versus Citizen Science

"Community-based Monitoring" - Monitoring where community members are the drivers and contribute with more than just observations (e.g. knowledge, interpretation)

"Citizen-science" - Research and monitoring involving community members (often used when community members, citizens, only contribute with data gathering



Danielsen et al., BioScience 71, 484-502 (2021)

From global to regional and local scale observations

Global scale examples:

GLOBE program: clouds, land cover, trees, ++ supported by NASA

eBird: established 20 years ago and is run by Cornell Lab of Ornithology

Regional – local scale examples:

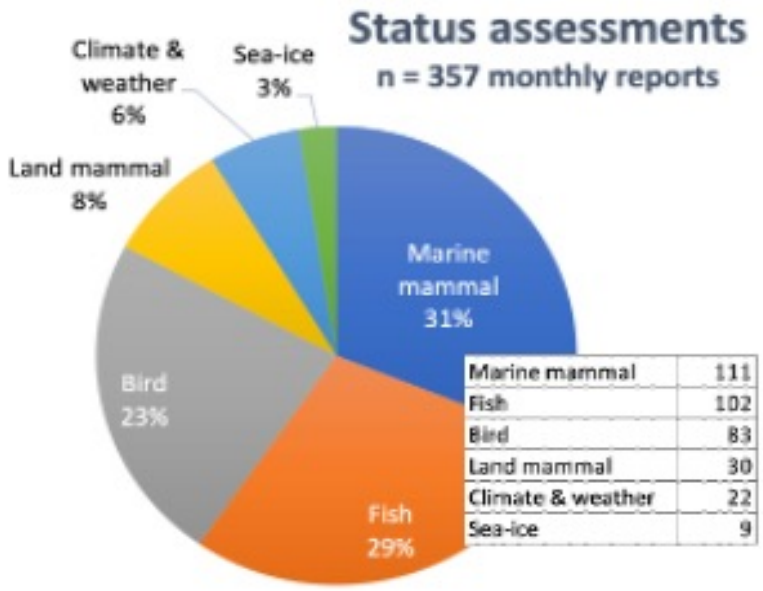
Alaska: Alaska Arctic Observatory and Knowledge Hub (AAOKH)

Greenland: the PISUNA program on management of living resources: organised on governmental level, involving local hunters and fishers to register marine mammals, fish species, etc.

Svalbard activities: involving tourists in marine data collection

More examples: see https://mkp28.wixsite.com/cbm-best-practice/

Community-based monitoring in Greenland: marine resources



- Community-based monitoring (CBM) is a method where indigenous and local communities are directly involved in environmenta data collection. Example above is from North-West Greenland

Community-based monitoring in Alaska: coastal risks and hazards

Noor Johnson, Olivia Lee, Nathan Kettle

- Identify the types of information used in short and long-term decisions and planning for coastal risks and hazards;
- Identify how existing community-based monitoring programs are situated within other information used in risk and hazard mitigation;
- Understand the role of standardization in connecting community observations with decision processes and the benefits and drawbacks of greater standardization for different actors.

Photo by Harley Jesse Walker

Community-based monitoring and Citizen science in the Svalbard area

Joint workshop in Longyearbyen 6-9 August 2022 organized by the CAPARDUS project and Norwegian Institute for Cultural Heritage Research (NIKU)

- ca 20 participants – excursion to study cultural heritage sites in Hiorthhamn
- Review of practices, guidelines, standards and regulations
- Discussion – group work on Arctic Practice Systsem concepts

Protection of cultural heritage in the Arctic

How can tourists and citizen science methods contribute ?

CULTCOAST

Capardus

With funding from The Research Council of Norway

How do we work with standardisation development ?

Identify and document how things are done within specific themes of importance in the Arctic

Less formal

More formal

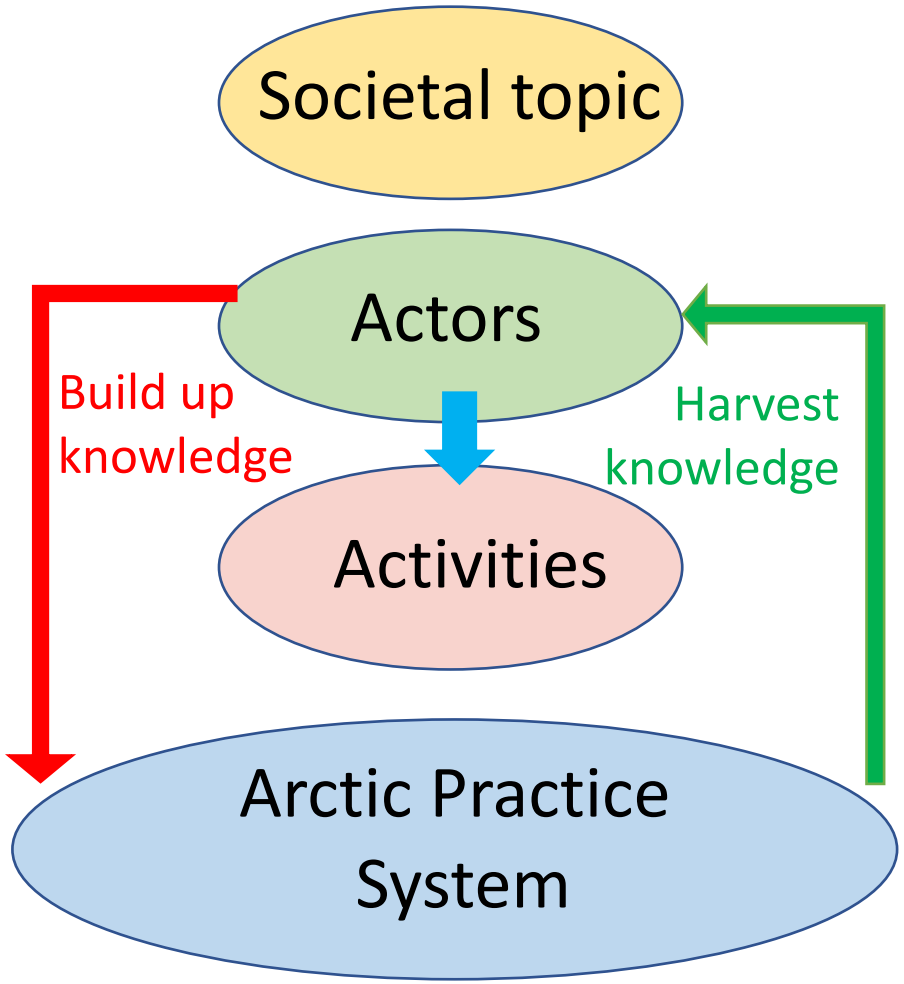
Traditions, norms, informal agreements	Not necessarily documented, but are topics for research in social sciences
Practices, guidelines, standards,	Documented through articles, reports, manuals, videos
Policies, regulations, conventions	Official documents, defining requirements, setting standards
National and international laws	Legal documents

How can Practices be documented ?

Documentation can be in the form of

- Reports and other written material (most common)
- Photos
- Video recordings
- Audio recordings
- Human experts explaining
- Other ?

How to develop and maintain an Arctic Practice System ?



Example 1:

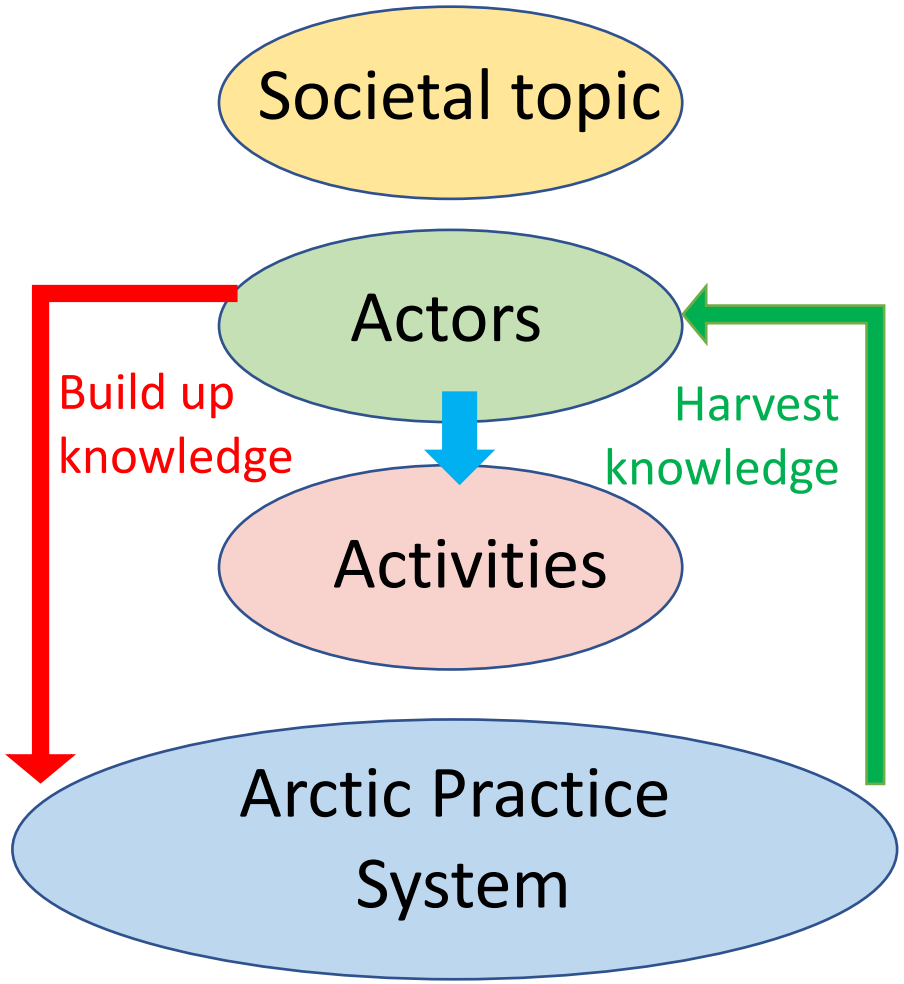
Fishing for food supply in a coastal community

Fishermen, processing industry, regulators equipment providers

All activities connected to fishing

A repository of information from reports, video- and audio material

Example 2:



Snow avalanche warning

National agencies and authorities, researchers, local communities

Snow observations and weather forecasting ++

A repository of information from reports, video- and audio material

Ocean Best Practice System is established under UNESCO IOC

What is Ocean Best Practice ?

"A method adopted by many people to carry out a task within ocean observation, research, assessment of environment, etc."

OBPS contains a repository of more than 1700 documents, tagged with 167581 terms and 6 terminologies available at https://www.oceanbestpractices.org/

unesco
Intergovernmental Oceanographic Commission

ocean best practices

capardus

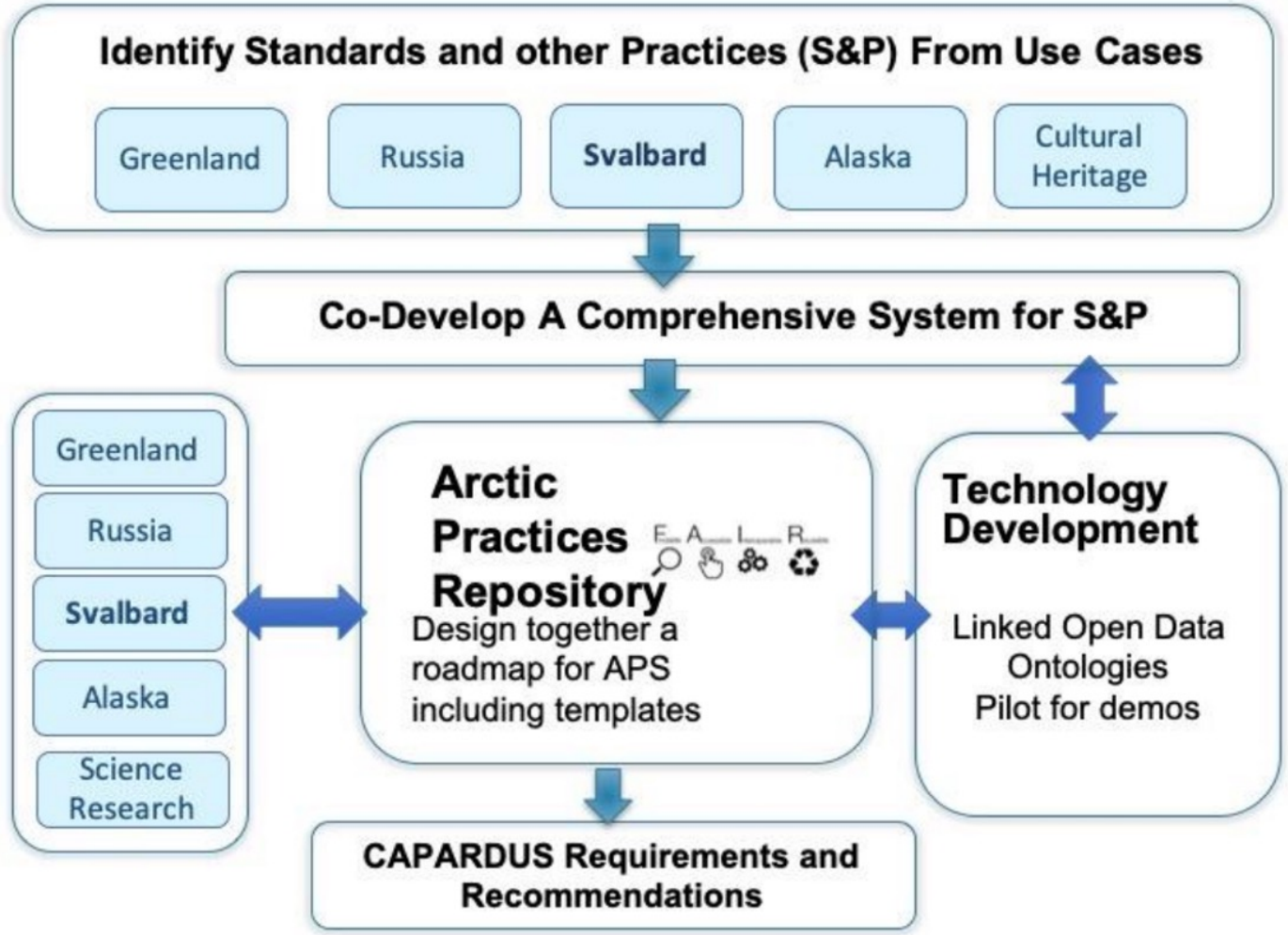
Arctic Practices Community- a test site under OBPS

The Arctic Practices Community is an initial repository for supporting CAPARDUS Arctic Practices System Design.
https://repository.oceanbestpractices.org/handle/11329/1291

At present the repository contains presently
155 documents, of which
73 respond to search words “Greenland” and “fisheries”
25 respond to search words “Svalbard tourism”

Design of an Arctic Practices System (APS)

- APS is planned to be a digital system about practices used by people living and working in the Arctic
- APS will document how things are done for example in collecting environmental data, which instruments are used, etc.
- APS will be built up by people who insert digital objects into the system and wants to share their knowledge with others
- A report is in preparation and will be published in June 2023



Recent publications on CBM and CS

Review of good practices

https://upcolorado.com/university-of-alaska-press/item/6022-community-based-monitoring-in-the-arctic

Special section in BioScience, May 2021

The Concept, Practice, Application, and Results of Locally Based Monitoring of the Environment

FINN DANIELSE
AND NEIL D. B

Connecting Top-Down and Bottom-Up Approaches in Environmental Obse

HAJO EICKEN,
POULSEN, OLIVI

Creating Synergies between Citizen Science and Indigenous and Local Knowledge

MARIA TENGÖ

The Use of Digital Platforms for Community-Based Monitoring

NOOR JOHNSON, MATTHEW L. DRUCKENMILLER, FINN DANIELSEN, AND PETER L. PULSIFER