

Developing community-based observations and citizen science in the Svalbard area

24 February 2023 0830 – 1230

Arctic Science Summit Week

Session ID06:

Community-based observing and citizen science – tools for participatory, sustainable development in the Arctic

Stein Sandven,
Nansen Environmental and Remote Sensing Center



The CAPARDUS project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869673.



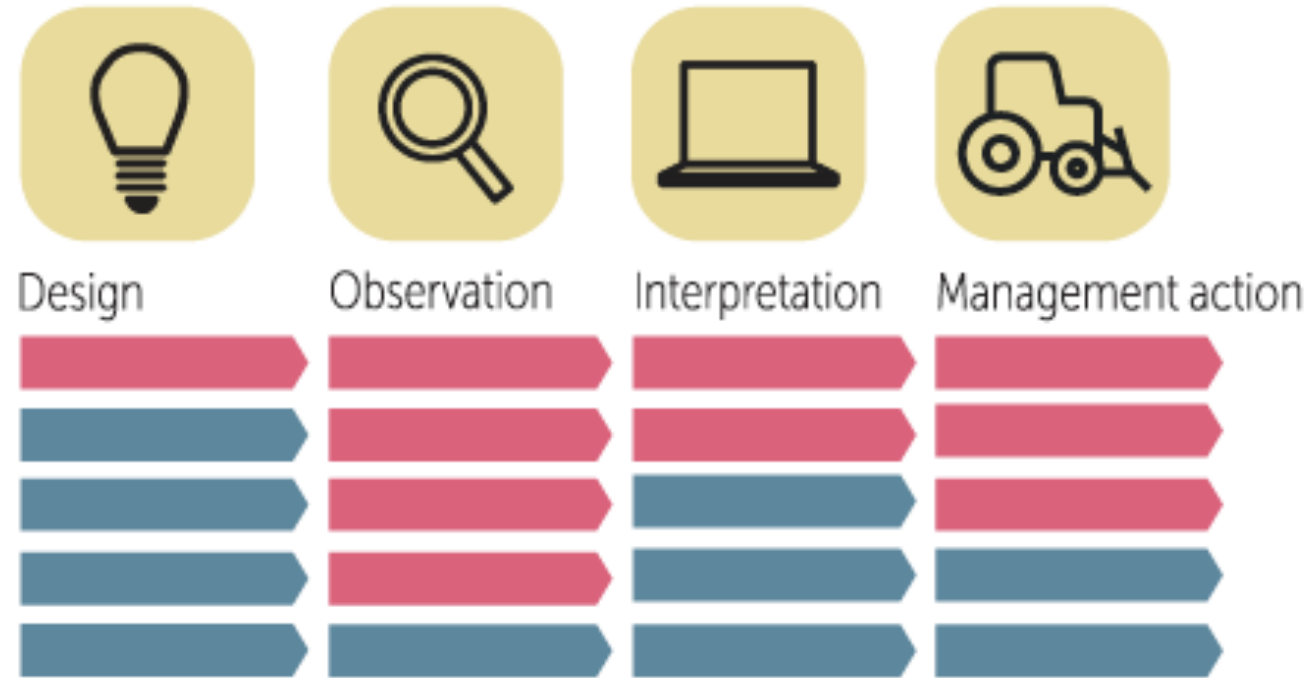
Community-Based Monitoring versus Citizen Science

“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)

■ = Community members
■ = Scientists

Autonomous local monitoring
Collaborative monitoring with local data interpretation
Collaborative monitoring with external data interpretation
Externally driven monitoring with local data collectors
Scientist-executed monitoring



Survey of Community-Based Monitoring programs in the Arctic

Results from the INTAROS H2020 project (2016-2022)

1. 170 CBM programs identified in the Arctic
2. 45 CBM programs were selected for analysis. Results are available in INTAROS reports*
3. Topics of the CBM programs: **Fisheries, Forestry, Herding and Hunting, Mineral and Hydrocarbon extraction, Shipping, Tourism**
4. The collected data must provide information for decision-making in matters of importance for the community (e.g. food supply, safety)
5. CBM programs are significant contributors to international environmental agreements and the UN Sustainable Development Goals

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:

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

TOURIST CRUISES & SCIENCE: involving tourists in marine data collection around Svalbard in collaboration with scientists at UNIS (University Centre in Svalbard)

PISUNA program



Fishermen who are part of the PISUNA climate stewardship program in Attu, Greenland, are monitoring a key species around their island — the Atlantic cod. (Photo by Meral Jamal, Nunatsiaq News, 24 Dec. 2022, <https://nunatsiaq.com/stories/article/chasing-the-atlantic-cod-with-pisuna/>)

Example of data from Svalbard area registered in eBird



*Records of Atlantic puffin *Fratercula arctica* (n = 622 records) from Svalbard 2002-2019 in the eBird database*

Puffin is listed as globally threatened by the World Conservation Union in the category Vulnerable. Records highlighted with a white flame are from eBird hotspots, areas with “many” checklists. Insert photo by Henrik Kisbye.

Citizen science on Arctic cruise ships

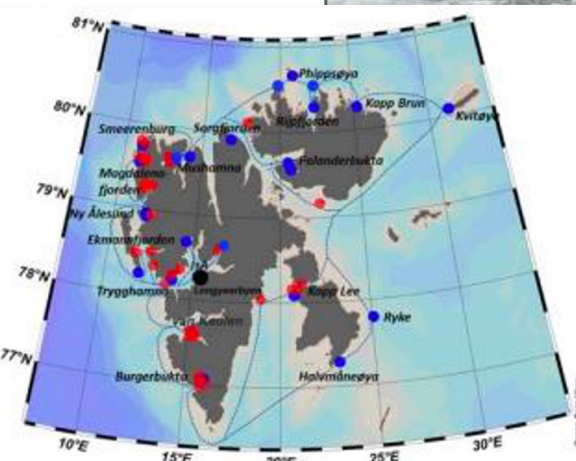
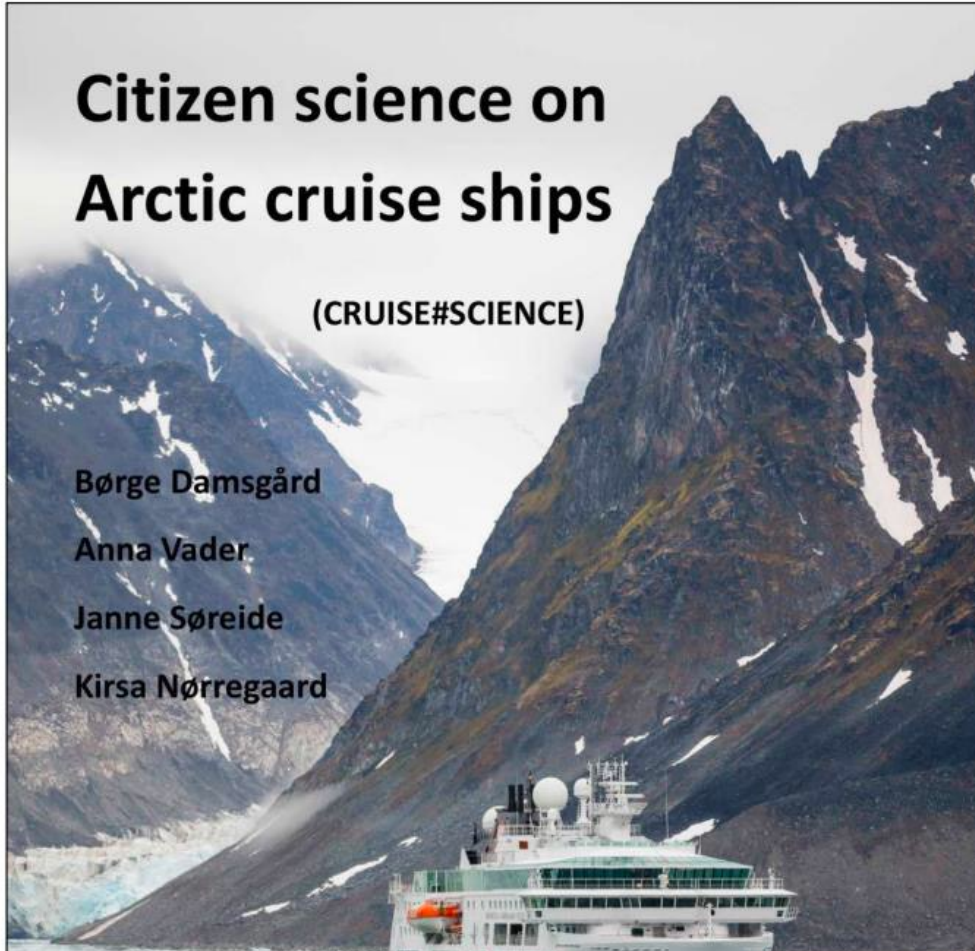
(CRUISE#SCIENCE)

Børge Damsgård

Anna Vader

Janne Søreide

Kirsa Nørregaard



©Sine Astad

Courtesy: Janne Søreide and Børge Damsgård, UNIS





Data collection during the whole year for several science programs: GLOBE (NASA), AURORASAURUS ++



Association of Arctic Expedition Cruise Operators (AECO)



Established in 2003
63 international members
57 operating vessels
1500 guides
64 guidelines
Contributor to several
Citizen Science programs



AECO's activities in Community-based
observing and Citizen Science



Courtesy: G. Gudmundsdottir, AECO

AECO's Guidelines and Citizen Science

AECO's guidelines

The backbone of AECO's work

- Operational Guidelines
- Visitor Guidelines
- Cleanup Guidelines
- Community Guidelines
- Biosecurity Guidelines
- Vegetation Guidelines
- Cultural Remains Guidelines

Citizen Science



Comments from the guests on board:

"...added great value to the educational program on board"

"...linked the lectures to science projects"

"...feel part of something important, not just cruising"

Protection of cultural heritage in the Arctic

Can tourists and citizen science contribute ?

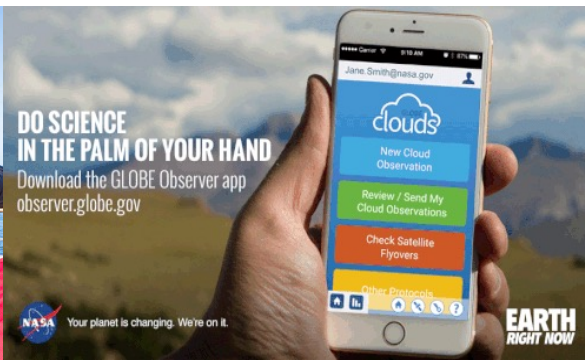




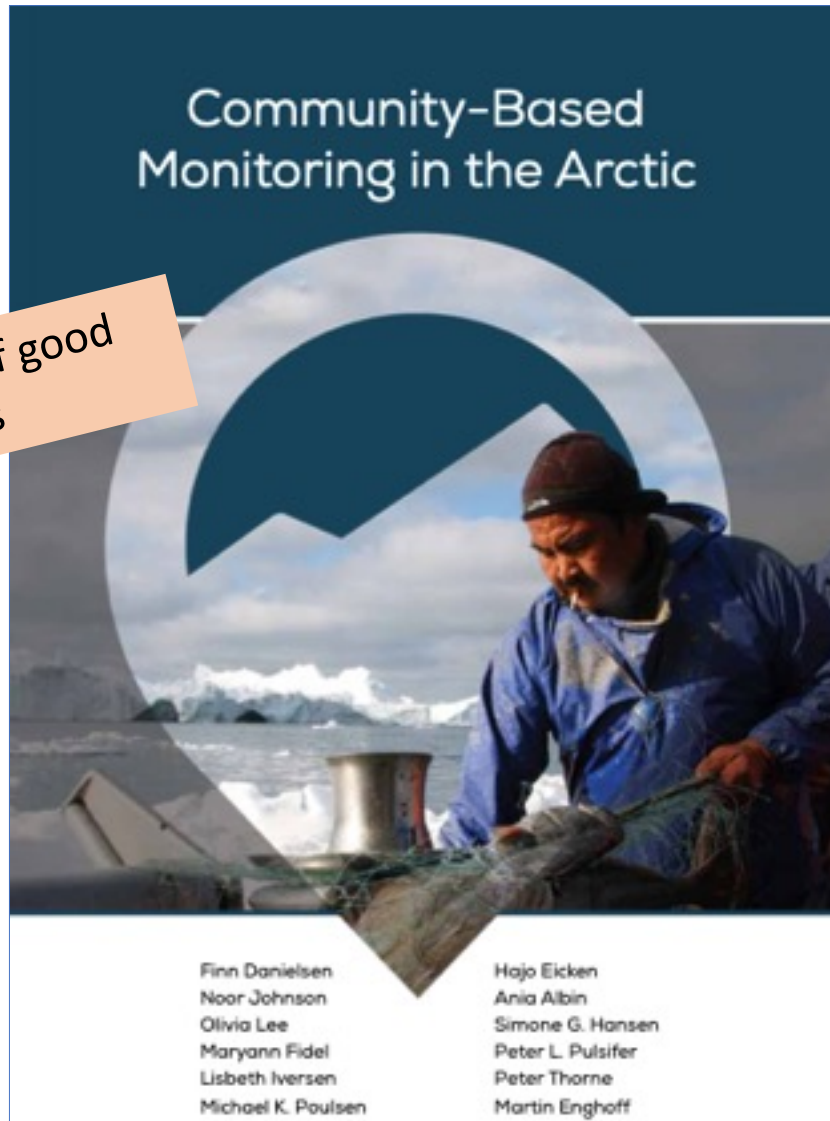
polarcollective.org
info.polarcollective@gmail.com

Polar CS Collective supports Citizen Science projects

- **Aurorasaurus** - Track auroras around the world (scientific partner: NASA Science Activation)
- **NASA GLOBE Clouds** - Cloud Observations & Atmospheric Measurements (scientific partner: NASA GLOBE Observer)
- **Seabird Surveys** for the Antarctic Site Inventory (scientific partner: eBird)
- **Secchi Disk Study** - Long-term Changes of Phytoplankton (scientific partner: Secchi Disk Foundation)
- **Happywhale** - Marine Mammal Photo-ID (scientific partner: International Whaling Commission and multiple regional research partners)
- **FjordPhyto** Phytoplankton Sampling (scientific partner: Vernet Lab at Scripps Institution of Oceanography)



Recent publications on CBM and CS



Community-Based Monitoring in the Arctic

Finn Danielsen
Noor Johnson
Olivia Lee
Maryann Fidel
Lisbeth Iversen
Michael K. Poulsen

Hajo Eicken
Ania Albin
Simone G. Hansen
Peter L. Pulsifer
Peter Thorne
Martin Enghoff

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

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

FINN DANIELSEN
AND NEIL D. B...

Special section in
BioScience, May 2021

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

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