

UArctic TN on Collaborative Resource Management – Proposal for endorsement 2021

Summary. With support from the Government of Denmark and the TN partners' own institutions, the partners have established a strong international partnership on topics of vital importance to Arctic societies: collaborative natural resource management and monitoring. In close dialogue with the UArctic Secretariat and UArctic Assembly, a new Thematic Network on collaborative resource management has been developed. Three key activities have been undertaken. First, a seminar was organized as a side-event of the 2nd Arctic Science Ministerial in Berlin to discuss good practice in collaborative resource management. Second, an experience exchange workshop was held in Japan, bringing the network participants together. Third, the partners convened an in-service, practice-based course on collaborative resource management in Greenland, to our knowledge the first of its kind. The course was primarily attended by public resource managers from all five of the country's municipalities. Because of the exceptional interest in the course, almost three times more participants completed it than planned. The experiences from the course are used by the partners to improve and scale-up further capacity development activities in collaborative natural resource management and monitoring across the Arctic and Sub-Arctic regions. Using "windows of opportunity", a very large number of other seminar, workshop and conference activities were also undertaken in support of capacity development on collaborative management and monitoring. During the pandemic, meetings have been held less regularly, planning has been difficult, activities more unpredictable, and several of us have had to prioritize staying safe, home-schooling children, and caring for parents.

1 Past activities

1.1 Applied funding

We successfully applied for DKK 500,000 from the Government of Denmark (2018). In 2019 and 2020, TN activities formed part of three EU H2020 applications but they were not successful.

1.2 Planned and conducted events, workshop, sessions in congresses

The importance of capacity-development in community-based management and community-based monitoring (CBM) was highlighted by the TN partners at multiple major events:

- At a side-event at the Fourth Session of the UN Environment Assembly in Nairobi.
- In a presentation at a symposium at the Citizen Science Association in Raleigh, North Carolina, US.
- At "Dansk Polarforskerdag" in Copenhagen, Dec. 2018 (panel discussion).
- At the annual meeting of the EU project INTAROS in Bremen, Jan. 2019.
- In a presentation and discussions at a meeting of the Sustained Arctic Observing System Committee on Observations and Networks (SAON CON) in Feb. 2019.
- In a workshop at the University Centre of Svalbard with the Association of Expedition Cruise Operators (AECO), tourism operators, key Arctic and global citizen science programs, scientists and decision-makers in Svalbard, Mar. 2019.
- In a presentation on co-management for c. 100 UArctic delegates to the UArctic Assembly (Copenhagen, Feb. 2020).



Figure 1. Panelists at the TN's side-event of the 2nd Arctic Science Ministerial in Berlin. From right to left, Hajo Eicken, Natsuhiko Otsuka, Anders Oskal and Malene Simon.

- Through co-development of a new UN-“one step entrypoint” organization for citizen science internationally with partners (the Global Citizen Science Partnership; Michael K. Poulsen, Finn Danielsen, Herizo Andrianandrasana and more; 2018-).
- At dialogue meetings with University of the Faroe Islands on initiating capacity development in collaborative management with related efforts in the Faroe Islands.
- In three presentations at the Arctic Observing Summit (AOS) in April 2020, led by Olivia Lee, UAF; M. K. Poulsen and F. Danielsen.
- In three presentations at European Geosciences Union General Assembly (EGU) 2020, by Shuhei Takahashi, Hokkaido University; Hajo Eicken, UAF; and F. Danielsen.
- In two presentations at the International Symposium on Arctic Research (ISAR-6) in Tokyo, May 2020, by Shuhei Takahashi, Hokkaido University; and F. Danielsen.
- Through suggesting topics for Arctic Science Ministerial 2021 (ASM) discussion on co-management to the ASM organizers (Government of Japan); the suggestions were subsequently discussed online (side event to ISAR-6).
- In a presentation held at the European Citizen Science Conference in Italy (Sept. 2020; M.K. Poulsen).
- In a one-hour tweet dialogue called “TweetChat” on the topic of “invisible citizen science”, hosted by North Carolina State University (Oct. 2020).
- In a Grand Challenges discussion session with external keynote speakers on the science of cross-weaving knowledge systems in the Arctic held at the EU EO4 Polar Science Workshop in Oct. 2020 (90 minutes; organized by NORDECO with Carleton University/ELOKA).
- At monthly meetings of the “CODATA–WDS” Task Group on Citizen Science under the International Council for Science.
- In peer reviews for multiple journals including *Science*, *BioScience*, and *Conservation Science and Practice*.
- In discussions with many partners on the development of a road map for improving the interoperability of (community-based monitoring) CBM and *in situ* monitoring approaches in Greenland and Svalbard.

- Through technical inputs on Indigenous and Local Knowledge and CBM for the Government of Greenland's engagement in the new agreement on Central Arctic Ocean fisheries.
- Through developing capacity in, and helping institutionalize, CBM efforts and the use of CBM data for decision-making among community members, civil society organizations, government resource managers and scientists in Greenland and Yakutia (in Yakutia, led by the Centre for Support to Indigenous Peoples of the North and the Republic Indigenous Peoples' Organization of Sakha Republic).
- Through supervision of Greenland Governments' PISUNA CBM program on a weekly basis via Skype, telephone and physical meetings. This activity included: facilitated documentation of the status of management decisions emanating from CBM; updated and considerably expanded the website and database of observations for the CBM network, and transferred PISUNA data to PISUNA-net; drafted potential policy on CBM implementation ("bekendtgørelse") for KNAPK (the Association of Greenland Fishers and Hunters) based on international experiences; organized community meetings with fishermen and other local observers; Assisted Avannaata Municipality in CBM expansion; supervised the scaling-up of CBM activities with KNAPK, and local and central authorities; met with the Qeqertalik mayor to discuss CBM scaling-up across the Arctic through the Arctic Mayors Forum; held discussions with the Government of Greenland Mineral Resources Activities Agency on the use of CBM for mineral resource activities.
- In an abstract submitted and approved for presentation at the Coastal Zone Canada 2020 Conference (scheduled for June 2020, postponed to 2021).
- In a popular article on the need to increase the number of Arctic resource managers who are able to use participatory approaches published in Shared Voices.
- During a 3 hour online workshop on stimulating increased practical use of local knowledge in North Atlantic Marine Mammal Commission (NAMMCO), Convention on International Trade in Endangered Species (CITES) and other international management bodies' advisory services, organized by NORDECO in Feb. 2021. Presentations by Amalie Jessen, Greenland Ministry of Fisheries, Jason Akearok, Nunavut Wildlife Management Board, Fern Wickson, NAMMCO, Jessica Lefevre, Alaska Eskimo Whaling Commission, Yuan Liu, CITES, Kuupik Kleist, ICC, as well as Maria Tengö and Pernilla Malmer, Stockholm University.
- In a presentation about the work of the TN at the Research Network Series on Scotland's role in the Arctic, in March, 2021
- At one co-hosted session and in two individual presentations at the Arctic Science Summit Week in Portugal (March 2021).
- Contribution to US Interagency Arctic Research Policy Committee cross-team collaboration discussions on the use of Arctic observations to meet resource management applications (March 2021)

1.3 Internal network meetings online

The project partners held regular meetings on Skype.

1.4 Education and research activities

The TN organized three key activities related to education and research on collaborative resource management:

- Seminar at the 2nd Arctic Science Ministerial. The TN organized an experience exchange seminar as a side-event of the 2nd Arctic Science Ministerial in Berlin on 24 October 2018 (Figure 1). The side-event involved six presentations and a panel discussion about how education and research institutions can contribute to increase the number of Arctic resource managers and scientists who are able to facilitate, implement and operationalize participatory approaches to natural resource management in practice. At the subsequent scientific meeting during the Arctic Science Ministerial, participants who had attended the experience exchange seminar highlighted the importance of enhancing capacity in community-based management and monitoring in the Arctic. Perhaps in part as a result of this, in the summary from the scientific meeting, community-based approaches to observing were given considerable attention.
- Experience exchange workshop. An experience exchange workshop (on interdisciplinary capacity development in collaborative natural resource management and monitoring) was hosted by Hokkaido University in Sapporo, Japan, in June 2019. A total of 15 participants from five countries attended the two-day workshop.
- In-service course. An in-service course in collaborative resource management in the Arctic was held for public resource managers and recently-graduated Greenland-based students in Nuuk in October 2019. The course comprised lectures, group discussions and exercises. A total of 25 participants attended the three-day course; this included staff from all five municipalities of Greenland (Figure 1). The course plan, reading materials, course program, lectures and exercises are freely available from the Thematic Network website. The course evaluation showed that participants in general were pleased with the course content and process.

1.5 Publications

In this section, we provide a list of publications co-authored by TN partners Oct. 2018 - March 2021.

2021:

Tengö, M., Austin, B., Danielsen, F. & Fernández-Llamazares, Á. 2021. Creating synergies between citizen science and Indigenous and local knowledge. *BioScience*. In press.

Danielsen, F., Enghoff, M., Poulsen, M.K., Funder, M., Jensen, P.M. & Burgess, N.D. 2021. The concept, practice, application and results of locally-based monitoring of the environment. *BioScience*. In press.

Eicken, H., Danielsen, F., Sam, J.-M., Fidel, M., Johnson, N., Poulsen, M.K., Lee, O.A., ... Enghoff, M. 2021. Connecting top-down and bottom-up approaches in environmental observing. *BioScience*. In press.

Johnson, N., Druckenmiller, M.L., Danielsen, F. & Pulsifer, P.L. 2021. The use of digital platforms for community-based monitoring. *BioScience*. In press.

Nuttall, M. 2021. Arctic ecology, Indigenous peoples and environmental governance. In David Thomas (ed.) *Arctic Ecology*. Oxford: Wiley Blackwell, pp. 409-422.

Sherbinin, A., Bowser, A., Chuang, T-R, Cooper, C., Danielsen, F., Edmunds, E. et al. 2021. The critical importance of citizen science data. *Frontiers in Climate* 3: 650760.

2020:

Cuyler, C., Daniel, C. J., Enghoff, M., Levermann, N., Møller-Lund, N., Hansen, P. N., ... & Danielsen, F. 2020. Using local ecological knowledge as evidence to guide management: A community-led harvest calculator for muskoxen in Greenland. *Conservation Science and Practice*, 2(3), e159.

Danielsen, F., Johnson, N., Lee, O., Fidel, M., Iversen, L., Poulsen, M.K.... Enghoff, M. 2020. *Community-based monitoring in the Arctic*. University of Alaska Press. 116pp. In press. (Peer reviewers: "a major contribution to turning CBM from a politically correct afterthought to 'real' science, into a rigorous and respected practice in its own right")

Danielsen, F., Adrian, T., Jensen, P.M., Muñoz, J., Shirk, J.L. & Burgess, N.D. 2020. Current approaches to citizen science. Pg. 25-29 in *Handbook of Citizen Science*. University of California Press.

Jeddi, Z., Voss, P. H., Sørensen, M. B., Danielsen, F., Dahl-Jensen, T., Larsen, T. B., ... & Frederiksen, P. O. 2020. Citizen seismology in the Arctic. *Frontiers in Earth Science* 8: 139.

Lee, O. 2020. Development of UArctic's Thematic Network on Collaborative Resource Management. Witness the Arctic Community Highlights. Accessible from: <https://www.arcus.org/witness-the-arctic/2020/1/highlight/2>

Nuttall, M. 2020. Water, ice and climate change in Northwest Greenland. *WIREs Water* 7(3): <https://doi.org/10.1002/wat2.1433>

Nuttall, M., Janne Flora and Astrid O. Andersen. 2020. Towards community-based narwhal conservation in Greenland. *Science* 370 (6515), 1: <https://science.sciencemag.org/content/370/6515/416.1/tab-e-letters>

Wheeler, H., Danielsen, F., Fidel, M., Hausner, V. H., Horstkotte, T., Johnson, N., ... & Ballari, Ø. 2020. The need for changes in the use of Indigenous knowledge along with science for decision-making. *People and Nature*. 2: 544–556.

2019:

Dodds, K. and M. Nuttall, 2019. *The Arctic: What Everyone Needs to Know*. Oxford and New York: Oxford University Press, pp. 272.

Dodds, K. and M. Nuttall 2019 'Geo-assembling narratives of sustainability in Greenland' (Klaus

Dodds and Mark Nuttall) in Ulrik Pram Gad and Jeppe Strandsberg (eds.) *The Politics of Sustainability in the Arctic: reconfiguring identity, space, and time*. London and New York: Routledge, pp. 224-241.

Enghoff, M., Vronski, N., Shadrin, V., Sulyandziga, R. & Danielsen, F. 2019. *Community-based monitoring in Yakutia, Arctic Russia*. INTAROS. CSIPN, RIPOSR, NORDECO and INTAROS.

Nuttall, M. 2019. Ice and the depths of the ocean: probing Greenland's Melville Bay during the Cold War in Stephen Bocking and Daniel Heidt (eds.) *Cold Science: environmental knowledge in the North American Arctic during the Cold War*. London and New York, pp. 23-41.

Nuttall, M. 2019. Sea ice, climate and resources: the changing nature of hunting along Greenland's northwest coast in Astrid B. Stensrud and Thomas Hylland Eriksen (eds). *Climate, Capitalism and Communities: an anthropology of environmental overheating*. London: Pluto Press, pp. 57-75.

2018:

Danielsen, F., Burgess, N.D., Coronado, I.M., Enghoff, M., Holt, S., Jensen, P.M., Poulsen, M.K. & Rueda, R.M. 2018. The value of indigenous and local knowledge as citizen science. Pg. 110-123 in *Citizen Science*. London: University College London Press.

Johnson, N., Fidel, M., Danielsen, F., Iversen, L., Poulsen, M.K., Hauser, D. & Pulsifer, P. 2018. *INTAROS community-based monitoring experience exchange workshop report, Québec*. Québec: ELOKA, Yukon River Inter-Tribal Watershed Council, NORDECO, NERSC & UAF. 27 pp.

Pocock, M.J.O., Chandler, M., Bonney, R., Albin, A. & Danielsen, F. 2018. A vision for global biodiversity monitoring with citizen science. *Advances in Ecological Research* 59, 169-223

2 Plans for 2021

2.1 Applications for funding

We plan to apply for funds from the Danish Government (DASHE) in April 2021.

2.2 Planned activities in 2021

The following activities are planned for 2021:

- Presentation at the Coastal Zone Canada 2021 Conference, in Iqaluit, Nunavut, June 2021
- Online meeting among the TN partners, summer 2021
- Subject to funding, we would like to hold a physical workshop where the TN partners can meet and where other actors interested in collaborative natural resource management and monitoring in the Arctic are invited. At the workshop we will together try to find the best ways to promote collaborative natural resource management and monitoring.
- We have many other ideas for planned activities in 2021 and 2022 but they depend on funding and getting beyond the pandemic.



Figure 2. Participants in the TN's UArctic course in Nuuk, Oct. 2019.
Photos and lay-out by S. Takahashi.