Mapping the organizations involved in Arctic Observing

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Network documentation offers a means of mapping and analyzing a group of participants in a larger community. In the case of the Arctic Observing community, a comprehensive network documentation effort would facilitate efficient coordination, increased transparency, and and a more welcoming community. Ultimately, a map of how organizations and projects interact, who works with who, and how information and decisions flow between groups would be helpful for anyone looking to engage with Arctic observing in a systematic sense.

Network analysis tools exist that can measure quantities including the connectedness of the network, the centrality of individual organizations, and the resiliency of the broader network. These rely on concepts of nodes (organizations) and edges (connections between organizations) weighted according to how connected they are.

In order to take advantage of these approaches, a dataset must be built consisting of a list of the organizations and how each of those organizations interacts, overlaps, or communicates with others. For the purposes of this analysis, "organizations" should be defined broadly, including projects (e.g., RNA CoObs or Arctic PASSION), private companies (e.g., cruise lines), Arctic communities (e.g., Utqiagvik), Indigenous organizations (e.g, Inuit Circumpolar Council), committees (e.g., IASC Cryosphere Working Group), organization boards (e.g., SAON), global organizations (e.g., Global Ocean Observing System), event coordinators (e.g., AOS organizing group), and observing efforts (e.g., AAOKH). Any effort that has multiple people involved, particular goals, regular activity to accomplish those goals, and is related to Arctic Observing should be included. A group working in Arctic observing that meets regularly is likely good candidate for this analysis.

Relevant connections between organizations also vary widely. Direct funding links are often the easiest to document, though even these are not widely published. Organizations can share information in a formal sense, through statements and similar documents, like with the Arctic Observing Summit submitting a statement to the Arctic Science Ministerial. Coordination on joint activities, whether that is working on a joint report or participation in an event, can be a particularly meaningful connection between organizations. Shared goals are important when they are specific and concrete: two parallel efforts to coordinate observations on the Greenland Ice Sheet would have shared goals in a meaningful sense, two efforts that are broadly working towards "better understanding of the Arctic system" would not. Finally, many organizations rely on the overlap of individuals between different efforts to carry information back and forth.

Potential questions this effort could address include (but are not limited to):

- How well connected are organizations working towards similar goals? Are there opportunities for better cooperation that could increase efficiency?
- Do certain actives or events serve as hubs for the community? Do these need additional or sustained funding to continue to serve this role?
- How reliant are decision-making structures within Arctic Observing on the efforts of individual people? Is there resiliency in the system if someone is unavailable or retires?
- Do existing organizations/projects/structures already exist that can coordinate the development or proposal of Shared Arctic Variables?

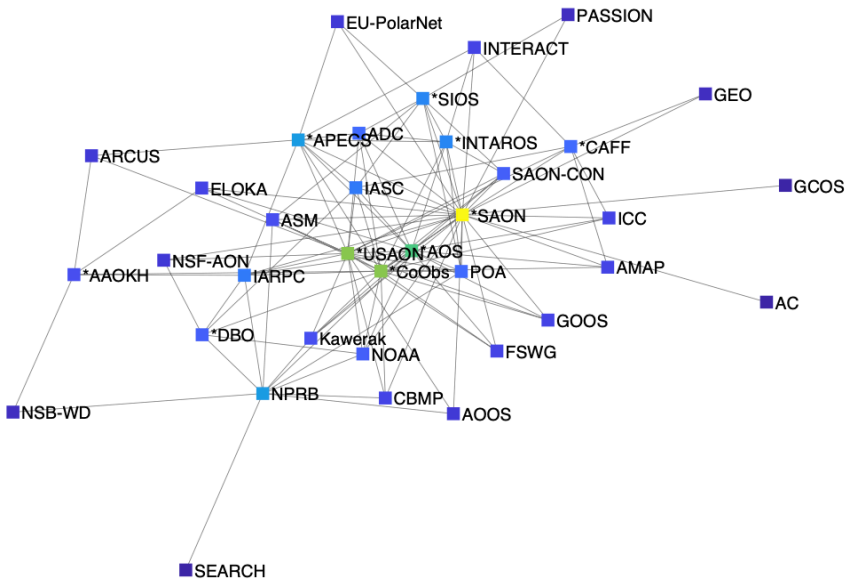

Figure: network map based on data gathered from ten organizations (indicated with a *), including only connections that consist of people in common between the two groups or a specific activity (e.g., writing a report). Organizations indicated with brighter colors are those with a higher number of documented connections, which mostly just indicates which organizations have been surveyed at this point.

Documenting the connections between organizations is a difficult and time consuming task.

An effort through the RNA CoObs project has focused on organizations directly connected to work in Alaska and the Pacific Arctic. With input from 10 organizations and projects, there are over 1200 documented connections within a set of 40 included groups, a subset of which are shown in the above figure. This information was collected through either a survey or a Zoom interview with someone in a position to represent the organization.

Several lessons learned from this (incomplete) effort will be critical to moving this forward:

- The choice of person to complete the survey or interview is critical: make sure it's a person who is very familiar with the organization, and who knows others in the community well.
- For organizations that are large or have wide-spread networks, it may be necessary to interview more than one person to fully document the connections.
- It is critical to have the full set of organizations identified before the interviews start: it is much harder to identify connections without being prompted for a particular organization.
- There are some ambiguous acronyms (e.g., Arctic Data Committee and the Arctic Data Center), and care should be taken to clarify which organization is being considered.
- As the network being documented grows, the process for any individual organization becomes longer: at some point it will be unmanageably large for the most-connected organizations. At that point, working from the outside in, with smaller groups identifying the connections with the larger organizations, can make the data collection process feasible.

The efforts through RNA CoObs to document a subset of the Arctic Observing effort continue, along with a related effort coordinated by the US National Committee to SAON. Linked efforts based in other hubs of Arctic observing activity would move this effort forward at a pan-Arctic scale.

For additional information:

Bradley, Alice and Martina Berrutti Bartesaghi. "A Network of Networks: Analyzing the Relationships Between Organizations Coordinating Arctic Observations" at AGU Fall Meeting 2021