

Alaska Project Background and Reflections on Participatory Mapping

Strategic Needs of Water in the Yukon (SNOWY)

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As part of the larger, NSF funded research project, Strategic Needs of Water on the Yukon (SNOWY), participatory mapping workshops were held in three villages (Kotlik, Chevak, St. Mary's) located in the lower Yukon River Basin and Yukon-Kuskokwim delta region of Alaska (Figure 1). The goal of these workshops was to create a suite of maps based on seasonal subsistence resource utilization and begin to assess changes to the winter climate in the Yukon. In concert with the maps, participants also created seasonal subsistence calendars listing resource utilization throughout the year and engaged in interviews to discuss seasonality.

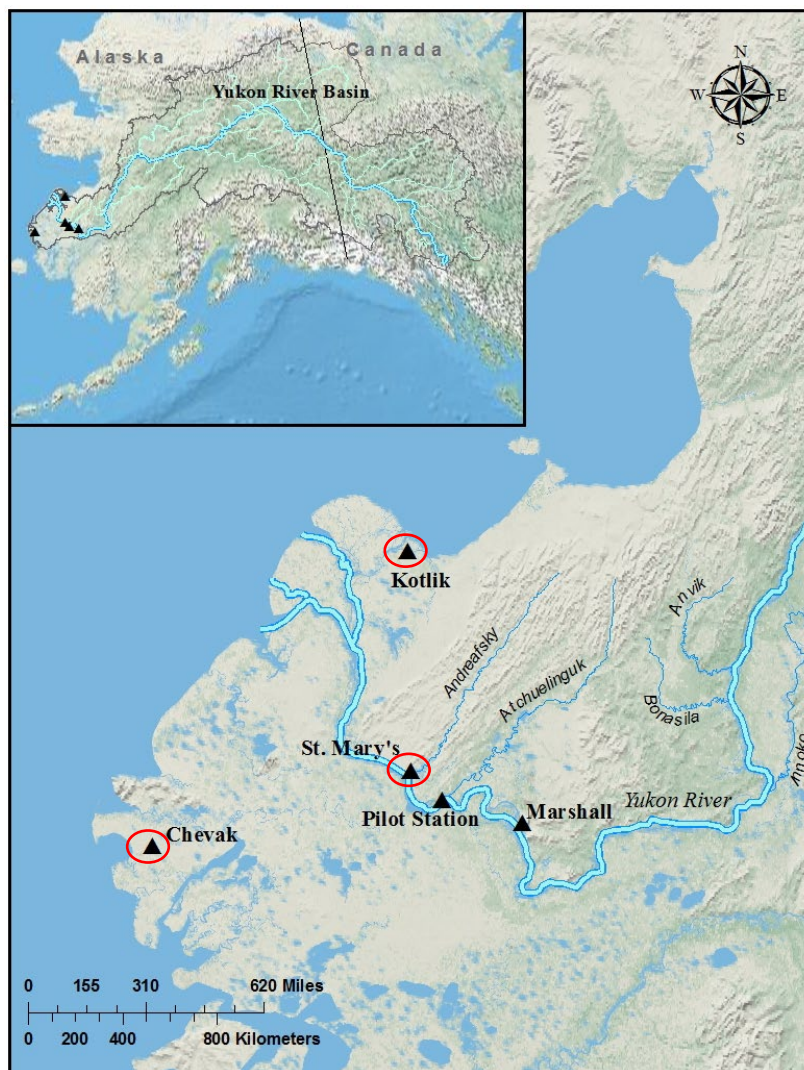


Figure 1: Location of villages for the SNOWY project. Locations circled in red are the communities where participatory mapping activities were held.

Project goals and roles of participants

The research focused on the nature and degree of the relationship between seasonality and subsistence resource vulnerability. We used data collected through semi-structured interview, participatory mapping, and seasonal calendar workshops in three communities located in the Yukon River Delta (YRD) over the course of two weeks in February 2014 and a return visit in May 2014.

Participants were recruited with the help of local contacts in the tribal councils in each community (Table 1). We held a potlatch in each community to inform the community about the activity and to solicit participants. We provided a small stipend and refreshments for all events.

Table 1: Village participants for participatory mapping activity

Village		Population	Tribal participants	# of participants: mapping&calendar/interviews/both
Chevak		938	Chevak Traditional Council	14/13/6
Kotlik		577	Kotlik Tribal Council, Bill Moore's Slough Tribal Council	21/16/8
St. Mary's		507	Yupit of ANDreafski, Algaciq Tribal Council	6/7/4

Participatory Mapping process

Participatory mapping was integrated with other participatory activities: creating a seasonal calendar to complement seasonal subsistence maps and semi-structured interviews. The flowchart (Figure 2) outlines two options when conducting participatory mapping: 1) beginning with a blank piece of paper and asking participants to hand draw the map or 2) using a satellite image or topographic map. We opted to use blank paper and then integrate satellite imagery into the process after maps were created.

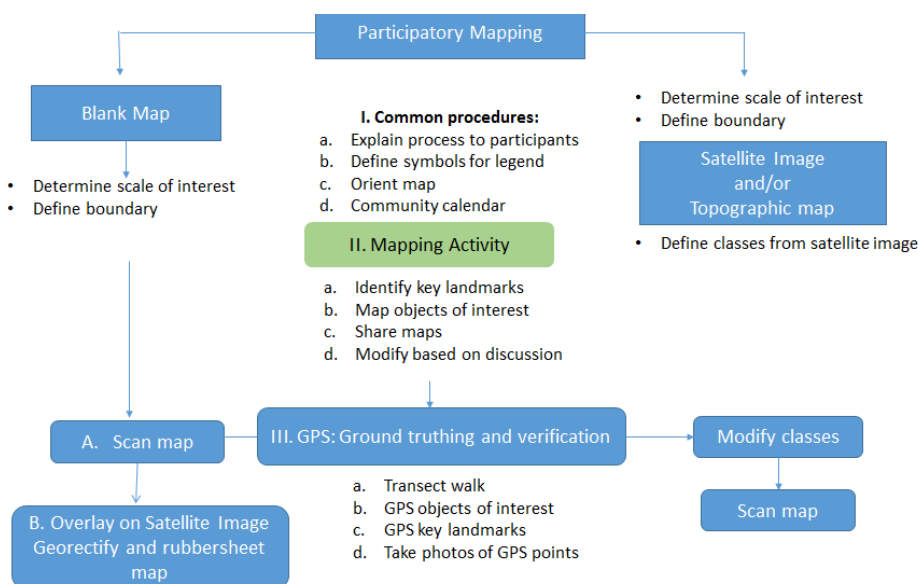


Figure 2: Methodology for participatory mapping

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Figure 3: Winter seasonal map and calendar of St. Mary's.



Figure 4: Seasonal map of St. Mary's overlaid on Google Earth images.

Results were returned to the villages for assessment, comments, and validation (Figures 5 and 6). Hand drawn maps from each village for each season were digitized. Digitization was completed by using the GPS locations of known landmarks chosen by participants during the workshops and matching environmental features displayed on hand drawn maps (rivers, sloughs, mountain ranges) with their counterparts on satellite images in Google Earth. Once the digital image was oriented by landmarks and environmental features, point locations of subsistence resources were added.

Employing three different qualitative data collection methods allowed us to compile a more comprehensive list of subsistence resources exploited in the villages of Kotlik and Chevak. Analyzing the data from all three sources (seasonal calendars, interview transcripts, and hand-drawn maps) made it possible to see where overlap between different participants occurred and where it did not. While the interviews captured the resources harvested by the individual and reflected a household or extended family pattern of usage (Herman-Mercer, 2016), calendars included all the resources the group could think of for each season. While the calendars gave us a comprehensive list of resources and their seasonal dimensions, interviews gave us contextual information about the current practice of subsistence harvesting associated with groups of extended family households (why needlefish are no longer harvested for example). Combining this contextual information with the comprehensive seasonal calendar and the spatial information provided by the hand-drawn maps we are able to make connections between local observations and knowledge of impacts on resources, cultural information about the processes and preferences of subsistence harvesting, and the role that distance plays in both (Herman-Mercer, et al, 2019).

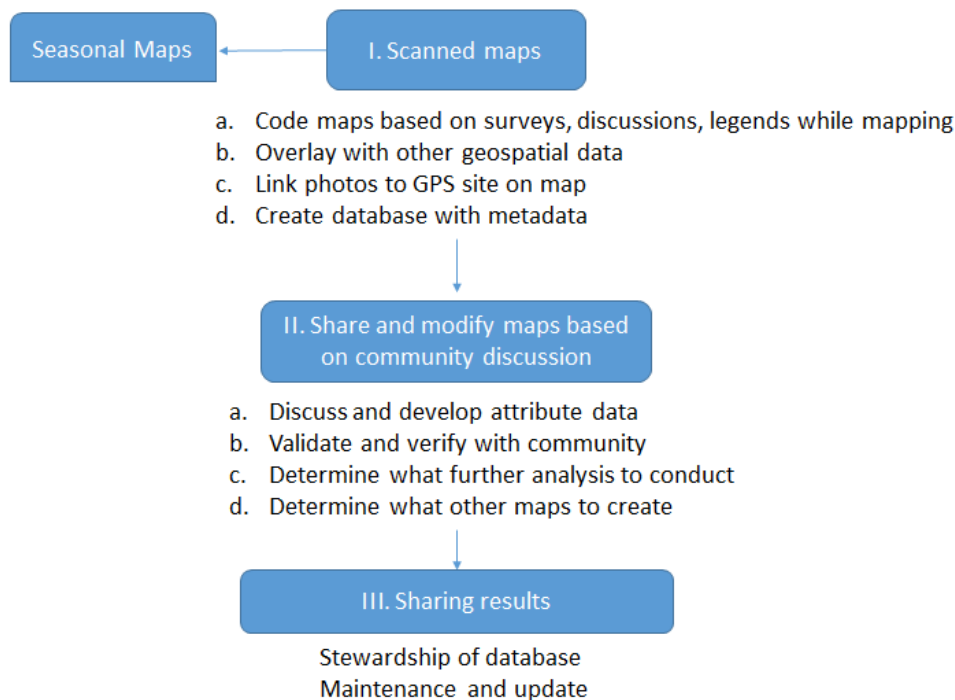


Figure 5: Process to validate data collected by participatory activity after data are collated.

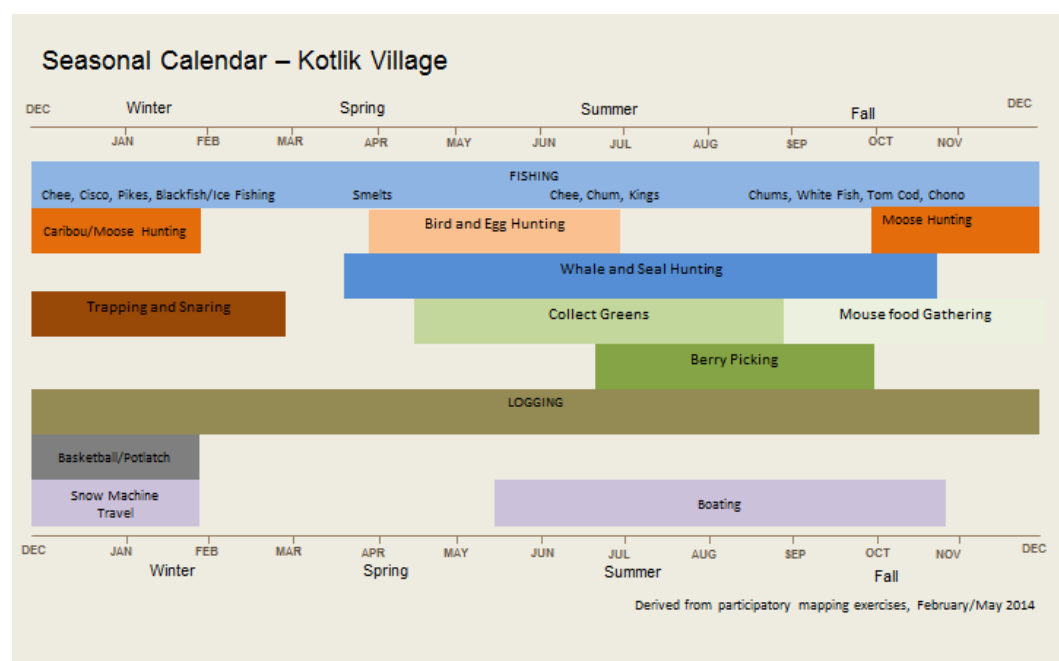


Figure 6: Seasonal Calendar, validated by Kotlik village.

Observations on the practice of participation in our projects

- Community members were keen to share and conduct mapping exercises.

- Participation is key activity of Arctic research. We discovered multiple other projects taking place across the communities we visited and felt that there needed to be better integration of these activities.
- However, several projects were citizen science projects, where local communities collected critical weather data to upload and share across the YRD and Alaska.
- Issues of participation erupted within mapping sessions – who was mapping and for what purpose? In one situation, the elders were not receptive to youth mapping with them.
- Sharing and listening to each other -- all results of mapping and seasonal calendars were shared as they were created to ensure the broadest participation as possible.
- Reluctance to share any information associated with hunting for fur-bearing animals (trap lines are sensitive).

Evaluate the costs and benefits that our projects have on stakeholders, including the researchers as facilitators of the mapping process

- Youth were excited to learn about new technologies and tools for data collection.
- Elders appreciated sharing their stories through mapping and interviews.
- We raised expectations for next steps: create a recipe book of country food...online atlas accessibility. We were unable to follow through on these activities due to lack of funding.
- Identified other issues considered more important: regional network for data collection on tundra conditions, daily weather metrics, water quality issues, salmon runs.
- Reassess approach – satellite images may be more helpful to track resources. However, communities appreciated time to discuss issues raised through mapping.
- Interesting results: gender made a difference; men's maps generally had a larger spatial extent, women's maps were of the surrounding area where country food could be collected (berries, mouse food, grasses, etc.), youth – all mapped where the basketball court was located and generally mapped the village.
- Seasons: largest distance travelled in winter – access to snow-covered trails; summer – movement by boat; few roads in this area; importance of wayfinding – using the landscape, clouds, wind, sun.

Share our lessons learned and recommendations

- Beginning with a blank map allows the boundaries of the map to be defined by the community.
- Beginning with a satellite image predetermines the geographic extent of the map for the community.
- An alternative method of having the community members choose the extent may be to hold a community meeting before the mapping workshop to jointly determine the geographic extent of a satellite image to use during the mapping workshop. However, the map will be limited by the resolution of the image available.
- Creating an online community atlas (Figure 7). Resources to develop, posting of materials and permission from community; using interviews with geography for an oral history – permission protected.

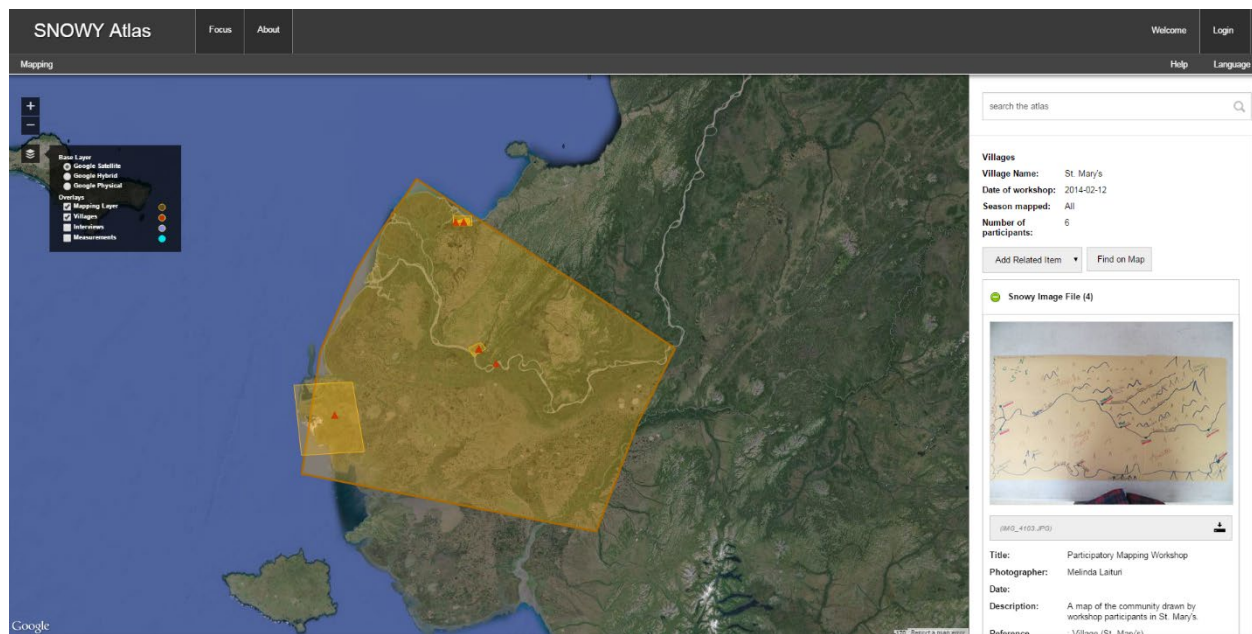


Figure 7: Preliminary SNOWY Atlas.

Summary:

- 1) Participatory mapping is an interactive exchange between local communities and researchers to intersect across cultures and livelihoods.
- 2) Multiple technologies are integrated using paper maps, global positioning systems, satellite images, and web-mapping.
- 3) Sharing is enhanced through community meetings to assess and re-evaluate map products and to post these products on the Internet.
- 4) This activity provided a lens to examine and learn across generations where maps created stories of past events (e.g., the resettlement of villages) and changing resource conditions (e.g., wildlife migration, ice breakup, seasonal shifts).

References:

Herman-Mercer, N., M. Laituri, M. Massey, E. Matkin, R. Toohey, K. Elder, P. Schuster, E. Mutter. (2019) Vulnerability of subsistence systems due to social and environmental change: A case study in the Yukon-Kuskokwim Delta, Alaska. *ARCTIC* 72(3):September, p. 258-272.

Herman-Mercer, N., E. Matkin, M. Laituri, R. Toohey, M. Massey, K. Elder, P. Schuster, E. Mutter. (2016) Changing times, changing stories: generational differences in climate change perspectives from four remote indigenous communities in Subarctic Alaska. *Ecology and Society* 21(3):28.

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