Conceptualizing Frozen Commons using Arts, Science, Local and Indigenous Knowledge (ArtSLInK)

NNA Research: Collaborative Research: Frozen Commons: Change, Resilience and Sustainability in the Arctic (NSF, # 2127364) Authors: BurnSilver, S., Degai, T., Kholodov, A., Ksenofontov, S., Kuklina, V., Petrov, A., Podusenko, S., Shaffer, L., Shiklomanov, A., Temte, J., Waterhouse, J., Zaslavskaya, O.

Frozen Commons

"Commons" are resources or lands that are held, used, protected and managed by groups of people together. "Commons" in the Arctic are usually frozen for most of the year. Put these ideas together and you get — "Frozen Commons" — or frozen lands and resources that multiple peoples and stakeholders have responsibility for and depend on — together. Examples of frozen commons are permafrost, snow, ice roads and ice-covered rivers, lakes and wetlands that support critical infrastructure and serve as hunting pathways or travel routes.

McGrath and Nikolai, communities on the upper Kuskokwim River are the focus of FC work in Alaska. Both communities are home to the Dichinarek' Hwa'tana (Timber River (Athabascan)) people. Strong collaborative relationships with the McGrath and Nikolai tribal councils are emerging, based on ideas and actions grounded in principles of collaboration

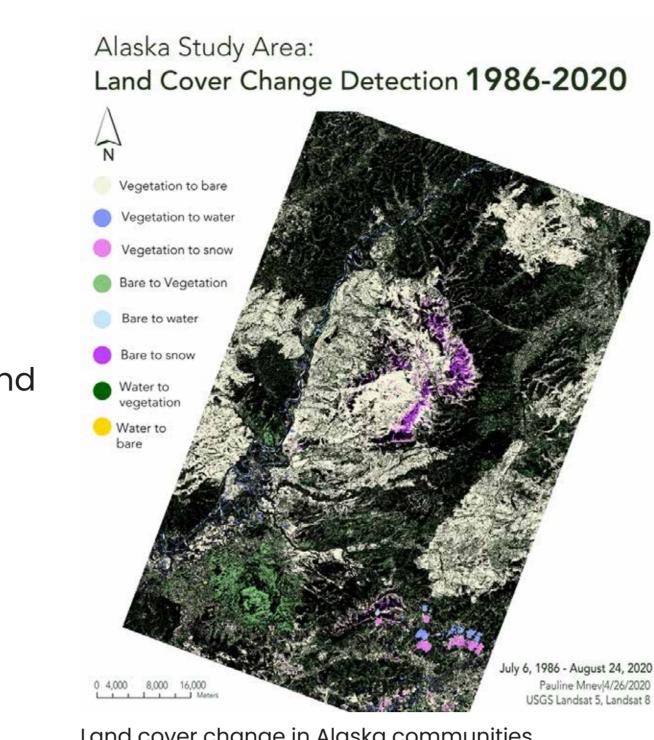
and co-production of knowledge. Two "community research leads" will be hired and community steering committees formed to collaborate on questions, methods and approaches to research.



Project objectives

Understand frozen commons that are important to people in Interior Alaska and the Republic of Sakha (Yakutia) in Siberia, as well as other regional and federal stakeholders in both places.

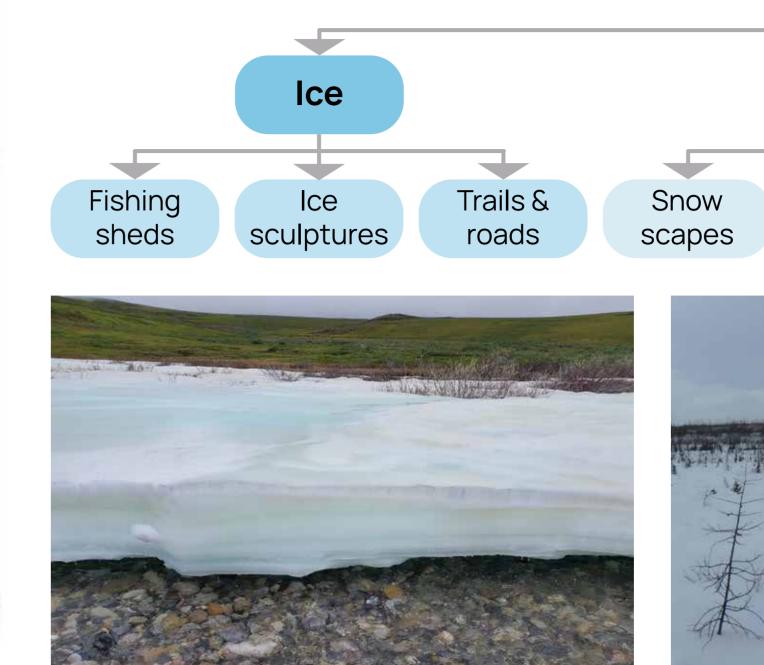
- X Ask what are the layers of beliefs and values underlying how people and stakeholders think about, or hold, use, protect, share and seek to manage ("govern") frozen commons?
- X Analyse how snow, permafrost and river/lake ice vary across space and time. Understand how geophysical elements of frozen commons are changing because of global climate change and human impacts.
- Karan Given how people depend on frozen commons, identify scenarios of adaptation that allow people and other stakeholders to respond to changes, and maintain livelihoods, infrastructure and important activities into the future.
- X Use the arts to interpret, value and share the meanings of Frozen



Local and

Indigenous

Knowledge



Indigenous and Local

The Frozen Commons project emphasizes Indigenous

research that breaks boundaries between academia,

travel to Nikolai and McGrath led to a proposal to use

engagement with frozen commons, and communicate

those relationships through art, stories and interviews.

Frozen Commons are historically managed collectively

based on rules in use and norms that define processes

of collective governance. In this way, Indigenous

to discussions of sustainability

methodologies and epistemologies where ice, snow

and permafrost are at the core of cultures are integral

PhotoVoice as a means to capture community daily

and Local knowledge as integral to postcolonial

social/natural sciences and the arts. For example,

communities and stakeholders, as well as



* FROZEN COMMONS

Examples of frozen commons

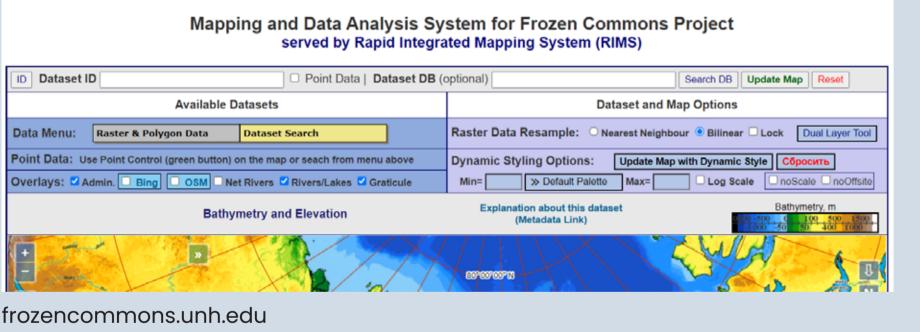
Knowledge

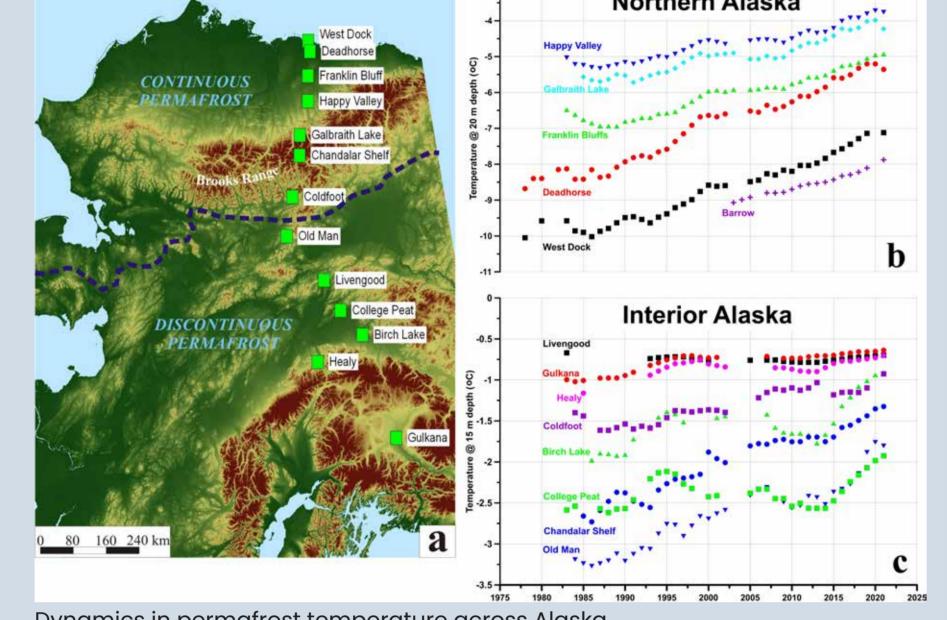
Natural Science - How are Frozen Commons changing?

The frozen commons are changing rapidly. Based on global climate change, permafrost in particular is undergoing the process of degradation. This process can be subdivided in two stages – (1) warming of frozen deposits to the range of phase transition of soil moisture and increasing the depth of seasonal thawing (active layer); and (2) intensive melting of ground ice. In Interior Alaska within the zone of discontinuous permafrost, mean annual ground temperature has reached critical values and the process of degradation has entered the second phase. Two ways of degradation depending on the ground ice content: 1) formation of taliks (a perennial unfrozen horizon between seasonally frozen layer and permafrost), when ice content does not exceed soil porosity, 2) subsidence and collapsing of the ground surface due to melting of excessive ground ice (development



Permafrost cellar in the town of Chersky Two key frozen commons (ice and permafrost) are declining and degrading with implications for subsistence, transportation and infrastructure. However, snowfall seems to be increasing. Degradation of permafrost affects both the effectiveness of permafrost (ice) cellars for subsistence foods and governance of





Dynamics in permafrost temperature across Alaska.

other resources like forest. Permafrost thawing can lead to formation of wetland (thermokarst) or area drought (taliks) which increases the risk of wildfires. Decreasing thickness and duration of seasonal ice in rivers/lakes also reduces opportunities for transportation via informal winter roads. Increasing snow has both positive and negative consequences. In regions characterised by continental climate with a dry hot Summer season, melted snow is one of the main sources of water for vegetation. On the negative side, increasing snow pack amplifies the rate of permafrost degradation and reduces the thickness of lake/river ice. Also, extreme snowfall can cause an extra load to infrastructure (roads, homes, public buildings), which require resources to repair and creates hazardous driving conditions on formal roads.

The project is developing an online system (FC-RIMS) that integrates biophysical and social data, maps outcomes, and facilitates analysis and information exchange around Frozen Commons. Users can visualize geospatial data, and use high resolution Open Street Maps (right maps)/Bing maps to find areas of significant socio-economic interest and explore changes occurring in underlying biophysical layers.

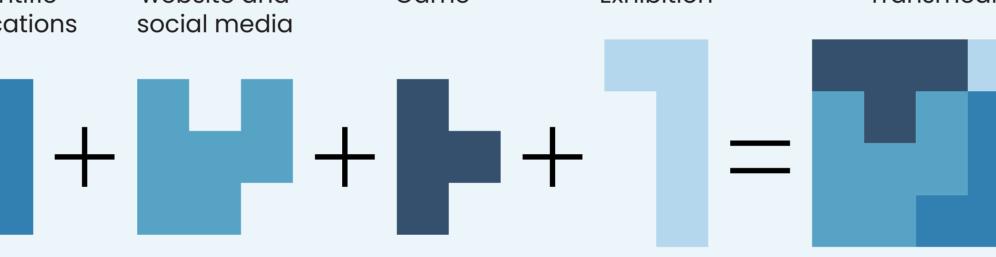
ArtSLInK = Arts, Science, Local and Indigenous Knowledge



artslink.space

ArtSLInK main focus is on how collaboration between artists, scientists, local and Indigenous communities can integrate content gathered and produced from various resources including artistic works and scholarly research that can be represented in the form of transmedia storytelling. Project members strive to pursue ArtSLInK approach that encompasses synchronous, equitable, co-productive engagement across the social and natural sciences, the arts, and place-based local and Indigenous knowledge systems, each with their distinct modes of exploration and expression.

Transmedia Storytelling



Science

Transmedia storytelling is a method to disperse a story across multiple mediums for creating an integral, combined and linked-up experience

Arts

AIVAN

AIVAN is an informal platform that unites Indigenous artists throughout the Arctic and beyond to share Indigenous wisdom through creative arts. Our virtual circle is held on a weekly basis to exchange knowledge, traditional crafts techniques, and facilitate discussions on the place of Indigenous arts in the 21st century.

The Crafty Storytelling Project (2022-2025) has emerged as an initiative of the Arctic Indigenous Virtual Artists Network. It brings together Indigenous artists and academics to think creatively about Frozen Commons and aims to foster co-production of knowledge on socio-ecological sustainability that engages different Indigenous and non-Indigenous knowledge systems across cultures, disciplines, and borders. One of the outcomes will be a crafty virtual exhibit and storytelling publication as a user-friendly way to inform broader society about diverse understandings of frozen matter.

aivan.uni.edu

their qualities and uses).

Sakha terminology conceptualizing frozen commons (e.g. snow, ice, permafrost,

Patchwork quilt created by Indigenous artists to represent their islets across Russian Arctic and US prairies

Visit to McGrath and Nikolai communities by team members Shauna BurnSllvei and James Temte

Artists and scholars collaborate to produce artistic installations to be presented at the group exhibition Arctic InfraScapes to be held during Arctic Social Sciences Week (ASSW) in Vienna, Austria from 17 to 24 February 2023. It displays interim results of several ongoing research projects with the main focus on the Arctic and its infrastructure/s - both hard and soft. It brings together artistic works created in collaboration with scholars doing research in the Arctic and other cryospheric zones.

Community Mural

Collaboratively with the APU Office of Research and Community Engagement and the Alaska Mural Project facilitate talking circles towards creation of community specific FC murals, honoring traditional ties to land and serving as a source of pride and community resilience. The murals will support efforts to share and celebrate Indigenous Knowledge.





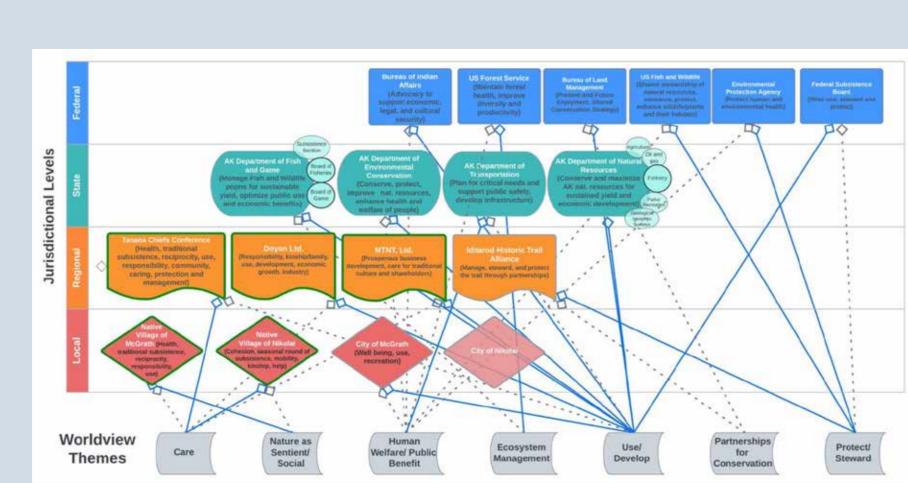


Social Science: What are underlying worldviews of Alaska stakeholdérs?

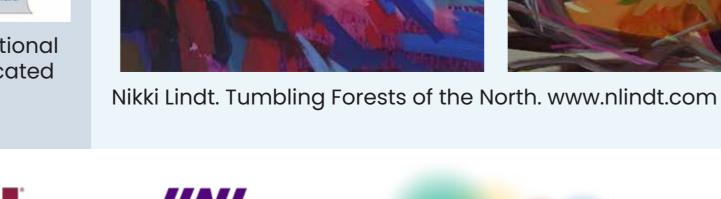
Shaffer and BurnSilver (ASU) identified 18 key stakeholders active in frozen commons landscapes around Nikolai and McGrath, Alaska, and described thei primary and secondary Worldviews. These stakeholders have care, use or management roles on landscapes in/surrounding the two Alaska communities are grouped by jurisdictional levels, e.g. community (4), regional (4), state (4), and federal (6). Five organizations are tribal. Our goal is an initial exploration of underlying "Worldviews", that is, the framework of ideas and beliefs that together form a global description used by individuals and groups to interpret and interact with the world (Dori et. al, 2020). We assume that these cognitive orientations play a role in how each organization might engage with, make decisions about, or manage frozen commons. A key word in context (KWIC) methodology was used to extract themes from public documents (e.g. web pages and annual reports, etc) and identify mission statements, values, and goals. Seven worldview themes emerged.

Preliminary analysis suggests there are clear differences in foundational understandings of human-landscape interactions across stakeholders. The documents of local and regional level tribal organizations (shapes outlined in green) emphasize unique themes, for example "Care" of subsistence lands and "Nature as sentient and social". Resource "use" for

sustainable yield and "development" is a primary theme for one local-level (city) stakeholder, all state level stakeholders, and three of six federal level stakeholders. The primary orientation of 2 of 3 regional tribal entities (MTNT and Doyen corporations) is "use" of resources, while their secondary worldview was "care". The secondary worldview theme "for human welfare or public benefit" is frequently expressed directly after the primary themes of "use [resources]" or "manage [ecosystems]." This linkage occurs for 4 of 6 federal level organizations, 1 of 4 state level organizations and one local level municipal (city) stakeholder.



Seven worldview themes emerged across 18 stakeholders across four jurisdictional levels (vertical axis). Primary (solid line) and secondary (dotted line) are indicated and text highlights key words by stakeholder







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