SECRETS TO ORGANIZING A TRANSFORMATIVE ARCTIC SCIENCE AND ENGINEERING CONFERENCE BY MERGING CODEVELOPMENT WITH CONVERGENCE AND BRINGING THE DIALOG TO THE ARCTIC

Jana Peirce, University of Alaska Fairbanks

NSF Navigating the New Arctic
Annual Community Meeting

Washington, D.C. | 6 March 2024

2023 PERMAFROST & INFRASTRUCTURE SYMPOSIUM:

Merging Science, Engineering and Community-Based Knowledge | 29 July – 5 Aug

COMMUNITY

Part I: Utqiagvik Conference

34 Visiting scientists, engineers, architects, and planners

15 North Slope government and community leaders

3½ days of presentation and discussions at the Barrow Arctic Research Center hosted by UIC Science

Field trips to see permafrost and infrastructure issues in Utqiagvik, and the coastal villages of Wainwright & Point Lay

Workshop for the North Slope Borough Assembly and Mayor

PART II

TRANSPORTATION

Part II: Dalton Highway Excursion

20 Visiting scientists, engineers, and planners

4 Alaska DOT engineers and project managers

3 day tour by motor coach of Prudhoe Bay Oilfield and the Dalton Highway + tour of the Permafrost Research Tunnel

Focus on permafrost issues and mitigation techniques in road construction and tundra rehabilitation

Concluding session at University of Alaska Fairbanks engineering building with keynote by the Commissioner of Alaska Department of Transportation

CO-CHAIRS

Billy Connor, UAF
Engineering Co-Chair

Vlad Romanovsky, UAF
Permafrost Co-Chair

GOALS

- Increase dialog between scientists and engineers
- See permafrost thaw and erosion issues firsthand and learn from local experts
- Create a forum for North Slope leaders and residents to engage with top scientists and engineers on their high-priority topics
- Reduce research fatigue by consolidating community outreach and engagement activities of multiple science teams working in the region
- Develop better strategies for improving Arctic infrastructure

SHORT VERSION

1. CONVERGENCE
2. COPRODUCTION
3. REDUCING RESEARCH FATIGUE
4. BETTER OUTCOMES

CONVERGENCE

18 scientists
12 planners / policy makers
10 engineers
7 project managers / coordinators
3 architects
1 artist
1 journalist

13 Indigenous
7 early career
3 international

21 academic
12 state/federal agencies
15 North Slope
4 business

34 men
18 women

“Discussions are invaluable where you have people with different expertise looking at the same thing. It requires them to explain things in terms that everyone can understand.”

— Billy Connor, UAF

COPRODUCTION

Chastity Olemaun, NSB Director of Planning and Community Services

UIC SCIENCE

Bill Tracey, Sr., NSB Assembly, Long-time resident of Point Lay

Griffin Hagle-Forster, Executive Director, Tagiugmiullu Nunamiullu Housing Authority

“There is no substitute to being in a place like Point Lay. It’s an efficient way to do away with a whole bunch of assumptions.

There is never a better way to get more people on the same page faster, so we can move onto the next phase faster.”

— Griffin Hagle, TNHA

REDUCING RESEARCH FATIGUE

Skip Walker, UAF

NNA Landscape Evolution in Ice-Rich Permafrost Systems

Point Lay and Prudhoe Bay

Ming Xiao, Penn State

NNA PIPER Project

Utqiagvik, Point Lay and Kaktovik

Howie Epstein, UVA

NNA Sensor Array Project

Utqiagvik

Elise Miller-Hooks, GMU

NNA Impacts of expanding Arctic shipping

Utqiagivk

LISTENING

Griffin Hagle, Yves Brower, and Scott Evans
Utqiagvik, Alaska

LISTENING

Jimmie Kagak, Vice Mayor/Fire Chief, and Eddie Kagak, Village Council
Wainwright, Alaska

DIALOGUE

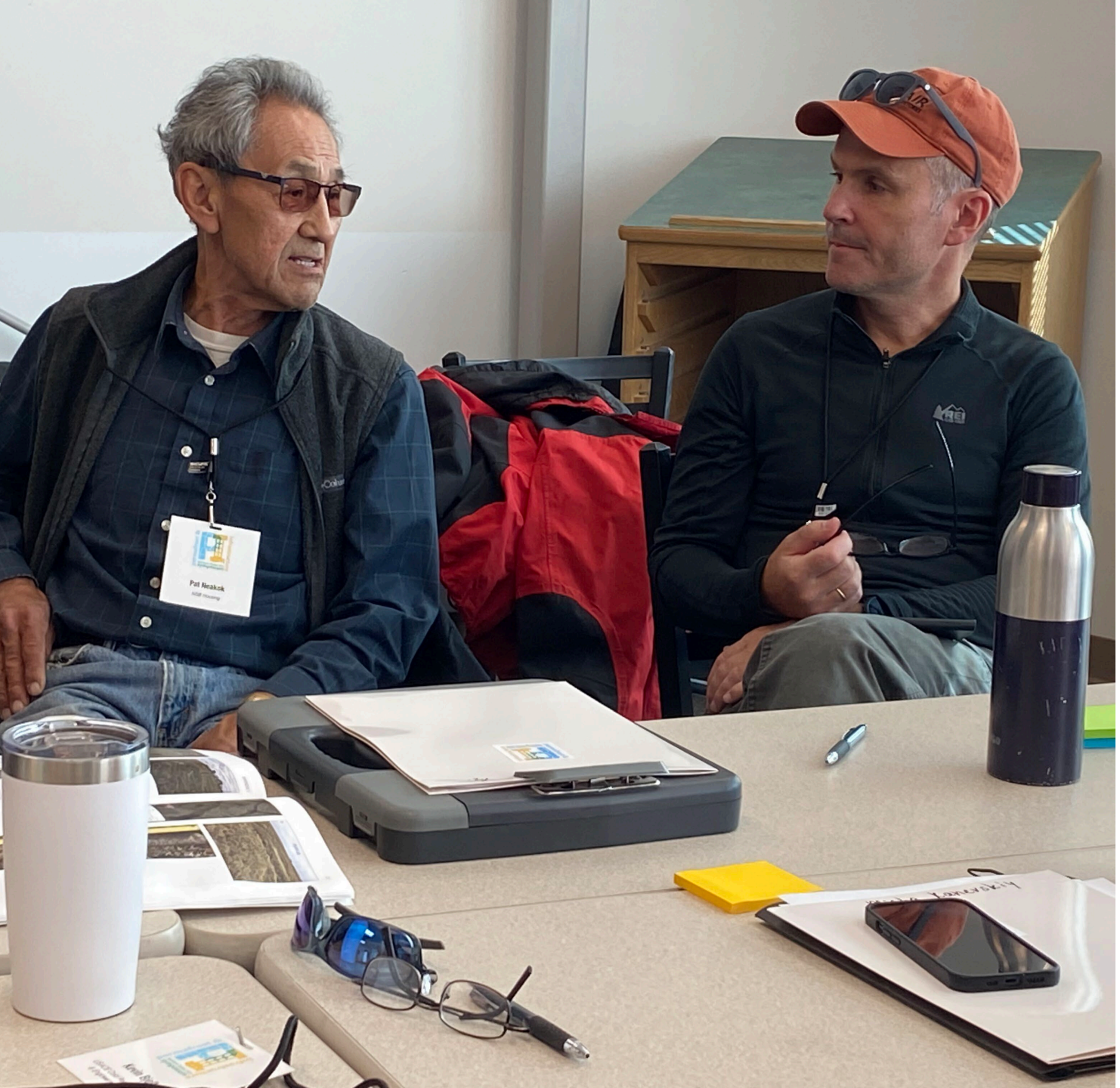
NORTH SLOPE BOROUGH ASSEMBLY WORKSHOP

“In the past five days, I've learned more than in the past five months, through really seeing it, and equally important, by talking to each of you.”

- Civil engineer

“It's really hard to get funding to go and visit sites, especially far away sites. It wouldn't be possible for me to see these sites until I already get a grant and I'm there doing fieldwork the first time, perhaps messing up for the first time.”

- Early Career Scientist



“There's a time where we get the tone deafness, where you're so focused on your work that you lose sight of the audience.

Thank you for sharing your work and creating meaningful dialogue with us, so we can translate your work into actionable items at the community level.”

- NSB Deputy Director

“I really, really appreciate attending a meeting that feels like it's going to go somewhere and something's going to happen from it.

I really don't enjoy attending meetings where it's just a lot of talking about what should be done.”

- Restoration ecologist

“The big benefit I saw from this is just hearing other people's ideas and their perspectives.

I'm going to come away with a different perspective and see things in a different light.”

- Alaska DOT engineer

INTRODUCTION TO INUPIAT CULTURE AND ETHICAL RESEARCH PRACTICES

UIC™
SCIENCE

CULTURE MINUTES

WE ARE ALL LEARNERS

LEARNING THE MOSQUITO DANCE

Saturday Evening Cultural Reception

Point Lay day trip – led by Bill Tracey, Sr.

Wainwright day trip – led by Jimmie Kagak

Utqiagvik field trip

Utqiagvik coastal erosion – led by Scott Evans and Hina Kilioni

Utqiagvik utilidor – led by Yves Brower

PRESENTATIONS

Jeff Russell, Alaska Department of Transportation & Public Facilities
Dalton District Superintendent, Northern Region Operations & Maintenance

BREAKOUT GROUPS


ON TO DEADHORSE

Prudhoe Bay Tour – led by Lorene Lynn and Bill Streever

Dalton Highway Tour – led by Alaska DOT and others

Permafrost Research Tunnel tour – led by Kevin Bjella

PROCEEDINGS

Proceedings of the Permafrost & Infrastructure Symposium

The Permafrost & Infrastructure Symposium: Merging Science, Engineering and Community-based Knowledge brought over 30 Arctic science and engineering experts to Northern Alaska from July 28 to August 5, 2023, to see the impacts of permafros
firsthand and to learn from those who live in the Arctic. The concept for the event was based on a convergence research model used by Transport Canada to pair scientific and engineering research practices with local knowledge and priorities to deve
infrastructure.

About

Overview of the Permafrost & Infrastructure Symposium

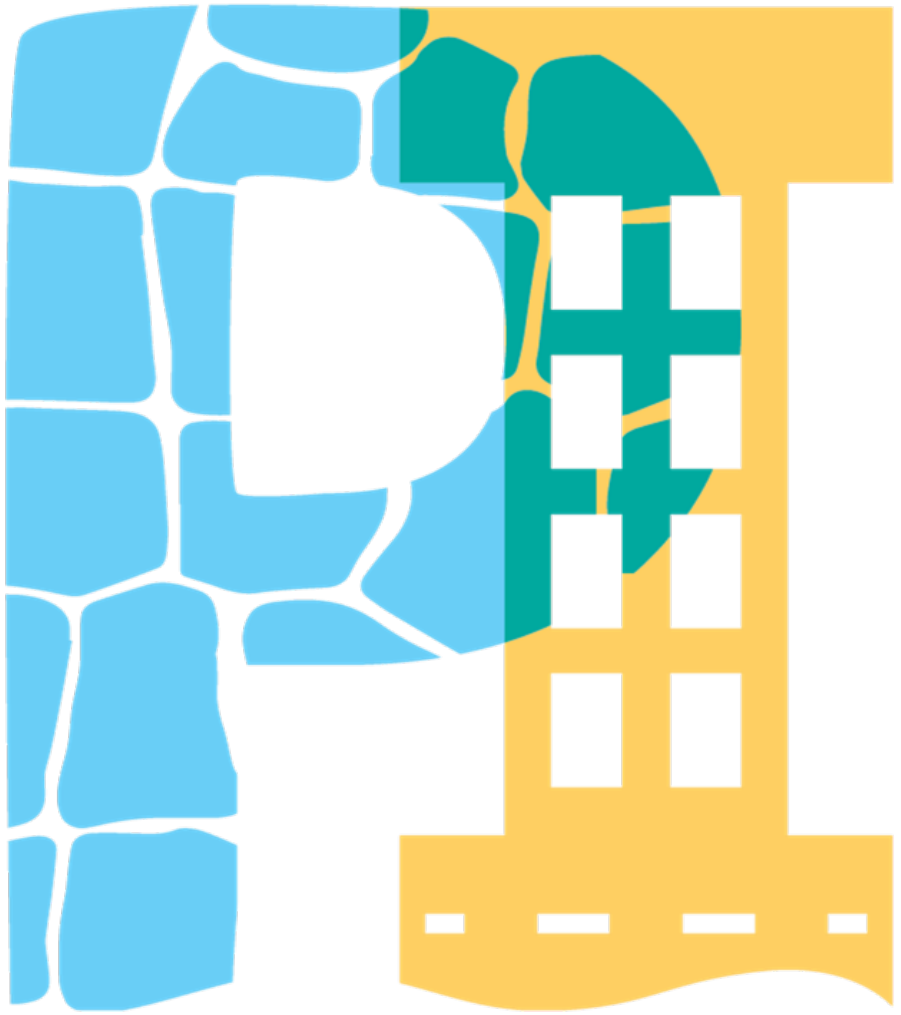
The Permafrost & Infrastructure Symposium in Northern Alaska was a first-of-its-kind event that increased dialog between scientists, engineers and planners, and North Slope experts who desig, buildi and maintain Arctic infrastructure.

The symposium brought over 30 Arctic scientists, engineers, and planners to Northern Alaska from July 28 to August 5 to witness firsthand the challenges associated with permafrost thaw and erosion and to learn from local experts. The event was based
Canada to pair scientific and engineering research practices with local knowledge and priorities to develop better strategies for improving Arctic infrastructure. Joined by 15 North Slope residents, participants gathered at the Barrow Arctic Research Cente
discussions on critical climate-related issues prioritized by local governments on the North Slope. International participants contributed perspectives from research in Greenland, Svalbard, and Arctic Canada. On the second day of the symposium, visitors
Lay, Wainwright, and within Utqiaġvik to see the issues being discussed first hand. In addition to providing a forum for North Slope leaders to engage with top scientists and engineers on high-priority issues, the symposium aimed to increase dialogue bet
research fatigue among community partners by consolidating outreach and engagement efforts of NSF-funded science teams working in the region. The first half of the symposium concluded with a 3-hour presentation and Q&A-session with the North Slo
assembly. The second half of the symposium focused on issues related to transportation infrastructure and tundra restoration. Participants were joined by engineers and construction managers from the Alaska Department of Transportation & Public Facili
coach in Prudhoe Bay and along the 416-mile Dalton Highway. A closing session at the University of Alaska Fairbanks on August 5 explored climate adaptation planning and implementation with presentations by the Commissioner of Alaska DOT&PF and
the Secretary. The symposium concluded with a final field trip to the Permafrost Research Tunnel near Fox, Alaska.

Six months after the event, the connections made and information shared at the Symposium are already having an impact. Among the outcomes being reported: Recommendations to NSB to remediate failing foundations in Point Lay by filling in thaw slu
Conversations with the Alaska DOT&PF started at the symposium are continuing related to harvesting tundra sod from new gravel pits for use in restoration projects and on laying fiber optic cable for geophysical monitoring along the Dalton Highway. Mat
excursion is being used in a new graduate level course in Cold Regions Engineering at the University of Pennsylvania. A participant from the NSB Port Authority said the symposium resulted in meaningful dialog that will make it possible to translate the kn
community level. A geotechnical engineer from ADOT&PF admitted that the experience has caused him to step back and reevaluate some of his previous beliefs. One early career scientist (ECS) said the symposium provided an opportunity she would no

OUTCOMES AFTER 6 MONTHS

- Point Lay residents have been given access to material to fill in thaw slumps around their homes
- Alaska DOT&PF considering laying fiber optic cable with sensors for geophysical monitoring along the Dalton Highway
- Alaska DOT&PF considering harvesting tundra sod for storage and use in restoration when opening a new gravel pit
- NSB Port Authority personnel have attended and presented at several science conferences
- Material developed from the field trips is being used in engineering curricula at Penn State and in Greenland
- Dynamic Arctic shipping models are being extended to incorporate whaling seasons
- A tribal resilience toolkit is being developed for transportation
- Several collaborative projects and proposals started or accelerated



symposium
Northern Alaska 2023

CODEVELOPMENT CONVERGENCE

BRINGING THE DIALOG TO THE ARCTIC

TOGETHER WITH OTHER TEAMS WORKING IN YOUR AREA

IT WILL LOOK DIFFERENT IN YOUR REGION BECAUSE THE PEOPLE, PRIORITIES AND ISSUES WILL BE DIFFERENT

ROOM FOR IMPROVEMENT

- Include a field trip for community members to tour research sites
- Involve more students
- More community interactions
- More and longer breaks and more free time
- More report out from separate field trips
- More oil industry participation
- More direction on the front end for expected outcomes
- More push to make more outcomes happen
- Add one more day for developing an action plan and timeline for implementing research
- More specific Symposium outcomes beyond reporting
- Discussion on carbon footprints of infrastructure projects

QUESTIONS?

NSF

UAF UNIVERSITY OF ALASKA FAIRBANKS

NNAIRPS Ice-Rich Permafrost Systems

UAF INE AIDC

PERMAFROST COASTAL SYSTEMS NETWORK

UIC SCIENCE