

# BRIDGING ARCTIC GATEWAYS 2023

## COLLABORATION WORKSHOP REPORT



This report is based on work supported by the National Science Foundation under Cooperative Agreement No. PLR-1928794. It documents activities and outcomes from the 2023 Bridging Arctic Gateways Workshop. All opinions, findings, and conclusions expressed in this report are those of the authors and do not necessarily reflect the views of any organization that provided support for the project or the endorsements of workshop participant home institutions, the ARCUS Board of Directors, or other members of the ARCUS consortium.

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# Executive Summary

This report, supported by the National Science Foundation under Cooperative Agreement No. PLR-1928794, encapsulates the proceedings and outcomes of the 2023 Bridging Arctic Gateways Workshop. Hosted by the Arctic Research Consortium of the U.S. (ARCUS), the University of Alaska Fairbanks (UAF), and the University of Maine (UMaine), the workshop aimed to establish and strengthen Arctic research connections between Alaska and Maine. Participants, including notable researchers and experts, engaged in collaborative discussions, tours, and presentations. The workshop identified key focus areas for future research collaboration, spanning Arctic field testing, technical innovation, higher education collaboration, the blue economy, workforce diversity, climate resilience, and more. Addressing barriers and acknowledging the need for inclusivity, the report outlines next steps, emphasizing strategic planning, securing funding for reciprocal visits, and expanding the initiative's influence. The report underscores the workshop's significance as a foundational step in building a comprehensive, cross-regional Arctic research agenda.

## Introduction

Change is taking place at a rapid rate across the planet, especially in the northern latitudes. The Arctic Ocean is projected to experience ice-free periods as early as 2035, a development unimaginable just decades ago. Global patterns will shift as nations seek to redefine trade routes, capture tourism business and consider territorial claims. This monumental change impacts all manner of life in the Arctic and surrounding areas and has implications for the future of global transportation, economic development, energy, telecommunications, national security, international trade, tourism, and more. Maine and Alaska are home to world-class research organizations and serve as the United States gateways to this changing Arctic, sharing common characteristics of remote and islanded communities, low populations, economic dependency on natural resources and more.

In response to the evolving Arctic "domain", the Arctic Research Consortium of the United States, the University of Maine, and the University of Alaska Fairbanks have come together to lead "Bridging Arctic Gateways", a partnership seeking to establish and strengthen Arctic research connections between Alaska and Maine, identify shared regional issues and opportunities for research coordination, and to develop a shared Arctic research agenda that enables enhanced collaboration between these two U.S. Arctic gateway regions. Supported by a small workshop grant from the National Science Foundation, the initiative was launched with an in-person workshop held 15-16 November 2023 at UAF. This workshop marks the initial step in developing a strategic and shared research agenda through determining mutually beneficial collaborative research goals, objectives and strategies.

"Bridging Arctic Gateways" emerged as a collaborative endeavor between ARCUS, UMaine, and UAF after a series of events in 2021-2022 provided a unique confluence of institutional leadership meetings, enhanced network ties, and a shared vision for the future of collaborative Arctic research. A central figure in these events was Dr. Alice "Pips" Veazey who joined the ARCUS Board in 2019 while serving as the Director of the Alaska National Science Foundation (NSF) Established Program to Stimulate Competitive Research at UAF. In 2021, Dr. Veazey

transitioned from her position at UAF to become the Director of the newly established Portland Gateway at UMaine.

Major staffing transitions of this kind are often a disruptive force within the diffuse U.S. Arctic research network. Institutional knowledge, capacity, and the personal relationships that enable collaboration are often lost or diminished when a faculty member assumes another position or leaves an organization. However, both Dr. Veazey's network-centric approach and her sustained involvement with the ARCUS consortium supported the continuation of her Arctic research community leadership and aided in the development of new collaborative efforts across geographic and institutional boundaries.

From 2021 to 2022, Dr. Veazey led the ARCUS Interdisciplinary Research Committee, addressing collaborative Arctic research challenges and integrating UMaine into the ARCUS consortium. Simultaneously, Dr. Diane Hirshberg from the University of Alaska Anchorage (UAA) collaborated with ARCUS to organize the inaugural UArctic North American members meeting in 2021, aiming to foster stronger ties among U.S. affiliates of the University of the Arctic (UArctic). The UArctic Assembly showcased Senator Angus King's commitment to advancing Maine's identity as a U.S. Arctic gateway as well as the influence and leadership of the New England Arctic Network institutions. Among these institutions were UMaine, the University of New Hampshire, the University of Southern Maine, and Dartmouth College from the ARCUS consortium.

Returning from the Assembly meeting, the ARCUS Board and staff were eager to continue building stronger linkages between New England institutions and other ARCUS members. This topic became a prominent discussion item during the 2022 ARCUS Annual Meeting (Myers, Wiggins, & Sheffield Guy 2022) and prompted ARCUS to propose "Bridging Arctic Gateways" as a workshop undertaken through the ARCUS Cooperative Agreement with the National Science Foundation's Office of Polar Programs in 2023.

The NSF provided core funding to ARCUS for the workshop with extensive in-kind support further extended to the project by UAF Vice Chancellor for Research Nettie La Belle-Hamer and UMaine Vice President for Research and Dean of the Graduate School Kody Varahramyan. ARCUS worked with Dr. Veazey to establish a project charter and identify the workshop leadership team that included: Pips Veazey and Anne Heberger Marino (UMaine), Brit Myers (ARCUS), Helena Buurman and Missy Wallace (UAF).

ARCUS' role as a bridging organization allowed it to serve as a unique linchpin in advancing the project. With established, long-term connections among the Arctic researchers and institutions involved, the consortium aided in maintaining and leveraging cross-network ties, recognizing gaps in U.S. Arctic research community connectivity, and mobilizing the resources and expertise necessary to advance collaborative U.S. Arctic research.

## Workshop Development: Planning & Preparation

Workshop development was informed by several **key principles** aimed at fostering collaboration and creating a meaningful experience for participants.

First, guided by the UMaine Portland Gateway's proficiency in **systems convening** (Wenger-Trayner & Wenger-Trayner, 2021), the workshop's leadership team meticulously crafted a workshop agenda (Appendix A) with several objectives. These encompassed generating broader awareness, sharing inspiration across campuses, cultivating partnerships, fortifying existing Arctic research connections, pinpointing shared regional issues, identifying opportunities for mutually beneficial coordinated research, and initiating the development of a shared research agenda. In short, this strategic approach aimed to facilitate expanded collaboration and cultivate a unified vision among participants.

Second, workshop leads concentrated on fostering initial connections across a relatively small number of participants representing several core organizations. This approach of a **minimum viable consortium** (Stakeholder Alignment Collaborative, 2022) involves assembling the smallest group necessary to kickstart and sustain a partnership. Opting for a smaller group at the outset offers several advantages when launching a complex new initiative. In addition to streamlining communication, this close-knit environment facilitates swift decision-making, nurtures a shared understanding of goals, and supports the rapid exploration of potential challenges and opportunities. This small group acts as a sturdy anchor, ensuring a resilient and stable foundation critical for the initiative's subsequent expansion and engagement efforts.

Third, the goal of enhanced collaboration relies heavily on the engagement of well-informed and highly engaged participants who can **serve as ambassadors** and advocate not only for their own research but also for broader research initiatives across the circumpolar North. This first workshop sought people with a history of interdisciplinary research specializing in Arctic issues who excel in their respective fields and have a track record of successful collaboration across institutional, sectoral, and disciplinary boundaries. The selection process was iterative so that the research interests of the initial round of invitees informed a second round of invitations to researchers who could potentially serve as disciplinary counterparts to individuals from the opposite gateway region.

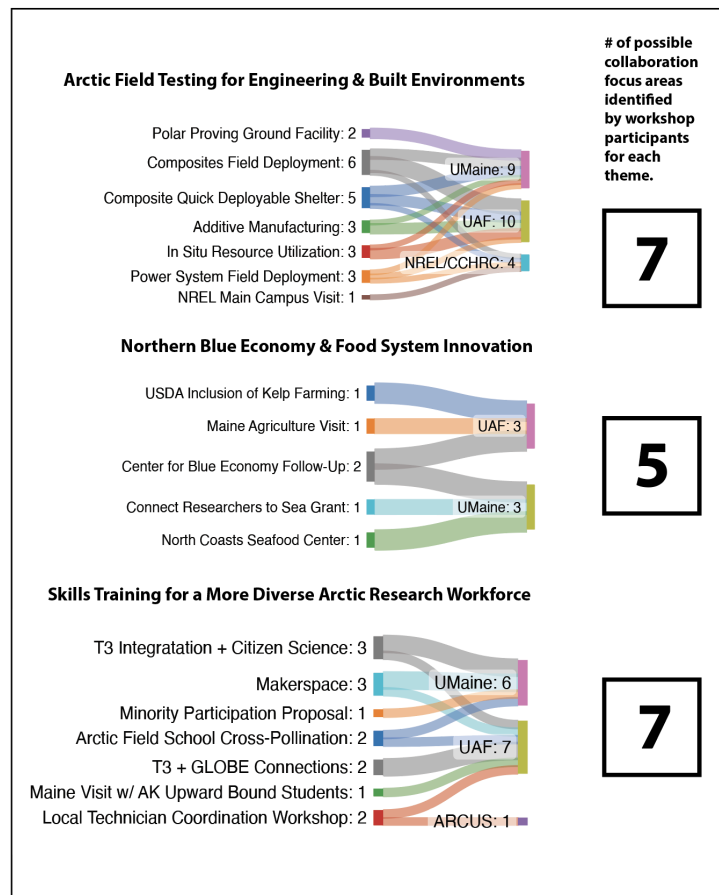
The workshop organizers are clear that the participant list for this first gathering did not try to address all perspectives of Arctic research for reasons listed above. Many perspectives, including those of Arctic Indigenous community members, industry representatives, government agencies, other institutions, and various research disciplines, are critical to the next steps as the team grows. The majority of the workshop participants are actively engaged with local communities, and the collective group recognized the crucial importance of collaborating with Indigenous scholars and community members. Despite these limitations, the workshop successfully convened a minimum viable consortium of skilled interdisciplinary research ambassadors to launch “Bridging Arctic Gateways”, providing a strong base for future expansion, outreach, and engagement efforts.

## Workshop Activities & Outcomes

The workshop employed a multi-faceted and inclusive approach to co-create research themes and identify projects for ongoing collaboration. To aid in developing and prioritizing ideas, participants took part in the following activities:

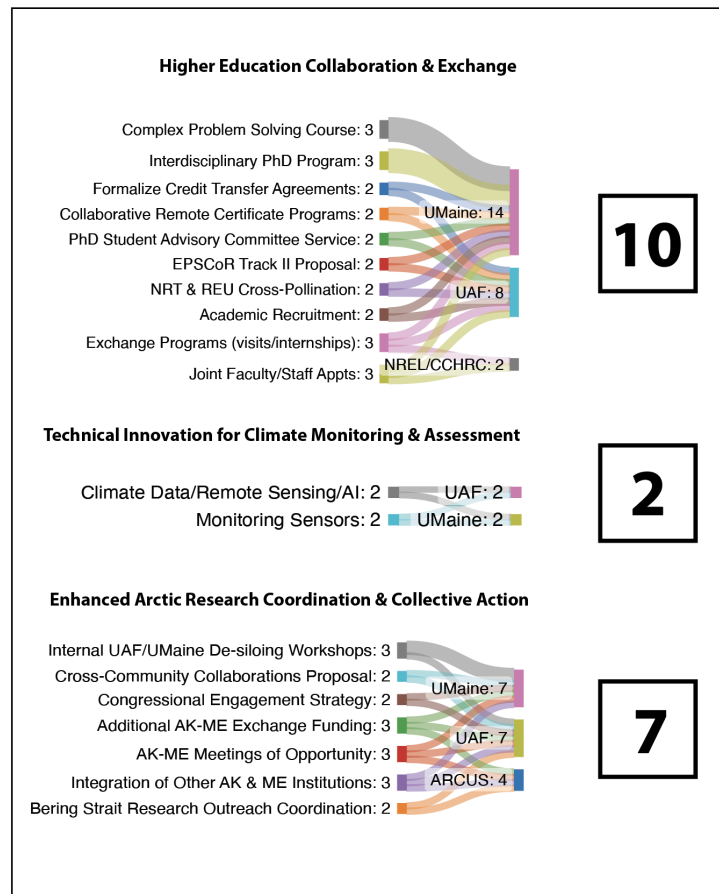
- 1) A **Pre-Meeting Survey** was conducted, seeking participant insights on existing and potential research ties between Alaska and Maine. The results, synthesized into thematic worksheets (Appendix B), guided subsequent small group discussions.
- 2) An **Introductory Online Meeting** provided a digital platform for participants to acquaint themselves and facilitated fine-tuning of the UAF attendee lineup based on UMaine interests.
- 3) In Fairbanks, UMaine participants had a firsthand experience delving into the cutting-edge research conducted at UAF through a series of **Laboratory Tours**. This immersive exploration provided them with valuable insights into diverse fields, including glider technology, climate dynamics, and engineering expertise.
  - a) A visit to Dr. Seth Danielson's lab focused on glider technology, offering insights into cutting-edge tools and methods crucial for monitoring and researching Arctic environments. Understanding these technological advancements created common ground for further discussion exploring innovative approaches in data collection and analysis.
  - b) An introduction to Alaskan climate dynamics by Rick Thoman provided UMaine participants with a firsthand look at the complexities of the Alaskan climate system, enabling discussions informed by regional Arctic climate change impacts.
  - c) A tour of both the NREL Cold Climate Housing Research Center and UAF engineering facilities showcased expertise in addressing Arctic-specific challenges, emphasizing the practical application of engineering solutions. This exposure facilitated discussions on developing innovative materials to support sustainable and resilient infrastructures for use in both the Arctic and other extreme environments.
- 4) A brief **driving tour** was also undertaken to showcase the tangible and visible impacts of thawing permafrost on Fairbanks roads, homes, and infrastructure. Participants witnessed firsthand the environmental changes and challenges posed by the thawing permafrost, gaining a deeper understanding of the region's evolving landscape and its implications for ongoing and future research endeavors.
- 5) **Presentations** delivered by key speakers also played a helpful role in enriching the workshop's knowledge landscape.
  - a) Dr. Brenda Konar and Gwen Holdmann introduced topics related to Alaska's blue economy and mariculture, shedding light on sustainable practices and potential collaborative opportunities in this burgeoning field.
  - b) Dr. Cheryl Rosa, representing the United States Arctic Research Commission (USARC), shared essential perspectives on national Arctic research priorities. Her insights not only informed participants about overarching goals but also emphasized the importance of aligning collaborative efforts with broader national research objectives.
  - c) Dr. Matthew Balazs enhanced the discussion with a presentation on community-engaged research, spotlighting the Alaska Coastal Cooperative's initiatives. Emphasizing community involvement in research, the presentation prompted discussions on the need for coordinated engagement with local communities.

- 6) During **small group discussions**, participants used **guiding worksheets** (Appendix C) with prompts and questions as frameworks for a more in-depth exploration of specific research themes. As new collaboration ideas surfaced during these discussions, **meetings of opportunity** were skillfully orchestrated to bring in other UAF expertise. These unplanned encounters between UMaine participants and a wider range of UAF faculty members provided a unique platform for participants to explore additional research themes beyond those explored in structured workshop sessions.
- 7) A **facilitated plenary discussion** served as a culminating activity on the final day of the workshop, leading to the **collective identification of promising topic areas for ongoing collaboration** and pinpointing contacts from each institution willing to lead activities (Fig. 1 & Fig. 2). Participants defined both short-term and long-term project timeframes, pinpointing potential obstacles for project sustainability and growth, and discussed upcoming meetings and events where “meetings of opportunity” might be used to bolster the alliance. This proactive and forward-thinking strategy underscores the workshop's dedication not only to identifying collaborative priorities but also to laying a strong foundation for the effective implementation and growth of a wider partnership.



**Figure 1:** Activities identified for follow-up collaboration between ARCUS, UAF, UMaine, and NREL CCHRC workshop participants, grouped by thematic research area.





**Figure 2:** Additional activities identified for follow-up collaboration between ARCUS, UAF, UMaine, and NREL CCHRC workshop participants, grouped by thematic research area.

## Building Together: Barriers to Overcome

Workshop participants identified and discussed several barriers facing the ongoing Bridging Arctic Gateways initiative that will require concerted effort and innovative strategies to overcome. The group acknowledged that these challenges have been well-documented and are not unique to these projects. These challenges include:

- **Navigating Funding Structures and Processes:** Navigating the intricate frameworks of diverse funding bodies such as the National Institutes of Health, NSF, the Department of Defense, and the Department of Energy, especially when partnering across projects and programs. The initiative will need to strategize on how to effectively work across these supporting institutions, considering the specific requirements and intricacies of each agency.
- **Having Sufficient Human Capital and Champions:** Long-term success for this initiative will hinge on securing dedicated individuals and influential champions who are

both committed to the initiative's objectives and also possess the influence to drive key decisions and garner support.

- **Navigating Internal University Processes:** Negotiating internal university processes marked by historical nuances, bureaucratic complexities, and cumbersome procedures is a significant barrier. The initiative must find ways to streamline these processes and foster a more agile and responsive environment.
- **Navigating Internal-External Interface Challenges:** A smooth interface between internal and external stakeholders is crucial. Ensuring that collaboration extends seamlessly beyond institutional boundaries demands strategic planning and effective communication strategies.
- **Working Respectfully and Equitably with Communities:** The variability of resources, particularly in Arctic communities, present challenges that need to be navigated with sensitivity and a focus on community well-being.

To tackle these barriers, the initiative will adopt a proactive stance, encouraging risk-taking and bold approaches. A creative mindset will be essential for devising innovative solutions to bypass or mitigate obstacles. Documenting and sharing successful strategies, including shared proposal templates, will help contribute to the collective knowledge base and foster a culture of collaboration and resourcefulness within the partnership. Overcoming these and other barriers encountered will require a multidimensional approach that encompasses strategic partnerships, innovative thinking, and a commitment to the initiative's overarching goals.

## Research Agenda Focus Areas

Post-workshop, organizers reviewed and synthesized the workshop notes and products generated during the event. This resulted in the development of a preliminary set of research focus areas that now lay the groundwork for future collaborative efforts between ARCUS, UAF, UMaine, and CCHRC.

Additionally, the focus areas identified will serve as a draft framework for the structured and purposeful engagement of other individuals and institutions with a shared interest in further developing collaborations between the U.S. Arctic Gateway regions of Alaska and the North Atlantic.

The research focus areas identified include:

- **Arctic Field Testing for Engineering & Built Environments**

This theme focuses on conducting practical tests and experiments in the Arctic environment to assess the performance and suitability of engineering solutions and built structures. It involves field testing to understand the unique challenges posed by the Arctic conditions, such as extreme cold, permafrost, and remote locations. The goal is to develop engineering and construction practices that are resilient and well-adapted to the specific challenges of the Arctic.

- **Technical Innovation for Arctic Climate Monitoring & Assessment**

This theme revolves around leveraging technological advancements, including the application of Artificial Intelligence (AI), to enhance the monitoring and assessment of the Arctic climate. It encompasses the development and deployment of innovative tools, sensors, and methodologies that integrate AI for gathering and analyzing data related to climate variables, ice conditions, permafrost dynamics, and other crucial indicators.

- **System Science Implications of Melting Ice**

Centered on the dynamic impacts of melting ice, this research theme explores the consequences of snowpack/snowmelt on terrestrial environments, advances in glaciology, climate modeling, and the vulnerability of tundra and boreal forests. The research seeks to unravel the intricate interactions between melting ice and the surrounding ecosystems, offering insights into the broader implications for the Arctic environment.

- **Arctic Law, Policy, Governance, & Security Strategies**

This research theme explores the interplay between Arctic policy, governance structures, and security dynamics, with a specific focus on shared challenges and joint efforts in the Alaskan Arctic and North Atlantic regions of the US. Investigating cross-regional implications of policy frameworks, governance models, and security strategies, the research emphasizes international collaborations, regulatory approaches, and diplomatic initiatives. It delves into the unique geopolitical dynamics and security challenges of both regions, aiming to identify synergies and areas of cooperation. Simultaneously, Arctic law addresses the complex regulatory landscape surrounding Arctic activities, considering indigenous rights, environmental protection, and international cooperation. This involves examining and developing legal frameworks tailored to the Arctic's distinctive geopolitical and environmental conditions. Collaborative efforts aim to establish effective and equitable legal structures supporting sustainable development and governance in the Alaskan Arctic and North Atlantic regions, contributing to comprehensive strategies for the sustainable development and protection of Arctic resources in the broader Alaskan-North Atlantic context.

- **Health Care & Medicine**

This theme emphasizes healthcare challenges related to remote healthcare delivery, indigenous health disparities, and the impact of climate change on public health. This area of research seeks to explore innovative medical practices, community-based health initiatives, and the integration of traditional knowledge into healthcare systems. The goal is to enhance healthcare resilience and responsiveness to the unique health needs of Arctic communities, fostering collaboration between medical professionals, researchers, and community stakeholders.

- **Northern Blue Economy & Food System Innovation**

Centered on advancing innovation in the blue economy and food systems in northern regions, this theme explores sustainable practices related to fisheries, mariculture,

aquaculture, and coastal/marine ecosystems. It aims to promote economic development while ensuring the resilience and sustainability of food systems. The focus is on developing innovative approaches to address challenges such as climate change, resource management, and community well-being.

- **Coastal Community Climate Resilience**

Focused on enhancing the resilience of coastal communities to changing climate conditions, this research theme addresses critical aspects such as climate adaptation, sea-level rise, predictive climate models, coastal erosion, and community-led infrastructure and relocation strategies. By integrating scientific insights with community-driven approaches, the research aims to develop robust resilience measures that align with the unique challenges posed by climate change in coastal areas.

- **"Uniquely Rural" Knowledge Exchange Opportunities**

This research theme delves into the distinctive opportunities for knowledge exchange within rural contexts, emphasizing the embrace of rural development, tribal engagement, local food systems, and community-based monitoring. It explores the synergies and interconnectedness of these elements, fostering collaborative approaches that empower local communities and contribute to sustainable rural development.

- **Facilitation of Arctic Higher Education Collaboration & Exchange**

Focused on fostering collaboration and exchange initiatives within the higher education sector, this theme aims to strengthen ties between academic institutions active in Arctic research and education. It involves creating platforms, programs, and mechanisms that facilitate the exchange of students, faculty, and resources between universities in the Alaskan Arctic and the North Atlantic regions. Of particular relevance to this cohort of institutions are the current challenges brought on by regional demographic changes, questions about the value of higher education, decreased state funding to universities, and the different needs and desires of students. Higher education paradigms are changing, and state university systems are recognizing that they are not able to be all things to all people. One approach to maintaining a strong diversity of disciplinary expertise is to develop connections among partner institutions with complementary capacity.

- **Skills Training for a More Diverse Arctic Research Workforce**

This theme is dedicated to enhancing the skills and diversity of the workforce engaged in Arctic research (beyond university students and faculty). It involves initiatives to provide training, education, and opportunities for individuals from diverse backgrounds to contribute to Arctic research efforts. The goal is to build a workforce that is well-equipped, inclusive, and reflective of the broader communities involved in Arctic research.

- **Enhanced Arctic Research Coordination & Collective Action**

This theme emphasizes the importance of coordinated efforts and collective action in Arctic research. It involves establishing mechanisms for improved collaboration, communication, and information-sharing among researchers, institutions, and stakeholders. The goal is to enhance the overall efficiency and impact of Arctic research by fostering a collaborative ecosystem where collective efforts address common challenges and advance shared goals.

- **Cross-Regional Collaboration Benefits to Arctic Gateway Regions**

This research theme investigates and seeks to quantify the mutual benefits derived from collaborative initiatives in the Arctic, emphasizing the value of shared research agendas and the advantages and rewards brought to both regions through their participation in non-competitive and cross-institutional collaboration activities.

The emergent collaboration themes outlined above reflect the richness of expertise among the event's participants and the participating institutions. They signify the depth of shared interests and potential areas where joint efforts could yield significant advancements. However, it's crucial to acknowledge that these themes are a snapshot, a reflection of the expertise present during this brief two-day event and that a wider net needs casting to incorporate a more comprehensive array of perspectives from the Alaskan Arctic and North Atlantic-focused research community.

As the workshop outcomes inform the ongoing creation of a shared research agenda, it becomes apparent that future endeavors should intentionally seek to broaden the spectrum of perspectives. Inclusivity and engagement with a more extensive network of researchers will be paramount to ensuring that the collaboration is comprehensive, representative, and reflective of the diverse challenges and opportunities present in both the Alaskan Arctic and the North Atlantic regions. The workshop laid the groundwork for several concrete partnership areas and the next steps will involve expanding the conversation to include a more diverse array of voices, experiences, and expertise.

## Next Steps

The coming months are critical for the long-term success of the Bridging Arctic Gateways initiative. The leadership team aims to secure funding for a reciprocal trip to bring Alaskan researchers to Maine that will build on the enthusiasm and energy that the cohort generated during the Fairbanks workshop. Achieving this within the next year will be key in capitalizing on the cohort's synergy and bringing proposed projects to life. The potential for a reciprocal visit also presents an exciting opportunity to enrich the discussion of identified thematic areas such as Arctic law and medicine (a particularly notable topic for two states currently lacking medical schools).

Strategic planning takes center stage as the team now works to identify and plan opportunistic meetings to advance their collective work. One short-term goal is the development of a session proposal for the American Geophysical Union Fall Meeting in 2024. This venue is envisioned as

a platform to showcase progress, exchange findings, and engage a wider audience in the initiative's goals.

The collective steps outlined here demonstrate a proactive approach toward expanding the initiative's influence, fostering collaboration, and ensuring sustained growth. Each element contributes to the overarching goal of creating a robust and impactful collaborative effort to align, connect, and support the distributed U.S. Arctic research community.

In summary, the workshop marks a notable first step in establishing a cross-regional Bridging Arctic Gateways research agenda. Upon reviewing the outcomes, the envisioned path forward involves addressing challenges and fostering meaningful programmatic partnerships among established partner organizations, while also expanding the discourse to include other regional contributors to Arctic research.

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## Appendix:

- Appendix A: Workshop Agenda
- Appendix B: Survey Synthesis Jamboards
- Appendix C: Discussion Table Reports



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## **Bridging Arctic Gateways Fairbanks Workshop**

**Fostering greater awareness, exchange, and convergence among research units at UMaine and UAF**

University of Alaska Fairbanks Troth Yeddha' campus  
BP Design Theater, 1764 Tanana Loop, Fairbanks, AK  
Akasofu Building, 2160 Koyukuk Dr, Fairbanks, AK

### **Tuesday, November 14, 2023**

2:52pm Most Mainers arrive at FAI, van transport to Sophie Station hotel

4:30 pm Pregame dinner or beverage @ Zach's Restaurant (optional)

### **Wednesday, November 15, 2023**

8:15 am Rental car transportation from Sophie Station to UAF campus

8:30 am Coffee and light breakfast at BP Design Theatre, JUB 401

9:00 am **Welcome to UAF and Land Acknowledgement**

- Chancellor White

- Vice Chancellor for Research La Belle-Hamer

Location: BP Design Theatre

9:15 am **Introductions and agenda**

- AKME organizing team; introduce new members

Location: BP Design Theatre

9:45 am **Depart on Climate and Housing Field trip**

10:00 am **National Renewable Energy Lab (NREL)**

- Led by Bruno Grunau

Location: NREL





- 10:45 am **"Local Climate Challenges" driving tour**
- 11:45 am **Climate stripes and climate projections**  
- Led by Rick Thoman  
Location: Akasofu 4th floor Climate Stripes hallway
- 12:30 pm **Lunch w/ keynote by Dr. Mike Sfraga**  
- Catered  
Location: Akasofu 501
- 2:00 pm **Breakout groups discussion**  
- Facilitated by AKME organizing team  
Location: Akasofu 501
- 3:45 pm Coffee break
- 4:30 pm Breakout group discussion (continued)  
- Pump House bar
- 6:00 pm Dinner  
- Pump House, reservation under Missy Wallace, UAF



## **Thursday, November 16, 2023**

- 8:15 am Rental car transportation from Sophie Station to UAF campus
- 8:30 am Coffee and light breakfast in Akasofu 501
- 9:00 am **Alaska Coastal Cooperative project**  
- Overview by Matthew Balazs  
Location: Akasofu 501
- 9:30 am **Depart on Arctic oceans and engineering tour**
- 9:45 am **Gliders lab visit**  
- Led by Seth Danielson  
Location: Danielson Lab
- 10:15 am Transport to Usibelli Building
- 10:30 am **Aligning UAF engineering programs to UAF's experiential learning vision**  
- Led by Bill Schnabel and Jeremy Kasper  
Location: TBD
- 11:45 am **Mariculture in Alaska**  
- Led by Gwen Holdmann and Brenda Konar  
Location: BP Design theater right before lunch
- 12:30 pm **Lunch**  
- Catered  
Location: BP Design Theatre
- 1:30 pm **Breakout groups discussion**  
- Facilitated by AKME organizing team  
Location: BP Design Theatre
- 3:15 pm Coffee break
- 4:00 pm More breakout groups discussion (walk to UAF Wood Center)  
- UAF pub
- 5:45 pm Optional Dinner  
- Green's (reservation under UAF)

# Appendix B: Survey Synthesis Jamboards

## "BLUE ECOSYSTEM/BLUE ECONOMY INNOVATION"

SOMETHING SEPARATE OR SPECIFIC TO KELP INDUSTRY INNOVATION NEEDED?

### Keywords

Fisheries, salmon/diadromous fish management, fisheries collapse, Mariculture, Aquaculture, Coastal/Marine Ecology, Kelp, Lower Trophic Level Extraction, mariculture location management/leasing, kelp processing/harvesting tech transfer, & vessel modification, Marine Biology, Working Waterfronts, Marine Workforce Development, Fisheries Sustainability Certification, Carbon Sequestration (kelp/deep ocean), expanding maritime trade and production, vessel energy, tidal energy, energy/fish interactions, oceanography, impacts of Arctic/North Atlantic ocean current circulation change, deep ocean exploration, Arctic ports

## ALASKA PATHFINDERS

University of Alaska Fairbanks

- \* Alaska Blue Economy Center
- \* Alaska Center for Energy & Power
- \* College of Ocean & Fisheries Sciences (Schery Umanzor, Michael Stekoll, )

### Other Pathfinders: From Alaska

- \* Alaska Sea Grant (M. Good, A. Jones, Q. Fong, S. Rice and G. Dunham, G. Bates, W. Bates)
- \* Alaska Fisheries Development Foundation
- \* Mariculture Restoration Consortium
- \* Alaska Conservation Council
- \* Alaska Seafood Marketing Institute
- \* Alaska Longline Fisheries Association
- \* University of Alaska Anchorage
- \* SE Alaska seaweed growers
- \* Barnacle Foods (Lia Heifetz)
- \* Taco Loco
- \* Prince William Sound Science Center
- \* The Denali Commission
- \* Sea Grove Kelp
- \* Alaska Shellfish Farms
- \* Blue Evolution/Kodiak Kelp Company
- \* Alaska Ocean Farms
- \* Metlakatla Indian Community (Keolani Booth)
- \* Southeast Sustainable Partnership
- \* NOAA Alaska Regional Office (Alicia Bishop)
- \* Kodiak Island Sustainable Seaweed (Nick Mangini)
- \* Blue Starr Fisheries (Eric Wyatt)
- \* Safety Cove Shellfish (Rod Jensen)
- \* Southeast Alaska Regional Dive Fisheries Association (Kate Sullivan)

### Other Pathfinders: Alaska Regional Focus

- \* World Wildlife Fund

### Connecting Projects (projects with existing AKME connections)

- \* Alaska Blue Economy Center
- \* Local Catch Network
- \* Crustal Ocean Biosphere Accelerator
- \* Arctic Impacts of Expanding Maritime Trade Routes
- \* DoE MARINER Projects
- \* Next-Gen River Power System Project
- \* MAIC Farmer to Farmer Grants (David Leith & Kristin Isfeld)
- \* National Seaweed Hub
- \* Business and Economic Planning for Seaweed Aquaculture Systems in the United States.
- \* Sustainable, Speedy Seeding and Optimizing Propagation of East and West Coast Kelp Species

### Inspiring Projects (no current AKME connection but could serve as a model for the other region)

- \* Alaska's New EPSCoR Proposal
- \* Searun Fish
- \* Alaska Young Fishermen's Summit
- \* Alaska FishBiz Program
- \* National Seaweed Symposium (next one AK??)

### New Collaborative Research Project Ideas

## MAINE PATHFINDERS

University of Maine

- \* Aquaculture Research Institute

### Other Pathfinders: From Maine

- \* Maine Sea Grant
- \* New England Ocean Cluster
- \* Ocean Renewable Power Co.
- \* Bigelow Laboratory
- \* Maine Maritime Academy
- \* Maine Aquaculture Innovation Center (MAIC)

### Other Pathfinders: North Atlantic Regional Focus

# "COLLABORATIVE FIELD RESEARCH TRAINEESHIPS"

Keywords

Arctic field training, education, youth empowerment, access & diversity, student & faculty exchange, insights from the "greatest graduate school experience" debate

## ALASKA PATHFINDERS

University of Alaska Fairbanks



Other Pathfinders: From Alaska

- \* University of Alaska Southeast
- \* Wrangell Mountain Center
- \* T3 Alliance/Upward Bound
- \* NREL CCHRC
- \* Alaska Sea Grant
- \* ARCUS

Other Pathfinders: Alaska Regional Focus

### Connecting Projects (projects with existing AKME connections)

- \* Juneau Icefield Research Program
- \* Arctic Education Alliance
- \* PolarTREC Program Alumni
- \* 42\* North/New England Arctic Network
- \* UArctic (North2North)
- \* PolarSTEAM

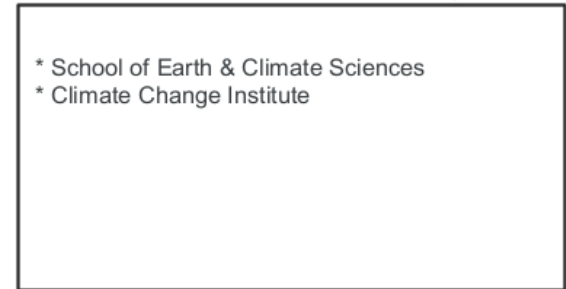
### Inspiring Projects (no current AKME connection but could serve as a model for the other region)

- \* SAUNNA: Systems Approaches to Understanding & Navigating the New Arctic (NRT)
- \* Ecosystem Science in the Face of Rapid Ocean Change: A Convergence Approach (NRT)

### New Collaborative Research Project Ideas

## MAINE PATHFINDERS

University of Maine



Other Pathfinders: From Maine

- \* University of Southern Maine
- \* Edward Little High School (Auburn, ME)

Other Pathfinders: North Atlantic Regional Focus

# "MELTING ICE"

## Keywords

Snowpack/snowmelt impacts on terrestrial environments, ice core recovery & interpretation, glaciology, snow/ice/water chemistry, climate modeling & analysis, permafrost carbon/methane cycles, tundra & boreal forest vulnerability, melting ice impacts on infrastructure

## ALASKA PATHFINDERS

University of Alaska Fairbanks

- \* International Arctic Research Center
- \* Geophysical Institute
- \* Toolik Field Station

Other Pathfinders: From Alaska

- \* University of Alaska Southeast
- \* NREL's Cold Climate Housing Research Center

Other Pathfinders: Alaska Regional Focus

## Connecting Projects (projects with existing AKME connections)

- \* UMaine/JIRP funded snow and firn research
- \* U.S. Ice Drilling Program
- \* NASA ABoVE
- \* Permafrost Carbon Network
- \* NGEE Arctic
- \* Navigating the New Arctic

## Inspiring Projects (no current AKME connection but could serve as a model for the other region)

## New Collaborative Research Project Ideas

## MAINE PATHFINDERS

University of Maine

- \* School of Earth & Climate Sciences
- \* Climate Change Institute
- \* School of Forest Resources (Daniel Hayes & Wouter Hantson)

Other Pathfinders: From Maine

- \* Gulf of Maine Research Institute (David Reidmiller)
- \* Bates College (Michael Retelle)

Other Pathfinders: North Atlantic Regional Focus

Keywords

# "UNIQUELY RURAL" KNOWLEDGE EXCHANGE OPPORTUNITIES

Rural development, human services, Tribal Engagement, Local Food Systems, retaining "traditional" knowledge (such as fish harvest/use), Emergency Response, Military-Connected Communities, Dealing w/ visitors (tourism), energy transitions, cold climate energy & housing, converter-dominated power systems, community-based monitoring, local histories/culture/ socioeconomic profiles, "dispersed community", "community security", unique community solutions, place-based talent

## ALASKA PATHFINDERS

University of Alaska Fairbanks

\* Alaska Center for Power & Energy

Other Pathfinders: From Alaska

\* NREL's Cold Climate Housing Research Center

### Connecting Projects (projects with existing AKME connections)

- \* STORM: Data-Driven Approaches for Secure Electric Grids in Communities Disproportionately Impacted by Climate Change
- \* Arctic Education Alliance
- 42\* North/New England Arctic Network
- \* ARCUS Community & Citizen Science in the Far North Community of Practice & 2024 Virtual Conference

### Inspiring Projects (no current AKME connection but could serve as a model for the other region)

- \* Alaska Tribal Resilience Learning Network

### New Collaborative Research Project Ideas

Other Pathfinders: Alaska Regional Focus

## MAINE PATHFINDERS

University of Maine

\* Hudson Museum

Other Pathfinders: From Maine

- \* University of Southern Maine
- \* Oak Foundation (or Anne Henshaw)
- \* Bowdoin College/Peary-MacMillan Arctic Museum

Other Pathfinders: North Atlantic Regional Focus

# "COASTAL COMMUNITY CLIMATE RESILIENCE"

## Keywords

climate adaptation, sea-level rise, coastal erosion, community-led relocation, managed retreat, working waterfronts, technical assistance, resilience capacity building, policy & decision-making, social dimensions of climate change, rural emergency response, rural response to coastal extreme weather events, food system response to climate change

## ALASKA PATHFINDERS

University of Alaska Fairbanks

- \* Alaska Center for Climate Assessment & Policy
- \* International Arctic Research Center (Elena Sparrow/Katie Spellman)
- \* Alaska Coastal Cooperative

Other Pathfinders: From Alaska

- \* AK Climate Adaptation Science Center (Malinda Chase)
- \* Katchemak Bay NERR (Syverine Bentz)

Other Pathfinders: Alaska Regional Focus

## Connecting Projects (projects with existing AKME connections)

- \* PoLAR Partnership Reaching Arctic Communities Facing Climate Change
- \* National Estuarine Research Reserve (NERR) System Coastal Ecosystem Services Project

## Inspiring Projects (no current AKME connection but could serve as a model for the other region)

- \* Winterberry & Alaska Berry Futures

## New Collaborative Research Project Ideas

## MAINE PATHFINDERS

University of Maine

- \* Climate Change Institute

Other Pathfinders: From Maine

- \* Maine Sea Grant
- \* Wells NERR (Chris Feurt)

Other Pathfinders: North Atlantic Regional Focus

# "ARCTIC COLLABORATION BENEFITS TO AK/NORTH ATLANTIC REGIONS "

## Questions:

Why is having a shared AKME or broader Alaska Arctic/North Atlantic research agenda valuable to the institutions/regions that take part? What value does participation in non-competitive cross-institutional collaborations with an Arctic focus bring to the organizations/individuals that participate & the missions they serve? How do we maximize this value?

## ALASKA PATHFINDERS

University of Alaska Fairbanks



Other Pathfinders: From Alaska

- \* University of Alaska Southeast
- \* NREL's Cold Climate Housing Research Center
- \* ABR Inc
- \* Alaska Ocean Observing System
- \* Alaska Pacific University
- \* Anchorage Museum
- \* Ilisagvik College
- \* Institute of the North
- \* Inuit Circumpolar Council Alaska
- \* Kawerak
- \* NOAA GML Barrow Observatory
- \* Sitka Sound Science Center
- \* Ted Stevens Center
- \* UIC Science
- \* University of Alaska Anchorage

Other Pathfinders: Alaska Regional Focus

## Connecting Projects (projects with existing AKME connections)

- \* AKME Bridging Arctic Gateways Workshop
- \* Arctic Research Consortium of the U.S.
- \* UArctic
- \* 42\* North/New England Arctic Network
- \* Navigating the New Arctic
- \* IARPC Collaborations
- \* U.S. Ice Drilling Program
- \* NASA ABoVE
- \* Permafrost Carbon Network
- \* NGEE Arctic
- \* Navigating the New Arctic
- \* All Other Projects Identified in Previous Slides

## Inspiring Projects (no current AKME connection but could serve as a model for the other region)

## New Collaborative Research Project Ideas

## MAINE PATHFINDERS

University of Maine



Other Pathfinders: From Maine

- \* University of Southern Maine
- \* University of Maine at Fort Kent
- \* Bowdoin College
- \* University of New England
- \* Maine Maritime Academy
- \* Bigelow Laboratory

Other Pathfinders: North Atlantic Regional Focus



## Appendix C: Discussion Table Reports

### Table Topic: Food Systems

Participants: Jodie, Brenda, Adam, Josh

Application: Built environment for extreme environments in support of sustainable food systems

What questions are you asking and why are they potentially important to both regions?

How is climate impacting resources?

How do we deal with a lack of capacity?

How do we help communities?

To what extent can we \_\_\_\_ local and regional self-reliance?

How do we convince policy-makers that seafood is part of food systems?

How to recognize Indigenous food systems? “Integrated” food systems

What factors related to this are similar and different between the two regions?

Both: Research fatigue, expert-focused seafood system, food security/health issues, especially among marginalized communities. small-scale marketing/farms.

18x bigger, isolated (AK)

What do we not know yet? What people/perspectives might be missing?

We do not know the role climate change will play in shifting food systems.

What resources, tools, and data, do you already have? What might be possible by working together?

Product development

Food system (supply change) capacity and relationships

Supply chain includes production, post-harvest, distribution, and consumption.

### Table Topic: Distributed Arctic Research/Education Consortia

Participants: Seth, Adam, Helena, Matthew

What questions are you asking and why are they potentially important to both regions?

How do we make connections between high school, college, and professional settings?

What are the avenues for funding?

How do we link scientific discovery and courses?

How to bolster a greater US program for polar research?

Where can experiential learning happen (i.e. where are the facilities, and dorms where programs can happen?)

What data will be collected that communities will use?

What factors related to this are similar and different between the two regions?

New England regional efforts, including 42 Degrees North

University structure (similar)

Upward Bound programs: AK has 5; Maine has 7.

PFAS is an issue in both places.

What do we not know yet? What people/perspectives might be missing?

Communities were not represented at this discussion.

What resources, tools, data, do you already have? What might be possible working together?  
Field schools and stations in Toolik, Juneau Icefield Research Project, Rural campuses, ACC, T3.

Community connections, Upward Bound, Other organizations in the state that provide infrastructure to help facilitate.

Other Points:

Issue: Funding (not personnel)- agencies keep disallowing education funding.  
EPSCoR Track II proposal?

**Table Topic: Community-Driven Research**

**Participants: Nettie, Brit, Gayle**

What questions are you asking and why are they potentially important to both regions?

A broad range of questions: Important: 1. Without early inclusion, solutions won't be accepted or functional. 2. Skills transfer needs to be built in. 3. What does a framework look like and how is it built/ maintained? Cooperative Extension Model? Also talking about moose & ticks, climate hazards, coastal infrastructure, WWF, Citizen science, visiting scientists/post-docs.

What factors related to this are similar and different between the two regions?

Climate hazards have a lot of cross-over between AK-ME. AK Is forced to be ahead, but collaboration would help. Geographic scope is different, coastal erosion exacerbated in AK. Both states have a climate plan.

What do we not know yet? What people/perspectives might be missing?

How to fund coordination and champions?

How do we fund a stable infrastructure?

How do we get cooperation and compliance from outside?

What resources, tools, data, do you already have? What might be possible working together?

Integration/community-controlled conversation.

Need to connect KSMC with KALI (Kodiak Archipelago Leaders Institute)

Other points:

Increased base funding for existing community-based research and networking them.

Cooperative Extension Model: 1. Staff who live in the community. 2. Know the community and their (scientific) speciality 3. Staff becomes a liaison into the community.

**Table Topic: Sustainable Built Environment in Extreme, Remote Conditions**

Participants: Cody, Bruno, Bill, Jeremy

What questions are you asking and why are they potentially important to both regions?

Built environment and materials for extreme remote environments.

What factors related to this are similar and different between the two regions?

Shared Juneau icefield project

Alaska is a more extreme and colder environment, also more remote.

Treat Island (Maine) highest number of freeze/thaw cycles in the world.  
Corrosive salt environment in Maine.  
In Maine, they do not have as many Indigenous aspects to their work.

What do we not know yet? What people/perspectives might be missing?

Coastal challenges of innovative solutions.

Large goal” coalesce the group on theme

Narrow goal: Field test , expand campsite projects

What resources, tools, data, do you already have? What might be possible working together?

New opportunities