

Alaska Climate Adaptation Science Center



External Review Team Final Report

*Prepared with and on behalf of the AK CASC External Review Team (ERT) by Donna Silverberg
Consulting*

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Background Information

About the Review Process

The external review of United States Geological Survey (USGS) Regional Climate Adaptation Science Centers (RCASCs or CASCs) Host-Universities is designed to gain information and insights from external reviewers about the activities and effectiveness of each RCASC Host-University, and to inform decisions about USGS's future development and administration of Host-University partnerships (this and additional information can be found [here](#).)

Donna Silverberg Consulting ([DS Consulting](#)) is the External Review Manager selected by the National Climate Adaptation Science Center (NCASC) through an open solicitation to design, coordinate, and conduct the structural and operational review component of the external reviews for all eight RCASC Host-Universities, including report writing with and on behalf of the ERT. The DS Consulting team consists of:

- Donna Silverberg, JD (Principal and External Review Team Lead, Facilitator, & Manager)
- Michelle Helman, MA Peace & Conflict Studies (Evaluation Specialist & Materials Co-Lead)
- Tina Patterson, MA Dispute Resolution, MDR, MCI Arb, CF APMP, CICM (Project Advisor and Facilitation Support)
- Colby Mills, BA Anthropology (Logistics and Facilitation Support)
- Charles Wiggins, LLM, (Report and materials editor)

Purpose of the Review

1. **Assess the competencies, efficiencies, challenges, and areas for improvement** of each RCASC host-university in managing the administrative requirements and terms and conditions of the corresponding host agreement;
2. **Assess the contribution** by each RCASC host-university and associated academic consortium with respect to:
 - a. Scientific Achievements on climate impacts and vulnerability science;
 - b. Collaborative Efforts with stakeholders to develop adaptation products applicable to priority regional decision-making;
 - c. Education and Training of early career professionals; and
 - d. Outreach and Communication services;
3. **Review the effectiveness** of each RCASC host-university and associated academic consortium in meeting the goals established under their current host agreements;
4. **Aid** the National Climate Adaptation Science Center (NCASC) in developing improved requirements for re-competition of the next university host agreements.

External Review Model Framework:

1. What was the Host's proposed approach?
2. What did the Host implement and how did they do it?
3. So what: What did the Host learn? How did they respond and adjust?

External Review Categories and Process Schedule

The Alaska CASC (AK CASC) External Review Team (ERT) was asked to focus on specific categories stemming from the Host-University's Proposal Narrative. These categories and the dates devoted to their discussion follows. Daily summaries of the ERT Sessions and a listing of session attendees may be found in Appendix 1:

	Feb 22	Feb 23	Feb 24	Feb 25
Topic	Administrative Management 	 Scientific Achievements and Collaborative Efforts 	 Capacity Building and Outreach & Communications 	Overall Effectiveness towards Host's Goals

External Review Team (ERT)

Review team composition:

ERT members were nominated by USGS administrators and then selected by the ERT Manager based on the following criteria, with a goal of having an ERT that had varying degrees of experience and expertise to suit the CASC. Each member had:

1. Scientific, administrative, and/or stakeholder engagement process knowledge;
2. Working knowledge of the CASC Network;
3. Time, willingness, and support to serve on the ERT;
4. No conflict of interest (e.g., not receiving funding from any CASC at this time, nor expecting to receive funding from the CASC they were reviewing in the next funding cycle).

AK CASC ERT Members included:

- Amanda Babson, Ph.D., Coastal Climate Adaptation Coordinator, Region 1 (National Park Service)
- Jessica Halofsky, Ph.D., Director, Northwest Climate Hub and Western Wildland Environmental Threat Assessment Center (USDA Forest Service)
- J. Michael Hudson, M.S., Regional Climate Change Coordinator/Fish and Wildlife Biologist (USFWS)
- Sara K. McBride, Ph.D., Research Social Scientist and Crisis Communication Leader (USGS)
- Megan O'Rourke, Ph.D., National Science Liaison, Climate Change Institute of Bioenergy, Climate, & Environment (USDA-NIFA)
- Joel Reynolds, Ph.D., Climate Science and Adaptation Coordinator, Climate Change Response Program (NPS)

All ERT members signed Conflict of Interest and Non-Disclosure forms prior to participating in the review.

Findings of the ERT – Administrative Management

	Institutional Development <i>Staffing, Leadership Team, and Consortium Members</i>		Fiscal Management <i>Budget, awards, and grant management</i>
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The Host and Consortium

The ERT finds that University of Alaska, Fairbanks (UAF) (hereafter Host) has developed a strong internal team whose long-term focus on building and maintaining positive relationships with whomever they work has enabled them to lead both their internal and external projects with success. The Consortium includes other schools within the UA statewide system, especially the Anchorage and Southeast campuses, and co-located climate and science programs at UAF. These include the physical host of the CASC, the International Arctic Research Center (IARC), the Scenarios Network for Alaska and Arctic Planning (SNAP), the Alaska Center for Climate Assessment and Policy/National Oceanic and Atmospheric Administration’s Regional Integrated Sciences and Assessments (ACCAP), the AK Fire Science Consortium (AFSC), and the Cooperative Institute for Alaska Research (CIFAR). The ERT is impressed by the way the Host and its partners administer the program and was encouraged to learn that highest levels at UAF have been and remain very supportive of the work done in partnership with USGS. As reported, the UAF administration view the CASC as a critical part of this Land, Sea, and Space Grant institution, and they continue to give full support to the Center for the long-term.

The programmatic organization of the AK CASC centers on research, science communication and capacity building, with a focus on co-produced knowledge in an environment of extreme weather, geographic challenges, and rapid climate change. The key elements of the Host’s proposal and program include: institutional arrangements; co-produced science; capacity building; data management; science communication; and staffing. ***The ERT finds that these elements have been successfully achieved even in the face of political shifts, social upheaval stemming from the COVID-19 pandemic, travel and communications challenges presented by the geographic scope of the region, and shifting partner needs for climate adaptation science and guidance in the face of rapid geologic and cryosphere changes.***

Governance: The governance structure of the Host in relation to the AK CASC consists of a management team (originally composed of Rupp, Bidlack, Bolton, and Trammell, and changing to Rupp, Fellman, and Bolton), senior scientists, fellows (undergrads, graduate students, and post-docs), other university staff (program coordinator, two communication specialists, data steward position, co-production coordinator, and administrative assistant), and representatives from other co-located programs. There are also several advisory committees that provide advice and input to the teams.

Leadership & Management Approach: The Host CASC Director, Scott Rupp, is also Deputy Director of IARC and Director of SNAP, providing organizational flexibility and added integration for co-produced science with similarly focused programs and scientists. Leadership developed a

set of aspirational goals at the start of the CASC in 2010 that guide their decisions and actions to this day:

- Provide leadership and expertise in Arctic Region climate modeling and its application;
- Provide leadership in the development of a new cohort of scientists;
- Provide leadership and expertise in Arctic Region hydrology and cryosphere science and its application; and
- Serve as a Center of Excellence in climate change adaptation and planning.

The ERT finds that this goal-focused management orientation, coupled with leadership who present as a model “servant leader”, has created an impressive working environment in an otherwise challenging landscape. The Host CASC Director clearly supports the success of his staff, partners, and projects in the furtherance of inclusive, co-produced science intended to help the broader good. His staff and new Host CASC Deputy Director all mirror this approach and their teamwork appears to be socially cohesive and supportive of one another, as well as of their many partners. ***The ERT finds added merit stemming from the addition of senior scientists, a Tribal Engagement Specialist, and two communication specialists to the Host’s staff and leadership team.*** These staff additions have allowed the team to formulate a vision for structuring their co-production of knowledge that includes active engagement of the state’s 229 Indigenous Tribes and an active, imbedded role for their science communication team in all they do.

The Host holds regular meetings to support communication and administration, including:

- Weekly meetings between the University and USGS;
- Bi-weekly communications team meetings;
- Monthly management team meetings; and
- Biannual leadership team meetings.

Administrative & Fiscal Management: ***The ERT finds that the Host is fully grasping the administrative and fiscal requirements and is fully meeting the terms of their agreement with USGS.*** The Host had re-competed successfully before and is now finalizing the second 5-year term of USGS funding. As such, they have had ten years to evolve the administrative, financial, and legal processes to ensure that management of the federal grant is done to specifications, on time, and according to USGS legal standards. As a major Land, Sea and Space-grant university, the Host has well-established fiduciary and administrative processes in place to ensure that the funding received from the USGS is correctly administered and applied to the workings of the AK CASC. Contributions in terms of both personnel and external funding from the Host, its partners, and other grant sources add substantially to the impact and effectiveness of the AK CASC. The Host has managed an impressive leveraging of investment (\$2 for every \$1 USGS has invested in the Center).

Administrative Competencies

The ERT finds that the overall University of Alaska (UA) system has provided excellent administrative and fiscal management which has supported and served the Host at the UAF. It

appears that the entire UA system is engaged and supportive of the Center, its staff, and the partnership with USGS over the long run.

The ERT finds the Host has exhibited competent integration and administration support in a variety of ways:

- The Host is investing meaningfully to increase tribal engagement both internally on its staff and leadership team and externally in partnership with the BIA, by hosting their Tribal Liaison and providing administrative support.
- The Host added senior scientists to the leadership team.
- The Host holds regular meetings for communication between different groups.
- The Host has a data steward position to manage data from projects funded by AK CASC.
- The Host now has two science communicators (one at UAF and one at UAS and, with the Communications Advisory Group, developed a science communications plan that is an excellent product and a model for guiding communication actions.
- The Host found creative work-arounds to challenges they faced (see below). Given a combination of political and COVID challenges, their systems and relationships supported flexibility and creativity to find effective, alternative approaches.
- Given federal budget delays and funding issues, the Host made prudent hiring decisions and did the best they could to maintain stability for their Fellows.
- The Host supported 46 Fellows, while also producing 72 peer reviewed articles, including 31 high-impact publications in 13 months.

Administrative Efficiencies

As a single-university system, the Host can move funds between programs easily, and can support different locations. Given the geographic scope and the remoteness of some regions, each location has their own climate/management issues and academic areas of expertise that, without effective Host support, could become disconnected.

The ERT finds the Host's fiscal management to be efficient and effective:

- The Host has a longstanding, proven pre- and post-award management system.
- UAF has a full service business office that supports the CASC.
- The Host is able to provide office space and administrative support for USGS personnel as well as visiting researchers, students, and interns (where appropriate).
- All the same administrative managers and others are in every meeting together, which allows information to be communicated and well-integrated.
- The Host is able to use UA systems to support savings on Facility and Administrative (F&A) rates and reinvest funding into the program. This allows the CASC to utilize (and depend upon) unrestricted F&A investment, and provides fiscal flexibility that the Federal government does not have. As a result, F&A funding is used to support travel and field work, giving flexibility to use local support in remote rural locations that would otherwise be administratively challenging. This has also added flexibility when bridging gaps in federal funding delays.

In addition, the ERT finds that the co-location with other relevant programs (e.g., ACCAP, AK Fire Science Consortium, and IARC) enhances the Host's ability to leverage expertise and capacity related to complex regional climate science and achieve synergies between programs. The ERT also commends the Host's impressive strength and capacity for building trusting relationships in both Tribal and research and management communities that enables their work to be as far reaching as possible.

Administrative Challenges

ERT members are impressed by how effectively the Host and its federal counterpart of the CASC applied creative solutions to manage the many challenges they faced over the past five years, while accomplishing a great deal in the face of those challenges. Challenges included:

- Statewide, university-based funding decisions and cuts led to faculty and staff seeking positions elsewhere with more long-term career certainty (e.g., the loss of co-PIs Bidlack and Trammell) and the loss of key partners such as the five Landscape Conservation Cooperatives in Alaska.
- Determining regional science needs associated with the dissolution of both The Alaska Climate Change Executive Roundtable (ACCER), and the Landscape Conservation Cooperatives (LCCs). ACCER served as the CASC stakeholder advisory committee and worked as an active partner to help define shared priorities for actionable science. LCCs were important to convening partners and helping to do science. Both roles remain vacant.
- COVID-19 derailed re-establishing a stakeholder advisory committee after the demise of ACCER and affected the ability to start co-production pilots and phase two projects. In addition, COVID-19 impeded hiring and posed difficulties for processing visas of international students and partners (a crucial global population for Arctic research).
- Timing of receiving USGS funds to the Host has been less than ideal (e.g., year 1 split was into two 6-month awards, and year 2 and 3 budgets were provided the day before the new award year). Unfortunately and admittedly, USGS has lacked the human capacity to process Host awards in a timelier manner.
- Providing meaningful engagement opportunities and information for all of the region's 229 Indigenous Communities remains a constant challenge. The logistics to get to and from, or even to have regular communication with, some of the remote areas in which the Tribes live has proven to be difficult.
- Maintaining on-going engagement of junior faculty, who must have publishing credits in order to progress towards tenure, is challenged by their work on co-produced science. The very nature of collaborative, co-produced science means that it takes more time to evolve and complete: finding partners, determining needs, and then working together to create scientific protocols in advance of doing the science means that meeting short-term publishing requirements can be very difficult. As such, the academic requirements serve as a disincentive for junior faculty involvement.

Opportunities for Improvement

While COVID and other challenges stopped planned progress, the ERT finds that the Host was able to pivot and make impressive progress on a communications plan and began to build out its Fellows project, including development of a plan of action. The ERT finds both of these plans to be commendable and encourages the Host to formalize them in the near term. In addition, the ERT sees an opportunity for the Host to learn from these plans and consider using a similar, intentional approach to developing and adopting plans in other areas such as: building more internal partnerships that focus on the social science dimensions of co-production and actionable science, and clarifying the CASC'S commitment to Diversity, Equity and Inclusion (DEI) (similar to, yet separate from, that of the IARC). The ERT sees an opportunity for greater publication of the Host's lessons learned regarding co-production, and thus a means of partially addressing the disconnect between co-production investments and academic reward systems. This is an arena the ERT feels would be extremely conducive to greater collaborations with social scientists.

RECOMMENDATIONS: Administrative Management

- 1) **Continue to make progress on formalizing your impressive communications and Fellows plans.**
 - Use these plans to develop other intentional approaches to build Host capacity in the social and behavioral sciences and DEI efforts.
- 2) **Enhance all of your strategy documents to clarify your internal process and decision-making for flexing to meet future challenges.**
 - How do/will you utilize your goals and values to make decisions regarding which opportunities you will follow? How will the next generation of leaders be included in the decision making process? How will you and others know if you have been successful?
- 3) **Provide added, intentional support to the in-coming Tribal Liaison and the current Tribal Engagement Specialist to assure a strong partnership, clear roles, and help build resilient ongoing efforts and work with Alaska's 229 Tribes.**
- 4) **Create and formalize a stakeholder advisory committee.**
 - Work with USGS to identify, convene, and maintain a stakeholder advisory committee to provide insights and prioritization of science needs, such as was provided by ACCER.
- 5) **Consider innovative and creative approaches to training your internal leadership cohort**
 - Consider rotating detail opportunities, mini sabbaticals, or ad hoc leadership roles to both bring up the next set of leaders while giving the current leaders opportunities to maintain time for research and publishing.

6) Work with UAF and USGS to find ways to overcome Promotion and Tenure (P&T) requirements that disincentivize junior faculty from doing co-production work.

- Consider helping junior faculty develop a phased view of projects that would allow them to write and publish more frequently.
- If a phased approach is not possible, request that P&T committees accept pre-published drafts of in-progress, collaborative, co-produced science done under the auspices of the AK CASC.

Findings of the ERT – Scientific Achievements

	Scientific Achievements <i>Scientific Achievements on climate impacts, vulnerability, and adaptation science</i>
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The Host described four aspirational goals for the science they produce with the AK CASC:

- Provide leadership and expertise in Arctic Region climate modeling and its application.
- Provide leadership in the development of a new cohort of scientists.
- Provide leadership and expertise in Arctic Region hydrology and cryosphere science and its application.
- Serve as a Center of Excellence in climate change adaptation and planning.

These aspirational goals have shaped the science the Host does both within the Host Agreement and outside of it. The Host has focused on developing scientific infrastructure, capacity, and ‘dynamical downscaling’ capabilities that fill an important need not filled by other agencies and institutions, as occurs in the lower 48. The AK CASC’s climate scenarios and data sets inform science and decision making in the region. In addition, the Host and its Federal counterpart at the CASC are developing the human capital needed to apply specialized climate research in the region by training a new cohort of scientists in climate science, and in the co-production of that science.

The Host’s approach to resourcing the overall goals is a combination of direct funding, leveraging funding from other sources, and utilizing F&A to support travel and remote field work. On the human side, some of the expertise needed for studying the Arctic Region is difficult to find (e.g., dynamical downscaling models limited to CONUS). ***As such, the ERT finds that the Host has done an exemplary job building the expertise within the CASC.***

The ERT finds that the Host has a very impressive track record of producing actionable science. The scientific products that have been produced are in collaboration with a variety of partners and cover a range of resource areas and needs such as snow, permafrost, hydrology, fish, wildlife, vegetation, hazards and the impacts of all of this on communities, etc. Some, but not all, of this scientific work uses a co-production of knowledge process with users/partners. As noted above, the integrative portfolios of related projects and programs improves efficiency, productivity, and impact (as well as attracting additional resources). Applied science projects also serve an

impressive number of diverse stakeholders, from federal agencies to local/regional governments and Tribes to industry. In addition, the Host has explicitly incorporated an external evaluation component regarding the co-production and actionability of their products and efforts.

Examples of the Host's work which the ERT finds compelling include: The Southeast AK salmon projects to serve regional Tribes; the Suicide Basin outburst flood projects to aid community, housing and transportation planning in the nearby area; Avalanche Reconstruction in Southeast AK; Juneau flood forecasting with the National Weather Service's River Forecast Center to help ensure pipelines are safely placed; dynamical downscaling to help predict the impacts of extreme climate events; and the Integrated Ecosystem Model for Alaska (IEM).

The ERT finds that the IEM is an outstanding example of a sustained effort to tackle an extremely challenging, integrative topic to help stakeholders understand plausible trajectories of those landscapes undergoing climate-driven ecological transformation. The Host's IEM effort to integrate interactions of major drivers of change is an impressive, sustained effort to make science products available and actionable by stakeholders.

In addition to the science applications, the ERT finds that the Host has modelled leadership of the co-production of science. By explicitly creating a Co-Production Working Group, the Host shows it is fully embracing the intention of its proposal and subsequent Host Agreement. It also shows flexibility and creativity in the manner by which the Host team modified their original approach to meet goals and develop cogent strategies to guide the process in light of unexpected challenges (COVID and state and national shifts at the policy level). By taking these actions, the Host has helped shift the larger research culture in agencies and the region. The Host team has done this successfully by involving stakeholders, then adjusting to related applications that fit with shifting priorities. One example of this is the Host's work with thermokarst modelling. It shifted from habitat modeling on National Petroleum Reserve-Alaska and the Seward Peninsula to taking that understanding and applying it to address very time-sensitive oil and gas exploration/development-driven questions at the Arctic National Wildlife Refuge.

The ERT finds that the Host very effectively targeted regionally critical information needs with its science efforts. Examples of this include supporting dynamically downscaled work in the absence of any other provider. By developing the necessary computational infrastructure and expertise, the Host shows awareness of how many stakeholders need that information, as well as information about arctic hydrology and cryosphere science. Even with COVID in play, the Host was successful at leveraging arctic research partners (e.g., Swiss avalanche modelling specialists) wherever they reside to address local needs (Juneau avalanche prediction).

Finally, the ERT was impressed by and encourage the continuation of the Host's collaboration with the Pacific Islands CASC. The two CASCs share the similarities of many Indigenous communities, separated by large amounts of space, and constraints on potential Host institutions that could benefit on multiple fronts from working with each other. This on-going effort allows both CASCs to leverage their joint resources (human and fiscal) to address challenges, study issues, and solve problems they share as 'non-CONUS' regions.

Administration changes limited the Host's ability to conduct climate change science and engage in partnerships. As a result of state and federal funding issues noted above, the CASC lost key science leaders, which prevented one of the five proposed projects from moving forward. The Host has replaced expertise in remote sensing. In addition, the COVID pandemic prevented the Host from holding a planned co-production summit. Still, the Host continued to collaborate with a variety of partners to develop impressive and useful climate adaptation science products.

One area the ERT suggests to bolster overall scientific achievements is to add more social scientists to the consortium. ERT agencies have found that including sociologists, anthropologists, and psychologists on their climate adaptation teams has made their information more accessible to a broader audience.

RECOMMENDATIONS: Scientific Achievement

- 1) **Seek rewards for your good work.** The ERT encourages the Host and its USGS counterpart to seek science awards (from American Geophysical Union, National Climate Adaptation Leadership Awards for Natural Resources and others) and added research funding from NGOs and others for the work the CASC has accomplished. The science applications are impressive and should be rewarded as such.
- 2) **Capture, document, and then share your insights about Co-Production of Knowledge.**
As noted in your Day 2 presentations, the issue has evolved in both application and theory. There are several definitions and/or types of co-production and various groups think differently about the topic. The work you have begun is impressive. Publishing what you have done and learned through your experiences will be a valuable addition to the field.
- 3) **Track and report the application of your science.**
How are resource management partners and stakeholders *applying* some of the adaptation science products? How are your products assisting the National Park Service, U.S. Fish and Wildlife Service, the Alaska Department of Fish and Game, Tribes and local communities? Are they mainly in terms of understanding vulnerabilities, or are you beginning to see adaptation actions?
- 4) **Expand the use of social scientists by building a cohesive network in your region.** Build on the very good work of Dr. Kristin Timm and add sociologists, anthropologists and psychologists to your consortium. Build a network of social scientists, help them to develop a clear vision of the work you want and need in the region, then lead the way forward with people on your own team.
 - a. Publish the results of these efforts so others can gain from your experience.

Findings of the ERT – Collaborative Efforts

	Collaborative Efforts <i>Collaborate with stakeholders to develop and deliver adaptation products applicable to priority decision-making</i>
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When the Host wrote and responded to the current proposal they addressed the requirements listed within concerning collaboration and co-produced science. Over time, the Host has found that, while the Beier et al. (2017) recipe for co-production, explicitly identified in the RFP, may work well for those within the federal government, it does not work well with Indigenous Tribal communities and other collaborative settings in AK. The Host acknowledged that academia has moved “co-production” to a new place in the past five years, with newly developed methods and ideas. However, the context in which the AK CASC operates is not addressed by that academic literature. As such, the Host team has tried different methods which has led them to establish their own approaches for the groups with whom they regularly collaborate.

The Host intentionally evolved the co-production process from an academic, theoretical approach to a practicable approach during the current cooperative agreement’s 5-year period, complete with an external evaluation about the effectiveness of the approach they have created. The result of the external evaluation led to an evaluative approach to all the Host’s co-production work. In practice, the Host includes a three-step process for the collaborative efforts, working closely with stakeholders at each step of the process: Front-end (pilot phase); formative (next step and forward movement of the project); and summative (final review of the effort). This approach supports work with collaborators to inform the foundation for shared principles that improve and guide the co-development process.

In addition to an overall process for their collaborative efforts, the Host team and its partners learned the following from the evaluation that affected on-going work: improve collaborator elicitation; develop an operational definition of ‘co-production’ that works for their region; gain a better understanding of the internal capacity required to meet the needs of all user communities; and, importantly, be aware that information needs of users are continually evolving within their decision contexts, as fast or faster than the science.

Host team members described many avenues for engaging their collaborative efforts: organic networking; workshops and training settings; use of partners’ networks; and wide dissemination of information seeking partners and eliciting partner needs and interests. The Host’s collaborative efforts are directed at and span across multiple sectors (such as infrastructure, transportation, public safety, fish and wildlife, recreation, community planning, emergency preparedness, and others). Each project begins by eliciting interest and engagement from partners on emerging issues to increase stakeholder resilience to future changes in climate. While COVID limited the possibility of doing in-person work, the Host team was able to pivot and hold smaller online work sessions.

The needs of Indigenous peoples in AK are substantial, and Host staff has put a focused lens and additional resources towards co-developing a tribal network, while also building internal capacity to work effectively with the needs of the region's 229 Indigenous Communities. While progress has been made, Host's staff is continuously developing the necessary processes and trusting relationships needed to enhance collaboration with Tribal partners. *The ERT finds the Host's emphasis on and explicit commitment to the importance of building strong, trusting relationships with Tribal members and Tribes to be noteworthy. The ERT encourages the Host to keep this commitment tied to future actions and decisions.*

One other noted collaborative effort internal to the CASC Network is that between the AK CASC and the PI CASC. The ERT encourages continuation of collaborative work on projects that are similar in nature, but separated in space (AK and the Pacific Islands). There are seven collaborative projects across PI-AK CASCs that not only benefit their own regions, but also the new cohort of scientists who are able to work on these projects. *The ERT finds that these efforts are informing land to sea processes not only in AK and the Pacific Islands, but they also have the potential to inform work elsewhere.*

The ERT finds that the Host has done an outstanding job of incorporating effective co-production as a driving principle for their work. The ERT was very impressed by the incorporation of an external evaluation to assess these efforts, provide feedback, and thus help guide improvement in collaboration, especially given the cultural differences that must be acknowledged and bridged by many of these collaborations. The ERT commends the Host for this evaluation of their co-production activities and, then, putting the results of that evaluation into practice. The projects described during the review and elsewhere incorporate a broad range of partners, including state, federal, private, and Tribal entities. The Host appears to be extremely effective with its collaborative efforts and is approaching the work with an explicit intention to become even more so.

RECOMMENDATIONS: Collaborative Efforts

- 1) Share broadly the lessons learned from the external evaluation of your collaborative efforts and your lived experience.
 - a. The lessons learned about eliciting interest and keeping partners engaged are important to pass more broadly than your own circle.
- 2) Continue to support and build your collaborative capacity with Tribes and the PI CASC
 - a. Continue your focus on building long lasting and trusting relationships as a foundation for your collaborative efforts.
 - b. Enhance your team with additional social scientists who can help maximize the learnings while also helping to amplify those learnings in the region and more broadly.

Findings of the ERT – Capacity Building

	Capacity Building <i>Educate and train to build capacity of early career professionals and others</i>
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UAF strives to build capacity by providing leadership in the development of a new cohort of scientists through its Fellows Program, the Inspiring Girls Expeditions, and the Alaska Tribal Resilience Learning Network (AK TRLN). The Host framed capacity building at UAF as a “programmatically way of moving forward support of climate research production, and leading by example as a CASC in Alaska”. This involves efforts to “marry” the CASC scientific approach noted above with the CASC training approach, which helps build skills that allow scientists to APPLY climate science in their own research, via the AK CASC Fellows Program (or the Fellows Cohort). The Host seeks to align its efforts both with the CASCs co-production research goals and the Host’s capacity building goals. In Alaska, this added capacity includes engagement and involvement of the next generation of Tribal Leaders and recognition of the challenges they face.

The ERT notes three key areas in which the Host has excelled:

Fellows Program - Since its establishment, the Fellows Program has accomplished a great deal and is a source of pride at UAF. The program utilizes a variety of training approaches to inculcate the skills necessary for engaging in applied climate change science and decision support (an inherently transdisciplinary domain). Highlights of the Fellows Program include: an undergraduate Climate Scholars Program; brown bag-style Skills Building Seminar Series (which train Fellows to navigate the diverse transdisciplinary nature of applied climate change science, and is pivotal in synthesizing training opportunities for Fellows); a Weekly Synergistic Seminar; and gatherings and networking opportunities to create a deeper sense of cohort.

In addition, the Host has sought to develop the next generation of climate science partnerships with activities such as: the AK CASC Fellows “All Hands” (which helps Fellows get to know each other, as well as local stakeholders); a PI-AK CASC Collaborative Intensives and training to help prepare Fellows for effective and productive networking at the AGU’s Fall Meeting; institutionalizing the research co-production process; and incorporating the tenets of diversity, equity, and inclusion (DEI) into all Fellows efforts by broadening the scope both of participants and direct partnerships while also exploring DEI in climate change science applications. The Host is in the process of formalizing the Fellows Program at UAF, with a planning process currently underway.

Fellows are introduced to opportunities for alternative science research careers outside of academia, and have direct exposure to the integration of science into policy and action at governmental, NGO, and industrial levels. One example of this was working with the Host to develop corporate Environmental, Social, and Governance (ESG) plans. The Host supported 46 Research Fellows within the 5-year agreement, with 14 participants in the current cohort, including the Host’s first intern. The Host has been very effective getting Fellows into and through the program. While it is not yet clear how successful Fellows may be in their careers

after they leave the CASC, several success stories were shared; several Fellows have moved into faculty positions at UAF or other universities.

The ERT finds that the Host has made an extremely noteworthy effort to build capacity of Fellows to participate in true co-production of knowledge that ensures science is targeting priority needs and is delivered, and translated, in ways that make it actionable. Based on the detail provided on the Climate Scholars Program, the programs are well thought out, offer meaningful training, and are tailored to local opportunities and needs. In particular, the use of an external evaluation component to provide feedback through all stages of pilot projects shows that the Host is building both human capacity *as well as* physical science infrastructure that is taken for granted in other regions of the country, but is not available in AK (e.g., regional climate modelling capacity and the necessary computational infrastructure to support that modelling).

Inspiring Girls Expeditions - The Host developed and supports another capacity building program called Inspiring Girls Expeditions which include Girls on Ice, Girls on Water, and Girls in the Forest. Through this program, girls aged 16-18 go on a 12-day expedition and learn about climate change, glaciology, hydrology, and other topics. The program also includes training in DEI topics. Instructors are early-career scientists, artists, and guides who teach the girls how to think about, design, and conduct research. More than 50% of instructors repeat their engagement across multiple years because they find it so personally enjoyable and beneficial to their careers. Importantly, the program has contributed to increasing interest in and capacity for girls to go into scientific fields. While the program suffered initial setbacks from COVID restrictions on face-to-face field trips, the Host was able to pivot and create the Girls Expeditions@Home program.

The ERT finds that the Inspiring Girls program is a creative, exciting, and effective program for reaching and training a diversity of participants, including 30% Alaska Native girls. The ERT also finds the program growth has been thoughtful, building on strengths and not overwhelming capacity. ERT members are impressed that Inspiring Girls has an evaluation component, “in addition to all the other amazing, inspiring aspects”.

Tribal Resilience Learning Network (TRLN) – Approximately 50% of federally recognized Tribes reside in AK. The 229 Tribes must navigate both seasonal and daily extreme environmental impacts of climate change. TRLN was created to learn about and address climate adaptation in the face of climate impacts to land, water, food security, and infrastructure. To build capacity, the Host and Tribal partners created a Building Resilience Today training to orient participants to future projections, document changes experienced, and build skills using adaptation tools. The Host’s ability to shift the Tribal Liaison position into the CASC (e.g., from BIA 3-year funding to a UAF position funded by CASC) has allowed the Host to develop a guiding framework for activities that focus on Indigenous perspectives and experiences, climate adaptation, and climate science. This in turn has supported the development of a great TRLN team and partnerships, with components for building a successful system of support so that Tribes may meet their own needs.

Moving forward, challenges include: poor internet connectivity in the face of increased shift to online activity due to COVID-19; limits to local level capacity to engage at the scale needed to address adaptation challenges; limited coordination of adaptation efforts across AK and at other relevant scales (regionally, statewide, and internationally as AK is the only Arctic state); and potential changes in Tribal Liaison's Host Organization. The Host has determined that responses to these challenges include: prioritizing one-on-one calls and TRLN cohort team training; creatively increasing local and regional Tribal capacity; developing a Community of Practice and refining coordination among adaptation practitioners; and supporting continuity within the Tribal Liaison program.

The ERT finds that the Host's efforts to engage Tribes and Indigenous Communities to ensure their needs are prioritized and addressed are extremely noteworthy. This includes developing the capacity on the university side to engage and develop appropriate people and processes (e.g., Malinda Chase and the forthcoming next round of BIA Tribal Resilience Liaisons), together with building capacity in the Tribes and villages to engage in these collaborations (via the Tribal Resilience Learning Network). The Host has put in place impressive evaluation processes in terms of capacity building around co-production of knowledge.

As one ERT member wrote:

"I'm so impressed with the Looking Back, Looking Forward approach of the TRLN. The relationships and applications are both building capacity and clear actionable science/collaboration. The creation of the new CASC hosted position that builds on the previous work and relationships to add consistency and stability in the face of external uncertainty is a sign that capacity priorities are forward thinking and ready to grow on a strong foundation. I'm impressed by the support for tribal adaptation that has been provided to date and excited by how much more you will be able to do going forward".

The ERT finds that the Host's capacity building programs are exemplary. In addition, these programs highlight the Host and IARC's values-based approach to DEI that clearly is an important part of the institution's culture. The Host's presentations and discussions demonstrated that individuals are deeply committed to advancing these values, and specific project-based progress is being implemented while simultaneously transferring small changes into larger institutional efforts. The Host has not yet evaluated diversity of the Fellows program, such as recruitment or retention metrics. Instead, the Host has managed thus far by focusing on a relationship-based approach. The Host currently is working to transfer successes of the Inspiring Girls program into other programs, which appears to the ERT to be an example of culture change.

RECOMMENDATIONS: Capacity Building

- 1) Continue the process of formalizing the Fellows Program with clear vision, goals, and metrics by which you can determine long-term success of your Fellows, and the program as a whole.

- Develop metrics of Fellows’ success. Include career tracks, in addition to academic careers, that include the professional arenas of the partners with whom you work to co-produce science and knowledge (e.g., local, state and federal agencies, Tribes, NGOs, corporations and other industries). Include metrics of DEI recruitment and retention.
- 2) **Develop metrics and track the success of all your capacity building programs.**
- The programs are apparently excellent; back this up with metrics that show the longer term effectiveness of the capacity you are building for climate science and adaptation.
- 3) **Expand Cultural Resources applications**
- Seize the opportunity that exists with your TRLN to integrate natural and cultural resource management as both an area from which to learn and a vehicle to transfer knowledge throughout projects.

Findings of the ERT – Outreach and Communications

	Outreach & Communications <i>Manage and transfer information and data related to research activities</i>
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The Host provided an overview of the 5-Year Communications Plan (Plan) and its related activities, including communication goals and objectives, goal successes, reporting and internal assessment, and next steps, as well as their Annual Implementation Plans. The 5-year Plan includes specific goals and approaches to evaluate the program’s success.

Both the Plan and the two dedicated communications staff are integrated into the UAF’s capacity building, communication, and research work, helping to make products more effective internally and externally (for example, web-based tools and guides). The Host’s science communication efforts began by providing quality science and application products targeted at particular audiences. Now, communication staff and their products have been integrated into co-production processes. The Host has intentionally incorporated communications activities into every phase of pilot projects in support of the adoption of and focus on co-produced knowledge.

In addition, the Plan supports more intentional placement of staff and products for various projects and partners. This has allowed the Host to be more systematic, having learned from successes and challenges, while maintaining the flexibility to do creative projects (such as the Alaska Voice project) that have served them well.

The ERT finds that the Host maintained an exemplary focus on communications and communications training during this agreement period. The communications team has held science communications training, media training, ‘difficult dialogues’ training, and online meeting facilitation training. The team has co-created a variety of science products, and

developed a co-production working group. They shared several communications products with more than 6,000 downloads and highlighted examples of how their products were used by stakeholders. The impact of the CASC science, collaboration and adaptation has been amplified by effective outreach and communications efforts. Having a strategy come together as a result of a learning process suggests the Host's impact should continue to grow.

The ERT was impressed by how the Host team is focused on grappling with Alaska communication realities (e.g., lack of broadband in rural communities – affecting both delivery of content as well as field work) and finding creative ways to address them. In addition to finding creative solutions to enhance connectivity, the team has also made certain that verbal descriptions must be adequate for science presentations that may not be “seen” by everyone attending the session.

In particular, the ERT finds that the “Alaska Voices” is an outstanding humanities-focused effort, raising awareness and engagement as well as showcasing the human side of the CASCs research and activities. The radio-based storytelling, in partnership with StoryCorps (as heard on National Public Radio), is not only a production stand-out, but also an inspiring recruitment tool for the next generations of climate scientists. The ERT believes the impact of *Inspiring Girls* and *Alaska Voices* is a very meaningful contribution to climate and science cultures. The humanities connections enhance the effectiveness of everything else the Host does in its work. ***The ERT finds that this is a resounding success story for the Host and its USGS counterpart that could serve as a model for how climate change and climate science can be communicated to audiences of all levels and regions.***

Looking forward, the Host hopes to leverage partners' education and outreach efforts in order to reach new audiences. It aims to target new groups and decision makers at all levels through social media and other platforms that can carry messages successfully about climate adaptation science and the need for planning and actions sooner than later.

The ERT finds the Host has made good initial efforts to evaluate communication. The Host will need to develop sustainable evaluation and monitoring approaches that capture the *impacts* of their efforts. These often are noticeable much later than the original activity, and even may be undertaken by researchers other than those involved in the original activity. Given its stage of development, the TRLN provides a possible venue for better tracking of communication impacts, and uses of CASC science.

The ERT noted a few factors that limited the Host's Outreach & Communications results:

- The realities and challenges of doing science and outreach in Alaska and the Arctic, from travel to telecommunications.
- The global pandemic and need for virtual engagement, combined with poor (and expensive) internet connectivity, impacting the ability of Tribes and partners to engage. This shows the great need for support that the Host and CASC cannot currently meet without additional funding.

- The lack of a national strategic plan that could inform development of AK CASC's 5-year communications plan. Still, the team was able to create their own communications plan.
- The change in State & Federal administrations and a shift in priorities and political support.
 - While the Host did not develop a Roster of AK Experts to help stakeholders identify regional human and science resources, they did develop various web-based resources to help address information needs.
 - The Host also developed FAQ materials on downscaled projections that can be accessed by all visitors to the SNAP website.

The ERT finds that the Host and its USGS counterpart showed substantial flexibility and creativity in responding to a variety of challenges. The entire CASC team (Host faculty, staff and USGS staff) focused on one-on-one engagements, and developed a community of practice to share and coordinate among adaptation practitioners. Producing the radio/podcast reach of *Alaska Voices* is a creative, meaningful way to mitigate some of the telecommunications, travel, and pandemic hardships they faced. The ERT commends the Host and team for intentionally developing and maintaining trusting relationships necessary to provide these alternate ways to reach people.

RECOMMENDATIONS: Outreach and Communications

1. **Consider a set of impact metrics that could further bolster the success and effectiveness of your communications work.**
 - What are the metrics for success and effectiveness, other than just listing the contributions or number of downloads?
 - Consider how you might relay the feedback received from end users of products as an established qualitative metric. Then consider, how do you publicize this success?
2. **Continue to develop appropriate linkages and communities of practice to the other Indigenous- and/or community- focused science and adaptation groups that may exist in Alaska as the TRLN gets off the ground.**
 - Leverage additional strong community and Tribal engagement that may exist in these other settings, such as the Northern Latitudes Partnerships (NLP) and work with your Tribal Liaison as she strengthens these ties. This outreach also might serve to support the capacity of the Host for its work with Tribes.
 - Ensure adequate communication and engagement with other AK adaptation efforts, such as the NLP, in developing this Community of Practice as others may be in a position to lead (or co-lead) from the grass roots level.

Findings of the ERT – Overall Effectiveness Towards Host Agreement

The ERT agrees that the Host and consortium were more than effective meeting the goals set out in their Proposal to USGS. The Alaska CASC has been very effective over the last five years in conducting cutting-edge climate change science, working with partners in co-producing much of

that science, building capacity of the current and next generation of climate scientists, and effectively communicating their work to a variety of audiences. They achieved all of this under difficult local and national circumstances, including a global pandemic. Their commitment to the time and effort needed to support co-production and science communication is unusual and impressive.

The ERT finds that the Host has applied creative solutions for the challenging problems it faced during the award period. Their on-going evaluation (both internal and external) of co-production and the processes that underlie excellence of such efforts are comprehensive and have led to evolution of their work through the course of the agreement. The Host's central focus on communication and co-production is outstanding and an important evolution from earlier agreements and approaches.

The ERT applauds the CASC's commitment to modeling the cultural changes they are promoting and shifting the science culture (co-production, communication, Tribal engagement, etc.). This culture change includes embracing co-production of knowledge as the working model for doing applied science. Development and implementation of the Tribal Resilience Learning Network is an especially noteworthy achievement, as is the mentorship of 46 fellows in a setting replete with diverse learning opportunities.

OVERALL ERT RECOMMENDATIONS

In addition to the recommendations noted above, the ERT makes the following recommendations about the review process and suggested approach for the Host, AK CASC (and consideration by National CASC with the entire CASC Network):

- **Clarify Roles and Responsibilities**
 - If the 2022 CASC legislation passes, take the opportunity to provide clarity about the roles and responsibilities that the federal side wishes to see in place at Host institutions.
- **Develop Metrics of Success**
 - As a means of continuously telling the success of your overall program, develop metrics of success such as 'numbers of papers/publications that stem from collaborative efforts' and 'provide actionable information to others' that are used by all RCASCs.
- **Create a path for providing co-production of science tenure credits**
 - Include in future Host agreements a commitment by host institutions to give credit for tenure purposes stemming from co-produced science in lieu of other academic tenure requirements.

- **Build capacity for Hosts and USGS CASC programs to hire additional staff and scientists**
 - Provide funds to support this capacity, and be a timely, ‘trustworthy’ partner to the universities as they continue to help the nation create a new generation of climate adaptation scientists.
 - Consider additional sources of funding ranging from philanthropic to public/private partnerships to add needed funds and flexibility that USGS cannot support.
- **Amplify the ‘exceptionals’ at the AK CASC**
 - Notice and learn from AKs exceptional programs: Inspiring Girls, their approach to communications and outreach, Alaska Voices, and the TRLN.
- **Develop a community of practice around Tribal engagement and partnerships**
 - The very nature of the CASCs and their placement in the Department of the Interior provides an excellent opportunity to share learnings that have stemmed from the co-production of knowledge with Tribes. What is being learned is profound and should be supported, shared and expanded upon by the AK CASC.
- **USGS – support the expansion of the social science network within this and other CASCs**
 - Work with the AK and other appropriate CASCs to create a shared vision for how social sciences could best support the work of CASCs. The very unsettling nature of climate change and the need to adapt to those changes has caused psychological, economic, social and other unrest for many. Bring social and behavioral scientists into the fold to help explore and provide actions that can help in all these areas.
- **Consider the next ‘long term, major investment’ goal**
 - To do this, think in terms of ‘if not for CASC, then who?’ This could help develop strategic investments such as earlier efforts on Regional Modelling, IEM, and cultural shift of co-production of knowledge (CPK) and TRLN.
- **Consider formalizing the relationship between the PI and AK CASCs**
 - Identify the parallels and efficiencies that are gained from this collaborative effort (e.g., logistically, culturally, similar geographic scope with large spaces between native communities).
- **National CASC - When the host is constrained to a single potential host institution**
 - Encourage leveraging more outside expertise on the leadership team.
 - Consider rotating leadership (lead PI) to support growth and reduce burnout.

REGARDING THE EXTERNAL REVIEW PROCESS
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- ***The ERT finds that the review process was organized well, smoothly run, and less taxing than prior reviews in which members participated.***
 - The preparatory materials and daily summaries were helpful to support the review and keep track of the information needed for review reporting.
 - The sessions were facilitated in a way that encouraged open and honest communications without anyone being defensive.

- ERT members could see the amount of time and preparation it took to do this review, especially given the online requirements stemming from COVID.
- **For future ERT reviews, the ERT recommends:**
 - NCASC should consider ways by which the overall review process could be streamlined. For example, work with the communications teams from the CASCs to develop a template for annual reports that could more easily be rolled-up into the external review process and report.
 - Include graphics and stories or presentations that ERT members and others may see that ‘show’ how the Host is doing its work.
 - Continue holding the ERT sessions online due to the improved accessibility for ERT members, overall carbon emissions footprint, and sustainability of the process being in alignment with climate change and adaptation.
 - AK CASC has developed programs (e.g. Alaska Voices, Inspiring Girls) that go beyond their proposal and host agreement and adapted the programs to changes in political and public health realities.
 - Consider how to set up the review of future proposals and agreements to encourage this type of opportunistic response.
 - At least for the two non-CONUS CASCs, provide a brief summary (not to exceed 2-4 pages) introducing the ERT to key characteristics of the CASC region. For example, thinking of AK:
 - Number of federally recognized Tribes,
 - Percentage of land jurisdictions (public, private, military, Tribal, etc.; 85% of National Wildlife Refuge System acreage, similar % for total National Park Service acreage),
 - Economic development (e.g., importance of subsistence and certain natural resource-focused industries in AK, such as commercial and recreational fishing), and
 - ‘State of science development/resources’ (e.g., there are 5 NOAA National Water Level Observation Network stations from Port Heiden north to border with Canada compared to about ten in Narragansett Bay; and a total of 27 on Alaska’s 6,640 miles of coastline; etc..).

END OF REPORT CONTENT

Scrivener’s Note: Author of this report: Donna Silverberg and her team Colby Mills, Tina Patterson, and Charles Wiggins; with acknowledgments to ERT members Amanda Babson (NPS), Jessica Halofsky (USDA), J. Michael Hudson (USFWS), Sara K. McBride (USGS), Megan O’Rourke (USDA), and Joel Reynolds (NPS). The ERT members reviewed and refined two drafts until all members could enthusiastically support having their names acknowledged on this Final ERT Review Report.

APPENDICES & ATTACHMENTS

Appendix 1 – Attendees

Attendees for all or part of the sessions, alphabetical by last name (affiliations included).

ERT Members: Amanda Babson (NPS), Jessica Halofsky (USDA), J. Michael Hudson (USFWS), Sara McBride (USGS), Megan O’Rourke (USDA-NIFA), and Joel Reynolds (NPS)

Consortium and CASC Presenters: Uma Bhatt (UAF), Allison Bidlack (UAF), Bob Bolton (UAF), Ryan Bellmore (USFS), Amy Breen (UAF), Malinda Chase (UAF), Mike DeLue (UAF), Jeff Falke (USGS), Jason Fellman (UAS), Jessica Garron (UAF), Steve Gray (USGS), Krista Heeringa (UAF/AK TRLN), Eran Hood (UAS), Paul Leonard (USFWS), Jeremy Littell (USGS), Mimi Lesniak (UAF), Scott Rupp (UAF), Molly Tankerseley (UAF), Kristin Timm (UAF), Erica McCall Valentine (The Scholar Ship), John Walsh (IARC), Gabriel Wolken (DGGS), and Joanna Young (UAF IARC Fellow).

Observers: Doug Beard (USGS), Gustavo Bisbal (USGS), Isabella Caltabiano (USGS), Janet Cushing (USGS), Emma Custer (SC CASC), Emily Fort (USGS), Anita Govert (SW CASC), Mari-Vaughn Johnson (PI CASC), and Darcy Widmayer (NW CASC).

Facilitation Team: Colby Mills, Tina Patterson, and Donna Silverberg (DS Consulting).

Appendix 2 – Daily Review Session Agendas and Session Summaries

Day 1 – Administrative & Fiscal Management

DAY 1	February 22, 2022: Administrative Management Purpose: Reflect on the Competencies, Efficiencies, Challenges, and Areas for Improvement of the host-university in managing the <u>administrative requirements and terms and conditions</u> of the corresponding host agreement, with a focus on Institutional Development and Fiscal Management review categories.	
Time AKST	Activity	Participants and Affiliation
9:00-9:15a	External Review Team - Closed Door Get settled and focused on task for the week and the day	Facilitation Team ERT Members
9:15-9:30a	Welcome, Introductions, & Role Clarification Brief welcome, round of introductions of ERT members, AK CASC team, and USGS team, and clarify roles	Donna Silverberg, ERT Manager/facilitator, DS Consulting
9:30-9:45	The Alaska CASC: Roles and Responsibilities	Steven Gray, USGS Dir, AK CASC
9:45-10:45a	<i>Institutional Development: Organizational Management and Leadership, Staffing, and Terms & Conditions</i> Overview of the AK CASC's administration, structure, host institution, & consortium	Scott Rupp, UA Fairbanks (UAF) Director, AK CASC
10:45-11:00a	Break To avoid zoom fatigue: Please turn off and step away from your computer screen if AT ALL possible!	
11:00-11:30a	Facilitated dialogue and discussion with ERT, and Q & A regarding Administration, Leadership and the AK CASC Consortium Structure	Facilitation Team AK CASC Team ERT members
11:30a-12:15p	<i>Review of Fiscal Management</i>	Scott Rupp, UAF Director, AK CASC
12:15-12:30p	Break To avoid zoom fatigue: Please turn off and step away from your computer screen if AT ALL possible!	
12:30-1:30p	Facilitated dialogue and discussion with ERT, and Q & A regarding Fiscal Management What are the host's Competencies, Efficiencies, Challenges, and Areas for Improvement?	Facilitation Team AK CASC Team ERT members
1:30-2:00	External Review Team - Closed Door Initial reflections on the day. Questions, concerns, and insights	Facilitation Team ERT Members

DAY 1: Facilitator's Summary
February 22, 2022, 9:00a – 2:00p AKST
Topic: Administrative & Fiscal Management

Prepared by DS Consulting Facilitation Team

The following summary was intended to capture basic discussion, reflections, concerns, and insights from the session.

Attendees present for all or part of the meeting (in alphabetical order):

ERT Members: Amanda Babson (NPS), Jessica Halofsky (USDA), Mike Hudson (USFWS), Sara McBride (USGS), Megan O'Rourke (USDA), and Joel Reynolds (NPS).

Consortium and CASC Presenters: Allison Bidlack (UAF), Bob Bolton (UAF), Malinda Chase (UAF), Jessica Garron (UAF), Steve Gray (USGS), Mimi Lesniak (UAF), and Scott Rupp (UAF).

Observers: Doug Beard (USGS), Gus Bisbal (USGS), Emily Fort (USGS), Anita Govert (SWCASC), Mari-Vaughn Johnson (PICASC), and Darcy Widmayer (NWCASC).

DS Consulting Team: Facilitator: Donna Silverberg, Reporting and Support: Tina Patterson, Colby Mills.

Purpose for Day 1: To reflect on the competencies, efficiencies, challenges, and areas for improvement of the host-university in managing the administrative requirements and terms and conditions of the corresponding host agreement, with a focus on institutional development and fiscal management review categories.

Welcome, Introductions & Role Clarification

Facilitator, Donna Silverberg, welcomed the group and conducted a round of introductions that included AK CASC ERT Members, USGS and AK CASC staff, and session observers. She noted that the purpose of this effort is to conduct a 5-year review (at year 6, due to COVID-19) of the AK CASC Host University, University of Alaska Fairbanks (UAF). The review is intended to look at what UAF proposed to do in their Cooperator Agreement with USGS, what they accomplished, what factors limited their success, where they overcame any barriers, and what lessons can be learned from all of this. The Review is an opportunity for the Host University to have in depth discussion and dialogue with the ERT to reflect on their success and identify areas for growth.

The Alaska CASC: Roles and Responsibilities

AK CASC Director, Dr. Steve Gray (USGS), welcomed the group with a presentation that introduced the AK CASC and its various roles and responsibilities within the larger National CASC system (this presentation can be viewed [here](#)). He noted that the AK CASC splits responsibilities between Anchorage, on the Federal side, and Fairbanks (UAF), on the administrative side. The role of the AK CASC is to address critical science needs and gaps related to climate adaptation, especially as it applies to natural resource management. The AK CASC is focused on addressing Department of the Interior (DOI) management issues, while striving to function with a “whole systems” approach to recognize broader connections.

Steve provided context about how the AK CASC conducts science planning, how the CASC decides on science priorities, and how available money is spent. Included in his overview were the challenges faced for science planning since 2020 when the new Alaska Governor declined to continue the CASC's science

advisory group, the Alaska Climate Change Executive Roundtable (ACCER), and the DOI placed a moratorium on new advisory committees. This has shifted focus at the AK CASC to use direct partner engagement as a means for identifying science priorities. Another significant challenge noted were changes to the AK CASC governance structure due to funding and COVID-19.

Steve explained that the Federal side of the CASC works on stakeholder engagement to identify science needs and develops science priorities for funding exclusive of UAF. On the other side, UAF works on science implementation, training, and congressional engagement. He also noted the AK CASC research priorities for 2022, the CASC organization and staffing structure, and 2021 actual spending. The AK CASC centers on a direct linkage between all activities and management/decision needs, and has the ability to apply many types of resources via its Federal-University relationship. In addition, and importantly, the CASC works to train the next generation of scientists and leaders. The AK CASC is a critical component of the larger UAF institution and the and USGS climate program. Steve noted that the success of the AK CASC, in large part, stems from the philosophy that it is one part of a larger climate science system, both in the region and much more broadly.

Institutional Development: Organizational Management and Leadership, Staffing and Terms & Conditions

AK CASC Host University Director, Dr. Scott Rupp (UAF), presented an overview of the AK CASC's administration, structure, host institution, and consortium since its establishment in September of 2010 (this presentation can be viewed [here](#).) The programmatic organization of the AK CASC is centered on research, science communication and capacity building, with a focus on co-produced knowledge. Key elements of their proposal and program include institutional arrangements, co-produced science, capacity building, data management, science communication, and staffing. Scott explained that the University administration is extremely supportive of the CASC.

Scott noted that the AK CASC has essentially accomplished everything agreed to on the Terms Sheet, and that the CASC is excited to provide a better sense of how it was accomplished and learn from the ERT how it might be improved. He noted that some of the staffing contemplated in the proposal shifted due to COVID-19 and state funding issues. In addition, while some faculty went elsewhere, they were able to add three scientists to the leadership team and a Deputy Director. He will put together a list of the three new researchers and their background expertise for the ERT; he also noted that expertise in social science is relatively thin on the team.

Dialogue and Discussion: Administration, Leadership, and the AK CASC Consortium Structure

Questions and comments from ERT Members led to the following clarifications and comments from the AK CASC Host University administrators:

- UAF has gone through the loss of personnel staff/faculty via institutional competition and loss of recent state funding. This has impacted the AK CASC some, though for the most part it has been relatively insulated from the loss in state funding; this year the CASC is scheduled to get a \$3 million increase (the first in 8 years not to have a decrease in annual state funding). 85% of the annual budget for CASC operations is through competitive funding (including business office personnel). This provides some stabilization for the program, although it has impacted longtime collaborators. The CASC is on a positive trajectory moving forward. The AK CASC would like to engage faculty and find another Co-Investigator, and believes now is the right time to start thinking about this. Although UAA funding was more impacted than UAF, it is stabilizing some too.

- With the rollout of co-produced pilot projects, the process for distributing funds internally is not confined solely to the team laid out in the AK CASC organizational chart, nor is it a competitive internal RFP process; instead, it is somewhere in-between. Pilot projects are mostly opportunistic: faculty link to projects which take advantage of their prior expertise, relationships, and trust which are identified in advance. They employ a process of understanding stakeholder needs and then seek opportunities to match, and being informed by the CASC science priorities. The Cooperative Agreement with USGS supports a nimbleness for the Host's capacity to address things as they come. As new needs arise, Scott can reach out to others outside of the leadership team.
- ACCER was the AK CASC Science Advisory Committee (SAC) in its function and how it was set up. With the inability to convene the group, the CASC leadership team reaches out and works individually with Federal and State agencies that populated ACCER. ACCER existed before the AK CASC, and when it functioned there was stakeholder fatigue and lack of capacity to attend meetings. This one-on-one input has been working well; identifying science priorities is not a challenge, picking out priorities within the available resources is.
- Given the limited staffing capacity of USGS, are UAF partners able to pick up capacity? Where is capacity still lacking? Where do priorities lie and why?
 - With respect to USGS funding, capacity is lacking everywhere. The highest priority is to support Tribal needs (33 AK communities at risk and needing relocation due to climate impacts and stressors) and to facilitate conversations in order to understand those needs and make connections. People and funding to support Tribal needs remains a large need.
 - More effort is also needed on building out the Fellows program. The need for the next generation of scientists within this specific expertise is significant and, given the specificity of science in the region (e.g., permafrost, cryospheric hazards, etc.), this is hard to develop in other regions. There also are science capacity needs for computing and modeling structures.
- The role of the Co-Production Advisory Committee was proposed as a working group to help identify and prioritize needs; as such, they have limited capacity. What was proposed hasn't worked out, primarily with the COVID-19 pandemic hitting in Year 3.
- Regarding Fellows, the idea of creating a cohort is great. What is the breakdown of participants? What are the opportunities and challenges stemming from the AK CASC encompassing only 1 university?
 - Within the 46 Fellows there are 9 Postdoc, 3 PhD, 8 MS, 25 undergrad students and 1 intern. It is hard to recruit grad students based on current funding levels. Alaska's statewide university system is a benefit because it means there are fewer people around the table, working with a cohort of Fellows in a logistically challenging place. COVID-19 has impacted the ability to develop a strong sense of cohort because people have not been able to be face-to-face, nor have they been able to do field work as before. That said, they have overcome these challenges by learning and capitalizing on new, remote ways for co-production.
- It was noted that, in light of all of these challenges, the UAF still had managed to publish 31 high-impact reports regarding the science they have done.

The AK CASC: Fiscal Management

Scott presented an overview of the AK CASC's fiscal management (this presentation can be viewed [here](#)). A major benefit and source of efficiency is that the CASC resides within the Alaska statewide university system. The Cooperative Agreement total budget is \$7,249,902, which is divided up between the five

years to coincide with Fellow development and co-production. The University's Facilities and Administrative (F&A) Investment provides a huge impact to the program by recouping around 50% of the total investment (around \$874,817). This allows the CASC to use this fund for unrestricted reinvestment following university rules and regulations, such as establishing a much-needed computing infrastructure, supporting travel, and other as needed funds for project support.

Scott reviewed the Cooperative Agreement funds management. The pre-award processes are managed via USGS OAG with the UAF OGCA, and post-award funds and processes are managed through the International Arctic Research Center (IARC) to UAS and UAA. He provided context on the IARC business office, focusing on its efficiencies and challenges it faced. Fiscal efficiencies include: the integrated pre- and post-award management; a full-service business office; Consortium members are all within the UA statewide system; and the ability to utilize (and depend upon) unrestricted F&A investment.

Fiscal challenges include: the Year 1 budget split into two 6-month awards; Year 2 and Year 3 budgets being provided the day before the new award year; delays in review and approval during the previous Federal Administration; and the COVID-19 pandemic. Despite these challenges, the AK CASC has been able to manage relatively well, and essentially have been able to accomplish everything it proposed to do, while perhaps becoming more risk-averse due to the multiple stressors the faced. While the COVID-19 pandemic has led to the inability to complete projects, or abandon things completely, and made it difficult for personnel to get into the field and interact in person, the budget has been stabilized by strong fiscal management and strong capacity at IARC.

Dialogue and Discussion: Fiscal Management

Questions and comments from ERT Members led to the following clarifications and comments from the AK CASC Host University administrators:

- F&A reinvestment is not exactly unique to the AK CASC, and although it's not a huge amount of money compared to the overall budget, the money is immensely useful.
- The delay in getting money to the university is a huge issue. There remains a lack of staff capacity to process awards at USGS. The former Federal Administration put approval processes in place that aided delay. This past year, however, the CASC received host agreement funding 2 months prior to start of the year, which was very helpful for planning and implementing.
- Regarding the AK CASC's longevity and budgetary challenges, it has never been hard to get full support and backing from the University's Administration long-term. UAF has been very supportive and view the CASC as a critical part of the Land, Sea, and Space Grant institution.

Dialogue and Discussion: Host University's Competencies, Efficiencies, Challenges, and Areas of Improvement

Based on questions and comments from ERT Members, AK CASC directors added the following clarifications and comments regarding the overall competencies, efficiencies, challenges and areas for improvement:

- What potential exists for expanding the partnership outside of the AK state university system?
 - AK Pacific University has been developing Tribal college capacity in Northern AK, Iñiaḡvik College which could broaden their partnerships, as well as considering working with non-government organizations such as The Nature Conservancy. The CASC is considering how those partnerships could be developed. They see good reasons to consider broadening the consortium to non-traditional institutions.

- Challenges to hiring primarily were due to the fiscal uncertainties stemming from delayed funding pieced out in two parts. This has improved in the last year or so. Recent challenges have been COVID-19 centered, due to travel and visa restrictions experienced by students and scientists.
- The co-location of the AK CASC with the IARC, NOAA's RISA program, and the AK Fire Science Consortium has been a big efficiency, allowing on-going interactions and relationships that support leveraging of each other's capacity. This has allowed the CASC to be efficient and do better work.
 - The CASC is always looking at options to expedite funding positions; some avenues like IPAs or the Pathways Program have capacity barriers on Federal side, and are easier for UAF to do.
- DEI efforts will be presented in detail later this week. The AK CASC is very active in efforts to increase diversity and make programs equitable, although it has taken time to get there. The RFP process and Federal process is not productive for allowing Native entities to apply for funds.
- F&A reinvestment has helped immensely with travel, fieldwork, and technology (equipment and supplies), as it is university-based unrestricted funding which is different than the Federal formula for "overhead".
- A great advantage for USGS working within the UA system is that UA has the experience and capacity to support fieldwork in Alaska that the Federal Government is not well-equipped to handle.
 - For example, UA understands how individuals need to get from point a to point b in a physical environment that makes travel of people and instruments extremely challenging.
- The issue of the need to publish, as a matter of tenure and promotion within the UA system hasn't been resolved, is broader than the AK CASC, and is not unique to UAF. This is a long-term 'academy' issue. At issue is the need to develop means for positively evaluating researchers and creating incentives to do time-consuming, co-produced research that might not meet the traditional timelines for faculty publication requirements in order to achieve full-professorship.
 - At UAF (not sure about UAS, UAA) a number of institutional unit criteria metrics (what is used to judge promotion) are now including "co-production-like" language in order to give credit to those people that engage in that type of research activity. It is a slow process which started within the last year.
 - Any suggestions or insights the ERT might provide in this regard would be appreciated.
- Regarding co-production and aspects of human research, is the AK CASC using the institutional Internal Review Board (IRB) or Paperwork Reduction Act (PRA)? The CASC has to abide by the IRB process, same for anything USGS funds through the RFP process.
 - Tribal IRBs have not been formalized in Alaska; there is not a Tribal uniform IRB process that the AK CASC is working with in the region.

Donna thanked the ERT, Consortium & CASC Members, and Observers for their participation, engagement and attendance at the session. And with that, the meeting was adjourned.

ERT Reflections on the Day

After reflecting on the material presented on UAF's administrative and fiscal management of the AK CASC, ERT Members were impressed by how effectively the CASC has applied creative solutions to manage the challenges they faced while accomplishing a great deal in the face of those challenges. The ERT looks forward to hearing more about the substantive work of the Host and CASC in the days to come. Initial questions from the ERT to the AK CASC Host University:

1. How did you use the prior ERT's advice/recommendations?
 - a. Did they help you to make any revisions to your plans for this cycle? (If yes, how/what?)
 - b. What was and will be most helpful for you to receive from this ERT?
2. How do you define co-production?
3. When doing co-produced science, how do you loop back to the managers, tribes, and communities with whom you developed the ideas/needs?
4. How are you measuring the effectiveness of your communications? Are you able to leverage IARC and ACAP for communication outreach?
 - a. Could you share your Communications Plan that you mentioned today with the ERT?

*This session summary was respectfully submitted by the Facilitation Team. Edits were welcome and sent to Day 1
Scribe: Colby Mills (colby@dsconsult.co).*

Day 2 – Scientific Achievements & Collaborative Efforts

DAY 2	February 23, 2022: Scientific Achievements and Collaborative Efforts Purpose: Reflect on the host-university and associated academic consortium's contributions with respect to: Scientific Achievement and Collaborative Efforts.	
Time AKST	Activity	Participants and Affiliation
9:00-9:15a	External Review Team - Closed Door	Facilitation Team & ERT Members
9:15-9:30a	Brief Daily Introductions and Setting the Day	Facilitation Team, AK CASC Team ERT Members
9:30-10:00a	<i>Scientific Achievements on climate impacts, vulnerability, and adaptation science:</i> Overview and introduction to presentations	Scott Rupp, UAF Director, AK CASC
10:00-10:45a	<i>Science Achievement and Collaborations: Part 1</i> - Climate Impacts on Aquatic Food Webs (20min) - Integrated Ecosystem Model (20min)	R. Belmore, USFS J. Little, USGS
10:45-11:00a	Break To avoid zoom fatigue: Please turn off and step away from your computer screen if AT ALL possible!	
11:00a-12:00p	<i>Science Achievement and Collaborations: Part 2</i> - Cryosphere Hazards in SE Alaska (20min) - Climate Change and Permafrost (20min) - Climate Downscaling and Extreme Events Research (20min)	G. Wolken, AK DGGs P. Leonard, USFWS J. Walsh
12:00-12:15p	Break To avoid zoom fatigue: Please turn off and step away from your computer screen if AT ALL possible!	
12:15-1:00p	<i>Co-production Research and Evaluation</i> - Co-production Evaluation (15min) - Co-producing Knowledge: Recommendations (20min)	Scott Rupp, UAF Director, AK CASC E. Valentine, The Scholar Ship K. Timm
1:00-1:30p	Facilitated dialogue and discussion with ERT, and Q & A regarding Scientific Achievements and Collaborative Efforts: - How is the host university managing their program and doing Actionable Science; what is the process? What patterns have emerged? What is/is not working well? - What are the host university and its academic consortium contributions to climate adaptation science? - How effective is the Host at engaging others in these activities? How do the Host's collaborative efforts enhance the Host's overall effectiveness?	Facilitation Team AK CASC ERT Members
1:30-1:45	External Review Team – Closed Door Initial reflections on the day. Questions, concerns, and insights	Facilitation Team ERT Members

DAY 2: Facilitator's Summary
February 23, 2022, 9:00a – 2:00p AKST
Topic: Scientific Achievements and Collaborative Efforts

Prepared by DS Consulting Facilitation Team

The following summary was intended to capture basic discussion, reflections, concerns, and insights from the session.

Attendees present for all or part of the meeting (in alphabetical order):

ERT Members: Amanda Babson (NPS), Jessica Halofsky (USDA), Mike Hudson (USFWS), Sara McBride (USGS), Megan O'Rourke (USDA), and Joel Reynolds (NPS).

Consortium and CASC Presenters: Uma Bhatt (UAF), Alison Bidlack (IARC), Bob Bolton (Co-PI, UAF), Ryan Bellmore (USFS), Amy Breen (UAF), Malinda Chase (UAF), Mike DeLue (UAF), Jeff Falke (USGS), Jason Fellman (UAS), Jessica Garron (UAF), Steve Gray (USGS), Eran Hood (UAS), Paul Leonard (USFWS), Jeremy Littell (USGS), Mimi Lesniak (UAF), Scot Rupp (UAF), Molly Tankerseley (UAF), Kristin Timm (UAF), Erica McCall Valentine (The Scholar Ship – external evaluator), John Walsh (IARC), and Gabriel Wolken (DGGG).

Observers: Doug Beard (NCASC), Gustavo Bisbal (NCASC), Janet Cushing (NCASC), Anita Govert (SW CASC), Emily Fort (NCASC), Mari-Vaughn Johnson (PI CASC), and Darcy Widmayer (NW CASC).

DS Consulting Team: Facilitator: Donna Silverberg; Reporting and Support: Tina Patterson and Colby Mills.

Purpose for Day 2: Reflect on the host-university and associated academic consortium's contributions with respect to: Scientific Achievement and Collaborative Efforts.

Welcome, Introductions & Role Clarification

Facilitator, Donna Silverberg, welcomed the group and conducted a round of introductions that included AK CASC ERT Members, USGS and AK CASC staff, and session observers. She noted that the review is an opportunity for the Host University to have in depth discussion and dialogue with the ERT to reflect on their success and identify areas for growth.

Follow-Up from Day 1

The ERT submitted questions to the AK CASC at the conclusion of Day 1. Scott responded via email. Below are the answers.

How did you use the prior ERT's advice/recommendations?

- A. Did they help you to make any revisions to your plans for this cycle? (if yes, how/what?)
- B. What was and will be most helpful for you to receive from this ERT?

The time between our review and our receiving the review panel's recommendations was more than 8 months. Because of how late the recommendations were received they provided limited usefulness.

1a. Not really. Unfortunately, the recommendations were received so late that we had to submit our re-compete proposal several months before we received the recommendations.

1b. What will be most helpful is a timely report with constructive feedback on how we can improve and/or ideas for expanding our efforts. We would also love to hear where we are doing great. What I think the ERT offers us is an outside perspective that might see things we can't so

we are excited to receive thoughts on how we can improve, expand, and/or address things we may not have considered.

How do you define co-production?

This is not a simple question. First, the RFP to which we responded for this 5-yr hosting agreement had a very strong view on a very specific definition/perspective of co-production. That RFP was primarily the result of the FACA that was operating at that time and a particular subgroup of FACA members. Their definition and more so their recipe for doing co-production was laid out in the attached paper by Beier et. al. Our proposal was developed to primarily follow Beier et. al's recipe for coproduction. What we have learned and as the issue has evolved in both application and theory is there are several different definitions and/or types of co-production and different groups think differently about this topic. You will learn tomorrow afternoon how our experience has evolved especially as it pertains to the coproduction of knowledge with Alaska Native and Indigenous Peoples. This may not be a satisfactory answer, but it is the best I can do in an email and I will look forward to discussing this further with the team throughout the week.

When doing co-produced science, how do you loop back to the managers, tribes, and communities with whom you developed the ideas/needs?

If/when we are doing things correctly the managers, tribes, etc. are actively involved throughout the life of the project. A couple of our presentation tomorrow should highlight where this has worked quite well. In projects that have evolved slower and perhaps with less consistent engagement we have used our science communication expertise to keep our managers, tribes, etc. informed through regular communications (as simple as an email) and/or through periodic meetings (which have become more difficult since spring of 2020).

How are you measuring the effectiveness of your communications? Are you able to leverage IARC and ACCAP for communication outreach? Could you share your Communications Plan that you mentioned today with the ERT?

We do have a series of metrics that are linked to our annual work plans that you will learn about on Thursday. We do indeed leverage the broader communications expertise within IARC. In fact, all the co-located groups have integrated all social media under the IARC umbrella while working to maintain visibility of the individual programs. This example will also be highlighted on Thursday. We also take advantage of other programmatic outreach efforts - for example the ACCAP seminar series has been a venue for communicating some of our work and we have done similar things with the Alaska Fire Science Consortium. You will learn more about our science communication plan on Thursday. You can find the plan [here](#).

Scientific Achievements on Climate Impacts, Vulnerability, and Adaptation Science

AK CASC Host University Director, Dr. Scott Rupp (UAF), provided a high-level overview to the ERT to help set context, metrics and to give a sense of accomplishments. The presentation is available [here](#). Scott shared the four aspirational goals of AK CASC that were developed at the start of the CASC, twelve years ago:

- Provide leadership and expertise in arctic region climate modeling and its application.
- Provide leadership in the development of a new cohort of scientists.
- Provide leadership and expertise in Arctic Region hydrology and cryosphere science and its application.

- Serve as a Center of Excellence in climate change adaptation and planning.

These aspirational goals have shaped the science the AK CASC does both within the Cooperative Agreement and outside of it. Scott noted that AK CASC has focused on developing scientific infrastructure, capacity, and dynamical downscaling capabilities, which has been a game changer. The AK CASC climate scenarios and data sets inform science and decision making. AK CASC is developing human capital to utilize and apply specialized climate research in the region by training a new cohort of scientists. Today the ERT will hear about AK CASC's portfolio of scientific achievements in several areas including avalanches, and permafrost degradation. AK CASC's approach to reaching goals is a combination of direct funding, leveraging funding from other sources, and F&A. On the human side of things, some of the expertise needed for studying the arctic region is difficult to find (e.g., dynamical downscaling). As such, AK CASC has tried to build the expertise within the CASC. On Day 3 the ERT will hear about the Fellows program and its participants' success.

Questions and Comments from the ERT

- Have you taken a look at some of the science philanthropies for funding?
 - We have discussed and there are other groups that have pursued philanthropic funding. We received Wilberforce funding in the past. Currently philanthropic funding competition is high and it's a challenge. We continue to follow the opportunities, yet so far, we have not had success.

Scientific Achievements and Collaborations

"Climate Impacts on Aquatic Food Webs"

Dr. Ryan Bellmore (USFS), Co-Investigator Dr. Jason Fellman (UAS), and Dr. Jeff Falke (USGS), spoke to the ERT about three studies that represent collaborative efforts in identifying the impacts of climate change on aquatic ecosystem. The presentation is available [here](#). The presenters shared that they and others use the studies' information to gain a better understanding of how salmon will respond to landscape-level changes in hydrology, especially in subsistence communities which rely on salmon as a food source. There are several jointly funded projects sponsored by PI and AK CASC.

Question

- What conversations are taking place as the projects evolve?
 - The PI and AK collaboration has helped developed a research network and identify linkages. More information about the PI-AK CASC collaborations is available [here](#).

"Integrated Ecosystem Model (IEM)"

Dr. Jeremy Littell (USGS), spoke to the ERT about the development of the IEM and opportunities for continued collaboration. The presentation covered IEM history, application, translational science, and prospectus including evolving user needs. The presentation is available [here](#). Dr. Amy Breen, shared a link to a beta version of the IEM web app tool for delivering location specific product summaries, it is available [here](#).

"Cryosphere Hazards in SE Alaska"

Dr. Gabe Woken (DGGs), and Dr. Eran Hood (UAS), talked to the ERT about cryosphere hazards. The presentation is available [here](#). Scott explained that when AK CASC talks about the cryosphere, it means the places where water is in its solid form, frozen into ice or snow or permafrost. The presenters shared that both lives and livelihoods depend on the cryosphere. A hazard is a natural occurrence that may impact public safety and critical infrastructure of diverse stakeholders. The stakeholder parties

collaborating in the study include UAF, USGS, Kensington Mine, and Alaska Division of Geological and Geophysical Surveys (DGGS). The study has also incorporated data provided by the Swiss Institute for Snow & Avalanche Research. The projects presented all were designed to directly inform decision makers (e.g., emergency warning and preparedness, transportation planning, etc.).

“Climate Change and Permafrost”

Co-Investigator Dr. Bob Bolton (UAF), and Dr. Paul Leonard (USFWS), spoke to the ERT about Climate Change and permafrost and thermokarst processes. The presentation is available [here](#). "Thermokarst is a terrain-type characterized by very irregular surfaces of marshy hollows and small hummocks formed as ice-rich permafrost thaws in Arctic areas". They look like a sinkhole, but of ice. The goal of this work is to answer to the question, “what are the consequences of thermokarst on changes in land cover /land surface types?” The work began in 2015 focused on interests in biological impacts and socio-economic impacts, presenters discussed the conceptual model they developed for the formation of the thermokarst processes, especially the events that trigger its initiation (‘climate priming’). The presenters shared a climate priming example for the period 2001 to 2020. An example of the AK CASC’s applied management approach, this project has allowed them to pivot in light of changing stakeholder needs and bring in other partners for collaboration. A student featured in the presentation, Ross, completed his MS as an AK CASC Fellow a couple years ago. He is now (recently) employed by UAF and is working with Bob Bolton on the projects.

Question

- Given the shift in stakeholder priorities and subsequent shift in project focus to address needs associated with guiding oil & gas exploration in the 10-02 area of Arctic NWR, is the thermokarst modeling (originally motivated to gain insight into projected habitat changes for arctic breeding migratory birds) moving forward?
 - Yes, and it is slow. The big issue is that we don’t know when it happens; with climate priming we’re getting closer to figuring it out.

“Climate Downscaling and Extreme Events Research”

Dr. Uma Bhatt (UAF), and Dr. John Walsh (IARC), spoke to the ERT about AK CASC’s Dynamical Downscaling. The presentation is available [here](#). Dr Katharine Hayhoe’s model illustrated the lack of downscaled data products covering all of Alaska (e.g., the CASC’s domain), so the team needed to address this fundamental, shared need by creating such foundational data products. The presenters explained the two types of downscaling: statistical and dynamical, including strengths and weaknesses of each approach. The presenters also discussed four completed downscaled products: ERA – Interim (observations), GFDL-CM3 and NCAR-CCSM4, Southeast CFSR 4km & 1km, Interior 1km Chena Basin. The presenters noted key takeaways: dynamical downscaling provides a comprehensive reconstruction of Alaska’s climate and weather history, it is fertile material for Masters and PhD projects that served as springboard for careers of AK CASC scientists, and the work is increasingly targeting policy relevant applications. A key result of the effort in SE AK was clarification of the spatial resolution required to appropriate capture the effects of the region’s topographical gradients (e.g., coastal mountain ranges) on the climate (e.g., 4k grid cells rather than 12 km or 20 km cells). This work has also required the CASC to create the necessary physical computing and human technical resources (servers, specific programming skills, etc.) to support such computationally intensive efforts.

Questions

- You have an impressive number of partners with whom you are doing your research. Do you have a process by which you invite partner engagement? Or is it organic?

- We have used multiple mechanisms. AKCASC has seen an increase in the number partners in the past three year's engagement, mostly within the research community. While mostly organic, AK CASC Also advertises opportunities to broaden their network.
- In addition, they maintain an ongoing list of individuals who have requested data.
- And workshops and presentations help to get the word out.

Co-production Research and Evaluation

Scott launched the discussion of co-production with a presentation that included a timeline illustrating the proposed timing and sequencing of AK CASC's co-production efforts. It includes a pilot phase, followed by a review of that phase before moving into the next phase. Their evaluation efforts are meant to provide an opportunity to learn and improve their work from the pilot to next phase of their research with partners. The presentation is available [here](#).

"Co-Production Evaluation"

External Evaluator Erica Valentine (The Scholar Ship), delivered a presentation on her work as an external evaluator of the AK CASC's co-production efforts. The presentation is available [here](#). Erica evaluated three of the five projects submitted in AK CASC's proposal: Artic LCC and Western Alaska LCC Landscape Change (e.g., thermokarst modelling), Southeast Alaska Stream Flow Models, and Interior Alaska Wildfire Forecasting. Erica discussed with the ERT evaluation approaches, the approaches used for the three projects (front-end, formative, and summative), preliminary conclusions, and questions to consider.

"Co-Producing Knowledge: Recommendations"

AK CASC Fellow, Dr. Kristin Timm (UAF), delivered a presentation on the Host's efforts to assess its approach to co-production. The presentation is available [here](#). AK CASC's co-production Pathway Working Group began in Summer 2020 with a reassessment of the goals of the co-production workshop that had to be abandoned due to COVID, and identification of alternative ways to achieve them; the working group's recommendations were finalized in February 2022. The steps included assessing the working group and scheduling meeting, developing and agreeing on working group core values, discussing aspirations and potential future efforts, drafting recommendations and multiple rounds of review and iteration. The assessment began with an intentional effort to identify and agree upon shared values for the team which then guided its work. The team also developed a set of recommendations representing six categories: 1- tribal engagement strategy, 2- relationships, representations and strategic guidance; 3- funding processes and power structures; 4 - training and continuing education; 5 - academic reward systems and structures; 6 - lessons learned and evaluation, including Indigenous evaluation.

Kristin shared five lessons from the process including: find consensus and honor everyone's ability to engage in the work in the midst of multiple competing personal and professional demands; keep the document short and focused (while also acknowledging the conversations we had, things that need to be said, and issues that emerged in review); try to balance the aspirational with the practical – AK CASC will not be able to do all these things and that is okay; try not to let perfectionism get in the way of progress.

Questions and Comments from the ERT

- How did you see political aspects and COVID impact your working group discussion?
 - There was a clear awareness that there was a change in political agendas and how we could make it work. Regarding COVID, it took a little for folks to realize what tools were available to support the work. The networking piece can be hard when you can't be in a face-to-face, in-person setting. Trust and relationship building are necessary as a foundation to the work.
- How would you suggest bridging the cultural divide of the cultural dynamics regarding perfection?

- By intentionally not letting perfection get in the way of the program, and identifying how we can recognize when we've made a mistake and still move forward. We're a 'big idea' group.
- Was there any discussion about the relationships needed to support open and transparent co-production work?
 - Yes; As an individual you may end up sharing more if you are in a space that supports being trusted and vulnerable. The capacity to create relationships and a sphere of being vulnerable or judged depended upon what tools, training or mentoring people had.
- Sometimes agency representatives and scientists get overwhelmed by training. Have you discussed creating a mentoring or guide, internal to the CASC, who could help shepherd people through the co-production process?
 - We discussed whether there's a need for a set of competencies for scientists and Fellows. There are some great papers on this this subject. We discussed the core competencies we see for this work and then worked backwards to develop tools necessary to support those skills being developed.
 - AK CASC did discuss and list a lot of existing trainings for future research and consideration. Kristin also shared a link to the Center for Scientific Collaboration and Community Engagement. It is available [here](#).

Facilitated dialogue and discussion with ERT, and Q & A regarding Scientific Achievements and Collaborative Efforts

- ERT members encouraged finding an opportunity for the AK CASC to partner with the USFWS to offer training on co-production of knowledge through the National Conservation Training Center (NCTC).
- Have you started envisioning what your work would look like in the next agreement?
 - We don't have solid next steps. At this point we need several positions filled to support our on-going efforts.
 - When AK CASC wrote and responded to the current RFP, they were trying to address the requirements listed with it. The AK CASC found the Beier et al. (2017) recipe for co-production, which was explicitly identified in the RFP, may work well for those within the federal government. However, they have discovered it doesn't work so well with native tribal communities and other collaborative settings in AK. Academia has moved "co-production" to a new place in the past 5 years, with lots of development of methods and ideas. However, while Scott acknowledged he has not kept pace with this growth, he believes the context in which the AK CASC operates is not really addressed by that academic literature. Instead, the CASC is starting to gain traction on effective approaches for the groups it regularly collaborates with.
 - Kristin noted that they have found the academic theories about of co-production are very different from the reality of co-production. First, it takes longer and time means money. Second, Groups need to wrestle with: What do you need? What's really going on in the community? What do we value? These questions and the commitment to co-production takes longer than was thought it would. Additionally, you must have flexibility to go in a different direction than originally envisioned if your partners need change (e.g., the thermokarst and permafrost presentation). This may be difficult if your science priorities don't align with the same focus. That said, the University has been successful in obtaining funding for numerous community-identified needs.
- One ERT member stated that it would have been helpful to have the co-production presentations first as this added process context helped to explain and underpin the science that had been produced as a result.

- What efforts have been made to bring in other social scientists? Anthropologists? Other resources with different lenses?
 - AK CASC is moving in this direction. The Host now has an economist and Kristin onboard. The consortium also has talented people and they are seeing interest in joining their work with the CASC.
 - The disparity in social science funding in climate research is a major issue. The human side of climate science is just as complex as the physical/natural science side. Kristin said she'd love to see more of a community around social science in the CASC system (and she recently discussed this with Alison Meadow at SW CASC).
- Regarding IEM, where's the conversation with NPS? USFWS?
 - Jeremy has been the point person for moving discussions about impact modeling. AK CASC has been spinning up the data to inform planning efforts. A good example is a project with Jeff Falke and DOD using Alfresco and TEM geo biochemistry into fish modes. Scott will ask Jeremy for a list of projects to share with ERT members
- What about your applications to cultural resources? Have partners come to you?
 - It's not been front and center in the science portfolio, so there has not been much effort to date. That said, the Tribal Resilience and Learning Network have looked at permafrost degradation of cellars in N Alaska, which has a big impact on cultural resources. There may be an opportunity for Malinda Chase, as well as other scientists to engage in this effort. The AKCASC has not yet funded this type of effort, but they are linked with another program at IARC. An ERT member highlighted the links between cultural resource work and natural resource work (e.g., on-going salmon studies), which Scott added possibility for caribou and fire management.

Donna thanked the ERT, Consortium & CASC Members, and Observers for their participation, engagement and attendance at the session. The meeting was adjourned.

This session summary was respectfully submitted by the DS Consulting Facilitation Team. Edits were welcomed and sent to Day 2 Scribe: Tina Patterson (tina.patterson@jadeitesolutions.com).

Day 3 – Capacity Building & Outreach and Communications

DAY 3	February 24, 2022: Capacity Building & Outreach and Communications Purpose: Reflect on the host-university and associated academic consortium's contributions with respect to Capacity Building and Outreach & Communications.	
Time AKST	Activity	Participants and Affiliation
9:00-9:15a	External Review Team - Closed Door	Facilitation Team ERT Members
9:15-9:30a	Brief Daily Introductions and Setting the Day	Facilitation Team, AK CASC Team, ERT Members
9:30-10:15a	<i>Capacity Building: Educate and train to build capacity of early career professionals and others</i> AK CASC Fellows Program	Scott Rupp, UAF Director, AK CASC Jessica Garron, UAF Dep. Director, AK CASC
10:15-10:30a	Break To avoid zoom fatigue: Please turn off and step away from your computer screen if AT ALL possible!	
10:30-11:45a	<i>Capacity Building: The Next Generation</i> - Inspiring Girls Expeditions (25 min) - Alaska Tribal Resilience Learning Network (25 min) - Diversity, Equity, and Inclusion (15 min)	Scott Rupp, UAF Director, AK CASC J. Young M. Chase Scott Rupp, UAF Director, AK CASC
11:45-12:00p	Break To avoid zoom fatigue: Please turn off and step away from your computer screen if AT ALL possible!	
12:00-12:45p	<i>Science Communications & Outreach: Manage and transfer information and data related to research activities</i>	M. Tankersley M. DeLue
12:45-1:00p	Science Communications Spotlight: Alaska Voices	B. Bolton
1:00-1:30p	Facilitated dialogue and discussion with ERT, regarding Capacity Building & Outreach and Communications <i>How is the host university and associated academic consortium doing their <u>Capacity Building</u>; How effective are they? What is the process? What patterns have emerged? What is/not working well? What is the host-university and associated academic consortium's contribution to <u>Capacity Building</u>? What were their limitations and how were they mitigated?</i> <i>What is the host-university and associated academic consortium's <u>Outreach & Communications</u> contribution for climate adaptation?</i> <i>What factors limited outreach and comms and how were they mitigated?</i>	Facilitation Team AK CASC ERT Members
1:30-2:00p	External Review Team - Closed Door Initial reflections on the day. Questions, concerns, and insights	Facilitation Team ERT Members

DAY 3: Facilitator's Summary
February 24, 2022, 9:00a – 2:00p AKST

Topics: Capacity Building & Outreach and Communications

Prepared by DS Consulting Facilitation Team

The following summary was intended to capture basic discussion, reflections, concerns, and insights from the session.

Attendees present for all or part of the meeting (in alphabetical order)

ERT Members: Amanda Babson (NPS), Jessica Halofsky (USDA), Mike Hudson (USFWS), Sara McBride (USGS), Megan O'Rourke (USDA), and Joel Reynolds (NPS).

Consortium and CASC Presenters: Bob Bolton (UAF), Allison Bidlack (UAF IARC), Malinda Chase (UAF/Aleutian Pribilof Islands Assoc.), Mike DeLue (UAF), Jessica Garron (UAF), Steve Gray (USGS), Krista Heeringa (UAF/AK TRLN), Scott Rupp (UAF), Molly Tankersley (UAS), and Joanna Young (UAF IARC Fellow).

Observers: Doug Beard (USGS), Gus Bisbal (USGS), Janet Cushing (USGS), Emma Custer (SCCASC), Emily Fort (USGS), Anita Govert (SW CASC), Mari-Vaughn Johnson (PI CASC), and Darcy Widmayer (NW CASC).

DS Consulting Team: Facilitator: Donna Silverberg, Reporting and Support: Tina Patterson and Colby Mills.

Purpose for Day 3: To reflect on the Host University, University of Alaska Fairbanks (UAF), and its associated consortium's contributions to climate adaptation science with respect to Capacity Building & Outreach and Communications.

Welcome, Introductions & Role Clarification

Facilitator, Donna Silverberg, welcomed the group and conducted a round of introductions that included AK CASC ERT Members, USGS and AK CASC staff, and session observers. She noted that the purpose of this effort is to conduct a 5-year review (at year 6, due to COVID-19) of the AK CASC Host University, University of Alaska Fairbanks (UAF). This review is intended to look at what UAF proposed to do in their Cooperator Agreement with USGS, what they accomplished, what factors limited their success, where they overcame any barriers, and what lessons can be learned from all of this. The Review is an opportunity for the Host University to have in depth discussion and dialogue with the ERT to reflect on their success and identify areas for growth. Donna reported that the work presented over the past two days has been inspiring to the ERT, especially given all of the immense challenges the AK CASC must navigate on a variety of levels.

Capacity Building: Educate and Train to Build Capacity of Early Career Professional and Others

AK CASC Host University Director, Dr. Scott Rupp (UAF), and Deputy Director, Dr. Jessica Garron (UAF), presented an overview of UAF's capacity building within the AK CASC, including an introduction to the AK CASC Fellows Program (this presentation can be viewed [here](#)). Scott noted that, while all the materials presented in Day 2 also encompass capacity building, today's focus is to show how UAF strives to build capacity by providing leadership in the development of a new cohort of scientists through its Fellows Program, the Inspiring Girls Expeditions, and the Alaska Tribal Resilience Learning Network (AK TRLN). These efforts align both with the CASC's co-production research goals and their capacity building goals.

Jessica framed capacity building at UAF as a programmatic way (the ‘programmatic science’) of moving forward with climate research production, and leading by example as a CASC in Alaska. This involves efforts to “marry” the CASC scientific approach (presented in Day 2) with the CASC training approach which helps to build skills that allow scientists to APPLY climate science in their own research and work, via the AK CASC Fellows Program (or the Fellows Cohort).

Research Fellowships within the 5-year agreement reached a total of 46 (significantly more than proposed), with 14 participants in the current cohort, including their first intern. Since its establishment, the Fellows Program has achieved numerous accomplishments, and remains a very effective program and source of pride at UAF. Highlights of the Fellows Program include: the undergraduate Climate Scholars Program; the brown bag-style Skills Building Seminar Series (which trains fellows in navigating the diverse transdisciplinary nature of applied climate change science), pivotal in synthesizing training opportunities for Fellows; the Weekly Synergistic Seminar; gatherings and networking opportunities to create a deeper sense of cohort and the next generation of climate science partnerships such as the AK CASC Fellows “All Hands” (which helps Fellows get to know both each other as well as local stakeholders), PI-AK CASC Collaborative Intensives (in the works!), and training to help prepare Fellows for effective and productive networking at the American Geophysical Union (AGU) Fall Meeting; institutionalizing the research co-production process; formalizing the Fellows Program at UAF; and incorporating the tenets of diversity, equity, and inclusion into all Fellows efforts by broadening the scope both of participants and direct partnerships while also exploring diversity, equity, and inclusion (DEI) in climate change science applications.

Questions and comments from ERT Members led to the following clarifications and comments from the AK CASC Host University leaders:

- UAF has been using the same virtual tools as everyone, the challenge is creating engaging virtual materials and information that are accessible to all. Which virtual platforms or tools have you found to support your work and its accessibility to help you move into the next hybrid phase of work?
 - The CASC and Fellows are working to capitalize on this ‘virtual’ period to explore different ways of communicating science such as graphic design strategies, game-ification, and also using words most effectively while not relying on visuals (for virtual situations where participant bandwidth does not support delivery of visual materials). They are figuring out which social media is worthwhile for which audiences, making efforts to tap into new modes of communication (such as how to build a successful e-poster), and exploring how Fellows can capitalize on different platforms to advance their careers strategically.
- In regards to cohort development and Fellows advancing into research careers:
 - Fellows are introduced to opportunities for alternative science research careers outside of academia and have direct exposure to the integration of science into policy and action on governmental, non-governmental organizations, and industrial levels. Ex: corporate Environmental, Social, and Governance (ESG) plans.
- The ERT noted that UAF has established a very good foundation for where the AK CASC wants to go moving forward. The CASC has modeled (and built capacity in understanding) that there is both a great value in personal relationships and networking AND a need for new communications that can bridge the many accessibility challenges faced in Alaska.

Capacity Building: The Next Generation

Scott emphasized that capacity building at UAF is focused on fostering the next generation of climate scientists by connecting with and providing all the capacity it can. In Alaska, this added capacity includes

engagement and involvement of the next generation of Tribal Leaders and the challenges they face. He shared stories of five past Fellows and their successful climate science arcs (presentation can be viewed [here](#)). The AK CASC has been highly effective at keeping graduated participants within the CASC or returning to the CASC later in their careers through their research. Alaska can be a harsh living experience and is not for everyone, so UAF works extra hard to keep these region-specialized scientists at or connected to UAF as they continue on their career paths.

Inspiring Girls Expeditions

Postdoctoral Fellow/Director of Inspiring Girls AK, Joanna Young (UAF), provided a history and context for developing the Inspiring Girls Expeditions (this presentation can be viewed [here](#)), while weaving in her own story as CASC Fellow that connected with the environment she studied. Highlights included: Joanna's published research on Glacier modeling; the launch of 'Girls on Ice Alaska' (GoI AK) as a unique field science, artistic observation and landscape exploration program, primarily CASC-funded; expanding to 'Inspiring Girls Expeditions AK' (Girls on Water and Girls in the Forest) and GoI AK finding a home at the AK CASC to prioritize serving AK students; efforts to broaden participation; participant success stories; and fostering participants' desire to act responsibly towards the environment and envision themselves as scientists. Joanna highlighted the published research on the program's efficacy. In 2022, there will be 3 expeditions with 27 participants and 14 seasonal staff.

Questions and comments from ERT Members led to the following clarifications and comments from the AK CASC Host University administrators:

- Any consideration of the term girls versus women on ice?
 - There hasn't been much consideration in changing the name to "women" vs "girls," although there is room to consider. Joanna noted that non-traditional gender identities within the program also may warrant a name change consideration.
- More than 50% of instructors repeat their engagement across multiple years because they find it so beneficial to their careers.

Alaska Tribal Resilience Learning Network

AK CASC Tribal Liaison (TL), Malinda Chase (UAF/Aleutian Pribilof Islands Association), presented on the Alaska Tribal Resilience Learning Network (TRLN) (this presentation can be viewed [here](#)). Malinda noted that her background within the Indigenous community informs the perspective she brings to the AK CASC. Highlights include: the various and extreme environmental impacts of climate change that the 229 Federally recognized Tribes must navigate seasonally, and even daily (approximately 50% of the Federally recognized tribes are in AK); TRLN efforts to address climate adaptation dynamically in the face of climate impacts to land, water, and food security and infrastructure; the Building Resilience Today training to orient people to future projections, document changes experienced, and more training with adaptation tools; the TL position's shift into the CASC (e.g., from BLM 3 year funding to UAF position funded by CASC); the guiding framework for activities that focus on Indigenous perspectives and experiences, climate adaptation, and climate science; the development of a great TRLN team and partnerships; and the components to building a successful system of support for Tribes to meet their own needs. Malinda felt strongly about including an evaluation component to the project, as part of the formal process (partnered with ACCAP), in an effort to continue informing current work with Tribes.

Moving forward, challenges include: poor internet connectivity, increased shift to online activity due to COVID-19, and limits to the local level capacity to engage at the scale needed to address adaptation challenges; limited coordination of adaptation efforts across AK and at other relevant scales (regionally, statewide, and internationally as only Arctic state); and potential changes in TL Host Organizations and

turnover in TLs themselves. Responses to these respective challenges include: prioritizing one-on-one calls and cohort team training; creatively increasing local and regional capacity; developing a Community of Practice and refining coordination among adaptation practitioners; and supporting continuity within the TL program.

Questions and comments from ERT Members led to the following clarifications and comments from the AK CASC Host University administrators:

- The AK TRLN does have a connection with the Northern Latitudes Partnership, and try to meet with them once a month internally. With the LCCs fading, coordination is a challenge and there are still technical assistance pieces that Tribes need. There remain areas for improvement.

Diversity, Equity, and Inclusion (DEI)

Scott presented UAF's approach to DEI at the AK CASC (this presentation can be viewed [here](#)). The primary areas that the CASC has been able to develop and work on within the last 5 years include: developing IARC's statement on Diversity, Equity, and Inclusivity (developed values as an institution); organizing/collaborating on trainings and events; integrating diversity and inclusion as a core value in IARC's strategic planning process; developing and using an IARC land acknowledgement statement; creating spaces for making diversity a visible priority; and actively addressing challenges in UAF's DEI work, such as no positions or funding that supports this work.

Science Communications & Outreach: *Manage and Transfer Information and Data Related to Research Activities*

AK CASC Science Communications Specialists, Molly Tankersley (UAS), and Mike DeLue (UAF), presented on communication and outreach at the AK CASC (this presentation can be viewed [here](#)). They provided an overview of the 5-Year Communications Plan and its activities, including communication goals and objectives, goal successes, reporting and internal assessment, and next steps, as well as their Annual Implementation Plans. The Plans and the communication staff are integrated into the UAF's capacity building, communication, and research work, helping to make products more effective internally and externally (for example, the web-based SNAP tools guide).

Communication Plan goals include: strengthening internal collaboration and communication, co-creating science products relevant to stakeholder needs, promoting AK CASC science to inform decision-making, and increasing understanding of climate adaptation science. Reporting and Internal Assessment is kept on track to keep on track via weekly reports and an annual report, annual implementation plans for achievable goals and reflection on achievements, and analytics for website traffic and social media. They noted that there is flexibility to adjust the communication goals if one is not meeting needs effectively and efficiently.

Looking forward, the Comms Team wants to: expand outreach methods with more video content, radio outreach (which they have found to be most effective for remote audiences), and quarterly external newsletters; reach new audiences with targeted outreach and improve social media impacts to reach specific stakeholders; finish developing the Pacific Islands-AK CASC collaboration website to broadcast its science more broadly; complete another Alda Center Training; and integrate communication in coproduction activities.

Questions and comments from ERT Members led to the following clarifications and comments from the AK CASC Host University administrators:

- There isn't one standard metric for making sure that media resources are reaching the right people. Their approach is more qualitative (especially in the AK TRLN) and they pay attention to individual feedback in those processes. They have found long-term relationship building to be critical for good communications.
- How do you engage stakeholders to determine what they are looking for in types of communications?
 - Integrating Comms staff at the project level from the beginning has helped navigate this so they can ask this question directly to stakeholders, listen to their needs, and then respond as best they can.
 - Dovetailing CASC communications with existing, effective partner methods also is utilized, such as the NOAA RISA longstanding comms outreach webinars that have been on schedules for years.
- Regarding making products ADA §508 compliant (requirement for all documents to be ADA accessible, in its original form or upon request), while there is no formal training with the Fellows, there is with the Comms Team. Currently, Comms are working to make the process for digital PDFs and website design most efficient. NCASC has also been working with the entire CASC Network to help with this issue.
- How would you define your success?
 - Growth towards the 5-year goals. On an annual basis, we revisit specific items for achievement at the end of the year for progress updates. This allows us to be more intentional with quantitative results via our Annual Implementation Plans, which are internal working documents for the current year to help manage and achieve goals.
- What are your evaluation metrics?
 - While numerical feedback does have value, the team is more interested in direct feedback from partners and stakeholders, finding it more useful in evaluating the effectiveness of their messages. If the right followers and stakeholders being reached, it can be more impactful than huge numbers of followers. The potential role of the TRLN in this was acknowledged.

Science Communications Spotlight: Alaska Voices

Co-Investigator, Dr. Bob Bolton (UAF), presented on the collaboration podcast project, Alaska Voices (presentation can be viewed [here](#)), that aims to tell the stories and show humanity behind science and scientists, and reveal what goes into creating the science. The team sought to find new ways to communicate its science via stories, rather than showing more typical data and numbers.

With support from the AK CASC, the project partnered with StoryCorps in 2017 to work with 12 research collaborators in creating 60 recorded conversations that were made publicly available. The podcast was launched from those conversations in May 2020. Voices include elders, co-producers, program managers, weather services, Inspiring Girls Expeditions participants, and more. Since its Season 1 launch, it has been heard in roughly 20 countries, been promoted on National Public Radio (NPR), and was featured on the USGS "outstanding in the field" podcast. The Comms Team is very proud of the Alaska Voices project and, although it's hard to quantify the impact other than through downloads, interactions from the community have been great. People express appreciation for the humanity of the science that comes through the stories. Looking ahead, the "Bridge Season" produced during COVID-19, is coming soon and Season 2 will launch in fall 2022.

Open Dialogue and Discussion: Capacity Building & Outreach and Communications

ERT Members were asked to consider the following questions regarding UAF's capacity building and outreach and communications. Questions the ERT was asked to consider for this review include:

1. How is the Host University and associated academic consortium doing their Capacity Building; How effective are they? What is the process? What patterns have emerged? What is/not working well? What is the Host-University and associated academic consortium's contribution to Capacity Building? What were their limitations and how were they mitigated?
2. What is the Host-University and associated academic consortium's Outreach & Communications contribution for climate adaptation?
3. What factors limited outreach and communications, and how were they mitigated?

ERT members began by noting how impressed they were with all of the AK communications efforts, including the Alaska Voices podcast project. ERT Members recognized the extreme challenges presented in access to reliable and affordable communication systems for communities throughout AK. The situation for those communities has not been resolved, and ERT members felt that getting that story out is really important, and could be integrated into the CASC's reporting and outreach plans. In order for the AK CASC & others to deliver actionable science, those communication avenues need to be varied and multiplied as often and broadly as possible. One member said they would put a link to the efforts on their own website to help provide access to an even broader audience regarding the AK CASCs notable work.

- Has UAF developed the Alaska Experts roster noted in the proposal?
 - Not yet. There is an Expert's Guide at UAF. The original vision could be rolled out in the next phase, as part of the 'Science Shop' effort. They did develop Expert Guide and FAQ with respect to downscaling (as part of the SNAP website).
- How is recruitment for the Alaska Voices podcast handled? How are stories developed and prioritized?
 - Recorded voices and producers all have different interests. At the outset, the producers expressed their own principles: tell a narrative, from a variety of perspectives, with people willing to participate, and in a way that fosters trust. They have capitalized on the opportunities available to talk to people. The stories told are consent-driven, including whether the final story is published or not: Stories are told the way people want them to be told. The team takes great care and caution regarding how conversations are produced and published. Continuing to building trust, which is integral to all done within the AK CASC, is critical for this project.
- Has UAF reached out to the GCI network or other main internet providers to donate bandwidth to access remote villages?
 - This has not been done yet, and is probably worth exploring. GCI in particular has had efforts to expand bandwidth and connectivity, although far from equitably distributing it around the state.
 - The CASC has extremely talented people with out-of-the-box thinking and ideas that are coming up with ways to more equitably distribute information to communities. There is a lot more to do to make connections to all.
 - Communication access is a 2-way problem; getting research and data out of rural areas/communities presents significant problems for communications, science and emergency management. Adding extreme weather events as a result of climate change on top of that compounds the challenges the team is seeking to overcome.
- With regards to how the 5-year agreement has played out: the change in Administrations also changed priorities. The CASC had to work through a variety of restrictions and lack of support by

pivoting away from planned activities to maintain capacity. Focusing on the science has helped the CASC successfully navigate the political landscape.

- The AK CASC is in a unique situation in terms of the team's longevity. Because there is not much competition with the UAF, this provides opportunities to build on products long-term. The ERT would like to hear leadership's thoughts on succession planning for the AK CASC.
 - Scott and Steve will provide answers on this during tomorrow's session.
- The ERT noticed a significant difference in the prepared documents received vs presentations in the sessions in terms of graphics and depth of discussion. They wondered, how could the CASC incorporate the vibrant themes presented into the written documents for future review teams?
 - UAF doesn't have a good answer yet! They have specific guidance to follow for annual reporting to USGS. This is something to think about moving forward.
 - Reflection on the richness of annual reports: there could be a multi-media report that includes links to more humanity-based projects such as Alaska Voices and Inspiring Girls Expeditions.
- ERT members noted that the Comms Team has a potential opportunity to get their work out by leveraging other federal agencies in the lower 48 to tell more of their stories. In addition, there might be other sources of funding to help build that out.

Donna thanked the ERT, Consortium & CASC Members, and Observers for their participation, engagement and attendance at the session. And with that, the meeting was adjourned.

This session summary was respectfully submitted by the DS Consulting Facilitation Team. Edits were welcome and sent to Day 3 Scribe: Colby Mills (colby@dsconsult.co).

Day 4 – Overall Effectiveness Towards Host Agreement

DAY 4	February 25, 2022: Overall Effectiveness Towards Host Agreement - Review the <u>overall effectiveness</u> of the host-university and associated academic consortium in meeting the goals established under their current host agreements; - Aid the NCASC in developing improved requirements for re-competition of the next university hosting agreements; and - What recommendations do you think the ERT should have for cross-CASC & NCASC learning from this Host?	
Time AKST	Activity	Participants and Affiliation
9:00-9:15	External Review Team - Closed Door	Facilitation Team & ERT Members
9:15-9:30a	Brief Daily Introductions and Setting the Day	Facilitation Team, AK CASC Team & ERT Members
9:30-10:30a	Review and Recap • The Alaska CASC: Successes, Effectiveness, and Next Steps • Clarifying questions from ERT members	Scott Rupp, UAF Director, AK CASC
10:30-10:45a	Break To avoid zoom fatigue: Please turn off and step away from your computer screen if AT ALL possible!	
10:45a-12:00p	Facilitated Dialogue and discussion with ERT regarding the Overall Effectiveness Towards Host Agreement Open dialogue and discussion between ERT and AK CASC team regarding the Overall Effectiveness and any questions left over from prior days	Facilitation Team AK CASC Team ERT Members
12:00-12:15p	Closing Remarks & Adjourn	Facilitation Team AK CASC Team ERT Members
12:15-12:30p	Break for ERT To avoid zoom fatigue: Please turn off and step away from your computer screen if AT ALL possible!	
12:30-1:30	External Review Team - Closed Door Discuss ideas and insights gleaned from the four days: • What stands out? What needs comment in the ERT report? What are your thoughts about the overall effectiveness of this Host with regards to its work in all areas? What recommendations come to mind for inclusion in your report? Clarify next steps in the process: • What is due and when? • Follow-up Zoom on March 1, 12-1:30 pm PST	Facilitation Team ERT Members

DAY 4: Facilitator's Summary
February 25, 2022, 9:00a – 2:00p AKST

Topic: Overall Effectiveness Towards Host Agreement

Prepared by DS Consulting Facilitation Team. The following summary was intended to capture basic discussion, reflections, concerns, and insights from the session.

Attendees present for all or part of the meeting (in alphabetical order):

ERT Members: Amanda Babson (NPS), Jessica Halofsky (USDA), Mike Hudson (USFWS), Sara McBride (USGS), and Joel Reynolds (NPS). *ERT Member, Megan O'Rourke (USDA) could not attend this session.*

Consortium and CASC Presenters: Bob Bolton (UAF), Ryan Bellmore (USFS), Mike DeLue (UAF), Jessica Garron (UAF), Steve Gray (USGS), Scot Rupp (UAF), Molly Tankersley (UAF)

Observers: Gus Bisbal (USGS), Isabella Caltabiano (USGS), Emily Fort (USGS), Mari-Vaughn Johnson (PICASC).

DS Consulting Team: Facilitator: Donna Silverberg; Reporting and Support: Tina Patterson and Colby Mills.

Purpose for Day 4: Review the overall effectiveness of the host-university and associated academic consortium in meeting the goals established under their current host agreements; aid the NCASC in developing improved requirements for re-competition of the next university hosting agreements; and to consider ERT recommendations for cross-CASC & NCASC learning from this Host.

Welcome, & Role Clarification

Facilitator, Donna Silverberg, welcomed the group and asked participants to introduce themselves including AK CASC ERT Members, USGS and AK CASC staff, and session observers.

Review and Recap

The Alaska CASC: Successes, Effectiveness, and Next Steps

AK CASC Host University Director, Dr. Scott Rupp (UAF), spoke to the ERT about the Host's successes, overall effectiveness, and planned next steps. The presentation is available [here](#).

Successes - Scott discussed eight high level successes, including the Inspiring Girls Expeditions and Alaska Tribal Resilience Network (TRLN). He noted that the TRLN serves the needs of 229 tribes, so the AK CASC needs to be innovative in its approach to meet the needs of those communities.

He also noted the amount of high quality, relevant, applied science, and the level of energy and talent they have brought to the Fellows Program and partnerships for the future. He noted that the Host staff and their federal counterparts have established relationships with stakeholders, and demonstrated the depth and breadth of trust they developed in these relationships through Bob and Paul's presentation ([here](#)). The Host's Communication Team is integrated within the university and innovative in their approach; he expressed pride that the entire AK CASC has many talented, energized people who are in it for the long run.

Effectiveness - Scott shared other aspects of the Host's effectiveness: UAFs management of all Federal cooperative agreements is close to an R1 university, and they have a straightforward system. The Host

works directly with stakeholders to meet their needs. However, in AK, stakeholder needs are often beyond the CASC's capacity. Instead, UAF has been able to administer and manage new approaches quickly so they can be both flexible and nimble to meet those needs. UAF's co-location with the IARC and others in their building means they have the ability to leverage expertise, infrastructure, funding and collaboration with world-class scientists, which is not possible at other organizations. For example, their cryosphere science will have impacts far beyond Alaska.

Scott reminded the ERT that UAF's successes, effectiveness, and next steps start with the AK CASC's aspirational goals:

- Provide leadership and expertise in arctic region climate modeling *and* its application
- Provide leadership in the development of a new cohort of scientists
- Provide leadership and expertise in arctic region hydrology and cryosphere science *and* its application
- Serve as a center of excellence in climate change adaptation and planning

Because of these goals, and the manner in which they have followed them, Scott feels an almost unlimited potential for what the AK CASC could do now and in the future.

Next Steps - Scott highlighted several next steps the Host hopes to do in the future:

- Build out the capacity of the TRLN to meet the growing needs of AKs 229 tribes, including getting Indigenous faculty engaged;
- Formalize the Fellows program and their cohort goals;
- Continue and build on the CMIP6 downscaling efforts;
- Implement the Co-Production of Knowledge (CPK) Working Group's recommendations;
- Increase the Host's efforts in the PI-AK CASC's collaboration.

Scott pointed the ERT to Kristin Timm's (UAF), report that outlines CPK recommendations ([here](#), see Day 2 where it lists short-, mid-, and long-term actions).

Clarifying Questions from ERT members

- Is Malinda's position now fully supported by the Host?
 - Yes. Malinda's position was initially the result of an MOU in which Bureau of Indian Affairs (BIA) funded tribal resilience liaisons who worked with the CASC. The BIA funding was for three years and she was an employee the Aleutian Pribilof Islands Association (APIA). The UAF and USGS realized the AK CASC needed Malinda to be part of the leadership team to keep the tribal lens front and center. This is not unique; SC CASC's tribal liaison is also a university employee.
 - Bringing Malinda onto the Host team provides consistency over time. Tribal liaisons who come in from the BIA pathway work with the AK CASC, but not for the CASC. BIA soon will have a new tribal liaison with whom Malinda and the CASC will work. They are hopeful this will allow Malinda and the new position to divide labor and increase capacity.

Facilitated Dialogue and discussion with ERT regarding the Overall Effectiveness towards Host Agreement Questions and Comments from the ERT

- What do you see as your role in the application of science?
 - The Host is in a unique position as single region and, because the UAF does not have a lot of competition, they have been able to think longer term than most RCASCs. Their focus has

been on building the trusting relationships required to do good applied science, especially with Indigenous people.

- Even though year five ends in July 2022, AK CASC will receive another year of funding. Some of the 'next step' items in today's presentation are scope of work items they plan to accomplish in this next year.
- UAF and consortium members have been leading a great deal of applied science. They now have built relationships that allow the team to hear the needs of tribes and co-produce knowledge that meets those needs. UAF wants to build out its Fellows' program further so it includes strong management connections and aligns with community needs. UAF has pulled people from other parts of the university when needed and also has looked at working with non-governmental organizations (NGOs) to broaden its application of science.
- A few examples of direct science application:
 - Jessica is working with Fairbank's North Star Borough on a Climate Adaptation Science hazardous mitigations strategy. UAF's science has supported development of community hazard mitigation plans and several community action plans, which have incorporated modeling data provided by AK CASC. UAF is also looking at developing a consortium specifically for coastal mitigation responses, which also would include direct application of the CASCs climate science.
- Steve Gray, USGS, noted that in order to get science into the hands who need it, it takes time, commitment, and relationships. Scott and his team have done this repeatedly and well.
- Regarding USGS' role with the AK CASC, USGS is more of hazard agency than a risk agency. How do you handle that?
 - USGS is ahead of the curve. We have operated in this space for quite a while and are comfortable determining when it is an emergency as opposed to a chronic problem.
- One ERT member observed that the PI-AK Collaboration seems to provide huge potential for collaboration and sharing on tribal and community adaptation efforts. Have you given any thought to making this collaboration more formal? Are you thinking about bringing researchers from Hawai'i into your AK work? Or expanding the worldview, bi-directionally?
 - While UAF has been engaged in a lively exchange of researchers between the regions, they have not yet looked at ways to engage local community members and/or Indigenous people in the work. UAF plans to do so, and Steve and Mari-Vaughn are looking into this from the USGS perspective. There also is interest in these collaborations from other agencies (e.g., USFWS). Scott and his team are utilizing natural relationships and shared interest areas to expand PI-AK collaboration. The partnership offers an opportunity to build connection in communities, give people hope, and resilience.
 - The parallels between Indigenous communities in the two regions also are thought provoking.
- What types of science of expertise do you think is missing? How would you secure the expertise?
 - There are certainly some gaps. Nathan Kettle was the only social scientist in the original proposal; we were not able to engage him as hoped. We will be bringing Kristin Timm back into the fold, she will soon be research faculty at IARC. And, we recently hired an environmentally-focused economist.
- How you have managed your remote sensing project once that position opened up (i.e., Jamie Tramwell's departure)? What is AK CASC doing with remote sensing?
 - We have been able to meet to meet this need in a couple of ways. The Deputy Director, Jessica, has deep remote sensing expertise. Jessica's PhD thesis was on remote sensing and decision-making. A number of other team members also have remote sensing expertise such as Gabe Wolken, Go Iwahana, and Julian Dann, a Fellow whose research has a heavy remote

sensing component. And our relatively new (as of November) Postdoc, Chris Waigle, is a remote sensor working on our wildfire pilot project and extensions.

- Do you see any weaknesses that you have not addressed that would like us to know about?
 - Honestly, no. I see shortcomings in capacity and delivery, some of which is the result of funding levels and politics. There are places we could do more or better if we had more funding (such as social science and measuring effectiveness), but there are not places in which we lack expertise to match our funding. Most of the shortcomings are on the federal side (e.g., getting money to the university on time). We are committed to doing the best we can with the hand we are dealt and the team has done great work.
- One ERT member commented on AK CASC's Climate Change Response Program (CCRP) work and the discussion on domains of social science (economics, science communication, etc.), highlighting the work of Amanda Craven and Katie Clifford related to ecological transformation and the psychological aspects of hazard and adaptation planning.
 - Also, look at [Aparna Bamzia-Dodson](#).
 - Yes; as an example, is the level of depression in the region associated with the impacts of climate change? It is already happening in Alaska and will continue to get worse. As biology-people, we can't get into these areas of research without acknowledging we're going to a dangerous space.
- Have you thought about what other opportunities exist on the science side?
 - Further developing our work with the TRLN. Our tribal engagement, and strategy as a whole, need to grow by a magnitude. Local tribes are already overwhelmed with requests to participate. Steve, Scott, Malinda have talked about how to continue to build support and capacity. This is our key area for growing our science.
 - We have also considered a spin off application of IEM into EarthMap and are developing technological solutions to automate and operate online with low bandwidth for rural communities.
- Is there an opportunity to work with Alaska Pacific University (APU) or Alaska Native Science & Engineering Program (ANSEP)?
 - Yes, we have worked with Ilisagvik College and plan to continue that to the extent possible.
- Are there other programs with which you have not yet partnered within the UA System?
 - Yes, there are other programs; the limitations are having mechanisms to incentivize rural locations to partner. Soft money has become extremely important to keep things moving forward.
- What are your thoughts to address climates needs?
 - Coordinate how we take leads or support. An example is the garden helper project with the NW Hub. In the past, the administration did not allow us to discuss climate change. AK Garden Helper served as a pilot for building tools that we are now refining for wider applications in natural resource management:
<https://www.snap.uaf.edu/tools/gardenhelper>.
- Has the Fellows Program or UAF personnel been evaluated for Diversity, Equity, and Inclusion (DEI)?
 - IARC has been quite active for five or six years navigating its own destiny and developing a culture in which DEI is front and center in everything we do. While the approach has not been programmatic or systematic, we discuss DEI issues at monthly meetings, part of working groups, and in our journal discussion groups.
 - UAF and the AK CASC is committed to learning and understanding from Alaska natives and Indigenous peoples. This has led to frank and uncomfortable discussions with partners, resulting in trainings and opportunities to tell stories at a human level. Examples of training

- include land acknowledgement and having difficult dialogues, which in turn became the impetus for Alaska Voices.
- We have not yet looked formally at the Fellows program participants (where they come from or demographics) or the CASC. Jessica and Bob spoke with the Vice Chancellor of Research about DEI, which resulted in developing field safety and DEI guidelines. We have worked with American Geophysical Union ([AGU](#)) and the Department of Energy to deliver seminars about DEI and field safety. And we have raised awareness about women in science. Within the university, other departments and units have noticed what we have done, come to learn, and then have taken information back to their own departments and units.
 - Both Scott and Steve have been leading since the start of the CASC. While early, what are your thoughts about succession planning? Have you thought about how you can successfully pass the Center to the next generation of leaders that you are developing?
 - For starters, we are not planning to go anywhere very soon! Scott and Steve have a fantastic relationship that has allowed them to be creative and successful with the CASC. Succession is hard to implement in academia, especially at UAF. Still, we are always searching for the most skilled, excited, energetic people we can find. Scott's leadership style at the CASC is to support people to be successful and, if they fail while trying, to have their back. They now have a deputy director on board, and that is an important step towards succession planning. They also have other people who could step in as Principal Investigator. Scott is confident that the CASC would continue if he or Steve left.
 - USGS is making an effort, within AK CASC and nationally, to address staffing and hiring. Steve's office brought on a research coordinator to help maintain institutional knowledge. Moving forward, the number one goal is to bring in a deputy director on the USGS side.
 - Have you considered rotating leadership to help people get a taste for the different tasks?
 - No. Scott thinks rotating leadership is a great idea. His Google Scholar profile looks great because he has co-authored with others, and he could use time to be a primary author again! He has learned the political advocacy and networking part of the job on-the-job. He loves the idea of introducing others on his team to these aspects without derailing their academic and publishing pursuits. Steve also likes the idea of rotating leadership. On the federal side, there has been talk of detailing people to the national office or international programs.
 - Going back to Day 1 and the loss of LCCs and ACCER: What's the best way to replace these programs more formally? Is there something the ERT could recommend?
 - We have managed to adapt to the loss of ACCER, although we do miss the ACCER communication function. The direction and guide of the CASC was not the only task of ACCER. We need to structure something focused solely on AK CASC.
 - The loss of the LCC was more important regarding science and communication. LCCs were also involved in our climate change coordination committee and operationalizing the ideas of ACCER.

Closing Remarks

Donna thanked the ERT, Consortium & CASC Members, and Observers for their participation, engagement, and attendance at all of the sessions. The meeting was adjourned.

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