University of Alaska
Fall 2017

Alaska EPSCoR

Alaska NSF EPSCoR is a partnership dedicated to growing Alaska's scientific research capacity, funded by the National Science Foundation and the State of Alaska.

Community Engagement

Stakeholder communication key to EPSCoR project

Across Alaska EPSCoR's three regional test cases, scientists have involved community stakeholders in their research, both to better address local needs and to enable local residents to use research findings for decision-making. Five years into the project, these efforts are bearing fruit.

Salmon 2050

The Southcentral Test Case's "Salmon 2050" project gathered people from Kenai governments, nonprofits and fisheries agencies to generate scenarios of how the area and its fisheries could change over the next few decades.

photo by Courtney Breest/Alaska EPSCoR

Graphic illustrator Lee Post describes a drawing he made during a Southcentral Test Case stakeholder meeting in October 2015. Post worked to visualize stakeholder discussions and conclusions.

"It's a look at what potential conditions exist for salmon in the future for the Kenai River basin," said test case lead Jamie Trammell. "These conditions are defined by what we call critical uncertainties of environmental factors or social factors that will lead to alternative conditions."

First, stakeholders met for a workshop at Kenai Peninsula College, at which they were asked to identify the top uncertainties and choices facing Kenai fisheries in the future. "We brought them through some exercises," Trammell said, "saying 'envision your best and worst futures, what are the characteristics.' And then, what kind of decisions do you need to make in the future?"

Climate change was the stakeholders' largest concern, with marine conditions and economic, population and land use pressures also cited. Test case scientists then used data from their own research to build models that consider the implications of these uncertainties and management choices. "It all comes

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From the PI

Anupma Prakash, Principal Investigator

Science doesn't do much good if it's locked in a drawer.

Outreach to communities, from the local to the global level, is an important aspect of the NSF EPSCoR program. So this newsletter focuses on some of the efforts we've been making to share our findings. This outreach is a two-way street: stakeholders across our test cases have played an active role in shaping our research to better address local concerns.

Continued outreach will be a focus of EPSCoR in 2017-18, during which time we're operating under supplemental funding while we await word on our proposal for our next 5-year research project. The Northern Test Case has plans for a follow-up event to the community workshop described on page 3, and the Southeast Test

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Community Engagement

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Humpback whale biologist Jan Straley presents at the Southeast Test Case research symposium in May 2016.

back to impacts to salmon abundance, and pretty much everyone (in the test case) is looking at some indicator of salmon abundance," Trammell said. "It integrates all components of the test case into one single story about the future."

More information about Salmon 2050 can be found at www.southcentral.epscor.alaska.edu/salmon-2050

A video about Alaska NSF EPSCoR stakeholder engagement can be viewed at https://tinyurl.com/yaeydkwl

At a second workshop, participants turned these results into five potential scenarios of the future of the Kenai. These included a major increase in industrial development, a flood of retirees, a sockeye salmon crash, an explosion in port fishing, and a level population coupled with a drop in salmon abundance. Trammell said the scenarios are meant to help facilitate greater understanding and coordination among agencies in charge of Kenai fisheries, who have been provided with the results.

"It's often used for strategic visions for a region, it's often used as the opportunity for interaction among the broader set of stakeholders to set a common vision for how things should proceed," he said. "It often leads into - and this is what we're hoping - this sort of watershed management framework where everyone can say, okay, this is a common set of our understandings of how the future may unfold."

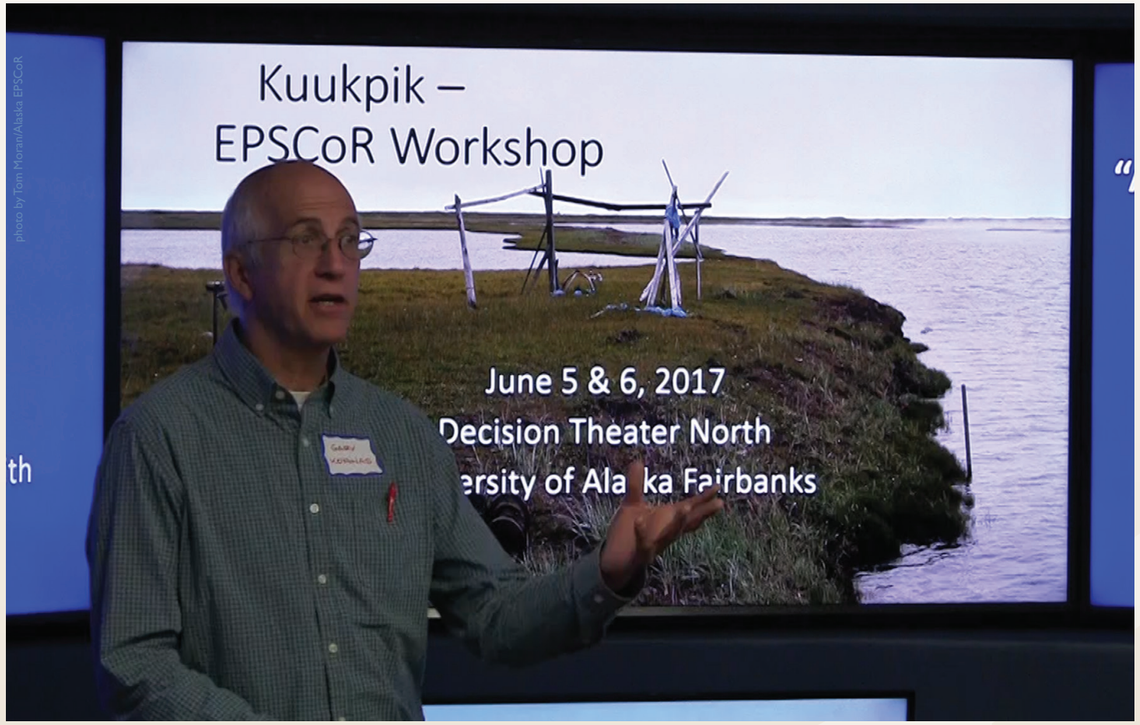
Icefields-to-Estuaries Symposia

The Southeast Test Case held two research symposia at which Juneau-area scientists shared findings with local tour leaders. "We're hoping that by communicating science to tour guides that they will in turn have a greater education base in order to educate their tourists, which really translates into us having a much greater outreach impact," said Suzie Teerlink, EPSCoR's former University of Alaska Southeast Outreach Coordinator.

In 2015, test case researchers hosted an event for about 60 guides at the Mendenhall Glacier Visitor Center, focused on helicopter tour operators. They followed that up a year later with a two-day symposium at UAS for both land-based and marine guides. About 135 people attended the 2016 version, at which scientists discussed research on salmon run timing, the economic value of glaciers, paralytic shellfish poisoning, and many other topics. Attendees also heard an in-depth presentation on ways to communicate about climate change. "I think the main message that we're trying to send is that cutting-edge research is being done here in our backyard," Teerlink said.

The Juneau events also included opportunities for attendees to help guide research priorities, such as a panel discussion in 2015. "It's really focusing on trying to make science accessible to stakeholders and trying to really engage with those stakeholders, in a way that we're trying to get information on what they need, how we can make our research and outreach objectives fit their needs," Teerlink said. "For me it's one of the best examples that we've been able to pull off in terms of really engaging with stakeholders and bringing the science to the community."

Attendees said the symposia offered up a wealth of information to aid in their tours. "Our company strongly encourages us to attend these so we can be more rounded as captains and naturalists, to share with the guests who come from around the world and also to help the naturalists who are new this season," said Diane Kyser, a captain with Gastineau Guiding who attended the 2016 event.



Northern Test Case lead Gary Kofinas introduces the Kuukpik - EPSCoR Workshop in June 2017.

Kuukpik Workshop

The Northern Test Case, which focuses on the Arctic village of Nuiqsut, brought together members of the Board of Directors of Kuukpik, Nuiqsut's Alaska Native Village Corporation, for a workshop to discuss findings in the region. Attendees learned about research into the two major kinds of change impacting the 400-person community: pronounced climate change due to its Arctic location, and burgeoning oil and gas development on its outskirts.

"We talked about a changing landscape, including a focus on biophysical changes driven in part by climate change, and also by changes in land use," said Gary Kofinas, a UAF Professor of Resource Policy and Management and head of the test case. "And as a part of that we talked about thawing permafrost, resulting in changes in hydrology and water runoff, how those changes affect fisheries, oil and gas development, and their impacts on land and people."

A dozen test case researchers used the Decision Theater North space (see page 6) to present on a variety of other topics as well, from shrubification's effect on subsistence animals, to impacts of changing permafrost hydrology on fish populations, to the resilience of Nuiqsut's economy.

But research presentations were only one aspect of the meeting, which was designed as a two-way conversation about the attendees' collective knowledge of local change. The twelve Kuukpik board members in attendance were given ample opportunities to ask questions and to contribute their own observations of change. Kofinas said some of these related directly to the types of physical, biological and social science conducted by EPSCoR, but the input also included comments on subjects such as contaminants potentially being loosed by thawing permafrost and river erosion.

"We had some of the richest conversation I've experienced, where scientists shared what they knew and locals were adding to that and complementing it, and in some cases noting observations and knowledge of the system that the researchers didn't have," Kofinas said.•

A Salmon Showman

One way or another, Ben Meyer spends a lot of time working with kids.

Meyer, an M.S. student in Fisheries at UAF, studies the potential effects of climate change on juvenile salmon. And when he's not focused on young fish, one of his hobbies involves entertaining crowds of children.

"My main occupation at the moment is being a graduate student," Meyer said. "And another sort of alter ego side business that I do is called Ben the Balloon Guy, where I get to go to parties and events and grand openings and make balloon art for people."

Meyer studies king and silver salmon in the Kenai River watershed, which spend their formative years in fresh water before migrating to the ocean. Meyer said this period of development can have major effects on salmon populations.

photo by Courtney Breest/EPSCoR

"Ben the Balloon Guy," AKA Alaska NSF EPSCoR graduate student Ben Meyer.

"There is a fairly well-developed consensus that if you are a juvenile salmon who grows well and is successful and gets bigger before you migrate out to the ocean, there's a better chance that you'll be able to return later on as an adult and reproduce," he said.

Meyer is working to better understand how these young salmon could be impacted by rising air temperatures. Specifically, he's studying salmon size, age, and diet in the Kenai River and in three of its tributaries - Beaver Creek, the Russian River and Ptarmigan Creek – that cover a range from slow lowland rivers to glacier-fed whitewater. The idea, he explained, is to pinpoint the "Goldilocks zone" across these waterways, in which salmon have ample food and exhibit robust growth rates.

"We're trying to look at where on that growth spectrum we observe them in nature, and measuring those parameters, temperature and food," he said. "By measuring those two things, we can understand, could their growth rates change in the future if water temperature in particular changes?"

Over two summers, Meyer and a technician regularly visited three sites in each waterway and two on the Kenai River. At each site they measured water temperature and captured juvenile fish with a series of traps. They measured and weighed the fish, and in some cases collected scale samples for use in determining the age of the fish. But the most intricate process was determining diet – done by anesthetizing the fish, slipping a tube down their throats and flushing out their stomach contents.

Meyer believes his research will show that rising air temperatures will have varied impacts on the waterways and salmon, both positive and negative. "This kind of research will likely confirm a growing idea that low elevation, low-gradient habitats like Beaver Creek are more likely to be sensitive to the effects of climate change in terms of salmon habitat," he said, "and that in terms of where we want to prioritize our conservation efforts, we should really consider these kinds of places - especially since, in the Kenai at least, this is where people like to live."

Watch a video about Meyer at https://tinyurl.com/ybqsle65

While Ben Meyer hones his conclusions in the lab, "Ben the Balloon Guy" also works salmon into his routine. Meyer uses balloons to depict the salmon life cycle: from egg, to alevin, to smolt, to adult, to spawner.

"When I started hanging out more with people who study salmon, I thought, I need to make a cool salmon hat for people to wear, and I could not find a good example of one out there, so I figured out how to make one," he said. "And I thought, this is a really cool adult salmon but really that's just one part of their life. And so I've been trying to figure out how to depict the rest of their life cycle."

Meyer has worked up an informal presentation about salmon that he delivers while crafting the balloons, which he has deployed for EPSCoR at multiple events across the state. He said the lessons he's teaching seem to be sticking.

"It's my hope that making a big colorful cartoony image of something will help burn what that looks like into someone's memory," he said. "After I did a few of these presentations I was curious, and so I was chatting with a few kids and I asked them if they remembered anything from it, and they were tossing out terms like parr and alevin and spawner that might not normally be in their vocabulary."•

Asking the Experts

There are many ways to gather information about remote Alaska, from satellites and drones to helicopter trips for field measurements. But Todd Brinkman also includes another approach: talking to the people who live there.

"I think working closely with communities results in stronger science," said Brinkman, a UAF Assistant Professor of Wildlife Ecology and a member of the Alaska NSF EPSCoR Northern Test Case. "They bring a very unique perspective to the conversation. They also are spending a lot of time out in the environment, interacting with the wildlife, and seeing some of these changes that we're not going to see from our offices here at the university."

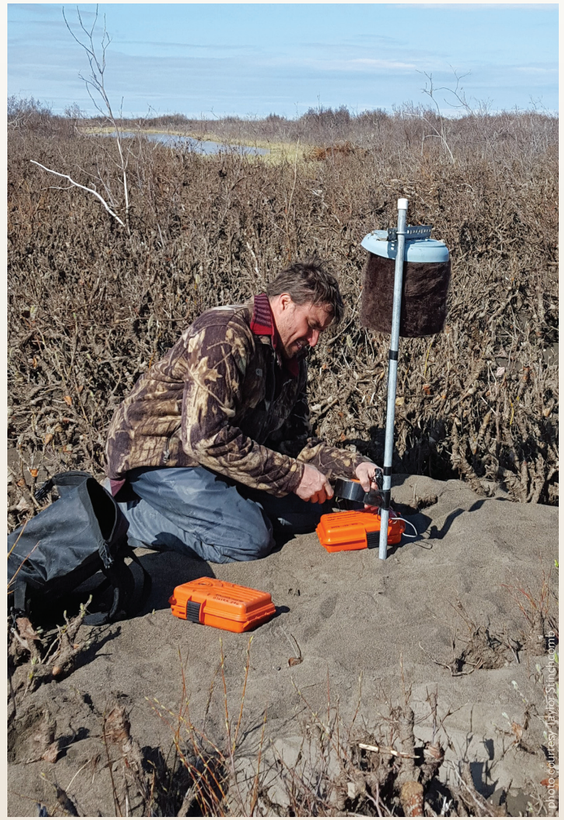


photo by Courtney Breest/EPSCoR

UAF Assistant Professor of Wildlife Biology Todd Brinkman installs a recording device to monitor the noise of aircraft activity on the North Slope.

Brinkman's interest in involving local residents in framing and interpreting research makes sense considering his scientific focus, which is interactions between humans and wildlife. Brinkman estimates he is currently working on seven to ten different projects, most of which touch on the intersection between ecology and social science. "In the field of wildlife management, we've largely ignored the human dimension, we've tried to look at these systems while isolating humans from them," he said. "But I think that's inappropriate because humans are influencing every natural system I can think of right now."

Brinkman applied his research approach to the North Slope village of Nuiqsut - the main focus of the Northern Test Case - when he supplied local subsistence hunters and fishers with camera-equipped GPS devices and asked them to photograph environmental and social changes. The result of the community-bsed monitoring program was a database of more than 200 geotagged pictures and accompanying data documenting river erosion, wildlife locations, landscape change from oil development, and even cultural events.

"It helped us understand what the community's thinking about," Brinkman noted. "It helped us better identify scientific research that we could conduct that would be of value to that area."

The hunters' input led Brinkman and UAF Wildlife Biology and Conservation graduate student Taylor Stinchcomb to launch a project to track the noise generated by aircraft around Nuiqsut hunting areas, and to study how it might affect patterns of subsistence animals and hunters. Brinkman and Stinchcomb set up a series of field microphones for a pilot season in 2015 and a full season in 2016, leading to a number of significant findings about aircraft noise. Among other results, they found a close association between human development and aircraft activity, and determined that the amount of aircraft activity within 30 kilometers of Nuiqsut was comparable to that around airports serving cities 900 times the size of the tiny subsistence village. Stinchcomb and Brinkman plan to travel to Nuiqsut in January to host a community meeting about the research and also to disseminate results in a newsletter.

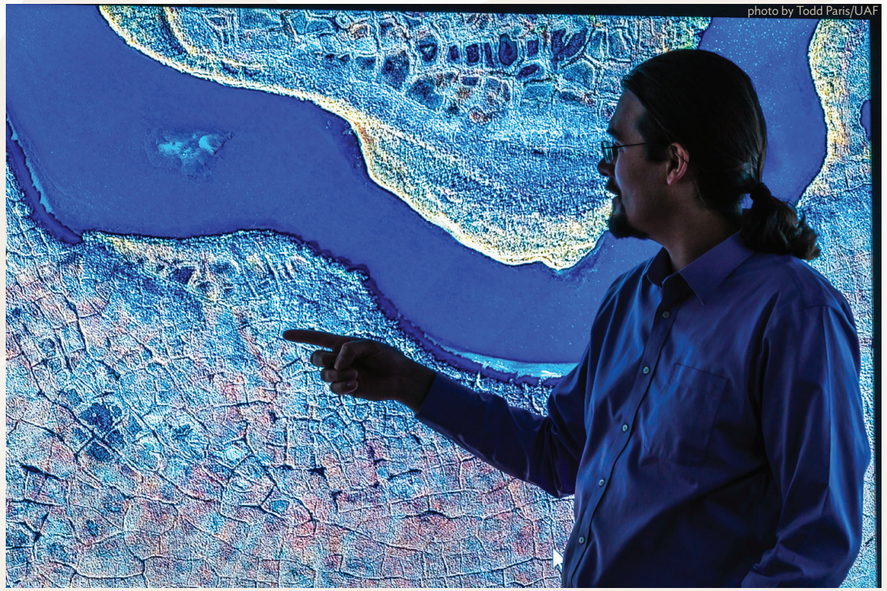
"This has been a problem for 30 years," Brinkman said, "and there's really been no effective way to address it, so we're just trying to get some baseline information on where and when this aircraft traffic is occurring, to maybe advance the discussion a little bit."

Brinkman first came to UAF as a Ph.D student in 2003 after receiving a bachelor's in Biology and Environmental Science at Minnesota State and a Master's in Wildlife Science at South Dakota State. He was hired as a tenure-track faculty member in 2014 through Alaska EPSCoR. His other projects include everything from refining a technique to locate polar bear dens, to examining the impacts of Southeast logging on deer habitat, to a study of the impacts of climate change on traditional harvests in Interior and Western Alaska communities. He's also engaged in a NASA project that has a similar methodology to his work in Nuiqsut, but which is specifically focused on the ways that climate change is impacting access to subsistence resources in Interior villages.•

Decision Theater North Picking Up Steam

The name "Decision Theater North" is something of a misnomer.

That's because the new visualization space in the West Ridge Research Building at UAF doesn't often function as a theater, even though its defining features are seven mammoth screens forming a semicircle along one wall. The main purpose of the room isn't presentation, it's dialogue.



Dayne Broderson of the Geographic Information Network of Alaska leads a discussion in Decision Theater North.

"With the complex problems facing the Arctic and the amount of research we're doing, we were looking for ways to bring people together to talk about current issues," said Alaska NSF EPSCoR Associate Project Director Pips Veazey, the prime mover behind Decision Theater North. "And so this is a space where we can bring together people to talk about complex issues and look at lots of data spread across the 60 million pixels' worth of screens."

The theater, which was funded by UAF and Alaska NSF EPSCoR, is based on similar spaces at Arizona State University and at the McCain Institute in Washington, D.C. In addition to the seven 75-inch screens ringing its conference table, it also features audio, a videoconference system, high-speed wi-fi, dedicated memory and 10-gig connectivity. As the name suggests, the room is designed to foster informed decisions, both within and outside of academia.

"There's research to suggest that people are more empathetic when they are looking at information on the screen together and discussing it, rather than videoconferencing or calling in to a teleconference," Veazey said.

The versatile space opened in 2016 and has been used for dozens of seminars, webinars, trainings, meetings and thesis defenses. It was used for multiple deomonstrations at Arctic Science Summit Week in 2016 and Week of the Arctic a year later, and in May it displayed the winners of an EPSCoR-sponsored visualization contest at its first-ever First Friday. The Federal Emergency Management Agency brought in 35 people from different agencies to the theater for a disaster simulation, and it hajs also been used for four "Mapathons" (see page 7) in which participants contribute content to the Open Street Maps database to aid humanitarian responders.

DTN is available for use by UA affiliates and community organizations. For more information visit http://www.dtn.alaska.edu

The theater also hosted a tsunami simulation run in collaboration with Sandia National Laboratories, which demonstrated the potential of merging Sandia software and UA research data to aid in emergency response. More recently, Alaska NSF EPSCoR researchers held a workshop with the Board of Directors of Kuukpik, the corporation of the North Slope village of Nuiqsut, to share EPSCoR work in the area and to identify common research interests (see page 2). Researchers filled the screens with information and imagery, kick-starting some animated back-and-forths among attendees.

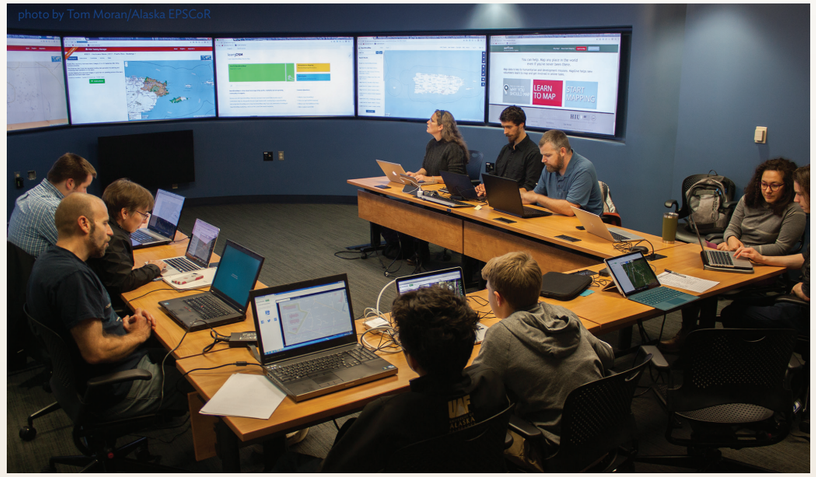
"It's almost like this excuse to bring people together here," Veazey enthused. "We have this space, how can we use it to serve our community, whether it's Fairbanks or the state of Alaska or the circumpolar North?"

The space is maintained and operated by EPSCoR with assistance from the Geographic Information Network of Alaska and the UAF Office of Information Technology. It's also spurred the creation of a developmental room across the hall, which began life as a place to program content for the theater, but has grown to include new technology for visualizing and sharing data, including a 360-degree camera, virtual reality gear and a 3-D printer.•

Lending Aid with a Laptop

By Erin Granger, Fairbanks Daily News-Miner

Alaska NSF EPSCoR and the Geographic Information Network of Alaska (GINA) recently offered Alaskans the chance to help Puerto Rico's recovery efforts using nothing but their laptops.



Volunteers help to map Puerto Rico at the EPSCoR/GINA Mapathon in Decision Theater North on September 28.

In late September, the two groups organized a three-day "Mapathon" event, in which individual volunteers gathered in the Decision Theater North visualization space to electronically map previously uncharted areas of Puerto Rico to aid emergency personnel responding to the aftermath of Hurricane Maria.

"After the hurricane, we were thinking, well, what can we do to help and lend support, and we thought, 'Well, we're good at making maps,'" said Tania Clucas, EPSCoR's Education, Outreach and Diversity Manager.

The volunteers identified and labeled features using web-based geospatial tools, selecting tasks from a list maintained by the group Humanitarian OpenStreetMaps. Clucas said it was an easy way for Alaskans to help from afar.

"We're off on this side of the continent and they're over there, but we still wanted to help," Clucas said. "And we've done some Mapathons before, and they focused on North Slope communities. In addition to September's Mapathon, which drew 24 volunteers, an October event also focused on Puerto Rico.

For more information about Humanitarian OpenStreetMaps or to volunteer visit https://www.hotosm.org

OpenStreetMaps works similarly to Google Maps in the sense that it provides satellite images of areas of land to illustrate infrastructure and natural elements. But much of the satellite imagery of Puerto Rico has not been mapped, which keeps emergency personnel on the ground from being able to identify what used to be in a place before it was destroyed.

According to Clucas, the Red Cross has been asking people to mark buildings, roads and other structures in OpenStreetMaps to help emergency personnel in Puerto Rico see where structures might have been prior to the hurricane. This helps workers to locate damaged gas lines, electrical lines and people who may be lost or trapped.

"There are not accurate, current, electronic maps for the emergency response groups," Clucas said. "If you have people who are coming in and trying to deal with getting the power back up for example, these people need to know where buildings were."

At the September event, volunteer efforts were displayed on a series of large screens in Decision Theater North. One screen showed a large map of all of Puerto Rico. On the adjacent screen, a section of the map was peppered with green, orange and white boxes. Green meant the area had been mapped and validated, orange meant it had been mapped but was awaiting validation, and boxes in white were areas that needed to be mapped, said GINA project manager Vanessa Raymond.

"They've divided up the area in question," Raymond said. "So just a few days ago, when we first started the Mapathon, we were working on that area right around that dam that was about to go."

Humanitarian OpenStreetMaps provides directions for users on how to outline buildings and identify structures and provides maps at varying levels of difficulty so everyone can help as they are able. "It gives them a tool to use where they didn't have anything before," Clucas said.

Raymond said it was the ideal way for the university to lend assistance. "It's the perfect blend of helping in something that really needs to be done, it uses our expertise, and we can train students or other people to learn new skills," Raymond said. "So for a university to be able to contribute to the common good and also be doing something educational I feel like is great."•

Honing skills at GINA

For Roberta Glenn, the North Slope isn't just a big space on a map: it's her home. So when the Inupiat native of Utqiagvik (née Barrow) and then-UAF undergrad began interning with the Geographic Information Network of Alaska (GINA) – first through the Arctic Slope Regional Corporation and later through Alaska NSF EPSCoR – her interests naturally gravitated north. And when she was tasked with populating a water supply index for the community of her choice, she turned her attention home.

Former GINA intern Roberta Glenn discusses her vulnerability assessment of Utqiagvik for a Geosciences class.

"I chose Utqiagvik," she said. "That was my idea because it was my hometown. Also I figured that was the community with the most data, and one where I could answer some questions because I know some of the indicators already."

Glenn is one of nine undergraduate interns that Alaska NSF EPSCoR has supported at GINA since summer 2016 (see sidebar). Students were taught some basic coding skills at "boot camps," then set to work on a variety of projects related to EPSCoR's online data portals, Decision Theater North, Geographic Information Systems (GIS), and other facets of GINA work.

Glenn's first task was to use GIS to delineate historical changes to the shoreline of the North Slope east of Utqiagvik. Then she shifted to working with fellow intern Roberta Walker to analyze data for North Slope lakes near the village of Nuiqsut, trying to determine whether variations in lake sizes in imagery from different decades were a result of long-term change or just seasonal fluctuations.

Next came Glenn's work on the Arctic Water Resources Vulnerability Index (AWRVI), an online product designed to quantify the vulnerability of a community's water supply. Filling out an index requires inputting up to 27 variables, including physical parameters such as acreage, precipitation, and wastewater treatment methods, and social information such as education and income levels, subsistence use, and transportation to and from the community.

"It includes these social and physical factors," she said, "and I always like looking for the social side of things, the anthropology side of things, and I like that it pulls together two fields of science."

Glenn completed the index for Utqiagvik through a combination of prior knowledge, research, and contacting local officials. She's since graduated from UAF with a degree in Geography and a minor in GIS, but continues to work on the AWRVI's for Alaska EPSCoR. She's been both inputting data obtained elsewhere in the project and populating an index for another community.

"One of the reasons I think they wanted me to work on AWRVI again this semester is not only because I had completed one by myself for Utqiagvik, but also, because I'm from a small Arctic community, I was able to speak to some of the low-scoring indicators and point out that maybe this low score isn't representative of what it's really like," she noted. "And, because of my familiarity both with the index and with Arctic communities, I have something to bring to the table in trying to improve the usability of the index."

Her internship took Glenn far: she presented at a Lockheed-Martin STEM Days event in August 2016, and shortly afterward traveled to Washington D.C. to personally present Alaska EPSCoR research to Alaska's Congressional delegation, as well as Alaska Gov. Bill Walker. In addition to her current work with EPSCoR, she worked this summer with both the Arctic Slope Regional Corporation and the state's Coastal Hazards Program, and has more work lined up with the latter.

Glenn said one of the most eye-opening elements of her work with GINA and EPSCoR was finding out the amount of research that takes place on the North Slope. She said one of her long-term goals is to pursue a Master's in Communication so she can learn how to communicate science at a local level, both on the North Slope and elsewhere.

"I have seen a lot of different science that is happening or going on regarding these communities, related to these communities, and it's something that I wasn't aware of," she said. "It made me want to be more involved in the science that's going on, especially around the North Slope, because that's my home, and also to be more involved in communicating it."•

GINA undergraduate interns

Roberta Glenn is one of nine undergraduate students who have interned at GINA since summer 2016 with partial or full support from Alaska NSF EPSCoR.

GINA intern Roberta Walker presents at the 2016 Alaska EPSCoR annual meeting.

• Ianjon Brower helped organize data from a Nuiqsut community-based monitoring program and also developed protoype temperature sensors to monitor ice cellars.

• Tristan Craddick developed content for the DTN development space's virtual reality system.

• Nicolette Edwards created geospatial products for the Southcentral Test Case's Salmon 2050 project.

• Andrew Herbst performed quality control on mapping products and also used Landsat data to analyze land surface temperature acrossEPSCoR test cases.

• Khan Howe worked to visualize the work of other GINA interns using the gaming engine Unity and the geospatial visualization program Cesium.

• Bobby Signor worked on both DTN and the DTN development space using Chef, a configuration management tool for DTN processes. He also provided IT guidance and support to DTN users.

• Patrick Steckman worked as a UAV and GIS instructor for EPSCoR's Modern Blanket Toss project and also contributed to a mapping project, worked in delimiting historic earthquake intensities, and helped to populate the EPSCoR data portal.

• Roberta Walker mapped lake change on the North Slope using historical aerial photography from 1955 and modern satellite imagery. She also worked with high school students through the BRiGHT Girls project.•

EPSCoR People

Gibson receives Track-4 Award

UAF International Arctic Research Center researcher Georgina Gibson has been awarded an NSF EPSCoR Track-4 fellowship. The 2-year, $222,000 award will fund Gibson and a graduate student to collaborate with Los Alamos National Laboratory in New Mexico to improve modeling of dissolved organic matter from Arctic rivers in mathematical models of the Arctic Ocean ecosystem.

Alaska well-represented at NSF EPSCoR National Conference

Eleven people affiliated with the Alaska NSF EPSCoR office attended the 2017 national NSF EPSCoR conference, held Nov. 5-8 in Missoula, Montana. Among Alaska attendees' activities, UAF Assistant Professor of Alaska Native Studies and Rural Development Charlene Stern participated in a panel discussion about STEM Engagement in Indigenous Communities; Alaska EPSCoR Associate Project Director Pips Veazey co-led a panel on Team Science and Community Development and served on a panel for a discussion of Managing, Sharing, and Sustaining EPSCoR Research Data; and EPSCoR PI Anupma Prakash co-led a discussion on Best Practices for Promoting Research Competitiveness.

Buma featured in National Geographic Blog

Alaska NSF EPSCoR faculty Brian Buma was the subject of a fascinating story in the National Geographic blog back in June. Buma, an Assistant Professor of Forest Ecosystem Ecology at UAS and an Alaska NSF EPSCoR faculty hire, tracked down nine long-abandoned research plots scattered throughout Glacier Bay National Park to study the ways plant communities may shift with climate change.

The article is located at https://tinyurl.com/y8aravc5.

Krupa receives awards

Twin congratulations are due to UAA's Megan Krupa, co-lead of EPSCoR's Southcentral Test Case. She received the "Best Practices: Alaskans and Salmon" award by Salmon Connect, a partnership of Alaskan organizations that seeks "to engage and connect a broad spectrum of Alaskan civil society interests around the future of wild salmon and Alaskans." And she has also been awarded an Alaska Salmon Fellowship by the Alaska Humanities Forum. The latter award entails $10,000 in cash and $75,000 more in funding for a salmon-related project.•

EPSCoR Briefs

Southcentral Test Case research synthesis featured in *Fisheries* journal

The journal *Fisheries* published a sweeping article summarizing Southcentral Test Case research into impacts of climate and landscape change on Southcentral salmon populations, and in turn on fishing communities. The piece was written by EPSCoR postdoc Erik Schoen with input from 15 test case researchers from across the UA system. The entire issue was structured around the article, which the magazine's editors described as "one of the longer and more complex manuscripts to ever appear in *Fisheries*. The article can be found on our website at www.alaska.edu/epscor.

EPSCoR supports travel to WAISC

Alaska NSF EPSCoR once again supported several UA affiliates to attend the Western Alaska Interdisciplinary Science Conference. EPSCoR attendees at this year's event, which was held April 26-29 at the Grand Aleutian Hotel in Unalaska, were UAA Fisheries PhD student Veronica Padula, UAA biological sciences postdoc Kathy Kelsey, UAF School of Education faculty Evan Sterling, UAF Fisheries Masters Student Janessa Esquible and Leah Bower of the Aleut International Association.

Science for Alaska lecture

Alaska NSF EPSCoR Project Director Anupma Prakash delivered the UA Geophysical Institute "Science for Alaska" lecture on February 7. The talk, entitled "How Do We Adapt to a Changing Environment?: Lessons from Alaska EPSCoR," is available for viewing on our website.

UA group receives InFEWS award

UAF researchers Bill Schnabel, Daisy Huang, Erin Whitney and Rich Wies and UAA researcher Jen Schmidt have received a $2.4 million NSF InFEWS (Innovations at the Nexus of Food, Energy and Water Systems) award to study how renewable power can help small Alaska communities to provide sustainable food, energy and safe water. The award proposal was spurred by a 2016 food, energy and water workshop which Alaska NSF EPSCoR helped to organize, and which had EPSCoR faculty hires as two of its co-PIs. Decision Theater North is also a beneficiary of the award, as the researchers plan to use it as a collaboration space.•

From the PI, continued from page 1

Case has envisioned a public scenario process based on that used in the Southcentral Test Case. Our students this year are focusing on working with EPSCoR research findings to make them available to the public in user-friendly formats.

We also have good news about EPSCoR on the national level: the program is no longer "Experimental." By a recent act of Congress, we are now the *Established* Program to Stimulate Competitive Research. The new name recognizes that the EPSCoR program, which was formed in 1978, is an integral and ongoing part of our national science infrastructure.

And in other good news out of D.C., Congress's proposed budget gives NSF EPSCoR at least as much funding as last year - a marked improvement over the president's budget, which sharply cut funding to the program. In fact, Congress is considering reinstating an EPSCoR program at the Department of Defense, which was defunded in the 2000's.

So the powers that be understand the important role EPSCoR programs can play in creating new knowledge. We're hoping our continued engagement efforts do the same not only for Nuiqsut, Juneau, and the Kenai, but for all the communities in Alaska and beyond.•

Teaching Through Technologies

A new project led by the Alaska Upward Bound program is using emerging technologies to increase the interest of low-income and first-generation-to-college high school students in science fields.

The "Teaching through Technologies (T^3) Alliance" instructs Upward Bound students in three novel technologies - unmanned aerial systems, 3-D printers, and codeable digital devices - to attract them to science, technology, engineering and math (STEM) disciplines. Upward Bound is a nationwide program that uses after-school and summer instruction to encourage at-risk students to continue to higher education. T^3 will institute curricula based on the three technologies at Upward Bound programs in at least 18 states and territories, engaging more than 360 students.


Photo by Carl France/Aquilo LLC

Modern Blanket Toss students conduct a mission in Bethel in November 2015.

"Upward Bound targets low-income students, as well as students who aspire to be the first member of their family to attend college," said John Monahan, director of Alaska Upward Bound and principal investigator of T^3. "It's really hard to convince these students that they have what it takes to succeed in STEM fields, and this sort of program can go a long way toward both getting them excited about STEM, and giving them the confidence to pursue it."

The 3-year program is funded by a $2.1 million NSF EPSCoR award and builds on "The Modern Blanket Toss," a successful NSF EPSCoR-funded project that used unmanned aerial systems to build interest in STEM fields through Upward Bound curricula in five rural Alaskan high schools. "The Modern Blanket Toss showed that novel technology is a great 'hook' to get kids into the sciences," Monahan said. "We're excited to be able to add new elements to the program and to take it nationwide."

Instructors and students will be recruited from at least 36 Upward Bound sites and given materials and online and in-person support to implement hands-on curricula based on these three technologies. Students will also receive instruction in STEM communication and leadership, and will participate in community service projects using the technologies. Co-PI's of the program are Nicole Norfles of the national Council for Opportunity in Education and Alaska EPSCoR Associate Project Director Pips Veazey, who will help to implement the curricula and to establish connections between Upward Bound and their respective organizations.

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NSF EPSCoR Provides Co-Funding

Through a process called "co-funding," NSF EPSCoR provides funds to other NSF departments to support worthy research projects in EPSCoR jurisdictions. NSF EPSCoR currently co-funds 11 Alaska awards for a total of $5.6 million:

• $278,913 for *Collaborative Research: Linking Landslide and Windstorm Exposure to Regional Carbon Stocks and Fluxes in the Largest U.S. Forest Carbon Reservoir, Southeast Alaska.* Principal Investigator Brian Buma, UAS.

• $139,017 for *Impacts of Polyandry and Mate Limitation on Female Fecundity and the Population Dynamics of the Aspen Leaf Miner.* Principal Investigator Patricia Doak, Co-PI Diane Wagner, UAF.

UAS faculty (and Alaska EPSCoR hire) Brian Buma, who is receiving NSF EPSCoR co-funding support.

• $502,465 for *Unraveling the Controls of Inorganic Carbon Dynamics in the Gulf of Alaska with a Regional Three-Dimensional Biogeochemical Model.* Principal Investigator Claudine Hauri, Co-PIs Katherine Hedstrom and Seth Danielson, UAF.

• $226,608 for *Slow Earthquakes and Earthquake Nucleation in the Lower Crust of Central Alaska.* Principal Investigator Stephen Holtkamp, UAF.

• $532,170 for *A Comparative Study of the Medical Ethnobotany of the Chukchi and Naukan Yupik of Siberia and the Central Alaskan Yup'ik.* Principal Investigator Kevin Jernigan, UAF-Kuskokwim Campus.

• $96,202 for *Linguistic and Ethnographic Investigations of Place Names and Narratives in Two Alaska Dene Languages: Toklat (Lower Tanana) and Middle Tanana.* Principal Investigator James Kari, UAF.

• $707,981 for *Control of Boreal Forest Soil Decomposition Processes by Plant Secondary Compounds.* Principal Investigator Mary Beth Leigh, co-PIs Andres Soria and Fenton Heirtzler, UAF.

• $195,289 for *CAREER: Imaging the Global Patterns and Drivers of the Ocean's Biological Carbon Pump.* Principal Investigator Andrew McDonnell, UAF.

• $2,482,859 for *NUNAPUT Stewardship through Science: Honoring Place in a Changing World.* Principal Investigator Deborah McLean, Co-PIs Tomas Marsik and Todd Radenbaugh, UAF-Bristol Bay Campus.

• $214,786 for *Collaborative Research: Using Field Experiments to Understand Household Barriers to Energy Efficiency in Alaska.* Principal Investigator Antony Scott, UAF.

• $260,000 for CEDAR: *Establishing a Meteor Radar at Poker Flat Research Range to Understand the Wind-Driven Circulation and Coupling of the Arctic Atmosphere.* Principal Investigator Denise Thorsen, Co-PI Richard Collins, UAF.