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Alaska EPSCoR

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

Down to Business

EPSCoR supports Startup Weekend, economic development

The dogs had their day at this year's Fairbanks Startup Weekend.

The two teams that took top honors at the annual entrepreneurship event both catered to canines (and to other pets as well): the second-place winners "Doggy Dispensary" proposed an attachment to automatic feeders to dispense CBD treats to anxious pets, while first place went to "Preparapet," an app providing information and services to first-time pet owners. In the latter case, the team had started out with plans to create a dog-matching service a la Tinder before the discussion turned to the concept of leasing pets and, finally, to the challenges of pet ownership.

"We realized, maybe people don't necessarily know how to take care of a pet," explained team member Addeline Mitchell, a recent UAF Computer Science graduate. "From there we said, you know what, if people don't know how to take care of a pet, where are they going to find out?"

photo by Tom Moran/Alaska NSF EPSCoR

Members of the "VitaVault" team pitch their proposal at Alaska Statrtup Weekend, November 17, 2019. The team proposed a service to securely store and transfer medical data.

The team's deliberative process was par for the course for Startup Weekend, which ran from November 15-17 at the Venue in downtown Fairbanks and which enjoyed support from Alaska NSF EPSCoR. On Friday, a couple dozen attendees gave 60-second pitches for novel products to address pressing problems. Teams coalesced around the six most popular ideas, then spent the weekend fleshing them out with the help of local industry mentors and some speedy mar-

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From the PI

Pips Veazey, Principal Investigator

News moves fast these days. That's one reason we've decided to update the distribution and frequency of the Alaska NSF EPSCoR newsletter. We're ceasing publication of our twice-a-year print edition in favor of a shorter online-only version, which will be published every month or two and made available through our listserv, website, and social media.

The new-look newsletter will be 2-4 pages long and include a mix of feature articles, program updates, important notices about award solicitations and other opportunities, and letters from myself. we hope you enjoy the format, which will enable us to share our most important news with the EPSCoR family on a regular basis, and will save a few trees to boot.

If you're not on the mailing list for this newsletter and would like to be, email Tom Moran at tmoran3@alaska.edu.

Economic Development

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ket research. Then on Sunday each team pitched their idea and business plan to a panel of local judges before a crowd of around 40 people.

The third-place prize went to "Inventory Insight," a proposal to use cameras and artificial intelligence to keep track of food supplies for restaurants or households. The other pitches were for an augmented-reality art gallery, an online service for storing and sharing medical records, and a distribution network for Aircrete, a form of next-generation concrete.

Members of the "Preparapet" team, which took first place at Fairbanks Startup Weekend, held Nov. 15-17, 2019 at the Venue in downtown Fairbanks.

"I thought we had an incredible mix of industries," noted Gerald Montuya, a UAF mechanical engineering undergrad and one of the organizers of the event. "We had high-tech solutions like the inventory one, and more industrial things like Aircrete, and we had more personal things like the doggy dispensary."

Montuya estimated about half of the participants at the Fairbanks event came from UAF, with the rest members of the community – including individuals from both Fort Wainwright and Eielson Air Force Base. The event was put on by the Techstars seed accelerator company (as part of a statewide series of events called Alaska Startup Week) with help from a number of local sponsors, including Alaska EPSCoR and two other UA organizations: the Alaska Center for Innovation, Commercialization, and Entrepreneurship (Alaska Center ICE) and the UAA-based Alaska Small Business Development Center. EPSCoR provided some direct financial support but made a more significant contribution by supporting Montuya and three other UAF students to travel to Columbia, Missouri to attend that community's Startup Weekend and incorporate the knowledge they gleaned into the Fairbanks event.

"The entire schedule was built around what we experienced down in Columbia," Montuya said. "We thought everything was well put-together … we felt that (it) was a comfortable place to start and that we didn't have to reinvent the wheel."

Alaska NSF EPSCoR has supported Alaskan startup events for several years and also supports a number of other economic development initiatives. It's all part of the organization's mission to increase the state's research capacity, noted EPSCoR Project Administrator Faye Gallant.

"Alaska NSF EPSCoR focuses on the needs of Alaska and our fundamental purpose is to build capacity in our state," Gallant said. "Through our economic development work, we can help make Alaska a great place to develop new ideas, both inside and outside of the university."

Other recent economic development events and efforts supported by EPSCoR include the Alaska Hackathon and small business awards given out by the Technology Research and Development Center of Alaska (Alaska TREND). More than 100 people in Fairbanks, Anchorage and Juneau took part in this year's Hackathon in October, which – like Startup Weekend - saw teams of tech-minded volunteers gather to develop a new service or product and to compete for awards; the distinction is that Hackathon teams put together a working prototype. This year's winner was an Anchorage team that designed an affordable Bluetooth door opener powered by a windshield wiper motor.

And back in September, Alaska TREND gave out five EPSCoR-funded "Phase 0" awards to Alaskan tech start-ups, for use in applying for larger federal grant support. Second place went to Rhizoform, LLC, which is developing a biodegradable foam derived from fungi for use in shipping seafood, and first place was awarded to The Launch Company, which is developing technology for space launches, including launch sites and fittings for launch vehicles.•

NSF Awards Alaskans "Track-4" Funding

University of Alaska researchers Tamara Harms, Ben Jones and Patrick Tomco recently received two-year "Track-4" awards from the national NSF EPSCoR organization. The awards will fund Harms, Jones and Tomco to further their work by collaborating with scientists in New York, Connecticut, Louisiana and Florida.

Harms, an Assistant Professor of Ecology with the UAF Institute of Arctic Biology, will receive $126, 218 for her project, Arctic Nitrous Oxide (N_2O): Training and Technical Advances to Quantify Emission of a Powerful Greenhouse Gas. Harms will work with researchers at the Cary Institute of Ecosystem Studies in Millbrook, New York to study the production in soils of nitrous oxide, a potent greenhouse gas. Large releases of nitrous oxide have been documented in high-latitude areas subject to permafrost thaw or wildfires, but it remains unclear how this nitrous oxide is produced and how long disturbed soils might generate emissions. This project will examine these processes with a goal of contributing to an improved ability to forecast potential N_2O emissions under the warmer, more nutrient-rich, and more fire-prone conditions predicted for high-latitude ecosystems.

Tamara Harms, Ben Jones and Patrick Tomco

Jones, a Research Assistant Professor with the Water and Environmental Research Center at the UAF Institute of Northern Engineering, will receive $295,256 for his project, PermaSense: Investigating Permafrost Landscapes in Transition Using Multidimensional Remote Sensing, Data Fusion, and Machine Learning Techniques. Jones and a postdoctoral researcher will train and collaborate with researchers at the University of Connecticut to acquire new data fusion and machine learning techniques, which they will use for a project to gather and analyze multidimensional remote sensing data on permafrost degradation.

Tomco, an Assistant Professor of Chemistry in the UAA Department of Chemistry, will receive $165,406 for his project, Formation, Photolysis, and Bioaccumulation of Dissolved Hydrocarbons from Chemically-Herded and Burned Crude Oil at High Latitudes. Tomco and a graduate student will use specialized equipment at the University of New Orleans and the National High Magnetic Field Laboratory in Tallahassee, Florida to analyze samples of Alaska North Slope crude oil, surface collection agents used to thicken oil spills to burn them off, and mussels collected from Resurrection Bay. These experiments will lead to a better understanding of how dissolved residues may form as a result of oil spill remediation, how sunlight may transform these residues, and what impacts they may have on susceptible marine organisms.

"Track-4" grants are awarded by the NSF to encourage researchers in EPSCoR's 28 states and territories to collaborate with researchers across the nation. They are one of four EPSCoR funding tracks: "Track-1" awards fund major research projects, such as the Fire and Ice project in Alaska; "Track-2" awards fund projects incorporating multiple EPSCoR states and territories; and "Track-3" awards fund projects to build diversity in STEM fields.

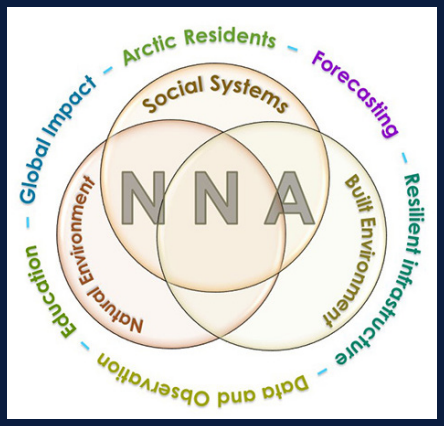
Four UAF faculty are also currently implementing previously-awarded Track-4 projects. Jeff Benowitz, a Research Assistant Professor with the Geophysical Institute, received $220,043 for his proposal "Why are Young Volcanic Rocks Undateable: Chemistry, Environment, or Instrumentation?" Eric Collins, an Assistant Professor with the College of Fisheries and Ocean Sciences, received $187,301 for his proposal "Advancing Machine Learning in Biological Oceanography through Interdisciplinary Collaborations." Georgina Gibson, a Research Assistant Professor with the International Arctic Research Center, received $221,867 for her proposal, "Modeling Dissolved Organic Matter at the Arctic Land/ocean Interface." And Ken Tape, an Associate Professor with the Geophysical Institute, received $200,382 for his proposal, "Predicting Beaver Colonization of the Arctic and Creation of Tundra Stream Oases."•

Opportunities and Announcements

NSF "Navigating the New Arctic" awards

The NSF has released the solicitation for its 2020 round of "Navigating the New Arctic" awards. The awards will fund "fundamental convergence research across the social, natural, environmental, and computing and information sciences, and engineering that address the interactions or connections between natural and built environments and social systems and how these connections inform our understanding of Arctic change and its local and global effects."

Full proposals are due February 11, 2020. The NSF has scheduled a series of informational webinars about the awards, the schedule for which can be found on the NSF NNA page.



Venn diagram of NSF "Navigating the New Arctic" program.

Several Fire and Ice personnel have already received NNA awards: Boreal Fires researchers Jen Schmidt and Matt Berman received $1.1 million for their portion of a 4-year project to study and map the natural hazards of unstable permafrost, wildfire and rain-in-winter events in Anchorage, Fairbanks, and Whitehorse. Boreal Fires researcher Peter Bieniek is co-PI of another $571,000 part of the same effort. And DEW lead Laura Conner is Co-PI of a $964,000 project to investigate indoor and outdoor winter air pollution in arctic environments.

UAS Microbiology faculty recruitment

The Fire and Ice project is looking to fill a tenure-track faculty position in Microbiology at UAS. The position will support undergraduate programs in Biology, Marine Biology, and Environmental Science through teaching, research and service. The hire will conduct research for the Fire and Ice project while also teaching courses including Microbiology; a service course for the Nursing program; Forest Ecosystem-related courses;and upper-division courses and seminars in their area of expertise.

The faculty position is one of five planned for the Fire and Ice project. The first hire was Gwenn Hennon, who began work as a UAF Oceanography faculty member in fall 2019.

First-generation STEM majors needed for study

Fire and Ice postdoc Megan McGinty is beginning an educational research project to examine the experiences of first-generation UAF students in STEM majors. She's looking for volunteers to sit down for a 30-60 minute interview. Participants will receive $50 per interview. Interested parties should contact Megan at mcmcginty@alaska.edu.

EPSCoR on film

We've started to stock the Alaska EPSCoR YouTube channel with content from the Fire and Ice project. Our recent offerings include:

- Introduction to hyperspectral imaging uses lively animation to explain how the Boreal Fires team is using hyperspectral remote sensing to better characterize fire fuels. The NSF liked this video so much they've asked us to prepare a version for broadcast.
- Jakalof River timelapse and Grewingk Glacier Lake timelapse condense months of stationary photos from two Fire and Ice Coastal Margins research sites into a few minutes each.
- Fire and Ice drone demo is a brief sampler of some of the drone footage shot this summer at Boreal Fires and Coastal Margins research sites.
- EPSCoR mentoring workshop is the presentation portion of a workshop given by UAF Provost Anupma Prakash following the 2019 All-Hands Meeting.

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If you wish to be added to (or removed from) the EPSCoR listserv, please contact Tom Moran at tmoran3@alaska.edu or (907)474-5581.