

# 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.

Fall 2011



## From the Director

Peter Schweitzer

I am writing these lines soon after the news of the NSF EPSCoR Cyberconnectivity award hit my inbox. We are excited about this new award, which will lay important groundwork for our ongoing efforts in connectivity, data storage, and visualization. But it's just the forerunner of a larger goal: a \$20 million NSF grant to fund a fourth phase of Alaska EPSCoR from 2012-17.

A faculty team from across the UA system is working on a proposal for the Phase IV grant, which is due in November. It will build on Phase III's integrative approach through an interdisciplinary examination of the vulnerability and adaptive capacity of Alaskan communities. Starting from a social-ecological system perspective, we are developing a place-based research program that focuses on solutions to the challenges of the 21st century.

In the meantime, we continue to administer our Phase

## EPSCoR Receives Cyber Grant \$1 million to fund Anchorage and Fairbanks projects

Both UAA and UAF will receive major computer upgrades thanks to a \$1 million grant recently awarded to Alaska EPSCoR.

The two-year National Science Foundation cyberconnectivity award will pay for internet service improvements centered on UAF's West Ridge and at UAA's new Integrated Science Building. It will also pay for major improvements to UAA's Planetarium and Visualization Theatre; fund the creation of a new "data portal" web site to consolidate and organize Alaskan research findings; and provide staff to create and download educational content for rural Alaskans.



photo by Michael Dinneen/UAA  
A portion of the NSF cyberconnectivity grant awarded to Alaska EPSCoR will go toward improvements to UAA's Planetarium and Visualization Theatre, enabling it to offer improved "decision theatre" programming like this Susitna Dam model.

The funding will benefit the University of Alaska in four ways. First, the grant will fund improvements to UAF's Upper Campus Hub Room, through which all internet service is routed for the campus' research-heavy West Ridge. The 14 buildings connected to the hub will have their connections to the UAF core network upgraded from 1 gigabyte/second (Gbps) to 10 Gbps. Additionally, outdated switching equipment will be removed and replaced with an improved and redundant system less susceptible to outages.

Continued on page 11

Continued on page 10

# PRESERVING PRESERVATION



UAF graduate student Ryota Kajita installs a datalogger in an ice cellar in the village of Savoonga.

**F**or generations, Native villagers on Alaska's northern coast have been storing whale meat in underground ice cellars, called sigluaqs, to preserve it during the relative warmth of the Arctic summer.

UAF grad students Ryota Kajita and Kyle Wendler are also interested in preservation. As rising temperatures and health concerns cloud the future of the ice cellars, the two Alaska EPSCoR graduate fellows hope to preserve the sigluaqs themselves: Kajita by immortalizing them through a documentary film, and Wendler by modeling a system of thermosyphons that could improve the cellars' functioning to keep them viable in the long term.

Kajita, who is pursuing his master's in Interdisciplinary Studies at UAF, became interested in the cellars through his advisor, Research Professor Kenji Yoshikawa, who has spent five years monitoring sigluaq temperatures in villages stretching along the arctic coast. His investigations have shown a rise of about one-half a degree Fahrenheit in the cellars, and he's personally investigated a number of cellars that have shown evidence of failure, such as water seepage. But Yoshikawa said results so far have been inconclusive.

"In general, we don't see failures," Yoshikawa said. "Most of them are still okay."

Kajita is working to document the present state of the sigluaqs, their use, and villagers' opinions as to why they may be failing. He's interviewed residents in a number of villages and heard conflicting answers about the reasons for possible problems with the cellars, ranging from climate change to poor locations.

"I'd like to know the scientists' view, and what villagers are thinking," Kajita said. "I'd like to document the present situation comprehensively."

Kajita said he is not attempting to decipher why or if some cellars are failing, but to create a snapshot of an important Native tradition in flux. He plans to edit his footage into a 30-minute documentary and also to produce shorter versions which can be used to educate village students about the sigluaqs.

"I'd like to combine all the people's thoughts," Kajita said. "Probably it will make good footage for the future. Children in villages can see what the ice cellars were like at that time."

Wendler, who is set to earn both his bachelor's and master's degrees in engineering from UAF this fall through a fast-track program, studied sigluaqs through an entirely different lens. Using 2-D and 3-D computer models he created himself, he ran tests to determine whether a system of thermosyphons – gas-filled tubes that dissipate ground heat into the air – can be used to improve the cellars' cooling power. He said the project is partially a response to climate warming, but also represents an effort to see whether ice cellar temperatures can be brought closer to U.S. Department of Agriculture food storage guidelines.

"They recommend zero degrees Fahrenheit, so that would be my ideal temperature," he said. "I'm just trying to cool it as much as possible, and



## Resilience 2011

Alaska EPSCoR had a strong presence at Resilience 2011, an international conference on resilience science held March 11-16 at Arizona State University. Alaska EPSCoR leaders Lil Alessa, Peter Schweitzer and Terry Chapin conducted a panel at the conference and led off the session with a presentation on Alaska EPSCoR activities.

In addition, EPSCoR funded travel to the conference for 11 University of Alaska faculty and students, including Jim Powell, Chanda Meek, Gary Kofinas, Corrine Knapp, Hassab Elrasoul Ali and Colette de Roo of UAF and Mark Altaweel, Kalb Stevenson, Matt Berman, Lil Alessa and Andy Kliskey of UAA.

## ICASS VII

Alaska EPSCoR provided partial travel funding for 11 University of Alaska researchers to attend the Seventh International Congress of Arctic Social Sciences, held in Akureyri, Iceland on June 22-26. EPSCoR-funded attendees included Courtney Carothers, Julie Raymond-Yakoubian, Catherine Chambers, Clarissa Dicke, Kristin Timm, Davin Holen Kara Hoover and Robin Bronen of UAF; Marie Lowe and Heather Hudson of UAA; and Erica Hill of UAS.

## Biology Grad Student Symposium

Alaska EPSCoR travel funding helped four UA students to attend the UAF Biology Graduate Student Association (BGSA) Interdisciplinary Research Symposium, held in March in Fairbanks. Grad students Elizabeth Sharp and Lisa Ebbs of UAA, Julie Nielsen of UAS, and Tim Mullet of UAF (who was doing fieldwork in Kenai) traveled to Fairbanks for the conference using Alaska EPSCoR funds.

EPSCoR students fared well at the event. EPSCoR graduate student fellow Dave Roon received the Best Oral Presentation award, and EPSCoR undergraduate grantee Sayde Ridling won the Best Poster award.

## Alaska State Science Fair

High school students in the EPSCoR-supported Alaska Rural Research Partnership took home multiple awards at the 2011 Alaska State Science and Engineering Fair. All six ARRP projects made it to the semi-finals. Awards taken home by ARRP participants included the Society for In Vitro Biology Award, first place finishes in the Plant Science and Microbiology categories, the Outstanding School Projects award, and the outstanding High School Science Teacher award.

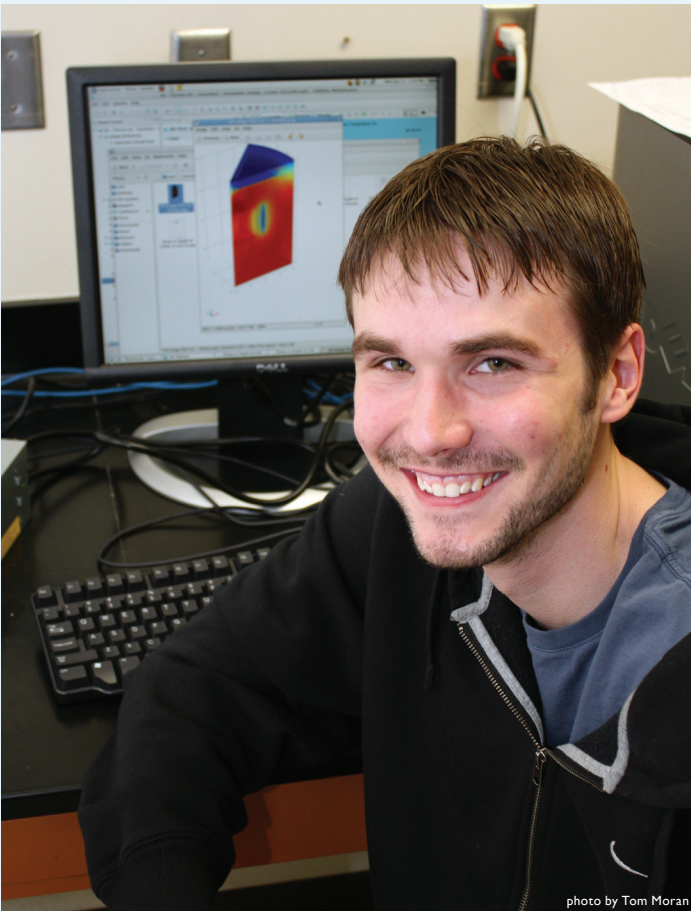


photo by Tom Moran

UAF graduate student Kyle Wendler with a sigluaq model.

thermosyphons have a good cooling effect.”

Wendler’s research required highly detailed models involving dozens of variables, such as air and soil temperatures, ground cover, the size and placement of the ice cellar, and air circulation. His preliminary results suggest that the installation of 16 thermosyphons ringing a sigluaq, along with a layer of ground-level insulation, could reduce the summer temperature of the cellar by around 6 degrees Celsius – not enough to bring the cellars in line with USDA recommendations, but enough to create a sigluaq that would prove more stable in the face of climate change.

Wendler said his EPSCoR stipend was a huge help, as his status as an undergrad-slash-grad student has made him ineligible for a teaching assistantship. In addition to the lab work, Wendler has also been trying to arrange a trip to the Arctic village of Kaktovik, as he has never had an opportunity to actually visit one of the ice cellars he’s been modeling for the past year.

“I’m really hoping to go up there,” he said. “I’d definitely like to see some of them before I finish my project.” ♦



# Weaving a Thesis

## Juneau undergrad studies Native artisans

**Y**oko Kugo may be a relative newcomer to Alaska, but her studies in the state span hundreds of years.

The Tokyo native and recent UAS graduate is studying Tlingit and Haida basket-weaving, using a scientific approach to see how it's affected by climate. She said she's intrigued by the long history of the practice, which has changed little for centuries.

"I saw ancient baskets in the Sheldon Jackson Museum in Sitka," Kugo said. "And I was struck by how today, people are weaving the same way, with the same materials. It's a cultural connection, which has been carried on for many generations from ancient times to today."

Kugo, an Alaska EPSCoR undergraduate grantee in both 2010 and 2011, first came to Alaska after several years backpacking the globe, deciding she wanted to explore "the end of the world." After some time spent exploring the Interior, she moved to Sitka, where her newfound interest in Native arts led her to begin making baskets herself, and taking classes that introduced her to the culture behind the objects.

"Every time I took a class from a different instructor, I learned a different way of thinking," she said. "Each weaver is very unique, they have their own way of teaching."

Kugo completed an Associate of Arts degree at the UAS Sitka campus and enrolled at the main UAS campus in Juneau, where she began to take a more scientific approach to Native arts. Classes in sociology and anthropology led her to wonder about the effects of changes in the environment and in land use patterns on the spruce roots and cedar bark Native weavers harvest for their craft.

Kugo has since researched the topic through ethnographic interviews and observation of Native artisans in Juneau, Sitka, Klawock and Ketchikan. Last summer she took another step forward by installing soil and air temperature and moisture sensors in three locations in Juneau and Sitka. She has been correlating data from the sensors with information from weavers about the timing and quality of their root and bark harvests and looking for relationships

between the two. She plans to continue the experiment in future years to allow for annual comparisons.

"I hope I can reach some conclusions," she said. "It's good to have one year of data, but it will be better if I can have at least two years because every year the conditions are different."



photo courtesy Yoko Kugo

Yoko Kugo displays one of the dataloggers she's using to record soil and air temperatures in areas of Juneau and Sitka.

Kugo said Alaska EPSCoR has been a boon to her research: she used her EPSCoR grants to help pay for the sensors and for trips to visit weavers and carvers, and used a separate EPSCoR travel grant to attend a March meeting of the Society for Applied Anthropology in Seattle. She also credits EPSCoR-affiliated UAS faculty Daniel Monteith and Erica Hill for mentoring and supporting her.

Kugo received her bachelor's degree from UAS in May - honored as the school's 2011 Outstanding Graduate in the Social Sciences - and is now continuing her studies at graduate school at UAA. She says the importance of her ongoing study lies in the central place of baskets in Native culture, noting that for most of history they have been far more than just collectibles. "For Alaska Natives, weaving and carving are not just art," she said. "They're survival."♦



# WAISC comes to Bethel

The doll, Charlotta Hillerdahl explained, was so tiny it resembled a peg – so they named it Peggy.

But Peggy was no small matter at this year's Western Alaska Interdisciplinary Science Conference, where an image of the 700-year-old wooden artifact was projected 12 feet tall for the roomful of people attending the Bethel science gathering. The totem was one of thousands of artifacts found in an unusually rich archeological dig in the Bering Sea village of Quinhagak.

"We have them in all sizes and all moods," Hillerdahl said of the dolls found at the coastal homesite, along with perfectly-preserved items like floor mats, a ladle, seeds and human hair, pots, harpoons, even grass ropes and fish bones. "We've managed to capture a whole house – for an archeologist, this is as good as it gets."

Hillerdahl, an instructor with the University of Aberdeen in Scotland, presented a keynote address on the Quinhagak site at WAISC, an annual conference that rotates among sites in Western Alaska. Hillerdahl was one of six attendees at this year's conference whose travel was financed by Alaska EPSCoR.

Attendees at this year's conference, the fourth of its kind and the first in Bethel, heard about much more than just archeology. Subject matter at the conference is ordered not around scientific fields but around geography, so 2011's conference – held from March 22-25

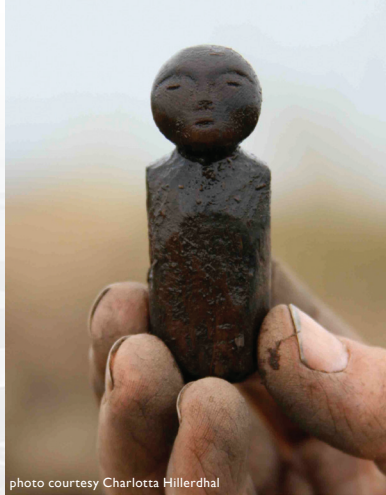


photo courtesy Charlotta Hillerdahl  
"Peggy," one of thousands of artifacts from a rich archeological dig in a Bering Sea village.

and organized by the UAF Kuskokwim Campus – was heavy on local topics such as Yu'pik language preservation and the wildlife of the Yukon-Kuskokwim Delta.

"Every part of the region has very unique qualities and aspects, and Bethel is very different from Dillingham and very different from Nome," said Rose Meier, an Assistant Professor of Botany at the Kuskokwim Campus and chief organizer of the 2011 WAISC. "So this really encompasses the whole Southwest coastal region that you wouldn't necessarily get in either of the other places."

In addition to the Quinhagak talk, the mix of scientists, students, agency workers, and local residents in attendance saw a demonstration of "isopod racing," in which tiny crustaceans are pitted

against each other in an effort to interest schoolkids in biology. They also heard talks on topics ranging from bedbug prevention, to studies of sheefish and salmon runs, to teaching Yu'pik words through the use of traditional songs.

"Somebody's talking about a modular nuclear reactor in villages as an alternative energy option, then someone's talking about immersion schools and someone's talking about honey buckets," said Meier. "It's really good to have that mix. You don't get that anywhere - it's looking for answers to complex questions, and pulling together stakeholders who might have some insights."



photo by Tom Moran  
Lilly Capell of the UAF Bristol Bay campus displays one of the isopods she races to interest K-12 students in science.



# Alaska EPSCoR Awards 2011

*Alaska EPSCoR awarded 33 graduate fellowships in spring 2011. Awards were given in EPSCoR's traditional disciplinary components but also in the interdisciplinary fields of Ecosystem Services, Mobilities, Human-Hydrological Systems, and Systems Modeling. Here are the recipients:*

## **Biology/Ecosystem Services**

Matthew Campbell, M.S. candidate, UAF

Advisor: J. Andres Lopez

Focus: The genetic structuring of Beringian blackfish populations.

Katie Christie, Ph.D. candidate, UAF

Advisor: Roger Ruess

Focus: The role of ptarmigan and other herbivores in shaping arctic shrub communities.

Rachel Garcia, M.S. candidate, UAF

Advisor: Cary de Wit

Focus: Economic factors affecting access to locally-grown Tanana Valley foods.

Tammy Hoem Neher, Ph.D. candidate, UAF

Advisor: Amanda Rosenberger

Focus: Characteristics of estuaries which impact salmon development.

Mary Hogan, M.S. candidate, UAF

Advisor: Thomas Kuhn

Focus: Using Alaska bog blueberry compounds to counter effects of alcohol abuse.

Corrine Knapp, Ph.D. candidate, UAF

Advisor: Terry Chapin

Focus: Adaptation planning for subsistence communities.

Ryan Kovach, Ph.D. candidate, UAF (Juneau)

Advisor: David Tallmon

Focus: The effects of climate change on the migration timing of several Alaska fish species.

Nazune Menka, Ph.D. candidate, UAA/F

Advisor: Terry Chapin

Focus: Pollutant levels in Alaskan moose, caribou, and wolves.

Laura Oxtoby, Ph.D. candidate, UAF

Advisor: Matthew Wooller

Focus: Contributions of sea ice algae to Pacific walrus diets.

Linnea Pearson, Ph.D. candidate, UAF

Advisor: Jennifer Burns

Focus: Thermoregulatory strategies of Alaskan seals.



Linnea Pearson

photo courtesy Linnea Pearson

Megan Peterson, Ph.D. candidate, UAF (Juneau)

Advisor: Courtney Carothers

Focus: Whale depredation on Alaskan longline fisheries

Garrett Savory, M.S. candidate, UAF

Advisor: Christine Hunter

Focus: Competition and interactions between Red and Arctic foxes on the North Slope.

Kyle Wendler, M.S. candidate, UAF

Advisor: Rorik Peterson

Focus: Using thermosyphons to improve the performance of permafrost cellars.

## **Social Science/Mobilities**

Kevin Colson, M.S. candidate, UAF

Advisor: Kris Hundertmark

Focus: Migration behavior in an emerging moose population.

Rebecca Hewitt, Ph.D. candidate, UAF

Advisor: Terry Chapin

Focus: Ectomycorrhizal fungi's role in the arctic tree line.

Davin Holen, Ph.D. candidate, UAF

Advisor: Peter Schweitzer

Focus: Long-term viability of rural Alaskan fishing communities.

Kristy Johnsson, M.S. candidate, UAF

Advisor: William Schneider

Focus: Impacts of watershed changes on subsistence and travel activities.



# Graduate Student Grants

Julie Raymond-Yakoubian, Ph.D. candidate, UAF  
Advisor: Peter Schweitzer  
Focus: Connections between fish resources and the cultural identity of Northwest Alaska Natives.

Nickole Robarge, M.A. candidate, UAF  
Advisor: Patrick Plattet  
Focus: Evangelical Christian movements in Homer and Delta Junction.

Amanda Robertson, Ph.D. candidate, UAF  
Advisor: Matt Olson  
Focus: Distribution of balsam poplars in northern latitudes.

David Roon, M.S. candidate, UAF  
Advisor: Mark Wipfli  
Focus: The effect of the invasive European Bird Cherry tree on Alaskan rivers.

Rebecca Sawyer, M.S. candidate, UAA  
Advisor: Doug Causey  
Focus: Linking genetic variation with parasite loads in Alaskan bear species.

Xiaoyu Zhang, M.S. candidate, UAA  
Advisor: Zhaohui Yang  
Focus: Effects of earthquakes on bridge foundations.

## Physical Science/Human-Hydrological Systems

Allison Butler, Ph.D. candidate, UAF  
Advisor: Gary Kofinas  
Focus: Alaska Native community perceptions of thawing permafrost.

Michael Golub, M.S. candidate, UAF  
Advisor: Jing Zhang  
Focus: Emissions from gas-powered vehicles in cold regions.

Rui Han, M.S. candidate, UAF  
Advisor: Jessica Cherry  
Focus: A hydrokinetic generator suitable for Alaskan river use.

Charles Jones, Ph.D. candidate, UAF  
Advisor: Larry Hinzman  
Focus: Seasonal changes in hazardous Alaskan river conditions.

Ryota Kajita, M.A. candidate, UAF  
Advisor: Kenji Yoshikawa  
Focus: Climate change effects on Alaska Native ice cellars.

James Kelly, M.S. candidate, UAF  
Advisor: Thomas Weingartner  
Focus: Freshwater runoff into the Alaska Coastal Current in the Gulf of Alaska.

Joseph Maharrey, M.S. candidate, UAF  
Advisor: James Beget  
Focus: Historic tsunami events in a Cook Inlet village.

David McAlpin, Ph.D. candidate, UAF  
Advisor: Franz Meyer  
Focus: Landscape changes in the wake of the 2009 Mt. Redoubt eruption.



Nazune Menka

Edda Mutter, Ph.D. candidate, UAF  
Advisor: Bill Schnabel  
Focus: Impacts of rural landfills and sewage lagoons on surface water quality.

Ravikanth Vajjha, Ph.D. candidate, UAF  
Advisor: Debendra Das  
Focus: Nanofluids in building heating systems.

## Integration/Systems Modeling

Adam Cornachione, M.S. candidate, UAF  
Advisor: Brian Hay  
Focus: Simulating an Alaskan communications network to study complex systems.

Brian Young, Ph.D. candidate, UAF  
Advisor: Jingjing Liang  
Focus: Modeling diversity in the Alaskan boreal forest.



# ONETREE to teach them all

The name “OneTree” is something of a misnomer. In fact, a total of 18 birch trees have now been recruited from a birch stand on Nenana Ridge for use in the EPSCoR-supported program, which uses various parts of the trees as tools to teach Fairbanks K-12 students about plant biology and climate change – and, in a larger sense, about observations and the scientific process.

“Kids get great critical thinking skills” out of OneTree experiments, noted UAF grad student Zac Meyers, the program’s lead science educator. “They get a really interesting project that they take ownership of, and they develop hypotheses, and as a result they become more attuned to what’s around them.”

Fairbanks’ OneTree program began in July 2009, when a single birch was cut down and used as the basis for over 40 art and science projects. The success of the program led to its expansion to schools throughout the Fairbanks North Star Borough School District. While science now makes up a significant chunk of the classwork, arts and crafts using tree products remain integral as well; it’s an approach that helps draw in more instructors, according to program coordinator Jan Dawe.

“There are teachers that are either very art-oriented or very science-oriented,” noted Dawe, an adjunct professor at UAF. “The thing that’s great about having the dual focus is that the teacher can start in the focus area that they’re most comfortable in. We’ve had art-oriented teachers who are dubious about science, so we can start with an art project and lead them gently into science.”

OneTree’s science instruction in the spring 2010-11 semester consisted of two projects. First, students studied growth rates in birches in different lengths of growing seasons, to see what is likely to change as the Interior’s historically short summers continue to lengthen. Second, they examined the growth rings of different trees in the stand to identify periods of relative climate stress, which can be determined by the width of the rings. Meyers said the studies help the students to learn and also corroborate similar research done at UAF.

“We’ve dated the trees at the university, and now they’re entered into a database, so that information in the future will be used to create this robust database,” he said. “Ours is just a subsample, but it shows that

just a subsample of a small stand of trees can have a lot of impact on the community and on the classrooms.”

OneTree’s EPSCoR funding came through a \$30,000 Integrative Faculty Development Grant awarded to Dawe for spring 2011. Dawe said the EPSCoR funding has had a “phenomenal” effect on the science portion of OneTree, enabling it to expand its climate



OneTree lead science educator Zac Meyers explains a “slide rule” of tree ring measurements to students at Randy Smith Middle School in Fairbanks.

change focus in particular.

“EPSCoR has made it possible for us to hire very talented students and to bring in more faculty at the university to start thinking about how can we really communicate science and especially the science of climate change,” Dawe said. “EPSCoR’s made it possible for us to do better and more targeted teacher training and to focus on climate change much more.”

About 400-500 Fairbanks students have participated in the science portion of the project so far. Chris Pastro, a Fairbanks middle school teacher in the program, said it has been instrumental in helping clue students in to the natural world around them and the ways that it’s changing.

“They’re observing rather than being passive,” she said. “I think that they’ve tried to also see what their part in the big picture is. They hear a lot about climate change, and they see that they’re the ones that are going to have to do something in the next few years.”◇



# 2011 EPSCoR Faculty Awards

**A**laska EPSCoR awarded 10 Integrative Faculty Development Awards in 2011 to teams of UA faculty working on integrative research projects. Awards were given in EPSCoR's traditional disciplinary components and in interdisciplinary fields of Ecosystem Services, Mobilities, and Human-Hydrological Systems, as well as one Outreach award. Here are the recipients:

## Biology/Ecosystem Services

Shannon Donovan, Assistant Professor of Geography & Environmental Studies, UAA  
Collaborator: Chanda Meek  
Focus: A social assessment and policy review of Alaskan black bear management.

Derek Sikes, Assistant Professor of Entomology, UAF  
Collaborators: Diane O'Brien, Jozef Slowik  
Focus: Population genetics and food web dynamics of arthropods of Kasatochi Island post-eruption.

David Tallmon, Associate Professor of Natural Sciences, UAS  
Collaborators: Sanjay Pyare, Daniel Monteith  
Focus: Changes in the distribution and abundance of Alaskan sockeye salmon.

## Social Science/Mobilities

Doug Causey, Professor of Biological Sciences, UAA  
Collaborators: Jeff Welker, Naomi Bargmann  
Focus: Fall bird migration in the Yukon-Kuskokwim Delta.

Steve Colt, Associate Professor of Economics, UAA  
Collaborators: Hajo Eicken, Amy Lauren Lovecraft, Andrew Mahoney  
Focus: Arctic tourism development in the wake of diminished sea ice.

Gary Holton, Associate Professor of Alaska Native Languages, UAF  
Collaborators: Ben Potter, Jonathan Manker, Sanjay Pyare, Mark Sicoli  
Focus: A database for Alaska Native place name information.



Derek Sikes

photo by Todd Paris/UAF

## Physical Science/ Human-Hydrological Systems

William Bolton, Post-Doctoral Researcher, UAF  
Collaborator: Jessica Cable  
Focus: Spring season water cycling and stream flow dynamics in the boreal forest.

Chris Donar, Assistant Professor of Science, UAS-Ketchikan  
Collaborators: Colleen Ianuzzi, Barbara Morgan

Focus: Microalgal diversity in Southeast Alaska freshwater and marine ecosystems.

Kenji Yoshikawa, Research Professor, UAF  
Collaborators: Miho Aoki, Elena Sparrow  
Focus: A seasonal frost monitoring network in Southeast Alaska.

## Outreach

Jan Dawe, Instructor, UAF  
Collaborators: Glenn Juday, Valerie Barber  
Focus: Involving Fairbanks K-12 students in an examination of the effects of climate change on Interior Alaska birch trees.

# Cyber Grant

*Continued from page 1*

"It'll mean there are multiple paths to and from the West Ridge, so in the event of an outage or multiple break in one line no data or connectivity to campus or to research partners will be lost," stated Karl Kowalski, the University of Alaska's Chief Information Technology Officer. "For ARSC (the Arctic Region Supercomputing Center), for IARC (the International Arctic Research Center), for the Alaska Satellite Facility, they all deal with very, very large data sets, and to be able to transmit them amongst themselves in the network and to their partners without interruption is critical."

Second, the award will fund hardware and software improvements at UAA's Planetarium and Visualization Theatre, which will enable the theatre to smoothly project simulations which can be manipulated in real time. The NSF funding will also pay for improved internet connectivity to the Integrated Sciences Building (site of the theatre) from the core UAA network.

"What we're getting is basically a complete upgrade to all of the rendering computers in the planetarium's computer cluster," said Planetarium Director Andy Puckett. "We're getting more storage space, more RAM, and better video cards, so this is all going to make it possible for us to do a lot more things in real time."

The improvements will allow EPSCoR to continue work on staging "decision theatres," in which land managers can simulate the results of policy choices on virtual landscapes. Building such simulations has been a thrust of EPSCoR researchers, but the current Planetarium hardware and connectivity only support relatively low-resolution and occasionally jittery graphics for interactive simulations. "What we're gaining here is the ability to make it even more immersive and realistic," Puckett said.

Third, the NSF award will fund staff at the Arctic Region Supercomputing Center to create a central

depository for data collected from dozens of Alaskan research organizations both inside and outside the university. The accumulated data will be accessible through a website available to users statewide, improving the ability of scientists to locate and sort results across disciplines.

"There are any number of units on campus that have data that currently aren't getting it online to the public," explained ARSC Chief Scientist Greg Newby. "We're going to give them a place to put those data piles, and that's going to be a data portal."

In some cases, Newby said, the portal will link to existing data-access websites, while in others data will be uploaded specifically for use through the portal. Information will be input as searchable metadata, allowing users to sort through the contents to quickly access, say, long-term rainfall or erosion patterns for a specific location.

"The data will be coming from a whole bunch of different sites at the same time," Newby said. "I think we're going to be able to have some really tremendous and sophisticated value added to

research through the site, very quickly."

Lastly, the award will fund a staff position and a student intern in the UAF Office of Information Technology who will work on configuring and installing new software which will improve Web access and distance learning capabilities for rural Alaskans. The funding will bolster the work of a National Telecommunications and Information Administration grant known as "Bridging the E-Skills Gap," which is designed to increase broadband access and knowledge across the state.

The overall NSF award to EPSCoR is part of the Foundation's Inter-Campus and Intra-Campus Cyberconnectivity (RII C2) grant program, which supports the improvement of broadband access for academic research. The grant will run through July 2013 and will be overseen by Alaska EPSCoR Principal Investigator Peter Schweitzer.●



photo by Tom Moran

The NSF Cyberconnectivity grant will fund key upgrades to UAF's West Ridge Hub Room, located in the Arctic Health Research Building.



# EPSCoR 2011 Undergraduate Grants

Alaska EPSCoR awarded 13 research stipends to undergraduates in spring 2011. The recipients were:

Kelcy Brunner, Applied Physics major, UAF  
Advisor: Nicole Molders  
Focus: Modeling Fairbanks particulate emissions and atmospheric conditions.

Kit Dawson, Physics major, UAF  
Advisor: Renate Wackerbauer  
Focus: Incorporating snow cover into an Arctic albedo model.

Christopher DeCou, Psychology major, UAF  
Advisor: Monica Skewes  
Focus: Perceptions of suicide among rural UAF students.

Rachel DeWilde, Biological Sciences major, UAF  
Advisor: J. Andres Lopez  
Focus: The genetic structuring of Beringian blackfish populations.

Mark Ferrell, Natural Sciences major, UAA  
Advisor: Andrew Kliskey  
Focus: Perceptions of water quality and quantity on the Kenai Peninsula.

Forest Haven, Anthropology major, UAS-Ketchikan  
Advisor: Priscilla Schulte  
Focus: Dynamics of traditional Alaska Native food systems.



Ben Wong

Yoko Kugo, Anthropology major, UAS  
Advisor: Daniel Monteith  
Focus: Tlingit and Haida basket-weaving.

Sayde Ridling, Biological Sciences major, UAF  
Advisor: Derek Sikes  
Focus: Arthropods on post-volcanic eruption Kasatochi Island.

Kristen Sparling, Biology major, UAF  
Advisor: J. Andres Lopez  
Focus: Broad whitefish on the North Slope.

Cheyanna Swisher, Wildlife Biology & Conservation major, UAF  
Advisor: Terry Chapin  
Focus: Effects of climate change on Inter-Alaska bird migration and distribution.

Rebekah Tee, Biochemistry major, UAA  
Advisor: John Kennish  
Focus: Changes in microbial communities in glacial soil.

Brett Woelber, Geology major, UAA  
Advisor: Andrew Kliskey  
Focus: Technical GIS assistance for the Bering Sea Sub-Network.

Ben Wong, Wildlife Biology & Conservation major, UAF  
Advisor: Christine Hunter  
Focus: Winter activity levels and browse preference of snowshoe hares.

## Director's Letter

*Continued from page 1*

III grant. Despite reduced funding in 2010-11, we were able to fund 39 travel awards, 33 graduate student and 13 undergraduate research stipends, and 10 integrative faculty development awards. In 2011-12 we will offer similar opportunities, including at least 16 travel awards, 14 graduate student awards, six undergraduate awards, and six Integrative Faculty Development Grants.

Grant solicitations will come out in September and grants will be awarded for the spring semester 2012. Preference for graduate student and faculty awards will go to individuals who have already received Alaska EPSCoR funding during Phase III, so we can focus on providing continuing support.

Leaner times are upon us. But we believe the cyberconnectivity award is both a welcome addition to our efforts and a harbinger of more good news to come.♦

## Alaska EPSCoR:

### Experimental Program to Stimulate Competitive Research

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# "Living on Earth" Returns

In February 2011, researchers from 16 EPSCoR states and territories descended on Anchorage and Girdwood for "Living on Earth II," a workshop on Social-Ecological Systems (SES) research organized by Alaska EPSCoR. The event, a follow-up to a similar gathering in 2009, was an opportunity for scientists from across the nation to share insights and developments in the SES field, which combines the social and hard sciences to unravel the relationships between people and their ecosystems.



"Social-Ecological Systems research provides a holistic view of looking at our environment, and is inherently interdisciplinary in nature, which is what the EPSCoR theme is focused on," noted Alaska EPSCoR Outreach Manager Pips Veazey, co-organizer of the event. "It's a method that we think is an important one in looking at events that are affecting the entire globe, such as climate change."

Activities at the workshop included a "Visualization Exercise," in which attendees crowded into the University of Alaska Anchorage's new Planetarium and Visualization Theatre to witness a first-hand display of interactive SES models. Other facets of the event included keynote speakers and presentations of SES

research by Alaskans and by researchers from Iowa, Kansas, Maine, New Hampshire and Wyoming. Veazey said the presentations were indicative of the progress scientists have been making in SES study.

"The field has moved forward as a whole, and some projects are more robust and concrete, so people actually had results to talk about," she noted. "At the first meeting in 2009, people talked about what they were wanting to do, or hoping to do or planning to do."

One noteworthy result of the workshop was that the states and territories present resolved to form a national coalition for SES study. The coalition will link research from its various members and to improve communication between themselves and out to the larger community. Additionally, EPSCoRs in Maine and the Virgin Islands are making plans to hold their own nationwide SES workshops in the near future.

"EPSCoR jurisdictions as a whole are just thinking more about the fields of resilience and sustainability, and there's this kind of critical mass now of people who understand the field and are wanting to move forward," said Veazey. ✦

## Living on Earth '11

*Social-Ecological Systems Workshop*