

# field notes

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## Twice the TREC



2011 PolarTREC teacher, Susy Ellison, samples spruce trees for a dendrochronology study in Alaska's Arctic National Wildlife Refuge. All photos: Susy Ellison

Susy Ellison is the high school science teacher we all wish we'd had. With projects like designing and building an energy-efficient straw-bale classroom, installing solar panels on the school's roof, and building a greenhouse (and growing things in it), Ellison is infusing her students with a strong sense of what she calls environmental literacy. Now in her 15<sup>th</sup> year at Yampah Mountain High School in Glenwood Springs, Colorado, Ellison spent the summer with two teams of Alaskan researchers as a [PolarTREC teacher](#), so this year's class will, no doubt, be in for some fun and interesting science activities.

Ellison's love for Alaska goes back to graduate school when she spent time in Prudhoe Bay studying how arctic foxes interact with nesting shorebirds and small mammals. Her field experience served her well this year as she traveled to the Arctic National Wildlife Refuge for a six-day [NSF-funded tree-ring study](#) with Kevin Anchukaitis and Angie Allen (Lamont-Doherty Earth Observatory), and to the Raven Bluff Site for two weeks with Jeff Rasic (UAF/NPS), William Hedman (BLM), and Ian Buvit (Central Washington University) for a [NSF-supported study on early human settlement](#) in arctic Alaska.

For the tree-ring study, field team members spent their time extracting straw-sized cores from standing white spruce trees in five sites spread over a few miles; Anchukaitis will compare annual growth rings from these cores with samples taken from fallen trees. By analyzing the thickness of annual rings, they will reconstruct North Slope climate and ultimately determine controls on the extent of arctic forest growth.



Traveling light - Ellison and Allen congratulate themselves on hauling all their gear in one trip.

“The tree-ring study was really interesting. Many scientists think that with climate warming and more carbon dioxide in the atmosphere, trees might just grow and grow and grow, but new research says this may not be true. You can keep feeding someone, but it's not going to make them taller,” explains Ellison. “I was impressed with how pretty simple science can provide pretty big answers. There were only three of us and we were just out there. We travelled light and fast. It was fun!”

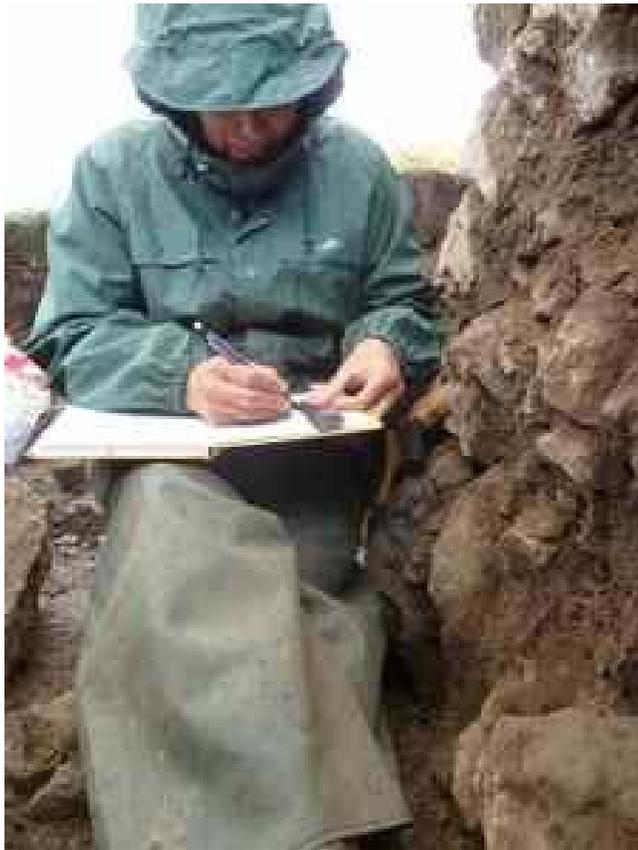
Following a 10-day break exploring the Kenai Peninsula, Ellison joined Jeff Rasic's team for a rainy and cool two week archaeological excavation near Kivalina. Despite the soggy weather, the group made the best of things and worked hard to maximize their field time. In addition to searching for artifacts in one-meter square pits started during the 2010 field season, Ellison participated in a soil survey and in reconnaissance flights wherein the group looked for new archaeological sites.



Dressing for success at the Raven Bluff site.

“We usually hear that the first people to North America came from Asia via the Bering Land Bridge and then headed south. The Raven site is about the same age, about 12,000 years old, as the Clovis culture sites farther south. At Raven we looked, in particular, for these fluted spear points so that they can be dated and compared to similar Clovis-age points. The idea is that people may have moved back and forth between Alaska and southern North America rather than unidirectionally,” says Ellison.

“The similarity in these projects is that we were looking at old stuff, attempting to get information that can be applied to the present and, perhaps, predict future changes in the Arctic,” Ellison says. “The scientists were so passionate about their studies and the field season in Alaska is so short – they had to get it done. Everyone worked really hard to complete the work required in the short time period.”



Ellison tries to stay dry while recording soil profile data.

Now that a new school year is underway, Ellison is thinking about ways to share her PolarTREC experiences with Yampah. So far, she's considering having students look at tree rings to determine Colorado's long-term fire history. She would also like to take a group backpacking in Utah to see some archaeological sites close to home while considering what clues they might leave behind for future archaeologists to find.

Ellison's school is run by the Mountain Board of Cooperative Educational Services, and serves students from four public school districts. The school serves as an alternative to students who have been unsuccessful in other area high schools for one reason or another.

"Teaching science at Yampah is very challenging," Ellison says. "Our classes are ungraded, which means that in one class I have students from all grades with all levels of science proficiency. I teach life, physical, and earth science so I have a lot of information to distill. Then, I put my own spin on it. I like to have an environmental focus with very hands-on projects. My experiences with PolarTREC have given me so many new ideas for how to communicate climate change issues and science research to all my students, regardless of their science background."—**Marcy Davis**

*PolarTREC (Polar Teachers and Researchers Exploring and Collaborating) is funded by the National Science Foundation's Office of Polar Programs and managed by the Arctic Research Consortium of the United States, or ARCUS. The program aims to give teachers professional development experiences conducting research in the polar regions with career scientists to boost the teachers' content knowledge and to give them hands-on experience in scientific inquiry. ARCUS is accepting applications through the end of September from teachers and researchers interested in participating in the PolarTREC program during the 2012-2013 research season. Visit the ARCUS PolarTREC website for more information: <http://www.polartrec.com/>*

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