

field notes

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Laura Lukes: Taking the Classroom to the Field



Laura Lukes, teacher and arctic adventurer! Photo: Laura Lukes

For science and geology teacher Laura Lukes, witnessing the moment a student's face lights up when a new discovery is made or a confounding problem is finally solved is one of the most rewarding moments of teaching. And this summer Lukes experienced those moments time and time again with an international group of two-dozen students at the Kangerlussuaq Field School in Greenland.

2011 marked the summer field school program's inaugural semester. For Lukes, it was the culmination of a year of hard work that began as an [Albert Einstein Distinguished Educator Fellow](#) at the [National Science Foundation's \(NSF\) Office of Polar Programs](#). While a fellow at NSF, she took the U.S. lead role on the Joint Science Education Project (JSEP). Her mission: to help organize a field school to bring together students and scientists from the U.S., Greenland and Denmark for hands-on scientific and cultural experiences.

"I really love the 'aha moments' where somebody finally understands something or learns something and it completely changes the way they feel," Lukes said. "To me those are the best moments and with programs like JSEP, you have those moments constantly."



The JSEP group puts their map-reading skills to the test. Photo by Hans Christian Sivertsen

Teaching Hands-on Science from Arizona to the Arctic

Before joining NSF, Lukes taught science and geology at a community college and high school in Scottsdale, Arizona where she first started coming up with ideas to take science from the textbook to the field. One of those initial ideas was a museum of minerals featuring displays tied to materials the high school students were studying in the classroom.

Lukes noticed there were several stock science samples from previous teachers collecting dust in storage. Since builders had just finished a new addition to the high school, Lukes had a bit of an “aha moment” herself. She and some students quickly got to work planning and building the mineral museum exhibits together.

“Although I’m no longer with the school, the long-term idea was for the students to help create rotating displays for the museum. It would be like a class project for them,” Lukes explained.

A Door to Teaching in the Arctic

After five years as a teacher in Scottsdale, Lukes applied for, and was awarded, the [Albert Einstein Distinguished Educator Fellowship](#) that started her on a path to the Arctic. The opportunity to develop the fledgling Greenland field school piqued her interest because she recognized the value of field research experience in a young person’s life and thought the JSEP field school could be a huge success.

“From talking with scientists over the years, I’ve informally figured out that a lot of them have had some sort of field or research experience themselves early on and that’s what got them interested in it [science/research],” Lukes said.

Over the course of the next year, Lukes teamed with other teachers and scientists to create a unique educational opportunity for high school students around the county and the world. Not only would her experiences in Greenland change the lives of the field school students, but it would open her eyes to a whole new world of interests.

On Their Way

A 2010 planning trip to Greenland was Lukes’ first time in the Arctic. Just figuring out what to pack was an eye-opening experience. By the time late June 2011 rolled around, Lukes and 24 high school students were boarding planes for the tiny settlement of Kangerlussuaq in western Greenland.



Laura Lukes (far right) and some of the field school students are all smiles.
Photo: Laura Lukes

Not Your Ordinary School Days

Lukes and her colleagues organized the field school so that the students would experience every step in the scientific process—from brain-storming project ideas and organizing data collection outings to analyzing data and presenting their findings. The students worked in research teams to get the feel for what it's like to collaborate with people from different countries, backgrounds and interests.

“The students came up with the idea for their own projects. The teacher really served as a guide for their own exploration, meaning I helped them stay focused and instructed them on how to do research properly. But the students really drove the questions and how they were going to collect data to answer them,” Lukes said.

Along the journey several scientists already in the area collecting data stopped by to teach the next generation of scientists a thing or two. Visiting scientists from various universities and agencies, including the Danish Meteorological Institute and the National Oceanic and Atmospheric Administration, presented their research and invited the field school participants out for data collection field trips or back to their field research site for a tour.



Research scientist Julia Bradley-Cook (a Fellow in an NSF-funded interdisciplinary, graduate research program in polar studies called IGERT) gives the JSEP students a lesson on how to measure carbon dioxide in soil. Photo: Taylor Estabrooks

Two unexpected visitors were a particular thrill for the Danish and Greenlandic students. A change in the day's flight schedule allowed the Danish minister of science and Greenland's minister of education to pay a visit to the field school. "They happened to be stuck in Kangerlussuaq for a while so they stopped by to hear the students' presentations! So the students really got a quality experience," Lukes said.



Surprise! Denmark's Minister of Science (left) stops by to listen to student presentations. Photo: Laura Lukes

Teaching (and Learning) More Than Science

The once-in-a-lifetime chance to bring students from three very different cultures together was a big part of the field school experience. Lukes and the students were in a camp-like setting for roughly four weeks.

“Personally for me, the most meaningful moments were talking with the Greenlandic students and having them start conversations about their culture and watching them get excited about talking about their culture,” Lukes said. She recalled them being very shy at first, but as time wore on they came out of their shells.

Now, Lukes still keeps in touch with many of her students. Two of the students from the U.S. recently started their first year of college and decided to choose engineering majors as a result of their experiences at the field school. Still other students are presenting their findings at professional conferences—the Geological Society of America and the American Geophysical Union—this fall and winter.

And what’s next for Lukes? The sky’s the limit. She is currently working on her doctorate at North Carolina State University in Raleigh. In between classes she still finds time to teach an online course at a community college in Arizona. She plans to remain involved and continue to grow the JSEP field school program now and in the future.

“Regardless of where I end up, I feel really passionate about student research experiences in the field and I really believe in developing this program and showing the evidence part of why these types of programs are so important.”

Here’s to great teachers!

To learn more about the Kangerlussuaq Field School and check out Lukes’ daily blog, visit: <http://www.polartrec.com/expeditions/greenland-education-tour-2011>. –Alicia Clarke

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