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Joint Science Education Project: Learning about polar science in Greenland

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The Joint Science Education Project (JSEP) is a successful summer science and culture opportunity in which students and teachers from the United States, Denmark, and Greenland come together to learn about the research conducted in Greenland and the logistics involved in supporting the research. They conduct experiments first-hand and participate in inquiry-based educational activities alongside scientists and graduate students at a variety of locations in and around Kangerlussuaq, Greenland, and on the top of the ice sheet at Summit Station.

The Joint Committee, a high-level forum involving the Greenlandic, Danish and U.S. governments, established the Joint Science Education Project in 2007, as a collaborative diplomatic effort during the International Polar Year to:
• Educate and inspire the next generation of polar scientists;
• Build strong networks of students and teachers among the three countries; and
• Provide an opportunity to practice language and communication skills

Since its inception, JSEP has had 82 student and 22 teacher participants and has involved numerous scientists and field researchers. The JSEP format has evolved over the years into its current state, which consists of two field-based subprograms on site in Greenland: the Greenland-led Kangerlussuaq Science Field School and the U.S.-led Arctic Science Education Week. All travel, transportation, accommodations, and meals are provided to the participants at no cost.

During the 2013 Kangerlussuaq Science Field School, students and teachers gathered data in a biodiversity study, created and set geo- and EarthCaches, calculated glacial discharge at a melt-water stream and river, examined microbes and tested for chemical differences in a variety of lakes, measured ablation at the edge of the Greenland Ice Sheet, and learned about fossils, plants, animals, minerals and rocks of Greenland. In addition, the students planned and led cultural nights, sharing food, games, stories, and traditions of their states, regions, and countries with one another.

A subset of the Field School students continue their polar science exploration by traveling to and experiencing science at the top of the Greenlandic ice sheet, as participants in Arctic Science Education Week. They launched weather balloons, took measurements of reflectivity to learn more about albedo, studied glaciers and ice sheets and created hands-on models to study their flow, shadowed the Summit science technicians on their rounds, practiced taking clean snow samples, examined a back-lit snow pit to observe the differences between seasonal snows and ice formation, and assisted researchers by taking samples from the snow pit for isotope analysis.

Lastly, I will share one group multi- and interdisciplinary activity used at JSEP which illustrates how to combine mathematics and science with global studies. As noted in the Mathematics of Planet Earth 2013 initiative: "The challenges facing our planet and our civilization are multidisciplinary and multifaceted, and the mathematical sciences play a central role in the scientific effort to understand and to deal with these challenges." In particular, this group activity uses mathematical modeling and data representation to spark a discussion of civic engagement and to raise awareness that the polar regions are critically important to the global system.