A Model for Student-Driven Research in the Polar Regions: Partnering International High School Students with Graduate Students and Stem Educators

Erica Wallstrom\(^1,2,3\), Lauren E. Culler\(^3,4\), Ross A. Virginia\(^3,4\)

\(^1\)Rutland High School, 22 Stratton Rd, Rutland, VT 05701

\(^2\)The Rowland Foundation, 34 West River Street, South Londonderry, VT 05155

\(^3\)Institute of Arctic Studies, Dickey Center for International Understanding, Dartmouth College, Hanover, NH 03755

\(^4\)Environmental Studies Program, Dartmouth College, Hanover, NH 03755;

The Joint Science Education Project (JSEP) is a three week experiential field-based learning opportunity in Kangerlussuaq and Summit, Greenland. This collaborative program brings together a diverse team of high school students, STEM educators, and polar scientists from the U.S., Denmark, and Greenland. The curriculum focuses on providing high school students with authentic field experiences through direct interactions with current polar scientists as well as through their own independent research projects. This experiential learning approach successfully engages students in STEM research while exposing them to the importance of polar science. While the entire program helps foster interest in the geosciences, this talk will focus on the benefits of student-driven research projects. The success and rigor of these independent projects results from the collaborative framework established between secondary STEM teachers and Dartmouth College polar researchers. This unique partnership, focused on student learning, supports both educational and scientific best practices. JSEP high school students are paired with Ph.D. student mentors based on the students’ interests and the graduate students’ fields of expertise. These groups work together to develop reasonable, testable questions and appropriate methods. The mentors also go into the field with the students and provide follow up technical support as questions arise. The STEM educators support the students with their data analysis and creation of presentations and outreach products. The creative and deliberate design of this program strengthens the communication skills of early career scientists while engaging the next generation of polar scientists in legitimate and original field experiences. Beyond producing tangible products such as research videos, both the Ph.D. and high school students develop mutually beneficial relationships that continue beyond the duration of the program. Participants will leave this session with an understanding of the JSEP framework for student-driven research, an appreciation for including polar topics in the secondary classroom, evidence of benefits to graduate students, and ideas for implementing collaborative programs between scientists and educators.