

Teacher-Researcher Networking Plan High Arctic Change 2014

Peggy McNeal, Los Coches Creek Middle School- teacher
Dr. Ross Powell, University of Northern Illinois- researcher
Dr. Julie Brigham-Grette, Univ. of Mass., Amherst- researcher

1. How will you communicate with the team before the field expedition?
 - Email will continue as the primary method of communication
 - Phone discussion between Peggy and Dr. Brigham-Grette during the pre-field logistics call. Other phone calls as needed.
 - Peggy also met Dr. Brigham-Grette at the PolarTREC Orientation and Sharefair and discussed items then.
2. Are there team or project conference calls or other preparatory activities that the teacher can participate in?
 - Dr. Brigham-Grette is sending out emails to the entire REU group with logistical and necessary information.
 - Peggy is soliciting (via email) information from the REU students to include as a “Meet the Team” journal entry and a way for students to get to know each other.
 - The group will meet prior to embarking on travel and undergo safety training in Longyearbyen prior to heading to Ny-Alesund.
 - Peggy is working on a connection between the Naval Oceanographic Office and the research team to facilitate the use of data and interaction with Navy science personnel
3. Are there ways you can collaborate before the expedition to inform the public, media and other schools about the upcoming expedition?
 - We are planning a Skype session with Dr. Brigham-Grette, Dr. Powell and Peggy’s students.
 - Peggy will write a pre-departure newspaper article to accompany a media release.
4. What background scientific information is essential for the field research? What journals, books or other materials will the teacher use to learn this content?
 - Dr. Powell provided Peggy with two published papers resulting from work completed on prior expeditions.
 - Participation in PEI’s master class “Slip, Sliding Away” and discussion.
 - While in Longyearbyen the group will receive introductory lectures about regional geography, climate and project objectives.
5. What useful educational tools can you provide to the researcher?
 - Peggy is developing classroom lessons based on *Environmental Literacy and Inquiry* sponsored by the Lehigh Environmental Initiative.

- Peggy is planning outreach activities with groups and classes based on *Class Zero Emissions, Climate Change Experiments* by the International Polar Foundation.
6. How can you be an effective assistant to the scientific efforts in real time?
 - Assist in mobilizing and demobilizing the boat for work each day
 - Operate one of the boats the students use for their sampling
 - Ensure boat safety for the students while operating
 - Assist students in sampling from the boat where appropriate
 - Assist students where needed in instrumentation preparation and maintenance, data downloading and sample preparation/processing in the field lab and in archiving samples for return shipping
 - Assist in general up-keep of lab facilities
 7. What science topics or issues would you like to discuss as a team while in the field?
 - How do tidewater glaciers work? What controls their stability?
 - What controls their calving and melting rates?
 - What are the effects of warming air and/or water temperatures?
 - What are the effects of sediment flux and buildup at the terminus?
 - What are the current conditions specifically in Kongsfjord that relate to current and future glacier behavior?
 - Where does the sediment come from and at what rates?
 - How is the sediment dispersed in the fjord and by what processes?
 - What proxies do the sediments contain to infer past ice behavior?
 - How does the data that we collect on the Svalbard glaciers fit into the overall pattern of climate change?
 - How can this be used to communicate climate change to the public and students?
 8. The timeframe for data collection and intense fieldwork may shorten time for additional conversations about Education and Outreach. How will you revisit your thoughts and ideas effectively?
 - The priority will be data collection and fieldwork. Peggy has talked with Dr. Brigham-Grette about how education and outreach was handled in the past with previous PolarTREC teachers, specifically Mark Goldner. He used some of the time that the REU students were using for data analysis and working on their specific research projects to write his journals and work on outreach. Hopefully, the same type of routine, balancing fieldwork and outreach will be productive. If not, then the additional conversations will have to wait until return. Because of time constraints, some of the post trip data analysis that usually takes place the week after return, will have to happen in the fall, so any education/outreach connected to that aspect will have to wait until then as well. This can be

accomplished through continued collaboration via email, phone and possibly Skype.

- Additionally, videoconferences can be held at night while in the field using Norsk Polar facilities. This will help to keep people engaged.
9. Can you identify unique aspects of the fieldwork that will engage students and the public?
 - A unique aspect of this particular expedition is that it is an REU program. The research team consists of undergraduate college students that aren't that much older than Peggy's current students. This will help her students connect to the expedition and potentially see themselves in this type of role in the near future. It will also help connect the undergraduate students that she will be teaching in the fall.
 - Some aspects of the fieldwork are fairly concrete and easy to grasp by the public. For example, analysis of a sediment core looks at rates of sediment deposition in the fjord and its composition. That is easy to understand and model with simple activities. Participants can understand how proxies can be used to interpret the past behavior of the glaciers and paleoclimate. It is important for the public to understand how scientists figure this out and how this type of research fits into the bigger picture of climate change.
 10. What skills as an educator can you offer the researcher?
 - A better understanding of K-12 science education to strengthen outreach and dissemination of the research.
 - General science communication
 - An NSTA publication article about the research and how it can be incorporated into classrooms. An NPR podcast would also be an excellent way to communicate the science involved in this expedition.
 11. What specific aspects of post-fieldwork are you interested in for follow-up?
 - As a teacher pursuing graduate education and science education research, Peggy's personal research interests involve using physical models to teach climate science to K-12 teachers. She is interested in taking aspects of post-fieldwork and developing lessons for pre-service teachers that model how the cryosphere is an integral part of the global climate system and how it influences surface energy, moisture fluxes and atmospheric and oceanic circulation.
 12. How will you collaborate to write and review lesson plans after the expedition? How will you regularly communicate outreach, teaching and research updates with one another in the future?
 - Email, phone calls and Skype are all possible methods of communication. Peggy will be in Kalamazoo, Michigan, which is

close to Northern Illinois University and Dr. Powell's location so in person collaboration and a classroom visit are possibilities.

13. How can you complement your lesson plans with an educational tool that is useful to your researchers?
 - Creation of a template for school visits and public events. Another idea is to make a podcast available on the REU website.
14. ARCUS provides some funding to support travel before and/or after the expedition to support collaboration between teacher and research team. What ideas do you have for utilizing this support?
 - In person collaboration to develop lessons that incorporate post-field work into lessons for pre-service teachers and K-12 students
 - Meet at the Geological Society of America and American Geophysical Union conferences and present in the education section. Sessions run by REU projects would also be relevant.
 - Participation in the annual International Arctic Workshop along with the REU students.
 - Potentially presenting at a polar science workshop at an NSTA conference
 - Continuing to network through PolarTREC and PEI
 - Continued collaboration at STEM events, science fairs, etc. in the Michigan/Illinois area between Peggy and Dr. Powell.