Post Fellowship Reporting - Project Summary

Report Title:	Yellowstone National Park: Combining the Sciences	**Name:**	Carrie Clark
Other Team Members:			
Program:	Oklahoma Program		
Trip Dates:	11/30/-0001 - 11/30/-0001	**Location Visited:**	Yellowstone National Park, Wyoming

Post Fellowship Reporting Template: PFR Template 02

Project Summary: With my Yellowstone Fellowship, I became a teacher/researcher and was able to learn better methods for connecting the physical, earth and life science in my lessons to the science found in the abundant diversity of Yellowstone National Park, Wyoming. During my trip, I was able to try out the scientific method in field research and had many opportunities to answer authentic and spontaneous questions using technology and logic.

At our school, we have access to a hand held computer interface called a LabQuest, as well as data probes. My goal was to use the LabQuest in Yellowstone's environment, and to bring my experience back to inspire and educate students and teachers to use the LabQuest regularly. I am in the process of selecting and training a special leader group of students, so together we can help as many science classrooms use this valuable and multifaceted equipment to collect first-hand data in experiments.

I was able to kayak Lake Yellowstone, cruise along the Grand Canyon of Yellowstone, hike challenging trails in the Upper and Lower Geyser Basins all while collecting water pH, water temperature, Global Coordinates, and taking rubbings of rocks and minerals. I got to collect audio and visual evidence of animals in the wild that I had only read about in books or seen in a zoo, including three bald eagles!

Some discoveries I made helped answer key questions in my proposal. One of my questions was whether you could feel the warmth of the hotspot beneath Yellowstone through the ground. I learned by observation around the park that the warmth does come through, but those places quickly become vents, geysers or mud pots.

I discovered that the LabQuests are energy eaters, and when you do field research to come prepared with battery backup plans. For classroom use, it will be perfect though. There are lots of excellent and easy to do labs that are programmed right into each handheld and in most cases, students can guide themselves.

Near the thermal features, the pH of the water is most likely acidic. You can really smell the sulfur and at the mud pots, you can observe how the sulfuric acid from well below the surface has worn away and melted the surface rocks. I was able to take various samples of water from the Firehole River, both above and below where many geysers and pools emptied into the river. What I observed is a lower pH just below where the thermal water empties. This seems to support the idea that the thermal areas tend to be acidic.

Career Impact: In Yellowstone, I challenged myself to climb, hike and paddle to locations to collect observations of life or water or rock data. I felt like I trained hard for the expedition, but once I got there, I soon realized that I hadn't trained hard enough. Many times I was scared, tired or just didn't know if I could do it. But each time, I saw that I could do it, that I'm a strong person and that I can rise to the challenge. I knew that this experience at Yellowstone was a once in a lifetime trip and I would look back. I wanted to be proud of myself for giving extra effort to complete this marvelous challenge. Those times in Yellowstone were some of the deepest and most rewarding moments of my life.

I feel a renewed sense of connection to the ideas of being a teacher/researcher, one who reflects and stays current on science and on how students learn and process information. I loved the challenge of designing and experiencing my own professional development, and as it turns out, my personal development too.

Classroom/Community Impact: There will soon be a student group who will receive training on the Labquest and they in turn can help teachers throughout the building when they want to use the Labquest. Students can troubleshoot the technology, leaving the teacher free to teach and monitor learning.

Originally, I thought I would want to hold mini sessions in my class, but I think instead that I will film my own students working on projects using the LabQuest and attach notes to the video clips. That way, the information can be shared with other teachers outside

my school, or in case a teacher wants to revisit ideas.

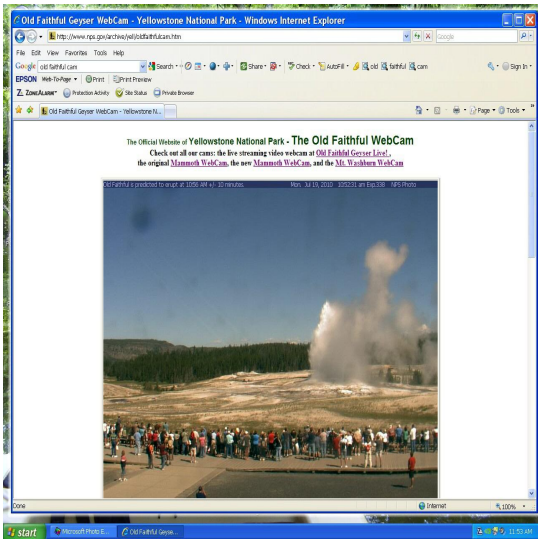
One other way of helping is to ask my principal if he could pay for a substitute for an hour or two, and let me travel to other teachers' classrooms to set up the experiments using the LabQuest and then to teach a couple of classes for them. The teacher can make notes and observations, ask questions, and watch my classroom management when using the handsets. Then, if he or she feels comfortable enough, I'll turn over the instruction to them and just stand by or let them do their thing. I think this will be most effective in increasing LabQuest usage by science teachers and students.

Open Response: *Selection of students for technology leadership
*Filming student groups at work on the LabQuest
*Teaching about the chemistry, life and land of Yellowstone
*Applying for local grant to purchase different probes
*Continuing my path as a teacher/researcher by comparing my results in Yellowstone with other rivers, streams and lakes, and ecosystems.
*Working with principal to find ways to assist teachers in the classroom.
*Developing a few video clips to help teachers become teacher/researchers and to help them use LabQuests in the classroom.

Quote: It was exhilarating to finally get to be an honest to goodness teacher/researcher, and to develop the skills to continue on that path for a long time to come.

Photos:

Trekking across the Continental Divide in Yellowstone

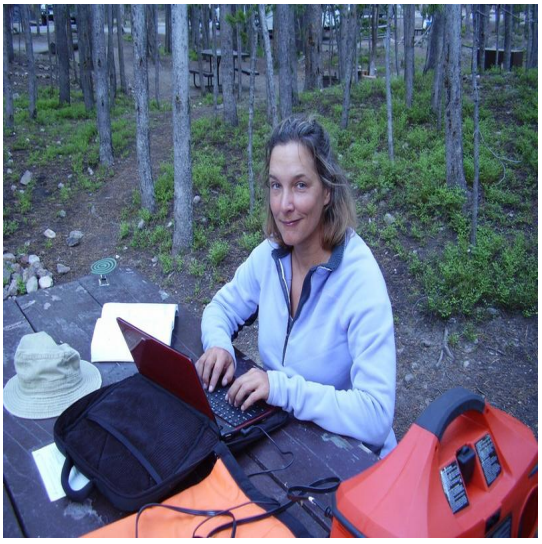


If you look closely, you'll see me on the walkway with my Fund For Teachers bag

Watching the wonder of Old Faithful

One way to collect data is by making a rubbing or by sketching

Using the LabQuest to record temperature at the Grand Prismatic Spring



Taking time to do some research and upload data

We kayaked to a remote location along Yellowstone's shoreline

Collecting pH and temperature readings of Solution Creek