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Stoney Creek teacher returns from polar research experience

By Mary Beth Almond



Eric Thuma stands on the McMurdo Ice Sheet, preparing to extract a seismometer. (Photo provided by Dr. Doug MacAyeal)

Posted March 8, 2017

ROCHESTER/ROCHESTER HILLS/OAKLAND TOWNSHIP — Eric Thuma, a physics teacher at Stoney Creek High School, recently spent three weeks in Antarctica assisting in scientific polar research.

Thuma was one of 12 teachers selected from about 200 who applied in a nationwide search for educators to participate in a polar research project through PolarTREC — Teachers and Researchers Exploring and Collaborating. PolarTREC, according to its website, is an educational research experience in which K-12 teachers participate in polar research, working closely with scientists as a pathway to improving science education. The program — administered by the nonprofit Arctic Research Consortium of the United States and primarily funded by the National Science Foundation — was first administered in 2004.

“Our goal is to invigorate polar science education and understanding by bringing educators and polar researchers together,” Janet Warburton, ARCUS project manager and principal investigator for PolarTREC, said in an email. “Our program places teachers with scientists that work in the Arctic and Antarctic for three- to six-week hands-on, field-based experiences. While in the field with the scientists, teachers learn about the polar regions, as well as a variety of science disciplines. Our objective is for the teachers to learn more

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teacher. After the science, they transfer it back to their classroom and improve their teaching with their students.

"They also develop long-term professional relationships between the education and research communities. For many teachers, the experience is not short term, but rather long term, as they incorporate their new knowledge into their careers," Warburton said in an email.

Thuma, 46, of St. Clair Shores, joined researcher Dr. Jim Madsen, from the University of Wisconsin — River Falls, from Dec. 30, 2016, to Jan. 24, 2017, at the United States McMurdo Station in Antarctica.

"The neat thing about McMurdo Station is there are scientists from all over the world there studying very different things. I'd be in the galley and I'd run into someone and start chatting, and they would be studying seal diving patterns. Then I would sit down and start talking with someone else who was an astrophysicist studying neutrinos, or I'd talk to a climatologist, or a person who is working on the stability of the ice sheet. Every day, there was something new to learn from some of the best scientists in the world and their particular discipline," Thuma said.

The team worked on the Antarctic Neutron Monitors for Solar Study, the longest continuously running experiment in Antarctica, dating back to 1961.

During the trip, Thuma helped dismantle two neutron monitors. Neutron monitors, he explained, are used to study cosmic rays and, indirectly, the sun, which occasionally undergoes solar storms that produce bursts of energetic particles that can disrupt satellites and power grids.

"A lot of it is fundamental research. We are just trying to understand how the sun works," Thuma said of the project. "But cosmic rays do have some very practical effects. If you get solar flares or coronal mass ejections, there is a lot of activity that the sun can produce. And if they sense too much of this cosmic radiation toward the Earth, then it can cause satellites to malfunction, problems with the power grid, problems with electronics, and so forth. So, long term, it would be nice if they had a way of using cosmic ray data to predict when this kind of thing was going to happen, and that would help to protect our electronics and infrastructure."

As part of the project, the neutron monitors were dismantled and repaired, and they will soon be moved from McMurdo Station to the Korean Antarctic base, Jang Bogo, where they will continue operation. They will join another neutron monitor station, formerly at McMurdo, that was redeployed at Jang Bogo in December 2015.

During the expedition, Thuma shared his experiences with his students via a daily blog and through live webcasts directly from the field.

"The students wanted to hear all about it, so it was a good way to motivate some of the discussion that we had about particle physics. They were also interested in the wildlife and what the weather was like and the fact that I had 24 hours of daylight — they were astounded by that," Thuma said. "It was just a good way to talk about a lot of different topics, and it also generated a lot of interest in science and engineering. We tend to think of scientists as working in a stuffy lab somewhere, when it turns out there are a lot of different scientists that go to exciting places, and there is a certain degree of exploration involved in scientific endeavors, which is something they hadn't really thought of."

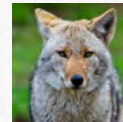
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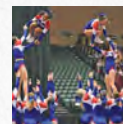


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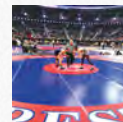


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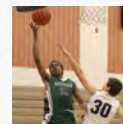
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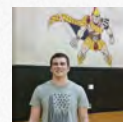
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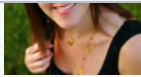
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