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Parishville Hopkinton teacher reports On Antarctica trip

By ALISHA REXFORD
PUBLISHED: TUESDAY, DECEMBER 16, 2014 AT 12:30 AM

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EDITOR'S NOTE- Glenn W. Clark embarked on two-month long scientific adventure to Antarctica with a team of scientists in January to explore the effects of climate change on the region.

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A year later, the Parishville-Hopkinton Central High School science teacher continues to share his experiences.

The veteran teacher has taught at Parishville-Hopkinton for nearly 30 years as a wilderness studies and biology teacher.

Before beginning his teaching career, he spent four years as a park and assistant forest ranger in the Adirondack Mountains of Northern New York.

In 2013, he was one of 17 teachers selected nationally to participate in the PolarTREC (Teachers and Researchers Exploring and Collaborating) program's Antarctic Research Consortium's 2013-2014 research trip that was fully funded by National Science Foundation.

His contribution to the project was to work side by side with the scientists and crew in all capacities in order to disseminate the information back to the general public about the research and expedition life.

Mr. Clark has spent the past year in the post stages of the program doing a three-part presentation at various schools, universities and other venues; including Colton-Pierrepont Central School, Potsdam High School, F S Banford Elementary, Evans Mills Elementary, Philidalpha Primary, St. Lawrence University's Biology Department, Scotia-Glenville Travelling Museum, Parishville-Hopkinton Central School, and the STANYS in Rochester.

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He also has upcoming visits in the works for 2015 at Clarkson University, SUNY Potsdam, S.O.A.R. Program, and the Adirondack Mt. Club.

Mr. Clark said that he wishes he could do more but because of his full-time teaching schedule it is difficult to coordinate times that work for both parties.

This is part one of a series following his themes of science, expedition life and findings.

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PARISHVILLE - Glenn W. Clark spent 47 days out at sea off the Sabrina Coast of Eastern Antarctica a year ago on an interdisciplinary science expedition studying the effects of warming sea and land temperatures.

The research crew consisted of 26 members, including Mr. Clark, from a variety of backgrounds in academia ranging from teachers and professors to undergraduate and graduate students and scientists from various governmental agencies around the world.

The reconnaissance trip was the first of its kind to explore the uncharted Totton and Mertz glacier systems. It included a group of scientists from three disciplines: geophysics, marine geology and physical oceanography.

Mr. Clark describes geophysics as the study of Earth through its physical properties. When describing the research, he references the devices used to gather data.

"They have these special machines called seismic streamers that shoot sound waves that bounce back and are picked up by another wire to determine what the bottom of the ocean floor looks like," he said. "It's a lot like going from one dimensional glasses to three dimensional glasses."

He also explains how he and a crew of marine geologists gathered and analyzed samples of different sediments, rocks, and other images from the sea floor.

"There's this machine called a 'jumbo piston core' which mines the bottom of the ocean floor with several different devices to collect sediments and rock samples," he said.

The physical oceanography portion of the trip tested the ocean water at varying depths for its abiotic factors- temperatures, currents, salinity, and oxygen concentration. Mr. Clark explains how they used a mooring device and various conductivity, temperature, and depth measurements (CTD) to gather samples and collect data to analyze later.

"The Totton Glacier region has a potential 6.9 meter (nearly 23 feet) increase in ocean levels. This amount is greater than that of all West Antarctica," he writes in an abstract, written after his trip.

In Mr. Clark's segment on initial scientific findings, he notes that the ocean's current temperatures have unexpectedly increased not only at the surface but far below it, having a negative effect to the stability of the ice sheet.

Initially the physical oceanographers, geologists, and seismologists believed that the remote Eastern section of the southern sphere was impervious to ice loss. However, due to more recent data those hypotheses have been disproven.

Prior to the research trip, there was no water temperature data for the entire eastern sector of the Antarctic. Today the changing global climate impacts on the region means warmer temperatures contribute to declining penguin populations, decreasing sea ice, rising sea levels, small vascular plants like Antarctic pearlwort and hair grass appearing, and continental ice sheets melting at increasing rates.

"The evidence for Global Warming is undeniable. This is happening, what's important is our ability to adapt to these changes," Mr. Clark said when discussing the eroding glacial system in Antarctica.

More information concerning the scientific findings from data collected on Mr. Clark's 2014 excursion to Eastern Antarctica will be available after the annual American Geophysical Union (AGU) Fall Meeting this week in San Francisco.

The presentation will include an interdisciplinary collaboration of geophysics, marine geology, and physical oceanography in their efforts to answer the following questions the excursion had set out to study:

- What are the characteristics of the ocean floor in terms of topography and geology?
- How much water from sub glacial lakes as well as their sites of discharge, and how will it increase the release of the east Antarctic ice sheet?
- How do changing ocean currents, temperatures and salinity weaken ice sheets by sub glacial infiltration?