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NIU professors from suburbs studying what's beneath Antarctic ice shelf

By Susan Sarkauskas

What's in the water deep below the ice in West Antarctica? And will it help scientists figure out how the ice shelf moves and melts, and how it relates to the theory of global warming?

Five people from [Northern Illinois University](#) — two professors, a doctoral student, a research associate and an undergraduate — will help find out this winter.

They are part of 40-person expedition to the site of Lake Whillans, where a large drill will use hot water to make a hole about 2,500 feet deep. Samples of water will then be taken from the lake, as well as core drillings from the ice.

Sounds simple enough. But the logistics are quite daunting, as one can't simply truck equipment and people in and out willy-nilly.

"It's a big planning job," said Ross Powell of Elburn, a lead investigator on the WISSARD: [Whillans Ice Stream Subglacial Access Research Drilling](#) project.

The three weeks of actual scientific collection in January are preceded by two months of prep work.

Ross departed earlier this month, along with doctoral student Timothy Hodson of Champaign and research associate John Winans, a computer expert, of Glen Ellyn. They will be joined in December by fellow NIU professor Reed Scherer of Elburn, and undergraduate Brian Guthrie of St. Charles. Crystal Lake elementary schoolteacher Becky Trummel, an adjunct instructor at NIU, will also join them, in late November.

The purpose

Until about 50 years ago, it was assumed that Antarctica was just an ice block resting on bedrock. But scientists have discovered that there are hundreds of lakes and rivers underneath its two ice shelves.

The \$10 million multiyear WISSARD program, funded by the National Science Foundation, is studying ice-sheet stability. Sub-ice water and sediment control how fast the ice flows into the Southern Ocean, according to Powell. When ice enters the ocean, it can melt, raising sea levels.

Scherer and Powell are professors in the geology and environmental geosciences department at NIU but specialize in different areas. Powell specializes in climate change and sedimentology, Scherer in micropaleontology and biostratigraphy.

Scherer is interested in what may be living, or did live, in the lake. If there are organisms, how do they survive without oxygen and light? Do they eat each other?

The scout work

Finding this out is quite the engineering and logistical feat, given the climate of Antarctica.

There's a short window of time to be out at Lake Whillans, during the austral summer. That's when temperatures rise to a balmy 5 degrees, and airplanes can land at the site.

It's why Powell, Winans and Hodson left so early. They were to fly to Christchurch, New Zealand, to pick up mandatory cold-weather outerwear from the U.S. Antarctic Program, and review safety and environmental precautions.

The group then flew to McMurdo Station, a coastal outpost on the continent. There, they and other members of the 40-person WISSARD team, plus contractors from Lockheed-Martin, will spend a month unloading 40-foot and 20-foot shipping containers full of scientific equipment, testing it to make sure it arrived safely and repacking it for a trip over the ice. They already tested the drill this summer at Lake Tahoe, the second-deepest lake in the United States, to make sure it could reach as deep as they want.

The equipment will be moved on 15 sleds by seven ski-equipped tractors 600 miles to the Lake Whillans site, a trip that will take about two weeks. During that time, Powell said he may fly back to New Zealand, to visit family there during the Christmas holiday.

Then the team will hop a C130 out of McMurdo to get to Lake Whillans for three weeks of research. "It's full-on," Powell said, with teams working around the clock. "It is pretty full focus."

That includes Trummel. Her job title is "embedded educator." She will be blogging about her experience at scienceroadshow.wordpress.com, sending emails and conducting video conferences with students while she is at McMurdo Station. Once she is out on the ice, she'll be the "eyes and ears of the scientists," documenting what goes on. However, she won't be able to communicate with students unless she can send her materials back to McMurdo — and that's if planes can fly in and out of the field station during the camp.

It will be Trummel's third trip to the Antarctic.

Attendees will have satellite telephones, and one of the Lockheed-Martin contractors is a field medic. The scientific equipment will be kept in heated insulated containers. One of the containers will serve as the mess hall.

Sleeping quarters, however, consist of a one-person tent and two extreme-rated down sleeping bags, one inside the other. Body heat keeps the tent warm enough, but "crawling out of that bag into the cold" is a psychologically tough matter, Powell said, laughing.

He's used to it, however. This is his 14th trip to Antarctica in the last 40 years, and he has also spent time in the Arctic. "Your body does adapt and you get used to the cold," he said, noting that when temperatures rise above freezing at McMurdo Station, people walk around in shorts.

The team will return to the United States in February, after schlepping everything, including waste, back from Lake Whillans to McMurdo.

Back home

Powell will miss his wife and two children. He will be able to call and email them when he is at McMurdo, but he will not have Internet access at Lake Whillans. "There aren't a lot of satellites going over the Poles," Powell said.

“She is a good sport about it,” Powell said of his wife. But the absence is getting more difficult for his children, who are now in high school. When they were younger, their sense of time wasn’t as keen, and they were more preoccupied with themselves, he said.

“The kids don’t like the thought of me being away for four months,” he said.