

Researchers head to coldest place on earth for global warming insight

November 22 2012, by Ted Gregory

Reed Scherer has heard the question: Why in the world does he devote his career to studying Antarctica, the coldest, windiest place on earth, a place that is 98 percent solid ice? Even his wife jokes that he could pursue his research in the Caribbean.

The Northern Illinois University professor's answer is simple. Almost imperceptible geographic and climate blips over the rest of the globe are exaggerated in Antarctica. It's a phenomenon known as polar amplification.

"The reason is obvious to me, anyway," Scherer said one sunny afternoon in his third-floor office in DeKalb, Ill., outside Chicago. "If you want to know how the world is changing on a global basis ... you go to the end member."

That's where he'll be Friday, at the end member that, in a way, also is a place of origins. He and NIU colleague Ross Powell, another distinguished Polar scientist, will meet in the Antarctic. Joining them are a Ph.D. student and a senior geology major from NIU, a research associate in the university's computer science department and a fourth-grade teacher from Crystal Lake.

For almost a month, the group will sleep in tents and toil for up to 15 hours a day in converted [shipping containers](#). Temperatures hover around 5 degrees Fahrenheit and 90 mph winds create massive snowdrifts and whiteouts. The reason for enduring that misery would

seem to be a contradiction. Their work will provide crucial insight into global warming.

The NIU professors are researchers in a key part of a \$10 million National Science Foundation project known as WISSARD, for Whillans Ice Stream Subglacial Access Research Drilling. It's a long-winded phrase for an effort aimed at studying ice sheet stability and subglacial life in [West Antarctica](#).

That's an important region for [climate change](#). Scientific evidence indicates that relatively recent instability in the [Antarctic ice sheet](#), which covers the land, is raising sea levels.

The NIU crew, among other tasks, is gathering data from subglacial Lake Whillans that will help understand the ice sheet's instability and lead to forecasting Antarctic ice activity. Those are fundamental factors in climate change.

Scherer, whose geological research specialty is micropaleontology - the study of microscopic fossils - also is taking samples from the lake he hopes will yield evidence of organisms that never have been seen.

"You always hope that there's some eureka moment," Scherer said, "but you never know what you'll find."

Powell's emphasis is sedimentology. In an email from the Antarctic, he called the sediments "libraries, and I try to read their books - detective mysteries - trying to find out who did it, how and why."

Studying the sediments can be significant in determining ice stability and how fast it responds to global warming and raises sea levels, Powell said.

Powell left home Nov. 1 and, like him, most of the others will remain in

the Antarctic until mid-February. As substantive as the work is, how it is being done may be nearly as fascinating. And daunting.

It starts at McMurdo Station, the logistics hub of the National Science Foundation Antarctic Program.

Established in 1955 on bare volcanic rock at the spot that is farthest south and still reachable by ship, McMurdo consists of about 85 structures, including dormitories, administrative buildings, power and water distillation plants, stores and a laboratory. Scherer likens it to a polar version of a 19th-century mining town.

While the researchers undergo survival training - known in the vernacular as "Happy Camper School" - and perform other preliminaries, a crew using giant Caterpillar tractors will haul equipment and supplies 570 miles to a site on the Ross ice shelf.

Researchers will arrive at camp via airplane about the first of the year and begin work. NIU, which has been sending scholars to the Antarctic since the early 1960s, is one of 10 universities in the project. In all, about 40 people are in the current group.

The heart of the research gets started after a \$3 million drill fitted with a hot water dispenser bores a 30-centimeter hole nearly 2,500 feet to subglacial Lake Whillans. Sophisticated instruments, gauges and other gadgets will be stacked in or near the hole.

As water, sediment and other material are pulled up, microbiological and particulate samples, among others, will be collected. Researchers also will record data in a number of areas, including water clarity, temperature and salt content.

It's crucial that the devices function properly but do not contaminate the

material taken from the subglacial lake or the environment. Researchers must use hydrogen peroxide and ultraviolet light to clean equipment and maintain the pristine conditions.

All of that work is unfolding against extremely cold and erratic weather where the sun never sets. The harsh conditions complicate how the equipment functions and test the composure of virtually everyone involved. Both are major concerns, Scherer and Powell said.

Portable toilets will be available but showers may not be. In addition to those rustic accommodations and wind chill that can reach -40 Fahrenheit, they will be dealing with the pressure of planning the expedition for months or years and facing a fairly short time to accomplish a great deal of complicated research.

The temptation, reinforced by difficulty sleeping in continuous sunlight, is to work until one drops, Scherer said. That tendency manifests itself in a zombielike bearing veterans call "McMurdo Sleep Eye." It is a main reason managers of the project try to impose workday limits.

Still, the excitement is such that researchers often work long hours six days a week, said Betty Trummel, who teaches at Husmann Elementary School in Crystal Lake. Trummel will arrive in McMurdo on Nov. 30, her third trip to the Antarctic as an education outreach coordinator.

"I want to make sure I hit all the targets that I'm setting up," Trummel said on her last day of classes at Husmann on Nov. 13. Her job includes working with researchers, chronicling their endeavors and spreading the word about those efforts.

"I really enjoy being the eyes and ears of the scientists and conveying what they're doing to the general public," said Trummel, who will be blogging about the experience at scienceroadshow.wordpress.com.

"Every way we can get the word out there is really important."

NIU computer science research associate John Winans, of Glen Ellyn, arrived at McMurdo on Nov. 5 and is responsible for developing software to record and display the data in real time and archive it. Like Trummel, he's nervous.

"What keeps me awake at night (in addition to the never-setting sun) is the constant reviewing of which could go awry and the planning of how to avoid and/or react to it," Winans said in an email.

"Antarctica is a very cold place with zero humidity. Computers and electronics do not favorably welcome the resulting static electricity. I'd hate to find out that we lost even one bit of scientific data because I overlooked something."

Ph.D. student Timothy Hodson and senior geology major Brian Guthrie complete the NIU contingent. Guthrie, 23, of St. Charles, said researchers "needed an extra pair of hands" and asked if he wanted to go months ago.

"I said, 'of course,' in a heartbeat," the mohawk-sporting Guthrie recalled standing outside Davis Hall on campus. "I just want to experience everything I can and go everywhere I can go. I don't want to pass up on something like this."

He is, however, going to buy additional long-sleeve Under Armour, thicker gloves, socks and ear protection, he said.

"The picture I get in my head," Guthrie said, "is very bright, very white and nothing around for miles."

Powell, on his 14th trip to the Antarctic - in addition to more than 30

campaigns to the Arctic - acknowledged it is an extremely difficult place to live and work.

Scherer said it's not his favorite place to visit and that he's doing it to gain "a handle on these issues with the long view" for generations.

But Powell used the same word as Trummel to describe Antarctica's allure: unique.

"And it really reminds you of where humans sit in the natural system," Powell said. "If everyone got exposed to the magnitude and power of nature like this, then there would be many different attitudes to how we could better live our lives."

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