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Science Secrets under the Ice

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Lora Koenig '99 participated as part of a team of scientists collecting data in Antarctica about Earth's climate history. She is shown here processing an ice core for safe shipment to a lab for analysis during a recent trip to Greenland.

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Lora Koenig's work has taken her to the ends of the earth.

On a recent expedition, she found herself pushing against 30-knot Antarctic winds and slogging through snow to lower herself into six-foot pits – all in the name of science. Beneath her boots, 6,000 feet of ice held clues to the Earth's past.

Koenig '99, a Ph.D. student in the Department of Earth and Space Sciences at the University of Washington, spent the summer in Antarctica drilling ice cores and studying climate change. She was part of a team of scientists, funded by the National Science Foundation, en route to the South Pole collecting data about Earth's climate history.

Traveling on sleds pulled by tractors, which Koenig described as mobile homes on skis, the group of researchers traversed the continent, stopping to drill an ice core every 100 kilometers. The cores enable researchers to reconstruct climate histories going back millions of years. The samples contain atmospheric information including records of past temperatures, gas concentrations, chemicals, storm systems, forest fires and volcanoes. Koenig collected 100-meter-long cores, which recorded 300-1,000 years of climate information.

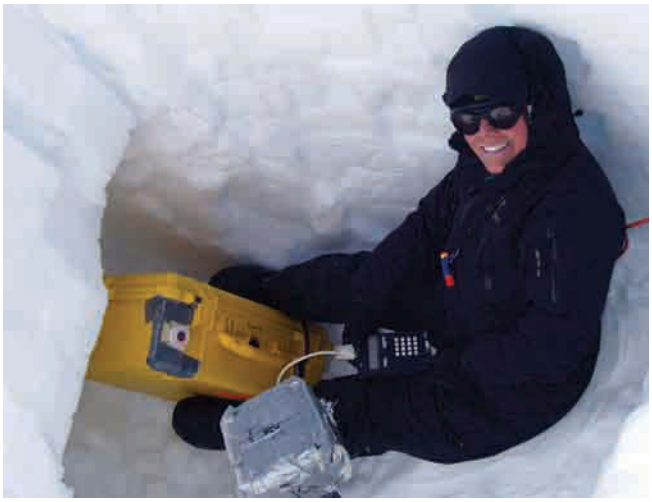
"We're trying to learn if the climate is changing significantly and how it's changing over large areas," said Koenig, who works with passive microwave satellites to determine temperature and snow accumulation rates.

The team's primary goal was to understand the climate of the last 1,000 years and use the information as a benchmark to predict future climates. The expedition began at Taylor Dome and will finish at the South Pole station in January 2008. The research will be combined into one large data set that documents climate history.

At roughly 1.5 times the size of the United States, Antarctica is the highest, driest, windiest continent on Earth. When Koenig arrived at the Taylor Dome field site in November – Antarctica's summer – temperatures dipped to minus 40. During a five-minute walk to the shelter, she felt the bite of the cold wind through her down parka and facemask.

"The cold temperature doesn't affect you as much as the wind chill," Koenig said. "Your face starts to hurt immediately if it's not covered."

Constant sunshine made it difficult to sleep, but Koenig learned to pull her hat down over her eyes to find darkness.



Lora Koenig '99 uses a radiometer to measure microwave emission of the snowpack. The measurements are used to validate space-borne satellite measurements of ice sheets.

"The sun never sets, it just goes around in a circle," she said. "You can't tell if it's the middle of the night or the middle of the day. You can work until 3 in the morning and there's the same amount of light."

Still, Koenig thrives on the extreme conditions. Last year, she studied the Greenland icecap in conjunction with NASA and the University of Washington.

It is work she prepared for at Linfield. With the help of Linfield advisor Steve Bricher '86, professor of mathematics, Koenig blended her love of environmental science, math and outdoor adventure at Linfield. She boosted her math major with an internship at the Yamhill County Watershed and twice participated in the Outdoor Environmental Studies class during January Term.

Growing up, Koenig heard plenty of stories about Linfield from parents Dan and Marilyn (Olsen) Koenig, both '70, who met on campus. As a student, she met her own husband, Joel Siderius '99, now a program coordinator at the University of Washington. Koenig said she benefited from the personal attention at Linfield.

"It always felt like a good fit," she said. "Now I realize how much Linfield really gave me in critical thinking skills and having someone there to help me through it all. You can never get lost at Linfield."

– Laura Davis