WEATHERPATTERNS

BY CHAD MOBLEY

WITH A WARMING CLIMATE, EARTH'S WEATHER PATTERNS ARE IN FLUX. THESE FOUR U RESEARCHERS ARE TRYING TO UNDERSTAND AND PREDICT HOW GLOBAL WARMING WILL AFFECT THE WEATHER.

PHOTOS COURTESY KEN GOLDEN

Sea ice plays an important role in earth's climate system — and it's vanishing fast. Through the 1980s and into the '90s, the Arctic sea ice pack extended over an average of 7 million square kilometers. In September, it was at 3.4 million square kilometers.

Current climate models all predict the gradual decline of summer Arctic sea ice. However, observed data of how fast the ice is melting significantly outpaces the current projections.

Ken Golden, a professor of mathematics at the U, heads up a research project intending to formulate new mathematical models accounting for the accelerated loss of sea ice.

"One of the major inaccuracies of global climate models is the failure to account for melt ponds," Golden says.

Melt ponds form in the summer and create a complex mosaic of snow, ice, and water. Their configurations have an effect on the rate of heat loss, and Golden is helping to more accurately project that rate.

Golden's colleagues in England and the Los Alamos National Laboratory then take the data and mathematical models he helps formulate to incorporate them into new global climate models and improve their accuracy.

PHOTO COURTESY JIM STEENBURGH

The old adage says if you don't like the weather in the West, wait an hour and it will change. Atmospheric sciences professor Jim Steenburgh wants to be a little more precise, though, and actually predict what changes await Mountain West weather.

"We're basically trying to figure out when you're going to have a bad commute, say in the wintertime," Steenburgh says. "Or if you want to look at it another way, when you should call in sick for a deep powder day."

Most of the research he is currently involved in is looking at lake-effect snow and accurately predicting the water content in a storm. Winter sports enthusiasts should be thankful for the work he and his team do to forecast deep powder.

"If you're a skier, you really want to have a certain type of snow to ski in," Steenburgh says. "You don't want to be skiing in Cascade concrete. We've developed techniques to better improve the prediction of that, for example. It's important for predicting snowfall amount, too. When you get snow that's 5 percent water, that's going to produce a lot more snow than [snow] that has 10 percent water content."

PHOTO COURTESY PAUL JEWELL

Fifteen thousand years ago, Lake Bonneville covered 40 percent of Utah. An associate professor of geology and geophysics, Paul Jewell studies its remnants in an effort to better understand how the climate in Utah has evolved throughout the past dozen centuries.

Wind and water move the earth's sediment from one place to another. By looking closely at that sediment in areas where Lake Bonneville once existed, much can be discovered about ancient weather patterns.

"You can say something about the strength of the storm of that time [and] which direction the wind came from," Jewell says. "The water balance was such that points to Utah having a much wetter, colder climate."

PHOTO COURTESY RICK FORSTER

The Greenland ice sheet is losing mass much like the polar ice caps. In April 2010, geography professor Rick Forster and four other researchers set out on an adventure across the southeast portion of the ice sheet via snowmobile. The researchers dragged an ice penetrating radar behind their sleds and pulled 50-meter ice core samples to look at annual snow layering. They were collecting data to validate climate models that calculate the rate at which the ice sheet is losing its mass. Forster and his team found the climate models were accurate.

"You have to know how much snow is accumulating every year," Forster says. "The models are important and that's why validating these models with data like we collected is important."