To understand earth's climate through time, scientists must use proxy data--paleoclimate information recorded by tree rings, fossil pollen, ocean sediments, coral, ice cores, and even rocks. This summer Paul Bierman and Tom Neumann (University of Vermont) embarked on an experimental study to look at how the Greenland Ice Sheet (GIS) has grown and shrunk over the last million years. Bierman and Neumann will use the isotopic signatures of rocks found this summer at today's ice sheet margin to get a picture of where and when Greenland rocks may have been exposed at the surface. Then they will combine these data with other climate proxy information and compare the results to today's climate. In simplest terms, these are the questions: when was the climate at least as warm as it is today and what did the GIS look like at that time, consequently, and how can we use this information to predict the future behavior of the GIS?

"The idea for this project came over a breakfast with Richard Alley, a glaciolo-

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VIEWING continued from page 1

to choose two contrasting sites on the western margin of the GIS: one in the south with historically unstable ice coverage and one in the north with more stable coverage," explains Neumann.

Prior to the ﬁeld effort, graduate students working with Bierman and Neumann analyzed satellite and aerial photos to get a better feel for the terrain near potential ﬁeld locations since transporting rock samples from remote collection sites is a challenge. They identiﬁed places with high concentrations of quartz-rich rock material that have been quarried by the ice and delivered to the

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percent that diffused more evenly off the lake's surface. This increased previous estimates of methane emissions from the same lakes five-fold. Extrapolating that data across north Siberian lakes means there could be 10 to 63 percent more methane bubbling into the atmosphere from northern wetlands than previously thought – a number that has big implications for climate modelers.

"One day things click and you realize, 'this is important,'" Walter said of the discovery of her bubble map.

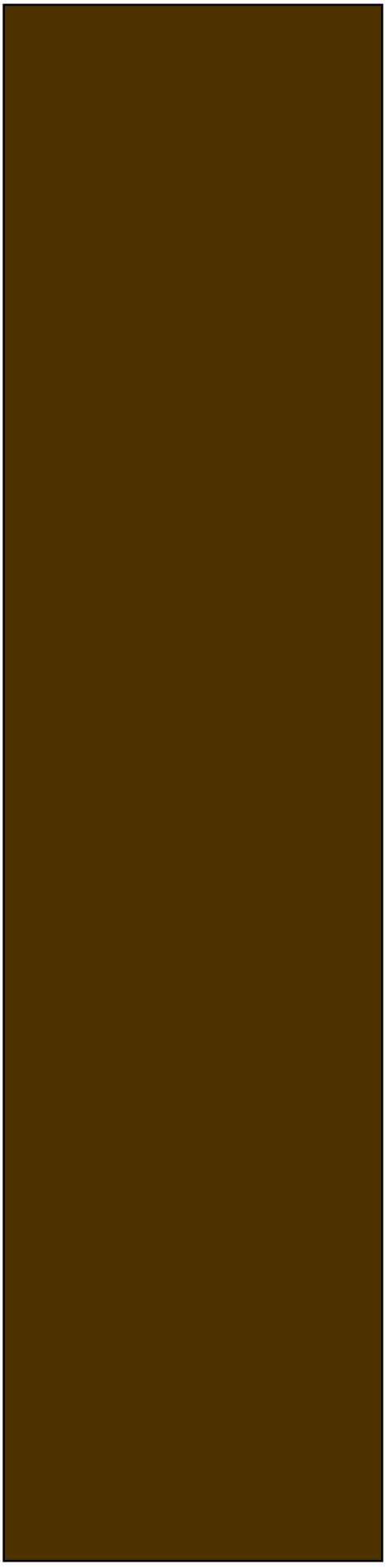
Or, as her thesis advisor Terry Chapin puts it, "Suddenly she showed that there's this very, very important global process that had been essentially ignored up until that time."

Her thesis, which turned into a paper in *Nature* in 2006, earned Walter the highly prestigious first-place award for a dissertation in science, math or engineering from the U.S. Council of Graduate Schools. She's now an assistant professor at the University of Alaska, Fairbanks.

Chapin, a professor of ecology at the University of Alaska, Fairbanks, said Walter combines an extreme work ethic with palpable, contagious excitement about her research.

Walter will ignite methane plumes, letting out a big whoop when they light, ostensibly to verify that the gas really is methane. But "more than anything, it's fun," she says, even if it's cost her some singed eyebrows and hair.

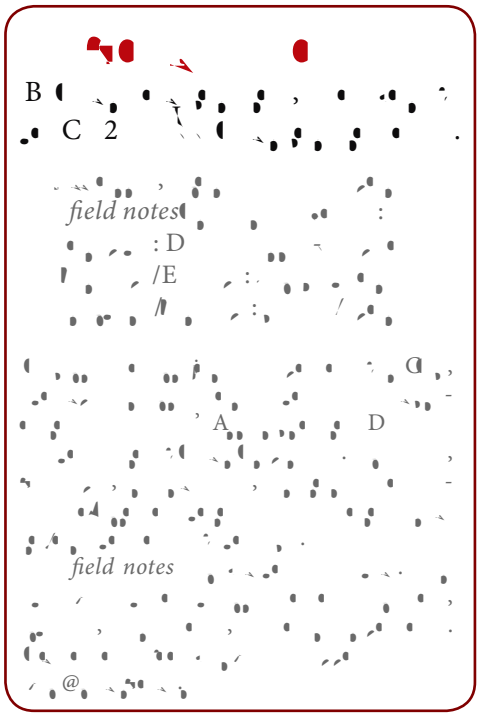
She fell in love with the outdoors



Around the island

For NSF's arctic research program, mid-to-late August is closing time in Greenland. Turn out the lights at Raven Camp,

lake ice as part of the Pan-Arctic Lake Ice Methane Monitoring Network (PAL-IMMN). She's NetSh13(d)-10(12wm[(B)2-(i)-1(n TD[(1(H)-14(2)-2(25(u)-35(r)]TJ-



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