The Harding Icefield

The Harding Icefield and its outflowing glaciers cover 700 square miles of Alaska's Kenai Mountains in glacier ice. Created more than 23,000 years ago during the Pleistocene Epoch, the Harding Icefield was a small piece of the vast ice sheet that covered much of Southcentral Alaska (*Figure 1*). Indeed, at the time, ice blanketed one third of the Earth's surface.

Naming the Ice

Icefield, ice cap, ice sheet—the terms can be confusing. Ice sheets are huge and continental in scope. Antarctica and Greenland are the only present-day ice sheets. Ice caps are dome-shaped and cover the terrain they rest on. Icefields vary in size and connect a series of glaciers. Bedrock can show through the ice of an icefield. The Harding Icefield is thousands of feet thick, but it does not completely bury the underlying mountains. Nunatak, meaning "lonely peak" is the term for such mountaintops surrounded in ice.

Over 30 glaciers of different size and type flow outward from the Harding Icefield. Some of these glaciers are tidewater (Aialik Glacier) or terminate in lakes (Skilak Glacier), and some end on land (Exit Glacier). Icefields are sensitive to climate change, growing and melting in response to changes in temperature and snowfall. Icefields also exert their own influence on local and global climate, changing pressure systems and wind directions, serving to keep adjacent land and water cold.

Climate Change Past and Present

Scientists studying glacial geology and past climates recognize that the last two and a half million years of Earth's history fluctuated periodically between cold and warm conditions. Studies of glacial deposits on land indicate at least four major periods of glaciation. Evidence from deep-sea cores suggests that a dozen major glaciations may have occurred during the Pleistocene Epoch. Most scientists accept the Milankovitch theory (see climate change section of this manual) of orbital forcing—that cyclical changes in the Earth's orbit around the sun are a principal cause of the ice age and long-term changes in the Earth's climate. Recent scientific studies are documenting

Alaska glaciers account for less than one percent of the Earth's area currently covered by ice, but a recent study suggests this ice is melting quickly. Airborne laser altimetry used to measure changes in volume and area of 67 glaciers in Alaska (including 14 glaciers from the Harding Icefield) estimates about 40 cubic miles of ice may be melting annually. This study further calculated that during the last decade, Alaska's melting glaciers contributed eight percent of the observed annual rise in global sea level.

significant short-term changes in Alaska glaciers and the Harding Icefield.

A National Park Service (NPS) study using aerial photographs and satellite imagery measured a three percent reduction in the surface area of the Harding Icefield over a period of 16 years. The NPS plans to repeat this study every ten years to monitor further changes.

In 2004, the NPS installed an automated weather station at 4,200 feet on a nunatak in the northeastern part of the Harding Icefield (*Figure 2*). The weather station records and transmits weather observations (temperature, wind speed and direction, relative humidity, precipitation, snow depth, and solar radiation) hourly. Current weather observations and summary reports can be viewed at the Western Region Climate Center's website: http://www.wrcc.dri.edu/cgi-bin/rawMAIN.pl?akAHAR

During the first three full years of operation, the lowest observed temperature was -21 degrees F, the highest observed temperature was 68 degrees F, and the maximum observed sustained wind gust was 117 miles per hour.

The Lure of the Icefield

Access to the Harding Icefield is exceptional in comparison to other large icefields. A steep, four-mile trail leads from the ranger station at Exit Glacier up to the edge of the icefield, affording visitors with a spectacular view and skilled mountaineers with ready access to the ice.

Before the early 1920s, local residents paid little attention to the huge icefield in the mountain range behind the town. Alutiiq and Dena'ina Natives were no doubt familiar with the ice and had accessed it, but there is no record of any attempted crossing until 1936. Yule Kilcher, a 27-year-old Swiss immigrant, had heard of the icefield and seen its edge from the steamer that had dropped him off in Seward. Needing to get to Homer and unwilling to wait for another steamer, Kilcher decided to cross the Harding. He headed up Lowell Creek but returned within a week, having learned a crossing like this would be more of an expedition than a hike.

The first known crossing of the icefield occurred in 1940 when two Alaskans, Eugene "Coho" Smith and Don Rising, crossed from Bear Glacier to Tustumena Lake. In the mid-1960s, two parties attempted but failed to make the crossing. In 1968, a mountaineering party departed Homer on horseback, travelled up Chernof Glacier on foot and skis, and completed the first ascent of Truuli Peak, the highest point on the Kenai Peninsula. Part of this group, including Yule Kilcher, continued across the Harding Icefield and skied down Exit Glacier. The trip took eight days. Notable recent explorations include a 14-hour solo crossing of the icefield from Skilak Glacier to Chernof Glacier and a kite-skiing expedition from Exit Glacier to Grewingk Glacier.

Ice as Far as the Eye Can See

In 1980, the founding legislation for Kenai Fjords National Park included a segment to protect and preserve the Harding Icefield and its out-flowing glaciers. Today, during the warmth of the mid-summer season, many people climb the Harding Icefield Trail to see the ice firsthand. At the top, the view is unlike any other: Mountain peaks enshrouded with ice stretch off into the distance and many must be tempted to come back someday, like Kilcher, and go further.

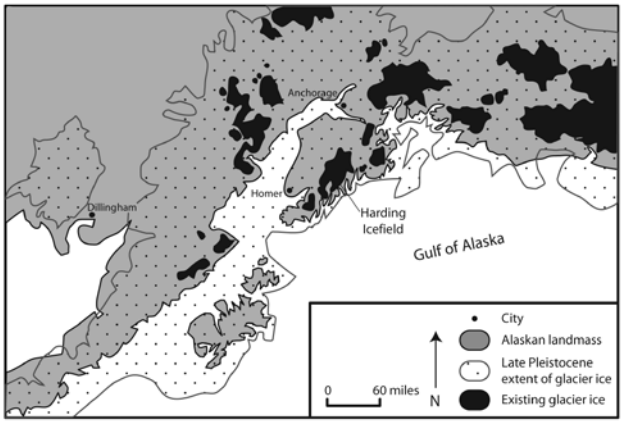

Figure 1: Extent of ice in Southcentral Alaska.

USGS photograph by Bruce Molnia

Figure 2: Nunatak on which the weather station is located.