Dangerous Ice Workshop
March 3, 2004
Fairbanks, Alaska

I- Purpose and Background

The purpose of this workshop was to bring local community members and scientists together to share information about Interior Alaska ice conditions on rivers and lakes. We wanted to hear their descriptions and explanations of conditions and determine if the topic of dangerous ice conditions is an area where local experts and scientists can work together to create understandings that could not be reached without each other's expertise. Several factors influenced us to pursue an exploratory workshop on dangerous ice. They are:

· Winter travel on lake and river ice is dangerous and conditions change often and quickly.
· A myriad of local factors influence ice conditions.
· Climate changes in the north are influencing the freeze-up/break-up regime.
· This is a subject of scientific and engineering interest as well as a matter of life and death for rural residents and urban recreationists who travel on Interior rivers and lakes.
· Observations of conditions over time and a comparative study of different areas can contribute to an expanded understanding of ice dynamics.

The idea for a workshop developed after a presentation by Samuel Demientieff, an Athabascan man who grew up on the Yukon and Tanana Rivers. Samuel has worked with the Observing Locally, Connecting Globally Project (OLCG) for several years, guiding science teachers on the Tanana River and explaining the changes he has observed in his lifetime of travel on the river. At the midwinter meeting of the OLCG science teachers in December 2003, Samuel was asked to talk about freeze-up and break-up as significant seasonal markers for northern climes.

Samuel's presentation at the teachers' meeting inspired us to seek support to explore the winter ice conditions and to propose a one-day workshop on the subject to the National Science Foundation. The Dangerous Ice Workshop was held March 3, 2004 at the University of Alaska Fairbanks and brought together local community experts on ice conditions and scientists who study ice.

II- Workshop Participants and their Backgrounds

Samuel Demientieff- Samuel grew up on the Yukon and Tanana Rivers where his father ran a barge service. Samuel traveled the rivers with his father in summer and traveled the frozen rivers in the winter. He lives on the Chena River in Fairbanks and is retired from the Bureau of Indian Affairs.

William (Billy) Demoski- Billy is an Athabascan who grew up in the Galena area on the Yukon River and spent his life as a subsistence hunter and trapper. His father was a dog team mail carrier and Billy told how his father depended on good lead dogs to help him determine where the ice was unsafe. He is the senior participant in the workshop.

Peter Snow- Peter grew up in the McGrath area on the Kuskokwim River. His father was a captain on the riverboats that supplied the villages. Peter grew up learning about unsafe ice conditions. He has worked with the local search and rescue squad in McGrath and is currently writing a book on survival skills.

Jack Reakoff- Jack lives in Wiseman, Alaska where he is a subsistence trapper on the Upper Koyukuk River. He travels long distances by snowmachine every winter, which has allowed him the opportunity to become very familiar with local ice conditions. He grew up on the Kantishna River and on the Yukon River around Galena so is knowledgable about the differences in conditions on each of these rivers, as well.

Martin Jeffries- Martin is professor of geophysics with the Geophysical Institute at the University of Alaska Fairbanks. His research concentration is ocean and lake ice. He has ice research projects throughout Alaska and in Antarctica. He directs the Alaska Lake Ice and Snow Observatory Network (ALISON) Project that gets teachers and their students involved in studying ice conditions in their communities.

Charles (Chuck) Slaughter- Chuck is an eco-hydrologist with many years of experience studying ice conditions in Interior Alaska, especially on the Chatanika River in the Fairbanks area. He is now at the University of Idaho with the Eco-hydrologics Research Group. He was able to travel to Fairbanks to participate in this workshop with support from the Arctic Research Consortium of the United States (ARCUS).

Larry Hinzman- Larry is a professor of water resources at the University of Alaska Fairbanks. He is a specialist in environmental engineering, environmental quality science, hydrology and ice dynamics. He has worked around Interior Alaska on a variety of water and ice related projects, as well as on the Hula Hula River in northern Alaska.

Knut Kielland- Knut is a wildlife ecologist with the Institute of Arctic Biology at the University of Alaska Fairbanks. He has traveled extensively on Interior Alaska lakes and rivers in winter, both as a scientist and as a dog musher. His perspective is a mixture of personal experience and observation, and scientific understanding.

Sidney Stephens- Sidney is a science educator affiliated with the University of Alaska Fairbanks and is one of the directors of Observing Locally, Connecting Globally (OLCG) - Global Change Education Using Western Science and Native Observations. Her role in OLCG is to help teachers integrate local knowledge into their science classes. She participated in this workshop to provide perspective on educational applications based on mixing local knowledge and western science.

William (Bill) Schneider- Bill is an anthropologist specializing in oral history and is the Curator of Oral History at the Elmer E. Rasmuson Library at the University of Alaska Fairbanks. As a dog musher, he has a personal interest in interior river and lake ice conditions.

Karen Brewster- Karen is a Research Associate with the Oral History Program at Elmer E. Rasmuson Library at the University of Alaska Fairbanks. She previously lived in Barrow, Alaska

where she worked with Inupiat elders on a variety of topics, including local history, whaling, subsistence traditions, and knowledge of sea ice. As a snowmachiner and skier, she also has a personal interest in Interior ice conditions.

Marla Statscewich- Marla is a Research Technician with the Oral History Program at Elmer E. Rasmuson Library at the University of Alaska Fairbanks. She assisted with organizing and recording the workshop. As a climber and back-country skier, she also has a personal interest in better understanding localized ice conditions.

Marie Mitchell- Marie was an independent videographer who video-taped the workshop.

III- Findings

Different Ice Conditions by Region - Participants at the workshop spoke about conditions on the Yukon, Tanana, Chena, Kuskokwim, and Upper Koyukuk Rivers. While there were similarities, many of us were struck by the differences. Contributing factors include topography and drainage, chemical composition, human and animal activity, and weather patterns.

How Dangerous Ice Conditions Develop - The participants described how conditions during break-up and at other times of the year impacted the currents and river bottom and how this in turn had an impact on where dangerous ice conditions could develop. This perspective has led us to recognize the importance of year long observations in order to understand impacts that manifest themselves during the ice season.

Safety and Rescue Emerged as Important Points for Discussion - The participants from local communities who live and work on the rivers spoke repeatedly about safety and rescue. In some cases, this was a re-telling of a bad experience and how they handled it; in other cases it was an explanation of how to prepare for emergencies such as falling through ice on the river.

Differences in Presentation Styles - The experts from communities tended to talk about what they had experienced and the ice scientists tended to summarize what they knew. While this finding was expected, we were pleased to see that the differences in styles did not hinder interaction. Often during the presentations, the scientists referenced the experiences of the local experts and the local experts commented about the conditions described by the scientists. This is what we had hoped would happen.

Role of Dangerous Ice Workshop as a Laboratory for Scientists and Local Experts to Combine Expertise and Approaches - The local experts and scientists worked well together and their mutual interest in the subject of dangerous ice provided a natural incentive, but we think there were other factors influencing the success and we hope to explore these further. First, we note that because the causes of dangerous ice conditions are so myriad, the subject lends itself to detailed descriptions based on local observations over the seasons and over many years. The scientists recognized and appreciated the observations that were shared. Second, the conditions also lend themselves to scientific explanation and measurement in such areas as the physics of ice formation, chemical analysis of ice, remote sensing for open water in winter, and measurement of heat exchange rates on lakes and rivers, to name a few. The local experts were

interested in these explanations and linked them to their own observations. They were also interested in how the scientists might be able to use instrumentation to determine chemical composition of ice and the role of thermal springs in creating open water conditions. Third, the workshop promoted interaction and questioning through the sharing of photos and stories and the alternating of scientist and local expert presentations. This structure helped create an environment of inquiry where all participants could engage and contribute.