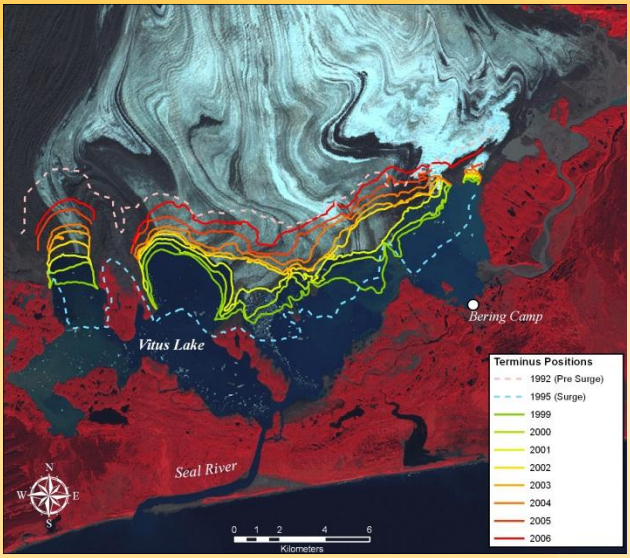
The Bering Glacier Program
A Scientific Approach to Understanding a Unique Natural Environment

www.beringglacier.org www.mtri.org

THE BERING GLACIER

The Bering Glacier is the largest and longest glacier in continental North America, with an area of approximately 5,175 km^2, and a length of 190 km. Located in coastal south central Alaska, it is bounded in the north by the St. Elias Mountains and in the south by the Gulf of Alaska. The Bering Glacier is also the largest surging glacier in America, having surged at least five times during the twentieth century.



Map Illustrating Terminus Migration of the Bering Glacier Over Time

BERING GLACIER FIELD PROGRAM

To better address the short- and long-term management of the Bering Glacier region, the Bureau of Land Management (BLM), in cooperation with the U.S. Geological Survey (USGS), has created a public/private partnership between federal, state, local, academic, non-governmental organizations (NGO), and commercial Bering Glacier stakeholders. The successful operation of the Bering research facility, populated by the stakeholders conducting investigations in geology, glaciology, paleontology, plant biology, animal biology, oceanography/water quality, remote sensing, and GIS decision support is testimony to the public/private partnership. BLM/USGS coordinated investigations of the Bering Glacier system have suggested that the site is biologically and environmentally significant. The investigations also show that the Bering system is very dynamic — a system that is undergoing profound changes.

UNDERSTANDING THE GLACIER HYDROLOGICAL PROGRAM

The overall research goal of the Bering Glacier hydrological team, composed of investigators from MTRI, University of Michigan, USGS, and BLM, is to understand the dynamics of the Bering Glacier and its effect on the Bering Glacier system hydrology. Specifically, a comprehensive sampling initiative is being conducted to help understand how changes in the Glacier affect the hydrological balance. It is the dynamic nature of the ecosystem that most adversely impacts the long-term BLM management of the Bering Glacier, and thus, understanding the cause and effect relationships of glacier dynamics to the hydrologically-dependent ecosystem is the major impetus for this investigation.

The Bering Glacier Program
A Scientific Approach to Understanding a Unique Natural Environment

www.beringglacier.org www.mtri.org

MTRI's Glacier Ablation Sensor System

Over the last five field seasons, the hydrological team has conducted a systematic survey of several interrelated pieces of the Bering Glacier hydrological system. These measurements have included:

- A bathymetric survey of Vitus and Berg Lakes
- Extensive CTD (conductivity, temperature, depth) sampling of Vitus and Berg Lakes to characterize the water masses making up the lakes
- Multi-parameter water quality sampling (pH, temperature, dissolved oxygen (DO), turbidity, salinity, conductivity, total dissolved solids (TDS), and oxygen reduction potential (ORP)) in Berg, Vitus, and over 30 of the glacial lakes that are part of the Bering Glacier system
- Water level observations at both at the Seal River and near the east end of Vitus Lake to quantify the tidal influence
- ADCP (acoustic doppler current profiler) measurements of the flow rates through the Seal River, as a function of tidal cycle, and Abandoned River discharge into Vitus Lake
- Automated collection of ablation rates and glacier movement to ascertain changes in ice volume
- Collection of water samples in Vitus Lake and the Abandoned River to quantify the effect of sediment loading on water column stability
- Analysis of remote sensing data to observe glacier movement and terminus positional dynamics, as well as to facilitate calculating changes in water volume in Vitus Lake

BERING GLACIER PORTAL

MTRI has created a web portal to support the Bering Glacier program. The purpose of the portal is to serve as a consolidated and centralized source of information for all stakeholders. Additionally, this portal is designed to facilitate digital collaboration and information sharing. Bering Glacier investigators have the ability to securely post data and documents related to their Bering Glacier investigations, thereby enhancing research collaboration and improving monitoring and management efforts.

Michigan Tech Research Institute
3600 Green Ct., Ste. 100 • Ann Arbor, MI 48105 • USA • 734.913.6840 (p) • 734.913.6880 (f) • www.mtri.org

Dr. Robert Shuchman
Institute Co-Director
(734) 913-6860
shuchman@mtu.edu

Liza Jenkins
Research Scientist
(734) 913-6869
lliverse@mtu.edu

For more information visit • www.mtri.org

Printed on recycled paper