

**BLACK RAPIDS GLACIER, ALASKA:
POTENTIAL HAZARD TO THE TRANS-ALASKA PIPELINE
AND THE UNCERTAIN BUILDUP TO THE NEXT SURGE**

by Thomas A. Heinrichs¹

Black Rapids Glacier, a surge-type glacier in the Alaska Range, most recently surged in 1937 and is currently in its quiescent phase. The U.S. Geological Survey and University of Alaska Fairbanks started a monitoring program as hazard-reconnaissance research for the trans-Alaska oil pipeline. As part of this program, mass balance, ice velocity, and changes in ice thickness were measured at three to ten sites each year from 1971 to the present. During several surges prior to 1937, ice crossed the Delta River and created glacier-dammed lakes, flooding areas of the Delta River valley in which the pipeline is located. Another surge is possible within the next several decades.

The behavior of Black Rapids Glacier during its quiescent phase is significantly different from that of Variegated Glacier, the only other well-studied surge-type glacier in Alaska. The ice velocity at Variegated Glacier steadily increased during the period of observation between its surges. At Black Rapids Glacier, the ice velocity has displayed fluctuations which are unexpected for a surge-type glacier--the annual velocity speeding up and slowing down as much as 44 percent of the long-term mean. These large velocity fluctuations indicate changes in the hydraulic or mechanical properties at the bed of the glacier.

from: AWRA - Alaska Section April 1992
WRC #114

¹ U.S. Geological Survey-WRD and Geophysical Institute, University of Alaska Fairbanks
800 Yukon Drive
Fairbanks, AK 99775

ALASKA WATER ISSUES

PROCEEDINGS

**Edward F. Chacho, Jr.
Technical Chairman**

**Alaska Section
American Water Resources Association**

**Water Research Center
Institute of Northern Engineering
University of Alaska Fairbanks
Fairbanks, AK 99775-1760**

WRC 114

April 1992