



Water & Environmental Research Center

University of Alaska Fairbanks

WERC-Fact Sheet-05-01
August 26, 2005

2005 Project Partners

- ◆ Geo-Watersheds Scientific
- ◆ BP Exploration
- ◆ ConocoPhillips Alaska
- ◆ Bureau of Land Management, Alaska
- ◆ Department of Natural Resources
- ◆ The Nature Conservancy
- ◆ The Northern Alaska Environmental Center
- ◆ North Slope Borough
- ◆ National Weather Service
- ◆ USGS

Introduction

Arctic lakes are used for a variety of resource development activities on the North Slope. Besides the annual use for ice roads and pads, lakes are also used for facility operations. Lakes are often in different watershed settings. Some are recharged by annual spring overflow from adjacent rivers. Some lakes are part of connected drainages involving multiple lakes and streams. Some lakes are isolated and dependant on the recharge from their own watersheds. Understanding these variations will help improve the understanding of how much water is available for use, and how to balance the needs of Arctic ecosystems and resource development.

Physical and Chemical Characteristics of Alaskan North Slope Lakes, and Variations Due To Water Use: 2005 Phase-2 Project Update

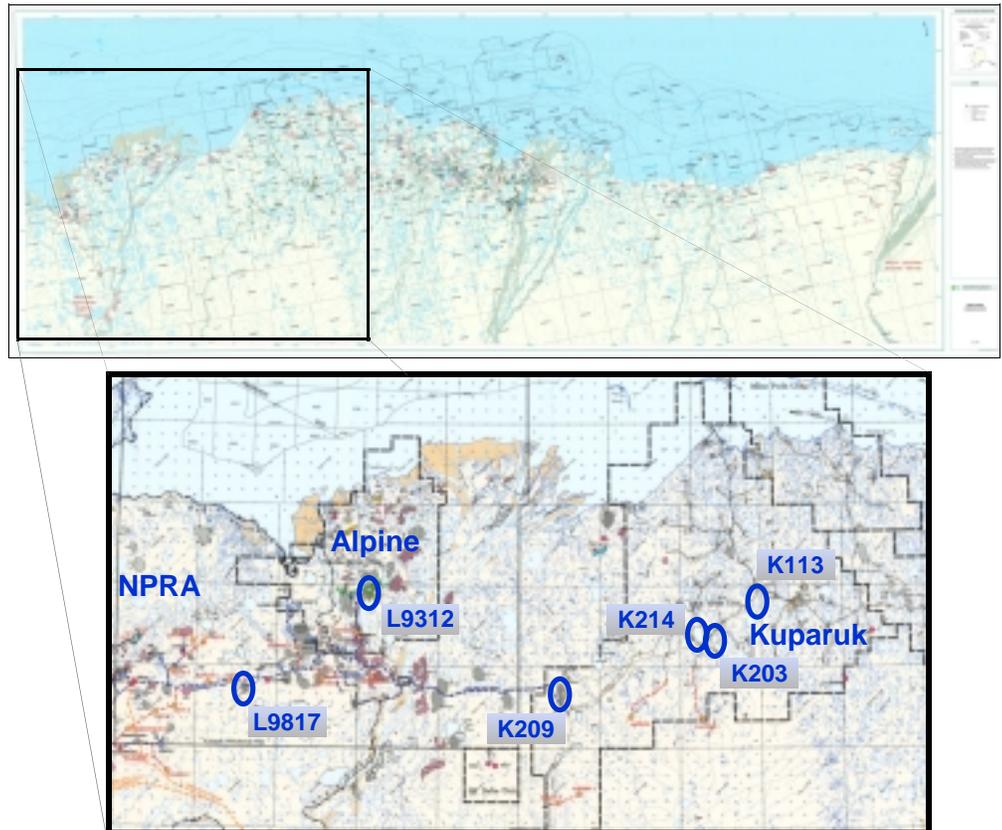


Figure 1. North Slope map indicating current study area (top) and map indicating six monitored lakes in 2004-05 (top image — BP Exploration, lower image — ConocoPhillips).

Project Information

In the Fall of 2002, the University of Alaska Fairbanks Water and Environmental Research Center, together with other project cooperators, initiated a study to obtain baseline information about the physical, and chemical characteristics of North Slope lakes in order to help assess some of the major questions related to lake water use. The project is entering a 3-year Phase-2 to continue improving the understanding of Arctic Lakes and water use. This project is funded in

part by a grant from the U.S. Department of Energy's Arctic Energy Office to the University of Alaska Fairbanks Arctic Energy Technology Development Laboratory (AETDL). Additional funding is provided by project cooperators in the form of financial and in-kind match. State and Federal resource agencies, industry representatives, and members of non-profit agencies provide input in stakeholder meetings.

- Lilly, M.R. and White, D.M.

Project Goals

The project's Phase 2 goals include developing better tools for resource managers and industry for predicting the amount of lake water available each season. The project group will be working in the following areas.

- ◆ Develop a network of weather and environmental monitoring sites to help support water use and tundra travel activities in NPRA
- ◆ Develop approaches to estimate the potential spring recharge to lakes and processes impacting lake recharge
- ◆ Develop watershed delineation approaches for Arctic Lakes
- ◆ Improve the understanding of chemical and physical processes related to dissolved oxygen concentrations in lakes
- ◆ Characterize the water use activities of facilities and develop approaches to evaluate long-term impacts of water use and related natural changes due to climate change
- ◆ Continue to reduce the permitting and management risks associated with arctic lake water use



Figure 2. Research raft on lake L9312 adjacent to the Alpine production facility. Monitoring at this lake will help understand water-use issues with year-round operations.

Figure 3: Lake L9817 Pump station at sunset, March 2005. This lake is used for ice road construction.



August 2005 Highlights

- ◆ *Summer field trips have recovered research rafts from Phase 1 Kuparuk area lakes.*
- ◆ *Water chemistry sampling at L9312 and K113 has been completed.*
- ◆ *Initial lake assessments have been made for new study lakes in the BP Exploration operations area. New lake stations will be installed in early winter.*
- ◆ *Selected climate stations for the USGS Global Terrestrial Network Permafrost (GTN-P) Active Layer have been upgraded to be included into the NPRA eastern real-time reporting network. Support from USGS and BLM will be very beneficial to Phase 2 objectives*

For More Information:

Please visit the following website for additional information:

www.uaf.edu/water/projects/northslope/lake_recharge/

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