



Water & Environmental Research Center

University of Alaska Fairbanks

WERC-Fact Sheet-04-01
July 28, 2004

Physical, Biological, and Chemical Characteristics of Alaskan North Slope Lakes, and Variations Due To Water Use: 2004 Update

2004 Project Partners

- ◆ GW Scientific
- ◆ BP Exploration
- ◆ ConocoPhillips Alaska
- ◆ Bureau of Land Management, Alaska
- ◆ Department of Natural Resources
- ◆ North Slope Borough

Introduction

Constructing ice roads and pads increases oil-field operators access for exploration with little or no environmental disturbance. If a discovery is made and development is warranted and approved, ice roads and pads can be used to reduce gravel roads and pads needed to support production facilities and pipelines. Construction of ice-roads and pads begins in December or January when the tundra mat is adequately frozen to support construction traffic and continues through April (weather dependant). Water supplies are additionally needed to support facility operations.

Numerous questions exist regarding potential environmental influences of lake-water withdrawals. Possible effects include changing water balances, aquatic organisms (including fish and invertebrates), and lake-water chemistry.

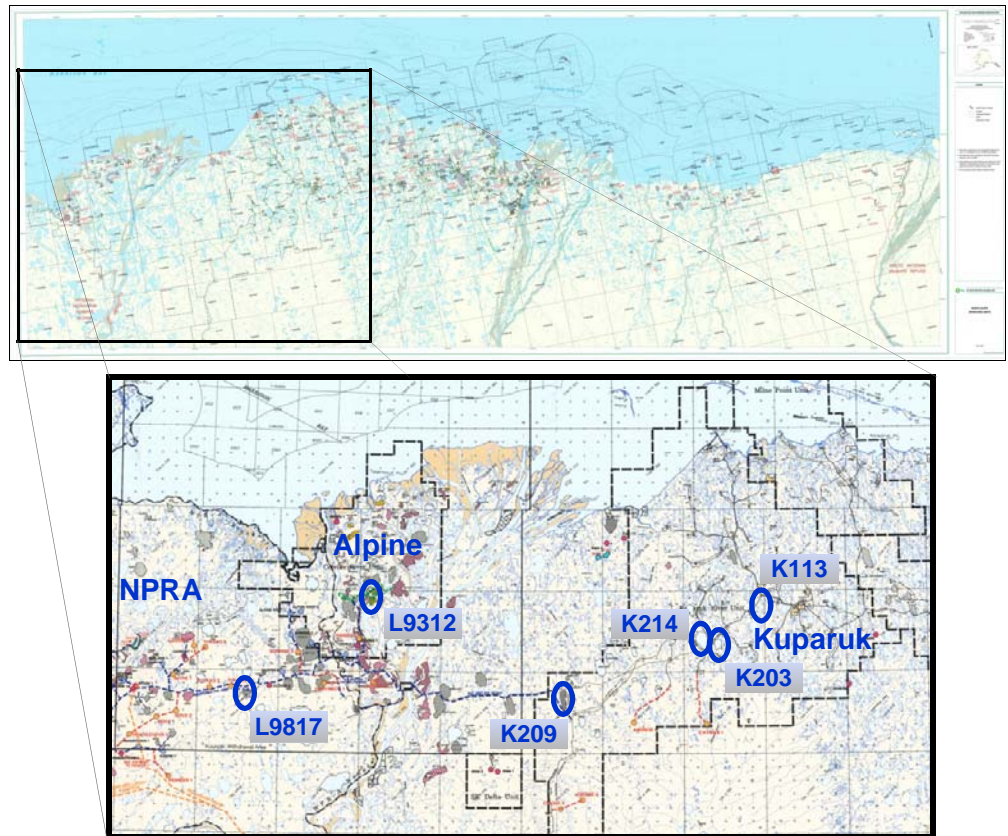


Figure 1. North Slope map indicating current study area (top) and map indicating the six monitored lakes (top image — BP Exploration, lower image — ConocoPhillips).

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, biological, and chemical characteristics of North Slope lakes in order to help assess some of the major questions related to lake water use. Automated data collection stations on lakes provide hourly data which is updated on the project Internet site at hourly intervals.

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.

- Hinzman, L.D., and Lilly, M.R.

Project Goals

- ◆ *Collect baseline environmental data on pumped and non-pumped tundra lakes*
- ◆ *Define hydrologic processes for evaluating tundra lake water-use implications*
- ◆ *Modeling of broad area coastal plain hydrology*
- ◆ *Internet data and project reporting*

July 2004 Project Highlights

- ◆ *North Slope water withdrawal and tundra lakes **annotated bibliography** produced in cooperation with BP Exploration*
- ◆ *Project staff added a new study lake at the Alpine Facility in cooperation with ConocoPhillips to help study **facility water-use** issues*
- ◆ *BLM researchers and project staff added a study lake in NPRA, BLM researchers are studying recharge processes, seasonal variability of lake levels, and lake sampling protocols*
- ◆ *Potential impacts due to current low winter water-use pumping have been **difficult to detect***
- ◆ *National Weather Service using project data to **improve weather forecasts** in region*
- ◆ *Defined the importance of **watershed areas** for determining available recharge for permitting*
- ◆ ***North Slope Borough** and **Trapper School** joined the project providing communication resources for new western lakes*

Figure 2. Researchers installing a data-collection raft on a tundra lake, where most accessibility to lakes is during winter.

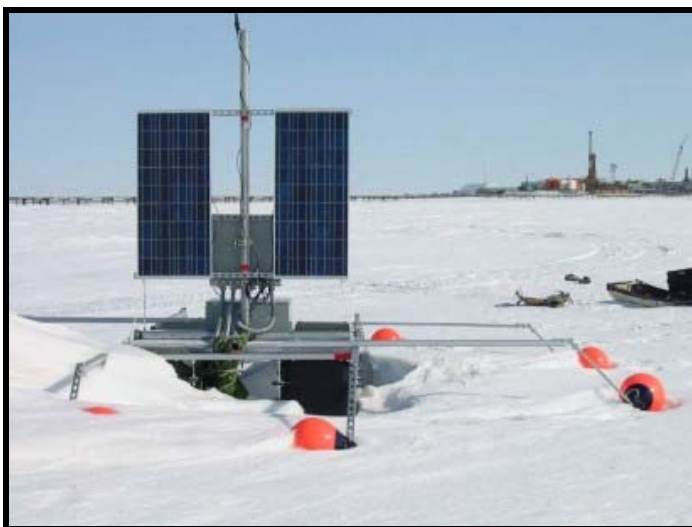


Figure 3. New 2004 raft installation on L9312 adjacent to the Alpine production facility. Monitoring at this lake will help understand water-use issues with year-round operations.

Figure 4: Ice road construction begins when the active layer (seasonally frozen ground) is satisfactorily frozen. Snow is packed and then pumped water is sprayed onto the snow surface until a sufficient road thickness is attained (photo — W. Morris).



For More Information:

If you would like to find out more about this project, please visit the following website:

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

Or contact:

Larry Hinzman (UAF) 907 474-7331, ffldh@uaf.edu

Douglas Kane (UAF) 907 474-7808, ffdik@uaf.edu

Michael Lilly (GWS) 907 479-8891, mlilly@gwscientific.com

Richard Kemnitz (BLM) 907 474-2225, rkemnitz@blm.gov