



The Water and Environmental Research Center (WERC) has two major objectives: foster **graduate education** and perform **quality research** that benefits northern people and the international circumpolar research community. Several factors make research challenging at these high latitudes: limited data collection sites, short duration of meteorological and hydrological data, extreme climate, remoteness of research sites and a variable and changing climate. Following is a brief description of some ongoing research at WERC.

⇒ The Alaska Department of Transportation and Public Facilities (AKDOT&PF) is collecting information for a transportation route starting from the Dalton Highway (in the vicinity of the White Hills) and heading west toward the Colville River. To make this infrastructure project successful, they need detailed information about how water flows throughout this landscape. **Surface-Water Data Collection for the Alaska Department of Transportation and Public Facilities North Slope Foothills Project** will collect data throughout this important and sensitive watershed.

⇒ In most Alaskan villages, access to clean drinking water is not something people take for granted. In many communities, untreated water is stored in the home in unlined, open storage containers that are easily contaminated by disease-causing bacteria. **Communities at Risk: Protecting Family Drinking Water in Rural Alaska** integrates research, education and outreach by combining efforts of the WERC, the Cooperative Extension Service and the local Tribal and City Councils. This project seeks to mesh traditional subsistence ways, healthy lifestyles, and new approaches to achieving safe drinking water for rural Alaskans.

⇒ The McCall Glacier, located in Alaska's Brooks Range, has the longest history of glaciological research of any glacier in Arctic Alaska, dating back to the late 1950s. A WERC team is currently leading a five year effort to extend these observations and relate them to freshwater contributions to the Arctic hydrological cycle. The McCall project is part of the **Detection and Attribution of Changes in the Hydrologic Regimes of the Mackenzie, the Kuparuk and the Lena River Basins** study.

⇒ **Mangrove Paleoecological Responses during Holocene Sea Level Changes: A Multiproxy Approach** is an interdisciplinary study of Belizian mangrove ecology and physiology at the ecosystem, landscape and regional level. This project takes a novel approach to studying past mangrove responses to environmental change throughout the Holocene (the last ~10,000 years), a period during which sea-level is known to have risen.

⇒ **Biodegradation of Synthetic Paraffin Fuel** is a project that studies how synthetic fuels spilled onto soil, gravel, or silt degrade over time, and what sort of natural soil microbes might breakdown such spills most efficiently, and how these microbes fair in Alaska's extreme environment.

⇒ In cooperation with BP Exploration (Alaska) Inc., Conoco-Phillips Alaska Inc. and the Department of Energy (DOE) we are examining the **Physical, Biological and Chemical Implications of Mid-Winter Pumping of Tundra Ponds**. During the winter months, a period of no recharge to the lakes, water is pumped from these lakes to build ice roads, aircraft runways and drilling pads.

⇒ The **Intersection Between Climate Change, Water Resources, and Humans in the Arctic** project is geared toward understanding the vital role freshwater plays in the lives of humans in the Arctic, how this role has changed in the recent past, and how it is likely to change in the future. Researchers conduct hydrological, cultural, and engineering studies throughout the Seward Peninsula.

Further information about our projects can be found at: <http://www.uaf.edu/water/>