Inventory and rescue of hydro-climate data

First step toward developing a hydrology monitoring network in Arctic Alaska

Project Description
Researchers from the University of Alaska Fairbanks are working with state, federal, and private entities in an effort to inventory and compile data related to hydrology and climate in Arctic Alaska. These data will be used in an analysis that identifies key locations for future environmental monitoring efforts in Arctic Alaska and parameters to measure at these locations (e.g., stream flow, air and soil temperature, snow depth, and solar radiation).

Why We Are Interested
This project gathers together scarce hydrology data, currently scattered among many places and institutions, and places it within one data structure and location. While there are many uses for these data, we are most interested in their ability to inform the design of a long-term hydrologic observation network for the Arctic LCC.

Project ID: ARCT2010-04
Year Funded – 2010
Start – July 2010
End – February 2012
Budget – $268,000

Research Partners:
University of Alaska Fairbanks
International Arctic Research Center
Water and Environmental Research Center

The Big Picture
Global climate models project a warmer and potentially wetter future for northern Alaska. How and where water will be distributed on the landscape is a crucial aspect of habitat change. We need to know how hydrologic processes may change under different climate scenarios, and to do that we need the most complete historical baseline possible. A first step is to inventory and compile available hydrologic and climate data.

Upper Kuparuk River near the Dalton Highway. Photo credit: Rob Gieck/WERC.
http://ine.uaf.edu/werc/projects/NorthSlope/upper_kuparuk/images
What Will Be Done
This work will be completed in two phases. During phase one, we will inventory available data related to hydrology and climate in Arctic Alaska and start to compile data within a relational geodatabase. During the second phase, we will make the data accessible through the web, and use it to design an improved climate and hydrologic monitoring network for Arctic Alaska.

Expected Outcomes
This work is the first step towards developing a network of long-term monitoring sites designed to enhance our understanding of water balance in arctic habitats and improve forecasts of future habitat conditions. In the near-term, the scientific, conservation, and engineering community will benefit from the existence of a comprehensive hydro-climate database.

Timeline
2010-2011: Inventory available hydro-climate data; design database; compile records.
February 2012: Final report that identifies key location for maintaining or re-establishing long-term monitoring.

Changes in water balance are expected to occur as the Arctic warms, but given the scant historical record, they may be difficult to document. Compiling data collected by numerous institution into a single database will help analyze trends.

To learn more about this project and other Arctic LCC projects visit: arcticlcc.org
or contact Greg Balogh, Coordinator at greg_balogh@fws.gov
or Philip Martin, Science Coordinator at philip_martin@fws.gov

The mission of the Arctic LCC is to identify and provide information needed to conserve natural and cultural resources in the face of landscape scale stressors, focusing on climate change, through a multidisciplinary program that supports coordinated actions among management agencies, conservation organizations, communities, and other stakeholders.

The Greater Kuparuk Watershed is one of the few rivers systems in Arctic Alaska with a history of long-term hydrologic monitoring. Map courtesy of Erica Betts/UAF.