
HIGH-MOUNTAIN PERMAFROST IN THE AUSTRIAN ALPS (EUROPE)

Gerhard Karl Lieb

*Institute of Geography
University of Graz, Heinrichstrasse 36, A-8010 Graz
e-mail: gerhard.lieb@kfunigraz.ac.at*

Permafrost research in the Austrian Alps (Eastern Alps) is based on a variety of methods, including at large scales, the measurement of the temperature of springs and of the base of winter snow cover, and at small scales, mainly an inventory of some 1450 rock glaciers. Taking all the information available into consideration, the lower limit of discontinuous permafrost is situated near 2500 m in most of the Austrian Alps. These results can be used for modelling the permafrost distribution within a geographical information system. Detailed investigations were carried out in the Doesen Valley (Hohe Tauern range) using additional methods, including several geophysical soundings. In this way, realistic estimates of certain permafrost characteristics and the volume of a large active rock glacier (some $15 \cdot 10^6 \text{m}^3$) were possible. This rock glacier has been chosen as a monitoring site to observe the effects of past and future climatic change.

ANNUAL WATER BALANCE FOR THREE NESTED WATERSHEDS ON THE NORTH SLOPE OF ALASKA

E.K. Lilly¹, D.L. Kane², L.D. Hinzman³, R.E. Gieck⁴

*Water and Environmental Research Center
University of Alaska Fairbanks, Fairbanks, Alaska 99775-5860*

1. e-mail: fnekl@uaf.edu

2. ffdlk@uaf.edu

3. ffldh@uaf.edu

4. fnreg@uaf.edu

Alaska's North Slope is underlain by continuous permafrost with an active layer varying in thickness from 25 cm to greater than 100 cm. We have been collecting snowpack, runoff, precipitation and meteorological data at three nested watersheds: Imnavait Creek Watershed (2.2 km²), Upper Kuparuk Watershed (146 km²), and the entire Kuparuk River Basin (8140 km²). In 1993 we began collecting data for the Upper Kuparuk Watershed. Initially one precipitation gauge was located at this site. In spring 1996 five additional gauges were installed and we found considerable differences in precipitation across the watershed because of topography. We reconstructed the precipitation for 1993-1995 based on trends detected in the 1996-1997 data. From these data, we compare water balances at three different watershed scales between 1993 and 1997. During the ablation period, snowmelt-generated runoff dominates while evapotranspiration dominates during summer months, particularly in the low gradient coastal plain.