

CLIMATIC INDICATORS IN AN ICE CORE FROM THE YUKON

G. Holdsworth and S. Fogarasi
National Hydrology Research Institute

H.R. Krouse and M. Nosal
University of Calgary
CANADA

ABSTRACT

Stable isotope data obtained from snow and ice cores retrieved from an altitude of 5340m on Mt. Logan (60°30'N; 140° 36'W) indicate that "isotopic seasons" are not generally in phase with calendar seasons. The former are phase lagged with respect to the latter by up to several months and appear to be correlated with SST'S and ocean heat transfer curves and/or the position of the Aleutian low rather than with air temperature or the temperature difference between the ocean surface and the core site. However, a low pass filtered $\delta^{18}O$ (δD) record seems to possess a temperature signal. Two check points for this are the isotopically cold periods at 1705-1715 AD and 1850-1860 AD which correspond to the coldest periods in a dendro-climatological time series for the northern Yukon.

A 3800m vertical profile of $\delta^{18}O$ (δD) defines the vertical structure of the atmosphere, indicating that the deep core site (5340m) is located near the base of geostrophic flow. A precipitation time series derived from the core data shows a significant cross-correlation with 80 yrs regionally averaged precipitation time series from the prairies and the steppes of the Soviet Union. A preliminary time series analysis on 204 yrs of data shows spectral power at ENSO frequency at 11 yrs and 21 yrs.