

Kerschner, H., G. Kaser and R. Sailer (2000): Alpine Younger Dryas glaciers as paleo-precipitation gauges. *Annals of Glaciology* 31, 80-84.

Abstract

Moraines of the Younger Dryas "Egesen-Stadial", which are widespread features in the Alps, are a valuable terrestrial data source for quantitative palaeoclimatic studies. The depression of the early Younger Dryas (Egesen-I) ELA shows a distinct spatial pattern. It was highest (ca. -450 - -500 m against "present-day") in those areas, which are exposed towards the West and Northwest. In the central, more shielded valleys, it was in the order of -300 m and less. Summer temperature depression, which can be derived from the Younger Dryas timberline depression is in the order of -3.5 K. The stochastic glacier-climate model by Ohmura and others (1992), which relates summer temperature and precipitation at the ELA is used to infer precipitation change. Results are compared with those obtained from the glacial-meteorological approach by Kuhn (1981a). Both models lead to highly similar results. During the early Younger Dryas, climate in the central valleys of the Alps seems to have been considerably drier than today. In those areas, which are open to the West and Northwest, precipitation seems to have been the same as today or even slightly higher. These results which are based on a rather dense network of data points agree well with the results from permafrost-climate studies and the more qualitative information from palaeobotanical research. They also support the results from Atmospheric General Circulation models for the Younger Dryas in Europe, which point towards a more zonal type of circulation.