Annual temperatures are generally rising in the northern hemisphere, but the trend is not that clear in Finland if considered on a centennial scale. There was, first, an ascending trend from the beginning of the 1900s to the mid-1930s, then followed by a descending trend up to the mid-1980s. Thereafter, an ascending trend has prevailed up to the present. The significance of warming trend seems, however, to be less significant as moving towards the north.

The temperature record of Sodankylä as well as the tree-ring indices of Scots pine (Pinus sylvestris L.) indicate that global warming cannot so far been recognized as drastically elevating temperatures or tree-growth. The last seven summers seem, however, to be warmer than the 100-yr average of the record. Another interesting issue is the rise of monthly minimum temperatures almost to the level of the 100-yr average of the record. As a conclusion, the Finnish pine timberline continues its advancing to the north and to higher altitudes.

The steady climate pattern in Finland is explained by flat and low geography just beside the Scandinavian mountains, the atmospheric circulation (the prevailing positive NAO) and the warmth of Gulf Stream. This climatic setting results in mean temperatures close to long-term averages, mild winters, cool summers and smaller in year-to-year variation. If the easterly winds would dominate in Finland, then summers would be warmer and winters colder.

Tree-rings are an ultimate proxy tool for providing past climate information. Metla, in cooperation with the universities of Helsinki and Joensuu, completed in 1990 a 7520-year tree-ring chronology of timberline Scots pine. This record, now 7639 years long, is used as the main source in our studies of past climate variations.

We know now that ancient timberline was 100-200 m higher and even 80 km norther than today. Summer mean temperatures were, accordingly, 2 - 4 degrees warmer than today.

Considering the causes of the current trend-like warming, it is useful to look, how climate varied during and after the warm and moist Atlantic period (ca. 7000 - 4500 years ago). At that time, pine timberline reached its maximum appearance in Finnish Lapland.

Obviously, the warmer summer climate of the Atlantic period did not cause any crucial consequences, e.g. the melting of glaciers did not cause any dramatic global climate cooling, comparable to 8.2k event.

The North Atlantic Oscillation (NAO) and the Finnish climate

Growing seasons of Scots pine (June-July) have been close to average during the last two decades. Midwinters (DJFM) were warm in the 1980s, but cool summers balanced the annual temperature again to be quite average.

THE LAST 1000 YEARS

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