

# Long-term temperature trends in Northern Siberia and Lapland inferred from tree-rings

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The northernmost conifers in the world are located well above the Arctic Circle in the Taymir region of northern Siberia and in the Northern Lapland. The trees respond to temperatures beyond the narrow season of actual cambial cell division by means of root growth, photosynthesis, lignification of cell walls, and other biochemical processes. March-September mean temperatures were analyzed for the past four centuries based on tree-ring data from Taymir and Northern Lapland (Sodankyla). These warm-season temperatures correlate with annual temperatures and indicate unusual warming in the 20<sup>th</sup> century. However, there is a loss of thermal response in ring widths since about 1970. Previously the warmer temperatures induced wider rings. Correlations between monthly regional temperatures and tree-ring chronologies showed significant values from May through November, with the exception of August (Taymir region) and from March through May (Northern Lapland). Moreover, Finnish series correlate much better with uncorrected “raw” regional temperature data. Some aspects of “raw” instrumental temperature records using for climatic change study are discussed. Most major warming and cooling trends are in agreement with other high-latitude temperature reconstruction based on tree-ring analyses with some regional differences in timing of cooling in the late 18<sup>th</sup> century and warming in the late 19<sup>th</sup> century.