



Detailed hydroclimatic varve record (2017-1909 CE) from Northern Finland

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As a result of Arctic amplification and the accompanying rapid temperature rise, climate in the Arctic region is currently experiencing significant changes. In order to increase the understanding of the underlying dynamics of these changes, reliably dated climatic proxy data are needed. In most cases continuous instrumental monitoring series cover only slightly over hundred years and monitoring network is still sparse in high northern latitudes. A longer perspective on natural climate variability can be obtained from natural archives, of which annually resolved ones offer the most precise source of data of past climatic and environmental variations. Until recently there has not been known lakes with ongoing varve formation on the Eurasian mainland fringing the Arctic Ocean. As a part of a study of climatic and environmental changes in the high northern latitudes, sediments deposited in Kevojärvi (69°45N, 27°00'E) in Finland have been investigated. Freeze cores recovered from the 35-m deep subarctic lake preserve a detailed varve record covering the last ca. 100 years (average varve thickness 7 mm). A highly resolved caesium-137 profile validates the annual nature of the distinctly laminated sediment deposited in Kevojärvi, and it reveals a detailed record of radioactive fallout resulting from nuclear testing and the Chernobyl accident. Physical and magnetic varve data suggest the varves preserve a refined record of variations in vernal snowmelt flood intensity, which is partly coherent with Northern Atlantic Oscillation index. The first results indicate Kevojärvi has large potential for longer hydroclimate reconstructions in the immediate vicinity to the Arctic Ocean.