



Project acronym: TREENE

Project title: Tree-ring Records of Extreme Events in Northern Europe

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Discipline: Earth Sciences & Environment: Global change & Climate observation

Station(s): Abisko Scientific Research Station (Sweden)

A new and perspective approach to investigate extreme climatic phenomena of the past is the analysis of structural anomalies in trees and shrubs. Wood anatomical abnormalities can give valuable additional information about the environmental conditions during tree growth and especially on extreme events. But young trees are very sensitive to climate extremes in compare with old trees. We will use a novel and promising method to build chronology of abnormalities based on different-age trees instead of study only ring width of long lived trees. We have already approved our method in northern Siberia to reconstruct cold and short growth periods, reveal relations between air temperature and frost-ring formation in Siberian Larch and Spruce. We build latitudinal profile near by the Abisko Scientific Research Station (3 sites) and if possible, altitudinal profile (3 elevation levels). We plan to quantify and qualify climatic extreme events by abnormal structures in coniferous and then to assess the effects of past, present and projected climatic extremes on the performance of individual trees based on the type, frequency, temporal and spatial distribution as well as intensity of structural abnormalities in tree rings of various coniferous tree species. We suppose also to show an increasing of climate continentality to the east changes frequency and intensity of abnormalities using whole meridional profile (including 4 study sites in Russia). This knowledge will be ultimately used to asses of on the dynamics of forests and tundra ecosystems and analyze recent climate changes and changes in the past.