Past changes in the Scots pine treeline and climate in Finnish Lapland - evidence from pine megafossils and lake sediments -

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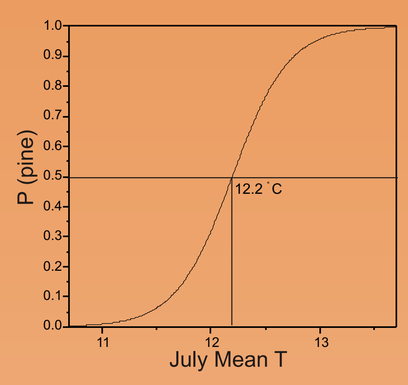
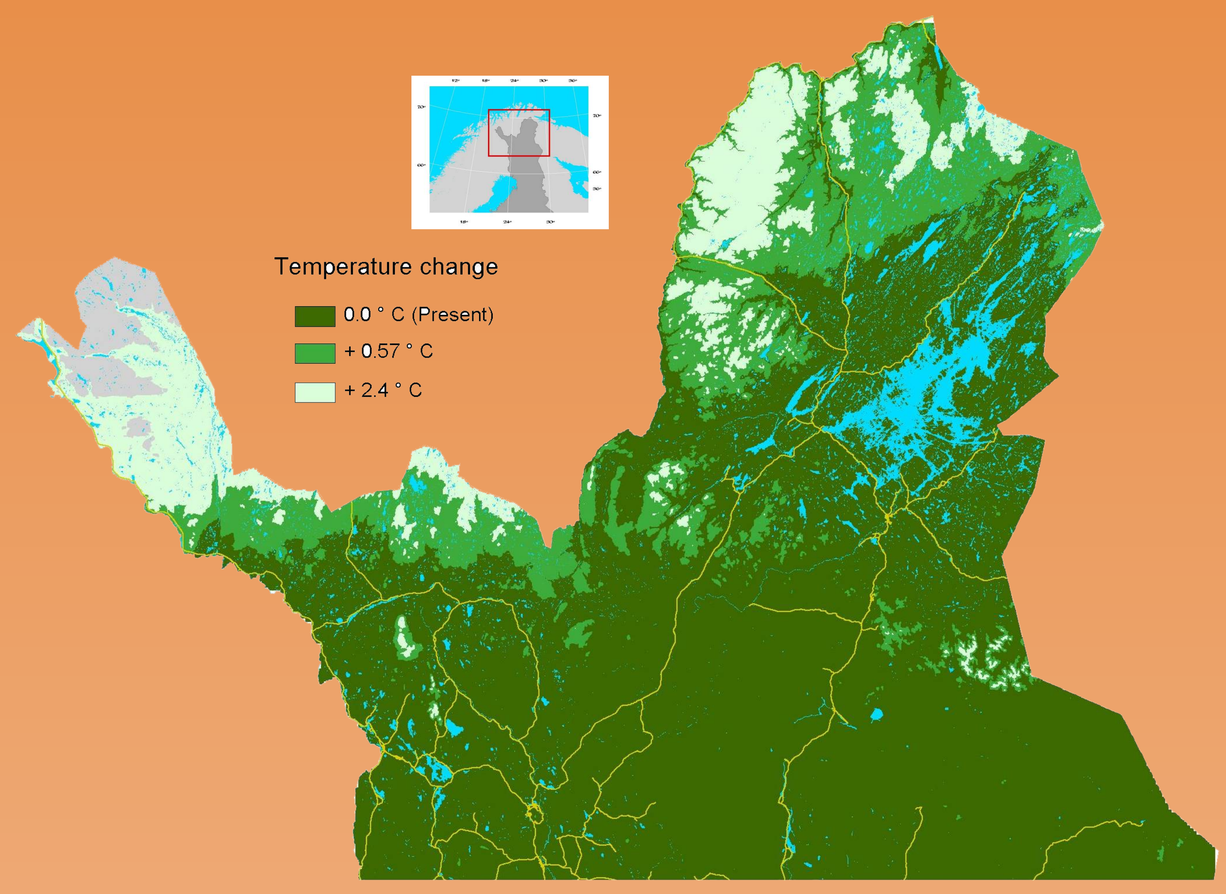
Dendrochronologically dated subfossil Scots pines beyond the present pine tree line together with stomata and pollen accumulation rate evidence from lake sediments was used to reconstruct the distribution of pine in space and time. Past mean July temperatures are reconstructed on the basis of assumption that mean July temperature at given site at given time has been at least as warm as it is at present pine treeline. The effect of the past glacioisostatic land uplift has taken into account in the minimum mean July temperature reconstruction.



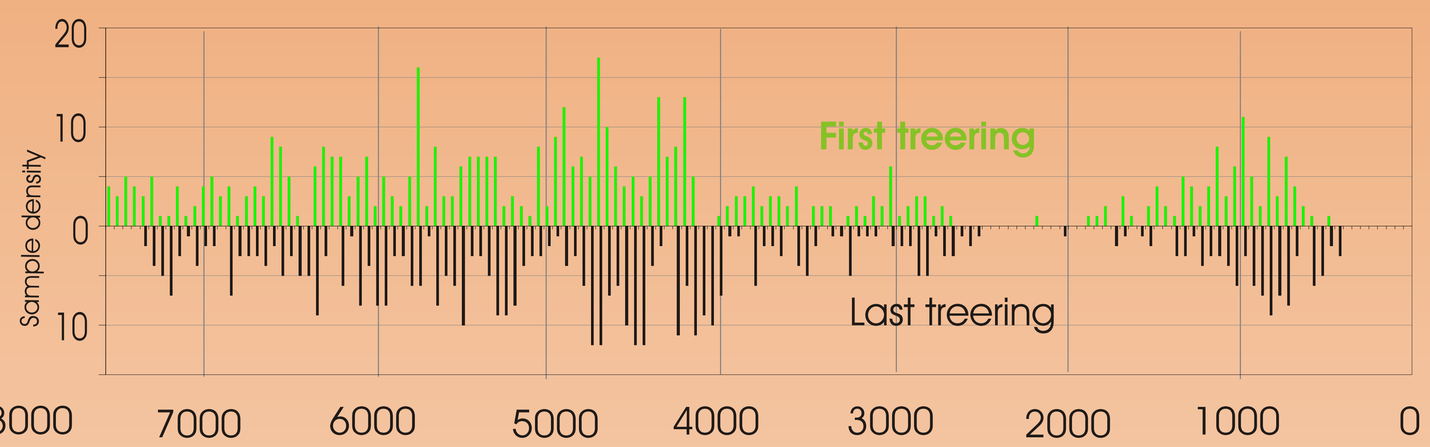
R^2: 0.42
p <<0,001
n: 309 000

Probability plot for a logistic model of the pine forest line, predicted by the mean July temperature (1961-1990). The model was constructed using the GIS-based nature inventory data of the Finnish Forest and Park Service and the spatially interpolated climate data.

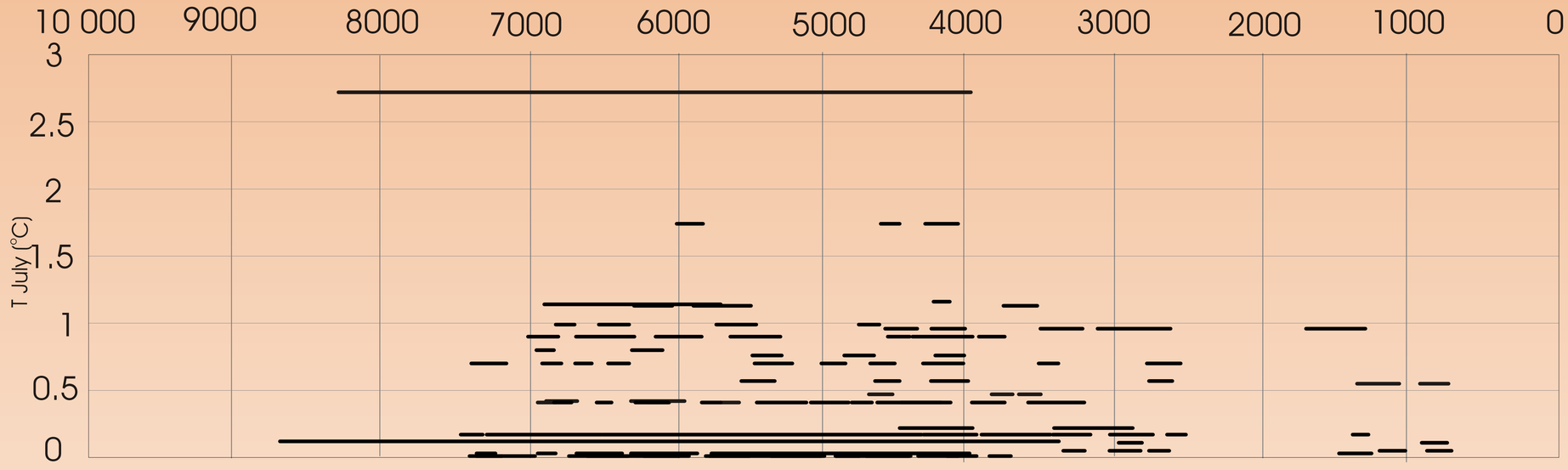


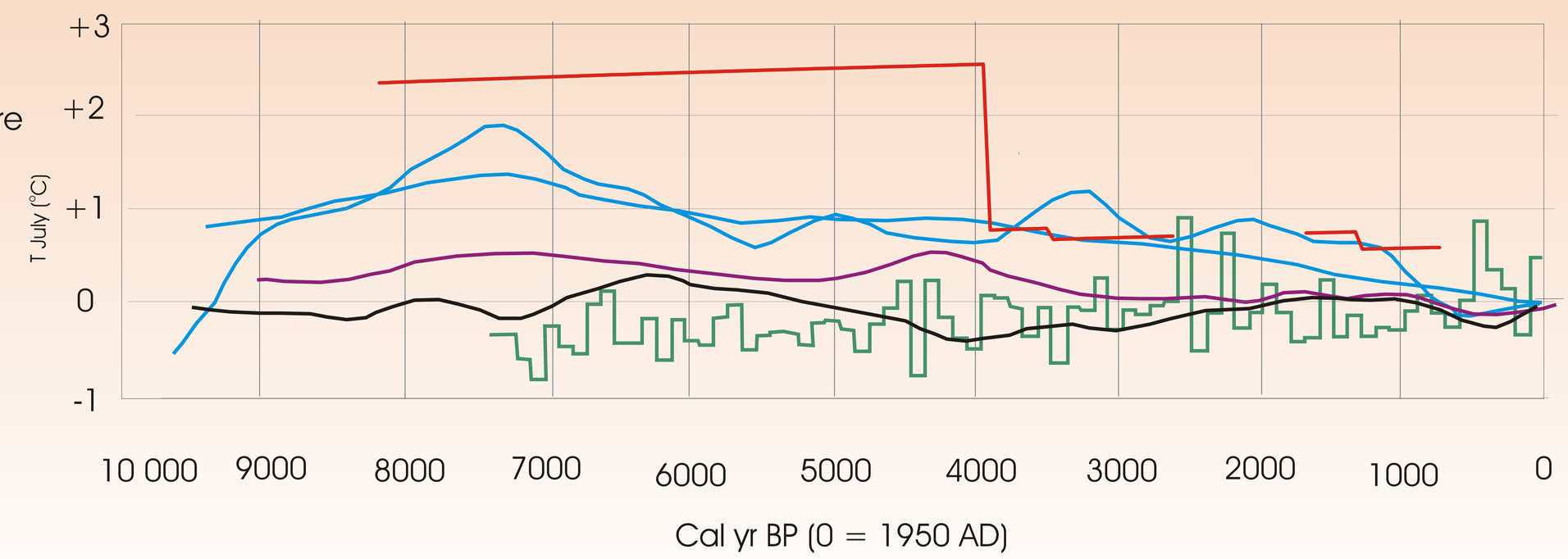
The modeled present and past pine treelines in Finnish Lapland. Past pine treelines describe the situation during the Holocene climate optimum (+2.4 °C) and the Medieval Warm Period (0.57 °C)

The time distribution from the first and the last dated tree ring above the present pine treeline. Sample size is that for 50-year non-overlapping period (cal yr BP 0=1950 AD).



Time distribution of the presence of pine is plotted according to the present mean July temperature difference between sites and present pine treeline (12.2 °C)



Available quantitative mean July temperature reconstructions from Finnish Lapland.

- This study
- Pollen
- Chironomids
- Diatom
- Tree-rings