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Daily temperature and daily photosynthetic production vs. Scots pine growth

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During the early days of dendrochronology, the growth of Scots pine near the northern timber line in Scandinavia has been shown to correlate strongly with summer temperature. We aimed to add a new aspect to the studies by analysing the relationship between daily rather than monthly mean temperatures and ring-widths of the species. Correlations between temperature sums for all time periods between 1.5. and 31.8. and ring-widths were calculated. In addition, modelled daily photosynthetic production was used in the analysis. The tree-ring data was collected from the Värriö natural park in northern Finland. Highest correlations between ring-width and daily temperatures were obtained for periods starting around the summer solstice (21.6.) and ending in late July. These periods are – incidentally – rather close to the month of July, traditionally identified as a strong regressor in this type of studies. The result was rather similar when estimated daily photosynthetic production of the species was used. The period yielding the highest correlation started slightly later, the beginning of July, and correlations were slightly weaker.