

## Potential of summer temperature reconstruction using tree-ring chronology of Japanese beech at the Shimokita Peninsula

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Various archives such as tree rings, ice cores, varves and historical documents have provided effective proxy data for unraveling the past climatic variability. Tree rings have given annually-resolved quantitative reconstructions of the past temperatures, precipitation, drought indices and other climatic parameters. Although there have been recent efforts to improve the coverage of dendroclimatic reconstructions in the East Asian region, tree-ring records are still sparse in Japan. It is worth developing tree-ring chronologies for investigating the dendroclimatic potential. The purpose of this study is to investigate temporal stability of climate-growth relationship for Japanese beech (*Fagus crenata*) for the northernmost Honshu Island and to investigate its potential to reconstruct past climate.

We used a tree-ring record of Japanese beech at the Shimokita Peninsula, the northernmost part of the Honshu Island. The standard techniques of dendrochronology were employed for chronology building. The climate-growth relationships were estimated using boot-strapped response function analysis. The response function shows that the ring width correlates positively with previous warm-season temperature. This suggests that the optimal growth of Japanese beech depends on an above-average hot summer in the previous year. The summer temperature was preliminary reconstructed, using a multiple linear regression model. The performance of the calibration model was validated by the standard cross calibration-verification method. As a result, the calibration model shows that the Japanese beech chronology have enough potential to reconstruct the past climatic variability.

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