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The potential for using tree-ring data from Jeju-island to reconstruct climate in subtropical Korea - A pilot study

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Annual rings from trees have been used to understand past climate variability beyond the observational records which started usually after 1950s. Here, as a preliminary study, we assess the possibility of using two conifer species from the humid subtropical island of Jeju, South Korea, as proxies for past regional climate variability of Korea and the Western North Pacific. Korean red pine (Pinus densiflora) and Korean fir (Abies koreana) were sampled on the southern slopes of the volcanic Mt. Halla at 1320 m and 1640 m a.s.l., respectively. Comparison with climate variables from a nearby meteorological station over the 1981-2011 period we found the strong positive association between temperature in January-May and Korean red pine growth, and positive association between precipitation in October and Korean fir. Moreover, the pine tree showed significant multi-month associations with both sea surface temperatures over the Western North Pacific and the Kuroshio Extension variability. Despite limitations in this pilot study, the results suggest a possibility of using subtropical trees from South Korea as indicators of past climate variability on local to regional scales.