



A tree-ring cellulose $\delta^{18}\text{O}$ -based July–October precipitation reconstruction since AD 1828, northwest Thailand

Chenxi Xu (1), Nathsuda Pumijumnong (2), Takeshi Nakatsuka (1), and Masaki Sano (1)

(1) Research Institute for Humanity and Nature, Motoyama, Kamigamo, Kita-ku, Kyoto, Japan, (2) Faculty of Environment & Resource Studies, Mahidol University, 999 Phutthamonthon 4 Road, Salaya, Phutthamonthon, Nakhon Pathom, 73170 Thailand

A tree-ring $\delta^{18}\text{O}$ chronology for the period 1828–2000 was developed from four *Pinus merkusii* trees, to find a reliable proxy for reconstructing precipitation in northwest Thailand. Inter-tree $\delta^{18}\text{O}$ correlations were high during the entire period ($r = 0.57\text{--}0.79$). The tree-ring $\delta^{18}\text{O}$ chronology shows significant negative correlations with regional July–October precipitation during the period 1901–2000 ($r = -0.62$) and with July–October river flow ($r = -0.54$), and is in good agreement with a shorter tree-ring $\delta^{18}\text{O}$ chronology from living *Pinus kesiya* in northwest Thailand. The spatial correlation analysis between tree-ring $\delta^{18}\text{O}$ and regional July–October precipitation also support that the tree-ring $\delta^{18}\text{O}$ of *Pinus merkusii* is a promising proxy to reconstruct precipitation in northwest Thailand. The tree-ring $\delta^{18}\text{O}$ -based July–October reconstruction, which accounts for 37.6% of the precipitation variance, shows a close relationship with El Niño–Southern Oscillation (ENSO) during the period 1871–2000, with the exception of during the past two decades; the exception may be related to the southeastward shift of the descending limb of Walker Circulation and increased frequency of Central Pacific ENSO.