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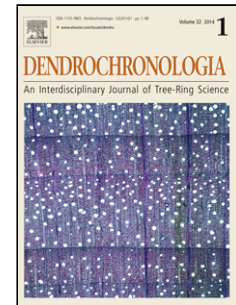
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High-elevation mountain hemlock growth as a surrogate for cool-season precipitation in Crater Lake National Park, USA

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Abstract

Snow dominates the hydrology and climate of the United States' central Pacific Coast, but because local measurements of snowpack and winter precipitation often extend back only a few decades, observations by themselves are not adequate to describe potential amplitude of wintertime conditions. Here we present a set of updated and extended mountain hemlock (*Tsuga mertensiana* [Bong.] Carr.) tree-ring width records from Crater Lake National Park, Oregon, and use these data to make inferences about snowpack prior to the start of instrumental monitoring. In July and August 2013, we collected cores from 228 trees at seven high-elevation hemlock stands that surround the crater's rim. The oldest tree had an inner ring date of A.D. 1474, and the longest ring-width chronology maintained a satisfactory common signal back to the middle of the 16th century. The growth of high-elevation mountain hemlock is strongly and inversely related to cool-season precipitation, making these records some of the most southerly examples of a robust inverse cool-season moisture signal in North American tree rings. The growth of these snow-limited forests does not appear to have been affected by the substantial

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