

400 YEARS OF PRECIPITATION VARIABILITY IN CENTRAL  
AND SOUTHERN CALIFORNIA RECONSTRUCTED FROM TREE-RINGS

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ABSTRACT

Precipitation variability at 31 stations ranging from San Diego to San Francisco and from the coast to the Sierras was characterized using the first two principal components. The first component, which accounted for 65% of the variance, consisted of positive loadings at all stations. The second component accounted for 15% of the variance and was characterized by positive loadings south of Pt. Conception and negative loadings to the north. Tree-ring chronologies from 17 sites were regressed against the precipitation components to produce reconstructions. The reconstruction of the first component was very accurate with a cross-validated percent variance explained of 77%. The reconstruction of the second principal component was much less reliable, explaining only 38% of the variance. Spectral analysis of the two reconstructions indicated that the variance of the first component was concentrated in time-scales of five-six years and less, while the second component had significant variance on time scales up to about 50 years.