Geophysical Research Abstracts
Vol. 21, EGU2019-3195, 2019
EGU General Assembly 2019

High-resolution land surface model to simulate site-specific inter-annual variation of conifers' earlywood and latewood ring width.

Eylon Shamir (1), Kai Lepley (2), Dave Meko (2), Ramzi Touchan (2), Rochelle Campbell (1), and Konstantine Georgakakos (1)

(1) Hydrologic Research Center, (eshamir@hrcwater.org), (2) Laboratory of Tree Ring Research, University of Arizona, Tucson Arizona.

We developed a process-based forward model that simulates the inter-annual variability of earlywood and latewood tree-ring width chronologies. This radial growth model relies on a land surface model that simulates sub-daily time series of snow water equivalent, soil water content, temperature, and actual evapotranspiration. We used this model to understand the dominant land surface processes that affect tree ring radial growth in a given location. The model was developed using annual earlywood and latewood ring width chronologies of five conifer species (Tsuga mertensiana, Abies magnifica, Abies concolor, Juniperus occidentalis, and Pinus ponderosa) from five sites, within a 60 km radius, at the Central Sierra Nevada, California. The model skill was compared to a simple process based radial growth model that uses monthly time series of temperature and precipitation and to a regression model that uses principal components of monthly climatological data as predictors. The ability of this radial growth model to capture the spatial and temporal variability among the tree sampling sites was also examined.