Abstract Title:
Eco-hydrological pathways inferred from stable isotopes in a Pinus ponderosa and Pinus monophylla woodland of the Sheep Range, southern Great Basin, USA

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Abstract:
This study examines the seasonal variation of stable isotopic ratios of water in two high-elevation species found in the southern Great Basin of Nevada- Pinus ponderosa and Pinus monophylla. The goal of this research is to test the hypothesis that hydrogen and oxygen ratios at this site are affected by summer precipitation from the North American Monsoon System (NAMS). Samples of xylem and leaf tissues from multiple trees at the site were collected and analyzed for delta-18O and delta-D. Additional samples from groundwater, soil layers, and precipitation were collected and analyzed. Sampling was performed bi-annually for the 2009 growing season, once pre-monsoon (June) and once post-monsoon (October).

The NAMS is highly variable both temporally and spatially, and variability is likely to increase with climate change. The impact of summer precipitation on ecosystem patterns and processes, particularly at high elevations in the Great Basin, is poorly understood. In order to develop better predictions of ecological responses to climate change in the southern Great Basin, we must assess the eco-hydrological cycle at mountain locations. The results of this study will serve to fill gaps in knowledge concerning the strength of the monsoon precipitation signal in the southern Great Basin and its potential impacts on ecological shifts in the face of climate change.

Keywords:
Pinus ponderosa, Pinus monophylla, stable isotopes, eco-hydrology, Great Basin, North American Monsoon