

Assessing Interannual Variation in Great Basin Big Sagebrush Growth Response to Climate

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An assessment of the growth response of key vegetative species to climatic variability is vital to identifying possible local impacts on ecosystems faced with climate change. This study utilized annual growth ring indices constructed from big sagebrush (*Artemisia tridentata*) stems collected in Spring Valley, NV as a measure of vegetative growth. Growth ring indices had a strong positive correlation with growth year precipitation (Oct-Sep; $r=0.67$) and similar correlations with winter (Oct-Feb) and growing season (Mar-Sep) precipitation ($r=0.49$ and $r=0.53$, respectively). Historical NDVIs (Normalized Difference Vegetation Index), an indicator of plant canopy status and photosynthetic activity, were regressed against sagebrush ring indices during the common interval of 1986-2010 in order to examine growth response through time at both the site (30x30m) and valley-wide scales. Growth ring indices showed significant positive correlations at both scales with coefficients ranging from 0.16-0.56 at the single site-pixel level and a coefficient of 0.68 at the multiple site-pixel level. Percent vegetative cover showed a slight but significant ($p=0.05$) positive effect on the correlations between ring growth and NDVI. Results so far indicate that sagebrush in Spring Valley appear less reliant on seasonal winter precipitation than expected from previous studies and are more susceptible to changes in total annual precipitation. Growth ring-NDVI comparisons were able to resolve this relationships at scales not typically seen in the literature and could allow for more accurate assessment of vegetative response to regional climate change. Cross-species ring index comparisons and more extensive meteorological data are currently being analyzed in order to place Spring Valley sagebrush ring indices in context with surrounding areas.