

ABSTRACT

THESIS: Growth-Climate Relationships of Sugar Maple (*Acer Saccharum* Marsh.) Along A Latitudinal Climate Gradient in its Western Range

STUDENT: Aaron Rudolph

DEGREE: Master of Science

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Sugar Maple is an ecologically and economically important species that is widespread throughout eastern North America. As climate change is predicted to modify temperature and precipitation regimes throughout the range of the species, it is important to understand how climate has impacted the growth of sugar maple in the past to predict how it may be affected in the future. However, little research has been conducted in the western half of the range of sugar maple to determine how climate will affect the radial growth of the species. A dendroecological study was conducted in Michigan, Indiana, Kentucky, and Missouri to determine how past temperature and precipitation regimes have affected sugar maple growth, and how that relationship has changed both spatially and temporally.

Sugar maple radial growth correlated strongest with maximum temperature, precipitation, and Palmer Drought Severity Index during the summer period of June-August across all sites. The strength of these correlations was also found to change over the last century with certain climate variables becoming stronger influencers of radial growth, while others have weakened. Stronger growth-climate correlations in the western part of the sugar maple range suggest that climate may be more influential in determining radial growth when compared to the eastern part

of the range. However, differences in climate-growth correlations were not particularly evident across a latitudinal gradient.