

SIERRA HOFFMAN, AMARIS JALIL, and MARK LESSER. Dept. of Biology, Shepherd University, Shepherdstown, WV, 25443. What factors influence *Quercus rubra* growth performance along elevational and exposure gradients

How tree species perform across the breadth of their realized niche is essential for understanding their response to changing environmental conditions. This is especially relevant in topographically heterogeneous landscapes, where changes in elevation, exposure, slope and aspect all interact to determine how a particular species will perform at any location. We focused on growth performance in *Quercus rubra* (red oak) in Shenandoah National Park. We established 4 transects that spanned >700 meters of elevation change. Each transect encompassed an exposure gradient from a stream-side to a ridgetop location, and were positioned on opposing aspects. Along each transect we cored five mature red oak trees at six equally spaced points. Tree cores were prepared using standard dendroecological methods. Temperature and precipitation data from 1945 to 2016 were obtained from National Climatic Data Center for nine weather stations surrounding Shenandoah National Park. Elevational lapse rates were calculated for temperature data to adjust regional temperature to accurately represent coring locations. Ring width was modelled against climatic and topographic variables to determine which variables were important to red oak growth.

Results showed spring and autumn precipitation and temperature from both current and previous year were associated with growth performance. Red oak growth was maximized at low elevations at near to intermediate distances from stream, however as elevation increased red oak performed better at greater distances from streams. As climate continues to warm, higher elevations may receive more precipitation due to evapotranspiration and red oak will be found further from streams at higher elevations.