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Volume 13

Washington University  
Undergraduate Research Digest

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Spring 2018

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#### Recommended Citation

Waltman, Emma, "Does an Increase in Average Temperature Favor Southern-Distributed Trees over Northern-Distributed Trees?" (2018). *Volume 13*. 216.

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# DOES AN INCREASE IN AVERAGE TEMPERATURE FAVOR SOUTHERN-DISTRIBUTED TREES OVER NORTHERN-DISTRIBUTED TREES?

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Ecological theory predicts that an individual will survive best if it resides in the center its species' geographical range. In determining a species' range, scientists have historically referred to its known native range, determined by decades of observation and mapping. However, global climate change has caused an increase in mean temperature across latitudes, and ecologists have documented associated shifts in species distributions, especially expansions of species' leading edges (i.e., cold limits). As temperatures continue to warm, a species' documented natural range may no longer be the best representation of where its individuals will best survive. According to the National Weather Service, St. Louis has experienced a warming of +1.41°C from 1982-86 to 2012-16. Using census data of a 4 Ha forest plot at Tyson Research Center, we investigated how tree survival has changed during 30 years of warming from the 1980s to the 2010s. We hypothesized that Tyson tree species located at the top third of their native ranges will have higher survival in the 2010s than they did in the 1980s because average temperatures in St. Louis are becoming warmer and therefore are more similar to temperatures at the center of their latitudinal ranges before the warming. Similarly, we hypothesized that tree species in the bottom third of their native ranges will have lower survival in the 2010s than they did in the 1980s, as Tyson's annual temperatures. The results of this study provide insight into how temperate tree species are responding to climate change and has the potential to inform future conservation and reforestation efforts.