



SCHOOL OF ENVIRONMENT AND NATURAL RESOURCES

GRADUATE EXIT SEMINAR

ZIYU DONG

Effects of Physiography and Fuel Characteristics on Fire Behavior



Future predictions show dramatic increases in fire probability in the eastern U.S. where the greatest occurrence and expansion of the Wildland/Urban Interface (WUI) exists. Therefore, more attention needs to be given to understanding the factors of fire behavior and fire environment in eastern forests. However, quantification of future trends in fire activity is challenging owing to the lack of spatially complete and consistently derived data. The regional and spatial variability, complex and non-linear interactions between weather, vegetation, and human activity add more uncertainty to future fire behavior. In this study, we examined the potential effects of topographic variables and forest attributes on the fire environment at the fine scale in southeast Ohio. Ninety-four plots were established to quantify three factors of terrain: aspect, slope position, and slope steepness (α). Fuel loads and fuel composition were analyzed to capture the interaction of terrain and fuel. Over the three topographic variables, aspects and slope position played a major role in the differences in forest structure and certain species abundance. This subsequently influenced the composition and characterization of the fuels. An ignition experiment was conducted under controlled laboratory conditions to determine how the differences in fuel composition, based on species, arising from different topographic positions can influence the potential differences in fire behavior. A linear correlation was found between fuel load composition (oak vs. maple) and forest attributes. Significant differences in the flame temperature between oak and maple were discovered.

Advisor: Dr. Roger A. Williams

Friday, April 14, 2023
10:00 A.M.

Location: Kottman Hall 333C

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