**Examining the spatial and temporal distribution of climate and productivity changes for Kentucky counties, 2000 to 2020**

Jeremy Sandifer, Simone Graham, and Buddhi R. Gyawali

Department of Agriculture, Communities, and the Sciences, Kentucky State University, Frankfort, KY, 40601

Over the last 40 years, estimates suggest that the average air temperature in the United States has increased by 2 degrees F. During this time, the Southeastern U.S. has witnessed more and prolonged heatwaves and enhanced precipitation frequency and amounts, in addition to the observed increases in severe weather reports, such as hail and tornadoes outbreaks. However, not all areas are impacted equally.

This project examined the most recent 20 years of climate station data, including precipitation, air temperature, and severe weather reports, as well as space-based measurement of the normalized difference vegetation index to better understand the impacts of a changing climate on the productivity of natural and managed lands in Kentucky counties.

Results indicate overall vegetation productivity has increased substantially across all months of the year across the state. In particular, the months of June and July have experienced significant increases in precipitation amounts and air temperatures. Changes in the occurrence of severe weather reports are uncertain, as the record is not a systemic product. The information derived from this study can aid farmers and land managers in mitigating the impacts from climate change by changing the rotation schedules or the timing in planting activities.