

## Evaluating historical development within riparian corridors in North Alabama for conservation

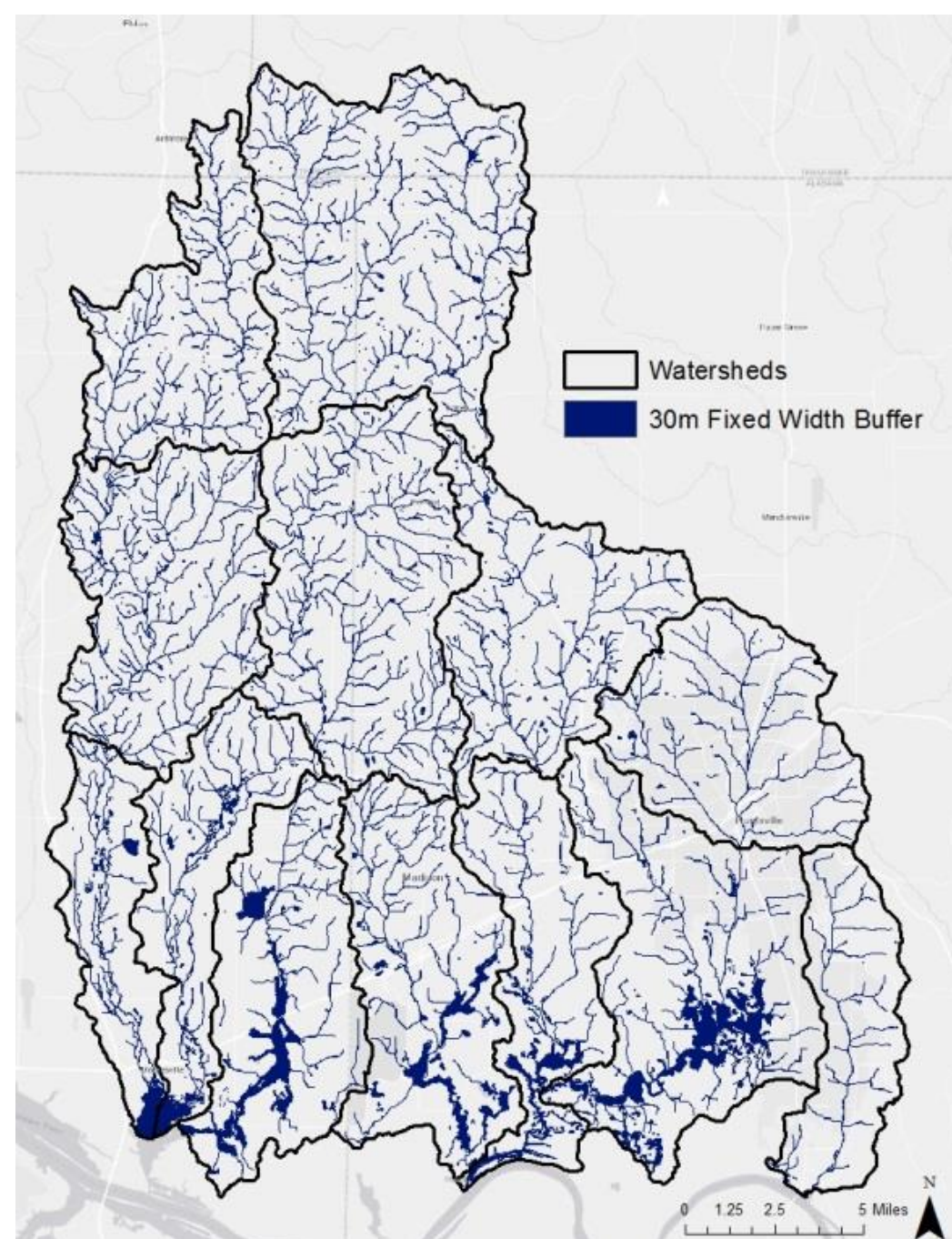
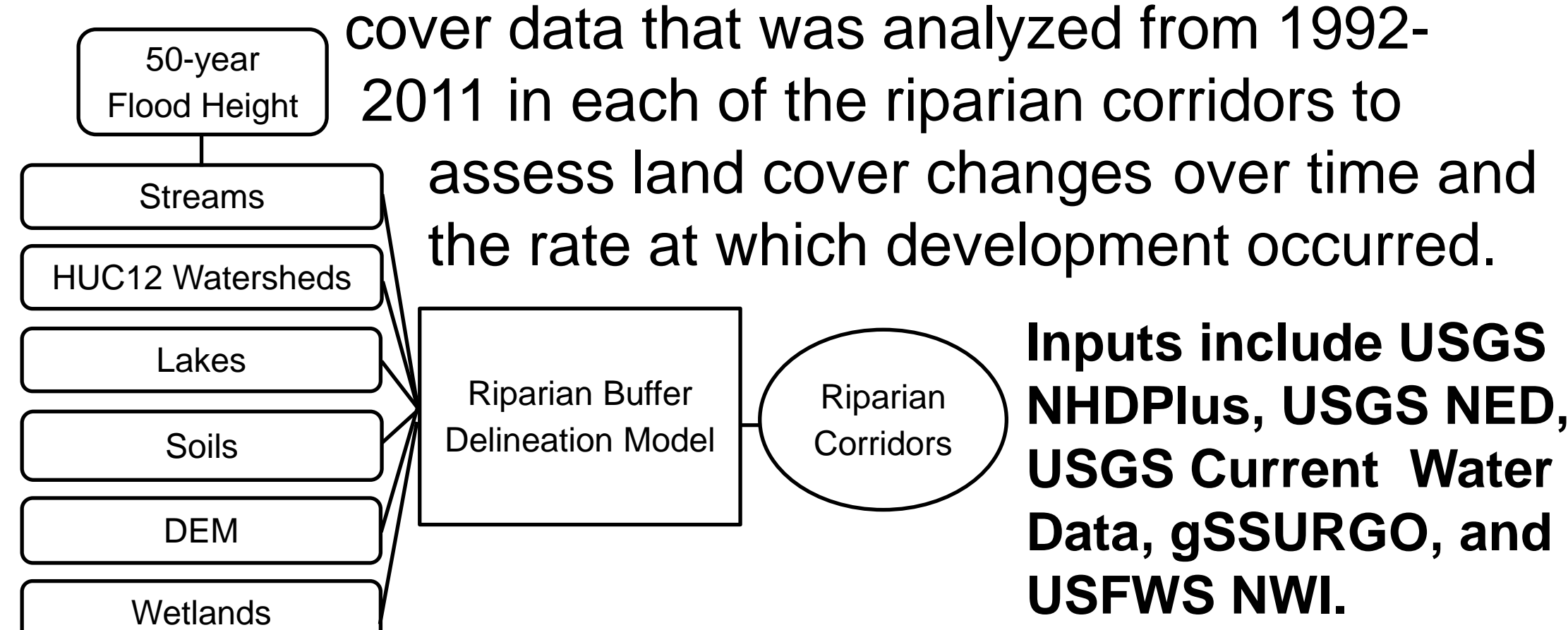
*Leah Parker, Department of Atmospheric Science  
Dr. Rob Griffin, Department of Atmospheric Science*

### Abstract

Riparian corridors provide numerous services for stream channels including nutrient and pollutant filtration, terrestrial and aquatic habitat stability, and sediment and erosion control. Disturbance to these crucial ecotones can be detrimental to the diverse array of inhabitants and overall water quality. Madison County in North Alabama has historically experienced rapid development which is currently expanding into neighboring Limestone County. This project utilizes the National Land Cover Database (NLCD) to assess historical trends within variable-width riparian corridors delineated with the Riparian Buffer Delineation Model (RBDM). By understanding historical land cover changes within riparian corridors in Madison County and Limestone County, those at risk of unfavorable land cover changes in the future can be identified. The results of this study can be evaluated to prioritize conservation efforts to protect the habitats and ecological processes that riparian corridors support.

### Methods

Defining the boundaries of a riparian corridor is challenging due to their high variability. Many management and policy organizations utilize fixed-width riparian buffers as comprehensive and feasible regulations, however, these buffers are based primarily on the stream channel and inadequately consider the surrounding floodplain, vegetation, and geomorphology of the area. To address this issue, Abood et al. (2012) developed the Riparian Buffer Delineation Model (RBDM), an ArcGIS toolbox that delineates variable-width riparian corridors utilizing readily available environmental data. The RBDM was utilized to delineate riparian corridors for thirteen HUC12 watersheds in North Alabama that are primarily located within Madison County and Limestone County. The National Land Cover Database provided historical land cover data that was analyzed from 1992-2011 in each of the riparian corridors to assess land cover changes over time and the rate at which development occurred.

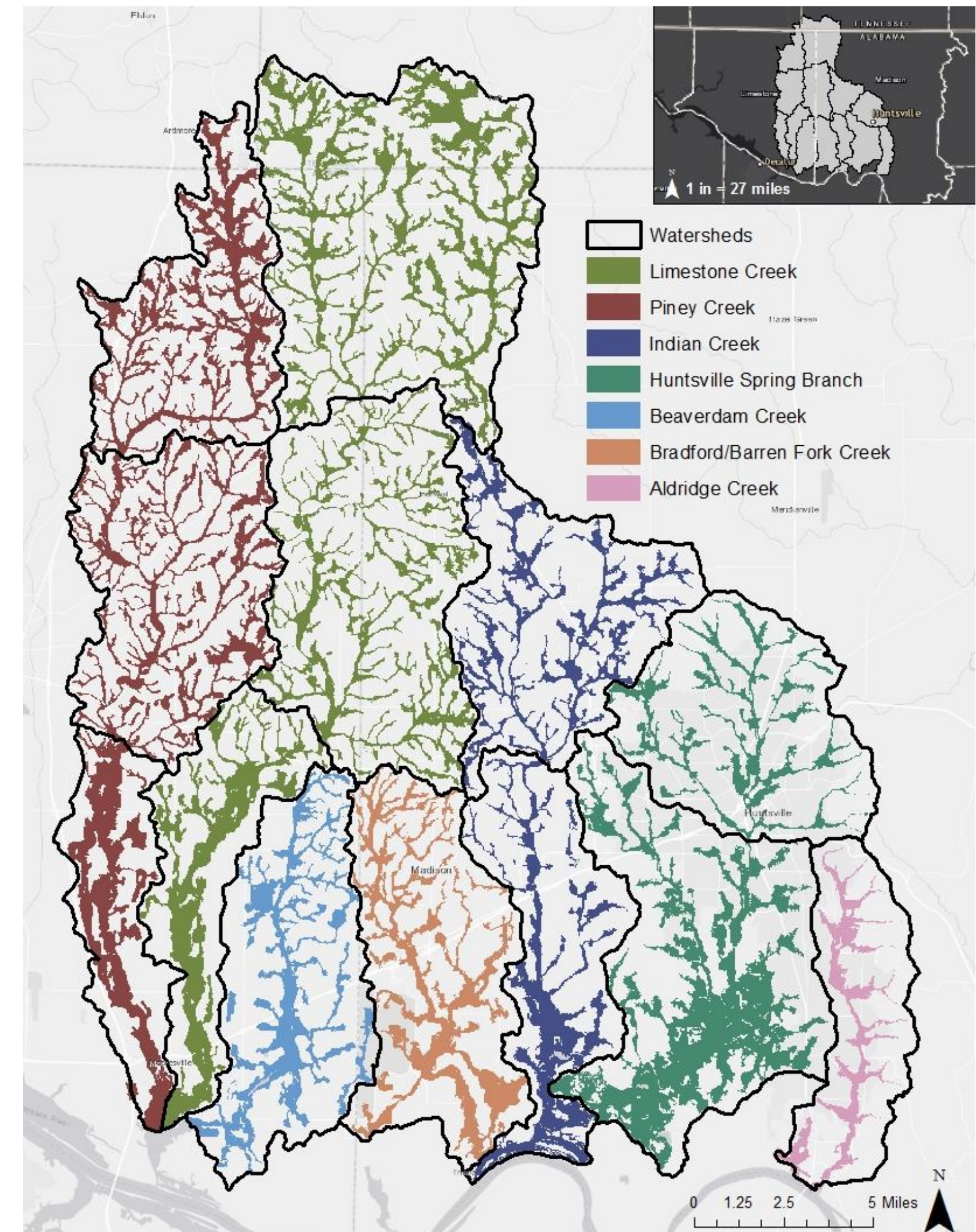


**An example of a fixed-width buffer of 30m.**

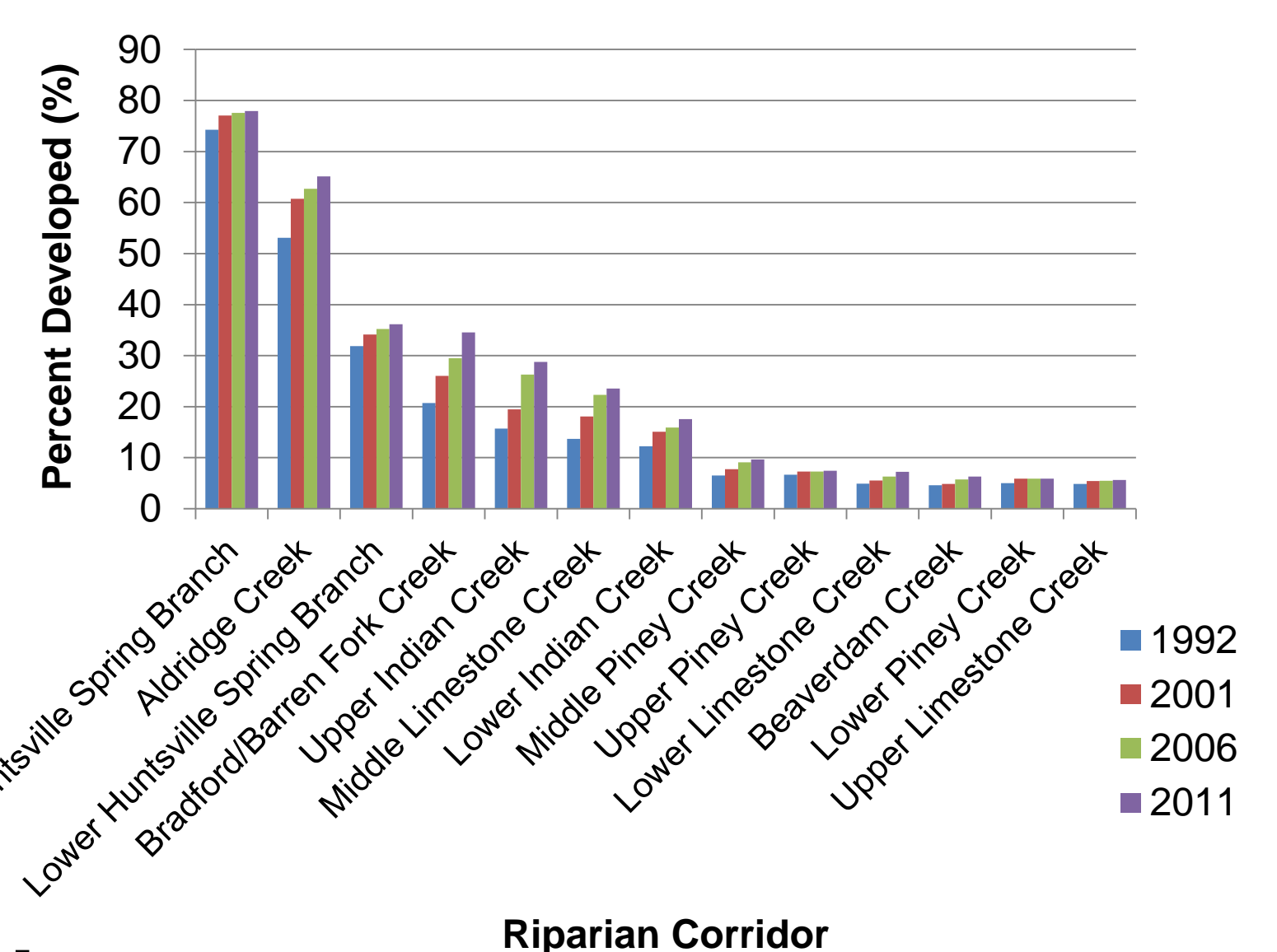
### Results

The highest developed riparian corridors were those located in Madison County near city centers such as Huntsville, AL. Urban sprawl is present as development begins to spread away from Huntsville and towards Limestone County. The majority of Madison County riparian corridors had larger percentages of development and faster rates of development than those in Limestone County.

**The percentage of developed land within each riparian corridor in 1992, 2001, 2006, and 2011.**



**Variable-width riparian corridors delineated using the RBDM.**



### Future Work

The results of this study will be analyzed and used to estimate the transition probabilities of each land cover classification becoming developed so that development in Limestone County riparian corridors can be forecasted. By recognizing the significance of riparian corridors and identifying those under the threat of unfavorable land cover changes in the future, these pristine ecotones can be prioritized to conserve the habitats and ecological processes that they support.

### Acknowledgements

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