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Mapping Cover Crop Usage in Calloway County, Kentucky

Ever since man made the change from hunters and gatherers to an agrarian lifestyle, erosion has slowly removed hectares of once fertile soils from crop land worldwide. As populations increase so does the demand for food, which ultimately increases the amount of erosion caused by agricultural activities. Previous farming practices once deemed revolutionary such as monocropping, synthetic fertilizers, and conventional tilling have only expedited the erosion process by destroying the soil's microbiome. Eroded soil eventually can make its way into rivers and lakes, decreasing the water quality with abnormally high levels of sediment and other pollutants carried away from farm fields.

Healthy soil is achieved through diversified crop rotations, using only organic fertilizers, and reduced or no-till practices which allow the microbiome of the soil to flourish and allow more nutrients to be absorbed by the crops. Another method used by farmers following the ideas of sustainable agriculture is implementing a cover crop during the time period a major cash crop such as corn or soybeans cannot be grown. The main function of a cover crop is to protect the soil from a multitude of environmental factors such as wind, water and temperature. By keeping soil covered with rooted plants, it is protected from wind and water erosion.

Farmland makes up roughly half of the land usage in Calloway County, Kentucky. The focus of this project was to quantify the cover crop usage during the winter months and determine if more farmers were implementing this sustainable agriculture practice. Suitable Landsat 7 and 8 images were used in correlation to National Land Cover Database years of 2001, 2006, 2011, 2016 and 2019 to determine which land was used for agriculture. The agricultural land was compared to the imagery collected in winter, spring and summer to determine which fields in Calloway County implemented cover cropping techniques. By determining the trends in cover crop usage over time, areas of concern, such as barren land near large rivers could be identified and addressed to mitigate erosion in Calloway County.

Key Words:
Remote Sensing
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