

The Spatio-Temporal Evolution of Irrigated Areas in the Georgia Coastal Plain

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Abstract. Agricultural landscapes are the most prevalent form of land cover globally and are likely to increase in the future due to the upward trend in population growth and demand for biofuels. By some estimates, agricultural landscapes comprise up to 40% of the global land cover. There has also been a growing trend towards irrigating agricultural land cover, especially in areas such as the Southeastern United States which has recently experienced periods of drought. Research has shown that irrigation alters temperature and precipitation patterns at various spatial scales and is a consumptive form of water use, thus it would be beneficial how this form of land-use change evolves over time. This study investigates the evolution of areas capable of irrigation in the Georgia Coastal Plains region by quantifying temporal and spatial changes in total acres irrigated primarily by using historical and current high resolution aerial photographs and satellite imagery. Irrigated areas are delineated through remote sensing data to map center pivot irrigation (CPI) systems. These systems irrigate circular, or arc like fields using a series of sprinklers mounted on a pipe supported by a row of mobile towers and rotate to distribute water supplied by a central well. Several Landsat band combinations are analyzed to produce the best contrast of existing CPI systems with the surrounding landscape and are readily identified using manual digitization techniques. Results will be presented that demonstrate a significant increase in the intensity of irrigation in terms of density and distribution within the Georgia Coastal Plain region during the 35-year period of analysis.