

**Alteration of Surface Energy Balance and Modification of Convective Rainfall in South
Florida as the Effects of Land Cover Change**

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Ph.D. Candidate, Oct. 31 2012

Abstract

Anthropogenic modification of land cover in south Florida has been considered as a major environmental challenge from the ecohydrological point of view. Following the intense human settlement and water management structures in the 20th century, half of the original wet and forested Everglades have been transformed to agricultural and urban uses which significantly altered the hydrologic balance of the region. Replacement of evapotranspirative wet and forested surfaces by dry and urban fabrics switches the dominant energy flux from latent to sensible heat ultimately resulting into the development of Urban Heat Island (UHI). It is reported that changed spatial pattern and enhanced intensity of convective rainfall are also possible due to UHI. This study aims to examine the long term (pre-drainage to post drainage) land cover change in south Florida and analyze the associated thermal effect at surface and near surface atmosphere. The research will be approached in three steps: estimate land surface temperature and land cover classes based on satellite images and historical information, calculate /or model the surface energy balance using energy flux equations and simulate the convective rainfall by combining estimated temperature, fluxes and observed meteorological parameters. The research is expected to fulfill two fold purposes, the first, it advances the understanding of post development hydrology in south Florida, and second, it inquires the spatial and temporal impacts of land cover change on microclimate of a subtropical city while most of the previous researches have been focused in temperate urban centers.