

Influence of Land Development Patterns on Rainfall and Temperature in the Southeastern USA

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Previous research using numerical models found the possible impact of long-term anthropogenic land-cover change on the regional climate of the Florida Peninsula during summertime. Most of this 90-year period land use changes were due the transformation of natural forest into agricultural lands. In this research, our objective was to explore how sensible a regional climate is, due to land-cover changes resulting from transforming forest and agricultural lands to land development for housing. Two current scenarios of land development based on the Central Florida Regional Growth Vision projected to 2050 were evaluated. The first scenario is based on the current growing trend where more development will be carried out on rural and sensitive environmental areas; whereas the second scenario is based on land development occurring within current cities and unincorporated population centers connected by corridors and conserving countryside and sensitive environments. To achieve this objective, a series of simulation experiments were conducted using the Florida State University/Center for Ocean-Atmospheric Prediction Studies (FSU/COAPS) Regional Spectral Model coupled to the National Center for Atmospheric Research (NCAR) Community Land Model (CLM2). Results showed differences between the simulated rainfall and temperatures patterns under both land development scenarios, differences that could potentially influence population requirements of water and energy due to the increments/decrements in both variables. Although this research is based on simulation experiments, results showed the sensitivity of the regional climate to land development, and the possibility to make better decision based on expected changes in the atmospheric conditions.

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