

GEOSPATIAL INDICES OF URBAN SPRAWL IN NEW JERSEY

by

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ABSTRACT OF THE DISSERTATION  
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Urban Sprawl has become an important issue for many rapidly developing areas. As the most densely populated state in America, New Jersey is experiencing dramatic landscape changes attributable to urbanization and will likely become the first state to reach build-out. This research examines the process of urbanization utilizing geospatial technologies to analyze patterns of urban growth that occurred in New Jersey at a number of different scales. A suite of twelve *geospatial indices of urban sprawl* (GIUS) are developed to measure indicators of problematic, inefficient and/or dysfunctional characteristics of urban growth within a landscape. The measurements include: (1) density; (2) leapfrog; (3) segregated land use; (4) regional planning inconsistency; (5) highway strip; (6) road infrastructure inefficiency; (7) alternate transit inaccessibility; (8) community node inaccessibility; (9) land resources consumption; (10) sensitive open space encroachment; (11) impervious surface impact; and (12) growth trajectory. The GIUS measures are operationalized at multiple scales and spatial areal units to analyze urban growth that occurred in New Jersey between 1986 and 1995. The analysis finds that there are many

different types of sprawl that can be identified and that rural or exurban sprawl exhibits the highest impact upon the socioeconomic/ecological integrity of a landscape on a per capita basis. The GIUS measures present a robust analytical approach for characterizing and comparing patterns of urban growth at multiple scales within localities or between regions. The measures provide an objective means of evaluating how well new development embodies characteristics of smart growth or urban sprawl.

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**DEDICATION**

Dedicated to Blanche and John Koonz and all whose shoulders I stand upon. May my  
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