GEOSPATIAL INDICES OF URBAN SPRAWL IN NEW JERSEY

by

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and approved by

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ABSTRACT OF THE DISSERTATION

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Richard G. Lathrop

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.
ACKNOWLEDGEMENTS

There are far too many people to thank than I can possibly fit within a single acknowledgements page and frankly, I’m really tired of typing. So, let me start with thanking all those who are not in writing but who are in my heart. I could never have done this work without so much love, support, understanding, patience, inspiration, copy-editing, suggestions, references, food, hugs, forgiveness, prayers, well-wishes, beer, more hugs, more food, more patience, more love and even more patience than given to me by so many people. You know who you are. My heartfelt appreciation for everyone is sprawling. I am especially grateful to my advisor, Rick, for his patience through all the rough edges and guidance to focus a lot of sprawling ideas into a coherent body of work. I am equally as grateful to Elvin Wyly for his enduring belief in the worthiness of my ideas and his bottomless support both academic and personal. I’m also grateful for the other members of my committee, Dave Tulloch for friendship and unending support (in multiple ways) and to Dr. Brail who, as an urban planner, provided the perfect compliment to a sprawling committee consisting of an ecologist, geographer and landscape designer. I am especially grateful to Lil and Pat Mulligan, Caroline Phillipuk, Chuck Colvard(mi amigo numero uno) & Susan McCann, Hong-Ling Wee, Cheryl Gowar, Renaud DePlaen, Joie Manzo, Esther Mas, Miriam MacGillis, Denise Royle, Tenley Conway, John Bognar, Jim Trimble, Tim Evans, Heather Mahaley, Dave Robinson, Bria Holcom, Scott Madry, Mike Medler, Marlene Cole, Michele Martel, all Rutgers staff people who ever helped me, Dick Scott, and the Rowan Department of Geography. Finally, I’d like to thank the developer who motivated my interest in land use with trespassing charges.
DEDICATION

Dedicated to Blanche and John Koonz and all whose shoulders I stand upon. May my work be worthy of those who have made it possible.

J.E.H. 2002
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