

URBAN SPRAWL IN THE STATE OF MISSOURI: CURRENT TRENDS, DRIVING FORCES, AND FUTURE GROWTH ON MISSOURI'S NATURAL LANDSCAPE

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ABSTRACT

Missouri reflects a full range of sprawl characteristics that include large metropolitan centers, which led growth in 1980s, and smaller metropolitan and rural areas, which led growth in 1990s. In order to study the historical patterns of sprawl, there is a need to quantitatively and geographically depict the extent and density of impervious surface for three time periods of 1980, 1990, and 2000 for the entire state of Missouri.

Mapped impervious surface is the best candidate of ancillary data for dasymetric mapping of population in several comparison studies. The current research examines the performances of dasymetric mapping of population with imperviousness as ancillary data and regression analysis of population using imperviousness as a predictor. Results from this work can be aggregated to any geographical unit (hydrologic boundaries, administrative boundaries, etc.).

A pilot future urban growth study for the two decades of 1980s and 1990s was done in Missouri. The historical urban growth of the two decades were analyzed then coupled with various predictor variables to investigate the influence of each predictor variables towards the process of urban growth. The knowledge learned from the process is then used to build an urban growth simulation model that is GIS-based with open framework for ease of management and improvement. Pixel level urban growth was simulated for year 2010, 2020 and 2030. This model framework is developed with the ultimate goal of simulating urban growth for the entire state of Missouri.