

Project Abstract

General urbanization trends indicate that population density is decreasing in the urban core of midwestern cities, while the population density of outlying areas is increasing. This trend has been noted in several metropolitan areas within EPA Region 7 (Missouri, Kansas, Nebraska and Iowa), including Springfield Missouri, Kansas City Kansas/Missouri, St. Louis Missouri/Illinois, and the Omaha, Nebraska/Council Bluffs, Iowa area. This study uses Landsat satellite imagery to examine how urbanization is occurring over time for these metropolitan areas. Satellite imagery for each area spanned the time period from approximately 1972 to 2000. The time interval between successive satellite scenes for each urban area was approximately five years. The time step varies somewhat due to the quality of the available satellite imagery (cloud cover effected the scene chosen). Unsupervised classification techniques are applied to each scene in order to determine the land cover present during each time period. Nine classes are used, three urban classes and six non-urban classes. Urban land use/cover classes include impervious, low-intensity urban, and high-intensity urban. The non-urban classes include water, forest, woodland, grassland, cropland, and bare/sparsely vegetated. After classification, each area is analyzed to determine the amount of urban increase occurring between image dates. Once established, the type and amount of each non-urban land cover being converted to urban land use/cover are examined. The general trend within each metropolitan area is that of increasing urbanization. The types and amounts of non-urban land cover being converted vary from city to city, largely based on what type of land cover is primarily found there. Visualization techniques were then applied to provide a more easily understandable representation of the urbanization occurring within the chosen metropolitan areas. Visualization is accomplished through the animation of the classified satellite imagery. Both static animations and fly-thru animations were developed.