INTERCENSAL URBAN POPULATION ESTIMATION

FROM NASA HIGH-ALTITUDE IMAGERY

AND PAST CENSUS DATA

An Abstract of a Thesis

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by

Randy Frosh

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ABSTRACT

The objective of this study was to determine if an easily repeatable and accurate method of intercensal population estimation could be developed by using remote sensing imagery as a source of urban area and past decennial census data as a source of density. It was noted that both researchers and administrators need an accurate, up-to-date method of obtaining population figures.

The urban built-up areas of sixty midwestern places were measured from NASA high-altitude color transparencies flown in December of 1969. The density variable for the cities was projected from 1940, 1950, and 1960 census density data by the use of a time series analysis. These two variables first were analyzed cartographically and statistically to determine their relationship to population and then entered into regression equations to test the accuracy of predicting the 1970 population.

It was found that area was a very good predictor of population, specifically when the independent variables were categorized and analysis of covariance performed. However the projected density values were not sufficiently related to the true, or "geographical" density to decrease the error in the population estimate. As a result, using area alone to predict population produced an average error of 12.9 percent, while the best estimate from the use of both area and density had an average error of 12.1 percent.

The desired error level of 5 percent or less was not obtained. However, the best estimate was more error free than are estimates of population made from population projections.