

## **Abstract**

This study compares the use of cadastral land use data with remotely sensed land cover data for urban sprawl studies using the Shannon's Entropy spatial metric. Many rapidly urbanizing countries lack the technological or economic infrastructure necessary to establish and maintain digital cadastral systems, so remotely sensed land cover data may be a viable option for performing urban growth and urban sprawl studies due to its accessibility, cost, and thematic consistency. Shannon's Entropy is a commonly used metric for measuring sprawl in regions outside of the United States, where cadastral data is not available. Few studies have compared land cover and cadastral land use data using Shannon's Entropy as the main comparison metric. The study uses Model Builder in ArcGIS to perform Shannon's Entropy calculations on the metropolitan areas of Minneapolis and Chicago during the period from 2000 to 2011. The calculation uses the proportion and dispersion of low-density land development within the study area to quantify sprawl. The study cities are divided up into buffer zones, and the proportion of low density land development is measured for each zone. This study found that there was no significant difference between the Shannon's entropy results between land use and land cover. The results suggest that land cover data may be suitable for urban footprint studies in regions where cadastral data is not readily available or otherwise unavailable. This study also found that both metropolitan areas had high entropy values, but entropy did not significantly increase over the study period. These results help inform the broader literature on usable data types for urban footprint studies, as well as the use of Shannon's entropy for such studies.