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# Transition Process Analysis Using Polygon-based Land Use Data

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Land use transition reflects human activities with natural environment in a time period. Spatial data are very important to examine the land use transition process. Currently, most of the land use data are available in regular cell-based format. Geometry of land use is important attribute as land use category but the geometric characteristics in cell-based data is very difficult to capture as compared to polygon based data.

This study aims to analyze land use transition process using polygon-based land use data. Firstly, intersection of two land use data at specified time period is necessary that provides four types of polygon events (i.e., no change, change in land use, change in geometry, and change in both). Secondly, land use transition process is classified into 6 classes (i.e., stable, substitution, division-stable, division-change, expansion, and conversion) which are based on land use category and geometry. These classes represent polygon state. Additionally, we analyze relationships between polygon state and geometry of land use to explain the impact of transition process.

Central area in Tsukuba City is selected as a case study. The results indicate that during the land use transition process, polygon experienced changes in land use category and geometry has a tendency to be involved *expansion* in polygon state which can be considered as neighborhood effect. *Expansion* lowers the compactness of the geometry as compared to the other polygon states.

Keywords: polygon event, polygon state, transition process, land use