

Historical Land Cover Change

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Objectives

To develop time series land cover maps for studying the historical land cover changes.

User Community

Boone County and City of Columbia planning departments are the user community for this product. This product helps the planners to understand the landscape change pattern over time and also assist in better future planning and management of urban growth and other land cover changes in Boone County.

Product Development

Time series maps were developed using multi-temporal Landsat TM data from 1984, 1992 and 2000. The first step in the processing was to co-register all leaves on and leaves-off images with a root mean square error (RMSE) of 0.3 pixels using Erdas Imagine image processing software. Then, training samples for classification and accuracy assessment were collected from different sources such as field survey, color infrared air photos and USGS DOQQs. Supervised Maximum likelihood algorithm was applied to each scene and classified all the six scenes separately. Finally, in order to capitalize on seasonal variation, two classified images from different seasons were combined to create an improved land cover for each year mentioned above. Figure 1 shows the land cover maps developed for 1984, 1992 and 2000. The overall accuracy of the images ranges between 80- 90%.

Lessons Learned

The products were delivered to the end users last month and we are still waiting for feedback. The multi-temporal images produced better results than individual season with supervised Maximum likelihood algorithm. One of the other important issues is related to the accuracy of the maps. Even though the current maps accuracy ranges from 80 to 90%, it is not well suited for planning purposes which require a high accuracy for the map products. In addition, planners showed interest in land cover predictions that could be useful in making better smart growth.

Future directions

Based on the lessons learned from the end users, the following activities will be attempted in future: 1) Improving the accuracy of the maps using or applying different classification algorithms such as Artificial Neural Network, Decision tree and Fuzzy logic approaches, 2) Developing land cover prediction models based on the historical and other socio-economic data sets.

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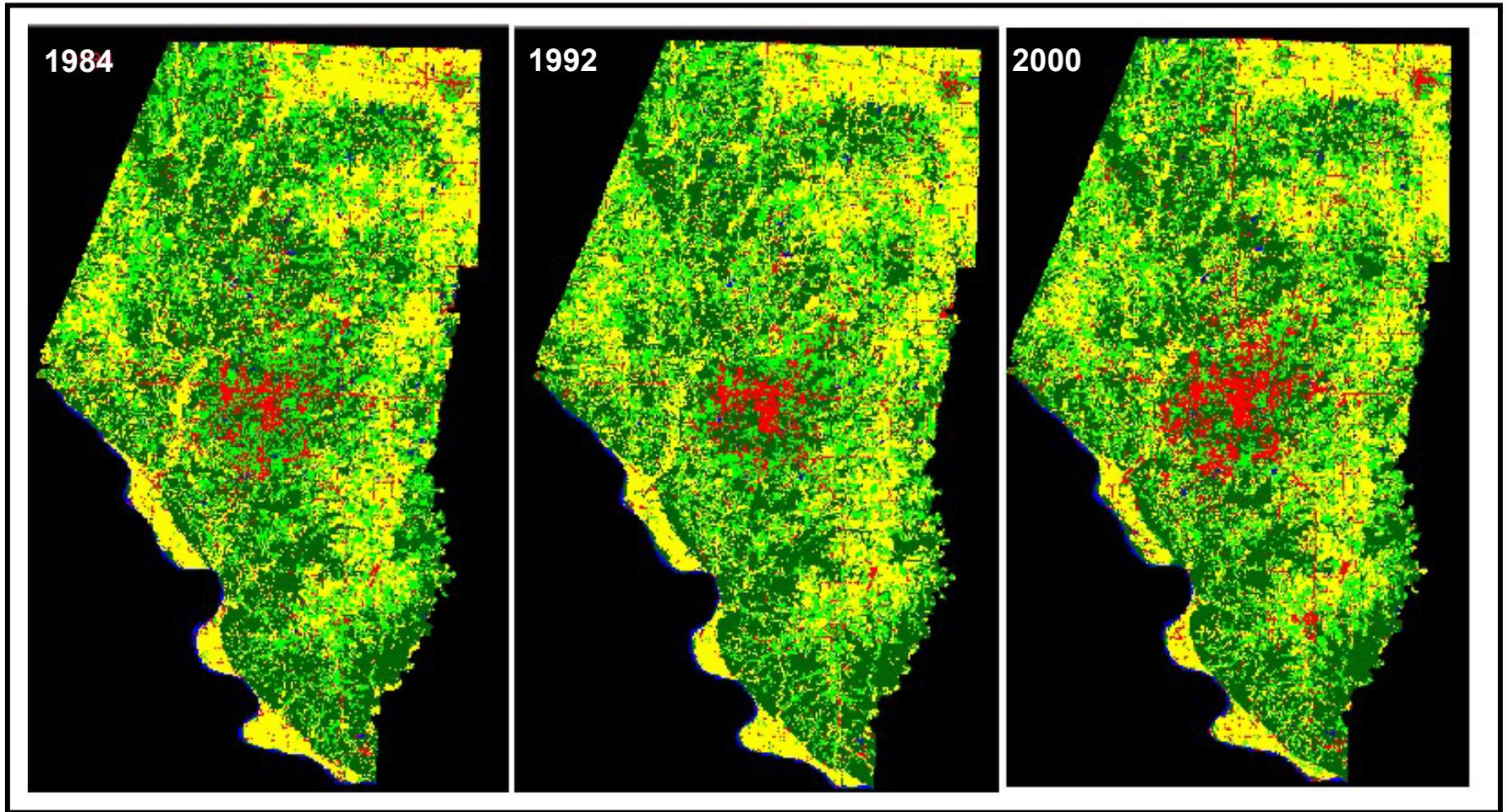


Figure 1. Historical land cover changes in Boone County, MO.

