MONITORING THE LARGE URBAN AGGLOMERATIONS GROWTH BY USING OBJECT-ORIENTED SVM METHOD FROM 1980s TO 2015 BASED ON REMOTE SENSING DATA

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THEME: This abstract is intended for the special session on "Time Series Analyses revealing Land Surface Dynamics"

KEY WORDS: urban agglomerations, Yangtze River delta, Urbanization, object-oriented classification, SVM, Dynamics of urban sprawl

ABSTRACT:

Nowadays the large river delta, the largest category of urban agglomerations, attracts considerable attention because of their population scale, economic, cultural, environmental and geographical complexity. Urban agglomerations are not only vital drivers for socio-economic development but also sources of various ecological and environmental challenges such as the serious of global warming, urban heat island, traffic Jam, imperviousness and land desertification. Therefore, it is of great significance for sustainable development to have knowledge about the urban agglomerations of large river delta growth and to monitor its dynamic change via using remote sensing technology. The objective of this paper is to take the urban agglomerations of Yangtze river delta as example, focusing on monitoring the spatial-temporal dynamics of the world's urban agglomerations with time intervals of about 10 years almost 40 years, extracting the dynamic changes of the urban agglomerations of Yangtze river delta area from 1970 to 2015.We propose an object-oriented classification method to extract impervious surfaces from Landsat TM imagery. So as to enhance data processing speed, object-oriented support vector machine (SVM) method was used for performing classification. By cross-validating the random selected validation points with geo-referenced field sites, Google Earth imagery and Landsat images, confusion matrices. With four statistical indicators (user's accuracy, UA; producer's accuracy, PA; overall accuracy, OA, and Overall Kappa Coefficient, OK) are conducted and used for assessing and validating the classification performance and accuracies. Our results shown that the overall classification accuracies derived from Landsat images were up to 80%. This research will provide scientific data for policy makers to carry on urban agglomerations' development and construct conservation-oriented, environmental-friendly, urban agglomerations.

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