Land Cover Classification in the Poyang Lake Region, China, Using Landsat TM and JERS-1 Synthetic Aperture Radar Data

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Abstract

The Poyang Lake is the largest fresh water lake in China. As an internationally important wetlands, conservation of wild birds needs updated information on land use and land cover in the Poyang Lake region. This paper introduced a non-parametric knowledge-based classification method (decision tree classifier) for land cover classification in the Poyang Lake region. We merged optical sensor (Landsat 5 TM) image with Japanese Earth Resource Satellite-1(JERS-1) synthetic aperture radar (SAR) images. The overall accuracy of the classification result was about 82%, of which forest was classified with higher accuracy (over 87%) and less errors of omission and commission. Main classification errors came from the similar spectrum of different land cover classes in winter. The seasonal dynamics should be considered for selecting optical satellite images for classification when using this pixel-based classification algorithm. The results of this study suggests that the non-parametric decision tree classifier together with fusion of optical and SAR images is an efficient method for mapping complex landscapes with agriculture, wetlands and forests.

Keywords

Decision tree classification method, Poyang lake, Remote sensing, JERS-1 SAR