

# LAND COVER MONITORING FOR MINING RECLAMATION AREA BASED ON RANDOM FOREST CLASSIFICATION FROM REMOTELY SENSED IMAGE<sup>1</sup>

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**Abstract:** The monitoring of land cover use and land cover change in the mining area is very important for the task of land reclamation and recovery. Comparing with traditional field-based survey and investigation methods, the remote sensing technology provide an effective and cost-efficient approach for fast information acquisition of land cover and land change information in the mining land reclamation area. In the mining land reclamation area, the strong topographic relief, the diversity, breakage, mixed distribution, and scattered layout of the surface features and other factors constitute the difficulties for remote-sensing image classification mapping. In order to improve the classification accuracy for land cover of mining reclamation area and provide technique reference for land reclamation monitoring and supervision, this article explored the monitoring and mapping method based on Random Forest algorithm for the reclamation area. Satellite and auxiliary dataset including GF-1 images, aerial images, DEM, and field investigation data acquired in October 2016 were used in this study. In this paper, the 33 features variables were selected and constructed 4 combined models on the basis of data image spectrum, topography, texture, space and other information to carry out random forest classification experiment, the precision was 82.79%, 84.91%, 86.75% and 88.16% respectively. Comparison with other classification methods such as support vector machine, maximum likelihood, and artificial neural network classifiers indicates that the random forest classifier could achieve the best accuracy with an overall accuracy of 88.16% and the Kappa coefficient of 0.83. Overall, we concluded that the random forest algorithm could achieve a satisfied classification accuracy of 88.16% under the multi-feature variables frame for mining reclamation area land cover mapping, which was better than SVM, MLC, and ANN classification results with the same feature variables. The random forest classifier was more efficient than SVM and more capable of dealing with multidimensional characteristic variables. This study may provide technical support and theoretical reference for the intelligent interpretation of remotely sensed images in the application of land reclamation monitoring and supervision task for land and resources administration.

**Additional Key Words:** reclamation area; land cover monitoring; random forest classification; multi-feature variables; feature selection.

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