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Application of multispectral remote sensing technology in water quality monitoring

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ABSTRACT

In order to understand the water quality of the Qinghe Reservoir in a timely and accurate manner, multi-spectral remote sensing technology is used to monitor the water quality. Using the OLI data of Landsat satellite, the correlations of single-band and band combination with the chlorophyll concentration and total suspended solids concentration of OLI data are analyzed by SPSS software. The largest correlation coefficient is selected to construct the ratio linear regression model and the nonlinear least squares support vector machine (LS-SVM). The two models are used to study the multi-spectral remote sensing inversion of chlorophyll a and total suspended solids in Qinghe Reservoir. The results show that compared with the ratio linear regression model, the LS-SVM model increases the decision coefficient R^2 of the predicted and actual chlorophyll a from 0.635 to 0.966, and the root mean square error decreases from 4.83 to 2.67; the coefficient R^2 of the predicted and actual suspended solids concentration is increased from 0.686 to 0.88, and the average relative error is reduced from 3.52% to 3.16%. The accuracy of multispectral remote sensing inversion of the concentration of chlorophyll a and total suspended solids is significantly improved by LS-SVM model.

Keywords: Multi-spectral remote sensing; Water quality; Monitoring; Chlorophyll a; Suspended solids; Least squares support vector machine

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