Monitoring Shallow Groundwater Contamination in Mine Area Using Remote Sensing Technology

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Abstract: Vegetative growth is tied closely to shallow groundwater, groundwater contamination and groundwater depth can be inferred by remotely monitoring the vegetation growth in the mining sites. The quantitative relationship between vegetation development and groundwater contamination in different geological environments was studied by using Landsat and ASTER GDME remote sensing images combined with measured groundwater contamination data. ENVI was used to extract vegetation index (VI) and other information to analyze forest health. The vegetation was finely classified in the GIS environment, and the vegetation area was divided according to the sensitivity of the vegetation to groundwater. According to the data collected on site, the mine area was finally divided into four ecological geological environments: a. sensitive healthy vegetation area; b. insensitive health vegetation area; c. sensitive disease vegetation area; d. insensitive disease vegetation area. The vegetation growth in the 'a' and 'c' areas is closely related to the groundwater depth, the better the vegetation growth, the shallower the groundwater depth. The occurrence of diseased or damagedvegetation in the 'c' and 'd' region indirectly indicated the contamination of groundwater. Therefore, it is of great significance to study the ecological effects of groundwater changes for guiding exploitation of mineral resources, ecological environmental protection and future rehabilitation efforts.

Key words: mining sites, groundwater contamination, remote sensing, environmental protection

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