

Groundwater potential analysis using the multiple spatiotemporal remote sensing approach in fractured rock of mountainous region

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Because of the costly field investigation, an optimum benefit technique, the multiple spatiotemporal remote sensing analysis, was used for long-term monitoring and assessment of groundwater potential capacity. In this study, we used the mentioned approach to derive the spatiotemporal index from Landsat imagery for identifying the land use change and understanding the regional hydrogeological characteristics, such as normalized difference vegetation index (NDVI), soil moisture index (SMI), land surface temperature (LST) and so on. To verify the index evaluation results, the hydrogeological properties including the core inspection, geophysical logging and hydraulic testing of totally 108 boreholes drilling in the fractured rock mass in mountainous region were collected. The pumping test results such as well capacity from 76 groundwater monitoring wells were also used to compare the potential groundwater capacity evaluated from remote sensing analysis. It was found a good agreement between the field investigation data and remote sensing analysis results. Therefore, the multi-scaled comprehensive analyses of natural and anthropogenic geomorphic features are suitable for providing more information to qualify and estimate the selections of investigated sites in the future.

Keywords: groundwater, fractured rock, remote sensing