Study on Methods of Monitoring Soil Moisture by Remote Sensing in Semi-arid Areas

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Soil moisture, as one of the most significant components of soil, always plays an important role in material cycle and energy exchange in the interface between land and atmosphere. As a consequent, study on soil moisture which has been generally regarded as one of the most difficult worldwide research, is not only vital in many fields such as agriculture, hydrology, and climatology, etc, but also a forefront of the emerging technology currently, remote sensing. If we take the fact into account that those methods, taking remote sensing quantitative retrieval, anomaly vegetation index, and vegetation condition index for instance, usually demand massive ground measured data and long series of remote sensing image data, we would find out that it is quite difficult to put them into practical applications both quickly and simply. In this paper, we choose Shiyang River valley, where the natural situation is characterized by its comparably weak ecological environment, as the researching area, and we try to explore a effective way, based on research ideas of vegetation supply water index (VSWI) and temperature/vegetation dryness index approach (TVDI), of monitoring soil moisture in arid and semi-arid areas quickly and directly by remote sensing technology; and in the next step, use this method to analyze changes of soil moisture of this region during the past 15 years. Through this study it would provide extremely persuasive support for ecological and environmental governance in Shiyang River valley. In this sense, it would no doubtly mean, to some extent, great scientific value and practical significance.
Keywords: Remote Sensing; Soil moisture; Vegetation Supply Water Index; Temperature/ vegetation dryness index approach

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