IDENTIFICATION OF SHALLOW GROUNDWATER REGIONS IN SEMI-ARID BRAZIL BY REMOTE SENSING METHODS

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RESUME

Employing remote sensing techniques for identifying regions with shallow groundwater depths is a recent advance reported by Menenti (1984). In semi-arid and arid regions, the evaporation can be reliably determined by soil balance methods. A rugged crust overlying a 20 cm deep groundwater table or a smooth hard, very dry soil surface overlying a 1 m deep water table are examples that can be cited to establish the efficacy of this method However, initial calibration by thermal infra-red radiometer or a neutron proble of ground reference points would be necessary to establish the required relationships for the interpretation of the data. The field data as obtained from observed piezometric heads would help in finding the detailed groundwater flow pattern.

The large daily amplitudes of surface temperatures observed in soft friable surfaces where groundwater discharge occurs is taken advantage of in predicting the shallow groundwater regions. Using the soil water flow simulation model SWATR of Feddes (1978), relationships between shallow groundwater depth and raio of actual to potential evaporation could be obtained. Is is proved that soil water flow keeps pace with the potential evaporation rate upto a certain depth, say 1 m, after which a sharp drop in relative evaporation occurs.

In this paper the potentially useful role of remotely sensed data to study the soil layering, surface energy balance and evaporation is semi-arid and arid regions of north-east Brazil is stressed.