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Comparison of Different Techniques to Estimate Surface Soil Moisture

Authors : S. Farid F. Mojtahedi, Ali Khosravi, Behnaz Naeimian, S. Adel A. Hosseini

Abstract : Land subsidence is a gradual settling or sudden sinking of the land surface from changes that take place underground. There are different causes of land subsidence; most notably, ground-water overdraft and severe weather conditions. Subsidence of the land surface due to ground water overdraft is caused by an increase in the intergranular pressure in unconsolidated aquifers, which results in a loss of buoyancy of solid particles in the zone dewatered by the falling water table and accordingly compaction of the aquifer. On the other hand, exploitation of underground water may result in significant changes in degree of saturation of soil layers above the water table, increasing the effective stress in these layers, and considerable soil settlements. This study focuses on estimation of soil moisture at surface using different methods. Specifically, different methods for the estimation of moisture content at the soil surface, as an important term to solve Richard’s equation and estimate soil moisture profile are presented, and their results are discussed through comparison with field measurements obtained from Yanco1 station in south-eastern Australia. Surface soil moisture is not easy to measure at the spatial scale of a catchment. Due to the heterogeneity of soil type, land use, and topography, surface soil moisture may change considerably in space and time.

Keywords : artificial neural network, empirical method, remote sensing, surface soil moisture, unsaturated soil
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