RESEARCH ON THE SOIL MOISTURE MULTI-SCALE REMOTE SENSING MONITORING

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Abstract:

Soil moristure is one of the most important parameters for surface energy balance. if it changes it will cause the change of other surface parameters , such as surface albedo, Soil heat capacity ,surface evapotration and vegetation growth conditions. And then result in the reappointment of surface energy and water, at last , those will induce other energy balance components change, such as the sensible heat from surface to atmosphere, the latent heat and radiation flux et.al.

Since remote sensing technology applied to soil moisture monitoring, it have formed a multi-source data, multi-spectral and multi-method system. But researchers always just use only one kind of remote sensing data in one monitoring application, neglected comprehensive utilization of multi-source data. This affects monitoring effectiveness and accuracy. To solve this problem, this research took Landsat-TM data and EOS-MODIS data as different scale data source for soil moisture remote sensing monitoring, in order to study how to build multi-scale remote sensing soil monitoring model that use multi-source data synthetically in one drought monitoring application.

The main research contents and conclusion are as followings:

First, we retrieved basic soil moisture monitoring parameters from different scale remote sensing data （TM & MODIS）, including: red band reflectivity, near-infrared waveband reflectivity, vegetation index (NDVI), and land surface temperature(LST). Then We build correction model between the same kind of basic monitoring parameter retrieved from different scale data, taking the one retrieved from TM data as quasi true value. Then took the MODIS basic monitoring parameters to simulate the one it will be when retrieved from TM data by using the correction model. We call this step scale correction. Then we used the new monitoring parameters , which is of MODIS data scale, but after scale correction by TM data, to simulate soil moisture. The results shows that the parameters after scale correction can

obtain higher acurracy of soil moisture monitoring than the ones from single scale data source.

Keywords: soil moisture, Remote sensing monitoring, Scale correction, Single scale, Multi-scale

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