A Method for Estimating Soil Moisture from ERS Scatterometer and Soil Data

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The potential of using ERS Scatterometer data for soil moisture monitoring over the Ukraine is investigated. The ERS Scatterometer is a C-band radar with a spatial resolution of 50 km and a high temporal sampling rate. An algorithm for estimating the surface soil moisture content is applied to 6 years of data. A qualitative comparison with meteorological observations and auxiliary information indicates that good-quality surface wetness values can be determined. A simple method is developed to relate the surface estimates with the profile soil moisture content. This model requires as input the remotely sensed radar data and soil data encompassing wilting level, field capacity, and porosity. The method was validated with an extensive data set of gravimetric soil moisture measurements in the 0–20 cm and 0–100 cm layers from the agrometeorological network in the Ukraine. It is found that the ERS Scatterometer data can be used to distinguish about five soil moisture levels with good confidence. Elsevier Science Inc., 1999

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