Scientific Information Portal in the World Wide Web: The Global Soil Moisture Archive 1992- 2000 from ERS Scatterometer Data

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Soil moisture is a key state variable of the global energy, water and carbon cycles and is such of cross-cutting importance for a wide range of scientific applications, from climate monitoring and ecological applications to the quantification of biogeophysical fluxes. Real-time soil moisture data would be of direct benefit to monitoring and better managing natural disasters such as droughts and floods. These outstanding situations for geographic regions may dramatically affect the population and the agricultural food production.

A method for soil moisture retrieval from spaceborne radar data, developed at the Institute of Photogrammetry and Remote Sensing of Vienna University of Technology, is opening new possibilities to provide soil moisture data for science and real-time applications. Recent research indicates that the technique has the potential to measure soil water content directly, cost-effectively and homogenous in space and time. The method utilises data from spaceborne C-band scatterometers: the ERS scatterometer which was flown on the European Remote Sensing Satellites ERS-1 and ERS-2 (starting in 1991) and the Advanced Scatterometer which will be launched on board of METOP (Meteorological Operational Satellite) in 2005.

For validating the methodology and demonstrating the value of the soil moisture data for various applications, the complete global ERS Scatterometer database from the years 1992 – 2000 was processed. To make it available for the scientific community and the public, the database will be published on the world wide web (WWW). The web site will show global visualizations of the Soil Water Index (SWI) with a spatial resolution of 50x50 km^2 and with a monthly time step resolution from 1993 to 2000. A main aim of this web page is to enable a worldwide discussion about soil moisture monitoring, application and possibilities to improve the algorithms. The scatterometer derived soil moisture data will be compared to conventional datasets: regional SWI maps and SWI anomaly maps will be compared to global rainfall data from the “Global Precipitation Climatalogy Center” (GUCCI), with rainfall and temperature time series from selected meteorological stations worldwide, with in-site soil moisture measurements from Russia; Ukraine, Illinois and China, and with modeled global soil moisture data.

For the upcoming ASCAT, real-time monitoring of soil moisture could become a reality. Real-time data could be made available over a web site, which would also serve to attract new users. With an estimated 201 million users on-line world wide is clear that the internet offers the potential to pass and receive information to and from a huge user community. In our case the internet is going very useful to present an accumulative data base.