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The analysis on ERS scatterometer derived soil water index data in China.

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The first multi-year global Soil Water Index (SWI) data set, derived from European Remote Sensing Satellite (ERS) scatterometer, is used to evaluate its ability to monitor water availability and precipitation distribution in China for the years 1992-2000. Monthly averaged in-situ relative soil moisture from Chinese meteorological gauge stations, as well as monthly precipitation data from the Global Precipitation Climatology Centre (GPCC) are employed to perform comparisons with SWI at local, regional, and country-wide scales. ERS derived SWI data in China is evaluated to be a good indicator for water availability at different scales. SWI and SWI anomaly data correlates well with the precipitation and in-situ soil moisture data. It has furthermore been demonstrated to reflect extreme climate events such as drought in the summer of 1997 and flood in the summer of 1998 in China. Additionally, SWI and the observed relative soil moisture data are used to retrieve soil moisture, which was used as an initial scheme to replace initial conditions of soil moisture (NCEP) in the model MM5V3 to simulate three heavy rainfall events in the summer of 1998 in Eastern China. Detailed analysis of the heavy rainfall simulation shows that both land-atmosphere interactions and atmospheric circulation were responsible for the heavy rainfall and the SWI retrieved soil moisture can improve the numerical model's performance. The development of mesoscale system plays an important role in the simulation regarding the change of initial soil moisture from SWI. Meanwhile, the retrieval can overcome the difficulties in soil moisture observation on a large scale and the retrieved soil moisture

may reflect the distribution of the real soil moisture objectively.