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Satellite Soil Moisture Estimation, Assessment, and Applications

Guest Editors:

Dr. Hui Lu

Dr. Hongquan Wang

Dr. Lun Gao

Dr. Xiaojun Li

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Message from the Guest Editors

As an essential hydrologic state variable in the Earth system, soil moisture plays an important role in modulating water and energy exchange within the soil–vegetation–atmosphere continuum, from a watershed to a global scale, largely through controlling the partitioning of precipitation into evapotranspiration, surface runoff, and infiltration. The global monitoring of soil moisture from space is important for improved land and weather forecasts, and the understanding of water, energy, and carbon cycles, as well as the improved management of water and food resources. Today, multiple space-borne platforms, such as the ESA's Soil Moisture and Ocean Salinity (SMOS) satellite and NASA's Soil Moisture Active Passive (SMAP) satellite, provide an unprecedented opportunity to estimate soil moisture. However, the retrieval of soil moisture remains challenging due to limited satellite observations, the high correlation between different polarizations, angles, and channels, as well as uncertainties in radiative transfer models and ancillary datasets.

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Editors-in-Chief

Dr. Prasad S. Thenkabail
Senior Scientist (ST), U. S. Geological Survey (USGS), USGS Western Geographic Science Center (WGSC), 2255, N. Gemini Dr., Flagstaff, AZ 86001, USA

Prof. Dr. Dongdong Wang
Institute of Remote Sensing and Geographic Information Systems, Peking University, Beijing, China

Message from the Editorial Board

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Contact Us

Remote Sensing Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland

Tel: +41 61 683 77 34
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remotesensing@mdpi.com
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