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IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing

Special Issue on "Remote Sensing of Soil Moisture"

Over the past decade, numerous satellite missions have provided publicly available global soil moisture data sets. These include SMOS (Soil Moisture and Ocean Salinity), AMSR2 (Advanced Microwave Scanning Radiometer), SMAP (Soil Moisture Active Passive), ASCAT (Advanced Scatterometer) and CYGNSS (Cyclone Global Navigation Satellite Systems) launched and maintained by ESA, JAXA and NASA. The soil moisture observations derived from these sensors have been used in earth system modeling and forecasting. With the sparse nature of soil moisture observations, the observations provided by these sensors are invaluable in advancing science, mapping hydrological disasters such as floods, droughts and landslides, and for providing management decisions for various water resources problems. However, the spatial resolution of most of these products are lower than 10-km, making them sub-optimal for local and regional applications. Furthermore, these microwave satellite systems typically pass over the same location on the Earth's surface every few days, depending on the orbit of the satellite. The gaps in the soil moisture time series from the microwave satellite systems can limit their usefulness. For instance, it can be challenging to track soil moisture changes over short periods if the data are only available every few days. This is particularly problematic in areas with rapidly varying soil moisture, like those with heavy rainfall or droughts. Real-time monitoring of soil moisture is essential for crop management and irrigation scheduling, but low temporal repeat can make data untimely, hindering effective decision-making. Satellite systems' low temporal resolution can also limit their ability to capture extreme weather events that may affect soil moisture, such as heavy rainfall or droughts. It is important to consider the temporal resolution of soil moisture data when using microwave satellite systems for modeling, forecasting, and management decisions. To address spatial and temporal resolution issues, various methods have been developed. These include downscaling the original soil moisture to higher spatial resolution, making it appropriate for local and regional applications. Additionally, demonstration of new satellites and innovative technologies, such as the Terrestrial Water Resources Satellite (TWRS), are needed to further improve the spatial and temporal resolution of soil moisture, and its integration with machine learning and data assimilation methods for producing realistic and continuous soil moisture dynamics.

The broad topics include (but are not limited to):
Active/passive microwave; Downscaling; Validation; Modeling; Data Assimilation; AI/ML
We will invite review papers on four topics, namely (a) modeling (b) assimilation (c) downscaling, and (d) applications of machine learning methods to improve soil moisture estimations from satellites.

Schedule

Apr 1, 2023	Submission system opening
Oct 31, 2023	Submission system closing

Format

All submissions will be peer reviewed according to the IEEE Geoscience and Remote Sensing Society guidelines. Submitted articles should not have been published or be under review elsewhere. Submit your manuscript on http://mc.manuscriptcentral.com/jstars, using the Manuscript Central interface and select the "Remote Sensing of Soil Moisture" special issue manuscript type. Prospective authors should consult the site https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=9082768 for guidelines and information on paper submission. All submissions must be formatted using the IEEE standard format (double column, single spaced). Please visit http://www.ieee.org/publications_standards/publications/authors/author_templates.html to download a template for transactions. Please note that as of Jan. 1, 2020, IEEE J-STARS has become a fully open-access journal charging a flat publication fee $1,250 per paper.

Guest Editors

Bin Fang	University of Virginia, bf3fh@virginia.edu
Hyunglok Kim	U.S. Department of Agriculture (USDA), Hyunglok.Kim@usda.gov;
Minha Choi	Sungkyunkwan University, mhchoi@skku.edu
Tianjie Zhao	Chinese Academy of Sciences, zhaotj@aircas.ac.cn
Venkataraman Lakshmi	University of Virginia, vlakshmi@virginia.edu