Contribution ID: **720** Type: **Oral Presentation**

Soil Moisture Data Fusion from Field Scale to Continental Scale

Monday, 31 May 2021 18:30 (15 minutes)

In past 3 decades, Harry Vereecken has addressed a number of topics related to soil hydrology covering a range of scales from pore to catchment. To honor his outstanding efforts, here we present a new data fusion scheme to merge soil moisture from various insitu and satellite platforms. In this work, we develop a novel multi-scale geostatistical algorithm which can combine massive remote sensing datasets at different spatio-temporal resolutions for enhanced understanding of the underlying physical processes. We apply the proposed algorithm combining soil moisture data from Soil Moisture Active Passive (SMAP) and Soil Moisture and Ocean Salinity (SMOS) with point data from U.S Climate Reference Network (USCRN) and Soil Climate Analysis Network (SCAN) across Contiguous US (CONUS) uncovering novel insights into soil moisture dynamics across scales. Using an underlying covariate-driven spatio-temporal process, the effect of dynamic and static physical controls—vegetation, rainfall, soil texture and topography—on soil moisture is quantified. We find that vegetation, rainfall and topography affect the mean soil moisture distribution across CONUS while soil texture determines the spatio-temporal covariance between soil moisture pixels. We successfully forecast 5-day soil moisture across CONUS for multiple spatio-temporal scales accompanied by uncertainty metrics. Finally, we discuss the potential applicability of the algorithm to future soil moisture missions and broader Earth-System processes.

Time Block Preference

Time Block C (18:00-21:00 CET)

References

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Student Poster Award

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Session Classification: MS25

Track Classification: (MS25) Subsurface Water Flow and Contaminant Transport Processes –Special Session in Honor of Harry Vereecken