Supplemental Material

Advances in Soil Moisture Retrieval from Multispectral Remote Sensing Using Unmanned Aircraft Systems and Machine Learning Techniques

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Supplemental Figures

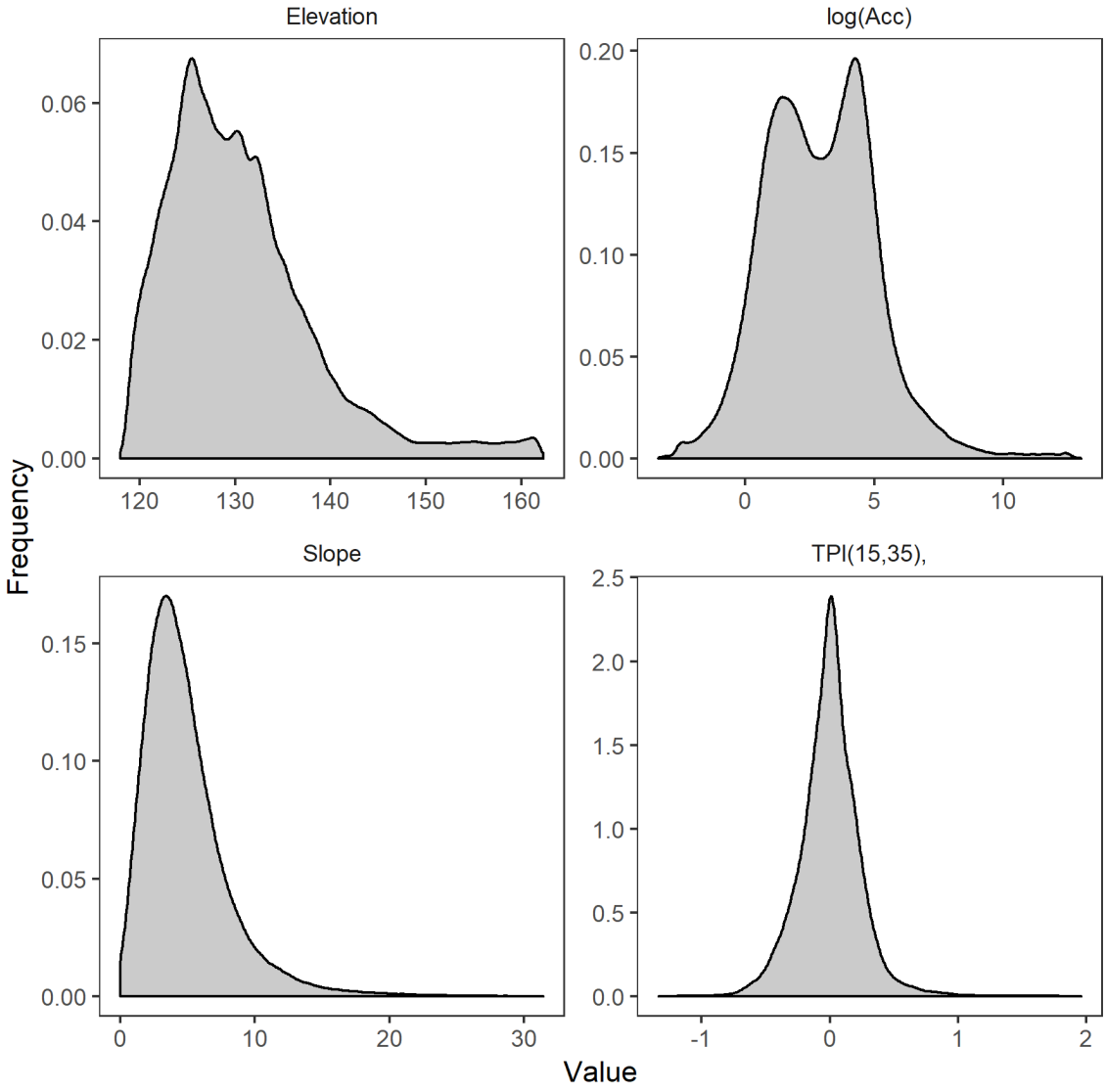

Figure S1 Kernel density estimate of values from four topographic variables for the study site. Elevation, flow accumulation, and slope variables were derived from 1 m resolution raster. (See Error! Reference source not found. **for a description of the variables)**

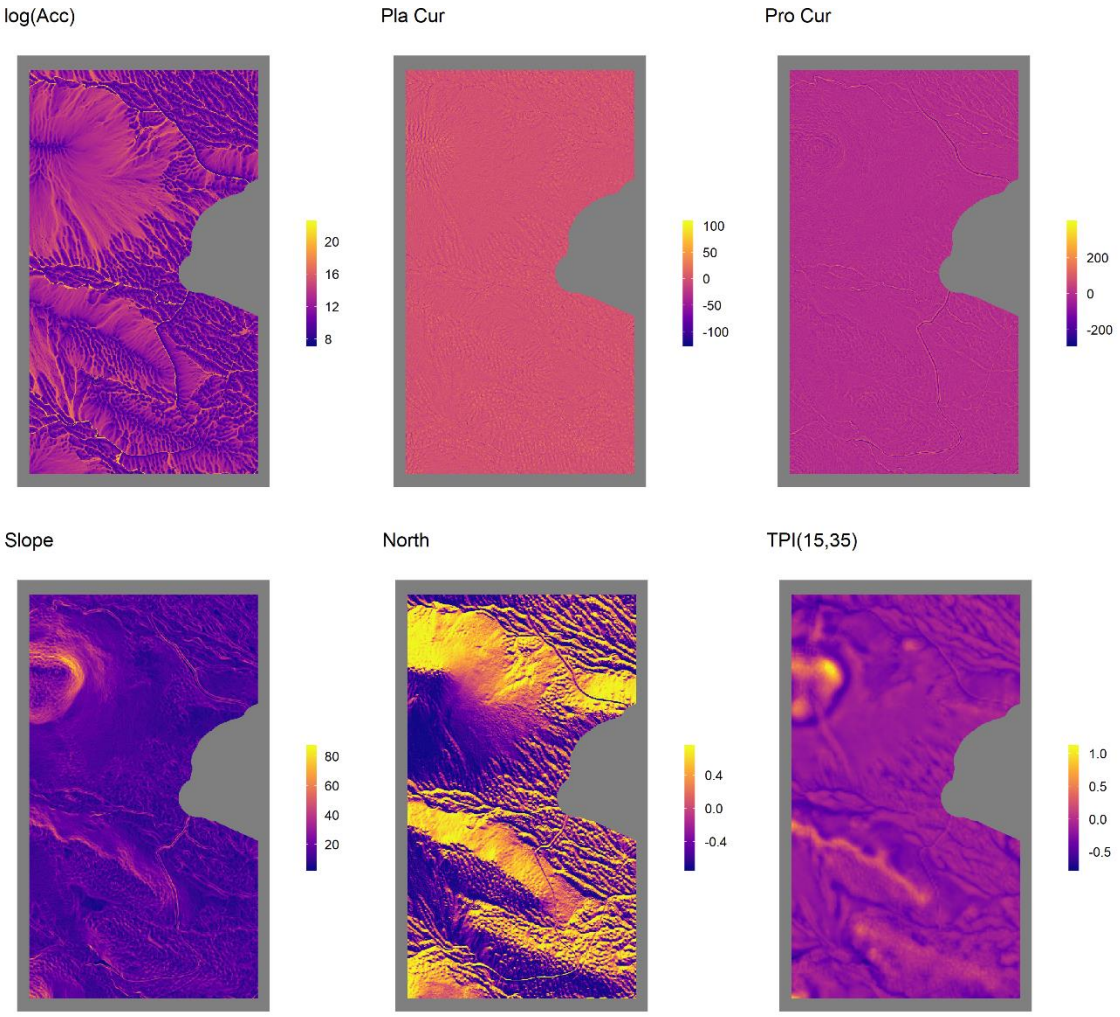

Figure S2 Values of some, 1 m resolution, topographic variables over the study area.

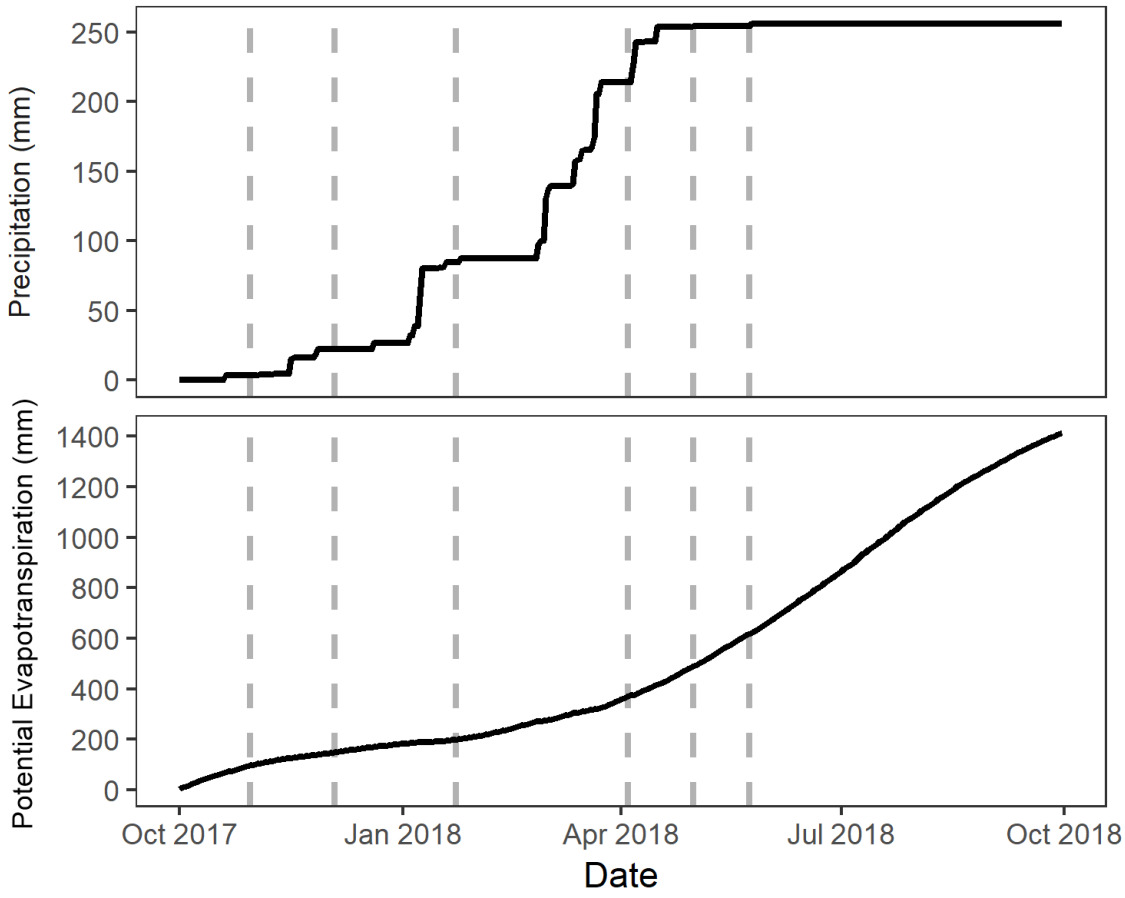

Figure S3 Cumulative precipitation and potential evapotranspiration for the 2018 water year (Source: UC Merced, and CIMIS Merced stations, respectively). Vertical dashed lines indicate measurement dates.

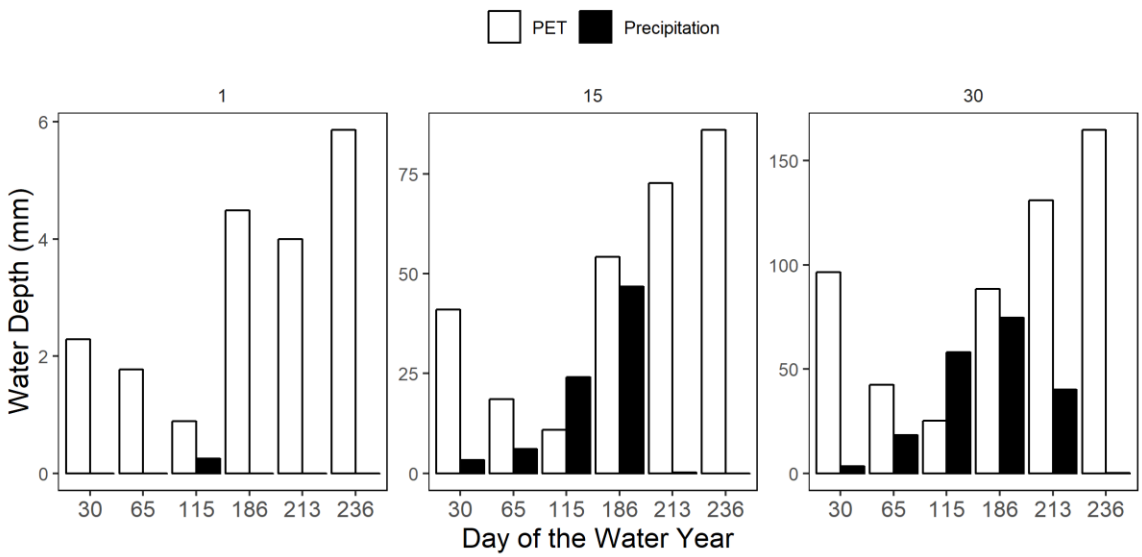

Figure S4 Rolling sums of precipitation and potential evapotranspiration by window size in days before the sampling date.

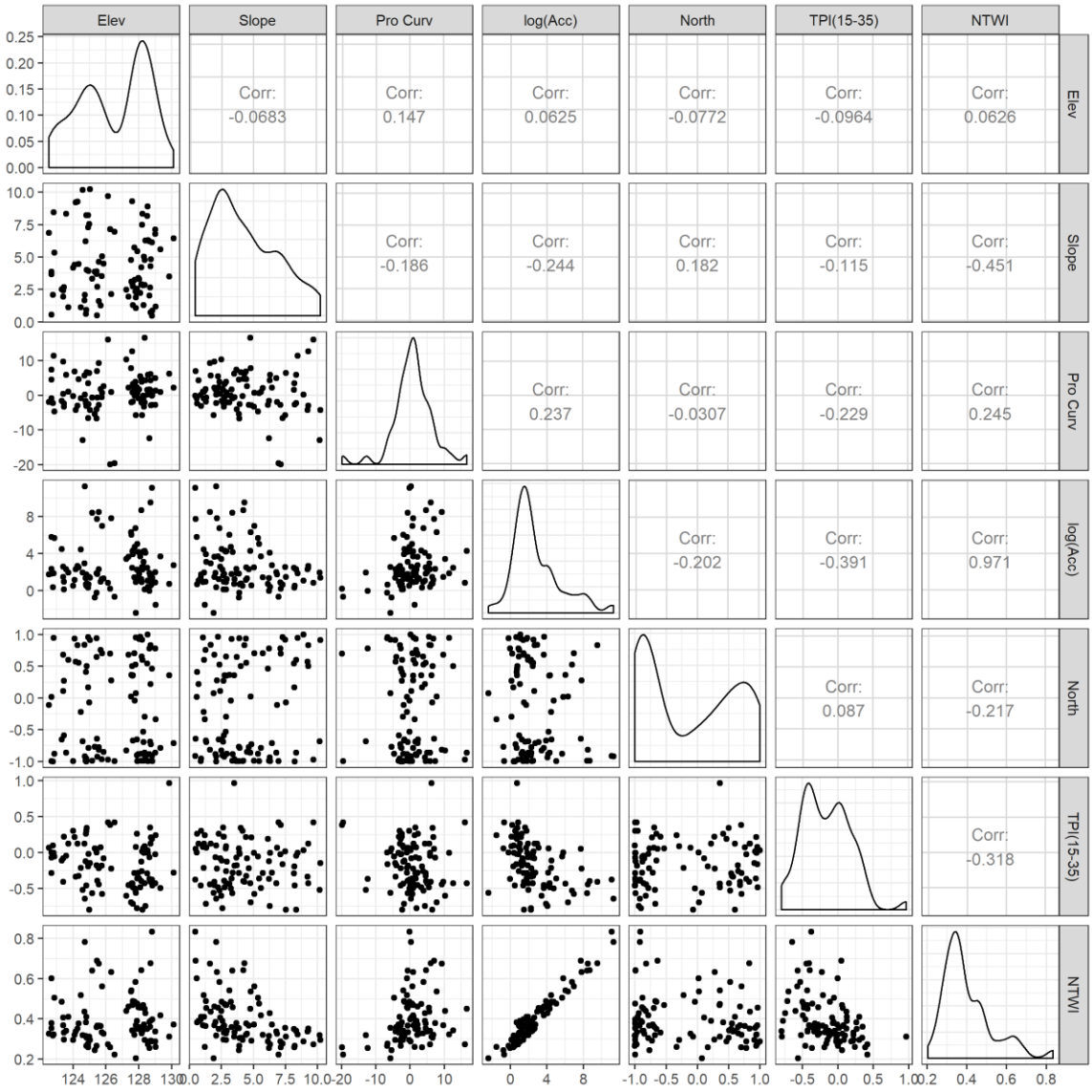

Figure S5 Plot matrix of selected terrain variables of the ground sampling points (from 1 m resolution raster). Top right diagonal panels show Pearson's correlation value, bottom left diagonal panels show scatter plot, and diagonal panels show density plots of variables. NTWI is the normalized topographic wetness index calculated from flow accumulation raster generated by multi-flow algorithm and TPI (15,35) is topographic position index with an inner diameter of 15 m and an outer diameter of 35 m.

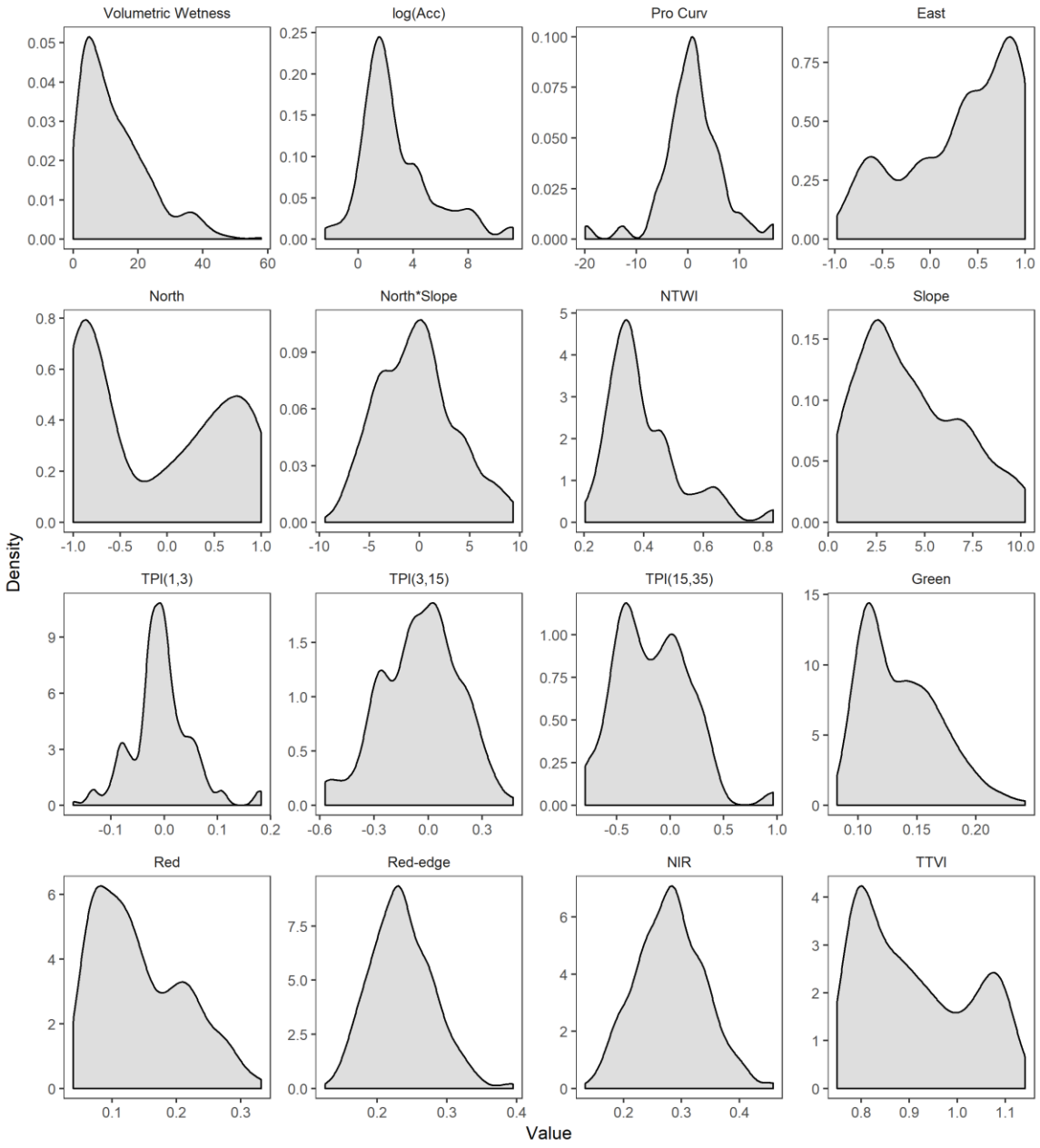

Figure S6 Kernel density estimate of values from selected variables in the data.

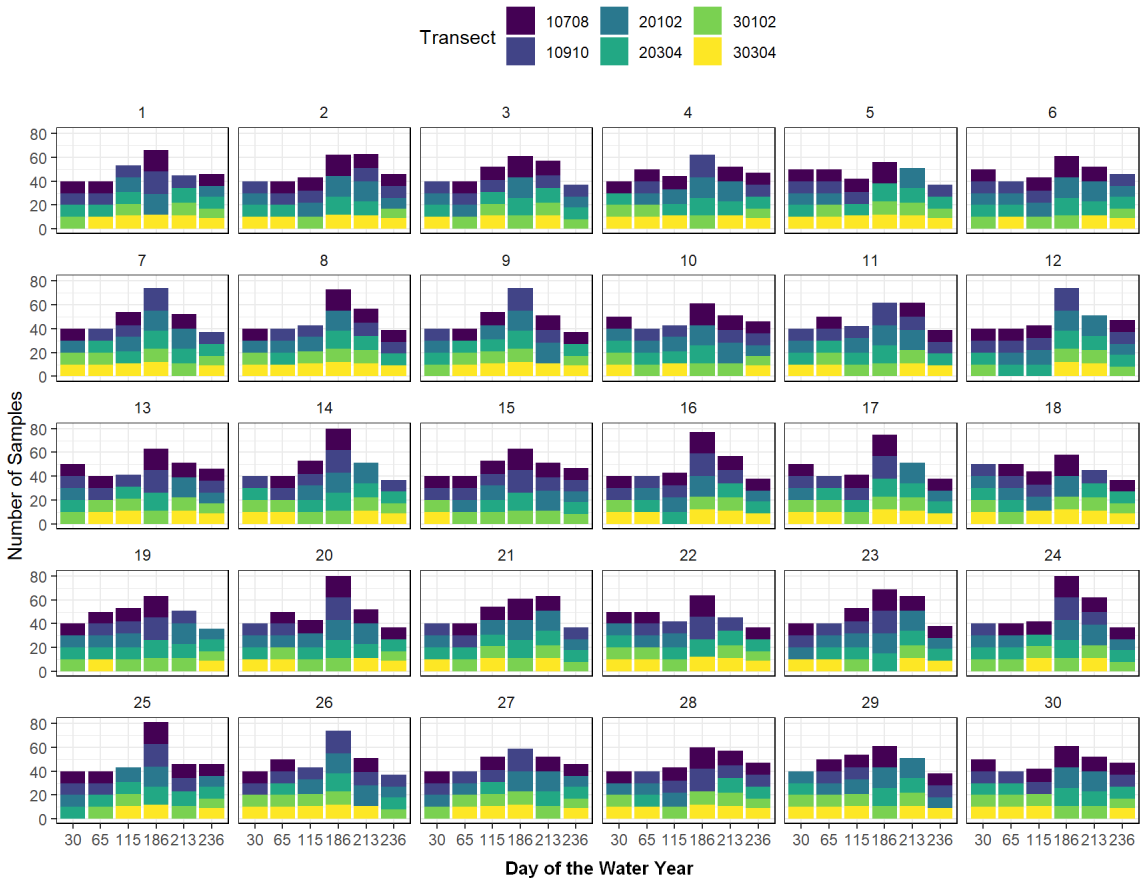

Figure S7 Number of samples in the 30 unique training sets grouped by sampling day and transect.

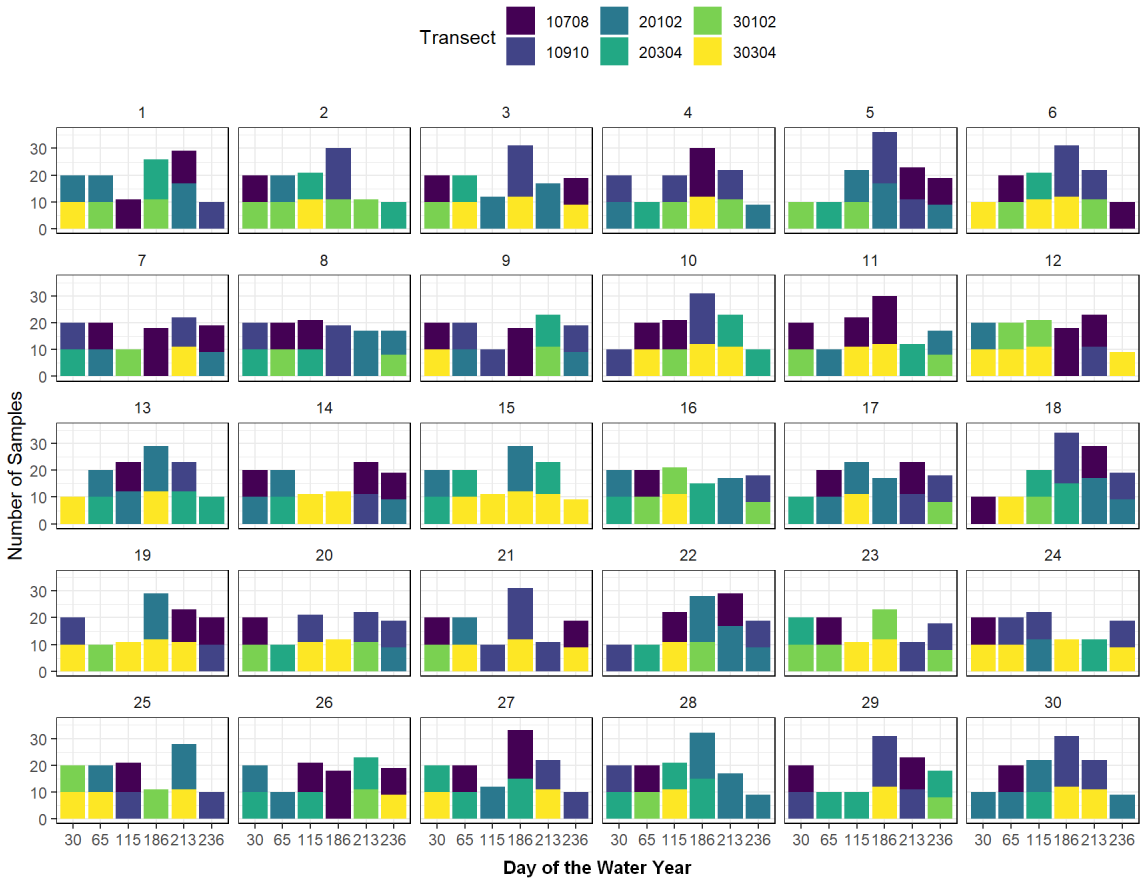

Figure S8 Number of samples in the 30 unique testing sets grouped by sampling day and transect.

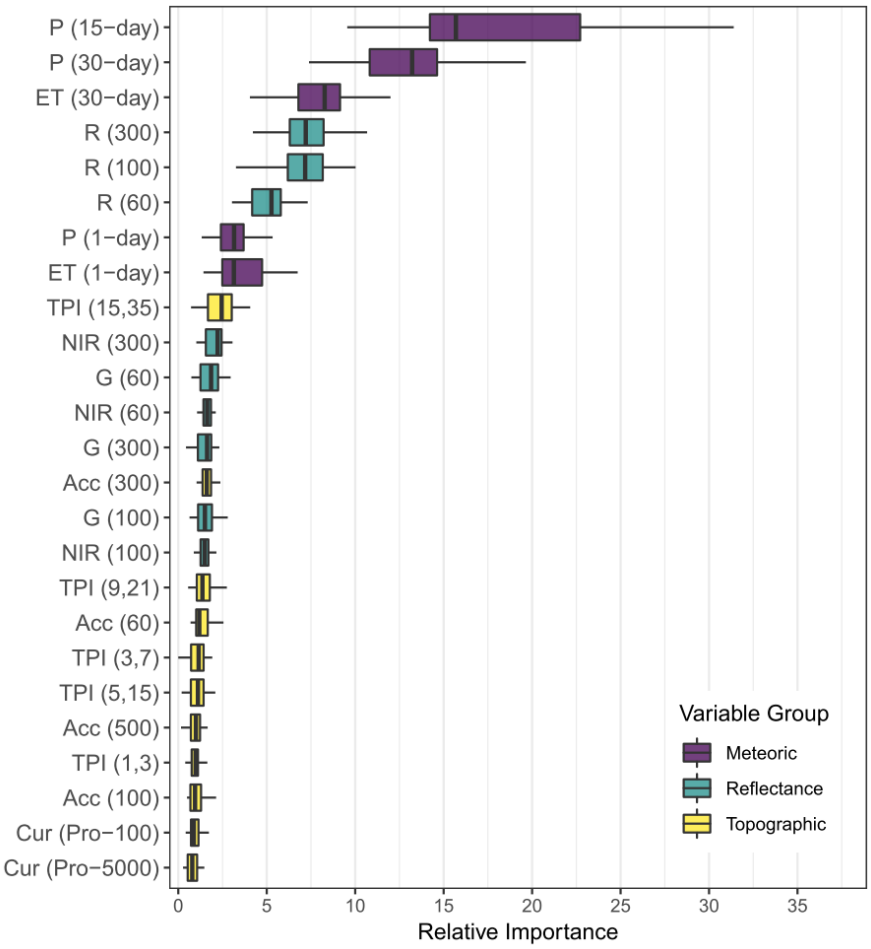

Figure S9 Sum of the relative variable importance distribution of the top 25 most important variables.

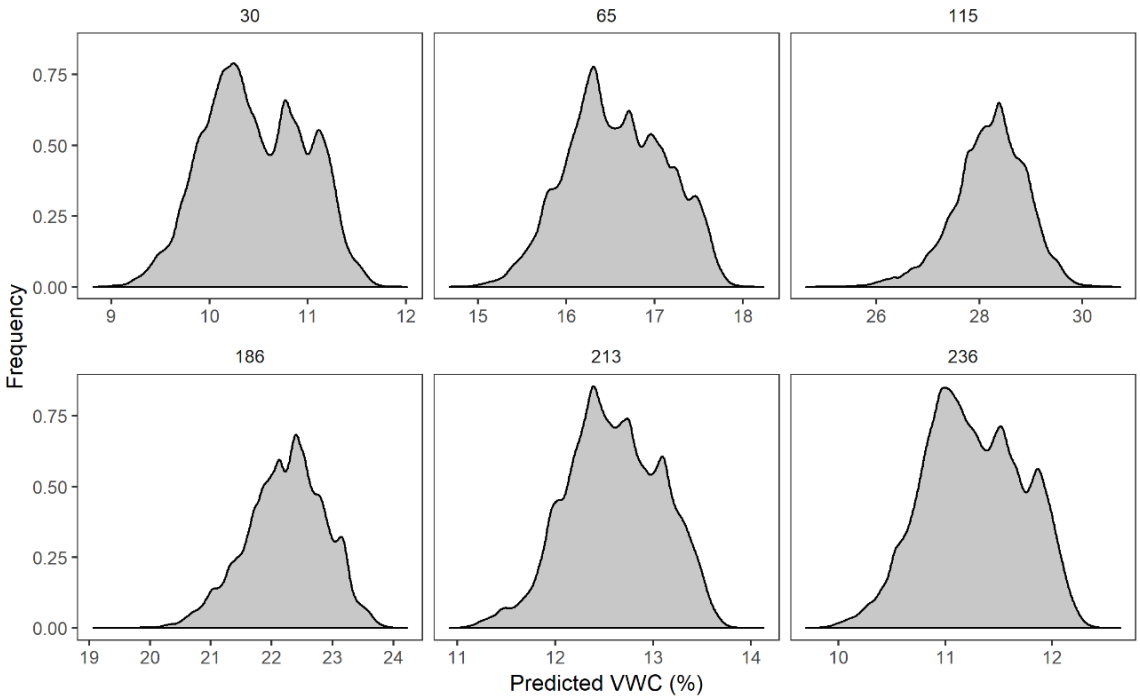

Figure S10 Kernel density estimate of predicted soil moisture over the study area for the six sampling days.