The Additivity Model to Estimate Water Retention of Mineral Soils. (S01-pachepsky190246-Poster)

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Abstract:

One approach to soil water retention estimation is to compute soil water retention by accumulating water retention of pore subspaces associated with soil textural and/or structural components. We developed an additivity model assuming that (a) water retention associated with a textural fraction can be measured on samples consisting exclusively of this fraction particles, and (b) the additivity is applicable to gravimetric water contents in the range of soil water potentials from -1500 KPa to 0 KPa. This model does not have fitting parameters. It was tested with data from the UNSODA database ranging from fine sand to clay. The root mean square errors (RSME) of the volumetric water content estimates were at the lower end of the range found in literature. At low water contents, a bias was detected that we corrected using dependence of the residual water content on proportion of clay and on the organic matter content. This correction resulted in RSME values in the range from 2.7 vol. % to 5.3 vol. %. The attained accuracy warrants testing the additivity model with additional data and improving it to account for influence of fine particles on water retention of coarse components.

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