Functional Evaluation of Different Scale Soil Hydraulic Pedotransfer Functions. (S01-nemes053149-Poster)

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Abstract:

To test the geographical validity of pedotransfer functions (PTFs), we used data of different scale databases as input to calibrate neural network models. Hungarian data were used to derive 'national scale' soil hydraulic PTFs, the HYPRES database was the basis of 'continental scale' PTFs, and a database containing mostly American and European data was used to develop 'intercontinental scale' PTFs. Accuracy of the estimations was tested at two levels, using independent Hungarian data. First, soil water retention curves (WRCs) were estimated. Average errors of 0.02 to 0.06 cm3cm-3 were obtained using national scale PTFs. International scale PTFs provided errors from 0.025 to 0.088 cm3cm-3. Estimated WRCs were then used to simulate soil moisture time-series of seven Hungarian soils. No significant differences were found among the different PTFs. Differences - averaged over a growing season - ranged from 0.064 to 0.069 cm3cm-3 while simulations using laboratory measured WRCs had an error of 0.061 cm3cm-3. International databases may offer alternatives to separate smaller databases and direct measurements, however, the degree of their representativity may be reflected in the results.

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