

Interactive comment on “Development of a Spatial Hydrologic Soil Map Using Spectral Reflectance Band Recognition and a Multiple-Output Artificial Neural Network Model” by Khamis Naba Sayl et al.

Anonymous Referee #1

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Sayl et al. 2017: Development of a spatial hydrologic soil map using spectral reflectance band recognition and a multiple-output artificial neural network.

The article deals with an important scientific development. The use of remote sensing for soil mapping. My main problem with the article is the extremely small dataset that the authors are using for their analysis. They used in total 25 soil samples, a small dataset that was split in 19 samples for validation and 6 for validation. Estimating an ANN on the basis of 19 samples that predicts sand, clay and silt contents on the basis of 9 bands of a LANDSAT 8 image just seems practically impossible or the authors should come with very good arguments. In addition, a validation on the basis of just 6 samples cannot provide accurate results. In addition, I have several other issues with

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the paper: The authors talk about "soils", "soil types", and "soil survey", but they only talk about topsoil texture in terms of sand, silt, clay. line 54: proximal sensing can also be done under field conditions. line 57: more important for efficient use of RS to characterize soil conditions is the soil cover (e.g., weeds, crop residues) and soil structure/roughness. line 68: I agree that 50% is a poor correlation, but the 100% certainly is not a poor correlation. One should be more specific. line 102-106: The authors indicated in the introduction that soil texture is an important property for the assessment of runoff. However, here the authors talk about a flat arid area, where the high infiltration rates are considered to be a problem. This does not seem to be very consistent. line 110: if a large part of the plateau is rocky, this should be considered in the subsequent analysis. There is now reference how the authors dealt with the rocky area. The authors should be more specific on the procedures. For example, they mention that the unsupervised classification was used to identify sampling locations but not how (line 138). They were certainly not selected by a GPS device. Most likely they were first identified on the classified map and subsequently located with the GPS. Another example, is that the soil classifications were "manipulated" with ArcGIS (line 156). However, no details on what the manipulation meant. line 140. Distinguishing properly between silt and clay is practically impossible with sieving. Details on the sample treatment are required. Line 152: Details on the Radial Basis Neural Network Model are required. In general, you could say that the description of the methodology is insufficient to be able to even apply the methodology in another area. Line 212: I wonder whether the authors can conclude on the basis of this study that the methodology is fast, reliable, and cost-effective.

Because of the above comments, I find the manuscript not suitable for publication in Hydrology and Earth System discussions.

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