Hydrol. Earth Syst. Sci. Discuss.,
doi:10.5194/hess-2016-92-RC3, 2016
© Author(s) 2016. CC-BY 3.0 License.

Hydrology and Earth System Sciences
Discussions

Interactive comment on "Incorporation of globally available datasets into the cosmic-ray neutron probe method for estimating field scale soil water content" *by* W. A. Avery et al.

Anonymous Referee #3

Received and published: 28 April 2016

General comments

The paper covers many of the issues facing those currently using, or planning to use, roving CRNPs and as such is very timely. It is well written and the results are well presented. I suggest only minor revisions before the paper is acceptable for publication in HESS. I think the title might best be modified to ensure the reader knows this is about the roving CRNP method rather than about the static CNRP method where the variables in question will likely be assessed directly and in detail.

Some discussion on the likely relative influence of the different pools of hydrogen would also be useful. As it stands now the reader has no idea if the relative impact of BWE or lattice water or SOC are as important or far less that the SWC which I imagine actually

dominates the count rate. There is some discussion later in the paper but maybe this could be raised earlier in the paper too to set the scene. The importance of some of the poorer correlations diminishes somewhat when you bear this in mind

Can you standardise the terminology around neutron energy. The terms 'epithermal' and 'low energy' have been used interchangeably.

Specific comments

L24 delete 'using'

L33 including forests too as a biomass source

L34 the signal is accounted for not minimised

L75 'measure' not 'measures'

L77 CRNPs

L130 low energy or epithermal – can you stick with one

L201 is fwe not equivalent to (18.01528 * 5) /162.1406 = 0.5556?

L230 chosen from one

L371 I think some discussion is warranted here (or later) about the actual water equivalent (kg/m2 or mm) that is held in the crop. I suggest this because this helps to give the reader an idea about the magnitude of this correction. If biomass water equivalent of 1 mm is equal to only 0.0033 cm3/cm3 for a soil depth of 300 mm then corrections for many less dense crops may not be needed or fall within the noise of CRNP measurements. Maybe it is also true that the highest BWE coincides with highest moisture and vice versa so the effects are further minimised in relation to SWC estimates.

L471 BWE at these levels of moisture must be very small and are probably insignificant in the corrections. Can you add these to strengthen this section?

L493 "statistically significant different mean values" do you mean "statistically different

mean values”?

L503 where does the 7 come from?

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., doi:10.5194/hess-2016-92, 2016.