

Interactive comment on “Shallow water table effects on water, sediment and pesticide transport in vegetative filter strips: Part A. non-uniform infiltration and soil water redistribution” by Rafael Muñoz-Carpena et al.

Anonymous Referee #3

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General Comments: This manuscript is very well organized and very well written. It addresses a topic of significant importance to the hydrologic modeling community. It offers an innovative alternative to the complexity of full Richard's Equation solutions to the infiltration process and the limitations of existing Green-Ampt based methods. The new method is computationally efficient and provides comparable results to the more complex, more computationally demanding, and potentially unstable Richard's Equation solution. Results compare well with the experimental data presented. The conclusions, that the new infiltration model effectively addresses shortcomings of ex-

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iting models in simulating water table effects on infiltration, are well supported by the both the model comparison analysis and the comparison with experimental data. The model development is well described and documented in the paper, and is very transparent through the presentation of mathematical equations and in providing additional details and code in the supplemental material. Given the complexity of the topic and mathematical rigor of the content, it reads very well and clear. The work builds upon previous research and methods developed by multiple groups of scientists, and does an excellent job of acknowledging and referencing previous work.

Specific Comments: 1. The research in this specific manuscript, “Part A”, is not specific to VFSs, other than the notion the riparian buffers in particular are likely to often be affected by a shallow water table that can impact infiltration. This paper has greater applicability beyond just VFS modeling, and has great value to hydrologic modeling in general. I would suggest that the authors consider modifying the title, abstract, and certain aspects of the introduction and conclusion to emphasize the broader relevance of this work as a step forward in improving the science of hydrologic modeling in general, beyond the simulation of filter strip processes. 2. Figure 3: The symbology for the different soils and model simulations are a bit difficult to discern. Some improvement in differentiation would be helpful. 3. Figure 4: Silty loam and sandy loam line symbols could be more distinct. 4. Figure 6: The caption says that RE simulations are shown on this figure, however, it appears that both model simulations shown in the figure are the new “simplified” method. 5. Figure 7: “i” in the figures should be defined in the figure caption as the other variables are. 6. Figure 9: It is not immediately clear what the different line symbology in this figure is meant to represent.

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