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Geoscientific Model Development Discussions
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Interactive comment on "Establishing relationship between measured and predicted soil water characteristics using SOILWAT model in three agro-ecological zones of Nigeria" *by* OrevaOghene Aliku and Suarau O. Oshunsanya

OrevaOghene Aliku and Suarau O. Oshunsanya

orevaoghenealiku@gmail.com

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1 Revision Note Journal Name: Geoscientific Model Development Manuscript Number: gmd-2016-165 Manuscript Title: Establishing relationship between measured and predicted soil water characteristics using SOILWAT model in three agro-ecological zones of Nigeria Dear Editor, Thank you very much for providing me with the opportunity to revise the manuscript. I have revised and improved all sections following your suggestions. NB: All revised areas have been highlighted in yellow colour in the annotated manuscript (manuscript tagged "Soil Water Characteristics Model Revised"). ANONY-

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MOUS REFEREE #2 General comments: Soil water is a highly spatially and temporally variable. Determining soil water is quite difficult. Real, direct measurement on soil is valuable. This study use SOILWAT model compared to laboratory measurement of soil physical properties (soil available water, bulk density, field capacity, saturated hydraulic conductivity, soil moisture content, maximum water holding capacity, and wilting point) at three agro-ecological sites of Nigeria. However, the results showed that SOILWAT cannot act as a good model to present the real status in the case. The authors should pass their own special opinion to modify it. Otherwise, this work remained uncompleted. For example, in page 7, line 227-228, as Saxton and Rawls (2006) indicated the organic matter content is important, and then the author should make a contribution to resolve it. Investigate the impact of vegetation on soil water is also needed. Besides, the purpose of this study also wants to manage irrigation planning and scheduling, but only the comparison between model and laboratory measurement has been shown. Not have detailed discussion in the management. The study should take responsibility for the research community, how the works can make a contribution to the related topic should be included. Response: The authors suggest that silt adjustment be included to the SOILWAT model in Page 1, Line 25, and Page 12, Line367, respectively. Also, the relation of this study to irrigation has been improved upon as seen in Page 13, line 399 – 404. Some questions and suggestions: Query: The review in performance of SOILWAT is lacked. How do authors think SOILWAT is a good tool to do such research in this region? Authors should use the physics formula to explain the uncertainties of predicted parameters. The explanations are too weak. 2 Response: Review performance of SOILWAT and the build-up to the use of the model has been improved upon as can be seen in Page 3, Line 78-96. The explanations have been improved upon and the formulae have been included in some of the explanation (Page 9, Line 268 – 272; Page 10, Line 303 – 305; Page 12, Line 375 – 379) to lay emphasize on the importance of some of the parameters and the uncertainties of predicted parameters. Query: Page 4, line 87: Why do authors choose these sites? Response: The reasons for the choice of these sites are stated in Page 3, Line 88-99. Query: Page 4, line 112:

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Lack of information as what in ‘Derived Savannah’ Response: The information for this Location has been improved upon as presented in Page 5, Line 133-139 Query: Page 4, line 117: Lack of information as what in ‘Derived Savannah’ It may need a real map to show the location of these three sites. Response: The information for this Location has been improved upon as presented in Page 5, Line 145-150. The Locations of these sites have been included as appeared in Figures 1, 2 and 3, respectively. Query: Page 7, line 222-223: The R-squared value (0.44) could not indicate that SOILWAT model can be used to predict soil available water. Response: The sentence has been rephrased in line 226-228 as suggested by the reviewer. Query: Page 9, line 279: The results showed SOILWAT overestimated at Derived savannah and rainforest but under estimated in Savannah in soil moisture content, how do authors comment it? Response: This sentence has been rephrased as suggested. Query: Page 21, Figure. 1: Please provide the description on it and also a better resolution one to replace it. 3 Response: Efforts to get a better resolution to replace this version of Figure 1 have been proved abortive. NB: Due to the revision carried out on the manuscript, additional references has been added to the list of references. Appreciation I must sincerely appreciate your criticism, contributions and suggestions, which have tremendously improved this manuscript. Thank you very much. OrevaOghene Aliku Department of Agronomy, University of Ibadan, Nigeria.

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