

Interactive comment on “Using hydro-climatic and edaphic similarity to enhance soil moisture prediction” by E. J. Coopersmith et al.

Anonymous Referee #4

Received and published: 11 April 2014

This paper investigates how a simple soil moisture model can be used at sites with no soil soil moisture measurements available for model training, but with similar climate and/or soil type. Given the sparsity of soil moisture measurements this is an important contribution as it allows to spatially generalize (soil moisture) model calibrations.

General comments:

The paper needs minor revisions. In my opinion the paper is very well written. It is straightforward to understand and clearly structured.

There are other simple soil moisture models that do not require soil moisture infor-

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mation for calibration. (Koster and Mahanama 2012, JHM; Orth et al. 2013, JHM) A reference to such approaches (e.g. in the discussion section) could indicate another possible direction in which to apply the derived results.

I appreciate the tables and information the authors provided in response to reviewer #1, I agree that these will improve the manuscript.

Specific comments:

Title: Maybe you want to consider simplifying your title such that a broader audience can understand it. I would think of e.g. "Using climate and soil information to generalize soil moisture prediction"

page 2323, line 7: remove "(precipitation"

page 2326: From equation 1, soil moisture content would never increase. I guess you add (possible) precipitation at each time step?

page 2326, lines 21-25: Why do you use different metrics (objective functions) that are minimized/maximized here?

page 2333: Please mention that this error correction approach cannot deal with trends in the soil moisture data.

page 2333, line 13: add "when considering the entire time series" before "but without flooding events ..."

page 2333, lines 16-18: In terms of droughts this shortcoming has more serious consequences. Whereas it may not matter much if it is wet or very wet, it is important if it is dry (plants may survive) or very dry (plants may die), especially in the context of irrigation management.

page 2336, lines 15-18: Would you say hydro-climate and soil type are about equally

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important or is it too little data to make such a statement here?

page 2337: The model may not only benefit from accounting for overland flow but also for subsurface flow/runoff, especially in hilly areas.

page 2338: What is the soil depth considered in the model? Satellite data represents only the upper centimeters of the soil and may therefore be of limited use to improve total column soil moisture model estimates.

Figure 2: Please label the x-axis. You can cut the range of the y-axis such that it starts at 0.3 or so.

Figures 3-6: Put exact dates/times on x-axis.

Figure 10: Some text is missing in the brown box.

Figure 11: Has it been referred to in the text? Use different colors for soil texture circle and hydroclimate circle.

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