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Hydrology and Earth System Sciences Discussions

Interactive comment on "Bi-criteria evaluation of MIKE SHE model for a forested watershed on South Carolina coastal plain" *by* Z. Dai et al.

Anonymous Referee #1

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Page 181 line 26: consider "good candidate" to "important hydrologic variable". Page 181 line 25 to 28: Water table depth is not surrogate of soil moisture. It is true that evapo-transpiration and discharge rate (particularly base flow) depend on subsurface water level, vegetation types, and geology type and structure (e.g. cracked hard rock). Page 184 lines 5 to 10: The weather station is 3 km away from the study site. Have you checked that there is minimum difference in weather between the study site and weather station particularly precipitation, PET, and wind data. If the all are in the coastal plain and there is no barrier (e.g.) between the study site and the weather station, then there should not be any difference else there should be difference in weather values. In such case how do you relate? Page 184 lines 5 to 10: Has any previous research compared the PET estimated using Penman-Monteith method with measured data? Page 190 line 25 to 28: Have you considered the rooting depth and density based on

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plant growing and dying stages? Page 191 line 25 to 29: Did you use spatial distributed horizontal hydraulic conductivities or weighted average? The sentence is confusing the use of the distributed hydraulic conductivity. page 192 line 24: have you considered the rooting depth and density for each vegetation types? If plant rooting depth and density is important for water table estimation, then it is also important for stream baseflow during summer. Baseflow depends on the water level of the area near to the streams during continued sunny days. Page 193 line 8 to 16: Have you checked the water level in saturated zone during these period. If the model is predicting higher water level, then the model also overestimates the streamflow during these period. If the water level is lower than the stream bed, then there should not be any flow. I can see from Figure 7c that model over-predicts water level. I do not think overprediction of MIKE SHE is an artifact, because Figure 6a and 7a shows that there is zero stream flow during some months. Figure 6a and 7a: show rainfall in bar chart. It is not continuous, Rainfall events are instantaneous. Figure 7a: it is not that clear. Make thick continuous line for simulated scenario and continuous measured line on it, so that one can see how both overlap each other. Figure 7b: Please take out the error bars because there are lots of points and the error bars does not provide any information anyway.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 179, 2010.