

Interactive comment on “Future humidity trends over the western United States in the CMIP5 global climate models and variable infiltration capacity hydrological modeling system” by D. W. Pierce et al.

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Received and published: 31 January 2013

Dear Anonymous Referee #1,

We would like to thank you for your comments on the discussion paper.

Like you, we are quite interested in trying a linear representation of observed Tdew to substitute for Equation 1, to see if it improves the results. This is of particular interest to us since the current formulation has problems in locations influenced by the marine

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environment, where one of us (Pierce) currently lives. Our plan is to continue this work in a follow on paper that quantifies options and approaches that can be used to improve the parameterization of humidity in both marine and arid interior locations of North America. We hope that this effort will help bring further attention to what we view as an important issue, i.e., continuing validation of land surface model parameterizations as they are put to ever more use by stakeholders and decision-makers. If that work is successful, we hope that it will contribute to improving the simulations as well, at least as far as the MTCLIM-VIC modeling system is concerned.

Wind speed is another interesting factor. As per your suggestion, in our revision we will add text to discuss this issue. Many existing papers using VIC do, as you say, include only climatological wind speed values from Maurer 2002. In a recent paper (Pierce and Cayan 2012, J Climate, in press but available at <http://journals.ametsoc.org/doi/pdf/10.1175/JCLI-D-12-00534.1>) we use daily wind speeds from the GCMs downscaled using the BCCA technique. The hope is that using daily wind speeds, even if not yet optimally downscaled, is better than using unchanging climatological wind speeds. We are currently working on improving the BCCA technique in a variety of ways, and part of that will include an analysis of downscaled wind speeds and the difference including these downscaled daily GCM wind speed fields makes to the simulation of runoff.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 13651, 2012.