

Interactive comment on “Errors in climate model daily precipitation and temperature output: time invariance and implications for bias correction” by E. P. Maurer et al.

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The manuscript presents approaches to follow bias correction in climate model outputs, namely precipitation and temperature. It is recognized that climate models have biases and without correcting them, the impact assessment research that relies heavily on these products can be erroneous. Clearly, the authors have recognized that the GCM biases can't be quantified by merely comparing model simulations and observations for a chosen historical period because these biases can vary between mean and extreme values and for different time slices of historical years. They found that using as few as 4 randomly-selected years might suffice the need for characterizing the biases in daily

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GCM precipitation and temperature and the analysis that includes a 12 year base set can provide higher confidence in the bias correction. In many mountainous western states, where winter precipitation can be a good indicator for spring and summer water availability, seasonal analysis of temperature and precipitation in Figure 3, 4 and 5 offers significant step forward in using this approach for the next generation climate model outputs as outlined by the authors.

For a wide range of impacts community that relies on climate model outputs, this manuscript offers a starting point for implementing bias correction of their own data. With the choice of grids covering the entire continental United States, the authors have demonstrated that GCMs have good geographic manifestations as another important conclusion of this paper. The final excellent conclusion for those performing climate change research is the fact that mean and extremes are comparable between the base set and the projected set. This gives a substantial level of confidence for the community that the framework for the individual experimental design for climate model downscaling and climate change impact assessment from various research groups can have a reliable range and not a manifestation of the bias from the GCM and downscaling methods. The foundation laid out in this manuscript can therefore serve as the basis for citation for future research, notwithstanding the fact that further expansion of this study on a regional scale and at high temporal resolution is warranted to confirm if the results remain true.

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