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Interactive comment on "EMDNA: Ensemble Meteorological Dataset for North America" *by* Guoqiang Tang et al.

Daniel Wright (Referee)

danielb.wright@wisc.edu

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The authors present an ensemble dataset of historical precipitation and temperature to support hydrologic analyses across North America. My review will be very brief, since three detailed reviews have already been obtained and they share a general concensus (which I share) that the manuscript is very strong and needs at most minor changes before publication.

I will admit that since there are already three reviews, I did not go as deep into the methods and results as I otherwise would have. So my first two comments may be things that are addressed in the methods. I have two general comments:

1. I understand that as a result of lower station densities at higher latitudes, the authors increase the search radius used to select stations for interpolation. While this is perfectly reasonable as a practical necessity, it isn't really right conceptually. Since the authors are blending in reanalysis products, an alternative way of thinking/dealing with this problem is that reanalysis should play a larger role in areas where station density is lowest. It may be that this is indeed how things shake out, but as I said, I didn't read things in enough detail to figure that out. Please comment.

2. My understanding of Newman's methods (e.g. Newman et al. 2015) from prior conversations is that station data are interpolated onto a grid of points that represent gridcell centers, and then the values at these center points are assumed to describe the grid-averaged value. I assume the same approach is taken in this study, albeit then modified with the reanalysis information. While I imagine this is a standard approach, I still have some concerns. First, and probably least, is that you are effectively representing grid-averaged precipitation based on station values. Second, due to the focus on the center of the grid cell, you could have a strange situation in areas with high station density, in which at least some members would say there is no precipitation in a grid cell, even if a gage within that cell (say near its edge) reports precipitation. How big an issue this could be in practice, I have no idea. Long story short: I'd be curious to see how the results of these sorts of methods differ when you interpolate them on a much finer grid (say 0.01 degrees) and then aggregate them back up to the final resolution (ie. 0.1 degrees). That would more or less address these conceptual problems.

3. While datasets such as this one are doubtless useful, anyone who knows me knows that I feel they have important limitations: specifically, I don't believe 0.1 degree daily is sufficient for realistic hydrologic simulations in many (perhaps most) landscapes. This is based on plenty of work by myself and others. The most directly relevant paper of mine being Sampson et al. (2020). I would urge the authors to ponder the more challenging issue of generating the subdaily, km-scale ensemble datasets that are needed for large-scale hydrologic predictions to actually work-if anyone has the skills to do it,

they do!

Reference: Sampson, Alexa A., Daniel B. Wright, Ryan D. Stewart, and Allison C. LoBue. “The Role of Rainfall Temporal and Spatial Averaging in Seasonal Simulations of the Terrestrial Water Balance.” Hydrological Processes 34, no. 11 (May 30, 2020): 2531–42. https://doi.org/10.1002/hyp.13745.

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