

## ***Interactive comment on “A national topographic dataset for hydrological modeling over contiguous United States” by Jun Zhang et al.***

### **Anonymous Referee #1**

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Overall, this is a well-explained paper producing a potentially useful dataset. I have some serious concerns about the initial/input DEM used for this entire dataset preparation and analysis. The paper claims to have started from the National Water Model (NWM) digital elevation model (DEM). This is very concerning since the NWM DEM has already been hydrologically-adjusted from the source DEM to meet the needs of WRF-Hydro and the NWM. A more scientifically rigorous approach would be to have started from the source 30m NED to work through your process.

It is unclear to me why the NWM seems such a focus of the paper since it should not have been the original DEM used. The NWM DEM has already been D8 processed and the authors then continued to change it into a D4 based hydrologic routing grid. The authors make the argument that they are improving the NWM DEM when really

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they are simply making it suitable for models that require D4 routing. The NWM grid is suitable already for D8 routing and contains accurate placements for NHDPlus v2 channels on the 250m grid. It is also apparent the authors excluded areas that are included in the NWM, such as the Great Lakes region. I think the authors would have a better justification starting from the source elevation data and creating a new DEM rather than starting from an already hydrologically processed DEM and manipulating it further.

Please also note the supplement to this comment:

<https://essd.copernicus.org/preprints/essd-2020-291/essd-2020-291-RC1-supplement.pdf>

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