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Interactive comment on "SCDNA: a serially complete precipitation and temperature dataset for North America from 1979 to 2018" *by* Guoqiang Tang et al.

Anonymous Referee #2

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This study develops a very useful dataset (SCDNA) of serially complete precipitation and temperature in North America. The dataset will benefit researchers in various fields with the long-term and gap-filled station data collected from multiple sources. The sophisticated framework for imputing missing values is well designed, which can be potentially applied in other regions of the world for the production of regional or even global serially complete datasets. From my perspective, the paper can be published on ESSD after the minor revisions, and I also have a few comments as below. 1. The differences between SCDNA and MSWEP show distinct differences along the boundaries of CONUS and Canada. Can you provide more detailed explanation about how observation time inconsistency causes this problem? 2. The paper said "Outputs from three

reanalysis products (ERA5, JRA-55, and MERRA-2) provided auxiliary information to estimate station records and were also used as an assessment benchmark. ". Can you give more explanation why you selected reanalysis products for benchmark? 3. The period from 1979 to 2018 is total 40 years. Numbers of stations with only at least 8-year records are shown in Table 1. Why only 8-year period records are showed? Are only stations with at least 8-year precipitation or Tmin and Tmax records between 1979 to 2018 utilized to evaluate the performance? Is there some difference between 8-year records and total records for evaluation? 4. Precipitation and minimum/maximum temperature are very widely used in hydrometeorological studies. I think probably this is why the three variables are chosen. Considering meteorological stations can usually measure more variables which also suffer from missing values, expanding this work to other variables would be very interesting for future studies. I suggest that the authors add some discussion about the applicability of your method to other variables.

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