

Earth Syst. Sci. Data Discuss., referee comment RC2
<https://doi.org/10.5194/essd-2021-303-RC2>, 2022
© Author(s) 2022. This work is distributed under
the Creative Commons Attribution 4.0 License.

Comment on **essd-2021-303**

Anonymous Referee #2

Referee comment on "HOTRUNZ: an open-access 1 km resolution monthly 1910–2019 time series of interpolated temperature and rainfall grids with associated uncertainty for New Zealand" by Thomas R. Etherington et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2021-303-RC2>, 2022

Title: A History of Open Weather in New Zealand (HOWNZ): an open access 1-km resolution monthly 1910-2019 time-series of interpolated temperature and rainfall grids with associated uncertainty
Author(s): Thomas R. Etherington et al.
MS No.: **essd-2021-303**
MS type: Data description paper

Review

The authors describe a monthly climate data set for New Zealand that is based on an interpolation of station data. They use a relatively simple interpolation approach – natural neighbour interpolation, and present monthly fields. Overall the paper is a welcome contribution and the data set will be useful for different applications. However, there are some comments that should be considered in the revision.

- Why is this data set referred to a "Weather Data"? In my view this is a climate data set.
- Not much is said about the underlying station data. Are these homogenised records? Was a breakpoint detection performed? (And how would inhomogeneities affect the result?)
- Perhaps a minor point, but the authors speak interchangeably of precipitation and rainfall. What about snow? This should be clarified.
- The authors indicate the number of cells with station data – perhaps also some other measures (e.g., average inter-station distance) would help in the comparison with similar products from other regions.
- The authors interpolate in anomaly space, but this implies that product used is fully consistent with observations. Were the station data compared to the climatology in the 1950-1980 period? (There could be biases, e.g., due to different altitudes in the underlying climatology, or other biases, urban effects etc.).

- The description of the method is not fully clear. For instance, the description of Fig. 2b ("mean of grid cell values that are as close or closer ... than a data cell") implies a circular region, whereas this is a Voronoi polygon. This could be addressed by adding, to Figure 2b, also the observation locations and the polygon outlines.
- I had difficulties with the description on line 98f. I struggled with the term "error rate", which is defined as " the ratio of the cross-validated absolute error to natural neighbour distance". This is then multiplied again with the natural neighbour distance (by which it was divided in the previous step). I struggle because the error rate is interpolated from the station cell, right? Isn't the natural neighbour distance zero at the location of a data cell (so, the error rate is undefined), or if it is 1 km (grid cell length), then the error rate is numerically the same as the cross-validated absolute error. I understand that the error rate must be in K per m and the "error-distance field" in K.
- Fig. 2 shows the interesting feature that the error can become small despite a large distance in regions between two stations with good cross-validation skill and no other station nearby.
- It is certainly an asset to provide the error as indicated in the paper. For the evaluation, it would however be interesting to also know some other measures (that do not necessarily need to be interpolated). Hofstra et al. list several.
- The methods does not make use of topographical information. Other studies (which the authors cite, e.g., Hofstra et al.) show that different methods perform differently well in mountainous terrain. New Zealand must be a prime example, yet this topic is only touched upon very briefly.
- In the examples used on Section 5, it might be interesting to say a few words about autocorrelation of errors (and spatial covariance).