



Comment on **essd-2020-346**

Anonymous Referee #1

Referee comment on "A high-resolution gridded dataset of daily temperature and precipitation records (1980–2018) for Trentino – South Tyrol (north-eastern Italian Alps)" by Alice Crespi et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2020-346-RC1>, 2021

This article describes the production of a high-resolution observational gridded dataset over Trentino - South Tyrol. The daily aggregated variables considered are temperature and precipitation.

The article is well structured and the presentation is clear and concise. The Introduction highlights the benefit of the study and includes a good review of the relevant literature on the topic. "Data and Methods" describes the study area and the observational database in a satisfactory manner. The interpolation scheme presented builds on a classical two-step approach. First, the climatologies are generated, then the authors use daily anomalies in their spatial analysis scheme, based on the underlying assumption of working with more Gaussian random fields. The "results and discussion" section includes the evaluation and presents a number of significant examples. As far as I can judge, there are no major flaws in the statistical analysis and the conclusions are well supported by the results. The accuracy and precision of the results are reasonable and comparable to state-of-the-art products in the Alps.

The presented method is not particularly original, because it has been applied before in the Alps, as the authors points out. The merit of this work is in the careful application of the method at such a high spatial resolution (250 m!) over complex terrain and with a pretty dense observational network. Furthermore, the final dataset is publicly available and this is a great merit of the authors. If the authors will regularly update this dataset, as they mention in their future plans (line 420), I can foresee a bright future for this dataset, which could be the basis for environmental applications and research in that part of the Alps.

In conclusion, the study is valuable. My advice to the editor is to publish it (almost) as it is. I just have a few comments.

Comments:

Figure 8, total precipitation climatology. The figure shows that the elevation has an effect on the spatial distribution of precipitation. However, it looks like the distance from the sea (or from the Po plain) also has an effect on this variable. Have the authors considered to include this variate (i.e. distance from the sea) in their study?

It is not clear if this dataset can be used to extract climatological trends of temperature and/or precipitation. Considering the construction of the observational dataset used, I think the answer may be positive. However, given the importance of such an application, I would recommend discussing this point explicitly in the text. Perhaps, the right place where to discuss this issue would be at the end of Sec 3.1 (right after the related discussion on Fig. 7), with a further reference in the conclusions.