



EGUsphere, referee comment RC1
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Comment on egusphere-2022-1140

Anonymous Referee #1

Referee comment on "A 258-year-long data set of temperature and precipitation fields for Switzerland since 1763" by Noemi Imfeld et al., EGU sphere,
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The manuscript presents a climate field reconstruction of daily temperature and precipitation in Switzerland in the period from 1763 onwards. The spatially resolved reconstruction is based on long station records from few stations. These are then upscaled using in the analog method, choosing the best analog of those historical data in a high-resolution present-climate data set. Some corrections are necessary to align the historical and present-day climatology. The analog reconstructions are then refined using an off-line Kalman Filter approach, which has been used in previous publications by the group in Bern

The manuscript is, in my opinion, very well written. It is clear, offers all information necessary to understand the method and the results. Although the aim of the manuscript is mainly to present the data set, a short more detailed study on the bad harvest years at the end of the 18th century is also presented. This is also instructive.

My recommendation is that the manuscript can be almost accepted as is now. I have a few recommendations that the authors may want to consider.

MAIN POINT

1) An advantage of daily-scale reconstructions is that one can also analyse the temporal persistence of climate anomalies. An open question is whether the analog + Kalman filter method is able to capture the serial correlation of the temperature reconstructions or the distribution of length of dry or wet periods, the so called storm inter-arrival times. This can be relevant for the study of droughts, for instance. Indeed the example presented in the manuscript seems to be characterized more by the length of the anomalies than by its intensity. Also, if the data presented here are to be used to drive an agricultural model, a good representation of the temporal persistence may be important.

I would thus suggest to include one figure with some of those results

MINOR POINTS

2) Are the data in the present reconstruction and in the data that flowed into EKF400v2 independent ?

3) The best estimate in the analog method is the closest analog, but the model error covariance matrix in the KF is estimated from the 50 closest analogues. Isn't this an inconsistency ? Shouldn't the central estimate be for instance the median of the 50 closest analogs ?

4) Crops need a certain amount of energy in the form of temperature to reach their different phenological stages

In my limited understanding, temperature is relevant for the speed of the the metabolic reactions in the plant. The energy itself stems from the solar radiation

5) The area, where a GDD of 1000 is never reached, is much larger, meaning, that some cereals never fully developed.

Two commas in the sentence need to be deleted: The area where a GDD of 1000 is never reached is much larger, meaning, that some cereals never fully developed.

6) I think that a sentence in English can not begin with a number. The title should read 'Two hundred and fifty years of..' .or it should be modified, for instance, by 'Daily weather over 205 years...'