Review of "seNorge_2018, daily precipitation and temperature datasets over Norway" By Cristian Lussana et al.

The authors present a new version of Norwegian national daily temperature and precipitation interpolated daily fields from the latter half of the 20th Century to date. The data product shall, undoubtedly, constitute a valuable national resource for decision makers within Norway and the broader Nordic region. To build confidence in the product peer review is certainly a necessary condition and thus I see eventual publication as important. In reviewing the discussion paper there are a number of issues that I believe the authors must address prior to acceptance.

Firstly, the paper structure requires significant work. The introduction mixes methods and discussion. The data section has a significant amount of methods in it and does not clearly denote the various observational / model sources used. Presently there is very limited description / analysis of the derived spatial fields and characterisation which would be important for users. Finally, there is no discussion section. My suggestion would be to substantively restructure the paper for readability into sections that go:
- introduction,
- data,
- methods,
- product analysis (including showing some example applications),
- verification,
- discussion and
- conclusion.

Then significant effort is required to shuffle content around to fit that structure, ensuring that relevant text ends up in the appropriate section. Given the need to restructure the paper I shall not point out minor typographical issues in the expectation that they may not persist under any revised structure. A number of other minor points should also, naturally, be resolved by undertaking such a restructure so I do not make these further here. Such a restructuring to my view is essential prior to acceptance.

In terms of the methods there is a significant issue in offsetting Tx/Tn from Tg by 12 hours. If Tg is the mean of 06 to 06 but Tx and Tn are maximum and minimum between 18 and 18 it is physically impossible to robustly assess consistency. This has been shown in e.g. GHCND and can follow from several toy examples you may wish to play with whereby for example a very strong warm front passes through at midnight which would be seen in one day for Tx and Tn but another day for Tg and may lead to an over-propensity of flagging good data as dubious accordingly. This propensity will vary seasonally (higher in winter half year) and geographically (higher further north / inland) where both diurnal structure decreases and synoptic variability increases. Significant justification would be required for maintaining the use of days offset by 12 hours for the three temperature elements and my strong recommendation would be to align these to the same time which would greatly simplify the analysis and assure better geophysical consistency with fewer false flags. It would also aid usability considerably to align the times for all 4 elements. So, whether you choose 06 to 06, 18 to 18 or some other times I would very strongly urge aligning the times used to define the day here which would enable greater usability and improved cross-checking.

The authors make a throw away remark at the end of page 2 regarding suitability for long-term trend characterisation which seems to rely upon findings of a prior analysis. It is unclear whether the findings would persist into the present dataset in the Norwegian context. It is necessary, in my view, to show this and the suggested change in overall paper structure should facilitate this.

In the methods X_i is used twice, one should be X_j. Then the same overhat nomenclature is used to denote both a point estimate and a spatial scale. This is very confusing to the reader in what is already a very statistically dense paper. Assuming that the average ESSD paper is not a statistician it would be very useful to simplify where possible the discussion of methods and certainly to use unique notations when talking about distinct things so as to not confuse unnecessarily your readers. Overall, a reduction in the number of equations would likely serve the ESSD readership.

The right hand panel of figure 6 uses a non-intuitive colour scale whereby wetter values are red and drier values blue (as I understand this panel at least). If I am correct it would be advisable to flip the colour bar so that the colours intuitively map to wet / dry rather than doing so counter-intuitively. If I am wrong then an improved explanation is required.