

Interactive comment on “Evaluation of seNorge2, a conventional climatological datasets for snow- and hydrological modeling in Norway” by Cristian Lussana et al.

Anonymous Referee #2

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The paper “Evaluation of se Norge 2, a conventional climatological datasets for snow- and hydrological modeling in Norway” by C. Lussana et al. presents an archive of high-resolution daily temperature and precipitation fields for Norway that goes back to 1957 and is updated each day. Both temperature and precipitation fields are based on observational data only: they are interpolated on a high-resolution grid by means of an Optimal Interpolation approach.

The issue of the paper is of high-relevance as high-resolution daily temperature and precipitation fields are of great interest for a number of users and applications. It is therefore very important investigating the methodologies that allow obtaining these

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fields and applying them to regions as Norway that have a good availability of long-term observational records. The presentation of seNorge2 and the comparison of it with earlier versions of the same dataset (versions 1.0 and 1.1) gives therefore a valuable contribution to climate research in general and to climate-service-focused research in particular. This also because the applied methodology is interesting and partially innovative: in particular, I find that the algorithm operating on a cascade of spatial scale can be used also in other regions contributing to obtain new spatial fields or to improve the already existing ones.

General comment

In spite of a very positive evaluation of the issue of the paper and of the used methodologies, I find that the paper has to be subjected to major revision before it can be considered for publication. The main deficits are: 1) The paper is not well structured; 2) There is too much information that hides the focus of the paper; 3) Many unnecessary details are given in some parts, whereas in other parts, especially in the ones that should allow other researchers to try using the same methodology, relevant information is not given.

The consequence of these deficits is that the paper is very hard to read even for a reader that is well introduced to the issue. Moreover, after spending a lot of time on the text the reader does not get all the information on what has exactly been done.

I do not think that these deficits can be solved by simply improving the organisation of the paper as in my opinion the first problem is that it considers too much issues: temperature fields, precipitation fields, hydrological measurements, snow models, DDD model are really too much for only one paper. All this issues require probably three papers.

My first suggestion is therefore to only focus on what is really relevant. I find that this is precipitation fields.

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I therefore suggest to delete all parts concerning temperature (these parts can be addressed in another paper if there is more useful information to provide than the one contained in Lussana et al (2017) – submitted to Quarterly Journal of the Royal Meteorological Society) and to focus the validation of the precipitation fields on the comparison between the modelled and the observed data. All the problems that make this comparison problematic (e.g. under estimation of measures in case of solid precipitation) can be briefly considered in the discussion, whereas other data and methods that should allow helping to understand these problems have, in my opinion, to be considered in other papers. Focusing only on the main objective of the paper should also allow better explaining the applied methodology providing all details that can help other researchers to apply it to other areas and data sets.

Detailed comments:

Title The current title is not clear. I do not think that many readers will understand from it that the paper presents more than 60 years of daily temperature and precipitation fields.

Abstract The abstract has to be revised according to the content of the revised version of the paper.

Introduction The introduction starts focusing on hydrological modelling only. Is hydrological modelling really the only motivation that makes daily temperature and precipitation fields useful? Do they not be interesting for agriculture? Moreover, is natural hazard connected only with discharge data? Beside to the motivation of the research and the history of seNorge, in my opinion, it should be useful to spend a few rows in the introduction to explain why version 2.0 is focused on an Optimal Interpolation approach whereas version 1.1. was based on a kriging approach. Specifically I suggest highlighting what are the goals of changing the approach. Naturally, also the introduction has also to be revised according to the content of the revised version of the paper, even though I have nothing against considering also temperature in the general presentation

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of the seNorge data set (i.e. up to line 87).

Description of seNorge2 The organisation of this section has to be revised. The paper should be organised in the typical section of a scientific paper (i.e. Introduction, data, methods, results, discussion, conclusions or in variants of this scheme (e.g. data and methods and/or results and discussion merged in the same section)). Here the presentation of the data set is rather easy. However, focusing the paper on precipitation only, some more information can be given, especially concerning data availability versus time. On the other hand, the presentation of the methodology is more complex. Here I suggest completely separating the introduction of Optimal Interpolation (OI) and the discussion of how it has been applied to Norway. The introduction of OI does not require too much details (the ones that are given in the manuscript are sufficient, more information is available from the cited references), whereas the application to Norway requires a more detailed presentation. I perfectly understand that the authors could not give these details in the current version of the manuscript as there is already too much information, however they should give it in the revised version. I also think that current section 2.3 (i.e. the key section to understand how the methodology works for precipitation data) should include examples allowing to better explain the content of the text.

Evaluation of se Norge 2 This is the section of the results. In the revised version they should concentrate on validation of the fields against the observed data. Nothing against for me if the results are merged with the discussion and presented in the same section (results and discussion). Current section 3.5 can therefore be merged with the presentation of the results if it helps for a clearer presentation of the results. This could help the authors to discuss the differences between the observations and the modelled fields on the basis of all the problems that are considered in the current version of the manuscript (sections 3.2 to 3.4). The discussion should however only highlight these problems. They have then to be addressed in other specific papers.

Conclusions The conclusions have to be revised according to the content of the revised

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version of the paper.

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