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

Anonymous Referee #3

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The paper describes a new version of the gridded gauge based data set seNorge2 over Norway. The method for gridding the precipitation information has been updated, and the philosophy behind the further development of the data set is described. Evaluations of the data set are performed with hydrological and other modeling attempts. I find the interpolation method very interesting, but the hydrological analysis seems to indicate a huge problem with the total amounts of precipitation. Further, the paper is too lengthy and includes too many evaluations of unclear nature. I therefore recommend major revision to cut down on the text, but the authors might want to consider recalculating the complete data set as I don't see how such large biases in average precipitation can be correct.

General comments: I appreciate the evaluation toward stream flow measurements, but they seem to disqualify the new data set in favor of the old one. SeNorge2 is aimed at hydrological use (according to the title), but it is apparently not well suited for that purpose! The analysis shows that seNorge2 has much too little precipitation, to the extent that the observed runoff is larger than the precipitation falling in the upstream area of the discharge gauge. Glacier melt or changes in storage terms can only explain a small fraction of the underestimation which is of the order of 20%. seNorge1.1 is much more reasonable in this sense and it seems it would be difficult to convince users of seNorge1.1 to switch to seNorge2.

So why does seNorge2 have so much less precipitation than seNorge1.1? There mus be something wrong in the interpolation part that explains this. I would like to see a table of the differences between each station and the nearest grid point, and also a more conventional difference of the two data sets, as such analyses should clearly show this lack of precipitation.

Technical comments: Title: I suggest changing the title (besides correcting the grammar). Is the intention that the data set is only used for snow and hydrology modeling? How has seNorge1 been used? It is probably best left to the user to define its use. I suggest a title change to something more informative along the lines of "seNorge2: a daily hihg-resoluiton gridded precipitation gauge data set for Norway since 1957"

General comments: Please use "km" not "Km"

L34: "(i.e. observational)"

L47-74: Please shorten this section and focus more on the new product.

L107-108: What are the weights if not equal? Do you mean "essentially the maximum and minimum temperature" instead of "eventually"? Please provide the weights as well.

L116: "all the stations in the region of interest.." Why are stations in Russia and the Baltic states of interest? Does Fig.1 show stations that are not used? If so, please

remove them.

L160-161: Are the investigations performed here? If so, please state that.

L445: As noted in the general comments, this section identifies a huge problem with seNorge2, with much too little precipitation amounts. This does not seem to be a problem in seNorge1.1, and indicates a strong deterioration in the new version.

L468: "less accurate but more precise" I believe the accuracy is way more important for hydrology than the preciseness, as the results are anyway averaged over the catchment areas. Please argue for your case if not.

There are too many figures, and I make some suggestions how to merge and reduce the number below.

Fig. 1: Please use a lighter blue color, it is difficult to tell them from the black.

Fig. 2: Join with Fig 1?

Fig. 4: Please stick with the same format as other maps and remove the labels below and to the left.

Fig. 5 and 6: Please join into one figure. Add 1:1 line in Fig6.

Fig. 7: use 1.0 as a limit and indicate values below this as in violation of the water budget.

FIg. 13: Put in table to save space?

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