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Interactive
comment

Interactive comment on "SPREAD: A high-resolution daily gridded precipitation dataset for Spain" *by* Roberto Serrano-Notivoli et al.

Anonymous Referee #4

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General comments:

This paper presents a new high resolution gridded daily precipitation product for Spain (Peninsula and Isles) using a state-of-the-art method. The dataset is of high relevance for many applications. The fact that the grid of uncertainties is provided as part of the dataset adds a lot of value to it. The article is well written, clear and easy to follow. The example of application of the dataset (indices of extremes) presented in the article is interesting and adds scientific value to the paper. The figures and tables are all pertinent and well described. The methods used to derive the dataset are not new. However, to my knowledge, no other such high resolution daily precipitation gridded product is

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publicly available in Spain. This dataset will be hugely valuable to a range of users. It will contribute to avoid an enormous amount of future duplicated effort by making available a fully validated high quality product for precipitation in Spain. Until now, each individual research group would produce their own gridded data, generally with lower quality due to lack of time or skills. Therefore this dataset will contribute to improve the quality of future research in a wide variety of fields as precipitation is relevant to so many disciplines (catchment hydrology, drought/floods studies, groundwater recharge, nitrogen deposition, ecosystems, agriculture, land surface processes, epidemiology, amongst many others). The fact that the values of uncertainty are included informs the user on the quality of the data which allows to make an informed decision on whether to trust the data at a given time and location. Uncertainty values are also a requisite for applying data assimilation techniques. The dataset will be relevant not only for scientists but also to many stakeholders (water managers, policy-makers, NGOs). For all the above, this dataset could potentially become the new reference high quality dataset for precipitation for Spain. Therefore, I would recommend the publication of this paper after some minor revisions described below.

Specific comments:

I. The manuscript:

The manuscript is generally well written, easy to follow and well structured. Below are a few specific comments to help improve some minor aspects of the paper.

1) In the introduction, page 1, line 27, the authors say "High-resolution spatiotemporal precipitation datasets are useful tools for land management", and that is the only example of potential application of their dataset they give. I can think of many more disciplines which would benefit from the existence of such a dataset, and I feel the introduction is not doing justice to the importance of this new dataset. The authors should emphasise much more on the value and impact this dataset will have in the scientific (and non-scientific) community for future studies in Spain. In the general comments

above, I give a few examples of fields where such gridded meteorological datasets are in high demand. The authors could use that list as a starting point to expand their introduction. A reader should be more convinced on why this dataset is so important, the introduction should include some examples of applications with a few key publications illustrating that (for example from other countries where such dataset already exist). This dataset is really of high value, so this should be reflected in the introduction.

2) Page 2, line 14: Brunet et al., 2006. This paper was about gridded temperature dataset, so probably not too relevant here, unless you add the word "meteorological" before "datasets" in the sentence "a few daily datasets have been made for Spain or some of its regions".

3) Page 2, line 24-25: "The uncertainties of these estimations depend on the density of observations used to compute the model": you don't mention once in your paper the uncertainties coming from the uncertainties in the raw raingauge data. See comment below number 5.

4) Page 3, line 18-20: Please include the areas in km2 of Peninsular Spain, Balearic Islands and Canary Islands so that a non-Spanish reader gets a quick feel of the density of each network.

5) Input data (page 3-4): Are the instruments uniform across the network? Which type of raingauge are they (automated or manual, or a mixture)? You do some quality control checks on your input data, which is very valuable. However, raingauge measurements are notoriously uncertain, especially in certain circumstances such as windy conditions (Rodda and Dixon, 2012), leading to significant undercatches, up to 16% in highly exposed areas (Rodda and Smith, 1986). Whereas these uncertainties are very difficult to estimate in practice, they should at least be acknowledged somewhere in your paper.

Rodda, J. C. and Dixon, H.: Rainfall measurement revisited, Weather, 67, 131-136, 2012.

Rodda, J. C. and Smith, S. W.: The significance of the systematic error in rainfall measurement for assessing wet deposition, Atmospheric Environment (1967), 20, 1059-1064, 1986.

6) Input data (page 3-4): When you measure precipitation, I assume this includes both rainfall and the water equivalent of new snow. It is probably worth stating that explicitly in the text.

7) Page 8 line 12: "greater radius": how much greater? If possible, it would be interesting to know the distance to the closest and the furthest 10 neighbours (maximum and mean) in Peninsular, Canary and Balearic Isles.

8) Page 9, line 10: "These months": which months are you referring to? November and December? Not clear from the text.

9) Page 10: Analysis on NWD, CDDm and CWDm: very interesting. Although it would have been even more interesting if this was done per year or per decade which would have allowed to see the evolution over 60 years. It would be very nice if this could be included in the application example, but the authors might feel this goes beyond the scope of this paper.

10) Page 12, line 16-17: see comments 3 and 5.

11) Page 32, Table 5: How come MAE for the Peninsula has systematically higher values than in table 4?

12) Page 33, Table 6: Please re-order the indices so that they are in the same order as in table 2. This would improve the readability greatly.

II. The dataset:

The dataset was very easily downloadable, with adequate metadata. Ideally, it would have been good if the data complied with some existing international standards or conventions for NetCDF files, such as CF conventions. These conventions are developed

to promote the interchange and sharing of netCDF files in a common format. Some tools or software require netcdf files to be CF or COARDS compliant. One recommendation of the CF conventions (which is compulsory for COARDS conventions) is that, for a multidimensional variable (such as the precipitation in this dataset), the order of the dimensions should be time, (height if present), lat (or y), lon (or x). This is not the case for this dataset, in which x comes before y, which means it can't be used with some tools. It is good practice to try and comply as much as possible to existing international standards so that datasets are as usable to as many users as possible. Having said that, this doesn't reduce the value of the dataset itself, which is still easily usable, and the order of the dimensions could be reasonably quickly fixed by the user if needed be.

Technical corrections:

Spelling: the use of English is inconsistent, the authors sometimes use British spelling (kilometre, neighbour, neighbouring, behaviour, favour, analyse) and sometimes American spelling (characterize, generalized, individualized, characterization, emphasizing). The authors should chose either British or American English and correct the spelling accordingly.

Page 3 line 11: remove the word "make"

Page 15 line 6: replace "most" by "more"

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