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Climate of the Past Discussions

Interactive comment on "Reconstruction of rainfall in Zafra (southwest Spain) from 1750 to 1840 from documentary sources" *by* M. I. Fernández-Fernández et al.

Anonymous Referee #2

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General remarks:

1) There should be more documentation of the source material (archives usually have accession numbers to refer to specific documents or collections of documents) and a Figure of a sample of the documents would be nice. There should also be some discussion as to the potential errors in using the documentary data. As well as the gaps and changes in "observers" mentioned in the text, changes or uncertainties in language, in expected values, in crops (which seem to be the basis of the documentary evidence) could all be discussed. What, for example, are the typical texts which are used as weather reports?

2) The paper as a whole provides very little quantitative evaluation of the series. Words such as “similar”, “confirmed”, “reliability” all seem to be used in vague statements without providing any quantitative or statistical evidence; these statements appear to be based only on a visual inspection of the time series presented.

3) The reconstruction itself makes several very large leaps of faith: first, that the estate reports are reliable as precipitation indicators; second that documentary evidence is as reliable as measurements (there is no discussion of potential biases towards undercount or exaggeration), and third, that the precipitation régime of the 90 years from 1750-1840 is the same as that of the 30 years from 1960-1990.

4) The fact that there does seem to be some kind of unspecified correspondence between the index presented here and the instrumental series for the same time period in other parts of the Iberian Peninsula in the same region suggests that there is some kind of precipitation signal which could possibly be extracted from this data. The only way to perform a reconstruction, however, is to have some kind of temporal overlap between the information being used and variable attempting to be reconstructed, which is not possible here. This makes it even more important to assess possible errors, biases and uncertainties as thoroughly as possible given the material that is available to work with. The authors would need to either 1) accept that there is no temporal overlap and leave this series as an index, rather than reporting the values as mm of precipitation (and certainly reporting values to the nearest tenth of a millimeter does not seem to reflect the accuracy of the estimates), 2) find some contemporaneous instrumental measurements of precipitation, or 3) use one of the published instrumental series cited in the paper as the target values and perform a statistical regression or other reconstruction method. It would be very difficult to find arguments sufficiently persuasive to convince readers that they should expect the precipitation regimes from 1750-1840 and 1960-1990 to be identical.

5) Update: Having read the comments of the first reviewer and the author’s response, It should be pointed out that Gimmi et al. (2007) used much more data than are used

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here. They used nearly 150 years of modern measured data, which would provide more robust measures of precipitation categories. They also calculated an estimated reconstruction from 174 stations over Europe. They were thus able to calculate uncertainties and errors by comparing the two results. They also provide much more detailed information concerning the documents and texts used. Their series is not a reconstruction in the sense that is often used in proxy data but a different method of estimation. In their conclusions, they state three conditions which they feel must be met to use their method, the first of which appears to invalidate this study for their method: "The qualitative observations need to be sufficiently detailed in order to distinguish different degrees of duration and intensity". Gimmi et al. (2007) were using direct daily descriptions of precipitation events, which (as I understand it) is not the case here: the authors here are using agricultural and estate reports. There is much good evidence that can be found in such reports, but the method used here over-reaches the limit of the data. There is a considerable body of literature devoted to extracting climate signals from indirect documentary evidence such as is used here.

Please also note the supplement to this comment:
http://www.clim-past-discuss.net/7/C1957/2011/cpd-7-C1957-2011-supplement.pdf

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Interactive comment on Clim. Past Discuss., 7, 3895, 2011.