

## ***Interactive comment on “Assessing extreme droughts in the Iberian Peninsula during 1750–1850 from rogation ceremonies” by F. Domínguez-Castro et al.***

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Thank you very much for your comments. In the following we answer the main points of your comments:

Referee: “Whereas the authors claim to subject new series, it is astonishing to note in table 1 (p 4061) that except for the towns of Calahorra, Teruel and Zafra, all already seem to be exploited in sometimes old publications (1990, 1995, 1997). One thus does not understand why the authors speak about 16 new series. Precise details on this subject would be the welcomes.”

Authors: We do not make reference to “16 new series” in the text. However we will

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revise the text to avoid this idea. As note by the reviewer, table 1 is clear in this aspect, it cites all the previous works and labels as “this work” the new series.

Referee: “In addition, the sources of records of these various rogations really are not clearly indicated. The will to keep these confidential documents can be understood on behalf of very young researchers. On the other hand, the undeniable notoriety of certain authors of this paper would not have made it possible to be more precise in the origin of the files. In the field of the historical method, it is highly recommended to justify its documentation at least partially. The reader must be satisfied with the publications in which these series were published (see table 1 p 4061).”

Authors: For the rogations series that have been published previously we cite here the previous works as we have done in Table 1 to avoid redundancies. About the new series we agree with the referee that more information is required. We will include an appendix with the information of the new series e.g.:

Calahorra - Archivo Catedralicio y Diocesano de Catedral de Calahorra, Cathedral Chapter Acts, 35 vol., 1451-1913.

Referee: “If the criticism of the source is carried out, it would have probably deserved to be more rigorous. Thus, it would have been necessary to insist on the fact that the rogations used relate to all of the cities. However, the city at modern times (16th-18th) is particularly sensitive to the extreme events and in particular to the drynesses since its provisioning depends largely on the level of the rivers for the routing of its food. One can thus consider that the religious perception of the dryness is exaggerated perhaps here than in the rural world.”

Authors: In Spanish pre-industrial society, local urban authorities had a good knowledge about production on rural areas with regular visits and inspections, looking and taking attention to correct management of transport resources and potential fluctuations of markets. Concerning problems of transport by drought, the fluvial transport in Spain was very limited and never was a way to move important quantities of food.

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Stable mechanisms of ships sending only exist between coastal cities (So called "Sea-wheat"). Orography did not permit contact by fluvial transport between producing areas and large cities. Most of direct provisions were obtained in a relatively small area around the cities.

Referee: "On the methodological plan, the authors indicate that they used other sources like the diaries and private correspondence. For as much, they do not seem to be really exploited whereas these documents bring to the historian information often more tangible than the only rogations. Thus they indicate the duration of the phenomenon, the reference marks of low water levels compared to the bridges or with the quays, of testimonys on the economic consequences (raising of prices of the supplies) and ecological (algae, died of fish) of these extreme events. Fault of being able to offer to the researchers exact sciences purely quantitative data, this textual information can be used to specify with a greater reliability severity of an event. Beyond, they represent invaluable tools to build an interdisciplinary dialogue and to compare the historical and contemporary drynesses."

Authors: Private diaries were used to construct some of the rogations series (Table 1). But the interesting aspect of this paper is that we have compared the same proxy (rogation ceremonies) simultaneously in many locations. It is true that when we identified an anomalous period, we studied all the sources available for those years, looking for details of the situation e.g. the letter from Benjamin Keen that describes the situation at Madrid during the drought (1750-1754). For every anomalous period we provide all the information that we have been able to collect.

Referee: "The results and the conclusions presented in connection with Tambora are very new and astonishing. Indeed, whereas the year 1816 is known for its spring and its very wet summer in Europe, the year 1817 is on the contrary particularly dry in Spain with a maximum number of rogations in the country. It seems well that it is about an Iberian exception in Europe and it would have been liked that the authors explain us the rehazos of this phenomenon thanks to the contest of the geophysicists."

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Authors: Indeed the result is not as astonishing as the referee mentioned. Previously, Trigo et al. (2009) found an important drought in Iberia during 1817, we support this idea giving more evidences and putting the event in a larger temporal context. Our results confirm the idea that the impact of the Tambora eruption in Iberia had been previously underestimated because of the lack of natural proxies and the reduced analysis made of documentary sources.

Referee: “It is regrettable that the authors did not justify their argumentation and their graphs by proposing in appendix a table containing the series of the historical drynesses by geographical site and by indicating the date and the approximate source of records (place, name of the issues of records) if it comprises a confidential aspect.”

Authors: As we cite in the conclusion, we are going to upload a file with all the series used to <http://salva-sinobas.uvigo.es/index.php/eng>.

Thanks for your comments

Trigo, R. M., Vaquero, J. M., Alcoforado, M. J., Barriendos, M., Taborda, J., García-Herrera, R., and Luterbacher, J.: Iberia in 1816, the year without a summer, *Int. J. Climatol.*, 29, 99–115, 2009.

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Interactive comment on *Clim. Past Discuss.*, 7, 4037, 2011.

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