

Interactive comment on “Flood frequency analysis of historical flood data under stationary and non-stationary modelling” by M. J. Machado et al.

M. J. Machado et al.

machado@mncn.csic.es

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Dear Dr. Balasch,

Firstly, thank you very much for your time and thoughtful review and comments. All the comments were very constructive to improve the manuscript towards the final publishable format.

Going to the answers to the comments:

1.- p. 530 lines 6-10: “Moreover: : :: : :”). The sentence seems to contradict the data deduced from figure 1c

This sentence referred to the paper by Salgueiro et al 2013, a study carried out in the
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lower Tagus river basin, where reservoir regulation is not as effective as in the upper catchment. In order to avoid confusion we have change this sentence as follow:

“Recent studies on the influence of the North Atlantic Oscillation (NAO) on the Tagus River flooding show evidence that the largest floods (average recurrence intervals >25 years) are associated with negative mode of NAO during the 20-25 days (of a total 40 days period length) before the flood peak (Salgueiro et al., 2013). Analysis of flood response under natural and dam-regulated regimes (before and after the construction of reservoirs ca 1957-60) revealed changes in the behaviour of flood peaks. In particular moderate floods (return intervals of 10-25 years) were blurred during the post-dam period due to flood peak discharge attenuation by reservoirs”.

2.- Suggestion: In section 4 (Historical flood occurrence and discharge estimates), historical floods reconstruction methodology is described (p. 536 line 8 to p. 538 line 8). This could be presented alongside the rest of the methods in section 3.1 (Floods records database). This section 3.1 could then be retitled as Flood hydraulic reconstruction and database and section 4 as Historical flood occurrence.

Thanks for this interesting suggestion. However, we think that the text presented in section 4 Historical flood occurrence are part of results, which if there are moved to section 3.1, it may lead in a mix between Methods and Results which we would like to avoid.

3.- Section 4: It is convenient to add a table with the reconstructed floods (year and peak flow).

There is a total of 59 historical floods, and it would be a long list, plus some comments regarding the hydrological meaning of each discharge (minimum, maximum, double bound). It may result in the long list. All this is already in the figures, particularly Fig. 1c) and if someone wants the data, always can contact the authors.

4. Figure 1c is profusely cited in the text due to its importance. However, it is too small

to be read with ease. I suggest to detach this figure from figures 1a and 1b so as to enable its enlargement.

Thanks for this comment. We agree that this part of the figure should be enlarged. In the revised manuscript will appear as a separate figure.

TECHNICAL CORRECTIONS Typing errors in the manuscript - p. 527 line 25: accent in Francés Done

- p. 529 line 14: in a basin of more than 9000 km², instead of flash floods, it would be preferable to speak of floods or riverine floods.

We fully agree, now is read only "floods"

-p.533 line 16: accent in Francés. Done

- This reference (as it appears in the text) is not included in the references section p. 536 line 1: Jiang et al. (2014) differs from Jian et al. in the references section (p. 553 line 13)

Corrected to Jiang et al.. The reference now is updated

- p. 538 line 11: it is Figure 1c instead of Figure 1 Done

- p.538 line 24: it is 1916 instead of 1616 Done

- p. 539 lines 9 and 10: specify the area where this happens: the Iberian Peninsula?

Done

- p. 540 line 14: it is Figure 1c instead of Figure 1

Done

- p. 545 lines 4 and 10: accent in Francés

p. 545 line 13-14: reference Cunderlik and Burns, 2003 differs from the one in the references section, where the second author appears as Burn

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"s" in Burn is deleted.

p. 546 line 6: it is 1878 instead of 1787

Thanks!. Done

p. 546 line 17: according to table 1 and figure 4, the return period of a peak flow of 400 m³s⁻¹ is 5 years instead of 10, as the text says

Thanks. Changed to 5 years.

p. 547 line 13: Hall et al., 2013 differs from Hall et al., 2014 in the references section

Changed to Hall et al., 2014

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