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Climate of the Past Discussions

Interactive comment on "North–south palaeohydrological contrasts in the central Mediterranean during the Holocene: tentative synthesis and working hypotheses" *by* M. Magny et al.

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To :

Denis-Didier Rousseau Editor of Climate of the Past

Dear Denis,

Many thanks for organizing the review procedure. Please, find, as attached files, a revised version of our manuscript cp-2013-42 entitled :

North-south palaeohydrological contrasts in the central Mediterranean during the Holocene: tentative synthesis and working hypotheses

Below, into the window Supplement, we have attached a pdf file including the revised version with corrections indicated in bold type, and into the window Figures, the revised version of Figures.

We endeavoured to revise our manuscript according to comments of the two referees as follows.

Remarks of Referee 1

In response to remark A of the Referee 1, we have completely deleted the mention of MRCAI (Zhao et al., 2010) from the text and from Figures 6 and 7.

According to remark B of the Referee 1, we have completed the text by adding indication about the season considered for the changes in insolation (e.g. summer insolation maximum).

The phrase pointed out by the Referee 1 (remark C) on page 1906 l. 25 has been completed.

Remarks of Referee 2

1. The referee 2 is right : both the winter and the summer precipitation decreased at Pergusa after 4500 cal BP. However, as extensively discussed in Magny et al. (2012c), the quantitative estimates show that the summer precipitation was more affected by the climate drying than the annual and the winter precipitation. Thus, the mid- to late Holocene transition corresponds to a mean lowering by ca 10-8% for annual and winter precipitation whereas the decrease in wetness reaches more than 30% in summer.

This progressively leads to a stronger seasonal contrast in precipitation, typical of the current Mediterranean climate of the region. The text has been completed accordingly. Regarding the Accesa data, the quantitative estimates suggest millennial trends towards drier (wetter) conditions in winter (summer) since ca 7500 cal BP. On a centennial scale, winter and summer appears to effectively show opposite oscillations except for the interval ca 5500-4500 cal BP due to an effect of the local vegetation (peak of Cyperaceae ; Peyron et al., 2011).

2. In the introduction of section 4 (page 1924), in addition to the NAO, we have actually mentioned possible influences of other atmospheric circulation patterns over the Mediterranean such as EAWR or North Sea-Caspian. However, we have focussed our discussion on the NAO which is often considered as the main circulation pattern for the North Atlantic zone and associated areas for the present days as well as for the Holocene period. Moreover, the examination of the possible impact of other (important) circulation patterns needs to present and discuss additional records from other key regions in Eurasia. So, given the present length of the paper, we have chosen to focus on the NAO. However, in response to the remark of the Referee 2, we have added a sentence to the conclusions and to the abstract to clearly mention the need to develop an exploration of the possible influences of other circulation patterns in explaining the apparent complexity of Holocene palaeoclimatic data from the Mediterranean area.

3. In response to the remark 3 of the Referee 2, we have clearly refered on page 1910 l. 5-7 to apparent contradictions between isotope records versus lake-level and glacial records with references where the reader may find more extensive discussions. Additional references have been included to provide further examples of such apparent contradictions.

4. In response to remark 4 of the Referee 2 about the interest of model simulations, we have completed the text on page 1928 by a reference to a paper by Gaetani et al. (2011) published in a peer-reviewed journal (GRL) and based on sensitivity experiments. Moreover, on page 1929, we refer to a paper by Lézine et al. (2011, QSR) which

clearly mentions model experiments to show how the presence of remnant ice-sheets may have been responsible for a southward shift of the atmospheric general circulation. In addition, the present paper (a bit long as it is !, see comment by the Referee 1) will be followed by a further paper more specifically centred on model experiments in combination with palaeoclimatic data.

5. In response to remark 5 of the Referee 5, we have checked and completed the figures to clearly indicate the proxy used for every record. For the comfort of the reader, we have chosen to show specific maps in Figures 8 and 9 instead a unique map with all data locations. In addition, we have revised Figure 2 to present not only the sites studied within the project LAMA, but also sites used for inter-regional comparisons in the central Mediterranean and in west-central Europe.

Finally, please, note that there an additional co-author : Elena Ortu.

We hope that this revised version will meet your expectations.

Yours sincerely Michel

Please also note the supplement to this comment:
http://www.clim-past-discuss.net/9/C1194/2013/cpd-9-C1194-2013-supplement.pdf

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Interactive comment on Clim. Past Discuss., 9, 1901, 2013.

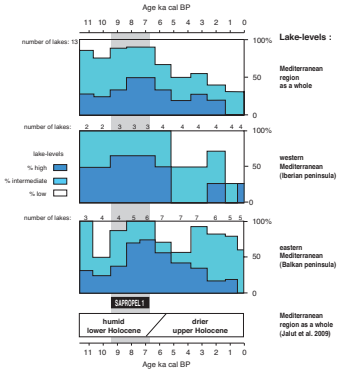

Figure 1

Fig. 1.

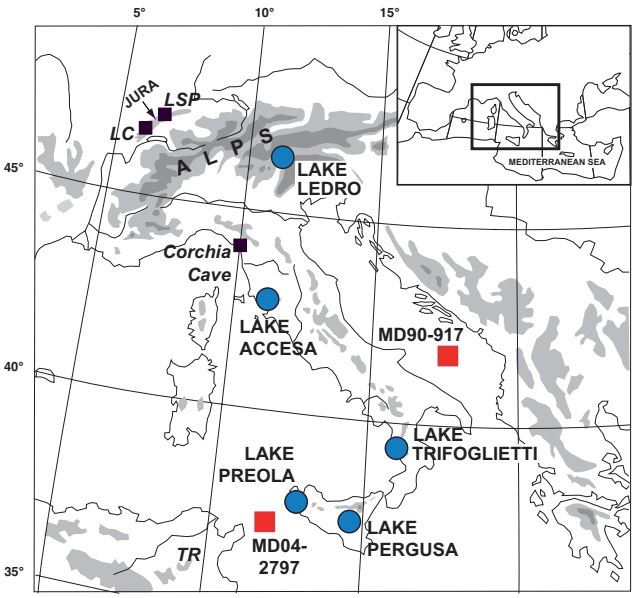

Figure 2

Fig. 2.

Figure 3

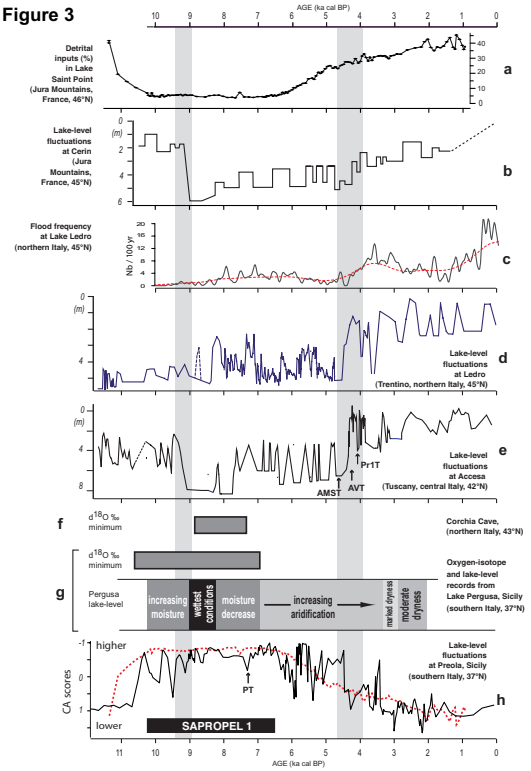

Fig. 3.

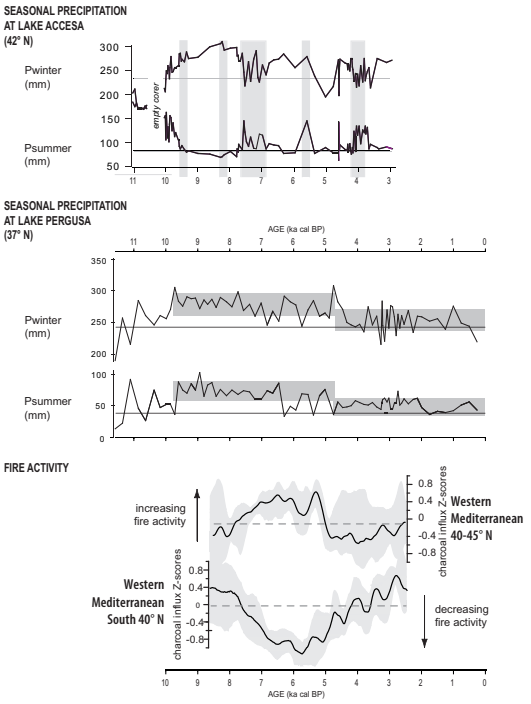

Figure 4

Fig. 4.

Figure 5

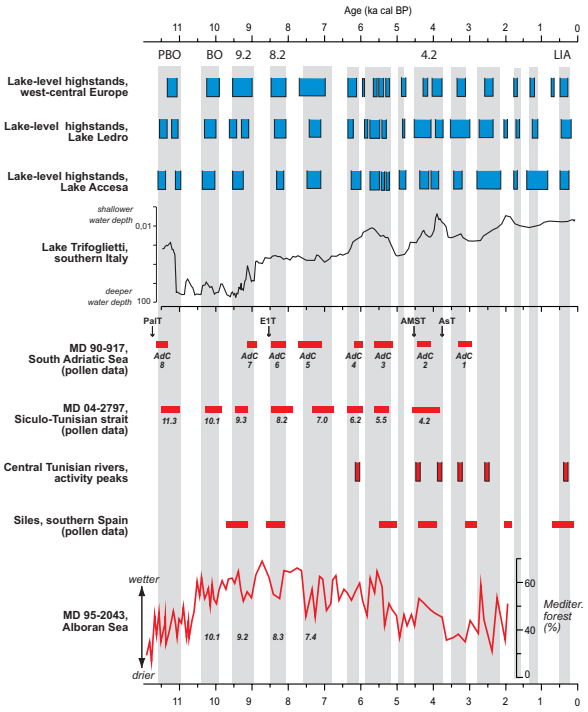

Fig. 5.

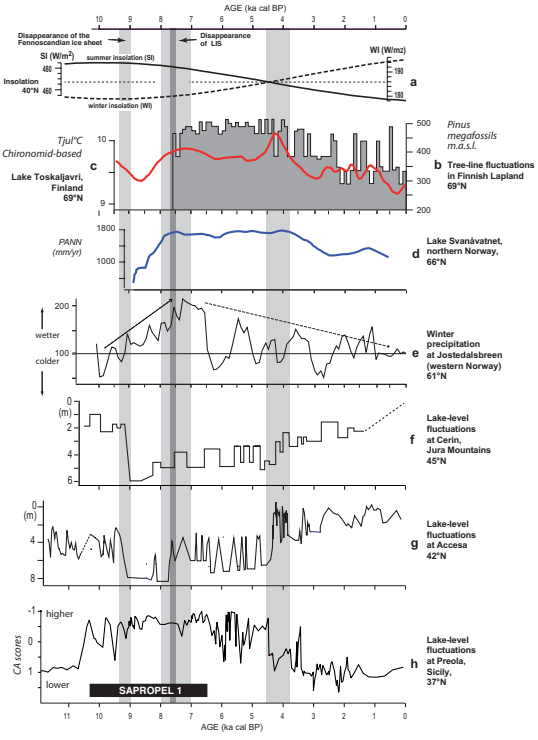

Figure 6

Fig. 6.

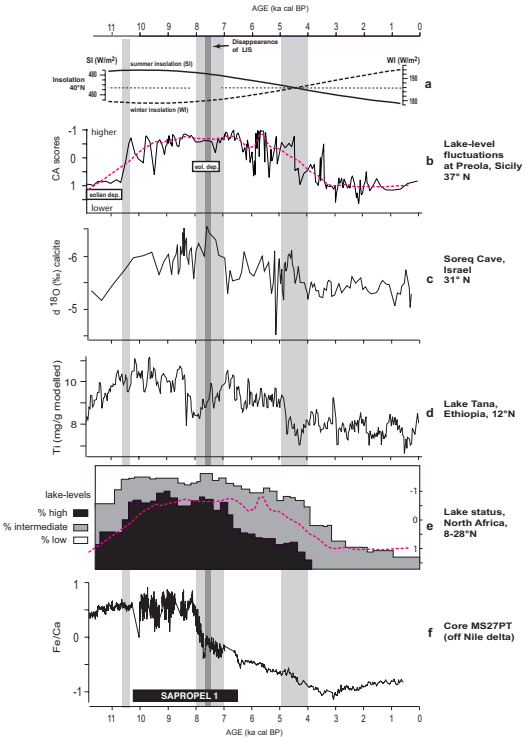

Figure 7

Fig. 7.

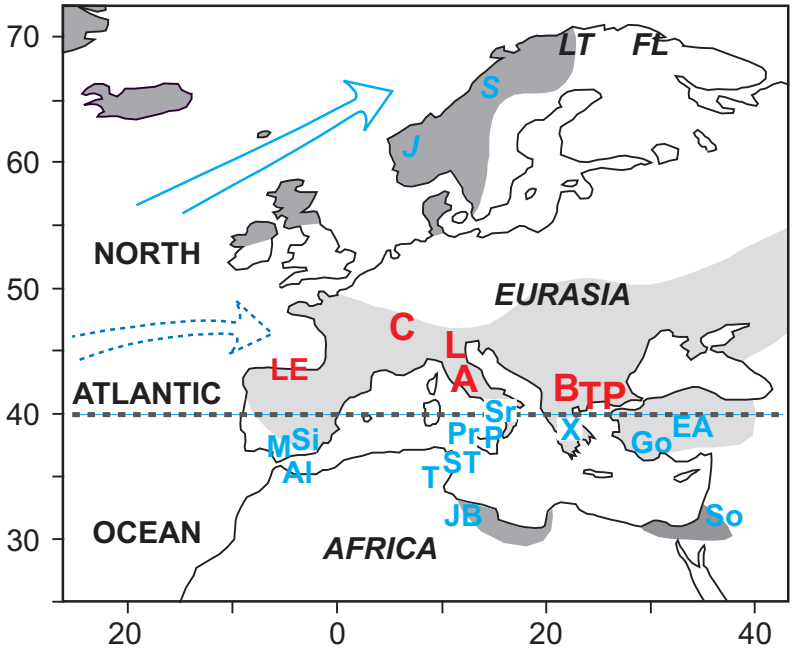

Figure 8

Fig. 8.

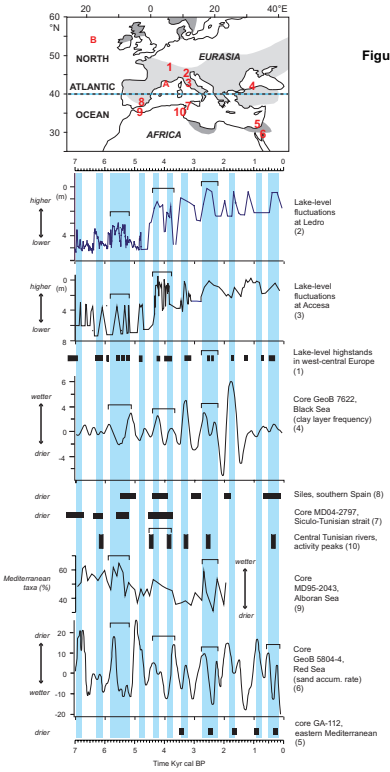

Figure 9

Fig. 9.