

Interactive comment on “Terrigenous input off northern South America driven by changes in Amazonian climate and the North Brazil Current retroflexion during the last 250 ka” by A. Govin et al.

A. Govin et al.

agovin@marum.de

Received and published: 28 February 2014

We thank both Reviewers and the editor for their comments on the revised manuscript. Their comments are in plain text. Our reply is in italic. Text modifications in the manuscript are in blue.

Editor's comments

Dear authors,

C3546

Your manuscript on "The terrigenous input off northern South America..." and its interpretation has now been seen by two reviewers. The reviewer response is overall positive and justifies publication of the manuscript after some revisions. Accordingly, I strongly encourage submission of a revised version of the manuscript. In your submission of a revised manuscript please provide a point-to-point reply to the points raised by the reviewers. There are three major points, where I would like you to draw special attention on in your revisions.

1. Reviewer 1 added an extensive list of additional references, which are essential for the interpretation of your data. Please discuss these papers in your manuscript and add references where necessary.

Following the Reviewer's comment, we significantly modified the Introduction. We added an extensive paragraph that highlights the main findings from Bolivian Altiplano lake sediment studies that we overlooked in the original manuscript. We also modified the presentation of speleothem records (reformulations, addition of the east-west antiphase highlighted by Cruz et al. 2009). Finally, we added missing references to lake sediment studies throughout the Discussion. Please see more details in our reply to the first comment of Reviewer 1 below.

2. While reviewer 2 seems to be very happy with your unmixing model, reviewer 1 would like to see some more justification of the results, especially with respect to the generally quite constant Andean contribution. Please add some more discussion on this point.

Relatively constant %-Andes values in our records indicate a relatively stable sedimentary system within the Amazon Basin during the recorded period. Due to steep topography and intense erosion in the Andes, Andean tributaries remained the main source of Amazon sediments over the last 250 ka, while past Amazonian precipitation changes are likely responsible for the small amplitude of %-Andes variations. We completed our discussion on %-Andes values to clarify this point (see our reply to Reviewer 1).

C3547

However, relatively stable %-Andes values are not in contradiction with increased input of terrigenous (vs. marine biogenic) material during glacial intervals, which are mainly controlled by global sea level variations. %-Andes values reflect the provenance (Andes vs. lowland) of terrigenous material within the Amazon Basin, which are little affected by sea-level changes. [We added section 5.1 to the Discussion in order to explain the factors controlling the relative proportions of terrigenous vs. marine biogenic fractions at our core sites.](#)

Finally, we disagree with the Reviewer that the east-west antiphase highlighted by Cruz et al. (2009) will affect our records. Such eastern contrasting rainfall patterns documented during the mid-Holocene are mostly restricted to NE Brazil and have very little influence on the easternmost Amazon tributaries which supply little sediment material (see our reply to Reviewer 1 for details). [This is now stated in the Discussion.](#)

3. Finally, from an editor's point of view I struggled a bit with the submission of this paper to the Interglacial Climate Dynamics special issue of CP. For your paper to appear in this special issue, I would suggest to add some extended discussion on the evolution of the sedimentation characteristics within interglacials and of existing/nonexisting differences between the different interglacials covered in your record. If you cannot provide this extended discussion, I would prefer to publish the paper in the regular section of CP and not in this special issue.

We understand the Editor's hesitation to include our manuscript in its present form in the Interglacial Climate Dynamics special issue of Climate of the Past. Our manuscript is focused on climate variations over the last 250 ka in order to investigate precessional changes that dominate our records. Unfortunately, our records lack resolution (i.e. sedimentation rates are too low) to investigate detailed variability within interglacials. In addition, while only the early Holocene is covered in our records and unsatisfactorily dating constraints characterize MIS 7 (Fig. 3), the Last Interglacial (MIS 5.5) is the only interglacial that is appropriately represented in our records. These limitations prevent detailed discussion of similarities and differences between interglacials. Therefore, we

C3548

are not be able to produce an extended and robust discussion of interglacial characteristics that is necessary to include the manuscript in the CP special, and we agree with the Editor's suggestion to include it in the regular section of CP.

Aline Govin, on behalf of all co-authors.

Interactive comment on Clim. Past Discuss., 9, 5855, 2013.

C3549