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Climate of the Past
Discussions

Interactive comment on "The C_{32} alkane-1,15-diol as a proxy of late Quaternary riverine input in coastal margins" *by* Julie Lattaud et al.

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Review of Lattaud et al. 2017

Accept with Major Revisions

Summary of the paper:

Lauttaud et al. tested if the fractional abundance of the C32 alkane 1,15-diol, compared to all other 1,13- and 1,15-diols, could be used as a proxy for riverine OM input in paleo work. Their proxy was ground truthed by comparing it to the BIT index of core top samples collected from the Mozambique Channel. Once they found a good correlation between the two proxies, the authors then applied their diol proxy to Quaternary sediments found off the Zambezi and Nile Rivers. Differences between the new diol

proxy and the BIT index were attributed to changes in either the sourcing of the soil OM to the river and/or changes in crenarchaeol abundance. Overall, the authors suggest that the C32 alkane 1,15-diol proxy is an adequate tracer for riverine OM inputs and that it is not as affected by soil and vegetation changes in the river's catchment area.

The main criticisms for this paper are as follows:

- The authors compare their diol proxy to the BIT index in order to determine if it traces riverine OM inputs; however, other proxies that better trace terrestrial OM inputs (e.g. lignin or long chain fatty acids) would be better to use. As stated in line 61 and throughout their discussion, the BIT index can also reflect changes in marine OM productivity.

- The discussion is focused more on how well the diol proxy compared to other proxies as opposed to how the riverine OM inputs may have responded to changes in climate. Some of the material they discuss in the methods and materials section should have been also included in their discussion, including the ITCZ's influence on both sites.

- The authors also do not address the differences in hydrology of the river systems they are analyzing. The reason for why the BIT index and the new diol index are so different for the Nile may be due to the longer length of the Nile River compared to the Zambezi River.

- Line 319: Authors mention there is an increase in precipitation in the catchment area between 38 and 35 kyr but the dD (Fig. 2D) appears to become more enriched during this time, which would indicate there are drier conditions.

- Line 383: The authors attributed the decrease in diol and brGDGT inputs during H1 for the Nile to drier conditions with reduced river flow. They then use the arid explanation again for the Nile River inputs from 0-5kyr; however, they mentioned the increase in soil input was related to less vegetation and less soil stabilization (line 422). Data/information should be provided for vegetation changes during H1 in the Nile or else the two different explanations will contradict each other.

- Line 417: Authors mention that the log(Ca/Ti) in figure 4 is decreasing over the 0-5ka record and that it indicates that there is less riverine OM input. This should actually be the reverse. If the value is lower, it would mean there is more riverine input, which throws off their interpretation for this time period.

- Line 421: Fig. 3b should be Fig. S3b

- Figures 2 and 4: Why flip the log(Ca/Ti) axis?

- Figure 4: Looks like the BIT index follows the log(Ca/Ti), which the authors describe as a proxy for riverine input, more than the proposed diol index

- Do the authors have data for the abundances of the marine 1,13- and 1,15- diols? They barely discuss how changes in the production of marine diols influence their proxy.

END of REVIEW

Interactive comment on Clim. Past Discuss., doi:10.5194/cp-2017-43, 2017.