Reply to the interactive comment of Dr. T. Bianchi on “The C_{32} alkane-1,15-diol as a proxy of late Quaternary riverine input in coastal margins”

We thank Dr. Bianchi for his helpful comments on our manuscript. Below follows our reply to the main comments.

-*The reviewer states that we only compare the %C_{32} 1,15-diol to the BIT index and that there are better proxies for riverine input that we could use, especially because the BIT index can be influenced by productivity.* The %C_{32} 1,15-diol was mainly compared to the BIT index and log(Ca/Ti), as these proxies represent riverine terrigenous input. Unfortunately, it could not be compared to lignin concentrations because this was not determined in our samples and we have little original sediment left but it would be the next goal of the study of the C_{32} 1,15-diol. We did not compare it to n-alkanes or long-chain fatty acids because both can also come from eolian input and not only from riverine material. This is especially true for the Nile site where it was shown that the n-alkanes can come from eolian input from the African peninsula (Blanchet et al., 2014). It is true that the BIT index is also influenced by archaeal productivity and that is why we also report the concentration of brGDGT to constrain the influence of the concentration of crenarchaeol (representing archaeal productivity) on the BIT index.

-*The reviewer says that the discussion is focused on the comparison of proxies and not on the relationship between the riverine input and the climate, especially with the change in ITCZ location.* It is true that the discussion is more focused on comparing the new proxy to others, as this was the main goal of our paper. Both regions have been intensively studied for past climate change including the ITCZ (Blanchet et al., 2014, Castaneda et al., 2009, 2010, 2011, 2016, Schefuss et al, 2011, Just et al., 2014, Tierney et al., 2008, Wang et al., 2013, Thomas et al., 2009, Box et al., 2011), including studies which have used the same sediment cores as used here. We do not want to repeat their conclusions in our manuscript. Rather, we explicitly chose these cores and regions as much is already known about the paleoclimate, which makes it easier to understand the behavior of a new proxy.

-*The reviewer indicates that part of the difference in correlation between the C_{32} 1,15-diol and BIT between the sites can be due to the different hydrological setting of the rivers.* We find it difficult to explain the difference in correlation between the C_{32} 1,15-diol and the BIT index by different hydrological settings and/or the length of the river alone. Rather we feel that the different correlations is due to the factors discussed in the manuscript.

-*The reviewer mentions that the δD decreases between 35 and 38ky (line 319) and does not increase leading to drier conditions and not more humid as stated in our manuscript.* The reviewer is correct, and we will delete this part of the discussion as the change in sea level is enough to explain the increase input of C_{32} 1,15-diol and brGDGTs in our core.

-*The reviewer indicates that we use the same environmental factor, i.e. aridity, to explain two different observations, i.e. a decrease in riverine input and an increase in soil erosion (line 383).* Data supporting the change in vegetation and aridity during 0-5ky have been reported by Blanchet et al. (2014) and this is mentioned in the manuscript at line 419, while data supporting the extreme aridity during H1, more than during 0-5 kyr, have been reported by Castaneda et al., (2016). It might be that the extreme aridity during H1 (when both Lake Tana and Lake Victoria, the sources of the Blue and White Nile, were desiccated) led to a lack of vegetation and increased soil erosion but also substantially reduced river flow, such that net export of soil OM was reduced. In contrast for the period between 0-5 ky, aridity is not as severe and thus the increased soil erosion combined with a moderately reduced river flow still leads to export of terrigenous OM as also shown by the relatively higher Ca/Ti (Castaneda et al., 2016).

-*The reviewer states that a decrease in log(Ca/Ti) during 0-5 ka indicates more riverine input*. It is true that log(Ca/Ti) is decreasing during 0-5ka and that it indicates more soil input, but it does not indicate per se more riverine input itself. There could be enhanced soil erosion which leads to a larger input of soil OM yet at a similar or even reduced river flow. This will be more precisely phrased.

- *The reviewer noticed that at line 421 the figure name should be S3b and not Fig. 3.* The figure name will be changed.

-*The reviewer is asking why the axis for log(Ca/Ti) has been inverted.* By flipping the log(Ca/Ti) we highlight the similarity between this proxy and the BIT and C_{32} 1,15-diol, making the correspondence between the three proxies clearer.

- *The reviewer says that in fig. 4 the BIT index and log(Ca/Ti) are more similar than the %C_{32} 1,15 and log (Ca/Ti).* The BIT index follows the log(Ca/Ti) better than the diol index as they both are influenced by soil erosion and the diol index is not.

-*The reviewer is asking is we have the concentration of the 1,13 and 1,14 diols.* Unfortunately, it was not possible to quantify the concentrations of the 1,13 and 1,15 diols as they were measured from long term stored archived extracts.