Climate of the Past Discussions

Clim. Past Discuss., referee comment RC1
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Comment on cp-2021-183

Anonymous Referee #1

Referee comment on "Millennial variability of terrigenous transport to the central–southern Peruvian margin during the last deglaciation (18–13□kyr□BP)" by Marco Yseki et al., Clim. Past Discuss., https://doi.org/10.5194/cp-2021-183-RC1, 2022

The authors present two marine sediment records of the last deglaciation interval from the Peruvian margin. They use XRF data and granulometry analyses to distinguish aeolian from fluvial sources in the sediment. The variations in these sources indicate changes in coastal surface winds and in the strength of the South American monsoon. The granulometry brings here novel data in this region where aeolian transport can be significant. The study clarifies the processes driving the sediment flux to the Peruvian margin, and allows for a reassessment of previous record of terrigenous input. The methods are sound and the data support the conclusions.

The authors provide important new paleoclimatic observations for the Pacific South American coast in the key period of the abrupt deglacial warming.

The article is generally clearly written, but the quality of the english is variable throughout the manuscript. The text could be somewhat condensed to make the reading easier.

Detail comments:

L97: at what depth are the anoxic conditions?

L110: precise "austral" winter and "austral" summer

L113: "large quantities" seems in contradiction with L115 "scarce flows of coastal rivers".

L119: "Aeolian clays and silts are transported offshore by trade winds" implies that the fine fraction is not only related to fluvial transport but also partly to aeolian transport, which is at odds with the conclusions. A clarification is required.

L128: please indicate the number of samples and the range of depth in the main text.

L130: 2017 coastal El Niño anomalies did not extend south of Lima. "El Niño" conditions may thus not be justified for Pisco.

L140: which calibration dataset does CALIB8.1 use? Base on the figure, I understand that the depth-age model is a sequence of linear models. This should be explained in the method section.

L149: "laminated packaged"? do you mean "lamination"?

L154: the relevant information is the 14C calibration dataset, not the software.

L174-178: this paragraph needs to be clarified, in part by improving the english.

L181-182: What about wind blown terrestrial material? Doesn't it contain Ti as well? In Haug et al 2001, Ti was used indeed as a proxy for river discharge but aeolian transport was not an issue there.

L185: "Zr has been widely used as a proxy for mean depositional grain-size"

Figure 2: add the sample depth to each graph.

L238: "we interpret...based on our interpretation". So, what is the interpretation based on?

L238-246: This paragraph should be shorter. The absence of a fine fraction peak in april 2017 in station E5 should be discussed.

L258: "when alongshore wind stress was anomalously enhanced at the mature phase of the Coastal El Niño". This contradicts earlier statement (introduction) about the increase of rainfall during El Niño. More details about the 2017 El Niño event are needed.

L262-263: I don't understand clearly what the authors mean.

L266: "desert" instead of "dessert"

L276-282: keeping EM3 as a wind proxy and excluding EM2 and EM4 only on the base of the slight increase of EM3 in one station in april 2017, seems weak. EM4 increased in Pisco in april 2017. The argument needs to be strengthened. The whole section in general is somewhat long and confusing.

L292: I did not understand from the previous section that EM2+EM3+EM4 would be considered as wind proxy in Pisco. This needs to be more clearly built and stated in section 4.1.

L296-297: a similar result would be obtained if Ti was both in fluvial and aeolian material, and Zr only in aeolian.

L320: "seasonal": which season? "poleward": North or South?

L333-334: "SST proxies..." please correct and clarify the sentence.

Figure 6 and 7: when possible, indicating a modern value for reference would be useful.

Supplementary Figure 1: legend for triangles is missing

supplementary figure 2: please add legend for the symbols. What are the stars? Dates from Salvatecci? Are they included in the calculation of the new age model? Indicate sedimentation hiatus.