

Interactive comment on “Reconstructing past variations in environmental conditions and paleoproductivity over the last ~ 8000 years off Central Chile (30° S)” by Práxedes Muñoz et al.

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Initially, we used several references for the study area. To favor comparable results and since most works extend further back from the Holocene, we avoided using research that went beyond the period of time during which we did our work. We also tried to focus on the area of study. Much work has been carried out far north or far south, with different responses to atmospheric and oceanographic forcing. These results are not comparable since our objective was to identify changes in productivity and changes in redox conditions in the past. While our findings complement the main results of other studies in the Chilean continental margin, they also provide information on the possible

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effects on atmospheric-oceanographic changes in one of the most important upwelling areas of the Chilean continental margin. We modified the introduction, the last part of the section about the study area and the last part of the discussion regarding paleoclimatic interpretations, and we used several of the references you suggested. . We believe this improves the discussion of our findings. The discussion in point 5.1 refers to the biogenic versus the terrigenous contributions. First, the organic component has been discussed when we talk about TOC and stable isotopes; then the inorganic, when we comment on the susceptibility and magnetic and metals. A paragraph has been included regarding the implications of the changes in the ^{15}N distribution and we have added citations, such as DePol-Holz. Contreras has not been considered because his work is focused on superficial sediments and temporal variation of ^{15}N . The study by Mohtadi et al 2008 does not highlight any results for the mid-Holocene; their core's data dates back 6 Ka and our study could be comparable only in some parts of their charts. and could be compared with our study only in a few points of its graphs. The core used off the Coquimbo area corresponds to depths in the slope under the influence of Intermediate Antarctic Water, as this study is focused on studying the changes of this water body after the Last Glacial Maximum. We included Ortega as a work submitted since the manuscript is forthcoming. However, this manuscript is based on the analysis of a short core of the Tongoy Bay. . In the case of Díaz-Ochoa, the work focuses on the last 200 years, the implications of which do not match our records. Additionally, the oceanographic dynamics in Mejillones are considerably different from those in Coquimbo.

Through the whole manuscript the authors refer to suboxic/anoxic conditions, however, the values given for the water station 16 seems to be well above the suboxic value of <0.2 ml/L. For station 1 it's really hard to distinguish if the values may be lower sometimes. I think the value ranges for oxic/suboxic/anoxic need to be given in the introduction. Also, while water values are presented the oxygen levels discussed refer to the sediment which needs to be made much clearer. Just because you have low oxygen in the water column this does not necessarily make the underlying sediments

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anoxic.

In the present conditions, bottom waters are normally suboxic. Therefore, in our sedimentary records the enrichment of metals like U, Re and Mo decrease dramatically. When we speak of anoxia, we are referring to periods in the past for which there are no oxygen records, but it is deduced from the distribution of proxies like U, Re and Mo, which point to a very low content of oxygen and even sulfides, suggested by a large enrichment of Cd and Mo. Strictly speaking, all the sediments are anoxic. The penetration of oxygen is only a few mm when the bottom waters are suboxic. In our case, the high deposition of organic material generates seasonal conditions of anoxia on the sediments due to high consumption during its degradation. Then these sediments are under the effect of anoxic conditions which seem to prevail during the mid-Holocene.

Add a discussion of the nitrogen isotope data. And compare to previous studies, such as (De Pol-Holz et al., 2006; 2007; Verleye et al., 2013).

We added a paragraph considering the works of De Pol-Holz and others that help establish the effect of the OMZ and upwelling on our site, thereby complementing our interpretations of metal distribution. Lines 537 to 551. No interpretations on nitrate reduction variability could be done since our core covers from the mid-Holocene onwards and because no major changes in $\delta^{15}\text{N}$ are expected during this period.

General remarks: The figures are often not focused, the labels are too small, and in figure 10 the age should be plotted on the y-axis as in the other figures.

We corrected the figures, except the figure on moisture pollen which displays better horizontally.

I would like to see a more comprehensive conclusion, so far it's more a summary. Suggestion: try to reduce information in methods and results section. Is the exact (something here is missing in the referee comments) We modified the conclusions.

Munsell chart colour really needed? Is a good guide for establishing the general com-

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position of the sediments

For example get rid of Line 181 to 183. These lines briefly explain how the cores were processed.

Specific remarks: Figure 1: Please add the surface circulation for the area. We added an outline of bay circulation based on studies available; some patterns are under study and yet to be defined. This is relevant to understand the arguments raised.

Figure 2: unsharp and colors are hard to distinguish, this needs revision, I suggest to use a color range that is more appropriate to highlight the DO values of the low end of the scale more. Numbers in this plot need to be larger as well.

We made the corrections and chose the best colors allowed by the Matlab program.

Figure 5: I think the accumulation rates for TOC should be given here instead of just (%), further please add the core number directly behind a.) and b.) in the figure.

The sedimentation rate does not change much, so to do a calculation with a relatively constant number does not contribute mostly to the results.

Figure 10: I suggest to also put the Age on the Y-axis here as in all the other figures.

Line 35 – add “The” before Coquimbo Line 78 to 83: rephrase, you cannot refer to “these boundary current ecosystems” in one sentence and then explain it afterwards. Line 131-132: maximum Chl a concentrations of ... Line 209-216: remove this paragraph, the section is already long and you only list the following chapters here. Line 218: change the comma to a dot. Line 384- 390. This was a bit confusing as a southern and northern area are introduced, but both cores studied are in the southern area? Line 720: “Past environmental changes are analogue...” please specify these changes clearly here. Line 724: “in this regard”, it's not clear what you are referring to Line 726: Studies based on pollen records ... There is a citation missing here! Line 747-51: rephrase, improve the connection to the sentence before by first saying that you see indications of higher continental inputs due to increased rainfall, than which of your

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data shows this and which other studies support this observation. I further suggest to split this sentence in two. Line 759: rephrase “peak drying”

Most of these lines were modified. We checked grammar mistakes and we modified several lines and paragraphs in order to answer to the comments by both referees.

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