

## ***Interactive comment on “Bottom-water deoxygenation at the Peruvian Margin during the last deglaciation recorded by benthic foraminifera” by Zeynep Erdem et al.***

### **Anonymous Referee #2**

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Erdem et al use benthic foraminiferal assemblages of live benthic foraminifera as a proxy assess bottom-water oxygen concentrations on fossil benthic foraminifera across the upper Peruvian Margin since the last deglaciation.

I do think this is an interesting study, however there are several important issues that need to be addressed to improve the study and interpretations:

1. In the current format, the authors have not demonstrated that the live population are identical too the dead population in the core tops, and without this evidence down-core reconstructions are not scientifically scrutinized.
2. Information concerning age models of the different cores is missing. The age model

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needs fully discussed and shown in the article as it is crucial to consider the context and interpretations of the reconstructions.

3. The authors should have a good look at their data and critically reflect whether their conclusions really reflect the data. The main Figure 6, I presume, shows reconstructed O<sub>2</sub> plus error. Main changes seem to occur during deglaciation. There does not appear to be any differences between LGM and core tops/late Holocene (the authors suggest a 30  $\mu$ M change from the LGM to Holocene at the lower OMZ boundary): -The first site at 626 m shows (within error!) similar O<sub>2</sub> values during the LGM as core top; e.g. no statistically significant increase in LGM oxygenation. -The second core at 1013 m: all reconstructed values are below present day values: no significant increase in LGM oxygenation here. -Third core site at 1249 m: LGM oxygen concentrations are lower compared with core top; so no significant LGM increase in oxygenation here. -Fourth core at 997 m: perhaps H1, early deglacial higher O<sub>2</sub> values; but no reconstructions for the LGM.

So none of the cores show that the Peruvian margin, at the water depths investigated, was better oxygenated during the LGM compared to today.

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