

## ***Interactive comment on ““OAE 3” – a low- to mid-latitude Atlantic oceanic event during the Coniacian-Santonian” by M. Wagreich***

**Anonymous Referee #1**

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The manuscript by Michael Wagreich is a follow-up of earlier studies that showed a rather restricted distribution of the so-called OAE3 event to marginal basins of especially the North Atlantic Ocean. Furthermore, this event is spread over a long time interval (Coniacian to Santonian) and not at all time equivalent in different locations. The author evaluates possible definitions of OAE3 and poses the question if this event really identifies as a significant and clearly defined event. Since there is a lot of confusion in the literature about the definition and also the spatial and spatial distribution of OAE3, I think this manuscript is an important contribution to the Cretaceous community because it shows clearly, that the term OAE3 is misleading. Therefore, the manuscript clearly qualifies for publication in *Climate of the Past*. There are, however, a few points that need attention by the author so that I recommend publication of the manuscript after minor to moderate revision.

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- The author introduces a new term (Atlantic anoxic event, AAE). I do not think that the community needs again a new acronym. There are OAEs and CORBs that already display the two main stages of the Cretaceous ocean. Introducing a new term is rather confusing and I think the author clearly shows in the manuscript, that there is no clearly distinguishable event in the Coniacian to Santonian. Furthermore, the title includes the term "Atlantic oceanic event", not Atlantic anoxic event. Since one of the main conclusions of the paper is that there is no clearly definable event, the title should be changed as well.

- Page 1211 line 17: just citing Leckie et al to account for the numerous studies that have suggested a more regional control and modification on OAE3 is not enough. In a manuscript that deals with OAE3 specifically, the mechanisms that are suggested to explain OAE3 in former studies should be mentioned in much more detail. This is an important point that is lacking in the manuscript so far.

- The last two paragraphs of section 2.1 contain a lot of interpretation that should be included in the discussion section and not into the results section.

- The author speculates that the Hitchwood event as defined by Jarvis et al 2006 might qualify as a potential candidate for an Late Turonian OAE3. This is highly speculative and therefore should be deleted. There is no clear evidence, that this isotope event is related to widespread deposition of organic-rich sediments at all.

- The last paragraph on page 1218 is in large parts a repetition of the introduction.

- The end of the discussion chapter, that deals with models explaining OAE3 is very focused on the studies done on the African margin. Furthermore, it only explains how the cycles in these shales are formed, not the formation of black shales itself. Here, I think, the author has to be much more specific and should also include alternative models published for other regions of the North Atlantic like Demerara Rise (which is time equivalent to the African black shale sequence) or the South American basins (e.g., Venezuela or Columbia).

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Some more technical comments and suggestions:

- Typos in lines (l) on page (p): l15, p1211; l1 and l5,p1213; l7,p1214, l15,p1216; l5,p1225
- Abstract line 20: The phrase "global oxic time intervals" sounds misleading at that point because there are still anoxic conditions in numerous places and certainly more than today.
- Lines 14-21 of page 1211 are hard to understand; please rephrase.
- Line 1 on page 1212: give references that show this long-term change in the Cretaceous climate (e.g. Huber et al 2002 and/or the new compilation for the Cretaceous of Friedrich et al 2012).
- Line 25 on page 1213: Please add the original references here and not only a study that summarizes these results.
- Lines 13-17 of page 1214 are hard to understand; please rephrase.
- Line 1 on page 1217: Friedrich and Erbacher 2006 do not contain stable isotope data. The correct reference might be Friedrich et al 2012, *Geology*.
- Line 11 on page 1219: Shouldn't it be Hofmann and Wagner 2001?

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