

Interactive comment on “Anoxia and salinity changes: a new Permian catastrophe record” by Marlise C. Cassel et al.

Anonymous Referee #1

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The paper by Marlise Cassel and co-authors is a comprehensive study of the Irati formation in southern Brazil, with a complex carbonate ramp history derived from numerous sources and proxies. There is a wealth of data in this paper, and the interpretations of the depositional history of the Paraná basin are based on grounded arguments. It is therefore my view that this dataset should eventually be published in a journal such as *Climate of the Past*. However, in its current form, the manuscript is in need of substantial work prior to eventual publication.

Firstly, the level of English language and grammar is well short of what is required of an international journal. There are numerous spelling mistakes throughout (e.g. Wingall instead of Wignall, hiper instead of hyper), and the current structure and use of abbreviations makes the manuscript extremely difficult to read. It took me 4 afternoons

C1

to get through the paper completely. If it is that much of a slog for someone who has agreed to review, then it will fail to be read by much of its target audience. I understand that it must be difficult to prepare a manuscript in a language other than one's native language, but the level of mistakes are too many to even begin suggesting corrections. The manuscript needs to be checked by someone with English as a 1st language to improve readability and grammar. I would also try and cut down on the number of abbreviations (e.g. Outer Ramp etc.) because it does nothing to help readability and the paper is not limited by a page count.

The second major issue with the paper in its current form is the catastrophe focus of the title, abstract, and interpretation. The end-Permian is indeed the largest mass extinction of the Phanerozoic, but the early- to mid-Permian (~pre 270 Ma) was not typified by the mass extinction of genera. Neither the Emeishan (~259 Ma) nor Siberian Traps (~251 Ma) are likely to be coincident with the Irati Fm, and these are among the prime contenders for ecosystem stress that led to the end-Permian mass extinctions. It is difficult to orientate when exactly the Irati formation is in Figure 2, given the lack of available dates, but it would appear that the majority of shales are found in the early Permian strata. I am not saying that this data is not interesting, it is just not indicative of mass extinctions. As much of the abstract, introduction, and conclusions frame this work in this context, all of these sections need to be rewritten. The structure of the paper needs to be altered accordingly, as the main points of this manuscript are tracking sea level changes and the response of shelf environments to these changes.

Thirdly, there is an urgent need for a graphical illustration of the Stratigraphic Scheme of depositional sequences (section 4.3). This would significantly aid the reader in understanding how the system evolved from inner ramp to outer ramp facies, and what this means for the evolution of the Paraná basin.

Overall, I recommend major revisions. There is a good dataset here, but it is currently marred by poor English and false linkage to end-Permian environmental disturbances.

C2

Minor comments: Figure 1. The boundaries of Paraguay, Uruguay, and Argentina are incomplete. Figure 2. If there is any available age constraints on the Irati Fm., please add them. Figure 3. Again, providing even rough ages of the different lithostratigraphic units would be very valuable here.

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