

## Comment on **essd-2021-158**

Ian Harding (Referee)

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Referee comment on "DINOSTRAT: a global database of the stratigraphic and paleolatitudinal distribution of Mesozoic–Cenozoic organic-walled dinoflagellate cysts" by Peter K. Bijl, Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2021-158-RC2>, 2021

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The author is to be congratulated on producing an excellent manuscript to support a innovative and novel database system that has been created (over a considerable period of time one assumes) with the help of several research assistants. The content of the article is entirely appropriate to serve as support for the publication of this unique new dataset which will prove to be of enormous use to the community working on various aspects of dinocysts, dinoflagellates and wider palynological, ecological and evolutionary subjects. I would go so far as to say that this database will be a game-changer, and represents one of those major leaps in any given subject that will be viewed in future as a watershed moment that brings objective quantification to the subject of dinocyst temporal and geographic ranges, enabling the group to be used as an even more powerful tool for the solution of geological and ecological problems.

The author provides robust explanation and justification for the selection and inclusion of the data from individual publications, including age conversions and error limits, which renders the dataset itself of high quality. The data set would indeed appear to be usable in its current format. The length of the article is appropriate, well structured and clear (though I'd suggest a few minor changes to some of the latter headings). There is some inconsistency in the use of tenses and abbreviations which need to be ironed out before the work is accepted, but all of these are minor and easily resolved, and are highlighted in the attached marked-up version of the manuscript. There are one or two abbreviations that need to be standardised through the script - these too are noted in the attachment. The figures and tables provide visually striking representations of a variety of compilations of the data in the new database, and elegantly demonstrate the enormous potential of this type of data compilation.

There is a significant issue with the reference list, which seems to be compiled in a non-standard sequence which makes it much more difficult to search than is necessary: for example, single authored publications should appear in the list before those the author wrote with others. The list as currently given seems to be in no particular order at all,

with papers by the same author not listed either that way or in date order... This must be sorted out for the sake of the reader.

The figures accompanying the manuscript serve to powerfully illustrate the power and future potential of this database. It will provide workers in the field with an extremely innovative and robust new tool that will be used to advance our understanding of many different aspects of dinoflagellates, their cysts, geological and geographic ranges, palaeoceanographic and ecological constraints on distribution and evolution. The database may be used in ways not yet foreseen, and which will only become evident as it is utilised by the community.

My main concern is when it comes to the future development of the database - at present the author seems to be taking on responsibility for doing this alone (albeit perhaps supported behind the scenes by unnamed research assistants). Such an approach (and the commitment to update the database every three years) seems to put an enormous responsibility on the shoulders of ultimately a single individual. I would thus urge the author to consider this point and the potential weaknesses that this could cause. Perhaps there may be ways in which the wider global community might be able to be involved in supporting the continual refinement and updating of the database whilst still being able to maintain its high quality (other than by simply providing new data, etc.) ?

Overall, I consider this to be a landmark database that has the potential to revolutionise the subject area, and the author (and his previous research assistants!) should be heartily congratulated on producing such a database that will serve to benefit the wider community.

Please also note the supplement to this comment:

<https://essd.copernicus.org/preprints/essd-2021-158/essd-2021-158-RC2-supplement.pdf>