Response to comments by Reviewer #2

1) Mulitza et al., present a global "living" repository of sediment cores with oxygen and carbon isotope data which include new and previously published data. They outline their data sources, organization, coverage, distribution, and potential future applications of this database. The authors explain the merit of the global atlas, how to download and navigate the data, invite others in to contribute data, and recommend uses for the atlas (e.g., education, expedition planning, etc.). I commend their effort to organize for the first time such decentralized and complicated data from many sources. I suggest that the paper be published after some minor revisions which would clarify information flow and provide context for the findings.

We thank Reviewer #2 for the constructive comments and very helpful suggestions for our manuscript. Our responses (plain text) are listed after the Reviewer's comments (text in italic font).

2) Missing data: A database not cited here may have relevant information for the atlas. The authors should compare their atlas to the database at https://doi.org/10.1594/PANGAEA.875998 and accompanying paper (https://doi.org/10.5194/essd-9-739-2017). Borreggine et al., 2017 assessed sediment core collection in the North Pacific, Sea of Japan, Bering Sea, and Sea of Okhotsk. They document meta data and isotope data among other characteristics. It would be beneficial to cross-check your atlas to this database to ensure no cores/records are missing and update numbers (i.e., # of cores, # of records, percentages, distribution data, figures, etc.) if necessary. The accompanying paper may also include analysis that could provide further context to this article.

The amount of foraminiferal isotope data generated over the last 50 years is enormous and new data are constantly produced and published. The task to assemble newly published and historical data in a single homogenous data product can only be approached iteratively. As ESSD encourages the generation of "living" data products, we are indeed committed to continuously update the atlas in the future both with newly published and historical data. The meta study by Borreggine et al. (2017, https://doi.org/10.5194/essd-9-739-2017) is a great source of information to recover and rescue older data and we will use it for a future update of the isotope atlas. However, as Borreggine et al. (2017) do not provide the actual isotope data or links to the data (which was not the purpose of that particular paper), the search for the isotope data listed therein with the necessary quality control and formatting would require too much time to be completed in reasonable time within this review. Furthermore, our data set is already very comprehensive (including many of the data listed in Borreggine et al., 2017) and the documentation of the sources in the appendix has already reached a considerable size (see comment #7 from Reviewer #2 and our response). We therefore suggest to follow a more practical iterative approach and propose to include and document the available data listed in Borreggine et al. (2017) into the next update of the atlas. To emphasize the need to rescue historical isotope data, we added two sentences to section 6 explicitly stating our plans to frequently update the atlas with newly published and historical data citing Borreggine et al. (2017) as an example for historical data to be included:

"As new foraminiferal isotope measurements become frequently available, we plan to update the atlas in reasonable intervals. Also, more historical isotope data may become available and need to be rescued (i.e., Borreggine et al., 2017)."

3)In Section 3, the authors assess data distribution and offer some brief explanations. Section 3.1 does a good job of explaining core distribution across ocean area and water column depth but does not offer an explanation as to why most cores are found in tropical regions, why isotope records are predominantly found in the Atlantic, or why the Mediterranean has the highest core density.

We agree and added the following two sentences with possible explanations to section 3:

"This pattern is likely the result of the year-round accessibility of low latitudes compared to high latitudes where, due to sea ice cover or harsh weather conditions in the cold season, expeditions are often constrained to the warm season."

"The Pacific and Indian Oceans are currently only covered by 2 and 2.1 cores/million km^2, respectively, which is likely a result of relatively low accumulation rates and poor carbonate preservation over large areas. In addition, the retrieval of sediment cores in the remote and deep central areas requires more ship time compared to the Atlantic and Mediterranean Sea."

4) Additionally, Section 3.2 may benefit from a brief analysis on why certain species are the most commonly used.

We agree and added the following sentence to section 3.2:

"These species have a relatively broad geographical coverage and are considered as mixed-layer species in their respective environments (Schiebel and Hemleben, 2017)."

5) The authors should provide concrete suggestions on how to apply their database beyond what is mentioned in Section 4. For example, they should expand their discussion in Section 4.3 on the merit of educating students about downcore isotope ratios and Section 5 with information on how to employ PDV.

We agree and added the following sentence to section 4.3:

"Lecturers may employ the atlas together with PaleoDataView or with custom software to show examples on how isotope stages may be identified in different geological settings and on how isotope differences between species may be explained by hydrography and foraminiferal ecology. Students may also actively explore the patterns of isotope stratigraphies from different parts of the global seafloor to actively learn how global factors such as ice volume and local factors such as SST and freshwater input influence stable isotope records."

Furthermore, we added information on where to download PaleoDataView to section 5 (data availability). More information on how to install and use PaleoDataView is given on the download site.

6) Since one of the stated goals from the authors is to contribute to the long-term maintainability and consistency of age models through this global atlas, the authors should include more detailed information about how other researchers can contribute new data in Section 6.

We agree and added the following sentence to section 6:

"Please contact the first author if you are interested to contribute to future updates of the atlas.".

7) The final table belongs in the supplement rather than the main text. In the attached PDF I have added these comments as well as others to the preprint for the authors to consider. The comments include technical corrections, wording suggestions, typos, and information structuring suggestions. Great work!

The final table is indeed very long and we understand the reasoning behind this suggestion. However, the ESSD submission guidelines state that "... citations should appear in the body of the article with a corresponding reference in the reference list". A similar recommendation can be found in the PAGES data guidelines (https://pastglobalchanges.org/science/data/data-guidelines): "... "data citations" appear in the main text alongside and in the same way as a bibliographic citation, and they are included in the reference section of the paper". A reference list/table in the supplement would probably not go into most citation data bases. We feel that it is important to give proper credit to the colleagues who generated and shared their data and thus see no alternative to an extensive table with citations in the appendix to keep the corresponding references in the main reference list of the paper.

The additional comments and suggestions in the attached PDF were very helpful and have been incorporated into the revised manuscript.