

Interactive comment on “GLODAPv2.2020 – the second update of GLODAPv2” by Are Olsen et al.

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The new cruise datasets added to GLODAP in this release constitute a substantial update to this already invaluable data product. The manuscript is clearly written and virtually ready to publish as it is. The first section of my comments below raises a few minor issues that the authors should consider before publication of this paper. The second section contains broader suggestions that might benefit future releases, but which are not necessary to include in this version.

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1 Comments for this manuscript

1.1 Version naming convention

The new version number/naming convention outlined in lines 146–147 is intuitive and clear to follow. It could be more strongly emphasised here that the exact version number used should always be reported in studies, rather than making a generic reference to GLODAP.

It might be helpful to also explicitly commit to what may and may not be changed between different levels of version release. For example, in the "minor" version increments new cruises may be added but data that was already there will not change (with the exception of bug fixes, such as described in section 3.3.1), whereas it sounds like a "major" version increment would involve a reanalysis of the entire dataset, in which the adjustments applied to existing datasets could be more fundamentally altered.

Even if it's not exactly as I've described, some sort of explicit commitment like this could be helpful — users who switch to a newer version could immediately know what they can rely on to be consistent, and what changes they need to watch out for — and now, as the new versioning system is introduced, seems like a good opportunity to do this.

1.2 Carbonate ion measurements

The "four variables" statement in line 360 ignores the increasing reliability of carbonate ion measurements (e.g. Sharp and Byrne, 2019). I suggest to modify this statement accordingly; it is not really necessary to specify "four" or any specific number here at all.

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1.3 pH adjustments — or not

It would be useful to recap that pH adjustments were not applied to the new data in this version where this is mentioned in the summary on lines 554–555.

1.4 Figures

The axis labels and other text notes on a couple of the figures are a bit too small relative to the figure size, making reading difficult (e.g. Figure 3).

Although you can work these out from context — if you are familiar with the field — several of the figures are missing axis labels and units for the variables shown (e.g. Figures 3 through 6).

1.5 Typos

Abstract: add a comma after "discrete $f\text{CO}_2$ " on line 56. Change "bias corrected product" to "bias-corrected product" on line 60.

I suggest to change "are released regularly" to "will be released regularly" on line 145.

Summary: the sentence on lines 554–555 is missing a full stop at the end.

2 Suggestions for future releases

The following points are not revisions that are necessary for this publication, but rather ideas that could be taken under consideration for future releases of GLODAP.

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2.1 Expand dataset sourcing

The latest GEOTRACES Intermediate Data Product (Schlitzer et al., 2018) contains some datasets with the core GLODAP variables that are not included in this GLODAP release. While it's unreasonable to expect the GLODAP team to continually seek out new data from an endless list of sources, it may be worth including the GEOTRACES IDPs for future versions given the typically high quality of the carbonate system data therein, abundance of auxiliary variables to aid secondary QC, and consistent data format.

2.2 Accept carbonate ion measurements

As noted above, carbonate ion measurements are now becoming usefully reliable (e.g. Sharp and Byrne, 2019) and becoming more widespread. Accepting this type of data into GLODAP would be a natural extension to the current set of core variables, adding a new dimension to some applications of the GLODAP database such as evaluating dissociation constants based on over-determined data points (e.g. Sulpis et al., 2020).

2.3 Update carbonate system calculations

The analysis here still uses CO2SYS for MATLAB v1 (van Heuven et al., 2011). Updating to at least CO2SYSv2 (Orr et al., 2018) would enable uncertainty propagation — given that some calculated marine carbonate system variables are reported, it would be useful to also propagate uncertainties from the measured variables and dissociation constants into the calculated variables.

Updating further still to the recently released CO2SYSv3 (Sharp et al., 2020) would also enable calculations with carbonate ion as an input variable, if these measurements were to be accepted in future GLODAP releases. Ammonia and sulfide speciation

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are also included in the alkalinity equation as of CO2SYSv3, which could improve the accuracy of marine carbonate system calculations in areas where these species are significantly abundant.

3 References

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