ESSDD

Interactive
comment

Interactive comment on "An Internally Consistent Dataset of δ^{13}C-DIC in the North Atlantic Ocean – NAC13v1" *by* Meike Becker et al.

Meike Becker et al.

mbecker@geomar.de

Response to Reviewer 2

Thank you very much for this review. We hope that we could address the raised issues in a sufficient way.

Generally, we agree that this dataset for the North Atlantic ocean can only be a start and should, in the best case, be extended to the globe. However, this is limited by the spatial overlapping of the respective cruises. The new δ^{13}C-DIC data of the 6 Meteor cruises, now clearly pointed out to us the need for an internal quality control and at the same time revealed enough crossovers for a reliable analysis.

We did not perform AOU vs. δ^{13}C-DIC plots for identifying outliers in the beginning.

For this review, however, we did so but there were no remaining outliers. (The cruise 64TR19900417 is completely out of the normal range, but it was flagged as bad anyway).

Please note, that changes we did in the manuscript or the dataset are italicized in the following and highlighted in red in the manuscript.

- **p 3:** "Anthropogenic δ^{13}C-DIC changes have been estimated by models (e.g. our 2013 paper mentioned above). These model results could potentially be used to estimate the effect in different regions."
  Answer:
  We agree that these model outputs could be used to estimate the effect of anthropogenic carbon on deep water masses. We decided, however, not to include this analysis in this publication as it's primary purpose is to provide a quality-controlled dataset for all kinds of further analysis.

- **p 7:** "Why does cruise 33MW199930704-1 have high quality data? Were there objective criteria used to determine this?"
  Answer:
  Sentence changed to:
  The cruise 33MW199930704-1 was analyzed by a reputable laboratory, has relatively low scatter and covers wide distances.
  Of course, it can never be completely excluded, that this data has a bias itself. However, by testing all other cruises against this one, we achieve internal consistency of the presented dataset.

- **l 140:** "these cruises are 10 years apart and I could imagine that at high latitudes anthropogenic δ^{13}C-DIC could have an impact. (see comments above)."
  Answer:
  Yes, both cruises are 10 years apart, but we suggest that 10-year-changes due

to anthropogenic carbon in the deep North Atlantic Ocean (here the region between 40-55° N) are smaller than the measurement uncertainty. Moreover, there is no trend observed with depth as it was found for some crossovers further north where the influence of anthropogenic carbon definitely has to be taken into account. Finally, for this specific crossover, the latter cruise had higher δ^{13}C-DIC data than the earlier one, which is not consistent with what we would expect for an increased amount of anthropogenic carbon in the latter cruise data.

- **Fig 3:** "the font and figure is too small. It is not readable. Please increase size."
  Answer:
  These two pictures are shown only as an example for a typical crossover. *However, we increased the font size.*

- **l 182:** ""-0.20 permil" but in Tab. 3 -0.15 permil is listed. Please check this inconsistency."
  Answer:
  Inconsistency was corrected.