ESSDD

Interactive
comment

Interactive comment on "An inventory of Arctic Ocean data in the World Ocean Database" *by* Melissa M. Zweng et al.

M. Steele (Referee)

mas@apl.washington.edu

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Review of Zweng et al., "An inventory of Arctic Ocean data in the World Ocean Database," submitted for publication to Earth System Science Data Discussions.

This is a very valuable contribution to the data science literature. I support publication after minor revision.

P1, L8: What is the definition of a "cast" (or a "profile")? For example, does a temperature profile from the surface down to 50 or 100 m depth qualify? What about down to 20 m? What about a salinity profile from 100 m depth to 150 m depth? Or a mooring with sensors at just a few depths, e.g., 50 m, 100 m, and 200 m? IE, what are the (1) upper/lower depth bounds, (2) minimum number of depth levels, (3) other thresholds

that determine a "cast?"

P2, L7: "...first recorded European expeditions..."

P3, L3: "...were not available..."

P3, L28: "...1-3 Sv into the Barents Sea from the Norwegian Sea..."

P4, L2-3: (1) "...variations in the North Atlantic Ocean..." (2) cut Aagaard and Carmack 1989 reference.

P4, L9: Swift et al (2005) and also: Steele, M. and W. Ermold, Steric sea level change in the Northern Seas, J. Climate, 20(3), 403–417, 2007.

P4, L14: Morison et al. (1996) and also: Steele, M. and T.ĂăBoyd, Retreat of the cold halocline layer in the Arctic Ocean, J. Geophys. Res., 103, 10,419-10,435, 1998.

P5, L17: What is a "federated search?" What is a "networked catalog?"

P5, L24: What is "format processing?"

P5, L30 (and P10, L14-15): It would be useful to provide some context to these statements. IE there are other global hydrographic data bases available; you should prove that WOD is the largest, as you claim. Also, is WOD the largest in the Arctic region?

P6, L16: Is this sentence "Figure 1 shows..." really necessary, given the earlier Figure 1 reference on P3, L19?

P6, L29: "...east of Inuvik..." ??? Inuvik is not on the coast. I do not see this swath.

P6, L29-30: "The Russian shelf has dense sampling..." It seems like this is really an overstatement. Most Russian arctic shelves have very poor sampling.

P7, L18-19: The very frequent sampling from MRBs really skews your statistics. You note this, which is good, but can you do better? EG can you provide a second set of statistics where you calculate daily mean profiles from each data type? Or just subsample to get once-daily sampling?

P7, L21-24: Is it necessary to include these numbers in the text, given that they are in the Table as well?

P8, L1: "...has not yet been added..." Why not, considering that these data sets started a long time ago?

P8, L5: Did you include UpTempO buoy data? Eg, https://arcticdata.io/catalog/#view/doi:10.18739/A2508R

What about Salargos buoy data? ftp://ftp.nodc.noaa.gov/nodc/archive/arc0001/9800040/1.1/data/0-data/atlas/html/dig/digargos.htm

P8, L15-18: So, which method did you use in Table 2?

P9, L6-10: Did you use Switchyard data? Eg: https://arcticdata.io/catalog/#view/doi:10.18739/A22G78

Figure 1: (1) You should mark the "High Arctic" ocean basin proper. (2) 80N is prominently discussed in the text: It should be marked here or on another figure. (3) The caption refers to the Lincoln Sea, but it is not marked on the map. (4) Your red contour includes the Iceland Sea, the Canadian Arctic Archipelago (a.k.a. the "Canadian Polar Shelf Sea"), Baffin Bay, and Davis Strait / Northern Labrador Sea, yet these are not included in your caption text. (5) Why is only 1 out of 4 deep basins in the Arctic Ocean marked? IE Canada, Makarov, Amundsen, and Nansen. Or C + M = Amerasian Basin; A + N = Eurasian Basin.

Figure 2: (1) The color scale is missing the units (just copy from Figure 4). (2) Should note that gaps = missing data (ie take this from the text and put it in the caption). (3) You should note the bias in this display of data density via lat/lon bins. IE even if data sampling was ok in the far north, the convergence of meridians means that it is likely that blue colors would still dominate. I realize that WOA is on a lat/lon grid, but that does not mean that you need to display your WOD results on this inappropriate grid for an Arctic paper. IE a better figure and statistics would use an EASE grid or similar.

Figure 3: (1) I do not see the peaks at 1882-1883 nor at 2007-2008. (2) I suggest putting the horizontal axis tick marks on the outside of the plot, so that they are visible apart from the blue bars. (3) And then you can mark these special observing periods IPY, IGY with thicker ticks or arrows.

Figure 5: (1) Can you make the lat/lon lines thicker and whiter on the land? (2) Colors are very hard to see when dots are tiny. Please make the colored dots on the key below the map larger. (3) I suggest that you note the locations of the MRB stars in the caption text, because they are very hard to find otherwise. (4) I suggest that you explain the acronyms in the caption text. (5) What is the order of overplotting here? IE which symbol is first, second, etc? But in fact, overplotting is not optimal. Another option might be to find the most common instrument in each grid cell, and color the cells that way. This method avoids overplotting and creates a much cleaner figure.

Interactive comment on Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2017-63, 2017.