Ocean Science

Discussions

EGU

Open Access

Interactive comment on "Decorrelation scales for Arctic Ocean Hydrography. Part I: Amerasian Basin" *by* Hiroshi Sumata et al.

Anonymous Referee #1

Received and published: 4 October 2017

Review of Sumata et al., "Decorrelation scales for Arctic Ocean hydrography. Part 1: Amerasian Basin," submitted to Ocean Science Discussions.

This is a very nice paper, and very well written. I have some minor comments that should be addressed before publication.

Line 66: You should define "representation error."

Line 120: Here you state that the vertical depth range of the analysis is 0-400 m. Then in Section 2.3, Figure 2, and beyond, you discuss depths deeper than 400 m. This is confusing.

Line 151: Please explain the "vertical stability test" in more detail.

Equation 1: It is a very poor choice of variable names to use T and S for "observed property" and "structure function" respectively, considering the key roles here of T and S for temperature and salinity. I strongly suggest a change in variable names.

Line 269: 10 km interval, 10 day interval. There are many instances (this is just one) where you have chosen a length or time scale for analysis, for binning, for smoothing, etc. A few times you justify your choice, but most of the time you do not, as in this instance. I suggest that each time you introduce a space or time scale, you provide some kind of justification for these choices, or an analysis that shows that the results are insensitive to the choice. (Another example: 10 km interval, 5-day interval, Line 379.)

Figure 8 and first paragraph of Section 3.3: Your text mentions 0-160 m depths, yet the figure shows 60-80 m; also text 200-400 m, but figure 350-375 m. This is confusing. Further, the black line evidently corresponds to the "southern perimeter of the Canada Basin" but this is not obvious in the figure nor is it explained as such in the figure caption.

Lines 337-339: Are you simply stating here the obvious point that real long-term trends might not be accurately represented by your sparse data set? This hardly needs mentioning. Or are you trying to make a different point? Please clarify.

Lines 341-345: It might be very interesting to see a map of the representative time.

Figure 9 and associated text: I think you should provide some discussion comparing Figure 9 and Figure 4: Why are they so similar, ie why is the scale of the mean field similar to the scale of the variance?

Lines 426-436: This is very interesting but it is speculative and should be written as such. IE I suggest changing text such as "due to . . ." to "possibly due to . . ."

Figure 13: Your text provides a brief explanation of the figure, but then provides no analysis. This suggests to me that it is not necessary. If you disagree, then I suggest

that you provide some analysis.

Appendix B: Is there an error in the Figure B1? It shows only a tiny bit more variance in ITP level-2 salinity at depth, and no more in temperature, in contrast to your claim in the text.

Figure 1: 1) Use a different color for the bathymetry vs. the data dots. 2) Please provide a bathymetric color scale. 3) Please provide geographic place names used in the paper on this figure.

Figure 3 and others: It is very difficult or impossible to see the difference in color between tiny colored dots or lines.