

## **Manuscript 02-2018-34: Author's response to the reviewers.**

I am very thankful to the both reviewers for helpful and important comments on the manuscript. Below are my detailed answers to the reviewers' comments. All changes in the revised version of the manuscript are highlighted yellow.

### **Response to Anonymous Referee #1**

1. I have noted in the text that including Argo data is not the novel feature of the WAGHC climatology. The importance of the Argo data is simply reflected in the title and the name of the gridded product.
2. Thank you for pointing to this name change. I made respective changes in the text.
3. The text was changed respectively.
4. The explanation of the smaller number of the profiles retained for the WAGHC climatology is provided.
5. I have added a sentence regarding the manual quality control. It was implemented only for the areas with extremely poor data coverage.
6. I included an additional piece of text pointing to this difference between the two products. The discussion of the differences between the climatologies due to the different median years is available in sections 9.3 and 9.5.
7. I have added a piece of text pointing to the regional climatologies produced recently by the NCEI. The reference to Seidov et al., 2018 was added. Unfortunately, the comparison with these climatologies is beyond the scope of the manuscript.
8. A justification for the 0.25-degree resolution is added in the end of the section 2 along with the new reference to the earlier paper by Boyer et al., 20005, where the authors elaborate on the spatial resolution of the gridded product.
9. I have corrected the statement. Thank you for pointing to this error.
10. I inserted the comma in the respective sentence and checked the text again.

### **Response to Anonymous Referee #2**

1. I have not provided the plot of the depth-dependent threshold value, as this value is given by a simple linear dependence on depth. Respective changes were introduced in the section 5.
2. The thresholds for T and S do not vary in space. I have provided their numerical values.
3. I have stressed in the text (lines 150ff) that imposing the threshold on maximal allowed level spacing minimizes the production of artificial water masses.
4. Thank you for the suggestion to use the volume T,S-histogram. I have replotted Fig.11, 13a-b which now show the volume fraction of each climatology.
5. Paranthesis inserted

6. “defines” changed to “defined”.
7. Fig. 5d corrected
8. The area numbers are explained in the figure caption.