

Interactive comment on “Near-ice Hydrographic Data from Seaglider Missions in the Western Greenland Sea in Summer 2014 and 2015” by Katrin Latarius et al.

Anonymous Referee #1

Received and published: 16 January 2019

GENERAL COMMENTS

This paper presents data, and associated data processing, from two Seagliders operating during the summer of 2014 and 2015 in the Western Greenland Sea. The multi-year seasonal context of the dataset is of value to the scientific community and this should be emphasized with more specific detail throughout the extent of the paper. The processing steps are numerous but are well documented. The final dataset appears to only contain post-processed data (original values are not preserved). The addition of quality flags would assist future users in determining the level of processing that has been applied, and help to identify known erroneous values (ie salinity spikes). Data

C1

accuracies and statistics should be discussed more quantitatively within the text portion of the paper, with particular attention given to any potential limitations and future applications of the data. There are typographical and grammatical errors throughout the paper that require attention. I suggest the following revisions be addressed prior to resubmission.

SPECIFIC COMMENTS

Abstract (P1): The abstract states the goals of the field program but lacks mention of the scientific findings and/or why the associated dataset is of relevance to the scientific community.

L32 (P1): For consistency in the sentence that refers to figure 1, add “in West Spitsbergen Current (WSC)” after “along their eastern rim”.

Figure 1 caption: I suggest the acronym definitions get moved to the bottom of the figure caption, below the description of the red arrows. Additionally, L48 (P1): consider rewording this sentence. The gradient in the red arrows is what is indicative of the cooling, so this should be stated first. Suggested rewording: “The red to yellow arrows indicate the relative cooling of the warm, saline Atlantic Water as it flows through the Nordic Seas and Arctic Ocean.”

L52-56 (P2-3): This paragraph should be more descriptive and/or reorganized. A few brief clarifying statements could help. The first sentence lacks temporal context (are the numbers listed a general average? Are the numbers listed percentages of total output over a year, during a specific season, or?). You then mention the temporal variability in freshwater transport in the EGC; how does this variability relate to the EGC's contribution to total freshwater output (the 50-75% you mention)? Additionally, variability in freshwater transport can be due to either variability in current speeds and/or variability in total volume fraction of freshwater to total seawater. Which (or both) is more influential here?

C2

L140-142 (P5-6): The parenthetical description of “roll” does not help to clarify this sentence. “Turn to the left/right” could refer to roll or yaw. Either eliminate, or use the actual axis of rotation in your description.

Section 2.3 (P6): Table 1 is very thorough and contains a lot of good information. You should summarize more of the pertinent information in the text portion of this section. Consider moving the last paragraph of section 2.2 to section 2.3. Your first explanation of the reasoning behind the mission planning is too general (L146-147); include more specifics up front. L154: “but later concentrated on a southeast to northwest section” – why? Also, please explain the voltage-cutoff and unstable flight behavior during summer 2014 (glider 127). What were the causes? It appears these issues were resolved for the second deployment of glider 127 but this is not well explained.

Section 2.4 (P7): Your description of the differences in ice regimes between the two seasons is well detailed. What are the implications to the datasets in terms of their capabilities, comparability with each other and with other datasets, etc?

Figure 3 (P8-9): On P9 why is one of the glider tracks represented by a dotted line but this is not described in the figure caption?

L228 (P10): Explain how the glider data are comparable to CTD data (in sample frequency, resolution?).

L280-281 (P12): Describe your matchup criteria (spatial and temporal) quantitatively (what does “close” mean?). I see the spatial criteria is listed in B.7 but should be mentioned here (or B.7 referenced).

B.4 (P15): Is the variable ‘numrec’ the same as ‘NOBS[#]’? The latter is what is used in the dataset available on PANGEA. This final column in the published dataset has missing values for select entries (ie PS93_SG127_hydrography profile 348, 8dbar, Direction 1). What does this mean? How can there be < 1 obs used for a line entry, when all other fields are populated?

C3

B.5 (P16): The steps outlined here seem circular. Why not smooth conductivity? Do you have a reference for this method and can you describe why you chose the thresholds that you did? What is the mean difference between original and recomputed values?

L333-335 (P18): Why did you choose not to include quality flags in your dataset, especially since you chose to leave uncorrected spikes? It seems this should be indicated in the dataset for the user in some way, either as a header note or (preferably) quality flags.

L395 (P21) and Figure 6: Your final statement of a reduction in salinity variability of 50% is too vague. It really only applies to Figure 6, glider 127, mission 2015 in the deep layer (which is difficult to see in the plot). Your plot should better exemplify this (zoom in on deep layer instead of surface?), and text should be more descriptive (is it an average reduction, and what is the std of the difference in variability?). Similarly, in table 4 ‘variability reduction of salinity’ should better describe the where the numbers came from, I assume they are averages of the differences in variability at each depth interval? I see an average reduction of mean variability of between ~8-10%, ~30-60%, and ~13-48% in the three layers, respectively, and across all missions.

L407-409 (P22): Great.

Table 4 (P24): Given the data quality and accuracies you outline in table 4, what are the limitations (are there any?) to use of the dataset, in terms of better understanding fluctuations/dynamics of changing freshwater fluxes in Nordic Seas?

Section 4: Interesting observations stemming from this dataset; the multi-year span provides great context for comparisons. This section lacks any concluding remarks.

TECHNICAL CORRECTIONS

L48 (P1): Improper use of semicolon. Remove the semicolon L55 (P3): Commas (or parentheses) needed after EGC and frozen: “EGC, both liquid and frozen, varies”. L67

C4

(P3): Poor sentence structure. Suggested correction: "However, it is also possible that liquid". L112-113 (P5): The sentence starting with "During winter" has poor structure. L122-123 (P5): Replace "his" with "its". "way of data sampling" is poor word choice. L133 (P5): Comma required after "If requested". "current" should be plural. L135 (P5): "lesser" should be "less". L184 (P7): Replace "have been" with "were". "Large part" should say "A large part". L194 (P8, Figure 3 caption): Poor sentence structure. L204 (P10): Only SN 127 is equipped with an oxygen sensor, per table 2. Either it is missing in the table for SN 558, or this line should be modified, "...conductivity, pressure, oxygen (SN127 only) and optical parameters..." L226 (P10): The Section 3.2 header is confusing and should be revised. L239 (P11): "byt" should be "by". L371-373 (P20): This sentence is poorly worded and should be revised. Figure 5 (P21): I think there are too many colors used in this figure. I suggest eliminating black (use red and green solid and dotted for the upper plots), or use red and blue only in both subplots (including dotted in the upper plots). Table 4 (P24): Please double check your references to processing steps in column 1. Many of them reference the wrong processing step (ie B.5 instead of B.7 in the last row).

Interactive comment on Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2018-141>, 2018.