

Answers to reviewer #1

- ✓ **Lines 26-28: Please add some details and reference about the referred unique ecosystems of the Arctic Ocean.**

We did not add details, the main point are already in the sentence. Adding information would be outside of the scope of the paper.

- ✓ **Lines 32-35: Reference is made to more than 1400 refereed scientific publications and 400 datasets resulting from CCGS Amundsen expeditions since 2003. Are these also publicly available on an annual basis? If yes, please add at least the most recent ones to the reference list or add a reference to where this information can be found.**

Datasets resulting from the central pool of scientific instruments onboard the Canadian Coast Guard Ship Amundsen since 2003 are available for public access at the Polar Data Catalogue (<https://www.polardata.ca/>) and other websites; for instance the bathymetry data are accessible at <http://www.omg.unb.ca/arctic-mapping/>; <https://www.ncei.noaa.gov/maps/bathymetry/>;

The Amundsen Science website includes an overview of all the available data at the Polar Data Catalogue (<https://amundsenscience.com/data/data-access/>).

We keep track of the scientific publications resulting from the CCGS Amundsen expeditions for reporting and internal purposes only. While we do not have a list of publications publicly available, we referred a few recent publications at line 32-35. The publications range from physical oceanography to geology, biogeochemistry, ecology and safety hazard assessments.

- ✓ **Lines 41-42: Please add labels for Labrador Sea, the Baffin Bay, the Canadian Arctic Archipelago, and the Beaufort Sea in Figure 1. Also consider adding the main circulation features as detailed in Section 1.1, distinguishing between cold and warm waters.**

Main circulations and labels were added in Figure 1 as suggested.

- ✓ **Line 144: Please add reference to the Winkler method.**

The following reference will be added.

Aminot, A., & Chaussepied, M. (1983). Manuel des analyses chimiques en milieu marin. Editions Jouve, CNEXO, Paris, 395 p.

- ✓ **Line 151: Please add reference to the Seabird website or to the Seabird data processing software.**

The following reference will be added.

Sea-Bird Electronics, Inc. (n.d): <http://seabird.com/software/sbe-data-processing>

- ✓ **Section 2.2: Were collocated data from the CTD-Rosette and in-situ samples used for inter-comparison and correction of the Moving Vessel Profiler data, where available?**

Collocated data from the CTD Rosette were available and used for inter-comparison and correction of the MVP Profiler data. In-situ samples were used to validate data from the CTD-Rosette. More details of the processings are available in the report processing (available with the data).

- ✓ **Line 254: If TS Diagram represented in Figure 5 are derived by transect profiles during leg 3 of 2021 expedition, it is not clear what is derived from Curry et al. (2011); Tang et al. (2004) in Fig. 5.**

The sentence in Line 254 was reformulated as follow:

The distinction between the different water masses observed in Fig. 5 has been made according to Curry et al. (2011); Tang et al. (2004).

- ✓ **Line 290: When you report: “Such dataset can be compare to the ones collected by the Amundsen during the 2021 expedition”, Do you mean that the 2 datasets are comparable or that you are going to compare them in a future works? If you intended the former, please rephrase and show results or comments on this.**

Line 290 now reads:

The Amundsen has been sampling in the Cape Bathurst area 12 times since 2003, which produces an extensive dataset that could be used by readers to assess interannual variability and trend in the region.

Recently, Massicotte et al. (2021) have compiled and standardized the collected datasets from the 2009 MALINA expedition in the Beaufort Sea in order facilitate their reuses.

- ✓ **Line 295: “Only the first 148 casts are presented in this paper” . Please explain.**

After the 148th dive of the MVP, the ship has changed its heading to enter Diana Bay towards Quaqtq. In order to make sense of the transect, only profiles acquired in a straight line (while crossing Hudson Strait) are presented in the paper and in figure.

Answers to reviewer #2

- ✓ **Fig.4 6 9 10 I doubt that temperature isolines reported in salinity maps and salinity isolines in temperature maps can help for a better data interpretation. I would suggest to use the same isolines of the displayed parameters or to better explain this in the figure captions.**

While we were hoping to maximize the information presented on each figure by adding isolines from different variables other than the ones displayed in color, we realize that it complicates the figure. and on the figures to maximize the information presented for better interpretation. Actually it does not, so we decided to follow your recommendation on using isolines from the displayed variable. It appears to help reading the figure.

- ✓ **2.1 What is the depth of TSG intake?**

The depth of TSG intake is 7 m.

- ✓ **2.2 Which was the maximum vessel speed to operate the MVP ?**

The maximum vessel speed is 8 knots

- ✓ **In Fig 10 Use the same units of the others figures for DO. Also report the temperature map. Are space and time scale consistent with the presence of internal waves?**

The unit of the DO on the Fig10 is now converted into microMolar.

We believe they are not related to the presence of internal wave. They seem to be generated by the repetitive free fall motion of the MVP fish along the transect. However, it is still premature to draw conclusions on the nature of the real phenomenon behind such structures. We did not comment on them to avoid interpretations of the data in order to meet a Data Paper content expectations. In this transect, the distances between each MVP free fall is generally about 500m, sometimes reaching 1km depending on depth of the water along the transect.

- ✓ **LADCP is mentioned (line 137) but nothing is shown or commented. Why ?**

LADCP is only mentioned as an example of what kind of instruments are installed on the Rosette, the same way other instruments such as the Deep Suna (Nitrate sensor) are presented in Table 1. The paper focuses mainly on the 2021 data expedition. However, LADCP data since 2010 are available freely for public access at Polar Data Catalogue under CCIN 12714 or with this link https://www.polardata.ca/pdcsearch/PDCSearchDOI.jsp?doi_id=12714