Thank you for all your comments and your time spent reviewing our manuscript. Your feedback helped us improve our manuscript and dataset. Kindly, find the response to your comments below.

RC 1   **General comments:**

- The dataset available on the website does not correspond to that described in the article. In fact, data available online are not validated as described in the article (sections 3.3 and 3.4): there are no Quality Codes related to the measured parameters, the calculated parameter (e.g. oxygen saturation) mentioned in the text is not present in the dataset, many data are well above "sensor range" and "expert range". This suggests that the dataset available on the website has not been validated, at least not according to the method described in the text.

AC

We apologize for this mistake. The previously published dataset corresponds to MAREL Carnot raw dataset which is downloaded from Coriolis. Also, it was few months longer than the one initially used. We took this opportunity to reprocess the published MAREL Carnot raw dataset as it provides more data which is very relevant for. Thus, the dataset we published now corresponds to the processed one.

In the raw dataset, the quality codes are present in one single column and requires deserialization. The values present can be greater than sensor ranges, and the column names can be confusing. In our processed dataset, the variables are renamed to make it easy for users, and the QC of each measurement is placed directly next to it.

For example: the column QC_Salinity_PSU, which contains the QC value for each measurement, is immediately after the column Salinity_PSU, which contains salinity readings.

RC 1
- Furthermore, the statistics summary (Tab. 3) presents data higher than the ranges used for data validation. Thus, it is not clear if the described processing has been applied to the dataset or not. This is the major issue for a contribution to Earth System Science Data.

AC   *Statistics in Table 3 was carried out again and the errors are corrected.*

Specific comments:

RC 1
- Is the data set accessible via the given identifier? The doi gives access to raw data, or data that do not correspond to what is described in the manuscript.

AC   *The old DOI gave access to raw data, and not the processed data. Now, we published the validated data, which can be accessed by the DOI.*

RC 1
- Is the data set complete? No, there are no quality codes, no information on sensors/instruments used over such a long time.
- Are error estimates and sources of errors given (and discussed in the article)? Only weakly. There are no indications on instruments used, which may have changed over time, neither if sensor calibrations have been regularly performed.

	• Are the accuracy, calibration, processing, etc. state of the art? There is no indication if sensors have been regularly calibrated.
AC	*In the raw data, Column 38 of the dataset is named QC and corresponds to quality code. Coriolis assign QC codes of raw dataset according to Argo quality control flag scale. (Information added in the manuscript). As mentioned earlier, we extracted the quality code for each observation. Then we placed the QC for each parameter in a QC column named "QC_" and followed by parameter symbol. In the validated (processed) dataset, this is clear.* *We added a table to provide information on the sensors used from 2004 until 2022, and their accuracies.* *For Sensor Calibration, we added this phrase to our manuscript: "Sensor calibration was performed on a regular basis, usually every three months"*
RC 1	• Are common standards used for comparison? There is no mention.
AC	*This comment is not clear for us. Please clarify*
RC 1	• The dataset cannot be used as it is as it requires the validation procedure described in the text. It can be useful once data Quality Control procedures are carried out and once information on acquisition protocols and on sensor calibration are made available. The lack of this information limits the use of this dataset for quantitative assessment of long-term variability. *The processed dataset is now accessible online. The users are now able to directly use it their research.*
RC 1	• A legend explaining the codes used in the dataset for the parameters is needed to understand what are the variables listed.
AC	*In the validated dataset, we renamed the variables to be clear, and in the manuscript, we added a column called "Given name" to table 2 (Former Table1)to help users easily identify the variables*
RC 1	• **Manuscript:** • **General comments:** • In its current form, the manuscript requires a deep formal and content revision. The text is not compliant with a scientific paper, the formal aspects need revision and English editing. Many parts need rephrasing. One relevant literature is missing, some statements are incorrect, or incorrectly attributed to the listed references and not supported by evidence. There is no information on which sensors were used over the almost 20 years, if they have changed, if they have been calibrated. This is very important for long term time-series. Pay attention to the use of punctuation and of conjunctions, avoid/limit the use of "in other words", "in general" which are not suitable for a scientific text,
AC	*We revised our manuscript accordingly. In general and In other words are removed. We added references to consolidate our statements.*

RC 1

- It is recommended to reorganize the whole section presenting the review of studies using MAREL Carnot data (from page 14 to 16), in order to better highlight approaches, research objectives and benefits.

AC

We revised pages 14 to 16 to make them coherent

RC 1

- There are no references to already well consolidated data Quality Control procedures. e.g.

  •Intergovernmental Oceanographic Commission. (1993). Manual of quality control procedures for validation of oceanographic data.

  • Bushnell, M. (2015, October). Quality assurance/quality control of real-time oceanographic data. In OCEANS 2015-MTS/IEEE Washington (pp. 1-4). IEEE.

  •SeaDataNet (2010) SeaDataNet: Data Quality Control Procedures, Version 2.0. Available via DIALOG https://www.seadatanet.org/Standards/Data-Quality-Control.

AC

We added the following statement in the manuscript and added the corresponding reference. "The QC codes are assigned according to Argo quality code flag scale."

RC 1

- •According to consolidated data validation procedures (e.g. SeaDataNet, 2010), the outcomes from data validation consist in assigning Quality Flags (or Quality Codes), without modifying or removing original data. The removal of data (regarded of bad quality) is highly controversial because once data are removed, they are lost; conversely, data quality definition is in someway subjective and data considered of bad quality could, in some cases, provide information on extreme events.

AC

We added this statement to our manuscript and provide a reference to it: "According to Argo quality control manual, measurements given a QC 4 are not to be used. A flag '4' is assigned when a relevant real-time QC test has failed, or for bad measurements that are known to be not adjustable, e.g. due to sensor failure "

RC 1

Specific comments:

- **Please see the attached file.**Parts highlighted in pink need rephrasing. Comments are included in the pdf.

AC

Done. We rephrased parts highlightrd in pink.

RC 1

- Please carefully revise and integrate section 3.4 (3.4.1, 3.4.2, 3.4.3, 3.4.4) which is very relevant for a data paper.

AC

We didn't clearly understand this comment. Is it requested

RC 1

- What are "major errors"? How is Quality Code Correction done? How are QC assigned? How is temporal alignement carried out?

AC

Sentence containing major errors is rephrased

We provided more details for the time alignment and QC correction in our manuscript.

RC 1
- Page 16: Huang & Schmitt 2014 do not deal with what is here stated.
- Alain & David 20220 not cited

AC *References Corrected.*

- In Conclusion (and also before): the link between fluorescence (which is measured) and HAB (Harmful algal blooms) is not so straightforward. Statements need to be carefully revised.

AC *Done*