

Interactive comment on “SURATLANT: a 1993–2017 surface sampling in the central part of the North Atlantic subpolar gyre” by Gilles Reverdin et al.

Anonymous Referee #1

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SURATLANT: a 1993–2017 surface sampling in the central part of the North Atlantic subpolar gyre

Gilles Reverdin et al.

Anonymous referee #

General comments This manuscript describes a data collection gathered from a dynamic region in the North Atlantic Ocean over a period stretching from 1993 to 2017 and includes observations from all seasons. An impressive achievement which merits publication in ESSD. It should provide a clear overview on the data, its strengths and its weaknesses. A revision is needed for that. The aims and scope of ESSD state that

"Any interpretation of data is outside the scope of regular articles ". This raises questions about including derived parameters, pH and fCO₂ which are not in the data file, and associated discussion texts and figures. Other related matters are a) the binning of data for presentation and b) applying adjustments based on Alkalinity-Salinity relations, issues which this reviewer finds defensible for the presentation and discussion of the data. These aspects require editorial decisions which might substantially alter and shorten the presentation. Consequently a diminished effort is given in this review on sections dealing with interpretations and derived parameters. The research effort described has expanded in scope and with time, thus developed with time into a series as is described in section 2. The research has progressed without monitoring guidelines such as are available today. The results are nevertheless valuable. The authors have clearly spent a considerable effort on flagging suspicious data using a variety of arguments. In some cases these seem speculative, e.g. for particulate phosphate contribution dissolved phosphate on page 16 line 424. What could be the source of particulate phosphate in January, mid winter? My point is that speculations on grounds for flagging or eliminating data are less important than describing the criteria for including the data. In discussing data problems and adjustments to sections of the data, the text should also report on how flags are used in the data file. The methods and uncertainties are dealt with in appendices. There, this reviewer finds sections on temperature and salinity missing although they are mentioned in the main text on page 6. The important parameter salinity is probably the one with the best method consistency through the time of observations. Furthermore, this reviewer sees no good reason to deal with some parameters in appendices and others in the main text. It should not be a problem to incorporate all into the main text. The text on the different parameters could be shortened and condensed. It is hardly necessary to include details on numbered sample bottles as is done on page 17.

Specific comments Page Line 5 102 Please explain the role and training of "ship riders".
6 109 Deleted regularly. 6 112 "by one of the authors". Please explain. 6 115 T
measured directly from a bucket. Is there an estimate of the measurement precision?

7 141 “Units are standard ones“ is meaningless without explanation. 7 149 Reference is needed on the GISS database. 7 155 “The error in doing it has little impact on the computation“. Add: for this region. 8 175 Reference is missing for Cooperative Global Atmospheric Data Integration Project (2016). 9 205 1-2-1 smoothing needs explanation. 10 259 Could there be other non silicious organisms than calcifying ones? 10 263 Reference is needed for denitrification on Arctic shekves. 16 436 How was the Certified Reference Material used? 17 443-445 Here a correction for mercuric chloride dilution is reportedly not applied for some samples but other samples are usually with the correction applied. Is it possible to be consistent and apply the correction to all results? 17 468 Here the correction for the mercuric chloride dilution could and should be applied to simplify the comparison. 18 477 “recent international inter-comparison“, reference or further information lacking. 20 550 Explain what IRMS is. 21 586 “The Nondal et al (2009) relation underestimates At for low S, but . . .“. Note that Nondal et al. describe two relationships, one for $S > 34.5$ and another for Polar Water with $S < 34.5$. Calculating At for $S < 34.5$ is very imprecise. 35 1104 It appears unlikely that all listed laboratories use a potentiometric method for the determination of DIC but none the more common coulometric DIC determination. 47 1483 Comparing Figures 2 and 11 on data distribution reveals data points in fig. 11 which seem outside the subpolar (SURATLANT) region, north of 65°N and as far north as 68°N , in the Iceland Sea. This data is in the data file and might deviate from the subpolar gyre relationships.

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Discussion paper

