

## ***Interactive comment on “Nordic Seas nutrients data in CARINA” by J. Olafsson and A. Olsen***

### **Anonymous Referee #1**

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This paper presents phosphate, nitrate, and silicate data for the Nordic Seas from the CARINA data set with qc and corrections based on crossover analyses. The work is valid and original. The main problem with the paper is many of the adjustments suggested come from a subjective application of the crossover analysis results. More rigorous criteria should be applied if the adjustments are to be accepted with confidence, or it should be made more explicit that the crossover analysis is a tool and other tools are also necessary to adjust the data (maybe including expert subjectivity). I would recommend publication with some changes:

- What do the authors mean by "the differences in data density in the two regions enforced the use of different QC methods" This should be elaborated. Does this refer to primary or secondary qc? Why were different methods needed and how do they differ? As it appears now, this is a rather weak reasoning for separating Arctic and Nordic Sea data.

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- It is good that 5 cruises were analyzed for both the Atlantic sector and the Nordic Seas sector. A little more should be written about how the analysis compare. For one cruise it is mentioned that the Nordic Sea qc resulted in an 'NC' designation due to lack of data, but the Atlantic qc resulted in a valid adjustment. Is this the case for all 5 cruises? If not how do the two analyses of each cruise compare? This is a good way to check if the entire CARINA dataset is internally consistent, or consistency is relative to the basin.

- The authors state in at least two cases that adjustments seem reasonable (Cruise 58AA19940826 Nitrate, Cruise 74JC19960720 Nitrate). This is subjective and does not inspire confidence in the analysis. Especially the later cruise, where the authors note that a 0.8 factor appears large, whereas 0.83 appears reasonable. The authors should state why subjective adjustments are necessary, other than the calculated adjustment didn't look right.

- Speaking subjectively, the corrections to cruise 5819940826 appear suspect in figure 4. While the deep values are in line with a later cruise, many middepth values appear to be adjusted too high.

- The fact that deep silicate values are changing over time calls into question the validity of the crossover analysis in this area for all variables. These changes are not seasonal, but they are significant changes nonetheless. Crossover analysis assumes a consistency in values at deep levels. This should be addressed.

- How do the 'NC' cruises fit into the CARINA data set? They are not internally consistent because they cannot be analyzed to find an adjustment factor. Should they be used for the purposes stated in the introduction?

- The data access paragraph is confusing. The uncorrected cruises are shown to be available on the given website. But these are not the important files. These uncorrected data are available through CCHDO and other sites. Please make it clear how to access and use the files with corrected data. Are all primary and secondary qc flags available

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with the corrected data? Are corrected and uncorrected data available in the corrected data files for comparison? Are the adjustment factors noted in the corrected data files?

- two small grammar errors: page 8, line 22 "For phosphate following 6 cruises..." add "the" after phosphate.

Figure 4 caption: "been drawn at drawn at" remove second "drawn at"

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