

## ***Interactive comment on “Arctic Ocean data in CARINA” by S. Jutterström et al.***

### **Anonymous Referee #2**

Received and published: 3 December 2009

I reviewed this manuscript regrettably late in the process. A careful review had been submitted and responded to. I will not duplicate material covered in that review.

This manuscript should be published. The earlier reviewer suggested improvements and clarifications, which the authors have agreed to. But even in its original form the manuscript is informative to any users of Arctic Ocean water column data regarding data quality and some of the difficulties putting together hydrographic data sets over the entire Arctic Ocean. The corrected data are a step forward for modelers and others. The procedures adopted by the authors do not produce 'clean' data sets, but they do help to reconcile some cruise-to-cruise data offsets and so will assist data users in examining the overall hydrography and ocean carbon structure of the Arctic Ocean. The criteria for recommending data adjustment were very conservative and in the end few data adjustments were recommended by the authors. The procedures used here differ from those discussed in the Tanhua et al (2009) reference cited by the authors

[see note next paragraph], and so this paper should be published as part of the record of the CARINA endeavor.

[Note: I finally had time to read the Tanhua et al (2009) reference cited by the authors and soon saw that the quality control procedures used there, though well conceived and implemented, were not appropriate to the sparse data from the Arctic Ocean. This manuscript should be published partly because it also demonstrates real world limits of the approach used in the Tanhua et al (2009) work.]

This paper was especially interesting to me because I have tried to use some of the data sets the authors examined, though rarely the ocean carbon parameters which were the focus of CARINA. I thought it would be interesting to see how these fared in the authors' bulk approach to data quality examination.

I quickly learned that the apparent internal precision of data from an individual cruise - one indicator of data quality - was of little matter to the bulk method used by the authors. For example, the noisy oxygen data from the pioneering 1991 Oden Arctic Ocean cruise (#177, 77DN19910726 in this work) fared reasonably well in the authors' results (see authors' Figure 9). The noise does show up in the wide standard deviation, but many readers will pay closer attention to the apparent low offset of these data. Yet these oxygen data are of limited scientific usefulness due to the data noise. That said, the authors' work will help users interested in bulk/average water properties over a basin rather than the structure of water masses within the basin.

In other cases data which I regarded as of very high quality were indicated for offset simply due to a difference with another data set which I also regarded as of very high quality. This reminded me of the situation in some of the WOCE Pacific nutrient data where offsets between high quality data sets remain to this day. An effort such as that carried out by these authors thus provides a means for the general bulk data user to move beyond such matters.

It is clear, in fact, that the authors have done the community a real service in jointly

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and carefully bulk-analyzing offsets between Arctic Ocean hydrographic/ocean carbon data sets.

I found no mistakes or need for any corrections to add to those discussed by the earlier reviewer. This paper should be published (with revisions as agreed to by authors' response to the earlier reviewer).

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Interactive comment on Earth Syst. Sci. Data Discuss., 2, 281, 2009.

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