

Interactive comment on “Evidence for greater oxygen decline rates in the coastal ocean than in the open ocean” by D. Gilbert et al.

Anonymous Referee #2

Received and published: 19 November 2009

The authors use published reports of dissolved oxygen trends in coastal waters, together with open-ocean dissolved oxygen values contained in oceanographic data bases to assess any bias in reported oxygen declines and for evidence of significant differences between coastal and open-ocean oxygen declines. The paper is well structured (clear and important goals/hypotheses) and the methods are adequately described. I applaud the authors for taking on this analysis of a timely and important topic. However, I could not find convincing evidence for some of the authors' conclusions (details below). I do think the conclusion about greater oxygen declines in coastal waters, hence the title of the paper, is statistically significant and supported by the data.

I recommend that this paper be published after major revision to either provide the needed data and analyses to support the authors' conclusions, or delete the unsup-

C3131

ported conclusions and just report the “greater oxygen decline rates in the coastal ocean” result.

Major concerns

1. The data used to establish the first conclusion (published oxygen trends more negative than those computed from raw oxygen data) are not comparable. The published time series are from various length records and from different absolute times than the raw oxygen data (Tables 4-6 are all for 1976-2000). The authors need to use comparable time series lengths and absolute times so that they can compare “apples to apples.”

2. The data to support conclusion two (trends more negative earlier in 20th century) are not presented quantitatively in the paper. None of the tables have information from 1951-1975. The only indication of the differences is shown qualitatively in Figs. 7 and 8. In addition, and this is important, the trends aren't more negative, that is the numerical trend values are not more negative, but, rather, the “odds of having negative trends increased by a factor of 2.”

Suggestions intended to improve the manuscript

a. Fig. 1: make dots bigger

b. Fig. 5: Is there a way to indicate the time series length for the trends? Maybe another histogram? Should the present trend histogram be subdivided by the time series length? That is, is there something systematic about the trend value based on the length of the time series? For example, a short time series could certainly have a larger trend value than one that spans many decades of ups and downs.

c. Fig. 6: This figure is not very helpful given the tiny size of the colored dots. Either make the dots much bigger (and use insets if necessary for regions with lots of samples) or delete the figure.

C3132

C3133