

1 **Reply to interactive comment given by Anonymous**  
2 **Reviewer #2, Biogeosciences Discuss., 9, C466–C469,**  
3 **2012.**

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10 We appreciate the comments given by Anonymous Reviewer #2, they helped a lot to improve  
11 the quality of the manuscript. We are going to incorporate relevant changes in the revised  
12 version of the manuscript, as following:

13 *The authors note a negative trend in dissolved oxygen (presumably found by visually*  
14 *inspecting figures 3-5). It would be interesting to discuss this in a little more detail, and*  
15 *particularly to show the linear trend in the figure, and also to give the slope of the line, with*  
16 *uncertainty. Is the decrease in oxygen due to changes in S/T, i.e. a solubility driven change,*  
17 *or is it a change also in the saturation (e.g. AOU) of oxygen? Oxygen trends in the world*  
18 *ocean have received a lot of attention lately so this would be valuable information. A*  
19 *discussion on drivers for trends would also be useful.*

- 20 • Yes, the trends in dissolved oxygen can be an indicator of changes in deep  
21 thermohaline circulation, and deserves particular attention. We computed the AOU  
22 trends and added some values in this paragraph to show real and significant existence  
23 of negative oxygen trends, but not going too deep in these investigations, as (i) being a  
24 bit out of the major topic (interannual and decadal variability), and (ii) the estimates of  
25 long-term trends, their significance and connection to the changes in the Adriatic  
26 thermohaline circulation are the topic of other research paper currently under review.

27 *The authors present an impressive time series in three very nice figures where properties are*  
28 *shown over time. In the text, the authors discuss the correlation of low/high periods of one*

1 *property (e.g. salinity) in relation to high/low concentration of another property (e.g. PO4).*  
2 *Some graphic representation of these relations would be useful for the reader, for instance*  
3 *property/property plots over time, or something that illustrates these relations. In fact, the*  
4 *discussion on the observed shifts in various properties is somewhat “hand-waving”, i.e. the*  
5 *authors deals with observed trends and variability without reporting on the statistical*  
6 *significance of the changes. By simply eye-balling figures 3-5 it seems to me that several of*  
7 *the noted variations are not statistically significant, but without access to the data this*  
8 *analysis can, obviously, not be done.*

9 • Thanks for the comment; we already did computations of correlations between salinity  
10 and PO4 when replying to the comments raised by Giuseppe Civitarese (see Fig. 1 in  
11 <http://www.biogeosciences-discuss.net/9/C246/2012/bgd-9-C246-2012.pdf>). So, we  
12 are going to incorporate this figure and additional correlation analyses to fortify the  
13 claims written in the text.

14 *For a reader not very familiar with known the circulation within the Adriatic Sea, I would*  
15 *encourage to extend the discussion of this, to compliment the more extensive introduction to*  
16 *the circulation in the Mediterranean Sea in general and for the Ionian Sea in particular.*

17 • Ok, we added some more material on that.

18 *There is already a lively debate around this manuscript regarding the possibility that*  
19 *intermediate waters from the Western Mediterranean Sea can be plausible transported to the*  
20 *Adriatic, as the authors suggest. I encourage the authors to address this more carefully, with*  
21 *references to other studies that show eastward flow in the Strait of Sicily etc. A more careful*  
22 *water mass analysis of the data on the section could be considered to support/reject that*  
23 *theory. I realize that some of this is already put to paper in the replies from the authors.*

24 • We agree, and plan to put more detailed discussion which will include the most  
25 relevant findings (with references) on the Sicily Strait exchange dynamics.

26 *Minor/editorial comments: 1. Page 929, line 5: consider citing Roether et al., 1996 (science)*  
27 *here.*

28 • Ok.

29 *Page 930, line 12-14: I do not understand why high NO3 and PO4 values in the “nutrient*  
30 *inputs” should favor a high N/P ratio. Please explain or reformulate.*

- 1       • Ok, corrected.

2       Page 930, last line: “Estuarine surface circulation”: *My understanding of the circulation into*  
3       *the Adriatic is that there is a significant horizontal gradient in the direction of the flow, as*  
4       *well as a vertical one, i.e. the eastern part of the Otranto Strait is often inflow to the Adriatic,*  
5       *whereas the western part is mainly outflow. This sentence does not really reflect that very*  
6       *well.*

- 7       • Ok, rewritten. The idea was to distinguish the difference between surface and deep  
8       Adriatic circulation by putting a simple conceptual phrases, but we agree that  
9       “estuarine surface circulation” is too simple for the 2D basin of significant cross-basin  
10      flow differences.

11      Page 934, line 8: *Why talk about “eastern part of” a section that is almost entirely oriented*  
12      *north-to-south?*

- 13      • That has something with general perception of the Adriatic and “eastern” and  
14      “western”, but the transect is really oriented north-south, so we changed the wording  
15      as suggested.

16      Page 934, line 26: “: : : increased 2-3 times in the mid: : :”. *Does the authors mean*  
17      *“increased during 2-3 occasions”? I don’t really see an increase in PO4 that is 2-3 times*  
18      *(larger than the mean), other than on a few occasions, i.e. individual data points.*

- 19      • Ok, corrected.

20      Page 935, line 15: “*deep anti-estuarine Adriatic circulation*”. *This might be a term that is*  
21      *well known for researchers familiar with the Adriatic circulation. I find it confusing,*  
22      *particularly in the context of my point 3 above. Please provide some text that (and references)*  
23      *to this theme.*

- 24      • Ok, a few sentences about Adriatic circulation are added in Introduction, to clarify the  
25      text in results and discussion.

26      Figures 6 and 7: *What is the x-scale on these plots, it is most likely not meters (m)? Would be*  
27      *nice to indicate which way is north and/or south (again, it is misleading to talk about*  
28      *east/west part of a section that is north/south in extension).*

- 29      • Uups, sorry, these are kilometres. Also, the indication of south/north is added in the  
30      figure captions.

1 *Page 937, line 15: “nutrient rich inflow of LIW”: This statement is somewhat surprising to*  
2 *me, I was under the impression that LIW was a water mass with particularly low nutrient*  
3 *concentrations. Maybe I am in error here, but looking at data from the eastern Med, the*  
4 *density range of LIW has very low nutrient concentrations. This seems to be confirmed by*  
5 *your data in that the nutrients are low when salinity is high.*

- 6 • Ok, corrected. Positive correlation between salinity and nutrients before 1980s is the  
7 result of vertical nutricline displacements, as pointed by the comments raised by  
8 Giuseppe Civitarese.