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Biogeosciences Discussions

Interactive comment on "NW Adriatic Sea variability in relation to chlorophyll-*a* dynamics in the last 20 years (1986–2005)" *by* L. Tedesco et al.

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General comments

We are grateful to Referee 2 for his/her comments on our paper. We found his/her comments and suggestions very useful to improve the manuscript.

We also believe that the topic we are discussing is very important. This is especially true for the northern Adriatic: over the past years it has been negatively affected not only by eutrophication phenomena (Degobbis et al., 2000), but also by the apperance of massive mucillages aggregates and anoxic episodes (Precali et al., 2005).

There are reasons to believe that a 20-year time series analysis of the NW Adriatic Sea chlorophyll-*a* and the other related variables goes beyond a regional interest. The northern Adriatic is, in fact, one of the most productive Mediterranean regions (Fonda

Umani et al., 2005). As it is mentioned at the beginning of the introduction (page 652–653), several factors contribute to the productivity of the area. The nutrient loads are the main reason for large and sudden phytoplankton blooms that trigger the production of the higher trophic levels, reaching the top predators. Studying the phytoplankton biomass, using the chlorophyll-*a* concentration as an indicator of the standing biomass, we provide a further contribution for better understanding the northern Adriatic biogeochemical variability. We also provide a statistical methodology that can be used in other areas of the Mediterranean basin. We agree with the referee that an overview of similar studies can further improve the value of our ms. We are currently evaluating which studies are suitable to be compared in a subsection of the Discussion section that will be named "Comparison with other similar long-term studies".

Specific comments

1: about Fig.1. We will add in Fig.1 a frame including the location of the two stations in the Eastern Mediterannean Sea, as the referee 2 suggests (http://flux.ve.ismar.cnr.it/ibm/html/socal/data).

2: about the statistical tests (page 655–656). We completely agree that statistical tests have to be performed according to the initial assumptions. We performed different tests since our data set was very heterogeneus and we intended to explore if different tests (in terms of power and kind of data) could give us different results. This did not happen and we obtained very similar results in both cases. Consequently, we chose to show the most proper and powerful tests. However, we understand that this part of the scientific work, where we explain the reasons which brought us to use one test rather than another one, does not need to be detailed in the paper and we will consequently remove it from the ms.

3: about time series plots. A very difficult part of the preparation of this ms was the choice of the data analysis to compute and to present, especially considering that very few such long data set analysis of the NW Adriatic has been published before (Bernardi

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Aubry et al., 2004; Degobbis et al., 2000). Since our main interest was to study the response of the chlorophyll-*a* to long-term trends and to the intra-annual variability of the other related variables and vice versa, we decided to focus on this variable, avoiding a too long, dispersive general paper. However, we will follow the Referee 2 suggestion and we will add 20 more plots of the time series of the other variables as additional electronic material to our ms (http://flux.ve.ismar.cnr.it/ibm/html/socal/data).

4: about Table 5. We will remove Table 5 and we will include the Shapiro-Wilk test results in the Sampling and Methods section, as the referee 2 suggests.

5: about Results section. We understand that this section is very long and can be hard to follow. We will shorten it, reporting only the main findings of the ms. We will leave the rest to the graphs and tables, as the referee 2 suggests.

6, 8: about Discussion section. We will try to link this section to the Results section without repeating some of the already described results and we will shorten it.

7: about the missing reference on page 665. We will add the following reference: e.g. in the Adriatic, Fonda Umani, 1996.

9: about Conclusions section. In this section we have reported our main findings and our suggestions for future works. We will try to make it even more condensed.

10: about the phosphorous dynamics. We will further discuss the role of phosphorous in regulating the phytoplankton cycle, also comparing our results with other papers that have provided similar findings (Degobbis et al., 2005; Socal et al., 1999).

The web page including the additional material is currently under construction and will be available within a few days.

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