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Biogeosciences Discussions

Interactive comment on "Carbon fluxes forced by anticyclonic mesoscale eddies generated by islands at the subtropical NE Atlantic Ocean" *by* S. Lasternas et al.

Anonymous Referee #2

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The manuscript by Lasternas et al. provides a comprehensive study of the phytoplankton biomass and cell health at stations within anti-cyclonic eddies (AE), cyclonic eddies (CE), and control stations. The cell lysis technique brings a novel and important perspective on understanding the biological communities in these eddies. However the manuscript can be strengthened by addressing some of the issues suggested below.

1. The authors have described the physics in details but it would have been nice to have a plot of isopycnal surface to understand the vertical displacement better.

2. The age of the eddies sampled is very important for interpreting the data (e.g Bentiez-Nelson et al., 2008). It would be nice to know the time of formation of these

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eddies based on satellite data with respect to the time of sample collection.

3. The depths of integration for some of the parameters are not clearly defined. How was it carried out - up to base of euphotic zone, certain isopyncal surface, mixed layer? This is extremely important and parity must be maintained when comparing cyclonic eddies, anti-cyclonic eddies and far-field regions.

4. The 3 hour incubation for PP could bias the data and this caveat should be mentioned in the text and why it was done so.

5. The author should add total and particulate PP data in Table 2 or 3. This data is relevant to the discussion.

6. The manuscript title should be re-phrased to better represent its focus on biological productivity/ community rather than carbon flux.

7. Figure 8 and 9 shows the same data and one or the other can be omitted.

8. It is interesting that for cyclonic eddies the nitrate and phosphate levels are higher where as silicate concentration is similar compared to the far-field station. The diatom population and mortality rate on the other hand are much higher in the cyclonic eddies compared to far-field station. Is this indicative of a more mature eddies in decaying phase of a bloom. The author should give some perspective on the how the age of any eddy could impact the biological community.

9. The authors do not have enough data to comment on the carbon flux. As seen by number of earlier papers, the relation between productivity and carbon flux is not linear and often (e.g. Maiti et al 2008) higher productivity did not translate to higher export inside eddies.

10. The manuscript is difficult to follow and the authors might consider editing the text under discussion and rewrite it in in term of the different parameters (compare and explain the differences between different eddies for each parameter) rather than other way round. The physics part of the eddies can be shorter. Appropriate figures should

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be referred during discussion.

Interactive comment on Biogeosciences Discuss., 9, 10241, 2012.