

## ***Interactive comment on “Large variability in continental shelf production of phytoplankton carbon revealed by satellite” by B. F. Jönsson et al.***

### **Anonymous Referee #1**

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The authors combined satellite estimates with velocity fields to evaluate the change of phytoplankton production in the Gulf of Maine, and large spatial variability is found for this region. I found the manuscript is well written and the approach is innovative, in particular it started to address the issues related to comparing observations of moving targets (water parcels), although the quantitative results may be questionable (see details below). I think the manuscript is publishable after major revisions per suggestions.

A few specifics:

- P8958, “... MODIS chl-a ... K\_490 ...” Clearly the estimated PC quantity is highly dependent on these inputs, which are not always accurate from ocean  
C4572

color satellite measurements. It would be important and helpful to tell the readers how good these satellite products are for the Gulf of Maine.

- P8958, “...  $z_e = \log_e(0.01)/K_{490}$  ... ” This  $z_e$  is not the euphotic depth (see Kirk 1994 or Mobley 1994 for the definition of euphotic depth). Westberry et al (2008) also pointed out this error. You may use the  $z_e$  product generated by the OBPB.

Kirk, J. T. O. (1994), *Light & Photosynthesis in Aquatic Ecosystems*, University Press, Cambridge.

Westberry, T., M. J. Behrenfeld, D. A. Siegel, and E. Boss (2008), Carbon-based primary productivity modeling with vertically resolved photoacclimation, *Global Biogeochemical Cycles*, , doi : 10.1029/2007GB003078.

- P8962, “... Bay of Fundy ...” Please mark this and other locations in your figures.
- P8965, “... bbp-based estimate of ... POC is not reliable ...” I would suggest to compare your results with the POC estimates generated with the Stramski et al (2008) model.

Stramski, D., R. A. Reynolds, M. Babin, S. Kaczmarek, M. R. Lewis, R. Röttgers, A. Sciandra, M. Stramska, M. S. Twardowski, B. A. Franz, and H. Claustre (2008), Relationships between the surface concentration of particulate organic carbon and optical properties in the eastern South Pacific and eastern Atlantic Oceans, *Biogeosciences*, , 171 – 201.

- It is not clear if/how time interval of image pairs affects the evaluations.