Biogeosciences Discuss.,
https://doi.org/10.5194/bg-2017-534-RC1, 2018


Biogeosciences Discussions

# *Interactive comment on* "A multi-method autonomous assessment of primary productivity and export efficiency in the springtime North Atlantic" *by* Nathan Briggs et al.

**Anonymous Referee #1**

Received and published: 31 January 2018

This is a nice exercise, and adds to the growing literature on comparisons of methods for primary production. I have five comments.

1. I'm not sure why the authors chose to cite Cullen et al. (1992). That study doesn't have any actual diel data; any diel relationships were guessed at. For example, if I remember correctly, they simply multiply their change in cp by 10. Also, Cullen et al. (1992) focus on growth rate, not productivity. Growth rate means a normalization to biomass, and therefore a much tougher estimate. I remember reading a recent paper by White et al., published last year (?) in GRL, which would be a better choice.

2. This work is not entirely novel, although I suppose the use of gliders is, and the



incorporation of PvsE estimates. But the same kind of results, with similar good (actually, maybe better) agreement was done in JGOFS' NABE, 20 years before these were done, and reported in Marra (2002) and Marra (2009, Aquat. Microbial Ecol., Fig. 4).

3. It would have been useful to plot the time courses of GPPchl, Chl, and POCcp together. GPPchl looks to be very close to the biomass measures, which means a simple multiplier to get from biomass to productivity. I'm not sure what this means. I would guess they shouldn't be so well matched, and that GPPchl would be expressed earlier in the bloom than Chl or POCcp. That they are well-matched in time, is dubious. In any case, that matchup should be discussed.

4. Bender et al. 1992 is cited incorrectly. The authors list is: Michael Bender, Hugh Ducklow, John Kiddon, John Marra, and John Martin. Makes me think the authors didn't read the paper.

5. In section 2.8.2 there is the phrase: "...incubations were performed at..." Actors "perform," not ocean-going scientists (at least not at sea).

6. I can't find where the authors talk about the environmental limitations in finding their relationships. Will the agreement among the methods that they find only happen when there is a shallowing mixed layer and increasing biomass? Will GPPchl still agree with GPPcp when the mixed layer is deepening, such as during a storm?

---

Interactive comment on Biogeosciences Discuss., https://doi.org/10.5194/bg-2017-534, 2018.