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Biogeosciences Discussions

Interactive comment on "Towards a merged satellite and in situ fluorescence ocean chlorophyll product" *by* H. Lavigne et al.

Anonymous Referee #1

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General Comments

This paper presents a new method for converting in situ fluorescence profiles to chlorophyll concentration using satellite-based chlorophyll data instead of the manufacturer's calibration coefficients (or a user's own pre- or post-deployment calibration). The purpose of this method is to make all in situ chlorophyll data inter-comparable, and thus facilitate comparisons within the global dataset of fluorescence-based chlorophyll estimates. This is an extremely important goal, and one worth working toward. The manuscript is well written and thoughtful. It makes an important contribution to the oceanographic community and I recommend it for publication after only minor revision.

My only reservation about the manuscript is that it doesn't state clearly enough that this method is not a way to actually calibrate, in a true sense, fluorometer measure-

ments. While this method performs the important task of 'correcting' in situ data to a single 'standard,' satellite measurements, it should still be emphasized that this method does not produce truly calibrated results. The authors do a commendable job of discussing and quantifying sources of error, but their general conclusion seems to be that the resulting data can be viewed as independent, calibrated data (though with some error). This may simply be a problem of semantics, but it is very important that the authors clarify that the method does not produce independent data. The results from this method are unavoidably tied to the satellite sensor used for reference, and may or may not represent "true" chlorophyll concentrations. A sentence or two to acknowledge this point more explicitly is all that is needed.

Specific Comments

1) p 11901, lines 21-22: "fluorescence is undoubtedly the one which has been the least scientifically exploited." Not sure what you mean here. Do you mean that despite the fact that nearly every ocean sampling program measures chlorophyll fluorescence, we as a community have not effectively used the data? What is your basis for that perspective? Please clarify.

2) p 11903, lines 15-17: "Consequently, in situ fluorescence profiles are only used to indicate a "generalized" biomass index (Strickland, 1968), interpreted to decide the depths for bottle sampling during a cruise." While this may be true in your research group, my impression is that fluorescence profiles are used quite often (rightly or wrongly) in a wide variety of oceanographic studies. As above, what is the basis for your opinion here?

3) p 11911, lines 14-15: "the impact of satellite error on the final "satellite-corrected" [Chl-a] estimations is minimised." Not sure what you mean here. Minimized how? Please clarify.

4) p 11911, lines 16-18: "Standardisation of error could be ascribed to the smoothing effect relative to the utilization of integrated Chl-a contents instead of surface values in

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the determination of the parameter." This sentence is awkward. Recommend reworking to improve clarity.

5) p 11914, line 5: "points are aligned over the first bisector." Not sure what this means. Do you mean that the points are spread evenly around the 1:1 line?

6) p 11916, lines 1-2: "Nevertheless, it is even more relevant within certain localised areas (i.e. the Mediterranean Sea ..." What is more relevant? The method? The errors? Please clarify.

7) p 11916, lines 5-6: "a narrower matchup protocol (i.e. 1-day and/or 0.1×0.1 box) does not significantly enhance the performance ..." This actually implies something very interesting. Inherent in your method is the assumption that chlorophyll is constant over the 8-day satellite window and area that includes your in situ profile. This result supports that assumption, within the 30%+ error.

Technical Corrections

1) p 11907, line 25, and p 11908, line 28: Do you mean Table 4 from Uitz et al.?

2) p 11918, line 24: I'm not sure if "homogenisation" is quite the right word here. Suggest something more like equalize, rectify, or coordinate.

– end of review –

Interactive comment on Biogeosciences Discuss., 8, 11899, 2011.