

## ***Interactive comment on “The value of adding optics to ecosystem models: a case study” by M. Fujii et al.***

### **Anonymous Referee #2**

Received and published: 13 July 2007

#### General comments:

I found this paper to be a stimulating and interesting paper, which adds to the field of research and focuses on an issue that is of importance to the community. It's good to see the list of parameters and their values (Table 1) that are included in the model runs as it highlights the complexity that such a model has to deal with and lack of constraining in-situ measurements.

The sensitivity analysis showed a strong influence by CDOM absorption, which was set to a constant concentration with depth, and as concluded (at the end of section 3.3.1) CDOM was highlighted an important parameter to embed. Therefore modelling studies are useful in showing not only where model development should occur, but also

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in highlighting key in-situ parameters that should be measured.

I have made some comments below, but they're primarily suggestions in terms of the format and detail of description. Therefore, I'm happy to recommend that this paper is published with minor corrections.

Specific comments:

Ecolight is given as the radiative transfer model, but the references cited on pg 1595 are for Hydrolight and so it would be helpful for the non-expert reader to have a statement about how they relate to each other.

Figure 4: TT011 and TT012 are mentioned in the legend, but not explained; there is a reference for Figure 9. It would also be useful to have some detail on the in-situ data in the main body of the paper as there is a large spread for some of the parameters e.g.  $\text{NO}_3$  and  $\text{SiOH}_4$ , but the text talks about standard measurements of 6 and 3  $\text{mmolNm}^{-3}$  (pg 1595).

I thought that the order could be improved in Section 3. Section 3.1 should clearly state it is about the tuned optics model or it could become the first Section in 3.2 that would be renamed something along the lines of "Optical (Case 2) model". The introduction to the non-coupled optics models needs to be within Section 2 as it is methodology rather than results. Also, the figures are discussed in terms of the optics (Case 2) model up to Section 3.3.1 and then Section 3.3.2 brings in the Case 1-1 and 1-2 discussions. I found it difficult to split my understanding of the figures in this way (wait for further explanations in a later section) and wanted to see the three models discussed together. I would therefore encourage the authors to consider this and if the sections are not rearrange there needs to be pointers in the earlier sections that let the reader know this discussion will follow.

The three curves in Figure 6 all show a decrease at the surface that is not obvious from the in-situ points and is not mentioned in the explanation (other than through the

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mention of subsurface maxima) within Section 3.2.1.

Technical corrections:

Pg 1586 Line 12: “.. Surface ocean color field[s] and subsurface light field[s] are ..”

Pg 1588 Line 8 “.. as [an] input to ..”

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Interactive comment on Biogeosciences Discuss., 4, 1585, 2007.

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4, S838–S840, 2007

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