

Interactive comment on “Joint use of satellite and in-situ data for coastal monitoring” by F. Gohin

Anonymous Referee #2

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This paper aims to underline potentiality of a joint use of satellite and in situ coastal stations to monitor the environmental status of the French continental shelf. The paper shows that the satellite chlorophyll and SPM products, derived from ocean color measurements using coastal algorithms, are able to correctly monitor the mean annual cycle of phytoplankton biomass and turbidity in the French continental shelf. The paper assess the satellite results by validating the satellite products with in situ coastal measurements. The paper proposes an original method to compute SPM from satellite data, and it is interesting since clearly shows the potential use of satellite products for monitoring the environmental status of coastal water. Nevertheless, the results are poorly presented and therefore the paper need a substantial revision. In particular the method proposed to compute turbidity from satellite data is inadequately described and the text need to be improved in order to allow a reader to understand the potentiality and limits of this method.

Specific comments and suggestions for improvement.

Section 2.1 page 959: The author says that the in situ dataset used in this paper are provided by the SRN and RHLN network plus additional measurements from short scientific cruises. The information on the measurements provided by these networks is not clearly presented in the paper. It is not clear if the 27 stations provides the same type of measurements, have the same sampling strategy, etc. Please provide for each station information on type of measurements acquired, frequency of the samples and number of measurements available, distance from the coast, etc. I believe that a table providing these information for each station can be very useful to quantify in situ dataset used in the paper and to qualify the results.

Section 2.1 page 959: The author say that in order to use the Cabourg data he built the satellite matchup using a pixel 3.5 Km far from this station. Since, in general the Chlorophyll and SPM near the coast experience large horizontal gradients, can the author provides additional elements to justify this choice.

Section 2.1 page 960 second paragraph: The author says that Chl measurements were made by fluorometry or spectrophotometry. It would be important to know the method used for chlorophyll estimates in each station, reporting the method used in the table describing the measurements. Moreover, It is important that the author provides information on the calibration method used to convert fluorometric measurements in chlorophyll.

Section 2.2.2 page 961: The author affirms that the method used by this paper is empirical as the OC4. I think that to compare this method with the OC4 is not correct and could be misleading. This sentence must be corrected. In fact the OC4 is an empirical method based only on in situ measurements (bio-optical dataset) and therefore is independent from the satellite Rrs data and from the software used to compute the Rrs value, while the method proposed by Gohin et al 2002 used both satellite Rrs and in situ chlorophyll measurements. This means that the LUT table are not independent of

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the satellite processing software used to produce the Rrs and in particular they should be revised at each new release of the software especially when the atmospheric correction used to retrieve the Rrs are modified. Moreover it will be important to know if the LUT used in the paper were updated (respect to the Gohin et al 2002 LUT) to take into account the differences introduced by the use of SeaDas V6.2. This is important issue since the new version of SeaDas introduced significant changes in atmospheric correction and then in Rrs.

Section 2.2.3 and Section 2.2.4

These two sections present the method to compute the turbidity from satellite Rrs. The two sections are poorly written. At the present the description of method starts in section 2.2.3 then, start again in section 2.2.4 and continue with additional information in 3.1.3. I strongly suggest to merge these two sections in one section introducing also the material of section 3.1.3 relative to the retrieval of the turbidity from satellite. The new section should present the method used to compute turbidity from satellite data in details, providing all the required information. In particular, the coefficients used for converting chl and NaP in absorption and backscattering coefficients must be provided in the paper. The variable $R^*(550)$ should be defined. The dataset used to compute alfa and beta in eq (2) should be described in details, giving information on how it was built (e.g matchup criteria used to build the dataset, station used, number of data available, range of data, ect). A figure showing the $R^*(550)$ compute used by insitu measurements versus Rrs(550) with the fit line should be introduced in the paper. The values of the alfa and beta coefficients should be provided in order to allow other researchers to apply the method. Finally the problem in operational application of method should be presented at the end of the section.

Section 3.1.1 page 964: Please provide the details on the method used to build be matchup. The information on bias a r2 are not sufficient to quantify the error. Please add information on other statistical standard parameters in general provide to validate OC data (eg. root mean square error, Absolute Percent Difference, relative percent

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difference).

Section 3.1.1 page 964: the author affirms that the method he used to validate the data, based on statistical properties of the annual cycle is more sophisticated and more appropriated then the use of match-up. Why? This should be discussed and clarify.

Section 3.1.3 This section should be removed and the text should be introduced in other section. In particular the part introducing eq (4) can go in section 2.1. The part relative to eq (5) and (6) can be introduced in the new version of section 2.2.3.

Finally I strongly recommend to introduce a table in which the statistical results (mean, P90, number of samples for in situ and satellite data) obtained at each station.

Fig 1. The name of the locations are very hard to read, please can you increase the characters or substitute with symbols.

Fig 3, Fig 4 Fig 5. Increase the size of the labels. Eliminate the information on the statistical results and put them in a table.

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