**Ocean Science
Discussions**

Interactive comment on "Assessment of MERIS ocean color data products for European seas" by G. Zibordi et al.

Anonymous Referee #1

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The paper by Zibordi et al. evaluates the accuracy of MERIS standard products following a reprocessing in 2012 (MERIS 3rd reprocessing). This evaluation is conducted using an extensive set of in situ and satellite match-up data, collected at various sites within European waters. Using a suite of statistical metrics, satellite products are compared with equivalent in situ data, so as to determine the performance of the MERIS standard products following the 3rd reprocessing. Statistical results from the 3rd reprocessing are also compared with equivalent statistics, conducted on the same in situ database, from the MERIS 2nd reprocessing and from two other ocean colour satellites (MODIS-Aqua and SeaWiFS). Results from these tests indicate that water-leaving radiance is significantly underestimated at blue wavelengths (negative bias) following this 3rd reprocessing. This negative bias propagates through to a significant overestimate (>100%) in total chlorophyll-a for both MERIS algal-1 and 2 products. The performance

of the TSM and adg(443) products are also evaluated following this third reprocessing, and found to perform reasonably in the case of TSM, but significantly underestimated for adg(443). Changes are also observed in the number of matchups and aerosol data products between the two MERIS reprocessing's (2nd and 3rd). There is a decrease in the average bias for the aerosol optical thickness in the 3rd reprocessing when compared to the 2nd, but the aerosol optical thickness and the angstrom exponent are overestimated when compared with in situ data.

This paper is well written, the structure is clear and the analysis is concise. Both the satellite and in situ data have been carefully explained and appear rigorously processed. The processing techniques are backed-up a wealth of peer-reviewed literature published mainly by the authors themselves. The statistical tests and the analysis is sound, and the summary and conclusions appear valid. In summary, it was a pleasure to read and review this manuscript and I recommend publication. I have provided a couple of general comments and some specific comments below, for the authors' consideration.

General comments:

I found it very useful that the authors compare the statistical results from the 3rd reprocessing with equivalent statistics, conducted on the same in situ database, from the MERIS 2nd reprocessing and from two other ocean colour satellites (MODIS-Aqua and SeaWiFS). However, given that MERIS data can now be processed with SeaDAS (Mélin et al. 2011 Optics Express Volume 19), it strikes me logical to compare the results with equivalent statistics conducted on the same in situ database using MERIS processed with SeaDAS. I understand that this paper is focused specifically on standard products from the respective space agencies, but I feel this may strengthen the analysis further. If not, at least a comment on this aspect is valid in the context of the study.

The plots and the tables are well constructed, but I do not quite understand why scatter

plots for 443nm were disregarded in the figures. I realise the statistical test on this wavelength are provided in the tables, but considering that 413nm is significantly underestimated, it may be interesting to see scatter plots at all wavelengths so as to fully appreciate how this negative bias changes spectrally.

Specific Comments:

Page 230: Line 3: I suggest removing the words "It is finally underlined that 15..." and replacing with "Fifteen......"

Page 230: Line 14: I suggest rephrasing the words "...even though an appreciable qualitative good agreement...."

Page 231: Line 19: I suggest adding a comma after the word "(UNFCCC 2011)"

Page 231: Line 25: Remove the full stop after the "(ii)"

Page 232: Line 13: Check spaces after symbols (appears to be an addition space (gap) after 1st symbol).

Page 233: Line 9: I suggest replacing "...is...." with "...would be..."

Page 233: Line 21: I suggest adding a comma after the word "signal"

Table 1: Caption: The symbol "N" needs to be put in italics.