

Reply to anonymous Referee #1

The authors present a publicly available, monthly, global dataset of the Forel-Ule index, hue angle, and Secchi disk depth derived from the ESA Ocean Colour Climate Change Initiative satellite times series of spectral remote-sensing reflectances. Generally speaking, the manuscript is well written and straightforward – almost terse, which I find acceptable as the algorithms and approaches are well documented. Overall, I see no major show-stoppers in its publication. Minor comments are provided below, most of which focus on grammar and presentation.

We appreciate the positive opinion of the referee and thank him/her very much for the time and feedback to improve the manuscript. We have taken all comments in consideration and have improved the manuscript accordingly. We agree on the “terse style”, but unfortunately ESSD articles can be like this, as the journal forbids any scientific interpretation of the data. Some minor editing has been made here and there to make parts smoother to read. With the example of the North Atlantic Ocean, we intended to provide some hints on further use and make the data more interesting for scientists.

Line 38: Suggest expanding satellite acronyms, adding agencies, and adding mission timelines, e.g., “the NASA Moderate Resolution Imaging Spectroradiometer onboard Aqua (Aqua-MODIS; 2002-present)” – or, changing “present” in the former to the last year included in OC-CCI.

We have expanded the sensors’ names, though not been explicit on the carrying platforms, in order to not to make the text cumbersome.

L42: Please indicate spectral dependency and provide units the first time a variable is introduced.

Done.

L72: Remove out of place “Rrs” or revise to “calculate them from Rrs”.

Corrected.

L80: “Downloaded product is the” is grammatically awkward. Do you mean “The source product for all derived variables presented in this dataset...”.

Indeed, this is much better. Corrected.

L99: Expand CIE acronym.

Done.

General comment on uncertainties: Just confirming that temporal, pixel-level uncertainties are not possible? This is generally apparent from this section, but would still be useful for clarity to state as such up front.

Indeed, the estimation of pixel-level uncertainties is not possible for the products released in this dataset. We are aware of this lack, but such information can only be given after a “spectral class discrimination”, using a large and quality-controlled in-situ dataset that spans the broadest dynamic range. In fact, such stringent requirements have the effect that not all products can be released with pixel-wise uncertainties in the OC-CCI dataset (Jackson et al., 2019). We have elaborated on this point in section 4. Validation in the revised version.

L135: Suggest mentioning that any systematic bias in the geophysical products will not be reduced like random noise.

Done.

L154: What is the remaining uncertainty estimate after 7.5% was subtracted in quadrature? Or, was the subtraction included in the “within 20%” stated on line 149? Even if reported elsewhere, the spectral values of calculated Rrs uncertainties (used on line 57) are worth repeating here. What other terms are included in the (quadrature-expressed) uncertainty budget?

The 7.5 % is a reasonable uncertainty estimate of the in-situ Rrs measurements. The statistics “within 20 % ” were taken from Table 3 of Pitarch et al. (2020) where we made a matchup between in-situ Rrs and OC-CCI Rrs. Subtraction in quadrature of 7.5 % from these Rrs uncertainties are the input to the Monte Carlo simulations of the hue angle, Forel-Ule and the Secchi disk depth whose results we report in Figure 1 and Table 2 of the present paper. All in all, we think that we have provided sufficient information for readers to follow and even duplicate out Monte Carlo experiment. Note that, following the suggestion by Reviewer 2, the code has been made publicly available.

Line 252: Global “patterns”. And, suggest rewording to “Despite the scale ranging from 0 to 21”.

Corrected.

Line 264: Neither the 0.25-deg nor the 1-deg datasets have been described yet. Generation of these datasets needs to be presented earlier in the manuscript.

These datasets are now introduced in section “3. Product description”.

References

Jackson, T., Chuprin, A., Sathyendranath, S., Grant, M., Zühlke, M., Dingle, J., Storm, T., Boettcher, M., and Fomferra, N.: Ocean Colour Climate Change Initiative (OC_CCI) –Interim Phase. Product User Guide. D3.4 PUG, 2019.

Pitarch, J., Bellacicco, M., Organelli, E., Volpe, G., Colella, S., Vellucci, V., and Marullo, S.: Retrieval of Particulate Backscattering Using Field and Satellite Radiometry: Assessment of the QAA Algorithm, *Remote Sensing*, 12, 77, <https://doi.org/10.3390/rs12010077>, 2020.