

Earth Syst. Sci. Data Discuss., referee comment RC2
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Comment on essd-2021-466

Arnold Dekker (Referee)

Referee comment on "Optical and biogeochemical properties of diverse Belgian inland and coastal waters" by Alexandre Castagna et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2021-466-RC2>, 2022

This is a worthwhile paper with interesting data well worth publishing. Its focus on inland and near coastal waters is needed. Excellent that this data set is published on Pangea. Perhaps also submit to LIMNADES?

Overall comments:

Title: as this paper does not cover all Belgian waters but a subset from the middle (Mechelen) to the west of the country I would change the title to e.g. Optical and biogeochemical properties of "representative" or "a selection" or "Flanders?" representative western Belgian inland and coastal waters.

Are you sure attenuation and turbidity fall under inherent optical properties? I don't agree as these measurements do not meet the definitions of IOPs. If you disagree please provide a reference such as from Kirk 2011 etc

Sometimes the word form is spelled as form-please check throughout the text

Specific comments:

Introduction: ...With little representation of inland waters: what about the Limnades publicly available dataset with over 1500 submissions?

L29-30 high spatial resolution (30 m) sensors, of which current global coverage and open access data is only available for multispectral missions: PRISMA and DESIS have some open access data.... as will the recently launched EnMap.

L 34: cover eight lakes, the Spuikom lagoon, the Scheldt estuary and the BCZ in the western part of Belgium (e.g. there are no waters sampled in Wallonia

L 43: should CDOM be added here?

L 102:2003). And.... Should there be a comma here or should this sentence start with a different word?

L 114 : how long were these samples stored before analysis?

L 132: I would refrain from using the term Neperian as it is 1) often spelled in different ways; 2) not well known what it means, 3) much easier to say the e power logarithm etc...

Paragraphs 2.3.1. and 2.3.2. describe the use of 0.45 um filter for CDOM and a 0.7 um filter for particulates. Where do you describe the properties of the 0.45 to 0.7 um residual? This needs to be discussed. There is a paper by Laanen et al that discusses this fraction and it is not negligible.

- See: Laanen, M.L., Peters, S.W.M., Dekker, A.G. and van der Woerd, H.J. (2011) Assessment of the scattering by sub-micron particles in inland waters; *Journal of the European Optical Society - Rapid Publications* 6, 110. [DOI: <http://dx.doi.org/10.2971/jeos.2011.110>].

L 200: this effect was dependent of lake .. do you mean this effect varied across the lakes???

L208: ... 850 nm, and including... this is not a normal sentence structure-please revise.

L216: is it: proportional to the concentration of particles and organic matter or is it: proportional to the organic fraction concentration of the particles? Please clarify as this is

confusing.

L217: this is also confusing: This loss of absorbing material was not observed in a study by Röttgers et al. (2014a) including samples from a diverse set of environments, though the authors did not apply NaClO to the North Sea or Baltic Sea samples..... so which samples from where did they apply NaClO? And is that relevant to your paper?

L250: what is the effect of salt water on the VSF at these angles? I am asking as you calibrate with deionised water-should you calibrate with pure filtered seawater?

L331: This sentence is worrying: The water-leaving signal is not strictly Lambertian, however this approximation is commonly used for remote sensing purposes (cf. Frouin et al., 2019). There are many papers that describe this factor (often referred to as Q) as ranging between 2 and 5 i.s.o. PI. It is too easy to choose one recent paper that ignores all of this and says L to E conversion = PI. Given the care you take to describe your methodology this needs an equivalent amount of attention citing relevant literature that also says this cannot be ignored. This also has effect on your equation in L350.....! And Line 367 where the measurement angle of 40 degrees should also be discussed with reference to the Q factor of the assumed factor of PI.

+ - L 478: Figure 14 Y-axis : elati e abundance???? What does that mean?

L495: the relative scarcity of similar open datasets in inland: what about Limnades?