Earth Syst. Sci. Data Discuss., author comment AC1
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Reply on RC1

Héloïse Lavigne et al.

Author comment on "The HYPERMAQ dataset: bio-optical properties of moderately to extremely turbid waters" by Héloïse Lavigne et al., Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2022-189-AC1, 2022

Responses to Reviewer #1

We thank you for all the time you spent reviewing our manuscript and your constructive comments. In the following, we reply to each of your comments. Your comments are copied in italic.

General comments

The manuscript proposed by H. Lavigne et al. aims to describe the HYPERMAQ dataset dedicated to provide optical and biogeochemical parameters necessary to develop algorithm for ocean colour observation to retrieve main biogeochemical parameter as the chlorophyll-a concentration. Dedicated field experiments have been driven in six contrasted regions.

The manuscript is concise, well written and details each HYPERMAQ dataset components.

As a general comment, I mainly suggest to add a discussion on the choice of the six sampled regions. Indeed, except a short justification in the conclusion, the reader can't easily appreciate the interest of sampling such different regions.

Reply: Indeed, the rational for this particular selection of sampling sites might not be very clear, the paragraph 2 has been extended to better explain the interest of these sampling sites. The following text has been added:

"Contrary to case-1 waters, optical properties of case-2 waters are impacted by terrestrial inputs of sediments and CDOM with concentrations ranging from low to extreme values. Hence, in these waters, the retrieval of water properties from bio-optical algorithms is extremely complex. As case-2 waters are generally highly connected to land-ocean interaction and human activities (estuaries, coastal and inland waters), it becomes critical to collect enough in situ data to help for the development of specific algorithms. Given the large diversity of case-2 waters, Hieronymi et al. (2016) defined four main groups: case-2 scattering (C2S), case-2 extremely scattering (C2SX), case-2 absorbing (C2A) and case-2

extremely absorbing (C2AX), suggesting that specific efforts in algorithm development should be given to each group. For instance, Hieronymi et al. (2017) proposed a multi-neural networks algorithm for case-2 waters atmospheric correction, but the algorithm was mostly trained and validated with synthetic datasets. In this context, the HYPERMAQ dataset provides bio-optical data from C2S and C2SX waters by sampling a very large diversity of waters affected by additional sediments inputs (see sample sites on Figure 1). Sample sites allow to obtain a large gradient in SPM and turbidity (1 to 700 FNU) by sampling Belgian coastal waters which are extremely turbid locally on the coast and less turbid further offshore. In addition, three estuaries known to be extremely turbid have been sampled (the Gironde, the Yangtze and the Rio de la Plata estuaries). As they are affected by tides, a gradient of turbidity could be sampled along the day with diverse influences of oceanic waters. These three estuaries, located on different continents, carry suspended particles with their own mineral properties, enriching then the database. Finally, two terrestrial lagoons were sampled. One with low to moderate concentrations in suspended sediments and one with extreme concentrations of both algae and non-algal suspended particles. This large diversity of sampled sites should then help to improve our knowledge of case-2 moderately to extremely scattering waters. A detailed description of each site is provided below. "

Furthermore, this paper described a bundled dataset. Each individual dataset is also associated to Pangaea doi. It would be interesting to list (and associate DOIs) in the bundled paper.

Reply: Thank you for this suggestion, sub-datasets are now listed in the section "data availability"

Considering the limited needed improvements included in general and specific comments, I recommend this paper for potential publication after minor revisions.

Specific comments

Title

The title is built on a project/dataset name, maybe linked to an undefined acronym (found on the web ? Hyperspectral and multi-mission high resolution optical remote sensing of aquatic environments). I think that the title would benefit from a more explicit title giving an idea of the addressed dataset and/or parameter.

Reply: Thank you for your suggestion title has been changed to "The HYPERMAQ dataset: bio-optical properties of moderately to extremely turbid waters"

Tables 1 to 3

Xangtze name is used instead of Yangtze.

Reply: Thank you for noticing this typo it has been corrected.

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3. Data collection

p. 5-6 / l. 164 – 184

Sections are switching from 3.2 to 3.4. Section 3.3 is missing.

Reply: Thank you for noticing this problem it has been corrected.

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5. Conclusion

p. 9 / l. 305 - Seven different studies areas are mentioned in the conclusion whereas six regions are described in the paper.

Reply: Thank you raising this inconsistency. It might have been a confusion with the two sampling cruises in the Belgian coastal waters, but in fact, there are only 6 sampling sites. This has been corrected.

Figure 8

Y-axis should be explicitly defined including considered units.

Reply: water reflectance is explicitly defined in the text as "rho_w" and is reminded in the figure caption. Water reflectance is unitless. This is now reminded in the figure caption.