This manuscript describes a large dataset from 2001-2021 for global daily gap filled chlorophyll-a. The authors developed a convolutional neural network called OCNET to reconstruct global chlorophyll-a concentration in open oceans. This dataset is very useful and important for the scientific community. The manuscript in general is well written, but would benefit from some minor clarifications, and adjustments before publication.

General Comments:

In line 155, the authors stated that they excluded regions from seas with surface salinities below 25. On the other hand, the minimum value of salinity shown in table 2 is 0. How? Please clarify this in the text.

According to ESSD, the DOI of the dataset and its in-text citation must be given in the abstract (https://www.earth-system-science-data.net/submission.html). Please add them.

Please Provide more details in section 5 (data availability section) about the dataset which is very relevant for a data description paper. For example, you can explain how are the data organized in different files (per year or ..), and how are the files named (chl_OCNET_.. followed by Date (day, month, year). What are the type of files (".asc", or ".csv".. etc) , separator (if any)… etc.

Specific Comments:

Line 15 in the abstract: missing data not "data missing"

Line 24 in the abstract: phytoplankton biomass not " phytoplankton mass"

Line 24- 25 in the abstract: The authors state that the "OCNET model achieves good performance in the reconstruction of global ocean Chl-a concentration data... etc.". We don't know how the model perform in polar regions or high latitudes (higher than 25) or coastal areas. It would be more precise to use the term "global open ocean". The sentence should then become as follows: "the OCNET model achieves good performance in the reconstruction of global **open** ocean Chl-a … etc."

Line 25 in the abstract: "captures temporal variations". It is recommended to write spatio-temporal.

Line 125: "Four" not "three" environmental variables

Line 259: add degree (°) to "0.25"

Please ensure consistency in the terminology used throughout the text and in the figures. For example, in line 333 and 341, the terms 'training set,' 'validation set,' and 'test set' are used, while in Figure 6, they are referred to as 'training set,' 'validating set,' and 'testing set.'

Line 346-347: I recommend that you use "compared to" instead of "while". The statement would become: "Based on the results of the OCNET model, regions 2, 3, and 5 show larger decreasing magnitudes, **compared to** other regions, which **also** exhibit a decreasing trend."

Line 369-370: I recommend that you use "compared to" instead of "while". The statement would then be: "From the results of bias, the training set shows a clear tendency of underestimation (Fig. 7d), compared to the validation and testing sets, which exhibit a less pronounced underestimation."

Line 372: global open ocean Chl-a concentration instead of "global Chl-a concentration"

I recommend that you change all statements starting with: "it can be seen" or "it can be observed" and ending with (figure #) to: "By referring to figure #", **or** "Figure # indicates/shows …. Etc". Below are some examples:

> *Line 387-388: "It can be seen that the output data of the OCNET model show a similar distribution to NOAA MSL12 data in the global tCC distribution (Fig.8(a–b))"*

> *Line 332: "it can be seen that the model performs well (Fig.6)"*

Line 335-336, the authors stated that OCNET performed well but shows poor performance in individual regions, and stated that "region 9, being mostly near the American continent, is heavily influenced by human activities, and the satellite data quality in coastal areas is also poorer...". Then, in their conclusion (Line 510-512), the authors concluded that "the model's performance was somewhat weaker in the eastern Pacific region compared to other areas. This may be due to specific climate characteristics that have a significant impact on phytoplankton growth and distribution or low quality of satellite-based dataset in this region". Isn't region 9 supposed to be the eastern Pacific? If yes, then please state the same reasons in both statements, and provide more details or examples on such climate characteristics that are specific to the eastern Pacific.

Figure 6 shows the evaluation indices of the training, testing and validating sets. Meanwhile, there is no indication to which dataset correspond the evaluation metrics shown in **table 4**. Although can be inferred by comparison, I recommend that you indicate in the text or table caption that they correspond to the training set. Readers shouldn't guess.

Several References lack DOI. Please add the corresponding DOI. Below are **some** examples of references lacking DOI:

Behrenfeld, M. J., O'Malley, R. T., Siegel, D. A., McClain, C. R., Sarmiento, J. L., Feldman, G. C., Milligan,A. J., Falkowski, P. G., Letelier, R. M., and Boss, E. S.: Climate-driven trends in contemporary ocean productivity, Nature, 444, 752-755, 2006.

Chen, S., Hu, C., Barnes, B. B., Xie, Y., Lin, G., and Qiu, Z.: Improving ocean color data coverage through machine learning, Remote Sensing of Environment, 222, 286-302, 2019.

Groom, S., Sathyendranath, S., Ban, Y., Bernard, S., Brewin, R., Brotas, V., Brockmann, C., Chauhan, P., Choi, J.-k., Chuprin, A., Ciavatta, S., Cipollini, P., Donlon, C., Franz, B., He, X., Hirata, T., Jackson, T., Kampel, M., Krasemann, H., Lavender, S., Pardo-Martinez, S., Mélin, F., Platt, T., Santoleri, R., Skakala, J., Schaeffer, B., Smith, M., Steinmetz, F., Valente, A., and Wang, M.: Satellite Ocean Colour: Current Status and Future Perspective, Frontiers in Marine Science, 6, 485 2019.