

## Review of manuscript essd-2024-21

### “Observed global ocean phytoplankton 1 phenology indices.”

This manuscript provides satellite-derived chlorophyll-a data from the Ocean Colour Climate Change Initiative at 4, 9, and 25 km spatial resolutions. The dataset is valuable and can be used in a wide range of research topics and real applications. A few concerns are listed below and the 1 one is the major one.

- 1. The accuracy of the data in reflecting the phytoplankton phenology has not been stated with field observation. This is needed to increase the confidence of the satellite-based data. I suggest the author choose a few typic locations with some field survey data and compare the direct observation with your data.**
2. In the method, a few critical percentage values were used to determine the phytoplankton phenology parameters, e.g., 75% of the amplitude of the bloom maximum peak magnitude, 5% of the chl-a range, 15% of the total cumulative chl-a concentration and of the median rate of change in chl-a concentration. Why do you choose different values as critical points and are there any standards or citations that suggest the use of these values? The reason should be pointed out in the manuscript. For example, three peaks would be detected in Figure 1 if a lower critical value is used.
3. Lines 210 to 214, it is not very clear to me, please re-edit to make your idea more clear.
4. Line 260, please describe the explanation provided in Brody et al., (2013) shortly here, so that the readers could understand the reason easier and more directly.
5. Figure 3 and the relevant text compare the three detection methods using CoV values, it is not clear if the three methods all differ from each other or only one of them resulted in discrepancy when CoV is large. A conclusive sentence is needed in the text. For example, the comparison between three values in line 312 is very clear that the integrated bloom chl-a climatology (2017-2022) is similar using 9 and 4 km maps, but is different from that determined using a 25 km map.