This manuscript presents a satellite-derived chlorophyll-a dataset from the Ocean Colour Climate Change Initiative, providing phenological metrics at 4, 9, and 25 km spatial resolutions. The dataset is accessible and can be analysed easily using GIS/coding. The dataset is highly valuable for various research applications, including ecosystem monitoring, biodiversity assessments, and climate impact studies. The study is well-conceived and has the potential to make a significant contribution to the field. Below, I provide some minor comments and suggestions for improvement:

1. A key concern is the lack of comparisons with prior phenology studies, particularly those utilizing *in situ* observations. While ship-based *in situ* measurements are indeed limited in spatial and temporal coverage, autonomous platforms such as BGC-Argo floats offer continuous data that could be utilized for such comparisons. Including a case study or analysis demonstrating agreement between satellite-derived and *in situ*-derived phenology metrics would enhance the dataset's credibility and highlight its utility. Additionally, discussing how the proposed dataset aligns with or diverges from earlier findings could provide valuable context.

For reference, here are some relevant studies that might inform such comparisons (no need to cite; they are provided for your consideration):

Demetriou, M., Raitsos, D. E., Kournopoulou, A., Mandalakis, M., Sfenthourakis, S., & Psarra, S. (2022). Phytoplankton Phenology in the Coastal Zone of Cyprus, Based on Remote Sensing and In Situ Observations. *Remote Sensing, 14(1),* 1–16. https://doi.org/https://doi.org/10.3390/rs14010012

Gittings, J. A., Raitsos, D. E., Kheireddine, M., Racault, M. F., Claustre, H., & Hoteit, I. (2019). Evaluating tropical phytoplankton phenology metrics using contemporary tools. *Scientific Reports*, *9*(1), 1–9. https://doi.org/10.1038/s41598-018-37370-4

Kalloniati, K., Christou, E. D., Kournopoulou, A., Gittings, J. A., Theodorou, I., Zervoudaki, S., & Raitsos, D. E. (2023). Long-term warming and human-induced plankton shifts at a coastal Eastern Mediterranean site. *Scientific Reports*, *13*(1). https://doi.org/10.1038/s41598-023-48254-7

Kournopoulou, A., Kikaki, K., Varkitzi, I., Psarra, S., Assimakopoulou, G., Karantzalos, K., & Raitsos, D. E. (2024). Atlas of phytoplankton phenology indices in selected Eastern Mediterranean marine ecosystems. *Scientific Reports*, *14*(1), 9975. https://doi.org/10.1038/s41598-024-60792-2

Racault, M. F., Raitsos, D. E., Berumen, M. L., Brewin, R. J. W., Platt, T., Sathyendranath, S., & Hoteit, I. (2015). Phytoplankton phenology indices in coral reef ecosystems: Application to ocean-color observations in the Red Sea. *Remote Sensing of Environment*, *160*, 222–234. https://doi.org/10.1016/j.rse.2015.01.019

2. Lines 498–501: Creating temporal composites is important for mitigating potential noise caused by interpolation errors in the OC-CCI dataset. While the product is highly valuable, it does exhibit some irregularities that can influence the calculation of phenology metrics, particularly at higher resolutions (e.g., 4 km), and therefore impact the derived phenology indicators described in this study. For example, when examining the spatial and temporal variability of phytoplankton growth period durations in the Indian Ocean (Figure 1), several regions (pixels) display durations ranging from approximately

100 to 600 days over the years. While such variability could be realistic in certain cases, it is important to recognize that, like any dataset, this product includes some irregularities that may affect its outputs.