

Interactive comment on “Impact of decadal reversals of the North Ionian circulation on phytoplankton phenology” by Héloïse Lavigne et al.

Anonymous Referee #2

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Summary:

This manuscript contributes to improve the studies about the relationships between the phytoplankton phenology and the cyclonic/anticyclonic circulation, performed in the North Ionian Sea. This paper is of scientific relevance, well written and logically organized. They present several tables and figures including lot information published about the issue. Unfortunately, however the results presented are not yet fully convincing in its present form, and some further work is needed to provide more solid evidence to some of the -at present- speculative results shown.

General comments:

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Language and grammar: generally, the manuscript is well written. Just a few sentences would need to be revised; there are some typos that would need to be corrected. Title: The title reflects most of the authors guidelines in the manuscript.

Abstract: The abstract presents a good summary of the manuscript. The context of the study is clearly defined. A suggestion could be to highlight the obtained results better.

Introduction: well written and exhaustive. However, in Page 3 - Line 15-16, authors should rewrite these sentences. Several authors of Mayot et al (2016) study coincide with the current work. The authors indicate that Mayot et al don't analyze the inter-annual variability, when the title itself is "Interannual variability of the". The authors should rewrite these sentences and specify what improvement or advance present this study with respect to the study of Mayot et al. (2016). Technical comment: Page 3, Line 13: Define CZCS and SeaWIFS.

Material and Methods: One of the main concerns I detect in the study is that they use chlorophyll concentration obtained from OC-CCI database that has been built using standard algorithms. It is known by all that in the Mediterranean, these algorithms do not work correctly and there are several studies, including some made by the same authors of this work, which indicate the use of specific chl-a algorithms for the Mediterranean Sea. Authors should use these algorithms (MedOC4, Volpe et al. 2007 for Case 1 waters and the AD4 algorithm for Case 2 waters type D'Alimonte and Zibordi, 2003) or demonstrate, through a statistical analysis, that there are no differences in the results of this study using standard instead of regional algorithms.

D'Alimonte D. and Zibordi G. (2003). Phytoplankton Determination in an Optically Complex Coastal Region Using a Multilayer Perceptron Neural Network. IEEE Trans. Geosci. Remote Sensing, vol. 41, pp. 286.

Volpe, G., Santoleri, R., Vellucci, V., Ribera d Acalà, M., Marullo, S., and D Ortizio, F. (2007). The colour of the Mediterranean Sea: Global versus regional bio-optical algorithms evaluation and implication for satellite chlorophyll estimates. Remote Sens.

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Environ., 107, 625-638.

On the other hand, I suggest that the authors can work with the Marine Copernicus database (OCEANCOLOUR_MED_CHL_L3_REP_OBSERVATIONS_009_073) that uses regional chlorophyll algorithms as well as a better spatial resolution (1km x 1km).

In fact, the authors use this type of data for temperature and salinity (Page 4, line 25). Results and discussion: in general, all the topics are well-treated and detailed. Anyway, several suggestions are given in the "technical comments" with the intent to improve the comprehension of the text.

Page 5, Lines 8-9. Why the authors use the value of 1uM to establish the nitracline? In addition, the authors should explain why they only work with nitrate and not with phosphate, when it is known by the scientific community to be a very important nutrient in the Mediterranean Sea.

Page 7, Lines 1-8, The authors found a linear relationship between the depth of the nitracline and the 28.9 kg/m³ isopycnal. The authors should clarify if this relationship is for the whole year or only for certain dates, since it can be modified clearly depending on the time (mixed or stratification period). This issue is very important since then you use this relationship to build figure 7.

Page 9, Line 25-30. The authors should provide empirical data to support these hypotheses.

Figures and tables: Figures and tables are appropriate. Anyway, minor suggestions are given below:

- Figure 4. Please, include in Figure 1 the line that has been performed the Hovmöeller diagram. - Write properly "Hovmöeller" throughout the text

References: prior work are fully cited

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Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2017-494>, 2017.

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