Biogeosciences Discuss., 12, C1025–C1027, 2015
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Biogeosciences
Discussions
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Interactive comment on "On the vertical distribution of the chlorophyll a concentration in the Mediterranean Sea: a basin scale and seasonal approach" *by* H. Lavigne et al.

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Received and published: 2 April 2015

General Comments This manuscripts presents the results of a descriptive analysis conducted on a large dataset of chlorophyll-a (chla) profiles collected in the Mediterranean Sea between 1994 and 2014. The main objective of the work is to improve our knowledge of the spatio-temporal variability of the vertical distribution of chla in this region. After applying a series of existing methods to convert fluorescence into chl and to quality control the data, the authors present a new methodology to characterize the shapes of chla profiles and further proceed with describing their climatological spatio-temporal characteristics in the Med Sea. The results confirm and expand upon

previous findings obtained mostly from satellite data by providing new quantitative and qualitative information on the seasonal variability of the vertical distribution of chla. Quantitative data are presented as monthly climatologies of chla in four key locations and as seasonal transects along the 5°W meridian. In addition, a qualitative description of the temporal variations of the shape of the chla profile is presented for different ecoregions. The authors then investigate the spatio-temporal variations of the depth of the deep chla maximum (DCM) and finally compare their dataset to an existing climatology and to parametrizations derived for the global ocean.

The authors conclude that the vertical distribution of chla in the Med Sea is generally characterized by the presence of a DCM. However, a large amount of spatial and temporal variability further affects the qualitative and quantitative characteristics of the chla profile.

Overall, I believe the results presented in this manuscript are significant and should be published pending minor revisions.

I would recommend addressing the following main points:

- I would have a native English speaker proofread the manuscript, as I found several typos (for some of them I added corrections).
- The manuscript would be stronger if you could provide (in section 1.2) a better justification as to why it is important to understand the dynamics of the vertical distribution of chla.
- The analysis is based on fluorescence data corrected for non-photochemical quenching (NPQ) using a previously published method, which is based on extrapolating the maximum fluorescence value in the mixed layer to the surface. I would expect this method to be insufficient to correct for NPQ in most of the Mediterranean Sea, where relatively shallow mixed layers and clear waters would allow

NPQ to affect fluorescence profiles much deeper than the mixed layer. I think it would be important to address and discuss this issue.

- I would restructure the Conclusion section so that it summarizes the most important findings. As it stands now, it seems like a continuation of the Discussion.

I have also added several minor comments to the original text: see attached pdf file.

Please also note the supplement to this comment:
http://www.biogeosciences-discuss.net/12/C1025/2015/bgd-12-C1025-2015-supplement.pdf

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Interactive comment on Biogeosciences Discuss., 12, 4139, 2015.