

Interactive comment on “Distribution of phytoplankton functional types in high-nitrate low-chlorophyll waters in a new diagnostic ecological indicator model” by A. P. Palacz et al.

Anonymous Referee #1

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The paper developed an ecological indicator model to estimate the phytoplankton functional types using Matlab artificial neural network (ANN) toolbox. The authors made a new attempt to estimate the phytoplankton functional type using ecological indicators and they indicated that their new algorithm can correctly interpret some basic ecological rules. This paper is of interest as it suggests new way to estimate the phytoplankton functional types. But it still needs to be improved for the following points.

1. The driving forces/factors which can alter the phytoplankton functional type are complicated. It depends on a lot of factors including the surrounding ecological systems. The authors provides SST, PAR, Wind speed, MLD and Chl as input variables. In my mind, even if the SST, PAR, wind speed and MLD are the same, the Chl may be dif-

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ferent, especially in different areas, so as the phytoplankton functional types. I did see a lot of algorithms using these variables to estimate primary productivity based on the mechanism of photosynthesis, but none for the phytoplankton functional types. The authors gave a reference which also used the ecological indicators to estimate four phytoplankton functional types but that algorithm is limited to one study area and the latitude, longitude and the time are considered as inputs. Have the authors tried to add the latitude, longitude or time as inputs to see if the model performs better?

2. The authors divided the confirmatory data into three groups, the training, the validation and the testing. However, I did not find the exact precision for each group of the data, nor the precision for the exploratory data. In the reference [1: Identifying four phytoplankton functional types from space: An ecological approach], they indicated that model could discriminate four major phytoplankton functional types (diatoms, dinoflagellates, coccolithophores, and silicoflagellates) with an accuracy of more than 70%. The authors described the algorithms performances a lot. However I could not find the quantitatively description for the algorithm's performance.

3. The algorithm developed here based on the NOBM data of the four areas in the Atlantic Ocean. That's why the algorithm performances are similar in these areas as indicated in Fig 6. The authors pointed out that the algorithm developed here shows some different characteristics with NOBM on the areas only for exploratory analysis. The results are possibly interesting, but not clearly presented. The authors used a box-average of long term annual mean contribution to compare these two model performances. Scattering figure/figures with monthly data may be better for the performance comparison.

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