

Interactive comment on “Picophytoplankton biomass distribution in the global ocean” by E. T. Buitenhuis et al.

Anonymous Referee #1

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General comments:

This paper written by Buitenhuis et al. describes a database for a global distribution of picophytoplankton biomass. This kind of work is very timely, given that we have come to an age of describing these basic biological parameters at a global scale, which has been rarely done before. This database, if later being public to the scientific community, will help aid in our understanding on global biogeochemical cycles and improve further predictions of ocean ecosystem in response to global change.

My main concern is that this database is not really global. The data sources are restricted to the work by the European and North American community. I don't know if the authors have tried to obtain data from other scientists. To my knowledge, there have been numerous measurements in western Pacific by Chinese and Japanese scientists

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(e.g., Jiao et al. Cont. Shelf Res. 2005; Ning et al. MEPS 2005; Liu et al. Deep-Sea Res. II 2002, 2007; Chen et al. Cont. Shelf Res. 2011). It seems that the British AMT cruises data (e.g., Zubkov et al. DSR1 1998, Zubkov et al. PIO 2000, Zubkov and Burkill Cytometry 2006) have not been included, either. I believe the available data should be much more than the current database.

Another concern is on the vertical variations of carbon-to-cell conversion factors, as the authors also noted. Apparently, the cellular carbon content is much greater in lower euphotic zone than in upper euphotic zone and one conversion factor is not sufficient for accurately estimating picophytoplankton carbon. For example, Liu et al. (DSR2, 2007, vol54, 1602-1616) have used two conversion factors (24 fg C cell⁻¹ for *Prochlorococcus* above 60 m and 62 fg C cell⁻¹ below 60 m).

Specific comments: Methods: Please give a description of how you gridded the data.

Page 227, line 25-27, it seems unnatural to put this paragraph here. The context is on the picophytoplankton biomass, not the ecological adaptation strategies of picophytoplankton.

Figures: I suggest drawing a figure with number of observations shown in each grid.

Technical corrections: Fig. 2 I only see two figures.

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