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Interactive comment on “Small diversity effects on ocean primary production under environmental change in a diversity-resolving ocean ecosystem model” by A. E. F. Prowe et al.

Anonymous Referee #1

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Overall, Prowe et al address an interesting aspect by asking whether the response of phytoplankton primary production on global warming is modulated by phytoplankton diversity.

My major concern is that phytoplankton diversity is represented in a way too simplistic manner. Neither spectral light use (e.g. Stomp et al. EcolLett 2007) is not considered, nor algal mixotrophy (e.g. Hartmann et al. PNAS 2012), nor susceptibility to grazing, motility etc. By limiting the niche-space to light and temperature, the model seems to be prone to yield limiting diversity-functioning relationships.

The authors do acknowledge the shortcomings of their model. Apart from technical

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problems, it should be kept in mind that our knowledge on phytoplankton trait diversity is quite limited. Taken as a 'proof of concept' rather than an explicit test whether global change effects are modulated by diversity of communities, the study by Prowe et al. may serve as a good starting point for elucidating global change effects. Studies combining the analytical approach undertaken here with experimental manipulation are especially needed to enhance our ability for predicting the effects of global change on ocean primary production.

Interactive comment on Biogeosciences Discuss., 10, 12571, 2013.

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