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Interactive comment on “Enhancement of photosynthetic carbon assimilation efficiency of phytoplankton assemblage in the future coastal ocean” by J.-H. Kim et al.

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The value of this work is that it examined PAM photophysiological responses by natural phytoplankton assemblages in mesocosms (1.5 tonnes size) under combined CO₂ and temperature (nutrient sufficient) climate change manipulations. The results that light utilisation efficiency was accelerated under high CO₂ (regardless of temperature increase) are intriguing but its broader applicability cannot be fully interpreted from the limited phytoplankton species information provided.

The critical impact of climate change drivers is causing a shift in phytoplankton species composition; there will be winners and losers, and the precise identity of them (whether

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it is a harmful bloom forming taxon or a keystone species for a fisheries food chain) is what really counts {Hallegraeff J. Phycol. 46, 220–235 (2010); Fu et al. MEPS 470: 207–233(2012).

It is only in the Materials and Methods that it becomes clear that the work was conducted in the Korean South Sea in late spring, and only at the very end in the Discussion that we are first introduced to the fact that the work was conducted during a diatom bloom dominated by *Skeletonema*, *Chaetoceros*, *Eucampia* [note misspelling]. No wonder therefore that the observed photophysiological changes were different from other similar published work on the (?nutrient deficient) Equatorial Pacific, or East and South China Sea.

This work as stands is presented in a topsy-turvy fashion. Available data on phytoplankton species composition need to be included in the results, and not just mentioned as an afterthought!

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