

## ***Interactive comment on “Mesocosm CO<sub>2</sub> perturbation studies: from organism to community level” by U. Riebesell et al.***

**U. Riebesell et al.**

Received and published: 8 May 2008

We thank referee #1 for the evaluation and detailed comments. In consideration of the referee's suggestions we have made the following changes:

"P642 L2-4 : this statement should be corroborated by references." Reference added

"P642 L4-6 : this statement should be corroborated by references." Reference added

"P642 L10-22 : A note of caution could be added here, since some of the cited experiments have used chemical conditions that are not realistic. For instance the study of Kurihara & Shirayama (2004) used pCO<sub>2</sub> values of 10,000 ppm that induced pH values down to 6.8." We have now omitted references to studies using CO<sub>2</sub> perturbations outside the range projected due to non-deliberate ocean acidification and have added a comment in this respect.

"P642 L10-22 : The work of Kurihara et al. (2007) reports on acidification effects on oyster larvae." Reference added

"P642 L10-22: Kikkawa et al. (2004) reports on acidification effects on red sea bream larvae." We did not include this reference because it applies CO<sub>2</sub> perturbations outside the range projected due to non-deliberate ocean acidification.

"P642 L265-27: A conceptual diagram summarizing the feed-back loops at pelagic ecosystem level due to acidification would be a nice addition." We feel that the information presently available is too scarce to be used for a defensible diagram on such feedback loops.

"P643 L3: References for the iron and phosphate enrichment experiments could be added." References added.

"P646 L14: According to Vogt et al. (2007) previous results on effects of acidification on DMS (Avgoustidi et al. 2007) were different from those obtained during PEECE-III." As the paper by Avgoustidi et al. is still under preparation, we feel it is too early to be referenced here.

"P648 L1: Here or elsewhere, it would be interesting to speculate on how far or close we are to develop simple; parameterizations that can be included in GC models (e.g. Gehlen et al. 2007), or if this is realistic or not considering the complexity of the responses to acidification." For individual processes (such as biogenic calcification) simple parameterizations of biological responses to ocean acidification have already been successfully incorporated in GC models (e.g. Heinze 2004, Gehlen et al. 2007, Ridgwell et al. 2007). Considering the present uncertainties about sensitivities, strengths, and longevities of biological responses to ocean change, their incorporation in global-scale ecosystems and biogeochemical models should be regarded primarily as sensitivity analyses. The latter sentence was added under section 4, para 1.

"P649 L21-28: I am aware of at least 2 ongoing initiatives that are looking into this, that

[Full Screen / Esc](#)[Printer-friendly Version](#)[Interactive Discussion](#)[Discussion Paper](#)

could be cited." We are not entirely sure which initiatives the referee is hinting at and are not aware of any citable publications from such initiatives. If provided with the corresponding references, we would be eager to include these in the revised manuscript.

REFERENCES: Heinze, C.: Simulating oceanic CaCO<sub>3</sub> export production in the greenhouse, *Geophys. Res. Lett.*, 13, L16308, doi:10.1029/2004GL020613, 2004

Gehlen, M., Gangstø, R., Schneider, B., Bopp, L., Aumont, O., and Ethe, C.: The fate of pelagic CaCO<sub>3</sub> production in a high CO<sub>2</sub> ocean: A model study, *Biogeosciences Discuss.*, 4, 533–560, 2007

Ridgwell, A., Zondervan, I., Hargreaves, J.C., Bijma, J., and Lenton, T.M. Assessing the potential long-term increase of oceanic fossil fuel CO<sub>2</sub> uptake due to CO<sub>2</sub>-calcification feedback. *Biogeosciences*, 4, 481–492, 2007

---

[Interactive comment on Biogeosciences Discuss.](#), 5, 641, 2008.

**BGD**

5, S502–S504, 2008

---

Interactive  
Comment

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

