

## ***Interactive comment on “Ocean biogeochemistry exhibits contrasting responses to a large scale reduction in dust deposition” by A. Tagliabue et al.***

**A. Tagliabue et al.**

Received and published: 22 October 2007

RESPONSE TO REVIEWER.

Review of Ocean biogeochemistry exhibits contrasting responses to a large scale reduction in dust deposition by Tagliabue, Bopp, and Aumont. By Anonymous Referee #1

General Comments on Tagliabue et al. This is a well-written and straightforward paper. -The finding that simulated reductions in Fe (via dust) influx show a lower sensitivity of ecosystem response than previous studies is certainly of interest. I cannot comments on the methods used for the modeling, as I am not a modeler.

>>We thank the reviewer for their positive and encouraging response to our paper. We respond to specific comments below in italics (preceded by \*\*).

Specific Comments In the end, I am left wondering which models, and which results, to believe: Those that have suggested relatively significant impacts (to ocean biogeochemistry and C cycling, for instance) of changes in dust flux, or those that (like this one) suggest minimal impacts. I appreciate the authors' caveats regarding the sensitivities of model results to particular model inputs (eg. importance of atmospheric deposition vs. other inputs, etc); I felt that they presented their results, and contrasted results with other models, in a very honest and straightforward manner. I can only echo their statement that "Notwithstanding, observational estimates of sedimentary Fe fluxes, as well as their geographic variability and the bioavailability of the Fe supplied, remain sparse (but see: Elrod et al., 2004; Lam et al., 2006, Blain et al., 2007) and require further investigation." Ultimately, I will reserve judgment on the importance of Fe on ocean biogeochemistry until we have sufficient data to further constrain the models. One other comment: Geologically speaking, 140 years is exceedingly brief; That is, changes in aeolian input in the geologic past, extending beyond the LGM, could have been much greater than supposed, and might pose a different challenge to the model results. I would appreciate more discussion of the influence of time on model results.

\*\*The reviewer is correct to note that the proposed increase in LGM dust deposition would have occurred over much longer timescales and would require a much greater model integration time in order to adequately represent the response of ocean biogeochemistry. We have noted this in our perspectives section.

Technical Corrections I found very few needed corrections; the writing is clear. There are minor issues with hyphenation and so forth.

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Interactive comment on Biogeosciences Discuss., 4, 2525, 2007.

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