

Interactive  
Comment

## ***Interactive comment on “A model for the benthic-pelagic coupling of silica in estuarine ecosystems: sensitivity analysis and system scale simulation” by S. Arndt and P. Regnier***

**Anonymous Referee #2**

Received and published: 13 April 2007

This article described a complex benthic-pelagic coupled model to understand the importance of silica supply for pelagic primary productivity from benthic diffusive flux versus riverine silica input, with a detailed sensitivity analysis on the intensity and timing of benthic diffusive fluxes over a range of dissolution and dissolution rates and duration of dissolved silica depletion in the water column. From the system-scale simulation, the authors concluded that “the benthic recycling of silica sustains only a small fraction (<1%) of the total pelagic primary production” in their study area and that “the benthic-pelagic coupling is thus minor importance on the system scale”.

I will start with my major question for this paper. If the system-scale simulation re-

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

sults hold (benthic flux is not important), then why is a complex and high-resolution benthic-pelagic coupled model needed for understanding the whole process. I got an impression from the manuscript that the authors put a significant amount of their effort on a seemingly trivial component of the system. The manuscript might be improved significantly if the authors can explain more clearly to readers regarding the logics for having such a complex model and doing detailed sensitivity studies for a component that is not important to the system. If the benthic flux of silica is about 1-2 orders smaller than the riverine input, would it be possible to just conduct some sort of scaling analysis with maximum dissolution rate, such that the maximum benthic flux can be estimated quickly, thus avoiding even having the benthic component? If that is the case, maybe the authors can get two separate papers out of this manuscript, with one on the benthic-pelagic model only (which can be applied to other system where the benthic component is indeed important), and the other on system-scale simulation for their estuarine system without benthic module.

Other than the above question I have, I feel the manuscript is well written with a clear description of the model. The topic fits the major themes of the journal well. I also agree with the other referee that some figures need to have larger size.

Overall, if the authors can address my major question, I think the manuscript is acceptable.

---

Interactive comment on Biogeosciences Discuss., 4, 747, 2007.

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