

Interactive  
Comment

***Interactive comment on “Silicon stable isotope distribution traces Southern Ocean export of Si to the eastern South Pacific thermocline” by G. F. de Souza et al.***

**G. F. de Souza et al.**

gfds@princeton.edu

Received and published: 6 September 2012

We thank the reviewer for her/his positive and concise review.

*Abstract line 7 to 9: ...What do you mean by ‘annual winter convection’ – is it the maximum convection depth in winter?*

This is indeed what is meant. We have rephrased the sentence.

*Section 5.1.1: I have problems following the logic here...the problem with the mixed layer model is that it requires a source of lower  $d_{30}\text{Si}$  that compensates in the annual mean for the ‘enrichment’ for incorporating high  $d_{30}\text{Si}$  – otherwise the mixed layer*

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



*d30Si would increase asymptotically towards the high d30Si values.*

Yes, indeed – without supply from depth, an annual mixed layer system with export across the winter mixed layer base would not only asymptote to high d30Si, but also to zero mixed layer [Si]. The reviewer is referring to a relatively fundamental biogeochemical concept – i.e. that continued export requires nutrient replenishment from depth. The manuscript makes numerous references to the fact that Si supply occurs from the deeper water column (e.g. P6419, L3-7 of the original manuscript; also Fig. 6), and even refers to the dominance (75-80%) of this source in L6 of P6419. The changes made to Section 5.1 in response to Reviewer 1's comments (adding the Supplementary Material B to the main text) results in this connection being more clearly accentuated, and we thus see no need to make any further changes.

*P6418, L3: 'isopycnal control' – the isopycnals do not control the distribution but the physical processes that act preferentially along the isopycnals such as lateral transport of advection along isopycnals.*

Agreed. However, in our opinion it is quite apparent that the formulation 'isopycnal control' does indeed mean 'control by isopycnally-acting processes' and we have not changed this in the revised manuscript.

*Table 1: Longitudinal range is wrong, it should be 103W.*

This had completely escaped our attention; thank you for the correction.

---

Interactive comment on Biogeosciences Discuss., 9, 6409, 2012.

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