Biogeosciences Discuss.,
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Biogeosciences Discussions

Interactive comment on "Isotopic fractionation of carbon during uptake by phytoplankton across the South Atlantic subtropical convergence" *by* Robyn E. Tuerena et al.

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Here we include responses to all of the comments: (1) Reviewer's comment (2) Author's comment

(1) 1/ A further comment concerning the following reply of the authors (page C7): "Although an increase in temperature in the ïn ËŻAgure shows an increase in ËĞ δ13CPOC and a decrease in ep, this will have very little effect compared to the predicted changes in carbon availability and cell size. "

I suggest authors make this future change (decrease) in d13CPOC more visible to the

reader by marking it in Figure 9b. For example they could mark the jump from the 400 ppm to the 500ppm level with inceasing temperature by an arrow.

(2) Agreed, we will amend Figure 9b accordingly.

(1) 2/ In their reply on the question about the latitudinal distribution of d13C-DIC, the authors don't really clarify the issue, I believe. Of course Southern Ocean d13C-DIC is very low because of upwelling of deep ocean waters depleted in 13C-DIC there, a phenomenon not present in the North Atlantic. So I feel the question about which process really imposes lower d13C-DIC in the North Atlantic is not satisfactorily resolved by their reply. Admitedly this is not the subject of their paper.

(2) We include a Figure to show the relationship between d13C-CO2 and CO2aq globally, using the data from Figure 8. The d13C falls in line with expected values for the given CO2aq of the North Atlantic (-9‰ red points in Figure1c). The Southern Ocean values are lower than the North Atlantic due to upwelling (-10-11‰, we will expand the axes in Figure 8b to make it more apparent (North Atlantic not as low as Southern Ocean).

Figure 1, relationship between d13C-CO2 and CO2aq. (a) map of data points, (b) d13C-CO2 and CO2aq with longitude as a z variable, (c) d13C-CO2 and CO2aq with latitude as a z variable.

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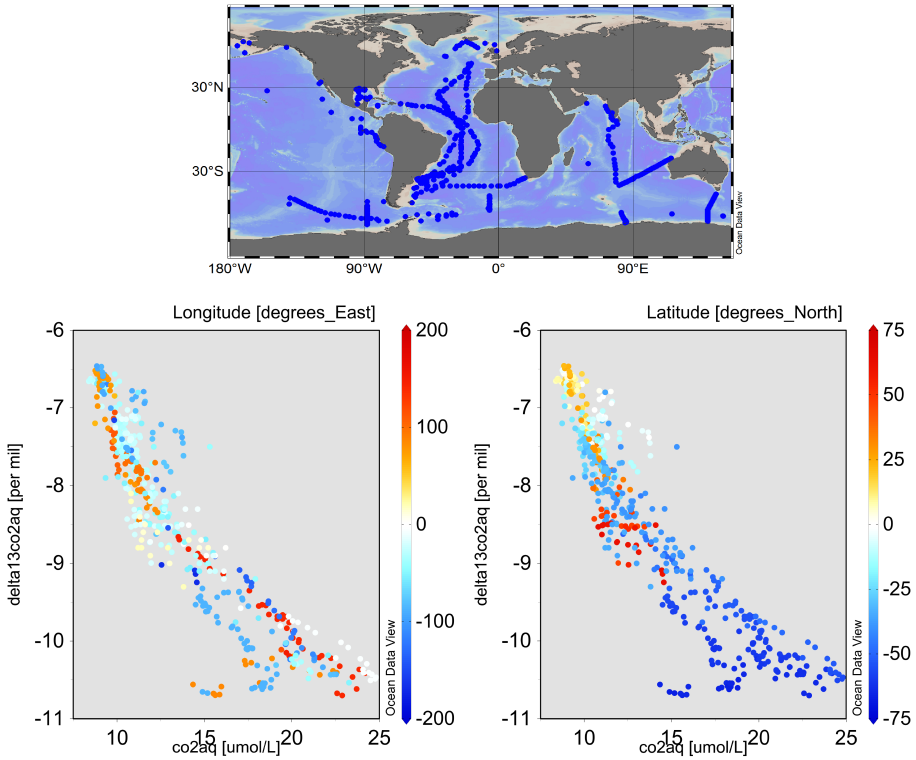
30°N
30°S
180°W
90°W
0°
90°E
Ocean Data View
Longitude [degrees_East]
Latitude [degrees_North]
delta13co2aq [per mil]
co2aq [umol/L]
Ocean Data View

Fig. 1.