

## ***Interactive comment on “Dynamics of seawater carbonate chemistry, production, and calcification of a coral reef flat, Central Great Barrier Reef” by R. Albright et al.***

**R. Albright et al.**

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Methods:

1. Please describe the drifters used for the night time experiments in more detail. Did you ever deploy the drifters during the day with the fluorescein patch to see if they agreed? Falter et al. (2008 JGR) found that current speeds determined using drifters were 30-100 % greater than those determined using ADCPs and dye patches (which agreed well with each other). Could your night time nec/ncp rates be biased by using drifters vs dye?

Please refer to our response to Reviewer 1, Comment 1.

C4069

2. Where is the Integrated Marine Observing System (IMOS 2012) located? How close to Davies Reef? Do the salinities collected here accurately represent those on the reef?

The Davies Reef Tower is located approximately 1.5 km from the center of the reef flat site. The tower is situated in the center of the lagoon. A YSI temperature and salinity logger that was deployed on the reef flat in August indicated that salinities on the reef flat were accurately represented by the IMOS station – both datasets indicated mean salinities ( $\pm 1$  SD) of  $35.6 \pm 0.1$ .

3. Please include info on how atmospheric pCO<sub>2</sub> was measured.

Atmospheric pCO<sub>2</sub> was not directly measured but was assumed to be 394  $\mu$ atm. This has now been added to the methods.

Results:

1. Please use SI units, i.e. km/h or m/s instead of knots.

The units have now been changed.

Discussion:

1. I agree with reviewer 2 that the limitations/errors involved with a Lagrangian approach and the possible relationship with the large scatter in the nec and ncp data need to be discussed.

Please see our response to Reviewer 1, Comment 2 regarding the sources of variation that are now included in the discussion.

2. 4.1 and 4.2 read a bit too much like a repetition of the results. These sections should be streamlined and perhaps combined if streamlining leaves them very short.

We have made efforts to streamline the results and discussion in the revised version of the manuscript.

C4070

3. What year did Barnes conduct their study on Davies Reef?

Barnes conducted his studies in 1981 and 1984 – this has already been noted in the discussion.

Tables:

Table 1: Why is there no range for T and S? Please include.

Ranges are now included.

Figures: In general the figures are of high quality and look good but could be larger. The text in several is too small and hard to see.

Unfortunately, we have no influence over figure size; this is determined by the formatting requirements of the journal.

Text size has been increased.

Figure 3: Difficult to see numbers and axis labels, make fonts bigger.

Font size has been increased from 18 to 22 for the axis numbers and to 26 for the axis labels.

Figure 4: Make fonts on y axis numbers and x axis dates bigger.

Font sizes have been increased.

Figure 5: All fonts a little bigger.

Font sizes have been increased.

Figure 6: Extremely difficult to see white arrows and text: make lines thicker and try bolding the text, you might want to try a different color. Figure needs to be larger.

Adjustments to line thickness and text have been made. Unfortunately, we do not have control over the figure size.

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Interactive comment on Biogeosciences Discuss., 10, 7641, 2013.

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