

## ***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.***

**Anonymous Referee #3**

Received and published: 28 June 2013

General:

This manuscript covers a study in which diel and seasonal trends in carbonate chemistry and net ecosystem calcification (nec) and net community production (ncp) rates were measured on a coral reef flat on the Great Barrier Reef. The manuscript is clearly written and the data are very valuable, as measurements of the carbonate chemistry within coral reef systems and of nec and ncp rates of coral reefs are sparse. More studies of this nature are needed to improve predictions of coral reef responses to continued anthropogenic ocean acidification. I do have some concerns about the methods and data that need to be addressed, see detailed comments below.

C3061

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?

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?

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

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

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.

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.

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

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

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.

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

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

Figure 5: All fonts a little bigger.

Figure 6: Extremely difficult to see white arrows and text: make lines thicker and try

C3062

bolding the text, you might want to try a different color. Figure needs to be larger.

Assuming the above points are addressed, I recommend publication of the manuscript following minor revisions.

---

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

C3063