

# Using radiocarbon in coral skeletons to reconstruct seep CO<sub>2</sub> input into seawater DIC at Milne Bay, PNG

S.J. Fallon,<sup>1,\*</sup> K. Fabricius,<sup>2</sup> J. Lough,<sup>2</sup> S. Noonan,<sup>2</sup> and C. Humphrey<sup>2</sup>

<sup>1</sup>*The Australian National University, ACT 0200, Australia*

<sup>2</sup>*Australian Institute of Marine Sciences, Townsville, QLD 4810, Australia*

Porites coral cores have been collected from unique volcanic CO<sub>2</sub> seeps in Milne Bay Province, Papua New Guinea. The CO<sub>2</sub> gas bubbles emerging from the reefs provide local ocean acidification conditions similar to those predicted for the middle to the end of this century, and beyond. Volcanic CO<sub>2</sub> bubbling through the seawater in Milne Bay is free of radiocarbon, resulting a unique signal that is preserved in the coral skeleton. We have measured the radiocarbon content of the coral skeleton back through time from sites heavily impacted by CO<sub>2</sub> and control sites not impacted by CO<sub>2</sub> seeps. Three impacted sites show an increase of CO<sub>2</sub> into the DIC by 4%, 10% and 14%. Using these values we can estimate the pH at the impacted sites. In 2009 the impacted sites had estimated pH of 7.85, 7.6 and 7.4. These values agree with in situ measurements of seawater pH at the time the corals were collected.

---

\*Electronic address: [stewart.fallon@anu.edu.au](mailto:stewart.fallon@anu.edu.au)