

## ***Interactive comment on “Coral records of reef-water pH across the central Great Barrier Reef, Australia: assessing the influence of river runoff on inshore reefs” by J. P. D’Olivo et al.***

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Received and published: 29 October 2014

This manuscript describes the relationship between pH, boron isotopic compositions and growth of reef corals under changing river discharge conditions. The scientific approach is both sound and the results are interesting in that they address one of the unarticulated, but long-standing issues in biological archives: that these corals are part of a dynamic reef community ecosystem that may not be driven by global but rather local changes. Generally, the manuscript is well-written and has few grammar and spelling issues. Specific scientific and written questions/suggestions/criticisms are outlined below (line by line).

C6274

### Specific Comments

Page 11444, line 25: Even though the title indicates that this study location is the Great Barrier Reef in Australia, it would be useful to indicate the region of European settlement and refer to the 1st figure.

Page 11445, line 2: one of a few times that the authors use “This” without a modifying noun: suggest “This change in discharge” or just “The change in discharge”

Page 11445, line 11: Despite implies an argument, suggest a word change to indicate that the sum of the prior work has not yet addressed the issue at hand

Page 11445, line 13: “because” instead of “since”

Page 11445, line 29: delete “which is”

Page 11447, line 4-5: other important environmental parameters is too vague – indicate the actual environmental parameters that you assessed

Page 11449 line 6-9: need to describe the procedures briefly even if published elsewhere – this is important because later (page 11450, line 24) indicate that extraction and purification is for 1 microgram of boron for water. What is the amount of material required to get the required amount for measurement? What is the required amount for measurement?

Page 11449 line 14: reporting precisions in 2 sigma, but is this SD or SE?

Page 11449 line 22: please compare measured standard values to accepted or published literature values

Page 11450 line 1: it is generally accepted that SW boron is constant, but because labs have different standard measurements (e.g. small offsets), should be using in-house measured seawater compositions. Also, given the possibility of slightly different seawater compositions due to dilution from river water this point should be directly addressed here.

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Page 11450 line 4: need reference for calculation of pKB

Page 11450 line 19-25: suggest moving all of this to beginning of methods section – so can compare methods for carbonates with water all at once

Page 11451 line 17-19: SE on a small number of samples is not appropriate and goes back to earlier comment about indicating at the beginning is 2-sigma is SD or SE throughout the manuscript.

Page 11452 line 16: does the linear regression take into account the different errors in the measurements? Or are you applying the external reproducibility precision?

Page 11456 line 25-27: this would be a good place to introduce the idea that the increase in pH of seawater is also correlated with lower growth of corals.

Page 11457 line 27: “specific environmental parameters” is not specific... suggest adding “such as...”

Section 4.2.4: the idea that phytoplankton blooms can inhibit coral growth (and even the evolution of corals) is longstanding and has implications throughout the geologic record and this body of literature needs to be referenced a little (e.g. Hallock, 1986)

Page 11460 line 16: suggest deleting “However”

Page 11460 line 19: “This suggests”, this what?

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Interactive comment on Biogeosciences Discuss., 11, 11443, 2014.