Biogeosciences
Discussions

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Interactive
Comment

Interactive comment on "Spatiotemporal variability of sedimentary organic matter supply and recycling processes in coral reefs of Tayrona National Natural Park, Colombian Caribbean" *by* E. Bayraktarov and C. Wild

Anonymous Referee #2

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The manuscript describes the rate of particulate organic carbon and nitrogen supply to sediments in 4 different bays over time. Sediment types are described (giving their porosity, grain size, POM, pigment, and carbonate content) and the oxygen consumption as well as calculated POC turnover rates. The study differentiates between sheltered and exposed sites and between upwelling and non-upwelling seasons. Although the manuscript gives a nice overview on the assessed parameters in 8 locations over a 13 month time period in monthly intervals there seem to be some major issues with this study:

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Interactive Discussion

Discussion Paper

The main problems, in my opinion, are:

1.) The introduction gives an overview on the ecological role of carbonate sands for aquatic systems. But from what I get from the results the study was conducted in coastal areas where the main component (> 90 %) is silicate sands. The authors state there are different properties between silicate and carbonate sands, but they do not mention the ecological role of silicate sediments or how they differ from carbonate sands at all in the introduction. Thus it seems a little incongruous.

2.) The main point of the manuscript is the assessment of seasonal upwelling and the exposure of the respective sampling sites on the assessed parameters. However, it seems neither indicators for upwelling (e.g., temperature, DOC, inorganic nutrient concentrations...) nor exposure (wave heights and impacts, currents, surge...) have been assessed during the sampling period, which makes relation of the assessed parameters to upwelling and exposure arbitrary.

3.) The particulate carbon turnover has been calculated via oxygen measurements. What about dissolved carbon in the incubation waters? Would parts of the dissolved organic carbon stock not be the more bioavailable fraction for microbes in the sediment and thus serve as food source – at least partly? This seems to prohibit a POC turnover rate calculation based on oxygen consumption rates?

4.) I know there was a recent manuscript published by this lab (Benthic Primary Production Budget of a Caribbean Reef Lagoon, Naumann et al 2013), describing the sediment as net autotrophic. Following the methods described in Wild et al. 2010 the remineralization incubations were conducted in the dark. The authors mention in the discussion that the potentially higher nutrients may lead to increased primary production during the day. Why was only the dark cycle measured after the previous findings published by this lab? Would not the net diurnal metabolism have more ecological significance?

Minor comments:

Abstract

Please try to write concise sentences in the abstract (Line 2 – 7). List the sediment properties in the abstract.

Statistical data analysis

It is explicitly mentioned here that differences were examined in respect to wave and current exposure. I can not find any assessment of these parameters in the manuscript.

Results

What is "close to significant"?

Discussion

The first sentence pics up on results which are not significant regarding the parameters measured and correlates them to parameters not assessed? What are low-energy sediments?

Interactive comment on Biogeosciences Discuss., 10, 19895, 2013.