Biogeosciences Discuss., 11, C8122–C8123, 2015
www.biogeosciences-discuss.net/11/C8122/2015/

Biogeosciences
Discussions
Open Access

Interactive comment on "Peru upwelling plankton respiration: calculations of carbon flux, nutrient retention efficiency and heterotrophic energy production" *by* T. T. Packard et al.

Anonymous Referee #1

Received and published: 19 January 2015

In this manuscript the authors use microbial ETS activity as a proxy for the export and degradation of particulate organic carbon from the epipelagic to the deep ocean. This relationship is described using a new metric, the nutrient retention efficiency (NRE), which is defined as the ratio of nutrient regeneration in a layer to the nutrients introduced into that layer. The paper is very well written, contains some interesting ideas/concepts and the topic is of high relevance for Biogeosciences. I therefore suggest that the manuscript is accepted for publication after some minor edits.

Minor comments

Introduction

Page 16179, line 14-15: Add references for the statements on the "studies of Jenkins" and the "vertex program". Page 16180, line 24: Spell out "HEP".

Methods

Page 16182, line 18-20: Please add a more detailed description of the ETS method used. Page 16182, line 25-26: This part is not clear for me; so please explain in more detail. Page 16183, line 5: Why was the data normalised? Page 16183, line 16-17: The assumption that no degradation of DOC is taking place is not supported by the literature; how would a more labile DOC pool impact your results? Page 16183, line 21: What is a "small seafloor C burial? Please be more precise. Page 16184, line 10: Spell out "NRE". Page 16185, line 5-21: Move the "Ocean setting" section to the results.

Results

Page 16186, line 9: This high respiration would not only be due to phytoplankton but also the associated heterotrophic bacteria. Page 16186, line 14: What impact would Anammox have on the calculations of anoxic respiration? Please explain and discuss this in more detail.

Discussion

Page 16189, line 10: Delete one of the "and" after POC.

Tables

Table 2-6: Are all tables necessary? Could some of them not be combined? Table 2: Please describe how you calculate potential R from the ETS activity.

Interactive comment on Biogeosciences Discuss., 11, 16177, 2014.