

Interactive comment on “Assessing net community production in a glaciated Alaska fjord” by S. C. Reisdorph and J. T. Mathis

Anonymous Referee #1

Received and published: 4 November 2014

General comments

The magnitude, spatial and temporal variability of net community production (NCP) in a glaciated fjord, was measured through different species: dissolved inorganic carbon (DIC), inorganic macronutrients, dissolved oxygen (DO) and particulate organic carbon (POC). Net community production varied with seasons. The work should concentrate on more general statements for the system and not treat the different sites separately.

Specific & technical comments

Abstract

Avoid acronym for Glacier Bay (GLBA) throughout the ms. It is not much longer than Glacier Bay and much better to read, the same is true for Gulf of Alaska (GOA), Prince

C6449

William Sound (PWS).

Introduction

P 4 Line 16 Definition of ecosystem functionality is essential since it is one of the objectives

P 5 all the NCP provided could be presented in a Table. I don't see how this data compared that are one order of magnitude different

Author propose that to understand the dynamics that drive NCP and the associated air-sea CO₂ fluxes related to deglaciation processes is of great interest worldwide. It seems interesting to compare with Chilean Patagonia and fjords in Norway, I strongly suggest this to improve generality. Expand on Aracena 2011 and fjords overall exchanges with the open ocean.

Pag 7 Keep focus in assessing net community production, in order to resolve about magnitude of sink for atmospheric CO₂. To connect with fish community structures or endangered species may be a different objective.

Methods

Pag 10 Line 20 replace (prepared and distributed by Andrew Dickson, UCSD) by “measures were standardized using certificated reference material distributed by Scripps Institution of oceanography (Dr. Andrew Dickson laboratory) “

Results and Discussion

Results

Spatial and seasonal distributions of DIC and nitrate are well described but I suggest that “carbon overconsumption”, the process in which more DIC is taken up than that inferred from the C:N Redfield ratio (Pag 15) should be clarified by means of a conceptual diagram (even qualitative) to take advantage of novel results, better understand results and facilitate certainties.

C6450

Figs 3 and 4 are not easy to follow, and this is linked to my final statement about Fig 7. Maybe the seasonality is less important than the overall spatial behaviour of the system. Seasonality in high latitudes is already a very well-known issue. Maybe the use of spatial statistic would contribute to better comprehend the behaviour of fjords in general.

Page 18 lines 6- 14 should be improved. Next 8 pages with only 3 references for discussion need to be shortened to arrive to the conclusions

I suggest the Results should be separated from the Discussion, I had to study the paper to be able to process all the text written data. Maybe another diagram should be included to show them.

Figure 7. Authors should take advantage of these results. They should synthesise about ecosystem functionality, is it one? are the different sites, different ecosystems? Which is the scale?

Please discuss Martiny et al. (2013), they suggested that the coupling between oceanic carbon, nitrogen and phosphorus cycles may vary systematically by ecosystem and proposes a C:N:P ration of 78:13:1 in cold, nutrient-rich high-latitude regions.

I recommend making major revision to the ms (synthesise results and then discuss) for reconsideration. Results are worth publishing and only poorly presented.

Interactive comment on Biogeosciences Discuss., 11, 13029, 2014.