

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

Anonymous Referee #2

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Biogeosciences Discuss., 11, 13029–13065, 2014 Assessing net community production in a glaciated Alaska fjord S. C. Reisdorph and J. T. Mathis

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General comments

The regions where glaciers meet the sea are of considerable interest. This paper describes results from an extensive sampling project covering all seasons. The presentation is, however, such that an evaluation of the scientific merits of this work is not feasible and publication is not recommended. I will mention some, but not all, issues behind coming to this conclusion. The description of the study area lacks numerical information on bathymetry, areas and salinity distribution. The presentation of the re-

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sults has to be raised to a level of overview and synthesis from the tedious rounds of descriptive text. Graphics and tables might improve the presentation in this respect. The primary subject of the manuscript, net community production, is assessed on the basis of salinity normalized DIC data. The details of the calculations are not sufficiently described but this reviewer recalls the paper by Friis et al. (1999) on the errors which may be introduced by conventional salinity normalization when the low salinity end-members have significant inorganic carbon concentrations (Friis et al., 2003).

Specific comments

In section 2 on methods one would expect to see the name of the vessel used on cruises, and a reference to the protocol for the oxygen determination, and an explanation for using $0.8\mu\text{m}$ filters for filtering nutrient samples, and what “muffled” means for glass fibre filters used for POC samples, and a mention of the type of the 13 mm glass fibre filters. And is the protocol for nutrient analyses really according to a reference from 1981? Since then quality control awareness has had a large and positive influence towards making nutrient results more reliable.

Glacial flour is one of the characteristics of glacial waters. Are there any carbonate minerals in the glacial flour that could affect the DIC determinations?

There are two errors in equation 2 on page 13038 and there is no explanation for choosing to use the cubic wind relationship of Wanninkhof and McGillis (1999). Nor is there an explanation for using one number in all seasons for atmospheric CO_2 , $395\mu\text{atm}$.

In section 4.2 the results of the NCP calculations are expressed both as $\text{mmolC/m}^2/\text{d}$, and as g C/season , which is not intelligible as the time unit used here “seasons” is either 2 or 3 months and it is not clear how NCP is integrated over areas. The sums of NCP per season, e.g. page 13044 line 24, come to very large numbers, incomprehensible to this reviewer.

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Friis, K., Körtzinger, A., Wallace, D.W.R., 2003. The salinity normalization of marine inorganic carbon chemistry data. *GEOPHYSICAL RESEARCH LETTERS* 1085 33, doi:10.1029/2002GL015898.

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