

Interactive comment on “Validation of carbon isotope fractionation in algal lipids as a PCO_2 proxy using a natural CO_2 seep (Shikine Island, Japan)” by Caitlyn R. Witkowski et al.

Anonymous Referee #2

Received and published: 6 July 2019

Witkowski et al. report carbon isotope fractionation from CO_2 into algal lipids found in various sample substrates in the vicinity of natural CO_2 seeps. They successfully use these sites to ground-truth the use of algal lipid carbon isotope fractionation as a pCO_2 proxy. I congratulate the authors on this novel, comprehensive, and concise study. I have some minor comments that should be addressed before acceptance. Further, I would like to ask the authors to use continuous line numbers in the future, as is standard practice.

Line comments: Page 4, 1: Why were the filters combusted only at 300 C for 3h? Standard practice is 450 C for 5h or similar.

Printer-friendly version

Discussion paper



Page 5, 6-8: Unclear if the reported pCO₂ values (is this dissolved CO₂?) are taken from the literature or are original data. If these are original data, the authors need to state in detail how pCO₂(aq) was calculated. If these are literature values, and not measured from the same samples as the d13C-DIC values, the authors need to state why they consider these values to be adequate for comparison with their samples (both in a spatial and temporal sense).

Page 5-6: The authors should include all data as either a main text table or supplementary table/data file, containing d13C-DIC, d13C-CO₂, d13C of biomarkers etc.

Page 8, 11-12: Is it reasonable to assume a constant temperature? Is there no seasonality in primary productivity at this site?

Page 8, 25-Page 9, 21: Here you could discuss the recent paper by Badger et al. (Climate of the Past, doi: 10.5194/cp-15-539-2019) suggesting insensitivity of alkenone-13C at low-mid pCO₂ levels.

Page 9, 18: “annually”

Page 9, 28: I would suggest being more cautious with the wording (“likely”) here. Can you provide evidence to support your argument for allochthonous input? Where would this come from?

Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2019-158>, 2019.

Printer-friendly version

Discussion paper

