Biogeosciences Discuss.,
https://doi.org/10.5194/bg-2020-232-AC3, 2020

Biogeosciences Discussions

Interactive comment on "Chemical characterization of Punta de Fuencaliente CO_2 seeps system (La Palma Island, NE Atlantic Ocean): a new natural laboratory for ocean acidification studies" *by* Sara González-Delgado et al.

Sara González-Delgado et al.

saglezdel@gmail.com

Received and published: 1 October 2020

Thank you for the review our manuscript and for your comments and constructive criticism. We have considered them and add more information to clarify the confusing points.

Responses to Referee's comments:

Referee #3; comment 1: "The authors describe the chemistry of a "new" CO2 vent system. Due to the extreme variability at all sites and the change in alkalinity, the relevance of these sites as a laboratory for future ocean acidification seems limited. Most of the locations seems to have already been described in previous publications. Perhaps the only new location is the lagoon site but its use as a natural analogue for past and future oceans is questionable due to the addition of brackish and groundwater. The other locations were already reported, following the nomenclature in Figure 1: * site H is reported in Hernández, C. A., C. Sangil, and J. C. Hernández. 'A New CO2 Vent for the Study of Ocean Acidification in the Atlantic'. Marine Pollution Bulletin 109, no. 1 (15 August 2016): 419–26. https://doi.org/10.1016/j.marpolbul.2016.05.040. * Site A, B are reported in Viotti, Sofía, Carlos Sangil, Celso Agustín Hernández, and José Carlos Hernández. 'Effects of Long-Term Exposure to Reduced PH Conditions on the Shell and Survival of an Intertidal Gastropod'. Marine Environmental Research 152 (1 December 2019): 104789. https://doi.org/10.1016/j.marenvres.2019.104789. * E,F,G data are not reported in this manuscript as far as I can see. As it is not evident what data is novel, please clearly state what part of the data is unpublished and novel data and which one is not. Also please clearly highligt what does the additional chemistry data add to the previously published studies. At the moment I have difficulties in recommending this manuscript for publication."

- Response: We agree with you that there is some caveats in these type of natural acidified system, however these cavities exists in all of the already described systems. We recommend you to see the Table 2 of our review paper (González-Delgado and Hernández 2018 - Advances in Marine Biology) where we do a comparison between natural acidified systems worldwide. Although, not perfect, these systems with their cavities are very useful to study the impact of OA on marine organisms and its capacity of adaptation, among other things. And, are by far more realistic than OA in vitro experiments. Therefore, we do not agree with you and these systems can be considered natural analogues of future oceans.

It is true that site H (Las Cabras), as well as, sites B and C (Playa del Faro and Los Porretos) have been previously reported. However, this study is the first detailed chemical characterization of the whole area and include new seeps (Echentive Lagune and Los Porretos). For the present study, we include data that have not been used before and that have been collected on the long-term and in a larger scale. Additionally, for this study pH, pCO2, temperature, alkalinity and salinity have been measured accurately using proper apparatus (e.g. VINDTA 3C for alkalinity). Therefore, we consider to be a novelty: (1) The precise chemical description of this acidified system composed of several CO2 seep points and, as you said, the description of the Echentive Lagoons (F and G). (2) All the data presented, and its spatial and temporal variability. (3) And the description of the process of acidification of the coastal area of Fuencaliente (Origin of the seeps).

We would like to clarify, again, that all the measurements in this work (see supplementary material 3) are unpublished data. And we believe that we have not at anywhere in the text given any indication to the contrary. It is true that there are pH and pCO2 measurements at Las Cabras and La Playa del Faro in the previous two papers. We have included this information in Lines 60 and 94. However, these measurements were made at another time and with a different, less precise, methodology and only at the sampling points.

Please also note the supplement to this comment:
https://bg.copernicus.org/preprints/bg-2020-232/bg-2020-232-AC3-supplement.zip

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