

Biogeosciences Discuss., referee comment RC1
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Comment on bg-2021-111

Anonymous Referee #1

Referee comment on "Temporal dynamics of surface ocean carbonate chemistry in response to natural and simulated upwelling events during the 2017 coastal El Niño near Callao, Peru" by Shao-Min Chen et al., Biogeosciences Discuss., <https://doi.org/10.5194/bg-2021-111-RC1>, 2021

The study describes the response of the carbonate system to a simulated upwelling event in large mesocosms installed off the Peruvian coast.

This is a well written and carefully executed study using state of the art methods. The authors did an excellent job describing the experimental design and addressing the uncertainties of their key parameters, pH and TA. This is a pretty straight forward manuscript in a well-designed experimental framework producing important quantitative results. The observed changes in air-sea CO₂ fluxes and the carbonate saturation state supply the scientific community with important information. These results help understanding the role of productive coastal upwelling systems for CO₂ exchange and ocean acidification in response to climate change and associated extensions of oxygen minimum zones and more frequent extreme weather events.

The authors carefully addressed measurement problems and uncertainties of their estimates and I see no major issue with their experimental approach, analytical methods or data interpretation.