

Response to Anonymous Referee #2

We would like to thank anonymous referee #2 for her/his thoughtful review. Our responses to all of the referee's comments and relevant short comments are italicized below.

The authors observed pH and pCO₂ of surface seawater for several years by using moor system and calculated present-day monthly omega. Then, they discuss biological thresholds of shellfish using pre-industrial calculated omega. Overall, I agree with the authors. I also would like to know time series changes of pH and omega during observation, but this would be another topic. Since the manuscript is well written, only a few minor comments are attached below.

We are also very interested in trends of pH and Ω aragonite during the time series; however, because the pH time series are not long enough yet to interrogate these trends, we did not focus on detection of long-term trends in this paper.

We agree with making all edits and minor changes brought up by the referee. We respond to the comments that require more detailed responses below.

Fig.2-7 I would like you to add pCO₂ data

Because a major focus of this paper was to better understand present day exposure to known biological thresholds for shellfish larvae around coastal moorings, we focused on the parameters for which these thresholds have been established. We agree that pCO₂ is also of interest to the ocean acidification community, but in order to maintain this focus and keep the paper to a reasonable length, we intend to present the pCO₂ analysis in a separate paper.

P4 L1 "Overall uncertainty..." Is it true? I think 2 uatm is too small.

Yes, we have published the uncertainty assessment, which uses lab testing and comparisons to ship-based measurements in the field, in the following publication: Sutton et al. A high-frequency atmospheric and seawater pCO₂ data set from 14 open-ocean sites using a moored autonomous system. Earth Syst. Sci. Data, 6, 353–366, 2014.

P4 L30 small errors?

These small errors could reflect the sensitivity of the pCO₂-pH pairing to systematic errors and/or slight mismatches in time and space of the pCO₂ and pH measurements (Cullison-Gray et al., 2011, Marine Chemistry 125: 82–90).

P11 L8-10 and P12 L4-5: I think these two sentences are inconsistent. Does ship-base observation underestimate or overestimate the variability of omega?

*Thank you for pointing out the inconsistency between these statements. We will add the clarification in the statement on page 12 lines 4-5 that ESMS and ship-based observations generally underestimate temporal variability of *open ocean* Ω aragonite.*