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Interactive comment on "Seasonal Carbonate Chemistry Variability in Marine Surface Waters of the Pacific Northwest" *by* Andrea J. Fassbender et al.

Anonymous Referee #1

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Peer Review

Fassbender, A.J., Alin, S.R., Feely, R.A., Sutton, A.J., Newton, J.A., Krembs, C., Bos, J., Meyzera, M., Devol, A., Ruef, W., and Pelletier, G., 2018. Seasonal carbonate chemistry variability in marine surface waters of the Pacific Northwest. Earth Syst. Sci. Discuss., doi:10.5194/essd-2017-138.

Manuscript under review for Earth System Science Data, March 2018

This manuscript uses a publicly available dataset to describe seasonal carbonate chemistry variability in surface waters in several regions through the Pacific Northwest. The dataset was created through a synthesis of both moored and discrete samples

collected from ships to explore spatial and temporal variability across monthly and 0.1 degree scales. Generally, the authors find that significant seasonal and cross-shelf (longitudinal) variability exists for each of 8 regions defined by topographic features and sea surface salinity. The authors also make a robust effort to identify and scale the errors associated with the data they describe.

In general, the authors' efforts to detail the errors associated with the compilation of their dataset represents the bulk of the analysis included here. I found this effort to be extremely meticulous and well thought through, such that the caveats associated with their analysis were clear and easy to understand. Given the careful attention given to data quality, the authors conclusions stand clearly and firmly on their own. In particular, I appreciated sections 4.2 and 4.3, which described the value of the dataset explicitly in terms of its limitations and strengths. In short, the authors were able to show that regardless of the sometimes substantial errors associated with their analysis, the qualitative interpretation of the data was unlikely to change.

For ESSD, reviewers are also asked to review the assets submitted with this manuscript. The extensive metadata record highlights the contributions of each author. The record is extensive enough to denote the unique style of each dataset, but also support the cohesive way in which the manuscript synthesized these data into a single submission. The assets themselves are also easy to understand and constructed well. For my part, I appreciated that the discrete and mooring data were separated into different .nc files for ease of use.

In summary, I am pleased to see that the authors of this manuscript have submitted a unique, useful, and complete dataset to ESSD. It should prove beneficial to others seeking to use this data as a future baseline against which to compare long-term changes or anomalous years. This large-scale environmental context will be an important asset for future research and management efforts in the Pacific Northwest. I have no major comments to contribute to the analysis given the authors attention to detail, and limited minor comments for the authors to address. I congratulate the authors on

their good work and encourage the editors to accept this manuscript for publication.

Minor Comments. This was the most carefully constructed manuscript I have reviewed in the last year. It was clear, well thought out, easy to read, and meticulously proofread. Without extensive grammar corrections, I note the following minor comments related to clarity in lines 539-548. Line 545. I encourage the authors to rephrase to exclude the word 'exceptional,' given that it can be interpreted both qualitatively (high-value, good) and quantitatively (statistical anomaly), and it is unclear which meaning the authors intend in this case.

Line 546-548. I struggle to interpret the meaning of the last sentence without additional context for the vertical scales the authors describe. I assume that the authors refer here to stratification over the upper few meters of the water columnâĂŤi.e., microstratification at the extremely near surface, within the surface mixed layerâĂŤrather than to the impacts of upwelling or other vertical mixing processes occurring in areas with strong depth gradients in carbonate parameters. However, if the authors do intend to say that the magnitude of the seasonal cycle is » than upwelling, this requires some additional explanation rather than a passing reference. I encourage the authors to more specifically state their meaning or to remove this sentence.

Interactive comment on Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2017-138, 2018.