Interactive comment on "First automatic pH measurements in the bottom layer of the Ria de Vigo (NW Spain)" *by* Juan L. Herrera et al.

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The data presented are of scientific interest in order to better understand the variability of pH at different time scale daily/seasonal in coastal waters. The ms is appropriate to support the publication of a data set, but a deeper justification of the short term pH variations observed during the deployments is considered necessary. The comparison of the pH probe with laboratory measurements indicates that the data are of good quality. The data presented consist of 4 set related to 4 different deployments carried out the first 2 in a deeper station of the Ria of Vigo and the second 2 in a shallower one less influenced by sediment resuspension. The first two data set show a high noise that according to the authors is related to the resuspended particles. The scientific relevance of the published data could be better motivated than only to "improve the

temporal resolution of the pH database in the Ria of Vigo". The authors could consider the differences among coastal and ocean definition (Klein et al., Global Change Biology 2019) also to motivate the relevance of the understanding of the processes affecting the CO2 system in coastal waters. I think that it would be useful if the authors could also evidence if there is a short term variability potentially related to tidal or light variations (depending on the local water transparency). A more sound motivation of the range chosen for the pH values check (7.5-8.25) should be provided. As the noise in Deployment 2 is much higher than in Deployment 1 and the reason according to the authors is due to the sediment resuspension can this data be still considered valid? Could the authors overlap the lab measurements on the various time series plots? Regarding the accuracy of the SAMI pH the authors refer to the nominal data reported by the factory, did they checked it? Was a purified indicator used also for the comparison between SAMI – pH and laboratory measurements? Potential errors introduced in pH estimate by using unpurified m cresol purple should be considered and discussed. The reversal of the correlation between pH and salinity should be better represented and explained than only assessing that it is attributable to alternating upwelling/downwelling events. The data related to the pH vs temperature and pH vs salinity regressions could be presented in plots and better discussed. It seems that during the Deployment 3 for colder water temperature ($<13.5°C$) the relationship between pH and T follows a positive linear relationship (r=0.885, p<0.001) whereas for temperature higher than $13.5°C$ the relationship is reversed (r=-0.583, p<0.001). The effect of the salinity on the pH it does not follow a linear relationship however a change is related to salinity: for higher salinity there seem to be an inverse relationship between pH and salinity (r=-0.3107, p<0.001). In the Deployment 4 there is a much higher short term variability of pH (>0.1 units/day) with strong change with respect to the deployment 3 which should be better addressed, presumably it could be related to variations in the seawater characteristics. Also during this deployment the relationship of pH is inverse with salinity and is stronger at salinity higher than 35.4 (r=-0.582, p<0.001). A justification of the abrupt pH change could help to show the validity of the collected data. In the references related to

autonomous pH time series only similar studies carried out in Spain are considered, a comparison with similar approaches in other geographic areas could be useful in order to evidence the relevance of the autonomous pH monitoring for understanding coastal carbon dynamics and processes.

Minor comments: L. 55. avoid the repetition of "measures" L.124. "Deployment 1 and 2 show positive pH trends". I suggest specifying "temporal trends" Figure 1. In the small inserted figure, the study area could be better evidenced. Figure 2. The statistical significance of the linear regression could be added in the figure. Figure 4. Avoid the overlap of the numbers on Y axis Figures 4 and 5. I suggest to evidence directly in the graphs those referring to station A and those referring to station B. Table 1. The title of the columns should be similar as for the measured parameters all refer to time series: pH series dates, temperature series dates,... or could be grouped under a common title as "time series dates".

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