



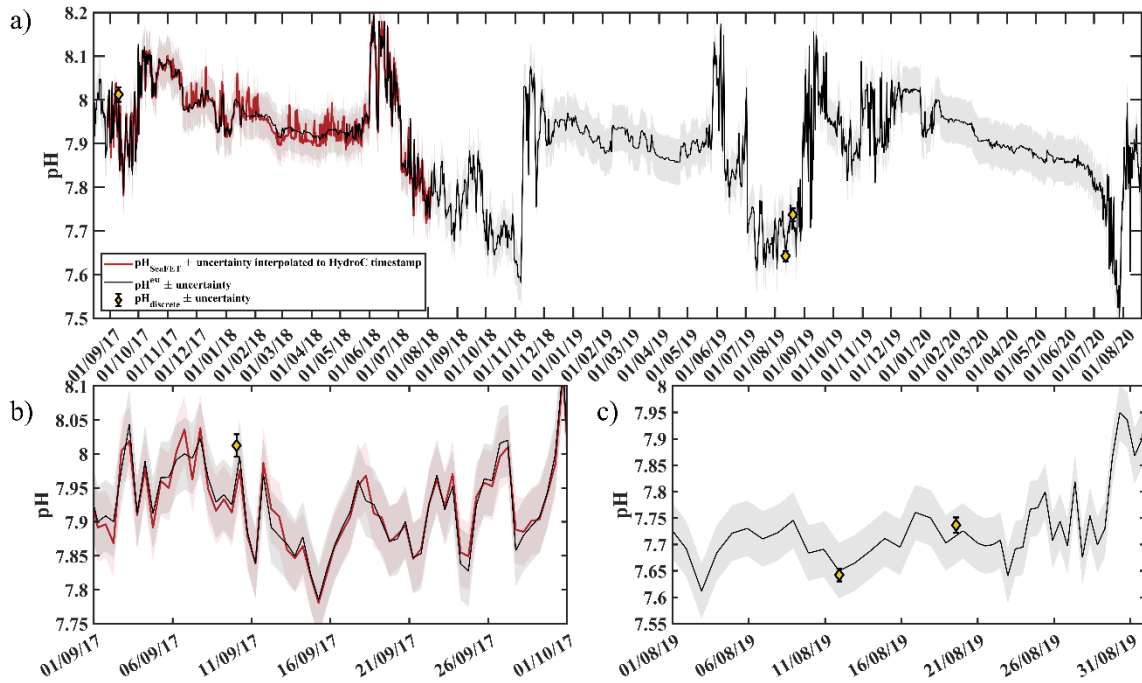
Supplement of

Insights into carbonate environmental conditions in the Chukchi Sea

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 2 **Figure S1. Time series of pH with uncertainty and *in situ* reference values.** (a) Timeseries of pH^{est}
 3 (black line), $\text{pH}_{\text{SeaFET}}$ (interpolated to HydroC timestamp; red line), and $\text{pH}^{\text{disc}}_{\text{calc}} \pm u_c$ (yellow faced
 4 diamonds with error bars). Uncertainty is shaded for $\text{pH}_{\text{SeaFET}}$ (light red) and pH^{est} (gray) and shown as
 5 error bars for $\text{pH}^{\text{disc}}_{\text{calc}}$. (b) Zoomed in section to highlight $\text{pH}^{\text{disc}}_{\text{calc}} \pm u_c$ used as reference (01/09/2017
 6 - 01/10/2017). (c) Zoomed in section to highlight $\text{pH}^{\text{disc}}_{\text{calc}} \pm u_c$ used as references (01/08/2019 –
 7 01/09/2019)

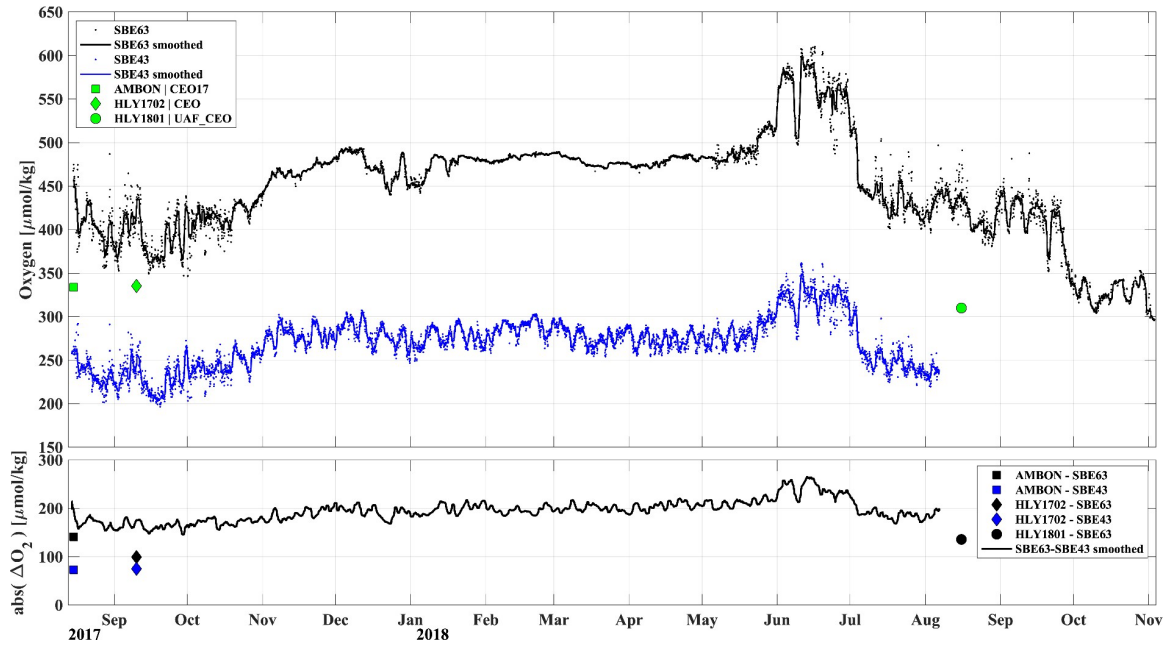


Figure S2. Evaluation of oxygen data. Top axes show timeseries of oxygen from a) post-calibration corrected and pumped SBE63 from 2017-2018 and 2018-2019 deployments (2 h resolution black dots, 36 hour moving mean smoothed black line), unpumped SBE43 from 2017-2018 deployment (2 h resolution blue dots, 36 hour moving mean smoothed blue line), and oxygen interpolated to moored sensor depth from AMBON 2017 cruise (green square; Danielson, 2021), HLY1702 cruise (green diamond; Cross et al., 2020a), and HLY1801 cruise (green circle; McRaven and Pickart, 2021). Bottom axes show absolute differences in oxygen between discrete or cast oxygen interpolated to moored sensor depth (AMBON=square, HLY1702=diamond, HLY1801=circle), and absolute difference between smoothed moored sensors (black line).

30 **References**

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