



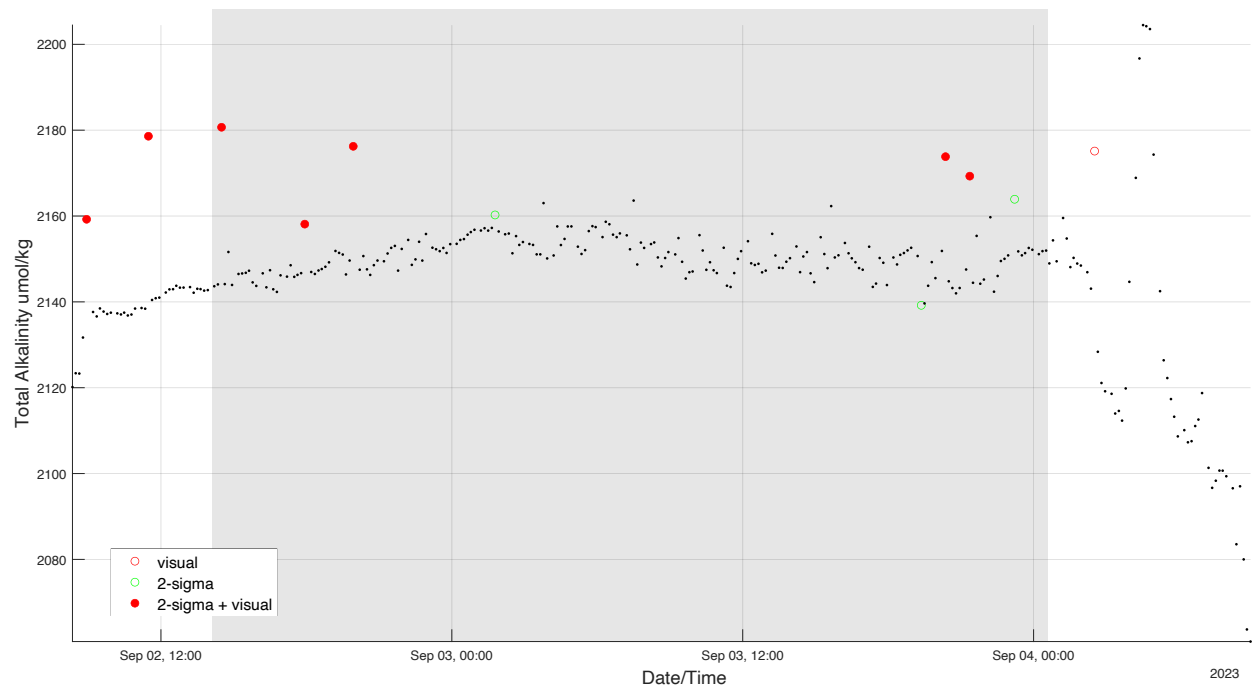
*Supplement of*

**A tracer study for the development of in-water monitoring, reporting, and verification (MRV) of ship-based ocean alkalinity enhancement**

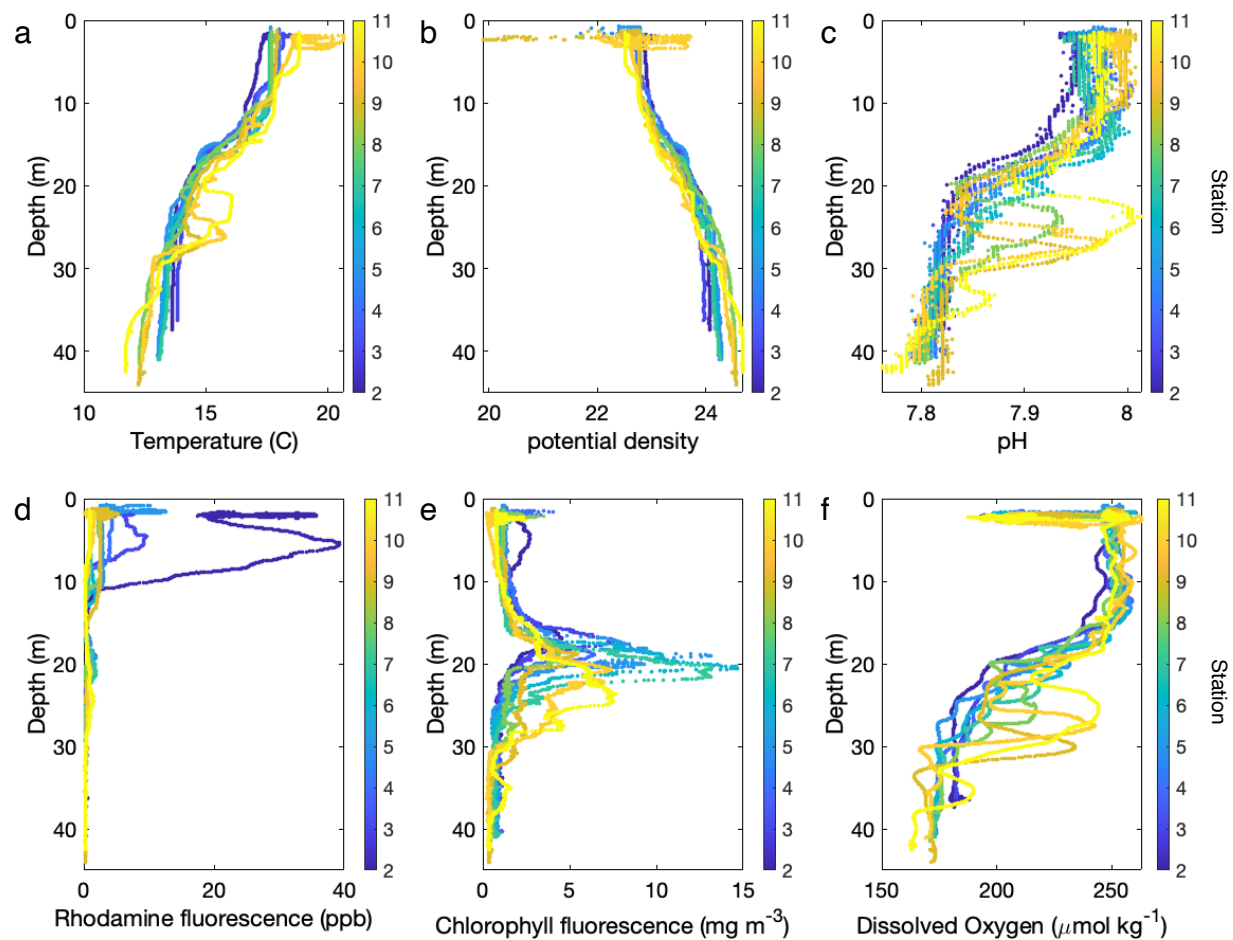
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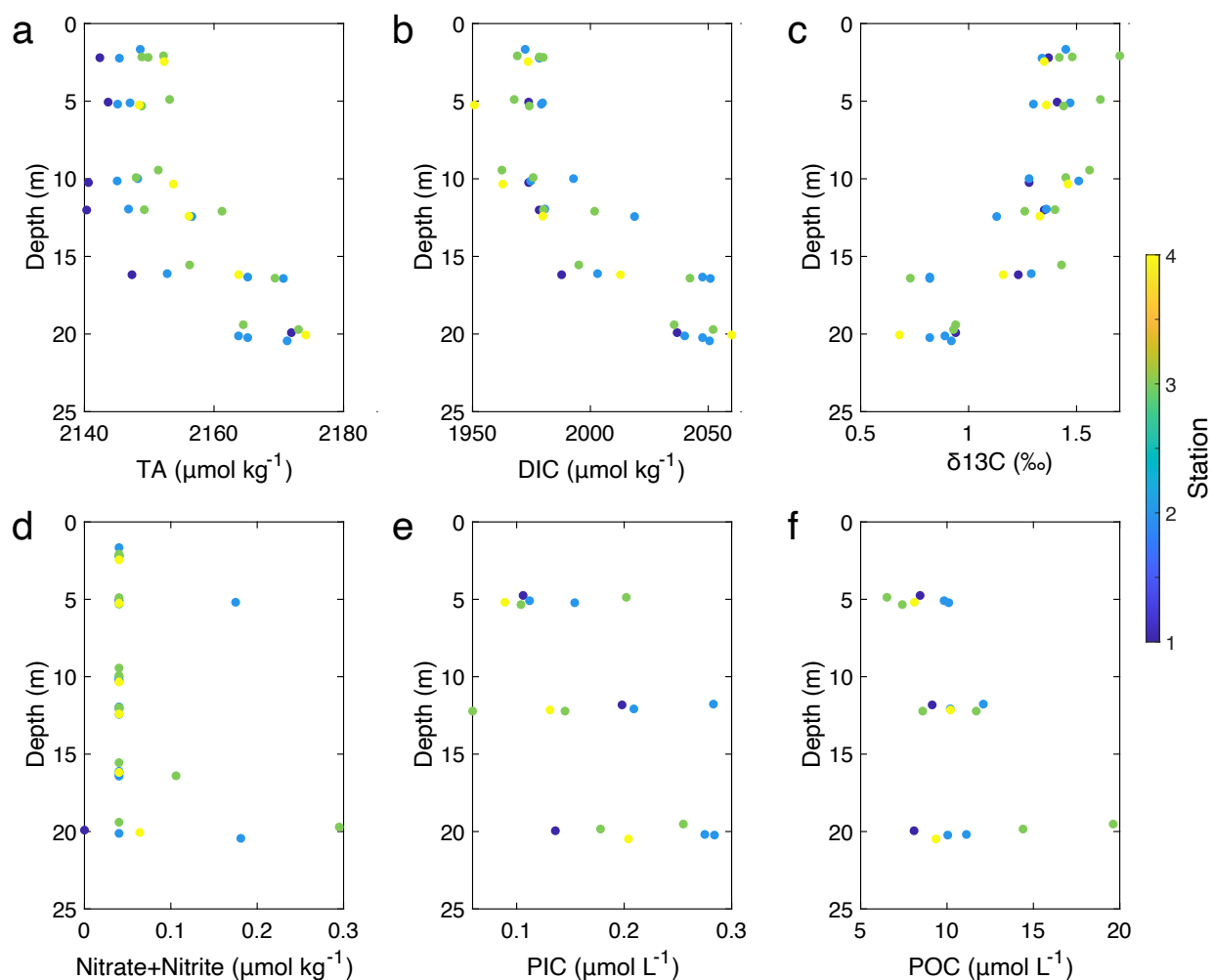
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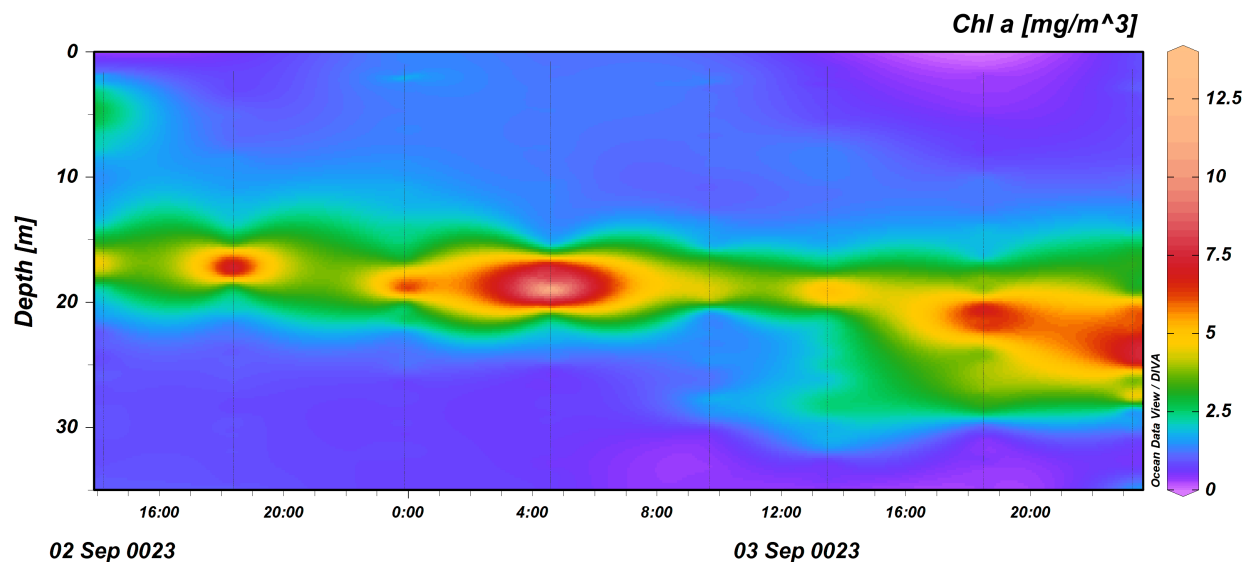
**Figure S1:** HydroFIA underway data, showing identified outliers. The gray window indicates the time period of the dispersal and monitoring period. Lower alkalinity after the monitoring ended corresponded with returning to the coastal zone with lower salinity and alkalinity. Outliers identified by the visual and 2-sigma methods are shown as filled red circles. Only visually identified outliers are in open circles. Only 2-sigma identified outliers are shown as green circles.



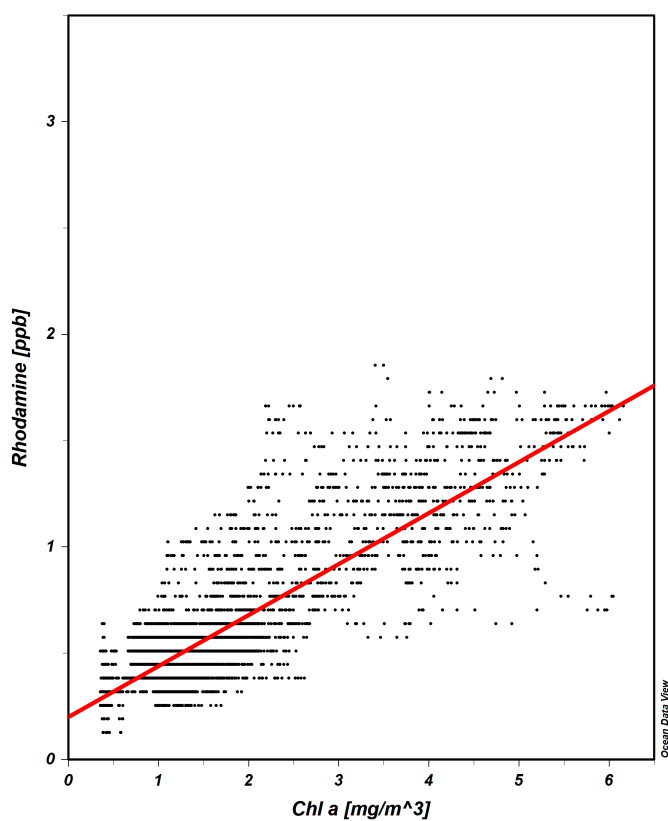
**Figure S2:** CTD sensor downcast data, taken in “in patch” stations throughout the monitoring period. Temperature (a), potential density (b), pH (c), rhodamine water tracer (RT) fluorescence (d), chlorophyll-*a* fluorescence (e), and dissolved oxygen (f).



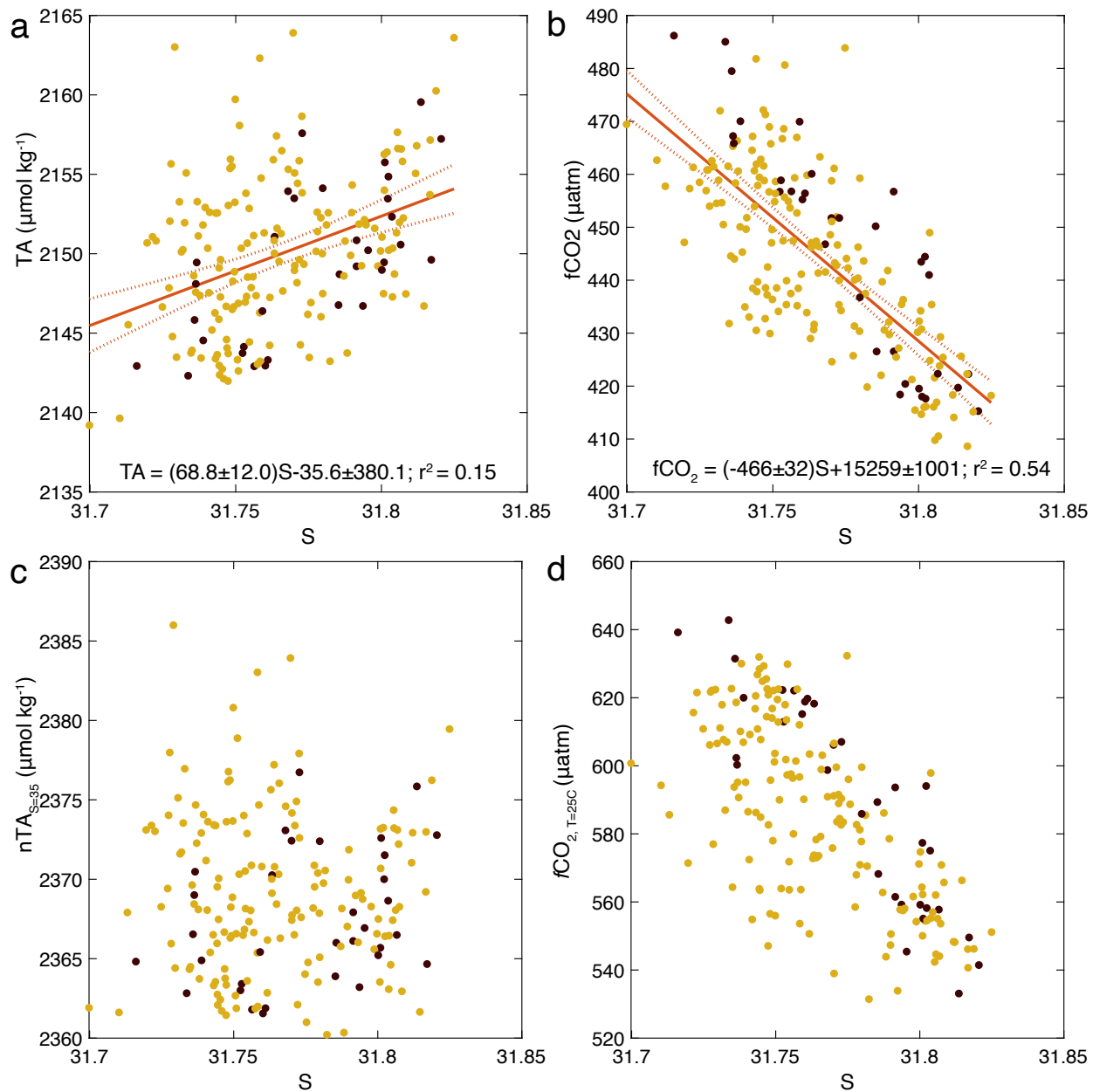
**Figure S3:** CTD bottle data, taken at the first four in-patch and out-of-patch stations. Total alkalinity (TA) (a), DIC (b),  $\delta^{13}\text{C}$ -DIC (c), Nitrate+Nitrite (d), particulate inorganic carbon (PIC) (e), and particulate organic carbon (POC) (f).



**Figure S4:** Section of Chl-*a* over time for the 9 CTDs taken inside the patch.



**Figure S5:** Correlation between Chl-*a* and rhodamine fluorescence. The regression shows all data in the out-of-patch stations, with the relationship  $\text{rhodamine (ppb)} = m \cdot (\text{Chl-}a \text{ (mg m}^{-3}\text{)}) + b$ , with  $m = 0.24 \pm 0.01 \text{ ppm mg}^{-1} \text{m}^3$  and  $b = 0.20 \pm 0.02 \text{ ppb}$ .



**Figure S6:** Salinity-property plots. (a) and (b) show the same plots as Fig. 9a and b, with linear regressions and errors shown. (c) shows salinity-normalized TA as a function of salinity, calculated as  $n\text{TA} = \text{TA}_{\text{meas}}/S \cdot 35$ , demonstrating no relationship with salinity. (d) shows temperature-normalized  $f\text{CO}_2$ , calculated at  $25^\circ\text{C}$ , as a function of salinity. The gradient across the salinity front is over  $100 \mu\text{atm}$ .