

Supporting Information

Oxygen consumption and organic matter remineralization in two subtropical, eutrophic coastal embayments

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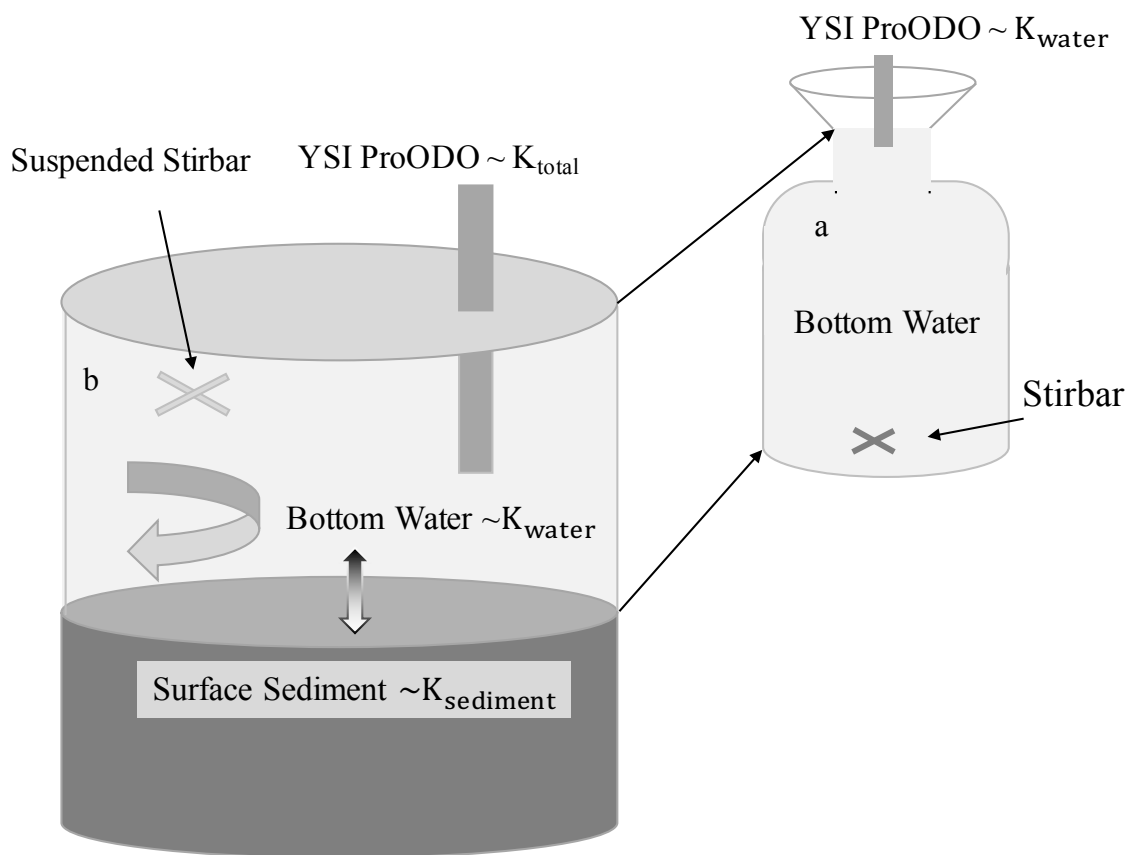


Fig. S1. Schematic diagrams of experimental setup for oxygen consumption rate measurements for (a) water column and (b) sediment-water interface.

An example of DO consumption rate calculations

Based on water salinity and the incubating temperature (Table S1), we calculated that saturated DO concentration in water incubation was $210.6 \mu\text{mol L}^{-1}$. The regression lines based on the first 200 mins (Fig. S4) showed the %DO consumption rate, i.e., $77.2\% \text{ d}^{-1}$. Therefore, the DO consumption rate can be calculated as $210.6 \mu\text{mol L}^{-1} \times 77.2\% \text{ d}^{-1} / 100 = 162.5 \mu\text{mol L}^{-1} \text{ d}^{-1}$, or $162.5 \text{ mmol m}^{-3} \text{ d}^{-1}$. Given that the average water depth was 2 m, then the depth-integrated DO consumption rate at Station BB6 in July 2015 was $325.1 \text{ mmol m}^{-2} \text{ d}^{-1}$ (Table S1).

The %DO consumption rate in the sediment core incubation (both overlying water and sediment, Fig. S2b) was $253.7\% \text{ d}^{-1}$ as measured by the DO sensor in the overlying water using the first 100 mins of data. Assuming that the DO consumption rate in the overlying water was the same as that in the water-only incubation, the net DO consumption rate across the sediment-water interface as translated to be equivalent to water column DO consumption was $253.7\% \text{ d}^{-1} - 77.2\% \text{ d}^{-1} = 176.5\% \text{ d}^{-1}$. Given that the overlying water depth in the sediment core was 12 cm, the sediment DO consumption rate integrated to this 12 cm was calculated as $44.6 \text{ mmol m}^{-2} \text{ d}^{-1}$.

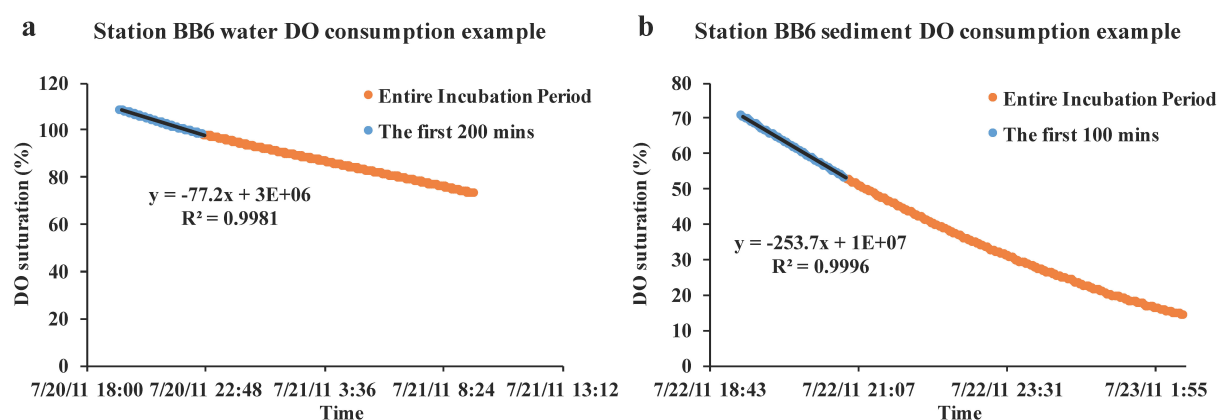


Fig. S2. The DO concentration changes during water and sediment incubations from Station BB6 in July 2015.

Table S1. An example of DO consumption rate calculations (Station BB6, July 2015).

BB6 July 2015		
	Water	Sediment
Temp (°C)	29.8	29.8
Salinity	21.5	21.5
DO Saturation concentration ($\mu\text{mol L}^{-1}$)	210.6	210.6
DO consumption rate total (% day ⁻¹)	-	253.7
DO consumption rate in overlaying water (% day ⁻¹)	-	77.2
DO consumption rate (% day ⁻¹)	77.2	176.5
DO consumption rate ($\mu\text{mol L}^{-1} \text{ day}^{-1}$)	162.5	371.8
Water depth (cm)	200	12
DO consumption flux ($\text{mmol m}^{-2} \text{ day}^{-1}$)	325.1	44.6

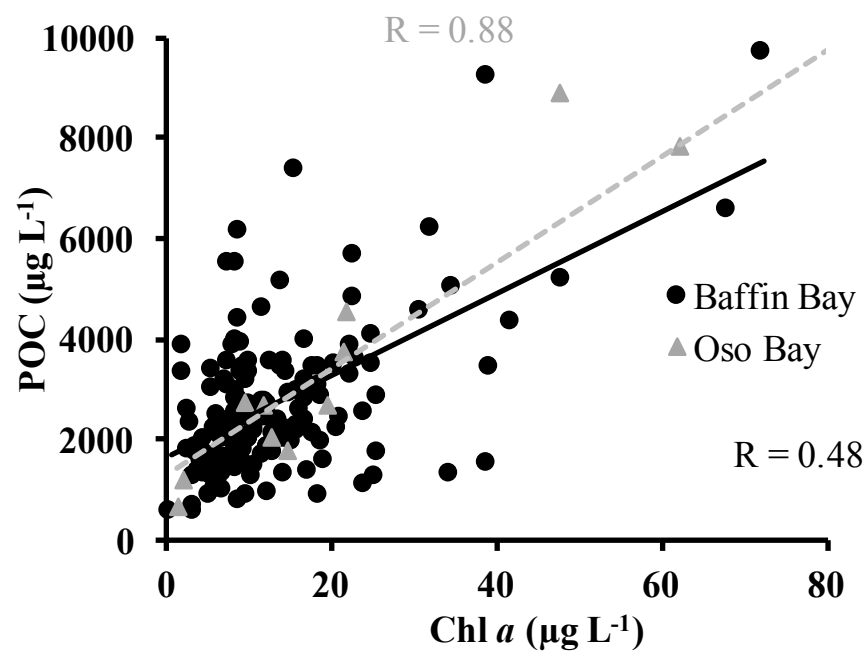


Fig. S3. The relationships between POC and Chl *a* concentrations in Baffin Bay and Oso Bay.

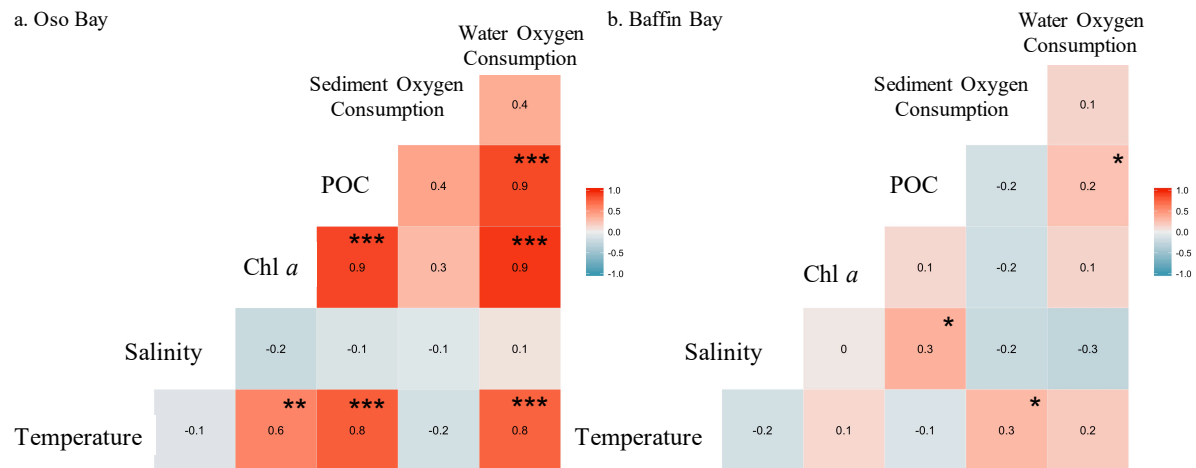


Fig. S4. Correlation analyses of multiple variables with sediment DO consumption and water DO consumption rates at Station Oso Ward in Oso Bay (a) and Stations BB3 and BB6 in Baffin Bay (b). * represents $p<0.05$, ** represents $p<0.01$, and *** represents $p<0.001$.