

**Mechanistic Links Between Climatic Forcing and Model-based Plankton Dynamics
in the Strait of Georgia, Canada**

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Introduction

This supporting information includes additional detail on model evaluations and interannual variability in model output.

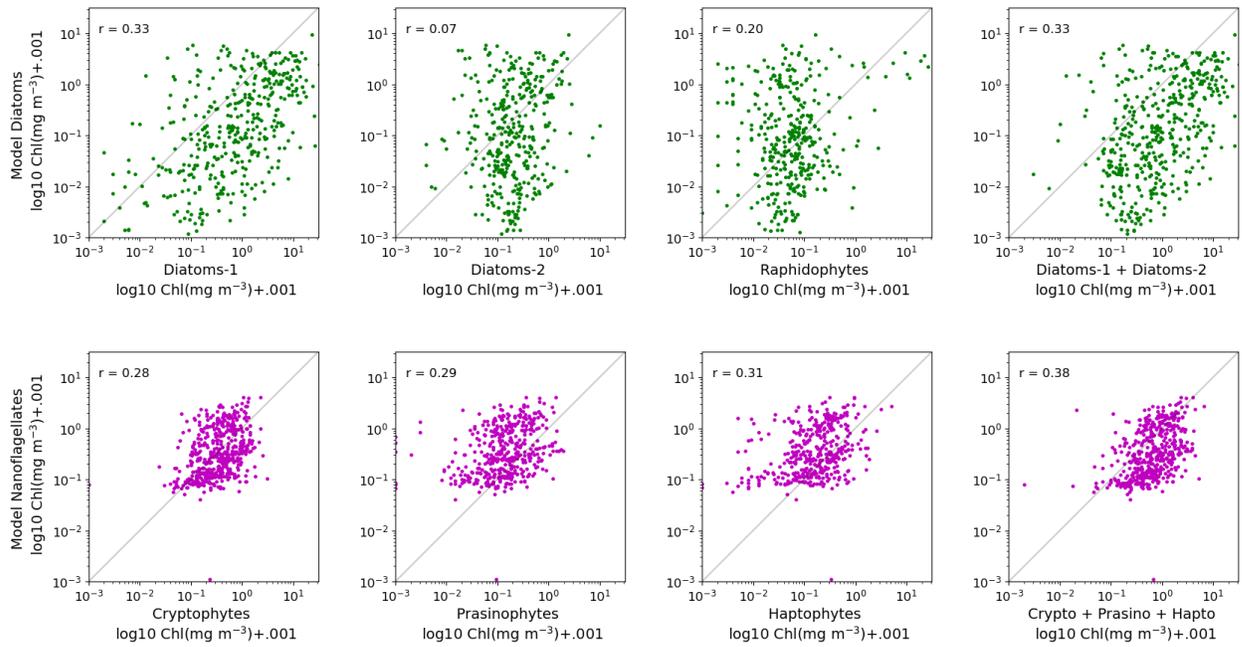


Figure S1. Point-by-point comparisons of SalishSeaCast model diatoms (top panels) and model nanoflagellates (bottom panels) evaluated against high performance liquid chromatography (HPLC) phytoplankton data from Nemcek et al., (2023) collected at stations throughout the Canadian waters of the Salish Sea from 2015-2019. Pearson correlation coefficient, r , is provided.

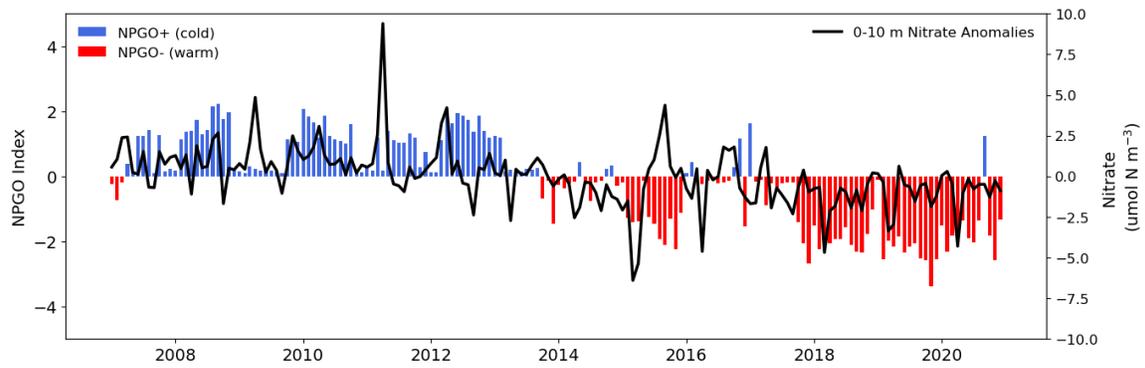


Figure S2. Monthly NPGO index during SalishSeaCast model years 2007 to 2020 and model-based 0-10 m depth-averaged nitrate anomalies from the Central Strait of Georgia, BC.

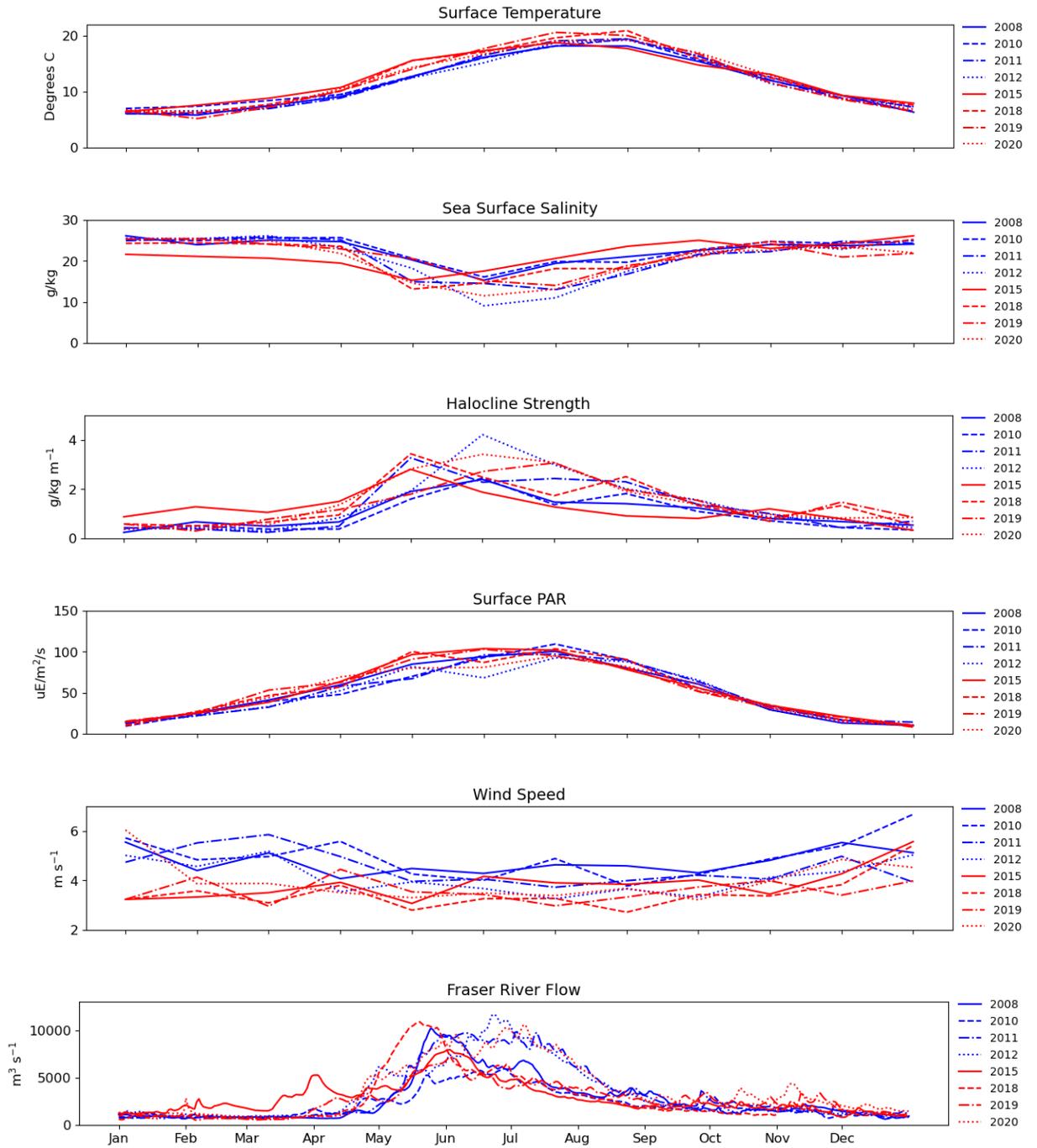


Figure S3. Interannual variability in the local physical parameters for the four coldest (NPGO positive; blue lines) and warmest (NPGO negative; red lines) years in the Central Strait of Georgia, BC.

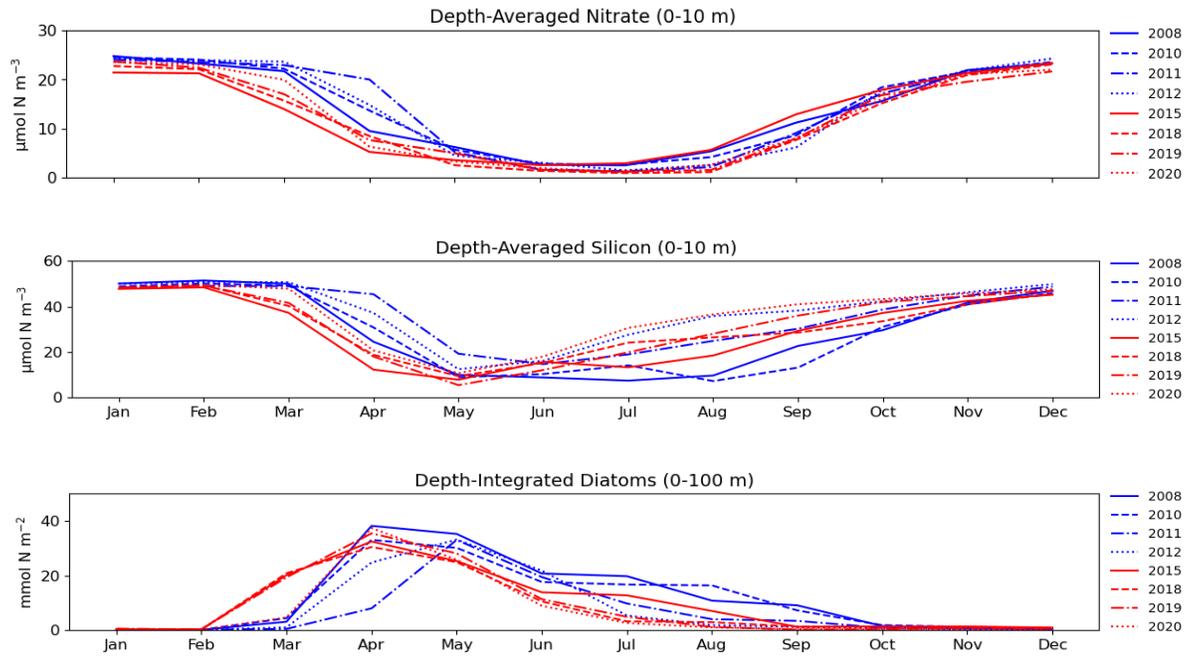


Figure S4. Interannual variability in nutrients (nitrate, silicon) and 0-100 m depth-integrated diatom biomass for the four coldest (NPGO positive; blue lines) and warmest (NPGO negative; red lines) years in the Central Strait of Georgia, BC.

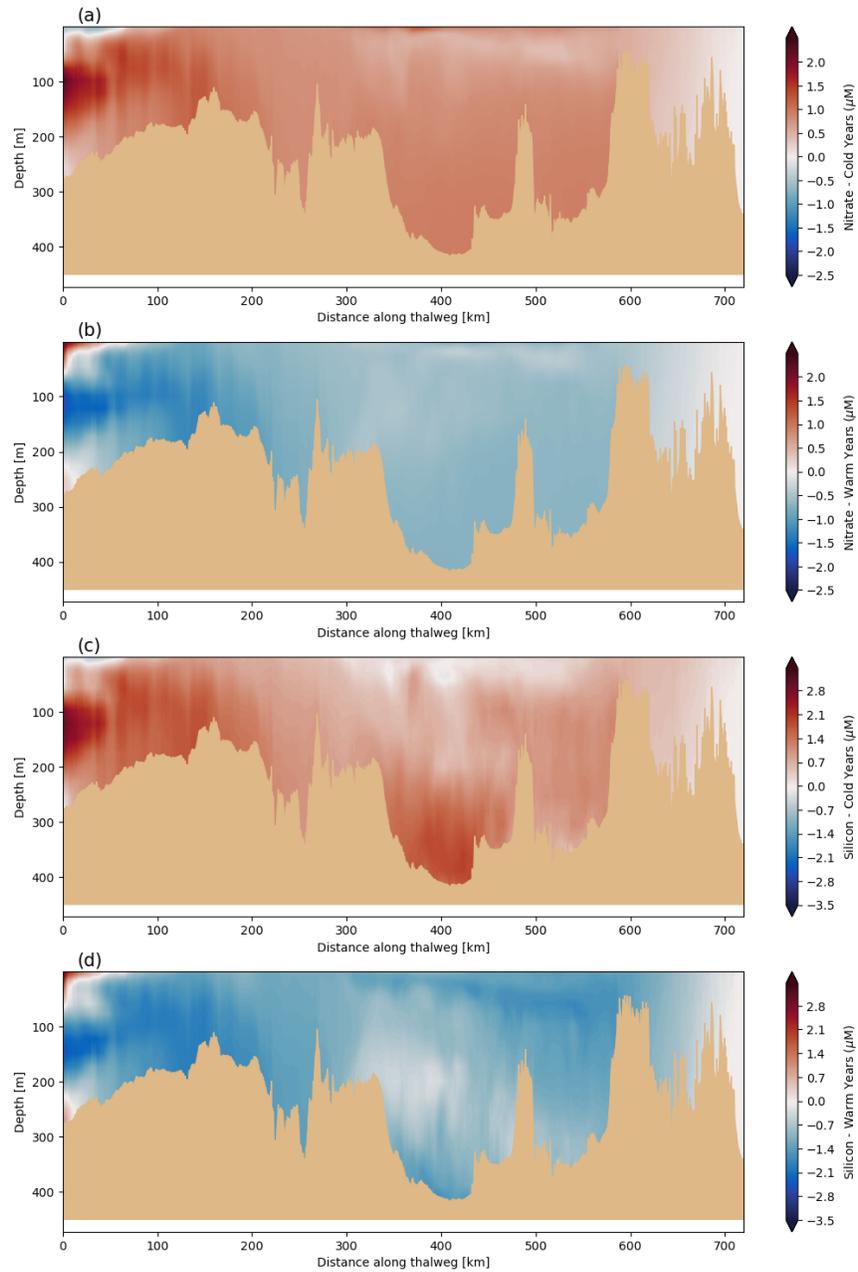


Figure S5. Winter nitrate and silicon anomalies along the thalweg during cold (a,c) and warm (b,d) years in the Canadian waters of the Salish Sea.

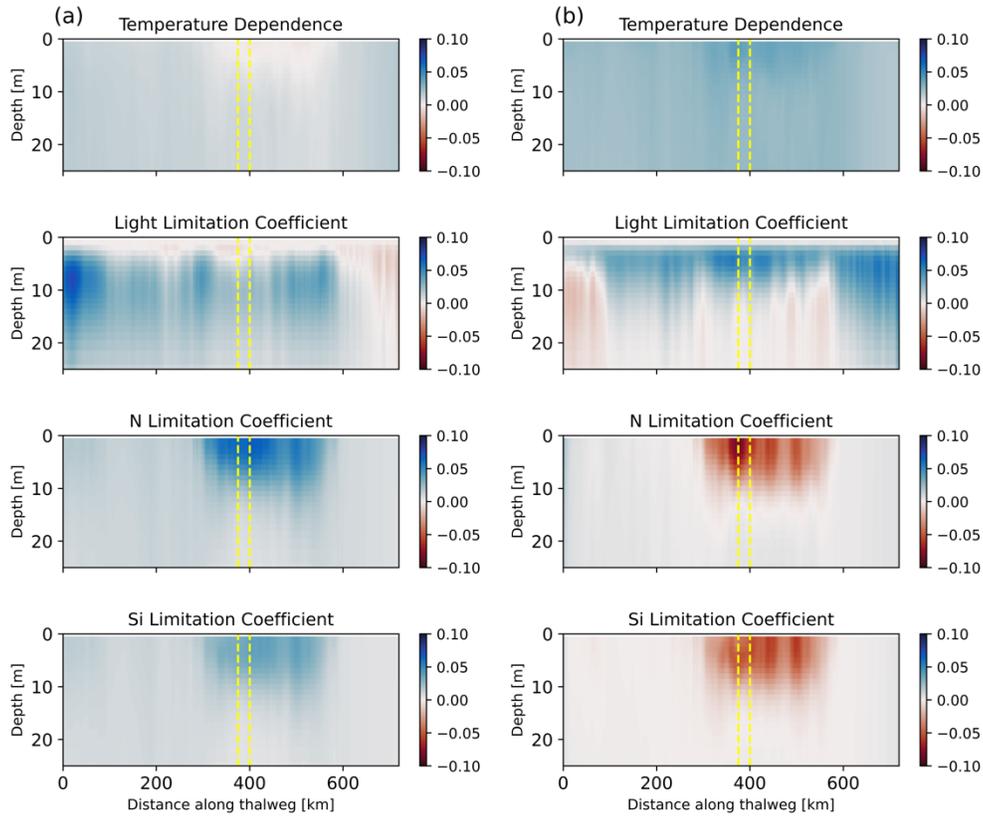


Figure S6. Anomalies in diatom temperature dependence and in light and nutrient (nitrate, silicon) limitation during (a) cold and (b) warm years compared to the 14-year climatology (2007-2020). Yellow vertical lines indicate approximate bounds of our Central SoG region along the thalweg. Colour bar is reversed so that blue = less limitation or temperature dependence compared to the climatology; red = more limitation or temperature dependence compared to the climatology. Data are from spring (April) across the 0-25 m depth range.

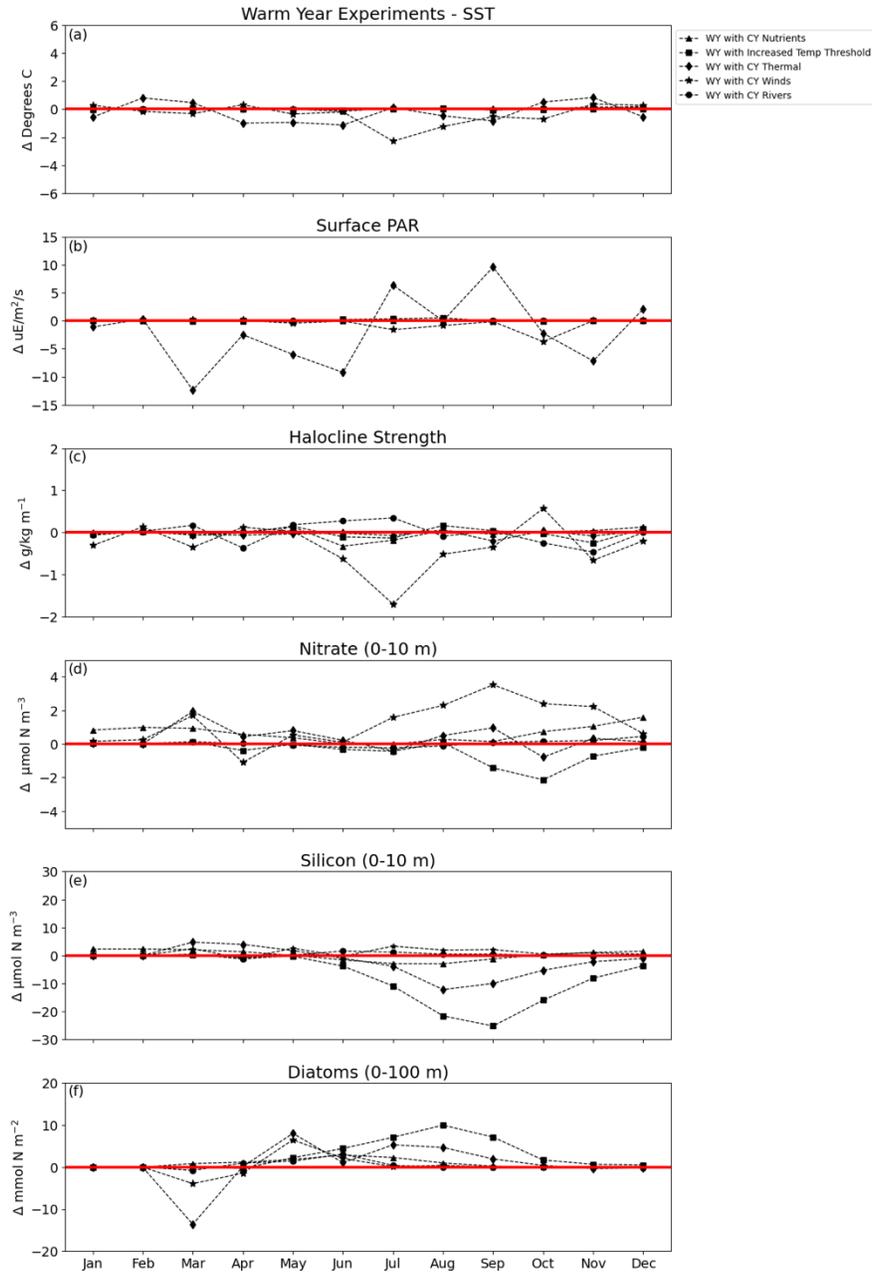


Figure S7. Results of experiments taking a “typical” warm year (WY) and swapping parameters from a “typical” cold year (CY). Nitrate and silicon are depth-averaged over 0-10 m; diatoms are depth-integrated over 0-100 m.

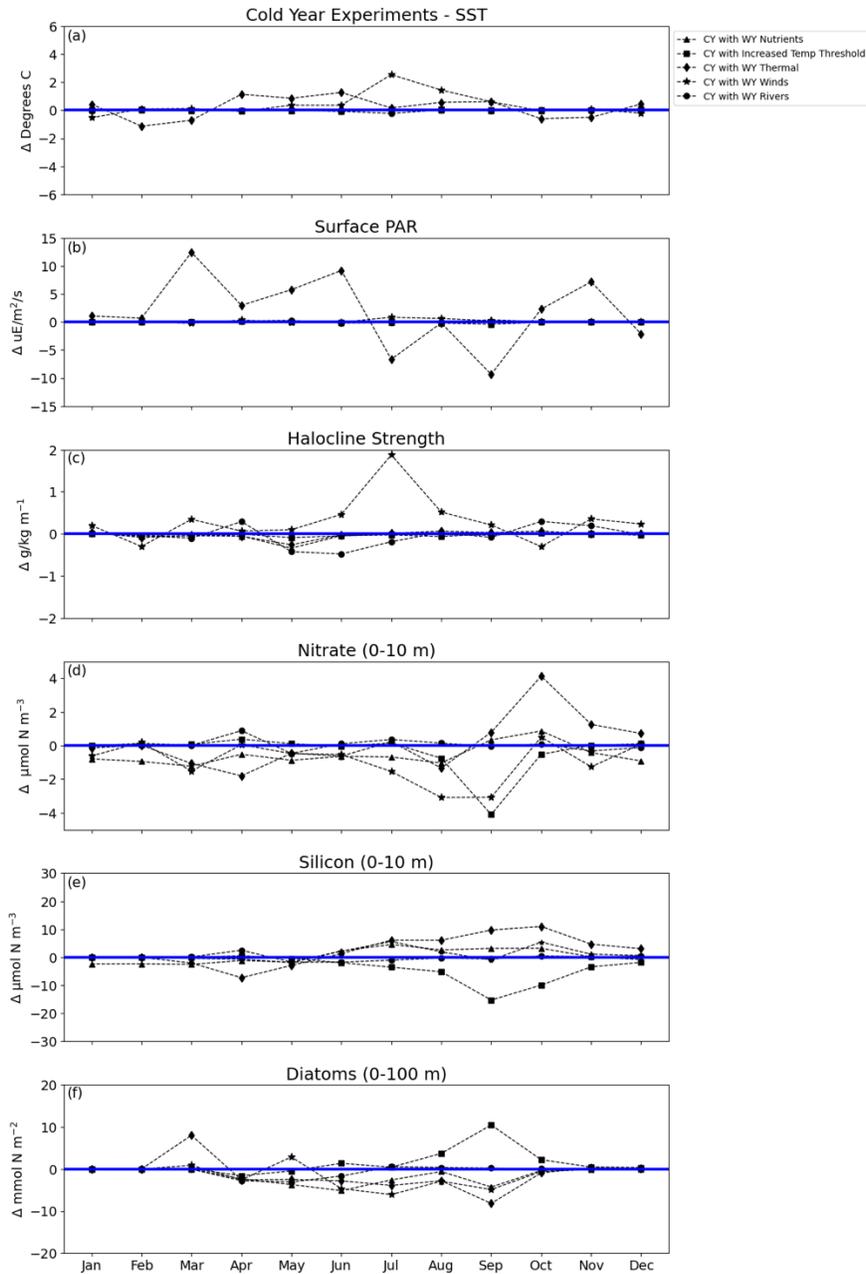


Figure S8. Results of experiments taking a “typical” cold year (CY) and swapping parameters from a “typical” warm year (WY). Nitrate and silicon are depth-averaged over 0-10 m; diatoms are depth-integrated over 0-100 m.