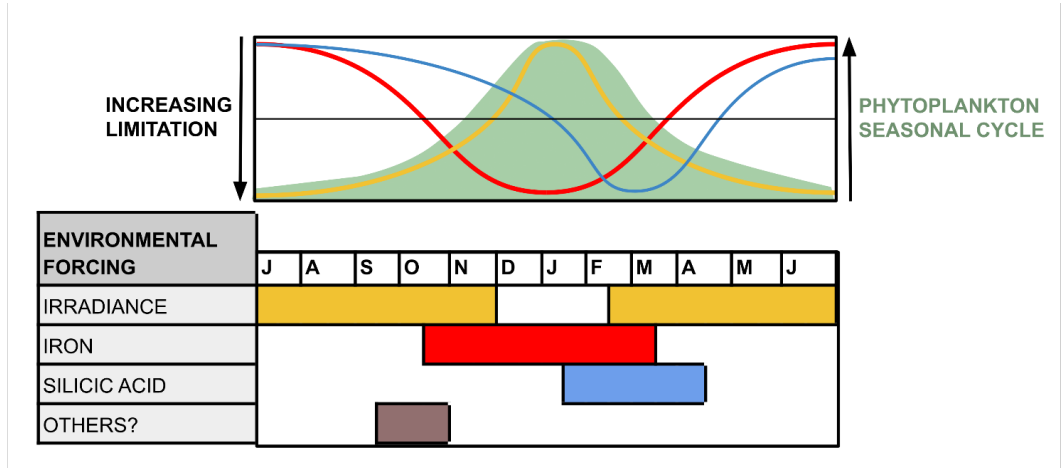
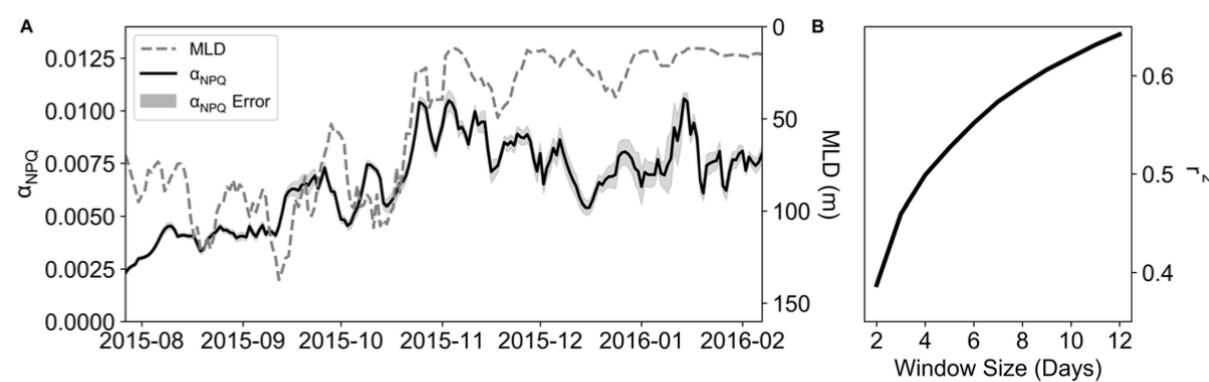


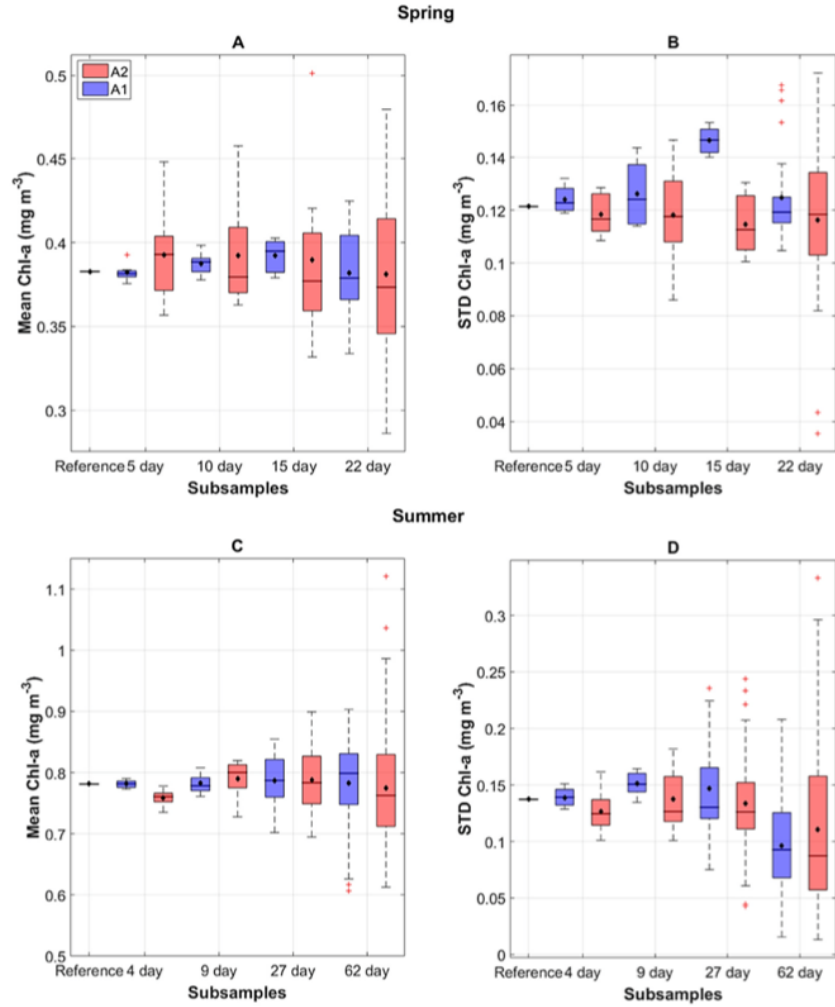
Supplementary Figures



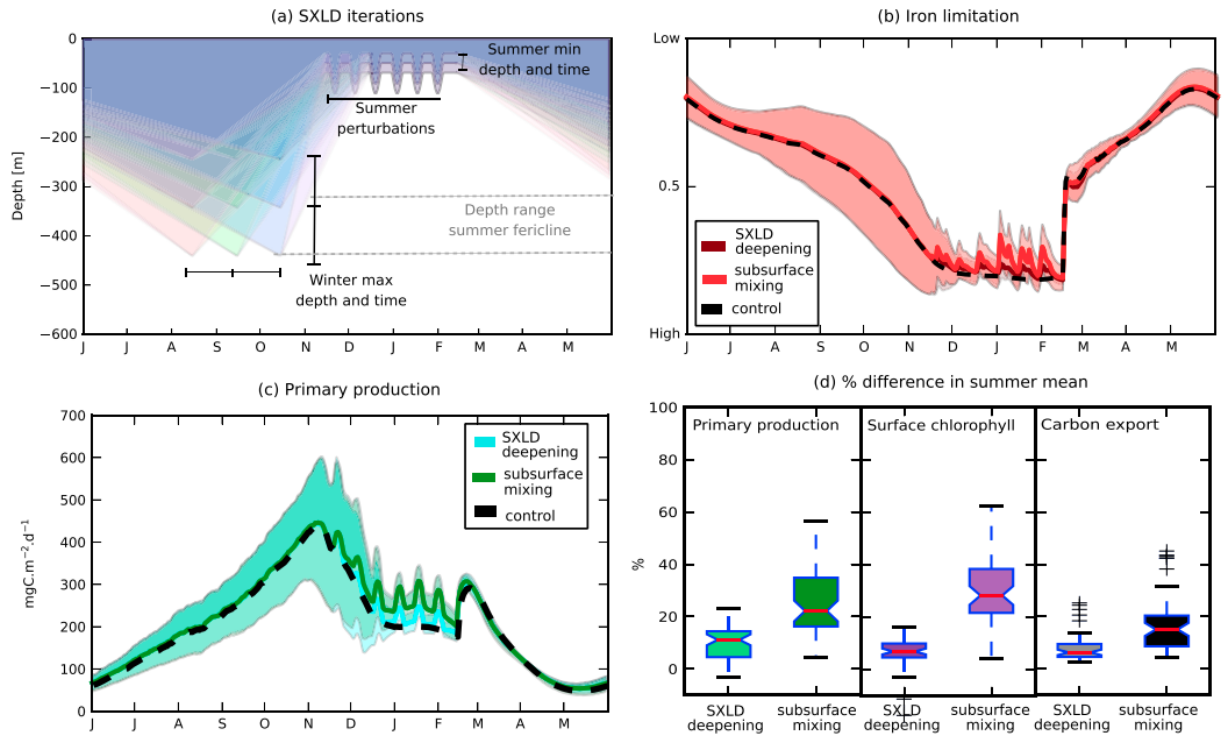
Supplementary Figure S1. Putative seasonal progression of factor(s) limiting or simultaneously limiting phytoplankton processes for diatoms in subpolar waters. Adapted from Boyd [36].



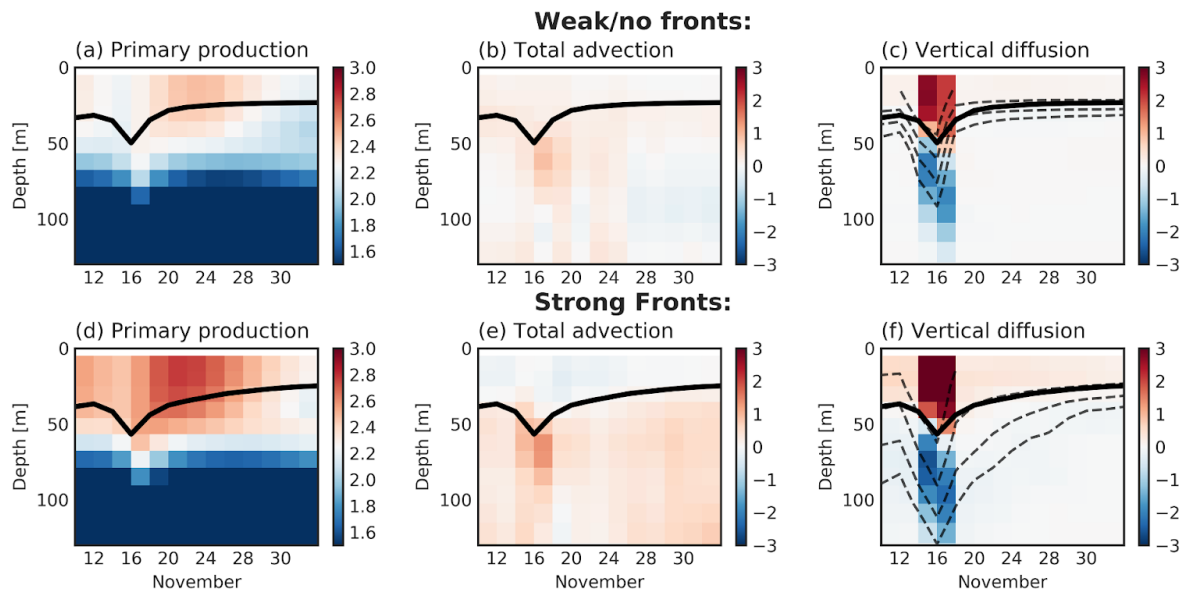
Supplementary Figure S2. From Ryan-Keogh and Thomalla [62]. a) A time-series of a 5-day rolling mean of α_{NPQ} and MLD (m) and b) Correlation coefficients of rolling averages of α_{NPQ} and MLD using different time windows (days).



Supplementary Figure S3. From Little et al. [54]. Box-and-whisker plots for the mean (a, c) and standard deviation (b, d) for subsampling at the dominant periods (A1; blue boxes) and corresponding random extractions (A2; red boxes) for the spring (upper panels) and summer surface chl-a time series (lower panels). The boxes represent the interquartile range, the central line denotes the median and the black dotted lines represent the range of the mean and standard deviation values captured in subsampling. The squares denote the means of the subsamples, while the outliers are denoted by red crosses. The reference time series means are represented by the first black line and dot.

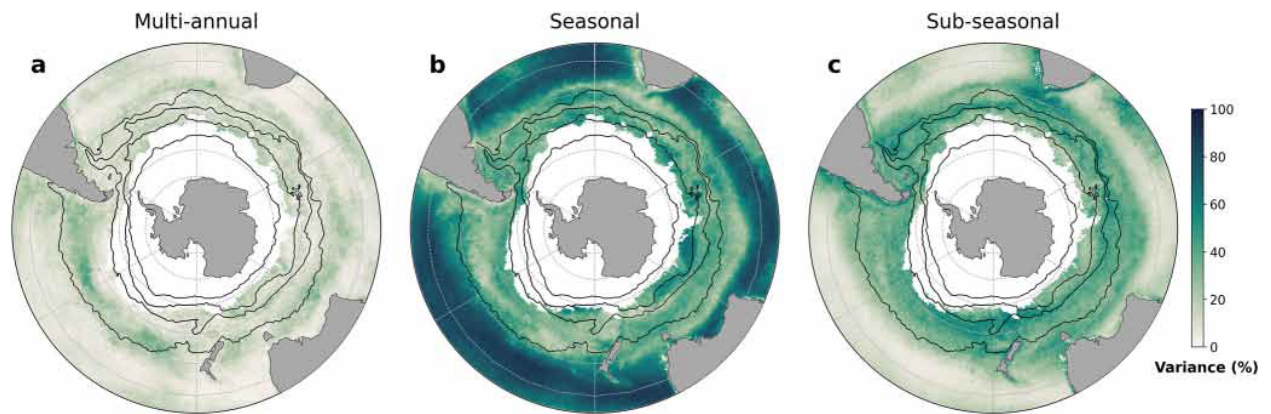


Supplementary Figure S4. From Nicholson et al. [118]. (a) Seasonal iterations of the strongly turbulent “surface mixing layer” (SXLD) (m), (b) simulated iron limitations on phytoplankton, (c) integrated PP (mg C m² d⁻¹), and (d) the percentage mean change in summer PP, surface chlorophyll-a, and carbon exported at 250 m (i.e., [subsurface mixing runs control runs]/control runs). Shading = standard deviation; solid line = mean of all iterations. Black dashed line = mean of control runs.



Supplementary Figure S5. From Nicholson et al. [114]. Depth-time composites separated and averaged in regions of weak/no fronts (a-c) and strong fronts (d-f) showing the storm-driven response of (a, d) net primary production and dissolved iron (DFe) supply for (b, e) total advection and (c, f) vertical diffusion (nmol DFe m⁻³ day⁻¹). (c, f)

Dashed lines are $\log_{10}(k_z)$ at -7 , -6 , -5 , and $-4 \text{ m}^2\cdot\text{s}^{-1}$. The black line is the mean MLD within fronts and no/weak fronts.



Supplementary Figure S6. Figure 3. Percentage of the total satellite-derived surface chlorophyll-a (SChl) variance explained by the (a) multi-annual, (b) seasonal, and (c) sub-seasonal components of the SChl decomposition. From Prend et al. [73].