Figure A1. Full curve (C, F, I) for the three growth-irradiance traits as a function of temperature. These are the same data from Fig. 2C,F,I, with freshwater species in green and marine in blue. The curve is a smoother from a GAMM fit to all the data, and the points show the partial residuals, which remove differences between species in the mean trait value across temperatures.
Figure A2. (A-C) Comparison across species of temperature optima for \( \alpha \) and \( \mu_{\text{max}} \), \( I_{\text{opt}} \) and \( \mu_{\text{max}} \), and \( \alpha \) and \( I_{\text{opt}} \), respectively. (D) Optimal temperature for growth as a function of irradiance. These are the same data from Fig. 3, with freshwater species in green and marine species in blue. The y-axis in this plot is relative \( T_{\text{opt}} \), which substracts the mean value of \( T_{\text{opt}} \) for each species, to better visualize how \( T_{\text{opt}} \) changes with irradiance for all species.
**Figure A3.** Trait envelopes for the three growth-irradiance traits across temperatures. These are the same data from Fig. 4A-C, with freshwater species in green and marine in blue. The solid line is the quantile regression fit to the 90th percentile of the data, the dashed line is an ordinary least squares fit to the mean of the data.

**Figure A4.** A plot analogous to Fig. 4D-F, but using a variable Chl:C ratio when calculating specific C uptake. The Chl:C model is taken from Behrenfeld et al. (2005); Chl:C = Chl:C_{min} + (Chl:C_{max} – Chl:C_{min})e^{-3I}, with Chl:C_{min} = 0.017 – 0.00045T, and Chl:C_{max} = 0.015 + 0.00005e^{0.215T}, and where T is temperature (°C) and I is daily irradiance (mol quanta m^{-2} h^{-1}). (A) Whole community growth rate vs. temperature, at irradiances below 20 µmol photons m^{-2} s^{-1}. The line is a least squares fit, with a slope not significantly different from zero (p = 0.17). (B) Whole community growth vs. temperature, at irradiances between 100 and 200 µmol photons m^{-2} s^{-1}. The least squares fit is significant (p < 10^{-3}), with a slope of 0.046 for \log_{10}(specific C uptake) vs. temperature. (C) Two-dimensional smoother from a GAM fit to whole community growth as a function of temperature and irradiance.
Figure A5. Interaction between temperature and irradiance in the photoacclimative growth model of Geider et al. (1997). The effect of temperature on growth is plotted for irradiances of 1, 10, 100, and 1000 µmol photons m\(^{-2}\) s\(^{-1}\). This plot uses their Eqns. 5, 9, and 12, with parameter values for *Skeletonema costatum* (row 5 in their Table 2).