

Parameter	Name			Source
Phytoplankton parameters		PS	PL	
V_{\max}	Maximum photosynthetic rate at 0 °C (d^{-1})	0.52	0.78	Kishi et al. (2007); Fennel et al. (2006, 2011); present study
k_{Gpp}	Temperature coefficient for photosynthesis ($^{\circ}\text{C}$) $^{-1}$	0.0693	0.0615	Kishi et al. (2007)
α_{P}	Initial slope of the P-I curve ($\text{m}^2 \text{W}^{-1}$) d^{-1}	0.028	0.035	Fennel et al. (2006, 2011)
KNO_3	Half saturation constant for nitrate (mmol N m^{-3})	1.0	3.0	Kishi et al. (2007)
KNH_4	Half saturation constant for ammonium (mmol N m^{-3})	0.1	0.5	Kishi et al. (2007)
KSi	Half saturation constant for silicate (mmol Si m^{-3})	–	3.0	Kishi et al. (2007)
θ_{\max}	Maximum-chlorophyll-to-carbon ratio	0.0428	0.0535	Fennel et al. (2006, 2011); Dune et al. (2010); present study
ϕ_{P}	Phytoplankton ratio extracellular excretion	0.08	0.08	Kishi et al. (2007)
PMor	Mortality at 0 °C ($\text{m}^3 \text{mmol N}^{-1} \text{d}^{-1}$)	0.016	0.016	present study
k_{PMor}	Temperature coefficient for mortality ($^{\circ}\text{C}$) $^{-1}$	0.0588	0.0693	Kishi et al. (2007)
Atp	Light attenuation due to chlorophyll ($\text{m}^2 \text{mg}^{-1}$)	0.0248	0.0248	Fennel et al. (2006, 2011)
w_{P}	Sinking rate (m day^{-1})	–	0.1	Fennel et al. (2006, 2011)
Zooplankton parameters		ZS	ZL	
GR_{mPS}	Maximum grazing rate at 0 °C on PS (d^{-1})	0.27	0.04	Gomez et al. (2017); present study
GR_{mPL}	Maximum grazing rate at 0 °C on PL (d^{-1})	0.07	0.24	Gomez et al. (2017); present study
GR_{mZS}	Maximum grazing rate at 0 °C on ZS (d^{-1})	–	0.14	Gomez et al. (2017); present study
k_{Gra}	Temperature coefficient for grazing (0°C) $^{-1}$	0.0531	0.0531	Gomez et al. (2017)
K_{SPZ}	Half saturation on PS (mmol N m^{-3}) 2	0.17	0.90	Gomez et al. (2017); present study
K_{LPZ}	Half saturation on PL (mmol N m^{-3}) 2	0.10	0.90	Gomez et al. (2017); present study
K_{SZZ}	Half saturation on ZS (mmol N m^{-3}) 2		0.90	Gomez et al. (2017); present study
ZMor	Mortality at 0 ° ($\text{m}^3 \text{mmol N}^{-1} \text{d}^{-1}$)	0.023	0.030	present study
k_{ZMor}	Temperature coefficient for mortality (0°C) $^{-1}$	0.0693	0.0693	Kishi et al. (2007)
α_{Z}	Assimilation efficiency	0.70	0.70	Kishi et al. (2007)
β_{Z}	Growth efficiency	0.30	0.30	Kishi et al. (2007)
Detritus parameters		DS	DL	
τ_{NH_4}	Decomposition to NH_4 rate at 25 °C (d^{-1})	0.045	0.020	Fennel et al. (2006, 2011)
τ_{DON}	Decomposition to DON rate at 25 °C (d^{-1})	0.045	0.020	Fennel et al. (2006, 2011)
w_{D}	Sinking rate (m day^{-1})	1	10	Kishi et al. (2007); Fennel et al. (2006, 2011); present study
k_{D}	Temperature coefficient for remineralization (0°C) $^{-1}$	0.0693	0.0693	Kishi et al. (2007)
				Value
Nit	Nitrification rate at 25 °C (d^{-1})		0.05	Fennel et al. (2006, 2011)
k_{Nit}	Temperature coefficient for nitrification ($^{\circ}\text{C}$) $^{-1}$		0.0693	Kishi et al. (2007)
I_{th}	Radiation threshold for nitrification inhibition (W m^{-2})		0.0095	Fennel et al. (2006, 2011)
D_{P}	Half-saturation radiation for nitrification inhibition (W m^{-2})		0.1	Fennel et al. (2006, 2011)
γ_{NH_4}	DON decomposition to NH_4 rate at 25 °C (d^{-1})		0.04	Yu et al. (2014); present study
τ_{Si}	Opal dissolution to SiOH_4 rate at 25 °C (d^{-1})		0.02	Jiang et al. (2014)
k_{DON}	Temperature coefficient for DON remineralization ($^{\circ}\text{C}$) $^{-1}$		0.0693	Kishi et al. (2007)
k_{Si}	Temperature coefficient for opal dissolution ($^{\circ}\text{C}$) $^{-1}$		0.0693	Kishi et al. (2007)
w_{Opal}	Opal sinking rate (m d^{-1})		10.0	present study
Att_{sw}	Light attenuation due to seawater (m^{-1})		0.037	Fennel et al. (2006, 2011)
C : N	Carbon-to-nitrogen ratio ($\text{mol C} (\text{mol N})^{-1}$)		6.625	Kishi et al. (2007); Fennel et al. (2006, 2011)