

# PhytoMFTM model parameters (preliminary)

symbol	variable	description	units	value	source
Physical parameters:					
$\kappa$	kappa	diffusive mixing constant	$[m\ day^{-1}]$	0.1/0.01	[Fasham, 1990/1993]
$\delta_D^N$	deltaD_N	remineralization rate	$[day^{-1}]$	0.05	[Fasham, 1990]
$k_w$	kw	light attenuation coefficient	$[m^{-1}]$	0.2	[Edwards & Brindley 1996]
affecting phytoplankton:					
$v$	v	phytoplankton sinking constant	$[mday^{-1}]$	0.04	[Edwards & Brindley 1996]
$I_{opt}$	OptI	optimum irradiance	$[E\ m^{-2}\ day^{-1}]$	30	[Acevedo-Trejos, 2015]
Phytoplankton parameters:					
$mo_P$	moP	mortality/excretion constant	$[day^{-1}]$	0.09	[Fasham, 1990]
functional type specific:					
$P_{dt}$	pt1	Diatoms			
$\Delta_{Si}^{dt}$	pt1_ratioSi	nitrogen to silicate ratio	$[\mu M\ Si\ \mu MN^{-1}]$	1.12	[Brzezinski, 1985]
$K_{Si}^{dt}$	pt1_K_Si	half-saturation constant of Si uptake	$[\mu M\ Si]$	2	[Kristiansen et al. 2000]
$U_N^{dt}$	pt1_U_N	half-saturation constant of N uptake	$[\mu MN]$	0.446	[Litchman et al. 2007]
$\mu_P^{dt}$	pt1_muP	growth rate	$[day^{-1}]$	1.5	[Litchman et al. 2007]
$P_c$	pt2	Coccolithophores			
$U_N^c$	pt2_U_N	half-saturation constant of N uptake	$[\mu MN]$	0.265	[Litchman et al. 2007]
$\mu_P^c$	pt2_muP	growth rate	$[day^{-1}]$	1.1	[Litchman et al. 2007]
$P_{dn}$	pt3	Dinoflagellates			
$U_N^c$	pt3_U_N	half-saturation constant of N uptake	$[\mu MN]$	0.009	[Litchman et al. 2007]
$\mu_P^c$	pt3_muP	growth rate	$[day^{-1}]$	0.6	[Litchman et al. 2007]
$P_n$	pt4	Nanoflagellates			
$U_N^n$	pt4_U_N	half-saturation constant of N uptake	$[\mu MN]$	0.045	[Litchman et al. 2007]
$\mu_P^n$	pt4_muP	growth rate	$[day^{-1}]$	1.7	[Litchman et al. 2007]
Zooplankton parameters:					
$mo_Z$	moZ	mortality/excretion constant	$[day^{-1}]$	0.0125	[Prowe et al. 2012]
$\delta_Z$	deltaZ	assimilation coefficient of grazing on $P_i$	[-]	0.75	[Fasham, 1990]
$\delta_\lambda$	deltaLambda	assimilation coefficient of $Z_\lambda$ grazing on $Z_\mu$	[-]	0.75	[Fasham, 1990]
$\mu_\lambda$	muIntGraze	maximum rate of $Z_\lambda$ grazing on $Z_\mu$	$[day^{-1}]$	0.05	[?]
$k_\lambda$	kIntGraze	half-saturation constant of $Z_\lambda$ grazing on $Z_\mu$	$[\mu MN]$	0.5	[?]
$Z_\mu$	zt1	Mikrozooplankton			
$\mu_Z^\mu$	zt1_muZ	maximum rate of grazing on $P_i$	$[day^{-1}]$	0.1	[Prowe et al. 2012]
$k_P^\mu$	zt1_Kp	half-saturation constant of grazing on $P_i$	$[\mu MN]$	0.5	[Prowe et al. 2012]
$g_\mu$	zt1-pred	higher order predation on $Z_\mu$	$[day^{-1}]$	0.01	[?]
$Z_\lambda$	zt2	Mesozooplankton			
$\mu_Z^\lambda$	zt2_muZ	maximum rate of grazing on $P_i$	$[day^{-1}]$	0.1	[Prowe et al. 2012]
$k_P^\lambda$	zt2_Kp	half-saturation constant of grazing on $P_i$	$[\mu MN]$	0.5	[Prowe et al. 2012]
$g_\lambda$	zt2-pred	higher order predation on $Z_\lambda$	$[day^{-1}]$	0.01	[?]

Feeding preferences:

	$P_{dt}$	$P_c$	$P_{dn}$	$P_n$
$Z_\mu$	0	1	1	1
$Z_\lambda$	1	1	1	0

where number is  $p_j^i$  denoting feeding preference of  $Z_j$  grazing on  $P_i$