

Corrigendum for *Schmittner et al.* [2008] “Future changes in climate, ocean circulation, ecosystems, and biogeochemical cycling simulated for a business-as-usual CO₂ emission scenario until year 4000 AD”, *Global Biogeochemical Cycles* 22, GB1013

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1. Typos in Appendix A

In equations A5 and A7 μ_P should be replaced by μ^*_P . The correct equations are:

$$S(P_D) = J_D P_D - G(P_D)Z - \mu^*_P P_D \quad (\text{A5})$$

$$S(D) = (1 - \gamma_1) [G(P_O) + G(P_D)]Z + \mu^*_P P_D + \mu_{P2} P^2_O + \mu_Z Z^2 - \mu_D D - w_D \partial D / \partial z. \quad (\text{A7})$$

In table A1 μ_P should be replaced by μ_{P2} , its correct terminology (Parameter column) should be ‘‘Quadratic mortality coefficient’’, and its unit should be $(\text{mmol m}^{-3})^{-1} \text{d}^{-1}$. The correct unit of the (quadratic) zooplankton mortality μ_Z must be $(\text{mmol m}^{-3})^{-1} \text{d}^{-1}$.

In equation A14 μ^*_{P0} should be replaced by μ_{P0} .

2. Error in the Calculation of Light Limitation

The results shown in *Schmittner et al.* [2008] were obtained with a coding error in the calculation of light limitation of phytoplankton growth. The function

$$\Phi(u) = \ln(u + \sqrt{1 + u^2}) - (\sqrt{1 + u^2} - 1) / u, \quad (1)$$

which is used in the calculation of the daily averaged growth as described in *Schmittner et al.* [2005], was approximated by

$$\Phi(u) = (0.555588u + 0.004926u^2) / (1 + 0.188721u) \quad (2)$$

as recommended by *Evans and Garçon* [1997] for $0 < u < 20$. In the code 0.04926 was erroneously used instead of 0.004926. This caused too little light limitation. We have also found that in many places $u > 20$ such that approximation (2) has large errors. We changed the code and implemented the original light limitation function (equation 1). This required some retuning of the other biological parameters in order to yield an essentially identical simulation of the biogeochemical tracer distributions. In addition to the parameter values reported in *Schmittner et al.* [2008] we now recommend the following parameter setting.

Parameter	Symbol	Value	Units
Maximum growth rate	a	0.20	d^{-1}
Linear mortality coefficient	μ_{P0}	0.014	d^{-1}
Quadratic mortality coefficient	μ_{P2}	0.05	$(\text{mmol m}^{-3})^{-1} \text{d}^{-1}$
CaCO ₃ over nonphotosynthetical POC production ratio	$R_{\text{CaCO}_3:\text{POC}}$	0.03	
Molar C:N ratio of organic matter	$R_{\text{C:N}}$	6.625	
Molar O ₂ :N ratio of aerobic remineralization	$R_{\text{O}_2:\text{N}}$	10.0	

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References

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