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Evidence that hyporheic zones increase heterotrophic metabolism and phosphorus uptake in forest streams

In our paper published in *Limnology and Oceanography* titled ''Evidence that hyporheic zones increase heterotrophic metabolism and phosphorus uptake in forest streams'' (Mulholland et al. 1997), we discovered an error in the calculation of gross primary production (GPP) and community respiration (R) rates. Although the corrected GPP and R values for the two study streams (Walker Branch [WB] and Hugh White Creek [HWC]) are considerably higher than the originally published values, the relative differences between the streams remain. Thus, the conclusion that our results provide evidence that higher rates of R are associated with larger hyporheic zones in forested streams is not altered by this error.

The error in the calculation of GPP and R rates stems from an incorrect formulation of the equation for the reaeration flux of oxygen in the diurnal upstream-downstream dissolved oxygen change technique for determining whole-stream metabolism rates as described by Marzolf et al. (1994). Young and Huryn (1998) point out that the reaeration flux of oxygen should be computed as $DO_{deficit} \times k_{oxygen} \times \Delta t$, where $DO_{deficit}$ is the difference between the dissolved oxygen concentration at saturation and the concentration in the stream, k_{oxygen} is the reaeration coefficient for oxygen, and Δt is the average time of travel for water between the upstream and downstream stations. Use of this revised formulation for reaeration flux resulted in considerably greater rates of GPP and R in WB than those originally published in Marzolf et al. 1994 (Marzolf et al. 1998). For the Mulholland et al. (1997) study, the revised GPP and R rates and P : R ratios for WB and HWC are presented in Table 1, along with the values presented in the originally published paper.

Table 1. Revised and originally published rates of gross primary production (GPP) and ecosystem respiration (R) and GPP : R ratios for the West Fork of Walker Branch (WB) and Hugh White Creek (HWC) during the periods 15–17 June 1993 and 11–13 July 1994, respectively (revises portions of table 3 in Mulholland et al. 1997).

	WB		HWC	
Parameter	Revised	Original	Revised	Original
GPP (g O_2 m^{-2} d^{-1})	0.32	0.14	0.21*	0.07
R (g O_2 m^{-2} d^{-1})	4.12	1.45	10.1**	3.41
GPP : R ratio	0.78	0.10	0.02	0.02

* Area-weighted average of rates for the upper (0.22 g O_2 m^{-2} d^{-1}) and lower (0.19 g O_2 m^{-2} d^{-1}) segments.
† Area-weighted average rates for the upper (8.94 g O_2 m^{-2} d^{-1}) and lower (11.3 g O_2 m^{-2} d^{-1}) segments.

In general, the revised GPP and R rates are two to three times greater than the original values. The rate of R in HWC is still about 2.4 times greater than R in WB, consistent with the suggestion in the original paper that the considerably larger hyporheic zone and the greater exchange rate between surface water and the hyporheic zone in HWC result in higher rates of ecosystem respiration in this stream compared with WB.

These revisions to rates of GPP and R alter some of the calculations presented in the last paragraph of the ''Results'' section in the original paper. Using the same approach as in the original paper, autotrophic P uptake rate is revised to 122 μg m^{-2} h^{-1} in WB and 80 μg m^{-2} h^{-1} in HWC, representing ca. 60% of total P uptake rate in WB and 15% of total P uptake rate in HWC (increases of 2.5–3 times the original values). Heterotrophic P uptake rates are revised to 82 μg m^{-2} h^{-1} in WB and 454 μg m^{-2} h^{-1} in HWC. Finally, the stoichiometric ratios for heterotrophic P demand (moles P taken up per mole C respired by heterotrophs) are revised to 1 : 1,954 in WB and 1 : 889 in HWC.

Patrick J. Mulholland

Environmental Sciences Division
Oak Ridge National Laboratory
P.O. Box 2008
Oak Ridge, Tennessee 37831-6036

Erich R. Marzolf

St. Johns River Water Management District
P.O. Box 1429
Palatka, Florida 32178-1429

Jackson R. Webster

Department of Biology
Virginia Tech
Blacksburg, Virginia 24061

Deborah R. Hart

Department of Zoology
Tel Aviv University
Ramat Aviv 69978
Tel Aviv, Israel

Susan P. Hendricks

Hancock Biological Station
561 Emma Drive
Murray, Kentucky 42071

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Size-dependent C : N uptake by phytoplankton as a function of irradiance: Ecological implications

Our paper published in *Limnology and Oceanography* (Vol. 43, p. 1362–1368) contains a significant typographic error. On page 1365, column 2, line 7 onwards should read: ''For the south basin, only the POC : PON data for the $<$2-μm fraction was significantly correlated with 1/k ($r = -0.547$, $P = 0.0284$, $n = 16$). There was no overall correlation between the POC : PON ratio for the $>$2-μm fraction and transparency in the south basin ($r = +0.218$, $P = 0.434$, $n = 15$), . . .''.

J-J. Frenette, W. F. Vincent, and *L. Legendre*

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