

Supporting Information for

Depth-partitioning of particulate organic carbon composition in the rising and falling stages of the Amazon River

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Introduction

The following supplementary tables elaborate on the compound-specific lipid and enzyme data discussed in the main text. Tables S1 and S2 provide the abundances and stable carbon isotope ratios of a number of compound-specific *n*-alkanes (carbon chain lengths 19-41) and fatty acids (carbon chain lengths 14-34) quantified in particulate organic carbon from the Amazon River mainstem, Tapajós River, Madeira River and Solimões River in 2005 and 2014. The lipids were extracted and purified using a number of methods described in Section 2.6 of the main text. Table S3 provides depth-specific activities of eight different enzymes analyzed in the Amazon River mainstem in July 2014 only. These enzyme activities were analyzed using –AMC (7-amino-4-methylcoumarin) and –MUB (4-methylumbelliferone)-based fluorogenic substrate proxies (Mullen et al. 2018).

References

Mullen, Lauren, Kim Boerrigter, Nicholas Ferriero, Jeff Rosalsky, Abigail van Buren Barrett, Patrick J Murray, and Andrew D Steen. 2018. ‘Potential Activities of Freshwater Exo-and Endo-Acting Extracellular Peptidases in East Tennessee and the Pocono Mountains’. *Frontiers in Microbiology* 9: 368.

Table S1. Abundances and $\delta^{13}\text{C}$ values of straight-chain *n*-alkanes ($\text{C}_{19}\text{-C}_{41}$) in large-volume (>100 L) and depth-specific (10 L) samples collected in June 2005, April 2014 and July 2014.

Location	Date	Depth	Chain length	Abundance	Abundance error	$\delta^{13}\text{C}$	$\delta^{13}\text{C}$ error
--	--	--	#	ng/ μg POC	ng/ μg POC	‰	‰
Mainstem	28 July 2014	0	19	2.87E-03	2.88E-04	-32.5	0.1
Mainstem		0	20	4.12E-03	4.14E-04	no data	no data
Mainstem		0	21	5.16E-03	5.18E-04	-31.2	0.8
Mainstem		0	22	4.86E-03	4.87E-04	no data	no data
Mainstem		0	23	6.74E-03	6.76E-04	no data	0.6
Mainstem		0	24	4.71E-03	4.72E-04	no data	no data
Mainstem		0	25	9.36E-03	9.40E-04	-31.4	0.4
Mainstem		0	26	7.33E-03	7.36E-04	no data	no data
Mainstem		0	27	1.53E-02	1.53E-03	-31.1	0.1
Mainstem		0	28	9.55E-03	9.59E-04	no data	no data
Mainstem		0	29	3.70E-02	3.72E-03	-33.1	0.0
Mainstem		0	30	1.15E-02	1.15E-03	no data	no data
Mainstem		0	31	3.97E-02	3.99E-03	-33.4	0.1
Mainstem		0	32	1.12E-02	1.13E-03	no data	no data
Mainstem		0	33	2.00E-02	2.01E-03	-32.6	0.2
Mainstem		0	34	7.02E-03	7.05E-04	no data	no data
Mainstem		0	35	6.09E-03	6.11E-04	-31.0	0.3
Mainstem		0	36	3.00E-03	3.01E-04	no data	no data
Mainstem		0	37	3.69E-03	3.71E-04	-30.1	2.0
Mainstem		0	38	2.39E-03	2.40E-04	no data	no data
Mainstem		0	39	1.97E-03	1.98E-04	-31.6	1.8
Mainstem		0	40	1.39E-03	1.39E-04	no data	no data
Mainstem		0	41	1.01E-03	1.01E-04	no data	no data
Mainstem	1 April 2014	0	19	1.09E-02	1.09E-03	-28.3	0.2
Mainstem		0	20	1.53E-02	1.53E-03	no data	no data
Mainstem		0	21	1.16E-02	1.16E-03	-28.9	0.1
Mainstem		0	22	1.14E-02	1.15E-03	no data	no data
Mainstem		0	23	1.28E-02	1.28E-03	-29.6	0.2
Mainstem		0	24	9.95E-03	9.97E-04	no data	no data
Mainstem		0	25	1.21E-02	1.21E-03	-29.8	0.1
Mainstem		0	26	9.98E-03	1.00E-03	no data	no data
Mainstem		0	27	1.58E-02	1.59E-03	-30.3	0.4
Mainstem		0	28	1.04E-02	1.04E-03	no data	no data
Mainstem		0	29	3.26E-02	3.27E-03	-33.1	0.3

Mainstem		0	30	1.07E-02	1.07E-03	no data	no data
Mainstem		0	31	3.38E-02	3.39E-03	-33.7	0.2
Mainstem		0	32	9.28E-03	9.29E-04	no data	no data
Mainstem		0	33	1.67E-02	1.67E-03	-32.4	0.3
Mainstem		0	34	4.97E-03	4.98E-04	no data	no data
Mainstem		0	35	6.05E-03	6.06E-04	-31.2	0.4
Mainstem		0	36	3.25E-03	3.26E-04	no data	no data
Mainstem		0	37	3.37E-03	3.38E-04	-31.0	0.3
Mainstem		0	38	2.50E-03	2.50E-04	no data	no data
Mainstem		0	39	2.14E-03	2.14E-04	-31.3	0.7
Mainstem		0	40	1.71E-03	1.72E-04	no data	no data
Mainstem		0	41	1.33E-03	1.34E-04	-34.1	0.7
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Mainstem	8 June 2005	0	19	2.09E-02	2.09E-03	no data	no data
Mainstem		0	20	1.21E-02	1.21E-03	no data	no data
Mainstem		0	21	1.10E-02	1.10E-03	no data	no data
Mainstem		0	22	1.40E-02	1.40E-03	no data	no data
Mainstem		0	23	1.71E-02	1.71E-03	no data	no data
Mainstem		0	24	1.10E-02	1.11E-03	no data	no data
Mainstem		0	25	1.59E-02	1.59E-03	no data	no data
Mainstem		0	26	1.01E-02	1.01E-03	no data	no data
Mainstem		0	27	1.95E-02	1.95E-03	no data	no data
Mainstem		0	28	1.78E-02	1.79E-03	no data	no data
Mainstem		0	29	4.07E-02	4.08E-03	no data	no data
Mainstem		0	30	2.45E-02	2.46E-03	no data	no data
Mainstem		0	31	4.15E-02	4.16E-03	no data	no data
Mainstem		0	32	1.61E-02	1.62E-03	no data	no data
Mainstem		0	33	2.14E-02	2.14E-03	no data	no data
Mainstem		0	34	7.28E-03	7.30E-04	no data	no data
Mainstem		0	35	9.55E-03	9.57E-04	no data	no data
Mainstem		0	36	2.00E-03	2.00E-04	no data	no data
Mainstem		0	37	3.28E-03	3.29E-04	no data	no data
Mainstem		0	38	1.55E-03	1.56E-04	no data	no data
Mainstem		0	39	2.74E-03	2.74E-04	no data	no data
Mainstem		0	40	2.00E-03	2.00E-04	no data	no data
Mainstem		0	41	1.65E-03	1.65E-04	no data	no data
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Solimões	4 June 2005	0	19	8.29E-03	9.40E-04	no data	no data
Solimões		0	20	5.56E-03	6.31E-04	no data	no data
Solimões		0	21	5.76E-03	6.53E-04	no data	no data
Solimões		0	22	7.86E-03	8.91E-04	no data	no data
Solimões		0	23	1.12E-02	1.27E-03	no data	no data
Solimões		0	24	8.57E-03	9.72E-04	no data	no data
Solimões		0	25	1.81E-02	2.05E-03	no data	no data
Solimões		0	26	1.86E-02	2.11E-03	no data	no data

Solimões		0	27	2.95E-02	3.35E-03	no data	no data
Solimões		0	28	2.59E-02	2.94E-03	no data	no data
Solimões		0	29	4.58E-02	5.19E-03	no data	no data
Solimões		0	30	2.09E-02	2.37E-03	no data	no data
Solimões		0	31	3.80E-02	4.31E-03	no data	no data
Solimões		0	32	1.11E-02	1.26E-03	no data	no data
Solimões		0	33	1.67E-02	1.89E-03	no data	no data
Solimões		0	34	3.20E-03	3.63E-04	no data	no data
Solimões		0	35	5.25E-03	5.95E-04	no data	no data
Solimões		0	36	1.35E-03	1.53E-04	no data	no data
Solimões		0	37	1.81E-03	2.05E-04	no data	no data
Solimões		0	38	7.15E-04	8.11E-05	no data	no data
Solimões		0	39	1.05E-03	1.19E-04	no data	no data
Solimões		0	40	6.93E-04	7.85E-05	no data	no data
Solimões		0	41	6.80E-04	7.71E-05	no data	no data
Madeira	6 June 2005	0	19	2.13E-02	2.16E-03	no data	no data
Madeira		0	20	1.73E-02	1.76E-03	no data	no data
Madeira		0	21	1.78E-02	1.80E-03	no data	no data
Madeira		0	22	1.87E-02	1.90E-03	no data	no data
Madeira		0	23	2.25E-02	2.29E-03	no data	no data
Madeira		0	24	1.65E-02	1.67E-03	no data	no data
Madeira		0	25	2.25E-02	2.29E-03	no data	no data
Madeira		0	26	1.94E-02	1.97E-03	no data	no data
Madeira		0	27	3.19E-02	3.24E-03	no data	no data
Madeira		0	28	4.18E-02	4.25E-03	no data	no data
Madeira		0	29	7.80E-02	7.92E-03	no data	no data
Madeira		0	30	6.65E-02	6.75E-03	no data	no data
Madeira		0	31	7.74E-02	7.86E-03	no data	no data
Madeira		0	32	4.47E-02	4.54E-03	no data	no data
Madeira		0	33	3.43E-02	3.48E-03	no data	no data
Madeira		0	34	1.38E-02	1.41E-03	no data	no data
Madeira		0	35	9.87E-03	1.00E-03	no data	no data
Madeira		0	36	3.91E-03	3.97E-04	no data	no data
Madeira		0	37	3.89E-03	3.96E-04	no data	no data
Madeira		0	38	2.38E-03	2.42E-04	no data	no data
Madeira		0	39	2.75E-03	2.79E-04	no data	no data
Madeira		0	40	2.36E-03	2.40E-04	no data	no data
Madeira		0	41	1.16E-03	1.18E-04	no data	no data
Mainstem	28 July 2014	54	19	1.15E-03	1.27E-04	no data	NaN
Mainstem		54	20	1.57E-03	1.73E-04	no data	NaN
Mainstem		54	21	2.68E-03	2.95E-04	-30.9	0.2
Mainstem		54	22	2.33E-03	2.56E-04	-29.6	0.4
Mainstem		54	23	2.75E-03	3.02E-04	-30.9	0.5

Mainstem		54	24	2.72E-03	2.99E-04	-29.9	0.5
Mainstem		54	25	4.67E-03	5.14E-04	no data	NaN
Mainstem		54	26	4.42E-03	4.86E-04	-29.6	0.6
Mainstem		54	27	6.18E-03	6.80E-04	-34.1	0.2
Mainstem		54	28	3.07E-03	3.38E-04	-28.5	3.7
Mainstem		54	29	1.62E-02	1.78E-03	-34.0	0.5
Mainstem		54	30	3.26E-03	3.59E-04	-37.3	0.5
Mainstem		54	31	1.57E-02	1.73E-03	-34.6	0.3
Mainstem		54	32	2.79E-03	3.07E-04	no data	NaN
Mainstem		54	33	6.95E-03	7.64E-04	-34.6	1.2
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Mainstem	2 April 2014	30.15	19	1.67E-03	1.69E-04	no data	NaN
Mainstem		30.15	20	2.22E-03	2.24E-04	no data	NaN
Mainstem		30.15	21	3.07E-03	3.09E-04	-29.6	0.4
Mainstem		30.15	22	3.02E-03	3.05E-04	-29.4	0.1
Mainstem		30.15	23	3.62E-03	3.65E-04	-31.1	0.1
Mainstem		30.15	24	2.61E-03	2.63E-04	-30.0	0.5
Mainstem		30.15	25	3.84E-03	3.87E-04	-30.3	0.3
Mainstem		30.15	26	3.50E-03	3.53E-04	-30.1	0.4
Mainstem		30.15	27	6.71E-03	6.77E-04	-32.3	0.2
Mainstem		30.15	28	3.07E-03	3.09E-04	-31.8	0.4
Mainstem		30.15	29	1.86E-02	1.88E-03	-34.5	0.1
Mainstem		30.15	30	3.47E-03	3.49E-04	-33.6	0.4
Mainstem		30.15	31	1.86E-02	1.88E-03	-34.9	0.0
Mainstem		30.15	32	2.81E-03	2.83E-04	-34.2	0.2
Mainstem		30.15	33	8.04E-03	8.11E-04	-34.7	0.3
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Mainstem	2 April 2014	2.7	19	0.00E+00	0.00E+00	no data	NaN
Mainstem		2.7	20	0.00E+00	0.00E+00	no data	NaN
Mainstem		2.7	21	3.59E-03	3.61E-04	no data	NaN
Mainstem		2.7	22	2.85E-03	2.86E-04	no data	NaN
Mainstem		2.7	23	0.00E+00	0.00E+00	no data	NaN
Mainstem		2.7	24	0.00E+00	0.00E+00	no data	NaN
Mainstem		2.7	25	0.00E+00	0.00E+00	no data	NaN
Mainstem		2.7	26	9.37E-03	9.41E-04	no data	NaN
Mainstem		2.7	27	0.00E+00	0.00E+00	no data	NaN
Mainstem		2.7	28	0.00E+00	0.00E+00	no data	NaN
Mainstem		2.7	29	5.26E-03	5.28E-04	no data	NaN
Mainstem		2.7	30	0.00E+00	0.00E+00	no data	NaN
Mainstem		2.7	31	6.35E-03	6.37E-04	no data	NaN
Mainstem		2.7	32	0.00E+00	0.00E+00	no data	NaN
Mainstem		2.7	33	0.00E+00	0.00E+00	no data	NaN
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Mainstem	2 April 2014	49.1	19	1.58E-03	1.58E-04	no data	NaN
Mainstem		49.1	20	2.36E-03	2.37E-04	no data	NaN
Mainstem		49.1	21	2.85E-03	2.86E-04	-30.4	0.7

Mainstem	49.1	22	2.92E-03	2.93E-04	-30.0	0.0
Mainstem	49.1	23	3.48E-03	3.49E-04	-31.0	0.2
Mainstem	49.1	24	2.45E-03	2.46E-04	-29.8	0.1
Mainstem	49.1	25	4.22E-03	4.23E-04	-31.2	0.1
Mainstem	49.1	26	4.74E-03	4.75E-04	-30.5	0.3
Mainstem	49.1	27	6.24E-03	6.25E-04	-34.4	0.5
Mainstem	49.1	28	2.68E-03	2.68E-04	-31.8	0.4
Mainstem	49.1	29	1.60E-02	1.60E-03	-34.2	0.1
Mainstem	49.1	30	2.88E-03	2.88E-04	no data	NaN
Mainstem	49.1	31	1.69E-02	1.69E-03	-35.9	0.1
Mainstem	49.1	32	2.05E-03	2.06E-04	-34.3	0.7
Mainstem	49.1	33	6.70E-03	6.71E-04	-34.2	0.1

Table S2. Abundances and $\delta^{13}\text{C}$ values of fatty acids ($\text{C}_{14}\text{-C}_{34}$) from large-volume (>100 L) and depth-specific (10 L) samples collected in June 2005, April 2014 and July 2014.

Location	Date	Depth	Chain length	Abundance	Abundance error	$\delta^{13}\text{C}$	$\delta^{13}\text{C}$ error
--	--	--	#	ng/ μg POC	ng/ μg POC	‰	‰
Mainstem	1 April 2014	0	14	0.31171	0.031	-27.7	0.1
Mainstem		0	16	2.4949	0.250	-29.2	0.2
Mainstem		0	18	3.3937	0.340	-28.6	0.3
Mainstem		0	20	0.097067	0.010	-29.2	0.2
Mainstem		0	22	0.20945	0.021	-31.6	0.5
Mainstem		0	24	0.14455	0.014	-28.8	0.4
Mainstem		0	25	0.037764	0.004	no data	no data
Mainstem		0	26	0.10798	0.011	-30.2	0.5
Mainstem		0	27	0.024168	0.002	no data	no data
Mainstem		0	28	0.091665	0.009	-32.0	0.5
Mainstem		0	29	0.026517	0.003	no data	no data
Mainstem		0	30	0.081735	0.008	-33.2	0.2
Mainstem		0	31	0.021069	0.002	no data	no data
Mainstem		0	32	0.061277	0.006	-33.5	2.3
Mainstem		0	33	0.012159	0.001	no data	no data
Mainstem		0	34	0.031169	0.003	-33.1	0.1
Mainstem	28 July 2014	0	14	0.1952	0.020	-33.0	0.0
Mainstem		0	16	3.4245	0.344	-30.8	0.4
Mainstem		0	18	3.9505	0.397	-29.2	0.2
Mainstem		0	20	0.096981	0.010	-30.9	0.0
Mainstem		0	22	2.3583	0.237	-34.2	0.5
Mainstem		0	24	0.15264	0.015	-32.5	0.6
Mainstem		0	25	0.037073	0.004	no data	no data
Mainstem		0	26	0.13925	0.014	-33.0	0.4
Mainstem		0	27	0.029239	0.003	no data	no data
Mainstem		0	28	0.13231	0.013	-32.9	0.6
Mainstem		0	29	0.037333	0.004	no data	no data
Mainstem		0	30	0.13233	0.013	-33.0	0.2
Mainstem		0	31	0.034962	0.004	no data	no data
Mainstem		0	32	0.10498	0.011	-33.3	0.3
Mainstem		0	33	0.021529	0.002	no data	no data
Mainstem		0	34	0.054067	0.005	-32.8	0.2
Tapajós	27 July 2014	0	14	2.2663	0.227	-36.7	0.1
Tapajós		0	16	23.249	2.333	-33.6	0.3
Tapajós		0	18	11.378	1.142	-29.7	0.3
Tapajós		0	20	0.33744	0.034	-34.1	0.6

Tapajós		0	22	0	0.000	-39.4	0.2
Tapajós		0	24	0.93488	0.094	-36.2	0.6
Tapajós		0	25	0.18406	0.018	no data	no data
Tapajós		0	26	0.62779	0.063	-35.5	0.7
Tapajós		0	27	0.069807	0.007	no data	no data
Tapajós		0	28	0.4066	0.041	-36.6	1.2
Tapajós		0	29	0.031529	0.003	no data	no data
Tapajós		0	30	0.095123	0.010	-35.5	0.2
Tapajós		0	31	0.040663	0.004	no data	no data
Tapajós		0	32	0.031174	0.003	-34.9	0.1
Tapajós		0	33	0.0079396	0.001	no data	no data
Tapajós		0	34	0.012265	0.001	no data	no data
Mainstem	8 June 2005	0	14	0.19	0.019	-35.9	1.6
Mainstem		0	15	0.063	0.006	no data	no data
Mainstem		0	16	0.871	0.087	-34.3	7.4
Mainstem		0	17	0.018	0.002	no data	no data
Mainstem		0	18	0.18	0.018	-31.0	1.5
Mainstem		0	19	0.05	0.005	no data	no data
Mainstem		0	20	0.049	0.005	-33.0	0.4
Mainstem		0	21	0.047	0.005	no data	no data
Mainstem		0	22	0.097	0.010	-37.5	0.8
Mainstem		0	23	0.028	0.003	no data	no data
Mainstem		0	24	0.175	0.018	-37.0	1.5
Mainstem		0	25	0.035	0.004	no data	no data
Mainstem		0	26	0.194	0.019	-36.5	1.6
Mainstem		0	27	0.04	0.004	no data	no data
Mainstem		0	28	0.223	0.022	-37.2	1.9
Mainstem		0	29	0.049	0.005	no data	no data
Mainstem		0	30	0.166	0.017	-35.3	1.4
Mainstem		0	31	0.038	0.004	no data	no data
Mainstem		0	32	0.099	0.010	-34.3	0.8
Mainstem		0	33	0.023	0.002	no data	no data
Mainstem		0	34	0.048	0.005	-34.2	0.4
Mainstem		0	35	0.066	0.007	no data	no data
Solimões	4 June 2005	0	14	0.187	0.021	-34.9	2.1
Solimões		0	15	0.046	0.005	no data	no data
Solimões		0	16	0.885	0.100	-34.7	9.9
Solimões		0	17	0.017	0.002	no data	no data
Solimões		0	18	0.169	0.019	-30.3	1.9
Solimões		0	19	0.012	0.001	no data	no data
Solimões		0	20	0.049	0.006	-30.9	0.5
Solimões		0	21	0.018	0.002	no data	no data
Solimões		0	22	0.087	0.010	-34.5	1.0

Solimões		0	23	0.031	0.004	no data	no data
Solimões		0	24	0.19	0.022	-34.1	2.1
Solimões		0	25	0.044	0.005	no data	no data
Solimões		0	26	0.316	0.036	-34.2	3.5
Solimões		0	27	0.046	0.005	no data	no data
Solimões		0	28	0.27	0.031	-35.4	3.0
Solimões		0	29	0.059	0.007	no data	no data
Solimões		0	30	0.203	0.023	-34.6	2.3
Solimões		0	31	0.05	0.006	no data	no data
Solimões		0	32	0.141	0.016	-34.4	1.6
Solimões		0	33	0.032	0.004	no data	no data
Solimões		0	34	0.064	0.007	-34.5	0.7
Solimões		0	35	0.102	0.012	no data	no data
Madeira	6 June 2005	0	14	0.089	0.009	-37.7	0.4
Madeira		0	15	0.024	0.002	no data	no data
Madeira		0	16	0.508	0.052	-37.6	2.5
Madeira		0	17	0.013	0.001	no data	no data
Madeira		0	18	0.099	0.010	-31.0	0.5
Madeira		0	19	0.006	0.001	no data	no data
Madeira		0	20	0.032	0.003	-31.2	0.2
Madeira		0	21	0.01	0.001	no data	no data
Madeira		0	22	0.05	0.005	-34.1	0.2
Madeira		0	23	0.018	0.002	no data	no data
Madeira		0	24	0.09	0.009	-35.5	0.4
Madeira		0	25	0.021	0.002	no data	no data
Madeira		0	26	0.085	0.009	-35.0	0.4
Madeira		0	27	0.018	0.002	no data	no data
Madeira		0	28	0.087	0.009	-35.0	0.4
Madeira		0	29	0.023	0.002	no data	no data
Madeira		0	30	0.075	0.008	-34.5	0.4
Madeira		0	31	0.018	0.002	no data	no data
Madeira		0	32	0.053	0.005	-33.7	0.3
Madeira		0	33	0.012	0.001	no data	no data
Madeira		0	34	0.027	0.003	-33.5	0.1
Madeira		0	35	0.034	0.003	no data	no data
Mainstem	28 July 2014	54	14	0.054832	0.006	-32.4	0.4
Mainstem		54	16	0.63583	0.070	-30.4	0.2
Mainstem		54	18	0.39584	0.044	-29.2	0.1
Mainstem		54	20	0.036354	0.004	-30.6	1.1
Mainstem		54	22	0.74563	0.082	-32.4	0.4
Mainstem		54	24	0.086899	0.010	-31.5	0.3
Mainstem		54	25	0.022954	0.003	no data	no data
Mainstem		54	26	0.10196	0.011	-31.1	0.8

Mainstem		54	27	0.023842	0.003	no data	no data
Mainstem		54	28	0.12934	0.014	-31.5	0.1
Mainstem		54	29	0.031932	0.004	no data	no data
Mainstem		54	30	0.13955	0.015	-32.2	0.2
Mainstem		54	31	0.028885	0.003	no data	no data
Mainstem		54	32	0.094013	0.010	-32.8	0.3
Mainstem		54	33	0.019822	0.002	no data	no data
Mainstem		54	34	0.045886	0.005	-32.6	0.8
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Mainstem	2 April 2014	30.15	14	0.070165	0.007	-29.9	1.3
Mainstem		30.15	16	1.7788	0.179	-29.2	0.4
Mainstem		30.15	18	1.7946	0.181	-28.8	0.3
Mainstem		30.15	20	0.053737	0.005	-30.1	0.3
Mainstem		30.15	22	0.2279	0.023	-31.5	0.6
Mainstem		30.15	24	0.097517	0.010	-32.0	0.3
Mainstem		30.15	25	0.023434	0.002	no data	no data
Mainstem		30.15	26	0.097554	0.010	-32.0	0.3
Mainstem		30.15	27	0.023332	0.002	no data	no data
Mainstem		30.15	28	0.11045	0.011	-32.7	0.2
Mainstem		30.15	29	0.029705	0.003	no data	no data
Mainstem		30.15	30	0.11388	0.011	-33.3	0.2
Mainstem		30.15	31	0.027346	0.003	no data	no data
Mainstem		30.15	32	0.083013	0.008	-33.3	0.3
Mainstem		30.15	33	0.015861	0.002	no data	no data
Mainstem		30.15	34	0.038895	0.004	-33.4	0.9
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Mainstem	2 April 2014	2.7	14	0.21517	0.022	no data	no data
Mainstem		2.7	16	3.6379	0.365	no data	NaN
Mainstem		2.7	18	3.4641	0.348	no data	NaN
Mainstem		2.7	20	0.0699	0.007	no data	no data
Mainstem		2.7	22	0.55703	0.056	no data	NaN
Mainstem		2.7	24	0.078868	0.008	no data	NaN
Mainstem		2.7	25	0.018353	0.002	no data	no data
Mainstem		2.7	26	0.056486	0.006	no data	NaN
Mainstem		2.7	27	0.022969	0.002	no data	no data
Mainstem		2.7	28	0.050916	0.005	no data	NaN
Mainstem		2.7	29	0.012918	0.001	no data	no data
Mainstem		2.7	30	0.05081	0.005	no data	NaN
Mainstem		2.7	31	0.011095	0.001	no data	no data
Mainstem		2.7	32	0.034628	0.003	no data	NaN
Mainstem		2.7	33	0.0078758	0.001	no data	no data
Mainstem		2.7	34	0.016382	0.002	no data	NaN
<hr/>							
Mainstem	2 April 2014	49.1	14	0.10537	0.011	-28.7	1.3
Mainstem		49.1	16	3.1154	0.312	-29.4	0.3
Mainstem		49.1	18	3.0324	0.304	-28.9	0.2

Mainstem	49.1	20	0.064186	0.006	-30.1	0.3
Mainstem	49.1	22	0.25316	0.025	-32.8	0.9
Mainstem	49.1	24	0.090366	0.009	-32.1	0.3
Mainstem	49.1	25	0.022487	0.002	no data	no data
Mainstem	49.1	26	0.092227	0.009	-32.1	0.1
Mainstem	49.1	27	0.024705	0.002	no data	no data
Mainstem	49.1	28	0.10805	0.011	-32.7	0.2
Mainstem	49.1	29	0.031813	0.003	no data	no data
Mainstem	49.1	30	0.11688	0.012	-33.2	0.2
Mainstem	49.1	31	0.031116	0.003	no data	no data
Mainstem	49.1	32	0.08853	0.009	-33.7	0.2
Mainstem	49.1	33	0.020959	0.002	no data	no data
Mainstem	49.1	34	0.045168	0.005	-33.2	0.3

Table S3. Activities of eight enzymes within particles throughout the Óbidos cross-section in July 2014.

Channel position	Depth	Substrate	Avg. activity	S.D. activity
<i>km</i>	<i>m</i>	--	$\mu\text{mol/L/hr}$	$\mu\text{mol/L/hr}$
0.34	42.8	Leu	0.077	0.0091
0.34	42.8	Phe	0.049	0.0042
0.34	42.8	AAF	0.021	0.0033
0.34	42.8	NAG	0.008	0.0039
0.34	42.8	Cello	0.000	0.0002
0.34	42.8	b-glu	0.001	0.0005
0.34	42.8	xyl	0.000	0.0000
1.6	54	Leu	0.040	0.0065
1.6	54	Phe	0.031	0.0019
1.6	54	AAF	0.013	0.0006
1.6	54	NAG	0.003	0.0005
1.6	54	Cello	0.001	0.0000
1.6	54	b-glu	0.003	0.0001
1.6	54	xyl	0.001	0.0001
1.6	54	PO4	0.028	0.0008
1.6	39.83	Leu	0.056	0.0037
1.6	39.83	Phe	0.045	0.0020
1.6	39.83	AAF	0.020	0.0101
1.6	39.83	NAG	0.005	0.0006
1.6	39.83	Cello	-0.001	0.0003
1.6	39.83	b-glu	0.004	0.0002
1.6	39.83	xyl	0.000	0.0002
1.6	39.83	PO4	0.030	0.0035
1.6	30.4	Leu	0.053	0.0034
1.6	30.4	Phe	0.040	0.0045
1.6	30.4	AAF	0.012	0.0023
1.6	30.4	NAG	0.005	0.0002
1.6	30.4	Cello	0.001	0.0001
1.6	30.4	b-glu	0.003	0.0003
1.6	30.4	PO4	0.007	0.0032
1.6	14.95	Leu	0.040	0.0029
1.6	14.95	Phe	0.031	0.0014
1.6	14.95	Cello	0.006	0.0088
1.6	14.95	b-glu	0.002	0.0006
1.6	14.95	xyl	-0.001	0.0033
1.6	14.95	PO4	0.018	0.0021
1.6	0.15	Leu	0.090	0.0042

1.6	0.15	Phe	0.065	0.0028
1.6	0.15	AAF	0.014	0.0022
1.6	0.15	NAG	0.006	0.0002
1.6	0.15	Cello	0.001	0.0004
1.6	0.15	b-glu	0.005	0.0003
1.6	0.15	xyl	0.001	0.0002
1.6	0.15	PO4	0.036	0.0150
2.2	53.06	Leu	0.063	0.0047
2.2	53.06	Phe	0.028	0.0214
2.2	53.06	AAF	0.003	0.0025
2.2	53.06	NAG	0.005	0.0004
2.2	53.06	Cello	0.001	0.0001
2.2	53.06	b-glu	0.003	0.0001
2.2	53.06	xyl	0.001	0.0001
2.2	53.06	PO4	0.023	0.0019
2.2	29.83	Leu	0.064	0.0035
2.2	29.83	Phe	0.044	0.0115
2.2	29.83	AAF	0.010	0.0029
2.2	29.83	NAG	0.004	0.0009
2.2	29.83	Cello	0.002	0.0016
2.2	29.83	b-glu	0.002	0.0002
2.2	29.83	xyl	0.000	0.0001
2.2	29.83	PO4	0.015	0.0028
2.2	3.33	Leu	0.071	0.0288
2.2	3.33	Phe	0.040	0.0050
2.2	3.33	AAF	0.020	0.0186
2.2	3.33	NAG	0.003	0.0001
2.2	3.33	Cello	0.001	0.0004
2.2	3.33	b-glu	0.003	0.0012
2.2	3.33	xyl	0.001	0.0003
2.2	3.33	PO4	0.018	0.0010
