JGR: Biogeosciences

Supporting Information for

Heterogeneity in hyporheic flow, pore water chemistry, and microbial community composition in an alpine streambed

Amelia R. Nelson[1*], Audrey H. Sawyer[1], Rachel S. Gabor[2], Casey M. Saup[1], Savannah R. Bryant[1], Kira D. Harris[1], Martin A. Briggs[3], Kenneth H. Williams[4,5], Michael J. Wilkins[6]

[1]School of Earth Sciences, The Ohio State University, Columbus, OH, USA.
[2]School of Environment and Natural Resources, The Ohio State University, Columbus, OH, USA.
[3]Hydrogeophysics Branch, U.S. Geological Survey, Storrs, CT, USA.
[4]Lawrence Berkeley National Laboratory, Berkeley, CA, USA.
[5]Rocky Mountain Biological Laboratory, Gothic, CO, USA.
[6]Department of Soil and Crop Science, Colorado State University, Fort Collins, CO, USA.

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Introduction

The supplementary materials present additional data and information to elucidate the biogeochemical conditions and relationships between hydrology, chemistry, and microbiology within Meander A in the East River during base flow.

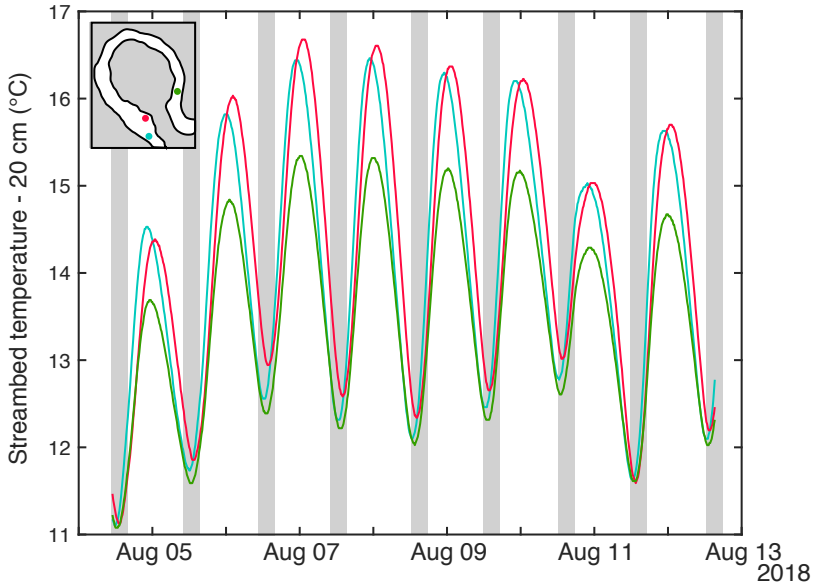

Figure S1. Geochemistry samples were taken on August 4 – August 13 between 11:00 am and 4:00 pm. Temperature time series at three locations in the meander (inset) at 20 cm depth show that temperature was consistently between 11 and 13 degrees Celsius during geochemical sampling periods.

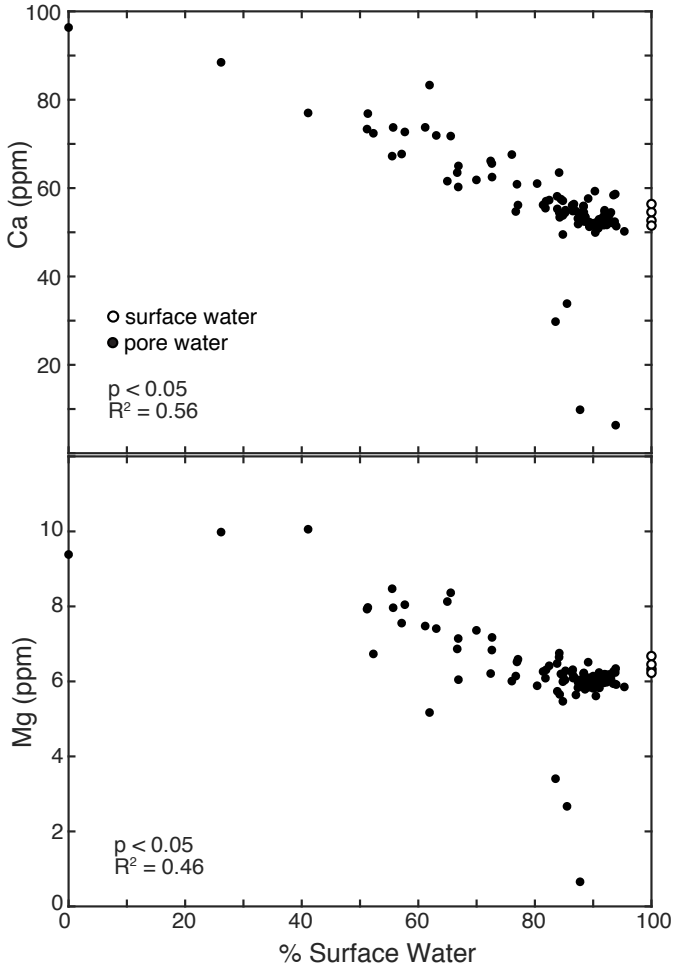

Figure S2. Linear relationship between %SW and Ca and Mg shows conservative behavior. Surface water samples are shown with open symbols.

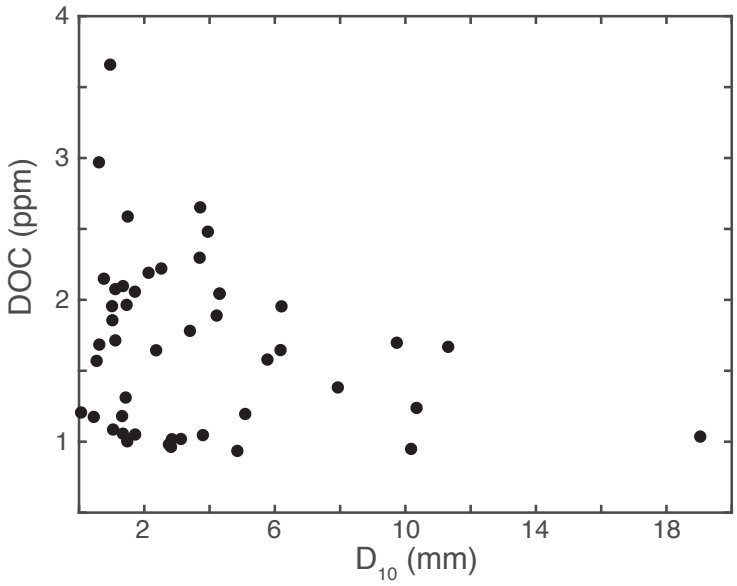

Figure S3. Samples with high DOC concentrations tend to be fine-grained (low D_{10}).

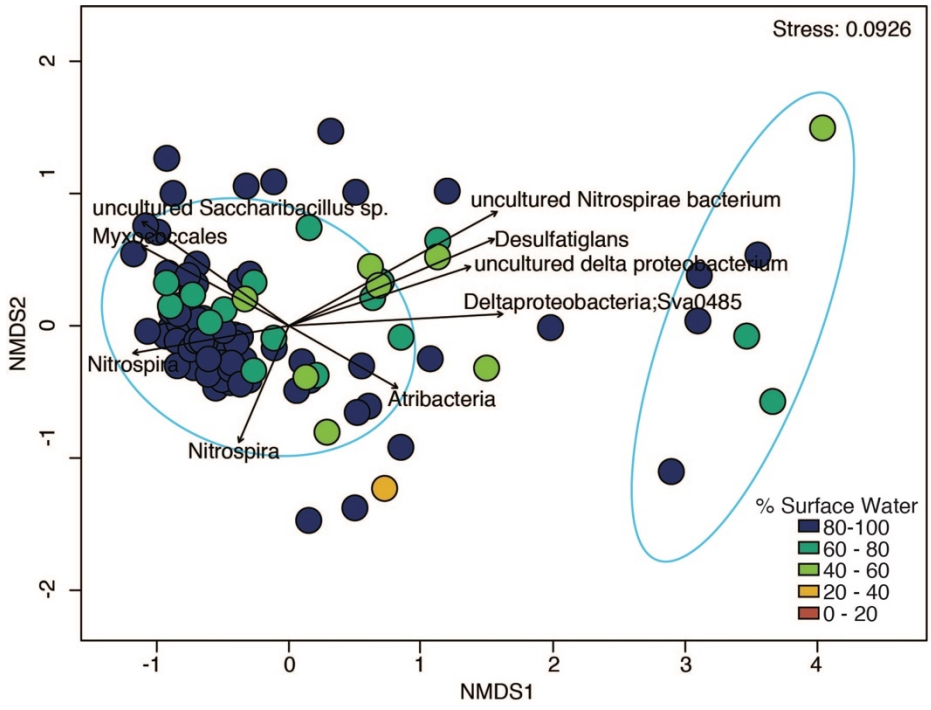

Figure S4. Non-metric multidimensional scaling (NMDS) of 16S rRNA sequencing data shows separation of communities based on ESV's. Vector length indicates the magnitude of effect, and proximity of points to vectors indicates correlations. Circled locations indicate groupings that are significantly different ($p < 0.05$).

	pH	O2	Potential aerobic respiration	% SW	VHG	DOC	Mn	Ca	Mg	D_{10}	LOI	HIX	FI	$SUVA_{245}$	Fraction Protein	Shannon	Simpson	Pielou	Species Richness	FaithPD
pH	1	**.64**	-.2	**.63**	-.27	**-.18**	**-.41**	**-.48**	**-.28**	.16	.03	**-.25**	**-.57**	**-.33**	.19	-.18	-.09	**.34**	**-.27**	**-.32**
O2	**.64**	1	**-.08**	**.56**	**-.33**	**-.14**	**-.32**	**-.33**	-.16	.01	.02	**-.31**	**-.61**	**-.24**	**.21**	-.16	-.14	**.22**	-.19	**-.25**
Potential aerobic respiration	-.2	**-.08**	1	0	**-.14**	**.06**	.07	0	**.05**	.18	-.14	-.01	**-.02**	.09	.16	.02	.06	.16	-.01	0
% SW	**.63**	**.56**	0	1	**-.28**	**-.35**	**-.72**	**-.75**	**-.68**	.21	.02	**-.44**	**-.66**	**-.24**	**.20**	-.13	-.07	.19	**-.22**	**-.29**
VHG	-.27	**-.33**	**-.14**	**-.28**	1	**.28**	.11	.29	.25	-.09	.11	.19	**.38**	-.04	.01	0	-.02	-.1	.04	.05
DOC	**-.18**	**-.14**	**.06**	**-.35**	**.28**	1	**.26**	**.13**	**.19**	-.23	-.02	**.10**	.16	-.07	.04	-.10	-.24	**-.24**	.01	.06
Mn	**-.41**	**-.32**	.07	**-.72**	.11	**.26**	1	**.54**	**.51**	.04	-.07	**.35**	**.28**	**.33**	-.16	.17	.09	0	.23	**.29**
Ca	**-.48**	**-.33**	0	**-.75**	.29	**.13**	**.54**	1	**.77**	-.19	-.1	**.35**	**.49**	.19	**-.23**	**.24**	**.36**	-.05	.18	**.23**
Mg	**- .28**	-.16	**.05**	**-.68**	.25	**.19**	**.51**	**.77**	1	-.19	-.1	**.39**	**.38**	.14	-.17	-.05	-.04	-.02	.01	.01
D_{10}	.16	.01	.18	.21	-.09	-.23	.04	-.19	-.19	1	-.1	-.09	-.16	.07	.28	-.18	-.25	-.1	-.15	-.18
LOI	.03	.01	-.14	.02	-.1	.11	0	-.1	-.1	-.1	1	-.01	-.2	-.12	-.1	.03	.01	-.1	.03	0
HIX	**-.25**	**-.31**	-.01	**-.44**	.19	**.10**	**.35**	**.35**	**.39**	-.09	-.1	1	**.32**	**.27**	**-.54**	.07	.07	-.2	.11	.17
FI	**-.57**	**-.61**	**-.02**	**-.66**	**.38**	.16	**.28**	**.49**	**.38**	-.16	-.2	**.32**	1	.11	-.13	.11	.09	-.3	.17	.23
$SUVA_{254}$	**-.33**	**-.24**	.09	**-.24**	-.04	-.07	**.33**	.19	.14	.07	-.12	**.27**	.11	1	-.13	.02	.04	**-.25**	.07	.11
Fraction Protein	.19	**.21**	.16	**.20**	.01	.04	-.16	**-.23**	-.17	.28	-.1	**-.54**	-.13	-.13	1	-.08	-.10	.07	-.10	-.11
Shannon	-.18	-.16	.02	-.13	0	-.10	.17	**.24**	-.05	-.18	.03	.07	.12	.02	-.08	1	**.82**	.1	**.87**	**.87**
Simpson	-.09	-.14	.06	-.07	-.02	-.24	.09	**.36**	-.04	-.25	.01	.07	.09	.04	-.10	**.82**	1	**.30**	**.51**	**.53**
Pielou	**.34**	**.22**	.16	.19	-.09	**-.24**	0	-.05	-.02	-.08	-.1	-.18	**-.25**	-.15	.07	.08	**.30**	1	-.15	-.20
Species Richness	**-.27**	-.19	-.01	**-.22**	.05	0	.23	.18	0	-.15	.03	.11	.17	.07	-.10	**.87**	**.51**	-.15	1	**.97**
FaithPD	**-.32**	**-.25**	0	**-.29**	.05	.06	**.29**	**.23**	0	-.18	0	.17	.23	.11	-.11	**.87**	**.53**	-.2	**.97**	1

Table S1. Correlation coefficients of measured variables. Bolded values have $p < 0.05$.