

Variable	Site	2014		2015		2016		2017		ANOVA results		
		U	R	U	R	U	R	U	R	Reach	Year	Reach (Year)
Hyporheic nitrate ( $\mu\text{M}$ )	KF	49.64 (30.82)	77.63 (14.03)	58.72 (8.80)	65.02 (0.97)	64.23 (7.51)	68.19 (2.45)	80.22 (3.96)	87.43 (2.60)	2014 2015 2016 2017	R > U	a a a b ns
	NF	65.21 (4.72)	65.99 (1.38)	48.84 (15.20)	54.47 (2.01)	38.18 (10.35)	41.20 (6.03)	48.55 (15.29)	41.54 (21.21)	2014 2015 2016 2017	ns	b ab a a ns
	SF	85.65 (21.68)	89.05 (7.15)	56.30 (9.95)	53.25 (20.42)	53.18 (23.01)	52.91 (18.26)	62.12 (21.37)	59.16 (22.38)	2014 2015 2016 2017	ns	b a a a ns
Hyporheic nitrite ( $\mu\text{M}$ )	KF	1.29 (0.91)	0.72 (0.16)	0.04 (0.02)	0.03 (0.00)	0.43 (0.06)	0.27 (0.14)	0.05 (0.00)	0.07 (0.04)	2014 2015 2016 2017	ns	d a c b ns
	NF	0.27 (0.03)	0.24 (0.05)	0.03 (0.01)	0.03 (0.00)	0.28 (0.09)	0.20 (0.10)	0.09 (0.02)	0.07 (0.01)	2014 2015 2016 2017	U > R	c a c b ns
	SF	0.24 (0.06)	0.20 (0.01)	0.04 (0.00)	0.03 (0.00)	0.28 (0.17)	0.13 (0.06)	0.05 (0.03)	0.04 (0.01)	2014 2015 2016 2017	U > R	b a b a ns
Hyporheic ammonium ( $\mu\text{M}$ )	KF	0.92 (1.19)	0.62 (0.08)	0.91 (0.43)	0.75 (0.23)	7.81 (4.97)	8.84 (1.65)	2.67 (0.99)	2.26 (1.06)	2014 2015 2016 2017	ns	a a c b ns
	NF	1.89 (0.20)	2.36 (1.38)	2.16 (2.47)	1.29 (0.91)	5.50 (4.87)	8.38 (1.17)	1.78 (0.21)	2.61 (1.42)	2014 2015 2016 2017	ns	a a b a ns
	SF	4.89 (7.24)	0.93 (0.37)	4.35 (6.82)	2.10 (1.18)	7.57 (14.19)	1.24 (1.31)	5.77 (9.53)	2.58 (1.07)	2014 2015 2016 2017	ns	ns ns ns ns

		2014		2015		2016		2017		ANOVA results			
Variable	Site	U	R	U	R	U	R	U	R	Reach	Year	Reach (Year)	
Hyporheic phosphate (μM)	KF	2.42 (1.02)	1.98 (0.63)	1.42 (0.17)	1.30 (0.03)	1.02 (0.35)	1.30 (0.15)	1.59 (0.16)	1.60 (0.09)	2014	ns	b	ns
										2015		a	
										2016		a	
	2017	b											
	NF	0.98 (0.16)	0.73 (0.11)	1.20 (0.45)	1.16 (0.11)	1.27 (0.64)	1.13 (0.07)	1.12 (0.07)	1.20 (0.17)	2014	ns	a	ns
										2015		b	
										2016		b	
	2017	b											
	SF	1.61 (0.73)	1.01 (0.17)	1.46 (0.28)	1.38 (0.26)	1.48 (0.69)	1.33 (0.18)	1.57 (0.25)	1.38 (0.20)	2014	ns	ns	ns
2015													
2016													
2017													
Hyporheic silicate (μM)	KF	639.65 (35.34)	701.44 (8.19)	15.28 (2.38)	12.75 (2.00)	393.93 (11.74)	319.54 (176.38)	4.37 (0.99)	120.31 (259.42)	2014	ns	c	ns
										2015		a	
										2016		b	
	2017	a											
	NF	589.69 (19.66)	591.97 (9.63)	4.61 (0.26)	6.16 (2.08)	264.83 (35.49)	202.13 (71.38)	3.08 (0.43)	3.14 (1.00)	2014	ns	c	ns
										2015		a	
										2016		b	
	2017	a											
	SF	685.04 (6.59)	682.27 (12.53)	13.43 (1.42)	16.95 (3.22)	419.64 (37.92)	419.70 (13.68)	3.28 (0.17)	3.63 (0.53)	2014	ns	d	ns
2015										b			
2016										c			
2017	a												
Hyporheic total nitrogen (μM)	KF	141.36 (66.68)	150.87 (3.08)	117.95 (11.17)	138.92 (18.09)	184.49 (25.01)	169.12 (24.21)	99.77 (5.52)	145.81 (27.13)	2014	ns	ab	ns
										2015		a	
										2016		b	
	2017	a											
	NF	124.54 (6.54)	203.92 (115.69)	80.65 (15.94)	115.27 (28.65)	139.22 (27.63)	177.10 (37.39)	84.18 (29.12)	129.26 (60.73)	2014	R > U	b	ns
										2015		a	
										2016		ab	
	2017	ab											
	SF	144.71 (18.80)	183.02 (49.91)	131.54 (21.21)	144.41 (25.66)	125.01 (15.15)	117.83 (31.64)	113.11 (51.22)	118.85 (48.24)	2014	ns	b	ns
2015										ab			
2016										a			
2017	a												

		2014		2015		2016		2017		ANOVA results			
Variable	Site	U	R	U	R	U	R	U	R		Reach	Year	Reach (Year)
Hyporheic total phosphorus (μM)	KF	6.85 (2.78)	4.62 (1.37)	6.16 (2.69)	8.31 (4.00)	12.39 (4.70)	9.24 (3.38)	6.99 (1.98)	13.30 (3.52)	2014 2015 2016 2017	ns	b ab a a	ns
	NF	4.46 (0.84)	12.76 (14.51)	5.03 (2.02)	7.41 (2.03)	4.25 (0.82)	13.27 (8.55)	5.02 (1.75)	15.26 (9.89)	2014 2015 2016 2017	R > U	ns	ns
	SF	10.88 (11.88)	11.63 (5.45)	7.95 (5.87)	18.81 (5.26)	7.73 (5.86)	4.36 (1.40)	11.62 (2.12)	14.46 (7.53)	2014 2015 2016 2017	ns	ns	ns
Hyporheic dissolved organic carbon (mg L-1)	KF	14.94 (9.05)	45.97 (18.00)	2.88 (0.32)	3.05 (0.30)	4.77 (1.45)	4.81 (0.17)	2.48 (0.44)	3.16 (0.38)	2014 2015 2016 2017	R > U	c a b a	ns
	NF	3.29 (0.10)	4.57 (0.55)	3.44 (0.10)	3.83 (0.28)	5.39 (0.68)	8.87 (6.50)	3.40 (0.66)	4.99 (3.66)	2014 2015 2016 2017	R > U	a a b a	R > U ns ns ns
	SF	65.58 (66.04)	30.71 (22.27)	2.97 (0.31)	3.04 (0.39)	4.35 (1.09)	3.88 (0.41)	5.52 (3.25)	6.74 (7.98)	2014 2015 2016 2017	ns	b a a a	ns
Hyporheic particulate organic matter (mg L-1)	KF	147.60 (124.08)	40.20 (18.05)	30.43 (28.19)	47.60 (54.36)	49.20 (36.13)	53.20 (40.34)	7.20 (7.56)	76.40 (33.81)	2014 2015 2016 2017	ns	ns	ns
	NF	11.40 (4.62)	102.58 (120.20)	27.20 (10.83)	60.93 (25.08)	18.40 (5.90)	51.60 (29.64)	10.00 (15.10)	82.40 (51.68)	2014 2015 2016 2017	R > U	ns	ns
	SF	26.07 (21.78)	95.14 (34.59)	29.20 (37.27)	58.00 (39.09)	19.20 (7.29)	59.20 (51.99)	32.40 (35.08)	53.60 (39.81)	2014 2015 2016 2017	R > U	ns	ns