

Table S1. Average denitrification (DNF) rates $\pm$ standard deviations (SD) and average nitrate ($\text{NO}_3\text{-N}$) concentrations from triplicate laboratory measurements for each location within the four study sites during the 2011–2012 sampling period.

Season Year	Site	Location	Average DNF ($\pm$ SD) ($\text{mg-N}\cdot\text{m}^{-2}\cdot\text{h}^{-1}$)	Average $\text{NO}_3\text{-N}$ ($\text{mg}\cdot\text{L}^{-1}$)
FALL 2011	UP	US	1.74 (2.45)	0.14
		DS1	0.42 (0.29)	0.02
		DS2	0.37 (0.04)	0.01
		DS3	0 (0)	< 0.01
	UL	US	3.69 (0.34)	0.36
		DS1	4.27 (0.78)	0.25
		DS2	1.76 (0.38)	0.27
		DS3	2.48 (0.81)	0.26
	SP	US	0.21 (0.11)	0.01
		DS1	0.22 (0.04)	0.03
		DS2	0.25 (0.03)	no data
		DS3	0.15 (0.03)	no data
	SL	US	0.47 (0.1)	0.09
		DS1	0.12 (0.01)	0.06
		DS2	0.67 (0.1)	0.10
		DS3	1.03 (0.45)	0.10
WINTER 2011	UP	US	1.42 (0.34)	0.43
		DS1	2.42 (0.23)	0.36
		DS2	2.12 (0.34)	0.35
		DS3	1.97 (0.3)	0.37
	UL	US	5.3 (1.41)	0.54
		DS1	4.17 (0.51)	0.39
		DS2	3.93 (0.36)	0.36
		DS3	4.3 (1.1)	0.34
	SP	US	1.83 (0.89)	0.19
		DS1	1.17 (0.21)	0.17
		DS2	0.47 (0.11)	0.15
		DS3	2.1 (0.32)	0.09
	SL	US	0 (0)	< 0.01
		DS1	0 (0)	< 0.01
		DS2	0 (0)	< 0.01
		DS3	0 (0)	< 0.01
SPRING 2012	UP	US	2.52 (0.22)	0.14
		DS1	1.04 (0.24)	0.11
		DS2	1.15 (0.28)	0.12
	UL	US	3.09 (0.41)	0.42
		DS1	3.38 (0.46)	0.38
		DS2	3.49 (0.6)	0.34
	SP	DS3	3.91 (0.22)	0.35
		US	0.84 (0.1)	0.17
		DS1	0.86 (0.33)	0.18
	SL	DS2	0.75 (0.13)	0.11
		DS3	3.76 (0.16)	0.22
		US	1.69 (0.48)	0.17
		DS1	1.22 (0.87)	0.19

DS2	2.39 (0.32)	0.26
DS3	1.34 (0.37)	0.27

Table S2. Average potential denitrification (DEA) rates ($\pm$ SD) and average sediment organic matter (OM) content (%) from triplicate laboratory measurements for each location within the four study sites during the 2012–2014 sampling period.

Season Year	Site	Location	Average DEA ($\pm$ SD) ($\text{mg-N}\cdot\text{m}^{-2}\cdot\text{h}^{-1}$)	Average OM ($\pm$ SD) (%)
FALL 2012	SL	US	35.06 (0.7)	3.13 (0.09)
		DS1	42.82 (0.78)	5.05 (0.14)
		DS2	34.96 (1.21)	2.75 (0.16)
		DS3	62.12 (1.73)	4.54 (0.32)
	SP	US	13.86 (0.47)	1.72 (0.53)
		DS1	19.99 (1.31)	2.79 (0.15)
		DS2	22.18 (1.83)	3.05 (0.18)
		DS3	10.81 (1)	2.36 (0.2)
	UL	US	19.88 (1.3)	0.84 (0.11)
		DS1	9.5 (1.02)	0.93 (0.03)
		DS2	7.99 (1.24)	1.05 (0.06)
		DS3	2.35 (0.66)	1.21 (0.08)
SUMMER 2012	SL	US	27.89 (2.87)	5.15 (0.01)
		DS1	45.91 (1.94)	5.64 (0.21)
		DS2	31.03 (1.93)	4.79 (0.28)
		DS3	15.42 (1.82)	5.2 (0.14)
	SP	US	12.02 (1.34)	2.82 (0.36)
		DS1	21.37 (3.17)	3.46 (0.33)
		DS2	10.23 (1.27)	2.94 (0.51)
		DS3	10.96 (1.27)	2.54 (0.12)
	UL	US	15.92 (1.04)	0.88 (0.06)
		DS1	7.24 (0.54)	0.88 (0.07)
		DS2	8.25 (1.19)	0.98 (0.22)
		DS3	2.62 (0.38)	0.68 (0.06)
WINTER 2012	SL	US	17.74 (0.32)	3.67 (0.12)
		DS1	22.66 (1.96)	2.74 (0.07)
		DS2	6.52 (0.49)	2.14 (0.29)
		DS3	12.46 (0.88)	3.93 (0.56)
	SP	US	7.41 (0.73)	1.19 (0.09)
		DS1	13.57 (1.85)	1.69 (0.22)
		DS2	15.03 (2.23)	2.5 (0.16)
		DS3	8.97 (1.75)	1.85 (0.28)
	UL	US	9.24 (1.5)	1.02 (0.11)
		DS1	6.8 (0.07)	0.97 (0.05)
		DS2	7.56 (0.78)	1.15 (0.12)
		DS3	5.79 (1.78)	0.87 (0.09)
SPRING 2013	SL	US	59.07 (3.41)	3.11 (0.41)
		DS1	51.1 (2.71)	3.59 (0.26)
		DS2	46.39 (3.66)	3.7 (0.34)
		DS3	23.81 (2.36)	2.84 (0.21)
	SP	US	13 (0.94)	2.1 (0.23)
		DS1	17.3 (0.79)	1.78 (0.11)
		DS2	27.12 (2.95)	2.31 (0.13)
		DS3	30.85 (2.4)	2.29 (0.16)

	UL	US	41.59 (3.58)	0.89 (0.07)
		DS1	31.12 (3.6)	1 (0.13)
		DS2	29.47 (1.45)	0.89 (0.14)
		DS3	18.14 (3.4)	0.73 (0.06)
FALL 2013	UP	US	26.71 (1.37)	1.08 (0.18)
		DS1	20.63 (1.05)	4.54 (0.36)
		DS2	45.56 (11.06)	3.59 (0.22)
		DS3	73.68 (10.29)	4.07 (0.95)
WINTER 2014	UP	US	19.19 (6.67)	no data
		DS1	19.51 (2.94)	no data
		DS2	no data	no data
		DS3	115.33 (16.71)	no data
SUMMER 2014	UP	US	32.54 (2.6)	1.71 (0.06)
		DS1	25.98 (0.91)	2.74 (0.1)
		DS2	36.84 (3.3)	2.22 (0.08)
		DS3	33.45 (1.94)	2.16 (0.06)
