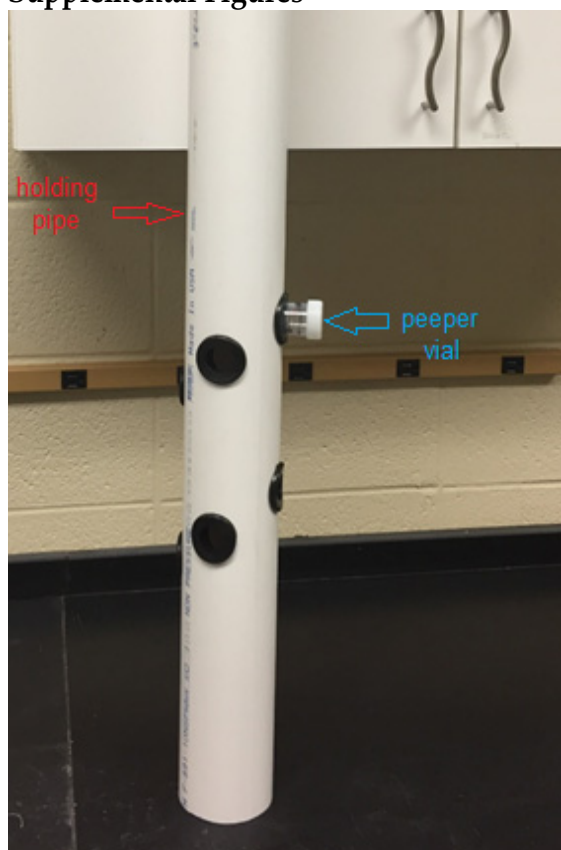


Supplemental Figures



(a)



(b)

Figure S1. Photos of a peeper device. (a) shows a peeper device before the deployment, and (b) shows a peeper device after the retrieval.

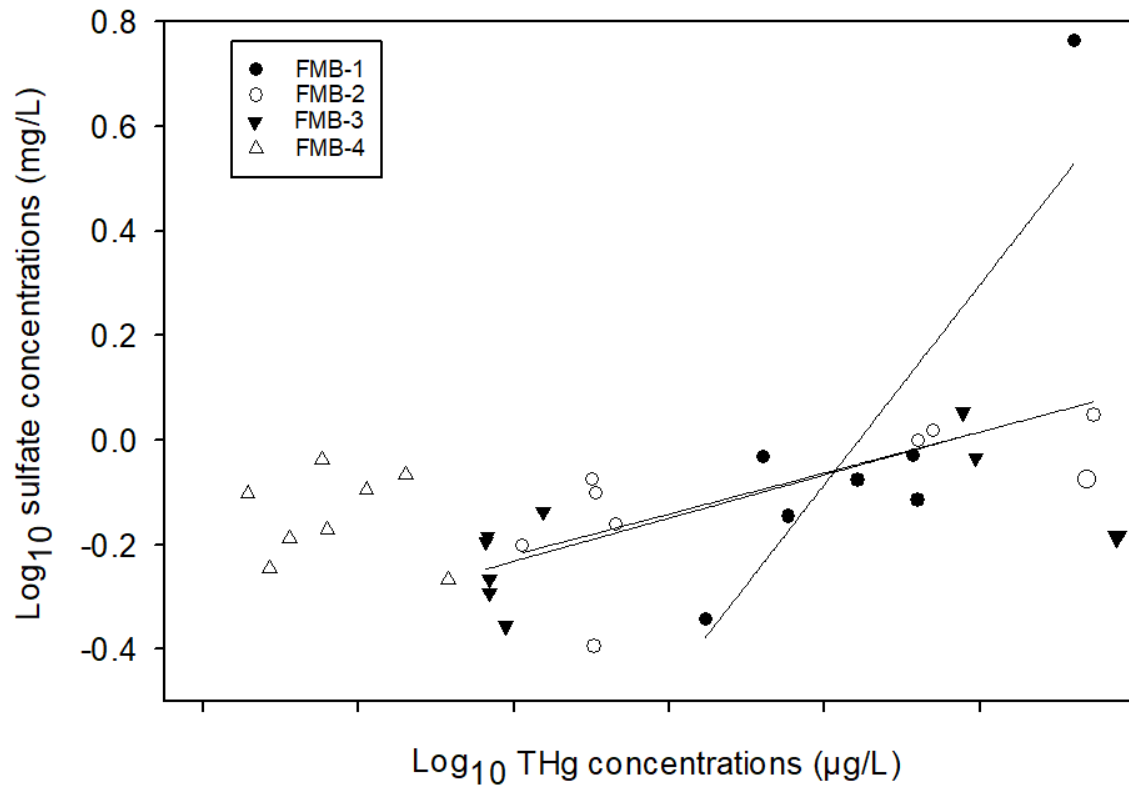
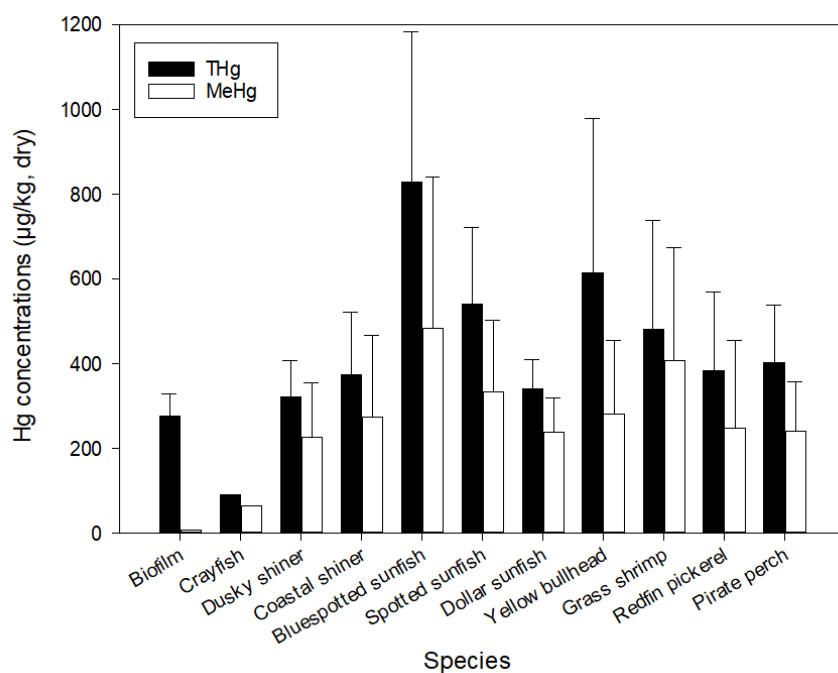
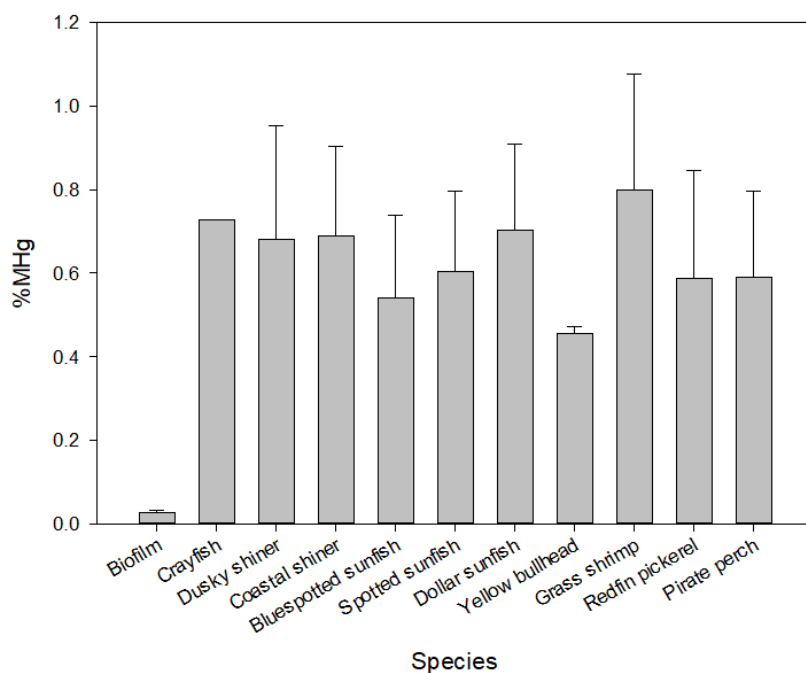


Figure S2. Relationships between porewater total mercury (THg) concentrations and sulfate in site FMB-1, -2, -3, and -4. Regression between THg and sulfate (a): FMB-1, $p = 0.01$, adjusted $r^2 = 0.73$, $n = 7$; FMB-2, $p = 0.03$, adjusted $r^2 = 0.48$, $n = 8$; FMB-3, $p = 0.007$, adjusted $r^2 = 0.69$, $n = 8$; FMB-4, $p > 0.05$, $n = 8$.



(a)



(b)

Figure S3. (a) Mercury (total and methyl-) concentrations and (b) percentage of methylmercury in total mercury (%MHg) in biota. Columns and error bars indicate means and standard deviations.

Supplemental Tables

Table S1. Definitions of mercury (Hg) species in this study.

Definition	Full name	Samples	Method
THg	Total Hg	Porewater, sediment, biota	Measured with Direct Mercury Analyzer-80
MHg	Monomethyl-Hg	Sediment, biota	Measured with MERX Automated Methylmercury System
IHg	Hg ²⁺ , HgOH ⁺ , Hg(OH) ₂ , Hg(OH) ₃ ⁻ , HgSO ₄	Water at SWI	Predicted by WHAM
IHg-DOC	DOC and IHg complex	Water at SWI	Predicted by WHAM
MHg salts	CH ₃ HgOH ⁺ , CH ₃ HgOH, CH ₃ HgCL	Water at SWI	Predicted by WHAM
MHg-DOC	DOC and MHg complex	Water at SWI	Predicted by WHAM
NLHg	Non-labile Hg	Water at SWI	[NLHg] = [THg] – [IHg] – [MHg salts] – [IHg-DOC]– [MHg-DOC]

SWI: sediment-water interface.

WHAM: Windermere Humic Aqueous Model.

Table S2. Depth profile of concentrations of total mercury (THg), methylmercury (MHg), and percentage of MHg in THg (%MHg) in the bulk sediment. The depth of 0 cm indicates the sediment-water interface (SWI).

Site	Depth (cm)	THg ($\mu\text{g/kg}$)	MHg ($\mu\text{g/kg}$)	%MHg (%)
FBM-1	4(floc)	534.3	15.9	3.0%
	0(SWI)	335.8	10.3	3.1%
	-4	331.1	9.26	2.8%
	-8	301.2	8.51	2.8%
	-12	278.9	7.92	2.8%
	-16	262.4	5.44	2.1%
	-20	279.0	4.41	1.6%
	-24	270.7	4.58	1.7%
FBM-2	4(floc)	292.7	5.18	1.8%
	0(SWI)	182.0	3.24	1.8%
	-4	174.0	2.97	1.7%
	-8	116.9	1.86	1.6%
	-12	106.5	1.84	1.7%
	-16	101.0	0.97	1.0%
	-20	66.0	0.88	1.3%
	-24	53.8	0.80	1.5%
FBM-3	4(floc)	241.9	4.89	2.0%
	0(SWI)	233.1	4.69	2.0%
	-4	190.7	3.18	1.7%
	-8	117.0	1.90	1.6%
	-12	106.9	1.73	1.6%
	-16	106.6	1.75	1.6%
	-20	107.2	1.74	1.6%
	-24	60.0	1.06	1.8%
FBM-4	4(floc)	232.6	2.73	1.2%
	0(SWI)	205.0	2.51	1.2%
	-4	192.8	2.41	1.2%
	-8	162.7	1.83	1.1%
	-12	155.3	1.82	1.2%
	-16	160.2	1.61	1.0%
	-20	158.5	1.41	0.9%
	-24	157.0	1.53	1.0%

Table S3. Depth profile of total mercury (THg), dissolved organic carbon (DOC), chloride, and sulfate in sediment porewaters. The depth of 0 cm indicates the sediment-water interface (SWI).

Site	Depth (cm)	THg ($\mu\text{g/L}$)	DOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
FBM-1	4	1.32	5.97	8.65	5.81
	0(SWI)	0.83	5.17	14.0	0.77
	-4	0.82	4.97	11.9	0.93
	-8	0.70	4.67	7.63	0.84
	-12	0.57	3.77	15.0	0.72
	-16	0.53	4.79	12.8	0.93
	-20	0.44	3.74	7.06	0.45
FBM-2	4	1.40	4.53	2.44	1.12
	0(SWI)	0.87	4.72	2.29	1.04
	-4	0.83	3.83	2.20	1.00
	-8	0.73	2.89	3.15	0.79
	-12	0.32	2.11	3.92	0.40
	-16	0.34	1.93	2.77	0.69
	-20	0.32	1.38	3.97	0.84
FBM-3	-24	0.26	1.96	3.12	0.63
	4	0.95	4.71	2.67	1.13
	0(SWI)	0.99	5.10	1.46	0.92
	-4	0.73	5.53	1.23	0.73
	-8	0.53	1.50	0.61	0.65
	-12	0.23	1.67	0.71	0.64
	-16	0.23	3.05	1.63	0.54
FBM-4	-20	0.25	1.76	1.23	0.44
	-24	0.23	2.02	2.23	0.51
	4	0.21	6.14	1.75	0.54
	0(SWI)	0.18	6.87	2.89	0.86
	-4	0.16	7.04	2.34	0.80
	-8	0.14	4.15	2.51	0.67
	-12	0.13	4.09	2.93	0.65
FBM-4	-16	0.14	4.13	2.75	0.92
	-20	0.11	4.19	7.84	0.79
	-24	0.12	4.36	11.2	0.57

Table S4. The output of the multiple linear regression that explores relationships between total mercury in porewater and dissolved organic carbon (DOC), sulfate, and chloride.

	Coefficient	Std. error	P	VIF
Constant	-0.37	0.12	0.047	
Log ₁₀ ^{DOC}	-0.08	0.28	0.77	1.23
Log ₁₀ ^{Chloride}	0.121	0.15	0.42	1.13
Log ₁₀ ^{Sulfate}	0.87	0.28	0.005	1.18

Table S5. Total mercury (THg), methylmercury (MHg), percentage of MHg in THg (%MHg), and stable carbon ($\delta^{15}\text{N}$) and nitrogen ($\delta^{13}\text{C}$) isotopes in biotic samples.

Species	Dry weight		Wet weight		%MHg	$\delta^{15}\text{N}$ (‰)	$\delta^{13}\text{C}$ (‰)
	THg ($\mu\text{g/kg}$)	MHg ($\mu\text{g/kg}$)	THg ($\mu\text{g/kg}$)	MHg ($\mu\text{g/kg}$)			
Biofilm	286.00	7.92			0.03	8.54	-29.52
Biofilm	298.00	8.94			0.03	7.99	-29.05
Biofilm	241.00	7.98			0.03	9.84	-29.91
Biofilm	274.00	7.92			0.03	8.37	-28.93
Biofilm	326.00	8.23			0.03	7.09	-29.10
Biofilm	396.00	9.45			0.02	/	/
Biofilm	304.00	8.15			0.03	7.49	-28.81
Biofilm	367.00	8.98			0.02	7.69	-29.24
Biofilm	277.00	6.51			0.02	6.91	-28.83
Biofilm	246.00	6.76			0.03	7.24	-28.92
Biofilm	241.00	7.84			0.03	7.36	-28.86
Biofilm	218.00	7.14			0.03	6.47	-28.18
Biofilm	257.00	8.38			0.03	10.31	-28.59
Biofilm	216.00	7.11			0.03	8.39	-28.12
Biofilm	236.00	7.02			0.03	8.27	-28.10
Biofilm	253.00	7.20			0.03	7.38	-27.96
Bluespotted sunfish	579.00	232.12	169.52	67.96	0.40	16.83	-31.08
Bluespotted sunfish	1080.00	736.23	287.86	196.23	0.68	11.30	-33.42
Coastal shiner	339.00	161.00	102.02	48.45	0.47	11.93	-29.47
Coastal shiner	282.00	254.73	84.87	76.66	0.90	13.80	-28.33
Crayfish	90.00	65.40	28.63	20.80	0.73	13.02	-28.25
Coastal shiner	411.00	344.18	117.10	98.07	0.84	15.25	-34.30
Coastal shiner	685.00	677.99	178.75	176.92	0.99	10.01	-28.62
Coastal shiner	273.00	132.86	57.23	27.85	0.49	12.64	-32.46
Coastal shiner	367.00	206.26	79.97	44.94	0.56	8.59	-31.35
Coastal shiner	261.00	151.22	64.27	37.24	0.58	16.16	-28.02
Dollar sunfish	350.00	143.50	93.16	38.20	0.41	14.80	-31.83
Dollar sunfish	311.00	181.18	84.45	49.20	0.58	14.64	-31.09
Dollar sunfish	446.00	327.00	131.29	96.26	0.73	15.21	-29.19
Dollar sunfish	249.00	173.63	63.51	44.29	0.70	15.40	-31.77
Dollar sunfish	382.00	290.04	85.58	64.98	0.76	/	/
Dollar sunfish	307.00	316.29	82.27	84.76	1.03	15.32	-34.34
Dusky shiner	379.00	423.69	97.67	109.19	1.12	11.12	-29.20
Dusky shiner	357.00	197.16	83.88	46.32	0.55	12.81	-28.33
Dusky shiner	439.00	480.15	110.44	120.79	1.09	9.20	-31.76
Dusky shiner	476.00	317.26	109.86	73.22	0.67	10.14	-31.00
Dusky shiner	348.00	224.11	100.57	64.77	0.64	12.96	-28.29

Dusky shiner	242.00	264.76	64.30	70.35	1.09	12.54	-27.63
Dusky shiner	266.00	83.28	74.09	23.20	0.31	10.01	-27.77
Dusky shiner	301.00	152.59	74.97	38.00	0.51	13.23	-29.12
Dusky shiner	243.00	144.90	65.57	39.10	0.60	13.74	-29.32
Dusky shiner	183.00	79.08	54.55	23.57	0.43	13.63	-29.13
Dusky shiner	283.00	141.31	79.85	39.87	0.50	12.68	-30.52
Dusky shiner	352.00	226.99	89.19	57.52	0.64	12.10	-28.93
Grass shrimp	686.00	523.61	164.54	125.59	0.76	15.70	-30.27
Grass shrimp	227.00	51.31	62.83	14.20	0.23	15.84	-32.25
Grass shrimp	411.00	468.25	104.27	118.80	1.14	/	/
Grass shrimp	845.00	741.70	199.08	174.74	0.88	16.86	-29.19
Grass shrimp	792.00	778.00	195.99	192.52	0.98	17.00	-29.99
Grass shrimp	193.00	175.50	54.39	49.46	0.91	15.04	-30.57
Grass shrimp	353.00	312.71	92.25	81.72	0.89	15.93	-29.56
Grass shrimp	347.00	209.55	92.20	55.68	0.60	16.50	-29.58
Grass shrimp	222.00	/	52.48	/	/	15.73	-29.52
Pirate perch	261.00	100.95	62.02	23.99	0.39	13.46	-30.89
Pirate perch	409.00	205.72	96.90	48.74	0.50	24.22	-35.25
Pirate perch	687.00	450.09	162.84	106.69	0.66	16.02	-34.21
Pirate perch	250.00	133.48	61.26	32.71	0.53	17.35	-31.27
Pirate perch	348.00	136.31	96.09	37.64	0.39	16.38	-33.20
Pirate perch	531.00	224.65	132.03	55.86	0.42	16.69	-34.72
Pirate perch	370.00	381.67	24.03	24.79	1.03	17.26	-32.88
Pirate perch	375.00	276.74	92.55	68.30	0.74	15.67	-32.67
Pirate perch	403.00	258.22	114.82	73.57	0.64	15.81	-31.88
Redfin pickerel	290.00	88.27	64.03	19.49	0.30	15.63	-29.39
Redfin pickerel	597.00	482.79	147.45	119.24	0.81	16.06	-30.37
Redfin pickerel	876.00	/	209.48	/	/	/	/
Redfin pickerel	563.00	/	130.96	/	/	/	/
Redfin pickerel	263.00	171.87	63.20	41.30	0.65	17.40	-29.02
Spotted sunfish	605.00	297.19	166.70	81.89	0.49	15.36	-31.33
Spotted sunfish	277.00	104.11	78.29	29.42	0.38	17.36	-29.91
Spotted sunfish	440.00	336.80	123.50	94.53	0.77	11.50	-27.96
Spotted sunfish	573.00	274.12	148.93	71.25	0.48	9.36	-29.06
Spotted sunfish	826.00	635.33	240.75	185.18	0.77	15.56	-28.75
Spotted sunfish	386.00	209.21	106.13	57.52	0.54	14.88	-31.02
Spotted sunfish	506.00	291.93	147.09	84.86	0.58	15.74	-30.39
Spotted sunfish	773.00	621.62	215.95	173.66	0.80	16.08	-29.63
Spotted sunfish	360.00	324.59	101.64	91.64	0.90	15.80	-28.46
Spotted sunfish	668.00	231.53	178.25	61.78	0.35	15.89	-30.14
Spotted sunfish	518.00	/	155.38	/	/	/	/
Yellow bullhead	640.00	297.59	/	/	0.46	14.71	-31.53
Yellow bullhead	1120.00	518.90	251.55	116.54	0.46	15.15	-28.14
Yellow bullhead	327.00	140.59	79.69	34.26	0.43	14.50	-32.03

Yellow bullhead	369.00	171.56	94.99	44.16	0.46	14.86	-34.56
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Note: / indicates the concentration was not measured due to an inadequate amount of samples