

SUPPORTING INFORMATION

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Polybrominated Diphenyl Ethers in the Sediments of the Great Lakes. 4. Influencing Factors, Trends, and Implications

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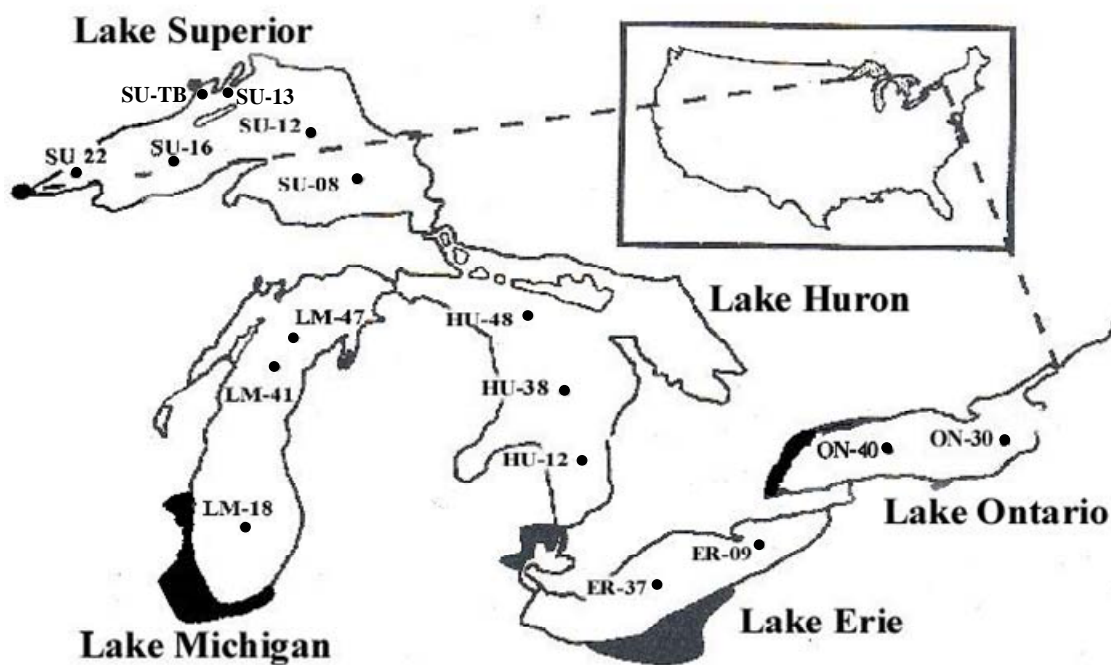


Figure S1. Laurentian Great Lakes sampling locations with major population centers shown in shaded areas. Thunder Bay (SU-TBay) and Station 13 in Lake Superior were not characterized for sediment properties and dated for deposition years due to insufficient amount of the samples, thus the results from these two sites were not used in the data analyses of this work.

Table S1. Sedimentation Rate and Focusing Factor at Each Location

ID	Latitude (N)	Longitude (W)	Sedimentation Rate ($\text{g cm}^{-2} \text{y}^{-1}$)		Focusing Factor
			CIC	CRS	
SU-08	47°36'21"	86°48'57"	0.0136 [#] ± 0.00095	0.0149 [#] ± 0.00073	1.08 [#] ± 0.0762
SU-12	47°51'22"	88°02'31"	0.0122 [#] ± 0.00029	0.0133 [#] ± 0.00073	0.79 [#] ± 0.0774
SU-16	47°37'17"	89°27'47"	0.0112 [#] ± 0.00047	0.0111 [#] ± 0.00029	1.37 [#] ± 0.0946
SU-22	46°48'05"	91°44'59"	0.0221 [#] ± 0.00100	0.0219 [#] ± 0.00025	0.74 [#] ± 0.0353
MI-18	42°43'00"	87°00'00"	0.0370 ± 0.00105	0.0362 ± 0.00070	2.86 ± 0.0535
MI-41	44°44'12"	86°43'14"	0.0362 ± 0.00237	0.0457 ± 0.00120	1.49 ± 0.0735
MI-47	45°10'42"	86°22'58"	0.0265 ± 0.00354	0.0353 ± 0.00120	1.45 ± 0.0558
HU-12	43°53'24"	82°03'24"	0.100 ± 0.00707	0.0913 ± 0.00707	2.44 ± 0.0493
HU-38	44°44'30"	82°03'15"	0.0226 ± 0.00479	0.0242 ± 0.00143	0.760 ± 0.0592
HU-48	45°16'42"	82°27'06"	0.0225 ± 0.00421	0.0295 ± 0.00222	0.876 ± 0.0492
ER-09	42°32'18"	79°37'00"	0.372 ± 0.123	0.147 ± 0.00903	1.61 ± 0.0352
ER-37	42°06'36"	81°34'30"	0.106 ± 0.0154	0.0786 ± 0.00865	1.25 ± 0.0417
ON-30	43°32'00"	76°54'00"	0.0349 ± 0.00212	0.037 ± 0.00236	1.15 ± 0.0573
ON-40	43°35'00"	78°00'00"	0.0328 ± 0.00127	0.0385 ± 0.00210	1.19 ± 0.0608

* The uncertainties of these data were estimated from the standard errors of the slopes of the linear regressions shown in the Supporting Information of the previous papers (1-3).

These values were slightly adjusted from previously reported values (1), after re-analyzing the data to correct a computation inaccuracy.

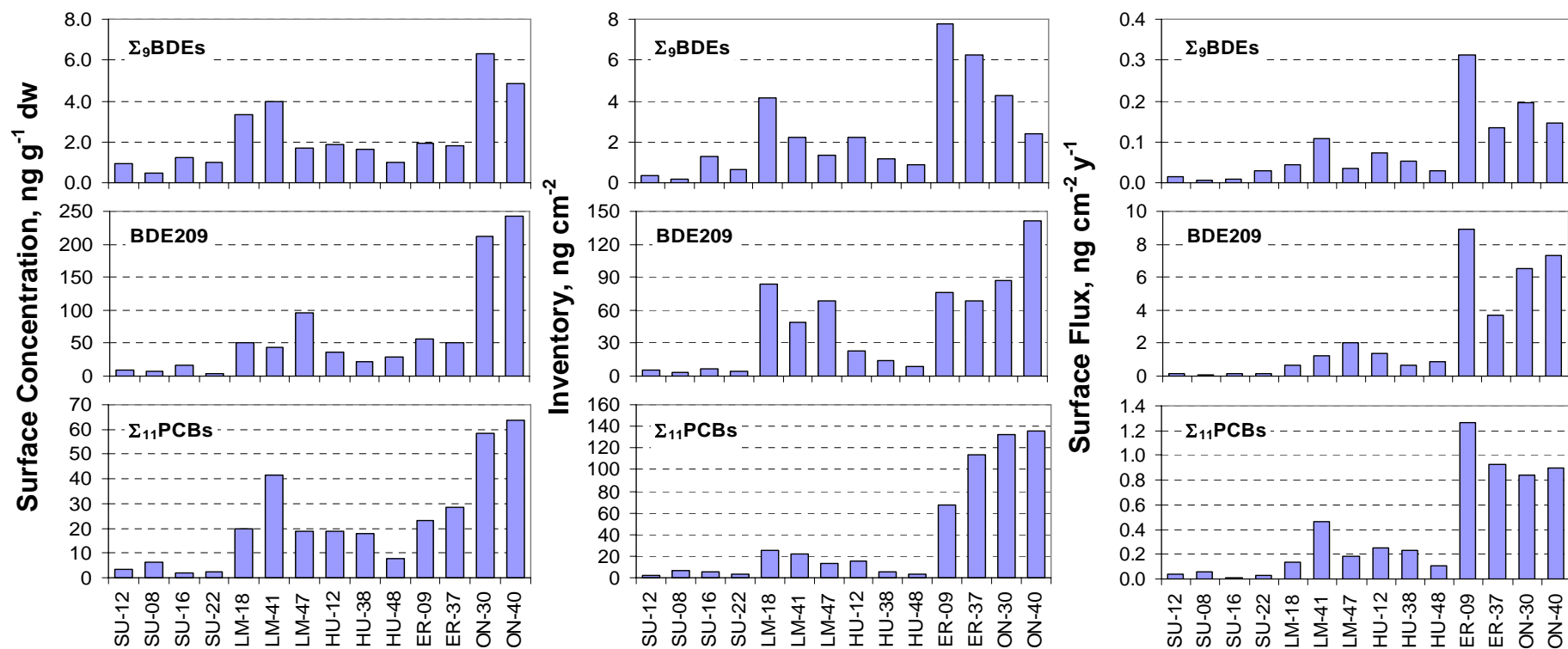


Figure S2. Comparison of PBDEs and PCBs among sampling locations in the Great Lakes.

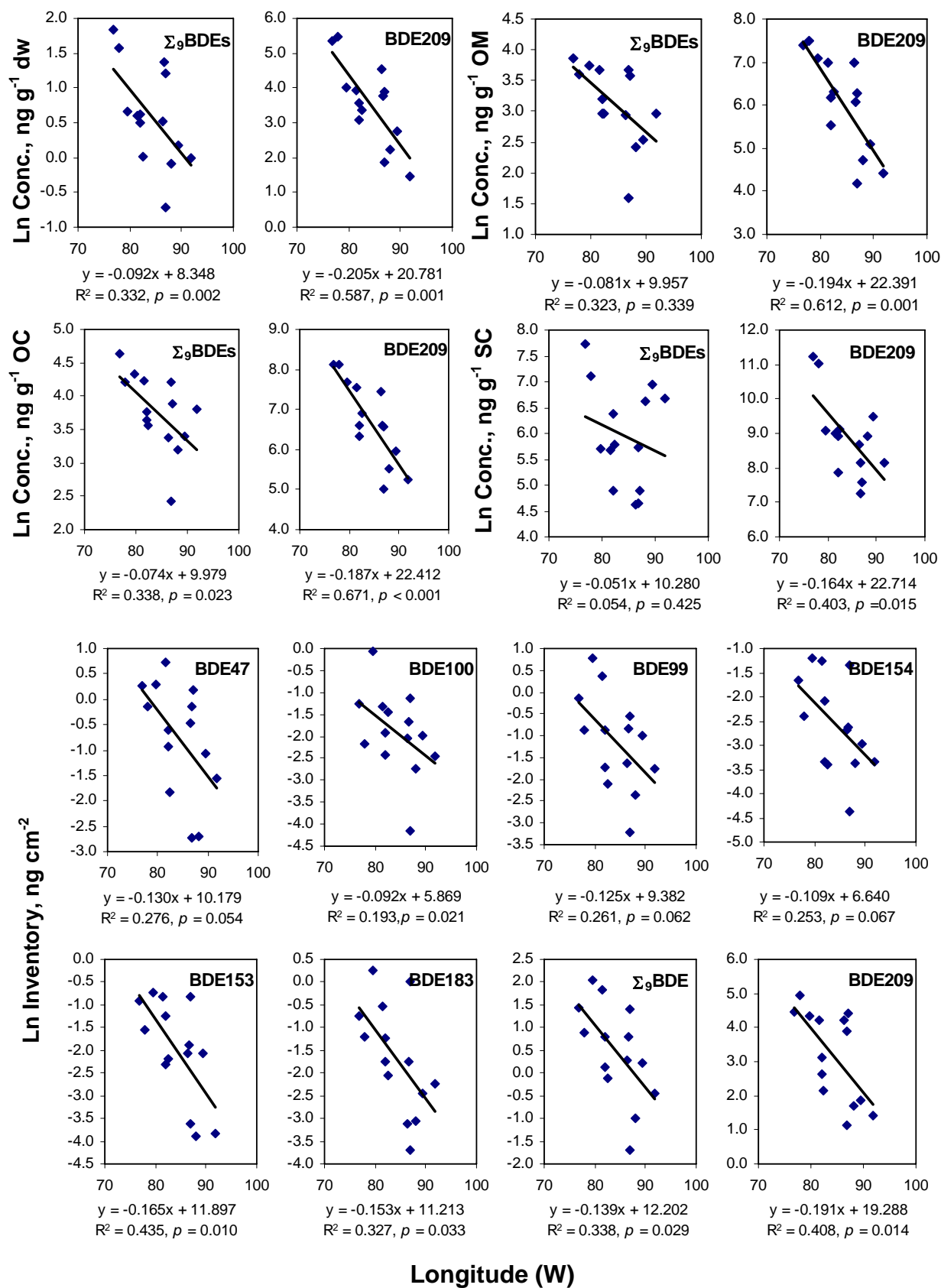


Figure S3. Concentration and inventory of PBDEs in sediment versus longitude.

Table S2. Urban Distance Factors

City	Latitude (N)	Longitude (W)	Population 2000-2001	Urban Influence Factor (UIF) = Population / Distance^2													
				SU08	SU12	SU16	SU22	MI18	MI41	MI47	HU12	HU38	HU48	ER09	ER37	ON30	ON40
Akron, OH	41.0804	81.5215	217,074	0.3	0.3	0.2	0.2	0.9	0.6	0.6	2.2	1.3	1.0	4.2	16.5	1.0	1.3
Albany, NY	42.6658	73.7990	875,583	0.7	0.6	0.5	0.4	0.8	0.8	0.8	1.9	1.8	1.6	3.9	2.1	12.0	6.9
Allentown, PA	40.5963	75.4777	637,958	0.4	0.4	0.3	0.3	0.7	0.6	0.6	1.5	1.3	1.1	3.9	2.2	5.3	4.1
Aurora, IL	41.7676	88.2930	142,990	0.3	0.3	0.3	0.4	6.3	1.1	0.9	0.5	0.4	0.4	0.3	0.5	0.2	0.2
Barrie, ON	44.3667	79.7000	148,480	0.3	0.3	0.2	0.2	0.4	0.5	0.5	3.9	4.1	2.6	3.6	1.7	2.5	5.7
Bay City, MI	43.5901	83.8886	403,070	1.6	1.2	1.0	0.8	5.5	6.0	5.7	17.7	10.6	8.3	3.0	6.4	1.3	1.8
Belleville, ON	44.1667	77.3667	87,395	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.6	0.6	0.5	1.3	0.5	13.7	12.8
Benton Harbor, MI	42.1164	86.4462	162,453	0.4	0.4	0.4	0.4	24.8	1.9	1.4	1.0	0.8	0.7	0.5	1.0	0.3	0.3
Boston, MA	42.3360	71.0179	589,141	0.3	0.3	0.2	0.2	0.3	0.4	0.4	0.7	0.7	0.6	1.2	0.8	2.4	1.7
Brampton, ON	43.6833	79.7667	325,428	0.7	0.5	0.4	0.3	0.9	1.0	1.1	9.5	6.9	4.2	19.8	6.2	6.1	16.0
Brantford, ON	43.1500	80.2833	86,417	0.2	0.1	0.1	0.1	0.3	0.3	0.3	3.2	1.7	1.0	11.4	3.5	1.1	2.4
Buffalo, NY	42.8898	78.8597	1,170,111	1.8	1.4	1.2	1.0	2.6	2.7	2.7	14.8	10.8	7.6	218.1	20.5	38.5	108.1
Canton, OH	40.8122	81.3733	406,934	0.5	0.5	0.4	0.4	1.5	1.1	1.0	3.4	2.1	1.6	7.0	19.2	1.8	2.4
Cedar Rapids, IA	41.9730	91.6696	191,701	0.4	0.4	0.5	0.7	1.2	0.8	0.6	0.3	0.3	0.3	0.2	0.3	0.1	0.2
Chicago, IL	41.8371	87.6850	9,157,540	22.0	20.4	21.1	22.3	716.9	83.0	61.3	34.8	29.3	28.2	20.4	35.7	11.3	13.8
Cincinnati, OH	39.1398	84.5060	1,979,202	2.1	1.9	1.9	1.8	9.8	4.7	4.2	6.2	4.6	4.0	6.3	11.6	3.1	3.7
Cleveland, OH	41.4797	81.6785	2,945,831	4.7	3.9	3.5	3.0	13.9	9.8	9.4	40.4	22.2	16.1	68.5	589.4	14.3	20.2
Collingwood, ON	44.5000	80.2333	21,500	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.8	1.0	0.6	0.4	0.3	0.3	0.5
Columbus, OH	39.9889	82.9874	1,540,157	1.9	1.7	1.6	1.4	7.5	4.1	3.7	7.9	5.4	4.4	9.6	22.1	3.7	4.6
Dayton, OH	39.7791	84.1974	950,558	1.2	1.1	1.0	1.0	5.9	2.7	2.4	3.9	2.8	2.4	3.9	8.2	1.8	2.1
Dearborn, MI	42.3113	83.2135	97,775	0.2	0.2	0.2	0.1	1.0	0.6	0.6	2.5	1.2	0.9	1.1	5.2	0.3	0.5
Des Moines, IA	41.5767	93.6174	456,022	0.6	0.7	0.8	1.3	1.5	1.0	0.9	0.5	0.5	0.5	0.3	0.5	0.2	0.3
Detroit, MI	42.3831	83.1022	5,456,428	12.9	10.5	9.2	7.7	52.7	35.5	32.8	154.3	71.7	51.2	66.3	325.5	20.1	28.7
Duluth, MN	46.7810	92.1180	243,815	1.4	2.2	5.0	307.4	0.7	1.1	1.1	0.3	0.4	0.4	0.2	0.3	0.2	0.2
Erie, PA	42.1259	80.0866	280,843	0.4	0.4	0.3	0.2	0.9	0.8	0.8	4.4	2.6	1.8	77.9	18.6	3.0	5.1
Evansville, IN	37.9842	87.5433	296,195	0.3	0.2	0.3	0.3	1.1	0.5	0.5	0.5	0.4	0.4	0.4	0.6	0.3	0.3
Flint, MI	43.0229	83.6928	124,943	0.4	0.3	0.3	0.2	1.7	1.3	1.2	4.7	2.3	1.7	1.1	3.1	0.4	0.6
Fort Wayne, IN	41.0738	85.1390	502,141	0.9	0.8	0.8	0.7	8.8	2.7	2.3	3.1	2.2	1.9	2.1	5.0	0.9	1.2
Gary, IN	41.5958	87.3441	102,746	0.2	0.2	0.2	0.2	6.3	0.8	0.6	0.4	0.3	0.3	0.2	0.4	0.1	0.2
Grand Rapids, MI	42.9613	85.6557	1,088,514	3.9	3.3	3.0	2.6	85.1	23.5	16.9	11.4	8.9	8.2	4.4	9.0	2.1	2.8
Green Bay, WI	44.5216	87.9898	226,778	1.8	1.6	1.7	1.5	4.9	21.2	10.6	1.0	1.0	1.1	0.4	0.7	0.3	0.3
Guelph, ON	43.5500	80.2500	117,344	0.3	0.2	0.2	0.1	0.4	0.4	0.4	5.2	3.1	1.7	7.6	3.1	1.6	3.6
Hamilton, ON	43.2500	79.8333	662,401	1.2	1.0	0.8	0.6	1.9	2.0	2.1	17.8	11.2	7.0	100.5	18.2	11.6	28.4
Hammond, IN	41.6210	87.4904	83,048	0.2	0.2	0.2	0.2	5.0	0.7	0.5	0.3	0.3	0.3	0.2	0.3	0.1	0.1
Houghton, MI	47.1136	88.5618	7,010	0.3	0.8	0.9	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Indianapolis, IN	39.7764	86.1462	1,607,486	2.1	1.9	1.9	2.0	14.3	5.2	4.4	5.0	3.8	3.4	4.1	7.5	2.1	2.5

Jersey City, NJ	40.7113	74.0650	240,055	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.4	0.4	0.3	0.9	0.6	1.6	1.2
Joliet, IL	41.5267	88.1224	106,221	0.2	0.2	0.2	0.2	4.1	0.8	0.6	0.3	0.3	0.3	0.2	0.4	0.1	0.1
Kalamazoo, MI	42.2747	85.5883	452,851	1.3	1.1	1.0	0.9	28.6	5.4	4.2	3.9	2.9	2.6	1.9	4.1	0.9	1.1
Kansas City, MS	39.1223	94.5520	1,776,062	1.4	1.5	1.7	2.3	3.2	2.2	2.0	1.3	1.2	1.2	1.0	1.4	0.7	0.8
Kingston, ON	44.2333	76.5000	146,838	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.7	0.7	0.6	1.5	0.7	20.7	7.4
Kitchener, ON	43.4500	80.5000	414,284	0.9	0.7	0.6	0.5	1.4	1.5	1.6	22.9	11.5	6.3	26.8	13.8	4.9	10.1
Lansing, MI	42.7091	84.5540	447,728	1.4	1.1	1.0	0.8	11.2	5.5	4.6	7.7	4.9	4.1	2.7	7.0	1.1	1.5
Leamington, ON	42.0500	82.5833	25,000	0.1	0.0	0.0	0.0	0.2	0.1	0.1	0.6	0.3	0.2	0.4	3.6	0.1	0.1
Lexington-Fayette, KY	38.0427	84.4595	479,198	0.4	0.4	0.4	0.4	1.5	0.8	0.7	1.0	0.8	0.7	1.1	1.8	0.6	0.7
Lincoln, NE	40.8164	96.6882	250,291	0.2	0.2	0.3	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.1	0.1
Livonia, MI	42.3982	83.3725	100,545	0.2	0.2	0.2	0.1	1.1	0.7	0.7	2.6	1.3	0.9	1.1	4.4	0.3	0.5
London, ON	42.9667	81.2500	432,451	0.9	0.7	0.6	0.5	2.0	1.9	1.9	29.2	10.0	5.7	21.5	44.1	3.4	5.8
Louisville, KY	38.2248	85.7412	1,025,598	0.9	0.9	0.9	0.9	3.9	1.9	1.7	2.1	1.7	1.5	2.1	3.3	1.1	1.3
Mackinac Island, MI	45.8560	84.6217	523	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Madison, WI	43.0798	89.3875	426,526	1.4	1.5	1.7	2.1	10.8	5.3	3.8	1.2	1.1	1.2	0.7	1.0	0.4	0.5
Manitowoc, WI	44.0986	87.6774	82,887	0.5	0.5	0.5	0.4	3.1	7.7	3.3	0.4	0.4	0.4	0.2	0.3	0.1	0.1
Marquette, MI	46.5508	87.3957	19,661	1.3	0.8	0.5	0.2	0.1	0.5	0.7	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Memphis, TN	35.1056	90.0070	1,135,614	0.6	0.6	0.6	0.7	1.4	0.9	0.8	0.8	0.7	0.7	0.8	1.0	0.5	0.6
Milwaukee, WI	43.0634	87.9666	1,689,572	6.4	5.9	6.2	6.5	219.3	37.8	23.6	7.1	6.5	6.6	3.6	5.9	2.1	2.6
Minneapolis, MN	44.9619	93.2668	2,968,806	8.9	11.2	17.1	53.2	9.4	11.1	10.1	3.7	3.8	4.1	2.3	3.0	1.7	2.0
Mississauga, ON	43.6333	79.6000	612,925	1.2	0.9	0.8	0.6	1.7	1.8	1.9	15.4	11.4	7.2	41.2	11.2	12.9	36.8
Montréal, QC	45.5000	73.6000	1,789,041	1.7	1.4	1.2	0.9	1.4	1.7	1.8	3.7	4.0	3.7	5.3	3.2	15.4	10.7
Muskegon, MI	43.2276	86.2555	40,105	0.2	0.1	0.1	0.1	5.8	1.4	0.8	0.3	0.3	0.3	0.1	0.2	0.1	0.1
Naperville, IL	41.7626	88.1543	128,358	0.3	0.3	0.3	0.3	6.3	1.0	0.8	0.4	0.4	0.4	0.3	0.4	0.1	0.2
Nashville-Davidson, TN	36.1716	86.7848	1,231,311	0.8	0.7	0.7	0.8	2.3	1.4	1.2	1.4	1.2	1.1	1.4	1.9	0.9	1.0
New York, NY	40.6698	73.9438	21,199,865	12.9	11.2	10.0	8.5	17.3	16.4	16.6	36.9	32.9	28.6	79.7	49.1	131.5	97.6
Newark, NJ	40.7241	74.1732	273,546	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.5	0.4	0.4	1.1	0.7	1.8	1.4
Niagara Falls, NY	43.0912	79.0162	55,593	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.8	0.6	0.4	9.0	1.0	1.7	5.7
Niagara Falls, ON	43.0833	79.1000	78,815	0.1	0.1	0.1	0.1	0.2	0.2	0.2	1.2	0.9	0.6	14.4	1.5	2.3	7.1
North Bay, ON	46.3333	79.4667	63,681	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.6	0.9	0.9	0.4	0.3	0.5	0.6
Oakville, ON	43.4500	79.6833	144,738	0.3	0.2	0.2	0.1	0.4	0.4	0.5	3.7	2.6	1.6	14.0	3.1	2.9	7.7
Omaha, NE	41.2639	96.0117	716,998	0.7	0.8	0.9	1.4	1.2	1.0	0.9	0.5	0.5	0.5	0.4	0.5	0.3	0.3
Orillia, ON	44.6000	79.4333	40,256	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.8	0.9	0.6	0.8	0.4	0.7	1.6
Oshawa, ON	43.8833	78.8500	139,051	0.3	0.2	0.2	0.1	0.3	0.3	0.4	2.1	1.9	1.3	5.3	1.6	5.3	24.0
Ottawa, ON	45.4167	75.7167	827,854	1.1	0.9	0.7	0.5	0.9	1.1	1.2	2.9	3.3	3.0	4.1	2.3	15.7	11.1
Owen Sound, ON	44.5667	80.8500	21,431	0.1	0.0	0.0	0.0	0.1	0.1	0.1	1.4	2.3	1.0	0.4	0.3	0.2	0.3
Peoria, IL	40.7450	89.6092	112,936	0.2	0.2	0.2	0.2	1.2	0.4	0.4	0.2	0.2	0.2	0.2	0.2	0.1	0.1
Peterborough, ON	44.3333	78.3333	71,446	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.8	0.8	0.6	1.4	0.5	3.4	9.3
Philadelphia, PA	40.0068	75.1347	6,188,463	3.9	3.4	3.0	2.6	5.8	5.2	5.3	12.0	10.3	8.8	28.1	17.8	35.2	28.8

Pittsburgh, PA	40.4392	79.9767	2,358,695	2.5	2.2	1.9	1.7	5.8	4.4	4.3	13.3	9.1	7.1	42.5	44.9	12.9	15.8
Port Huron, MI	42.9937	82.4336	32,338	0.1	0.1	0.1	0.0	0.2	0.2	0.2	3.0	0.8	0.5	0.6	2.2	0.2	0.2
Richmond Hill, ON	43.8667	79.1167	132,030	0.2	0.2	0.2	0.1	0.3	0.4	0.4	2.4	2.1	1.4	5.6	1.7	4.0	14.6
Rochester, NY	43.1687	77.6158	1,037,831	1.4	1.1	0.9	0.7	1.8	1.8	1.9	7.7	6.6	5.1	32.9	8.7	207.3	335.1
Rockford, IL	42.2703	89.0631	371,236	1.0	0.9	1.0	1.2	11.9	3.3	2.5	1.0	0.9	0.9	0.6	1.0	0.4	0.4
Sarnia, ON	42.9500	82.4000	70,876	0.2	0.1	0.1	0.1	0.5	0.4	0.4	6.0	1.7	1.1	1.3	5.3	0.3	0.5
St Ste. Marie, MI	46.4846	84.3655	16,542	0.3	0.2	0.1	0.1	0.1	0.2	0.4	0.1	0.2	0.4	0.0	0.1	0.0	0.0
South Bend, IN	46.5333	84.3333	74,566	1.5	0.7	0.4	0.2	0.3	1.0	1.6	0.6	1.0	1.8	0.2	0.3	0.2	0.2
Springfield, IL	39.7814	89.6447	201,437	0.2	0.2	0.3	0.3	1.3	0.6	0.5	0.3	0.3	0.3	0.3	0.4	0.2	0.2
St Ste. Marie, ON	41.6753	86.2657	265,559	0.6	0.5	0.5	0.5	15.5	2.3	1.7	1.5	1.1	1.0	0.9	1.7	0.4	0.5
St. Catharines, ON	43.1667	79.2500	377,009	0.6	0.5	0.4	0.3	0.9	1.0	1.0	6.5	4.6	3.1	65.1	7.5	10.0	30.4
St. Louis, MS	38.6361	90.2443	2,603,607	2.4	2.4	2.6	3.1	9.3	4.8	4.1	3.2	2.8	2.7	2.6	3.8	1.7	1.9
St. Paul, MN	44.9477	93.1037	287,151	0.9	1.1	1.7	5.4	1.0	1.1	1.0	0.4	0.4	0.4	0.2	0.3	0.2	0.2
St. Paul, MN	44.9333	93.0833	287,151	0.9	1.1	1.7	5.3	1.0	1.1	1.0	0.4	0.4	0.4	0.2	0.3	0.2	0.2
St. Thomas, ON	42.7833	81.2000	33,236	0.1	0.1	0.0	0.0	0.1	0.1	0.1	1.7	0.6	0.4	1.9	5.1	0.3	0.4
Sterling Heights, MI	42.5800	83.0305	124,471	0.3	0.2	0.2	0.2	1.2	0.9	0.8	4.5	1.9	1.3	1.6	7.3	0.5	0.7
Sudbury, ON	46.5000	81.0167	155,601	0.7	0.5	0.4	0.2	0.4	0.7	0.8	1.7	3.5	5.0	0.8	0.6	0.7	1.0
Syracuse, NY	43.0411	76.1441	650,154	0.7	0.6	0.5	0.4	0.8	0.9	0.9	2.7	2.5	2.1	7.8	3.1	96.2	24.8
Thunder Bay, ON	48.4500	89.2000	121,986	3.0	10.4	13.7	1.7	0.3	0.6	0.7	0.2	0.3	0.3	0.1	0.1	0.1	0.1
Toledo, OH	41.6640	83.5816	618,203	1.2	1.0	0.9	0.8	6.6	3.4	3.0	8.0	4.7	3.6	5.3	20.5	1.8	2.4
Toronto, ON	43.7000	79.4167	5,603,686	10.8	8.5	7.0	5.3	14.4	15.9	16.8	123.3	97.1	63.0	329.8	89.9	135.1	424.7
Traverse City, MI	44.7544	85.6029	14,532	0.1	0.1	0.1	0.1	0.2	1.9	2.4	0.2	0.2	0.2	0.0	0.1	0.0	0.0
Utica, NY	43.0969	75.2284	299,896	0.3	0.2	0.2	0.2	0.3	0.3	0.4	1.0	0.9	0.8	2.3	1.1	14.5	5.6
Vaughan, ON	43.7833	79.6000	182,022	0.4	0.3	0.2	0.2	0.5	0.5	0.6	4.7	3.7	2.3	9.5	3.0	3.8	10.7
Warren, MI	42.4930	83.0282	138,247	0.3	0.3	0.2	0.2	1.3	0.9	0.9	4.5	2.0	1.4	1.8	8.6	0.5	0.8
Washington, DC	38.9051	77.0162	7,608,070	4.9	4.3	3.9	3.4	8.6	7.1	7.0	15.7	12.8	10.8	35.9	27.6	28.6	27.4
Windsor, ON	42.3000	83.0167	307,877	0.7	0.6	0.5	0.4	2.8	1.9	1.8	8.2	3.9	2.7	3.9	21.1	1.2	1.6
Yonkers, NY	40.9470	73.8675	196,086	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.4	0.3	0.3	0.8	0.5	1.3	1.0
Overall				155	147	153	480	1422	396	325	762	509	388	1485	1606	958	1466

References

City coordinates: <http://worldatlas.com/aatlas/imageg.htm>
City Population: <http://www.census.gov/population/www/cen2000/phc-t3.html>
http://en.wikipedia.org/wiki/Great_Lakes
Note: US cities: 2000 census; Ontario Cities: 2001 Canadian census.
Distance calculation: <http://www.meridianworlddata.com/Distance-Calculation.asp>

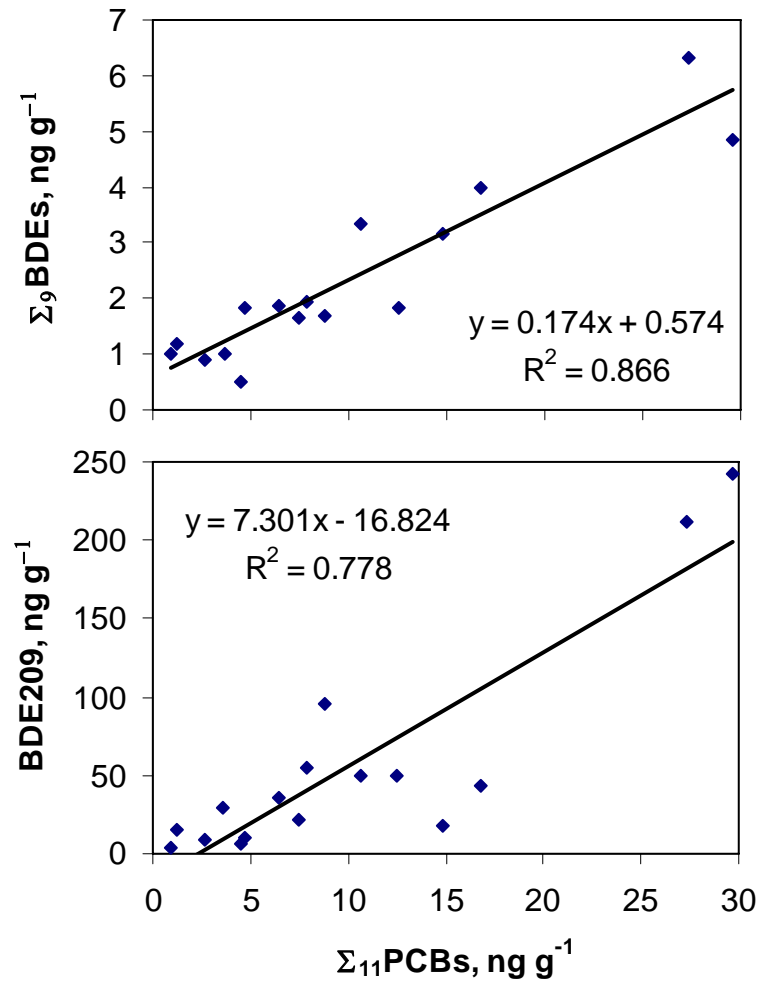


Figure S4. Correlations between surface concentrations of PBDEs and PCBs

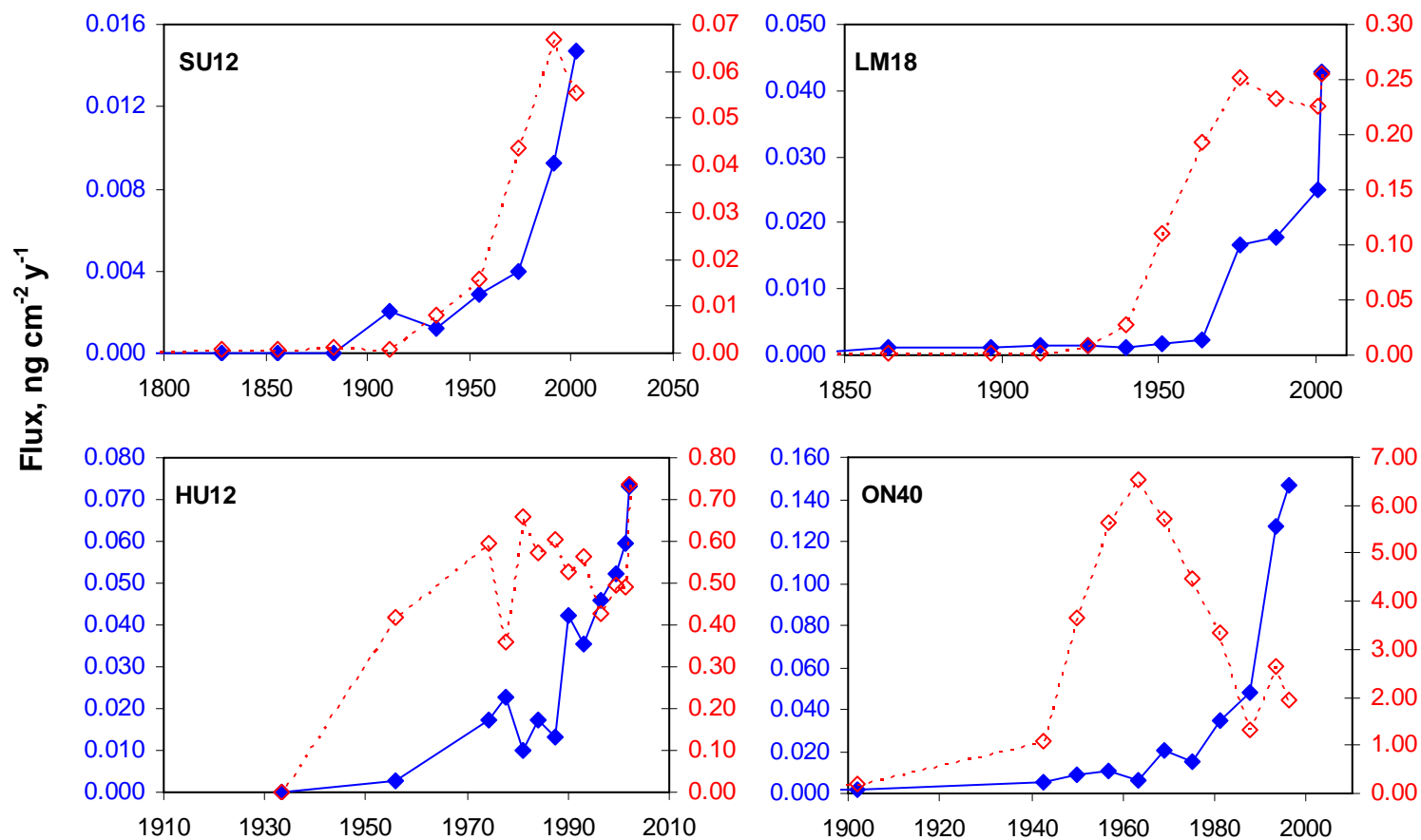


Figure S5. Temporal trends of fluxes of PBDEs (blue filled diamonds and solid line) and PCBs (red empty diamonds and dashed line)

Table S3. Correlations of Major PBDE Congeners

	47	100	99	154	153	183	209
Surface Concentrations (N = 16)							
47	1						
100	0.621	1					
99	0.762	0.719	1				
154	0.757	0.759	0.786	1			
153	0.799	0.518	0.856	0.726	1		
183	0.865	0.633	0.750	0.834	0.761	1	
209	0.710	0.571	0.592	0.568	0.505	0.613	1
Inventory (N = 14)							
47	1						
100	0.517	1					
99	0.796	0.873	1				
154	0.735	0.761	0.840	1			
153	0.800	0.756	0.835	0.963	1		
183	0.583	0.882	0.811	0.914	0.890	1	
209	0.872	0.509	0.669	0.586	0.672	0.553	1
Surface Flux (N = 14)							
47	1						
100	0.526	1					
99	0.657	0.916	1				
154	0.662	0.959	0.917	1			
153	0.816	0.239	0.493	0.381	1		
183	0.832	0.852	0.887	0.932	0.608	1	
209	0.849	0.813	0.889	0.856	0.677	0.887	1

Table S4. Results of Model Development

#	Intercept	Year	Latitude	Ln OM	Longitude	UDF	R ²	F	p-value
In Σ_9BDE Concentration (ng g⁻¹ dry weight)									
1	-97.57	0.0491					0.561	132.7	2.78E-20
2	-84.46	0.0472	-0.2088				0.678	108.4	4.56E-26
3	-82.62	0.0453	-0.2346	0.7213			0.731	92.5	5.55E-29
4	-82.94	0.0456	-0.1939	0.6684	-0.0223		0.735	70.2	2.66E-28
5	-73.61	0.0418	-0.0568		-0.0655		0.465	29.6	7.70E-14
6	-75.75	0.0399		1.0018	-0.0766		0.552	41.8	1.03E-17
7	-95.64	0.0463		0.7367		0.00069	0.704	80.8	7.50E-27
In BDE209 Concentration (ng g⁻¹ dry weight)									
8	-53.96	0.0287					0.111	9.8	2.39E-03
9	-32.36	0.0240	-0.2741				0.321	18.4	2.80E-07
10	-37.37	0.0241	-0.3320	1.7496			0.627	43.1	1.85E-16
11	-35.31	0.0233	-0.2749	1.6730	-0.0343		0.637	33.3	4.90E-16
12	-3.16	0.0022	-0.0189		-0.0031		0.440	26.7	7.90E-13
13	-3.81	0.0025		-0.0972	-0.0087		0.512	35.7	7.40E-16
14	-59.13	0.0270		1.8212		0.00102	0.580	35.5	1.68E-14
In Σ_9BDE Flux (ng cm⁻² y⁻¹)									
15	-115.72	0.0566					0.393	67.4	6.40E-13
16	-84.98	0.0520	-0.4895				0.734	142.3	2.29E-30
17	-86.28	0.0533	-0.4713	-0.5100			0.748	101.1	1.95E-30
18	-87.48	0.0544	-0.3166	-0.7113	-0.0848		0.780	89.6	2.38E-32
19	-938.24	0.6644	1.9322		-5.1508		0.237	8.0	1.06E-04
20	-1327	0.7171		70.1434	-4.2755		0.502	25.8	1.16E-11
21	-112.41	0.0553		-0.4752		0.00139	0.694	77.2	3.93E-26
In BDE209 Flux (ng cm⁻² y⁻¹)									
22	-90.45	0.0453					0.160	15.1	2.12E-04
23	-48.49	0.0361	-0.5323				0.620	63.6	4.15E-17
24	-50.02	0.0361	-0.5500	0.5330			0.636	44.9	6.95E-17
25	-43.48	0.0339	-0.3692	0.2901	-0.1087		0.694	43.0	8.20E-19
26	-51.87	0.0396	-0.1980		-0.1980		0.430	19.3	1.92E-09
27	-55.95	0.0402		-0.2589	-0.2545		0.414	18.1	5.46E-09
28	-86.12	0.0411		0.6435		0.00166	0.552	31.6	2.06E-13

Values in the columns for independent variables Intercept, Year, Latitude, Ln OM, Longitude, UDF are the regression parameter of the variables.

Predicted concentrations using Models 3 and 10 are compared with measured values in Figure 4 of the paper. The ANOVA for these two models are given on next page.

ANOVA Table for Model 3

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.8551
R Square	0.7312
Adj R Square	0.7233
Std Error	0.5417
Observations	106

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Sig F</i>
Regression	3	81	27.13	92	5.55E-29
Residual	102	30	0.23		
Total	105	111			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	-82.623	6.970	-11.86	0.000	-96.448	-68.799	-96.448	-68.799
Year	0.045	0.003	13.301	0.000	0.039	0.052	0.039	0.052
Latitude	-0.235	0.032	-7.375	0.000	-0.298	-0.171	-0.298	-0.171
Ln OM	0.721	0.160	4.495	0.000	0.403	1.039	0.403	1.039

ANOVA Table for Model 10

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.792
R Square	0.627
Adj R Square	0.612
Std Error	0.653
Observations	81

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Sig F</i>
Regression	3	55.2	18.4	43.1	1.85E-16
Residual	77	32.9	0.4		
Total	80	88.1			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	-37.37	12.39	-3.016	0.003	-62.052	-12.696	-62.052	-12.696
Year	0.024	0.006	3.978	0.000	0.012	0.036	0.012	0.036
Latitude	-0.332	0.042	-7.855	0.000	-0.416	-0.248	-0.416	-0.248
Ln OM	1.750	0.220	7.947	0.000	1.311	2.188	1.311	2.188