

Methylmercury in Freshwater Fish Linked to Atmospheric Mercury Deposition
(es061480i)

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Figure and Table Captions for Supporting Information

Table A. Summary statistics for methylmercury (MeHg) in fillets of largemouth bass (30–40 cm total length) from the 39 states that were included initially in the 1999 U.S. EPA database (1). All concentrations were measured and reported as total Hg, which is presumed equal to MeHg (2).

Table B. Wet atmospheric Hg deposition fluxes for the 25 states with largemouth bass methylmercury data (i.e., Table A). Values in parentheses are one standard error of the mean.

Table C. Mean (± 1 SE) annual precipitation depth, wet atmospheric fluxes of sulfate and acid, air temperature, and surface water pH for the 25 states with largemouth bass methylmercury data (i.e., Table A). All atmospheric deposition results are from the National Atmospheric Deposition Program (20), air temperature is the annual mean, typically among multiple locations in each state, between 1971 and 2000 (21), and pH values are summarized from the U.S. Environmental Protection Agency STORET database (22).

Figure A. Temporal variation of methylmercury (MeHg) in largemouth bass (30–40 cm total length) from four Michigan lakes (22). Error bars are one standard error of the mean.

Figure B. Temporal patterns of methylmercury (MeHg) in largemouth bass (30–40 cm total length) from Louisiana (a) bayous, (b) lakes, (c) rivers, and (d) reservoirs where fish MeHg levels have been surveyed for more than seven years (24). Error bars are one standard error of the mean.

Figure C. Temporal variation of wet atmospheric mercury fluxes at fifteen locations in the United States where eight or more years of Hg deposition data is available; (a) northeast and (b) southeast locations, (c) Minnesota, (d) Wisconsin, and (e) western states. Values for the Vermont site (VT) are from Keeler and co-workers (19), whereas all other deposition information is from the Mercury Deposition Network (15).

Figure D. Relation between weighted-mean concentration of MeHg in fillets of largemouth bass (30–40 cm total length) and average annual wet atmospheric deposition of total Hg among states where periods of fish and atmospheric Hg sampling coincide: IA, Iowa (1996–2004); KS, Kansas (1998); LA, Louisiana (1999–2000); MI, Michigan (1992–1994); MN, Minnesota (1996–1997); NH, New Hampshire (2001); NY, New York (2002); OK, Oklahoma (1996–2003); VT, Vermont (1993–2003); WA, Washington (2001–2002); WV, West Virginia (2001–2003). Results for NH (shown circled; see text) are not included in the regression analysis. Error bars are ± 1 SE.

Figure E. Relation between weighted-mean concentration of MeHg in fillets of largemouth bass (30–40 cm total length) and the fraction of water bodies in each state that are either (a) lakes, (b) reservoirs, or (c) rivers among the 25 American states considered in this analysis: AL, Alabama; AR, Arkansas; CA, California; CT, Connecticut; FL, Florida; GA, Georgia; IA, Iowa; KS, Kansas; KY, Kentucky; LA, Louisiana; ME, Maine; MA, Massachusetts; MI, Michigan; MN, Minnesota; NH, New Hampshire; NJ, New Jersey; NY, New York; NC, North Carolina; OK, Oklahoma; OR, Oregon; TX, Texas; VT, Vermont; WA, Washington; WV, West Virginia; WI, Wisconsin.

Table A. Summary statistics for methylmercury (MeHg) in fillets of largemouth bass (30–40 cm total length) from the 39 states that were included initially in the 1999 U.S. EPA database (1). All concentrations were measured and reported as total Hg, which is presumed equal to MeHg (2).

State	Weighted mean ^a		Samples analyzed	Number of fish	Number of water bodies ^b	Sampling period	References/comments
	MeHg ($\mu\text{g g}^{-1}$ wet wt)	Total length (cm)					
AL	0.52 (0.02)	36.8 (0.2)	54	286	31 (11/12/8)	1992–1995	1
AZ	—	—	—	—	—	—	Not analyzed ^c
AR	0.61 (0.01)	34.6 (0.1)	244	689	104 (68/0/36)	1991–1995	1
CA	0.26 (0.01)	34.8 (0.2)	27	155	18 (13/2/3)	1990–1994	1 ^d
CT	0.41 (0.01)	34.7 (0.2)	330	330	51 (42/6/3)	1995	1 ^e
DE	—	—	—	—	—	—	Not analyzed ^f
FL	0.64 (0.01)	34.5 (0.1)	912	912	133 (88/2/43)	1990–1995	1
GA	0.24 (0.01)	34.4 (0.1)	88	440	34 (21/1/12)	1991–1995	1
IL	—	—	—	—	—	—	Not analyzed ^g
IN	—	—	—	—	—	—	Not analyzed ^h
IA	0.16 (0.01)	34.7 (0.2)	34	157	33 (29/0/4)	1994–2004	3 ⁱ
KS	0.23 (0.05)	34.5 (0.9)	5	5	3 (3/0/0)	1998	4 ^j
KY	0.45 (0.03)	34.1 (0.6)	3	15	3 (0/1/2)	1990–1991	1
LA	0.39 (0.01)	34.4 (0.1)	882	3580	174 (79/9/86)	1994–2000	5 ^k
ME	0.75 (0.02)	35.0 (0.3)	20	91	11 (11/0/0)	1993	1
MD	—	—	—	—	—	—	Not analyzed ^c
MA	0.39 (0.02)	34.4 (0.2)	141	141	43 (30/10/3)	1987–1994	1 (n = 90), 6 (n = 51)
MI	0.40 (0.01)	34.7 (0.2)	269	269	43 (35/0/8)	1990–1995	1
MN	0.29 (0.01)	34.0 (0.3)	34	82	25 (25/0/0)	1987–1997	1
MS	—	—	—	—	—	—	Not analyzed ^c
MO	—	—	—	—	—	—	Not analyzed ^c
NE	—	—	—	—	—	—	Not analyzed ^c
NH	0.63 (0.02)	34.3 (0.3)	130	130	43 (41/2/0)	1993–2001	1 (n = 19), 6 (n = 111)
NJ	0.42 (0.03)	34.8 (0.3)	130	130	49 (32/9/8)	1992–1996	7 ^l
NM	—	—	—	—	—	—	Not analyzed ^k
NY	0.40 (0.03)	35.5 (0.3)	51	62	15 (8/7/0)	1981–2002	1 (n = 19), 6 (n = 32)
NC	0.46 (0.01)	34.7 (0.1)	724	862	68 (23/3/42)	1990–1995	1

OH	—	—	—	—	—	—	Not analyzed ^c
OK	0.57 (0.02)	34.4 (0.1)	88	417	31 (26/5/0)	1985–2004	8 ^j
OR	0.23 (0.02)	32.9 (0.9)	9	9	3 (1/1/1)	1994–1997	1 (<i>n</i> = 7), 9 (<i>n</i> = 2) ⁱ
PA	—	—	—	—	—	—	Not analyzed ^c
RI	—	—	—	—	—	—	Not analyzed ^m
SC	—	—	—	—	—	—	Not analyzed ⁿ
TN	—	—	—	—	—	—	Not analyzed ^c
TX	0.26 (0.04)	34.1 (0.7)	5	8	5 (1/1/3)	1990–1995	1
VT	0.34 (0.02)	35.1 (0.3)	29	75	15 (15/0/0)	1993–2003	1 (<i>n</i> = 8), 10 (<i>n</i> = 21)
WA	0.21 (0.01)	35.5 (0.3)	72	72	14 (14/0/0)	2001–2002	1 ^j
WV	0.32 (0.04)	34.8 (0.7)	27	27	17 (14/1/2)	2001–2003	12 ^p
WI	0.34 (0.01)	34.6 (0.2)	224	225	77 (65/3/9)	1990–1994	1

^aWeighted-mean concentration = $\sum_i n_i Hg_i / \sum_i n_i$, where *n* is the number of largemouth bass in a composite sample (*n* = 1, if an individual fish), and *Hg* is the average level of total Hg in the composite or individual fish. Weighted-mean of total length was calculated similarly. Values in parentheses are one standard error of the mean.

^bThe number of water bodies classified as a lake, reservoir, or river is in parentheses (lake/reservoir/river). Ponds and marshes are considered lakes, and bayous were classified as rivers.

^cNo length data were reported for this state in ref. 1.

^dTwo composites from the American River, one composite from Lake Nacimiento, and one fish from Lake Pillsbury were excluded from analysis because these systems have known mining and/or geological sources of Hg in the watershed.

^eLargemouth bass from Dodge Pond (*n* = 15, mean *Hg* = 1.13 $\mu\text{g g}^{-1}$) were not included because this lake is contaminated with mercury from a research center that used Hg in its tests.

^fOnly one sample in ref. 1.

^gAll Illinois fish reported in ref. 1 were from either the Mississippi or Ohio Rivers.

^hData for Indiana largemouth bass reported in ref. 1 were not used because the recovery of Hg from spiked samples was not within the quality control limit.

ⁱThis source includes all fish from ref. 1 as well as more recent results.

^jRef. 7 includes all fish from ref. 1 as well as additional results. Five largemouth bass from both Manasquan Reservoir (mean *Hg* = 2.19 $\mu\text{g g}^{-1}$) and Atlantic City Reservoir (mean = 3.58 $\mu\text{g g}^{-1}$) were not included because these systems have suspected point sources of Hg.

^kNew Mexico largemouth bass were not analyzed because of potential mining sources of Hg throughout the state.

^lLargemouth bass from watersheds with known point sources of Hg from mining were excluded from analysis (i.e., Cottage Grove and Dorena Reservoirs (13, 14)).

^mRhode Island largemouth bass were not analyzed because of insufficient sample information (i.e., date, collection/analysis agency, sample type) in ref. 1.

ⁿData for South Carolina largemouth bass reported in ref. 1 were not used in this analysis because the analytical detection limit for many samples ($0.25 \mu\text{g g}^{-1}$) was unacceptably high.

^oData reported in ref. 11 were analyzed in lieu of those in ref. 1, which contains estimated concentrations for only two composite samples from unknown locations in Washington state.

^pData in ref. 12 were used because no West Virginia largemouth bass included in ref. 1 were between 30 and 40 cm.

Table B. Wet atmospheric Hg deposition fluxes for the 25 states with largemouth bass methylmercury data (i.e., Table A). Values in parentheses are one standard error of the mean.

State	Location (MDN site)	Sampling period	Wet Hg deposition ($\mu\text{g m}^{-2} \text{y}^{-1}$)	Reference
AL	Baldwin County (AL02)	06/05/2001–06/08/2004	20.2	15
	Bibb County (AL03)	06/20/2000–06/22/2004	11.6	15
	Mobile County (AL24)	05/22/2001–05/25/2004	14.0	15
	<i>AL mean</i>		15.3 (2.6)	
AR	Adair County, east OK (OK99)	05/06/2003–05/04/2004	14.1	15
	Franklin Parish, north LA (LA10)	10/13/1998–04/13/2004	14.7	15
	Stoddard County, south MO (MO46)	04/02/2002–03/30/2004	13.4	15
	<i>AR mean</i>		14.1 (0.4)	
CA	Santa Clara County (CA72)	01/11/2000–01/13/2004	2.9	15
	Tulare County (CA75)	07/22/2003–07/20/2004	3.1	15
	Mendocino County (CA97)	12/23/1997–12/21/1999	4.3	15
	Moffett Field, Santa Clara County	01/2000–03/2001	4.4	16
	Long Marine Lab, Santa Cruz County	02/2000–03/2001	4.0	16
	<i>CA mean</i>		3.7 (0.3)	
CT	Mean value for four locations	12/13/1995–04/14/1997	8.0 (2.0)	17
FL	Broward County (FL04)	01/06/1998–01/06/2004	20.2	15
	Citrus County (FL05)	07/01/1997–06/29/2004	14.6	15
	Dade County (FL11)	03/05/1996–03/09/2004	20.0	15
	Orange County (FL32)	09/05/2003–09/07/2004	16.7	15
	Palm Beach County (FL34)	07/08/1997–07/06/2004	15.7	15
	<i>FL mean</i>		17.4 (1.1)	
GA	Charlton County (GA09)	07/29/1997–07/27/2004	13.9	15
	Paulding County (GA40)	06/13/2000–06/15/2004	13.6	15
	<i>GA mean</i>		13.7 (0.1)	
IA	Redwood County, south MN (MN27)	07/02/1996–06/29/2004	7.3	15
KS	Routt County, north CO (CO97)	09/29/1998–09/28/2004	7.7	15
	Montezuma County, south CO (CO99)	12/26/2001–12/30/2003	4.2	15
	<i>KS mean</i>		5.9 (1.8)	
KY	Edmonson County (KY10)	09/10/2002–09/07/2004	11.2	15
LA	Calcasieu County (LA05)	10/13/1998–04/13/2004	11.7	15
	Franklin Parish (LA10)	10/13/1998–04/13/2004	14.7	15
	Rapides Parish (LA23)	02/06/2001–08/03/2004	14.7	15
	Tangipahoa Parish (LA28)	10/13/1998–04/14/2004	12.5	15
	<i>LA mean</i>		13.4 (0.8)	
ME	Cumberland County (ME02)	06/10/1997–06/08/2004	6.4	15
	Piscataquis County (ME09)	09/03/1996–08/31/2004	5.5	15
	Cumberland County (ME96)	01/06/1998–01/06/2004	7.4	15
	Hancock County (ME98)	03/05/1996–03/02/2004	7.3	15
	<i>ME mean</i>		6.6 (0.4)	
MA	Barnstable County (MA01)	07/29/2003–07/27/2004	7.7	15
MI	Pellston, Emmet County	03/1992–03/1994	5.7	18
	South Haven, Van Buren County	03/1992–03/1994	11.1	18
	Dexter, Washtenaw County	03/1992–03/1994	8.9	18
	<i>MI mean</i>		8.5 (1.6)	
MN	Itasca County (MN16)	02/27/1996–02/24/2004	8.0	15
	Lake County (MN18)	03/12/1996–03/09/2004	6.7	15

	Mille Lacs County (MN22)	04/23/2002–04/20/2004	9.0	15
	Morrison County (MN23)	07/02/1996–06/29/2004	8.5	15
	Redwood County (MN27)	07/02/1996–06/29/2004	7.3	15
		<i>MN mean</i>	7.9 (0.4)	
NH	Belknap County (NH00)	05/04/2001–05/06/2003	4.6	15
	Rockingham County (NH05)	03/27/2001–03/26/2002	4.3	15
		<i>NH mean</i>	4.5 (0.2)	
NJ	Montgomery County, east PA (PA60)	11/23/1999–11/25/2003	10.4	15
	Pike County, east PA (PA72)	09/14/2000–09/14/2004	9.9	15
		<i>NJ mean</i>	10.2 (0.3)	
NY	Essex County (NY20)	12/10/1999–12/09/2003	6.9	15
	Pike County, northeast PA (PA72)	09/14/2000–09/14/2004	9.9	15
	Erie County, northwest PA (PA30)	06/20/2000–06/22/2004	9.2	15
		<i>NY mean</i>	8.7 (0.9)	
NC	Columbus County (NC08)	12/05/1995–12/02/2003	12.7	15
	Washington County (NC42)	02/28/1996–03/02/2004	9.3	15
	Sevier County, east TN (TN11)	01/30/2002–01/27/2004	15.0	15
		<i>NC mean</i>	12.3 (1.7)	
OK	Adair County (OK99)	05/06/2003–05/04/2004	14.1	15
	Tarrant County, north TX (TX50)	08/28/2001–08/31/2004	9.5	15
	Gregg County, north TX (TX21)	03/12/1996–03/09/2004	11.4	15
		<i>OK mean</i>	11.7 (1.3)	
OR	Washington County (OR01)	04/15/2003–04/13/2004	3.2	15
	Lane County (OR10)	12/13/2002–12/09/2003	6.8	15
		<i>OR mean</i>	5.0 (1.8)	
TX	Gregg County (TX21)	03/12/1996–03/09/2004	11.4	15
	Tarrant County (TX50)	08/28/2001–08/31/2004	9.5	15
	Sierra County, NM (NM10)	05/13/1997–05/11/2004	4.6	15
		<i>TX mean</i>	8.5 (2.0)	
VT	Underhill, Chittenden County	01/01/1993–12/31/2003	9.7	19
WA	King County (WA18)	12/31/1996–12/30/2004	7.6	15
	Washington County, north OR (OR01)	04/15/2003–04/13/2004	3.2	15
		<i>WA mean</i>	5.4 (2.2)	
WV	Madison County (VA28)	10/22/2002–10/21/2003	11.2	15
	Greene County, southwest PA (PA37)	05/27/1999–05/25/2004	9.6	15
		<i>WV mean</i>	10.4 (0.8)	
WI	Douglas County (WI08)	03/12/1996–03/09/2004	7.4	15
	Florence County (WI09)	03/19/1996–03/16/2004	7.4	15
	Milwaukee County (WI22)	10/03/2002–09/28/2004	8.1	15
	Sauk County (WI31)	01/11/2001–01/12/2004	9.3	15
	Shawano County (WI32)	02/12/2002–02/10/2004	8.3	15
	Vilas County (WI36)	03/12/1996–03/09/2004	8.2	15
	Walworth County (WI99)	01/07/1997–01/06/2004	10.4	15
		<i>WI mean</i>	8.5 (0.4)	

Table C. Mean (± 1 SE) annual precipitation depth, wet atmospheric fluxes of sulfate and acid, air temperature, and surface water pH for the 25 states with largemouth bass methylmercury data (i.e., Table A). All atmospheric deposition results are from the National Atmospheric Deposition Program (20), air temperature is the annual mean, typically among multiple locations in each state, between 1971 and 2000 (21), and pH values are summarized from the U.S. Environmental Protection Agency STORET database (22).

State	Location (NADP site)	Sampling period	Precipitation depth (cm)	Mean atmospheric flux (mmol m ⁻² y ⁻¹)			Annual air temp (°C)	Surface water pH ^a
				SO ₄ ²⁻	H ⁺	Annual atmospheric flux (mmol m ⁻² y ⁻¹)		
AL	Dallas County (AL10)	1995–2004	125	13.4	24.3	31.5 ± 2.9	17.6 ± 0.8	6.49 ± 0.04 (405)
	De Kalb County (AL99)	1995–2004	140	19.4	30.0			
	Baldwin County (AL02)	2002–2004	212	20.3	38.0			
	Mobile County (AL24)	2002–2004	179	18.8	33.7			
	AL mean	164 ± 20	18.0 ± 1.6	18.0 ± 1.6	15.0			
	Bradley County (AR02)	1995–2004	138	131	14.6			
AR	Clark County (AR03)	1995–2004	100	10.3	22.8	10.5	14.7	10.5
	Marion County (AR16)	1995–2004	100	10.3	14.7			
	Washington County (AR27)	1995–2004	108	11.1	11.1			
	AR mean	119 ± 9	12.7 ± 1.2	12.7 ± 1.2	16.5 ± 2.6			
CA	Siskiyou County (CA76)	1995–2004	38	0.4	0.4	16.7 ± 0.3	7.30 ± 0.01 (7239)	1.6
	Shasta County (CA96)	2001–2004	88	1.2	1.2			
	Nevada County (CA50)	2003–2004	68	0.7	0.7			
	Mendocino County (CA45)	1995–2004	99	2.0	4.3			
	Yolo County (CA88)	1995–2004	49	1.9	0.5			
	Tuolumne County (CA99)	1995–2004	125	2.2	4.6			
	San Benito County (CA66)	2000–2004	34	0.8	1.4			
	Tulare County (CA75)	1995–2004	107	2.3	3.5			
	Los Angeles County (CA42)	1995–2004	67	2.4	4.6			
	San Bernardino County (CA67)	2001–2004	19	0.7	0.8			
	CA mean	69 ± 11	1.5 ± 0.3	2.8 ± 0.5	15.7 ± 0.7			
	Windham County (CT15)	2000–2004	116	14.3	30.6			
	Orange County, east NY (NY99)	1995–2004	130	22.3	48.3			

	Suffolk County, south NY (NY96)	2004	120	14.4	20.4	
	Franklin County, west MA (MA08)	1995–2004	122	16.4	37.5	
FL		<i>CT mean</i>	122 ± 3	16.9 ± 1.9	35.1 ± 5.2	10.6 ± 0.5
		2001–2004	152	13.2	25.0	
		1995–2004	132	11.2	21.2	
		1995–2004	124	13.0	25.6	
		1997–2004	130	15.3	29.4	
		1995–2004	136	17.3	30.7	
		1995–2004	145	12.4	22.5	
		1995–2004	157	12.0	16.1	
		<i>FL mean</i>	139 ± 5	13.5 ± 0.8	24.4 ± 1.9	22.2 ± 0.6
		1995–2004	120	15.0	25.6	
GA		1995–2004	113	10.1	18.1	
		1995–2004	98	10.4	17.6	
		2003–2004	105	10.8	21.5	
		1998–2004	123	12.8	27.0	
		2003–2004	112	13.0	16.5	
		<i>GA mean</i>	112 ± 4	12.0 ± 0.8	21.1 ± 1.8	17.6 ± 0.4
		1995–2004	86	11.8	5.3	
		1995–2004	83	10.7	5.2	
		1995–2004	63	6.6	2.0	
		<i>GA mean</i>	77 ± 7	9.7 ± 1.6	4.2 ± 1.1	8.9 ± 0.4
IA		1995–2004	51	4.6	0.9	
		1995–2004	84	10.3	6.6	
		1995–2004	110	13.2	11.8	
		1995–2004	84	9.5	5.9	
		<i>IA mean</i>	77 ± 7	9.7 ± 1.6	4.2 ± 1.1	8.9 ± 0.4
KS		1995–2004	51	4.6	0.9	
		1995–2004	84	10.3	6.6	
		1995–2004	110	13.2	11.8	
		1995–2004	84	9.5	5.9	
		<i>KS mean</i>	82 ± 12	9.4 ± 1.8	6.3 ± 2.2	12.2 ± 0.5
KY		2000–2004	122	14.7	23.8	
		2003–2004	139	17.5	29.5	
		2004	131	27.5	42.0	
		1995–2004	120	19.2	32.6	
		1995–2004	120	20.9	36.8	
		1995–2004	116	17.2	33.6	
		<i>KY mean</i>	124 ± 4	19.5 ± 1.8	33.1 ± 2.5	13.4 ± 0.2
LA		1995–2004	154	16.5	26.6	
		<i>LA</i>				

	Washington Parish (LA30)	1995–2004	157	16.1	26.9
	Gregg County, east TX (TX21)	1995–2004	117	15.7	22.9
	Hinds County, west MS (MS10)	1995–2004	142	14.3	23.4
	<i>LA mean</i>	142 ± 9	15.7 ± 0.5	25.0 ± 1.0	19.6 ± 0.4
ME	Oxford County (ME08)	2000–2004	101	8.9	20.8
	Cumberland County (ME02)	1995–2004	104	11.0	24.6
	Cumberland County (ME96)	1998–2004	109	12.2	24.3
	Franklin County (ME04)	2003–2004	105	7.9	16.0
	Piscataquis County (ME09)	1995–2004	106	8.9	21.4
	Hancock County (ME98)	1995–2004	128	14.1	28.1
	Penobscot County (ME95)	2003–2004	104	8.7	20.0
	Aroostook County (ME00)	1995–2004	89	8.3	17.5
	<i>ME mean</i>	106 ± 4	10.0 ± 0.8	21.6 ± 1.4	5.8 ± 1.8
MA	Franklin County (MA08)	1995–2004	122	16.4	37.5
	Middlesex County (MA13)	1995–2004	110	17.4	36.1
	Barnstable County (MA01)	1995–2004	119	17.0	30.2
	<i>MA mean</i>	117 ± 4	16.9 ± 0.3	34.6 ± 2.2	9.6 ± 0.7
MI	Houghton County (MI99)	1995–2004	82	7.7	10.4
	Schoolcraft County (MI48)	2001–2004	92	11.5	15.5
	Chippewa County (MI98)	1995–2004	79	10.9	17.7
	Cheboygan County (MI09)	1995–2004	83	12.4	19.8
	Leelanau County (MI29)	2003–2004	94	13.4	19.0
	Wexford County (MI53)	1995–2004	91	14.8	22.5
	Tuscola County (MI51)	2000–2004	64	13.0	17.2
	Kalamazoo County (MI26)	1995–2004	78	15.7	21.3
	Washtenaw County (MI52)	2000–2004	89	15.9	22.4
	<i>MI mean</i>	84 ± 3	12.8 ± 0.9	18.4 ± 1.3	7.1 ± 0.7
MN	Cook County (MN08)	1997–2004	64	7.5	8.4
	Lake County (MN99)	1997–2004	73	8.1	9.0
	Lake County (MN18)	1995–2004	63	5.1	5.0
	St. Louis County (MN32)	2001–2004	74	5.1	4.8
	Itasca County (MN16)	1995–2004	78	6.0	5.7
	Morrison County (MN23)	1995–2004	72	6.5	3.6
	Pine County (MN28)	1998–2004	76	8.0	4.4
	Anoka County (MN01)	1997–2004	74	8.6	4.4

		Redwood County (MN27)	1995–2004	63	6.6	2.0		
		Grafton County (NH02)	MN mean	71 ± 2	6.8 ± 0.4	5.2 ± 0.7	5.2 ± 0.8	7.80 ± 0.00 (30832)
NH		Oxford County, west ME (ME08)	1995–2004	121	15.9	38.4		
		Cumberland County, west ME (ME02)	2000–2004	101	8.9	20.8		
		Middlesex County, east MA (MA13)	1995–2004	104	11.0	24.6		
			1995–2004	110	17.4	36.1		
			NH mean	109 ± 4	13.3 ± 2.0	30.0 ± 4.3	7.7	6.78 ± 0.01 (8061)
NJ		Atlantic County (NJ00)	2000–2004	112	16.3	30.4		
		Mercer County (NJ99)	1995–2004	113	20.9	43.1		
		Pike County, east PA (PA72)	1995–2004	120	19.7	44.5		
		Orange County, east NY (NY99)	1995–2004	130	22.3	48.3		
			NJ mean	119 ± 4	19.8 ± 1.3	41.6 ± 3.9	12.5 ± 0.3	7.34 ± 0.01 (4828)
NY		Orange County (NY99)	1995–2004	130	22.3	48.3		
		Ulster County (NY68)	1995–2004	144	22.1	50.1		
		Chautauqua County (NY10)	1996–2004	114	26.2	51.7		
		Cayuga County (NY08)	1995–2004	84	18.7	34.2		
		Oswego County (NY52)	1995–2004	127	25.8	52.2		
		Herkimer County (NY29)	2004	117	14.9	30.0		
		Essex County (NY20)	1995–2004	110	14.7	34.2		
		Essex County (NY98)	1995–2004	117	14.3	30.8		
		Franklin County (NY22)	2000–2004	92	14.9	28.8		
			NY mean	115 ± 6	19.3 ± 1.6	40.0 ± 3.4	10.1 ± 0.7	7.75 ± 0.01 (55613)
NC		Mason County (NC25)	1995–2004	169	17.5	34.6		
		Yancey County (NC45)	1995–2004	195	23.8	46.1		
		Rowan County (NC34)	1995–2004	100	19.3	34.2		
		Scotland County (NC36)	1995–2004	120	16.3	31.9		
		Wake County (NC41)	1995–2004	119	15.4	24.8		
		Sampson County (NC35)	1995–2004	118	14.6	16.1		
		Onslow County (NC29)	2003–2004	164	15.8	28.0		
		Carteret County (NC06)	2000–2004	150	14.0	23.8		
		Bertie County (NC03)	1995–2004	123	14.7	26.2		
			NC mean	140 ± 10	16.8 ± 1.0	29.5 ± 2.8	15.6 ± 0.8	7.06 ± 0.00 (6793)
OK		Texas County (OK29)	1995–2004	46	4.9	0.8		
		Alfalfa County (OK00)	1995–2004	84	9.5	5.9		
		McClain County (OK17)	1995–2004	90	10.5	9.2		

		Washington County, west AR (AR27)	1995–2004	108	11.1	10.5	
			<i>OK mean</i>	82 ± 13	9.0 ± 1.4	6.6 ± 2.2	7.71 ± 0.01 (13816)
OR	Benton County (OR02)	1995–2004	169	5.4	7.6		
	Benton County (OR97)	1995–2004	99	2.5	4.0		
	Lane County (OR10)	1995–2004	228	3.6	11.1		
	Union County (OR18)	1995–2004	56	0.8	2.8		
	Skamania County, south WA (WA98)	2003–2004	147	4.6	7.5		
		<i>OR mean</i>	140 ± 30	3.4 ± 0.8	6.6 ± 1.5	10.6 ± 0.6	7.65 ± 0.01 (5065)
TX	Culberson County (TX22)	1995–2004	42	5.2	1.8		
	Brewster County (TX04)	1995–2004	29	3.1	1.3		
	Bailey County (TX02)	1995–2004	45	5.4	1.9		
	Edwards County (TX16)	1995–2004	59	6.4	4.8		
	Wise County (TX56)	1995–2004	80	9.6	7.9		
	Gregg County (TX21)	1995–2004	117	15.7	22.9		
	Colorado County (TX20)	1995–2004	108	11.3	14.5		
	Bee County (TX03)	1995–2004	78	8.5	7.3		
	Nueces County (TX39)	2003–2004	98	11.4	7.0		
		<i>TX mean</i>	73 ± 10	8.5 ± 1.3	7.7 ± 2.3	19.3 ± 0.5	8.12 ± 0.00 (13229)
VT	Bennington County (VT01)	1995–2004	111	17.3	38.3		
	Chittenden County (VT99)	1995–2004	123	16.3	34.5		
		<i>VT mean</i>	117 ± 6	16.8 ± 0.5	36.4 ± 1.9	7.3	6.97 ± 0.01 (11056)
WA	Jefferson County (WA14)	1995–2004	323	8.1	15.4		
	Pierce County (WA21)	1995–2004	107	4.2	9.5		
	Pierce County (WA99)	2000–2004	120	2.9	8.2		
	Skamania County (WA98)	2003–2004	147	4.6	7.5		
	Skagit County (WA19)	1995–2004	210	5.1	16.9		
	Whitman County (WA24)	1995–2004	53	1.7	2.8		
		<i>WA mean</i>	160 ± 39	4.4 ± 0.9	10.1 ± 2.1	10.3 ± 0.5	8.01 ± 0.00 (13160)
WV	Fayette County (WV04)	1995–2004	127	23.9	48.8		
	Gilmer County (WV05)	2000–2004	118	22.0	45.8		
	Tucker County (WV18)	1995–2004	128	24.4	50.3		
		<i>WV mean</i>	124 ± 3	23.4 ± 0.8	48.3 ± 1.3	11.5 ± 0.7	7.40 ± 0.01 (7195)
WI	Washburn County (WI37)	1995–2004	78	7.9	5.3		
	Sawyer County (WI97)	2002–2004	72	7.4	4.3		
	Taylor County (WI35)	2000–2004	99	11.0	7.0		

Vilas County (WI36)	1995–2004	80	7.4	8.3
Florence County (WI09)	1995–2004	69	8.0	9.0
Oconto County (WI25)	1995–2004	78	10.9	13.3
Shawano County (WI32)	2003–2004	70	9.4	9.5
Portage County (WI28)	1995–2004	70	9.7	8.5
Vernon County (WI98)	1995–2004	79	10.6	8.0
Walworth County (WI99)	1995–2004	86	14.4	16.9
<i>WI mean</i>				
	78 ± 3	9.7 ± 0.7	9.0 ± 1.2	8.0 ± 0.4

^aTotal number of pH determinations is in parentheses. Mean pH values are based on all available data between 1990 and 2005, except for North Carolina and Minnesota (1990–2000 only) and Florida (1990–1995 only). pH values less than 2 or greater than 12 were excluded from the summary statistics for each state.

Figure A. Temporal variation of methylmercury (MeHg) in largemouth bass (30–40 cm total length) from four Michigan lakes (23). Error bars are one standard error of the mean.

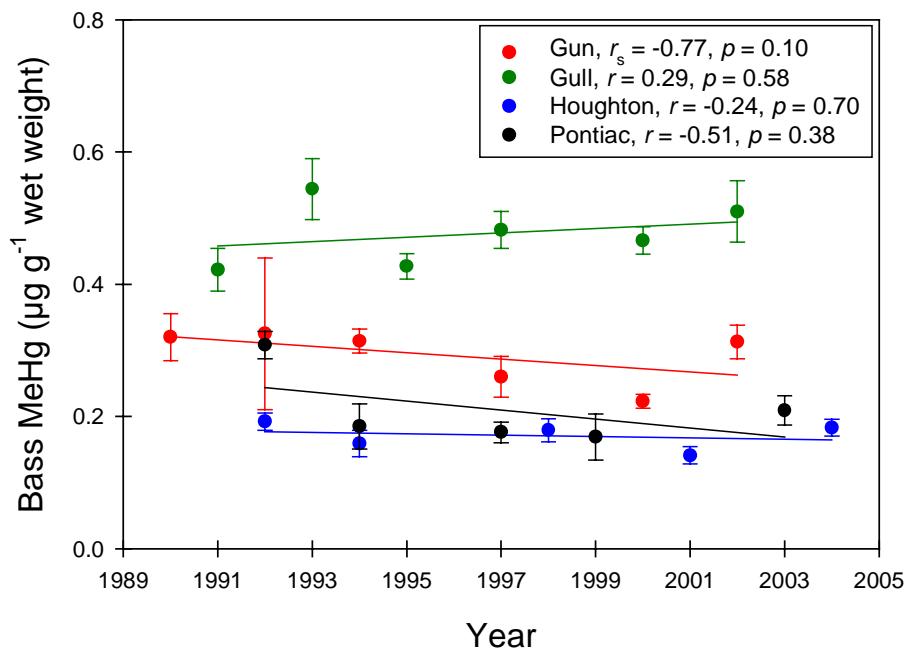


Figure B. Temporal patterns of methylmercury (MeHg) in largemouth bass (30–40 cm total length) from Louisiana (a) bayous, (b) lakes, (c) rivers, and (d) reservoirs where fish MeHg levels have been surveyed for more than seven years (24). Error bars are one standard error of the mean.

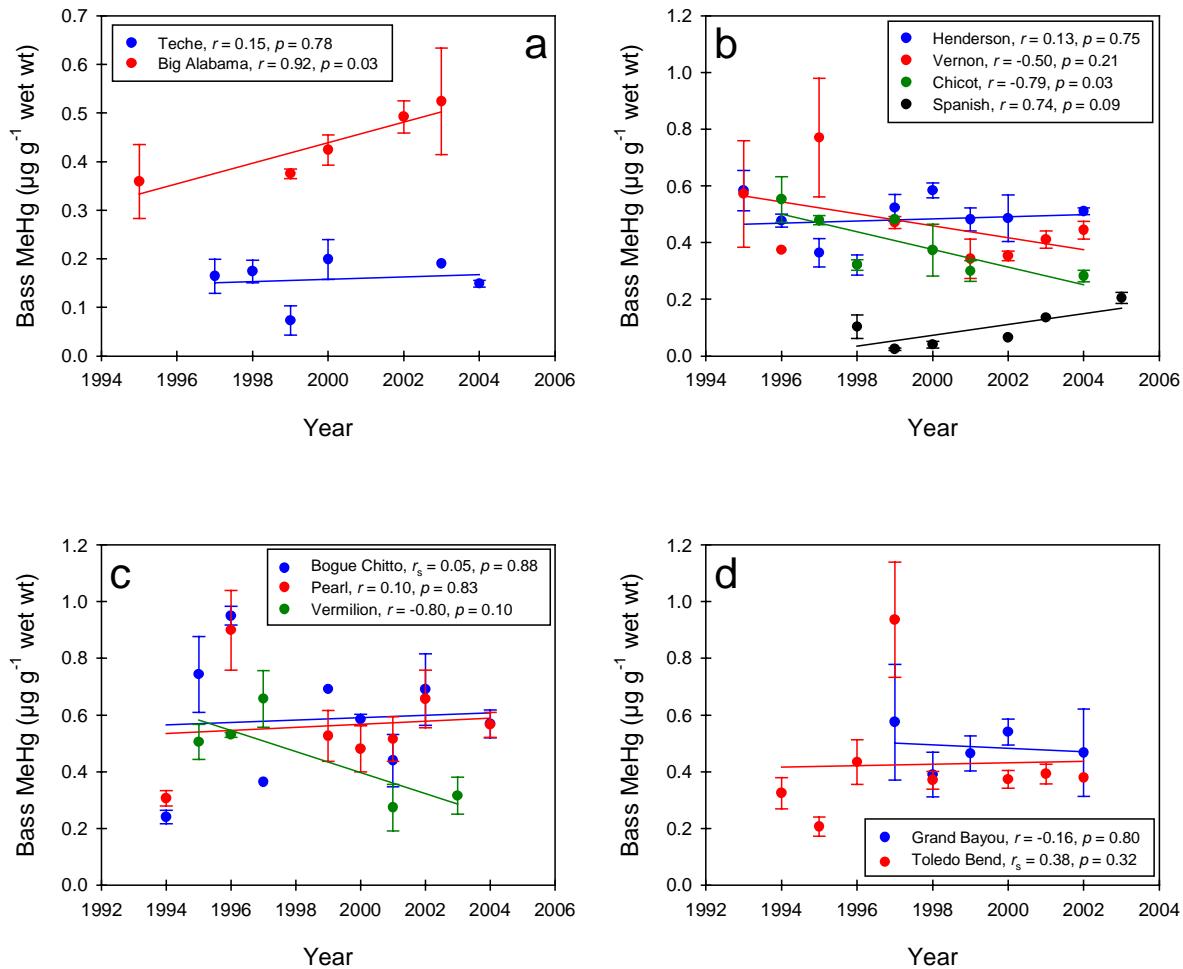


Figure C. Temporal variation of wet atmospheric mercury fluxes at fifteen locations in the United States where eight or more years of Hg deposition data is available; (a) northeast and (b) southeast locations, (c) Minnesota, (d) Wisconsin, and (e) western states. Values for the Vermont site (VT) are from Keeler and co-workers (19), whereas all other deposition information is from the Mercury Deposition Network (15).

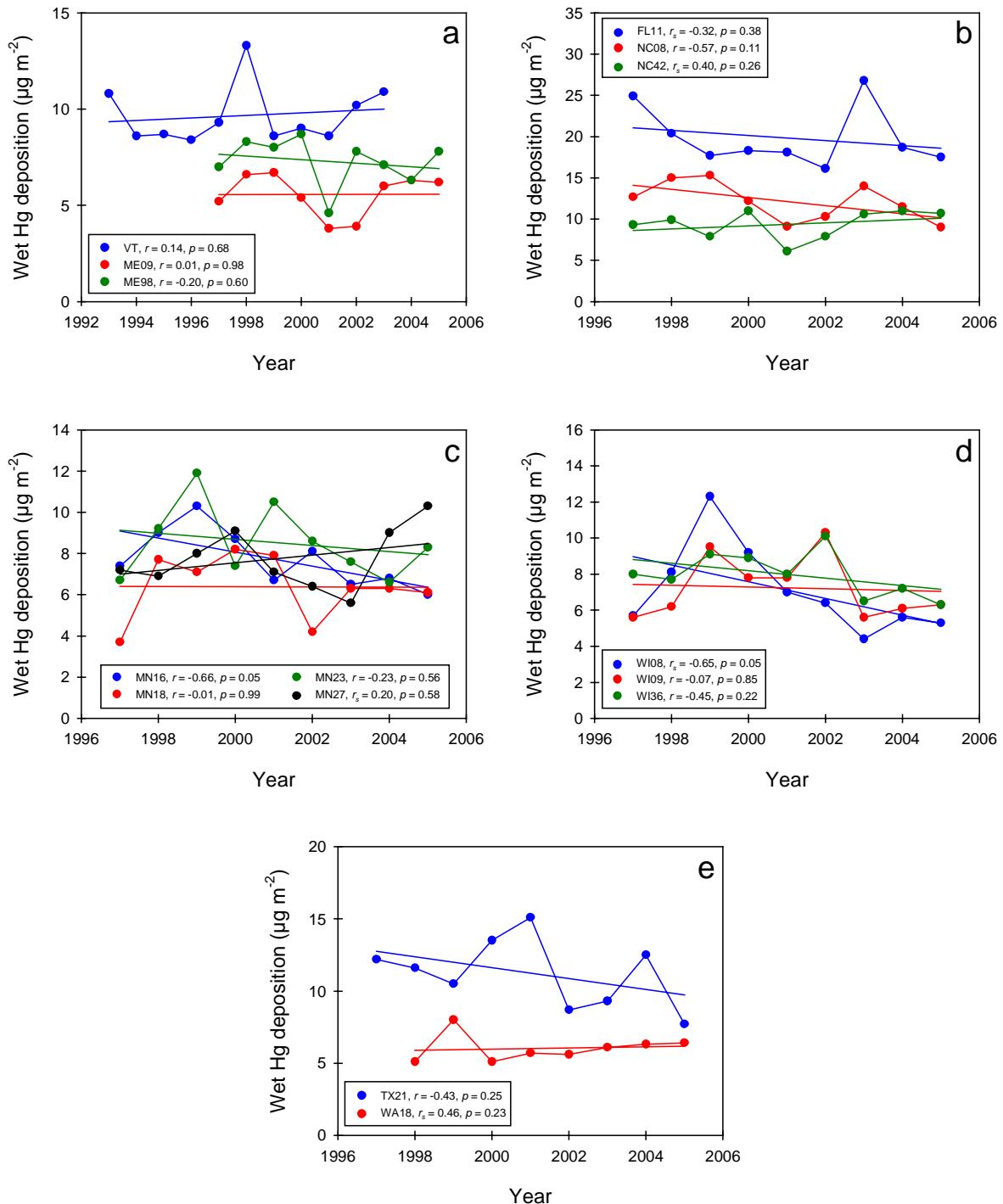


Figure D. Relation between weighted-mean concentration of MeHg in fillets of largemouth bass (30–40 cm total length) and average annual wet atmospheric deposition of total Hg among states where periods of fish and atmospheric Hg sampling coincide: IA, Iowa (1996–2004); KS, Kansas (1998); LA, Louisiana (1999–2000); MI, Michigan (1992–1994); MN, Minnesota (1996–1997); NH, New Hampshire (2001); NY, New York (2002); OK, Oklahoma (1996–2003); VT, Vermont (1993–2003); WA, Washington (2001–2002); WV, West Virginia (2001–2003). Results for NH (shown circled; see text) are not included in the regression analysis. Error bars are ± 1 SE.

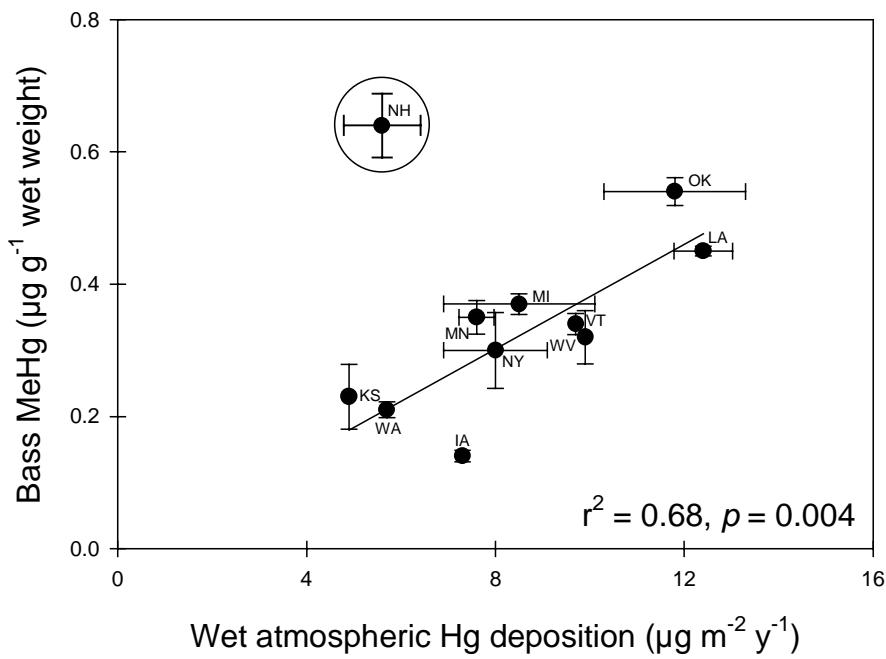
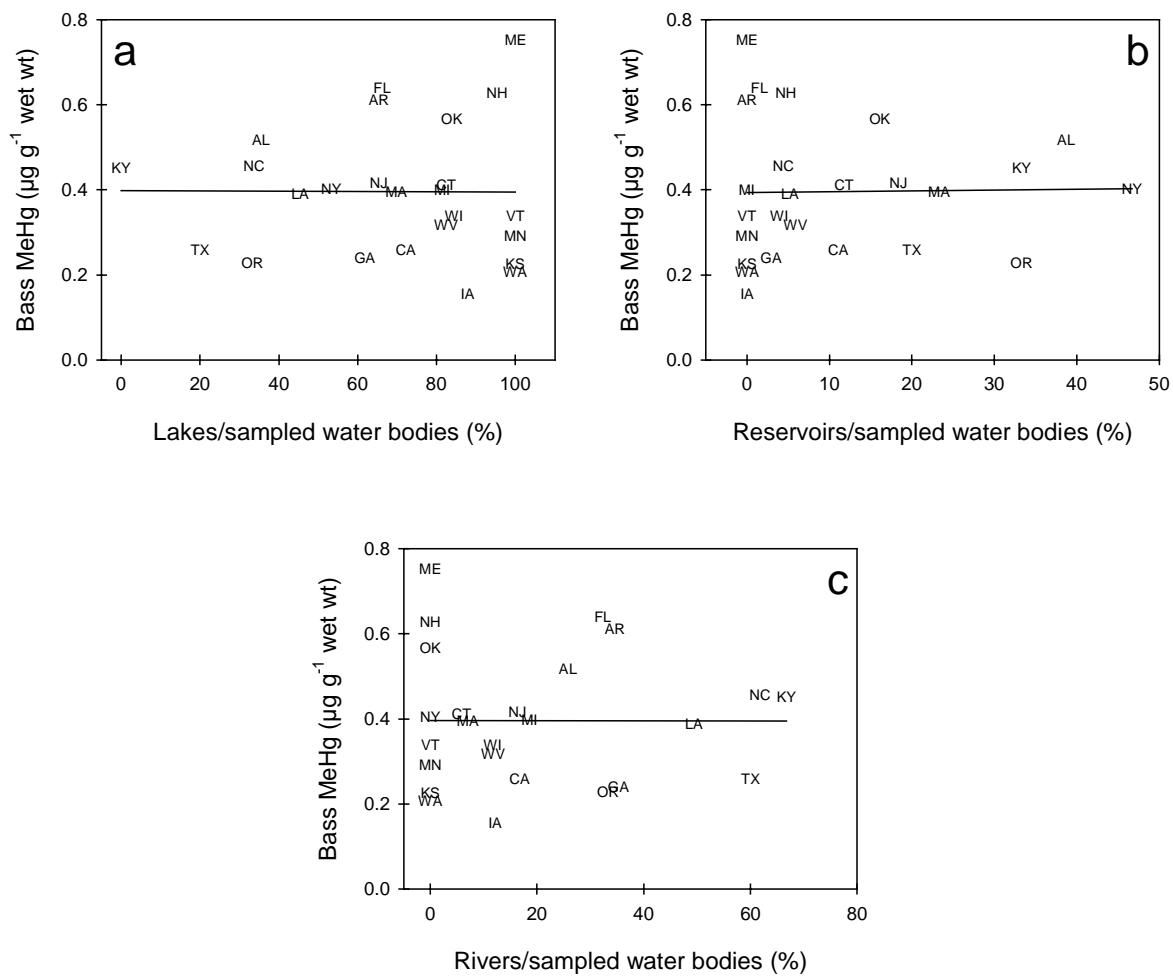


Figure E. Relation between weighted-mean concentration of MeHg in fillets of largemouth bass (30–40 cm total length) and the fraction of water bodies in each state that are either (a) lakes, (b) reservoirs, or (c) rivers among the 25 American states considered in this analysis: AL, Alabama; AR, Arkansas; CA, California; CT, Connecticut; FL, Florida; GA, Georgia; IA, Iowa; KS, Kansas; KY, Kentucky; LA, Louisiana; ME, Maine; MA, Massachusetts; MI, Michigan; MN, Minnesota; NH, New Hampshire; NJ, New Jersey; NY, New York; NC, North Carolina; OK, Oklahoma; OR, Oregon; TX, Texas; VT, Vermont; WA, Washington; WV, West Virginia; WI, Wisconsin.



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