

Supporting Information

Spatial and Temporal Patterns of Mercury Concentrations in Freshwater Fish across the Western United States and Canada

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Table S1. Data sources for fish mercury concentrations. * indicates that databases may include data originally associated with other State, Provincial, or Federal agencies. However, any duplicate data records between datasets have been purged.

Data Source	Years of Record	Number of Sites	Number of Hg Records
Alaska Dept of Environmental Conservation	2001-2012	88	1,069
Arizona Department of Environmental Quality	1995-2010	46	762
Alberta Environment	1991-2008	30	2,654
Alberta Research Council	1982-1993	38	866
California Environmental Data Exchange Network (CEDEN)	1978-2011	546	5,731
Colorado Dept of Public Health and Environment/Parks and Wildlife/Water Quality Control Division	2004-2012	93	515
Environment Canada*	1970-2010	319	7,245
Washington Dept of Ecology	1986-2011	32	611
Fisheries and Oceans Canada	1971-2004	607	21,734
Idaho Dept of Environmental Quality	2006-2008	25	40
Indian and Northern Affairs Canada	1988-2004	18	918
Montana Department of Fish Wildlife and Parks	1992-2011	88	522
Utah Division of Water Quality	1999-2011	245	2,724
New Mexico Environment Dept	1991-2012	29	307
Nevada Dept of Wildlife/Division of Environmental Protection	2005-2013	131	1,415
North Dakota Dept of Health	1990-2009	92	2,473
Oregon Health Authority/Oregon Dept of Environmental Quality	1987-2008	27	418
Saskatchewan Environment	1970-2010	229	12,791
South Dakota Dept of Environment and Natural Resources	1996-2012	123	2,912
Upper Columbia River Project	1986-2009	7	926
US EPA*	1969-2010	1420	13,289
US FWS*	1985-2010	503	5,179
US Geological Survey*	1992-2014	273	10,685
Wyoming Game and Fish Dept	1972-2011	40	524

Table S2. Taxonomic groupings, foraging guild size distribution (fork length) and total mercury (THg) concentrations ($\mu\text{g/g ww}$) in muscle tissue of 208 species of fish from western North America between 1969 and 2014. *Species without length-THg relationships and thus not size-adjusted for statistical modeling.

Species Grouping	Common Name Scientific name	Foraging Guild	N	# of Unique Sites	Median Fork Length (cm) (Min - Max)	Median THg concentration (Min - Max)
Anadromous salmonid	Arctic Char (anadromous) <i>Salvelinus alpinus</i>	Piscivore	40	7	57.0 (18.6 – 75.0)	0.048 (0.01 – 0.08)
	*Atlantic Salmon <i>Salmo salar</i>	Piscivore	3	1	30.8 (24.1 – 31.0)	0.290 (0.280 – 0.290)
	Chinook Salmon <i>Oncorhynchus tshawytscha</i>	Piscivore	205	33	72.1 (25.1 – 101.6)	0.097 (0.001 – 0.589)
	*Chum Salmon <i>Oncorhynchus keta</i>	Piscivore	4	1	63.5 (60.0 – 66.0)	0.056 (0.051 – 0.072)
	Coho Salmon <i>Oncorhynchus kisutch</i>	Piscivore	184	18	56.25 (30.0 – 91.0)	0.039 (0.003 – 0.260)
	Sockeye Salmon <i>Oncorhynchus nerka</i>	Planktivore	54	6	57.9 (38.2 – 69.8)	0.051 (0.030 – 0.084)
	Rainbow trout (steelhead) <i>Oncorhynchus mykiss</i>	Piscivore	36	7	72.9 (60.4 – 90.2)	0.121 (0.008 – 0.365)
	*Unknown salmonid		3	2	77.5 (29.1 – 77.5)	0.126 (0.04 – 0.177)
Arctic grayling	Arctic Grayling <i>Thymallus arcticus</i>	Generalist invertivore	329	77	30.6 (6.4 – 47.5)	0.069 (0.010 – 0.470)
Atherinids	Inland Silverside <i>Menidia beryllina</i>	Planktivore	53	9	NA	0.109 (0.024 – 0.639)
Black basses	Largemouth Bass <i>Micropterus salmoides</i>	Piscivore	5808	9	32.7 (3.7 – 64.0)	0.311 (0.001 – 6.61)
	Smallmouth Bass <i>Micropterus dolomieu</i>	Piscivore	1969	9	29.5 (4.4 – 71.4)	0.247 (0.008 – 11.27)
	Spotted Bass <i>Micropterus punctulatus</i>	Piscivore	166	9	26.8 (12.1 – 45.9)	0.456 (0.027 – 1.55)
	*Unknown black bass	Piscivore	52	3	31.9 (25.1 – 46.2)	0.156 (0.063 – 0.850)
Burbot	Burbot	Piscivore	907	113	59.0	0.190

	<i>Lota lota</i>				(12.4 – 94.6)	(0.01 – 6.40)
Carp	Common Carp <i>Cyprinus carpio</i>	Benthivore	2226	505	41.9 (2.9 – 75.8)	0.126 (0.001 – 3.65)
	Goldfish <i>Carassius auratus</i>	Benthivore	52	31	32.1 (12.1 – 40.4)	0.11 (0.013 – 1.60)
	*Grass Carp <i>Ctenopharyngodon idella</i>	Benthivore	2	2	45.4 (41.5 – 49.2)	0.058 (0.017 – 0.100)
Catfishes	Black Bullhead <i>Ameiurus melas</i>	Generalist	545	194	24.6 (9.7 – 24.6)	0.100 (0.010 – 1.43)
	*Blue Catfish <i>Ictalurus furcatus</i>	Piscivore	4	1	28.3 (27.0 – 33.9)	0.175 (0.140 – 0.210)
	Brown Bullhead <i>Ameiurus nebulosus</i>	Generalist	295	76	22.6 (4.2 – 40.0)	0.150 (0.007 – 1.31)
	Channel Catfish <i>Ictalurus punctatus</i>	Piscivore	1546	296	42.1 (14.0 – 84.3)	0.200 (0.008 – 2.35)
	Flathead Catfish <i>Pylodictis olivaris</i>	Piscivore	12	8	38.2 (28.0 – 54.0)	0.190 (0.020 – 0.400)
	*Stonecat <i>Noturus flavus</i>	Benthivore	8	5	15.0 (13.0 – 15.3)	0.082 (0.049 – 0.097)
	White Catfish <i>Ameiurus catus</i>	Piscivore	119	31	25.9 (18.6 – 34.1)	0.280 (0.010 – 3.20)
	Yellow Bullhead <i>Ameiurus natalis</i>	Generalist	61	20	20.2 (12.3 – 42.4)	0.190 (0.028 – 3.07)
	Unknown bullhead	Generalist	250	29	23.7 (14.5 – 55.8)	0.067 (0.017 – 1.10)
	*Unknown catfish	Generalist	12	6	56.9 (35.6 – 67.0)	0.315 (0.067 – 1.00)
Char	Arctic Char <i>Salvelinus alpinus</i>	Generalist	21	2	26.7 (21.2 – 58.0)	0.038 (0.020 – 0.250)
	Brook Trout <i>Salvelinus fontinalis</i>	Generalist	1464	261	20.2 (3.90 – 59.3)	0.070 (0.004 – 1.54)
	Bull Trout <i>Salvelinus confluentus</i>	Piscivore	178	23	30.6 (8.10 – 78.8)	0.187 (0.002 – 1.80)
	Dolly Varden <i>Salvelinus malma</i>	Generalist	297	49	15.3 (1.50 – 60.6)	0.030 (0.002 – 0.994)
	Lake Trout	Piscivore	4383	285	53.0	0.270

	<i>Salvelinus namaycush</i>				(8.6 – 113)	(0.01 – 12.3)
	splake <i>Salvelinus fontinalis</i> × <i>Salvelinus namaycush</i>	Piscivore	61	10	29.6 (12.6 – 38.3)	0.135 (0.037 – 1.86)
	*Sunapee Trout <i>Salvelinus alpinus oquassa</i>	Generalist	1	1	18.0	0.020
Chub	Arroyo Chub <i>Gila orcuttii</i>	Generalist invertivore	28	12	6.3 (5.8 – 23.1)	0.055 (0.015 – 0.149)
	*Bigeye Chub <i>Hybopsis amblops</i>	Generalist invertivore	1	1	12.8	0.010
	*Bonytail Chub <i>Gila elegans</i>	Generalist invertivore	8	2	NA	0.081 (0.043 – 0.188)
	*Chihuahua Chub <i>Gila nigrescens</i>	Generalist invertivore	3	1	NA	0.031 (0.026 – 0.307)
	Creek Chub <i>Semotilus atromaculatus</i>	Generalist	50	21	13.9 (11.2 – 21.7)	0.088 (0.030 – 0.278)
	Flathead Chub <i>Platygobio gracilis</i>	Generalist invertivore	43	28	20.5 (10.3 – 27.6)	0.081 (0.031 – 0.696)
	*Gila Chub <i>Gila intermedia</i>	Generalist invertivore	13	2	NA	0.099 (0.076 – 0.172)
	Lake Chub <i>Couesius plumbeus</i>	Generalist invertivore	46	7	10.8 (5.8 – 14.0)	0.067 1225
	Roundtail Chub <i>Gila robusta</i>	Generalist invertivore	118	16	29.0 (21.7 – 39.3)	0.195 (0.042 – 1.66)
	*Silver Chub <i>Macrhybopsis storeriana</i>	Generalist invertivore	1	1	NA	0.192
	*Sonora Chub <i>Gila ditaenia</i>	Generalist invertivore	2	2	NA	0.121 – 0.280
	Tui Chub <i>Gila bicolor</i>	Generalist invertivore	268	29	8.50 (3.2 – 35.8)	0.075 (0.011 – 1.42)
	Utah Chub <i>Gila atraria</i>	Generalist invertivore	30	8	14.6 (13.3 – 28.7)	0.217 (0.063 – 0.618)
	*Yaqui Chub <i>Gila purpurea</i>	Generalist invertivore	3	1	NA	0.0382 (0.006 – 0.189)
Cichlids	*Convict Cichlid <i>Amatitlania nigrofasciata</i>	Generalist invertivore	1	1	9.10	0.108
	*Tilapia	Generalist	81	14	16.1	0.032

	<i>Tilapia spp.</i>	invertivore			(7.6 – 33.0)	(0.006 – 0.189)
Cisco	Arctic Cisco <i>Coregonus autumnalis</i>	Planktivore	21	1	33.6 (30.5 – 37.5)	0.019 (0.015 – 0.025)
	Cisco (lake herring) <i>Coregonus artedii</i>	Planktivore	143	18	33.5 (9.0 – 60.5)	0.100 (0.010 – 0.144)
	Least Cisco <i>Coregonus sardinella</i>	Planktivore	50	3	30.0 (13.5 – 37.0)	0.043 (0.026 – 0.119)
	Cisco (unspecified)	Planktivore	72	5	25.3 (15.5 – 40.4)	0.111 (0.040 – 0.610)
Herring	*Gizzard Shad <i>Dorosoma cepedianum</i>	Planktivore	27	14	22.8 (3.40 – 36.5)	0.021 (0.008 – 0.190)
	*American Shad <i>Alosa sapidissima</i>	Planktivore	12	2	20.7 (16.8 – 21.2)	0.170 (0.020 – 0.444)
	*Threadfin Shad <i>Dorosoma petenense</i>	Planktivore	16	7	16.8 (14.8 – 28.3)	0.068 (0.013 – 0.311)
	*Unknown herring	Planktivore	22	1	NA	0.078 (0.060 – 0.128)
Crappie	Black Crappie <i>Pomoxis nigromaculatus</i>	Piscivore	592	157	20.9 (2.7 – 39.2)	0.172 (0.005 – 3.84)
	White Crappie <i>Pomoxis annularis</i>	Piscivore	114	34	22.0 (7.5 – 35.4)	0.325 (0.041 – 2.20)
	Unknown crappie	Piscivore	115	26	26.3 (12.2 – 34.5)	0.250 (0.016 – 3.00)
Freshwater drum	Freshwater Drum <i>Aplodinotus grunniens</i>	Benthivore	78	11	38.6 (15.0 – 72.3)	0.196 (0.015 – 0.770)
Gar	*Shortnose Gar <i>Lepisosteus platostomus</i>	Piscivore	10	4	57.5 (43.0 – 65.0)	0.400 (0.161 – 0.553)
	*Longnose Gar <i>Lepisosteus osseus</i>	Piscivore	1	1	74.9	0.32
Goldeye	Goldeye <i>Hiodon alosoides</i>	Generalist invertivore	1409	68	33.7 (13.7 – 47.0)	0.420 (0.010 – 7.70)
	Mooneye <i>Hiodon spp.</i>	Generalist invertivore	10	1	26.7 (24.0 – 27.7)	0.150 (0.010 – 0.250)
Inconnu	Inconnu <i>Stenodus nelma</i>	Piscivore	188	15	71.8 (35.5 – 117)	0.138 (0.007 – 0.970)
Killifish	*Banded Killifish <i>Fundulus diaphanus</i>	Generalist	12	1	4.3	0.008

		invertivore			(3.2 – 6.2)	(0.006 – 0.012)
	*Desert Pupfish <i>Cyprinodon macularius</i>	Generalist invertivore	2	1	NA	0.017 – 0.019
	*Leon Springs Pupfish <i>Cyprinodon bovinus</i>	Generalist invertivore	4	1	NA	0.021 (0.016 – 0.212)
	*Pecos Gambusia <i>Gambusia nobilis</i>	Generalist invertivore	7	3	NA	0.035 (0.014 – 0.058)
	*Pecos Pupfish <i>Cyprinodon pecosensis</i>	Generalist invertivore	14	3	NA	0.018 (0.016 – 0.046)
	*Plains Killifish <i>Fundulus zebrinus</i>	Generalist invertivore	19	10	NA	0.049 (0.005 – 0.279)
	*Sailfin Molly <i>Poecilia latipinna</i>	Generalist invertivore	33	2	NA	0.014 (0.013 – 0.054)
	*Western Mosquitofish <i>Gambusia affinis</i>	Generalist invertivore	4391	92	3.50 (0.100 – 6.10)	0.085 (0.005 – 28.5)
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Lamprey	*Klamath River Lamprey <i>Lampetra similis</i>	Piscivore	10	1	NA	0.743 (0.107 – 1.08)
	*Pacific Lamprey <i>Lampetra tridentata</i>	Piscivore	178	23	62.0 (58.1 – 65.9)	0.493 (0.013 – 1.69)
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Minnows	*Bigmouth Shiner <i>Notropis dorsalis</i>	Generalist invertivore	4	4	NA	0.087 (0.019 – 0.162)
	Brassy Minnow <i>Hybognathus hankinsoni</i>	Generalist invertivore	23	5	4.0 (3.0 – 9.8)	0.094 (0.028 – 0.189)
	*California Roach <i>Hesperoleucus symmetricus</i>	Generalist invertivore	122	27	8.30	0.209 (0.013 – 2.30)
	*Central Stoneroller <i>Camptostoma anomalum</i>	Generalist invertivore	3	3	NA	0.061 (0.038 – 0.091)
	Chiselmouth <i>Acrocheilus alutaceus</i>	Generalist invertivore	44	26	20.5 (8.0 – 30.0)	0.091 (0.020 – 1.13)
	Common Dace <i>Leuciscus leuciscus</i>	Generalist invertivore	9	1	6.1 (5.1 – 7.1)	0.027 (0.016 – 0.104)
	*Common Shiner <i>Luxilus cornutus</i>	Generalist invertivore	16	16	NA	0.097 (0.038 – 0.200)
	*Emerald Shiner <i>Notropis atherinoides</i>	Generalist invertivore	25	12	7.5 (7.1 – 8.0)	0.060 (0.014 – 0.291)
	Fathead Minnow <i>Pimephales promelas</i>	Generalist	204	83	7.0	0.054

	invertivore			(3.8 – 8.2)	(0.003 – 1.02)
Finescale Dace <i>Phoxinus neogaeus</i>	Generalist invertivore	11	2	7.9 (6.0 – 10.8)	0.130 (0.040 – 0.396)
*Golden Shiner <i>Notemigonus crysoleucas</i>	Generalist invertivore	26	10	10.1 (8.0 – 11.1)	0.207 (0.019 – 0.274)
*Hardhead <i>Mylopharodon conocephalus</i>	Generalist invertivore	9	6	14.2	0.124 (0.076 – 0.790)
Hitch <i>Lavinia exilicauda</i>	Generalist invertivore	18	8	11.1 (7.3 – 23.5)	0.095 (0.027 – 0.290)
*Longfin Dace <i>Agosia chrysogaster</i>	Generalist invertivore	34	10	NA	0.103 (0.023 – 0.250)
Longnose Dace <i>Rhinichthys cataractae</i>	Generalist invertivore	55	34	6.8 (4.1 – 21.4)	0.121 (0.004 – 0.579)
Northern Redbelly Dace <i>Chrosomus eos</i>	Generalist invertivore	24	4	7.7 (6.9 – 9.0)	0.084 (0.007 – 0.149)
Peamouth <i>Mylocheilus caurinus</i>	Generalist invertivore	207	45	23.5 (13.7 – 32.3)	0.180 (0.024 – 2.25)
Pearl Dace <i>Margariscus margarita</i>	Generalist invertivore	50	6	8.1 (6.5 – 10.9)	0.114 (0.026 – 0.309)
*Plains Minnow <i>Hybognathus placitus</i>	Generalist invertivore	1	1	NA	0.011
Red Shiner <i>Cyprinella lutrensis</i>	Generalist invertivore	140	49	5.4 (4.8-12.3)	0.057 (0.003 – 0.413)
*Redside Dace <i>Clinostomus elongates</i>	Generalist invertivore	1	1	10.5	0.121
Redside Shiner <i>Richardsonius balteatus</i>	Generalist invertivore	1422	72	4.4 (3.0 – 18.7)	0.071 (0.006 – 1.03)
*Rio Grande Silvery Minnow <i>Hybognathus amarus</i>	Generalist invertivore	6	1	NA	0.041 (0.035 – 0.078)
*Rudd <i>Scardinius erythrophthalmus</i>	Generalist invertivore	2	2	30.8 – 35.9	0.050 – 0.280
Sacramento Blackfish <i>Orthodon microlepidotus</i>	Generalist invertivore	95	16	34.2 (18.9 – 46.0)	0.600 (0.016 – 2.20)
*Sand Shiner <i>Notropis stramineus</i>	Generalist invertivore	23	18	4.4 (3.9 – 9.1)	0.059 (0.012 – 0.138)

	Speckled Dace <i>Rhinichthys osculus</i>	Generalist invertivore	350	71	6.6 (3.9 – 22.2)	0.094 (0.001 – 0.946)
	*Splittail <i>Pogonichthys macrolepidotus</i>	Generalist invertivore	4	3	NA	0.122 (0.109 – 0.140)
	*Spotfin Shiner <i>Cyprinella spiloptera</i>	Generalist invertivore	3	3	NA	0.028 (0.026 – 0.118)
	Spottail Shiner <i>Notropis hudsonius</i>	Generalist invertivore	96	6	7.0 (6.5 – 8.3)	0.076 (0.017 – 0.169)
	*Western Silvery Minnow <i>Hybognathus argyritis</i>	Generalist invertivore	2	2	NA	0.020 – 0.063
	Unknown minnow	Generalist invertivore	46	17	6.6 (4.7 – 20.5)	0.069 (0.033 – 1.05)
Morone bass	Striped Bass <i>Morone saxatilis</i>	Piscivore	452	30	40.4 (11.9 – 93.4)	0.291 (0.035 – 7.40)
	White Bass <i>Morone chrysops</i>	Piscivore	359	39	30.8 (10.3 – 60.9)	0.408 (0.006 – 8.80)
	Whiterock bass <i>Morone chrysops x M. saxatilis</i>	Piscivore	171	21	36.5 (10.7 – 71.7)	0.230 (0.011 – 0.864)
Pike	Muskellunge <i>Esox masquinongy</i>	Piscivore	19	4	73.5 (67.3 – 97.1)	0.534 (0.197 – 0.757)
	Northern Pike <i>Esox lucius</i>	Piscivore	15934	1026	58.7 (8.7 – 130)	0.240 (0.002 – 9.99)
	Tiger muskellunge <i>Esox masquinongy X Esox lucius</i>	Piscivore	8	4	67.5 (38.7 – 92.4)	0.21 (0.100 – 0.560)
Pikeminnow	*Colorado Pikeminnow <i>Ptychocheilus lucius</i>	Piscivore	131	30	64.9	0.499 (0.036 – 1.42)
	Northern Pikeminnow <i>Ptychocheilus oregonensis</i>	Piscivore	2030	145	5.6 (2.8 – 69.4)	0.110 (0.009 – 3.46)
	Sacramento Pikeminnow <i>Ptychocheilus grandis</i>	Piscivore	134	26	39.1 (18.5 – 51.2)	0.390 (0.02 – 2.84)
	Umpqua Pikeminnow <i>Ptychocheilus umpquae</i>	Piscivore	17	4	20.8 (13.4 – 43.9)	0.257 (0.086 – 1.36)
Sculpin	*Coastrange Sculpin <i>Cottus aleuticus</i>	Generalist invertivore	1	1	NA	0.035

	Mottled Sculpin <i>Cottus bairdii</i>	Generalist invertivore	90	34	11.9 (8.6 – 14.3)	0.022 (0.002 – 0.142)
	Pacific Staghorn Sculpin <i>Leptocottus armatus</i>	Generalist invertivore	57	13	18.9 (4.2 – 30.1)	0.040 (0.021 – 0.670)
	Paiute Sculpin <i>Cottus beldingi</i>	Generalist invertivore	16	7	9.0 (5.1 – 10.7)	0.092 (0.004 – 0.236)
	Prickly Sculpin <i>Cottus asper</i>	Generalist invertivore	120	23	8.4 (3.3 – 26.8)	0.051 (0.008 – 2.19)
	Reticulate Sculpin <i>Cottus perplexus</i>	Generalist invertivore	57	9	NA	0.066 (0.009 – 0.218)
	*Riffle Sculpin <i>Cottus gulosus</i>	Generalist invertivore	125	22	8.8 (8.6 – 8.9)	0.102 (0.023 – 0.488)
	*Shorthead Sculpin <i>Cottus confuses</i>	Generalist invertivore	7	5	NA	0.042 (0.020 – 0.128)
	Slimy Sculpin <i>Cottus cognatus</i>	Generalist invertivore	253	31	6.0 (3.8 – 12.2)	0.048 (0.003 – 1.11)
	Torrent Sculpin <i>Cottus rhotheus</i>	Generalist invertivore	34	11	6.4 (4.4 – 12.6)	0.072 (0.009 – 0.193)
	*Wood River Sculpin <i>Cottus leiopomus</i>	Generalist invertivore	1	1	NA	0.054
	Unknown sculpin	Generalist invertivore	179	46	7.6 (5.1 – 16.4)	0.070 (0.001 – 1.39)
Stickleback	*Brook Stickleback <i>Culaea inconstans</i>	Generalist invertivore	19	6	NA	0.033 (0.026 – 0.339)
	*Ninespine Stickleback <i>Pungitius pungitius</i>	Generalist invertivore	1	1	4.8	0.076
	Threespine Stickleback <i>Gasterosteus aculeatus</i>	Generalist invertivore	476	38	3.9 (2.5 – 6.5)	0.092 (0.016 – 0.455)
Sturgeon	*Lake Sturgeon <i>Acipenser fulvescens</i>	Benthivore	52	4	107 (42.7 – 156)	0.140 (0.020 – 0.640)
	*Shovelnose Sturgeon <i>Scaphirhynchus platyrhynchus</i>	Benthivore	23	3	NA	0.100 (0.054 – 0.351)
	*White Sturgeon <i>Acipenser transmontanus</i>	Benthivore	157	27	57.7 (18.8 – 169)	0.130 (0.012 – 1.28)
	*Sturgeon (unspecified)	Benthivore	30	8	83.8 (37.5 – 122)	0.228 (0.030 – 3.60)
Suckers	Bigmouth Buffalo	Benthivore	37	6	57.0	0.390

<i>Ictiobus cyprinellus</i>				(35.0 – 73.0)	(0.040 – 0.575)
*Blue Sucker <i>Cycleptus elongates</i>	Benthivore	11	3	NA	0.094 (0.030 – 0.295)
*Bluehead Sucker <i>Catostomus discobolus</i>	Benthivore	63	20	28.5 (8.1 – 32.6)	0.054 (0.017 – 0.159)
Bridgelip Sucker <i>Catostomus columbianus</i>	Benthivore	54	30	33.3 (8.6 – 52.3)	0.081 (0.005 – 0.817)
Carp sucker <i>Carpiodes carpio</i>	Benthivore	46	25	35.0 (12.8 – 55.6)	0.115 (0.02 – 0.580)
*Cui-Ui <i>Chasmistes cujus</i>	Benthivore	1	1	NA	0.065
Desert Sucker <i>Catostomus clarkii</i>	Benthivore	78	22	17.1 (8.0 – 25.7)	0.089 (0.012 – 1.00)
Flannelmouth Sucker <i>Catostomus latipinnis</i>	Benthivore	228	39	40.9 (19.7 – 50.9)	0.087 (0.013 – 0.360)
*Golden Redhorse <i>Moxostoma erythrurum</i>	Benthivore	5	2	36.7 (26.9 – 46.9)	0.180 (0.082 – 0.245)
*June Sucker <i>Chasmistes liorus</i>	Benthivore	1	1	NA	0.050)
Klamath Largescale Sucker <i>Catostomus snyderi</i>	Benthivore	12	2	33.6 (21.0 – 44.0)	0.088 (0.027 – 0.446)
Klamath Smallscale Sucker <i>Catostomus rimiculus</i>	Benthivore	22	6	24.2 (15.7 – 37.1)	0.083 (0.024 – 0.173)
Largescale Sucker <i>Catostomus macrocheilus</i>	Benthivore	1178	169	38.2 (3.5 – 70.4)	0.141 (0.011 – 3.27)
Longnose Sucker <i>Catostomus catostomus</i>	Benthivore	1086	120	37.6 (5.7 – 64.0)	0.156 (0.009 – 2.77)
*Lost River Sucker <i>Deltistes luxatus</i>	Benthivore	3	1	NA	0.050 (0.038 – 0.056)
Mountain Sucker <i>Catostomus platyrhynchus</i>	Benthivore	78	29	14.7 (10.0 – 27.6)	0.081 (0.005 – 0.418)
Quillback <i>Carpiodes cyprinus</i>	Benthivore	13	6	35.5 (13.4 – 47.5)	0.580 (0.023 – 4.20)
*Razorback Sucker <i>Xyrauchen texanus</i>	Benthivore	114	18	41.7 (40.6 – 42.0)	0.072 (0.032 – 1.20)
Redhorse (unspecified) <i>Moxostoma spp.</i>	Benthivore	42	14	37.8	0.300

					(16.0 – 42.2)	(0.042 – 5.30)
*Rio Grande Sucker <i>Catostomus plebeius</i>	Benthivore	1	1	NA		0.039
Sacramento Sucker <i>Catostomus occidentalis</i>	Benthivore	236	76	39.3 (7.8 – 49.4)		0.179 (0.02 – 2.70)
*Santa Ana Sucker <i>Catostomus santaanae</i>	Benthivore	4	3	11.5 (3.0 – 12.9)		0.033 (0.027 – 0.170)
Shorthead Redhorse <i>Moxostoma macrolepidotum</i>	Benthivore	103	37	32.0 (13.9 – 44.6)		0.189 (0.012 – 0.690)
*Shortnose Sucker <i>Chasmistes brevirostris</i>	Benthivore	4	1	NA		0.083 (0.057 – 0.191)
Silver Redhorse <i>Moxostoma anisurum</i>	Benthivore	14	1	21.0 (10.2 – 23.4)		0.011 (0.008 – 0.018)
Smallmouth Buffalo <i>Ictiobus bubalus</i>	Benthivore	9	3	52.9 (36.5 – 63.8)		0.340 (0.07 – 0.480)
Sonora Sucker <i>Catostomus insignis</i>	Benthivore	22	7	24.7 (12.4 – 47.5)		0.136 (0.053 – 0.422)
Tahoe Sucker <i>Catostomus tahoensis</i>	Benthivore	47	14	20.4 (2.8 – 30.4)		0.124 (0.029 – 1.10)
Utah Sucker <i>Catostomus ardens</i>	Benthivore	54	20	24.9 (10.9 – 46.2)		0.104 (0.024 – 0.720)
White Sucker <i>Catostomus commersonii</i>	Benthivore	1764	281	36.1 (5.3 – 59.0)		0.123 (0.001 – 5.70)
Sucker (unspecified)	Benthivore	327	90	24.2 (6.4 – 66.5)		0.210 (0.002 – 2.28)
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Sunfishes	Bluegill <i>Lepomis macrochirus</i>	Generalist	867	209	15.4 (2.7 – 32.4)	0.138 (0.01 – 3.80)
	*Bluespotted Sunfish <i>Enneacanthus gloriosus</i>	Generalist invertivore	4	1	16.8 (14.8 – 19.5)	0.260 (0.240 – 0.280)
	Green Sunfish <i>Lepomis cyanellus</i>	Generalist	316	119	13.8 (4.8 – 39.0)	0.128 (0.001 – 1.89)
	*Longear Sunfish <i>Lepomis megalotis</i>	Benthivore	1	1	12.3	0.040
	Pumpkinseed <i>Lepomis gibbosus</i>	Generalist invertivore	142	19	6.3 (1.7 – 20.6)	0.039 (0.007 – 0.725)
	Redear Sunfish <i>Lepomis microlophus</i>	Benthivore	116	31	20.1	0.145

					(13.0 – 28.8)	(0.010 – 0.870)
	Rock Bass <i>Ambloplites rupestris</i>	Generalist	19	10	19.0 (12.0 – 25.0)	0.162 (0.061 – 0.357)
	Sacramento Perch <i>Archoplites interruptus</i>	Piscivore	12	5	14.7 (10.8 – 25.7)	0.520 (0.030 – 2.50)
	*Tule Perch <i>Hysterocarpus traskii</i>	Generalist invertivore	22	5	12.35	0.131 (0.086 – 0.336)
	Warmouth <i>Lepomis gulosus</i>	Generalist invertivore	1	1	NA	0.023
	Sunfish (unspecified)	Generalist	11	5	12.1 (8.4 – 16.8)	0.190 (0.080 – 0.544)
Trout	Apache Trout <i>Oncorhynchus apache</i>	Generalist	32	5	32.1 (11.8 – 45.5)	0.125 (0.030 – 0.513)
	Brown Trout <i>Salmo trutta</i>	Generalist	1844	433	30.1 (4.1 – 76.6)	0.105 (0.009 – 2.84)
	Chinook Salmon (Juvenile) <i>Oncorhynchus tshawytscha</i>	Generalist invertivore	131	3	14.0 (5.8 – 19.0)	0.370 (0.007 – 1.02)
	Coho Salmon (Juvenile) <i>Oncorhynchus kisutch</i>	Generalist invertivore	11	3	8.3 (7.5 – 9.7)	0.197 (0.074 – 1.72)
	*Columbia River Redband Trout <i>Oncorhynchus mykiss gairdneri</i>	Generalist	13	9	NA	0.080 (0.030 – 0.230)
	Cutthroat Trout <i>Oncorhynchus clarkii</i>	Generalist	1231	248	26.3 (3.8 – 64.2)	0.079 (0.001 – 1.39)
	Golden Trout <i>Oncorhynchus aguabonita</i>	Generalist invertivore	45	1	15.1 (10.9 – 17.2)	0.083 (0.030 – 0.177)
	Kokanee <i>Oncorhynchus nerka</i>	Planktivore	360	62	27.3 (11.5 – 50.9)	0.094 (0.001 – 1.39)
	Lahontan Cutthroat Trout <i>Oncorhynchus clarkii henshawi</i>	Piscivore	44	13	23.5 (13.7 – 48.5)	0.130 (0.037 – 0.775)
	Rainbow Trout <i>Oncorhynchus mykiss</i>	Generalist	4392	857	28.4 (6.5 – 88.9)	0.075 (0.001 – 2.80)
	Redband Trout <i>Oncorhynchus mykiss</i>	Generalist	395	69	16.8 (5.0 – 37.3)	0.123 (0.017 – 2.40)
	Tiger trout <i>Salmo trutta X Salvelinus</i>	Generalist	46	13	27.8	0.075

	<i>fontinalis</i>				(10.7 – 56.2)	(0.026 – 0.464)
	Trout (unspecified)	Generalist	44	9	37.4 (17.2 – 73.3)	0.180 (0.070 – 0.568)
Walleye/ Sauger	Sauger <i>Sander canadensis</i>	Piscivore	742	63	37.1 (18.4 – 60.1)	0.675 (0.01 – 9.99)
	saugeye <i>Sander vitreum x S. canadense</i>	Piscivore	25	6	44.8 (29.7 – 67.8)	0.310 (0.05 – 0.95)
	Walleye <i>Sander vitreus</i>	Piscivore	17696	810	43.0 (4.5 – 85.7)	0.310 (0.001 – 16.0)
Whitefish	Bonneville whitefish <i>Prosopium spilonotus</i>	Generalist invertivore	20	1	36.9 (25.0 – 45.6)	0.042 (0.021 – 0.087)
	Broad whitefish <i>Coregonus nasus</i>	Generalist invertivore	251	15	49.0 (36.0 – 60.0)	0.053 (0.01 – 0.224)
	Humpback whitefish <i>Coregonus pidschian</i>	Generalist invertivore	120	7	43.1 (30.1 – 59.8)	0.066 (0.008 – 0.201)
	Lake whitefish <i>Coregonus clupeaformis</i>	Generalist invertivore	3529	201	42.0 (5.0 – 90.9)	0.074 (0.008 – 0.490)
	Mountain whitefish <i>Prosopium williamsoni</i>	Generalist invertivore	1293	199	27.5 (4.8 – 48.5)	0.085 (0.002 – 0.830)
	Round whitefish <i>Prosopium cylindraceum</i>	Generalist invertivore	348	28	34.5 (17.2 – 55.0)	0.087 (0.008 – 2.64)
	Whitefish (unspecified)	Generalist invertivore	201	41	40.9 (12.2 – 85.5)	0.060 (0.007 – 0.490)
Yellow perch	Yellow perch <i>Perca flavescens</i>	Generalist	2036	305	20.4 (4.1 – 44.4)	0.124 (0.01 – 1.68)
	Perch (unspecified)	Generalist	679	53	22.0 (3.4 – 33.2)	0.140 (0.01 – 1.40)

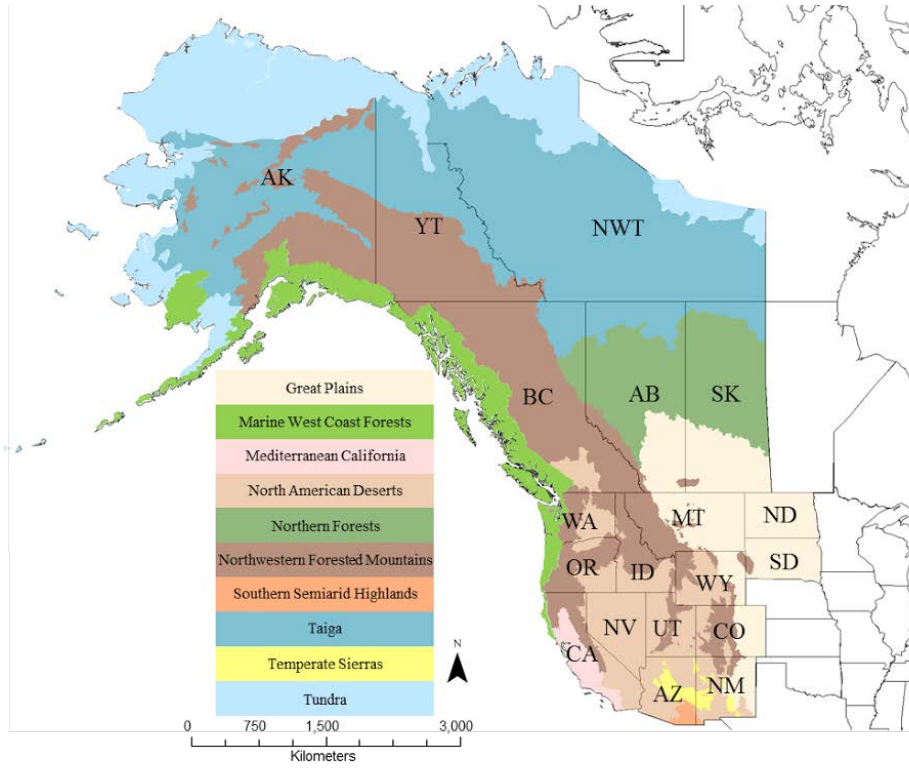


Figure S1. Map of study area overlaid with Level 1 ecoregions designations (Omernik, 1987).

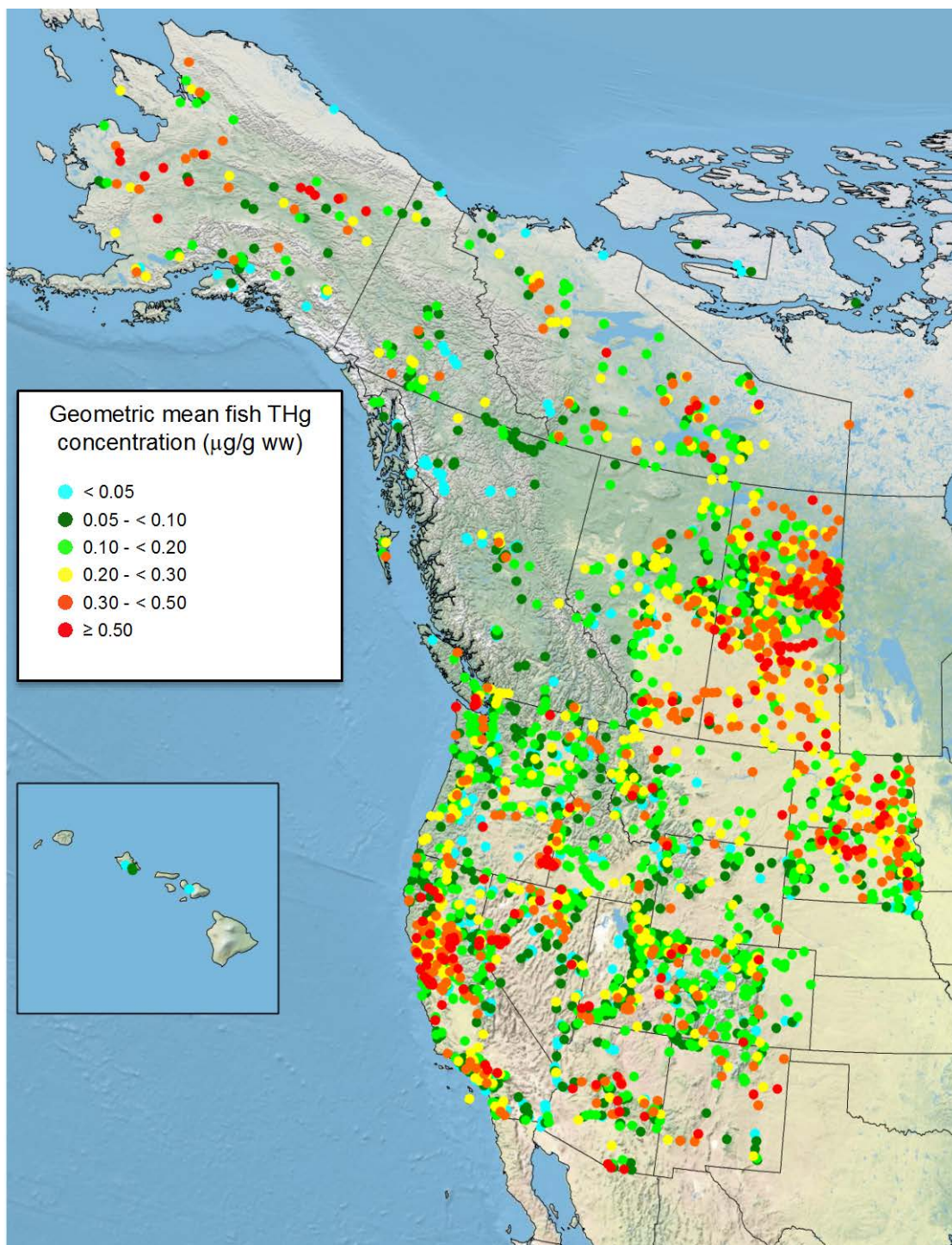


Figure S2. Site specific geometric mean fish total mercury (THg) concentrations ($\mu\text{g/g}$ wet weight) across western US and Canada for sites with 3 or more fish samples. Concentrations represent geometric mean THg in muscle tissue across all fish species and years for each site. Data are not adjusted for fish size.

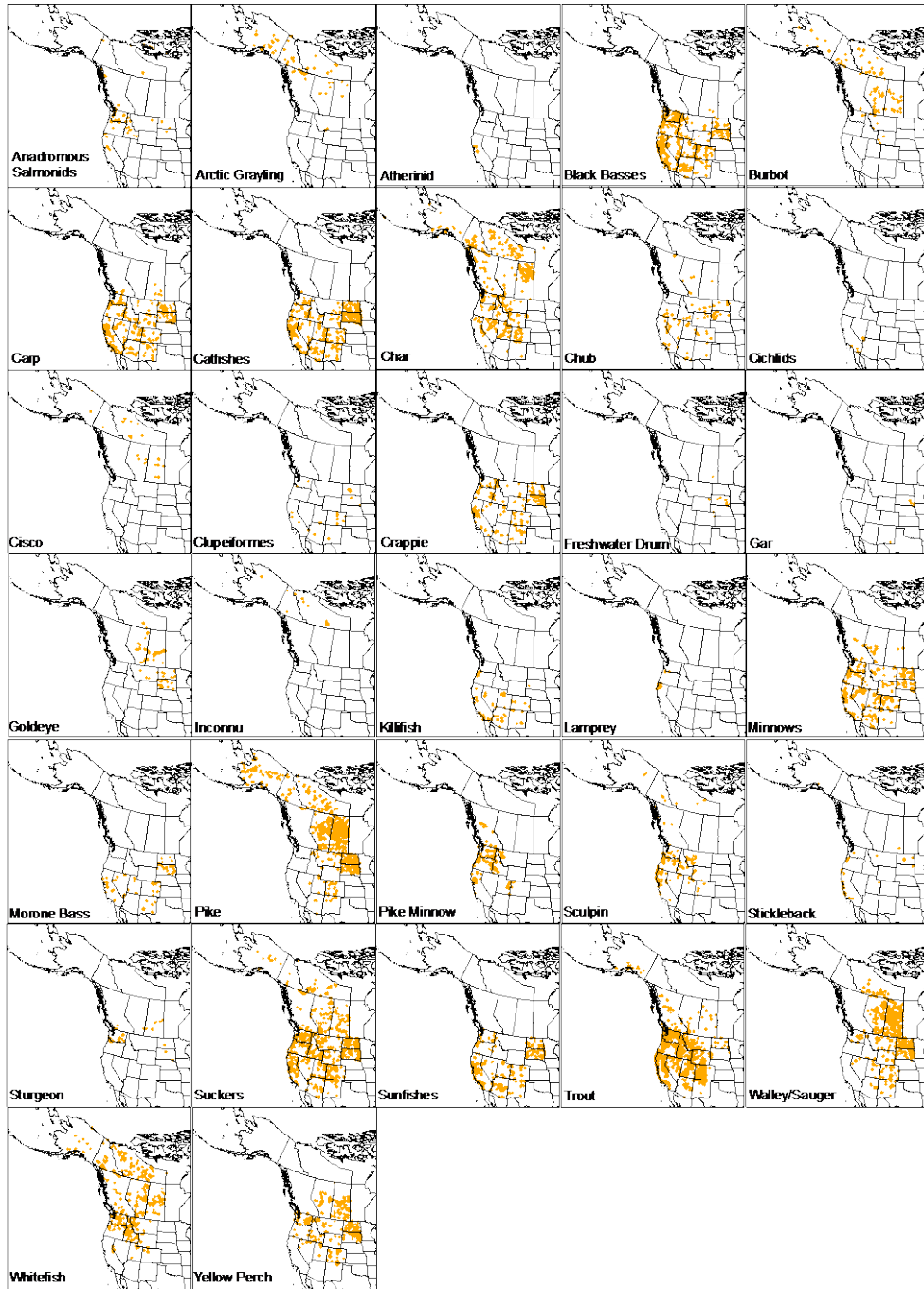


Figure S3. Taxonomic distribution of fish sample locations.

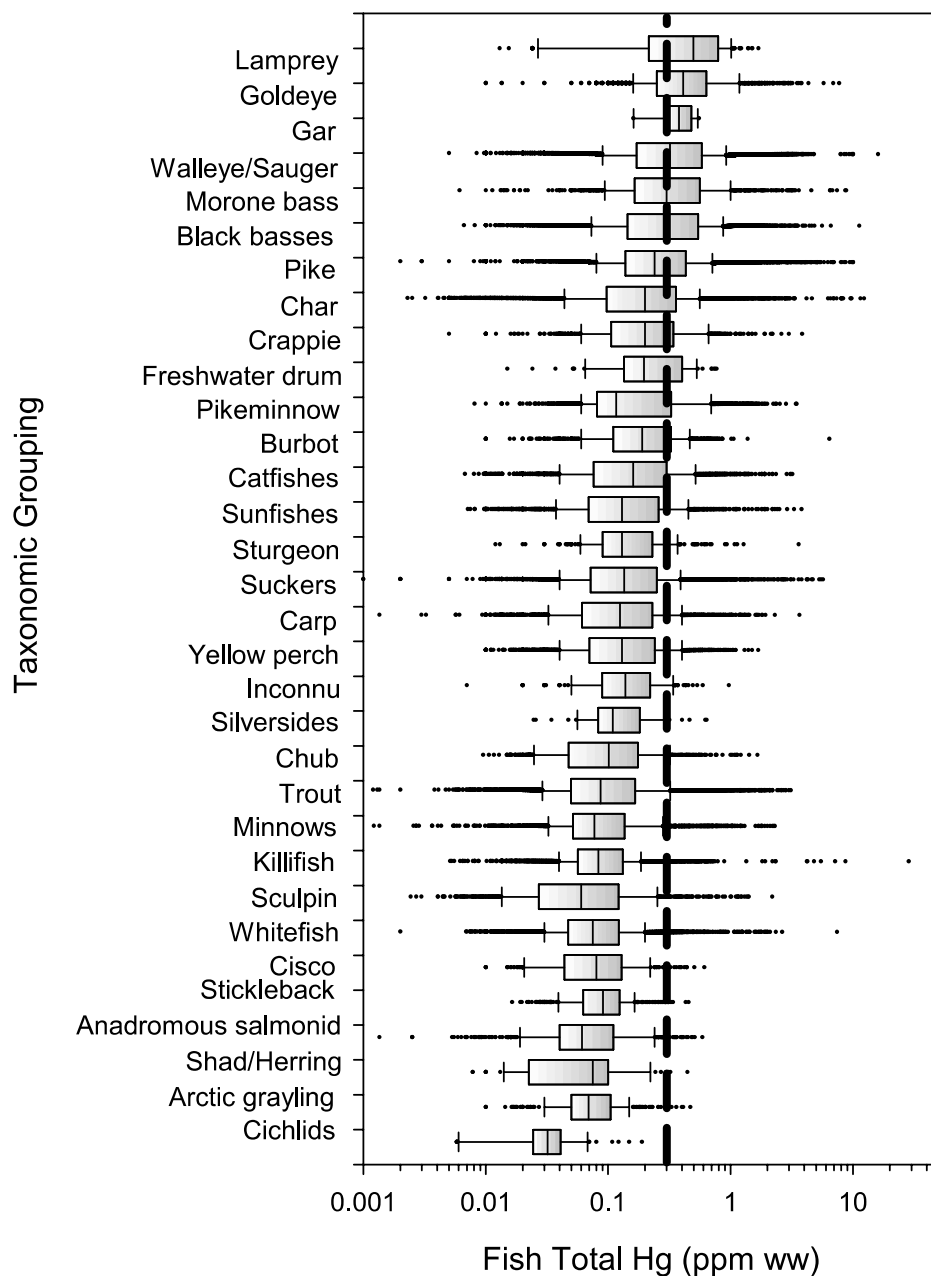


Figure S4: Distribution of fish muscle total mercury (THg) concentrations ($\mu\text{g/g}$ wet weight) within and among taxonomic groupings across western US and Canada. Species that comprise each grouping can be found in Table 2. Vertical dashed line represents the US EPA fish tissue residue criterion for protection of human health (0.3 mg/g wet weight)

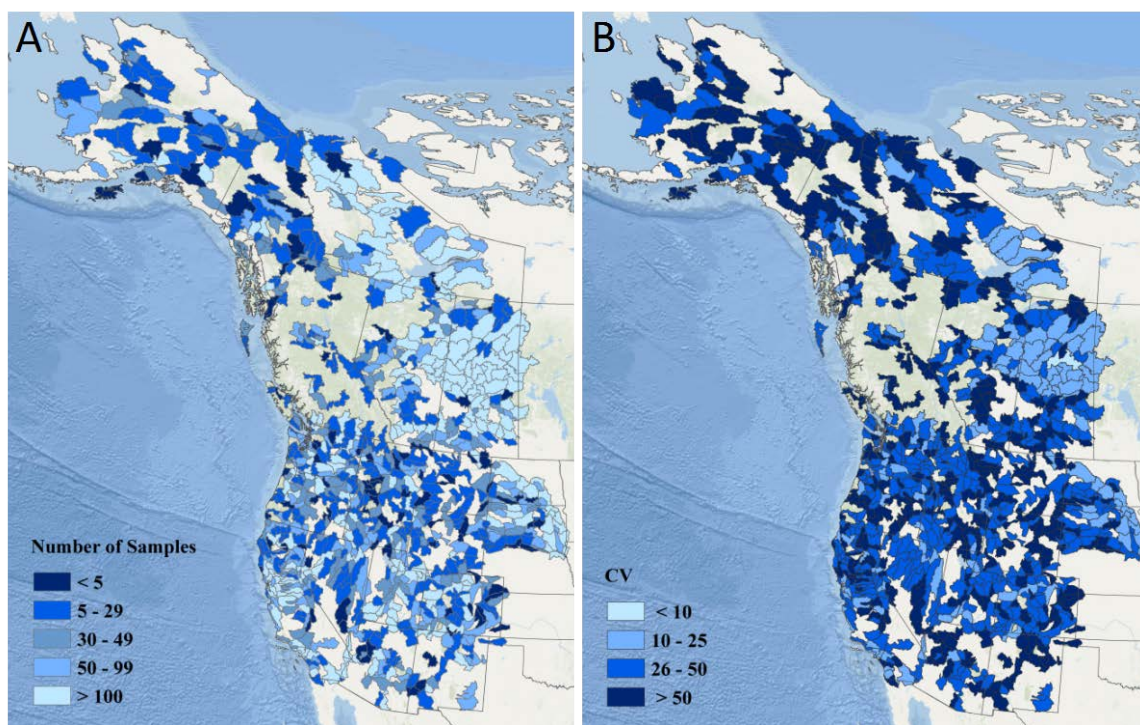


Figure S5. (A) Fish sample size in each HUC-8 used for modeling relativized fish total mercury (THg) concentrations (see figure 4). (B) The coefficient of variation (as a percentage) for the model-estimated least squares mean THg concentration for each HUC-8 presented in figure 4.

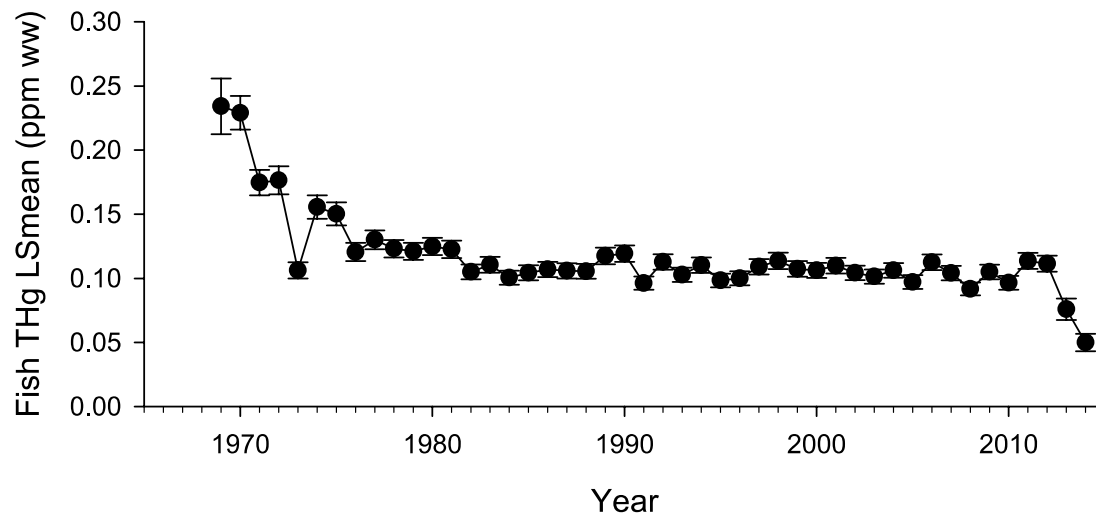


Figure S6. Least squares mean total mercury (THg) concentrations ($\mu\text{g/g ww}$) in fish muscle tissue across western North America between 1969 and 2014. Least squares mean concentrations account for the effects of site and species. Error bars represent standard error. Decadal sample sizes are as follows: pre 1970 = 76; 1970-1979 = 9,864; 1980-1989 = 16,454; 1990-1999 = 23,326; 2000-2009 = 32,939; 2010-2014 = 13,454.

Literature cited

Omernik J. Ecoregions of the conterminous United States. *Ann Assoc Am Geogr* 1987; 77: 118-225.