Mercury distribution across 14 U.S. forests. Part II: Patterns of methyl mercury concentrations and areal mass of total and methyl mercury

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Supporting Information

(3 Tables, 1 Figure)

Supporting Tables:

Table S1: Site information of the 14 sites sampled in this study.

Site	Site Location	Date sampled	Recent Fire History	Dominant Species	Soil Type	Latitude	Longitude	Elevation (m asl)	Precipitation (mm)	Aver Temp (°)
S1	Gainesville, FL	9-May	2009 (prescribed fire)	Slash and longleaf pine	sandy, siliceous, thermic Ultic Alaquods	29.74	-82.22	50	1228	22
S2	Oak Ridge, TN	9-May	None	White and black oak, hickories, and red maple	fine kaolintic thermic Typic Paleudults	35.97	-84.28	325	1350	16
S3	Ashland, MO	9-Sep	None	White oak, mixed oaks, and hickories	fine, smectitic, mesic Aquertic Chromic Hapludalfs and clayey-skeletal, mixed, superactive, mesic Typic Argiudolls	38.73	-92.2	210	1023	14
S4	Little Valley, NV	7-Oct	None	Jeffrey pine	sandy and fine-loamy mixed, frigid Typic Xeropsamments	39.12	-119.93	2010	550	5
S5	Little Valley, NV	7-Oct	1981 (wildfire)	Manzanita, snowbrush	sandy and fine-loamy mixed, frigid Typic Xeropsamments	39.12	-119.93	2010	550	5
S6	Marysville, CA	8-May	None	Blue oak, foothill pine	fine, mixed, thermic Typic Haploxeralfs	39.25	-121.28	386	775	17
S7	Truckee, CA	7-Nov	None	Jeffrey pine, white fir	fine-loamy mixed, frigid Ultic Haploxeralfs	39.37	-120.16	1767	568	6
S8	Truckee, CA	7-Nov	2002 (prescribed fire)	Jeffrey pine, white fir	fine-loamy mixed, frigid Ultic Haploxeralfs	39.37	-120.16	1767	568	6
S9	Niwot Ridge, CO	8-Jul	None	Subalpine fir, Engelmann spruce, lodgepole pine	sandy Inceptisols	40.03	-105.55	3050	800	1
S10	Hart, MI	9-Oct	None	Sugar maple	sandy, isotic, frigid Typic Haplorthods	43.67	-86.15	210	812	8
S11	Bartlett, NH	8-Oct	None	Red maple, American beech, paper birch, eastern hemlock	coarse textured Spodosols and Inceptisols	44.06	-71.29	272	1300	5
S12	Howland, ME	8-Oct	None	Red spruce, eastern hemlock	fine, mixed, thermic Typic Haploxeralfs	45.2	-68.74	60	1040	7
S13	Thompson Forest, WA	8-Jul	None	Douglas fir	loamy-skeletal, isotic, mesic Dystric Entic Durochrepts	47.38	-121.93	220	1140	10
S14	Thompson Forest, WA	8-Jul	None	Red alder	loamy-skeletal, isotic, mesic Dystric Entic Durochrepts	47.38	-121.93	220	1140	10

Table S2. Linear regression analyses of MeHg concentrations to Latitude, Precipitation, Soil C, and Clay content separated for litter and soil layers using all 12 sites

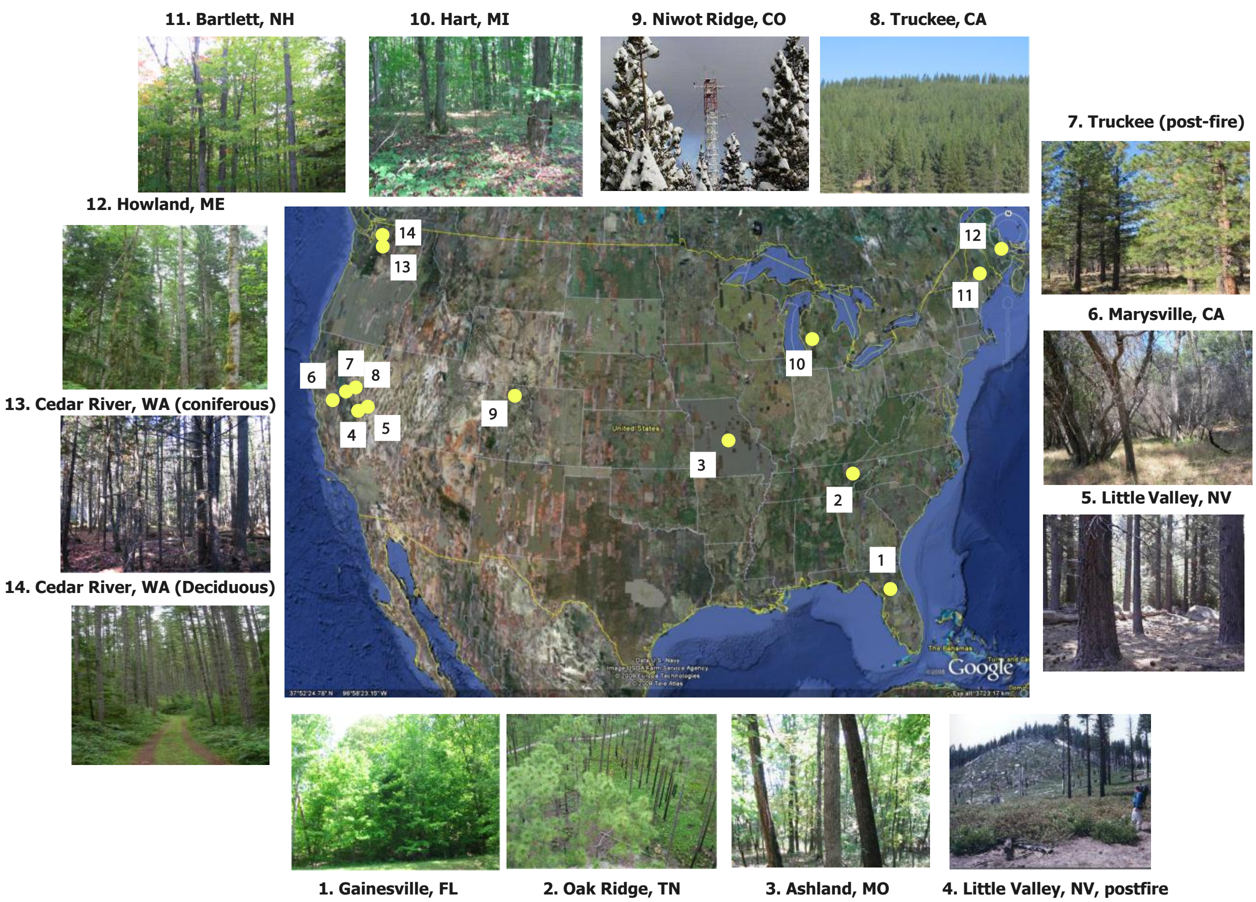
	Soil C		**Latitude**		**Precip**	
Component	*P*	r^2	*P*	r^2	*P*	r^2
Litter Oi	-	-	*n.s.*	-	*n.s.*	-
Litter Oe	-	-	*0.04*	0.18	*n.s.*	-
Litter Oa	-	-	*0.07*	0.21	*n.s.*	-
Soil 0-20 cm	*<0.01*	0.50	*0.07*	0.14	*n.s.*	-
Soil > 20 cm	*<0.01*	0.34	*n.s.*	-	*0.06*	0.16

Table S3. Scaling protocols to estimate areal mass of THg and MeHg for respective research sites.

Site	Site Location	Aboveground	Multiplied by	Litter	Multiplied by:	Soil	Multiplied by	References
S1	Gainesville, FL	Carbon Inventory (site level; n = 1)	Hg/C ratio (plot-level; n = 4)	Litter Mass (plot-level, n = 4)	Hg concentrations (plot-level, n = 4)	Bulk density (site level; n = 1; 3 depths)	Hg concentrations (plot-level; n = 4; 3 depths)	Quantitative Sampling (Litter); Powell et al., 2008; Pers. Communication: Carlos A. González, Univ. Florida, Gainseville
S2	Oak Ridge, TN	Biomass Inventory (plot-level, n = 4)	Hg concentrations (plot-level; n = 4)	Litter Mass (plot-level, n = 4)	Hg concentrations (plot-level, n = 4)	Carbon Mass (plot-level; n = 4; 4 depths)	Hg/C ratio (plot-level; n = 4; 4 depths)	Quantitative Sampling (Litter), Personal Communication: Dale W. Johson, Univ. of Nevada, Reno
S3	Ashland, MO	Biomass Inventory (site-level; n = 1)	Hg concentrations (plot-level; n = 4)	Litter Mass (site-level, n = 1)	Hg concentrations (plot-level, n = 4)	Carbon Mass (site-level, n = 1; 6 depths)	Hg/C ratio (plot-level; n = 4; 6 depths)	Quantitative Sampling (Litter); Personal Communication: Paul J. Hanson, Oak Ridge National Laboratory, Stephen G. Pallardy, Univ. of Missouri, Columbia
S4	Little Valley, NV	Biomass Inventory (plot-level, n = 4)	Hg concentrations (plot-level; n = 4)	Litter Mass (plot-level, n = 4)	Hg concentrations (plot-level, n = 4)	Soil Mass (plot-level, n = 4; 3 depths)	Hg concentrations (plot-level; n = 4; 3 depths)	Quantitative Sampling (Litter); Personal Communication: Dale W. Johson, Univ. of Nevada, Reno
S5	Little Valley, NV	Biomass Inventory (plot-level, n = 4)	Hg concentrations (plot-level; n = 4)	Litter Mass (plot-level, n = 4)	Hg concentrations (plot-level, n = 4)	Soil Mass (plot-level, n = 4, 3 depths)	Hg concentrations (plot-level; n = 4; 3 depths)	Quantitative Sampling (Litter); Personal Communication: Dale W. Johson, Univ. of Nevada, Reno
S6	Marysville, CA	Biomass Inventory (site-level; n = 1)	Hg concentrations (plot-level; n = 4)	Litter Mass (site-level, n = 1)	Hg concentrations (plot-level, n = 4)	Soil Mass (plot-level; n = 4; 3 depths)	Hg concentrations (plot-level; n = 4; 3 depths)	Quantitative Sampling (Soil); Personal Communication: Rebecca Wenk, Univ. of California, Berkeley
S7	Truckee, CA	Carbon Inventory (plot-level, n = 4)	Hg/C ratio (plot-level; n = 4)	Carbon Mass (plot-level, n = 4)	Hg/C ratio (plot-level, n = 4)	Soil Mass (plot-lvel; n = 4, 2 depths)	Hg concentrations (plot-level; n = 4; 2 depths)	Quantitative Sampling (Litter); Personal Communication: Dale W. Johson, Univ. of Nevada, Reno
S8	Truckee, CA	Carbon Inventory (plot-level, n = 4)	Hg/C ratio (plot-level; n = 4)	Carbon Mass (plot-level, n = 4)	Hg/C ratio (plot-level, n = 4)	Soil Mass (plot-lvel; n = 4, 2 depths)	Hg concentrations (plot-level; n = 4; 2 depths)	Quantitative Sampling (Litter); Personal Communication: Dale W. Johson, Univ. of Nevada, Reno
S9	Niwot Ridge, CO	Biomass Inventory (plot-level, n = 2)	Hg concentrations (plot-level; n = 4)	Litter Mass (plot-level, n = 2)	Hg concentrations (plot-level, n = 4)	Soil Mass (plot-level, n = 2, 4 depths`	Hg concentrations (plot-level, n = 4, 4 depths)	Personal Communication: Margaret R. Richards, Univ. of Colorado, Boulder
S10	Hart, MI	Carbon Inventory (site-level, n = 1)	Hg/C ratio (plot-level; n = 4)	Carbon Mass (site-level, n = 1)	Hg/C ratio (plot-level, n = 4)	Carbon Mass (site-level, n = 1; 4 depths)	Hg/C ratios (plot-level, n = 4, 4 depths)	Quantitative Sampling (Litter), Pregitzer et al., 2008; Peronal Communication: Kurt Pregitzer, Univ. of Idaho, Moscow
S11	Bartlett, NH	Biomass Inventory (plot-level, n = 4)	Hg concentrations (plot-level; n = 4)	Litter Mass (plot-level, n = 4)	Hg concentrations (plot-level, n = 4)	Carbon Mass (plot-level, n = 4, 2 depths)	Hg/C ratios (plot-level, n = 4, 3 depths)	Quantitative Sampling (Litter), Personal Communication: Andrew D. Richardson, Harvard Univ. Cmbridge, Scott V. Ollinger, Univ. New Hampshire, Durham
S12	Howland, ME	Biomass Inventory (site-level; n = 1)	Hg concentrations (plot-level; n = 4)	Litter Mass (site-level, n = 1)	Hg concentrations (plot-level, n = 4)	Soil Mass (site-level, n = 1, 5 depths)	Hg concentrations (plot-level, n = 4, 5 depths)	Quantitative Sampling (Litter); Dail et al., 2009; Personal Communication: Andrew D. Richardson, Harvard Univ. Cambridge
S13	Thompson Forest, WA	Carbon Inventory (site-level, n = 1)	Hg/C ratio (plot-level; n = 4)	Carbon Mass (site-level, n = 1)	Hg/C ratio (plot-level, n = 4)	Carbon Mass (site-level, n = 1, 3 depths	Hg/C ratios (plot-level, n = 4, 3 depths)	Cole et al., 1995
S14	Thompson Forest, WA	Carbon Inventory (site-level, n = 1)	Hg/C ratio (plot-level; n = 4)	Carbon Mass (site-level, n = 1)	Hg/C ratio (plot-level, n = 4)	Carbon Mass (site-level, n = 1, 3 depths	Hg/C ratios (plot-level, n = 4, 3 depths)	Cole et al., 1995

Supporting Figure Legends:

Figure S1. Map and pictures of 14 forest sites that were systematically sampled for this research project. Map is based on Google™ Earth map of the United States.



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