

SUPPLEMENTARY INFORMATION

Snow Amplification of Persistent Organic Pollutants at Coastal Antarctica

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Figure S5. HCB $\text{Ln } f_s/f_a$ ratios versus $\text{Log } K_{OA}$.

Figure S6. Diffusive snow-air fluxes of polychlorinated biphenyls (PCBs).

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Figure S8. Comparison of snow-air partition coefficients (K_{SA}) reported for POPs.

Text S1. Air-snow diffusive exchange flux.

The exchange velocity (m d⁻¹) was calculated following Hansen et al. (2006 and 2008)^{1,2}

$$v^{-1} = (v_{air})^{-1} + (v_{snow})^{-1}$$

The air side exchange velocity is calculated by:

$$v_{air} = k^2 U \left(\ln \left(\frac{Z_W}{Z_0} \right) \ln \left(\frac{Z_{ref}}{Z_0} \right) \right)^{-1}$$

where k is von Karman's constant (0.4), U is the wind speed, Z_W is the height of the wind (10 m), Z_{ref} is the reference height (2 m), and Z_0 is the surface roughness for snow (0.001 m). v_{snow} is given by the snow diffusion coefficient, D_{snow} , divided by the thickness of the layer of the snowpack exchanging chemicals with the atmosphere, here assumed to be the top 20 cm of the snowpack. D_{snow} is calculated as follows:

$$D_{snow} = D_{air} \left(1 - \frac{\rho_{snow}}{\rho_{ice}} \right)^{1.5}$$

where D_{air} is the diffusion coefficient of the organic molecule in air, calculated according to Schwarzenbach et al. (2005),³ ρ_{snow} is the sample snow density and ρ_{ice} is the ice density (0.917 g cm⁻³).

Text S2: Meta-analysis of snow-air partition coefficients (K_{SA}) and prediction of snow amplification of fugacities.

As equation [1] refers to melted snow - air fugacity gradients, it considers the chemicals in the dissolved phase only. Snow scavenges gas and aerosol phase POPs, but taking into account that aerosol concentrations are very small at Antarctica and most POPs are found mainly in the gas phase, we considered only the wash-out of gas phase compounds by snow, when possible (Table S13).

The snow-air partition coefficient (K_{SA}) is given by the concentration in snow over the concentration in the gas phase (C_S/C_{SA}). We reviewed the previous reports of simultaneous measurements of concentrations of POPs in snow and air, and a total of 7 publications were found.⁴⁻¹⁰ There is a significantly larger number of publications reporting POPs in snow, but they lack of concurrently measured atmospheric concentrations. Table S15 summarizes the data set contained in the 7 publications used in this work. This data was used to derive Figures S8 and Figure 6. We focused on K_{SA} as reported directly from chemical measurements, we did not consider estimates of the

wash-out ratios of gas phase POPs by models even if these were partly based on measurements. For the estimation of $K_{SAH'}$, we used the temperature corrected H' values (at 274K) as reported elsewhere.¹¹⁻¹⁴

Table S1. Average surface (at 0.2 to 5 m depth) CTD data from the Raquelia and Johnson sampling sites. PAR means photosynthetic active radiation.

Date	Sampling station	Temperature (°C)	Salinity (PSU)	PAR	Fluorescence (RFU)	Turbidity (NTU)	Seawater and Plankton samples	ΣNO _x	NH ₄ ⁺	PO ₄ ³⁻
15/12/2014	Raquelia	0.46	34.01	129.51	0.52	4.86	SW1-P1	29.129	1.342	2.029
16/12/2014	Johnson	0.82	33.68	161.21	0.33	5.97	SW2-P2	24.839	3.771	1.742
18/12/2014	Raquelia	0.70	33.81	207.84	0.68	5.50	SW3-P3	16.175	2.068	1.436
23/12/2014	Johnson	1.24	33.70	203.10	0.50	3.90	SW4-P4	23.465	3.940	1.783
24/12/2014	Raquelia	0.20	34.00	367.00	0.22	3.18	SW5-P5	24.018	4.681	1.646
26/12/2014	Johnson	1.24	33.70	203.10	0.50	3.90	SW6-P6	18.490	12.602	1.456
29/12/2014	Raquelia	0.48	33.99	295.60	0.41	3.59	SW7-P7	27.674	22.620	1.831
31/12/2014	Johnson	1.33	33.84	431.20	0.28	3.92	SW8-P8	23.997	22.401	1.768
02/01/2015	Johnson	1.52	33.77	294.90	0.25	2.65	SW9-P9	23.829	10.652	1.859
05/01/2015	Raquelia	1.34	33.55	259.30	0.59	4.87	SW10-P10	15.386	22.747	1.350
07/01/2015	Johnson	1.32	33.59	550.20	0.43	4.92	SW11-P11	17.270	22.483	1.639
09/01/2015	Raquelia	1.12	33.95	126.04	0.57	2.27	SW12-P12	15.464	22.512	1.346
12/01/2015	Raquelia	1.64	33.81	307.60	0.43	3.13	SW13-P13	21.490	7.954	1.613
14/01/2015	Johnson	1.97	33.36	154.07	1.21	3.68	SW14-P14	14.870	21.409	1.359
16/01/2015	Raquelia	1.26	33.91	68.30	1.91	3.02	SW15-P15	22.884	8.841	1.636
19/01/2015	Johnson	1.23	33.69	176.72	1.01	5.95	SW16-P16	19.506	22.954	1.716
21/01/2015	Raquelia	0.40	33.55	179.76	0.91	5.70	SW17-P17	25.825	22.636	1.813
23/01/2015	Johnson	1.15	33.34	49.63	1.57	6.65	SW18-P18	21.415	1.657	1.746
26/01/2015	Raquelia	1.55	33.55	81.98	1.12	5.79	SW19-P19	20.178	23.211	1.663
29/01/2015	Johnson	1.51	33.29	29.67	1.63	10.55	SW20-P20	14.157	21.756	1.755
02/02/2015	Raquelia	1.83	33.73	67.37	1.21	5.07	SW21-P21	12.001	22.768	1.715
05/02/2015	Johnson	1.71	33.19	67.40	1.04	12.38	SW22-P22	18.363	8.589	1.870
10/02/2015	Raquelia	1.66	33.58	46.30	1.62	7.24	SW23-P23	21.866	23.152	1.948
12/02/2015	Johnson	1.83	33.33	42.01	1.52	10.46	SW24-P24	12.973	22.832	2.193
16/02/2015	Raquelia	1.82	33.52	305.40	0.68	6.15	SW25-P25	23.917	22.861	1.958
19/02/2015	Johnson	1.91	33.39	137.83	0.92	8.23	SW26-P26	20.656	14.476	2.109

Table S2. Fugacity sampling ancillary data

Sampling Start	Sampling end	Samples	mean T.(°C)	min. T.(°C)	max. T.(°C)	Surface
03/12/14	09/12/14	F1-1	0.4	-3.7	7	Soil with vegetation
09/12/14	16/12/14	F1-2	0.4	-2.1	5	Soil with vegetation
16/12/14	22/12/14	F1-3	1.0	-1.1	5.1	Soil with vegetation
22/12/14	29/12/14	F1-4	0.9	-3.3	5.1	Soil with vegetation
29/12/14	05/01/15	F1-5	1.0	-1.3	6.7	Soil with vegetation
05/01/15	12/01/15	F1-6	0.8	-1.3	4.4	Soil with vegetation
12/01/15	19/01/15	F1-7	0.5	-3.8	3.4	Soil with vegetation
19/01/15	26/01/15	F1-8	2.0	-0.2	5.5	Soil with vegetation
26/01/15	02/02/15	F1-9	2.6	0.4	5.5	Soil with vegetation
02/02/15	09/02/15	F1-10	2.2	-0.8	6.9	Soil with vegetation
09/02/15	16/02/15	F1-11	2.1	-0.2	5.5	Soil with vegetation
02/12/14	09/12/14	F2-1	0.3	-3.7	7	Snow
09/12/14	16/12/14	F2-2	0.4	-2.1	5	Snow
16/12/14	23/12/14	F2-3	1.0	-1.1	5.1	Snow
23/12/14	30/12/14	F2-4	0.8	-3.3	4.4	Snow
30/12/14	06/01/15	F2-5	0.9	-1.3	6.7	Snow
06/01/15	13/01/15	F2-6	0.6	-1.5	3.9	Snow
13/01/15	20/01/15	F2-7	0.6	-3.8	3.4	Snow
20/01/15	27/01/15	F2-8	2.2	0.2	5.5	Bare soil
27/01/15	03/02/15	F2-9	2.5	0.4	5.2	Bare soil
03/02/15	10/02/15	F2-10	2.3	-0.8	6.9	Bare soil
10/02/15	17/02/15	F2-11	2.3	0.4	5.5	Bare soil
03/12/14	10/12/14	F3-1	0.4	-3.7	7	Snow
10/12/14	17/12/14	F3-2	0.5	-2.1	5	Snow
17/12/14	24/12/14	F3-3	0.8	-1.5	5.1	Snow
24/12/14	31/12/14	F3-4	0.8	-3.3	4.4	Snow
31/12/14	07/01/15	F3-5	0.7	-1.3	6.7	Snow
07/01/15	14/01/15	F3-6	0.7	-1.5	3.9	Snow
14/01/15	21/01/15	F3-7	0.7	-3.8	3.6	Bare soil
21/01/15	28/01/15	F3-8	2.3	0.3	5.5	Bare soil
28/01/15	04/02/15	F3-9	2.4	-0.8	5.2	Bare soil
04/02/15	11/02/15	F3-10	2.4	-0.8	6.9	Bare soil
11/02/15	18/02/15	F3-11	2.4	0.4	5.5	Bare soil
05/12/14	12/12/14	F4-1	0.8	-1.6	7	Snow
12/12/14	19/12/14	F4-2	0.7	-2.1	5	Snow
19/12/14	28/12/14	F4-3	0.7	-3.3	5.1	Snow
28/12/14	02/01/15	F4-4	0.7	-1	4.4	Snow
02/01/15	09/01/15	F4-5	0.6	-1.3	6.7	Snow
09/01/15	17/01/15	F4-6	0.7	-3.8	3.9	Snow
17/01/15	23/01/15	F4-7	1.3	-3.8	4.4	Snow
23/01/15	30/01/15	F4-8	2.6	0.3	5.5	Snow
30/01/15	06/02/15	F4-9	2.6	-0.8	6.9	Snow
06/02/15	13/02/15	F4-10	2.0	-0.2	5.5	Snow
05/12/14	12/12/14	F5-1	0.8	-1.6	7	Snow
12/12/14	19/12/14	F5-2	0.7	-2.1	5	Snow
19/12/14	28/12/14	F5-3	0.7	-3.3	5.1	Snow
28/12/14	02/01/15	F5-4	0.7	-1	4.4	Snow
02/01/15	09/01/15	F5-5	0.6	-1.3	6.7	Snow
09/01/15	17/01/15	F5-6	0.7	-3.8	3.9	Snow
17/01/15	23/01/15	F5-7	1.3	-3.8	4.4	Snow
23/01/15	30/01/15	F5-8	2.6	0.3	5.5	Snow
30/01/15	06/02/15	F5-9	2.6	-0.8	6.9	Snow
06/02/15	13/02/15	F5-10	2.0	-0.2	5.5	Snow

Table S3. Air, snow, seawater and plankton recoveries

Surrogate	PUFs	Snow	Seawater	Plankton
PCB65	110±44%	90±14%	57±23%	71±17%
PCB200	84±24%	96±16%	63±23%	94±5.6%

Table S4. Ambient air PCB and OCP concentrations (pg m⁻³)

pg m ⁻³	F1A1	F1A2	F1A3	F1A6	F1A7	F1A8	F1A9	F1A10	F1A11	F2A1	F2A2	F2A3	F2A4	F2A5	F2A7	F2A8	F2A9	F2A10	F2A11
ΣOCPs	13.52	14.49	4.93	10.95	13.55	18.97	14.12	11.12	12.36	2.38	11.80	10.03	10.37	11.33	12.01	14.34	10.44	15.57	11.91
HCB	13.52	14.49	4.93	10.95	13.55	17.04	14.12	11.12	12.36	2.38	11.80	10.03	10.37	11.33	12.01	14.34	10.44	14.10	11.91
ΣHCH					1.93												1.47		
α-HCH	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
β-HCH	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
γ-HCH	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	1.93	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	1.47	<LOQ
δ-HCH	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
ΣPCBs	33.39	46.87	50.01	15.67	7.73	44.85	48.19	35.97	23.96	37.84	75.97	69.89	63.00	44.56	3.67	42.33	13.30	47.25	80.32
PCB18	2.11	5.04	<LOQ	2.07	1.98	4.66	<LOQ	4.29	1.92	2.57	<LOQ	<LOQ	<LOQ	1.35	<LOQ	4.43	1.22	3.00	<LOQ
PCB17	0.51	0.67	1.57	0.42	0.25	1.32	0.33	<LOQ	<LOQ	1.64	0.31	1.21	<LOQ	<LOQ	<LOQ	2.00	<LOQ	0.68	<LOQ
PCB31+28	0.44	1.53	1.10	<LOQ	<LOQ	0.17	<LOQ	3.51	1.32	1.30	1.12	1.50	1.92	0.78	<LOQ	0.25	0.26	<LOQ	<LOQ
PCB52	6.53	9.53	3.49	<LOQ	1.87	<LOQ	<LOQ	<LOQ	<LOQ	13.54	22.82	24.54	8.89	22.86	<LOQ	17.65	<LOQ	<LOQ	49.41
PCB49	1.98	3.33	<LOQ	<LOQ	<LOQ	1.45	<LOQ	1.92	1.73	4.45	1.40	5.22	<LOQ	3.52	<LOQ	2.64	<LOQ	1.65	<LOQ
PCB44	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB74	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	5.88	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB70	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	2.94	13.82	3.52	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB95	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	2.51	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB99+101	0.78	<LOQ	<LOQ	0.36	<LOQ	3.10	0.77	<LOQ	<LOQ	1.71	7.25	<LOQ	0.61	0.49	<LOQ	1.30	<LOQ	1.76	1.85
PCB87	<LOQ	2.53	2.81	<LOQ	<LOQ	1.25	<LOQ	<LOQ	0.25	<LOQ	3.62	2.36	2.69	1.17	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB110	<LOQ	0.37	0.56	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.63	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB82	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB151	0.94	7.86	14.81	0.72	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.56	7.09	11.21	14.66	5.58	<LOQ	0.34	<LOQ	0.45	<LOQ
PCB149	8.69	5.66	2.35	3.05	3.22	13.63	27.43	18.96	15.58	2.76	3.11	1.49	1.80	0.93	1.22	2.95	3.44	23.73	19.27
PCB118	<LOQ	<LOQ	9.97	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB153	<LOQ	1.02	1.15	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	1.19	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	3.25	<LOQ	<LOQ

PCB132	6.97	4.67	<LOQ	8.64	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	2.76	3.34	3.30	7.37	<LOQ	2.19	6.50	3.44	2.43	9.27
PCB105	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.45	0.48	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	4.50	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB138	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	2.31	<LOQ	<LOQ	<LOQ	<LOQ	0.06	0.03	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB158	0.08	<LOQ	<LOQ	<LOQ	<LOQ	0.55	0.08	<LOQ	0.05	<LOQ	0.13	0.05	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.02	<LOQ
PCB187	3.06	<LOQ	1.42	<LOQ	<LOQ	6.08	11.27	4.57	1.94	<LOQ	1.05	0.96	6.38	4.29	<LOQ	2.65	1.02	7.36	<LOQ
PCB183	<LOQ	0.65	0.84	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	1.19	0.77	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB128	<LOQ	0.29	0.21	<LOQ	<LOQ	0.21	0.17	<LOQ	<LOQ	<LOQ	0.27	0.19	0.24	<LOQ	<LOQ	<LOQ	<LOQ	0.15	<LOQ
PCB177	<LOQ	1.32	2.36	0.27	0.20	2.72	0.12	<LOQ	<LOQ	0.93	2.54	3.49	0.44	0.24	<LOQ	0.18	0.06	0.29	<LOQ
PCB156	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.92	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.71	<LOQ
PCB171	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.08	<LOQ	<LOQ	<LOQ	<LOQ	0.17	<LOQ	<LOQ	<LOQ	0.05	<LOQ	<LOQ	0.11	<LOQ
PCB180	<LOQ	0.86	3.38	0.14	<LOQ	3.34	1.16	0.66	0.31	0.73	3.52	4.99	1.09	0.14	<LOQ	0.52	<LOQ	<LOQ	<LOQ
PCB191	<LOQ	0.91	1.73	<LOQ	<LOQ	0.99	<LOQ	<LOQ	<LOQ	<LOQ	0.78	2.06	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB169	1.30	0.65	<LOQ	<LOQ	0.22	0.96	6.13	2.06	0.81	<LOQ	1.40	3.78	3.42	3.20	0.21	0.71	0.61	4.44	0.52
PCB170	<LOQ	<LOQ	0.30	<LOQ	<LOQ	0.65	0.24	<LOQ	0.04	0.13	0.22	<LOQ	0.60	<LOQ	<LOQ	0.20	<LOQ	0.45	<LOQ
PCB201/199	<LOQ	<LOQ	1.98	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ

Table S4. Ambient air PCB and OCP concentrations (pg m⁻³) (continuation)

pg m ⁻³	F3A1	F3A2	F3A3	F3A4	F3A5	F3A6	F3A7	F3A8	F3A9	F3A10	F3A11	F4A1	F4A2	F4A3	F4A4	F4A5	F4A6	F4A7	F4A8	F4A9	F4A10
ΣOCPs	14.93	12.50	10.89	10.72	13.59	12.99	16.47	18.24	14.18	3.40	12.22	10.63	14.53	15.84	10.30	8.47	6.40	2.18	11.01	10.81	9.42
HCB	14.93	12.50	10.89	10.72	13.59	12.99	16.47	15.25	14.18	3.40	12.22	10.63	14.53	13.66	10.30	8.47	6.40	2.18	11.01	10.81	9.42
ΣHCH							2.99							2.18							
α-HCH	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
β-HCH	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
γ-HCH	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	2.99	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	2.18	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
δ-HCH	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
ΣPCBs	37.87	44.96	39.09	55.44	44.31	26.10	29.08	57.08	17.13	34.82	10.13	9.87	37.58	76.27	27.86	47.76	15.56	39.33	75.67	60.32	22.73
PCB18	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	9.35	<LOQ	<LOQ	2.32	0.99	<LOQ	7.95	<LOQ	<LOQ	1.60	4.27	<LOQ	<LOQ	<LOQ
PCB17	<LOQ	0.33	<LOQ	0.78	0.44	0.94	0.39	0.24	<LOQ	<LOQ	<LOQ	<LOQ	0.44	1.09	0.49	<LOQ	1.59	0.90	<LOQ	<LOQ	<LOQ
PCB31+28	0.51	0.18	0.24	<LOQ	1.07	<LOQ	0.33	0.85	<LOQ	<LOQ	<LOQ	0.17	0.56	1.03	0.69	1.68	<LOQ	1.72	0.19	1.08	<LOQ
PCB52	10.11	6.28	11.44	16.05	4.19	3.60	<LOQ	<LOQ	5.49	<LOQ	0.29	0.48	2.55	<LOQ	0.48	<LOQ	1.64	<LOQ	<LOQ	<LOQ	1.20
PCB49	<LOQ	2.13	<LOQ	5.18	<LOQ	<LOQ	<LOQ	3.21	0.98	<LOQ	<LOQ	1.75	<LOQ	2.81	2.47	<LOQ	1.19	<LOQ	<LOQ	<LOQ	1.77
PCB44	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	1.27	<LOQ
PCB74	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	7.93	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	11.36	4.35	3.03	<LOQ	<LOQ	<LOQ	12.26	<LOQ
PCB70	5.54	11.24	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	8.21	4.63	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB95	<LOQ	<LOQ	2.34	<LOQ	<LOQ	3.87	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	3.92	<LOQ
PCB99+101	0.48	0.91	<LOQ	<LOQ	0.49	<LOQ	2.20	1.48	1.17	<LOQ	<LOQ	<LOQ	<LOQ	0.90	1.23	1.85	1.40	0.99	4.30	3.12	2.26
PCB87	<LOQ	1.64	2.39	3.15	1.65	<LOQ	0.87	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	1.77	2.26	2.43	1.76	0.40	<LOQ	0.22	<LOQ	<LOQ
PCB110	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	1.48	<LOQ	<LOQ	0.52	0.48	0.43	<LOQ	<LOQ
PCB82	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB151	0.41	7.48	13.08	17.39	7.75	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.35	8.12	5.06	10.35	7.28	0.81	1.28	<LOQ	<LOQ	<LOQ
PCB149	4.27	5.09	4.46	3.43	6.80	3.15	3.91	9.87	7.65	21.72	7.43	1.48	2.27	3.72	2.33	1.52	3.13	7.95	57.45	29.13	13.34
PCB118	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	1.16	<LOQ	<LOQ
PCB153	<LOQ	3.26	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.99	<LOQ	<LOQ	<LOQ	<LOQ	2.68	1.73	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ

PCB132	1.44	4.94	4.90	6.03	5.32	13.42	<LOQ	2.60	<LOQ	2.17	<LOQ	4.12	9.02	<LOQ	<LOQ	1.41	1.99	11.32	<LOQ	5.49	2.85
PCB105	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.82	<LOQ	<LOQ	<LOQ	<LOQ	0.31	<LOQ	<LOQ
PCB138	0.16	<LOQ	0.02	<LOQ	0.56	<LOQ	2.79	0.74	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.85	<LOQ	<LOQ	<LOQ	0.05	0.62	0.49	<LOQ
PCB158	0.03	0.02	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.99	<LOQ	0.74	<LOQ	<LOQ	<LOQ	0.27	<LOQ	<LOQ	0.43	0.29	0.16	<LOQ	<LOQ
PCB187	<LOQ	0.98	<LOQ	<LOQ	0.99	<LOQ	1.08	4.57	1.36	3.20	<LOQ	<LOQ	<LOQ	0.75	<LOQ	<LOQ	<LOQ	1.74	3.01	2.79	1.08
PCB183	<LOQ	<LOQ	<LOQ	<LOQ	0.43	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	1.23	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB128	0.57	<LOQ	<LOQ	<LOQ	0.00	0.13	0.49	0.98	<LOQ	0.69	<LOQ	<LOQ	<LOQ	0.77	<LOQ	0.27	<LOQ	0.80	0.24	<LOQ	<LOQ
PCB177	5.41	0.08	<LOQ	0.58	5.41	0.41	6.65	3.35	<LOQ	0.54	0.09	0.33	0.20	2.32	1.23	10.85	0.49	1.70	2.37	<LOQ	<LOQ
PCB156	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	1.72	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	3.98	<LOQ	0.37	<LOQ	<LOQ	0.28	<LOQ	<LOQ
PCB171	0.46	0.04	<LOQ	<LOQ	0.22	<LOQ	0.43	0.08	<LOQ	0.34	<LOQ	0.06	0.56	4.92	0.12	0.52	<LOQ	<LOQ	0.35	<LOQ	<LOQ
PCB180	5.78	0.04	<LOQ	1.43	5.91	0.58	7.23	5.06	<LOQ	0.54	<LOQ	0.15	0.77	0.93	1.24	12.13	0.38	3.88	2.67	<LOQ	<LOQ
PCB191	1.05	<LOQ	<LOQ	<LOQ	1.41	<LOQ	1.49	1.26	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.73	<LOQ	2.54	<LOQ	1.19	<LOQ	<LOQ	<LOQ
PCB169	1.42	0.32	0.21	1.02	1.33	<LOQ	1.10	0.97	0.48	3.79	<LOQ	<LOQ	<LOQ	1.40	0.34	1.90	<LOQ	0.78	1.91	0.76	0.22
PCB170	0.21	<LOQ	<LOQ	0.42	0.34	<LOQ	0.13	0.84	<LOQ	1.08	<LOQ	<LOQ	0.42	4.29	0.12	0.65	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB201/199	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	8.98	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ

Table S4. Ambient air PCB and OCP concentrations (pg m⁻³) (continuation)

pg m ⁻³	F5A1	F5A2	F5A3	F5A4	F5A5	F5A6	F5A7	F5A8	F5A9	F5A10
ΣOCPs	39.64	11.10	17.37	9.58	9.00	12.68	10.76	17.95	7.67	9.76
HCB	17.15	11.10	17.37	9.58	9.00	12.68	10.76	15.71	7.67	7.29
ΣHCH	22.49							2.24		2.46
α-HCH	1.73	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	2.24	<LOQ	<LOQ
β-HCH	11.72	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
γ-HCH	5.18	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
δ-HCH	3.85	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	2.46
ΣPCBs	129.52	66.52	36.89	72.07	23.69	7.69	36.36	39.44	23.86	19.45
PCB18	10.51	2.20	1.81	<LOQ	<LOQ	2.17	<LOQ	<LOQ	1.24	1.29
PCB17	14.08	<LOQ	0.16	<LOQ	0.90	0.61	0.50	0.90	<LOQ	<LOQ
PCB31+28	4.77	0.51	0.12	1.96	0.65	<LOQ	0.75	<LOQ	0.56	<LOQ
PCB52	9.52	8.33	2.68	4.82	0.77	0.22	<LOQ	<LOQ	1.52	<LOQ
PCB49	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	1.86	<LOQ	<LOQ
PCB44	44.09	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB74	<LOQ	<LOQ	<LOQ	5.74	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB70	16.18	9.68	9.97	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB95	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB99+101	5.08	<LOQ	<LOQ	0.91	<LOQ	0.48	2.48	<LOQ	<LOQ	2.08
PCB87	2.02	3.18	2.40	3.06	1.64	<LOQ	0.79	<LOQ	<LOQ	<LOQ
PCB110	0.43	<LOQ	<LOQ	<LOQ	0.75	<LOQ	<LOQ	<LOQ	<LOQ	0.69
PCB82	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB151	1.25	15.64	12.94	17.13	7.46	0.29	<LOQ	0.43	<LOQ	<LOQ
PCB149	3.91	2.14	2.72	2.44	0.96	1.44	6.07	15.80	9.11	5.34

PCB118	1.15	<LOQ	<LOQ	<LOQ	2.01	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB153	<LOQ	<LOQ	1.87	1.75	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB132	2.32	1.76	<LOQ	<LOQ	<LOQ	1.96	<LOQ	5.63	2.26	1.58
PCB105	0.55	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB138	0.16	0.02	<LOQ	0.01	<LOQ	<LOQ	0.07	0.21	0.77	4.01
PCB158	0.56	0.02	<LOQ	0.03	<LOQ	<LOQ	0.02	<LOQ	<LOQ	<LOQ
PCB187	1.44	<LOQ	0.92	<LOQ	<LOQ	<LOQ	2.74	9.08	6.05	2.91
PCB183	0.93	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB128	0.66	0.55	<LOQ	0.51	<LOQ	<LOQ	0.70	<LOQ	<LOQ	<LOQ
PCB177	2.88	6.84	<LOQ	10.43	2.51	0.13	9.61	0.43	<LOQ	<LOQ
PCB156	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB171	0.18	0.39	0.30	0.52	<LOQ	<LOQ	0.51	<LOQ	<LOQ	<LOQ
PCB180	3.13	8.41	<LOQ	12.40	3.86	0.20	10.33	1.36	0.24	<LOQ
PCB191	<LOQ	1.51	<LOQ	2.82	1.65	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB169	3.00	3.76	1.00	3.82	<LOQ	0.18	1.33	3.14	2.10	1.55
PCB170	0.72	0.16	<LOQ	1.19	0.54	<LOQ	0.46	0.59	<LOQ	<LOQ
PCB201/199	<LOQ	1.41	<LOQ	2.53	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ

Table S5. Air equilibrated in-situ with soil/snow PCB and OCP concentrations (pg m⁻³)

pg m ⁻³	F1S1	F1S2	F1S3	F1S4	F1S5	F1S6	F1S7	F1S8	F1S9	F1S10	F1S11	F2S1	F2S3	F2S4	F2S5	F2S6	F2S7	F2S8	F2S9	F2S11
ΣOCPs	90.18	171.02	145.93	43.89	64.58	104.75	59.42	136.15	109.03	37.64	83.93	7.21	6.89	10.22	7.99	13.66	13.89	13.82	13.38	3.54
HCB	72.40	128.46	81.01	38.29	52.90	86.57	49.36	105.65	70.53	37.64	63.68	7.21	6.89	10.22	7.99	13.66	13.89	13.82	13.38	0.44
ΣHCH	8.89	21.28	32.46	2.80	5.84	9.09	5.03	15.25	19.25		10.12									1.55
α-HCH	8.89	15.79	11.10	2.80	5.84	9.09	5.03	9.46	6.72	<LOQ	4.86	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
β-HCH	<LOQ	5.49	6.41	<LOQ	<LOQ	<LOQ	<LOQ	5.79	12.53	<LOQ	5.26	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
γ-HCH	<LOQ	<LOQ	2.20	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	1.55
δ-HCH	<LOQ	<LOQ	12.75	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
ΣPCBs	47.24	108.98	139.29	117.60	100.93	111.63	57.05	73.67	48.74	21.85	43.31	25.47	234.50	48.22	57.49	49.53	48.98	45.79	30.17	25.29
PCB18	5.35	10.78	12.59	1.86	7.00	12.12	4.15	8.66	8.38	2.99	7.71	4.38	9.52	4.19	9.75	9.20	7.69	6.89	9.31	2.77
PCB17	1.22	2.06	4.73	1.18	1.62	1.27	1.19	2.74	1.95	1.08	1.26	0.85	2.14	2.40	3.98	2.08	2.64	2.36	2.24	<LOQ
PCB31+28	7.52	10.23	9.63	5.27	10.56	12.50	7.04	10.53	6.89	1.93	5.32	4.26	16.97	7.10	10.51	10.54	9.79	10.55	7.68	1.00
PCB52	9.81	8.40	8.04	16.45	12.47	15.03	15.43	17.06	9.84	2.49	2.88	5.05	4.44	8.41	5.35	6.13	6.70	13.84	<LOQ	3.15
PCB49	<LOQ	<LOQ	36.06	1.73	33.43	49.30	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.90	1.57	1.74	2.55	3.00	1.67	1.54	1.63	1.11
PCB44	4.02	7.50	9.17	3.98	6.28	6.44	5.66	9.86	4.07	<LOQ	5.32	<LOQ	<LOQ	<LOQ	1.60	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB74	<LOQ	<LOQ	5.02	<LOQ	3.56	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	4.56	<LOQ	<LOQ	3.76	<LOQ	<LOQ	<LOQ	<LOQ
PCB70	<LOQ	<LOQ	8.40	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	2.97	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB95	<LOQ	<LOQ	3.42	17.43	2.86	2.55	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	7.71	<LOQ	<LOQ	4.54	<LOQ	<LOQ	<LOQ	<LOQ
PCB99+101	3.25	6.08	6.75	2.13	2.06	2.85	2.81	2.01	1.48	0.69	0.96	1.14	11.34	1.55	<LOQ	1.40	2.38	1.89	2.20	0.77
PCB87	<LOQ	3.74	5.38	5.21	2.19	<LOQ	0.72	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	4.17	2.25	7.77	0.77	0.86	0.31	<LOQ	<LOQ
PCB110	<LOQ	0.43	0.68	<LOQ	<LOQ	<LOQ	0.42	0.24	0.35	<LOQ	<LOQ	0.40	<LOQ	0.24	<LOQ	<LOQ	0.31	0.33	0.30	<LOQ
PCB82	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	2.47	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB151	0.56	9.05	11.71	19.73	8.69	<LOQ	0.34	<LOQ	<LOQ	<LOQ	<LOQ	0.26	14.38	11.01	7.87	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB149	5.78	10.10	6.72	4.01	4.30	4.84	5.64	7.79	8.07	5.92	7.91	1.58	<LOQ	1.40	1.40	1.75	1.22	2.95	3.03	9.80
PCB118	1.15	<LOQ	2.29	1.71	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	5.39	<LOQ	0.82	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB153	1.22	2.03	2.27	<LOQ	<LOQ	<LOQ	<LOQ	0.98	<LOQ	<LOQ	<LOQ	<LOQ	3.07	1.60	1.40	<LOQ	0.71	<LOQ	<LOQ	<LOQ

PCB132	1.77	1.52	1.87	<LOQ	4.90	2.25	<LOQ	4.08	<LOQ	<LOQ	9.03	3.50	1.21	4.24	<LOQ	4.09	<LOQ	1.45	<LOQ	<LOQ
PCB105	<LOQ	0.48	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB138	0.62	0.07	0.52	<LOQ	<LOQ	0.11	0.45	1.89	0.13	0.09	0.07	0.16	<LOQ	0.40	<LOQ	0.28	0.23	1.65	0.11	1.33
PCB158	<LOQ	<LOQ	0.10	<LOQ	<LOQ	<LOQ	0.42	<LOQ	0.02	<LOQ	0.01	0.01	5.25	0.20	0.57	<LOQ	0.24	<LOQ	<LOQ	<LOQ
PCB187	1.25	1.94	<LOQ	2.76	0.93	1.58	1.09	5.29	4.38	3.59	1.26	<LOQ	3.82	0.77	<LOQ	1.10	0.90	1.06	2.27	1.88
PCB183	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.45	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	2.75	<LOQ	2.33	0.51	<LOQ	<LOQ	<LOQ	0.89
PCB128	0.34	0.73	0.06	1.16	<LOQ	<LOQ	0.03	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	2.14	<LOQ	0.78	<LOQ	0.69	<LOQ	0.04	<LOQ
PCB177	1.16	11.92	1.52	12.84	<LOQ	<LOQ	5.22	0.32	<LOQ	<LOQ	0.30	<LOQ	43.57	<LOQ	0.56	<LOQ	5.52	<LOQ	<LOQ	0.22
PCB156	<LOQ	0.45	<LOQ	1.26	<LOQ	<LOQ	0.29	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	1.66	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB171	0.08	0.61	0.06	1.94	<LOQ	<LOQ	0.26	0.13	0.19	0.11	0.16	0.03	5.44	<LOQ	<LOQ	<LOQ	0.28	0.11	0.13	0.33
PCB180	1.70	13.57	1.74	12.78	0.08	0.07	5.90	1.16	0.24	<LOQ	0.12	<LOQ	50.74	0.42	0.25	0.37	6.01	0.25	0.45	0.44
PCB191	<LOQ	2.82	<LOQ	2.55	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	9.77	<LOQ	<LOQ	<LOQ	0.84	<LOQ	<LOQ	<LOQ
PCB169	0.33	3.76	0.45	<LOQ	<LOQ	0.27	<LOQ	<LOQ	2.53	2.53	0.86	<LOQ	10.86	0.30	<LOQ	<LOQ	0.17	0.33	0.62	1.33
PCB170	0.10	0.72	0.12	1.62	<LOQ	<LOQ	<LOQ	0.94	0.24	0.44	0.15	<LOQ	3.81	<LOQ	<LOQ	<LOQ	0.12	0.27	0.15	0.28
PCB201/199	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	5.73	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ

Table S5. Air equilibrated in-situ with soil/snow PCB and OCP concentrations (pg m⁻³) (continuation)

pg m ⁻³	F3S1	F3S2	F3S3	F3S4	F3S5	F3S6	F3S7	F3S8	F3S9	F3S10	F3S11	F4S1	F4S2	F4S3	F4S4	F4S5	F4S6	F4S7	F4S8	F4S9
ΣOCPs	15.78	13.67	3.49	11.91	5.28	1.72	5.00	16.65	12.57	12.33	14.04	9.50	10.17	2.01	9.77	6.70	6.49	12.16	10.66	18.12
HCB	10.50	13.67	3.49	11.91	5.28	1.72	5.00	16.65	12.57	12.33	14.04	9.50	10.17	2.01	9.77	6.70	6.49	9.38	10.66	8.19
ΣHCH	2.64	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	1.39	<LOQ	4.96
α-HCH	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
β-HCH	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	4.96
γ-HCH	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	1.39	<LOQ	<LOQ
δ-HCH	2.64	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
ΣPCBs	20.01	38.18	56.82	53.83	17.84	65.87	18.52	22.91	29.57	45.54	31.66	32.50	34.53	57.41	112.37	58.04	15.21	46.85	55.16	43.40
PCB18	<LOQ	2.37	3.15	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	2.17	<LOQ	2.47	1.50	3.46	2.05	<LOQ	<LOQ	1.10	3.39	<LOQ	1.51
PCB17	<LOQ	<LOQ	2.58	<LOQ	<LOQ	5.55	<LOQ	<LOQ	0.36	<LOQ	<LOQ	<LOQ	1.03	1.45	<LOQ	0.47	<LOQ	<LOQ	<LOQ	<LOQ
PCB31+28	0.14	0.48	4.39	0.13	0.27	1.15	0.28	<LOQ	<LOQ	0.01	<LOQ	<LOQ	1.20	1.45	1.77	0.54	1.24	0.33	0.23	<LOQ
PCB52	3.40	6.08	1.03	4.46	1.08	4.24	<LOQ	<LOQ	1.96	1.67	<LOQ	13.40	11.97	<LOQ	50.53	40.31	<LOQ	<LOQ	<LOQ	<LOQ
PCB49	<LOQ	2.11	3.56	<LOQ	1.16	1.06	<LOQ	<LOQ	1.89	<LOQ	<LOQ	1.57	<LOQ	<LOQ	0.90	<LOQ	<LOQ	<LOQ	0.93	<LOQ
PCB44	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	2.56	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	10.01	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB74	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	6.02	2.86	<LOQ	2.76	4.83	<LOQ	<LOQ
PCB70	4.72	<LOQ	<LOQ	<LOQ	<LOQ	5.18	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB95	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB99+101	<LOQ	1.30	3.77	2.39	0.84	<LOQ	1.15	<LOQ	<LOQ	1.96	<LOQ	0.48	1.05	<LOQ	1.58	<LOQ	0.44	1.60	2.75	1.28
PCB87	<LOQ	2.04	4.87	3.73	0.99	0.25	<LOQ	<LOQ	<LOQ	0.89	<LOQ	<LOQ	1.90	2.38	2.50	1.19	<LOQ	0.92	<LOQ	<LOQ
PCB110	<LOQ	<LOQ	1.06	<LOQ	0.63	1.50	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.26	0.34	0.33	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB82	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB151	<LOQ	6.65	10.53	13.39	4.27	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.31	5.55	10.30	10.56	6.05	<LOQ	0.71	0.61	<LOQ
PCB149	4.20	6.73	7.47	6.02	3.67	9.77	4.22	12.10	19.17	34.63	27.30	6.00	2.93	2.27	3.84	3.68	3.16	14.34	39.26	34.64
PCB118	<LOQ	<LOQ	<LOQ	1.18	1.60	1.84	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	1.34	2.57	<LOQ	<LOQ	<LOQ
PCB153	<LOQ	3.88	1.22	2.00	1.03	6.96	<LOQ	0.93	<LOQ	<LOQ	<LOQ	0.93	1.15	2.17	0.98	1.60	<LOQ	<LOQ	<LOQ	<LOQ

PCB132	3.02	4.79	4.05	<LOQ	<LOQ	6.21	<LOQ	4.97	<LOQ	<LOQ	<LOQ	6.42	1.88	<LOQ	<LOQ	2.60	1.47	<LOQ	5.59	1.62
PCB105	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB138	0.11	0.20	<LOQ	0.20	0.11	0.81	<LOQ	0.40	0.14	0.55	0.07	0.31	0.25	0.73	<LOQ	0.11	0.17	1.76	0.16	<LOQ
PCB158	0.05	<LOQ	1.20	<LOQ	<LOQ	0.62	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.17	<LOQ	<LOQ
PCB187	<LOQ	1.07	<LOQ	1.38	0.94	<LOQ	1.82	2.55	2.22	3.10	0.86	<LOQ	0.84	0.87	<LOQ	<LOQ	1.01	1.69	3.45	2.47
PCB183	<LOQ	<LOQ	3.98	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	2.03	<LOQ	<LOQ	0.93	<LOQ	<LOQ	<LOQ
PCB128	0.32	<LOQ	0.34	0.15	0.28	<LOQ	0.25	<LOQ	<LOQ	<LOQ	<LOQ	0.30	0.07	<LOQ	0.57	<LOQ	0.03	0.43	<LOQ	0.29
PCB177	1.61	0.29	1.17	6.69	0.33	<LOQ	4.38	<LOQ	<LOQ	<LOQ	<LOQ	0.31	0.43	2.43	11.88	<LOQ	<LOQ	4.24	0.03	0.06
PCB156	<LOQ	<LOQ	0.42	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	1.06	<LOQ	<LOQ	<LOQ	0.31	<LOQ	0.42
PCB171	<LOQ	<LOQ	0.90	0.32	<LOQ	0.50	0.34	0.10	0.09	<LOQ	0.14	0.17	<LOQ	<LOQ	0.57	<LOQ	<LOQ	0.21	0.19	<LOQ
PCB180	2.26	0.06	1.13	7.67	0.64	11.51	4.14	0.49	0.44	<LOQ	0.31	0.54	0.47	4.19	13.41	0.16	<LOQ	5.39	0.42	0.16
PCB191	<LOQ	<LOQ	<LOQ	1.73	<LOQ	<LOQ	0.89	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	3.96	2.42	<LOQ	<LOQ	1.09	<LOQ	<LOQ
PCB169	<LOQ	0.12	<LOQ	1.87	<LOQ	<LOQ	0.90	0.93	1.04	2.44	0.38	<LOQ	<LOQ	<LOQ	5.56	<LOQ	0.34	4.81	1.44	0.91
PCB170	0.19	<LOQ	<LOQ	0.51	<LOQ	6.15	0.15	0.44	0.08	0.28	0.13	<LOQ	<LOQ	0.69	1.29	<LOQ	<LOQ	0.63	0.11	0.05
PCB201/199	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	3.00	1.16	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ

Table S5. Air equilibrated in-situ with soil/snow PCB and OCP concentrations (pg m⁻³) (continuation)

pg m ⁻³	F5S1	F5S2	F5S3	F5S4	F5S5	F5S6	F5S7	F5S8	F5S9	F5S10
ΣOCPs	9.66	8.52	11.07	11.13	17.64	9.15	8.71	22.70	6.40	10.76
HCB	9.66	8.52	11.07	11.13	11.16	9.15	8.71	18.67	6.40	10.76
ΣHCH	<LOQ	<LOQ	<LOQ	<LOQ	3.24	<LOQ	<LOQ	2.01	<LOQ	<LOQ
α-HCH	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	2.01	<LOQ	<LOQ
β-HCH	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
γ-HCH	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
δ-HCH	<LOQ	<LOQ	<LOQ	<LOQ	3.24	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
ΣPCBs	49.36	31.38	44.14	66.01	45.43	9.96	42.05	73.42	27.29	14.04
PCB18	1.24	1.35	<LOQ	<LOQ	1.26	3.24	<LOQ	<LOQ	<LOQ	1.91
PCB17	<LOQ	0.45	0.19	0.32	2.76	0.41	0.17	0.75	<LOQ	<LOQ
PCB31+28	0.53	1.16	0.93	1.06	3.50	1.19	0.76	1.89	0.58	0.23
PCB52	9.95	11.02	12.31	15.04	<LOQ	<LOQ	25.20	58.98	<LOQ	<LOQ
PCB49	2.08	2.09	<LOQ	3.14	2.16	1.75	1.37	1.45	1.01	<LOQ
PCB44	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	1.81	<LOQ	<LOQ
PCB74	<LOQ	<LOQ	<LOQ	4.35	<LOQ	<LOQ	<LOQ	4.88	<LOQ	<LOQ
PCB70	20.36	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB95	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	3.67	<LOQ	<LOQ
PCB99+101	0.83	0.57	2.69	1.87	3.27	0.68	1.92	<LOQ	1.60	1.26
PCB87	1.81	1.67	3.60	2.65	2.56	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB110	<LOQ	<LOQ	0.28	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB82	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB151	8.35	8.18	14.87	8.77	11.41	<LOQ	0.69	<LOQ	<LOQ	<LOQ
PCB149	<LOQ	<LOQ	1.34	<LOQ	0.97	0.80	3.37	<LOQ	14.76	3.51
PCB118	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	1.11	<LOQ	<LOQ	<LOQ	<LOQ
PCB153	<LOQ	<LOQ	<LOQ	<LOQ	1.14	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ

PCB132	3.97	3.12	<LOQ	<LOQ	4.86	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB105	<LOQ	<LOQ	0.42	<LOQ	0.54	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB138	0.05	0.06	0.06	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	2.58	0.41
PCB158	<LOQ	0.05	0.10	<LOQ	<LOQ	<LOQ	0.08	<LOQ	<LOQ	<LOQ
PCB187	<LOQ	0.84	1.31	0.87	1.03	<LOQ	3.90	<LOQ	4.09	3.66
PCB183	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.50	<LOQ	<LOQ	<LOQ	<LOQ
PCB128	<LOQ	<LOQ	0.12	0.30	0.53	<LOQ	0.10	<LOQ	<LOQ	0.05
PCB177	<LOQ	0.29	2.28	8.64	0.54	0.03	1.28	<LOQ	<LOQ	0.12
PCB156	<LOQ	<LOQ	<LOQ	<LOQ	2.43	<LOQ	<LOQ	<LOQ	0.40	<LOQ
PCB171	<LOQ	<LOQ	0.22	0.42	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB180	<LOQ	0.20	2.16	9.95	0.96	0.24	1.58	<LOQ	<LOQ	0.12
PCB191	<LOQ	<LOQ	<LOQ	2.30	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB169	0.17	0.33	0.90	3.55	0.63	<LOQ	1.62	<LOQ	2.10	2.46
PCB170	<LOQ	<LOQ	0.37	1.21	2.04	<LOQ	<LOQ	<LOQ	0.16	0.31
PCB201/199	<LOQ	<LOQ	<LOQ	1.56	2.84	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ

Table S6. PCB and OCP $\ln f_s/f_a$ ratios.

$\ln f_s/f_a$	F1-1	F1-2	F1-4	F1-6	F1-7	F1-8	F1-9	F1-10	F1-11	F2-1	F2-3	F2-4	F2-5	F2-7	F2-8	F2-9	F2-11
HCB	1.68	2.18	2.05	2.07	1.29	1.82	1.61	1.22	1.64	1.11	-0.38	-0.01	-0.35	0.14	-0.04	0.25	-3.29
PCB18	0.93	0.76		1.77	0.74	0.62		-0.36	1.39	0.53			1.98		0.44	2.03	
PCB17	0.88	1.13	-0.29	1.10	1.58	0.73	1.77			-0.66	0.57				0.16		
PCB31+28	2.84	1.90	1.57			4.13		-0.60	1.40	1.18	2.42	1.31	2.60		3.73	3.39	
PCB52	0.41	-0.13	1.55		2.11					-0.99	-1.71	-0.06	-1.45		-0.24		-2.75
PCB49										-1.60	-1.20		-0.32		-0.54		
PCB74																	
PCB70										0.01							
PCB99+101	1.43			2.07		-0.43	0.65			-0.41		0.93			0.37		-0.87
PCB87		0.39	0.62								0.57	-0.18	1.89				
PCB110		0.17								-0.46							
PCB151	-0.52	0.14	0.29							-0.77	0.25	-0.29	0.34				
PCB149	-0.41	0.58	0.54	0.46	0.56	-0.56	-1.22	-1.16	-0.68	-0.56		-0.25	0.41	0.00	0.00	-0.13	-0.68
PCB118			-1.76														
PCB153		0.69															
PCB132	-1.37	-1.12		-1.35						0.24	-1.01	-0.55			-1.50		
PCB138						-0.20											
PCB158							-1.66		-1.26								
PCB187	-0.90		0.66			-0.14	-0.94	-0.24	-0.44		1.38	-2.11			-0.92	0.80	
PCB183																	
PCB128		0.94	1.71								2.44						
PCB177		2.20	1.69		3.28	-2.14					2.53		0.87				
PCB156																	
PCB171						0.46								1.78			
PCB180		2.76	1.33	-0.74		-1.05	-1.60		-0.97		2.32	-0.97	0.54		-0.73		

PCB191	1.13	0.39					1.56					
PCB169	-1.38	1.75		-0.89	0.20	0.06	1.06	-2.45	-0.18	-0.76	0.02	0.93
PCB170		1.70	0.37	0.00		1.33				0.30		
PCB201/199												

Table S6. PCB and OCP $\ln f_s/f_a$ ratios (continuation).

$\ln f_s/f_a$	F3-1	F3-2	F3-3	F3-4	F3-5	F3-6	F3-7	F3-8	F3-9	F3-10	F3-11	F4-1	F4-2	F4-3	F4-4	F4-5	F4-6	F4-7	F4-8	F4-9
HCB	1.11	0.09	-1.14	0.11	-0.94	-2.02	-1.19	0.09	-0.12	1.29	0.14	-0.11	-0.36	-1.92	-0.05	-0.23	0.01	1.46	-0.03	-0.28
PCB18	0.53										0.06	0.41		-1.36			-0.38	-0.23		
PCB17	-0.66					1.78							0.85	0.29						
PCB31+28	1.18	0.98	2.89		-1.38		-0.18						0.76	0.34	0.94	-1.13		-1.65	0.17	
PCB52	-0.99	-0.03	-2.41	-1.28	-1.36	0.16			-1.03			3.34	1.55		4.67					
PCB49	-1.60	-0.01							0.66			-0.11			-1.01					
PCB74														-0.64	-0.42					
PCB70	0.01																			
PCB99+101	-0.41	0.36			0.54		-0.65								0.25		-1.16	0.48	-0.45	-0.89
PCB87		0.22	0.71	0.17	-0.51								0.07	0.05	0.03	-0.39				
PCB110	-0.46													-1.49						
PCB151	-0.77	-0.12	-0.22	-0.26	-0.60							-0.11	-0.38	0.71	0.02	-0.18		-0.59		
PCB149	-0.56	0.28	0.52	0.56	-0.62	1.13	0.08	0.20	0.92	0.47	1.30	1.40	0.25	-0.49	0.50	0.88	0.01	0.59	-0.38	0.17
PCB118																				
PCB153		0.17						-0.06					-0.84	0.22						
PCB132	0.24	-0.03	-0.19			-0.77		0.65				0.44	-1.57			0.61	-0.30			-1.22
PCB138					-1.65			-0.61						-0.15				3.59	-1.36	
PCB158																		-0.51		
PCB187		0.09			-0.05		0.52	-0.58	0.49	-0.03				0.15				-0.03	0.14	-0.12
PCB183														0.50						
PCB128							-0.66											-0.61		
PCB177		1.23		2.44	-2.79		-0.42					-0.05	0.75	0.05	2.27			0.92	-4.32	
PCB156														-1.32						
PCB171							-0.24	0.19				1.05							-0.60	
PCB180		0.28		1.68	-2.23	2.99	-0.56	-2.33				1.30	-0.49	1.50	2.38	-4.30		0.33	-1.85	

PCB191			-0.51				1.69	-0.08		
PCB169	-0.95	0.61	-0.20	-0.04	0.77	-0.44	2.81	1.83	-0.28	0.19
PCB170		0.20	0.16	-0.64		-1.35	-1.82			
PCB201/199							-1.10			

Table S6. PCB and OCP $\ln f_s/f_a$ ratios (continuation)

$\ln f_s/f_a$	F5-1	F5-2	F5-3	F5-4	F5-5	F5-6	F5-7	F5-8	F5-9	F5-10
HCB	-0.57	-0.26	-0.45	0.15	0.22	-0.33	-0.21	0.17	-0.18	0.39
PCB18	-2.13	-0.49				0.40				0.39
PCB17			0.21		1.12	-0.38	-1.05	-0.19		
PCB31+28	-2.20	0.82	2.01	-0.62	1.68		0.01		0.03	
PCB52	0.04	0.28	1.52	1.14						
PCB49								-0.25		
PCB74				-0.28						
PCB70	0.23									
PCB99+101	-1.81			0.73		0.36	-0.25			-0.50
PCB87	-0.11	-0.64	0.40	-0.15	0.45					
PCB110										
PCB151	1.90	-0.65	0.14	-0.67	0.43					
PCB149			-0.70		0.01	-0.59	-0.59		0.48	-0.42
PCB118										
PCB153										
PCB132	0.54	0.57								
PCB138	-1.06	1.09							1.21	-2.28
PCB158		0.86					1.55			
PCB187			0.35				0.36		-0.39	0.23
PCB183										
PCB128				-0.55			-1.91			
PCB177		-3.16		-0.19	-1.53	-1.37				
PCB156										
PCB171			-0.31	-0.22			-1.85			
PCB180		-3.75		-0.22	-1.40	0.15	-1.88			

PCB191				-0.20				
PCB169	-2.85	-2.45	-0.11	-0.07	0.20	0.00	0.46	
PCB170				0.02	1.33			
PCB201/199				-0.48				

Table S7. PCB and OCP surface snow concentrations (pg L⁻¹).

pg L ⁻¹	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
ΣOCPs	8.36	32.26	6.60	25.66	44.32	25.2	29.4	36.75	21.33	36.29
HCB	6.26	8.59	4.96	11.94	15.49	5.50	8.87	11.00	5.74	5.32
ΣHCH	2.10	23.67	1.64	13.72	28.83	19.70	20.53	25.75	15.60	30.97
α-HCH	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	1.10
β-HCH	2.10	19.05	<LOQ	9.36	<LOQ	13.95	17.99	25.75	15.60	23.58
γ-HCH	<LOQ	4.62	1.64	4.36	20.26	3.20	2.53	<LOQ	<LOQ	2.61
δ-HCH	<LOQ	<LOQ	<LOQ	<LOQ	8.57	2.55	<LOQ	<LOQ	<LOQ	3.68
ΣPCBs	168.58	158.68	91.97	245.78	417.30	101.50	228.48	235.50	78.30	146.42
PCB18	<LOQ	3.59	<LOQ	5.54	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB17	1.21	4.48	0.34	3.55	10.38	4.70	4.00	25.63	3.60	6.35
PCB31+28	6.84	8.54	3.62	6.51	<LOQ	1.05	10.95	3.63	3.88	9.87
PCB33	3.04	4.15	1.22	2.64	<LOQ	<LOQ	5.32	<LOQ	<LOQ	2.88
PCB52	23.37	25.68	27.33	45.94	140.20	18.80	31.88	54.50	13.45	16.35
PCB49	2.99	4.06	<LOQ	4.68	25.21	11.40	5.98	8.88	<LOQ	13.58
PCB44	5.05	9.48	3.07	9.74	42.50	10.50	11.81	30.88	9.33	37.42
PCB74	2.41	2.33	<LOQ	4.30	16.31	3.10	4.46	<LOQ	1.66	<LOQ
PCB70	8.09	8.82	3.45	15.55	11.53	4.50	14.19	9.63	3.11	2.41
PCB95	14.17	11.67	6.01	20.60	13.84	5.65	17.59	10.25	4.36	10.50
PCB99+101	34.50	33.94	15.43	49.76	67.55	20.35	51.80	41.13	14.22	17.66
PCB87	4.47	5.56	<LOQ	7.69	<LOQ	<LOQ	8.41	<LOQ	<LOQ	3.31
PCB110	6.44	5.37	2.35	9.68	8.07	2.80	8.36	4.25	2.75	2.34
PCB82	2.95	<LOQ	<LOQ	5.16	<LOQ	<LOQ	3.19	<LOQ	1.33	3.78
PCB151	4.92	2.47	2.27	4.46	5.27	1.95	3.95	2.88	1.58	1.17
PCB149	13.27	7.75	7.15	13.66	19.44	5.65	10.85	10.13	5.62	5.99
PCB118	7.46	6.91	3.11	12.37	12.03	3.45	9.93	7.50	3.60	3.38
PCB153	10.50	6.77	6.90	<LOQ	20.10	4.55	9.68	11.38	4.53	4.88
PCB132	2.86	1.21	1.22	<LOQ	3.95	1.10	1.57	2.00	1.09	1.34
PCB105	1.74	1.12	0.63	<LOQ	3.29	0.65	1.57	2.00	0.61	1.04
PCB138	5.59	<LOQ	3.07	7.53	<LOQ	<LOQ	5.12	5.00	<LOQ	<LOQ
PCB158	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB187	1.79	0.89	2.06	1.78	5.11	<LOQ	1.52	<LOQ	0.97	0.74
PCB183	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB128	<LOQ	2.15	<LOQ	2.96	0.66	<LOQ	1.42	3.00	0.73	0.17
PCB177	0.72	0.28	0.34	0.75	1.81	<LOQ	0.91	<LOQ	0.12	<LOQ
PCB156	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.13
PCB171	1.39	1.26	0.55	2.37	1.65	0.50	1.27	<LOQ	0.53	<LOQ
PCB180	2.32	<LOQ	1.85	2.69	8.40	0.80	2.23	2.63	1.09	1.14
PCB191	<LOQ	<LOQ	<LOQ	4.52	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB169	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB170	<LOQ	<LOQ	<LOQ	0.91	<LOQ	<LOQ	0.51	<LOQ	<LOQ	<LOQ
PCB201/199	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB208	0.49	0.19	<LOQ	0.43	<LOQ	<LOQ	<LOQ	0.25	0.16	<LOQ
PCB195	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ

PCB194	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB205	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB206	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB209	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ

Table S8. PCB and OCP correlations with snow density.

Pearson Correlations		
This study		Snow density
Σ OCPs	Pearson Correlation	-,707*
	Sig. (2-tailed)	.022
	N	10
HCB	Pearson Correlation	-,761*
	Sig. (2-tailed)	.011
	N	10
γ -HCH	Pearson Correlation	-,852*
	Sig. (2-tailed)	.015
	N	7
PCB33	Pearson Correlation	-,879*
	Sig. (2-tailed)	.021
	N	6
PCB52	Pearson Correlation	-,818**
	Sig. (2-tailed)	.004
	N	10
PCB49	Pearson Correlation	-,728*
	Sig. (2-tailed)	.041
	N	8
PCB74	Pearson Correlation	-,891**
	Sig. (2-tailed)	.007
	N	7
PCB99+101	Pearson Correlation	-,713*
	Sig. (2-tailed)	.021
	N	10
PCB153	Pearson Correlation	-,733*
	Sig. (2-tailed)	.025
	N	9
PCB105	Pearson Correlation	-,733*
	Sig. (2-tailed)	.025
	N	9
PCB187	Pearson Correlation	-,791*
	Sig. (2-tailed)	.020
	N	8
PCB177	Pearson Correlation	-,832*
	Sig. (2-tailed)	.020
	N	7
PCB180	Pearson Correlation	-,762*
	Sig. (2-tailed)	.017
	N	9
Σ PCBs	Pearson Correlation	-,760*
	Sig. (2-tailed)	.011
	N	10

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Pearson Correlations		
Khairy et al., 2016		Snow density
α -HCH	Pearson Correlation	-,985**
	Sig. (2-tailed)	.000
	N	6
β -HCH	Pearson Correlation	-,997**
	Sig. (2-tailed)	.003
	N	4
γ -HCH	Pearson Correlation	-,927**
	Sig. (2-tailed)	.008
	N	6
Σ HCHs	Pearson Correlation	-,970**
	Sig. (2-tailed)	.001
	N	6
Σ OCPs	Pearson Correlation	-,837*

	Sig. (2-tailed)	.019
	N	7
PCB11	Pearson Correlation	-.848 [*]
	Sig. (2-tailed)	.016
	N	7
PCB28+31	Pearson Correlation	-.783 [*]
	Sig. (2-tailed)	.037
	N	7
PCB66	Pearson Correlation	-.817 [*]
	Sig. (2-tailed)	.025
	N	7
PCB77	Pearson Correlation	-.943 ^{**}
	Sig. (2-tailed)	.001
	N	7
PCB118	Pearson Correlation	-.859 [*]
	Sig. (2-tailed)	.013
	N	7
PCB114	Pearson Correlation	-.884 ^{**}
	Sig. (2-tailed)	.008
	N	7
PCB105	Pearson Correlation	-.939 ^{**}
	Sig. (2-tailed)	.002
	N	7
PCB126	Pearson Correlation	-.988 ^{**}
	Sig. (2-tailed)	.001
	N	5
PCB182+187	Pearson Correlation	-.755 [*]
	Sig. (2-tailed)	.050
	N	7
PCB180+193	Pearson Correlation	-.782 [*]
	Sig. (2-tailed)	.038
	N	7
PCB169	Pearson Correlation	-.988 [*]
	Sig. (2-tailed)	.012
	N	4

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table S9. PCBs and HCB net air-snow fluxes ($\text{pg m}^{-2} \text{d}^{-1}$)

$\text{pg m}^{-2} \text{d}^{-1}$	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
HCB	3.97	-2.93	-3.83	0.49	-1.18	-16.39	-6.03	-1.96	-0.83	1.65
PCB18	1.42									
PCB17	-0.62		0.32		0.34	5.46	3.13	-0.74		
PCB31+28	2.32	-0.23	0.68	0.12	5.56		6.35	1.32	-0.10	0.15
PCB52	-6.38	-4.07	6.11	-0.08	-6.92	-21.08	1.64			
PCB49	-2.67		2.11	-0.01		7.20	2.11	0.59	0.40	
PCB44							2.66			
PCB74							3.91			
PCB70	0.02	-0.50					5.38			
PCB95					2.55		0.67			
PCB99+10										
1	-0.41		0.79	0.15	3.75	7.33	1.40	-0.38	-0.63	-0.55
PCB87			-0.67	0.15						
PCB110	-0.17		0.33			2.06	1.50			
PCB151	-0.21		-4.68	-0.30	1.01	-4.79				
PCB149	-0.82	-0.04	0.68	0.59		5.63	2.51	-0.29	2.02	-3.38
PCB118					1.78		1.84	1.84		
PCB153			-1.42	0.22	0.98	2.29	6.69			
PCB132	0.52		-2.71	-0.05	-0.67	-1.59	-7.95	-0.49	-0.82	
PCB138		-0.03	0.13	0.07				0.17		
PCB187			0.76	0.03	0.88				-0.40	0.93
PCB128		-0.14	-0.44			0.63		0.03	0.11	0.03
PCB177		-2.06	-2.85	0.07	12.35	2.12				0.07
PCB156									0.15	
PCB171	0.02				1.68	1.63	0.46			
PCB180		-1.91	-3.84	0.00	14.09	2.05	4.99	-0.05	-0.03	0.07
PCB170		-0.01								

Table S10. PCB and OCP surface seawater concentrations (pg L⁻¹)

pg L ⁻¹	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	SW9	SW10	SW11	SW12	SW13	SW14	SW15	SW16	SW17	SW18	SW19	SW20	SW21	SW22	SW23	SW24	SW25	SW26
ΣOCPs	2.5	0.6	4.6	6.4	3.0	3.4	2.4	2.0	1.9	2.3	2.4	3.4	3.5	0.8	3.6	2.3	17.1	3.5	5.0	2.6	6.2	4.1	4.4	6.5	2.2	2.5
HCB	2.5	<LOQ	2.8	1.7	1.9	2.8	1.9	2.0	1.9	1.9	1.6	2.0	2.0	<LOQ	2.8	1.8	10.4	2.2	3.6	2.2	1.7	3.0	3.4	3.3	2.2	2.1
ΣHCHs	<LOQ	0.6	1.9	4.7	1.1	0.6	0.6	<LOQ	<LOQ	0.4	0.8	1.3	1.6	0.8	0.8	0.5	6.6	1.3	1.5	0.4	4.5	1.1	1.0	3.2	<LOQ	0.4
α-HCH	<LOQ	<LOQ	<LOQ	0.5	0.3	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.7	<LOQ	0.5	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
β-HCH	<LOQ	<LOQ	0.9	0.5	<LOQ	<LOQ	0.6	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	1.1	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.7	<LOQ	<LOQ
γ-HCH	<LOQ	0.6	0.6	3.7	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.4	0.8	0.9	0.9	0.8	<LOQ	0.5	1.4	0.8	1.0	0.4	4.5	<LOQ	1.0	0.7	<LOQ	0.4
δ-HCH	<LOQ	<LOQ	0.5	<LOQ	0.8	0.6	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.5	0.7	<LOQ	0.8	<LOQ	3.5	0.5	<LOQ	<LOQ	<LOQ	1.1	<LOQ	1.8	<LOQ	<LOQ
ΣPCBs	34.3	13.6	117.5	31.3	71.8	68.7	48.0	71.0	41.5	29.8	61.4	62.6	50.5	35.6	60.0	47.6	109.4	56.0	109.4	42.6	57.5	93.8	50.4	72.4	59.0	35.8
PCB18	<LOQ	<LOQ	0.1	<LOQ	<LOQ	0.5	<LOQ	0.2	<LOQ	<LOQ	0.5	<LOQ	1.0	<LOQ	1.0	0.7	1.2	<LOQ	<LOQ	<LOQ	7.6	0.9	1.1	4.2	<LOQ	1.0
PCB17	<LOQ	<LOQ	0.7	4.2	0.6	0.3	0.2	0.2	0.1	0.2	0.8	1.2	0.7	1.6	2.1	1.8	3.3	0.9	1.4	0.7	0.8	3.3	0.9	6.5	1.0	0.7
PCB31+28	<LOQ	<LOQ	1.7	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	1.0	<LOQ	2.7	1.5	2.2	<LOQ	1.3	2.1	<LOQ	1.6	1.3	<LOQ
PCB33	<LOQ	<LOQ	0.6	<LOQ	0.4	0.3	<LOQ	<LOQ	<LOQ	<LOQ	0.4	0.5	0.4	0.4	0.5	0.3	15.3	1.6	0.9	1.0	1.1	0.5	0.8	<LOQ	<LOQ	<LOQ
PCB52	2.8	0.6	7.0	2.1	3.0	3.5	2.6	2.4	3.2	3.1	3.8	3.3	2.6	2.0	3.7	3.6	4.5	7.3	16.8	15.3	5.5	5.1	4.7	6.1	4.9	2.9
PCB49	0.3	<LOQ	1.0	<LOQ	0.7	0.7	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	5.3	<LOQ	0.9	0.5	0.7	0.6	<LOQ	0.6	0.6	<LOQ
PCB44	<LOQ	<LOQ	<LOQ	0.3	0.8	0.6	0.3	0.3	0.2	<LOQ	0.4	0.4	0.4	0.1	0.4	0.3	<LOQ	0.2	15.3	0.2	0.6	0.4	0.3	0.3	0.5	0.2
PCB74	<LOQ	<LOQ	0.9	<LOQ	0.4	0.5	<LOQ	<LOQ	0.4	<LOQ	<LOQ	0.4	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.5	0.8	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB70	0.8	<LOQ	2.3	<LOQ	1.5	1.6	0.8	1.0	0.8	0.5	1.1	1.1	1.1	0.5	0.9	0.7	1.0	1.1	2.4	0.5	1.0	1.2	0.7	0.8	0.9	0.6
PCB95	<LOQ	<LOQ	6.5	<LOQ	3.2	3.4	1.8	2.7	1.5	0.8	3.2	2.9	2.4	1.6	3.0	1.9	2.9	1.4	3.0	1.1	1.7	3.4	1.4	2.5	2.2	1.2
PCB99+101	10.6	4.1	23.0	7.5	13.3	14.9	10.0	13.2	10.1	7.2	11.4	10.5	9.1	6.5	10.7	8.4	12.9	6.3	9.9	5.8	6.7	12.4	6.8	9.1	8.9	6.9
PCB87	<LOQ	<LOQ	1.3	<LOQ	0.9	1.0	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB110	<LOQ	<LOQ	2.2	<LOQ	1.5	1.3	0.7	1.0	0.5	0.2	1.3	1.1	0.9	0.6	1.1	0.8	1.6	0.7	1.1	0.5	0.7	1.2	0.5	0.9	1.0	0.5
PCB82	<LOQ	<LOQ	1.4	<LOQ	0.6	0.6	<LOQ	0.6	<LOQ	<LOQ	0.8	0.8	0.6	<LOQ	0.7	<LOQ	1.0	<LOQ	0.8	<LOQ	<LOQ	0.9	<LOQ	0.6	0.6	<LOQ
PCB151	2.1	1.1	6.5	1.5	4.2	4.2	2.8	4.6	2.2	1.6	3.4	3.3	2.5	2.1	3.8	2.6	4.5	2.4	3.9	1.7	2.3	5.6	2.9	3.7	3.5	2.3
PCB149	3.5	2.2	18.0	3.8	11.1	10.2	7.2	12.0	5.5	3.5	9.7	10.4	7.2	6.3	9.3	7.4	15.2	7.6	11.7	4.8	7.3	15.0	8.2	10.7	9.6	5.6
PCB118	<LOQ	<LOQ	2.7	<LOQ	1.5	1.5	1.1	1.5	1.1	<LOQ	1.6	1.7	1.3	<LOQ	1.2	1.1	3.4	<LOQ	6.6	<LOQ	1.1	1.8	<LOQ	1.2	1.3	<LOQ

PCB153	8.7	<LOQ	16.1	6.5	11.0	10.3	8.7	12.8	8.0	6.9	8.4	9.3	7.8	6.0	8.4	7.1	12.3	8.5	13.3	5.2	7.2	14.7	8.9	9.2	9.1	6.4
PCB132	<LOQ	3.4	2.7	<LOQ	1.2	1.0	0.8	1.4	0.3	<LOQ	2.1	2.2	1.5	1.1	1.6	1.3	3.0	1.4	2.6	0.5	1.3	2.9	0.7	1.9	1.5	0.3
PCB105	<LOQ	1.0	0.5	<LOQ	0.2	0.2	0.2	0.2	0.1	<LOQ	0.4	0.4	0.3	0.2	0.3	0.3	0.8	0.2	0.3	0.1	0.2	0.5	<LOQ	0.3	0.2	<LOQ
PCB138	1.2	<LOQ	7.2	1.6	4.4	4.0	3.2	4.9	2.3	1.2	4.1	4.5	3.5	2.5	3.4	3.1	6.4	3.8	5.3	1.7	3.2	6.4	3.0	4.2	3.8	2.2
PCB158	<LOQ	<LOQ	0.8	<LOQ	0.5	0.5	0.4	0.6	0.3	<LOQ	0.4	0.5	0.4	0.3	0.4	0.4	0.8	0.4	0.5	<LOQ	0.4	0.7	0.3	0.4	0.5	0.3
PCB187	1.5	<LOQ	3.4	1.2	2.7	2.2	1.9	3.2	1.5	1.6	2.1	2.1	1.7	1.3	1.9	1.6	3.0	2.4	2.5	1.1	1.8	3.7	2.7	2.2	2.2	1.5
PCB183	0.7	<LOQ	1.6	0.6	1.2	0.9	0.8	1.4	0.7	0.7	0.9	0.9	0.8	<LOQ	0.8	0.7	1.2	1.0	1.0	<LOQ	0.8	1.6	1.2	1.0	1.0	0.7
PCB128	<LOQ	<LOQ	0.3	<LOQ	0.1	0.1	0.1	0.1	<LOQ	<LOQ	0.2	0.3	0.2	0.1	0.1	0.1	0.4	0.2	0.3	<LOQ	0.2	0.4	<LOQ	0.2	0.2	<LOQ
PCB177	0.1	0.1	1.3	0.2	1.0	0.7	0.6	1.0	0.4	0.2	0.8	0.8	0.6	0.4	0.6	0.6	1.2	1.0	1.0	0.3	0.7	1.4	0.7	0.8	0.8	0.4
PCB156	0.1	<LOQ	0.4	<LOQ	0.3	0.2	0.2	0.3	0.1	<LOQ	0.2	0.2	0.2	0.1	0.2	0.2	0.3	0.3	0.3	0.1	0.2	0.4	0.2	0.2	0.2	0.1
PCB171	<LOQ	<LOQ	0.7	<LOQ	0.5	0.4	0.3	0.4	0.2	<LOQ	0.4	0.5	0.4	0.2	0.3	0.4	0.5	0.4	0.5	<LOQ	0.3	0.5	0.2	0.4	0.4	0.2
PCB180	1.9	0.9	4.2	1.6	3.3	2.3	2.5	3.7	1.8	1.8	2.1	2.3	2.0	1.3	1.8	1.8	3.2	3.3	3.0	1.2	2.1	4.3	3.0	2.2	2.3	1.5
PCB191	<LOQ	0.1	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.1	<LOQ	<LOQ	<LOQ	<LOQ
PCB169	<LOQ	<LOQ	0.4	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB170	<LOQ	0.1	1.3	0.1	1.0	0.7	0.6	1.0	0.3	0.1	0.8	0.8	0.7	0.4	0.5	0.5	1.2	1.1	1.0	0.2	0.6	1.3	0.8	0.7	0.7	0.4
PCB201/199	0.1	0.1	0.4	0.1	0.4	0.2	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.1	0.1	0.3	0.3	0.1	0.1	0.1
PCB208	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.1	0.1	0.1	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB195	<LOQ	<LOQ	0.1	<LOQ	0.1	0.1	<LOQ	0.1	<LOQ	<LOQ	<LOQ	0.1	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.1	<LOQ	<LOQ	<LOQ	0.1	0.1	<LOQ	0.1	<LOQ
PCB194	<LOQ	<LOQ	0.3	<LOQ	0.3	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	<LOQ	0.1	0.1	0.1	0.2	<LOQ	<LOQ	0.1	0.2	0.2	<LOQ	0.1	<LOQ
PCB205	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB206	<LOQ	<LOQ	<LOQ	<LOQ	0.2	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB209	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ

Table S11. Plankton PCB and OCP concentrations (ng g_{dw}⁻¹)

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	P23	P24	P25	P26
ΣOCPs	1.69	3.16	0.46	2.07	1.03	2.65	0.99	1.72	1.44	1.09	3.09	1.96	2.06	1.64	1.37	0.35	1.97	1.80	1.25	1.97	1.32	1.87	2.45	1.07	1.65	2.07
HCB	<LOQ	0.29	<LOQ	<LOQ	0.20	0.22	0.49	0.43	0.02	0.39	0.26	<LOQ	0.61	0.13	0.45	0.05	0.14	0.16	0.43	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.30	<LOQ
ΣHCHs	1.69	2.87	0.46	2.07	0.83	2.43	0.50	1.28	1.42	0.70	2.83	1.96	1.44	1.51	0.92	0.30	1.83	1.64	0.82	1.97	1.32	1.87	2.45	1.07	1.36	2.07
α-HCH	0.53	0.86	<LOQ	0.55	<LOQ	<LOQ	0.26	0.59	0.49	0.29	0.22	0.77	0.58	<LOQ	0.41	<LOQ	0.32	0.43	<LOQ	0.57	0.52	0.92	1.11	0.49	0.60	<LOQ
β-HCH	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
γ-HCH	0.50	0.90	<LOQ	0.68	<LOQ	1.05	<LOQ	<LOQ	0.45	0.16	2.36	<LOQ	0.38	0.71	<LOQ	<LOQ	1.18	0.68	0.36	0.47	0.34	<LOQ	<LOQ	<LOQ	0.36	0.93
δ-HCH	0.66	1.11	0.46	0.84	0.83	1.38	0.25	0.69	0.47	0.25	0.26	1.18	0.49	0.80	0.51	0.30	0.33	0.52	0.46	0.92	0.46	0.95	1.34	0.58	0.40	1.15
ΣPCBs	28.67	40.82	14.55	71.00	14.38	15.08	4.90	6.91	40.63	11.72	67.67	5.13	111.75	46.20	15.10	3.08	3.78	5.43	4.31	7.68	12.55	17.07	27.91	3.50	6.92	82.47
PCB18	<LOQ	<LOQ	<LOQ	0.50	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	2.81	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	1.15	0.20	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB17	1.29	0.78	0.17	0.68	0.58	0.77	0.32	0.41	0.30	0.18	0.19	0.59	0.31	0.22	0.28	<LOQ	0.32	0.29	0.18	0.00	0.39	0.31	2.06	0.11	0.27	0.48
PCB31+28	<LOQ	<LOQ	<LOQ	0.05	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.03	0.08	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB33	0.69	<LOQ	0.45	1.02	<LOQ	<LOQ	0.21	<LOQ	<LOQ	0.19	<LOQ	<LOQ	0.72	<LOQ	0.55	0.20	<LOQ	<LOQ	<LOQ	0.97	<LOQ	<LOQ	<LOQ	0.62	<LOQ	3.39
PCB52	2.79	<LOQ	2.10	3.86	4.46	3.48	<LOQ	1.72	2.46	0.81	1.55	<LOQ	2.47	4.27	1.08	1.01	<LOQ	<LOQ	<LOQ	3.67	1.12	6.12	12.09	1.09	1.85	9.87
PCB49	0.03	0.16	<LOQ	1.08	0.30	<LOQ	0.05	<LOQ	0.17	0.02	0.25	<LOQ	0.34	<LOQ	0.10	0.51	<LOQ	<LOQ	<LOQ	<LOQ	0.02	0.03	0.45	0.02	0.06	<LOQ
PCB44	0.05	<LOQ	<LOQ	0.39	0.10	<LOQ	<LOQ	0.53	0.13	0.00	0.15	<LOQ	0.14	0.10	0.08	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.10	0.07	0.22	<LOQ	<LOQ	0.31
PCB74	0.18	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.22	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.58	1.39	<LOQ	<LOQ	0.44
PCB70	0.32	0.57	0.74	0.68	0.35	0.61	0.07	0.21	0.21	0.14	0.17	0.48	0.34	0.32	0.28	<LOQ	0.16	0.02	0.19	0.07	0.32	3.78	0.22	0.24	0.21	0.44
PCB95	1.34	<LOQ	<LOQ	2.78	<LOQ	<LOQ	<LOQ	0.18	0.89	<LOQ	1.89	<LOQ	1.25	2.25	0.58	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.74	<LOQ	6.57	<LOQ	0.61	2.69
PCB99+101	2.29	<LOQ	<LOQ	8.87	<LOQ	<LOQ	0.57	<LOQ	<LOQ	0.96	7.31	<LOQ	3.83	<LOQ	1.51	<LOQ	<LOQ	1.28	<LOQ	<LOQ	1.39	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB87	<LOQ	<LOQ	<LOQ	0.63	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.06	0.30	<LOQ	<LOQ	<LOQ	0.03	<LOQ	<LOQ	0.02	0.24	<LOQ	0.03	<LOQ	<LOQ	<LOQ	0.03	<LOQ
PCB110	0.21	0.08	0.11	1.44	0.18	<LOQ	0.06	0.05	0.23	0.14	0.59	0.11	0.14	0.06	0.15	<LOQ	0.04	0.13	0.04	<LOQ	0.27	<LOQ	<LOQ	0.02	0.17	<LOQ
PCB82	0.11	0.12	0.04	0.89	0.05	0.11	0.05	0.05	0.11	0.09	0.38	0.07	0.16	0.19	0.14	0.02	0.04	0.11	0.06	0.05	0.17	0.07	0.11	0.04	0.09	0.13
PCB151	0.74	1.35	0.39	1.65	0.35	0.17	0.18	0.11	1.06	0.33	3.83	0.15	4.31	2.02	0.58	0.05	0.07	0.20	0.19	0.05	0.30	0.24	0.33	0.05	0.20	1.06
PCB149	2.48	4.02	1.51	6.61	3.17	0.94	0.58	0.66	3.92	1.09	10.72	0.81	11.28	8.76	1.87	0.41	0.25	0.68	0.61	0.35	1.27	2.72	2.17	0.53	0.86	5.64
PCB118	<LOQ	0.04	<LOQ	2.83	0.05	0.11	0.02	0.02	0.15	0.27	0.96	0.11	0.36	<LOQ	0.25	<LOQ	0.01	0.11	0.04	<LOQ	0.30	0.20	<LOQ	<LOQ	0.07	0.09

PCB153	2.45	5.04	1.39	7.40	1.18	1.22	0.55	0.66	6.08	1.26	10.11	0.55	10.70	7.13	1.56	<LOQ	0.35	0.58	0.73	0.37	1.20	0.44	0.11	0.02	0.61	8.37
PCB132	0.34	0.41	0.04	2.05	<LOQ	0.11	0.09	0.02	0.89	0.26	1.62	0.11	1.44	1.22	0.39	0.01	0.05	0.09	0.04	<LOQ	0.34	<LOQ	<LOQ	<LOQ	0.09	0.48
PCB105	<LOQ	0.12	<LOQ	0.55	<LOQ	0.28	0.15	0.11	0.06	0.10	0.14	0.18	<LOQ	0.10	0.08	<LOQ	0.05	0.05	0.06	0.35	0.15	0.17	0.17	0.11	0.09	<LOQ
PCB138	1.21	2.62	0.72	5.64	0.48	0.66	0.30	0.32	3.35	0.88	4.89	0.22	4.91	3.31	0.92	0.14	0.20	0.36	0.31	0.22	0.76	0.27	<LOQ	0.02	0.39	5.11
PCB158	0.21	0.45	0.15	0.71	0.25	0.17	0.06	0.18	0.42	0.12	0.50	0.07	0.69	0.45	0.27	0.04	0.07	0.09	0.07	0.10	0.17	0.17	0.11	0.02	0.10	0.57
PCB187	1.82	3.81	1.17	2.41	0.45	0.99	0.36	0.34	4.26	0.64	4.86	0.22	11.50	3.56	0.90	0.15	0.20	0.31	0.37	0.42	0.69	0.37	0.22	0.11	0.31	7.00
PCB183	0.87	1.89	0.46	1.31	0.23	0.28	0.15	0.14	2.01	0.40	2.17	<LOQ	4.91	1.80	0.45	0.19	0.04	0.09	0.12	0.05	0.27	0.10	<LOQ	<LOQ	0.10	3.22
PCB128	0.05	0.04	<LOQ	1.08	<LOQ	<LOQ	0.01	<LOQ	0.17	0.11	0.30	<LOQ	0.22	0.13	0.08	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.07	<LOQ	<LOQ	<LOQ	<LOQ	0.13
PCB177	0.92	1.68	0.39	1.42	<LOQ	<LOQ	0.12	<LOQ	2.03	0.34	1.98	<LOQ	5.31	1.57	0.37	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.24	<LOQ	<LOQ	<LOQ	<LOQ	3.92
PCB156	0.32	0.66	0.15	0.66	<LOQ	<LOQ	<LOQ	<LOQ	0.72	0.15	0.71	<LOQ	1.79	0.55	0.13	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	1.32
PCB171	0.13	0.37	0.07	0.94	<LOQ	<LOQ	<LOQ	0.02	0.28	0.19	0.33	<LOQ	0.40	0.16	0.07	<LOQ	<LOQ	0.04	<LOQ	0.02	<LOQ	0.03	<LOQ	<LOQ	<LOQ	0.44
PCB180	3.87	7.46	2.06	7.09	1.03	2.38	0.49	0.48	6.27	1.45	5.25	0.33	20.65	4.21	1.20	0.20	0.32	0.32	0.46	0.30	1.05	0.37	0.39	0.07	0.34	15.59
PCB191	0.16	0.04	0.06	<LOQ	0.15	<LOQ	<LOQ	<LOQ	0.04	<LOQ	0.06	<LOQ	0.34	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.26
PCB169	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.02	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB170	1.58	3.03	0.78	2.89	0.25	0.83	0.17	0.14	2.14	0.70	1.85	0.11	7.98	1.41	0.45	0.04	0.08	0.07	0.13	0.05	0.44	0.03	<LOQ	<LOQ	0.11	5.55
PCB201/199	0.95	1.68	0.46	0.84	0.05	0.22	0.07	0.00	0.97	0.27	0.77	<LOQ	5.70	0.51	0.17	<LOQ	<LOQ	<LOQ	0.03	<LOQ	0.14	<LOQ	<LOQ	<LOQ	<LOQ	2.38
PCB208	0.00	2.09	0.50	0.71	0.55	1.38	0.16	0.53	0.49	0.18	0.25	1.00	0.81	1.25	0.39	0.11	0.30	0.41	0.36	0.60	0.44	0.99	1.28	0.45	0.36	1.54
PCB195	0.34	0.61	0.17	0.39	0.03	0.06	0.02	0.00	0.32	0.10	0.26	<LOQ	2.51	0.19	0.06	<LOQ	<LOQ	<LOQ	0.03	<LOQ	0.05	<LOQ	<LOQ	<LOQ	<LOQ	0.84
PCB194	0.92	1.68	0.46	0.92	0.13	0.33	0.08	0.02	0.49	0.28	0.43	<LOQ	5.27	0.22	0.11	<LOQ	0.11	<LOQ	0.03	<LOQ	0.12	<LOQ	<LOQ	<LOQ	<LOQ	1.19
PCB205	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.20	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB206	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.76	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
PCB209	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ

Table S12. Gross diffusive absorption fluxes of PCBs and HCB to coastal seawater ($\mu\text{g m}^{-2} \text{d}^{-1}$)

$\mu\text{g m}^{-2} \text{d}^{-1}$	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	SW9	SW10	SW11	SW12	SW13	SW14	SW15	SW16	SW17	SW18	SW19	SW20	SW21	SW22	SW23	SW24	SW25	SW26
PCB18																	-182	-666	-490					-47	-101	-64
PCB17	-4.5	-2.9			-7.0	-34	-20	-6.2	-6.7	-6.2	-70	-9.3	-15	-9.3	-22	-14	-4.2	-16	-11							
PCB28	-1.8	-1.2	-4.3	-17				-11	-12	-11				-5.8	-14	-8.9	-11	-42	-31							
PCB52	-66	-43	-213	-815	-109	-544	-320	-45	-49	-45	-212	-27	-44							-194	-153			-4.1	-9.1	-5.7
PCB49	-14	-9			-23	-116	-67										-29	-113	-81	-23	-18					
PCB44																										
PCB74																	-71	-278	-200							
PCB70	-106	-69																								
PCB95			-20	-80							-107	-13	-21													
PCB99	-3	-2						-1.9	-2.0	-1.9				-15	-37	-23	-7.6	-30	-22	-16	-13					
PCB87	-16	-10	-40	-155	-19	-97	-57	-16	-17	-16				-15	-35	-22										
PCB110																										
PCB82																										
PCB151	-41	-26	-127	-512	-61	-314	-182	-43	-47	-43																
PCB149	-41	-26	-63	-246	-18	-89	-52	-55	-60	-56	-144	-18	-30	-55	-134	-85	-100	-385	-278	-200	-157	-833	-1101	-78	-173	-107
PCB118																										
PCB153	-64	-42															-23	-82	-61							
PCB132	-75	-50	-128	-468	-59	-284	-170	-82	-89	-83	-1077	-147	-239				-48	-175	-128			-143	-186			
PCB105																										
PCB138			-1.1	-3.3				-24	-26	-24				-195	-396	-277	-36	-110	-85							
PCB158	-0.69	-0.46															-37	-121	-92			-88	-111			
PCB187	-40	-27						-40	-43	-41				-72	-146	-102	-206	-638	-491	-136	-112	-439	-548			
PCB183								-21	-22	-21																
PCB128											-36	-11	-15	-73	-120	-94	-113	-253	-210			-176	-206			
PCB177	-6.3	-4.5			-30	-97	-67	-402	-426	-403	-99	-24	-34	-739	-1331	-988	-266	-690	-556			-110	-132	-7.2	-13	-9.2

PCB156																-168	-405	-331													
PCB171	-2.1	-1.5						-11	-12	-11						-34	-68	-48	-4.6	-14	-11						-55	-67			
PCB180	-6.0	-4.8						-160	-349	-272	-837	-871	-839	-183	-69	-88	-1335	-2010	-1626	-754	-1471	-1256						-156	-179		
PCB191											-222	-230	-223						-295	-431	-354	-208	-384	-331							
PCB169	-56	-48	-46	-80	-152	-280	-227	-236	-243	-236						-240	-340	-283	-183	-317	-276	-133	-121	-1230	-1390						
PCB170						-63	-114	-93	-61	-63	-61						-28	-39	-33	-159	-271	-237						-348	-393		
PCB201/199																															
ΣPCBs	-543	-369	-643	-2376	-701	-2318	-1529	-2116	-2218	-2122	-1929	-318	-487	-3112	-5123	-3957	-2610	-6461	-5179	-703	-573	-3579	-4313	-136	-297	-186					
HCB	-165	-108	-251	-944	-91	-449	-266	-182	-197	-183	-937	-123	-201	-381	-904	-579	-252	-943	-689	-595	-469	-207	-270	-209	-458	-287					

Table S13. Gross diffusive volatilization fluxes of PCBs and HCB from coastal seawater (pg m⁻² d⁻¹)

pg m ⁻² d ⁻¹	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	SW9	SW10	SW11	SW12	SW13	SW14	SW15	SW16	SW17	SW18	SW19	SW20	SW21	SW22	SW23	SW24	SW25	SW26
PCB18			13			95		12			138		64		236	111	99				1234	272	434	354		113
PCB17			68	1596	23	61	22	13	3.8	11	254	49	45	159	498	282	268	265	298	141	132	987	335	552	180	85
PCB28			183												251		224	463	502		213	652		137	240	
PCB52	159	24	714	838	113	645	281	141	202	182	1210	135	176	199	906	549	359	2219	3745	3208	915	1544	1849	514	901	337
PCB49	17		107		27	128											441		211	118	127	204		47	116	
PCB44				125	31	110	33	20	14		135	18	25	14	95	39		61	3403	33	98	130	123	25	84	20
PCB74			90		15	95			23			17						145	188							
PCB70	43		241		57	302	86	57	51	27	364	44	72	54	231	105	84	353	529	101	165	367	274	68	169	69
PCB95			683		119	653	206	157	98	46	1090	120	160	165	771	299	239	461	707	244	281	1080	585	211	418	141
PCB99	604	152	2424	3245	498	2924	1126	785	651	431	3967	431	619	673	2764	1363	1055	2085	2326	1285	1148	4033	2964	774	1731	815
PCB87			135		33	188																				
PCB110			217		53	231	75	58	32	12	416	46	62	58	262	118	125	208	241	101	119	366	196	70	188	59
PCB82			143		23	113		34			244	32	42		165		81		165			267		51	113	
PCB151	115	38	666	604	151	786	307	262	139	94	1107	134	165	213	932	399	360	748	879	364	377	1729	1185	309	648	261
PCB149	190	77	1793	1476	400	1863	767	683	338	201	3061	412	471	621	2224	1114	1192	2305	2560	986	1176	4496	3240	872	1748	634
PCB118			253		54	257	113	82	63		437	64	83		265	151	257		1342		160	485		91	215	
PCB153	448		1467	2067	379	1649	847	684	461	371	2210	352	473	535	1708	953	904	2210	2575	955	1057	3786	2960	706	1487	665
PCB132		117	259		42	165	80	74	18		587	86	94	106	342	180	227	394	526	88	199	790	244	151	252	33
PCB105		31	42		6.8	30	13	12	5.7		70	13	18	16	43	29	52	41	43	18	29	94		19	30	
PCB138	54		544	343	136	487	256	226	116	56	759	152	182	187	504	323	408	731	801	246	382	1243	715	275	500	195
PCB158			63		15	68	33	28	15		93	17	22	24	67	41	51	86	79		46	160	86	30	65	26
PCB187	65		256	274	83	268	153	146	71	75	381	70	89	92	290	170	192	472	376	166	217	718	646	143	287	127
PCB183	29		110	109	34	106	62	61	32	32	150	29	38		112	71	72	187	144		89	285	268	60	116	54
PCB128			12		1.2	3.8	2.0	2.7			17	5.8	6.2	4.2	8.7	5.3	14	14	22		10	34		8.0	10	
PCB177	4.8	3.0	74	27	24	58	37	35	13	6.2	94	22	25	21	60	41	61	132	109	31	60	183	111	42	73	24

PCB156	1.5		20	4.5	7.1	15	8.9	9.4	2.7	1.3	22	5.5	6.7	4.6	14	10	12	34	22	6.6	17	44	31	11	18	7.0
PCB171			45		13	43	23	16	9.2		69	15	18	14	45	35	30	68	67		35	94	41	22	50	19
PCB180	28	11	91	67	43	66	55	59	30	29	76	31	34	26	56	44	77	152	121	49	75	201	163	53	85	44
PCB191		0.45	0.61		0.29							0.19										1.0				
PCB169			3.3																							
PCB170		0.58	8.3	1.6	4.6	5.4	3.9	5.3	1.5	0.6	7.5	3.7	3.7	2.3	4.5	3.8	9.7	16	12	2.8	6.8	18	12	5.9	7.7	3.5
PCB201/199	0.40	0.15	1.6	0.52	1.22	1.01	0.83	0.94	0.37	0.44	0.93	0.44	0.48	0.22	0.72	0.50	1.2	3.0	1.4	0.80	1.11	3.1	3.0	0.78	1.1	0.61
ΣPCBs	1757	454	10724	10778	2388	11417	4592	3666	2392	1574	16958	2304	2996	3190	12854	6437	6894	13854	21997	8146	8368	24268	16464	5606	9732	3729
HCB	145		295	692	76	540	215	124	124	118	539	88	140		707	294	885	682	825	486	297	928	1387	295	430	249

Table S14. PCB and HCB net air-seawater diffusive fluxes ($\mu\text{g m}^{-2} \text{d}^{-1}$). Negative values mean net absorption fluxes.

pg m ⁻² d ⁻¹	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	SW9	SW10	SW11	SW12	SW13	SW14	SW15	SW16	SW17	SW18	SW19	SW20	SW21	SW22	SW23	SW24	SW25	SW26
PCB18			13			95		12			138		64		236	111	-83	-666	-490		1234	272	434	308	-101	49
PCB17	-4.5	-2.9	68	1596	16	27	1.7	6.9	-2.8	4.5	184	40	30	150	476	267	264	250	287	141	132	987	335	552	180	85
PCB28	-1.8	-1.2	179	-17				-11	-12	-11				-5.8	237	-8.9	213	421	472		213	652		137	240	
PCB52	93	-19	501	24	3.8	101	-39	96	153	137	998	108	132	199	906	549	359	2219	3745	3014	762	1544	1849	510	892	331
PCB49	3.0	-9.3	107		4.3	12	-67										412	-113	130	95	108	204		47	116	
PCB44				125	31	110	33	20	14		135	18	25	14	95	39		61	3403	33	98	130	123	25	84	20
PCB74			90		15	95			23			17					-71	-133	-12							
PCB70	-64	-69	241		57	302	86	57	51	27	364	44	72	54	231	105	84	353	529	101	165	367	274	68	169	69
PCB95			663	-80	119	653	206	157	98	46	982	107	139	165	771	299	239	461	707	244	281	1080	585	211	418	141
PCB99	601	150	2424	3245	498	2924	1126	783	649	429	3967	431	619	659	2727	1340	1047	2055	2305	1269	1135	4033	2964	774	1731	815
PCB87	-16	-10	95	-155	14	91	-57	-16	-17	-16				-15	-35	-22										
PCB110			217		53	231	75	58	32	12	416	46	62	58	262	118	125	208	241	101	119	366	196	70	188	59
PCB82			143		23	113		34			244	32	42		165		81		165			267		51	113	
PCB151	74	12	539	92	90	471	125	219	92	51	1107	134	165	213	932	399	360	748	879	364	377	1729	1185	309	648	261
PCB149	149	51	1730	1229	383	1774	715	628	278	146	2917	394	441	566	2090	1030	1092	1920	2281	786	1019	3663	2139	795	1574	526
PCB118			253		54	257	113	82	63		437	64	83		265	151	257		1342		160	485		91	215	
PCB153	384	-42	1467	2067	379	1649	847	684	461	371	2210	352	473	535	1708	953	881	2128	2514	955	1057	3786	2960	706	1487	665
PCB132	-75	67	130	-468	-17	-119	-90	-7.7	-71	-83	-491	-61	-145	106	342	180	180	219	398	88	199	647	58	151	252	33
PCB105		31	42		6.8	30	13	12	5.7		70	13	18	16	43	29	52	41	43	18	29	94		19	30	
PCB138	54		543	339	136	487	256	201	90	31	759	152	182	-8.7	108	46	372	621	716	246	382	1243	715	275	500	195
PCB158	-0.69	-0.46	63		15	68	33	28	15		93	17	22	24	67	41	14	-34	-13		46	72	-25	30	65	26
PCB187	25	-27	256	274	83	268	153	106	28	34	381	70	89	20	143	68	-14	-166	-116	30	105	279	99	143	287	127
PCB183	29		110	109	34	106	62	40	10	11	150	29	38		112	71	72	187	144		89	285	268	60	116	54
PCB128			12		1.2	3.8	2.0	2.7			-19	-5.1	-8.8	-69	-112	-88	-99	-239	-188		10	-142	-206	8.0	9.8	
PCB177	-1.5	-1.6	74	27	-5.9	-39	-31	-367	-413	-397	-6	-1.6	-9.5	-718	-1271	-947	-205	-558	-446	31	60	73	-21	35	60	15

PCB156	1.5		20	4.5	7.1	15	8.9	9.4	2.7	1.3	22	5.5	6.7	4.6	14	9.7	-156	-371	-309	6.6	17	44	31	11	18	7
PCB171	-2.1	-1.5	45		13	43	23	5.0	-2.9	-11	69	15	18	-20	-23	-13	26	55	56		35	39	-27	22	50	19
PCB180	22	5.9	91	67	-117	-283	-217	-778	-840	-810	-108	-38	-53	-1309	-1953	-1582	-676	-1320	-1135	49	75	45	-17	53	85	44
PCB191		0.45	0.61		0.3			-222	-230	-223		0.19		-295	-431	-354	-208	-384	-331			0.97				
PCB169	-56	-48	-43	-80	-152	-280	-227	-236	-243	-236				-240	-340	-283	-183	-317	-276	-133	-120.68	-1230	-1390			
PCB170		0.58	8.3	1.6	-59	-108	-89	-56	-61	-61	7.5	3.7	3.7	-26	-35	-29	-150	-256	-225	2.8	6.8	-331	-381	5.9	7.7	3.5
PCB201/199	0.40	0.15	1.6	0.52	1.2	1.0	0.83	0.94	0.37	0.44	0.93	0.44	0.48	0.22	0.72	0.50	1.22	3.00	1.4	0.80	1.1	3.1	3.0	0.78	1.1	0.61
ΣPCBs	1214	85	10082	8402	1687	9100	3063	1550	174	-548	15029	1987	2510	78	7731	2480	4285	7393	16818	7443	7795	20688	12151	5470	9435	3543
HCB	-20	-110	44	-250	-15	91	-50	-59	-73	-65	-400	-35	-61	-380	-200	-290	630	-260	140	-110	-170	720	1100	86	-28	-38

Table S15. Summary of literature works reporting POPs in snow and air. The estimated K_{SA} and $K_{SAH'}$ are reported in Figures S6 and 7, respectively. When the original work only reported the mean but not the individual concentrations, it is indicated after the number of sampling points.

Publication	POP family	#Snow samples	Snow phase	Snow sampling points	#Air samples	Air phase	Air sampling points	Location
Franz et al. 1998	PCB PAHs	3 (only snow precipitation events)	Dissolved +particulate phase	1	3 (only snow precipitations events)	gas+aerosol phase	1	Minnesota Minneapolis/St. Paul, United States
Zhang et al. 2015	PAHs	24 (only snow precipitation events from 20 December to 1 April)	Dissolved +particulate phase	3	24 (only snow precipitation events from 20 December to 1 April)	gas+aerosol phase	3	Athabasca oil sands region in northern Alberta, Canada
Xie et al. 2015	Neutral PFASs	9	Dissolved +particulate phase	6	45 (mean)	gas + aerosol phase	1	Ny-A° lesund, Arctic
Wang et al. 2015	Neutral PFASs	12 (mean)	Dissolved	several (antarctic peninsula)	4 (antarctic samples)	Gas phase	4	Antarctic Peninsula
Li et al. 2017	OPEs	6	Dissolved	6	9	Gas phase	9	Northeast Atlantic and the Arctic Ocean
Casal et al. 2018	PAHs	10	Dissolved	10	51	Gas phase	4	Livingston Island, Antarctic Peninsula
This study	PCBs	10	Dissolved	10	51	Gas phase	4	Livingston Island, Antarctic Peninsula

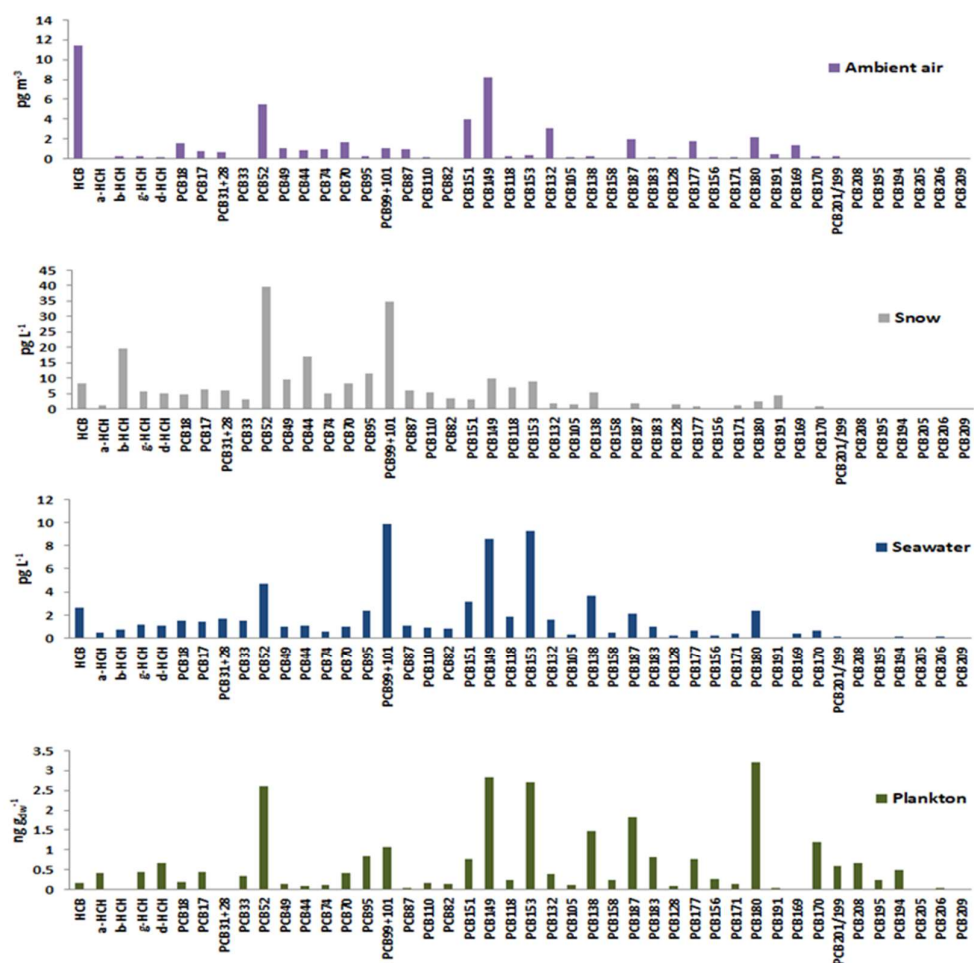


Figure S1: Congener profiles of PCBs in air, snow, seawater and plankton from coastal Livingston island.

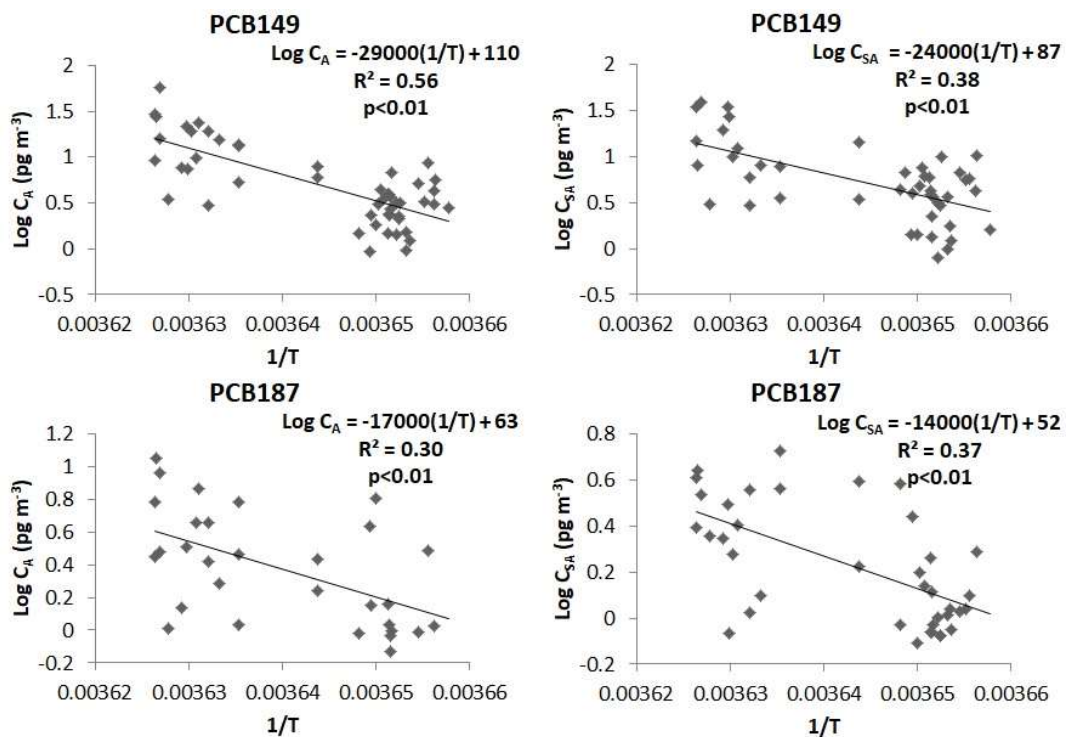


Figure S2. PCB-149 and PCB-187 concentrations in ambient air (C_A) and air equilibrated in-situ with soil/snow (C_{SA}) correlations with inverse of temperature.

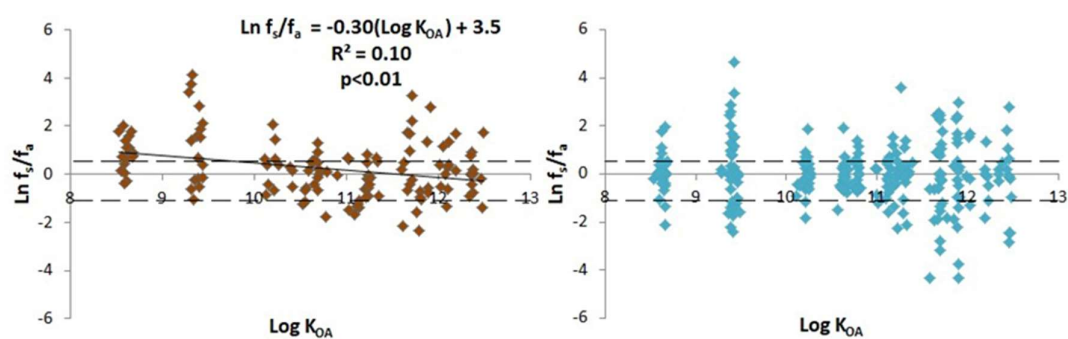


Figure S3. Soil-air fugacity ratios ($\text{Ln } f_s/f_a$) versus the octanol-air partition coefficient (K_{OA}) (left panel), and snow-air fugacity ratios versus K_{OA} (right panel).

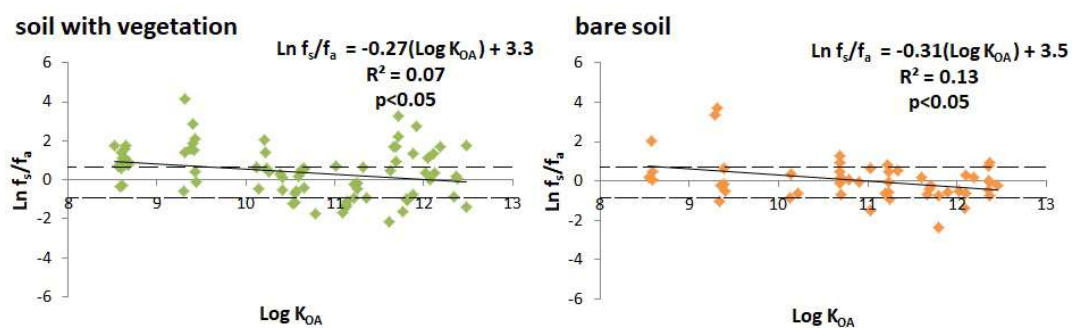


Figure S4. PCBs soil to air fugacity ratios (Ln f_s/f_a) versus the octanol-air partition coefficient (Log K_{OA}) for bare soil and soil with vegetation (Figure S3 shows the two data sets in one single graph).

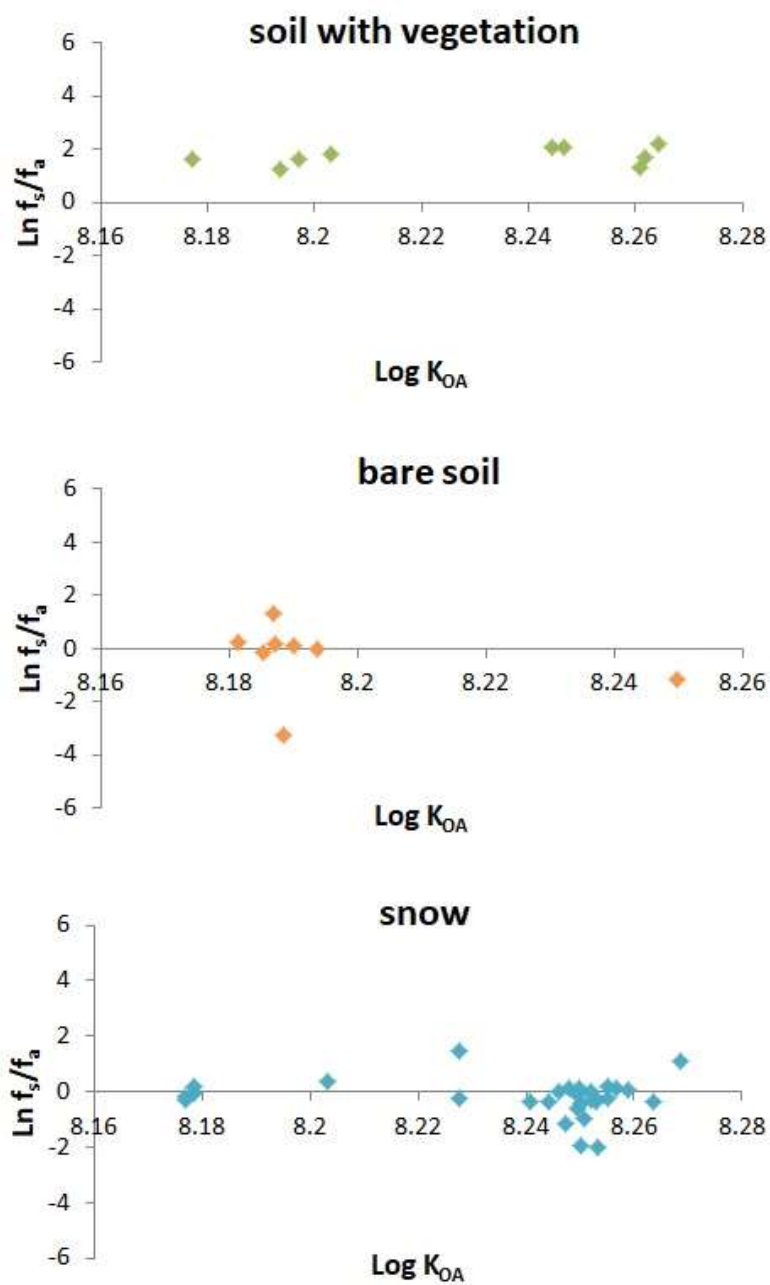


Figure S5. HCB soil/snow to air fugacity ratios ($\ln f_s/f_a$) versus the octanol-air partition coefficient ($\log K_{OA}$).

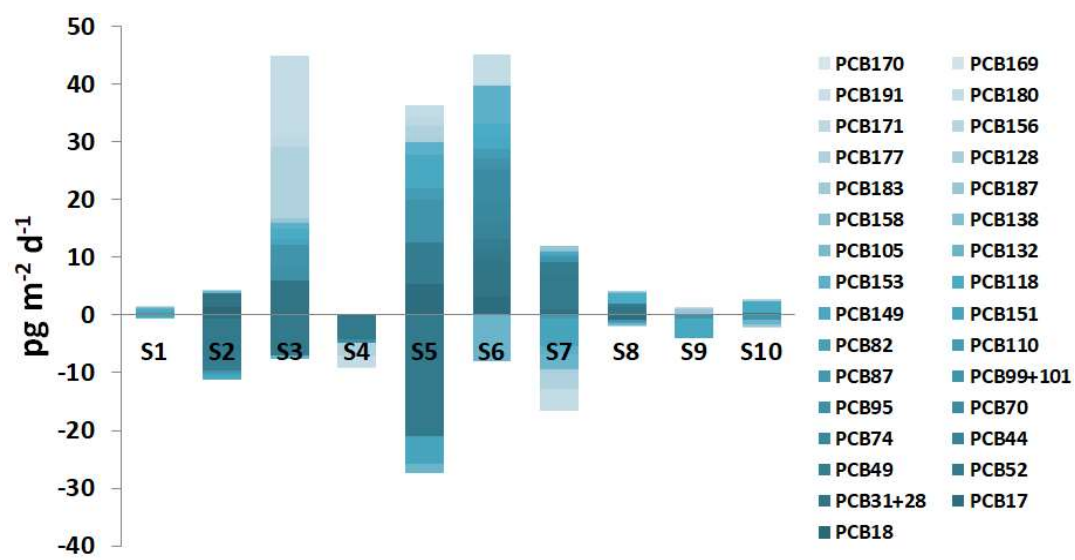


Figure S6. Diffusive snow-air fluxes of polychlorinated biphenyls (PCBs) ($\text{pg m}^{-2} \text{d}^{-1}$).

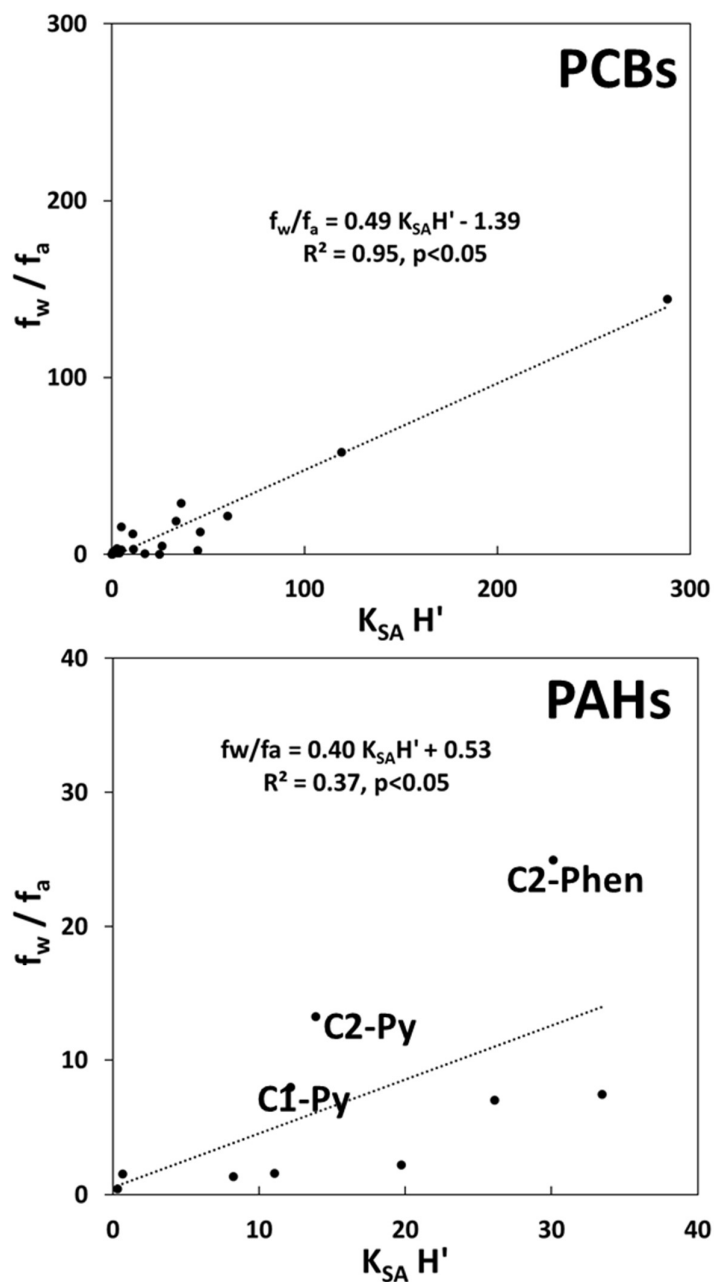


Figure S7: Snow amplification of fugacity ratios between seawater and air (f_w/f_a) for PCBs (upper panel) and for PAHs (lower panel). For PCBs, there were two congeners with a large influence on the regression coefficient, but not on the slope, so these were not removed. There was a PAH with a large influence on regression coefficient and slope, so it was removed from the analysis.

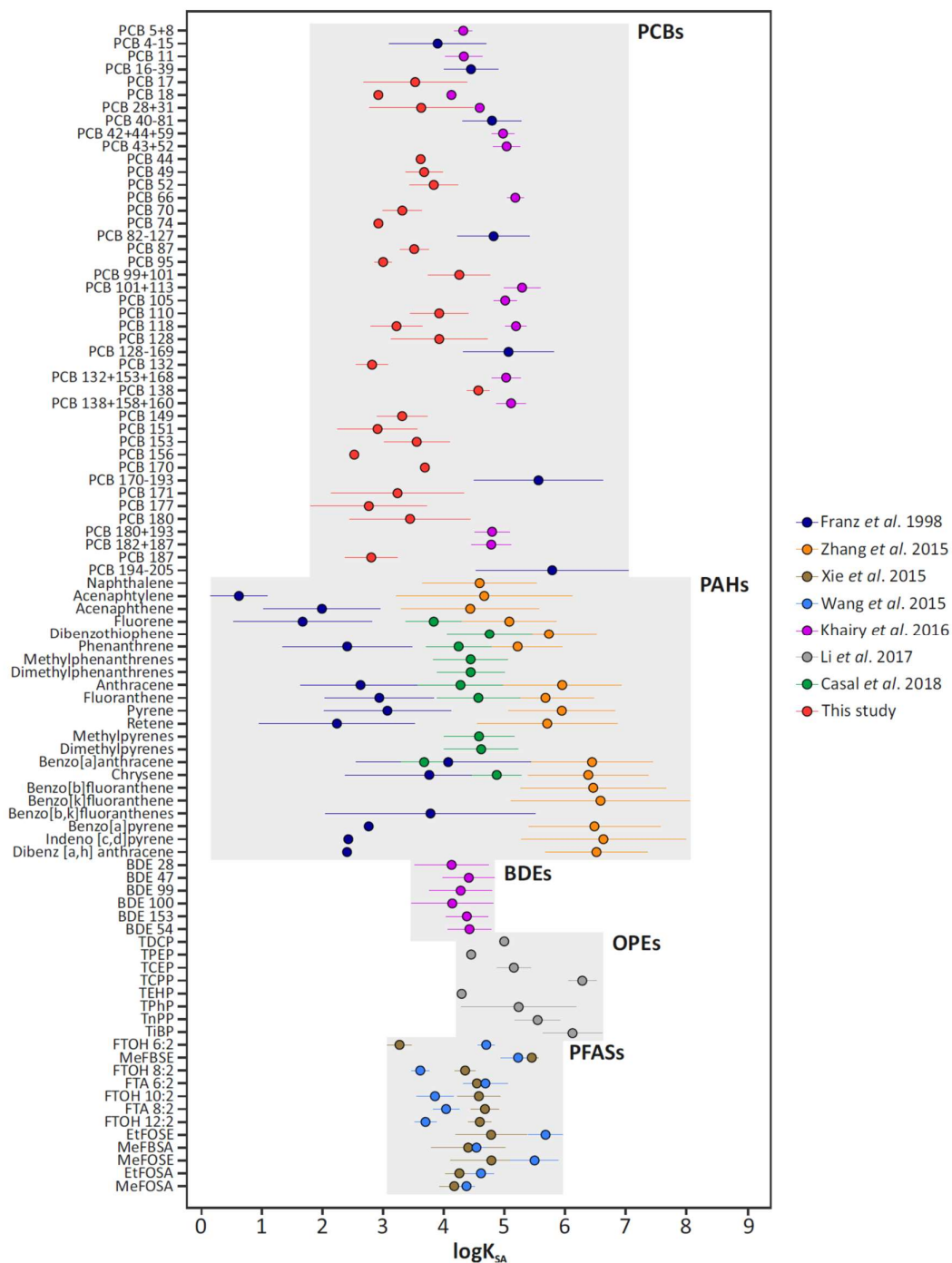


Figure S8. Comparison of snow-air partition coefficients (K_{SA}) reported in the literature for POPs (See Table S15 for details), and those generated in this study. The results shown are the mean and standard deviation of $\log K_{SA}$.

References for Supplementary material

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