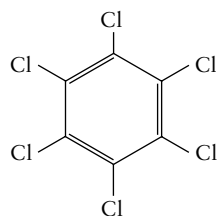


Table 6-A1. Physical and chemical properties of organic contaminants.

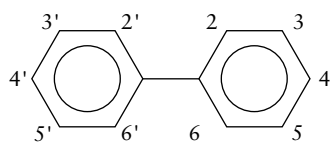
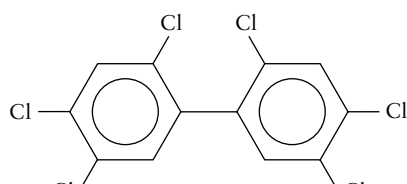
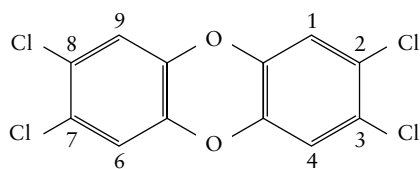
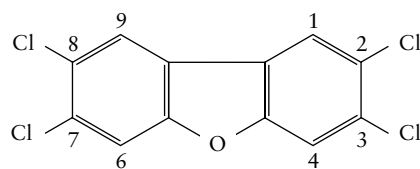
Common name	Chemical name	Formula	Molecular weight	Aqueous solubility at 25°C*			log Kow (at 25°C)	Henry's Law Constant, H _{Pa m³/mole} (25°C)	Vapour pressure over solid** P _S , Pa (25°C)	Vapour pressure over liquid** P _L , Pa (25°C)	Mean half-life		
				S _{mg/m³}	C _S mmol/m ³	C _L mmol/m ³					Air	Water	
Organochlorines													
Hexachlorobenzene (HCBz)	Hexachlorobenzene	C ₆ Cl ₆	284.8	0.005 ^a	0.0176 ^a	1.87 ^a	5.5 ^a	131 ^a	0.0023 ^a	0.2447 ^a	~ 2 years ^a	~ 6 year ^a	
Chlordane (CHL)	1,2,4,5,6,7,8,8-Octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindan	C ₁₀ H ₆ Cl ₈	409.8	0.05 ^b	0.122 ^b	0.87 ^b	3 ^b	9.02(20°C) ^b	0.00111 ^b	0.0079 ^b	6.2 hours ^c	14.4-20.6 days ^c	
cis-chlordane	1,2,4,5,6,7,8,8-Octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindan	C ₁₀ H ₆ Cl ₈	409.8	–	–	–	–	87.1 ^d	–	–	–	–	
trans-chlordane	1,2,4,5,6,7,8,8-Octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindan	C ₁₀ H ₆ Cl ₈	409.8	–	–	–	–	131.7 ^d	–	–	–	–	
Dieldrin	1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydroexo-1,4-endo-5,8-dimethano–naphthalene	C ₁₂ H ₈ Cl ₆ O	380.9	0.17 ^b	0.442 ^b	17.0 ^b	3.7 ^b	1.12(20°C) ^b	0.00049 ^b	0.019 ^b	–	More 4 years ^c	
Hexachlorocyclohexane (HCH)	1,2,3,4,5,6-hexachlorocyclohexane	C ₆ H ₆ Cl ₆	290.9										
α-HCH				1 ^b	3.44 ^b	84.0 ^b	3.8 ^b	0.87(20°C) ^b	0.003 ^b	0.073 ^b	2.3 days ^c	92-771 hour ^c	
β-HCH				0.1 ^b	0.348 ^b	290.0 ^b	3.8 ^b	0.12(20°C) ^b	3.96×10 ⁻⁵ ^b	0.033 ^b	–	–	
γ-HCH (lindane)				6.5 ^b	22.8 ^b	190.0 ^b	3.8 ^b	0.13(20°C) ^b	0.003 ^b	0.025 ^b	2.3 days ^c	92-771 hour ^c	
Toxaphene	Chlorinated bornanes and camphenes	C ₁₀ H ₁₀ Cl ₈	414	0.5 ^b	1.20 ^b	4.6 ^b	3.3 ^b	0.42(20°C) ^b	0.000494 ^b	0.0019 ^b	4-5 days ^c	6 hours ^c	
o,p' and p,p'-DDE	1,1-dichloro-2,2-bis-(p-chlorophenyl)-1,1-dichloroethene	C ₁₄ H ₈ Cl ₄	318	0.04 ^b	0.126 ^b	0.63 ^b	5.7 ^b	7.95(20°C) ^b	0.001 ^b	0.0050 ^b	–	–	
p,p'-DDT	1,1,1-trichloro-2,2-bis-(4-chlorophenyl)-ethane	C ₁₄ H ₉ Cl ₅	354.5	0.003 ^b	0.00845 ^b	0.065 ^b	6.0 ^b	2.36(20°C) ^b	1.95×10 ⁻⁵ ^b	0.00015 ^b	–	–	
Endosulfan	5-norbornene-2,3-dimethanol-1,4,5,6,7,7-hexachlorocyclic sulfite	C ₉ H ₆ Cl ₆ O ₃ S	406.9	0.15 ^b	0.374 ^b	1.70 ^b	3.6 ^b	2.98(20°C) ^b	0.0011 ^b	0.0050 ^b	1.23 hour ^c	less than 1 week ^c	
α-Endosulfan		C ₉ H ₆ Cl ₆ O ₃ S	406.9	0.51(20°C) ^c	1.25(20°C) ^c	–	3.83 ^c	–	–	–	–	–	
β-Endosulfan		C ₉ H ₆ Cl ₆ O ₃ S	406.9	0.45(20°C) ^c	1.10(20°C) ^c	–	–	–	–	–	–	–	
Mirex	1,1a,2,2,3a,4,5,5,5a,5b,6-dodecachlorooctahydro-1,3,4-methano-1H-cyclobuta(cd)pentallene	C ₁₀ Cl ₁₂	545.59	5.45×10 ⁻⁵ ^b	0.0001 ^b	5.70 ^b	6.9 ^b	839.37(20°C) ^b	9.99×10 ⁻⁵ ^b	4.76 ^b	–	–	
Polychlorinated biphenyls (PCBs)													
tri-chlorobiphenyls	(24 isomers)	C ₁₂ H ₇ Cl ₃	257.5				5.5-5.9	24.3-92.2			3 weeks	2 years	
tetra-chlorobiphenyls	(42 isomers)	C ₁₂ H ₆ Cl ₄	292.0					5.6-6.5	1.72-47-6		2 months	6 years	
penta-chlorobiphenyls	(46 isomers)	C ₁₂ H ₅ Cl ₅	326.4					6.2-6.5	24.8-151		2 months	6 years	
hexa-chlorobiphenyls	(42 isomers)	C ₁₂ H ₄ Cl ₆	360.9					6.7-7.3	11.9-818		8 months	6 years	
hepta-chlorobiphenyls	(24 isomers)	C ₁₂ H ₃ Cl ₇	395.3					6.7-7.0	5.4		8 months	6 years	
octa-chlorobiphenyls	(12 isomers)	C ₁₂ H ₂ Cl ₈	429.8					7.1	38.1		2 years	6 years	
nona-chlorobiphenyls	(3 isomers)	C ₁₂ H ₁ Cl ₉	464.2					7.2-8.2	–		2 years	6 years	
PCB 28	2,4,4'-Trichlorobiphenyl	C ₁₂ H ₇ Cl ₃	257.54	0.16 ^a	0.621 ^a	1.28 ^a	5.8 ^a				~ 3 weeks ^a	~ 2 years ^a	
PCB 52	2,2',5,5'-Tetrachlorobiphenyl	C ₁₂ H ₆ Cl ₄	291.99	0.03 ^a	0.103 ^a	0.42 ^a	6.1 ^a	47.59 ^a	0.0049 ^a	0.002 ^a	~ 2 months ^a	~ 6 years ^a	
PCB 101	2,2',4,5,5'-Pentachlorobiphenyl	C ₁₂ H ₅ Cl ₅	326.43	0.01 ^a	0.0306 ^a	0.0986 ^a	6.4 ^a	35.48 ^a	0.00109 ^a	0.0035 ^a	~ 2 months ^a	~ 6 years ^a	
PCB 110	2,3,3',4',6-Pentachlorobiphenyl	C ₁₂ H ₅ Cl ₅	326.43	0.004 ^a	–	–	6 ^a	–	–	–	~ 2 months ^a	~ 6 years ^a	
PCB 153	2,2',4,4',5,5'-Hexachlorobiphenyl	C ₁₂ H ₄ Cl ₆	360.88	0.001 ^a	0.00277 ^a	0.0163 ^a	6.9 ^a	42.9 ^a	0.000119 ^a	0.0007 ^a	~ 8 months ^a	~ 6 years ^a	
PCB 171	2,2',3,3',4,4',6-Heptachlorobiphenyl	C ₁₂ H ₃ Cl ₇	395.32	0.002 ^a	0.00506 ^a	0.046 ^a	6.7 ^a	5.4 ^a	0.0000273 ^a	0.00025 ^a	~ 8 months ^a	~ 6 years ^a	
Polychlorinated dibenzo-p-dioxins/furans													
Tetrachlorodibenzo-p-dioxin	TCDD	C ₁₂ H ₄ O ₂ Cl ₄	322.0	0.0193	0.00006	0.0352	6.8	3.337	2.00 ×10 ⁻⁷	1.18×10 ⁻⁴	~ 1 week	~ 3 weeks	
Pentachlorodibenzo-p-dioxin	PnCDD	C ₁₂ H ₃ OCl ₅	356.4	0.118	0.000331	0.0159	7.40	0.266	8.80 ×10 ⁻⁸	4.23×10 ⁻⁶	~ 3 weeks	~ 3 weeks	
Hexachlorodibenzo-p-dioxin	HxCDD	C ₁₂ H ₂ OCl ₆	391.0	0.00442	1.13 ×10 ⁻⁵	0.00321	7.8	1.084	5.10 ×10 ⁻⁹	1.45×10 ⁻⁶	~ 3 weeks	~ 2 months	
Heptachlorodibenzo-p-dioxin	HpCDD	C ₁₂ HOCl ₇	425.2	0.0024	5.64 ×10 ⁻⁶	0.00133	8.0	1.273	7.5 ×10 ⁻¹⁰	1.77×10 ⁻⁷	~ 3 weeks	~ 2 months	
Octachlorodibenzo-p-dioxin	OCDD	C ₁₂ OCl ₈	460.0	0.000074	1.61 ×10 ⁻⁷	0.00014	8.20	0.684	1.10 ×10 ⁻¹⁰	9.53×10 ⁻⁷	~ 3 weeks	~ 8 months	
Tetrachlorodibenzofuran	TCDF	C ₁₂ H ₄ OCl ₄	306.0	0.419	1.37 ×10 ⁻⁴	0.136	6.1	1.461	2.00 ×10 ⁻⁶	1.99×10 ⁻⁴	~ 1 week	~ 3 weeks	
Pentachlorodibenzofuran	PnCDF	C ₁₂ H ₃ OCl ₅	340.42	0.236	6.93 ×10 ⁻⁴	0.0341	6.5	0.505	3.50 ×10 ⁻⁷	1.72×10 ⁻⁵	~ 3 weeks	~ 3 weeks	
Hexachlorodibenzofuran	HxCDF	C ₁₂ H ₂ OCl ₆	374.87	0.00825	2.20 ×10 ⁻⁵	2.12×10 ⁻³	7.0	1.454	3.20 ×10 ⁻⁸	3.08×10 ⁻⁶	–	–	
Heptachlorodibenzofuran	HpCDF	C ₁₂ HOCl ₇	409.31	0.00135	3.30 ×10 ⁻⁶	4.03×10 ⁻⁴	7.4	1.425	4.70 ×10 ⁻⁹	5.74×10 ⁻⁷	~ 3 weeks	~ 2 months	
Octachlorodibenzofuran	OCDF	C ₁₂ OCl ₈	443.76	0.00116	2.61 ×10 ⁻⁶	5.27×10 ⁻⁵	8.0	0.191	5.0 ×10 ⁻¹⁰	1.01×10 ⁻⁷	~ 3 weeks	~ 8 months	

* C_S is the solubility of the chemical in the solid state; C_L is the solubility of the chemical in the liquid state. ** P_S is the vapor pressure of the pure chemical in the solid state; P_L is the vapor pressure of the pure chemical in the liquid (or subcooled liquid) state.
References: a. Mackay *et al.* 1992a, 1992b. b. Suintio *et al.* 1988. c. Howard 1991. d. Atlas *et al.* 1982. – indicates no data available.

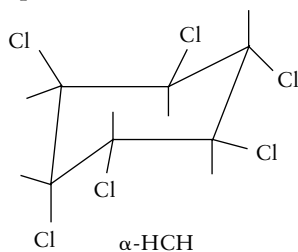
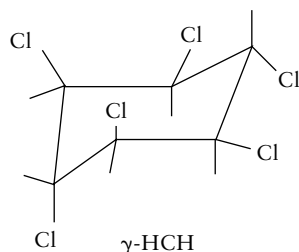
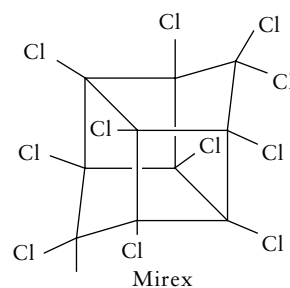
Table 6-A2. Chemical structures of persistent organic pollutants

Industrial products and by-products

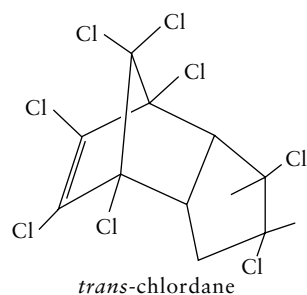
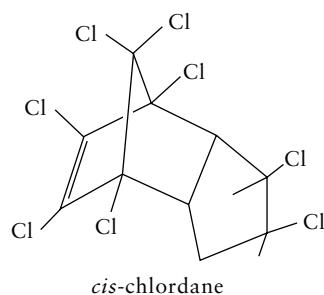
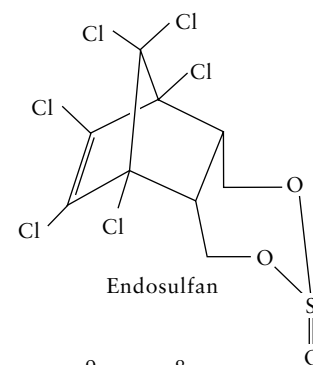
Hexachlorobenzene

Polychlorinated biphenylsBiphenyl substitution
nomenclaturePCB 153
(2,4,5,2',4',5'-Hexachlorobiphenyl)**Polychlorinated dibenzo-*p*-dioxins and dibenzofurans**2,3,7,8-Tetrachlorodibenzo-*p*-dioxin

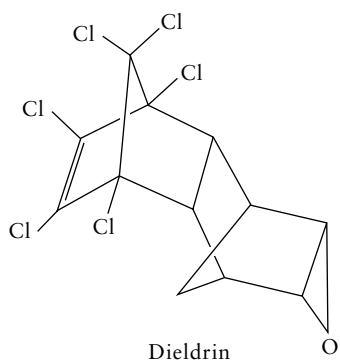
2,3,7,8-Tetrachlorodibenzofuran

Chlorinated pesticides α -HCH γ -HCH

Mirex

*trans*-chlordane*cis*-chlordane

Endosulfan



Dieldrin

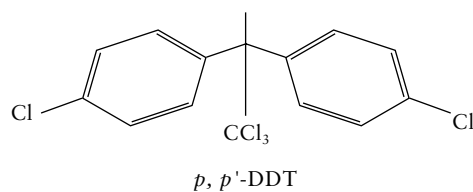
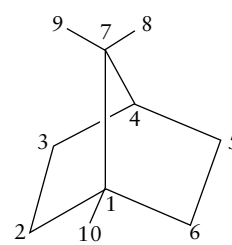
*p,p'*-DDTToxaphene
The most important congeners have 6-10 Cls

Table 6-A3. Concentrations and ranges of organochlorine residues (ng/g dw) in soils and plants in the Arctic.

Location	Source	Date	n	ΣCBz	ΣHCH	ΣCHL	ΣDDT	Σ3-CB	Σ4-CB	Σ5-CB	Σ6-CB	Σ7-CB	Σ8-CB	ΣPCB	Toxaphene	Dieldrin	Reference
Soil																	
Taimyr Peninsula (76-77°N, 99-103°W)	Soil	August 1994	10	0.14 (0-0.28)	1.49 (0.17-3.38)	0.66 (0.34)	1.48 (0.05-4.62)	–	–	–	–	–	–	1.98 (0-7.84)	–	0.01 (0-0.04)	2
Yamal Peninsula (69-72°N, 67-70°W)			4	0.71 (0.18-1.17)	5.07 (2.48-6.74)	0.81 (0.31-1.15)	1.81 (0.98-2.37)	–	–	–	–	–	–	3.00 (2.24-3.11)	–	0.003 (0 -0.01)	2
Pechora River mouth	Peaty soil	August 1994,		0.5	5.52	0.33	2.86							7.85			
	Loamy soil	August 1995		0.27	2.67	0.38	2.31							3.22			
Yugorskiy Peninsula	Sandy soil			0.07	1.13	0.32	0.57							0.89			2
	Loamy soil				0.06	2.18	0.19	0.26							0.51		
Yamal Peninsula	Sandy soil			0.54	4.83	0.21	1.63							3.13			
	Loamy soil			0.65	5.87	0.15	1.86							3.58			
Aion Island	Peaty soil			4.55	3.31	0.84	1.45							5.77			
	Loamy soil			3.77	2.82	1	2.23							3.45			
Wrangel Island	Peaty soil			4.42	1.41	0.38	0.58							4.13			
	Loamy soil			1.43	0.41	0.32	2.31							2.76			
Shmidt Cape	Peaty soil			1.16	1.22	0.43	1.78							0.76			
	Loamy soil			1.31	0.54	0.32	2.27							1.94			
Taimyr Peninsula (west)	Loamy soil			0.2	2.15	0.08	1.15							3.52			
	Tundra			0.07	0.29	0.16	0.2							2.24			
	Gley soil			0.21	3.58	0.25	2.51							3.2			
Taimyr Peninsula (east)	Loamy soil			0.16	1.55	0.1	0.7							1.79			
	Gley soil			0.11	2.19	0.11	1.47							3.61			
Olenek Gulf	Loamy soil			0.2	2.11	0.62	0.95							1.52			
	Gley soil			0.08	2.17	0.36	1.39							2.1			
Basidiomycetes																	
Yamal Peninsula (69-72°N, 67-70°E)	<i>Mycota</i> sp.	August 1995	1	0.5	3.46	0	9.06	–	–	–	–	–	–	1.5	–	–	6
Yugorskiy Peninsula (68-66°N, 61-66°E)	<i>Russula lutea</i>		2	0.035 (0-0.07)	0.42 (0.34-0.5)	0.45 (0.23-0.67)	1.2 (0.54-1.85)	–	–	–	–	–	–	1.025 (0.75-1.3)	–	–	6
Lichens																	
Central Siberia (72-76°N, 116-144°E)	Lichenophyta	July 1994	1	0	0.06	0	0.27	–	–	–	–	–	–	0	–	0	2
Western Russia (67-70°N, 41-50°E)	Lichenophyta		1	0.04	0.22	0.04	0.7	–	–	–	–	–	–	0	–	0.09	
E. Siberia and Chukotka (69-71°N, 164-179°E)	Lichenophyta		2	–	–	–	–	–	–	–	–	–	–	3.82-5.87	–	–	
Taimyr Peninsula (67°N, 99-111°E)	Lichenophyta		2	–	–	–	–	–	–	–	–	–	–	1.86-2.28	–	–	
Taimyr Peninsula (74°33'N, 98°35'E)	Lychenophyta	May 1995	1	0.25	5.16	1	1.89	–	–	–	–	–	–	0.9	–	–	6
Kotuy River, near Khatanga (71°50'N, 102°20'E)	<i>Dactylina arctica</i>																
	Lichenophyta		3	0.36 (0.16-0.66)	3.42 (1.66-5.12)	1.55 (0-3.04)	2.96 (2.13-4.18)	–	–	–	–	–	–	3.2	–	–	
Yamal Peninsula (69-72°N, 67-70°E)	<i>Cetraria islandica</i>	August 1995	1	–	–	–	–	–	–	–	–	–	–	0	–	–	
Inuvik, NWT	Lichenophyta	1993-1994		0.66	2.10	0.09	0.12	–	–	–	–	–	–	0.16		0.0411	4
Bathurst, NWT	Lichenophyta	1993-1994		0.73	2.27	0.11	0.44	–	–	–	–	–	–	0.35	–	0.005	
Cambridge Bay, NWT	Lichenophyta	1993-1994		1.38	2.40	0.21	0.26	–	–	–	–	–	–	0.53	–	nd	
Makinson Inlet, NWT	<i>Umbellaria</i>			1.0	2.1	1.5	1.1							2.68	18.7	0.72	1
				(0.8-1.2)	(1.9-2.3)	(1.2-1.8)	(0.5-1.7)							(1.63-3.73)	(13.2-24.2)	(0.4-1.04)	
King Edward Pt., NWT	<i>Umbellaria</i>			0.7 (0.4-1.0)	1.9 (1.4-2.4)	1.5 (0.8-2.2)	1.1 (0.9-1.3)							1.43 (0.16-2.70)	25.6 (7.8-43.4)	0.64 (0.47-0.81)	1
Bryophytes																	
Central Siberia (72-76°N, 116-144°E)	Bryophyta (3 spp.)	July 1994	7	0.05-0.04 (0-0.14)	0.95-0.57 (0.07-1.97)	0.039-0.046 (0-0.13)	0.90-0.86 (0.30-2.81)	–	–	–	–	–	–	0.062±0.162 (0-0.43)	–	0 0	2
Western Russia (67-70°N, 41-50°E)	Bryophyta (2 spp.)		3	(0-0.08)	(0.17-0.38)	(0.03-0.08)	(0.29-1.21)	–	–	–	–	–	–	0	–	(0-0.14)	
E. Siberia and Chukotka (69-71°N, 164-179°E)	Bryophyta		2	–	–	–	–	–	–	–	–	–	–	0.00-0.52	–	–	
Taimyr Peninsula (67°N, 99-111°E)	Bryophyta	August 1994	3	–	–	–	–	–	–	–	–	–	–	0.00-1.34	–	–	
Taimyr Peninsula (76°10'N, 99°23'E)	<i>Bryophyta</i> sp.	August 1995	1	0.4	3.7	0.96	2.24	–	–	–	–	–	–	2.4	–	–	6
Yamal Peninsula	Bryophyta	1995	1	–	–	–	–	–	–	–	–	–	–	1.78	–	–	2

(69-72°N, 67-70°E) Yamal Peninsula (69-72°N, 67-70°E)	<i>Bryophyta</i> sp.	July 1995	2	0.53 (0.1-0.96)	1.43 (0.08-2.78)	0.04 (0-0.08)	0.68 (0.56-0.8)	– (1.22-4.8)	–	–	–	–	–	3.01	–	–	6
Mosses																	
Kolyma Delta, E. Siberia 69°21'N, 163°34'E)	<i>Sphagnum</i> sp.	August 1995	1	0	2.82	0	3	–	–	–	–	–	–	3.6	–	–	6
Southern Finland	<i>Sphagnum</i> sp.	1994	20	–	–	–	–	43	33	32	25	6.7	–	140	–	–	3
Northern Finland	<i>Sphagnum</i> sp.	1994	6	–	–	–	–	15	13	12	9.8	2.3	–	51	–	–	3
Northern Norway	<i>Hylocomium splendens</i>	1977	Total	–	–	–	–	15.5	7.6	2.9	1.5	0.35	0.23	–	–	–	5
		1985	of 46	–	–	–	–	1.6	2.2	2.1	1.6	0.42	0.11	–	–	–	
		1990		–	–	–	–	2.0	2.4	1.5	1.4	0.56	0.12	–	–	–	
Southern Norway	<i>Hylocomium splendens</i>	1977		–	–	–	–	17.1	15.7	8.1	3.9	0.97	0.34	–	–	–	5
		1985		–	–	–	–	2.3	2.9	2.6	1.5	0.35	0.15	–	–	–	
		1990		–	–	–	–	2.2	2.5	1.9	1.2	0.15	0.14	–	–	–	
Willows																	
Central Siberia (72-76°N, 116-144°E)	<i>Salix</i> branches	July 1994	1	0.05	1.19	0.14	0.59	–	–	–	–	–	–	0	–	0	2
E. Siberia and Chukotcha (69-71°N, 164-179°E)	<i>Salix</i> branches		1	–	–	–	–	–	–	–	–	–	–	0	–	–	
Yamal Peninsula (69-72°N, 67-70°E)	<i>Salix</i> branches	August 1994	2	–	–	–	–	–	–	–	–	–	–	0.00-5.88	–	–	
Yamal Peninsula (69-72°N, 67-70°E)	<i>Salix</i> sp.	July 1995	1	0.4	2.84	0.16	0.92	–	–	–	–	–	–	3.2	–	–	6
Chukotka Penin., Russia (68°34'N, 180°30'E)	<i>Salix</i> sp.		1	0.48	4.51	1.16	2.91	–	–	–	–	–	–	3.4	–	–	
Wrangel Island, Russia (71°08'N, 179°23'E)	<i>Salix</i> sp.	August 1995	1	0.74	12.36	2.44	4.9	–	–	–	–	–	–	3	–	–	
Yugorskiy Peninsula (68-66°N, 61-66°E)	<i>Salix reptans</i>	1995	1	0	0	0.43	2.36	–	–	–	–	–	–	7.8	–	–	6
Birches																	
Yamal Peninsula (69-72°N, 67-70°E)	<i>Betula</i> leaves	August 1995	3	–	–	–	–	–	–	–	–	–	–	1.66	–	–	6
Yugorskiy Peninsula (68-66°N, 61-66°E)	Betulaceae <i>Betula tundrae</i>		1	3.1	2.91	0.85	2.58	–	–	–	–	–	–	7.47	–	–	6
Yamal Peninsula (69-72°N, 67-70°E)	Betulaceae <i>Betula tundrae</i>	July 1995	1	0.47	1.99	0.18	0.54	–	–	–	–	–	–	4	–	–	
Saxifrage																	
Ellesmere Island (77-81°N)	<i>Saxifragia oppositifolia</i>	Spring 1990	27	1.54±0.65 (0.47-3.15)	4.88±2.20 (1.43-8.62)	1.66±0.45 (0.87-2.29)	1.21±0.47 (0.28-2.15)	–	–	–	–	–	–	5.77±2.80 (1.34-11.2)	11.94±7.99 (1.82-43.0)	0.46±0.19 (0.22-1.01)	1
Axel Heiberg Island (76-82°N)	<i>Saxifrage</i> sp.		2	(1.28-1.35)	(3.58-4.24)	(0.93-0.95)	(0.28-0.30)	–	–	–	–	–	–	(0.92-3.78)	(1.58-1.82)	(0.41-0.48)	1
Misc. Vascular Plants																	
Wrangel Island, Russia (71°08'N, 179°23'E)	Legume	August 1995	1	0.5	5.02	0.2	4.24	–	–	–	–	–	–	3.08	–	–	6
	Leguminosae	1995															
	<i>Oxytropis</i> sp. Rose		1	0.54	3.8	0.78	1.24	–	–	–	–	–	–	4.42	–	–	6
	Rosaceae																
	<i>Dryas punctata</i>		1	0	0.78	0.5	2.95	–	–	–	–	–	–	6.4	–	–	6
Yugorskiy Peninsula (68-66°N, 61-66°E)	Rosaceae <i>Rubus cha-</i> <i>maemorus</i> Buckwheat		1	0	2.71	0.94	6.13	–	–	–	–	–	–	8.6	–	–	6
	Polygonaceae																
	<i>Rumex arcticus</i>																
	Leadwort		1	0.07	0.56	0.09	1.06	–	–	–	–	–	–	1.3	–	–	6
	Plumbaginaceae																
	<i>Armeria maritima</i>		1	1.1	0.56	0.41	1.64	–	–	–	–	–	–	6.27	–	–	6
	Crowberry																
	Empetraceae																
	<i>Empetrum andro-</i> <i>gynum</i> Stonecrop		1	0.1	0.54	0.32	1.32	–	–	–	–	–	–	1.5	–	–	6
	Crassulaceae <i>Rhodiola rosea</i>																
E. Siberian Sea, Aion Island (69°48'N, 169°22'E)	Heath		1	1.6	7.16	0.62	1.6	–	–	–	–	–	–	6.84	–	–	6
Lopatka Cape, E. Siberia (72°11'N, 148°25'E)	Sedge		1	1.1	11.32	0.3	5.92	–	–	–	–	–	–	4.15	–	–	6
	Cyperaceae <i>Eriophorum</i> sp.																

References

- France *et al.* 1997. Σ CBz = Sum of tetra- and pentachlorobenzene and HCBz. Σ HCH = Sum of α -, β -, and γ -HCH. Σ CHL = Sum of oxy, *cis*-, *trans*-chlordane, heptachlor epoxide, and *cis*-, *trans*-nonachlor. Σ DDT = Sum of *o,p'*-DDT, *p,p'*-DDT, *o,p'*-DDD, *p,p'*-DDD, *o,p'*-DDE, and *p,p'*-DDE. Σ PCB = Sum of 7-9 congeners.
- Melnikov *et al.* 1995. Σ CBz = Sum of HCBz and pentachlorobenzene. Σ HCH = Sum of α - and γ -HCH. Σ CHL = Sum of heptachlor, *cis*-chlordane, and *trans*-nonachlor. Σ DDT = Sum of *o,p'*-DDT, *p,p'*-DDT, *o,p'*-DDD, *p,p'*-DDD, *o,p'*-DDE, and *p,p'*-DDE. Σ PCB = Sum of 7-9 congeners.
- Himberg and Pakarinen 1994. Σ 3-CB (trichloro) = Sum of PCB congeners 17, 18, 24, 27, 16, 32, 25, 26, 28, 31, 33, 22. Σ 4-CB (tetrachloro) = Sum of congeners 52, 49, 47, 48, 44, 41, 64, 40, 70, 66. Σ 5-CB (pentachloro) = Sum of congeners 95, 90, 101, 87, 110, 118. Σ 6-CB (hexachloro) = Sum of congeners 136, 151, 149, 146, 132, 153, 141, 138, 128. Σ 7-CB (heptachloro) = Sum of congeners 179, 176, 178, 187, 183, 174, 177, 171, 180, 170, 190.
- B. Elkin unpubl. data, 1995. Σ CBz = HCBz only. Σ HCH = Sum of α -, β -, and γ -HCH. Σ CHL = Sum of oxy, *cis*-, *trans*-chlordane, heptachlor epoxide, and *cis*-, *trans*-nonachlor. Σ DDT = Sum of *p,p'*-DDE, *p,p'*-DDD and *p,p'*-DDT. Σ PCB = Sum of 43 congeners.
- Lead *et al.* 1996. Σ 3-CB (trichloro) = Sum of PCB congeners 28, 30. Σ 4-CB (tetrachloro) = Sum of congeners 40, 54, 52, 61/74, 66. Σ 5-CB (pentachloro) = Sum of congeners 104, 101, 119, 110, 82/151, 118, 105. Σ 6-CB (hexachloro) = Sum of congeners 155, 149, 138, 126, 128. Σ 7-CB (heptachloro) = Sum of congeners 188, 187, 183, 185, 170, 180. Σ 8-CB (octachloro) = Sum of congeners 202/156, 194.
- Melnikov *et al.* 1996. Σ CBz = Sum of HCBz and pentachlorobenzene. Σ HCH = Sum of α -, β -, and γ -HCH. Σ CHL = Sum of oxy, *cis*-, *trans*-chlordane, heptachlor, and *cis*-, *trans*-nonachlor. Σ DDT = Sum of *o,p'*-DDT, *p,p'*-DDT, *o,p'*-DDD, *p,p'*-DDD, *o,p'*-DDE, and *p,p'*-DDE. Σ PCB = Sum of 7-9 congeners.

Table 6-A4. Concentrations of organochlorine residues in terrestrial herbivores, birds in the terrestrial food web in summer, and peregrine falcon prey species. Note that different entries are in different units, and may represent dry, wet, or lipid weights (dw, ww, or lw). Brackets indicate ranges, and for the Swedish data, the range of mean concentrations.

Capture location	Country	n	Sex	Tissue	Lipid, %	Units	α-HCH	β-HCH	γ-HCH	ΣHCH	p,p'-DDE	p,p'-DDD	p,p'-DDT	ΣDDT	Mirex	Dieldrin	cis + trans CHL	oxy-CHL	Hepta-chlor-epoxide	ΣCHL	ΣCBz	ΣPCB	Toxa-phene	Refer-ence
Rangifer tarandus (Caribou/reindeer)																								
Pond Inlet, NWT	Canada	1	♀	Fat	—	ng/g ww	9.8	1.8	1.6	13	0.4	1.2	1.3	2	0.2	0.8	2.1	3	—	5	30	11	—	4
Lake Harbour, NWT		1	♂	Fat	—		22.0	1.3	1.7	25	1.2	0.5	1.5	3	0.1	1.5	0.3	3.8	—	5	47	25	—	
Iqaluit, NWT		1	♂	Fat	—		25.0	0.8	1.5	27	1.6	0.4	< 0.3	2	0.3	0.9	0.1	1.2	—	2	84	52	—	
Iqaluit, NWT		1	♂	Liver	—		6.9	1.4	0.1	8	0.5	0.6	0.3	1	0.7	2	0.3	6.5	—	8	1	8	—	
Iqaluit, NWT		1	♂	Muscle	—		1.0	0.3	0.1	1	0.1	0.1	0.1	2	0.1	0.05	0.05	0.06	—	0.2	2	2	—	
Arctic Bay, NWT		1	♀	Fat	—		39.0	3	2.8	42	0.6	1.2	0.4	2	0.08	0.8	0.8	2.9	—	5	57	12	—	
Clyde River, NWT		1	♀	Fat	—		6.0	0.5	0.3	7	0.4	< 0.3	< 0.4	1	0.4	0.7	< 0.1	2.8	—	3	57	23	—	
Broughton Island, NWT	Canada	1		Fat	—	ng/g ww	18	0.6	0.6	19	4.2	0.7	0.9	4	< 0.1	1.7	< 0.1	2.5	—	5	25	33	13	5
Broughton Island, NWT		1		Muscle	—		0.7	0.1	0.1	1	1.1	0.1	0.4	1	0.1	0.4	0.1	1.3	—	2	1.2	10	3	
Prince of Wales Island (1978)	Canada	5	♂	Liver	—	ng/g ww	2.2	< 0.05	< 0.05	2.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	1.6	nd	1.6	0.93	< 0.15	—	6
Arviat, NWT	Canada	10		Fat	78.6	ng/g lw	—	—	—	26.9	—	—	—	0.5	—	0.4	—	—	—	1.6	56.2	6.2	—	3
Southampton Is., NWT		10		Fat	85.6		—	—	—	26.7	—	—	—	0.9	—	0.3	—	—	—	1.3	39.1	8.8	—	
Cape Dorset, NWT		8		Fat	54.5		—	—	—	39.8	—	—	—	2.6	—	0.6	—	—	—	5	108.3	31.7	—	
Lake Harbour, NWT		10		Fat	83.5		—	—	—	27.8	—	—	—	1.8	—	0.5	—	—	—	2.4	129.4	25.2	—	
Cambridge Bay, NWT		10		Fat	81.4		—	—	—	15.5	—	—	—	0.31	—	nd	—	—	—	0.76	41.3	6.3	—	
Inuvik, NWT		9		Fat	84.4		—	—	—	3.3	—	—	—	nd	—	nd	—	—	—	0.04	26.0	0.55	—	
Bathurst Area, NWT		20		Fat	45.5		—	—	—	9.7	—	—	—	1.9	—	0.07	—	—	—	0.8	32.9	10.7	—	
Pond Inlet, NWT	Canada	10		Liver	4.5	ng/g ww	2.3	0.4	0.0	2.7	0.0	0.0	0.0	0.0	0.2	0.7	0.0	5.0	0.4	5.4	2.7	1.2	—	
Taloyoak, NWT		10		Liver	5.2		2.0	0.3	0.0	2.3	0.0	0.0	0.0	0.0	0.2	0.4	0.0	3.3	0.5	3.9	0.7	0.6	—	
Beverly, Yukon		9		Liver	4.1		0.6	0.3	0.0	0.9	0.0	0.0	0.0	0.0	0.1	0.1	0.0	1.1	0.1	1.3	1.5	0.5	—	
Ross River (Finlayson Herd)	Canada	5		Fat	78.8 (67-88)	ng/g ww	4.05 (2.3-7.95)	0.655 (0.70-2.3)	0.33 (n.d.-0.65)	5.035 (3.0-10.9)	< 0.08 (n.d.-0.5)	< 0.05 (n.d.-n.d.)	< 0.25 (n.d.-n.d.)	< 0.13 (n.d.-0.5)	< 0.04 (n.d.-9.5)	< 0.5 (n.d.-n.d.)	< 0.035 (n.d.-n.d.)	< 0.45 (n.d.-n.d.)	< 0.4 (n.d.-n.d.)	< 0.13 (n.d.-n.d.)	32.1 (20-56.5)	< 1.3 (n.d.-n.d.)	—	8
Yana Gulf Coast	Russia	1		Liver	—	ng/g ww	2.9	—	2.1	5.00	2.68	1.16	0.84	5.52	0.4	0	0	—	0.2	0.12	5.84	34.5	—	2
Pronchishev Range	1994	1		Liver	—		2.6	—	2.2	4.80	4.20	2.68	1.52	9.36	0	0	0.05	—	0	0.45	16.6	26.3	—	
Yamal Peninsula		1		Liver	—		5	—	5.4	10.4	40.6	1.72	0.84	43.5	0	0	0.16	—	0.04	0.76	10.9	41.1	—	
Taimyr Peninsula		1		Liver	—		5.6	—	7.2	12.8	3.48	0.08	1.08	7.00	0	0	0.2	—	0.08	0.48	1.68	16.5	—	
Kanin Peninsula		1		Liver	—		2	—	2.6	4.60	3.56	0.68	0.68	5.12	0	0	0.12	—	0	1	3.14	18.4	—	
Yamal Peninsula	Russia	1		Liver	—	ng/g ww	0.11	0.08	0.12	0.31	0.57	0.4	0.28	1.29	0	0	0.04	—	0	0.26	0.08	2.92	—	10
Taimyr Peninsula	1995	1		Liver	—		0.01	0.02	0.09	0.3	0.25	0.1	0.32	0.93	0	0	0.05	—	0.04	0.44	0.14	3.1	—	
Yugorskiy Peninsula		1		Liver	—		0.07	0.14	0.09	0.12	0.33	0.28	0.25	0.76	0	0	0.03	—	0.13	0.4	0.05	3.4	—	
Kotelniy Island		1		Liver	—		0.04	0.06	0.11	0.21	0.36	0.12	0.25	0.78	0	0	0	—	0	0.22	0.03	1.6	—	
Yenisey River		1		Liver	—		0.04	0.13	0.09	0.26	0.26	0.12	0.32	0.79	0	0	0.08	—	0.14	0.46	0.17	2.1	—	
Svalbard	Norway	35		Liver	2.18 (0.08-4.15)	ng/g ww	< 0.24	0.99 (1.0-1.4)	0.50	1.43 (0.99-1.87)	< 0.42	< 0.80	< 1.20	< 2.42	< 0.60	—	< 0.36	0.78 (0.4-1.2)	—	0.78 (0.39-1.22)	0.283 (0-0.91)	< 14.28	—	1
Svalbard	Norway	35		Fat	86.3 (21.6-95.9)		2.65 (0-6.58)	1.2 (0-34.2)	< 0.24	6.07 (0-36.7)	2.10	< 0.80	< 1.20	2.33	< 0.60	—	< 0.36	< 0.36	—	< 1.86	8.68 (0-34.7)	< 14.28	—	
Finnmark	Norway	6		Fat	—		—	< 10	< 10	< 20	—	—	—	< 10	< 10	< 10	—	—	—	0.0195 (0.003-0.042)	< 80	—	11	
Abisko	Sweden	10/y 1990-1994		Muscle	—	ng/g lw	4-12	—	2-8	—	—	—	—	1-2	—	—	—	—	—	—	—	48	—	12
Ovibos moschatus (Muskox)																								
Sachs Harbour (1985)	Canada	4	♂	Liver	—	ng/g ww	1.45	< 0.05	< 0.05	1.45	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	2.5	n.d.	2.5	3.88	0.26	—	6
Sachs Harbour (1985)	Canada	6	♀	Liver	—		1.21	< 0.05	< 0.05	1.21	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	2.15	n.d.	2.15	1.83	0.21	—	

<i>Lepus arcticus</i> (Arctic hare)																								
Arctic Bay, NWT	Canada	1	♀	Fat	–	ng/g ww	4.6	0.3	0.4	5	0.6	< 0.1	0.3	0.9	0.1	0.9	0.04	0.9	–	2	11	3	–	4
Arctic Bay, NWT	Canada	1	♀	Liver	–		0.4	< 0.1	0.1	1	0.05	< 0.1	< 0.3	< 0.4	0.03	0.4	< 0.08	0.2	–	0.6	0.4	1	–	
Arctic Bay, NWT	Canada	1	♀	Muscle	–		0.4	< 0.01	0.02	1	0.01	0.02	0.2	< 0.2	0.01	0.03	0.2	1.7	–	4	0.2	0.4	–	
<i>Lepus</i> sp. (Hare)																								
Grande-Baleine, Quebec	Canada	9		Fat	1.24	ng/g ww	<1	<1	<1	<1	–	–	–	<1	<1	<1	<1	<1	<1	<1	1	<1	–	9
		3		Liver	3.57		1	<1	<1	1	–	–	–	<1	<1	<1	<1	<1	<1	<1	1.04	<1	–	
<i>Spermophilus parryi</i> (Arctic Ground Squirrel)																								
Rankin Inlet, NWT	Canada	7			–	ng/g ww	–	–	–	–	0	–	–	–	–	0	–	–	–	–	–	0	–	7
<i>Dicrostonyx groenlandicus</i> (Collared lemming)																								
Rankin Inlet, NWT	Canada	13		Whole body	–	ng/g ww	–	–	–	–	0.008 (0-0.114)	–	–	–	–	0	–	–	–	–	–	0.055 (0-4.168)	–	7
<i>Lemmus sibiricus</i> (Brown lemming)																								
73°17', 116°54'	Russia	1		Liver	–	ng/g dw	0.94	–	1.3	2.24	1.01	0.24	0.69	2.69	0	0	–	–	0.1	0.2	0.63	13.93	–	2
75°30', 143°14'	Russia	1		Liver	–		0.27	–	0.38	0.65	0.08	0.07	0.43	0.67	0	0	–	–	0.06	0.12	0.42	11.07	–	
<i>Branta bernicla</i> (Brant)																								
Kara Sea	Russia	1		Liver		ng/g ww	0.69	0	1.03	1.72	6.28	0.43	5.76	14.37	0	–	0.09	–	0.88	0.85	1.12	99.5	–	10
<i>Anser fabalis</i> (Bean goose)																								
RZ*	Russia	1		Liver	–		0.06	–	–	0.14	0.42	–	–	0.84	0.00	0.00	–	–	0.07	0.06	0.12	5.25	–	2
<i>Lagopus mutus</i> (Ptarmigan)																								
Broughton Island, NWT	Canada	1	♂	Muscle	–	ng/g ww	0.3	< 0.02	0.05	0.4	0.1	0.09	0.14	0.3	< 0.02	0.13	< 0.02	0.06	–	0.8	0.3	4	–	4
Arctic Bay, NWT	Canada	1	♀	Liver	–		1.7	< 0.06	0.06	1.8	0.7	0.2	0.7	1.6	0.7	0.15	0.11	0.11	–	0.4	0.4	0.2	–	
Arctic Bay, NWT	Canada	1	♀	Muscle	–		0.9	0.03	0.08	1	0.05	0.08	0.14	0.3	0.01	0.07	0.06	0.04	–	0.2	0.3	0.6	–	
Lake Harbour, NWT	Canada	1	♀	Fat	–		47	1.3	4.3	53	2.4	2.2	6.7	11	0.02	2.2	2.1	2.2	–	7.4	5.8	12	–	
Broughton Island, NWT	Canada	1		Muscle	–		0.5	0.2	0.3	1	0.2	0.1	0.2	0.5	–	0.1	0.2	0.1	–	1	0.3	18	3	5
<i>Lagopus lagopus</i> (Willow Ptarmigan)																								
ESS*	Russia	1		Liver	–	ng/g ww	0.22	0	0.18	0.4	1.09	1.44	0.48	3.47	0.12	–	0.38	–	0	0.84	0.28	14.8	–	10
<i>Philomachus pugnax</i> (Ruff)																								
RZ*	Russia	1		Liver	–	ng/g ww	0.02	–	–	0.06	0.6	–	–	0.73	0.00	0.00	–	–	0.66	0.09	0.13	0.40	–	2
ESS*	Russia	1		Liver	–		0.18	–	–	0.54	1.45	–	–	2.08	0.15	–	–	–	0.1	1.61	0.47	52.9	–	10
<i>Eudromia morinellus</i> (Dotterel)																								
RZ*	Russia	1		Liver	–		0.06	–	–	0.13	0.5	–	–	0.68	0.00	0.00	–	–	0.00	0.04	0.19	0.85	–	2
<i>Clangula hyemalis</i> (Oldsquaw, long-tailed duck)																								
TP*	Russia	2		Liver	–		7.2 (0.5-13.9)	–	–	7.81 (0.6-15.0)	8.925 (6.15-11.7)	–	–	18.7 (10.2-27.2)	11.48 (0.46-22.5)	–	–	–	0.28 (0.12-0.44)	0.495 (0.32-0.67)	8.4 (0.9-15.9)	156.2 (45.4-267)	–	10
<i>Squatarola squatarola</i> (Black bellied plover)																								
YP*	Russia	1		Liver	–		0.06	–	–	0.11	0.24	–	–	0.88	0.00	0.00	–	–	0.08	0.10	0.18	1.16	–	2
<i>Stercorarius pomarinus</i> (Pomeraine jaeger)																								
ESS*	Russia	1		Liver	–		0.17	–	–	0.17	17.8	–	–	31.42	0.1	–	–	–	3.02	0.49	3.08	135	–	10
<i>Stercorarius longicaudus</i> (Long-tailed jaeger)																								
TP*	Russia	1		Liver	–		0.12	–	–	0.12	6.85	–	–	11.2	0.36	–	–	–	0	0.97	4.25	57.9	–	10
Peregrine falcon prey species from near Rankin Inlet, NWT, 1993																								
<i>Eremophila alpestris</i> (Horned lark)		7		Whole body	–	µg/g ww	–	–	–	–	0.07 (0-0.17)	–	–	–	–	0	–	–	–	–	–	0.008 (0-0.06)	–	7
<i>Charadrius semipalmatus</i> (Semipalmated plover)		5		Whole body	–		–	–	–	–	0.50 (0.102-1.07)	–	–	–	–	0.02 (0-0.11)	–	–	–	–	–	0.40 (0-2.06)	–	
<i>Calcarius lapponicus</i> (Lapland longspur)		10		Whole body	–		–	–	–	–	0.005 (0-0.016)	–	–	–	–	0 (0-0.36)	–	–	–	–	–	0.03	–	
<i>Cephus grylle</i> (Black guillemot)		8		Whole body	–		–	–	–	–	0.17 (0.10-0.24)	–	–	–	–	0.004 (0-0.02)	–	–	–	–	–	0.38 (0.13-0.66)	–	
<i>Anas acuta</i> (Pintail)		4		Whole body	–		–	–	–	–	0.47 (0.09-0.91)	–	–	–	–	0.09 (0-0.36)	–	–	–	–	–	2.11 (0-5.40)	–	
<i>Calidris pusilla</i> (Semipalmated sandpiper)		3		Whole body	–		–	–	–	–	0.21 (0-0.70)	–	–	–	–	0 (0-0.10)	–	–	–	–	–	0.03	–	
<i>Anthus spinoletta</i> (Water pipit)		5		Whole body	–		–	–	–	–	0.69 (0.004-9.50)	–	–	–	–	0 (0-0.79)	–	–	–	–	–	0.14	–	

Capture location	Country	n	Sex	Tissue	Lipid, %	Units	α-HCH	β-HCH	γ-HCH	ΣHCH	<i>p,p'</i> -DDE	<i>p,p'</i> -DDD	<i>p,p'</i> -DDT	ΣDDT	Mirex	Dieldrin	<i>cis</i> + <i>trans</i> -CHL	oxy-CHL	Hepta-chlor-epoxide	ΣCHL	ΣCBz	ΣPCB	Toxa-phene	Refer-ence
<i>Calidris alpina</i> (Dunlin)		1		Whole body	–		–	–	–	–	0.04	–	–	–	–	0	–	–	–	–	–	0	–	
<i>Plectrophenax nivalis</i> (Snow bunting)		2		Whole body	–		–	–	–	–	0 (0-0.07)	–	–	–	–	0	–	–	–	–	–	0.03	–	
<i>Clangula hyemalis</i> (Oldsquaw, long-tailed duck)		5		Whole body	–		–	–	–	–	1.08 (0.61-3.75)	–	–	–	–	0.51 (0.02-4.02)	–	–	–	–	–	6.88 (2.88-18.9)	–	
Peregrine falcon prey species from Northern Sweden, 1976-1977																								
<i>Anas crecca</i> (Teal)		6		Muscle	3.1	ppm ww	–	–	–	–	–	–	–	0.02 (0.01-0.05)	–	–	–	–	–	–	–	0.14 (0.07-0.31)	–	13
<i>Aythya fuligula</i> (Tufted duck)		3		Muscle	3.4		–	–	–	–	–	–	–	0.06 (0.02-0.10)	–	–	–	–	–	–	–	0.21 (0.11-0.40)	–	
<i>Lagopus lagopus</i> (Willow grouse)		13		Muscle	2.5		–	–	–	–	–	–	–	n.d.	–	–	–	–	–	–	–	n.d.	–	
<i>Lagopus mutus</i> (Ptarmigan)		8		Muscle	2.5		–	–	–	–	–	–	–	n.d.	–	–	–	–	–	–	–	n.d.	–	
<i>Fluvialis apricaria</i> (Golden plover)		5		Muscle	3.1		–	–	–	–	–	–	–	0.93 (0.07-2.90)	–	–	–	–	–	–	–	0.19 (0.09-0.28)	–	
<i>Limicola falcinellus</i> (Broad-billed sandpiper)		1		Muscle			–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
<i>Philomachus pugnax</i> (Ruff)		10		Muscle	2.9		–	–	–	–	–	–	–	0.12 (0.02-0.58)	–	–	–	–	–	–	–	0.02 (n.d.-0.05)	–	
<i>Gallinago gallinago</i> (Snipe)		5		Muscle	2.6		–	–	–	–	–	–	–	0.02 (n.d.-0.04)	–	–	–	–	–	–	–	0.03 (n.d.-0.05)	–	
<i>Numenius phaeopus</i> (Whimbrel)		4		Muscle	3.9		–	–	–	–	–	–	–	0.1 (0.08-0.11)	–	–	–	–	–	–	–	0.09 (0.07-0.12)	–	
<i>Tringa erythropus</i> (Spotted redshank)		4		Muscle	2.4		–	–	–	–	–	–	–	0.67 (0.32-1.60)	–	–	–	–	–	–	–	2.00 (0.14-6.10)	–	
<i>Tringa nebularia</i> (Greenshank)		5		Muscle	3.2		–	–	–	–	–	–	–	0.95 (0.42-1.70)	–	–	–	–	–	–	–	0.92 (0.21-2)	–	
<i>Tringa glareola</i> (Wood sandpiper)		5		Muscle	4.2		–	–	–	–	–	–	–	0.12 (0.04-0.18)	–	–	–	–	–	–	–	0.06 (0.04-0.08)	–	
<i>Larus ridibundus</i> (Black-headed gull)		7		Muscle	4.9		–	–	–	–	–	–	–	0.31 (0.15-0.54)	–	–	–	–	–	–	–	1.89 (0.31-5.70)	–	
<i>Turdus pilaris</i> (Fieldfare)		5		Muscle	2.3		–	–	–	–	–	–	–	0.29 (0.03-1.10)	–	–	–	–	–	–	–	0.14 (0.08-0.23)	–	
<i>Turdus iliacus</i> (Redwing)		5		Muscle	2.2		–	–	–	–	–	–	–	0.11 (0.06-0.22)	–	–	–	–	–	–	–	0.22 (0.06-0.75)	–	

– indicates that the compound was not measured; n.d. indicates that the compound was not detected.

* Russian Arctic Regions: BI: Bel'kovskiy Island; RZ: Russkiy Zavorot; ET: East Taimyr; YP: Yamal Peninsula; TP: Taimyr Peninsula; ESS: East Siberian Sea.

References and explanations of summation in tables

1. J.U. Skaare *et al.* unpubl. data. ΣHCH = Sum of α-, β-, and γ-HCH. ΣDDT = Sum of *o,p'*-DDT, *p,p'*-DDT, *o,p'*-DDD, *p,p'*-DDD, and *p,p'*-DDE. ΣCHL = Sum of oxychlordane, *cis*- and *trans*-chlordane, *cis*- and *trans*-nonachlor or their quantification limits. ΣCBz = HCBz only. ΣPCB = Sum of quantification limits of 35 congeners.
2. Melnikov *et al.* 1995. ΣHCH = Sum of α- and γ-HCH. ΣDDT = Sum of *o,p'*-DDT, *p,p'*-DDT, *o,p'*-DDD, *p,p'*-DDD, *o,p'*-DDE, and *p,p'*-DDE. ΣCHL = Sum of heptachlor, *cis*-chlordane, and *trans*-nonachlor. ΣCBz = Sum of hexachlorobenzene and pentachlorobenzene. ΣPCB = Sum of 7-9 congeners.
3. Elkin and Bethke 1995 and unpubl. data. ΣHCH = Sum of α-, β-, and γ-HCH. ΣCHL = Sum of oxy, *cis*-, and *trans*-chlordane, heptachlor epoxide, and *cis*- and *trans*-nonachlor. ΣDDT = Sum of *p,p'*-DDE, *p,p'*-DDD and *p,p'*-DDT. ΣCBz = HCBz only. ΣPCB = Sum of 43 congeners.
4. Thomas and Hamilton 1988.
5. Muir *et al.* 1988b. ΣHCH = Sum of α-, β-, and γ-HCH. ΣSDDT = Sum of *p,p'*-DDE, *p,p'*-DDD and *p,p'*-DDT. ΣCBz = HCBz only.
6. National Registry of Toxic Chemical Residue Database, Canadian Wildlife Service, Hull, Quebec, unpubl. data. ΣPCB = Sum of congeners 138 and 180; other congeners not detected at < 0.07.
7. Johnstone 1994.
8. Gamberg 1993. ΣHCH = Sum of α-, β-, and γ-HCH. ΣDDT = Sum of *o,p'* and *p,p'* DDE, DDD, and DDT. ΣCHL = Sum of oxy, *cis*-, and *trans*-chlordane, heptachlor, and *cis*- and *trans*-nonachlor. ΣCBz = HCBz only.
9. SOMER 1993a. ΣHCH = Sum of α-, β-, and γ-HCH. ΣDDT = Sum of DDE, DDD, and DDT. ΣCHL = Sum of oxy, *cis*-, and *trans*-chlordane, heptachlor epoxide, and *cis*- and *trans*-nonachlor. ΣCBZ = HCBz only.
10. Melnikov *et al.* 1995. ΣHCH = Sum of α-, β-, and γ-HCH. ΣDDT = Sum of *o,p'*-DDT, *p,p'*-DDT, *o,p'*-DDD, *p,p'*-DDD, *o,p'*-DDE, and *p,p'*-DDE. ΣCHL = Sum of heptachlor, *cis*-chlordane, and *trans*-nonachlor. ΣCBz = Sum of hexachlorobenzene and pentachlorobenzene. ΣPCB = Sum of 7-9 congeners.
11. J.U. Skaare unpubl. data 1996. ΣHCH = Sum of β-, and γ-HCH. ΣCBZ = HCBz only. ΣPCB = Sum of detection limits of 8 congeners.
12. M. Olsson unpubl. data. ΣPCB = Congeners 118, 138, and 153.
13. Lindberg *et al.* 1985. ΣDDT = *p,p'*-DDE, *p,p'*-DDD, and *p,p'*-DDT

Table 6-A5. Concentrations of organochlorine residues in terrestrial carnivores, including birds of prey. All data for birds of prey are in µg/g ww, data for all other all terrestrial carnivores are in ng/g ww.

Capture location	n, single/ group	Tissue	Age, months	% Lipid	α- HCH	β- HCH	γ- HCH	ΣHCH	p,p'- DDE	p,p'- DDD	p,p'- DDT	ΣDDT	Mirex	Dieldrin	cis + trans CHL	oxy- CHL	Heptachlor- epoxide	ΣCHL	HCBz	ΣPCB	Refer- ence	
<i>Falco peregrinus anatum</i> (Peregrine falcon, <i>anatum</i> race)																						
NWT and Yukon 1966-1972	3-7	Eggs	–	–	–	–	–	–	12.9	0.28	0.04	13.2	–	0.69	–	–	0.16	–	0.016	–	1	
NWT and Yukon 1973-79	1-17	Eggs	–	–	n.d.	0.03	n.d.	0.03	11.4	0.12	0.27	11.8	0.32	0.67	n.d.	0.12	0.21	–	0.048	8.8		
NWT and Yukon 1980-87	5-13	Eggs	–	–	–	0.08	n.d.	0.08	12.8	0.03	0.03	12.9	0.28	0.34	n.d.	0.10	0.24	–	0.047	5.6		
<i>Falco peregrinus tundrius</i> (Peregrine falcon, <i>tundrius</i> race)																						
Collections before 1990																						
NWT and Ungava 1966-1972	2-31	Eggs	–	–	–	–	–	–	5.1	0.3	0.33	6.4	–	0.04	–	–	0.006	–	0.12	–		
NWT and Ungava 1973-1979	3-12	Eggs	–	–	n.d.	n.d.	n.d.	n.d.	11.9	0.12	0.13	12.4	0.04	0.69	–	0.03	0.045	–	0.33	12.8		
NWT and Ungava 1980-1987	7-26	Eggs	–	–	n.d.	0.05	n.d.	0.05	6.8	0.05	0.04	7	0.2	0.57	–	0.16	0.046	–	0.39	9.8		
Rankin Inlet, NWT 1981-1985	11-25	Eggs	–	–	–	–	–	–	7.59 (1.79-29.3)	0.04 (0.0-0.37)	0.1 (0.0-1.41)	–	–	0.41 (0.13-1.66)	–	0.21 (0.08-0.80)	0.36 (0.09-5.92)	–	0.03 (0.0-0.15)	8.74 (1.95-47.76)	7	
Rankin Inlet, NWT 1981-1985	18	Chick blood	–	–	–	–	–	–	0.02 (0-0.08)	–	–	–	–	n.d.	–	–	n.d.	–	–	n.d.		
Rankin Inlet, NWT 1981-1985	22	Adult- blood (♂)	–	–	–	–	–	–	0.93 (0.18-8.19)	–	–	–	–	0.05 (0-0.30)	–	–	0.06 (0-0.35)	–	–	0.23 (0-2.55)		
Rankin Inlet, NWT 1981-1985	62	Adult- blood (♀)	–	–	–	–	–	–	0.76 (0.15-6.56)	–	–	–	–	0.07 (0-0.27)	–	–	0.04 (0-0.72)	–	–	0.53 (0-3.84)		
Collections after 1990																						
Rankin Inlet, NWT 1991-1994	20	Eggs	–	–	–	–	–	–	4.45 (0.76-28)	0.012 (0-0.20)	0.004 (0-0.03)	–	0.496	0.361 (0.05-1.8)	–	0.211 (0.04-0.90)	0.265 (0.05-1.4)	–	0.03 (0.0-0.17)	8.31 (1.87-45.6)	2	
Rankin Inlet, NWT 1991-1996	79	Chick blood	–	–	–	–	–	–	0.059 (0-2.7)	n.d.	0.002 (0-0.18)	0.06 (0-0.16)	0.006 (0-0.6)	0.002 (0-0.6)	–	0.003 (0-0.7)	0.001 (0-0.04)	–	0.001 (0-0.016)	0.124 (0-0.26)	2	
Rankin Inlet, NWT	28	Adult- blood (♂)	–	–	–	–	–	–	0.32 (0.50-1.9)	n.d. (0-0.40)	0.46 (0-0.30)	0.023 (0-0.92)	0.03 (0-0.043)	0.032 (0-3.3)	–	0.012 (0-0.94)	0.025 (0-0.94)	–	0.002 (0-0.94)	0.202 (0-13.9)		
Rankin Inlet, NWT	51	Adult- blood (♀)	–	–	–	–	–	–	0.6 (0-4.5)	n.d.	n.d.	n.d.	0.079 (0-2.1)	0.03 (0-0.37)	–	0.005 (0-0.94)	n.d.	–	0.005 (0-0.94)	0.95 (0-13.9)		
<i>Peregrine chicks found dead:</i>																						
Rankin Inlet, NWT 1991-1994	7	Chick liver	<1	–	–	–	–	–	9.56	0.048	0.058	9.67	0.90	0.33	–	0.82	0.67	–	0.16	25.64	2	
Rankin Inlet, NWT 1991-1995	7	Chick-breast	<1	–	–	–	–	–	5.46	1.35	0.11	6.92	0.35	0.048	–	0.54	0.19	–	0.085	15.99		
Kola Peninsula, Russia	8	Egg		3.6			0.018	0.086	3.5	0.009	0.022		0.019	0.059	0.008	0.033	0.039	–	0.033	7	10	
<i>Haliaeetus albicilla</i> (White-tailed sea eagle)																						
1974-1994																						
W. Coast, 63°N, Norway	3-9	Eggs	–	–	–	–	–	0.03±0.01	9.32±13.0	–	–	10.4±14.62	0.15	0.32±0.22	–	–	–	–	1.17±0.71	0.19±0.21	39.8±43.8	9
W. Coast, 64°30'N, Norway	1-6	Eggs	–	–	–	–	–	0.04±0.01	3.37±1.11	–	–	3.47±1.11	–	0.25	–	–	–	–	1.41±0.71	0.09±0.06	8.56±1.55	
W. Coast, 66°N, Norway	5-24	Eggs	–	–	–	–	–	0.04±0.03	3.39±2.18	–	–	3.73±2.47	0.04	0.27±0.24	–	–	–	–	0.60±0.52	0.06±0.05	8.31±6.05	
W. Coast, 66-69°N, Norway	4-21	Eggs	–	–	–	–	–	0.04±0.07	2.79±1.77	–	–	2.98±1.95	0.04	0.17±0.09	–	–	–	–	0.94±0.91	0.05±0.04	6.75±3.95	
All locations, Norway, 1994	12-20	Eggs	–	–	–	–	–	0.04±0.05	2.6±1.4	–	–	–	0.07	0.18±0.03	–	–	–	–	0.86±0.53	0.06±0.05	7.1±4.1	
Kola Peninsula, Russia	8	Egg		4.1			0	0.012	0.7	0.024	0		0.002	0	0.008	0.004	0.003	–	0.004	2	10	
<i>Falco columbarius</i> (Merlin)																						
Unknown Arctic location	1	Eggs	–	–	–	–	–	–	33.2	–	–	–	–	0.23	–	–	0.082	–	0.003	1.3	3	
Unknown Arctic location	4	Eggs	–	–	–	–	–	–	16.5	–	–	–	–	0.95	–	–	0.29	–	0.047	–		
<i>Falco rusticolus</i> (Gyrfalcon)																						
NWT 1966	1	Eggs	–	–	–	–	–	–	9.02	0.048	n.d.	9.1	–	0.17	–	–	0.057	–	0.02	–	3	
NWT and Yukon 1973-1979	5-10	Eggs	–	–	–	–	–	–	0.33	n.d.	n.d.	0.33	–	0.016	–	–	0.016	–	0.014	0.6		
NWT and Yukon 1980-1988	6	Eggs	–	–	–	–	–	–	0.12	–	–	0.12	–	0.02	n.d.	0.03	0.03	–	0.07	0.47		
Iceland 1979-1992	28	Muscle	0-6	<3	–	–	–	n.d.	–	–	–	0.34	–	–	–	–	–	–	0.02	1.42	4	
Iceland 1979-1992	14	Muscle	7-12	<3	–	–	–	n.d.	–	–	–	1.63	–	–	–	–	–	–	0.10	8.88		
Iceland 1979-1992	9	Muscle	13-18	<3	–	–	–	n.d.	–	–	–	4.13	–	–	–	–	–	–	0.12	26.3		
Iceland 1979-1992	5	Muscle	15±28+	<3	–	–	–	n.d.	–	–	–	9.15	–	–	–	–	–	–	0.18	37.1		
<i>Mustela vison</i> (Mink)																						
(ng/g wet weight)																						
Inuvik, NWT 1992	21	Liver	–	5.7	–	–	–	0.10	–	–	–	0.77	–	0.15	–	–	–	–	1.46	0.31	5.32	5
Inuvik, NWT 1993	17	Liver	–	6.2	–	–	–	0.18	–	–	–	1.24	–	0.15	–	–	–	–	1.51	0.44	11.57	
Inuvik, NWT 1994	20	Liver	–	4.5	–	–	–	0.04	–	–	–	1.58	–	0.07	–	–	–	–	1.77	0.26	4.94	
Fort Good Hope, NWT	18	Liver	–	7.5	–	–	–	0.16	–	–	–	3.35	–	0.45	–	–	–	–	2.30	0.67	17.17	
Fort Rae, NWT	14	Liver	–	5.9	–	–	–	0.20	–	–	–	4.73	–	0.22	–	–	–	–	2.97	0.48	24.7	
Fort Providence, NWT	21	Liver	–	5.54	–	–	–	0.05	–	–	–	10.86	–	0.23	–	–	–	–	2.2	0.38	92.5	
Fort Liard, NWT	4	Liver	–	5.7	–	–	–	0.26	–	–	–	13.66	–	0.22	–	–	–	–	1.67	0.83	25.83	

Capture location	n, single/ group	Tissue	Age, months	% Lipid	α- HCH	β- HCH	γ- HCH	ΣHCH	<i>p,p'</i> - DDE	<i>p,p'</i> - DDD	<i>p,p'</i> - DDT	ΣDDT	Mirex	Dieldrin	<i>cis</i> + <i>trans</i> CHL	oxy- CHL	Heptachlor- epoxide	ΣCHL	HCbz	ΣPCB	Refer- ence
Fort Resolution, NWT	7	Liver	–	6.2	–	–	–	0.03	–	–	–	7.41	–	0.16	–	–	–	0.61	0.31	25.15	
Fort Smith, NWT	26	Liver	–	4.5	–	–	–	0.11	–	–	–	3.75	–	0.74	–	–	–	3.48	0.52	23.51	
Grande-Baleine, Quebec	2	Muscle	–	5.88	<1	<1	<1	<1	–	–	–	16.61	<1	3.55	<1	5.82	1.04	6.86	1.30	161.15	6c
Grande-Baleine, Quebec	2	Liver	–	4.43	<1	<1	<1	<1	–	–	–	43.18	3.12	6.62	<1	21.38	1.39	22.77	2.17	351.14	6a
<i>Mustela erminea</i> (Ermine) (ng/g wet weight).																					
Grande-Baleine, Quebec	1	Muscle	–	1.96	<1	<1	<1	<1	–	–	–	<1	<1	<1	<1	<1	<1	<1	<1	13.67	6 a
<i>Martes americana</i> (Marten) (ng/g wet weight).																					
Fort Good Hope, NWT	16	Liver	–	4.5	–	–	–	0.35	–	–	–	2.43	–	6.97	–	–	–	13.6	3.47	37.35	5
Grande-Baleine, Quebec	7	Muscle	–	1.55	<1	<1	<1	<1	–	–	–	8.07	<1	<1	<1	1.61	<1	1.61	1.58	24.68	6 d
Grande-Baleine, Quebec	2	Liver	–	4.81	1.06	<1	<1	1.06	–	–	–	<1	4.37	4.19	<1	46.86	<1	46.86	5.1	122.3	6 b
<i>Vulpes vulpes</i> (Red Fox) (ng/g wet weight).																					
Grande-Baleine, Quebec	4	Muscle	–	3.93	1.83	1.26	<1	3.09	–	–	–	6.7	1.1	1.56	<1	6.13	1.26	8.47	9.45	17.81	6 c, f
Grande-Baleine, Quebec	4	Liver	–	8.56	1.58	1.69	<1	3.27	–	–	–	<1	1.91	2.91	<1	12.71	1.76	15.92	6.76	27.39	
<i>Canis lupus</i> (Wolf) (ng/g wet weight)																					
Bathurst, NWT 1993-94	10	Liver	–	4.78	0.14	0.29	–	0.43	0.12	0.03	–	0.16	0.07	0.11	0.02	2.08	0.34	2.45	1.91	2.92	8
		Muscle	–	2.57	0.21	0.68	0.00	3.46	0.00	–	–	0.00	0.01	0.01	0.03	0.50	0.08	0.61	2.19	1.58	
Cambridge Bay, NWT 1993-94	10	Liver	–	4.59	0.25	0.23	–	0.49	–	–	0.21	0.21	0.27	0.58	–	4.85	1.01	5.88	1.80	1.97	
		Muscle	–	3.78	0.18	0.19	–	0.38	–	–	–	–	0.01	0.07	–	0.63	0.07	0.17	1.31	0.90	
Inuvik, NWT 1993-94	10	Liver	–	6.38	0.44	0.59	0.01	1.04	0.18	–	–	0.18	0.25	0.67	–	3.79	1.03	4.82	5.85	7.25	
		Muscle	–	2.35	0.19	0.31	0.02	0.52	0.10	–	–	0.10	0.01	0.02	0.00	0.38	0.03	0.42	1.79	1.61	

ΣHCH = Sum of α-, β-, and γ-HCH.

ΣDDT = Sum of *p,p'*-DDE, *p,p'*-DDD and *p,p'*-DDT.

– indicates that the compound was not measured;

n.d. indicates that the compound was not detected.

References

1. Peakall *et al.* 1990, adapted geometric means. ΣPCB = Sum of individual congeners. As Aroclor 1254:1260 (1:1). ΣHCH = β-HCH only.
2. Johnstone 1994, geometric means. Geometric means and ranges
3. Noble and Elliot 1990, geometric means. ΣPCB = As Aroclor 1254:1260.
4. Ólafsdóttir *et al.* 1995, medians. ΣPCB = Sum of 10 congeners. Samples found dead.
5. Poole *et al.* 1995, ng/g arithmetic means. ΣCHL = Sum of oxy, *cis*-, and *trans*-chlordanes, heptachlor epoxide, and *cis*- and *trans*-nonachlor. ΣPCB = Sum of 43 congeners. ΣHCH = Sum of α-, β-, and γ-HCH. ΣDDT = Sum of *p,p'*-DDE, *p,p'*-DDD, and *p,p'*-DDT.
6. SOMER 1993a, 1993b.
 - a. ΣCHL = Sum of oxy, *cis*-, and *trans*-chlordanes, heptachlor epoxide, and *cis*- and *trans*-nonachlor. ΣHCH = Sum of α-, β-, and γ-HCH. ΣDDT = Sum of DDE, DDD, and DDT.
 - b. ΣHCH = α-HCH only.
 - c. ΣHCH = α- and β-HCH.
 - d. ΣCHL = oxychlordanes only.
 - e. ΣCHL = Sum of oxychlordanes and heptachlor epoxide.
 - f. ΣCHL = Sum of oxychlordanes, heptachlor epoxide, and *trans*-nonachlor.
7. Court *et al.* 1990, geometric means and ranges. ΣDDT = Sum of DDE, DDD, and DDT.
8. Elkin unpubl. data 1995. ΣCHL = Sum of oxy, *cis*-, and *trans*-chlordanes, heptachlor epoxide, and *cis*- and *trans*-nonachlor. ΣPCB = Sum of 43 congeners.
9. Nygard and Skaare 1996. ΣDDT = *p,p'*-DDE only.
10. Henny *et al.* 1994.

Table 6-A6. Concentrations of organochlorine pesticides in rivers of Russia flowing to the Arctic Ocean (Roshydromet 1995).

River	Sea drainage	Statistic	α -HCH	β -HCH	γ -HCH	Concentration ($\mu\text{g/L}$) ^a			
						<i>p,p'</i> -DDT	<i>p,p'</i> -DDE	<i>p,p'</i> -DDD	2,4-D
North-flowing rivers and lakes of Kola Peninsula	Barents Sea	Mean	0.002	–	0.001	<0.001	<0.001	–	–
		Range	0-0.015	–	0-0.025	–	–	0-0.01	–
South/east-flowing rivers and lakes of Kola Peninsula	White Sea	Mean	0.002	–	0.001	<0.001	<0.001	<0.001	–
		Range	0-0.060	–	0.036	–	–	–	–
North Dvina	White Sea	Mean	0.004	<0.001	0.004	<0.001	<0.001	<0.001	–
		Range	0-0.188	–	0-0.121	–	–	–	–
Mezen	White Sea	Mean	0.002	<0.001	0.004	–	–	–	–
		Range	0-0.016	–	0-0.018	–	–	–	–
Pechora	Pechora Sea	Mean	0.001	<0.001	0.003	–	–	–	–
		Range	0-0.013	–	0-0.018	–	–	–	–
Ob ^b	Obskaya Gulf/Kara Sea	Mean	0.01	0.006	0.039	0.005	0.001	–	1.61
		Range	0-0.585	0-1.40	0-1.77	0-1.11	0-0.10	–	0-26
Taz	Obskaya Gulf/Kara Sea	Mean	<0.001	–	<0.001	<0.001	–	<0.001	–
		Range	0-0.016	–	0-0.030	–	–	–	–
Yenisey	Kara Sea	Mean	0.009	–	0.006	<0.001	<0.001	<0.001	7.95
		Range	0-0.099	–	0-0.096	–	–	–	0-65
Pyasina	East Kara Sea	Mean	0.022	–	0.015	<0.001	–	<0.001	–
		Range	0-0.099	–	0-0.098	–	–	–	–
Anabar	Laptev Sea	Mean	<0.001	–	<0.001	<0.001	–	<0.001	–
		Range	–	–	–	–	–	–	–
Olenek	Laptev Sea	Mean	<0.001	–	<0.001	<0.001	–	<0.001	–
		Range	–	–	–	–	–	–	–
Lena	Laptev Sea	Mean	0.004	–	0.001	<0.001	<0.001	<0.001	–
		Range	0-0.065	–	0-0.033	–	–	–	–
Yana	Laptev Sea	Mean	<0.001	–	<0.001	<0.001	–	<0.001	–
		Range	–	–	–	–	–	–	–
Kolyma	East Siberian Sea	Mean	0.003	–	<0.001	<0.001	–	<0.001	–
		Range	0-0.033	–	–	–	–	–	–

a. Dash indicates not reported; zeros in the range of concentrations indicates < 0.001 $\mu\text{g/L}$.

b. Sampling in the Russian portion of the Ob sites not specified.

Table 6-A7. Organochlorines ($\mu\text{g/g dw}$) in suspended sediment from major rivers in the Russian Arctic, 1995.

Place	Description	Date	Latitude	Longitude	ΣCBz^a	ΣHCH^b	ΣCHL^c	ΣDDT^d	ΣPCB^e
River Ob	Ob Gulf	29 Aug. 1995	68°53'N,	74°12'E	0.01	0.01	0.02	0.13	0.50
River Ob		30 Aug. 1995	68°24'N,	73°50'E	0.01	0.00	0.00	0.20	0.30
River Ob	Near Salekhard	15 July 1995	66°33'N,	66°47'E	0.02	0.02	0.00	0.16	0.38
River Pechora	Near Nosovaya	9 July 1995	68°59'N,	54°48'E	0.05	0.05	0.12	0.68	4.90
River Pechora		10 July 1995	68°40'N,	55°50'E	0.08	0.13	0.29	0.77	11.20
River Pechora		10 July 1995	68°42'N,	55°31'E	0.00	0.02	0.00	0.35	0.00
River Pechora		10 July 1995	68°37'N,	55°29'E	0.54	0.04	0.88	0.70	16.20
River Pechora		11 July 1995	68°35'N,	55°05'E	0.15	0.06	0.29	2.75	26.60
River Pechora		11 July 1995	68°20'N,	54°46'E	0.12	0.17	0.54	0.26	4.00
River Pechora		11 July 1995	68°30'N,	54°35'E	0.43	0.74	0.62	1.25	19.90
River Pechora	Near Nosovaya	12 July 1995	68°19'N,	54°26'E	0.03	0.58	0.28	3.89	11.40
River Pechora		16 July 1995	68°44'N,	57°13'E	0.29	0.03	0.09	0.34	5.30
River Pechora		10 July 1995	68°54'N,	55°48'E	0.05	0.02	0.00	0.39	0.31
River Kolyma	Near Pokhodsk	20 June 1995	69°59'N,	161°48'E	0.00	0.06	0.18	0.69	1.10
River Kolyma		20 June 1995	69°32'N,	161°00'E	0.04	0.04	0.25	0.87	1.90
River Kolyma		20 June 1995	69°43'N,	161°00'E	0.20	0.08	0.38	1.10	0.50
River Kolyma		20 June 1995	69°55'N,	160°22'E	0.01	0.04	0.16	0.61	0.80
River Yenisey		25 Aug. 1995	72°06'N,	82°00'E	0.03	0.06	0.02	0.28	1.31
River Yenisey	Near Ladygin Yar	26 Aug. 1995	71°25'N,	83°10'E	0.07	0.04	0.04	0.24	2.90
River Yenisey	Near Norilsk	5 July 1995	69°24'N,	86°10'E	0.07	0.04	0.04	0.47	3.14

Results of 0.00 indicate concentrations less than the detection limit (approximately 0.01 $\mu\text{g/g}$).a. ΣCBz = Sum of pentachlorobenzene and HCBz. b. ΣHCH = Sum of α -HCH and γ -HCH. c. ΣCHL = Sum of heptachlor, heptachlor epoxide, *cis*- and *trans*-chlordane, and *cis*- and *trans*-nonachlor.d. ΣDDT = Sum of *o,p'*- and *p,p'*-DDE, *o,p'*- and *p,p'*-DDD, and *o,p'*- and *p,p'*-DDT. e. ΣPCB = Sum of 7 congeners, CBs 28, 52, 101, 118, 153, 138, 180, analyzed by capillary GC.

Table 6-A8. Concentrations of major OC groups in freshwater surface sediments (ng/g dw).

Location	Region	Latitude	Longitude ¹	% OC	HCBz	ΣHCH	ΣDDT	ΣPCB ²	Reference
Wonder	Central Alaska	63.5	-150.9	7.0		6.40	4.50	241	1
Elusive	North Alaska	68.8	-148.5			0.07	0.09	0.18	2
Desperation	North Alaska	68.3	-158.8			0.04	0.12	0.25	
Feniak	North Alaska	68.3	-158.3			0.11	0.31	0.04	
Schrader	North Alaska	69.4	-145.0	1.0		0.19	0.09	0.11	
Lindeman	South Yukon	60.0	-137.0		0.10	0.62	0.90	11.6	3
Laberge	South Yukon	61.2	-135.2		0.33	1.14	0.98	38.9	
Fox	South Yukon	61.2	-135.5		0.6	0.46	0.36	18.4	4
Little Atlin	South Yukon	60.3	-134.0		0.86	0.45	3.56	35.5	
Kuzawa	South Yukon	60.3	-136.4	1.7	0.08	0.15	0.05	3.06	
Great Slave	Southwest NWT	61.4	-114.4	1.9	1.10	0.31	0.41	8.66	5
Yaya	West NWT	69.0	-135.0	7.0				10.5	6
Lake 3	West NWT	69.0	-136.0	2.3				2.8	15
Belot	West NWT	66.9	-126.3	5.0	0.11	0.27	0.91	27.1	7,6
L. Ste Therese	West NWT	64.6	-121.3	3.1	0.97	0.56	0.91	12.1	7,6
Amituk	Cornwallis Is	75.0	-93.8	1.4	1.14	0.91	1.68	12.2	8,3
Sophia	Cornwallis Is	75.1	-93.6	3.0	0.09	0.05	0.34	4.0	
Hawk	East NWT	63.6	-90.7	12.8	1.80	2.88	5.11	38.5	
Far	East NWT	63.7	-90.7	3.0	0.29	2.52	1.54	18.5	
Buchanan	Axel Heiberg Is	79.5	-87.5	1.3	1.26	3.06	0.77	16.1	
Hazen	Ellesmere Is	81.8	-71.5	1.7	1.01	0.57	0.10	2.42	
Ammasalik	Greenland	65.6	-38.1	4.5	<0.1	<0.1	0.10	0.10	9
Nuuk/Itinnera	Greenland	64.4	-50.4	44.7	<0.1	<0.1	0.10	0.10	
Isortoq	Greenland	60.9	-47.5	29.4	<0.1	<0.1	0.10	0.10	
Thule/Olrik	Greenland	77.2	-68.0	16.0	<0.1	<0.1	0.10	0.10	
Storvatnet	Nordland	68.3	14.5	13.3	1.40	0.50	1.00	15.4	10,11
Storvatnet	Nordland	69.3	16.0	14.8	0.90	<0.10	1.30	10.9	
Langvatnet	Nordland	68.5	16.7	8.6	0.50	<0.10	0.60	5.2	
Holmevatn	Nordland	68.4	16.7	16.8	0.90	<0.10	0.60	12.3	
Skøvatnet	Troms	69.0	17.9	5.3	0.30	<0.10	0.80	10.2	
Ø. Kaperdalsvatn	Troms	69.3	17.4	16.7	0.40	0.10	0.20	8.40	
Ellasjøen	Bear Island	74.5	18.9	5.2	0.50	<0.10	4.30	35.5	
Storvatnet	Troms	69.2	19.3	1.6	0.10	<0.10	0.10	2.40	
Barentsvann	Spitsbergen	78.6	20.9	6.3	0.80	<0.10	0.40	5.70	
Langfjordvatn	Troms	70.2	20.5	14.2	0.20	<0.10	0.10	5.30	
Josvatnet	Troms	69.6	21.3	2.5	0.10	<0.10	0.30	2.80	
Storvatnet	Finnmark	70.0	22.9	3.7	1.89	0.43	1.22	2.28	
Lavvujav'ri	Finnmark	69.0	23.7	13.1	4.30	0.80	1.12	5.37	
Avzejav'ri	Finnmark	68.9	23.4	12.1	5.43	1.25	1.07	3.62	
Vuorasjav'ri	Finnmark	69.0	23.2	12.9	3.63	0.65	0.81	4.07	
Vouddajav'ri	Finnmark	70.0	24.8	3.4	1.58	0.15	0.30	1.17	
Ravdujav'ri	Finnmark	68.7	24.7	8.2	4.84	5.87	0.41	4.92	
Gavdujav'ri	Finnmark	68.7	24.6	6.2	5.22	0.62	1.72	3.10	
Pahtajärvi	Finland	68.2	24.0	>10.0				3.58	12
Sierramjärvi	Finland	69.2	26.9	>10.0			0.23	1.90	
Gålgutjav'ri	Finnmark	70.3	28.0	10.1	1.58	0.25	0.53	1.80	10,11
Haukesjøen	Finnmark	69.9	29.3		3.35	0.69	0.54	15.6	
Magistervatnet	Finnmark	70.5	29.2		4.31	0.39	0.44	3.60	
Lake 222	Finland	69.5	29.2	>10.0				3.39	12
Langvatn	Finnmark	69.7	30.6	12.0	3.66	0.38	1.16	14.9	10,11
Rabbvatnet	Finnmark	69.7	30.5	12.6	3.47	0.57	2.95	12.4	
Syltevikvatnet	Finnmark	70.5	30.4	10.9	0.92	0.13	0.53	1.18	
L. Ropelvatn	Finnmark	69.8	30.2	12.8	2.35	0.21	3.85	13.4	
Andrevann	Finnmark	69.7	30.0		1.92	0.08	1.14	18.1	
Pol. Kanin	Russia	68.4	46.0	20.3	1.56	15.2	1.10	3.54	
O. Kolguyev	Russia	68.7	48.6	37.1	0.94	11.9	1.35	3.49	
Pechora River	Russia	66.9	53.0		0.02	0.05	1.62	0.25	15
Pechora Guba	Russia	68.9	53.5	1.4	0.39	2.97	0.14	3.05	
W. Yamal	Russia	70.2	67.3	15.9	1.51	9.98	0.61	29.9	
O. Belyi	Russia	73.1	70.1		0.51	0.35	0.05	1.55	
Ob River	Russia	66.1	67.0		0.06	0.14	0.20	0.57	15
Yenisey River	Russia	70.4	83.0		0.08	0.14	0.40	0.47	15
Taimyr Peninsula	Russia	74.4	98.6		0.33	0.90	3.98	0.56	10,11,13,14
Taimyr Peninsula	Russia	74.5	98.6		0.18	0.34	0.70	1.20	
Pol. Chelyuskin	Russia	77.4	102.3	1.7	0.17	1.74	0.11	5.24	
Khatanga river	Russia	72.5	105.0		0.005	0.030	0.085	0.460	15

N.E. Taimyr	Russia	76.4	112.3	1.1	0.14	1.71	0.10	0.34	
Lena River	Russia	72.5	127.0		0.05	0.16	0.425	0.56	15
O. Kotelnyi	Russia	75.0	137.7	4.9	0.30	1.17	0.11	1.00	
Pol. Shirokostan	Russia	72.4	139.4	1.4	0.09	0.53	0.12	0.45	
NW Indiginka delta	Russia	70.1	147.4		0.06	0.17	0.27	0.89	15
NW Indiginka delta	Russia	71.6	149.2	25.7	1.01	2.92	0.35	2.14	10,11
Kolyma River	Russia	69.0	161.0		0.02	0.03	0.09	0.50	15
O. Wrangel	Russia	70.9	179.1	5.2	0.54	3.28	0.18	1.80	

1. All west longitudes are negative.

2. PCB congeners determined:

Muir *et al.* 1996c: CBs 8/5, 18, 17, 16/32, 22, 31, 28, 33, 52, 49, 47/48, 44, 61/41/71, 40, 64, 70/76, 74, 66/95, 60, 91, 101, 99, 83, 97, 87, 85, 110, 118, 151, 149, 146, 153, 141, 138, 158, 178/129.

Skotvold 1996: CBs 18, 28, 31, 47, 52, 60, 66, 74, 99, 101, 105, 114, 118, 123, 128, 138, 149, 153, 156, 157, 167, 170, 180, 187, 189, 209.

Vartiainen *et al.* 1997: CBs 18, 28/31, 33, 77, 80, 51, 52, 49, 47, 74, 66, 60, 81, 126, 101, 99, 110, 123, 118, 114, 122, 105, 169, 153, 141, 138/137, 159, 167, 128, 156, 157, 180, 170, 187, 183, 189, 194, 206.

Melnikov *et al.* 1995, 1996a: CBs 28, 31, 101, 118, 153, 138, 180.

Allen-Gil *et al.* 1997: CBs 8, 18, 28, 29, 33, 44, 50, 52, 66, 87, 101, 105, 118, 128, 138, 153, 170, 180, 187, 195, 200, 206, 209.

References:

1. Gubala *et al.* 1995; 2. Allen-Gil *et al.* 1997; 3. Lockhart and Muir 1996; 4. Lockhart 1994; 5. Evans *et al.* 1996; 6. Lockhart *et al.* unpubl. data; 7. Muir *et al.* 1996b; 8 = Muir *et al.* 1995a; 9. Cleeman *et al.* 1996a; 10. Skotvold 1996; 11. Skotvold unpubl. data 1996; 12. Vartiainen *et al.* 1997; 13. Melnikov *et al.* 1995; 14. Roshydromet 1995; 15. Melnikov *et al.* 1996.

Table 6-A9. Mean levels of organochlorines (ng/g ww) in freshwater fish and invertebrates. All Arctic char data are for landlocked fish; values for anadromous char and broad whitefish are in Annex Table 6-A17.

Species/ Location	Region or nearest Community	Year(s)	Sex	n, single/group	Tissue	% Lipid	ΣCBz	ΣHCH	ΣCHL	ΣDDT	ΣPCB	Toxaphene ^a	Dieldrin	Mirex	Endrin	Reference
Freshwater fish																
<i>Salvelinus alpinus</i> (Arctic char)																
Amituk Lake	Cornwallis Island, NWT	1989	♂	12	Muscle	4.40	5.5	2.05	47.3	32.2	72.5	203	10	0.77	—	1
Char Lake	Cornwallis Island, NWT	1992	♂	5	Muscle	4.15	3.14	2.64	17.8	114	290	41.3	2.87	—	—	
Hazen Lake	N. Ellesmere Island	1990	♂	6	Muscle	4.6	3.1	2.7	29.8	11.9	39.6	165.3	2.5	1.5	—	
Pahtajärvi	Finnish Lapland		♂ ♀	11	Muscle	1.06	0.99	2.57	0.55	2.11	—	—	<0.1	—	0.15	9
Pahtajärvi	Finnish Lapland		♀	4	Muscle	1.29	—	—	—	—	1.01 (1.67)	—	—	—	—	
Pahtajärvi	Finnish Lapland		♂	3	Muscle	1.52	—	—	—	—	1.05 (1.73)	—	—	—	—	
Lake 222	Finnish Lapland		♂ ♀	4	Muscle	0.41	2.5	3.03	0.35	1.4	—	—	0.1	—	0.1	
Lake 222	Finnish Lapland		♀	2	Muscle	0.43	—	—	—	—	1.71 (2.63)	—	—	—	—	
Lake 222	Finnish Lapland		♂	2	Muscle	0.4	—	—	—	—	1.26 (1.95)	—	—	—	—	
Linnévänn	N. Norway	1994	♂ ♀	18	Muscle	2.6	—	—	—	—	5.4	12	—	—	—	
Kongressvannet	N. Norway	1994	♂ ♀	11	Muscle	2.0	—	—	—	—	25.0	—	—	—	—	
Nuuk	Greenland	1994	♂ ♀	25	Muscle	2.50±2.36	0.72±0.9	0.66±0.6	4.38±5.8	2.45±2.4	8.88±7.4	11.0±13.6	1.04±0.80	—	—	16
Ammasalik	Greenland	1994	♂ ♀	25	Muscle	3.60±5.50	1.79±2.3	0.67±0.8	20.2±18	12.3±11.5	35.8±57.6	48.6±65.2	2.03±2.3	—	—	
Thule	Greenland	1994	♂ ♀	11	Muscle	3.50±2.50	1.5±1.36	0.67±0.35	4.31±3.72	3.13±1.81	10.5±5.67	22.0±20	1.30±0.66	—	—	
Isortoq	Greenland	1994	♂ ♀	15	Muscle	1.40±1.00	0.87±1.6	0.20±0.2	3.74±1.9	8.63±7.6	18.6±18.4	10.5±7.1	1.84±5.9	—	—	
Lake Blåsjön (dwarfs)	Sweden		♂ ♀	16	Muscle	1.07	—	—	—	4.61	17	—	—	—	—	14
Lake Blåsjön (normal)	Sweden		♂ ♀	14	Muscle	1.35	—	—	—	1.37	4.72	—	—	—	—	
<i>The following entry is in ng/g lw:</i>																
Lake Abiskojaure	Sweden	1994		10	Muscle	—	18	9	—	23	160	—	—	—	—	19
<i>Coregonus clupeaformis</i> (Lake whitefish)																
Colville Lake	Colville, NWT	1992		9	Muscle	2.6	—	1.05	1.85	1.71	4.44	11	—	—	—	
Fisherman Lake	Fort Simpson, NWT	1990	♂ ♀	4	Muscle	—	—	—	—	—	—	—	—	—	—	
Fox Lake	S.W. Yukon	1993		5	Muscle	1.8	—	0.7	—	6.1	6.4	5.7	—	—	—	5
Fox Lake	S.W. Yukon	1993		1	Muscle	—	—	—	0.5	3	4.5	3.1	—	—	—	3
Gordon Lake	Yellowknife, NWT	1991	♂ ♀	5	Muscle	2.74	—	0.92	5.5	3.7	7.9	23.8	—	—	—	1
Great Slave Lake	Ft. Resolution, NWT	1994	♂ ♀	4	Muscle	18.8	—	6.1	25.9	8.3	22.2	154	—	—	—	
Bennett Lake	Whitehorse, Yukon	1990-1993		3	Muscle	2.08	—	0.8	1.3	2.3	2.7	26	—	—	—	6
Atlin Lake	BC / Yukon border	1990-1993		2	Muscle	0.25	—	0.2	0.3	0.5	0.1	6	—	—	—	
Kluane Lake	Whitehorse, Yukon	1990-1993		3	Muscle	1.8	—	1	1	1.8	3.5	7	—	—	—	
Kusawa Lake	Whitehorse, Yukon	1990-1993		9	Muscle	1.1	—	0.5	—	15	21	17	—	—	—	5
Kusawa Lake	Whitehorse, Yukon	1990-1993		1	Muscle	0.7	—	—	0.8	0.4	2.8	4.6	—	—	—	3
Lake Laberge	Whitehorse, Yukon	1990-1993		6	Muscle	2.5	—	1.7	—	155	280	44	—	—	—	1
Lake Laberge	Whitehorse, Yukon	1990-1993		3	Muscle	3	—	—	8.5	212	61	33.8	—	—	—	15
Watson Lake	Whitehorse, Yukon	1990-1993		2	Muscle	2.2	—	—	2.7	464	6.9	<11.7	—	—	—	
Other Locations	Yukon	1990-1993		2 - 5	Muscle	0.3-3.6	—	—	0.1-5.1	0.2-6.6	0.3-8.3	0.2-52	—	—	—	
Marsh Lake	Whitehorse, Yukon	1990-1993		5	Muscle	0.76	—	1.7	1.2	5.8	2	29.9	—	—	—	6
Tagish Lake	Whitehorse, Yukon	1990-1993		1	Muscle	0.9	—	0.6	2.2	1.5	3.4	30	—	—	—	
Grande-Baleine lakes	N. Quebec	1989		3	Muscle	1.33	<5	<5	<5	<5	<15	—	<5	<5	<5	10
Nottaway-Broadback-Rupert	N. Quebec	1991		15	Muscle	1.65	<1	<1	<1	1.03	1.98	—	<1	<1	>1	11

Species/ Location	Region or nearest Community	Year(s)	Sex	n, single/group	Tissue	% Lipid	ΣCBz	ΣHCH	ΣCHL	ΣDDT	ΣPCB	Toxaphene ^a	Dieldrin	Mirex	Endrin	Reference
Nottaway-Broadback-Rupert	N. Quebec	1991		10	Liver	5.19	<1	0.63	<1	0.94	4.08	–	<1	<1	<1	
Avzejav'ri	Finnmark, Norway	1994		15	Muscle	0.6525	–	0.10	0.17	0.36	0.82	–	0.05	–	0.07	7
Lavvujav'ri	Finnmark, Norway	1994		8	Muscle	1.89	–	0.12	0.23	0.63	1.58	–	0.08	–	0.07	
Ravdujav'ri	Finnmark, Norway	1994		2	Muscle	0.26	–	0.10	0.03	0.15	0.54	–	0.03	–	<0.01	
Storvindeln	N. Sweden	1986		1	Muscle	0.66	0.09	0.2	0.20	3.10	3.80	–	1.00	–		21
<i>Lota lota</i> (Burbot)																
Alexie Lake	Yellowknife, NWT	1992		5	Liver	26.3	–	4.89	14.7	13.6	26.9	40.5	–	–	–	2
Fort Good Hope	N. MacKenzie River	1994		12	Liver	31.0	12.8	9.07	24.5	39.6	56.6	169.1	2.13	0.69	–	
Great Slave Lake	Ft. Resolution, NWT	1993		7	Liver	28.2	–	7.18	39.6	51.7	103	286.7	–	–	–	
Great Slave Lake	Ft. Resolution, NWT	1994	♂ ♀	6	Liver	35.0	–	10.2	114	57.0	178	758	–	–	–	1
Trout Lake	Ft. Simpson, NWT	1992	♂ ♀	6	Liver	40.3	–	13.7	33.3	19.8	50.1	152	9.92	11.6	–	
Slave River	Ft. Smith, NWT	1990-1993		41	Liver	–	–	–	–	5-286	13-990	61-1890	–	–	–	22
Fox Lake	S.W. Yukon	1990-1993		6	Liver	27.6	–	18.0	11.7	126	52.0	54.0	–	–	–	6
Atlin Lake	BC / Yukon border	1990-1993		6	Liver	33.1	–	63.0	138	105	135	1533	–	–	–	
Kluane Lake	Whitehorse, Yukon	1990-1993		2	Liver	35.1	–	2.1	9.9	43.0	50.0	54.0	–	–	–	
Lake Laberge	Whitehorse, Yukon	1990-1993		35	Liver	44.0	–	–	217	3433	1267	2301	–	–	–	15
Schwatka Lake	S.W. Yukon	1990-1993		3	Liver	15.3	–	10.4	20.0	282	104	272	–	–	–	6
Teslin Lake	Whitehorse, Yukon	1990-1993		3	Liver	40.3	–	6.3	50.9	114	175	267	–	–	–	
Other Locations	Yukon	1990-1993		2-8	Liver	27-47	–	–	10-183	21-272	50-579	54-945	–	–	–	15
Lake Pahtajärvi	Finnish Lapland		♂ ♀	4	Liver	37.3	12.3	1.53	–	3.2	25.4	–	<0.1	–	4.38	9
Yenisey River	near Karaul, Russia	1995		1	Liver	–	1.68	2.6	26.74	195.8	295	–	–	0.12	–	17
<i>Salvelinus namaycush</i> (Lake trout)																
Lake Belot	Colville, NWT	1992		11	Muscle	4.20	–	3.17	17.4	20	44.1	115	–	–	–	2
Colville Lake	Colville, NWT	1992		7	Muscle	5.20	–	0.89	3.27	2.46	8.92	10.3	–	–	–	
Fish Lake	Banks Island, NWT	1993		8	Muscle	4.15	–	2.46	10.5	13.1	27.1	50.1	–	–	–	13
Gordon Lake	Yellowknife, NWT	1993	♂ ♀	6	Muscle	2.96	–	0.68	7.92	5.35	16.3	23.1	–	–	–	1
Peter Lake	Rankin Inlet, NWT	1994		16	Muscle	1.8	2.3	0.9	8.1	8.3	27.2	50.0	0.5	–	–	2
Raddi Lake	Banks Island, NWT	1993		6	Muscle	4.00	–	1.55	12	17.1	33.5	42.8	–	–	–	13
Travalliant Lake	Mackenzie Delta, NWT	1993		5	Muscle	3.10	–	1.15	4.25	2.03	8.79	17.1	–	–	–	2
Trout Lake	Ft. Simpson, NWT	1992	♂ ♀	9	Muscle	4.16	–	1.6	7.18	3.83	11.2	17.2	–	–	–	1
Kusawa Lake	S.W. Yukon	1990-1993	♂ ♀	10	Muscle	1.76	–	1.2	16.6	40.5	78.4	81.3	–	–	–	1
Lake Laberge	Whitehorse, Yukon	1990-1993		27	Muscle	6.10	–	–	30	458	448	344	–	–	–	15
Watson Lake	Whitehorse, Yukon	1990-1993		2	Muscle	5.20	–	–	2.2	3427	38	<12.9	–	–	–	
Other Locations	Yukon	1990-1993		2-15	Muscle	1.2-7.1	–	–	1.2-21	14-403	3.5-128	4.6-296	–	–	–	
Atlin Lake	BC / Yukon border	1990-1993		15	Muscle	1.72	–	1.9	9.6	6.9	12.6	124	–	–	–	6
Bennett Lake	S.W. Yukon	1990-1993		10	Muscle	1.93	–	2.9	25.2	38.7	67.7	304	–	–	–	
Fox Lake	S.W. Yukon	1990-1993		9	Muscle	1.40	–	1	–	6.1	10	6.2	–	–	–	5
Kluane Lake	Whitehorse, Yukon	1990-1993		3	Muscle	3.60	–	1.7	3	8.5	13.8	19	–	–	–	6
Marsh Lake	Whitehorse, Yukon	1990-1993		3	Muscle	3.37	–	2.8	6.6	9.8	8.6	106	–	–	–	
Tagish Lake	Whitehorse, Yukon	1990-1993		12	Muscle	2.16	–	2.8	16.3	44	33	238	–	–	–	
Teslin Lake	Whitehorse, Yukon	1990-1993		3	Muscle	7.05	–	0.6	7.3	15.7	23	59	–	–	–	
Elusive Lake	N. Alaska	1991	♂ ♀	21	Liver	1.93	0.32	1.53	–	4.12	1.03	–	–	–	–	8
Elusive Lake				21	Muscle	0.72	0.68	0.01	0.26	0.32	0.46	–	–	–	–	
Feniak Lake	N. Alaska	1991		12	Liver	1.70	0.05	0.82	6.55	9.26	28.53	–	–	–	–	
Feniak Lake				12	Muscle	1.06	0.01	0.00	1.85	2.59	5.18	–	–	–	–	
Schrader Lake	N. Alaska	1991		11	Liver	11.18	0.14	1.57	4.52	6.98	5.46	–	–	–	–	
Schrader Lake				11	Muscle	1.87	0.02	0.50	1.40	4.24	2.79	–	–	–	–	
Lac Bienville	Grande-Baleine, N. Quebec	1989		6	Muscle	1.5	<5.0	<5.0	<5.0	6.68	47.1	–	–	–	–	10
Lac Bienville	Grande-Baleine, N. Quebec	1989		2	Liver	6	<5.0	<5.0	174	898	–	–	–	–	–	
Lac Raraire	Grande-Baleine, N. Quebec	1989		2	Muscle	0.72	<5.0	<5.0	<5.0	<5.0	<15.0	–	–	–	–	
Lac Morpain	Grande-Baleine, N. Quebec	1989		2	Muscle	1.96	<5.0	<5.0	<5.0	6.69	34.7	–	–	–	–	
Lac des Loups Marins	Grande-Baleine, N. Quebec	1989		3	Muscle	1.01	<5.0	<5.0	<5.0	5.6	28.9	–	–	–	–	
Lac Amichinatwayach	Grande-Baleine, N. Quebec	1989		2	Muscle	1.09	<5.0	<5.0	<5.0	<5.0	<15.0	–	–	–	–	
<i>Salmo trutta</i> (Brown trout)																
Lake 222	Finnish Lapland		♀	1	Muscle	0.41	13.4	11.3	0.2	2.8	–	–	<0.1	–	<0.1	9
<i>Esox lucius</i> (Northern pike)																
Lake Laberge	Whitehorse, Yukon	1990-1993		5	Muscle	1.8	–	–	14	247	90	48	–	–	–	15
Other Locations	Yukon	1990-1993		3-6	Muscle	0.4-0.6	–	–	<0.1-0.5	<0.2-2.5	<0.2-1.1	<0.1-1.2	–	–	–	
Lac Bienville, Grande-Baleine,	N. Quebec	1989		1	Muscle	0.5	–	<5.0	<5.0	<5.0	<15.0	–	–	–	–	
Lac Morpain, Grande-Baleine,	N. Quebec	1989		1	Muscle	0.7	–	<5.0	<5.0	<5.0	<15.0	–	–	–	–	
Nottaway-Broadback-Rupert	N. Quebec	1991		41	Muscle	0.41	<1	<1	<1	0.95	4.5	–	<1	<1	>1	11
Nottaway-Broadback-Rupert	N. Quebec	1991		24	Liver	12.93	1.3	0.75	8.9	62.4	341	–	<1	1.94	>1	

<i>Thymallus arcticus</i> (Arctic grayling)																
Lake Laberge	Whitehorse, Yukon	1990-1993	♂ ♀	6	Muscle	1.7	–	–	1.8	22	21	25	–	–	–	15
Other Locations	Yukon	1990-1993		3-6	Muscle	0.7-1.7	–	–	<0.2-0.4	<0.3-0.7	<0.5-1.1	<0.2-2.7	–	–	–	8
Desperation Lake	N. Alaska	1991	♂ ♀	10	Liver	2.02	0.27	0.00	0.03	0.29	1.51	–	–	–	–	
Desperation Lake				9	Muscle	5.75	0.01	0.35	0.32	0.16	0.68	–	–	–	–	
Elusive Lake	N. Alaska	1991		21	Liver	3.84	0.00	0.13	0.00	0.64	5.92	–	–	–	–	
Elusive Lake				20	Muscle	2.70	0.03	0.04	0.19	0.16	–	–	–	–	–	
Feniak Lake	N. Alaska	1991		16	Liver	1.48	0.00	0.22	0.26	2.10	1.93	–	–	–	–	
Feniak Lake				17	Muscle	2.45	0.01	0.19	–	1.20	0.87	–	–	–	–	
Schrader Lake	N. Alaska	1991		25	Liver	1.75	0.01	0.09	0.34	1.40	7.15	–	–	–	–	
Schrader Lake				25	Muscle	2.70	0.01	0.30	0.42	0.27	1.41	–	–	–	–	
<i>Catostomus catostomus</i> (Longnose sucker)																
Kusawa Lake	S.W. Yukon			1	Muscle	1.2	–	–	1.9	11.9	19.1	5.9	–	–	–	3
Lake Laberge	Whitehorse, Yukon			3	Muscle	0.8	–	–	2.7	24.1	21.3	17.8	–	–	–	10
Grande-Baleine	N. Quebec	1989		2	Muscle	1.05	<5	<5	<5	<5	<15	–	<5	<5	<5	
Nottaway-Broadback-Rupert	N. Quebec	1991		17	Muscle	1.83	<1	<1	<1	1.92	8.24	–	<1	<1	<1	
Nottaway-Broadback-Rupert	N. Quebec	1991		2	Liver	12.6	1.47	<1	5.65	35.95	157.2	–	<1	0.54	<1	
<i>Salmo salar ouananiche</i> (Ouananiche)																
Grande-Baleine	Quebec	1989		1	Muscle	1.88	<5	<5	<5	<5	<15	–	<5	<5	<5	10
<i>Coregonus artedii</i> (Shallowwater cisco)																
Nottaway-Broadback-Rupert	N. Quebec	1991		19	Muscle	1.44	0.54	0.52	<1	0.69	4.3	–	<1	<1	<1	11
Nottaway-Broadback-Rupert	N. Quebec	1991		6	Liver	5.37	0.98	1.2	1.02	1.85	8.9	–	<1	<1	<1	
<i>Acipenser fulvescens</i> (Lake sturgeon)																
Nottaway-Broadback-Rupert	N. Quebec	1991		6	Muscle	2.52	<1	<1	0.67	10.6	9.5	–	<1	<1	<1	11
Nottaway-Broadback-Rupert	N. Quebec	1991		7	Liver	16.14	0.94	0.91	3.33	26.63	40.01	–	<1	<1	<1	
<i>Stizostedion vitreum</i> (Walleye)																
Walleye	Hay River, NWT	1994		3	Muscle	1.190	–	0.157	0.653	0.610	1.351	0.397	–	–	–	22
Slave River	Ft. Smith, NWT	1990-1993		41	Liver	–	–	–	–	<2-21	13-118	<2-137	–	–	–	11
Nottaway-Broadback-Rupert	N. Quebec	1991		50	Muscle	0.45	<1	<1	<1	0.79	4.01	–	<1	<1	<1	
Nottaway-Broadback-Rupert	N. Quebec	1991		26	Liver	6.01	0.59	0.54	1.88	9.77	55.8	–	<1	0.57	<1	
<i>Salvelinus fontinalis</i> (Brook trout)																
Nottaway-Broadback-Rupert	N. Quebec	1991		6	Muscle	1.48	<1	<1	0.54	1.17	3.18	–	<1	<1	<1	11
Nottaway-Broadback-Rupert	N. Quebec	1991		9	Liver	12.2	3.82	1.35	5.13	6.74	19.33	–	<1	<1	<1	
<i>Catostomus commersoni</i> (White sucker)																
Nottaway-Broadback-Rupert	N. Quebec	1991		24	Muscle	0.6	<1	<1	<1	0.78	1.83	–	<1	<1	<1	11
Nottaway-Broadback-Rupert	N. Quebec	1991		4	Liver	3.58	<1	<1	<1	2.73	12.75	–	<1	<1	<1	
<i>Myoxocephalus quadricornis</i> (Fourhorn sculpin)																
Nottaway-Broadback-Rupert	Quebec	1991		1	Muscle	0.39	<1	<1	<1	0.46	2.7	–	<1	<1	<1	11
Nottaway-Broadback-Rupert	Quebec	1991		2	Liver	8.45	1.25	2.75	7.75	11.25	69.4	–	<1	<1	<1	
<i>Oncorhynchus tshawytscha</i> (Chinook salmon)																
Whitehorse, Klukshu Rivers	Yukon	1990-1993		2-6	Muscle	0.9-1.0	–	–	2.0-3.9	9.0-13	7.1-14	35-43	–	–	–	15
<i>Oncorhynchus keta</i> (Chum salmon)																
Porcupine River	Yukon	1990-1993		3	Muscle	1.2	–	–	0.9	1.8	2.3	21	–	–	–	15
<i>Oncorhynchus nerka</i> (Sockeye salmon)																
Klukshu River	Yukon	1990-1993		3	Muscle	–	–	–	0.9	3.1	3.1	9.3	–	–	–	15
Invertebrates																
<i>Zooplankton</i>																
Fox Lake	S.W. Yukon	1993		1		2.6	–	–	0.6	0.6	1.1	2.5	–	–	–	3
Kusawa Lake	S.W. Yukon	1993		1		2.7	–	–	1.1	0.6	3.2	7.9	–	–	–	22
Lake Laberge	Whitehorse, Yukon	1993		1		1	–	–	0.9	2.4	4.6	9.6	–	–	–	
Great Slave Lake	Ft. Resolution	1994		3		9.7	1.7	9.2	6.1	8.4	47.5	15.7	1.2	–	–	
Great Slave Lake	Lutsel Ke	1994		3		25.7	1.2	18.6	10.9	5.5	30.3	65.1	2.3	–	–	
Wager Bay area				3		1.0	–	–	–	–	14.8	–	–	–	–	
Iqaluit area	S. Baffin Island	1993		4		1.7	–	–	–	–	18.6	–	–	–	–	
Lake Harbour area	S.E. Baffin Island	1993		2		1.5	–	–	–	–	20.5	–	–	–	–	
Sophia Lake	Cornwallis Island	1993		1		3.2	–	–	–	–	21.9	–	–	–	–	
Char Lake	Cornwallis Island	1993		1		0.8	–	–	–	–	15.6	–	–	–	–	
Pond Inlet area	N. Baffin Island	1993		5		1.5	–	–	–	–	41.5	–	–	–	–	

Species/ Location	Region or nearest Community	Year(s)	Sex	n, single/group	Tissue	% Lipid	ΣCBz	ΣHCH	ΣCHL	ΣDDT	ΣPCB	Toxaphene ^a	Dieldrin	Mirex	Endrin	Reference
Pond Inlet area	N. Baffin Island	1993		5		1.5	–	–	–	–	41.5	–	–	–	–	
Amituk Lake	Cornwallis Island	1993		5		0.9	–	–	–	–	53.0	–	–	–	–	
Two Basin, Coal, EU1	S.E. Ellesmere Is.	1993		3		0.8	–	–	–	–	12.1	–	–	–	–	
<i>Tricoptera</i> (Limnephilidae)																
Fox Lake	S.W. Yukon			1		12.4	–	–	7.4	24.7	26.2	18.9	–	–	–	3
Lake Laberge	Whitehorse, Yukon			2		2.3	–	–	0.5	1.2	2.1	2.2	–	–	–	
Molluscs (<i>Fossaria</i> sp. and <i>Gyraulus</i> sp.)																
Kusawa Lake	Whitehorse, Yukon			2		1.05	–	–	0.55	0.25	0.85	4.4	–	–	–	3
Lake Laberge	Whitehorse, Yukon			3		0.67	–	–	0.43	1.03	2.03	1.6	–	–	–	
Chironomids (from benthic grabs and fish stomachs)																
Lake Laberge	Whitehorse, Yukon			6		2.95	–	–	1.45	19.85	8.5	4.45	–	–	–	3
Amphipods (<i>Gammarus</i> sp.)																
Great Slave Lake	Ft. Resolution			3		25.7	1.2	18.6	10.9	5.5	30.3	65.1	2.3			22
Great Slave Lake	Lutsel Ke			2		26.5	1.2	29.6	24.3	11.4	32.5	248.6	4.7			
Fox Lake	S.W. Yukon			1		0.5	–	–	0.4	1	3.7	1.6	–	–	–	3

a. Toxaphene concentrations calculated using a single response factor.
– indicates that the compound was not measured.

References

- Muir and Lockhart 1993b.
ΣCBz = Sum of tetra- and pentachlorobenzene and HCBz. ΣHCH = Sum of α-, β-, and γ-HCH. ΣCHL = Sum of oxy-, *cis*-, and *trans*-chlordane, heptachlor epoxide, and *cis* and *trans*-nonachlor.
ΣDDT = Sum of *o,p'*-DDT, *p,p'*-DDT, *o,p'*-DDD, *p,p'*-DDD, *o,p'*-DDE, and *p,p'*-DDE. ΣPCB = Sum of 92 peaks or 105 congeners.
- Muir and Lockhart 1994. As Muir and Lockhart (1) above.
- Schindler and Kidd 1993. As Muir and Lockhart (1) above.
- Muir and Lockhart 1993a. As Muir and Lockhart (1) above.
- Kidd and Schindler 1994. As Muir and Lockhart (1) above. Analyses included shells for *Fossaria* sp. and *Gyraulus* sp.
- Palmer 1992.
- Skotvold *et al.* unpubl. data 1996, Akvaplan Niva. ΣPCB = Sum of 6 congeners 28, 52, 101, 138, 153, 180.
- Allen-Gil *et al.* 1997. ΣHCH = Sum of α-HCH and γ-HCH. ΣCHL = Sum of *cis*- and *trans*-chlordane, heptachlor epoxide, and *trans*-nonachlor. ΣDDTs = Sum of *p,p'*-DDE, -DDD and DDT.
ΣPCB = Sum of 8, 18, 28, 29, 44, 52, 66, 87, 101, 105, 108/118/149, 128, 138, 153, 170, 180, 187, 195, 200, 206, 209.
- Korhonen *et al.* 1997. ΣPCB. The first value is 9 congeners 28, 52, 101, 118, 105, 153, 138, 156, 180.
The second value in brackets is 38 congeners: 18, 28, 33, 77, 80, 51, 52, 49, 47, 74, 66, 60, 81, 126, 101, 99, 110, 123, 118, 114, 122, 105, 169, 153, 141, 138, 159, 167, 128, 156, 157, 180, 170, 187, 183, 189, 194, 206.
- SOMER 1993a, 1993b. ΣHCH = Sum of α-HCH and γ-HCH. ΣCHL = Sum of γ-chlordane, α-chlordane, heptachlor, heptachlor epoxide, and oxychlordane. ΣDDT = Sum of DDE, *o,p'*-DDT, *p,p'*-DDD, *p,p'*-DDT.
- SOMER 1994. ΣHCH = Sum of α-HCH, β-HCH and γ-HCH. ΣCHL = Sum of *cis*- and *trans*-chlordane, *cis*- and *trans*-nonachlor, heptachlor, heptachlor epoxide, and oxychlordane.
ΣDDT = Sum of *o,p'*-DDD, *o,p'*-DDT, *p,p'*-DDD, *p,p'*-DDE, and *p,p'*-DDT.
- Skotvold 1996. ΣPCB = Sum of 6 congeners 28, 52, 101, 138, 153, 180.
- Muir and Lockhart 1996. As Muir and Lockhart (1) above.
- Hammar *et al.* 1993. ΣPCB = Sum of 41 congeners; ΣDDT = *p,p'*-DDE only.
- Palmer unpubl. data.
- Cleemann and Fromberg 1996a, 1996b. ΣCBz = HCBz only. ΣHCH = α-, β- and γ-HCH. ΣCHL = *Trans*-nonachlor only. ΣDDT = Sum of *p,p'*-DDT, *p,p'*-DDD, and *p,p'*-DDE. ΣPCB = Sum of congeners 28, 31, 52, 101, 105, 118, 138 (+163), 153, 156, and 180.
- Melnikov *et al.* 1995, 1996. ΣCBz = Sum of hexachlorobenzene and pentachlorobenzene. ΣHCH = α-, β- and γ-HCH.
ΣCHL = Sum of heptachlor, *cis*-, *trans*-chlordane, and *cis*-, *trans*-nonachlor. ΣDDT = Sum of *o,p'*-DDT, *p,p'*-DDT, *o,p'*-DDD, *p,p'*-DDD, *o,p'*-DDE, and *p,p'*-DDE. ΣPCB = Sum of 7 congeners (CBs 28, 52, 101, 118, 153, 138, 180).
- Korhonen *et al.* 1997.
- M. Olsson unpubl. data.
- B. Koenig unpubl. data. ΣPCB = Sum of congeners 18, 28+31, 52, 49, 47/48, 44, 101, 99, 87, 110, 151, 149, 118, 153+105, 138, 156, 180, 199, 170/190, 196/203, 195, 194, 209.
- Jansson *et al.* 1993. Pooled sample of whitefish muscle; ΣPCB = Sum of 28, 52, 101, 118, 138, 153, 180.
- Evans 1994. As Muir and Lockhart (1) above.

Table 6-A10. Mean and range of concentrations (ng/L) of major organochlorine groups in seawater (filtered and unfiltered) from the Russian Arctic, 1994-1995.

Sea	Depth, m	Year	Statistic	Latitude	Longitude	N	Type	ΣPCB ^a	ΣCBz ^b	ΣHCH ^c	ΣCHL ^d	ΣDDT ^e
Laptev Sea	1	1994	Mean	74°72'N, 128°22'E		25	Filtered	2.54	0.12	0.42	0.24	0.76
			SD					2.94	0.18	0.38	0.26	0.59
			Min	72°00'N, 114°00'E				0.00	0.00	0.00	0.00	0.06
			Max	75°58'N, 136°44'E				10.50	0.82	1.55	1.02	2.40
Laptev Sea	15-22	1994	Mean	74°64'N, 132°64'E		8	Filtered	2.79	0.19	0.44	0.22	1.02
			SD					2.28	0.26	0.40	0.12	0.72
			Min	72°00'N, 114°00'E				0.00	0.00	0.00	0.00	0.20
			Max	75°30'N, 136°30'E				6.69	0.80	1.30	0.50	2.30
Laptev Sea	30-48	1994	Mean	74°50'N, 122°55'E		6	Filtered	1.08	0.07	0.27	0.31	0.39
			SD					1.53	0.06	0.19	0.34	0.34
			Min	74°30'N, 114°00'E				0.00	0.00	0.05	0.03	0.00
			Max	75°30'N, 129°30'E				3.88	0.14	0.60	0.95	0.99
Kara Sea	1	1994	Mean	72°59'N, 77°84'E		25	Filtered	3.49	0.24	0.35	0.56	1.49
			SD					3.26	0.29	0.54	0.35	1.61
			Min	68°00'N, 72°00'E				0.00	0.01	0.05	0.16	0.27
			Max	78°60'N, 87°59'E				14.93	1.58	2.99	1.84	8.18
Kara Sea	15-22	1994	Mean	71°29'N, 75°68'E		8	Filtered	3.21	0.16	0.15	0.51	0.84
			SD					3.30	0.13	0.10	0.36	0.52
			Min	68°00'N, 72°04'E				0.00	0.00	0.06	0.08	0.13
			Max	73°59'N, 80°58'E				10.07	0.43	0.38	1.01	1.77
Kara Sea	30-48	1994	Mean	74°25'N, 80°35'E		3	Filtered	4.82	0.44	0.76	0.49	1.57
			SD					3.77	0.50	0.58	0.36	0.41
			Min	73°00'N, 73°00'E				0.48	0.06	0.15	0.14	1.27
			Max	75°60'N, 85°30'E				7.27	1.01	1.31	0.86	2.03
Pechora Sea	1	1992	Mean	69°75'N, 56°32'E		5	?	0.55	0.06	3.33	0.02	0.27
			SD					0.75	0.07	0.25	0.04	0.35
			Min	68°05'N, 54°01'E				0.00	0.00	3.00	0.00	0.07
Kara Sea			Max	69°50'N, 58°47'E				1.87	0.17	3.65	0.10	0.89
Kara Sea	1	1995	Mean	73°35'N, 73°69'E		14	Unfiltered	2.51	0.20	0.69	0.01	0.98
			SD					2.21	0.20	0.84	0.02	1.09
			Min	69°00'N, 59°00'E				0.00	0.04	0.08	0.00	0.00
			Max	77°50'N, 85°60'E				7.32	0.83	3.38	0.08	3.59
Kara Sea	15-36	1995	Mean	72°38'N, 76°77'E		5	Unfiltered	0.77	0.26	0.41	0.17	0.37
			SD					0.81	0.22	0.26	0.27	0.15
			Min	68°10'N, 61°07'E				0.00	0.06	0.15	0.00	0.21
			Max	74°60'N, 83°60'E				2.35	0.57	0.81	0.56	0.62
Kara Sea	50-115	1995	Mean	74°30'N, 72°50'E		2	Unfiltered	0.21	0.07	0.28	0.00	0.29
Baydaratskaya Gulf			Min	72°00'N, 59°41'E				0.00	0.00	0.05	0.00	0.26
			Max	77°00'N, 85°60'E				0.43	0.13	0.51	0.00	0.33
Kara Sea	1	1995	Mean	69°69'N, 66°56'E		5	Unfiltered	6.12	0.31	0.80	0.57	0.45
			SD					2.71	0.14	0.30	0.21	0.51
			Min	68°04'N, 65°02'E				3.10	0.12	0.40	0.24	0.04
			Max	69°55'N, 67°50'E				10.30	0.48	1.20	0.77	1.20
Kara Sea	1	1995	Mean	70°24'N, 73°33'E		8	Unfiltered	0.51	0.14	0.36	0.11	0.44
Obskaya Gulf			SD					0.00	0.45	0.11	0.39	0.12
			Min	68°00'N, 72°04'E				0.00	0.03	0.00	0.00	0.03
			Max	72°47'N, 74°50'E				1.40	0.34	1.09	0.34	0.94
Kara Sea	1	1995	Mean	72°14'N, 81°01'E		3	Unfiltered	1.60	0.07	0.18	0.00	0.05
Yenisey Gulf			SD					2.77	0.08	0.10	0.00	0.09
			Min	72°06'N, 80°00'E				0.00	0.00	0.07	0.00	0.00
			Max	72°26'N, 82°01'E				4.80	0.16	0.27	0.00	0.16
Pechorskaya Gulf	0.1-1	1995	Mean	68°38'N, 55°81'E		10	Unfiltered	1.16	0.18	2.86	0.10	0.85
			SD					0.78	0.14	1.27	0.09	0.46
			Min	68°19'N, 54°05'E				0.40	0.05	1.20	0.00	0.35
			Max	68°59'N, 57°50'E				3.04	0.47	5.12	0.28	1.82

Results of 0.00 indicate concentrations less than the detection limit (approximately 0.01 µg/g).

a. ΣPCB = Sum of 7 congeners, CBs 28, 52, 101, 118, 153, 138, 180, analyzed by capillary GC. b. ΣCBz = Sum of pentachlorobenzene and HCBz. c. ΣHCH = Sum of α-HCH and γ-HCH.

d. ΣCHL = Sum of heptachlor, heptachlor epoxide, *cis*- and *trans*-chlordane, and *cis*- and *trans*-nonachlor. e. ΣDDT = Sum of *o,p'*- and *p,p'*-DDE, *o,p'*- and *p,p'*-DDD and *o,p'*- and *p,p'*-DDT.

Table 6-A11. Mean and range of concentrations of major organochlorine groups in suspended particulate matter from the Russian Arctic seas (µg/g), 1994-1995.

Sea	Subregion	Year	Statistic	Latitude	Longitude	n	SPM, mg/L	ΣPCB ^a	ΣCBz ^b	ΣHCH ^c	ΣCHL ^d	ΣDDT ^e
Pechora Sea		1994	Mean	68°39'N,	55°43'E	5	3.2	0.38	0.05	3.03	0.04	0.17
			SD				1.8	0.57	0.04	0.06	0.03	0.23
			Min	68°0'N,	54°12'E		1.2	0.00	0.03	3.00	0.00	0.00
			Max	69°45'N,	57°49'E		6.0	1.37	0.11	3.14	0.06	0.58
Kara Sea	Central	1994	Mean	75°7'N,	81°54'E	5	1.0	0.50	0.04	0.07	0.06	0.51
			SD				0.5	0.34	0.03	0.05	0.05	0.36
			Min	74°0'N,	78°16'E		0.5	0.19	0.00	0.04	0.00	0.21
			Max	76°20'N,	87°59'E		1.5	0.95	0.07	0.15	0.12	1.14
Kara Sea	Yenisey Gulf	1994	Mean			3	0.5	2.18	0.14	0.08	0.19	1.24
			SD				0.2	2.02	0.09	0.07	0.14	0.92
			Min	72°3'N,	79°0'E		0.3	0.00	0.03	0.00	0.03	0.34
			Max	73°33'N,	82°6'E		0.7	3.99	0.21	0.13	0.29	2.17
Kara Sea	Ob' Gulf	1994	Mean	70°33'N,	73°25'E	6	7.9	0.43	0.02	0.05	0.04	0.14
			SD				7.6	0.37	0.04	0.04	0.03	0.05
			Min	68°0'N,	72°8'E		1.4	0.00	0.00	0.02	0.00	0.09
			Max	72°40'N,	74°51'E		19.8	0.90	0.10	0.11	0.08	0.22
Chukchi Sea	South	1995	Mean	68°44'N,	187°32'E	13		1.81	0.12	0.08	0.16	0.34
			SD					1.60	0.10	0.05	0.10	0.34
			Min	66°5'N,	182°0'E			0.00	0.02	0.02	0.02	0.00
			Max	70°60'N,	197°60'E			5.20	0.31	0.18	0.34	0.88
East Siberian Sea	South	1995	Mean	70°85'N,	168°39'E	4		2.53	0.03	0.02	0.09	0.39
			SD					2.04	0.04	0.02	0.05	0.23
			Min	69°0'N,	163°20'E			0.30	0.00	0.00	0.04	0.24
			Max	71°60'N,	172°59'E			5.10	0.08	0.04	0.15	0.73
Kara Sea	South	1995	Mean	72°48'N,	68°28'E	7		1.35	0.04	0.02	0.05	0.48
			SD					1.66	0.03	0.03	0.04	0.39
			Min	69°0'N,	59°1'E			0.10	0.00	0.00	0.00	0.16
			Max	74°50'N,	83°60'E			4.30	0.08	0.08	0.13	1.15
Kara Sea	Baydaratskaya Gulf	1995	Mean	69°76'N,	66°45'E	2		0.75	0.12	0.03	0.04	0.53
			Min	68°36'N,	65°40'E			0.30	0.02	0.02	0.00	0.18
			Max	69°55'N,	67°50'E			1.20	0.22	0.04	0.08	0.87
Kara Sea	Ob Gulf	1995	Mean	71°24'N,	72°59'E	3		0.24	0.01	0.03	0.01	0.18
			SD					0.25	0.01	0.04	0.01	0.04
			Min	70°8'N,	72°8'E			0.00	0.00	0.00	0.00	0.14
			Max	72°40'N,	73°30'E			0.50	0.02	0.08	0.02	0.22
Kara Sea	Yenisey Gulf	1995	Mean			2		0.26	0.03	0.01	0.00	0.19
			Min	72°33'N,	79°8'E			0.00	0.00	0.00	0.00	0.08
			Max	72°44'N,	80°11'E			0.52	0.05	0.02	0.00	0.29
Laptev Sea	South	1994	Mean	74°80'N,	132°39'E	5	1.44	0.32	0.00	0.04	0.00	0.22
			SD				0.52	0.09	0.00	0.02	0.00	0.04
			Min	72°0'N,	126°0'E		0.70	0.24	0.00	0.01	0.00	0.18
			Max	75°57'N,	136°44'E		1.95	0.47	0.01	0.07	0.00	0.26

Results of 0.00 indicate concentrations less than the detection limit (approximately 0.01 µg/g).

a. ΣPCB = Sum of 7 congeners, CBs 28, 52, 101, 118, 153, 138, 180, analyzed by capillary GC. b. ΣCBz = Sum of pentachlorobenzene and HCBz. c. ΣHCH = Sum of α-HCH and γ-HCH.

d. ΣCHL = Sum of heptachlor, heptachlor epoxide, *cis*- and *trans*-chlordane, and *cis*- and *trans*-nonachlor. e. ΣDDT = Sum of *o,p'*- and *p,p'*-DDE, *o,p'*- and *p,p'*-DDD and *o,p'*- and *p,p'*-DDT.

Table 6-A12. Levels of organochlorines (ng/L, means and ranges in brackets) in the sea ice and snow cover of the coastal and offshore regions in the seas of the Russian Arctic for the winter season of 1993 (Melnikov *et al.* 1995, 1996).

Sea, area	Concentrations in sea ice, ng/L						Concentrations in snow cover (ng/L)					
	α-HCH	γ-HCH	<i>p',p'</i> -DDE	<i>p,p'</i> -DDD	<i>p,p'</i> -DDT	ΣPCB ^a	α-HCH	γ-HCH	<i>p',p'</i> -DDE	<i>p,p'</i> -DDD	<i>p,p'</i> -DDT	ΣPCB ^a
Kara Sea, Baydaratskaya Gulf	0.52 (0.1-1.41)	0.22 (0.12-0.51)	0.13 (0-0.45)	0.17 (0-0.65)	0.28 (0-0.7)	0.65 (0-1.5)	0.28 (0.2-0.3)	0.2 (0.1-0.3)	0.09 (0.05-0.1)	0.11 (0.03-0.2)	0.38 (0.2-0.7)	0.95 (0.5-2.0)
Kara Sea, south-western part	0.42 (0.1-1.0)	0.34 (0.1-0.8)	0.14 (0-0.45)	0.19 (0-0.65)	0.29 (0-0.7)	0.91 (0-1.8)	0.25 (0.15-0.4)	0.19 (0.1-0.35)	0.09 (0-0.4)	0.07 (0-0.2)	0.22 (0-0.7)	0.82 (0-2.7)
Kara Sea, Ob-Yenisey Shelf	n.d. ^b	n.d.	0.06 (0-0.19)	0.06 (0-0.11)	0.18 (0-0.24)	n.d.	0.33 (0.2-0.45)	0.39 (0.1-0.8)	0.16 (0-0.4)	0 ^c	0.47 (0.15-1.4)	1.78 (0-5.6)
Kara Sea, eastern part	0.09 (0-0.2)	0.07 (0-0.15)	0.04 (0-0.05)	0.04 (0-0.1)	0.07 (0-0.1)	0.99 (0-2.75)	0.39 (0-0.95)	0.24 (0.1-0.45)	0.11 (0-0.2)	0.03 (0-0.2)	0.49 (0-1.9)	1.06 (0-4.7)
Kara Sea, Ob Bay	n.d.	n.d.	n.d.	n.d.	n.d.	1.26 (0-3.8)	0.23 (0.2-0.3)	0.22 (0.15-0.3)	0.08 (0.03-0.1)	0.03	0.22 (0.15-0.3)	0.83 (0.5-1.5)
Kara Sea, Yenisey Gulf	n.d.	n.d.	0.06 (0-0.14)	0.07 (0-0.11)	0.14 (0-0.38)	n.d.	0.35 (0.3-0.4)	0.49 (0.1-0.8)	0.18 (0.1-0.4)	0	0.63 (0.2-1.4)	2.26 (0.5-5.6)

Laptev Sea, western part	0.25 (0.2-0.3)	0.2 (0.15-0.40)	0.07 (0-0.1)	0.17 (0-0.3)	0.88 (0.25-1.5)	0.9 (0-1.3)	0.32 (0.2-0.4)	0.34 (0.15-0.6)	0.07 (0-0.1)	0.14 (0-0.4)	0.74 (0.25-2.9)	1.2 (0-3.2)
Laptev Sea, Khatanga Shelf	0.42 (0.31-0.79)	0.27 (0.05-0.34)	0.13 (0-0.35)	0.11 (0-0.27)	0.31 (0-0.48)	0.84 (0-1.46)	0.2 (0-0.46)	0.15 (0-0.40)	0.1 (0-0.21)	0.05 (0-0.15)	0.2 (0-0.37)	0.91 (0-3.0)
Laptev Sea, eastern part	0.31 (0.21-0.76)	0.19 (0.14-0.32)	0.24 (0-0.45)	0.18 (0-0.38)	0.42 (0.15-0.69)	0.84 (0-1.25)	0.31 (0.2-0.45)	0.07 (0-0.4)	0.06 (0-0.15)	0.05 (0-0.1)	0.17 (0-0.3)	1.68 (0-3.2)
Laptev Sea, Lena Shelf	0.35 (0.3-0.4)	0.08 (0.05-0.1)	0.07 (0-0.1)	0.04 (0-0.1)	0.5 (0.25-0.75)	1.25 (0-6)	0.38 (0.15-0.9)	0.19 (0-0.7)	0.11 (0-0.2)	0.08 (0-0.2)	0.44 (0.2-0.6)	4.03 (1.2-8.2)
Eas Siberian Sea, offshore zone	0.6 (0.15-1.18)	0.45 (0.22-0.64)	0.6 (0-0.88)	0.1 (0-0.15)	0.9 (0.21-1.4)	1.3 (0-10)	0.6 (0.2-0.92)	0.2 (0-0.51)	0 (0-0.47)	0.35 (0-1.9)	1.1 (0-1.9)	1.38 (0-3.0)
East Siberian Sea, Kolyma-Indigirka Shelf	0.54 (0.25-0.67)	0.25 (0.15-0.45)	0.22 (0-0.29)	0.11 (0-0.17)	0.5 (0-0.84)	0.52 (0-1)	0.11 (0.1-0.15)	0.45 (0-1.7)	0.19 (0-0.7)	0.12 (0-0.3)	0.39 (0-0.7)	0.6 (0-1.0)
East Siberian Sea, Chaun Bay	0.25 (0.15-1.26)	1.65 (0.45-1.65)	0.4 (0-0.74)	0.15 (0-0.35)	0.6 (0-0.95)	0.95 (0-1.5)	0.28 (0.1-0.5)	0.33 (0.1-0.6)	0.28 (0.1-1.0)	0.15 (0-0.4)	0.66 (0.25-1.8)	1.49 (0-5.2)
Chukchi Sea	0.2 (0.08-0.37)	0.1 (0.07-0.25)	0.1 (0-0.25)	0.05 (0-0.10)	0.35 (0-0.77)	0.67 (0-1.8)	0.34 (0.1-0.7)	0.54 (0-2.5)	0.26 (0-0.7)	1.45 (0-11.8)	1.02 (0.2-3.4)	1.67 (0-5.2)

a. ΣPCB = Sum of 7 congeners (31, 52, 101, 118, 138, 153, 180). b. n.d. = no data available. c. Zeros indicate results below detection limits. These limits are not given, but are approximately 0.1 ng/L.

Table 6-A13. Air-surface exchange processes, parameters, and environmental data used for mass balance modeling of HCH, toxaphene, and PCBs in the Arctic Ocean.

Process	Term
Rain/snow scavenging of particles	$W_p \phi C_a P$
Rain scavenging of vapors	$W_g(1 - \phi) C_a P$
Snow scavenging of vapors	Not calculated
Dry deposition of particles	$V_d \phi C_a$
Air-sea gas exchange, deposition	$k_a(1 - \phi) C_a$
Air-sea gas exchange, volatilization	$k_a C_w H / RT_a$
Volatilization from the snowpack	Not calculated

Parameter	Frequency	Source
C_a	Monthly	HCH, Toxaphene and PCBs – Fellin <i>et al.</i> 1996; Barrie, unpubl. data; Oehme <i>et al.</i> 1995b (HCH and PCB in EAO)
C_w	Constant	HCHs and toxaphene – Jantunen and Bidleman 199b; Bidleman, unpubl. data; PCB – Iwata <i>et al.</i> 1994b; Chernyak <i>et al.</i> 1995
C_{precip}	Monthly	Calculated
F	Monthly	Gloersen <i>et al.</i> 1992; LeDrew <i>et al.</i> 1992
F_{open}	Monthly (rain)	HCH – Kucklick <i>et al.</i> 1991
H	Constant (seawater)	Toxaphene – Murphy <i>et al.</i> 1987; PCB – Tateya <i>et al.</i> 1988
k_a	Constant	Cotham and Bidleman 1991 (used for HCH, toxaphene and PCBs)
P	Monthly	Barrie <i>et al.</i> 1992
ϕ	Monthly	Calculated from the Junge/Pankow equation; using VP_L
R	Constant	
T_a	Monthly	Barrie <i>et al.</i> 1992
T_w	Constant	
V_d	Constant	Cotham and Bidleman 1991
W_p	Constant	Cotham and Bidleman 1991
	100 000	Jan.-Apr., Sept.-Dec.
	300 000	May-August
W_g	Monthly	Calculated

Table 6-A14. Summary of major organochlorines (ng/g dw) in Arctic marine sediments.

Region/Sea	Site	Latitude	Longitude ^a	% Org. C	HCBz	ΣHCH	ΣDDT	ΣPCB	Reference
High Arctic Ocean	High Arctic Ocean	78.7	1.9		0.10	0.18	0.13	0.74	1
Norwegian Sea	808	67.8	6.0	0.84				0.26	2
High Arctic Ocean		77.1	8.9		0.05	0.17	0.09	1.20	1
		79.2	10.9		0.08	0.16	0.11	1.86	1
		81.7	13.9		0.11	0.25	0.27	0.69	1
Norwegian Sea	44	78.0	14.2	1.74	15.10	1.00	0.03	3.88	3
	43	78.0	14.2	2.10	11.90	1.00	0.03	31.43	3
	46	78.0	14.2	2.59	9.17	0.57	0.50	8.79	3
	41	78.0	14.2	3.45	5.30	0.90	0.50	21.93	3
	Lofoten area/Skrova	68.1	14.7	0.57	0.25	0.50	0.50	2.50	4
	Lofoten area/Lundøy	68.1	15.2	0.95	0.25	0.50	0.50	3.65	4
	3	78.2	15.7	2.10	7.90	1.50	0.03	0.25	3
	1	78.2	15.7	1.58	3.40	0.83	0.03	0.25	3
	2	78.2	15.7	1.97	13.60	1.00	0.03	0.25	3
	Finnsnes-Skjervøy area	68.9	17.1	1.80	0.10	0.10	0.35	1.05	4
	Finnsnes-Skjervøy area	69.5	18.1	1.86					4
High Arctic Ocean		78.7	20.9		0.13	0.30	0.15	0.93	1
Norwegian Sea	Finnsnes-Skjervøy area	70.1	21.1	1.66	0.10	0.15	0.15	0.90	4
	9	76.5	21.8	2.39	0.65	0.31	0.03	0.13	3
	Hammerfest-Honningsvåg	70.4	22.5	1.65					4
	Hammerfest-Honningsvåg	70.7	24.4	2.60	0.10	0.20	0.30	1.20	4
Barents Sea	Hammerfest-Honningsvåg	70.9	26.2	1.86	0.10	0.15	0.25	1.10	4
	14	75.4	26.6	1.67	0.50	0.33	0.03	0.25	3
High Arctic Ocean		77.7	26.9		0.11	0.12	0.14	1.09	1
Barents Sea	Hammerfest-Honningsvåg	70.9	26.9	1.76					4
	26	77.2	27.6	2.23	1.20	0.43	0.03	0.25	3
	Varanger Peninsula area	70.9	28.6	1.92	0.10	0.15	0.25	1.00	4
	7	78.0	29.1	1.46	0.60	0.05	0.03	0.25	3
	Varanger Peninsula area	69.9	30.1	1.85	0.10	0.15	0.20	0.95	4
	Varanger Peninsula area	70.6	30.3	1.44					4
	18	75.1	30.5	2.13	0.50	0.05	0.03	0.25	3
	20	74.9	33.2	1.26	0.80	0.93	0.03	0.25	3
	22	66.5	34.2	0.60	0.10	0.05	0.10	0.48	3
		69.3	35.0			3.41	2.74		5
	23	66.2	35.1	0.42	0.10	0.05	0.10	0.58	3
	25	65.2	35.2	0.16	0.03	0.05	0.03	0.25	3
		70.0	36.0			2.93	4.16		5
		70.4	36.0		0.08	2.25	3.73		5
		69.3	36.0			4.62	3.91		5
	26	64.7	36.1	3.56	0.60	0.30	0.70	2.50	3
	27	65.3	36.7	1.63	0.20	0.20	0.60	1.83	3
		69.4	36.8			3.08	1.84		5
		71.3	37.1		0.15	3.87	3.10		5
	32	65.5	37.9	1.49	0.30	0.20	0.03	2.23	3
		69.7	38.0		0.05	3.66	2.28		5
		71.8	38.0		0.08	5.18	3.30		5
	31	65.1	38.8	1.72	0.20	0.20	0.90	1.65	3
		70.7	39.3		0.15	1.53	0.40		5
	28	64.8	39.3	0.81	0.10	0.05	0.10	0.70	3
	33	65.9	39.5	1.93	0.20	0.13	0.90	1.90	3
	29	64.9	39.6	1.36	0.10	0.13	0.50	1.25	3
	30	65.1	39.8	0.16	0.03	0.05	0.03	0.25	3
		72.5	40.6		0.05	2.70	1.90		5
		72.5	41.3		0.04	2.39	1.19		5
		71.3	41.5		0.02	2.19	4.78		5
		73.5	42.1		0.08	3.41	3.35		5
		73.1	42.2			3.01	3.00		5
		72.9	42.2			3.03	3.21		5
		73.5	42.8			2.95	2.28		5
		73.2	42.9		0.23	3.57	2.19		5
		71.8	43.0			3.98	4.77		5
		72.9	43.0			4.41	1.88		5
		72.9	43.4			1.67	2.13		5
		73.5	43.5			1.77	15.75		5
		73.2	43.6		0.05	1.77	1.20		5
	2	79.6	47.0	1.72	15.80	0.05	0.03	0.25	3

Kara Sea	3	79.5	48.6	1.66	8.50	0.05	0.03	0.25	3
		70.4	49.6		0.01	0.21	0.28	0.45	5
	5	79.5	50.0	1.63	13.60	0.05	0.03	0.25	3
	3	68.6	50.0	6.70					3
		68.7	50.1			0.33	0.44	0.28	5
	6	69.6	50.8	8.10					3
		69.7	50.8		0.01	0.25	0.50	0.53	5
		69.9	51.3		0.05	0.71	0.78	1.45	5
		70.4	52.3		0.01	0.15	0.51	0.03	5
	12	80.4	52.3	0.56	4.20	0.05	0.03	0.25	3
		69.2	53.0			0.14	0.47		5
	7	70.1	53.4	1.90					3
		69.8	54.0		0.03	0.58	1.04	0.95	5
	Pechora Gulf	68.3	54.4		0.01	0.04	0.34	0.24	6
	11	70.7	54.6	16.5					3
	8	70.5	54.6	19.2					3
	Barents Sea	69.4	54.9			0.22	0.66	0.25	5
	14	70.2	55.0	17.0					3
	13	70.4	55.1	20.0					3
	29	68.6	55.2	9.6					3
	Barents Sea	69.3	55.3		0.03	0.24	0.62	1.16	5
	Pechora Gulf	68.6	55.5		0.31	0.35	5.61	0.49	6
	12	70.3	55.6	20.1					3
	Pechora Gulf	69.0	55.6		0.03	0.04	0.24	0.24	6
	Pechora Gulf	68.7	55.8		0.03	0.14	0.89	0.01	6
	Barents Sea	69.0	56.0			0.15	0.31		5
	27	69.0	56.0	0.50					3
	Barents Sea	69.2	56.2		0.01	0.19	0.43	0.01	5
	Barents Sea	69.4	56.3		0.04	0.84	1.19	1.67	5
	Barents Sea	69.3	56.7		0.01	0.08	0.24		5
	Barents Sea	69.8	56.8		0.01	0.15	0.29	0.14	5
	Barents Sea	69.2	56.8			0.11	0.78	0.45	5
	26	69.2	57.2	0.50					3
	Pechora Gulf	68.8	57.2		0.02	0.11	0.88	0.42	6
	19	70.2	57.2	4.50					3
	Barents Sea	69.6	57.3		0.01	0.36	1.05	0.77	5
	Barents Sea	69.2	57.3			0.11	0.31	0.05	5
	20	70.3	57.5	7.80					3
	7	80.7	57.8	1.45	7.10	0.63	0.03	0.25	3
	21	70.2	58.1	3.80					3
	15	81.1	58.7	0.96	6.20	0.33	0.03	0.25	3
	24	69.4	58.9	1.00					3
	22	69.8	59.2	6.10					3
		73.0	60.5		0.07	0.09	0.19	0.40	6
	1	70.0	61.7	1.55	0.50	0.05	0.03	0.25	3
	Baydaratskaya Gulf	69.3	65.2		0.11	0.09	0.39	0.01	6
	Baydaratskaya Gulf	69.5	65.5		0.04	0.06	0.26	0.42	6
	2	69.7	65.6	0.47	0.03	0.05	0.03	0.25	3
	5	71.0	65.8	0.11	0.03	0.05	0.03	0.25	3
	Baydaratskaya Gulf	69.6	65.8		0.05	0.09	0.48	0.33	6
	4,5	70.0	66.0	1.05	0.30	0.05	0.03	0.25	3
	Baydaratskaya Gulf	69.7	66.2		0.05	0.01	0.18	0.01	6
	Baydaratskaya Gulf	69.2	66.2		0.03	0.11	0.15	0.24	6
	3	69.3	66.2	0.50	0.20	0.05	0.03	0.25	3
	Baydaratskaya Gulf	69.3	66.4		0.04	0.18	0.36	0.24	6
	Baydaratskaya Gulf	69.4	66.7		0.08	0.08	0.37	0.01	6
	Baydaratskaya Gulf	69.2	67.0		0.09	0.17	0.45	0.23	6
	Baydaratskaya Gulf	68.9	67.0		0.08	0.20	0.37	0.33	6
		76.0	67.3		0.09	0.09	0.39	0.30	6
	Baydaratskaya Gulf	69.0	67.3		0.05	0.12	0.19	0.01	6
	Baydaratskaya Gulf	69.4	67.4		0.04	0.10	0.36	0.01	6
	Baydaratskaya Gulf	69.1	67.7		0.06	0.12	0.22	0.34	6
	Baydaratskaya Gulf	68.9	67.7		0.08	0.08	0.32	0.64	6
	Kara Sea (Baydaratsk)	69.1	67.7		0.01	0.01	0.11	0.01	6
	Baydaratskaya Gulf	69.2	67.9		0.14	0.20	0.25	0.23	6
	Baydaratskaya Gulf	69.2	68.1		0.07	0.17	0.44	0.42	6
	Baydaratskaya Gulf	68.8	68.2		0.08	0.18	0.39	0.23	6
	Baydaratskaya Gulf	68.5	68.3		0.03	0.15	0.33	0.01	6
		74.0	69.0		0.10	0.12	0.16	0.30	6
	Ob Gulf	71.5	72.1		0.01	0.03	0.28	1.10	6

Region/Sea	Site	Latitude	Longitude ^a	% Org. C	HCBz	ΣHCH	ΣDDT	ΣPCB	Reference
Laptev Sea		75.0	72.2		0.13	0.15	0.25	0.01	6
	Ob Gulf	71.4	72.5		0.03	0.01	0.12	0.01	6
	Ob Gulf	71.5	72.6		0.03	0.06	0.16	0.90	6
	Ob Gulf	71.4	72.8		0.01	0.03	0.05	0.56	6
	7	73.0	73.0	0.97	0.20	0.05	0.03	0.25	3
	Ob Gulf	73.0	73.0		0.10	0.19	0.80	1.60	6
	Ob Gulf	71.5	73.0		0.12	0.10	0.26	1.20	6
	Ob Gulf	70.3	73.1		0.04	0.05	0.27	0.01	6
	Ob Gulf	70.1	73.1		0.01	0.09	0.07	0.01	6
	Ob Gulf	72.0	73.2		0.28	0.22	0.61	1.40	6
	Ob Gulf	72.0	73.2		0.03	0.07	0.09	0.01	6
	9	74.0	73.3	1.64	0.30	0.05	0.03	0.25	3
	10	74.5	73.3	0.18	0.03	0.05	0.03	0.25	3
	Ob Gulf	72.7	73.3		0.06	0.10	0.24	0.80	6
	Ob Gulf	72.7	73.3		0.01	0.05	0.08	0.01	6
		73.8	73.3		0.02	0.03	0.05	0.20	6
	Ob Gulf	70.3	73.4		0.04	0.06	0.24	0.70	6
	Ob Gulf	68.4	73.8		0.01	0.03	0.03	0.01	6
	Ob Gulf	70.3	73.8		0.03	0.03	0.18	2.10	6
	Ob Gulf	68.4	73.9		0.06	0.14	0.15	0.30	6
	Ob Gulf	69.0	73.9		0.06	0.06	0.27	0.40	6
	Ob Gulf	72.7	74.0		0.10	0.13	0.67	2.20	6
	Ob Gulf	69.0	74.0		0.02	0.09	0.10	1.10	6
	Ob Gulf	69.0	74.1		0.01	0.03	0.35	0.80	6
	Ob Gulf	68.4	74.1		0.01	0.01	0.15	0.48	6
	Ob Gulf	68.4	74.1		0.04	0.06	0.24	0.20	6
	Ob Gulf	68.9	74.2		0.01	0.01	0.25	0.30	6
	Ob Gulf	68.8	74.3		0.16	0.05	0.16	1.10	6
	Ob Gulf	68.8	74.3		0.08	0.20	0.17	0.01	6
	Ob Gulf	72.7	74.4		0.08	0.10	0.37	1.50	6
	Ob Gulf	72.7	74.4		0.05	0.05	0.03	0.01	6
	6	72.5	74.4	1.77	0.30	0.05	0.03	0.25	3
		76.2	76.6		0.04	0.11	0.14	0.50	6
		73.7	78.3		0.03	0.09	0.25	0.20	6
		76.0	78.3		0.04	0.05	0.25	0.30	6
	11	74.3	78.6	0.32	0.03	0.05	0.03	0.25	3
	Yenisey Gulf	72.6	79.1		0.22	0.21	0.28	0.01	6
		75.0	79.7		0.08	0.06	0.39	0.90	6
	Yenisey Gulf	73.0	79.7		0.12	0.11	0.34	0.24	6
		74.2	80.0		0.07	0.01	0.15	0.01	6
	Yenisey Gulf	73.0	80.0		0.12	0.07	0.67	0.21	6
	Yenisey Gulf	72.4	80.0		0.07	0.12	0.70	1.20	6
	12	73.6	80.1	0.99	0.20	0.05	0.03	0.25	3
	Yenisey Gulf	72.7	80.2		0.07	0.14	0.37	0.62	6
	Yenisey Gulf	73.1	80.3		0.16	0.19	0.53	0.54	6
	13	72.4	80.7	0.20	0.50	0.05	0.03	0.25	3
	Yenisey Gulf	72.2	81.0		0.08	0.15	0.24	0.24	6
	14	73.9	81.1	1.46	0.30	0.43	0.03	0.25	3
	Yenisey Gulf	72.1	82.0		0.04	0.10	0.32	0.72	6
		75.0	83.5		0.14	0.19	0.40	0.50	6
		74.3	84.3		0.08	0.07	0.55	0.01	6
		77.0	85.3		0.09	0.03	0.14	0.01	6
		75.2	85.3		0.10	0.25	0.36	0.70	6
		76.0	87.3		0.15	0.11	0.30	0.30	6
		77.7	105.7		0.01	0.02	0.12	0.75	6
		74.1	110.9		0.01	0.04	0.06	0.52	6
		74.6	111.2		0.01	0.02	0.05	0.40	6
		74.5	114.3		0.10	0.08	0.91	0.82	6
		75.5	126.0		0.02	0.05	0.43	0.36	6
		73.8	127.0		0.01	0.04	0.08	0.41	6
		73.6	129.5		0.01	0.03	0.11	0.41	6
		71.6	129.9		0.01	0.01	0.03	0.10	6
		71.1	130.2		0.01	0.06	0.04	0.57	6
		72.0	130.5		0.03	0.09	0.45	0.01	6
		75.5	130.5		0.01	0.06	0.43	0.42	6
		73.3	131.5		0.02	0.05	0.06	0.75	6
		73.8	134.0		0.11	0.15	0.28	0.01	6

		71.6	135.9		0.01	0.13	0.44	0.71	6
		74.5	136.0		0.05	0.08	0.38	0.24	6
		76.0	136.7		0.01	0.07	0.64	0.21	6
East Siberian Sea		74.4	145.3		0.02	0.03	0.04	0.30	6
		75.3	145.8		0.01	0.03	0.08	0.43	6
		72.1	151.2		0.02	0.06	0.08	0.65	6
		71.6	151.2		0.01	0.18	0.07	1.50	6
		76.1	153.0		0.06	0.25	0.05	1.80	6
		75.0	153.9		0.02	0.13	0.08	0.48	6
		75.5	154.5		0.16	0.58	0.13	1.50	6
		69.7	162.3		0.01	0.03	0.03	0.50	6
		70.0	166.0		0.09	0.03	0.08	0.89	6
		69.8	170.9		0.01	0.02	0.05	0.10	6
Norwegian Sea	657	61.7	-5.8	0.70	0.01	0.03	0.18	0.66	2
	674	62.1	-6.8	1.34	0.02	0.04	0.23	0.65	2
	642	61.7	-7.8	0.56	0.02	0.04	0.16	0.77	2
	588	61.7	-7.8	0.58				0.25	2
	586	63.2	-9.8	0.38				0.25	2
	796	70.8	-9.8	0.86				0.31	2
Greenland Sea	604	62.4	-11.0					0.25	2
	787	67.0	-12.5	0.75				0.30	2
	J70563B2	65.9	-13.2	0.93					4
	J70563B4	65.8	-13.2	1.00					4
	J70563B1	65.9	-13.4	0.85					4
	J70563D1	65.7	-13.4	0.80				0.21	4
	652	68.2	-16.2	0.78				0.25	2
	J70616A1	66.4	-16.8	0.51					4
	J70371C2	63.7	-21.7	0.40					4
	J70371C1	63.7	-21.8	0.37				0.19	4
	J70371C1	63.7	-21.9	0.37					4
Denmark Strait	Scoresby	70.5	-22.1			0.10	0.15	0.45	7
Icelandic waters	J70424D2	64.2	-24.1	0.51					4
	J70424D2	64.2	-24.2	0.52					4
	J70424D1	64.1	-24.3	0.56					4
	J70424D3	64.1	-24.3	0.46				0.19	4
	J70424D3	64.0	-24.3	0.53					4
	J70424D3	64.1	-24.4	0.55					4
	624	62.4	-25.4	0.65				0.35	2
Davis Strait/Baffin Bay	Nanortalik	60.4	-45.4			0.10	0.15	0.45	7
	Disko	69.1	-53.3			0.10	0.15	0.45	7
	Thule	77.5	-69.2			0.10	0.15	0.45	7
Central Hudson Bay	FOGO4-1	58.0	-81.0		0.19314	0.14	0.51	8.37	8
Wellington Bay		69.3	-107.0					0.05	9
Queen Maud Gulf		68.8	-105.0					0.44	9
Liverpool Bay	Mackenzie Delta – E900	70.3	-128.8		0.51	1.56	1.31	0.15	10
	– E670	69.5	-130.7		0.35	1.06	1.11	0.18	10
	– E500	69.7	-131.5		0.79	0.37	1.92	0.32	10
	– E300	69.1	-132.6		0.75	0.41	0.33	0.28	10
	– E200	68.9	-133.2		1.10	0.13	0.43	0.80	10
	– Mason Bay	69.6	-134.1		0.30	1.07	1.50	0.08	10
Beaufort/Chukchi Sea	C01	75.0	-162.0		0.03	0.01	0.16	0.08	10
	C01-duplicate	75.0	-162.0		0.03	0.01	0.15	0.38	10
Bering Sea	C1 (core)	57.0	-164.9		0.04	0.05	0.07	0.24	11
Beaufort/Chukchi Sea	F09	73.5	-166.0		0.10	0.35	0.20	0.26	10
Bering Sea	Site 75	66.6	-167.3		0.11	0.33	0.94		12
Chukchi Sea	S3	68.9	-167.5	1.33	0.04	0.08	0.01	0.14	11
Bering Sea	Site 96	65.1	-170.8		0.10	0.09	0.82		12
Beaufort/Chukchi Sea	F02	74.5	-171.0		0.22	0.12	0.24	0.33	10
Bering Sea	S2	62.5	-171.2	0.34	0.06	0.04	0.01	0.13	11
	Site 45	67.8	-172.9		0.45	1.13	5.10		12
Beaufort/Chukchi Sea	TC	75.3	-174.0		0.12	0.03	0.21	0.31	10
	E04	77.0	-174.1		0.07	0.02	0.18	0.24	10
Bering Sea	Site 109	54.6	-175.5		0.11	0.20	0.90		12
Beaufort/Chukchi Sea	E01	78.8	-176.0		0.04	0.01	0.12	0.23	10
Bering Sea	Site 13	62.2	-179.9		0.10	0.09	1.30		12

a. All west longitudes are negative.

References: 1. Savinov and Savinova unpubl. data (analyzed by DFO Winnipeg); 2. IMRN (Norway); 3. dos Santos *et al.* 1996a. 1996b; 4. OSPARCOM/JMG and Akvaplan NIVA data (provided by ICES database);

5. Savinov and Savinova unpubl. data; 6. Roshydromet (Russia)/Vlasov and Melnikov 1995; 7. Cleeman *et al.* 1996b/NERI/Denmark; 8. Lockhart unpubl. data 1996; 9. Bright *et al.* 1995b; 10. Macdonald unpubl. data 1996; 11. Iwata *et al.* 1994b; 12. Rice *et al.* 1992.

Table 6-A15. Mean concentrations ($\pm$ SD), and ranges (in brackets), of major organochlorines in marine invertebrates. All values are in ng/g ww unless the tissue is Lipid, where values are lw.

Taxon	Body of Water or Location	Region and Country	Tissue	n	% lipid	Σ CBz	Σ HCH	Σ CHL	Σ DDT	Σ PCB	Toxaphene	Dieldrin	Mirex	Heptachloroxide	Reference
Epontic particles	Barrow Strait	Canada Archipelago	Lipid	1		10-20	200-230	10-100	230-410	20-360	10-140				1
Phytoplankton	54.8°N, 176.5°W	Bering Sea	Whole organism	1	0.76	<0.2	0.78	0.56	1.52	3.0	–				10
Phytoplankton	66°N, 168-169°W	Bering Sea	Whole organism	2	0.055	<0.2	<0.08	0.79	1.59	3.0	1.0				
Arthropoda (crustaceans)															
'shrimp'	66°N, 168-169°W	Bering Sea	Whole organism	2	3.90	0.44	1.34	0.28	0.77	<2.4	1.0				10
Isopoda g. sp.	73-67° N, 74-85°E	Kara Sea, Russia 1994	Whole organism	4	–	0.30	0.54	0.17	2.47	1.28	–	–	–	0.07	4
						(0.10-0.73)	(0.22-0.90)	(0.00-0.50)	(1.12-4.40)	(0.05-1.91)				(0.01-0.15)	
	73°-77° N, 68°-80°E	Kara Sea, Russia 1995	Whole organism	2	–	0.27	0.27	0.04	2.10	5.72	–	–	0.085	0.025	8
						(0-0.54)	(0-0.53)	(0-0.07)	(0.88-3.33)	(5.1-6.35)			(0-0.17)	(0-0.05)	
	69°01'-12' N, 67°20'-51'E	Baydaratskaya Gulf, Russia 1994	Whole organism	2	–	0.25	0.31	0.075	1.12	0.76	–	–		3.17	4
						(0.19-0.3)	(0.27-0.34)	(0.03-0.12)	(0.72-1.52)	(0.00-1.51)				(1.10-5.25)	
	68° N, 67°E	Baydaratskaya Gulf, Russia 1995	Whole organism	2	–	0.32	0.56	0.07	0.99	8.75	–	–	0	0	8
						(0.18-0.45)	(0.46-0.65)	(0-0.65)	(0.79-1.19)	(2.4-15.1)					
	72°30'.16 N, 73°49'.78E	Ob Gulf, Russia 1995	Whole organism	1	–	0.74	0.81	0	3.9	6.25	–	–	0	0	
	72°26'.2 N, 80°01'.6 E	Yenisey Gulf, Russia 1995	Whole organism	1	–	0.21	0.96	0	2.05	2.6	–	–	0	0	
Amphipoda g. sp.															
	74° N, 72°-83° E	Kara Sea, Russia 1995	Whole organism	2	–	0.1	0.52	0.20	1.23	4.59	–	–	0	0	8
						(0-0.2)	(0.14-0.9)	(0-0.205)	(1.15-1.3)	(4.02-5.17)					
	72°30'.16 N, 73°49'.78 E	Ob Gulf, Russia 1995	Whole organism	1	–	0.38	0.64	0	2.31	4.97	–	–	0	0	
	68°52'.0 N, 67°02'.0 E	Baydaratskaya G., Russia 1995	Whole organism	1	–	0.25	0.83	0.07	0.83	5.14	–	–	0	0	
Amphipods (Pelagic)	Barrow Strait	Cornwallis Island, Canada	Lipid	1		1-20	70-90	4-430	1-4	1-3	50-400				
Amphipods (<i>Anonyx</i>)	Barrow Strait	Cornwallis Island, Canada	Lipid	1		70-150	430-6300	120-180	60-220	66-380	588-1300				1
<i>Orchomene</i> sp.	Cambridge Bay	Victoria Island, Canada		2	–					(32-36)	–	–			6
<i>Cumacea</i> g. sp.	73° N, 68° E	Kara Sea, Russia 1995	Whole organism	1	–	0.29	0.66	2.03	0.02	2.23	–	–	0	0	
Urochordata (tunicates)															
<i>Ascidacea</i> sp.	75°14'.45 N, 85°16'.43 E	Kara Sea, Russia 1994	Whole organism	1	–	0.15	0.26	0.08	1.13	0.81	–	–	–	0.05	4
		Baydaratskaya Gulf, Russia 1994	Whole organism	2	–	0.07	0.28	0.02	1.00	0.02	–	–	–	1.90	
						(0.00-0.13)	(0.21-0.35)	(0.00-0.03)	(0.88-1.12)	(0.00-0.03)				(0.36-3.43)	
Annelida (segmented worms)															
<i>Nephytes</i> sp.	75°14'.45 N, 85°16'.43 E	Kara Sea, Russia 1994	Whole organism	1	–	0.31	0.44	0.08	1.97	6.60	–	–	–	0.11	4
	69°12'.09 N, 67°51'.36 E	Baydaratskaya G., Russia 1994	Whole organism	1	–	0.19	0.37	0.06	1.60	4.18	–	–	–	0.10	
Echiuridae sp.	73°00' N, 73°00' E	Kara Sea, Russia 1994	Whole organism	2	–	0.14	0.14	0.12	2.10	2.35	–	–	–	0.115	4
						(0.12-0.16)	(0.14-0.15)	(0.11-0.12)	(2.07-2.14)	(1.98-2.71)				(0.11-0.12)	
<i>Sedentaria</i> g. sp.	72° N, 73° E	Baydaratskaya Gulf, Russia 1995	Whole organism	2	–	0.18	0.46	0	1.61	1.41	–	–	0	0	8
						(0.2-0.16)	(0.34-0.58)		(1.53-1.7)	(0.5-2.32)					
<i>Errantia</i> g. sp.	72°26'.2 N, 80°01'.6 E	Yenisey Gulf, Russia 1995	Whole organism	1	–	0.24	0.07	0	1.71	1.2	–	–	0	0	8
Echinodermata (starfishes, sea urchins, sea cucumbers and sea-lilies)															
<i>Stegophiura nodosa</i>	73°39'.76 N, 78°17'.39 E	Kara Sea, Russia 1994	Whole organism	1	–	0.29	0.56	0.07	3.25	3.35	–	–	–	0.09	4
	69°43'.93 N, 65°10'.20 E	Baydaratskaya G., Russia 1994	Whole organism	1	–	0.16	0.37	0.04	1.43	2.40	–	–	–	0.10	
Ophiuroidea g. sp.	74-75° N, 85-73° E	Kara Sea, Russia 1994	Whole organism	2	–	0.18	0.56	0.07	2.15	2.48	–	–	–	0.10	4
						(0.03-0.34)	(0.45-0.68)	(0.04-0.10)	(1.83-2.46)	(2.12-2.84)				(0.06-0.14)	
<i>Strongylocentrotus droebachiensis</i>	Cambridge Bay	Victoria Island, Canada		14	–	–	–	–	–	<1.0-210)	–	–	–		6b
	Wellington Bay/ Queen Maud Gulf	Victoria Island, Canada		2	–	–	–	–	–	(24-26)	–	–	–		6a
Mollusca (molluscs, chitons, clams, snails)															
Bivalve sp.	63-67°N, 172-177°W	Bering Sea	Muscle	5	1.2	2	8.9	0.63	0.56	1.80	–				10
<i>Bivalvia</i> g. sp.	Sanikiluaq	S. Hudson Bay, Canada	Whole organism	–	–		<0.1	1.0	0.6	1.1					2
<i>Septentrion</i> sp.	Manitounuk Sound	E. Hudson Bay, Canada	Whole organism	–	–	<0.01	0.30	0.2	0.2	2.5	2.99				3
<i>Serripes groenlandica</i> sp.	69°12-43' N, 67-65° E	Baydaratskaya Gulf, Russia 1994	Muscle	2	–	0.21	0.36	0.03	1.17	4.28				0.15	4
						(0.20-0.21)	(0.34-0.38)	(0.00-0.06)	(0.97-1.37)	(3.76-4.80)					
	68°52'.0 N, 67°40'.0 E	Baydaratskaya Gulf, Russia 1995	Soft body	1	–	0.03	0.02	0	0.89	3.1			0	0	8
	73°00'.0 N, 68°39'.1 E	Kara Sea, Russia 1995	Soft body	1	–	0.1	0.08	0	1.82	5.9			0	0	
	72°40'.0 N, 73°20'.0 E	Ob Gulf, Russia 1995	Whole organism	1	–	0.06	0.21	0	2.21	4.5			0	0	
	72°26'.2 N, 80°01'.6 E	Yenisey Gulf, Russia 1995	Whole organism	1	–	0.28	0.5	0	0.75	0			0	0	
<i>Arctica islandica</i>	Cambridge Bay	Victoria Island, Canada		2	–	–	–	–	–	<2.4-1.9)					6b
<i>Mya truncata</i>	Cambridge Bay	Victoria Island, Canada		4	–	–	–	–	–	(0.89-2.2)					6a
	Wellington Bay/ Queen Maud Gulf	Victoria Island, Canada		1	–	–	–	–	–	<0.62					6b
<i>Macoma</i> sp.	69°-72° N, 61°-67°E	Kara Sea, Russia 1995	Soft body	2	–	0.28	0.28	0.08	1.29	3.46			0.015	0	8
						(0.1-0.45)	(0.1-0.46)	(0-0.16)	(0.57-2.02)	(2.5-4.42)			(0-0.03)		

<i>Mytilus edulis</i> (Blue Mussel)	72° N, 73°-74°E	Ob Gulf, Russia 1995	Whole organism	2	–	0.17 (0.15-0.17)	0.26 (0.14-0.38)	0	2.17 (1.72-2.62)	5.29 (3.69-6.88)	0	0.01 (0-0.02)	4
	69°10-12' N, 66-67°E	Baydaratskaya G., Russia 1994	Muscle	2	–	0.27 (0.18-0.35)	0.59 (0.48-0.70)	0.03 (0.00-0.06)	2.60 (2.42-2.78)	3.63 (2.70-4.56)		0.12 (0.1-0.14)	
	63°30' N, 21°W	Iceland		2	1.41 (1.02-1.79)	0.064 (0.052-0.075)	–	–	0.22 (0.210-0.239)	0.53 (0.462-0.588)			
	64°30' N, 23°W	Iceland		3	0.77 (0.70-0.91)	0.014 (0.0080-0.017)	–	–	0.080 (0.041-0.16)	0.94 (0.56-1.47)			
	64°30' N, 22°W	Iceland		2	1.03 (0.95-1.10)	0.027 (0.022-0.033)	–	–	0.16 (0.16-0.17)	1.50 (1.44-1.56)			
	64°30' N, 21°W	Iceland		3	1.22 (0.66-1.53)	0.041 (0.011-0.080)	–	–	0.274 (0.20- 0.31)	1.87 (1.54-2.13)			
	65°30' N, 14°W	Iceland		2	1.45 (1.38-1.52)	0.099 (0.085-0.11)	–	–	0.27 (0.24-0.29)	1.31 (0.80-1.83)			
	66°30' N, 24° W	Iceland		2	0.86 (0.81-0.91)	0.069 (0.037-0.10)	–	–	0.23 (0.18-0.29)	1.39 (0.98-1.80)			
	67°N, 19° W	Iceland		2	0.76 (0.74-0.84)	0.052 (0.022-0.083)	–	–	0.23 (0.18-0.29)	0.89 (0.61-1.17)			
	Cambridge Bay	Victoria Island, Canada		2	–	–	–	–	–	(2.7-3.2)			6a
<i>Tridonta borealis</i>	Wellington Bay/Queen Maud G.	Victoria Island, Canada		1	–	–	–	–	–	0.99			7
	Disko	Greenland	Muscle	15	1.3 (1.1-1.6)	0.030 (<0.05-0.05)	0.390 (0.30-0.54)	0.090 (0.07-0.16)	0.240 (0.12-0.48)	0.590 (0.43-0.82)			
	~69° N, 53°18-20'W	Greenland	Muscle	14	2.1 (1.65-2.8)	0.090 (0.07-0.14)	0.820 (0.59-1.23)	0.160 (0.11-0.23)	0.430 (0.25-0.84)	0.850 (0.61-1.07)			
	Nanortalik	Greenland		14	1.9 (1.2-3.1)	0.080 (<0.05-0.13)	0.590 (0.32-0.95)	0.360 (0.10-0.95)	0.810 (0.34-1.79)	1.400 (0.79-2.93)			
	Uummannaq	Greenland	Muscle	14	1.9 (1.2-3.1)	0.080 (<0.05-0.13)	0.590 (0.32-0.95)	0.360 (0.10-0.95)	0.810 (0.34-1.79)	1.400 (0.79-2.93)			
	~71°22' N, 53°51'W	Greenland		14	1.9 (1.2-3.1)	0.080 (<0.05-0.13)	0.590 (0.32-0.95)	0.360 (0.10-0.95)	0.810 (0.34-1.79)	1.400 (0.79-2.93)			
	Baydaratskaya G., Russia 1994		Whole organism	1	0.17	0.21	0.09	2.51	2.12			0.17	4
	Ob Gulf, Russia 1995		Whole organism	1	0.15	0.23	0	1.68	3.24		0	0.02	8
	Yenisey Gulf, Russia 1995		Whole organism	1	0	0.12	0	1.27	1.8		0	0	
	Yenisey Gulf, Russia 1995		Whole organism	1	0.03	0.05	0	1.22	2.11		0	0	8
<i>Ioldia amigdalea</i>	68°52'.0 N, 67°40'.0 E	Baydaratskaya Gulf, Russia 1995	Soft body	1		0.11	0.07	0	0.37	4.5	0	0	8
<i>Buccinum</i> sp.													
Zooplankton (>150 µm)	75-80°N, 170-180° E	Mid-Arctic Ocean, Aug-Sept 1994	Whole organism	1	28.5	1.4	3.9	5.9	6.2	42.6	26.9	1.6	9
	80-85°N, 170-180° E	Mid-Arctic Ocean, Aug-Sept 1994	Whole organism	1	26.0	1.9	2.7	5.4	6.2	42.7	26.9	1.4	
	85-88°N, 170-180° E	Mid-Arctic Ocean, Aug-Sept 1994	Whole organism	1	28.4	1.6	3.4	6.2	7.2	60.3	24.4	1.9	
	88-90°N, 0-20° E	Mid-Arctic Ocean, Aug-Sept 1994	Whole organism	1	22.8	2.0	3.1	5.8	7.0	43.0	20.9	1.9	
Zooplankton (>500 µm)	Barrow Strait	Canada archipelago	Lipid	1		5-130	110-180	8-107	2-10	4-20	200-1400		1
Zooplankton (>150 µm)	53-67°N, 171-178°W	Bering Sea	Whole organism	4	1.32	0.49	2.1	1.22	6.1	5	2		10
Other invertebrates													
Maldanidae sp.		Kara Sea, Russia 1994	Whole organism	1		0.27	0.70	0.28	1.70	2.15		0.19	4
Spionidae sp.		Kara Sea, Russia 1994	Whole organism	1		0.46	0.65	0.12	3.09	1.18		0.04	4
<i>Phascolosoma margaritaceum</i>	69°50'.0 N, 61°59'.5 E	Kara Sea, Russia 1995	Whole organism	1		0	0.08	0.03	0.34	0.7	0	0	8
<i>Travisia</i> sp.		Baydaratskaya Gulf, Russia 1994	Whole organism	1		0.23	0.35	0.08	0.85	0.91		0.26	4
Milne-Edwardsia sp.	72°40'.0 N, 73°20'.0 E	Ob Gulf, Russia 1995	Whole organism	1		0.06	0	0	1.08	5.3	0	0	8

References, Explanations of summation in tables

1. Hargrave unpubl. 1994. See Muir *et al.* 1995 for list of OC components.

2. Cameron and Weis 1993.

3. ΣCBz = Sum of tetra- and pentachlorobenzene and HCBz. ΣHCH = Sum of α-, β-, and γ-HCH. ΣCHL = Sum of oxy-, cis-, and trans-chlordane, heptachlor epoxide, and cis- and trans-nonachlor.

ΣDDT = Sum of o,p'-DDT, p,p'-DDT, o,p'-DDD, p,p'-DDD, o,p'-DDE, and p,p'-DDE. ΣPCB = Sum of 92 peaks or 105 congeners.

4. Melnikov *et al.* 1995. ΣPCB = Sum of 7-9 congeners. ΣDDT = Sum of o,p'-DDT, p,p'-DDT, o,p'-DDD, p,p'-DDD, o,p'-DDE, and p,p'-DDE. ΣHCH = Sum of α- and γ-HCH. ΣCHL = Sum of heptachlor epoxide, cis-chlordane, and trans-nonachlor. ΣCBz = Sum of hexachlorobenzene and pentachlorobenzene.

5. Data provided by ICES database 1994. ΣPCB = Sum of 11 congeners 31, 52, 101, 105, 118, 128, 138, 153, 156, 170, 180. ΣDDT = p,p'-DDE only. ΣCBz = HCBz only.

6. Bright *et al.* unpubl. data. a. ΣPCB = Sum of 47 congeners. b. Estimated maximum detection limit of individual congeners.7. Cleemann *et al.* 1996c, 1996e. ΣPCB = Sum of 10 congeners 28, 31, 52, 101, 105, 118, 128, 138, 153, 156 and 180. ΣDDT = Sum of p,p'-DDT, p,p'-DDD, and p,p'-DDE. ΣCBz = HCBz only. ΣCHL = Trans-nonachlor only. ΣHCH = Sum of α-, β-, and γ-HCH.8. Melnikov *et al.* 1996a. ΣPCB = Sum of 7-9 congeners. ΣDDT = Sum of o,p'-DDT, p,p'-DDT, o,p'-DDD, p,p'-DDD, o,p'-DDE, and p,p'-DDE. ΣHCH = Sum of α-, β-, and γ-HCH.

ΣCHL = Sum of heptachlor, cis-chlordane, trans-chlordane, cis-nonachlor, and trans-nonachlor. ΣCBz = Sum of hexachlorobenzene and pentachlorobenzene.

9. Muir and Macdonald unpubl. data 1996. ΣPCB = Sum of 92 peaks or 105 congeners.

10. Rice *et al.* 1992. ΣPCB = Aroclor 1254. ΣCBz = HCBz; only non-detects were included in calculation of means as 1/2 detection limit.

Table 6-A16. Mean levels of organochlorines (ng/g ww) in Arctic seabirds and shorebirds.

Country	Arctic Region	Age	Tissue	No. Samples	No. eggs or chicks /sample	Years	% Lipid	HCBz	ΣCBz	α-HCH	ΣHCH	ΣCHL	p,p'-DDE	ΣDDT	Dieldrin	ΣPCB	Σ4-CBs	Σ5-CBs	Σ6-CBs	Σ7-CBs	Σ8-CBs	Mirex	Heptachlor-epoxide	Reference
<i>Cepphus grylle</i> (Black guillemot)																								
Canada	ELA	Egg		9	3	1993	10.7	87.8	98.0	9.70	18.2	124	124	146	15.3	423	42.3	110	217	44.7	6.30	–	–	1
Canada	HA	Egg		5	1-3	1993	8.06	49.6	63.2	12.2	19.7	54.1	102	130	12.3	254	27.6	54.3	126	39.3	3.20	–	–	
Canada	ELA	Chick	Whole body	1	10	1993	11.5	16.5	17.9	3.60	4.90	24.4	20.2	24.7	9.40	58.8	4.60	13.8	33.2	6.90	0.30	–	–	
Canada	HA	Chick	Whole body	1	10	1993	14.7	31.7	42.4	7.60	13.0	39.1	38.8	39.6	10.9	141	11.8	25.7	89.9	11.3	1.70	–	–	
<i>Uria aalge</i> (Common guillemot)																								
Norway	HO	Egg		5		1992-1993	11.8	90.0	–	–	3.12	40.0	250	290	–	480	–	–	–	–	–	–	–	3
Norway	KP	Egg		5		1992-1993	11.7	100	–	–	3.11	40.0	310	380	–	980	–	–	–	–	–	–	–	
<i>Rissa tridactyla</i> (Black-legged kittiwake)																								
Canada	HA	Egg		10	1-3	1993	9.27	40.5	44.3	1.30	5.00	42.7	118	123	11.8	536	31.4	95.0	258	118	29.7	–	–	1
Canada	HA	Chick	Whole body	1	1	1993	7.70	14.5	18.2	2.60	4.00	19.8	27.90	38.0	4.70	180	10.4	31.6	88.5	39.5	8.10	–	–	
Russia	FJL	Adult	Liver	5		1991	2.16	10.5	–	–	1.10	12.6	–	14.7	–	306	–	–	–	–	–	–	–	2
Russia	FJL	Adult	Muscle	5		1991	1.94	8.30	–	–	2.10	12.8	–	16.8	–	203	–	–	–	–	–	–	–	
Russia	FJL	Adult	Fat	1		1991	67.5	3.20	–	–	0.40	2.80	–	4.30	–	21.6	–	–	–	–	–	–	–	
Norway	BI	Adult	Liver	4		1991	1.33	11.9	–	–	6.70	25.0	–	74.3	–	729	–	–	–	–	–	–	–	
Norway	BI	Adult	Brain	4		1991	1.98	4.10	–	–	10.4	3.10	–	3.40	–	55.7	–	–	–	–	–	–	–	
Norway	BI	Adult	Fat	3		1991	61.4	300	–	–	31.1	526	–	630	–	8970	–	–	–	–	–	–	–	
Norway	SB	Adult	Liver	5		1991	1.08	6.80	–	–	0.400	5.00	–	14.90	–	119	–	–	–	–	–	–	–	
Norway	SB	Adult	Brain	5		1991	0.780	1.50	–	–	0.300	0.700	–	2.20	–	18.5	–	–	–	–	–	–	–	
Norway	SB	Adult	Fat	5		1991	64.1	331	–	–	24.3	312	–	1095	–	8240	–	–	–	–	–	–	–	
Norway	HO	Adult	Liver	5		1991	3.16	12.3	–	–	1.30	13.6	–	18.8	–	185	–	–	–	–	–	–	–	3
Norway	HO	Adult	Brain	4		1991	5.13	7.80	–	–	0.80	5.80	–	7.50	–	87.2	–	–	–	–	–	–	–	
Norway	HO	Adult	Fat	5		1991	68.0	334	–	–	22.3	620	–	1050	–	11610	–	–	–	–	–	–	–	
Norway	HO	Egg		22		1992-1993	8.50	50.0	–	–	3.72	40.0	80	–	–	590	–	–	–	–	–	–	–	
Norway	NO	Egg		5		1992-1993	9.46	80.0	–	–	6.01	70.0	200	230	–	920	–	–	–	–	–	–	–	
Norway	LO	Egg		5		1992-1993	9.47	70.0	–	–	3.82	120.0	260	320	–	1380	–	–	–	–	–	–	–	
Norway	SB	Egg		5		1992-1993	9.43	70.0	–	–	3.94	90.0	240	310	–	1110	–	–	–	–	–	–	–	
Russia	BI		Liver	1		1994	–	6.74	7.19	0.05	0.12	0.03	5.27	5.84	0.00	79.6	–	–	–	–	–	0.21	3.36	4
<i>Somateria mollissima</i> (Common eider)																								
Canada	ELA	Egg		5	3	1993	17.3	10.4	10.4	1.40	1.4	14.1	14.0	14.0	7.20	30.1	0.00	6.60	22.9	0.70	0.00	–	–	1
Canada	WLA	Egg		5	3	1993	16.1	17.1	18.7	4.70	13.2	24.6	14.6	14.6	8.50	30.7	0.00	11.1	18.3	1.30	0.00	–	–	
Russia	FJL	Chick	Liver	5		1991	2.60	1.90	–	–	0.20	1.60	–	1.20	–	2.80	–	–	–	–	–	–	–	2
Russia	FJL	Chick	Muscle	5		1991	1.30	4.60	–	–	3.40	6.90	–	2.70	–	4.50	–	–	–	–	–	–	–	
Norway	SB	Chick	Liver	2		1991	0.50	1.15	–	–	0.85	1.60	–	3.35	–	12.4	–	–	–	–	–	–	–	
Norway	SB	Chick	Brain	2		1991	2.55	1.60	–	–	10.4	0.50	–	2.00	–	6.90	–	–	–	–	–	–	–	
Norway	SB	Chick	Fat	2		1991	47.0	26.5	–	–	3.90	24.0	–	133	–	455	–	–	–	–	–	–	–	
Norway	SB	Adult	Liver	4		1991	1.50	4.10	–	–	0.70	3.80	–	9.70	–	24.3	–	–	–	–	–	–	–	
Norway	SB	Adult	Brain	4		1991	0.80	1.10	–	–	1.60	0.40	–	1.60	–	4.60	–	–	–	–	–	–	–	
Norway	SB	Adult	Fat	4		1991	56.5	97.4	–	–	98.9	68.2	–	350	–	730	–	–	–	–	–	–	–	
Norway	NO	Egg		5		1992-1993	16.6	<10	–	–	1.26	<10	20.00	30.00	–	20.00	–	–	–	–	–	–	–	3
<i>Polysticta stelleri</i> (Steller's eider)																								
Russia	TP		Liver	1		1995	–	3.39	3.39	0.08	0.16	0.98	3.21	7.52	–	35.2	–	–	–	–	–	0.33	1	5
<i>Larus hyperboreus</i> (Glaucous gull)																								
Canada	WLA	Egg		10	2-3	1993	8.50	54.8	57.1	0.30	21.0	62.8	238	241	7.90	389	21.3	97.3	209	55.6	6.00	–	–	1
Canada	HA	Egg		10	2	1993	8.64	169	189	1.90	67.7	342	1580	1600	25.2	2290	123	397	985	640	133	–	–	
Canada	HA	Chick	Whole body	1	4	1993	12.70	167	190	2.30	29.7	161	1133	1140	26.7	1680	62.3	248	623	614	75.3	–	–	
Norway	SB	Adult	Liver	5		1991	1.20	17.8	–	–	2.90	34.1	–	130	–	398	–	–	–	–	–	–	–	2
Norway	SB	Adult	Brain	5		1991	1.34	6.40	–	–	0.70	7.00	–	57.9	–	111	–	–	–	–	–	–	–	
Norway	SB	Adult	Fat	5		1991	50.7	490	–	–	106	1310	–	4010	–	15980	–	–	–	–	–	–	–	
Norway	BI	Adult	Liver	5		1991	6.90	50.6	–	–	6.20	117	–	315	–	1844	–	–	–	–	–	–	–	
Norway	BI	Adult	Brain	4		1991	2.11	6.80	–	–	2.90	9.60	–	45.9	–	126.1	–	–	–	–	–	–	–	
Norway	BI	Adult	Fat	5		1991	36.9	357	–	–	38.70	993	–	3100	–	12870	–	–	–	–	–	–	–	
Russia	TP		Liver	1		1995	–	127	127	0.17	0.34	68.13	209	829.4	–	4840	–	–	–	–	–	253	12.8	5
<i>Larus argentatus</i> (Herring gull)																								
Norway	HO	Egg		5		1992-1993	8.85	40.0	–	–	5.16	70.0	220	260	–	830	–	–	–	–	–	–	–	3
Norway	HJ	Egg		5		1992-1993	12.9	60.0	–	–	3.59	210	440	520	–	2300	–	–	–	–	–	–	–	
Norway	NO	Egg		5		1992-1993	9.06	100	–	–	8.59	260	1000	1169	–	2670	–	–	–	–	–	–	–	
Norway	LO	Egg		5		1992-1993	8.06	210	–	–	2.73	210	530	640	–	1530	–	–	–	–	–	–	–	

Russia	ET	Adult	Liver	3		1994	–	2.61 (1.67-3.36)	2.74 (1.77-3.58)	0.07 (0.05-0.09)	0.10 (0.06-0.15)	0.62 (0.09-1.67)	16.23 (11.1-20.8)	17.41 (12.6-22.4)	0.00	148 (91.6-185)	–	–	–	–	–	0.11 (0.00-0.34)	5.14 (2.17-8.94)	4
Russia	YP	Adult	Liver	1		1994	–	1.96	0.18	0.05	0.11	0.10	17.30	0.88	0.00	207	–	–	–	–	–	0.05	2.84	5
Russia	TP		Liver	1		1995	–	39.4	39.4	0.25	0.44	6.74	118	155.73	–	1686	–	–	–	–	–	0	0.73	5
<i>Somateria spectabilis</i> (King eider)																								
Canada	ELA	Egg		5	3	1993	14.2	11.9	12.2	0.30	2.70	21.4	12.0	12.1	10.0	41.7	5.30	12.50	22.60	1.30	0.00	–	–	1
Russia	RZ	Adult	Liver	1		1994	–	0.02	0.07	0.02	0.02	0.04	0.05	0.21	0.00	0.15	–	–	–	–	–	0.00	0.00	4
Russia	LS		Liver	1		1995	–	0.05	0.05	0.2	0.64	0.24	0.13	0.13	–	26.7	–	–	–	–	–	0.07	0	5
<i>Fulmaris glacialis</i> (Northern fulmar)																								
Canada	HA	Egg		5	3	1993	11.9	62.8	69.4	2.90	4.80	136	428	490	12.9	563	27.1	124	247	134	23.9	–	–	1
Canada	HA	Chick	Whole body	1	10	1993	12.7	26.6	30.0	6.00	7.50	63.70	235	248	5.80	302	11.4	58.6	142	71.6	14.1	–	–	4
Russia	KS		Liver	4		1995		37.1	38.32	0.38	0.56	12.96	142	487.19	–	3151	–	–	–	–	–	40.8	2.28	5
<i>Uria lomvia</i> (Thick-billed murre, Brünnich's guillemot)																								
Canada	ELA	Egg		10	3	1993	13.5	113.5	126.1	9.20	20.3	60.6	312	318	23.7	397	35.6	85.40	198	59.3	13.9	–	–	1
Canada	HA	Egg		10	3	1993	12.8	56.8	66.0	9.20	19.1	40.4	245	255	13.4	327	36.1	64.70	147	58.1	16.3	–	–	3
Canada	HA	Chick	Whole body	2	6,10	1993	8.45	46.2	55.6	2.90	7.70	21.8	165	166	10.1	195	18.9	36.40	92.9	34.1	11.2	–	–	3
Canada	ELA	Chick	Whole body	1	10	1993	10.0	61.7	68.6	2.50	5.90	37.9	192	192	13.8	192	16.0	38.60	102	25.6	8.20	–	–	3
Norway	HO	Egg		5		1992-1993	11.3	110	–	–	4.17	50.0	290	340	–	530	–	–	–	–	–	–	–	3
Norway	KP	Egg		5		1992-1993	11.4	100	–	–	4.47	40.0	290	340	–	920	–	–	–	–	–	–	–	3
Norway	SB	Egg		5		1992-1993	12.4	40.0	–	–	6.05	40.0	400	480	–	500	–	–	–	–	–	–	–	3
Russia	BI		Liver	4		1994	–	6.19 (2.51-11.9)	6.45 (2.65-12.3)	0.06 (0.04-0.09)	0.12 (0.04-0.24)	0.08 (0.05-0.12)	3.48 (2.27-5.52)	3.91 (2.41-6.36)	0.00	7.76 (5.02-13.6)	–	–	–	–	–	0.11 (0.00-0.22)	0.81 (0.44-1.49)	4
Russia	LS		Liver	1		1995	–	19.9	20.3	0.29	0.51	0.62	6.85	11.96	–	71.2	–	–	–	–	–	0.67	1.07	5
<i>Phalacrocorax aristotelis</i> (Shag, Cormorant)																								
Norway	HO	Egg		5		1992-1993	4.41	30.0	–	–	3.53	90	130	180	–	710	–	–	–	–	–	–	–	3
Norway	NO	Egg		5		1992-1993	4.66	30.0	–	–	3.10	70	170	200	–	480	–	–	–	–	–	–	–	3
Norway	LO	Egg		5		1992-1993	4.50	20.0	–	–	2.94	40	80	90	–	280	–	–	–	–	–	–	–	3
<i>Fratercula arctica</i> (Puffin)																								
Norway	HO	Egg		5		1992-1993	8.86	90	–	–	4.10	170	280	380	–	1060	–	–	–	–	–	–	–	3
Norway	NO	Egg		5		1992-1993	11.9	90	–	–	7.07	100	300	350	–	580	–	–	–	–	–	–	–	3
Norway	LO	Egg		5		1992-1993	11.9	60	–	–	3.01	100	190	270	–	530	–	–	–	–	–	–	–	3

Canadian Arctic Regions: 1. ELA: Eastern Low Arctic, 2. WLA: Western Low Arctic, 3. HA: High Arctic. Barents Sea Area. 1. SB: Svalbard, 2. BI: Bjørnøya (Bear Island), 3. FJL: Frans Josef Land, 4. HO: Hornøya. 5. KP: Kola Peninsula, 6. NO: South Tromsø / North Nordland, 7. LO: Lofoten, and 8. HJ: Hjelmsøy, West Finnmark. Russian Arctic Regions: 1. BI: Bel'kovskiy Island, 2. RZ: Russkij Zavorot, 3. ET: East Taimyr, 4. YP: Yamal Peninsula, 5. TP: Taimyr Peninsula, 6. KS: Kara Sea, 7. LS: Laptev Sea, 8. ESS: East Siberian Sea.

References

- Braune 1994a, 1994b. ΣCBz = Sum of 1, 2, 3, 5 & 1, 2, 3, 4 tetrachlorobenzene, pentachlorobenzene, and HCBz. Braune, unpubl. data. ΣHCH = Sum of α -, β -, and γ -HCH. ΣCHL = Sum of oxy, *trans*-, and *cis*-chlordane, *trans*- and *cis*-nonachlor, and heptachlor epoxide. ΣDDT = Sum of *p,p'*-DDE, *p,p'*-DDD, and *p,p'*-DDT. ΣPCB = Sum of 42 PCB congeners 28, 31, 42, 44, 49, 52, 60, 64, 66/95, 70, 74, 87, 97, 99, 101, 105, 110, 118, 128, 129, 137, 138, 141, 146, 149, 151, 153, 158, 170/190, 171, 172, 174, 180, 182/187, 183, 185, 194, 195, 200, 201, 203, and 206. $\Sigma 4\text{-CBs}$ = Sum of Tetrachlorobiphenyl congeners 42, 44, 49, 52, 60, 64, 66/95, 70, and 74. $\Sigma 5\text{-CBs}$ = Sum of Pentachlorobiphenyl congeners 87, 97, 99, 101, 105, 110, and 118. $\Sigma 6\text{-CBs}$ = Sum of Hexachlorobiphenyl congeners 128, 129, 137, 138, 141, 146, 149, 151, 153, and 158. $\Sigma 7\text{-CBs}$ = Sum of Heptachlorobiphenyl congeners 170/190, 171, 172, 174, 180, 182/187, 183, and 185. $\Sigma 8\text{-CBs}$ = Sum of Octachlorobiphenyl congeners 194, 195, 200, 201, and 203.
- Savinova *et al.* 1995b. ΣHCH = Sum of α -, β -, and γ -HCH. ΣCHL = Sum of oxychlordane, *trans*-nonachlor, and heptachlor epoxide. ΣDDT = Sum of *o,p'* and *p,p'*-DDE, DDD, and DDT. ΣPCB = Sum of 19 PCB congeners 28, 99, 101, 105, 110, 114, 118, 128, 138, 141, 153, 156, 157, 170, 180, 187, 194, 206, and 209.
- Barret *et al.* 1996. ΣHCH = Sum of α -, β -, and γ -HCH. ΣCHL = Sum of oxy, *trans*-, and *cis*-chlordane, and *trans*- and *cis*-nonachlor. ΣDDT = Sum of *p,p'*-DDE, *o,p'*- and *p,p'*-DDD and DDT. ΣPCB = Sum of 21 PCB congeners 28, 66, 99, 101, 105, 110, 118, 128, 138, 141, 149, 153, 156, 170, 171, 172, 174, 180, 194, 206, and 209.
- Melnikov *et al.* 1995. ΣCBz = Sum of HCBz and pentachlorobenzene. ΣHCH = Sum of α - and γ -HCH. ΣCHL = Sum of heptachlor, *cis*-chlordane, and *trans*-nonachlor. ΣDDT = Sum of *o,p'*-DDT, *p,p'*-DDT, *o,p'*-DDD, *p,p'*-DDD, *o,p'*-DDE, and *p,p'*-DDE. ΣPCB = Sum of 7-9 congeners.
- Melnikov *et al.* 1995, 1996. ΣCBz = Sum of HCBz and pentachlorobenzene. ΣHCH = Sum of α -, β -, and γ -HCH. ΣCHL = Sum of oxy, *cis*-, and *trans*-chlordane, heptachlor, and *cis*- and *trans*-nonachlor. ΣDDT = Sum of *o,p'*-DDT, *p,p'*-DDT, *o,p'*-DDD, *p,p'*-DDD, *o,p'*-DDE, and *p,p'*-DDE. ΣPCB = Sum of 7-9 congeners.

Table 6-A17. Mean concentrations $\pm$ 1 SD, and/or ranges (in brackets), in ng/g ww (lipid weight for several Arctic char entries), of major organochlorines in anadromous and marine fishes collected 1990-1994.

Location	Region and Country	Tissue	n ^a	% lipid	ΣCBz	ΣHCH	ΣCHL	ΣDDT	ΣPCB	Toxaphene	Dieldrin	Mirex	Heptachl.-epoxide	Reference
Anadromous fishes														
<i>Salvelinus alpinus</i> (Arctic char)														
Kangiqlualujuaq	Ungava Bay, Canada	Muscle and skin	4	10.2±6.1	10.5±3.21	6.10±5.27	22.7±6.8	11.8±4.0	53.8±31.6	155±59	6.2±1.3	<0.1	–	1
Kangiqlualujuaq	Hudson Strait, Canada	Muscle and skin	9	8.59±1.98	3.36±2.02	2.02±0.95	9.8±4.9	5.0±3.0	24.0±9.63	76.5±34.7	3.22±1.2	<0.1	–	
Inukjuaq	E. Hudson Bay, Canada	Muscle and skin	4	3.55±1.88	2.45±2.33	3.10±1.76	11.1±12.2	11.8±14.4	56.6±21.7	34.1±31	1.36±0.9	<0.1	–	
Salluit	Hudson Strait, Canada	Muscle and skin	4	6.60±1.95	4.01±1.49	3.31±1.12	12.4±5.8	6.9±4.5	21.9±12.7	86.5±64.4	3.28±0.67	<0.1	–	
Sanikiluaq	S. Hudson Bay, Canada	Muscle and skin	8	4.9±3.2	1.88±0.93	2.06±0.88	7.79±4.39	7.62±4.39	23.6±17.0	33.7±29.3	1.31±0.73	0.46±0.40	–	
Peter Lake	W. Hudson Bay, Canada	Muscle and skin	6	3.24±1.54	2.71±1.08	2.0±0.90	3.89±2.02	4.81±2.13	11.3±3.51	12.9±3.52	0.11±0.04	0.14±0.05	–	
Buchanan Lake	Axel Heiberg Island, Canada	Muscle and skin	10	7.23	–	2.93	9.79	3.65	6.82	17.3	–	–	–	1
Wellington Bay	Victoria Island, Canada	Whole fish excl. liver	3	–	–	–	–	–	2.7-5.3	–	–	–	–	7
Cambridge Bay	Victoria Island, Canada	Whole fish excl. liver	2	–	–	–	–	–	3.4-3.5	–	–	–	–	
Rickardvannet	Spitsbergen	Muscle and skin	4	3.10	–	–	–	–	20±12	–	–	–	–	14
Diesetvannet	Spitsbergen	Muscle and skin	5	2.94	–	–	–	–	2.47	–	–	–	–	
Kola Peninsula	Russia	Muscle and skin	3	4.13±0.76	4.16±0.44	2.92±0.84	3.01±0.74	5.65±0.77	26.6±2.65	35.4±14.0	–	0.59±0.08	–	3
Khatanga River	Russia	Muscle and skin	1	–	0.44	1.05	0.98	1.64	7.6	–	–	0.13	0.15	12
Ob River	Near Salekhard, Russia	Muscle and skin	1	–	0.69	0.81	1.73	2.69	8.4	–	–	0.52	0.18	
<i>The following entries are in ng/g lw</i>														
Somerset Island	Canada	Muscle and skin	8	–	–	83±19	173±98	98±60	35±212	736±427	–	–	–	1
Pond Inlet (Mittimatalik)	Canada	Muscle and skin	10	–	–	69±11	46±13	19±6	173±64	301±78	–	–	–	
Spence Bay (Talurluaq)	Canada	Muscle and skin	10	–	–	87±6	65±64	23±15	23±53	248±158	–	–	–	
<i>Coregonus nasus</i> (Broad whitefish)														
Campbell Lake	Mackenzie Delta, Canada	Muscle and skin	4	3.21±3.04	0.87±0.90	1.97±2.67	1.62±1.79	1.00±1.31	2.17±1.37	5.03±2.72	0.10±0.10	0.05±0.06	–	2
Kugalluk River	Mackenzie Delta, Canada	Muscle and skin	9	3.75±1.63	1.40±0.83	1.09±0.56	1.69±0.68	0.67±0.30	6.19±3.99	6.85±4.91	0.13±0.19	0.05±0.06	–	
L100	Mackenzie Delta, Canada	Muscle and skin	4	10.8±2.35	4.05±1.54	3.52±2.25	8.90±2.47	4.76±2.18	8.73±5.11	37.6±15.3	1.05±0.38	0.26±0.09	–	
Travallant Lake	Mackenzie Delta, Canada	Muscle and skin	4	2.58±0.53	0.56±0.15	0.46±0.11	0.67±0.11	0.31±0.05	1.86±0.69	4.30±0.97	0.08±0.02	0.10±0.02	–	
Horseshoe Bend	Mackenzie Delta, Canada	Muscle and skin	9	3.1±0.9	0.29±0.17	0.18±0.11	1.02±0.60	0.15±0.11	0.82±0.42	3.21±1.62	0.10±0.05	0.08±0.06	–	
Ob River	Russia	Muscle and skin	11	1.5±0.5	0.73±0.53	1.52±0.62	1.85±0.78	3.74±1.44	5.66±0.93	3.66±1.49	0.22±0.11	0.18±0.20	–	4
Khatanga River	Russia	Muscle and skin	1	–	0.72	1.72	0.66	2.02	9.2	–	–	0.34	0.22	12
Yenisey River	Near Karaul, Russia	Muscle and skin	2	–	0.8	1.25	0.82	6.165	7.5	–	–	0.261	0.22	
				–	(0.24-1.36)	(0.53-1.92)	(0.46-1.18)	(5.47-6.85)	(6.4-8.6)	–	–	(0.06-0.04)	(0.07-0.08)	
Indigirka River	Near Chokurdakh, Russia	Muscle and skin	1	–	0.25	0.48	0.29	2.45	10.2	–	–	0	0	
<i>Coregonus autumnalis</i> (Arctic cisco)														
Pechora River	Russia	Liver	5	–	0.37	0.49	0.11	2.24	2.99	–	0.00	0.00	0.04	10
				–	(0.19-0.46)	(0.17-0.83)	(0.00-0.19)	(1.42-3.15)	(2.34-3.89)	–	–	–	(0.00-0.07)	
Ob River	Russia	Liver	5	–	2.04	0.28	0.04	4.50	17.1	–	0.00	0.00	0.26	
				–	(0.86-2.86)	(0.22-0.36)	(0.00-0.14)	(2.61-6.43)	(6.98-26.3)	–	–	–	(0.07-0.43)	
Ob River	Near Salekhard, Russia	Liver	2	–	0.7	2.03	4.45	12.085	25.2	–	–	0	0.26	12
				–	0	(1.92-2.14)	(3.37-5.53)	(6.3-17.87)	(39.4-11)	–	–	(0.06-0.07)	(0.4-0.54)	
Khatanga River	Near Khatanga, Russia	Liver	1	–	0.5	1.54	2.4	3.08	8.4	–	–	0.22	0.32	
<i>Coregonus muksun</i> (Muksun)														
Indigirka River	Near Chokurdakh, Russia	Muscle and skin	2	–	0.235	0.755	0.82	2.38	13.75	–	–	0.01	0.025	12
				–	(0.22-0.25)	(0.74-0.77)	(0.66-0.98)	(1.55-3.21)	(9.1-18.4)	–	–	(0-0.01)	(0-0.05)	
Khatanga River	Near Khatanga, Russia	Muscle and skin	1	–	0.53	0.2	1.99	1.71	5	–	–	0.3	0.18	
<i>Coregonus lavaretus pidschian</i> (Pidschian)														
Ob River	Near Salekhard, Russia	Muscle and skin	1	–	0.25	0.39	0.66	0.86	2.5	–	–	0.18	0	12
<i>Gobiidae</i> g. sp.														
Baidaratskaya Gulf	Russia	Muscle and skin	2	–	0.705	0.9	1.73	3.32	8.4	–	–	0.22	0.32	12
				–	(0.51-0.9)	(0.82-0.98)	(1.57-1.89)	(3.02-3.62)	(7.8-9.2)	–	–	(0.35-0.45)	(0.15-0.23)	
Pechora River	Russia	Muscle and skin	1	–	1.04	0.56	1.52	6.33	10.2	–	–	0.07	0.14	
<i>Stenodus leucichthys nelma</i> (Inconnu)														
Yenisey River	Near Karaul, Russia	Muscle and skin	1	–	0.18	0.96	2.12	11.94	27.2	–	–	0.06	0.28	12
Marine Fishes														
<i>Myoxocephalus quadricornis</i> (Fourhorn sculpin)														
Cambridge Bay	Victoria Island, Canada	Muscle and skin	5	2.00	–	1.9	5.10	24.5	50.0	–	1.50	<0.1	–	6
	Whole fish excl.	Liver	24	–	–	–	–	–	7.3-230	–	–	–	–	7
Wellington Bay	Victoria Island, Canada	Muscle and skin	4	1.40	–	1.40	6.30	1.30	(2.4-7.3)	–	1.00	<0.1	–	6
Hall Beach	Foxe Basin, Canada	Whole fish	9	2.00	–	2.2	2.80	2.70	–	–	0.80	<0.1	–	
<i>Myoxocephalus scorpius</i> (Short-horn sculpin, sea scorpion)														
Cambridge Bay	Victoria Island, Canada	Whole fish excl. liver	10	–	–	–	–	–	(4.4-39)	–	–	–	–	7

Wellington Bay	Victoria Island, Canada	Whole fish excl. liver	1	–	–	–	–	(0.79-2.0)	–	–	–	–	–	–	–
Disko	Greenland	Liver	2	11.5±0.40	2.2±0.10	5.3±0.60	2.8±0.60	4.3±0.30	5.6±1.40	–	–	–	–	–	13
Qeqertat	Greenland	Liver	2	19.5±10.50	6.4±3.00	14.3±7.70	7.1±3.10	9.6±3.90	12.8±4.90	–	–	–	–	–	–
Scoresbysund	Greenland	Liver	2	26.1±1.90	18.4±1.80	24.6±3.10	31.7±4.90	59.5±5.20	83.6±8.60	–	–	–	–	–	–
Unartoq	Greenland	Liver	2	28.4±5.50	8.3±4.40	16.1±2.50	11.9±6.80	25.3±12.70	24.1±11.60	–	–	–	–	–	–
Other unidentified sculpin															
64°02'N, 172°21'W	Bering Sea	Whole fish	1	5.4	<0.47	0.74	0.9	6.2	<3.2	–	–	–	–	–	19
<i>Reinhardtius hippoglossoides</i> (Turbot, Greenland halibut)															
Cumberland Sound	Baffin Island, Canada	Muscle and skin	10	17.0±3.67	39.8±3.81	15.1±1.62	127±13.7	129±12.9	165±18.5	566±59.3	25.2±3.37	0.99±0.12	–	–	5
		Liver	15	24.4±5.80	14.6±3.80	18.9±6.30	59±14.6	68±24.8	136±57.5	340±109	–	–	–	–	–
E. Beaufort Sea	Banks Island, Canada	Muscle and skin	10	14.6±3.21	48.4±3.56	13.6±1.28	115±7.91	128±10.4	202±15.8	667±50.1	24.4±3.30	2.84±0.35	–	–	15
Davis Strait	W. Greenland	Liver	?	20.0±10.00	18.0±13.0	1.9±1.10	36±29.0	106±110.0	119±102.0	–	–	–	–	–	–
<i>Boreogadus saida</i> (Arctic cod, polar cod)															
Resolute Bay	Lancaster Sound, Canada	Whole fish	3	7.32±0.39	3.98±0.70	3.34±0.48	5.90±1.80	6.53±1.79	6.20±1.24	39.0±11.2	0.94±0.22	0.04±0.03	–	–	4
73°04'N, 48°10'E	Barents Sea, Norway	Liver	5×5	36	14	9	40	45	91	–	–	–	–	–	9
				(28-41)	(12-16)	(7-11)	(32-45)	(35-50)	(72-114)	–	–	–	–	–	–
76°05'N, 41°00'E	Barents Sea, Norway	Liver	5×5	41	11	10	38	17	82	–	–	–	–	–	–
				(38-46)	(7-14)	(9-12)	(30-48)	(30-48)	(65-101)	–	–	–	–	–	–
75°15'N, 54°27'E	Barents Sea, Norway	Liver	5×5	50	7	13	25	11	47	–	–	–	–	–	–
				(43-55)	(6-8)	(11-15)	(21-27)	(21-27)	(36-62)	–	–	–	–	–	–
76°39'N, 14°52'E	Barents Sea, Norway	Liver	5×5	43	13	9	46	33	47	–	–	–	–	–	–
				(41-46)	(12-15)	(8-9)	(38-54)	(38-54)	(37-64)	–	–	–	–	–	–
72°00'N, 13°54'W	Jan Mayen/	Liver	2×5	50	7	9	28	13	25	–	–	–	–	–	11
	North Atlantic Ocean		+1×9	(46-56)	(6.5-7.7)	(9-10)	(24-32)	(12-15)	(21-29)	–	–	–	–	–	–
78°37'N, 01°51'E	Greenland Sea	Liver	2×5	38	7	11	32	29	72	–	–	–	–	–	–
			+1×16	(30-50)	(5.5-9)	(8-16)	(28-41)	(23-35)	(39-114)	–	–	–	–	–	–
71°53'N, 09°06'W	Jan Mayen/	Liver	5×5	56	8	7	52	57	71	–	–	–	–	–	–
	North Atlantic Ocean			(41-68)	(6-8.9)	(6-8)	(40-60)	(34-83)	(44-111)	–	–	–	–	–	–
West Svalbard	Liver		52	36.8		6.3		28.5	31.5	–	–	–	–	–	16
			11×2-11	29-43		2-8		17-53	19-58	–	–	–	–	–	–
	Muscle and skin		52	1		0.18		0.46	0.6	–	–	–	–	–	–
			18×2-4	0.9-1.3					0.42-0.89	–	–	–	–	–	–
Pechora Sea and	Liver		90	55.1		16.6		31.4	72.7	–	–	–	–	–	17
South Novaya Zemlya			12×4-14	52-62		15-18		24-54	59-106	–	–	–	–	–	–
	Muscle and skin		57	0.8		0.22		0.22	0.54	–	–	–	–	–	–
			14×2-7	0.7-0.8		0.20-0.26		0.12-0.37	0.30-0.86	–	–	–	–	–	–
70-75°N, 170-180°E	Mid-Arctic Ocean, Aug-Sept 1994	Whole fish	2	2.8	0.8	1.1	3.5	6.1	22.1	32.4	1.0	–	–	–	18
75-80°N, 170-180°E	Mid-Arctic Ocean, Aug-Sept 1994	Whole fish	3	3.4	1.4	1.4	4.8	7.3	23.9	34.1	1.0	–	–	–	–
<i>Gadus ogac</i> (Greenland cod)															
Cambridge Bay	Victoria Island, Canada	Whole fish excl. liver	9	–	–	–	–	–	(4.4-39)	–	–	–	–	–	7
Wellington Bay	Victoria Island, Canada	Whole fish excl. liver	2	–	–	–	–	–	(0.79-2.0)	–	–	–	–	–	–
<i>Gadus morhua</i> (Atlantic cod, cod)															
69°28'N, 35°49'E	Barents Sea, Norway	Liver	25	48	23	12	75	114	392	–	–	–	–	–	9
				(29-66)	(13-44)	(9-16)	(39-181)	(67-201)	(158-685)	–	–	–	–	–	–
74°22'N, 41°02'E	Barents Sea, Norway	Liver	5	49	28	14	140	163	264	–	–	–	–	–	–
				(43-53)	(23-32)	(12-16)	(97-207)	(123-261)	(133-456)	–	–	–	–	–	–
77°25'N, 37°07'E	Barents Sea, Norway	Liver	25	55	26	11	76	98	165	–	–	–	–	–	–
				(41-64)	(17-35)	(3-17)	(52-107)	(69-131)	(94-344)	–	–	–	–	–	–
76°39'N, 14°52'E	Barents Sea, Norway	Liver	25	41	19	7	108	166	205	–	–	–	–	–	–
				(19-76)	(7-36)	(4-12)	(60-202)	(93-344)	(115-420)	–	–	–	–	–	–
71°32'N, 29°00'E	Barents Sea, Norway	Liver	25	40	27	8	137	336	–	–	–	–	–	–	–
				(5-69)	(9-40)	(3-11)	(91-191)	(116-248)	(192-603)	–	–	–	–	–	–
62°34'N, 06°14'W	Faeroe Islands	Liver	5×5	61	10	5	25	46	63	–	–	–	–	–	11
				(56-65)	(9-11)	(4-5)	(22-30)	(42-50)	(52-68)	–	–	–	–	–	–
67°06'N, 08°31'E	Halten Banken	Liver	5×4-5	56	16	7	111	253	352	–	–	–	–	–	–
				(35-64)	(6-27)	(4-9)	(60-162)	(129-452)	(232-519)	–	–	–	–	–	–
66°43'N, 12°56'E	Iceland	Liver	5×5	48	16	9	49	71	76	–	–	–	–	–	–
				(43-51)	(12-19)	(7-9)	(40-57)	(60-98)	(63-109)	–	–	–	–	–	–
65°N, 23°W	Iceland	Liver	2	41.1	13.0	–	–	60.0	129	–	–	–	–	–	8
				(38.5-43.8)				(55.0-65.0)	(127-132)	–	–	–	–	–	–
65°N, 13°W	Iceland	Liver	5	51.1	29.0	–	–	75.6	131	–	–	–	–	–	–
				(42.9-57.8)	(25.0-38.0)			(47.0-110)	(78.0-174)	–	–	–	–	–	–
66°N, 12°W	Iceland	Liver	1	60.5	32.0	–	–	56.0	75.9	–	–	–	–	–	–
66°30'N, 25°W	Iceland	Liver	5	45.6	24.6	–	–	55.6	97.7	–	–	–	–	–	–
				(36.5-57.2)	(21.0-31.0)			(41.0-75.0)	(70.9-129)	–	–	–	–	–	–
66°30'N, 24°W	Iceland	Liver	1	63.6	38.0	–	–	75.0	96.1	–	–	–	–	–	–

Location	Region and Country	Tissue	n ^a	% lipid	ΣCBz	ΣHCH	ΣCHL	ΣDDT	ΣPCB	Toxaphene	Dieldrin	Mirex	Heptachl.-epoxide	Reference
66°30', 14°W	Iceland	Liver	1	57.4	27.0	–	–	(75.0-75.0)	(96.1-96.1)	–	–	–	–	
66°30'N, 13°W	Iceland	Liver	5	51.5 (47.4-53.3)	22.0 (18.0-25.0)	–	–	62.0 44.0 (39.0-55.0)	85.4 79.2 (67.7-97.6)	–	–	–	–	
Baydaratskaya Gulf	Russia	Muscle and skin	1	–	0.29	1.42	1.75	2.12	9.6	–	–	0.07	0.12	12
<i>Hippoglossoides platessoides</i> (Long rough dab, American plaice)														
69°06'N, 42°15'E	Barents Sea, Norway	Liver	5×5	5 (3-10)	3 (1-5)	2 (1-3)	7 (4-11)	11 (7-15)	36 (21-48)	–	–	–	–	9
70°36'N, 46°47'E	Barents Sea, Norway	Liver	5×5	6 (3-11)	3 (1-4)	2 (1-3)	7 (4-11)	9 (6-14)	22 (12-35)	–	–	–	–	
73°04'N, 48°10'E	Barents Sea, Norway	Liver	5×5	7 (3-16)	3 (1-5)	2 (1-4)	7 (3-11)	7 (2-12)	15 (7-21)	–	–	–	–	
76°38'N, 36°26'E	Barents Sea, Norway	Liver	5×5	17 (11-21)	8 (5-11)	4 (3-5)	18 (14-24)	18 (13-22)	27 (18-33)	–	–	–	–	
76°39'N, 14°52'E	Barents Sea, Norway	Liver	5×5	18 (12-22)	6 (5-7)	3 (2-4)	14 (11-17)	12 (11-15)	16 (13-19)	–	–	–	–	
74°00'N, 18°00'E	Barents Sea, Norway	Liver	5×5	8 (6-9)	6 (5-7)	2 (1-2)	18 (16-20)	30 (19-43)	57 (36-79)	–	–	–	–	
66°01'N, 11°54'W	Iceland	Liver	5×5	21 (18-27)	10 (9.4-12.3)	5 (4.3-5.6)	39 (32-48)	47 (34-63)	38 (30-47)	–	–	–	–	11
<i>Limanda limanda</i> (European yellowtail flounder, Common dab)														
64°N, 23°W Whole fish	Iceland	Liver	2	15.2 (14.6-15.8)	–	–	–	25.5 (25.0-26.0)	45.0 (40.2-49.8)	–	–	–	–	8
64°30'N, 23°W	Iceland	Liver	1	26.0	–	–	–	38.0	59.8	–	–	–	–	
64°30'N, 16°W	Iceland	Liver	2	20.4 (18.9-21.8)	–	–	–	38.5 (34.0-43.0)	53.7 (46.7-60.7)	–	–	–	–	
64°30'N, 16°W	Iceland	Liver	1	23.3	–	–	–	54.0	68.9	–	–	–	–	
66°30'N, 25°W	Iceland	Liver	2	17.1 (14.7-19.6)	–	–	–	12.0 (10.0-14.0)	44.2 (24.2-64.2)	–	–	–	–	
66°30'N, 25°W	Iceland	Liver	1	13.2	–	–	–	16.0	35.4	–	–	–	–	
<i>Pleuronectes</i> sp. (Plaice)														
Pechora River	Russia	Muscle and skin	1	–	1.23	0.79	1.12	3.97	6.4	–	–	0.04	0.06	12
<i>Clupea harengus</i> (Atlantic herring)														
64°30'N, 15°W	Iceland	Muscle and skin	1	9.32	1.30	–	–	2.70	3.77	–	–	–	–	8
66°30'N, 24°W	Iceland	Muscle and skin	1	11.9	1.95	–	–	8.05	10.9	–	–	–	–	
<i>Sebastes marinus, mentella</i> (Redfish)														
Davis Strait	W. Greenland	Liver	?	17.0±8.00	3.9±2.10	9.4±1.50	18±13	93±70.0	127±79.0					15
61°26'N, 31°42'W	Irminger Basin/North Atlantic	Liver	5×5	12 (9-16)	4 (2.6-5)	2 (2-3)	23 (12-34)	77 (54-101)	67 (35-91)	–	–	–	–	11
66°01'N, 11°54'W	Iceland/North Atlantic	Liver	5×5	14 (10-30)	6 (3.4-12.7)	2 (2-4)	15 (9-30)	21 (13-39)	22 (14-38)	–	–	–	–	
71°01'N, 09°01'W	Jan Mayen/North Atlantic	Liver	4×5	23 (16-30)	8 (6-8.9)	4 (3-6)	20 (14-27)	29 (26-36)	33 (31-37)	–	–	–	–	
67°06'N, 08°31'E	Halten Banken/North Atlantic	Liver	5×5	25 (17-37)	10 (6.9-13.3)	3 (2-4)	51 (46-59)	131 (91-177)	159 (114-203)	–	–	–	–	
59°30'N, 41°45'W	Kap Farvel/North Atlantic	Liver	5×5	12 (9-15)	5 (3.3-5.6)	2 (1-2)	29 (25-33)	111 (98-130)	109 (79-149)	–	–	–	–	
60°33'N, 09°33'W	Faeroe Islands	Liver	5×5	24 (20-27)	9 (6-12)	3 (2-4)	49 (29-63)	119 (76-148)	115 (104-136)	–	–	–	–	
<i>Eleginus navaga</i> (Navaga)														
East Pechora Sea		Muscle and skin	5×5	0.7	0.4	0.17	0.59	0.91	1.9	–	–	–	–	17
		Liver	4×5	0.7-0.7 21.5 21-23	0.33-0.53 13.4 12-15	0.16-0.18 8.2 7.3-9.6	0.52-0.72 61.2 53-69	0.8-1.1 82.4 70-97	1.6-2.4 223 183-255	–	–	–	–	
<i>Mallotus villosus</i> (Capelin)														
East Pechora Sea		Whole fish	3×4-5	1 1.0-1.1	–	0.39 0.35-0.43	4.14 2.8-4.5	5.3 5.0-5.5	7.2 6.3-8.8	–	–	–	–	17

<i>Brosme brosme</i> (Tusk)	West Greenland	Liver	58.0±9.00	41.0±7.0	13.0±4.00	132±42	552±272.0	522±210.0	15
Davis Strait									
<i>Antimora rostrata</i> (Blue hake)	West Greenland	Liver	53.0±6.00	35.0±8.0	6.4±1.80	125±35	762±216.0	615±215.0	15
Davis Strait									
<i>Centroscyllium fabricii</i> (Black dogfish)	West Greenland	Liver	72.0±5.00	27.0±12.0	8.9±4.30	47±13	667±422.0	384±162.0	15
Davis Strait									
<i>Macrourus berglax</i> (Roughhead grenadier)	West Greenland	Liver	43.0±10.00	17.0±12.0	6.3±3.00	86±88	124±173.0	315±381.0	15
Davis Strait									
<i>Anarhichas denticulatus</i> (Jelly wolffish)	West Greenland	Liver	35.0±8.00	8.2±3.60	5.4±1.90	10±4	24±9.0	38±13.0	15
Davis Strait									
<i>Hydrolagus affinis</i> (Smalleyed rabbit fish)	West Greenland	Liver	70.0±9.00	2.5±1.00	9.4±1.50	19±8	298±86.0	212±56.0	15
Davis Strait									

a. Individuals and/or (pools × individuals)

- References**
- Muir and Lockhart 1993a: Toxaphene quantified with a single response factor; ΣCBz = Sum of tetra- and pentachlorobenzene and HCBz; ΣHCH = Sum of α -, β -, and γ -HCH; ΣCHL = Sum of oxy-, *cis*-, *trans*-chlordane, heptachlor epoxide, and *cis*-, *trans*-nonachlor; ΣDDT = Sum of *o,p'*-DDT, *p,p'*-DDT, *o,p'*-DDD, *p,p'*-DDD, *o,p'*-DDE, and *p,p'*-DDE; ΣPCB = Sum of 92 peaks or 105 congeners.
 - Muir *et al.* 1994: As Muir and Lockhart (1) above.
 - Savinova and Muir unpubl. data: As Muir and Lockhart (1) above.
 - Muir and Lockhart 1994: As Muir and Lockhart (1) above.
 - Muir and Lockhart 1996: As Muir and Lockhart (1) above.
 - Bright *et al.* 1995b: ΣPCB = Sum of 23 individual or co-eluting congeners.
 - Bright *et al.*, unpubl. data: ΣPCB = Sum of 47 congeners.
 - Data provided by ICES database 1994: ΣCBz = HCBz only; ΣDDT = *p,p'*-DDE only; ΣPCB = Sum of 11 congeners (101, 105, 118, 128, 138, 153, 156, 170, 180, 31, and 52).
 - Stange and Klungsoyr 1997: ΣPCB = Sum of 13 congeners; ΣDDT = Sum of *p,p'*-DDD, *p'*,*p*-DDE, and *p'*,*p*-DDT; ΣCHL = Sum of *trans*-nonachlor, oxychlordane, and α - and β -chlordane; ΣCBz = HCBz only; ΣHCH = Sum of α -, β -, and γ -HCH.
 - Melnikov *et al.* 1995: ΣCBz = Sum of HCBz and pentachlorobenzene; ΣHCH = α - and γ -HCH; ΣCHL = Sum of heptachlor, *cis*-chlordane, and *trans*-nonachlor; ΣDDT = Sum of *o,p'*-DDT, *p,p'*-DDT, *o,p'*-DDD, *p,p'*-DDD, *o,p'*-DDE, and *p,p'*-DDE; ΣPCB = Sum of 7-9 congeners.
 - Stange *et al.* 1996a: ΣCBz = HCBz only; ΣHCH = α -, β -, and γ -HCH; ΣCHL = Sum of α - and γ -chlordane, oxychlordane and *trans*-nonachlor; ΣDDT = Sum of *p,p'*-DDT, *p,p'*-DDD and *p,p'*-DDE; ΣPCB = Sum of congeners 28, 31, 52, 101, 105, 118, 128, 138, 149, 153, 156, 170, and 180.
 - Melnikov *et al.* 1995, 1996: ΣCBz = Sum of HCBz and pentachlorobenzene; ΣHCH = α -, β -, and γ -HCH; ΣCHL = Sum of heptachlor, *cis*-, *trans*-chlordane, and *cis*-, *trans*-nonachlor; ΣDDT = Sum of *o,p'*-DDT, *p,p'*-DDT, *o,p'*-DDD, *p,p'*-DDD, *o,p'*-DDE, and *p,p'*-DDE; ΣPCB = Sum of 7-9 congeners.
 - Cleemann *et al.* 1996: ΣPCB = Sum of 11 congeners (28, 31, 52, 101, 105, 118, 128, 138, 153, 156, and 180); ΣDDT = Sum of *p,p'*-DDT, *p,p'*-DDD, and *p,p'*-DDE; ΣCBz = HCBz only; ΣCHL = *trans*-nonachlor only; ΣHCH = Sum of α -, β -, and γ -HCH.
 - Skotvold 1996: ΣPCB = Sum of 10 congeners (28, 31, 52, 101, 118, 149, 138, 153, 156, and 180).
 - Berg *et al.* 1996: ΣPCB = Sum of 19 congeners (28, 74, 99, 101, 105, 110, 118, 128, 138, 141, 153, 156, 157, 170, 180, 187, 194, 206, and 209).
 - Killie and Dahle 1996a: ΣPCB = Sum of 11 congeners.
 - Killie and Dahle 1996b: ΣPCB = Sum of 11 congeners.
 - Muir and Macdonald unpubl. 1996: ΣPCB = Sum of 92 peaks or 105 congeners.
 - Rice *et al.* 1992: ΣPCB = Aroclor 1254; ΣCBz = HCB; only non-detects were included in calculation of means as $1/2$ detection limit.

Table 6-A18. Recent (collected primarily post-1990) mean concentrations (ng/g ww) of organochlorines in marine mammal samples from Arctic waters.

Region	Location	Tissue	Species	Sex	Year	Age, years	Statistic	n	% lipid	ΣCBz^a	ΣHCH	ΣCHL	ΣDDT	ΣPCB	Toxaphene	Dieldrin	Mirex	Reference
Hudson Strait	Salluit	Blubber	Harp seal	♀		16.9	Mean	8	—	—	—	—	486	897	—	—	—	6
						7.9	SD		—	—	—	—	289	295	—	—	—	
N.E. Greenland	(West Ice)	Blubber	Harp seal	♀	1990	16	Mean	10	92.8	67.0	85.4	418	668	909	—	—	—	1,4
				Pups	1990	—	Mean	10	68.0	170.0	143	360	605	626	—	—	—	
N.E. Greenland	(West Ice)	Blubber	Harp seal	♂	1990	10.9	Mean	8	—	118	36.4	—	946	2830	—	—	—	5
						5.3	SD	—	—	84.5	12.6	—	933	2940	—	—	—	
Barents Sea	N. Norway (Skjanes)	Blubber	Harp seal	♂ ♀	1988/89	—	Mean	13	—	—	—	—	1600	3800	—	—	—	1
Barents Sea	N. Norway (Jarfjord)	Blubber	Harp seal	♂ ♀	1990	—	Mean	38	—	—	—	—	3100	3000	—	—	—	1
S. Barents Sea	White Sea	Blubber	Harp seal	Pups	1993	<1	Mean	11	80.4	110	69.3	698	710	1370	2100	82.2	12.0	3
						—	SD	—	9.7	64.8	22.0	300	437	725	1130	35.2	7.5	
S. Barents Sea	East ice	Blubber	Harp seal	♀		14	Mean	7.0	94	260.0	110.0	2290	3270	4420	—	—	—	2
						9-26	Range		92-96	50-640	70-190	350-5250	550-7870	750-9810	—	—	—	
				♂		11.0	Mean	9.0	92	130.0	90.0	1400	2180	2970	—	—	—	2
						6-19	Range		90-94	60-280	50-140	610-2120	1110-3510	1120-5450	—	—	—	
Iceland	Hofn	Blubber	Harbor seal	♂ ♀	1988	—	Mean	7	—	8.00	17.0	—	1550	5220	—	—	—	7
Barents Sea	Jarfjord	Blubber	Harbor seal	♂ ♀	1989/90	—	Mean	7	—	—	—	—	—	5200	—	—	—	1
Norwegian Sea	Versteralen	Blubber	Harbor seal	♂ ♀	1990	—	Mean	8	—	—	—	—	—	3400	—	—	—	1
S. Barents Sea	Jarfjord	Blubber	Grey seal	♂ ♀	1989	—	Mean	24	—	—	—	—	—	5700	—	—	—	1
						—	SD	—	1.5	—	—	—	889	614	—	—	—	
				♂	1990	—	Mean	8	95.3	—	—	—	1510	1720	—	—	—	

Region	Location	Tissue	Species	Sex	Year	Age, years	Statistic	n	% lipid	ΣCBz ^a	ΣHCH	ΣCHL	ΣDDT	ΣPCB	Toxaphene	Dieldrin	Mirex	Reference
Barents Sea Barents Sea S. Barents Sea E. Greenland W. Greenland	Svalbard	Blubber	Ringed seal	♂ ♀	1986	~6	SD	—	1.8	—	—	—	1150	991	—	—	—	8
		Blubber	Ringed seal	♀	1990	—	Mean	7	—	140	—	—	1660	2870	—	—	—	
	Jarfjord	Blubber	Ringed seal	♂ ♀	—	—	Mean	5	96.5	—	—	—	1070	1130	—	—	—	9
		Blubber	Ringed seal	♂ ♀	—	—	Mean	12	—	—	—	—	2900	2500	—	—	—	
	Scoresbysund	Blubber	Ringed seal	♂ ♀	1994	—	Mean	25	91.0	17.0	152	—	1410	1010	—	—	—	10
		Blubber	Ringed seal	♂ ♀	1994	—	Mean	25	88.0	12.0	125	—	429	278	—	—	—	
	Disko	Blubber	Ringed seal	♂ ♀	1994	—	SD	—	3.0	4.0	33	—	127	82	—	—	—	10
						—	Mean	25	92.0	13.0	127	—	765	575	—	—	—	
	Nanortalik	Blubber	Ringed seal	♂ ♀	1994	—	SD	—	3.0	5.0	49	—	333	263	—	—	—	
						—	Mean	25	88.0	13.0	129	—	546	441	—	—	—	
E. Baffin Island	Cumberland S.	Blubber	Ringed seal	♀	1994	—	SD	—	3.0	5.0	64.0	—	400	265	—	—	—	11
						5.7	Mean	10	95.4	37.6	179	322	359	467	175	71.3	3.43	
						3.9	SD	—	2.4	9.4	21.8	129	166	195	65.8	33.5	1.60	
						5.8	Mean	10	95.3	36.1	210	470	703	675	180	64.4	5.49	
E. Hudson Bay	Inukjuaq	Blubber	Ringed seal	♀	1989/92	4.9	SD	—	2.7	7.1	36.9	324	890	597	83.9	21.2	5.21	12
						5.4	Mean	7	92.8	54.8	276	1010	1010	1300	307	82.0	9.62	
						4.2	SD	—	5.3	53.0	231	1340	1160	1560	327	100	8.37	
						5.5	Mean	4	94.7	61.6	275	708	1140	1230	221	86.6	8.74	
S. Hudson Bay	Sanikiluaq	Blubber	Ringed seal	♂ ♀	1989	6.1	SD	—	2.0	17.5	123	453	681	636	112	102	5.24	13
						—	Mean	3	87.2	—	434	393	1650	1280	—	187	—	
						—	SD	—	—	—	175	96.7	700	323	—	113	—	
						—	Mean	6	—	—	69.4	224	168	562	—	40.8	—	
N. Baffin Island	Arctic Bay	Blubber	Ringed seal	♀	1993	—	SD	—	—	—	17.3	55.7	24.8	417	—	18.1	—	14
						—	Mean	10	—	—	68.3	358	260	1160	—	30.9	—	
						—	SD	—	—	—	31.7	102	59.9	416	—	33.8	—	
						7.4	Mean	10	—	80.5	201	299	189	296	177	64.5	5.70	
Lancaster Sound	Barrow Strait	Blubber	Ringed seal	♀	1993	5.4	SD	—	—	20.4	67.9	92.3	58.7	66.8	80.6	27.4	6.35	11
						10.6	Mean	10	—	111	250	1270	1540	1440	547	115	26.1	
						6.7	SD	—	—	50.5	98.6	978	1900	1200	441	61.9	24.9	
						3.6	Mean	10	92.7	87.7	310	466	334	535	146	78.4	6.82	
SW Ellesmere Isl.	Eureka	Blubber	Ringed seal	♀	—	2.3	SD	—	0.9	26.8	141	119	108	154	47.3	36.6	3.80	11
						3.3	Mean	10	92.9	103	384	478	365	655	163	93.9	9.29	
						2.1	SD	—	1.1	19.0	102	156	168	184	97.1	37.9	3.98	
						—	Mean	7	91.5	187	255	613	673	1270	441	96.1	—	
Amundsen Gulf	Holman	Blubber	Ringed seal	♂	1989	—	SD	—	2.1	96.2	108	189	261	315	136	30.2	—	11
						—	Mean	9	90.8	185	302	1000	1030	2050	561	130	—	
						—	SD	—	1.9	80.8	121	344	266	707	226	44.2	—	
						—	Mean	4	—	—	117	143	269	241	—	—	—	
W. Hudson Bay	Arviat	Blubber	Ringed seal	♀	1992	—	SD	—	—	—	38.5	49.8	211	44.3	—	—	—	15
						—	Mean	—	—	—	—	—	217	366	—	—	—	
						9.1	SD	—	—	—	—	—	170	110	—	—	—	
						4.3	Mean	24	91.1	63.2	335	806	840	1110	297	91.1	19.0	
S. Beaufort Sea	Barrow (AK)	Blubber	Ringed seal	♂	1988	—	SD	—	4.7	35.4	204	330	398	425	304	54.6	10.4	16
						—	Mean	2	—	—	—	—	—	225	640	—	13.6	
						—	Mean	2	—	—	—	—	—	590	420	—	73.0	
						4.8	Mean	29	89	28	180	470	3600	4200	—	—	—	
Kara Sea	Yenisey Gulf	Blubber	Ringed seal	♂	1995	2.1	SD	—	3.6	13	68	280	2400	1900	—	—	—	17
						6.3	Mean	9	91	25	120	390	2300	3400	—	—	—	
						5.6	SD	—	1.4	14	34	180	490	710	—	—	—	
						—	Mean	9	89.3	899	337	2410	3270	5520	6060	397	66.2	
S. Beaufort Sea	Mackenzie Delta	Blubber	Beluga	♀	1993-1994	—	SD	—	2.9	171	83.7	422	1210	1820	2300	94.0	30.7	11
						—	Mean	26	89.9	956	334	2486	3440	5010	6330	410	74.1	
						—	SD	—	2.6	128	93.7	319	641	1618	2020	124	28.0	
						—	Mean	8	83.9	798	429	2000	3260	4880	6860	479	10.7	
S. Beaufort Sea	Husky Lakes	Blubber	Beluga	♂	1989	—	SD	—	5.8	309	116	699	1550	1560	3170	189	2.66	11
						—	Mean	5	80.2	315	361	683	598	1510	2570	207	6.25	
						—	SD	—	4.1	159	157	288	275	640	1060	89.1	4.25	
						—	Mean	5	90.6	531	300	1280	1360	2320	3330	194	23.1	
E. Bering Sea	Point Lay	Blubber	Beluga	♀	1990	>5	SD	—	4.5	348	127	616	837	1096	1700	97.4	7.53	18
						—	Mean	7	88.2	868	320	2100	3120	4170	3160	343	52.1	
						—	SD	—	3.7	80.6	64.2	179	571	644	1510	53.8	14.7	
						8.2	Mean	10	88.4	234	163	1070	1860	2706	4750	345	15.0	
W. Greenland	Disko Bugt	Blubber	Beluga	♀	1989/90	3.9	SD	—	2.8	166	113	689	1820	2150	2860	215	11.3	19
						6.9	Mean	13	90.3	497	234	1790	2890	4720	7500	742	8.59	
						3.7	SD	—	4.8	166	78.4	346	570	932	1830	204	8.19	
						5.9	Mean	61	89.0	552	298	1920	2880	4010	7710	756	13.2	

				♂	1989/90	4.5 4.8 5.1	SD Mean SD	– 54 –	4.6 89.1 5.2	405 825 477	165 388 144	1100 2600 1160	1930 4370 2730	2300 5580 2500	4050 10600 4550	494 1040 576	10.1 18.5 18.5		
S. Beaufort Sea	Mackenzie Delta	Muktuk	Beluga	♂ ♀		– – –	Mean SD Mean	20 – 20	4.3 1.4 10.2	34.0 12.1 81.6	21.2 9.0 29.7	133 54.2 353	202 104 413	246 102 373	372 172 1530	24.0 9.84 85.9	2.87 1.66 1.91		19
N.W. Greenland	Nuussuaq	Muktuk	Beluga	♂ ♀		– – –	Mean SD Mean	20 – 20	4.3 4.3 3.4	76.7 23.2 34.0	208 266 8.3	208 196 85.2	202 196 97.6	413 373 122	353 899 328	246 60.7 6.98	1.91 0.88 1.23		19
N.W. Greenland	Nuussuaq	Kidney	Beluga	♂ ♀		– – –	Mean SD Mean	20 – 20	3.4 1.4 18.5	34.0 18.5 6.5	8.3 46.6 63.5	85.2 46.6 63.5	97.6 63.5 122	122 68.6 214	328 214 7930	6.98 3.01 228	1.23 0.95 5.80		11
Lancaster Sound	Creswell Bay	Blubber	Narwhal	♂	1991	– – –	Mean SD Mean	8 – 12	91.4 1.9 80.3	267.3 115.8 23.2	85.0 16.7 99.5	1990 380 312	3230 872 32.8	3200 765 199	7930 2410 451	228 52.1 154	5.80 7.84 5.18		12
N. Hudson Bay	Foxe Basin	Blubber	Walrus	♂	1988?	14.4 9.2 12.5	Mean SD Mean	12 – 12	80.3 5.3 80.9	23.2 7.60 15.3	99.5 15.1 62.6	312 64.4 166	32.8 8.85 20.8	199 46.2 90.0	451 116 201	154 42.0 71.8	5.18 1.57 2.96		12
E. Baffin Island	Loks Land	Blubber	Walrus	♂ ♀		3.2 10.8 2.8	SD Mean SD	– 6 4	5.2 82.4 6.0	4.06 54.8 33.9	12.7 156 81.5	98.9 2080 2190	12.9 605 709	54.6 1640 1580	123 359 202	37.0 284 184	1.66 22.6 18.3		12
E. Hudson Bay	Inukjuak	Blubber	Walrus	♂	1989	16.8 12.1 13.8	Mean SD Mean	4 – 9	84.5 4.7 82.4	66.5 33.3 61.9	267 149 214	6290 4240 2750	4610 3170 2160	11500 8470 4790	3490 2440 1451	911 436 464	216 176 78.0		12
N.E. Hudson Bay	Akulivik	Blubber	Walrus	♂	1989	9.6 11.0 4.6	SD Mean SD	8 – 2	4.2 83.2 5.5	47.9 23.4 12.6	114 116 76.8	1780 1170 2110	924 561 1090	2380 1200 2060	954 420 286	428 251 225	46.4 17.5 19.7		12
W. Greenland	Thule	Blubber	Walrus	♂	1988	6.5 10 1	Mean SD SD	2 11 5	87.4 86.3 3.4	16.4 20.7 4.4	126 107 20	238 99 39	45.5 70.4 39.0	195 244 67	606 314 41	209 86 43	2.7 7.4 2.7		21
				♂		10 0.4	Mean SD SD	– – –	86.9 4.7 1.8	19.3 5.9 –	109 28.8 –	116 45 2020	79 48 4340	301 98.9 11500	319 39 –	100 59 –	8.9 1.9 –		1
Barents Sea	Svalbard	Skin biopsy	Walrus	♂ ♀	1991/92	–	Mean	26	1.8	–	–	2020	4340	11500	–	–	–		1
S. Barents Sea	Tufjord, Norway	Blubber	Harbor porpoise	♂ ♀	1988/89	–	Mean	7	–	–	473	3700	15400	24500	–	3200	–	22	
W. Greenland	Maniitsoq	Blubber	Harbor porpoise	♂ ♀	–	–	Mean	2	99.0	500	130	–	5000	2600	–	–	–	23	
S. Barents Sea	N. Norway	Blubber	Minke whale	♂	1988/89	–	Mean	17	–	–	–	–	2300	2700	–	–	–	1	
				♂	–	–	Mean	20	–	–	–	–	1200	1100	–	–	–		
		Blubber	Minke whale	♂	1992	–	Mean	31	–	–	–	–	2400	3700	–	–	–		1
				♂	–	–	Mean	30	–	–	–	–	1400	2000	–	–	–		

a. Results for Σ CBz for references 2, 4, 5, and 10 are for HCBz only.

References

1. Skaare 1996; 2. Kleivane *et al.* 1996; 3. Savinova and Muir unpubl. data; 4. Espeland *et al.* 1996; 5. Oehme *et al.* 1995d; 6. Beck *et al.* 1994; 7. Luckas *et al.* 1990; 8. Oehme *et al.* 1988; 9. Daelemans *et al.* 1993; 10. Cleeman *et al.* 1996c, 1996d; 11. Muir 1994, 1996; Muir *et al.* unpubl. data; 12. Muir *et al.* 1995c; 13. Cameron and Weis 1993; 14. Cameron *et al.* 1997; 15. Addison 1995a; 16. Schantz *et al.* 1993; 17. Nakata *et al.* 1996; 18. Becker *et al.* 1995; 19. Stern *et al.* 1994; 20. Muir *et al.* 1995c; 21. Muir and Born 1996, unpubl. data; 22. Kleivane *et al.* 1995; 23. Granby and Krinze 1991.

Table 6-A19. Concentrations of non-ortho substituted PCBs and PCDD/Fs in Arctic marine biota (pg/g ww).

Region	Location	Year	Species	Tissue	Sex	Statistic	Individuals /Pools	CB 77	CB 126	CB 169	2378- TCDD	PCDD	HxCDD	HpCDD	OCDD	TCDF	PCDF	HxCDF	HpCDF	OCDF	TEQs ^a		Refer- ence
																					PCB	PCDD/F	
Cambridge Bay	Victoria Is.	1991	Sea urchins	Whole organism		Mean	2	52	13	<10	–	–	–	–	–	–	–	–	–	–	1.3		1
		1991				Mean	2	<10	<10	<10	–	–	–	–	–	–	–	–	–	–			
Inner Bokfjord	N. Norway	1994	Mussels	Whole organism		Mean	4 pools	–	–	–	0.40	0.12	0.23	0.19	0.41	3.18	1.65	0.77	0.35	1.22		0.20	11
Heikeneset	Jarfjord	1994	Mussels	Whole organism		Mean	1 pool	–	–	–	0.45	0.10	0.10	0.05	0.20	2.00	1.20	0.10	0.20	0.50		0.35	
Cambridge Bay	Victoria Is.	1991	Sculpin	Liver		Mean	2	30	19	<10	–	–	–	–	–	–	–	–	–	–	1.9		1
			Sculpin	Whole organism		Mean	2	67	45	<10	–	–	–	–	–	–	–	–	–	–	4.5		
W. Davis Strait	Broughton Is.	1988	Arctic char	Whole organism		Mean	8	63.1	10.2	0.5	–	–	–	–	–	–	–	–	–	–	1.1		2
N. Baffin Is.	Pond Inlet	1989	(anadromous)	Whole organism		Mean	10	6.9	1.4	1.5	1	–	–	–	–	1	–	–	–	–	0.16	1.1	
Hudson Strait	Kangiassualujjuak	1989		Whole organism		Mean	6	23.5	24.8	0.3	–	–	–	–	–	–	–	–	–	–	2.5		
Hudson Strait	Salluit	1989		Whole organism		Mean	2	23.9	8.4	<0.5	–	–	–	–	–	–	–	–	–	–	0.85		
Lancaster Sound	Somerses Is.	1989		Whole organism		Mean	8	10.6	2.8	1.7	2	–	–	–	–	1	–	–	–	–	0.31	2.1	
Larsen Sound	Spence Bay	1989		Whole organism		Mean	10	10.7	1.6	1.1	<1	–	–	–	–	<1	–	–	–	–	0.17		
Lancaster Sound	Resolute Bay	1992	Arctic cod	Whole organism		Mean	3	5.5	0.5	0.5	–	–	–	–	–	–	–	–	–	–	0.06		3
Prestøyskjær	Jarfjord	1994	Atlantic cod	Muscle		Value	1 pool	–	–	–	0.04	0.01	0.02	0.02	0.10	0.06	0.06	0.04	0.06	0.29		0.04	11
Russevikkneset	Inner Bokfjord	1994	Atlantic cod	Muscle		Value	2 pools	–	–	–	0.01	0.01	0.01	0.01	0.08	0.04	0.03	0.04	0.04	0.24		0.02	
Barents Sea	Svalbard	1981	Ringed seal	Blubber	♂ ♀	Mean	16	–	–	–	8.8	18.5	–	–	–	10	9.7	–	–	–		23.9	4
Barents Sea	Svalbard	1986	Ringed seal	Blubber	♂ ♀	Mean	7	–	–	–	3.4	7	4.1	1.46	20.7	13	8.5	<0.2	0.27	1.30		12.9	5
Barents Sea	Svalbard	1990	Ringed seal	Blubber	♂ ♀	Mean	13	102	191	<10	–	–	–	–	–	–	–	–	–	–	19.2		6
Barents Sea	S. Barents Sea	1987	Ringed seal	Blubber	♂ ♀	Mean	5	–	–	–	12	16	–	–	–	12	8.8	–	–	–		25.6	4
Barents Sea	S. Barents Sea	1987	Harp seal	Blubber	♀	Mean	3	–	–	–	<1.7	4.3	–	–	–	7.2	6	–	–	–		5.9	4
Greenland Sea	West ice	1991	Harp seal	Blubber	♂ ♀	Mean	11	179	215	190	0.81	2.71	4.30	0.80	3.43	5.87	4.79	3.14	0.58	0.62	23.5	5.9	7

Region	Location	Year	Species	Tissue	Sex	Statistic	Individuals /Pools	CB 77	CB 126	CB 169	2378- TCDD	PCDD	HxCDD	HpCDD	OCDD	TCDF	PCDF	HxCDF	HpCDF	OCDF	TEQs ^a		Reference
																					PCB	PCDD/F	
E. Hudson Bay	Inukjuak	1989-1992	Ringed seal	Blubber	♀	SD		90	107	275	0.25	1.16	2.71	0.19	1.63	2.36	1.70	1.66	0.22	0.31	13.5	2.4	8
						Mean	7	51.0	183	17.5	—	—	—	—	—	—	—	—	—	—	18.5		
			Ringed seal	Blubber	♂	SD		29.3	199	12.0	—	—	—	—	—	—	—	—	—	—	20.1		
						Mean	4	53.7	258	34.3	—	—	—	—	—	—	—	—	—	—	26.1		
						SD		29.5	267	21.9	—	—	—	—	—	—	—	—	—	—	27.0		
W. Baffin Bay	Broughton	1986	Ringed seal	Blubber	♂ ♀	Mean	4	86.2	94.4	14.4	11.0	—	1.0	—	1.0	3.0	—	—	—	—	9.6	11.4	2,9
						SD		39.3	31.7	17.3	—	—	—	—	—	—	—	—	—	—	3.4		
S. Beaufort Sea	Tuktoyaktuk	1986	Ringed seal	Blubber	♂	Value	4/1 pool	—	—	—	4.0	<3	—	—	—	2	<3	—	—	—		4.2	9
Queen Maud Gulf	Cambridge Bay	1986	Ringed seal	Blubber	♂	Value	4/1 pool	—	—	—	12.0	<3	—	—	—	4	<3	—	—	—		12.4	
Larsen Sound	Spence Bay	1986	Ringed seal	Blubber	♂	Value	4/1 pool	—	—	—	15.0	<3	—	—	—	<3	<3	—	—	—		15.0	
Lancaster Sound	Barrow Strait	1986	Ringed seal	Blubber	♂	Value	10/1 pool	—	—	—	35.0	<3	—	—	—	4	<3	—	—	—		35.4	
N. Baffin Is.	Admiralty Inlet	1986	Ringed seal	Blubber	♂	Value	11/1 pool	—	—	—	37.0	<3	—	—	—	5	<3	—	—	—		37.5	
N. Hudson Bay	Coral Harbour	1986	Ringed seal	Blubber	♂	Value	4/1 pool	—	—	—	3.0	<3	—	—	—	7	<3	—	—	—		3.7	
W. Hudson Bay	Rankin Inlet	1986	Ringed seal	Blubber	♂	Value	4/1 pool	—	—	—	2.0	<3	—	—	—	4	<3	—	—	—		2.4	
E. Hudson Bay	Akulivik	1989-1992	Walrus	Blubber	♂	Mean	4/1 pool	21.9	94.0	2.8	7.3	8.3	4.8	0.48	5.0	0.5	0.9	0.5	0.5	0.73	9.4	12.5	8
						SD		12.4	77.1	1.4	—	—	—	—	—	—	—	—	—	—	7.7		
E. Hudson Bay	Inukjuak	1989-92	Walrus	Blubber	♀	Mean	9	53.1	401	9.6	2.3	2.09	0.82	0.47	8.88	0.65	0.2	0.2	1.55	7.82	40.2	3.6	8
						SD		43.1	321	14.4	—	—	—	—	—	—	—	—	—	—	32.3		
						Mean	4	17.3	1044	6.6	—	—	—	—	—	—	—	—	—	—	104.5		
						SD		10.6	964	12.3	—	—	—	—	—	—	—	—	—	—	96.5		
W. Baffin Bay	Pond Inlet	1982	Narwhal	Blubber	♀	Mean	6	128.2	92.7	42.1	—	—	—	—	—	—	—	—	—	—	9.8		2
						SD		69.6	68.2	30.0	—	—	—	—	—	—	—	—	—	—	7.2		
			Narwhal	Blubber	♂	Mean	11	198.9	186.8	51.7	0.5	—	1.0	—	1.0	1.0	—	—	—	—	19.3	0.7	2,9
						SD		195.7	99.0	22.9	—	—	—	—	—	—	—	—	—	—	10.2		
Lancaster Sound	Creswell Bay	1992	Narwhal	Blubber	♂	Mean	8	88.2	182	31.6	—	—	—	—	—	—	—	—	—	—	18.6		3
						SD		41.1	46.5	11.9	—	—	—	—	—	—	—	—	—	—	4.8		
Lancaster Sound	Creswell Bay	1992	Beluga	Blubber	♂	Mean	2	99.7	188	133	—	—	—	—	—	—	—	—	—	—	20.2		3
					♀	Mean	1	26.9	23.3	16.5	—	—	—	—	—	—	—	—	—	—	2.5		
E. Baffin Is.	Cumberland Sound	1984	Beluga	Blubber	♂	Mean	6	105.1	201.1	96.8	1.0	—	5.0	—	<8	1.0	—	—	—	—	21.1	1.6	2,9
						SD		105.8	127.1	28.7	—	—	—	—	—	—	—	—	—	—	13.0		
S. Beaufort Sea	Mackenzie Delta	1989	Beluga	Blubber	♀	Mean	5	49.8	62.5	126.3	—	—	—	—	—	—	—	—	—	—	7.5		3
						SD		45.0	36.7	52.1	—	—	—	—	—	—	—	—	—	—	4.2		
			Beluga	Blubber	♂	Mean	8	87.6	195.4	542.4	—	—	—	—	—	—	—	—	—	—	25.0		
						SD		52.3	76.8	354.1	—	—	—	—	—	—	—	—	—	—	11.2		
Victoria Is.	Hadley Bay	1983-84	Polar bear	Fat	♂ ♀	Value	6 /1 pool	—	—	—	11	<3	<4	—	21	<2	<3	—	—	—		0.02	9
Melville Island	M'Clure Strait	1983-84	Polar bear	Fat	♂ ♀	Value	6 /1 pool	—	—	—	18	<3	<4	—	44	<4	<3	—	—	—		18.0	
Larsen Sound	Spence Bay	1983-84	Polar bear	Fat	♂ ♀	Value	8/1 pool	—	—	—	23	<3	<4	—	13	<2	<3	—	—	—		23.0	
Lancaster Sound	Barrow Strait	1983-84	Polar bear	Fat	♂ ♀	Value	10/1 pool	—	—	—	20	<3	<4	—	10	<2	<3	—	—	—		20.0	
N. Baffin Is.	Pond Inlet	1983-84	Polar bear	Fat	♂ ♀	Value	20/1 pool	—	—	—	4	<3	<4	—	8	<2	<3	—	—	—		4.0	
W. Baffin Bay	Clyde River	1983-84	Polar bear	Fat	♂ ♀	Value	10/1 pool	—	—	—	5	<3	<4	—	11	<2	<3	—	—	—		5.0	
W. Davis Strait	Broughton Is.	1983-84	Polar bear	Fat	♂ ♀	Value	10/1 pool	—	—	—	3	<3	<4	—	8	<2	<3	—	—	—		3.0	
E. Baffin Is.	Cumberland Sd.	1983-84	Polar bear	Fat	♂ ♀	Value	10/1 pool	—	—	—	<2	<3	<4	—	<8	<2	<3	—	—	—			
N. Hudson Bay	Coral Harbour	1983-84	Polar bear	Fat	♂ ♀	Value	10/1 pool	—	—	—	2	<3	<4	—	9	<2	<3	—	—	—		2.0	
W. Hudson Bay	Rankin Inlet	1983-84	Polar bear	Fat	♂ ♀	Value	10/1 pool	—	—	—	2	<3	<4	—	8	<2	<3	—	—	—		2.0	
Svalbard		1990	Polar bear	Milk (lw)		Mean	6	141	47	120	0.6	1.3	1.5	4.7	44.9	0.4	1.2	0.5	0.8	1.8	5.9	2.2	10

a. TCDD toxic equivalents (pg/g) calculated, where sufficient data are available, based on TEFs from Ahlborg *et al.* (1994) for PCBs (CBs 77, 126, and 169 only) and TEFs for PCDD/Fs from the Nordic model.

References

- Bright *et al.* 1995b;
- Ford *et al.* 1993;
- Muir 1994;
- Bignert *et al.* 1989;
- Oehme *et al.* 1988;
- Daelemans *et al.* 1993;
- Oehme *et al.* 1995a;
- Muir *et al.* 1995c;
- Norstrom *et al.* 1990;
- Oehme *et al.* 1995b;
- Schlabach and Skotvold 1996a, 1996b.

Table 6-A20. Mean concentrations and ranges of POPs in polar bear and Arctic fox. Values in brackets are ranges, except for values from Norstrom *et al.* (1998) where brackets indicate 95% confidence intervals.

Species /Location	Year	n (pools or individ.)	Age, years	Sex	Tissue	α -HCH	β -HCH	Σ HCHs	Σ CBz	p' -DDE	Σ DDTs	Σ CHL	Σ PCBs	Dieldrin	Reference
<i>Ursus maritimus</i> (Polar bear)															
Concentrations are in $\mu\text{g/kg}$ (ng/g) lw:															
Canada	1969	6-7			Fat	—	—	(120-380)	(94-150)	—	(390-2030)	(560-1880)	(1890-4500)	(160-460)	1
Canada	1982-1984	6-20			Fat	—	—	(300-870)	(190-400)	—	(120-1190)	1810-7090)	(3240-8250)	(170-960)	
Concentrations are in $\mu\text{g/g}$ ww:															
Svalbard	1978-1989	7			Liver	—	1400 (500-4200)	—	—	—	—	9700 (5700-21100)	—	800 (500-1200)	2
		16	Adult		Liver	—	—	—	20 (<10-110)	180 (<10-400)	—	—	13000 (100-780000)	—	
		5	<2		Liver	—	—	—	20 (<10-50)	120 (<100-2700)	—	—	12000 (200-35000)	—	
		7	Adult		Fat	—	—	—	120 (<50-220)	750 (<100-2700)	—	—	31000 (2900-90000)	—	
		3	<2		Fat	—	—	—	540 (<50-1500)	1300 (200-3400)	—	—	15000 (4100-21000)	—	
Values are age- and sex-corrected geometric means and their 95% confidence limits, except for dieldrin, which are uncorrected geometric means. ♀c = female with cub, ♂M = predicted mean value (from linear model) for 11-year-old males.															
Concentrations are in $\mu\text{g/kg}$ (ng/g) lw:															
R1 ^a	1993	17		♂ ♀c	Fat	—	—	—	—	274	—	727	7948	31	3
R2	1988-1990	9		♂ ♀c	Fat	—	—	—	—	80	—	997	2763	45	
Bering Sea		3		♂M	Fat	59	272	609	183	—	—	—	—	—	
Beaufort Sea		3		♂M	Fat	160	129	432	310	—	—	—	—	—	
R3	1989-1993	25		♂ ♀c	Fat	—	—	—	—	285	—	2956	20256	145	
R4	1989-1990	12		♂ ♀c	Fat	—	—	—	—	73	—	1453	5191	85	
R5	1989-1990	21		♂ ♀c	Fat	—	—	—	—	112	—	1952	8632	96	
		4		♂M	Fat	121	152	249	258	—	—	—	—	—	
R6	1989-1990	13		♂ ♀c	Fat	—	—	—	—	52	—	2141	4566	147	
		5		♂M	Fat	316	172	468	445	—	—	—	—	—	
R7	1990	10		♂ ♀c	Fat	—	—	—	—	113	—	1766	4280	157	
		10		♂M	Fat	152	143	324	206	—	—	—	—	—	
R8	1989-1990	10		♂ ♀c	Fat	—	—	—	—	72	—	1500	3062	142	
		5		♂M	Fat	173	136	316	209	—	—	—	—	—	
R9	1989-1990	18		♂ ♀c	Fat	—	—	—	—	184	—	1987	5985	185	
		10		♂M	Fat	76	196	212	196	—	—	—	—	—	
R10	1989-1990	5		♂ ♀c	Fat	—	—	—	—	386	—	4055	6819	—	
		5		♂M	Fat	125	132	321	220	—	—	—	—	—	
R11	1989-1990	29		♂ ♀c	Fat	—	—	—	—	215	—	2073	5565	233	
		27		♂M	Fat	122	119	241	156	—	—	—	—	—	
R12	1989-1990	33		♂M	Fat	—	—	—	—	238	—	1689	5942	159	
R13	1990-91	12		♂ ♀c	Fat	—	—	—	—	560	—	4632	10873	335	
		9		♂M	Fat	186	71	259	179	—	—	—	—	—	
R14	1989-1991	9		♂ ♀c	Fat	—	—	—	—	219	—	2074	7049	190	
		3		♂M	Fat	140	119	272	280	—	—	—	—	—	
R15	1990	18		♂ ♀c	Fat	—	—	—	—	265	—	3093	24316	298	
		10		♂M	Fat	63	154	217	161	—	—	—	—	—	
R16	1990	14		♂ ♀c	Fat	—	—	—	—	287	—	3292	22735	245	
Concentrations are in ng/g lw:															
Svalbard	1990-1994	8	1-2	♂ ♀c	Fat	—	—	233 (109-365)	200 (75-496)	567 (287-1120)	—	3380 (912-6000)	11400 (4810-18300)	—	6
Svalbard		25	3-6	♂ ♀c	Fat	—	—	197 (<4-473)	191 (64-522)	305 (<2-859)	—	3440 (858-8310)	16400 (5250-36700)	—	
Svalbard		23	7-15	♀c	Fat	—	—	163 (<4-358)	192 (49-461)	372 (<2-1820)	—	3150 (364-7550)	15700 (4790-41500)	—	
Svalbard		20	7-15	♂	Fat	—	—	385 (212-1150)	215 (62-480)	340 (58-1490)	—	1250 (184-2970)	28100 (6960-80300)	—	
Svalbard		9	16-22	♂	Fat	—	—	318 (133-644)	238 (34-947)	342 (89-1050)	—	613 (199-1870)	16600 (5540-27700)	—	
<i>Alopex lagopus</i> (Arctic fox)															
Concentrations are in ng/g lw:															
Svalbard	1973-1974	44			Liver	—	—	—	—	—	—	—	12400	—	4
Mean % lipid = 7.9%					Fat	—	—	—	—	—	—	—	12600	—	
	1983-1984	27			Liver	—	—	—	—	—	—	—	9700	—	

a. Geographical locations of R1 to R16 are given in Table 6.17.

1. Norstrom *et al.* 1988; ΣHCHs = Sum of α - and β -HCH; ΣCBz = PCBz and HCBz; ΣDDT = Sum of p,p' -DDT, p,p' -DDE, and p,p' -DDD; ΣCHL = Sum of 8 compounds; ΣPCB = Sum of 15 congeners.
2. Norheim *et al.* 1992; ΣCBz = HCBz only; ΣCHL = oxychlordane, heptachlor, and heptachlor epoxide; ΣPCB = Sum of 23 congeners.
3. Norstrom *et al.* 1997; ΣHCHs = Sum of α - and β -HCH; ΣCBz = PCBz and HCBz; ΣDDT = Sum of p,p' -DDT, p,p' -DDE, and p,p' -DDD; ΣCHL = Sum of 12 compounds; ΣPCB = Sum of 19 congeners.
4. Wang-Andersen *et al.* 1993; ΣPCB = Sum of PCB congeners 138, 153, 170, 180, 194, 206, and 209.
5. J.U. Skaare, unpubl. data; ΣHCHs = Sum of α -, β -, and γ -HCH; ΣCBz = HCBz only; ΣDDT = Sum of p,p' -DDT, p,p' -DDE, o,p' -DDT, o,p' -DDD, and p,p' -DDD; ΣCHL = Sum of oxychlordane, *cis*- and *trans*-chlordane, *cis*- and *trans*-nonachlor; ΣPCB = Sum of 35 congeners.
6. Bernhof *et al.* 1996; ΣPCB = Sum of 22 congeners.

Table 6-A21. Polychlorinated dibenzo-*p*-dioxins and furans in Arctic freshwater and marine sediments.

a. OC = organic carbon; LOI = loss on ignition.
b. TEQs based on Ahlborg *et al.* 1994. Concentrations of non-ortho PCBs not shown.

References

1. Evans 1996; 2. Evans *et al.* 1996; 3. Vartiainen *et al.* 1997; 4. Schlabach and Skotvold 1996a, 1996b; 5. Yufit and Khotuleva 1994; 6. C. de Wit, unpubl. data; 7. R. Macdonald, unpubl. data 1996.

Table 6-A22. Concentrations (pg/g ww) of polychlorinated dibenzo-*p*-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs) and non-ortho substituted PCBs (nPCBs), as well as TCDD TEQs in terrestrial and freshwater Arctic animals.

Species	Location	Country	n	% Lipid	Tissue	PCDD/Fs (2,3,7,8-substituted) pg/g wet weight													TEQ (pg/g wet weight basis)			Reference
						TCDD	PnCDD	HxCDD	HpCDD	OCDD	TCDF	PnCDF	HxCDF	HpCDF	OCDF	CB 77	CB 126	CB 169	PCDD/Fs	nPCBs ^a	Total TEQs	
Reindeer/Caribou ^b	Aitejokk	Sweden	P	84.4	Fat	<0.2	<0.3	<0.5	<0.7	<2.0	<0.1	<0.4	<0.5	<0.4	<2.0	2.2	13.5	2.5	0	1.5	1.5	1
	Ammarnäs	Sweden	P	90	Fat	<0.2	<0.3	<0.5	<0.7	<2.0	0.9	<0.4	<0.5	<0.4	<2.0	0.16	1.7	0.13	0.09	0.93	1.02	1
	Jarfjord Holmengrå	Norway	3	83.1	Fat	0.94	2.23	4.80	0.32	0.72	2.01	16.06	16.58	0.91	2.24				9.45			7
	Stilla	Norway	3	72.1	Fat	0.24	0.48	0.66	0.25	0.49	0.79	1.37	0.82	0.22	0.88				0.70			7
	Finlayson	Canada	P	84.2	Fat	<0.45	<0.32	<0.74	<0.98	0.38	<0.30	<0.58	<1.63	<0.80	<0.20	3.41	6.4	0.86	<0.01	0.55	0.62	2
	Tay	Canada	P	84.2	Fat	<0.05	0.12	0.08	0.25	1.09	0.2	0.52	0.36	0.23	0.25	3.04	5.74	0.58	0.18	0.49	0.76	2
	Bonnet Plume	Canada	P	83.8	Fat	<0.11	<0.13	<0.26	<0.20	0.66	<0.48	0.25	<0.70	<0.13	<0.06	2.92	9.64	0.75	<0.01	0.82	0.93	2
	Bathurst	Canada	P	43	Fat	<0.19	<0.40	<0.64	0.33	2.14	<0.90	0.74	<1.12	<0.23	<0.26	5.14	7.16	0.88	<0.01	0.21	0.33	2
	Southampton Is.	Canada	P	92.3	Fat	<0.15	0.3	0.1	<0.32	1.65	0.16	0.63	0.23	<0.48	<0.13	6.45	26.7	2.28	0.29	0.49	0.85	2
	Cape Dorset	Canada	P	19.2	Fat	0.73	1.67	1.77	0.73	4.69	0.99	1.77	1.98	<0.93	<0.21	10.3	74.7	11.8	0.46	0.47	1.23	2
	Lake Harbour	Canada	P	80.4	Fat	0.14	0.31	0.57	0.39	1.13	0.35	0.77	0.61	0.22	0.25	5.52	30.7	3.42	2.5	0.52	3.29	2
Mink	South NWT	Canada	3		Fat	<0.1	<0.1	2	<0.1	<0.1	5	<0.1	<0.1	<0.1	<0.1							3
Otter	Lapland	Sweden	P	3	Muscle	<0.12	0.36	0.1	<0.40	<0.92	0.1	0.1	<0.12	<0.32	<0.85	2.5	38	52	0.1	6.7	6.8	1
Peregrine falcon	Kola Peninsula	Russia	6		Egg	11	11	13.6	0.7	2.6	30.0	38.7	8.5	0.5	1.4	1500	1300	300	35	186	221	4
White-tailed eagle	Kola Peninsula	Russia	1	4.1	Egg	1.3	1.6	1.1	<0.3	1.8	1.6	5.7	1.5	0.2	0.3	100	200	100	5.0	12	17	4
Osprey	Storuman/Kiruna	Sweden	2	2.9	Muscle	1.9	3	2.0	0.6	<1.2	1.3	4.7	1.1	<0.34	<0.7	540	355	75	6.1	45	51	1
White-tailed eagle	Lapland	Sweden	2	3.9	Egg	1.5	2.7	1.3	0.5	3.5	6.1	10.0	5.2	1.3	<3	265	545	340	8.0	80	88	1
Arctic char (landlocked)	Lake Abiskojaure	Sweden	P	1.2	Muscle	<0.07	<0.09	<0.2	<0.2	<0.45	0.16	<0.12	<0.1	<0.18	<0.43	4.8	2.6	1.2	0.02	0.32	0.34	1
	Lake Pahtajärvi	Finland	11	1.1	Muscle+skin	0.01	<0.01	0.06	0.26	0.36	0.06	<0.01	0.14	0.9	0.31	1.83	0.39	0.1	0.057	0.049	0.32	5
	Lake Nitsijärvi	Finland	6		Muscle+skin	<0.01	<0.01	0.1	0.135	0.3	0.29	0.082	<0.01	<0.01	<0.01	3.2	1.78	0.77	0.101	0.202	0.30	5
	Lake 222	Finland	12	0.4	Muscle+skin	<0.01	<0.01	0.01	0.056	0.091	0.069	0.082	<0.01	<0.01	<0.01	1.26	1.18	0.59	0.056	0.13	0.19	5
	Lake Haukesjøen	Norway	P	1.5	Muscle+skin														0.14		0.14	7
	Amituk Lake	Canada	12	4.4	Muscle+skin											7.1	9.3	1.1			0.95	6
	Buchanan Lake	Canada	10	7.2	Muscle+skin											1.9	7.3	0.8			0.74	6
	Char Lake	Canada	5	4.3	Muscle+skin											22.0	73.4	3.4			7.4	6
	Lake Hazen	Canada	7	5.0	Muscle+skin											<0.5	<0.5	14.4			0.14	6
	Pajala	Sweden	P	0.5	Muscle	<0.02	<0.02	0.03	<0.02	0.05	0.19	0.07	0.04	<0.02	<0.03	4.3	2.6	<0.2	0.05	0.28	0.33	1
	Pajala	Sweden	P	21.6	Liver	0.39	0.65	2.2	1.3	0.75	12	3.8	2.4	0.67	<0.1	189	146	<17	3.75	18.5	22.3	1
	Pahtajärvi	Finland	4	37.3	Liver	<0.01	0.08	0.15	<0.01	<0.01	3.9	0.56	0.6	<0.01	<0.01	40	41.2	32.7	0.7	4.65	5.35	5
	Nitsijärvi	Finland	5		Liver	<0.01	<0.01	0.52	0.27	0.87	13.1	1.48	<0.01	<0.01	<0.01	60	53.1	25.2	2.76	5.86	8.62	5
Burbot	Lake Laberge	Canada	7	36.6	Liver	<0.1					28.3					395.9	1510.0	1410.6			166	6
	Fox Lake	Canada	4	29.9	Liver											5.7	23.8	11.5			2.5	6
	Great Slave Lake	Canada	7	35.5	Liver	<0.1					2.7					5.0	6.7	10.1			0.8	6
	Slave River	Canada	41		Liver	<0.06-16					<1.3-45											8
	Lake 222	Finland	4	0.4	Muscle+skin	<0.01	<0.01	0.01	0.03	0.14	0.08	0.04	<0.01	<0.01	<0.01	0.94	0.59	0.28	0.08	0.067	0.1	5
	Lake trout	Canada	5	1.2	Muscle+skin	<2					<2					8.1	18.6	48.1			2.4	6
Brown trout	Lake trout	Canada	6	8.4	Muscle+skin	<2					3.3					60.2	144	61.8			15.1	6
	Pike	Sweden	10	0.6	Muscle	<0.01	<0.01	<0.03	<0.2	<0.5	0.22	0.05	<0.01	<0.2	<0.5	0.43	1.1	0.88	0.05	0.13	0.18	1
	Walleye	Canada	41		Whole fish	<0.06-2.6					<0.01-2.3											8
	Lake whitefish	Sweden	P	0.5	Muscle	<0.06	<0.08	<0.2	<0.11	<0.1	0.41	0.18	<0.09	<0.08	<0.1	17	3.2	1.8	0.09	0.38	0.47	1
	Lake whitefish	Norway	1	1.7	Muscle+skin														8.29			7
	Lake whitefish	Canada	4	18.8	Muscle+skin	0.1					0.7					3.0	2.6	1.9			0.47	6

a. TEQs for nPCBs includes CB 105 and CB118 if reported by the authors.

b. Pooled samples from female fat except for samples from Sweden (3-year-old males). Pooled samples consisted of 3-20 samples from each herd in Canada; 10 in Sweden. TEQs in Swedish samples include CBs 105 and 118 using TEFs of Ahlborg *et al.* (1994).

References

1. C. de Wit, unpubl. data;
2. Muir, unpubl. data;
3. Poole, unpubl. data 1996;
4. Henney *et al.* 1994;
5. Mannio, unpubl. data.
6. Muir and Lockhart 1994;
7. Schlabach and Skotvold 1996a, 1996b;
8. Peddle *et al.* 1995.