Table 1. Bothnian Bay and Sea water sampling.

Shipboard station[a]	Date	Coordinates N, E	Off Holmön	Date
1 (C14) + 2	18/07/2011	62.10, 18.55	HOLW1	06/07/2012
		62.22, 18.80	HOLW2	06/07/2012
3 (C3)	19/07/2011	62.65, 18.95	HOLW3	05/01/2013
5 + 6 (A5)	20/07/2011	65.05, 22.96	HOLW4	05/01/2013
		65.17, 23.23	HOLW5	05/04/2013
7 + 8 (A13)	21/07/2011	64.83, 22.34	HOLW6	05/04/2013
		64.71, 22.07		
GA1	07/05/2012	62.86, 18.26		
C14	08/05/2012	62.10, 18.55		
B3	08/05/2012	63.50, 19.82		
RA2	09/05/2012	65.73, 22.45		
A5	09/05/2012	65.17, 23.23		
A13	10/05/2012	64.71, 22.07		

a) See Figure 1 for locations.

Table 2. Passive and high volume air sampling.

	Holmön				Krycklan				Sandskär		
Passive	**Start**	**End**	**Days**	**Passive**	**Start**	**End**	**Days**	**Passive**	**Start**	**End**	**Days**
HOLPAS1	27/07/2011	21/10/2011	86	KRYPAS1	08/07/2011	20/10/2011	107	SKRPAS1	08/09/2011	21/01/2012	135
HOLPAS2	21/10/2011	22/01/2012	93	KRYPAS2	20/10/2011	22/01/2012	93	SKRPAS2	25/02/2012	25/05/2012	90
HOLPAS3	22/01/2012	17/05/2012	116	KRYPAS3	22/01/2012	16/05/2012	116	SKRPAS3	25/05/2012	14/08/2012	81
HOLPAS4	17/05/2012	11/08/2012	86	KRYPAS4	16/05/2012	14/08/2012	96	SKRPAS4	14/08/2012	06/01/2013	145
HOLPAS5	11/08/2012	05/01/2013	147	KRYPAS5	14/08/2012	28/12/2012	136				

	Shipboard			mean T		Holmön			mean T
Hi-Vol	**Start**	**End**	**m^3 air**	**^oC**	**Hi-Vol**	**Start**	**End**	**m^3 air**	**^oC**
SHV1	07/05/2012	07/05/2012	115		HOLHV1	17/05/2012	17/05/2012	101	7.8
SHV2	07/05/2012	08/05/2012	720		HOLHV2	17/05/2012	19/05/2012	1615	7.3
SHV3	08/05/2012	09/05/2012	615		HOLHV3	27/05/2012	29/05/2012	1683	10.4
SHV4	09/05/2012	09/05/2012	110		HOLHV4	03/06/2012	03/06/2012	109	10.1
SHV5	09/05/2012	10/05/2012	674		HOLHV5	24/06/2012	26/06/2012	1301	14.3
					HOLHV6	26/06/2012	26/06/2012	81	13.8
					HOLHV7	05/07/2012	05/07/2012	56	16.8
					HOLHV8	05/07/2012	07/07/2012	1713	18.2
					HOLHV9	17/08/2012	19/08/2012	1389	15.8
					HOLHV10	19/08/2012	19/08/2012	65	14.2
					HOLHV11	19/08/2012	22/08/2012	2196	12.8
					HOLHV12	23/08/2012	23/08/2012	105	12.1

Table 3. Ions monitored for GC-ECNI-LRMS analysis.

Target Compounds[a]	Quantifying	Qualifying	Surrogate Compound[a]	Quantifying
HCBz	284	286	$^{13}C_6$-HCBz, $^{13}C_6$-γ-HCH	292, 261
HCHs	255	257	$^{13}C_6$-γ-HCH	261
TC,CC	410	412	$^{13}C_{10}$-TN	254
TN,CN	444	446	$^{13}C_{10}$-TN	454
HEPX	388	386	$^{13}C_{10}$-HEPX	398
DIEL	380	382	$^{13}C_{12}$-DIEL	392
ENDO-I, II	404	406	$^{13}C_9$-ENDO-I, II	415
ENDO SUL	386	388	$^{13}C_9$-ENDO-I, II	415
CPF	313	315	d_{10}-CPF	322
DAC	332	330	mean, all OCP surrogates	
TFN	335	305	d_{14}-TFN, NQ[b]	349
CHT	266	264	NQ[b]	
DBA	79	81	d_5TBA, $^{13}C_6$-γ-HCH	261
TBA	344	346	d_5TBA, $^{13}C_6$-γ-HCH	351, 261
			$^{13}C_{12}$-PCB105 (I.S.)	338

a) hexachlorocyclohexanes (α- and γ-HCH), hexachlorobenzene (HCBz), *trans*-chlordane (TC), *cis*-chlordane (CC), *trans*-nonachlor (TN), cis-nonachlor (CN), heptachlor *exo*-epoxide (HEPX), dieldrin (DIEL), endosulfan-I and II (ENDO-I and II), endosulfan sulphate (ENDO SUL), chlorpyrifos (CPF), dacthal (chlorthal dimethyl) (DAC), trifluralin (TFN), chlorothalonil (CHT), 2,4-dibromoanisole (DBA), 2,4,6-tribromoanisole (TBA)

b) NQ = native TFN and CHT not quantified due to interferences, labelled TFN quantified at mass 349 for recovery trials.

Table 4. Blank values for air and water samples, pg.

Target	Air				blank % of	Water				blank % of
Compounds[a]	Mean	SD	N	LOD	mean sample[b]	Mean	SD	N	LOD	mean sample[c]
HCBz	96.5	91.2	11	370	1.8	15.3	8.7	2	41.3	3.9
α-HCH	38.2	37.9	13	152	1.4	76.7	22.9	2	146	2.4
γ-HCH	30.8	25.5	7	107	1.5	118		1		2.6
TC	4.8	3.8	21	16.2	1.5	12.7	6.8	2	33.2	7.4
CC	5.4	4.8	21	19.7	1.7	11.6	3.1	2	20.9	8.2
TN	3.6	2.5	21	11.0	1.5	7.5	0.3	2	8.3	8.6
CN	1.3	1.4	17	5.4	7.1	2.8	1.0	2	5.9	19.7
HEPX	29.5	47.1	15	171	7.6	124	121	2	488	77.4
DIEL	34.6	26.9	15	115	4.6	40.5	12.8	2	78.9	7.1
ENDO-I	11.1	8.2	21	35.9	1.3	11.7	0.4	2	12.9	9.4
ENDO-II	6.9	5.6	17	23.6	27.1	13.4	1.4	2	17.7	35.9
ENDO SUL	7.2	8.2	14	31.8	16.1	64.0	9.0	2	91.0	2.2
CPF	2.9	2.7	13	11	6.6	20.0	21.2	2	83.6	50.1
DAC	1.1	0.5	12	2.6	2.0	5.4	5.7	2	22.5	4.0
DBA	325	254	9	1087	8.3	190	109	2	516	3.7
TBA	145	161	9	628	2.3	593	790	2	2961	6.0

a) Abbreviations given in Table 3.

b) = mean blank*100/mean sample quantity, based on a 500 m^3 sample for most compounds and 100 m^3 for HCBz, DBA and TBA.

c) = mean blank*100/mean sample quantity, based on a 40-L sample.

Table 5. Percent recovery of surrogate compounds.

Surrogate	Passive air PUFs			Hi-Vol air PUFs			Water XAD-2 column		
Compound[a]	Mean	SD	N	Mean	SD	N	Mean	SD	N
$^{13}C_6$-HCBz				68.0	15.3	19			
$^{13}C_6$-γ-HCH	103.5	21.2	17	97.0	14.4	23	59.9	14.4	14
$^{13}C_{10}$-TN	97.9	27.8	17	85.7	13.0	23	45.2	14.6	14
$^{13}C_{10}$-HEPX	94.8	30.0	17	98.5	18.4	22	49.0	14.4	14
$^{13}C_{12}$-DIEL	84.8	15.6	17	101.8	26.9	22	68.8	30.1	14
$^{13}C_9$-ENDO-I	100.6	22.9	14	97.7	18.4	23	42.0	16.8	14
$^{13}C_9$-ENDO-II	110.2	51.7	17	104.7	24.6	23	50.7	33.1	14
d_{10}-CPF	97.8	31.0	10	126.3	40.0	18	76.9	35.4	14
d_{14}-TFN	82.0	31.3	12	98.4	53.3	19	97.4	40.6	14
d_5-TBA				107.6	20.2	8			
All surrogates	96.9	31.1	121	95.0	26.9	182	61.2	31.5	112

a) Abbreviations given in Table 3.

Table 6. Halogenated compounds in Bothnian Bay (BB) - Bothnian Sea (BS) surface water[a], pg L^{-1}.

	July 2011	July 2011	May 2012	May 2012	May 2012	July 2011	July 2011	May 2012	May 2012	May 2012	Jan. 2012	Jan. 2012	July 2012	July 2012			
	BS	**BS**	**BS**	**BS**	**BS**	**BB**	**BB**	**BB**	**BB**	**BB**							
Compound[b]	**1(C14)+2**	**3(C3)**	**C14**	**B3**	**GA1**	**5+6(A5)**	**7+8(A13)**	**RA2**	**A13**	**A5**	**HOL1**	**HOL2**	**HOL3**	**HOL4**	**Mean**	**SD**	**%RSD**
HCBz	3.1	12	12	17	17	4.9	8.2	14	12	12	7.9	3.3	6.5	6.4	9.7	4.6	47.1
α-HCH	74	118	91	74	108	72	117	46	79	71	74	78	59	58	80	22	27.1
γ-HCH	319	140	151	74	102	86.7	76.1	44	63	173	69	82	119	112	115	69	60.0
TC	5.2	7.2	14.5	1.8	2.6	5.1	6.2	0.95	4.4	0.92	2.0	1.6	3.6	3.9	4.3	3.5	82.4
CC	4.6	5.9	7.4	2.1	2.5	3.8	5.7	1.1	3.0	1.4	1.3	*0.3*	2.9	4.1	3.3	2.1	62.7
TN	3.9	4.7	3.3	1.6	1.4	2.4	2.3	1.6	1.7	0.95	1.0	*0.1*	1.6	2.1	2.0	1.2	59.6
CN	*0.07*[c]	0.50	0.11	0.35	0.36	*0.07*	*0.07*	0.24	0.50	0.29	*0.07*	*0.07*	0.36	0.46	0.25	0.17	68.8
DIEL	15	14	19	15	23	7.5	14	10	13	12	11	11	19	17	14	4.2	29.8
ENDO-I	2.3	3.3	2.3	3.1	I[d]	*0.2*	*0.2*	4.0	1.9	2.3	I	I	3.6	4.4	2.5	1.4	54.9
ENDO-II	2.8	*0.2*	0.69	0.66	*0.2*	*0.2*	*0.2*	0.83	0.56	0.74	*0.2*	*0.2*	0.60	0.57	0.62	0.68	109.3
ENDO SUL	92	136	52	53	50	123	134	37	44	67	49	52	68	53	72	35	48.0
CPF	1.3	10.1[e]	0.87	1.2	0.86	1.0	2.0	0.53	0.54	0.60	0.96	1.20	10.4[e]	I	1.0	0.4	42.1
DAC	4.4	3.8	3.5	2.6	3.9	5.3	8.9	2.1	2.1	2.5	2.3	2.0	1.5	2.5	3.4	1.9	56.7
DBA	84	48	106	154	233	83	63	161	125	146	86	105	163	204	126	54	42.7
TBA	240	382	173	226	385	521	151	116	134	130	154	183	338	379	251	127	50.6

a) Station designations and locations in Table 1 and Figure 1.

b) Compound abbreviations in Table 3.

c) Values in italics were below detection, 1/2 the LOD (Table 4) was entered for statistical purposes.

d) I = interference, distortion of chromatographic peak or quantifying/qualifying ion ratio outside the ±20% limit.

e) Suspect value, not included in mean.

Table 7. Reports of halogenated compounds in water, pg L^{-1}.

	BB-BS[b]	NNA[c]	Grld. Sea[d]	WCA[e]	ECA[f]		NAGL[g]
Compound[a]	**2011-2012**	**2008**	**2004**	**2008**	**2007**	**2010-11**	**1996-2000**
HCBz	9.7	0.2	4.6	5.2	5.8		
α-HCH	80	58	13	980	547		260-2800
γ-HCH	115	20	4.7	203	164		240-940
TC	4.3	0.7	0.05	0.64	0.35	0.85	1.9-4.1
CC	3.3	0.7	0.08	1.1	0.90	1.90	3.3-5.4
TN	2.0			0.56	0.48	0.88	1.5-3.2
CN	0.26						0.3-1.4
HEPX	<6	1.4		39	18		10-45
DIEL	14			27	33	51	83-137
ENDO-I	2.5			3.6	5.9	2.7	
ENDO-II	0.62			0.70	3.7	0.65	
ENDO SUL	72					7.9	
CPF	1.0			23	7.1	16	
DAC	3.4			14	33	22	
DBA	126			9.1	28		
TBA	251			8.3	98		

a) Compound abbreviations in Table 3.
b) Bothnian Bay - Bothnian Sea, this study.
c) Northern North Atlantic, south of Iceland (11).
d) Greenland Sea, between Svalbard and Greenland (12).
e) Western Canadian Arctic (Beaufort Sea) (13,14).
f) Eastern Canadian Arctic (Hudson Bay, Labrador Sea) (13,14).
g) North American Great Lakes (15).

Table 8. Halogenated compounds in air of the Bothnian Bay - Sea region from passive sampling, pg m^{-3}

	Holmön[a]				Krycklan[a]			Sandskär[a]	Overall		
Compound	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**1**	**mean**	**SD**	**%RSD**
HCBz	18	32	27	9.5	12	26	16	36	22	10	43.5
α-HCH	9.8	6.2	I	7.5	8.8	4.9	2.9	16	8.0	4.2	52.7
γ-HCH	3.1	2.9	I[d]	5.6	3.1	2.7	5.0	5.6	4.0	1.3	33.3
TC	0.25	0.43	0.45	0.20	0.22	0.30	0.31	0.70	0.36	0.17	46.3
CC	0.94	0.75	0.81	0.60	0.90	0.51	0.58	1.6	0.84	0.35	41.3
TN	0.79	0.73	0.83	0.57	0.89	0.41	0.60	1.4	0.78	0.30	38.1
CN	0.090	0.051	0.066	0.089	0.13	0.029	0.043	0.15	0.081	0.042	52.3
HEPX	2.0	1.0	*0.2*[c]	1.8	2.2	0.67	0.64	1.6	1.3	0.7	58.0
DIEL	2.1	2.5	I[d]	I	2.0	1.5	1.8	3.9	2.3	0.9	37.0
ENDO-I	3.7	2.7	4.2	1.8	6.7	1.9	2.7	5.4	3.6	1.7	47.6
ENDO-II	*0.03*	0.049	*0.03*	*0.03*	0.10	0.035	0.035	0.11	0.052	0.033	63.3
CPF	0.039	0.10	NA[e]	NA	0.017	0.043	0.11	0.11	0.070	0.041	59.4
DAC	0.17	0.046	NA	NA	0.12	0.043	0.059	0.059	0.08	0.05	61.7
DBA	12	23	6.6	7.6	14	25	4.7	18	14	7.6	54.8
TBA	18	42	20	15	9.0	28	9.2	17	20	11	54.8

a) Conversion from collected mass to air concentration assumes sampling rate of 4 m^3 day^{-1}.

b) See Table 2 for deployment periods

c) Values in italics were below detection, 1/2 the LOD (Table 4) was entered for statistical purposes.

d) I = interference, distortion of chromatographic peak or quantifying/qualifying ion ratio outside the ±20% limit.

e) NA = not analysed.

Table 9. Halogenated compounds in air of the Bothnian Bay - Sea region from high volume sampling, pg m-3

	Holmön[a], air volume, m^3												Shipboard[a], air volume, m^3					Overall		
	101	**1615**	**1683**	**109**	**1301**	**81**	**56**	**1713**	**1389**	**65**	**2196**	**105**	**115**	**720**	**615**	**110**	**674**			
Compound	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**mean**	**SD**	**%RSD**
HCBz	59	BT[b]	BT	55	BT	34	81	BT	BT	44	BT	34	110	BT	37	46	BT	56	25	45.5
α-HCH	5.9	3.7	4.2	7.3	BT	5.0	9.0	BT	BT	9.0	BT	4.0	8.4	4.0	2.4	I[d]	3.00	5.5	2.4	43.2
γ-HCH	6.4	2.1	1.8	4.3	BT	22[c]	I	BT	BT	8.5	BT	I	4.0	5.2	4.9	I	4.9	4.7	2.0	43.7
TC	2.0	0.45	0.50	1.0	0.56	0.64	1.5	0.87	0.52	0.36	0.36	0.32	0.49	0.33	0.22	0.22	0.29	0.63	0.49	77.4
CC	1.4	0.43	0.52	0.93	0.59	0.64	1.4	0.87	0.71	0.49	0.51	0.43	0.64	0.46	0.32	0.33	0.40	0.65	0.32	49.1
TN	0.94	0.36	0.37	0.66	0.44	0.44	0.88	0.62	0.49	0.32	0.35	0.30	0.50	0.34	0.26	0.28	0.37	0.47	0.20	43.2
CN	NA[e]	0.03	0.03	NA	0.04	NA	NA	0.05	0.05	NA	0.04	NA	NA	0.024	0.016	NA	0.026	0.033	0.012	36.7
HEPX	NA	0.38	0.37	NA	0.94	NA	NA	1.15	0.82	NA	0.65	NA	NA	0.27	0.25	NA	0.42	0.58	0.32	55.4
DIEL	NA	1.1	1.1	NA	2.0	NA	NA	2.7	1.8	NA	1.2	NA	NA	1.2	0.62	NA	1.0	1.4	0.62	43.7
ENDO-I	1.9	0.61	0.81	1.5	1.6	1.3	2.0	2.2	4.2	2.5	3.6	2.1	1.2	0.88	0.59	0.73	1.3	1.7	1.0	59.0
ENDO-II	NA	0.029	0.027	NA	0.045	NA	NA	0.074	0.042	NA	0.022	NA	NA	*0.02*[f]	*0.02*	NA	0.071	0.039	0.021	54.0
ENDO SUL	NA	0.025	0.022	NA	0.11	NA	NA	0.18	0.14	NA	0.17	NA	NA	*0.02*	*0.02*	NA	0.048	0.081	0.068	83.8
CPF	NA	0.094	0.054	NA	0.067	NA	NA	0.071	0.044	NA	0.038	NA	NA	0.034	0.037	NA	0.073	0.057	0.020	35.9
DAC	NA	0.081	0.081	NA	0.14	NA	NA	0.21	0.16	NA	0.16	NA	NA	0.034	0.037	NA	0.073	0.11	0.062	56.9
DBA	41	BT	BT	54	BT	81	34	BT	BT	20	BT	36	34	BT	BT	16	BT	40	20	51.9
TBA	59	BT	BT	42	BT	32	112	BT	BT	33	BT	48	126	BT	BT	57	BT	64	36	56.2

a) See Table 2 for sampling dates.
b) Not quantified due to breakthrough from front to back PUF.
c) Suspect value, not included in average.
d) I = interference, distortion of chromatographic peak or quantifying/qualifying ion ratio outside the ±20% limit.
e) NA = not analysed in samples with the lower air volumes.
f) Values in italics were below detection, 1/2 the LOD (Table 4) was entered for statistical purposes.

Table 10. Organochlorine pesticides in air, pg m^{-3}.

	Sweden			Finland		Canada		Norway
	BB-BS[b]	Råö (5)	Råö (4)	Pallas (5)	Pallas (4,25)	Arctic (13,14)[c]	Alert (25)	Svalbard (25)
Compound[a]	2011-2012	2011	2005	2011	2005	2007-08	2005	2006
HCBz	56						52	72
α-HCH	4.3	4.2	7.9	4.9	9.9	24	13	11
γ-HCH	6.8	2.9	6.4	1.5	2.8	3.8	1.7	1.9
TC	0.49	0.17	0.36	0.12	0.31	0.36	0.25	0.22
CC	0.74	0.38	0.71	0.27	0.74	0.67	0.64	0.61
TN	0.62	0.48	0.66	0.25	0.63	0.53	0.42	0.35
CN	0.057							0.094
HEPX	0.95					1.9	0.84	
DIEL	1.9					3.3	0.81	
ENDO-I	2.7	3.0		9.1		3.4	5.6	
ENDO-II	0.046	0.11		0.11		0.52		
CPF	0.063					1.9		
DAC	0.096					1.6		
DBA	40					16		
TBA	64					23		

a) Compound abbreviations in Table 3.

b) Bothnian Bay - Bothnian Sea, this study.

c) Average of shipboard measurements in western and eastern Canadian Arctic.

Table 11. Air and water concentrations and Henry's law constants (H), and organic carbon/water partition coefficients (log K_{DOC}) for gas exchange estimates.

	pg m^{-3}		H^b, Pa m^3 mol^{-1}						Log K_{DOC}		%
Compound[a]	Air	Water	25°C	Ref.[c]	m	Ref.[d]	b	Notes[e]	25°C	Notes[f]	dissolved[g]
HCBz	56	9670	65	33	-2637	33	10.66	FAV	5.33	exp.	53.9
α-HCH	5.5	79900	0.74	32	-2966	32	9.82	FAV	3.88	exp.	97.1
γ-HCH	4.7	115000	0.31	32	-2987	32	9.51	FAV	3.52	exp.	98.7
TC	0.63	4300	6.8	33	-2303	35,36	8.55	FAV	5.26	est.	57.7
CC	0.65	3300	5.7	33	-2190	35,36	8.10	FAV	5.22	est.	59.9
TN	0.47	2040	12	35	-2749	35,36	10.30		5.22	est.	59.9
DIEL	1.4	14300	1.1	33	-2462	35	8.30	FAV	4.81	est.	79.2
ENDO-I	1.7	2500	0.70	33	-1784	35	5.83	FAV	4.94	exp.	87.6
ENDO-II	0.039	620	0.045	33	-1647	35	4.18	FAV	4.78	exp.	79.1
CPF	0.057	1000	0.57	34	-3391	35	11.13	FAV	4.62	exp.	85.7
DAC	0.11	3380	0.23	34	-2600	avg.	8.08	FAV	4.56	exp.	87.3
DBA	40	126000	13	37	-2600	avg.	10.37		3.84	est.	97.3
TBA	64	251000	75	37	-2600	avg.	11.14		4.23	est.	93.7

a) Abbreviations given in Table 3.

b) Parameters of log H = m/T + b. Intercept b is calculated from log H at 25°C and slope m.

c) Reference for value at 25°C, avg. = estimated as average of other slopes.

d) Reference for slope m.

e) FAV = thermodynamically consistent "final adjusted value" at 25°C.

f) exp. = experimental (Matyas Ripszam), est. = estimated from correlation of log K_{DOC} to log K_{OW}.

g) Calculated from eq. 4 using C_{DOC} = 4 mg L^{-1}.

Table 12. Water/air fugacity ratios (FR)[a,b] of organohalogen compounds in Bothnian Bay - Sea.

	A. No binding to DOC					B. Adjusted for binding to DOC[c]				
	Water temperature, K					Water temperature, K				
	273	**278**	**283**	**288**	**293**	**273**	**278**	**283**	**288**	**293**
HCBz	0.77	1.1	1.6	**2.3**	**3.3**	0.41	0.61	0.88	1.3	**1.8**
α-HCH	0.58	0.89	1.4	**2.0**	**3.0**	0.56	0.87	1.3	**2.0**	**2.9**
γ-HCH	0.40	0.62	0.94	1.4	**2.1**	0.40	0.61	0.93	1.4	**2.1**
TC	**3.9**	**5.5**	**7.6**	**10**	**14**	**2.3**	**3.2**	**4.4**	**5.9**	**8.0**
CC	**2.7**	**3.7**	**5.0**	**6.7**	**8.9**	1.6	**2.2**	**3.0**	**4.0**	**5.4**
TN	**3.3**	**4.9**	**7.2**	**10**	**15**	**2.0**	**3.0**	**4.3**	**6.3**	**9.0**
DIEL	0.86	1.2	1.7	**2.4**	**3.3**	0.68	0.97	1.4	**1.9**	**2.6**
ENDO-I	**0.13**	**0.16**	**0.21**	**0.26**	0.33	**0.11**	**0.14**	**0.18**	**0.23**	**0.29**
ENDO-II	**0.10**	**0.12**	**0.16**	**0.19**	**0.24**	**0.08**	**0.10**	**0.12**	**0.15**	**0.19**
CPF	0.40	0.65	1.0	1.7	**2.6**	0.34	0.56	0.90	1.4	**2.2**
DAC	0.49	0.72	1.0	1.5	**2.1**	0.43	0.63	0.90	1.3	**1.8**
DBA	**2.8**	**4.1**	**5.9**	**8.4**	**12**	**2.7**	**4.0**	**5.7**	**8.1**	**11**
TBA	**21**	**30**	**43**	**61**	**86**	**19**	**28**	**40**	**57**	**80**

a) Air, water concentrations and Henry's law constants in Table 11. Assumes same air and water temperatures.

b) Bold numbers indicate significant departure from water-air equilibrium, see text.

c) K_{DOC} and calculated percent dissolved C_W in Table 11.

Table 13. Gas exchange fluxes of organohalogens in Bothnian Bay - Sea, ng m^{-1} d^{-1}.

	Water and air temperatures, K[a]														
	273			278			283			288			293		
Compound[b]	V[c]	D[c]	N[c]	V	D	N	V	D	N	V	D	N	V	D	N
HCBz	-1.0	4.7	3.6	-1.1	3.4	2.3	-1.2	2.5	1.3	-1.2	1.8	0.60	-1.27	1.33	0.068
α-HCH	-1.07	2.0	0.9	-1.7	2.0	0.31	-2.5	2.0	-0.54	-3.7	1.9	-1.7	-5.2	1.9	-3.4
γ-HCH	-0.67	1.7	1.0	-1.04	1.7	0.68	-1.6	1.7	0.14	-2.4	1.7	-0.66	-3.5	1.7	-1.8
TC	-0.20	0.15	-0.047	-0.25	0.14	-0.11	-0.30	0.12	-0.18	-0.35	0.10	-0.25	-0.40	0.09	-0.32
CC	-0.15	0.16	0.0038	-0.19	0.14	-0.049	-0.23	0.13	-0.10	-0.28	0.11	-0.16	-0.31	0.10	-0.22
TN	-0.12	0.10	-0.019	-0.15	0.086	-0.066	-0.18	0.071	-0.11	-0.21	0.057	-0.16	-0.24	0.044	-0.20
DIEL	-0.25	0.47	0.22	-0.35	0.46	0.11	-0.49	0.45	-0.035	-0.66	0.44	-0.22	-0.87	0.42	-0.45
ENDO-I	-0.054	0.56	0.50	-0.070	0.56	0.49	-0.088	0.55	0.46	-0.11	0.55	0.44	-0.14	0.54	0.40
ENDO-II	-0.0008	0.013	0.013	-0.0011	0.014	0.013	-0.0013	0.014	0.012	-0.0017	0.014	0.012	-0.0021	0.014	0.012
CPF	-0.0058	0.020	0.014	-0.010	0.020	0.010	-0.015	0.020	0.0046	-0.024	0.020	-0.004	-0.037	0.019	-0.018
DAC	-0.015	0.039	0.024	-0.021	0.039	0.018	-0.031	0.039	0.0083	-0.044	0.040	-0.005	-0.062	0.040	-0.023
DBA	-41	4.4	-36	-45	3.3	-42	-48	2.5	-46	-51	1.8	-49	-53	1.4	-52
TBA	-96	1.5	-94	-98	1.1	-97	-99	0.75	-98	-100	0.53	-100	-101	0.38	-100

a) Assumed conditions: same water and air temperatures, constant air and water concentrations, constant wind speed (5 m s-1).
CW adjusted for DOC binding.
b) Abbreviations in Table 3.
c) V = volatilisation, D = deposition, N = net. Eq. 6-9 in the text.

Table 14. Gas exchange fluxes and loadings of organohalogen groups[a] to Bothnian Bay, present situation.

	Fluxes, ng m^{-2} $year^{-1}$			Loadings, kg y^{-1}		
Compound[a]	**Volatilisation**	**Deposition**	**Net**	**Volatilisation**	**Deposition**	**Net**
HCBz	-281	674	394	-10.7	25.6	15.0
HCHs	-974	883	-90.5	-37.0	33.6	-3.4
CHLs	-166	79.1	-87.4	-6.3	3.0	-3.3
DIEL	-115	109	-5.8	-4.4	4.1	-0.22
ENDOs	-21.0	136	115	-0.80	5.2	4.4
CPF	-3.7	4.8	1.1	-0.14	0.18	0.040
DAC	-7.4	9.4	2.0	-0.28	0.36	0.078
BAs	-35080	862	-34218	-1333	32.8	-1300

a) Abbreviations of individual compounds in Table 3. Compound groups:
HCHs = α- + γ-HCHs, CHLs = TC + CC + TN, ENDOs = ENDO-I + ENDO-II

Table 15. Gas exchange fluxes and loadings of organohalogen groups[a] to Bothnian Bay, future scenario.

	Fluxes, ng m^{-2} $year^{-1}$			Loadings, kg y^{-1}		
Compoun	**Volatilisation**	**Deposition**	**Net**	**Volatilisation**	**Deposition**	**Net**
HCBz	-417	1071	654	-15.8	40.7	24.9
HCHs	-1454	1323	-131.5	-55.3	50.3	-5.0
CHLs	-244	120.5	-123.6	-9.3	4.6	-4.7
DIEL	-169	163	-6.1	-6.4	6.2	-0.23
ENDOs	-31.0	203	172	-1.18	7.7	6.5
CPF	-5.6	7.2	1.6	-0.21	0.27	0.059
DAC	-11.0	14.1	3.1	-0.42	0.54	0.119
BAs	-52308	1366	-50941	-1988	51.9	-1936

	Absolute percent change from present situation[b]					
	Fluxes, ng m^{-2} $year^{-1}$			Loadings, kg y^{-1}		
Compoun	**Volatilisation**	**Deposition**	**Net**	**Volatilisation**	**Deposition**	**Net**
HCBz	48.5	58.8	66.2	48.5	58.8	66.2
HCHs	49.3	49.7	45.3	49.3	49.7	45.3
CHLs	46.6	52.4	41.4	46.6	52.4	41.4
DIEL	47.7	49.9	5.6	47.7	49.9	5.6
ENDOs	47.6	49.9	50.3	47.6	49.9	50.3
CPF	50.6	49.6	46.3	50.6	49.6	46.3
DAC	49.0	49.7	52.4	49.0	49.7	52.4
BAs	49.1	58.5	48.9	49.1	58.5	48.9

a) Abbreviations of individual compounds in Table 3. Compound groups:
HCHs = α- + γ-HCHs, CHLs = TC + CC + TN, ENDOs = ENDO-I + ENDO-II
b) $abs(N_{future} - N_{present})*100/abs(N_{present})$.

Table 16. Bulk deposition fluxes and total loadings to Bothnian Bay.

	Bulk deposition[a], ng m^{-2} $month^{-1}$						
Compound[b]	**Krycklan 2009-10 (2,3)**	**Abisko 2009-10 (2,3)**	**Råö 2011 (5)**	**Råö 2005 (4)**	**Pallas 2011 (5)**	**Pallas 2005 (4)**	**Geom. Mean 2009-11**
α-HCH	1.9	21.7	2.2	5.8	0.89	2.0	3.0
γ-HCH	11.7	108	7.5	16.1	1.3	2.4	10.5
TC	0.30	0.62	0.56	0.24	0.20	0.15	0.38
CC	0.25	0.72	0.77	0.33	0.23	0.28	0.42
TN	0.32	0.23	0.23	0.22	0.18	0.13	0.23
ENDO-I			4.6		4.9		4.7
ENDO-II			2.6		2.1		2.3
ENDO SUL			4.0		6.4		5.1

	Total loadings to Bothnian Bay, kg y^{-1}						
	Gas deposition BB[c]	**Gas volatilisation BB[c]**	**Bulk deposition BB[d]**	**Bulk deposition WS[e]**	**Total deposition BB**	**Total deposition WS**	
HCHs	33.6	-37.0	6.2	45.6	39.8	45.6	
CHLs	3.0	-6.3	0.47	3.5	3.5	3.5	
ENDOs	5.2	-0.80	5.5	40.9	10.7	40.9	

a) Precipitation + dry particle deposition.
b) Abbreviations in Table 3.
c) Present situation, Table 14.
d) Based on geometric mean fluxes for 2009-2011,
e) Bulk deposition to the Bothnian Bay watershed (catchment), 280 700 km^2.