Supplementary Information

TIME TRENDS OF POLYBROMINATED DIPHENYL ETHERS (PBDES) IN ANTARCTIC BIOTA

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Additional details on sampling and analysis

Plankton Sampling: Ring net tows that were predominantly 0.5 m in diameter with an 80 µm mesh ring net (Antarctic Peninsula) or 30 µm mesh ring net outside of the Peninsula Region , after which contents were further sieved through a 25 µm mesh sieve. Occasionally some variability in the ring nets used due to equipment restrictions (various mesh sizes ranging from 80 – 450 µm), but all samples were collected from the surface mixed layer (~30 m).

Krill sampling: At some sites, numerous krill were collected and provided enough biomass for "replicates" to be performed. In this case the replicates consisted of different individual krill from the same sample collection and were averaged and presented as one sample (SI Table S2 where * indicates multiple samples).

Seal milk extractions: The following day, each sample was vortexed for 1 minute, followed by extraction three times in an ultrasonic bath with 20mL each of n-hexane/acetone (2:1) for 5 minutes. After each extraction, the organic layer was separated by centrifugation at 4000 rpm for 5 minutes. Combined extracts were evaporated, solvent exchanged to n-hexane, and brought to a final volume of 5mL. 200µL (from the 5mL) was taken for determination of percent lipid. Extracts were treated with sulfuric acid (concentrated) in an ice bath to denaturate lipids, partitioned on water (to remove excess acid), evaporated to 1mL, and cleaned on SPE cartridges (6 cc) filled with 2 g silica and topped with 1 g acidic silica (40%). PBDEs were eluted with 50mL n-hexane/DCM (60:40). To determine percent lipid, the 200 µL aliquot to pre-weighed aluminum boats and left to dry overnight. The boats were re-weighed, with the difference in weights representing % lipid in the 200 µL, which was then extrapolated to % lipid in the 5 mL sample.

PBDE Analysis at URI-GSO: Injection port, GC/MS/MS interface, and ion trap temperatures were set to 260°C, 280°C, and 220°C respectively. The temperature program began at 140°C, held for 2 min, ramped at 10°C min^{-1} to 180°C, 3°C min^{-1} to 220°C, 10°C min^{-1} to 310°C and held for 5 min. Quantification ions were adapted from a Waters® method produced by Worrall et al. (2004) [9]. A calibration standard curve was created for each congener with concentrations ranging from 0.005 ng/µL – 0.500 ng/µL [9]. Peak areas were measured, response factors calculated, and concentrations determined via surrogate and injection standards using a MassLynx/QuanLynx software package. Hexane was run every 5 samples and instrument drift was monitored with QC check standards every 10 samples (0.005 ng/µL and 0.05 ng/µL).

Analysis of BDE 209: Quantification of PBDE-209 was performed using an Agilent 6890N GC and a 5973N MS with instrument and column conditions similar to those described in LaGuardia et al., (2006).[31] Briefly, an Agilent DB-5HT 15 m high temperature, thin-film (0.25 mm id, 0.1 mm, 0.1 um) column was used to minimize thermal degradation of PBDE 209. The MS was operated in electron capture negative ionization and select ion monitoring mode with ions 484-486 and 494-496 monitored for PBDE-209 and ^{13C}-PBDE-209, respectively. Methane was used as reaction gas and the ion source, quadrupole and transfer line temperatures were kept at 150 °C, 150 °C and 300 °C, respectively.

Table S1 - Fur Seal sample information for the breeding season 2000/01. "ND" indicates no data. For all of the attached fur seal ample info tables, the sampling location is the same at Cape Shirreff, Livingston Island (aprx. 62°28'S, 60°46'W).

Seal ID	Breeding Season	Date	% Lipid	$\delta^{13}C$	$\delta^{15}N$	Breed	Age
203	2000/2001	8-Dec-00	75.0	-21.9	11.1	Perinatal	8
208	2000/2001	10-Dec-00	69.0	-23.5	9.8	Perinatal	8
199	2000/2001	7-Dec-00	73.4	-21.9	11.0	Perinatal	14
190	2000/2001	5-Dec-00	60.2	-22.5	10.6	Perinatal	12
201	2000/2001	8-Dec-00	82.4	-21.6	10.6	Perinatal	15
207	2000/2001	10-Dec-00	61.3	-21.2	11.9	Perinatal	7
196	2000/2001	7-Dec-00	64.8	-22.1	10.8	Perinatal	9
211	2000/2001	11-Dec-00	66.4	-21.5	11.1	Perinatal	16
205	2000/2001	8-Dec-00	56.4	-23.1	9.6	Perinatal	10
206	2000/2001	10-Dec-00	66.9	-22.1	10.1	Perinatal	14
197	2000/2001	7-Dec-00	66.9	-22.6	10.7	Perinatal	11
216	2000/2001	12-Dec-00	63.1	-22.0	10.6	Perinatal	11
214	2000/2001	12-Dec-00	58.7	-22.9	10.1	Perinatal	7
195	2000/2001	7-Dec-00	65.4	-22.3	10.1	Perinatal	13
215	2000/2001	12-Dec-00	62.0	-22.0	10.5	Perinatal	13
192	2000/2001	6-Dec-00	60.9	-21.2	12.0	Perinatal	7
204	2000/2001	8-Dec-00	67.2	-22.6	10.0	Perinatal	9
188	2000/2001	5-Dec-00	73.1	-21.6	10.9	Perinatal	9
202	2000/2001	8-Dec-00	69.6	-22.3	11.4	Perinatal	16
200	2000/2001	8-Dec-00	74.3	-22.4	10.7	Perinatal	ND
213	2000/2001	12-Dec-00	74.6	-21.5	10.9	Perinatal	9

Table S2 - Fur Seal sample information for the breeding season 2001/02.

Seal ID	Breeding Season	Date	% Lipid	$\delta^{13}C$	$\delta^{15}N$	Breed	Age
253	2001/2002	11-Dec-01	64.5	-21.5	11.8	Perinatal	10
239	2001/2002	6-Dec-01	67.1	-23.0	11.0	Perinatal	11
233	2001/2002	5-Dec-01	75.0	-22.1	11.3	Perinatal	10
257	2001/2002	15-Dec-01	57.9	-22.0	10.3	Perinatal	13
236	2001/2002	6-Dec-01	69.7	-22.1	11.6	Perinatal	9
245	2001/2002	7-Dec-01	70.2	-23.1	10.8	Perinatal	15
250	2001/2002	9-Dec-01	75.3	-21.3	11.2	Perinatal	8

Table S3 - Fur Seal sample information for the breeding season 2004/05. "ND" indicates no data.

Seal ID	Breeding Season	Date	% Lipid	$\delta^{13}C$	$\delta^{15}N$	Breed	Age
353	2004/2005	5-Dec-04	72.1	-22.8	10.3	Perinatal	14
364	2004/2005	11-Dec-04	70.8	-20.6	10.9	Perinatal	8
367	2004/2005	11-Dec-04	65.7	-23.1	11.2	Perinatal	9
373	2004/2005	12-Dec-04	66.6			Perinatal	17
369	2004/2005	12-Dec-04	69.2	-23.7	8.9	Perinatal	11
362	2004/2005	7-Dec-04	70.5	-22.7	11.3	Perinatal	ND
361	2004/2005	7-Dec-04	73.3	-22.1	10.5	Perinatal	13
358	2004/2005	7-Dec-04	70.3	-22.5	10.7	Perinatal	ND
355	2004/2005	5-Dec-04	71.1	-22.6	10.9	Perinatal	13
350	2004/2005	4-Dec-04	82.4	-22.2	11.3	Perinatal	12
372	2004/2005	12-Dec-04	69.9	-22.2	10.7	Perinatal	18
373	2004/2005	16-Dec-04	58.8			Perinatal	17

Table S4 - Fur Seal sample information for the breeding season 2009/10. "ND" indicates no data.

Seal ID	Breeding Season	Date	% Lipid	$\delta^{13}C$	$\delta^{15}N$	Breed	Age
342	2009/2010	2-Dec-09	59.2	-23.7	9.0	Perinatal	14
184	2009/2010	5-Dec-09	65.8	-21.4	9.8	Perinatal	17
255	2009/2010	4-Dec-09	59.0	-21.6	11.0	Perinatal	13
435	2009/2010	13-Dec-09	65.3	-22.4	10.3	Perinatal	13
447	2009/2010	7-Dec-09	74.4	-21.4	10.1	Perinatal	13
416	2009/2010	14-Dec-09	64.7	-22.0	11.2	Perinatal	9
455	2009/2010	14-Dec-09	66.7	-21.5	10.0	Perinatal	14
428	2009/2010	4-Dec-09	71.8	-20.8	11.1	Perinatal	12
392	2009/2010	4-Dec-09	60.7	-21.5	9.7	Perinatal	13

Table S5 – Fur Seal sample information for the breeding season 2010/11.

Seal ID	Breeding Season	Date	% Lipid	$\delta^{13}C$	$\delta^{15}N$	Breed	Age
184	2010/2011	4-Dec-10	54.4	-21.2	10.4	Perinatal	17
341	2010/2011	10-Dec-10	83.1	-21.8	11.8	Perinatal	16
367	2010/2011	1-Dec-10	72.7	-22.8	10.8	Perinatal	14
479	2010/2011	4-Dec-10	73.3	-22.0	11.4	Perinatal	13
491	2010/2011	14-Dec-10	79.8	-19.6	13.8	Perinatal	ND
482	2010/2011	7-Dec-10	70.5	-22.9	11.9	Perinatal	19
461	2010/2011	29-Nov-10	78.4	-23.5	9.9	Perinatal	15
389	2010/2011	7-Dec-10	68.2	-22.9	11.5	Perinatal	9
473	2010/2011	3-Dec-10	74.6	-23.6	9.9	Perinatal	ND
460	2010/2011	27-Nov-10	66.5	-23.6	9.2	Perinatal	10

Table S6 - Fur Seal sample information for the breeding season 2011/12. "ND" indicates no data.

Seal ID	Breeding Season	Date	% Lipid	$\delta^{13}C$	$\delta^{15}N$	Breed	Age
461	2011/2012	28-Nov-11	63.4	-	-	perinatal	16
460	2011/2012	29-Nov-11	64.6	-	-	perinatal	11
468	2011/2012	2-Dec-11	53.8	-	-	perinatal	10
441	2011/2012	3-Dec-11	65.9	-	-	perinatal	14
408	2011/2012	4-Dec-11	64.6	-	-	perinatal	14
477	2011/2012	5-Dec-11	61.5	-	-	perinatal	14
479	2011/2012	4-Dec-11	67.4	-	-	perinatal	9
470	2011/2012	5-Dec-11	68.2	-	-	perinatal	13
476	2011/2012	5-Dec-11	65.9	-	-	perinatal	12
AO5	2011/2012	6-Dec-11	63.0	-	-	perinatal	11
496	2011/2012	7-Dec-11	58.9	-	-	perinatal	10
267	2011/2012	8-Dec-11	66.5	-	-	perinatal	10
453	2011/2012	8-Dec-11	68.1	-	-	perinatal	14
435	2011/2012	10-Dec-11	55.0	-	-	perinatal	14
AO9	2011/2012	13-Dec-11	62.3	-	-	perinatal	5
472	2011/2012	3-Jan-12	70.3	-	-	non-perinatal	ND
495	2011/2012	3-Jan-12	60.4	-	-	non-perinatal	14
479	2011/2012	11-Jan-12	60.6	-	-	non-perinatal	14
461	2011/2012	14-Jan-12	59.8	-	-	non-perinatal	16
AO5	2011/2012	15-Jan-12	62.2	-	-	non-perinatal	11
460	2011/2012	16-Jan-12	62.2	-	-	non-perinatal	11
476	2011/2012	20-Jan-12	64.4	-	-	non-perinatal	12
496	2011/2012	21-Jan-12	66.5	-	-	non-perinatal	10
AO9	2011/2012	23-Jan-12	64.7	-	-	non-perinatal	5
477	2011/2012	24-Jan-12	59.0	-	-	non-perinatal	14
470	2011/2012	26-Jan-12	61.5	-	-	non-perinatal	13

Table S7 - Fur Seal sample information for the breeding season 2012/13. "ND" indicates no data.

Seal ID	Breeding Season	Date	% Lipid	$\delta^{13}C$	$\delta^{15}N$	Breed	Age
227	2012/2013	28-Nov-12	55.8	-	-	Perinatal	15
A03	2012/2013	29-Nov-12	50.0	-	-	Perinatal	11
460	2012/2013	29-Nov-12	65.3	-	-	Perinatal	12
486	2012/2013	1-Dec-12	67.0	-	-	Perinatal	11
A05	2012/2013	1-Dec-12	51.7	-	-	Perinatal	12
479	2012/2013	2-Dec-12	57.1	-	-	Perinatal	15
2975	2012/2013	3-Dec-12	60.7	-	-	Perinatal	11
470	2012/2013	3-Dec-12	52.0	-	-	Perinatal	14
477	2012/2013	3-Dec-12	58.0	-	-	Perinatal	15
381	2012/2013	4-Dec-12	64.4	-	-	Perinatal	19
359	2012/2013	4-Dec-12	62.4	-	-	Perinatal	14
474	2012/2013	14-Dec-12	60.7	-	-	Perinatal	15
423	2012/2013	4-Dec-12	57.9	-	-	Perinatal	17
423	2012/2013	4-Dec-12	53.0	-	-	Perinatal	17
267	2012/2013	6-Dec-12	61.3	-	-	Perinatal	15
452	2012/2013	6-Dec-12	57.6	-	-	Perinatal	20
A01	2012/2013	6-Dec-12	60.5	-	-	Perinatal	12
408	2012/2013	8-Dec-12	59.7	-	-	Perinatal	10
386	2012/2013	8-Dec-12	63.9	-	-	Perinatal	13
475	2012/2013	8-Dec-12	60.5	-	-	Perinatal	7
416	2012/2013	10-Dec-12	63.7	-	-	Perinatal	11
416	2012/2013	10-Dec-12		-	-	Perinatal	11
455	2012/2013	10-Dec-12	68.2	-	-	Perinatal	16
488	2012/2013	10-Dec-12	61.4	-	-	Perinatal	13
A09	2012/2013	11-Dec-12	58.9	-	-	Perinatal	6
482	2012/2013	11-Dec-12	59.7	-	-	Perinatal	21
400	2012/2013	16-Dec-12	61.4	-	-	Perinatal	19
A06	2012/2013	17-Dec-12	50.9	-	-	Perinatal	14

492	2012/2013	26-Dec-12	48.0	-	-	Non-Perinatal	19
478	2012/2013	29-Dec-12	52.0	-	-	Non-Perinatal	9
495	2012/2013	30-Dec-12	52.5	-	-	Non-Perinatal	15
6093	2012/2013	30-Dec-12	67.0	-	-	Non-Perinatal	4
441	2012/2013	31-Dec-12	44.0	-	-	Non-perinatal	15
472	2012/2013	2-Jan-13	68.9	-	-	Non-Perinatal	ND
435	2012/2013	5-Jan-13	59.0	-	-	Non-Perinatal	15
476	2012/2013	7-Jan-13	74.0	-	-	Non-perinatal	13
461	2012/2013	24-Jan-13	56.0	-	-	Non-perinatal	16
486	2012/2013	25-Feb-13	84.0	-	-	Non-perinatal	12

Table S8 - Fur Seal sample information for the breeding season 2013/14

Seal ID	Breeding Season	Date	% Lipid	$\delta^{13}C$	$\delta^{15}N$	Breed	Age
467	2012/2014	1-Dec-13	50	-	-	Non-perinatal	15
227	2013/2014	24-Feb-14	14	-	-	Non-perinatal	16
476	2013/2014	24-Feb-14	62	-	-	Non-perinatal	14
AO1	2013/2014	25-Feb-14	70	-	-	Non-perinatal	16
AO6	2013/2014	26-Feb-14	82	-	-	Non-perinatal	15
460	2013/2014	26-Feb-14	77	-	-	Non-perinatal	13

Table S9 – Sample information for plankton.

Sample ID	Dominant Phytoplankton Species	Latitude	Longitude	Year	Date	Percent Lipid	$\delta^{13}C$ Avg	± StDev	$\delta^{15}N$ Avg	± StDev	General Area
PH 1	Likely phaeocystis	-77.98	-176.80	2007	Dec. 30	0.73	-28.9	0.14	-1.1	0.18	Ross Sea
PH 2	Likely phaeocystis	-74.18	-112.70	2007	Dec. 16	0.71	-30.4	0.13	0.2	0.24	Amundsen Sea
PH 3	Likely phaeocystis	-74.18	-112.70	2007	Dec. 16	1.05	-29.8	0.19	1.5	0.06	Amundsen Sea
PH 4	Likely phaeocystis	-73.57	-115.50	2007	Dec. 19	0.6	-31.7	0.11	1.0	0.56	Amundsen Sea
PH 5*	Likely phaeocystis	-77.08	-170.50	2008	Jan. 1	2.5	-24.6	0.23	3.3	0.61	Ross Sea
PH 6*	Likely phaeocystis	-77.98	-176.80	2007	Dec. 30	2.68	-24.6	0.38	3.2	0.80	Ross Sea
PH 7	Likely phaeocystis	-77.38	-171.30	2007	Dec. 31	1.19	-31.1	0.46	0.1	0.24	Ross Sea
PH 8	Likely phaeocystis	-77.38	-171.30	2007	Dec. 31	0.53	-32.7	0.18	-0.1	1.40	Ross Sea
PH 9	Likely phaeocystis	-77.98	-176.80	2007	Dec. 30	0.73	-28.9	0.30	-0.1	0.38	Ross Sea
PH 10	Likely phaeocystis	-73.97	-107.50	2007	Dec. 14	1.28	-32.0	0.03	0.9	0.31	Amundsen Sea Polynya
PH 11	Likely phaeocystis	-77.38	-171.30	2007	Dec. 31	1.27					Ross Sea
PH 13	Likely phaeocystis	-77.85	-178.70	2007	Dec. 30	0.982	-31.0	0.70	0.2	1.25	Ross Sea
PH 15	Likely phaeocystis	-73.57	-115.50	2007	Dec. 19	0.721	-31.8	0.07	-0.5	0.02	Amundsen Sea
PH 16	Diatoms	-69.53	-75.52	2010	Jan. 28	1.699	-27.1	0.39	1.8	0.17	Antarctic Peninsula
PH 17*	Diatoms	-66.89	-68.92	2010	Jan. 13	1.852	-33.0	0.37	2.7	0.34	Antarctic Peninsula
PH 19	Likely phaeocystis	-77.02	-170.50	2008	Jan. 2	0.459	-30.6	1.48	0.4	0.53	Ross Sea
PH 20	Diatoms	-68.97	-73.56	2010	Jan. 21	4.652	-30.5	0.41	1.1	0.44	Antarctic Peninsula
PH 21	Diatoms	-68.97	-73.56	2010	Jan. 21	4.652					Antarctic Peninsula
PH 23*	Phaeocystis	-69.46	-102.10	2010	Dec. 23	2.45	-27.5	0.18	2.1	0.12	Southern Bellingshausen Sea
PH 27	Phaeocystis	-72.96	-117.00	2010	Dec. 26	1.56	-27.8	1.38	1.6	0.25	Amundsen Sea
PH 24	Phaeocystis	-75.42	-149.00	2011	Jan. 5	1.24	-29.8	0.21	2.0	0.33	Southern Amundsen Sea
PH 26	Diatoms	-64.82	-64.04	2011	Mar. 5	2.01	-30.4	0.25	1.9	0.34	Antarctic Peninsula
PH 26b	Diatoms	-64.82	-64.04	2011	Mar. 5	2.53					Antarctic Peninsula
PH 28	Phaeocystis	-75.40	-149.00	2011	Jan. 5	0.93	-31.7	0.31	1.6	0.35	Southern Amundsen Sea
PH 29	Phaeocystis	-78.64	-164.30	2011	Jan. 8	0.66	-30.0	1.46	0.9	0.71	Ross Sea
PH 31*	Diatoms	-64.78	-64.07	2011	Mar. 7	3.04	-27.0	0.15	2.8	0.34	Antarctic Peninsula
PH 32*	Diatoms	-68.28	-75.12	2011	Feb. 1	1.89	-19.5	0.25	4.3	0.14	Antarctic Peninsula
PH 33*	Phaeocystis	-78.64	-164.30	2011	Jan. 1	6.72	-28.7	0.20	3.2	0.50	Ross Sea
PH 34*	Diatoms	-67.84	-69.78	2011	Jan. 18	2.85	-18.5	0.26	6.1	0.10	Antarctic Peninsula
PH 35*	Diatoms	-64.79	-64.07	2011	Mar. 1	3.7	-32.0	0.31	2.5	0.28	Antarctic Peninsula
PH 35b*	Diatoms	-64.79	-64.07	2011	Mar. 1	3.7	-32.0	0.31	2.5	0.28	Antarctic Peninsula
PH 36*	Diatoms	-64.79	-64.07	2011	Mar. 7	3.61	-28.3	0.19	2.2	0.28	Antarctic Peninsula

Table S10 – Sample information for krill.

Sample ID	Species	Size Class	Latitude	Longitude	Year	Date	Avg % Lipid	δ15N	δ13C	Avg Number of Krill per Sample
Kr1*	E. superba	Gravid	-66.991	-69.280	2007/08	Jan	28.4			22
Kr2	E. superba	Mature Females	-66.991	-69.280	2007/08	Jan	24.54			27
Kr3*	E. superba	Gravid	-66.991	-69.280	2007/08	Jan	30.2			18
KR4	E. superba	Mature Females	-66.991	-69.280	2007/08	Jan	23.46			24
Kr5*	E. superba	Gravid	-66.991	-69.280	2007/08	Jan	29.9			22
Kr6	E. superba	Mature Females	-66.991	-69.280	2007/08	Jan	26.17			19
Kr7	E. superba	Juveniles	-66.991	-69.280	2007/08	Jan	17.62			120
Kr9*	E. superba	Gravid	-66.991	-69.280	2007/08	Jan	26.2	5.04	-22.57	21
Kr10	E. superba	Mature females	-66.991	-69.280	2007/08	Jan	22.31	5.34	-22.64	26
Kr11*	E. superba	Gravid	-66.991	-69.280	2007/08	Jan	27.6	4.55	-22.10	41
Kr12	E. superba	Mature females	-66.991	-69.280	2007/08	Jan	19.85	4.75	-22.90	38
Kr13	E. superba	Juveniles	-64.895	-64.181	2007/08	Jan. 13	20.97			182
Kr14*	E. superba	Adult	-66.991	-69.280	2007/08	Jan	25.4	4.83	-24.80	40
Kr15*	E. superba	Adult	-64.895	-64.181	2007/08	Jan	25.7	3.48	-26.91	107
Kr16*	Thysan	Thysan	-64.895	-64.181	2007/08	Jan	13.7			
Kr17*	E. superba	Adult	-64.929	-64.251	2007/08	Jan	25.2	3.81	-27.60	86
Kr18*	E. superba	Juveniles	-68.030	-69.285	2007/08	Jan. 2008	19.5			272
Kr19*	E. superba	Adult	-64.929	-64.251	2007/08	Jan	24.6	3.41	-27.21	177
Kr20	Thysan	Thysan	-64.929	-64.251	2007/08	Jan	15.45			
Kr21	E. superba	Juveniles	-64.929	-64.251	2007/08	Jan	18.01	3.54	-27.55	216
Kr22*	E. superba	Adult	-68.030	-69.285	2007/08	Jan	24.8	4.06	-25.96	77
Kr23	E. superba	Juveniles	-66.991	-69.280	2007/08	Jan	16.79	4.03	-25.22	252
Kr24*	E. superba	Adults	-66.991	-69.280	2007/08	Jan	24.3	5.06	-24.32	59
Kr25*	E. superba	Adult	-64.929	-64.251	2007/08	Jan. 13	18.0	3.51	-27.14	89
Kr26*	E. superba	Adult	-67.379	-70.907	2007/08	Jan	25.8	3.16	-26.54	62
Kr27*	E. superba	Adults	-66.991	-69.280	2007/08	Jan	26.6	5.26	-23.41	59
Kr28*	E. superba	Adults	-64.929	-64.251	2007/08	Jan. 13	19.8	3.27	-27.20	118
Kr29*	E. superba	Juveniles	-67.379	-70.907	2007/08	Jan	20.0	2.92	-26.46	316
Kr30*	E. superba	Juveniles	-67.379	-70.907	2007/08	Jan	18.1	2.54	-26.47	308
Kr31a_Gravid	E. superba	Gravid	-69.102	-76.447	2011	Jan. 27	25.72	3.32	-22.73	11
Kr31c_Adults	E. superba	Adults	-69.102	-76.447	2011	Jan. 27	25.79	4.17	-22.84	41
Kr32*	E. superba	Juveniles	-69.527	-75.516	2011	Jan. 30	32.6	6.50	-18.28	107
Kr33a_Juvis*	E. superba	Juveniles	-64.933	-64.400	2011	Jan. 10	25.1	4.54	-22.53	205
Kr33c_Adults	E. superba	Adults	-64.933	-64.400	2011	Jan. 10	25.92	4.16	-23.55	26
Kr34a_Adults*	E. superba	Adults	-61.936	-73.783	2011	Jan. 9	21.0	4.27	-24.93	38
Kr34b_Gravid	E. superba	Gravid	-61.936	-73.783	2011	Jan. 9	26.84	3.39	-25.14	16

Table S11 – Sample Information for fish.

Sample ID	Species	Latitude (°)	Longitude (°)	Date	Weight (g)	Lipids (%)	Individuals per sample	$\delta^{13}C$ (‰)	$\delta^{15}N$ (‰)
FI 1	Myctophid	-67.6	-70.1	2010/2011	2.1	48.09	3	-23.6	9.8
FI 2	Myctophid	-64.9	-64.4	2010/2011	1.6	49.64	2	-24.0	9.2
FI 3	Myctophid	-67.5	-70.6	2010/2011	2.7	51.94	3	-23.3	9.8
FI 4	Antarctic silverfish	-67.8	-69.1	2010/2011	0.63	21.65	2	-21.5	11.0
FI 5	Antarctic silverfish	-67.8	69.1	2010/2011	0.40	31.43	2	-21.4	10.7

Table S12 - Blank concentrations for all PBDE samples. All blanks consisted of a hydro matrix material and the average of all blanks was subtracted from all samples.

Concentration (ng/sample)	BDE-2	BDE-8	BDE-15	BDE-30	BDE-28	BDE-49	BDE-47	BDE-100	BDE-99	BDE-154	BDE-153	BDE-183
Kr8_Blank	ND	ND	ND	ND	ND	ND	0.35	0.16	0.19	ND	ND	ND
KrB6	ND	ND	ND	ND	ND	ND	ND	ND	0.60	ND	ND	ND
Kr 20 Blank	ND	ND	ND	ND	ND	ND	0.33	ND	ND	ND	ND	ND
Kr Blank 1	ND	ND	ND	ND	ND	ND	0.14	ND	0.17	ND	ND	ND
Blank 2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Kr Blank 3	ND	ND	ND	ND	ND	ND	0.42	ND	ND	ND	ND	ND
Blank 7	ND	ND	ND	ND	ND	ND	0.70	0.22	0.33	ND	ND	ND
Blank 8	ND	ND	ND	ND	ND	ND	0.31	ND	0.65	0.16	0.14	ND
Blank 11	ND	ND	ND	ND	ND	ND	0.35	ND	0.41	ND	ND	ND
B9	ND	ND	ND	ND	ND	ND	ND	ND	0.50	0.16	ND	ND
B10	ND	ND	ND	ND	ND	ND	0.14	ND	ND	ND	ND	ND
B12	ND	ND	ND	ND	ND	ND	0.25	ND	ND	ND	ND	ND
Mix9501	ND	ND	ND	ND	ND	ND	ND	ND	0.20	ND	ND	ND
002-95-01	ND	ND	ND	ND	ND	ND	0.17	ND	ND	ND	ND	ND
Blank 13	ND	ND	ND	ND	ND	ND	ND	ND	0.22	ND	ND	ND
002-70-03RRF	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Blank 4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PH B5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average							0.18	0.02	0.18	0.02	0.01	
StDev							0.20	0.06	0.23	0.05	0.03	

ND: not detected

Table S13: Concentrations (ng/g lipids) of PBDEs in the blanks (average $\pm$ StDev), instrument detection limits (IDL) and limit of detection (LOD) for the samples analyzed at GSO, URI.

	Blanks (ng/g lipids)[a] (n = 8)	IDL (pg/µl)	LOD (ng/g lipids)[b]
BDE-2	0.003 $\pm$ 0.003	0.54	0.011
BDE-8	0.005 $\pm$ 0.003	0.85	0.014
BDE-15	0.004 $\pm$ 0.003	0.93	0.011
BDE-30	0.004 $\pm$ 0.003	0.72	0.012
BDE-28	0.024 $\pm$ 0.004	0.41	0.036
BDE-49	0.005 $\pm$ 0.004	0.84	0.016
BDE-47	0.097 $\pm$ 0.006	0.67	0.114
BDE-100	0.013 $\pm$ 0.001	0.78	0.017
BDE-99	0.088 $\pm$ 0.023	0.86	0.157
BDE-154	0.014 $\pm$ 0.005	0.62	0.029
BDE-153	0.010 $\pm$ 0.002	0.71	0.017
BDE-183	0.019 $\pm$ 0.007	0.97	0.040

a: calculated based on average lipid content of all the samples; b: calculated as average blank concentrations + 3 times StDev.

Table S14: % recoveries of PBDEs in the matrix and blank spikes.

	Matrix spikes (2 ng; n = 5)	**Matrix spikes (5 ng; n = 5)**	**Blank spikes (2 ng; n = 3)**
BDE-2	92±2.4	94± 3.0	93±2.0
BDE-8	94±1.8	98± 1.0	97± 1.0
BDE-15	97±2.1	100± 1.0	99± 3.0
BDE-30	98±1.0	97± 2.0	98± 2.0
BDE-28	99±1.5	99± 3.0	100± 3.0
BDE-49	97±2.1	100± 2.0	99± 2.0
BDE-47	102±2.4	98± 3.0	102± 1.0
BDE-100	99±3.0	100± 2.0	100± 2.0
BDE-99	100±2.4	98± 2.0	98± 1.0
BDE-154	99±1.3	98± 2.0	99± 2.0
BDE-153	97±2.5	100± 3.0	98± 2.0
BDE-183	95±1.2	98± 3.0	97± 3.0

Table S15 – PBDE concentrations in fur seal milk for the breeding season 2000/2001.

BDEs-2, -8, -15, -30 and BDE 183 were not detected and are thus not presented. Concentrations are in ng/g lipid and the values below have a recovery correction factor of 77.86% (average Recovery for PCBs) applied to account for any potential losses.

Sample ID	**BDE-28**	**BDE-49**	**BDE-47**	**BDE-100**	**BDE-99**	**BDE-154**	**BDE-153**	**$\sum_7$PBDEs**
203	<LOD	0.18	0.36	0.18	0.23	<LOD	<LOD	0.95
208	<LOD	0.25	0.69	<LOD	0.69	<LOD	<LOD	1.63
199	<LOD	<LOD	0.41	0.08	0.22	0.13	<LOD	0.84
190	<LOD	0.12	0.41	<LOD	0.36	0.10	<LOD	0.99
201	<LOD	0.32	0.37	<LOD	0.17	<LOD	<LOD	0.86
207	<LOD	<LOD	0.29	<LOD	0.25	<LOD	<LOD	0.54
196	0.3	<LOD	0.95	0.24	0.81	<LOD	<LOD	2.26
211	0.1	0.18	0.86	0.19	0.54	0.20	0.18	2.27
205	<LOD	<LOD	0.48	<LOD	0.25	<LOD	<LOD	0.73
206	<LOD	<LOD	0.41	0.12	0.36	<LOD	<LOD	0.90
197	<LOD	<LOD	0.50	0.25	0.49	<LOD	0.34	1.58
216	<LOD	0.13	0.17	<LOD	<LOD	<LOD	<LOD	0.30
214	0.2	0.26	0.64	0.21	0.42	<LOD	<LOD	1.72
195	<LOD	<LOD	0.43	0.24	0.53	<LOD	<LOD	1.20
215	<LOD	0.35	0.41	<LOD	0.21	<LOD	<LOD	0.97
192	<LOD	0.24	0.45	<LOD	0.25	<LOD	<LOD	0.95
204	<LOD	<LOD	0.11	<LOD	<LOD	<LOD	<LOD	0.11
188	<LOD	<LOD	0.39	<LOD	0.29	<LOD	<LOD	0.68
202	<LOD	0.25	0.22	<LOD	0.03	<LOD	<LOD	0.49
213	<LOD	<LOD	0.50	<LOD	<LOD	<LOD	<LOD	0.50
200	<LOD	<LOD	0.32	0.15	0.21	<LOD	<LOD	0.68
Average	**0.043**	**0.11**	**0.45**	**0.084**	**0.31**	**0.032**	**0.032**	**1.00**
Median	<LOD	<LOD	0.41	<LOD	0.25	<LOD	<LOD	0.93
St dev	0.071	0.12	0.20	0.094	0.20	0.048	0.078	0.57
St error	0.015	0.026	0.042	0.020	0.043	0.010	0.017	0.12
% detect	18	50	100	45	82	18	14	100

<LOD: below the limit of detection

Table S16– PBDE concentrations in fur seal milk for the breeding season 2001/2002.

BDEs-2, -8, -15, -30 and BDE-183 were not detected and are thus not presented. Concentrations are in ng/g lipid and the values below have a recovery correction factor of 77.86% (average Recovery for PCBs) applied to account for any potential losses.

Sample ID	**BDE-28**	**BDE-49**	**BDE-47**	**BDE-100**	**BDE-99**	**BDE-154**	**BDE-153**	**$\sum_7$PBDEs**
253	<LOD	<LOD	0.19	<LOD	<LOD	<LOD	<LOD	0.19
239	<LOD	<LOD	0.47	<LOD	0.23	<LOD	<LOD	0.70
233	<LOD	<LOD	0.24	<LOD	0.17	<LOD	<LOD	0.42
257	<LOD	0.46	0.51	<LOD	0.23	<LOD	<LOD	1.19
236	<LOD	<LOD	0.17	<LOD	<LOD	<LOD	<LOD	0.17
245	<LOD	<LOD	0.74	<LOD	0.30	<LOD	<LOD	1.04
250	<LOD	<LOD	0.59	<LOD	0.50	<LOD	<LOD	1.09
Average	**<LOD**	**0.073**	**0.42**	**<LOD**	**0.23**	**<LOD**	**<LOD**	**0.69**
Median	<LOD	<LOD	0.47	<LOD	0.23	<LOD	<LOD	0.70
St dev	<LOD	0.17	0.22	<LOD	0.15	<LOD	<LOD	0.43
St error		0.060	0.078		0.051			0.15
% detect	0	13	88	0	63	0	0	100

<LOD: below the limit of detection

Table S17 – **PBDE concentrations in fur seal milk for the breeding season 2004/2005.**

BDEs-2, -8, -15, -30 and BDE-183 were not detected and are thus not presented. Concentrations are in ng/g lipid and the values below have a recovery correction factor of 77.86% (average Recovery for PCBs) applied to account for any potential losses.

Sample ID	**BDE-28**	**BDE-49**	**BDE-47**	**BDE-100**	**BDE-99**	**BDE-154**	**BDE-153**	**$\sum_7$PBDEs**
353	<LOD	0.27	0.84	0.17	0.59	0.17	<LOD	2.05
364	<LOD	<LOD	0.63	0.20	0.55	<LOD	0.27	1.64
367	<LOD	<LOD	2.20	0.46	2.14	0.28	0.36	5.44
373	<LOD	<LOD	0.64	<LOD	0.24	<LOD	<LOD	0.88
369	0.12	<LOD	0.70	<LOD	0.35	<LOD	<LOD	1.17
362	<LOD	<LOD	0.62	0.14	0.36	<LOD	<LOD	1.13
361	<LOD	<LOD	0.62	0.21	0.31	<LOD	0.17	1.31
358	0.16	0.22	0.58	0.13	0.37	<LOD	0.17	1.64
355	0.13	0.17	0.52	<LOD	0.41	<LOD	0.23	1.45
350	<LOD	<LOD	0.46	0.14	0.25	<LOD	<LOD	0.85
372	0.20	0.19	0.68	0.11	0.38	<LOD	<LOD	1.58
373	0.17	<LOD	0.72	<LOD	0.77	<LOD	<LOD	1.66
Average	**0.076**	**0.076**	**0.77**	**0.13**	**0.56**	**0.050**	**0.11**	**1.73**
Median	<LOD	<LOD	0.635	0.135	0.375	<LOD	<LOD	1.515
St dev	0.074	0.10	0.46	0.13	0.52	0.085	0.13	1.22
St error	0.020	0.029	0.13	0.036	0.14	0.024	0.036	0.34
% detect	38	8	54	62	92	15	38	100

<LOD: below the limit of detection

Table S18 – PBDE concentrations in fur seal milk for the breeding season 2009/2010.

BDEs-2, -8, -15, and -30 were not detected and are thus not presented. Concentrations are in ng/g lipid and the values below have a recovery correction factor of 77.86% (average Recovery for PCBs) applied to account for any potential losses.

Sample ID	**BDE-28**	**BDE-49**	**BDE-47**	**BDE-100**	**BDE-99**	**BDE-154**	**BDE-153**	**$\sum_7$PBDEs**
342	<LOD	<LOD	0.93	0.38	0.61	<LOD	<LOD	1.93
184	<LOD	<LOD	0.65	<LOD	0.10	<LOD	<LOD	1.55
255	0.21	<LOD	0.66	0.29	0.32	<LOD	<LOD	2.07
435	<LOD	<LOD	0.45	<LOD	0.30	<LOD	<LOD	0.75
447	<LOD	<LOD	0.50	<LOD	0.30	<LOD	0.29	1.09
416	0.18	0.18	0.56	0.24	0.21	0.37	0.32	3.14
455	<LOD	<LOD	1.03	0.22	1.20	0.30	0.41	3.16
428	<LOD	<LOD	0.37	<LOD	0.18	<LOD	<LOD	0.74
392	<LOD	<LOD	0.72	<LOD	0.70	<LOD	0.38	1.80
Average	**0.057**	**0.027**	**0.65**	**0.13**	**0.44**	**0.086**	**0.16**	**1.80**
Median	<LOD	<LOD	0.65	<LOD	0.30	<LOD	<LOD	1.80
St dev	0.078	0.057	0.22	0.15	0.35	0.14	0.18	0.90
St error	0.026	0.019	0.072	0.050	0.12	0.047	0.061	0.30
% detect	22	11	78	44	100	22	44	100

<LOD: below the limit of detection

Table S19 – **PBDE concentrations in fur seal milk for the breeding season 2010/2011.**

BDEs-2, -8, -15, and -30 were not detected and are thus not presented. Concentrations are in ng/g lipid and the values below have a recovery correction factor of 77.86% (average Recovery for PCBs) applied to account for any potential losses.

Sample ID	**BDE-28**	**BDE-49**	**BDE-47**	**BDE-100**	**BDE-99**	**BDE-154**	**BDE-153**	**$\sum_7$PBDEs**
184	<LOD	<LOD	0.76	<LOD	0.53	<LOD	<LOD	1.29
341	<LOD	<LOD	0.43	<LOD	<LOD	<LOD	<LOD	0.43
367	<LOD	<LOD	0.22	<LOD	<LOD	<LOD	<LOD	0.22
479	0.09	<LOD	0.47	0.12	0.33	0.11	0.16	1.85
491	0.10	0.19	0.57	0.10	0.34	0.11	0.18	1.76
482	0.13	0.24	0.69	<LOD	0.36	0.13	0.16	2.03
461	0.14	0.22	0.53	0.16	0.28	<LOD	0.15	1.73
389	<LOD	0.21	0.78	0.21	0.45	0.21	0.13	2.26
473	<LOD	<LOD	0.42	0.13	0.23	<LOD	0.26	1.04
460	<LOD	0.36	1.12	0.28	1.11	0.29	0.27	3.43
Average	**0.057**	**0.13**	**0.60**	**0.10**	**0.38**	**0.092**	**0.13**	**1.60**
Median	0.018	0.099	0.550	0.110	0.335	0.062	0.155	1.745
St dev	0.052	0.132	0.251	0.096	0.294	0.097	0.097	0.928
St error	0.016	0.042	0.079	0.030	0.093	0.031	0.031	0.309
% detect	40	30	70	60	80	50	70	100

<LOD: below the limit of detection

Table S20 – PBDE concentrations (ng/g lipid) in fur seal milk for the breeding season 2011/2012.

Sample ID	BDE-28	BDE-49	BDE-47	BDE-100	BDE-99	BDE-154	BDE-153	$\sum_7$PBDEs
461	0.16	0.12	1.45	0.40	0.46	0.42	0.51	3.52
460	0.09	0.08	0.79	0.14	0.20	0.21	0.17	1.68
468	0.15	0.16	1.38	0.26	0.32	0.41	0.34	3.02
441	0.17	0.07	1.70	0.03	0.15	0.21	0.51	2.84
408	0.22	0.40	3.91	0.60	0.80	0.80	0.81	7.54
477	0.27	0.15	2.19	0.13	0.33	0.18	0.45	3.7
479	0.10	0.06	1.01	0.13	0.20	0.17	0.16	1.83
470	0.14	0.14	3.70	0.13	0.54	0.09	0.09	4.83
476	0.10	0.14	6.17	0.28	0.94	0.06	<LOD	7.715
AO5	0.08	0.13	1.28	0.08	0.08	0.06	0.06	1.77
496	0.09	0.13	1.29	0.14	<LOD	0.12	0.10	1.92
267	<LOD	0.14	1.40	0.07	<LOD	0.09	0.07	1.85
453	<LOD	0.12	2.37	0.12	0.28	0.16	0.16	3.24
435	0.11	0.16	2.19	0.12	0.17	0.10	0.08	2.93
AO9	0.05	0.25	2.14	0.12	0.14	0.15	0.07	2.92
472	0.20	0.48	4.94	0.26	0.28	0.37	0.15	6.68
495	0.14	0.25	3.57	0.21	0.26	0.13	0.17	4.73
479	0.06	0.39	3.51	0.22	0.36	0.31	0.14	4.99
461	0.10	0.12	1.36	0.12	0.24	0.13	0.09	2.16
AO5	0.13	0.30	2.13	0.22	0.17	0.37	0.23	3.55
460	0.07	<LOD	0.90	0.08	0.26	0.09	0.09	1.5
476	0.08	0.30	1.92	0.16	0.28	0.22	0.16	3.12
496	0.09	0.15	1.22	0.11	0.12	0.10	0.11	1.9
AO9	<LOD	0.14	1.92	0.12	0.48	0.17	0.19	3.02
477	0.08	0.08	1.55	0.07	0.27	0.13	0.08	2.26
470	0.09	0.09	3.91	0.28	1.22	0.18	0.26	6.03
Average	**0.11**	**0.18**	**2.30**	**0.18**	**0.34**	**0.21**	**0.20**	**3.51**
Median	0.095	0.140	1.920	0.130	0.265	0.165	0.155	3.020
St dev	0.061	0.115	1.354	0.120	0.275	0.161	0.183	1.812
St error	0.012	0.023	0.266	0.024	0.054	0.031	0.036	0.355
% detect	88	96	100	100	100	100	96	100

Table S21 – PBDE concentrations (ng/g lipid) in fur seal milk for the breeding season 2012/2013.

Sample ID	BDE-28	BDE-49	BDE-47	BDE-100	BDE-99	BDE-154	BDE-153	$\sum_7$PBDEs
227	0.08	0.090	1.169	0.07	0.13	0.09	0.11	1.73
AO3	0.08	0.070	0.804	0.08	0.12	0.09	0.03	1.27
460	0.03	0.095	0.777	0.04	0.11	0.05	0.09	1.18
486	0.09	0.098	1.114	<LOD	0.10	0.08	<LOD	1.48
AO5	0.07	0.123	1.356	0.08	0.05	0.07	0.01	1.76
479	0.08	0.089	1.423	0.07	0.01	0.04	<LOD	1.71
2975	0.02	0.055	1.136	0.08	0.11	<LOD	<LOD	1.40
470	0.05	0.117	1.017	0.05	0.06	0.03	0.02	1.35
477	0.08	0.134	0.992	0.16	0.20	0.17	0.13	1.85
381	0.05	0.137	1.879	0.14	0.24	0.12	0.05	2.63
359	<LOD	0.072	0.893	0.08	0.13	0.04	<LOD	1.22
474	0.06	0.167	1.635	0.14	0.20	0.16	0.03	2.41
423 location 5	0.41	0.232	1.342	0.22	0.22	0.28	0.24	2.94
423 location 12	0.34	0.225	1.428	0.26	0.25	0.28	0.27	3.05
267	0.07	0.100	1.196	0.03	0.11	0.09	<LOD	1.60
452	0.06	0.129	1.598	0.08	0.14	0.06	0.03	2.11
AO1	0.05	0.160	1.576	0.11	0.13	0.14	0.06	2.24
408	0.16	0.073	3.395	0.17	0.74	0.14	0.01	4.69
386	0.03	0.029	0.849	0.07	0.18	0.06	<LOD	1.22
475	0.22	0.195	1.883	0.22	0.37	0.28	0.18	3.36
416 location 4	0.08	0.158	1.801	0.11	0.13	0.16	0.08	2.53
416 location 14	0.08	0.128	1.681	0.11	0.16	0.20	0.07	2.43
455	0.12	0.101	1.740	0.11	0.20	0.06	0.05	2.38
488	0.13	0.092	1.066	0.10	0.13	0.05	0.01	1.58
AO9	0.04	0.090	0.952	0.08	0.17	0.07	0.07	1.49
482	0.04	0.563	1.635	0.15	0.52	0.12	0.07	3.10
400	0.09	0.250	1.363	0.15	0.20	0.11	0.06	2.22
AO6	0.04	0.314	1.788	0.16	0.09	0.16	0.05	2.61
492	0.15	0.305	2.139	0.18	0.34	0.22	0.04	3.38
478	0.15	0.212	1.772	0.08	0.42	0.18	0.12	2.92
495	0.07	0.187	1.984	0.12	0.21	0.16	<LOD	2.72
6093	0.04	0.172	1.603	0.06	0.26	0.08	0.11	2.32
472	0.33	1.275	12.194	0.74	0.77	0.99	0.21	16.51
435	0.05	0.166	1.471	0.10	0.14	0.08	0.11	2.12
441	0.076	0.378	0.7462	0.1116	0.1981	0.2476	0.1394	1.90
461	<LOD	0.2434	0.5041	0.0814	0.2054	0.0258	0.0159	1.08
486	<LOD	0.1165	0.214	0.0497	0.1424	0.1239	0.1144	0.76
476	0.031	0.2296	0.5816	0.1126	0.1664	0.0805	0.0408	1.24
Average	**0.099**	**0.19**	**1.65**	**0.13**	**0.213**	**0.143**	**0.071**	**2.5**
Median	0.073	0.136	1.393	0.105	0.168	0.100	0.050	2.115
St dev	0.091	0.207	1.844	0.116	0.163	0.159	0.068	2.472
St error	0.015	0.034	0.299	0.019	0.027	0.026	0.011	0.401
% detect	97	100	100	97	97	97	71	100

<LOD: below the limit of detection

Table S22 – PBDE concentrations (ng/g lipid) in fur seal milk for the breeding season 2013/2014.

Sample ID	BDE-28	BDE-49	BDE-47	BDE-100	BDE-99	BDE-154	BDE-153	$\sum_7$PBDEs
467	<LOD	0.32	1.32	0.13	0.46	0.16	0.09	2.47
476	<LOD	0.13	0.21	0.09	0.15	0.03	0.05	0.65
227	<LOD	0.69	1.74	0.90	1.12	1.26	0.67	6.37
AO6	<LOD	0.26	0.47	0.11	0.16	<LOD	<LOD	1.00
460	<LOD	0.16	0.32	0.10	<LOD	<LOD	<LOD	0.62
AO1	<LOD	0.29	0.37	0.12	0.16	0.34	0.17	1.46
Average		**0.308**	**0.74**	**0.24**	**0.36**	**0.30**	**0.17**	**2.1**
Median		0.275	0.420	0.115	0.160	0.095	0.070	1.230
St dev		0.201	0.633	0.323	0.398	0.486	0.254	2.204
St error		0.082	0.258	0.132	0.162	0.198	0.104	0.900
% detect	0	100	100	100	100	67	67	100

<LOD: below the limit of detection

Table S23 - Plankton PBDE concentration information. BDEs-2, -8, -15, and -30 were not detected and are thus not presented. Concentrations are in ng/g lipid and the values below have a recovery correction factor of 78.94% (average Recovery for PCBs) applied to account for any potential losses. Sample IDs that are accompanied by an *asterisk** indicate a $\delta^{15}N$ value > 2.0‰.

Sample ID	Date	BDE-28	BDE-49	BDE-47	BDE-100	BDE-99	BDE-154	BDE-153	$\sum_7$PBDEs
PH 1	30-Dec-07	5.22	<LOD	11.89	3.18	15.38	0.00	4.37	40.05
PH 2	16-Dec-07	2.73	4.02	39.22	9.49	38.09	6.04	6.82	106.41
PH 3	16-Dec-07	4.27	<LOD	32.55	6.94	25.95	3.11	8.46	81.28
PH 4	19-Dec-07	0.00	<LOD	<LOD	<LOD	<LOD	<LOD	5.22	5.23
PH 5	1-Jan-08	2.17	<LOD	8.58	2.07	4.60	1.50	1.93	20.85
PH 6	30-Dec-07	1.93	<LOD	10.07	1.96	5.71	0.00	2.39	22.07
PH 7	31-Dec-07	<LOD	<LOD	18.79	2.73	11.29	0.00	3.73	36.55
PH 8	31-Dec-07	6.69	<LOD	40.38	7.57	27.46	6.09	11.02	99.21
PH 9	30-Dec-07	<LOD	3.84	4.43	<LOD	7.68	<LOD	6.45	22.40
PH 10	14-Dec-07	<LOD	<LOD	25.59	7.32	19.63	2.19	5.83	60.57
PH 11	31-Dec-07	7.39	<LOD	13.48	4.62	10.39	<LOD	4.98	40.87
PH 13	30-Dec-07	<LOD	<LOD	23.03	4.44	14.46	<LOD	6.67	48.61
PH 14	19-Dec-07	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
PH 15	19-Dec-07	<LOD	<LOD	33.77	8.44	14.54	<LOD	<LOD	56.76
PH 19	2-Jan-08	8.50	<LOD	5.64	<LOD	<LOD	<LOD	12.04	26.19
PH 16	8-Feb-10	3.35	4.32	105.76	27.30	110.74	12.33	15.62	279.42
PH 17	13-Jan-10	6.07	<LOD	103.42	33.90	136.74	13.87	24.33	318.33
PH 20	21-Jan-10	1.13	<LOD	0.81	0.54	1.10	<LOD	1.32	4.91
PH 21	21-Jan-10	0.77	<LOD	1.32	0.55	1.10	<LOD	1.43	5.18
PH 26	5-Jan-11	<LOD	1.62	18.77	4.56	22.88	2.59	5.40	55.82
PH 26b	5-Jan-11	<LOD	<LOD	16.34	7.93	15.86	<LOD	<LOD	40.14
PH 31	7-Mar-11	1.62	<LOD	8.12	<LOD	3.86	<LOD	<LOD	13.60
PH 32	1-Feb-11	<LOD	<LOD	3.81	<LOD	<LOD	<LOD	<LOD	3.82
PH 34	18-Jan-11	<LOD	<LOD	8.33	1.48	5.21	<LOD	<LOD	15.03
PH 35	1-Mar-11	<LOD	<LOD	5.57	1.35	7.74	<LOD	1.90	16.57
PH 35b	1-Mar-11	<LOD	<LOD	5.17	<LOD	2.92	<LOD	<LOD	8.10
PH 36	7-Mar-11	<LOD	<LOD	5.69	<LOD	5.05	<LOD	2.46	13.21
Average		**1.9**	**0.52**	**20**	**4.8**	**19**	**1.8**	**4.9**	**53**
Median		0.02	0.01	10.07	1.96	7.74	0.01	3.73	26.19
St dev		2.67	1.31	27.01	8.08	31.96	3.70	5.64	76.45
St error		0.51	0.25	5.20	1.55	6.15	0.71	1.09	14.71
% detect		48	15	100	67	93	30	74	96

Table S24 – Krill PBDE concentration information. Concentrations are in ng/g lipid and the values below have a recovery correction factor of 69.1% (based on α-HCH-d_6 in a surrogate standard) applied to account for any potential losses. Sample IDs that are accompanied by an *asterisk** indicate a combined sample of replicates.

Sample ID	**Year**	**BDE-28**	**BDE-49**	**BDE-47**	**BDE-100**	**BDE-99**	**BDE-154**	**BDE-153**	**$\sum_7$PBDEs**
Kr1* Gravid	2007/2008	0.06	0.21	0.10	<LOD	<LOD	<LOD	<LOD	0.48
Kr2 Adult	2007/2008	<LOD	<LOD	0.23	<LOD	<LOD	<LOD	0.14	0.44
Kr3* Gravid	2007/2008	0.04	<LOD	0.13	<LOD	<LOD	<LOD	0.03	0.32
Kr4 Adult	2007/2008	0.12	<LOD	0.37	<LOD	<LOD	<LOD	<LOD	0.55
Kr5* Gravid	2007/2008	0.03	<LOD	0.09	<LOD	<LOD	<LOD	<LOD	0.24
Kr6 Adult	2007/2008	<LOD	<LOD	0.57	<LOD	0.19	<LOD	<LOD	0.81
Kr7 Juve	2007/2008	0.20	<LOD	0.71	<LOD	0.17	<LOD	<LOD	1.12
Kr9* Gravid	2007/2008	0.11	<LOD	0.38	<LOD	<LOD	<LOD	0.10	0.67
Kr10 Adult	2007/2008	<LOD	<LOD	0.07	<LOD	<LOD	<LOD	<LOD	0.20
Kr11* Gravid	2007/2008	0.05	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	0.22
Kr12 Adult	2007/2008	<LOD	<LOD	0.08	<LOD	<LOD	<LOD	<LOD	0.22
Kr13 Juve	2007/2008	<LOD	<LOD	0.26	0.19	<LOD	<LOD	<LOD	0.56
Kr14* Adult	2007/2008	0.08	<LOD	0.17	<LOD	<LOD	<LOD	<LOD	0.37
Kr15* Adult	2007/2008	0.04	<LOD	0.09	<LOD	<LOD	<LOD	<LOD	0.24
Kr16* Thysan	2007/2008	0.42	<LOD	0.67	<LOD	0.15	<LOD	<LOD	1.28
Kr17* Adult	2007/2008	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	0.20
Kr18* Juve.	2007/2008	0.04	<LOD	0.29	<LOD	<LOD	<LOD	<LOD	0.39
Kr19* Adult	2007/2008	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	0.14
Kr20 Thysan	2007/2008	<LOD	<LOD	0.56	<LOD	0.10	<LOD	<LOD	0.72
Kr21 Juve	2007/2008	<LOD	<LOD	0.77	<LOD	0.09	<LOD	<LOD	0.91
Kr22* Adult	2007/2008	0.08	<LOD	0.42	<LOD	<LOD	<LOD	<LOD	0.55
Kr23 Juve	2007/2008	0.31	<LOD	0.71	<LOD	<LOD	<LOD	<LOD	1.13
Kr24* Adult	2007/2008	<LOD	<LOD	0.61	0.47	1.86	0.21	0.30	3.48
Kr25* Adult	2007/2008	0.13	<LOD	0.34	<LOD	<LOD	<LOD	0.03	0.56
Kr26* Adult	2007/2008	<LOD	<LOD	0.28	<LOD	<LOD	<LOD	<LOD	0.40
Kr27* Adult	2007/2008	<LOD	<LOD	0.13	<LOD	<LOD	<LOD	<LOD	0.23
Kr28* Adult	2007/2008	<LOD	<LOD	0.12	<LOD	<LOD	<LOD	<LOD	0.19
Kr29* Juve	2007/2008	<LOD	<LOD	0.41	<LOD	<LOD	<LOD	<LOD	0.49
Kr30* Juve	2007/2008	0.06	<LOD	0.49	<LOD	<LOD	<LOD	<LOD	0.62
Kr31 Gravid	2010/2011	<LOD	<LOD	0.27	0.11	0.17	<LOD	<LOD	0.60
Kr31 Adult	2010/2011	0.14	<LOD	0.11	<LOD	<LOD	<LOD	<LOD	0.37
Kr32* Juve	2010/2011	0.03	<LOD	0.40	<LOD	<LOD	<LOD	<LOD	0.49
Kr33* Juve	2010/2011	<LOD	<LOD	0.33	0.18	<LOD	<LOD	<LOD	0.60
Kr33 Adult	2010/2011	<LOD	<LOD	0.90	<LOD	<LOD	<LOD	<LOD	1.04
Kr34* Adult	2010/2011	0.05	<LOD	0.34	<LOD	<LOD	<LOD	0.25	0.68
Kr34 Gravid	2010/2011	0.14	<LOD	0.23	<LOD	<LOD	<LOD	<LOD	0.49
Average		**0.068**	**0.014**	**0.33**	**0.034**	**0.12**	**<LOD**	**0.031**	**0.61**
Median		0.028	<LOD	0.287	<LOD	0.079	<LOD	<LOD	0.491
St dev		0.088	0.033	0.233	0.087	0.302	0.032	0.066	0.570
St error		0.015	0.006	0.039	0.015	0.050	0.005	0.011	0.095
% detect		53	3	100	11	81	3	17	100

Table S25 – Average trophic levels, concentrations of BDE 47 and Σ_7 BDEs (mean ± standard error) from 2010/11 sample set for all organisms with available isotope and concentration data.

	trophic level		**[BDE 47]**		**[$\sum_7$BDEs]**	
Biota	Mean	S.E.	average	S.E.	average	S.E.
phytoplankton	1.0	0.4	53	12	148	34
Krill	1.59	0.35	0.32	0.04	0.86	0.15
Fish	3.20	0.22	<LOD	n/a	<LOD	n/a
fur seals	3.48	0.39	1.2	1.4	2.3	0.2

Figure S1 – Isotopic composition of all biota sampled.

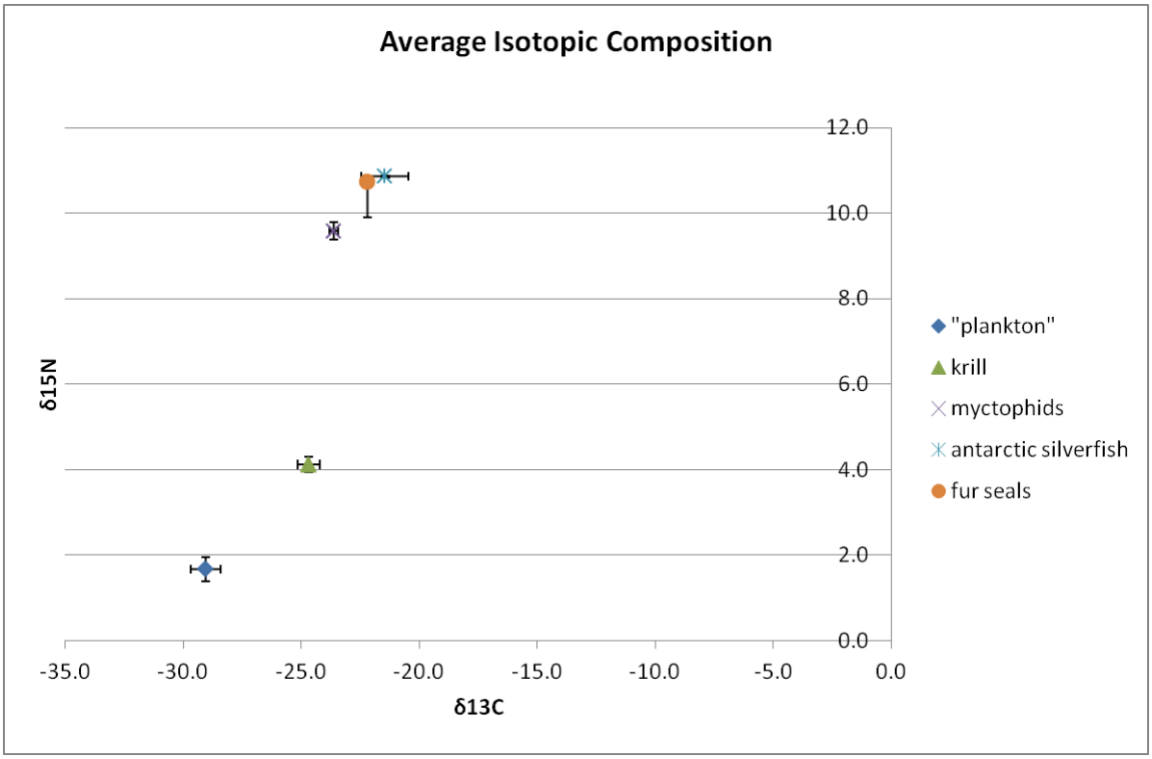

Figure S2: Average Σ_{12}PBDEs (ng/g lipid) in Krill by size class (2011 sampling season). Error bars represent standard error.

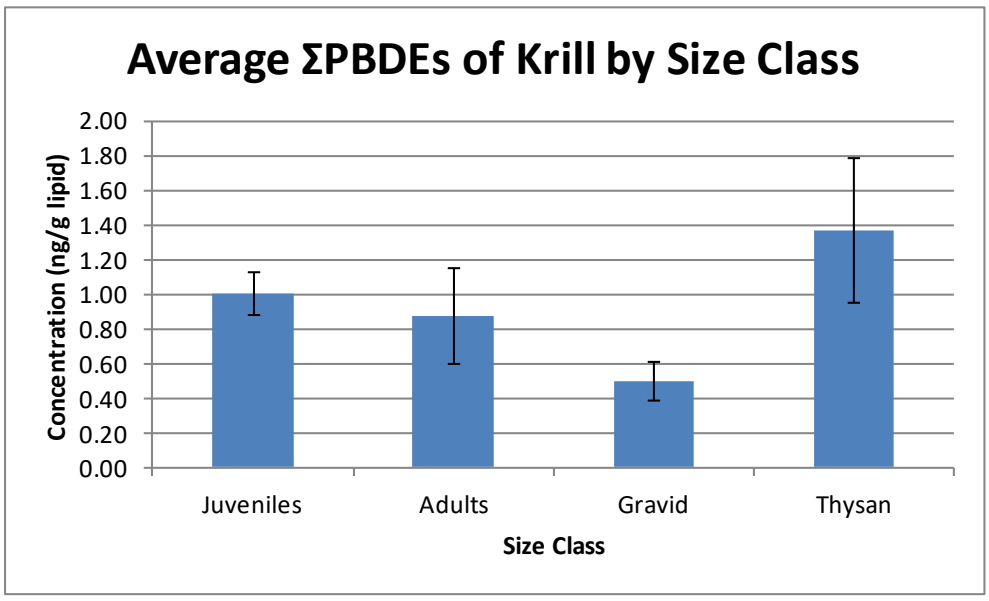

Figure S3 - Ratio of BDE concentrations in milk collected twice at least 1 year apart (n=18)