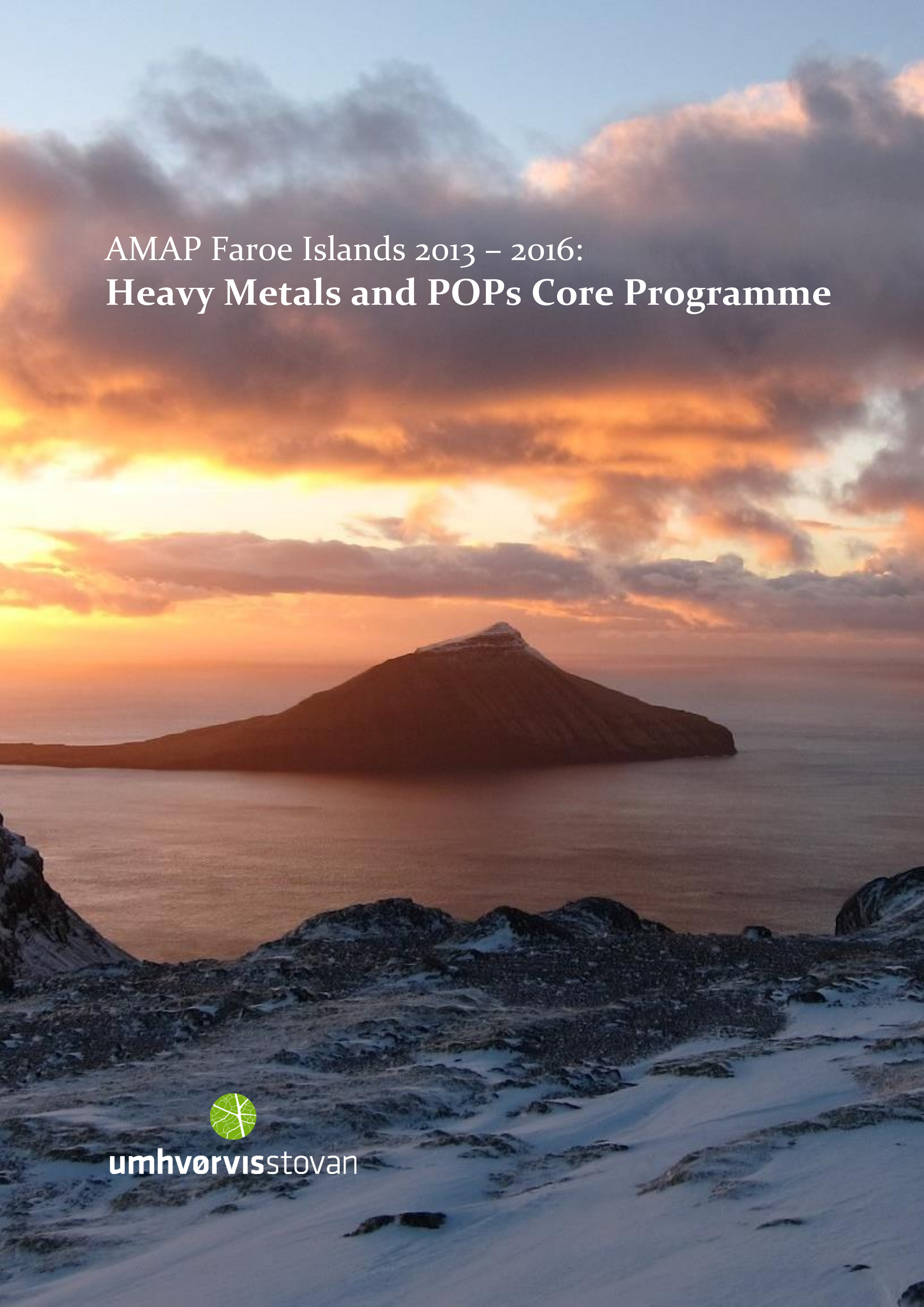
AMAP Faroe Islands 2013 – 2016:
Heavy Metals and POPs Core Programme



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AMAP Faroe Islands 2013 – 2016:
Heavy Metals and POPs Core Programme

Arctic Monitoring and Assessment Programme

Birgitta Andreasen, Katrin Hoydal, Rakul Mortensen, Sissal Vágsheyg Erenbjerg and Maria Dam

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AMAP Faroe Islands 1999-2000: Heavy Metals	Olsen, J., Hoydal, K. and Dam, M., 2001, AMAP Faroe Islands 1999-2000 Heavy Metals. Food and Environmental Agency, Faroe Islands, pp 62.	87-7972-470-1 http://www.us.fo/Files/Filer/US/utgavur/2003/amap_greenland_and_the_faroe_islands_1997-2001_vol3.pdf
AMAP Faroe Islands 1999-2000: POPs	Hoydal, K., Olsen, J. and Dam, M, 2003. AMAP Faroe Islands 1999-2000 POPs. In: Hoydal, K. and Dam, M. (eds) 2003. AMAP Greenland and the Faroe Islands 1997-2001. Vol. 3: Faroese Environment. Ministry of Environment, Copenhagen, pp 265. Available at www.hfs.fo/Ritgerðir.	
AMAP Faroe Islands Heavy Metals and POPs Core Programme 2004	Hoydal, K. and Dam, M. 2005. AMAP Faroe Islands Heavy metals and POPs Core programme 2004. Food, Veterinary and Environmental Agency, Report no. 2005:2. Torshavn, Faroe Islands, pp.76. Available at www.hfs.fo/Ritgerðir.	99918-967-5-9 http://www.us.fo/Files/Filer/US/utgavur/2004/amap_2004-2005_150_dpi.pdf
AMAP Faroe Islands Heavy Metals and POPs Core Programme 2005-2008	Hoydal, K. and Dam, M. 2009. AMAP Faroe Islands Heavy metals and POPs programme 2005-2008. Report no. US 2009:1, Environment Agency, Faroe Islands, pp. 101.	978-99918-819-1-1 http://www.us.fo/Files/Filer/US/utgavur/2009/amap_report_press_20.01.2010.pdf
AMAP Faroe Islands Heavy Metals and POPs Core Programme 2009-2012	Sanna í Túni Nielsen, Rakul Mortensen, Katrin Hoydal, Sissal Vágsheyg Erenbjerg and Maria Dam, 2014. AMAP Faroe Islands Heavy Metals and POPs Core Programme 2009-2012 Environment Agency, Faroe Islands ISBN: 978-99918-819-9-7, pp. 64 excl. appendices.	978-99918-819-9-7 http://www.us.fo/Files/Filer/US/utgavur/2014/AMAP%202009-2012_rapport_til_print.pdf

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Preface

The present report is part of the national contribution to the international Arctic Monitoring and Assessment Programme (AMAP), under the umbrella of the Arctic Council. The report summarises the results of the core programme monitoring of heavy metals and persistent organic pollutants (POPs) in terrestrial, freshwater and marine environments of the Faroe Islands. The monitoring is done according to guidelines adopted by AMAP, with adaptations that reflect the special Faroese pollution exposure issues and the experience gained from earlier work.

Úrtak

Hendan frágreiðingin tekur samanum úrslit, sum eru fingin í sambandi við eftiransing av dálkingarevnum í AMAP (Arctic Monitoring and Assessment Programme) kanningarsamstarvinum (sí eisini www.amap.no). Frágreiðingin fevnir um kanningar av tungmetalum og seint niðurbrótiligum lívrunnum eiturevnum (POPs) í úrvaldum verum í feskvatni, á landi og í havumhvørvinum í Føroyum. Úrslitini eru partur av áhaldandi arbeiði, sum byrjaði í 1996 og hevur hildið áfram við skiftandi orku síðani tá.

Í Talvu 1 sæst hvørji sløg av djórum eru kannað í AMAP tungmetal og POP kanningarskránni fyri Føroyar, og verða viðgjørd í hesi frágreiðing. Støðugir isotopar eru eisini við í talvuni, hesir eru tó ikki dálkingarevni, men verða kannaðir, tí teir kunnu siga nakað um støði í føðinetinum. Talvan vísir eisini, hvør vevnaður er kannaður, og hvørji dálkingarevni eru kannað.

Afturat nýggju kanningarúrslitunum eru aðrar dátur, sum stuðla uppundir tulkingina av úrslitunum, við í frágreiðingini; bæði lívfrøðilig dáta fyri viðurskifti, sum kunnu elva til variatión í innihaldinum av dálkingarevnum, men eisini ein útvaldur partur av eldri dátum, sum eru við til at seta nýggju úrslitini í perspektiv. Hendan lýsingin av eldri dátum er gjørd í tann mun, har dátur hava verið lutfalsliga lætt atkomulig, og er sostatt ikki gjørd miðvíst fyri øll sløg. Summi av hesum eldru úrslitunum eru fingin til vega í AMAP høpi, meðan onnur eru fingin til vega í sambandi við umhvørviseftiransingina ella serstakar kanningarverkætlanir. Metingar av broytingum í konsentratiónum við tíðini eru ikki gjørdar sum ein innbygdur partur av kanningarætlanini, men verða eitt nú gjørdar í sambandi við arbeiðið í altjóða AMAP serfrøðingabólkum, og verða tøkar í sambandi við tað arbeiði. Víst verður til https://www.amap.no/projects.

Talvu 1 Yvirlityvir kannaði sløg í 2013-2016

Slag	**Innsavningar ár**	**Vevnaður**	**Kanningar**:							
			Hg	Cd	Se	POPs	PBDEs	PFASs	HBCD	Støðugir isotopar
Grind (Pilot whale)	2013, 2015, 2016	Spik				+	+		+	
		Tvøst	+		+					+
		Livur	+	+	+			+		
		Nýra		+						
Toskur (Cod)	2013, 2014, 2015,2016	Livur				+				
		Flak	+							+
Teisti (Black guillemot)	2013, 2015	Livur	+	+	+					
		Fjaðrar	+							
	2013, 2014, 2016	Egg	+			+				+
Havhestur (Fulmar)	2016	Livur	+	+	+					+
		Fjaðrar	+							
Bleikja (Arctic char)	2014	Flak	+		+	+				+
Síl (Brown trout)	1999, 2000	Flak	+		+	+				+
Seyður (Sheep)	2013, 2015	Livur	+	+	+					
		Tálg				+				

Summary

The present report summarises the monitoring data acquired in partial fulfilment of the circumpolar Arctic Monitoring and Assessment Programme (AMAP), further details are available on the website, www.amap.no. The contribution encompasses analyses of heavy metal and persistent organic pollutants (POPs) in freshwater, terrestrial and marine environments of the Faroe Islands. The monitoring results are part of an ongoing effort that began in 1996, and which has continued though with adaptions and varying intensity.

The abiotic and biotic sample types included in the AMAP Faroe Islands Heavy Metals and POPs Core Programme presented in this report are shown in Table 1. Stable isotopes are included in the monitoring programme as indicators of placement in the food web. The Table also specifies the various tissues and the contaminants that have been analysed.

In addition to presenting the newly acquired analytical data, the report also contains information that assists in the overall interpretation of the results. The biological parameters that give rise to variability in the concentration of pollutants are discussed, and the most recent data are given perspective by presenting a suitable selection of previously acquired data. Some of the older data included for perspective were acquired in the context of the AMAP Programme and some were acquired in connection with other projects or programmes of the Environment Agency.

Table 1 OverView of the analysed species in 2013-2016.

Species	**Sampling year**	**Tissue**	**Analysis**:							
			Hg	Cd	Se	POPs	PBDEs	PFASs	HBCD	Støðugir isotopar
Pilot whale	2013, 2015, 2016	Blubber				+	+		+	
		Muscle	+		+					+
		Liver	+	+	+			+		
		Kidney		+						
Cod	2013, 2014, 2015,2016	Liver				+				
		Muscle	+							+
Black guillemot	2013, 2015	Liver	+	+	+					
		Feather	+							
	2013, 2014, 2016	Egg	+			+				+
Northern Fulmar	2016	Liver	+	+	+					+
		Feather	+							
Arctic char	2014	Muscle	+		+	+				+
Brown trout	1999, 2000	Muscle	+		+	+				+
Sheep	2013, 2015	Liver	+	+	+					
		Tallow				+				

Contents

1 Introduction

Monitoring of environmental contaminants according to the guidelines adopted by the AMAP programme began in the Faroe Islands in 1996. The monitoring has been adjusted and optimized where pertinent, and the resulting monitoring scheme is shown on the next page (Table 1.1).

The results in this report are from analyses in 2013-2016 and are part of the AMAP core monitoring programme of heavy metals and POPs in biota from terrestrial, freshwater and marine environment. The previous AMAP projects undertaken by the Food and Veterinary Authority and the Environment Agency of the Faroe Islands are reported in Larsen and Dam, (1999), Olsen et al. (2003), Hoydal et al. (2003), Hoydal and Dam (2009, 2005), and Nielsen et al. (2014).

The metals analysed include mercury, cadmium and the metalloid selenium. The POPs analysed include hexachlorobenzene (HCB), 14 single congeners of polychlorinated biphenyls (PCBs), and pesticides such as chlordanes, β-hexachlorohexane, HCH, "dichlorodiphenyltrichloroethane" DDT (in some instances both p,p- and o,p-isomers), mirex, and five individual congeners (parlars) of toxaphene. In pilot whale also polybrominated diphenyl ethers (PBDEs), and per- and polyfluoroalkyl substances (PFASs) were analysed. In addition, stable isotope ratios of $^{15}N/^{14}N$ and $^{13}C/^{12}C$ have been analysed in four species.

1.1 Analytical methods

Mercury and cadmium analyses were performed at the Food and Veterinary Agency of the Faroe Islands (FVA), and POPs and selenium analyses were performed at Centre de Toxicologie du Quebec (CTQ) in Canada. However, since 2015 selenium analyses were performed at FVA. PBDE and PFAS analyses were performed at the University of Örebro, Sweden. Stable isotopes of nitrogen and carbon were analysed at Stable Isotopes in Nature Laboratory (SINLAB), University of New Brunswick, Canada.

1.1.1 Metal analysis

Until 2015 at the FVA, cadmium was analysed with atom absorption spectrophotometry using either graphite furnace (Perkin Elmer 1100B) or flame (Perkin Elmer 2380) excitation, depending on the metal analyte content of the examined material. Mercury was analysed with the Flow Injection Mercury System (FIMS) 400 (Mercury analysis system). Since 2015, the metal analyses at FVA (mercury, cadmium and selenium) have been carried out using ICP-MS.

Quality assurance: Double determinations were performed. A certified reference material and a blank control sample were analysed in connection with each series. The certified reference material and the blank were digested in the same manner as the samples. A 4-point standard curve was always made. The FVA laboratory participates in regular inter-calibration, for example, Quasimeme (Quality assurance of information for marine environmental monitoring in Europe). The FVA laboratory is accredited (DANAK) for mercury and cadmium analysis.

At CTQ, selenium was analysed using ICP-MS after sample digestion with concentrated nitric acid.

1.1.2 POPs

When the term POPs is used in this report, it is normally used as a common term for PCB, HCB and pesticides; thus PBDE is normally not included.

All samples, for which POP results are presented in the present report, were analysed for POPs by CTQ.

POPs analyses at CTQ

The CTQ laboratory is accredited under ISO 17025 by the Standards Council of Canada and participates in many national and international quality control programs including, the Northern Contaminants Program (NCP) of the Ministry of the Environment of Ontario, the External Quality Assessment Scheme QUASIMEME (www.quasimeme.org), as well as the German External Quality Assessment Scheme (G-EQUAS) for Biological Monitoring in Occupational and Environmental Medicine. The CTQ laboratory also participates in AMAP.

Extraction and analysis by GC-MS

Tissue samples were analysed for the following compounds: PCBs 28, 52, 99, 101, 105, 118, 128, 138, 153, 156, 163, 170, 180, 183 and 187, hexachlorobenzene, β-HCH, α-chlordane, γ-chlordane, oxychlordane, cis-nonachlor, trans-nonachlor, mirex, o,p'-DDE, p,p'-DDE, o,p'-DDT, p,p'-DDT, parlar 26, parlar 32, parlar 50 and parlar 62.

Table 1.1 Overview of the monitoring series forming part of the AMAP Faroe Islands core Heavy Metals and POPs monitoring programme.

	Chemical parameters	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Pilot whales																						
blubber	PCB, pesticides, PBDE		v		v	v	v	v	v	v			v		v	v	v	v	v	v	v	v
muscle	Hg, Cd**, Se, Stable isotopes*, PFAS		v		v	v	v	v	v	v		v	v		v	v	v	v	v	v	v	v
kidney	Cd				v	v	v	v				v	v		v	v	v	v	v	v	v	v
liver	Hg, Cd, Se, PFAS						v	v		(v)		v	v		v	v	v	v	v	v	v	v
Black guillemot																						
eggs	PCB, pesticides, Hg, Stable isotopes*				v	v	v	v		v		v		v		v		v		v		v
liver	Hg, Cd, Se	v						v			v		v		v		v		v		v	
feathers	Hg	v						v			v		v		v		v		v		v	
Sculpin																						
liver	PCB, pesticides, Hg, Cd, Se,				v	v	v	v		v												
muscle	Stable isotopes*							v		v												
Cod																						
muscle	Hg		v			v	v		v	v	v	v	v	v	v	v	v	v	v	v	v	v
liver	PCB, pesticides		v			v	v		v	v	v	v	v	v	v	v	v	v	v	v	v	v
Arctic char																						
muscle	PCB, pesticides, Hg, Se, Stable isotopes*			(v)		v	v	v		v	v		v		v	v	v	v	v	v		
Sheep																						
liver	Hg, Cd, PFAS		v		v		v				v			v	v		v		v		v	
tallow	PCB, pesticides													v	v		v		v		v	
Hare																						
liver	PCB, pesticides, Hg, Cd, Se		v		v		v			v		v		v		v						

*Analyses of selected stable isotopes of nitrogen and carbon began in 2002, but have not been done as frequently as, e.g., analyses for metals. See Chapter 9 for further details.

** Analysis of cadmium in muscle tissue of pilot whales was discontinued from 2010

The sample weight used for the analyses was dependent on the nature of the matrix and the fat content and ranged from 0.025 g (whale blubber), 1.0 g (fish tissues, muscles, eggs and liver) to 4.0 g (subcutaneous fat).

The tissue samples were enriched with isotopically labelled surrogate (internal) standards (hexachlorobenzene-$^{13}C_6$, α-HCH-$^{13}C_6$, oxychlordane-$^{13}C_{10}$, trans-nonachlor-$^{13}C_{10}$, p,p'-DDE-$^{13}C_{12}$, PCB 141-$^{13}C_{12}$, PCB 153-$^{13}C_{12}$, PCB 180-$^{13}C_{12}$, parlar 26-$^{13}C_{10}$ and parlar 50-$^{13}C_{10}$), mixed with dichloromethane and chemically dried using sodium sulphate. The compounds were then extracted from the matrix by ultrasound sonification followed by filtration. A part (10 %) of the organic solvent extract was used to gravimetrically determine the percentage of total lipids in the sample. The remaining fraction was concentrated by evaporation and subsequently purified using gel permeation chromatography (GPC) and cleaned-up on a Florisil column.

The extracts were analysed on a GC-MS with an Agilent 6890 Network gas chromatograph (GC), coupled with an Agilent 5973 Network mass spectrometer (MS) (Agilent Technologies, Mississauga, Ontario, Canada) and with an Electron Capture Detector (ECD). The GC was fitted to the MS with an Agilent 60 m DB-XLB column (0.25 mm i.d., 0.25 µm film thickness) and to the ECD with an Agilent 50 m Ultra-1 column (0.20 mm i.d., 0.33 µm film thickness). The ECD detector served mainly to quantify the PCB congeners 28 and 52, if the detection limit was not obtained with the mass detector, and to validate MS results. The measurement of ions generated was performed in single ion monitoring (SIM), with negative chemical ionization (NCI) and methane (99.97 %) as the reagent gas. Samples (3 μL) were injected in pulsed split less mode. The temperature program was as follows: 2 min at 100°C followed by an increase to 200 °C at a rate of 20 °C min^{-1}, increase to 245 °C at a rate of 1.5 °C min^{-1} hold 10 minutes, increase to 280 °C at a rate of 20 °C min^{-1} hold 5 minutes and finally an increase to 330 °C at a rate of 30 °C min^{-1} hold 15 minutes. The total run time was 70.42 minutes.

Quantitation and method performance

The calibration was made with an extracted curve using corn oil. The linearity of the six-point curve was evaluated during the validation of the analytical method, due to time considerations and to maintain a high throughput production, the quantitation was based on a single, extracted mid-point calibration. The concentration of the analytes was calculated with the ratio of peak areas relative to their labelled internal standards. Concentrations were reported per lipid weight (units of micrograms per kilogram) and the Limit of Detection (LOD) for all compounds ranged from 0.1 to 10 μg kg^{-1}. For each sample, the LOD was adjusted relative to the weight of the sample and the lipid content, providing different LODs for each sample. For each of the analytes, the LOD was determined by first estimating the concentration equivalent to a signal-to-noise ratio of three. The laboratory then measured 10 replicates of a sample with the analytes at a concentration from 4 to 10 times the estimated LOD. The calculated LOD became the value equivalent to thrice the standard deviation (SD) of those 10 replicates. The intra-day precision was between 1.7% and 8.3% and the inter-day was between 1.7% and 9.3%. Based on spiked levels (5 µg kg^{-1} in corn oil, n = 3), recovery was between 54% and 79% for all the analysed compounds.

The certified reference material used during the analyses was fish tissue (SRM-1947), containing all the analysed compounds, and was provided by the National Institute of Standards & Technology (NIST; Gaithersburg, MD, USA). The overall quality and accuracy of the analyses was monitored by regular participation in the Northern Contaminants Program (NCP) of the Ministry of the Environment of Ontario and the External Quality Assessment Scheme QUASIMEME.

The "Aroclor 1260" value reported in this report was calculated from individually quantified congeners, using a factor of calibration that was determined on a human tissue matrix. Thus, when applying this Aroclor 1260 value, it is implicitly assumed that the metabolism/degradation of the various PCB congeners in the species considered is the same as in humans.

PBDEs

Polybrominated diphenyl ethers (PBDEs) were analysed in pilot whale blubber samples at the MTM Research Centre, University of Örebro, Sweden. The blubber samples were treated as described in Rotander et al. (2012b). Five to ten grams of blubber were homogenized in a mortar with anhydrous sodium sulphate and extracted with a mixture of n-hexane/toluene (1:1, v:v) using open column chromatography. Lipid content was determined gravimetrically. Sample clean up was performed using three different columns in series, i.e., multilayer silica column, alumina oxide column and carbon column. All samples were analysed on a high resolution GC-MS system (Autospec Ultima; Waters Inc.) operating at

>10,000 resolution using EI ionization at 35 eV. All measurements were performed in the selective ion recording mode (SIR), monitoring the two most abundant ions of the molecular bromine cluster. Quantification was performed using the internal standard method. Split-less injection was used to introduce 1 µL of the final extracts on the column (a DB-5MS column from J&W; 30 m x 250 μm i.d. x 0.25 µm film thickness). Detection levels were calculated at an S/N ratio of three, corrected for recovery of the internal standard. The criteria for positive peak identification were an isotope ratio within ±15 % of the theoretical value and a retention time match with that of the corresponding labelled compound. Recoveries were between 50-150 % for all samples.

PFAS

Per- and polyfluorinated alkyl substances (PFASs) were analysed in pilot whale liver samples at the MTM Research Centre, University of Örebro, Sweden. The analyses were done as described in Rotander et al. (2012a). In short, standards used were native (C_4, C_6, C_8-C_{12}, C_{14}, C_{16}, C_{18}) and mass-labelled (C_4-C_{16}) perfluorocarboxylic acids (PFCAs), native (C_4-C_{10}, C_{12}) and mass-labelled perfluorosulfonates (PFSAs) (C_4, C_6, C_8), native (4:2, 6:2, 8:2) and mass-labelled (6:2, 8:2) fluorotelomer sulfonates (FTSAs), and native and mass-labelled perfluorosulfonamide (PFOSA), all obtained from Wellington Laboratories (Guelph, Ontario, Canada). Liver samples were homogenized and 0.5 g was used for extraction. Labelled internal standards were added to the samples before extraction with acetonitrile. Further clean up was performed with ENVI-carb. PFASs were analysed using an Acquity UPLC system coupled to a triple quadruple mass spectrometer XEVO TQ-S (Waters Corporation, Milford, USA), in negative electrospray ionization mode. A 100 mm C18 BEH column (1.7 μm, 2.1 mm) was used for separation. Mobile phases were 2 mM ammonium acetate in water, and 2 mM ammonium acetate in methanol.

HBCD

Hexabromocyclododecanes (HBCDs) were analysed in pilot whale blubber at the Department of Environmental Science, Aarhus University, Denmark. The analysis were conducted as previously described in Vorkamp et al. (2011). In brief, 0.5 g of the homogenized sample was spiked with $^{13}C_{12}$-labelled standards of α-, β- and γ-HBCD (Cambridge Isotope Laboratories, Tewksbury, MA, USA). The samples were Soxhlet extracted with hexane:acetone (4:1), reduced in volume by rotary evaporation and cleaned on a column containing aluminium oxide, silica (with and without H_2SO_4) and Na_2SO_4. The first fraction was eluted with 250 mL hexane. The HBCD isomers eluted in the second fraction with 250 mL hexane:dichloromethane (1:1). The HBCD fraction was evaporated to dryness and re-dissolved in 500 μL methanol. The samples were analyzed by high performance liquid chromatography-mass spectrometry (HPLC-MS/MS).

1.1.3 Stable isotopes

The ratio analyses of the two stable isotopes $^{15}N/^{14}N$ and $^{13}C/^{12}C$ were done at SINLAB. The samples were analysed for $d^{13}C$ and $d^{15}N$ using a Thermo-Finnigan Delta Plus isotope-ratio mass spectrometer (Bremen, Germany) interfaced with a Carlo Erba NC2500 Elemental Analyzer (Milan, Italy) via the Conflo II or Conflo III, respectively. This is a continuous flow system using helium as a carrier gas. Samples were converted to a gaseous state via combustion.

Four IAEA standards (N_1, N_2, CH_6 and CH_7), three elemental standards (acetanilide, cyclohexanone, and nicotinamide) and one internal standard (bovine liver) were used throughout each run to ensure high quality control.

1.2 Data Analysis

Data were analysed and figures were produced using the open source software R version 3.5.1 (R Develompment Core Team, 2018) using the packages included in tidyverse version 1.2.1 (Wickham, 2017).

2 Sampling

2.1 Black Guillemot (*Cepphus grylle*)

2.1.1 Black Guillemot eggs

Black guillemot eggs were sampled in June at two locations, in Koltur in 2013, 2014 and 2016 and in Skúvoy in 2014. One egg was sampled from each nest and the eggs were stored in a refrigerator (ca. 5°C) until further treatment.

The eggs were weighed and height and breadth were measured. The top of each egg was removed with a scalpel, or a hole was made in the top of each egg, and the contents were poured into a heat-treated glass (400 °C for four hours).

The yolk and white were mixed with a stainless steel fork, and subsamples were taken in polymethylpentene jars for POP analysis at CTQ and in microcentrifuge tubes for stable isotope analysis at SINLAB. The remaining egg sample was analysed for Hg at the FVA. The samples were stored at -20°C until shipment to the laboratories.

The eggshell thickness was measured shortly after emptying the egg using a micrometre calliper. Measurements of shell thickness were done at three different places as near to the widest part of the egg as possible with the membrane left on. The measured eggshell thicknesses are shown in Appendix A.

2.1.2 Black Guillemot liver and feather

Young black guillemots (2K)[a] were shot at Tindhólmur the 3th of May 2013 and 2nd of May 2015, and at Sveipur the 26th of March 2013 and the 24th of March and the 4th of April in 2015. Because of delays in obtaining a sampling permit for shooting 15 black guillemots in 2017, the sampling was rescheduled to March 2018. Due to the increased difficulties in obtaining permission to shoot black guillemots from the relevant authorities, the environmental monitoring of young black guillemot will cease in year 2018 and Northern Fulmar will instead be monitored.

The full weight of each bird was recorded prior to dissection. The sex was recorded and the stomachs with their contents were placed in storage in the Environmental Specimen Bank (ESB) for potential future use. Livers were sampled and stored in heat-treated glass jars (400°C for four hours) and frozen at -20°C until analysis. The livers were analysed for Hg and Cd at the FVA, and for Se, in 2013 at CTQ and in 2015 at FVA. Feather samples were taken (body contour feather under the left wing) and analysed for Hg at the FVA.

Samples of kidney and muscle were stored in polyethylene bags at -20°C and deposited in the ESB for potential future use. The polyethylene bags used for sample storage are invariably Minigrip®.

2.2 Northern Fulmar (*Fulmarus glacialis*)

Northern fulmars were caught near Vestmanna on the 2nd of September 2016. The young[b] birds are caught with nets while they lie on the surface of the sea.

The sex was recorded and the stomachs with their contents were taken for storage in the Environmental Specimen Bank (ESB) for potential future use. Livers were sampled and stored in heat-treated glass jars (400°C for four hours) and frozen at -20°C until analysis. The livers were analysed for Hg, Cd and Se at the FVA. Feather samples were taken (body contour feather under left wing) and analysed for Hg at the FVA.

Samples of subcutaneous fat was stored in heat treated aluminium foil, samples of kidney were stored in plastic containers, and muscle samples were stored in polyethylene bags at -20°C and deposited in the ESB for potential future use.

2.3 Cod (*Gadus morhua*)

Cod were sampled at the station “Mýlingsgrunnurin” northeast of the Faroe Islands in October 2014 (n = 25) and 2016 (n = 27) with trawl by the research vessel *Magnus Heinason* and in October 2013 (n = 25) and 2015 (n = 28) with long line by the fishing boat *Gordrúgvin*.

The cod were frozen whole until sample preparation.

During the sample preparation, the (thawed) cod were weighed and the fork length measured before the livers were extracted and stored in heat-treated glass jars at -20 °C until analysis. Samples were taken of muscle from the right side fillet and stored in PE

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[a] Second calendar year. Hatched in early June the previous year.

[b] Fledglings, hatced in June the same year

bags (samples intended for metal analyses), in microcentrifuge tubes (for stable isotopes analyses) or heat-treated aluminium foil at -20 °C until analysis for storage in the ESB. The liver was dissected and one liver lobe was placed in a heat treated jar or a Nalgene polymethylpentene (PMP) jar for subsequent persistent organic pollutants analyses, and the remains were similarly packed for storage in the ESB. The sex and reproductive maturity were determined from the gonads.

The majority of the cod were analysed as individual samples, but from each year, two pooled samples were prepared with 5-8 individuals in each. The liver samples were analysed for POPs at CTQ. Muscle samples were analysed for Hg at the FVA and for stable isotopes at SINLAB.

2.4 Long-finned pilot whale (*Globicephala melas*)

Pilot whale samples are collected in connection with the traditional whale hunts. The sampling takes place after the killing and prior to the meat and blubber distribution. At this time, the whales are cut open by an abdominal cut, to facilitate cooling. The samples of blubber and muscle are taken at the ventral and caudal side of these abdominal cuts. Pieces of blubber, muscle, liver and kidney were sampled and placed in polyethylene bags and stored at -20 °C until subsampling and (shipment for) analysis. As part of the sampling, the length of the whale in cm and/or the size in *skinn* (a special Faroese unit for measuring the size of the whale based on an assessment of the mass fit for human consumption) and the sex may be determined; otherwise, these data will be available from the authorities on site.

Pilot whale samples were collected in 2013, 2015 and 2016, but not in 2014. Pilot whale samples analysed as part of the AMAP Core Programme since 2001 are shown in Table 2.1.

The muscle samples were analysed for Hg at the FVA in the Faroe Islands and Se since 2015, prior to 2015 Se was analysed at CTQ in Canada. Stable isotope analysis was conducted at SINLAB.

The liver samples were analysed for Hg and Cd at the FVA in the Faroe Islands and Se since 2015. Prior to 2015 Se was analysed at CTQ in Canada.

Kidney samples were analysed for Cd at the FVA in the Faroe Islands.

Table 2.1 Number of pilot whale samples analysed in the AMAP Core Programmes of the Faroe Islands in 2001-2015

		Number of samples analysed			
Location	Date	Muscle	Blubber	Liver	Kidney
Miðvágur	06.07.01	25	25	20	20
Tórshavn	03.09.02	25	25	20	20
Hvalvík	30.08.03	25	25	-	-
Bøur	04.06.04	23	23	-	-
Hvannasund	28.08.06	15	15	8	8
Leynar	06.09.06	10	10	7	7
Tórshavn	03.07.07	11	11	9	9
Gøta	13.07.07	14	14	6	6
Hvannasund	05.01.09	13	38	8	8
Hvalvík	23.05.09	24	29	7	7
Vestmanna	24.06.10	17	17	7	7
Tórshavn	02.07.10	8	8	8	8
Vestmanna	09.02.11	13	13	6	6
Vestmanna	02.09.11	11	11	9	9
Klaksvík	10.07.12	10	10	9	9
Hvannasund	09.08.12	15	15	6	6
Fuglafjørður	30.07.13	12	12	8	8
Sandavágur	08.08.13	13	13	7	7
Miðvágur	06.06.15	9	11	7	6
Hvannasund	29.06.15	5	7	8	8
Tórshavn	23.07.15	11	7	-	1
Hvannasund	06.07.16	9	9	6	6
Hvannasund	26.07.16	12	12	4	4
Leynar	07.11.16	4	4	5	5
Total		***334***	***364***	***175***	***175***

Blubber samples were analysed for POPs at CTQ, PBDE at the Örebro University, Sweden, and HBCD at Aarhus University, Denmark. Liver samples were analysed for PFAS at Örebro University, Sweden. During the preparation of the blubber samples, the outer part of the blubber that had been in contact with the wrapping was removed. The blubber samples were transferred to polymethylpentene jars and kept frozen until analysis.

2.4.1 Defining groups

Following studies by Desportes et al. (1993) and Martin and Rothery (1993), pilot whales are divided into the following groups with regard to sex and sexual maturity:

Juvenile females: All females < 375 cm
Adult females: All females ≥ 375 cm
Juvenile males: All males < 494 cm
Adult males: All males ≥ 494 cm

Since 2006, muscle and blubber have been sampled from preferably young individuals, whereas liver and kidney have been sampled from preferably older (large) individuals. This sampling strategy was different from the one used in previous years and was chosen following statistical analyses of time series (Dam and Rigét, 2006), which established a higher probability of detecting directional trends in younger (immature) whales than in older individuals. Thus, it was decided to adjust the monitoring so that pilot whale muscle and blubber samples were analysed with the purpose of detecting possible time-trends, whereas liver and kidney samples were analysed with the objective of detecting negative biological effects of pollutants. Since 2015, the samples used for monitoring of pollutants have preferentially been taken from young males, with the purpose of eliminating variability stemming from the sex parameter in the time trend analyses.

2.5 Arctic char (Salvelinus alpinus)

Arctic chars were caught by angling in the lake á Mýrunum by members of the anglers association "Føroya Sílaveiðifelag" in June and September in 2014 with permission from the Veterinary Department of the FVA. The fish were wrapped in PE plastic bags and frozen at -20 °C until further treatment. Before and after fishing, the fishing tackle was disinfected with the commercial disinfectant VirkonS.

Since 2014, it has proven difficult to obtain Arctic char from the lake á Mýrunum, because of work connected to hydropower production based on water in this lake. The power company (SEV) had to perform maintenance work on the pipeline running from this lake to a hydropower plant and thus had to lower the water level of the lake the summer of 2015 and again in 2016. Both in 2015 and 2016 anglers tried to fish Arctic char at the lake without luck. Additionally, these disturbances to the lakes ecosystem could inflict extra variability in temporal trend pollutant data, and as Arctic char is only found in few other lakes on the Faroe Islands and in scarcer amount than á Mýrarnar a switch to another location is not optimal. Brown trout is more readily available in the Faroe Islands and in multiple locations; therefore in future AMAP monitoring, brown trout may be used as monitoring species instead of Arctic char, see also next section.

The length and weight of each fish was recorded. Muscle samples were taken from the right side fillet and analysed for Hg at the FVA, for Se and POPs at CTQ, and stable isotopes at SINLAB. The otoliths were used for age determined by the Natural History Museum of Kópavogur in Iceland. The livers were placed in heat-treated glass or polymethylpentene jars and stored in the ESB at -20 °C for potential future studies.

2.6 Brown trout (*Salmo trutta*)

Due to the already mentioned difficulties in obtaining Arctic char, investigations into the suitability of brown trout as a monitoring species in AMAP has begun. Both the analysis of pollutant concentration variation and profiles within a lake and between lakes has been initiated by using the brown trout samples already available in the ESB.

Brown trout were caught by angling in the lakes Stóravatn and Lítlavatn on the island Sandoy in June 1999 and 2000. The fish were wrapped in plastic bags, frozen at -20 °C, and stored in the ESB until sample preparations in 2017.

The length and weight of each fish was recorded. Muscle samples were taken from the right side fillet and analysed for Hg and Se the FVA, for POPs at CTQ and for stable isotopes at SINLAB. The otoliths were sampled and age determined by the Natural History Museum of Kópavogur in Iceland.

The livers were placed in heat-treated glass jars and stored in the ESB at -20 °C for potential future studies.

2.7 Sheep (*Ovis aries*)

The livers and tallow were sampled during the slaughtering season (October) in 2013 and 2015 from female sheep (ewe, n = 10) and lambs (n = 10) that had been grazing in Norðradalur. The samples were kept frozen at -20 °C until further sample preparation.

The sheep from each year were analysed as four pooled samples, two with five female sheep and two with five lambs.

The livers from 2013 were analysed for Hg and Cd at FVA and for Se at CTQ, whereas samples from 2015 were analysed for Hg, Cd and Se at FVA. Tallow samples were analysed for POPs at CTQ.

3 Heavy metals

3.1 Black guillemot and Northern Fulmar

3.1.1 Black guillemot eggs

A summary of Hg in black guillemot eggs is given in Table 3.1 and the complete data series of Hg in black guillemot egg is plotted in Figure 3.1. The results of the individual eggs are given in Appendix A.

The temporal data of Hg in black guillemot eggs are plotted in Figure 3.1 for the two different egg collection locations Koltur and Skúvoy. It can be observed that the Hg concentration was slightly higher in the eggs collected in Skúvoy in the years 2004 – 2014, though, only statistically significant for years 2006 and 2010, as indicated by the asterisk in Figure 3.1. However, the most recently collected eggs from Koltur in 2016 have the highest measured median Hg concentration since the regular analysis of black guillemot eggs from the Faroe Islands started in 1999. Black guillemot eggs have not been collected in Skúvoy since 2014.

Table 3.1 Summary of Hg in black guillemot eggs from 2013, 2014 and 2016.

Year	Location		Dry matter %	Hg mg kg^{-1} ww egg
2013	Koltur	*N*	7	
		mean	25.63	0.58
		median	**25.50**	**0.60**
		min	24.80	0.43
		max	27.40	0.70
		sd	0.85	0.11
2014	Koltur	*N*	6	
		mean	27.30	0.67
		median	**26.10**	**0.65**
		min	24.60	0.46
		max	31.60	0.88
		sd	3.07	0.16
	Skúvoy	*N*	10	
		mean	25.91	0.77
		median	**25.60**	**0.80**
		min	23.20	0.57
		max	28.10	0.94
		sd	1.51	0.10
2016	Koltur	*N*	10	
		mean	24.61	0.96
		median	**24.60**	**0.95**
		min	23.20	0.56
		max	26.20	1.50
		sd	0.83	0.32

Table 3.2 Hg, Se and Cd concentrations in black guillemot liver 2013 and 2015.

Year		Dry matter	Hg	Se	Cd
		%	mg kg^{-1} ww liver		
2013	*N*		16		
	mean	32.06	1.11	2.11	0.47
	median	**32.00**	**1.15**	**2.20**	**0.38**
	min	29.00	0.78	1.50	0.29
	max	35.00	1.46	2.60	0.98
	sd	1.53	0.18	0.35	0.19
2015	*N*		15		
	mean	32.99	1.72	1.90	0.54
	median	**33.50**	**1.58**	**1.91**	**0.44**
	min	30.30	1.07	0.89	0.34
	max	34.60	3.28	2.51	1.26
	sd	1.40	0.63	0.41	0.25

Table 3.3 Hg, Se and Cd concentrations in northern fulmar liver from 2016.

Year		Dry matter	Hg	Se	Cd
		%	mg kg^{-1} ww liver		
2016	*N*		10		
	mean	29.28	0.29	2.45	0.23
	median	**29.45**	**0.29**	**2.41**	**0.20**
	min	27.40	0.10	1.61	0.10
	max	30.90	0.48	4.06	0.51
	sd	1.22	0.12	0.73	0.12

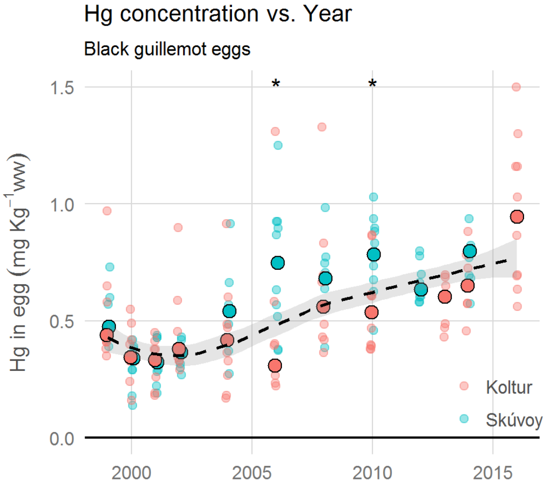

Figure 3.1 Hg concentration in black guillemot eggs from Koltur and Skúvoy from 1999-2016. The two different locations Koltur and Skúvoy are represented by red and blue respectively. The larger data points with a black outline represent the median of a particular year for that particular location. The data have been robust LOESS fitted with a symmetric argument and the 95 % confidence of the fit is shown. The asterix on the top indicates year where there is a significant (p<0.05, by Wilcoxon) difference between two locations.

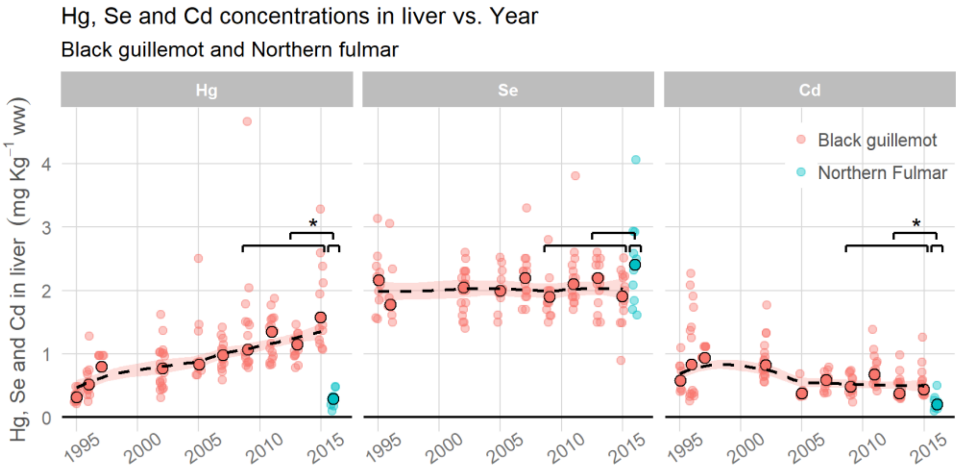

Figure 3.2 Temporal plot of the concentrations of Hg, Se and Cd in liver of black guillemot (red) and northern fulmar (blue). The larger data points with a black outline represent the median of a particular year for that particular species. The black guillemot data have been robust LOESS fitted with a symmetric argument (black dashed line) and the 95 % confidence of the fit is shown. The asterix indicate if there is a significant (p<0.05, by Wilcoxon) difference between the concentrations found in the last four years (2009 – 2015) in black guillemot and northern fulmar.

3.1.2 Black guillemot and northern fulmar liver

The concentration of heavy metals in black guillemot liver was analysed in birds shot for scientific purposes near Sveipur and Tindhólmur, 3 females and 13 males in March-May 2013 and 6 females and 9 males in March-May 2015. The same analysis was done in livers of fledging northern fulmar (n=10) caught (for consumption) close to Vestmanna in August 2016.

The summary results of Hg, Cd and Se in black guillemot and northern fulmar livers are given in Table 3.2 and Table 3.3. The individual results are given in Appendices B and C.

The Hg, Se and Cd concentrations in black guillemot livers from 1995 to 2015 and northern fulmar from 2016 are plotted in Figure 3.2. A comparison of means by Wilcoxon shows that Hg and Cd are significantly higher in black guillemot liver than in northern fulmars. No significant difference is found in the Se concentration in livers of the two species, this is indicated by the asterisk on the different plots in Figure 3.2.

3.1.3 Black guillemot and northern fulmar feathers

The feathers of black guillemots sampled in 2013 and 2015 and northern fulmars sampled in 2016 were analysed for Hg. A summary of the results is shown in Table 3.4 and Table 3.5. Individual results are shown in Appendices B and C.

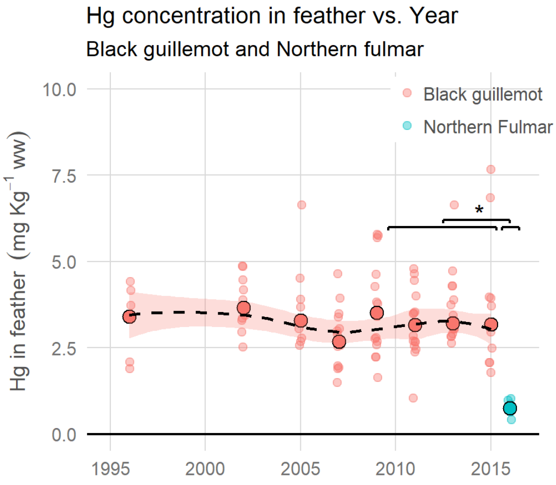

Figure 3.3 Temporal data of the Hg concentration in black guillemot (red) and northern fulmar (blue) feathers from 1996 to 2016. The larger data points with a black outline represent the median of particular species and year. The data has been LOESS fitted with a symmetric argument and the 95 % confidence of the fit is shown. The asterix indicate if there is a significant (p<0.05, by Wilcoxon) difference between the concentrations found in the last four years in black guillemot and northern fulmar.

The Hg concentrations in feather (under wing) of black guillemot from 1996 to 2016 and northern fulmar from 2016 have been plotted in Figure 3.3. The mean feather Hg concentration in black guillemot over the last four monitored years (2009 – 2015) was significantly higher ($p < 0.5$, by Wilcoxon) than in the 2016 northern fulmar, this is also true when comparing the whole dataset.

Table 3.4 Hg in black guillemot feathers from 2013 and 2015.

Year		Dry matter %	Hg mg kg^{-1} ww feather
2013	*N*	16	
	mean	77.19	3.61
	median	**74.85**	**3.21**
	min	65.90	2.63
	max	91.80	6.64
	sd	7.41	1.01
2015	*N*	15	
	mean	76.35	3.56
	median	**78.90**	**3.18**
	min	60.20	1.78
	max	92.50	7.67
	sd	10.20	1.64

Table 3.5 Hg in northern fulmar feathers from 2016.

Year		Dry matter %	Hg mg kg^{-1} ww feather
2016	*N*	10	10
	mean	77.08	0.77
	median	**78.00**	**0.76**
	min	69.10	0.42
	max	84.00	1.02
	sd	5.21	0.18

Table 3.6 Hg in cod muscle.

Year		Length cm	Dry matter %	Hg mg kg^{-1} ww muscle
2013	*N*	25 (13 indv, 2 pooled (6, 6 indv))		
	mean	49.4	20.1	0.083
	median	**49.0**	**20.3**	**0.073**
	min	42.0	18.4	0.052
	max	57.0	20.6	0.209
	sd	4.3	0.5	0.037
2014	*N*	25 (13 indv, 2 pooled (6, 6 indv))		
	mean	48.5	20.8	0.035
	median	**48.5**	**20.9**	**0.036**
	min	42.5	20.0	0.021
	max	53.5	21.6	0.049
	sd	2.8	0.4	0.006
2015	*N*	27 (15 indv, 2 pooled (6, 6 indv)		
	mean	48.5	20.1	0.048
	median	**48.5**	**20.1**	**0.048**
	min	44.0	19.6	0.039
	max	53.5	20.9	0.062
	sd	2.2	0.4	0.005
2016	*N*	28 (15 indv, 3 pooled (5, 5, 3 indv)		
	mean	50.5	21.0	0.034
	median	**50.0**	**20.9**	**0.030**
	min	45.0	20.3	0.017
	max	56.0	22.2	0.070
	sd	2.9	0.6	0.015

Figure 3.4 shows the Hg concentrations (log-transformed) in feather vs. liver in black guillemot and northern fulmar, along with the linear regression models fitted on the northern fulmar data (blue), and the black guillemot data differentiated by the location they were sampled (Sveipur and Tindhólmur, red and green respectively). The feather and liver Hg concentrations have a significant linear correlation for northern fulmar and black guillemot at Tindhólm location, p-values of 1.1e-6 and 0.0015 respectively. However the linear model of the Tindhólm data only explains around 20 % of the variance, appose to the near 96 % of the variance explained by the linear model of the norther fulmar data. In contrast, the linear model of the black guillemot sampled at Sveipur indicates no correlation between the Hg concentration in feather and liver.

3.2 Cod

Cod muscle samples from 2013, 2014, 2015 and 2016 were analysed for Hg and a summary of the results is shown in Table 3.6. Individual results and data on biological parameters are reported in Attachment E.

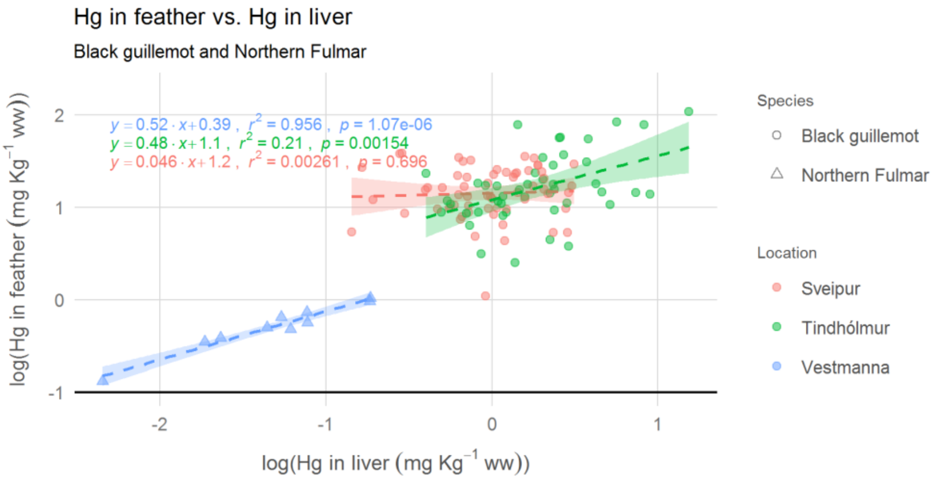

Figure 3.4 Log transformed Hg concentration in feather vs. Hg concentration in liver of black guillemot (circle) at two different locations Sveipur (red) and Tindhólm (green) and northern fulmar (triangle) at Vestmanna (blue). The dashed lines indicate a linear fit of the data and the 95 % confidence interval is depicted, the equations for each line is printed. One individual black guillemot with an Hg concentration in feather of 19.8 was treated as an outlier.

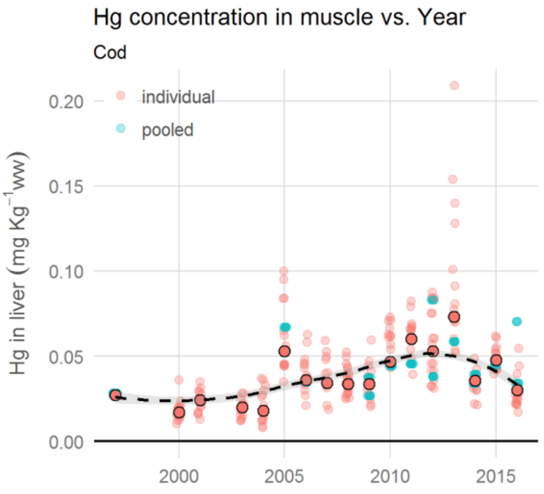

Figure 3.5. Temporal data of the Hg concentration in cod (fork-length 40 – 60 cm and total weight 500 – 2500 g) muscle from the Faroe Shelf from 1997 to 2016, individual and pooled samples, red and blue respectivly. The larger data points with a black outline represent the median of that particular year. The data has been LOESS fitted with a symmetric argument and the 95 % confidence of the fit is shown.

Of the cod livers analysed, the highest concentrations were found in 2013. The 2013 analyses showed some of the highest individual Hg concentrations found in the last 20 years, see Figure 3.5. These high mean and individual concentrations were however not found the following years (2014-2016).

In Figure 3.5 it is also possible to compare the individual cod samples (red dots) and the pooled cod muscle samples (blue dots), the pooled samples consist of 3 – 6 individuals each. It can be observed that the pooled samples generally lie within the spread of the individuals samples, with the exception of one of the pooled samples of 2016, however this sample consisted of the three largest cods sampled that year. The pooled sampling method can thus be used as a good representation of a year, however the true variation between individuals is lost and further statistical analysis can be difficult when only a few data point represent each year.

Therefore, from this point on, the pooled sampling method will no longer be part of the monitoring programme of cod, as these do not provide any additional information to the temporal data analysis.

3.3 Pilot whale

Table 3.7 Heavy metals (Hg and Se) in muscle tissue from juvenile pilot whales from 2013 to 2016.

			Dry matter	Hg	Se
Year	Date		%	mg kg^{-1} ww muscle	
2013	30-jul	*N*	(1 female and 6 males)		
		mean	30.1	2.0	1.0
		median	**30.0**	**2.0**	**1.0**
		min	26.0	1.5	0.8
		max	33.0	2.6	1.3
		sd	2.4	0.4	0.2
	08-aug	*N*	(4 females and 6 males)		
		mean	29.4	1.6	1.0
		median	**29.0**	**1.6**	**1.0**
		min	26.0	1.2	0.8
		max	32.0	2.4	1.3
		sd	1.5	0.4	0.2
2015	06-jun	*N*	(1 female and 5 males)		
		mean	29.2	1.7	0.9
		median	**29.4**	**1.8**	**0.9**
		min	28.5	1.0	0.7
		max	29.6	2.5	1.3
		sd	0.4	0.5	0.2
	23-jul	*N*	(7 males)		
		mean	28.7	2.2	1.0
		median	**28.4**	**2.1**	**1.0**
		min	27.4	1.2	0.8
		max	30.5	3.3	1.2
		sd	1.2	0.8	0.2
2016	06-jul	*N*	(9 males)		
		mean	26.6	1.8	0.6
		median	**26.7**	**1.7**	**0.6**
		min	25.2	0.7	0.6
		max	27.9	2.8	0.7
		sd	0.7	0.7	0.1
	26-jul	*N*	(12 males)		
		mean	30.3	2.0	0.9
		median	**30.3**	**1.9**	**0.9**
		min	27.4	1.5	0.7
		max	33.0	2.9	1.0
		sd	1.7	0.4	0.1
	07-nov	*N*	(4 males)		
		mean	27.6	2.1	0.9
		median	**27.6**	**2.1**	**0.8**
		min	26.5	1.7	0.7
		max	28.8	2.4	1.1
		sd	1.1	0.3	0.2

Pilot whales sampled in 2013, 2015 and 2016 were analysed for Hg and Se in muscle, Hg, Se and Cd in liver, and Cd in kidney. The summary of the results from the heavy metal analyses in the various tissues are shown in Table 3.7 to Table 3.9, the complete datasets for each individual whale are provided in Appendix D.

3.3.1 Muscle

A summary of the results of the heavy metals (Hg and Se) analyses in juvenile pilot whale muscle is given in Table 3.7. The concentrations of Hg and Se in juvenile pilot whale muscle samples from the present, as well as previous studies from 1994 onwards are shown in Figure 3.7.

It is well documented that the Hg concentration increases with age in pilot whales due to accumulation (Caurant et al., 1994, 1993; Dam, 2000). Age is not a parameter that is easily measured in pilot whales; for the young individuals however, length may be used as

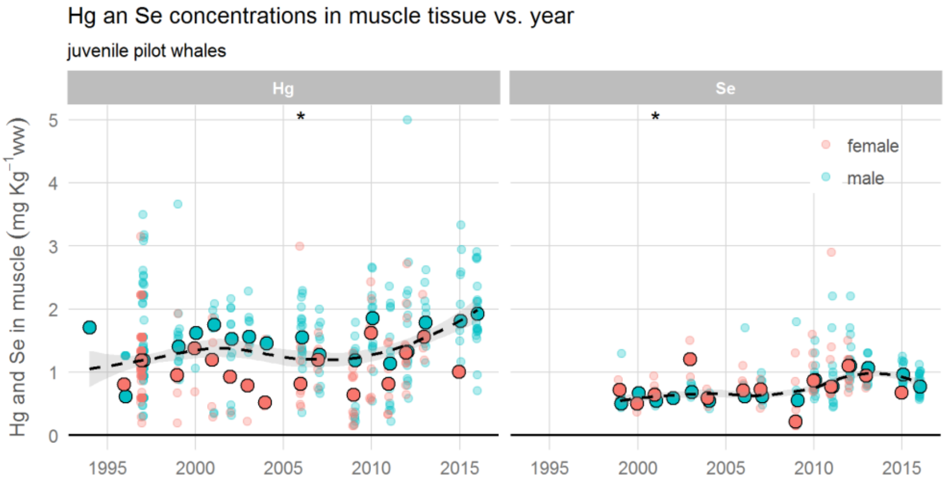

Figure 3.7 Time series of the concentrations of Hg and Se in muscle tissue of juvenile pilot whales, female (red) and male (blue).The larger data points with a black outline represent the median of a particular pod for that particular Sex. The data has been robust LOESS fitted (black dashed line) and the 95 % confidence of the fit is shown. The asterix on the top indicates year where there is a signifivant (p<0.05, by Wilcoxon) difference between male and female concentrations

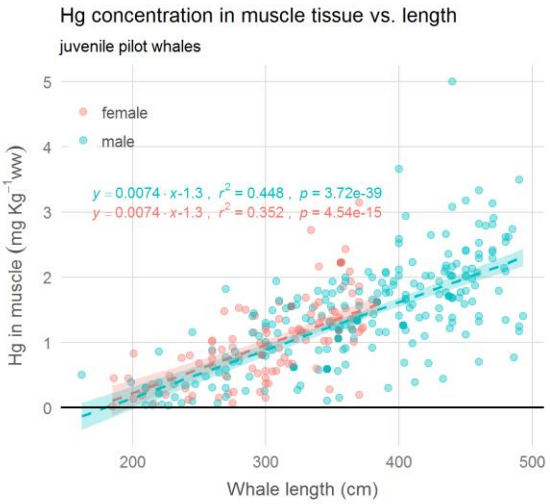

Figure 3.8 Hg concentration in muscle tissue of juvenile pilot whales plotted against the whale length (cm), females (red) and males (blue). The dashed lines indicate a linear fit of the data and the 95 % confidence interval is depicted, the equations for each fit is also printed.

a proxy for age (Bloch et al., 1993). In Figure 3.8 the Hg muscle concentration in juvenile pilot whales (males and females) is plotted against the whale length. The figure contains all of the available data, i.e. this current study along with previous studies, and the linear fit shows that there is a significant ($p < 0.05$) correlation between the Hg muscle concentration and the whales length, both for female and male whale; however, this linear fit only explains around 40 % of the variation in the data.

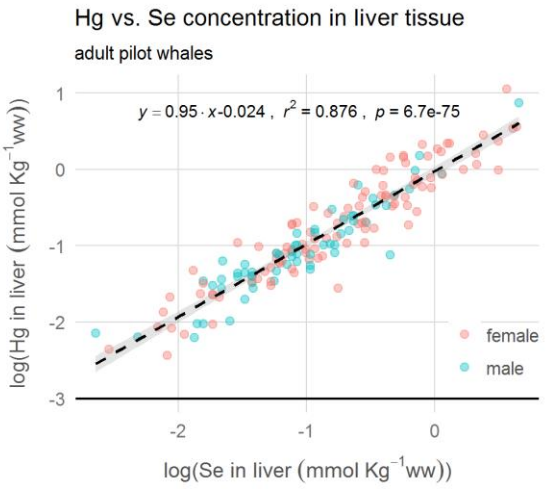

Figure 3.6 Log transformed Se and Hg concentrations in liver samples of female (red) and male (blue) adult pilot whales from year 2001 to 2016. A linear regression model has been fitted to the data, the equation is printed on the plot. One individual whale with Hg conc of 3.52 mg kg^{-1} (the lowest concentration recorded) was considered an outlier.

3.3.2 Liver

Heavy metals Hg, Se and Cd were analysed in adult pilot whale liver tissue. A summary of the results are shown in Table 3.8 and depicted in Figure 3.10 along with the results from previous years.

The median Hg, Se and Cd concentrations in liver of adult pilot whales since 2001 were 74, 30 and 26 mg kg^{-1} ww respectively.

Table 3.8 The heavy metals (Hg, Se and Cd) in pilot whale liver tissue in adults from year 2013 to 2016.

Year	Date		Dry matter %	Hg mg kg^{-1} ww liver	Se mg kg^{-1} ww liver	Cd mg kg^{-1} ww liver
2013	30-jul	*N*	7 (3 females and 4 males)			
		mean	28.6	77.9	25.9	13.8
		median	**28.0**	**72.9**	**20.0**	**10.4**
		min	27.0	43.8	14.0	5.2
		max	31.0	162.0	53.0	23.7
		sd	1.7	40.7	13.3	7.9
	08-aug	*N*	6 (3 females and 3 males)			
		mean	26.0	144.0	42.8	16.8
		median	**25.5**	**158.5**	**44.3**	**16.2**
		min	25.0	42.4	15.0	6.6
		max	28.0	238.0	75.0	24.1
		sd	1.3	86.8	25.1	6.3
2015	06-jun	*N*	5 (2 females and 3 males)			
		mean	29.0	61.1	30.0	26.6
		median	**29.0**	**53.1**	**23.0**	**26.5**
		min	28.4	22.2	12.1	2.2
		max	29.5	125.0	63.9	59.1
		sd	0.5	39.5	21.2	22.2
	29-jun	*N*	8 (1 females and 7 males)			
		mean	28.9	94.3	40.3	17.1
		median	**29.1**	**75.2**	**35.7**	**14.7**
		min	28.1	42.3	19.2	8.9
		max	29.4	160.0	71.8	29.9
		sd	0.5	41.0	17.2	7.6
2016	06-jul	*N*	6 (4 females and 2 males)			
		mean	27.5	122.6	44.9	39.3
		median	**27.5**	**103.0**	**40.5**	**42.4**
		min	26.3	47.7	19.9	22.0
		max	28.6	282.0	87.4	51.3
		sd	1.0	84.9	24.9	12.1
	26-jul	*N*	4 (4 males)			
		mean	27.0	75.4	27.3	24.7
		median	**27.2**	**70.3**	**24.9**	**23.6**
		min	26.2	51.9	18.0	11.9
		max	27.5	109.0	41.4	39.7
		sd	0.6	24.2	10.1	12.8
	07-nov	*N*	5 (5 females)			
		mean	26.5	141.0	42.9	39.1
		median	**25.7**	**120.0**	**40.2**	**34.8**
		min	24.5	19.0	6.2	21.2
		max	29.2	252.0	83.5	71.1
		sd	1.9	89.5	27.9	19.5

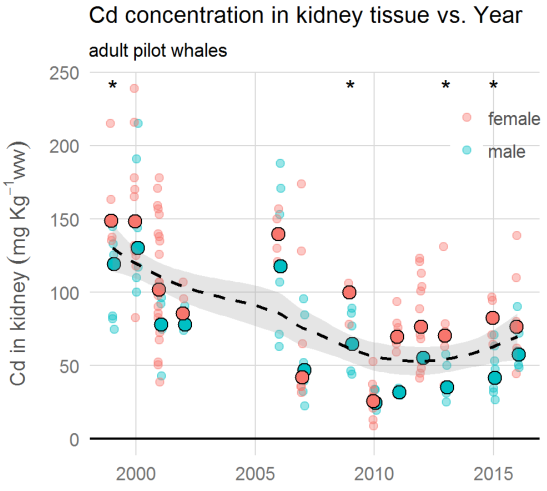

*Figure 3.9 Temporal data of the Cd concentration in kidney tissue of adult pilot whales from 1999 to 2016. Female and male whale are represented by red and blue respectively. The larger data points with a black outline represent the median of that particular year. The data has been **robust** LOESS fitted (dashed lines) and the 95 % confidence of the fit is shown. The asteriks on the top indicates years where there is a signifivant ($p<0.05$, by Wilcoxon) difference between male and female concentrations.*

Figure 3.6 shows Hg vs. Se in liver tissue of adult pilot whales, there is a significant (r^2 =0.87, $p < 0.05$) linear correlation between the two elements.

A liver Hg level of 60 mg kg^{-1} ww has been suggested as a negative effects threshold level in marine mammals (Law, 1996).

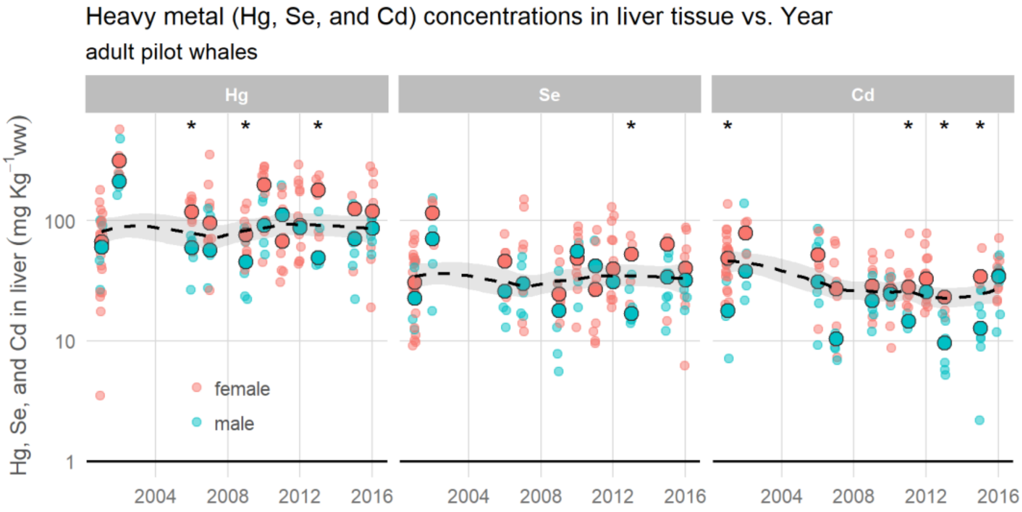

*Figure 3.10 Time series of Hg, Se and Cd concentrations (log scale) measured in adult pilot whale livers from 2001 until 2016. Female and male whale are represented by red and blue respectively. The larger data points with a black outline represent the median of that particular year. The data has been **robust** LOESS fitted (dashed lines) and the 95 % confidence of the fit is shown. The asterix on the top indicates year where there is a signifivant ($p<0.05$, by Wilcoxon) difference between male and female concentrations.*

Table 3.10 Hg and Se concentration in Arctic char muscle from 2014.

Year		Length	Dry matter	Hg	Se
		cm	%	mg kg^{-1} ww muscle	
2014	*N*	19			
	mean	25.0	24.1	0.21	1.88
	median	**24.0**	**23.3**	**0.21**	**1.87**
	min	20.4	20.6	0.14	1.73
	max	33.0	36.1	0.34	2.23
	sd	3.1	3.5	0.06	0.11

Table 3.11 Hg and Se concentration in brown trout muscle from 1999 – 2000.

Year		Length	Dry matter	Hg	Se
		cm	%	mg kg^{-1} ww muscle	
1999	*N*	12			
	mean	22.71	22.94	0.13	1.19
	median	**23.75**	**22.95**	**0.14**	**1.12**
	min	15.00	21.90	0.05	1.07
	max	30.00	24.00	0.19	1.45
	sd	4.82	0.62	0.05	0.13
2000	*N*	5			
	mean	27.70	23.30	0.13	1.13
	median	**29.00**	**23.40**	**0.14**	**1.18**
	min	20.00	22.70	0.08	0.98
	max	34.00	23.90	0.18	1.23
	sd	5.09	0.46	0.04	0.11

Similarly, a range from 20 to 200 mg kg^{-1} ww of Cd in liver has been suggested to be the threshold for potential organ dysfunction in marine mammals (Law, 1996).

3.3.3 Kidney

Kidney samples from adult pilot whales were analysed for Cd. The results summaries are shown in Table 3.9, and individual results are found in Appendix D.

The threshold for potential kidney dysfunction in marine mammals due to Cd contamination may be in the range of 200-400 mg/kg ww (Law, 1996). The maximum kidney Cd concentration measured in these 60 individuals was 139 mg kg^{-1}, thus all were below the suggested limit range.

The Cd kidney concentration in adult pilot whales from years 1999 to 2016 has been depicted in Figure 3.9.

3.4 Arctic char and brown trout

Arctic char and brown trout muscle was analysed for Hg and Se. The summary results of heavy metals in Arctic char and brown trout are shown in Table 3.10 and Table 3.11 and individual results are found in Appendix F and G.

The Hg and Se concentrations measure in Arctic char and trout muscle from 1997 until now have been plotted in Figure 3.11.

Table 3.9 Cd in pilot whale kidney in adults from 2013 to 2016.

Year	Date		Dry matter	Cd
			%	mg kg^{-1} ww kidney
2013	30. jul	*N*	7 (3 females and 4 males)	
		mean	26.4	56.5
		median	**25.4**	**36.7**
		min	24.3	25.1
		max	34.1	131.0
		sd	3.5	37.3
	08. aug	*N*	6 (3 females and 3 males)	
		mean	26.0	54.0
		median	**25.3**	**53.9**
		min	22.6	33.3
		max	31.0	78.4
		sd	2.9	17.7
2015	06. jun	*N*	4 (3 females and 1 male)	
		mean	25.7	73.3
		median	**24.4**	**67.7**
		min	23.5	63.4
		max	30.4	94.6
		sd	3.2	14.6
	29. jun	*N*	8 (1 female and 7 males)	
		mean	22.8	50.5
		median	**22.5**	**44.7**
		min	20.9	26.8
		max	25.4	96.7
		sd	1.5	23.3
	23. jul	*N*	1 (1 male)	
		mean	26.9	40.1
		median	**26.9**	**40.1**
		min	26.9	40.1
		max	26.9	40.1
		sd	-	-
2016	06. jul	*N*	6 (4 females and 2 males)	
		mean	27.6	73.1
		median	**25.5**	**74.4**
		min	22.6	57.9
		max	35.9	90.1
		sd	5.5	11.9
	26. jul	*N*	4 (4 males)	
		mean	30.2	53.6
		median	**31.1**	**52.9**
		min	26.6	48.6
		max	32.1	60.1
		sd	2.5	5.1
	07. nov	*N*	5 (5 females)	
		mean	29.2	89.1
		median	**29.4**	**77.0**
		min	23.2	44.6
		max	33.5	138.8
		sd	4.3	36.2

The Hg concentrations in Arctic char and brown trout muscle are comparable, the difference between the two was found to be non-significant ($p > 0.5$, Wilcoxon) for year 2000 for which Hg data of both Arctic char and brown trout are available. Whereas the Se concentrations in brown trout were found to be slightly lower than that measured in Arctic char ($p < 0.05$, Wilcoxon) for year 2000, see Figure 3.11.

Brown trout sampled in the period 1997 to 2000 in four different lakes: Fjallavatn, Leitisvatn, Lítlavatn, and Stóravatn have been analysed for Hg and Se, see Figure 3.12.

Table 3.12 Hg, Cd and Se concentration in lamb and ewe (juvenile and adult female) liver samples.

Year	Maturity	Bulk ID	N	Dry matter %	Hg*	Se	Cd
						mg kg^{-1} ww liver	
2013	Lamb	Oa-2013-1	5	35.0	<0.010	0.240	0.020
		Oa-2013-2	5	34.0	<0.010	0.490	0.020
	Sheep	Oa-2013-3	5	35.0	0.014	0.460	0.100
		Oa-2013-4	5	32.0	0.017	0.515	0.120
2015	Lamb	Oa-2015-1	5	30.7	<0.010	0.301	0.015
		Oa-2015-2	5	31.4	<0.010	0.330	0.024
	Sheep	Oa-2015-3	5	30.9	<0.010	0.453	0.127
		Oa-2015-4	5	31.1	<0.010	0.438	0.059

*Detection limit for Hg was 10 µg/kg. In statistical analysis values below detection limit were replaced by half the value of the detection limit.

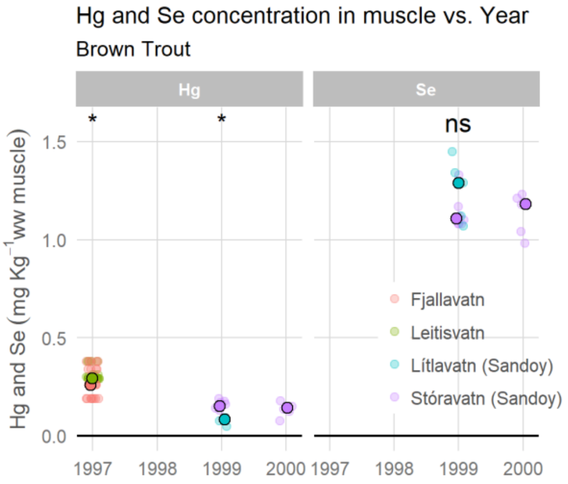

Figure 3.12 Se and Hg concentrations in brown trout muscle from 1997 to 2000 sampled at different locations. The larger data points with a black outline represent the median of that particular location that year. The asteriks on the top indicates years where there is a significant (p<0.05, by Wilcoxon) difference between sampling locations, whereas a non significant difference is indicated by "ns" (p>0.05).

3.5 Sheep

Livers from adult females (sheep, ewe) and juveniles (lamb) were analysed for Hg, Se, and Cd. The results of the heavy metal analyses on the pooled samples are shown in Table 3.12 and can be found in Appendix H. The Hg concentration was below the detection limit in the lambs from 2013 and in both groups in 2015. The Cd concentrations were much higher in ewes than in the lambs (statistically significant p > 0.05, Wilcoxon, see Figure 3.13). The Se concentrations also appear to be higher in ewes although the differences between groups are not as distinct as for Cd.

The sheep livers were analysed as pooled samples and the individual variations can thus not be evaluated. Sheep have been analysed for metals since 1997 (some as individual and some as pooled samples) and the liver Cd concentrations are shown in Figure 3.13.

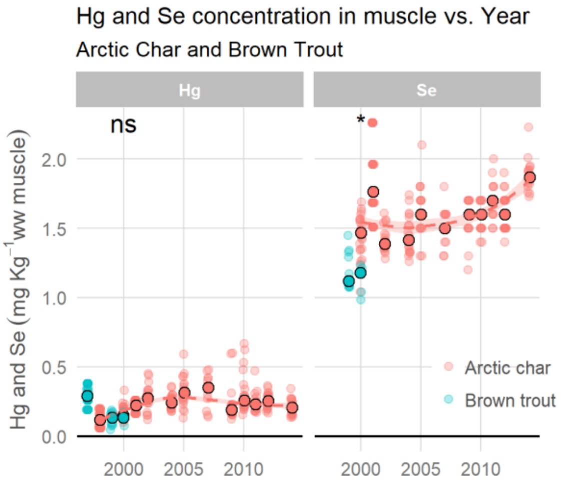

Figure 3.11 Time series of Se and Hg concentrations in Arctic char and trout muscle from 1997 to 2014. The larger data points with a black outline represent the median of that particular species that year. The data has been ***robust*** *LOESS fitted and the 95 % confidence of the fit is also shown. The asteriks on the top indicates years where there is a significant (p<0.05, by Wilcoxon) difference between sampling locations, and non significant "ns" (p>0.05)..*

The location from which sheep have been sampled has changed during the years and Figure 3.13 indicates that the pasture location seem to be important for the Cd concentrations. The Cd concentrations are similar in Vestmanna from 1997 to 2001 and in Norðradalur from 2008 to 2015, but the concentrations in Vestmanna were much higher than in Norðradalur and in Koltur.

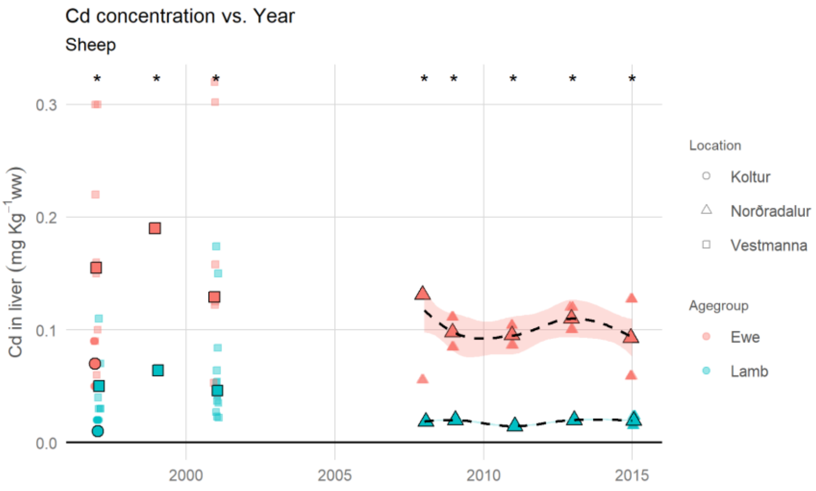

Figure 3.13 Time series of the Cd concentration in liver tissue of sheep. Ewe and lamb represented by red and blue respectively, sampled at three different locations. The larger data points with a black outline represent the median of that particular year and location. The data from Norðrdalur has been ***robust*** *LOESS fitted (dashed lines) and the 95 % confidence of the fit is shown. The asteriks on the top indicates year where there is a signifivant (p<0.05, by Wilcoxon) difference between ewe and lamb concentrations.*

4 Persistent Organic Pollutants

4.1 Black guillemot eggs

Black guillemot eggs were sampled on the islands of Koltur in 2013 and 2014 and Skúvoy in 2014. Eggs were also collected in 2016 from Koltur, but due to difficulties in obtaining an import permit to Canada for avian samples, it was decided to exclude them in this report, these will be analysed in 2017 and thus included in the next report.

The summary of selected pollutants are given in Table 4.1 to Table 4.3 and individual results are available in Appendix A. In Figure 4.1 the data of selected POPs (PCB 153, p,p'-DDE, HCB, and Toxaphene Par. 50) from this work and previous years AMAP monitoring have been plotted.

The temporal data from 1999, when the monitoring of POPs in black guillemot eggs started, indicates that for some POPs the concentrations are decreasing, as is seen for PCB 153, p,p'-DDE, and Toxaphene Par. 50 (Figure 4.1). These latest years of data (2013 and 2014) do show an increase in some of the POPs (e.g. PCB 153, p,p´DDE and HCB) , and somewhat moreso in the eggs from Koltur compared to Skúvoy.

Table 4.1 PCB in black guillemot eggs (µg kg^{-1} lipid weight).

Year	Location		Lipids %	Aroclor 1260	PCB 153 *µg kg^{-1} lw*	PCB5*
2013	Koltur	*N*	7			
		mean	9.1	3271	480	914.5
		median	**8.9**	**3200**	**470**	**879.0**
		min	8.4	2400	370	685.8
		max	10.0	4600	650	1278.3
		sd	0.6	769.7	101.5	205.6
2014	Koltur	*N*	6			
		mean	8.1	4083	586.7	1131.8
		median	**8.8**	**3900**	**560**	**1077.3**
		min	4.7	2700	400	763.6
		max	11.0	6100	900	1687.5
		sd	2.4	1155	171.0	316.7
	Skúvoy	*N*	10			
		mean	9.4	2930	420	804.6
		median	**9.8**	**2750**	**390**	**748.2**
		min	6.1	2100	310	593.3
		max	11.0	4300	600	1181.0
		sd	1.6	673.4	90.6	183.6

* PCB5 is calculated as the sum of PCB 101, 118, 138, 153 and 180, the congers PCB 28 and 52 were all below the detection limit. The concentration of PCB 101 was below LOQ for two samples in 2014, these are included as LOQ/2 in the summary calculations.

Table 4.2 Toxaphene and p,p'-DDE in black guillemot eggs (µg kg^{-1} lipid weight).

Year	Location		Lipids %	par. 26	par. 32	par. 50 *µg kg^{-1} lw*	par. 62	p,p'-DDE
2013	Koltur	*N*	7					
		mean	9.1	15.0	3.5	48.0	12.8	235.7
		median	**8.9**	**13.0**	**3.5**	**45.0**	**12.0**	**210.0**
		min	8.4	9.8	2.7	33.0	8.7	150.0
		max	10.0	24.0	4.5	72.0	18.0	380.0
		sd	0.6	5.4	0.7	14.0	3.0	73.9
2014	Koltur	*N*	6					
		mean	8.1	22.5	4.0	83.2	14.2	246.7
		median	**8.8**	**21.0**	**4.2**	**82.5**	**13.0**	**245.0**
		min	4.7	9.2	2.4	34.0	7.0	190.0
		max	11.0	38.0	5.8	150.0	23.0	340.0
		sd	2.4	12.9	1.2	46.9	6.5	56.1
	Skúvoy	*N*	10					
		mean	9.4	11.7	1.7	44.6	10.8	184.0
		median	**9.8**	**11.0**	**1.7**	**45.0**	**11.0**	**180.0**
		min	6.1	8.7	1.0	32.0	7.8	140.0
		max	11.0	16.0	2.3	57.0	15.0	260.0
		sd	1.6	2.7	0.4	7.1	2.4	32.4

Table 4.3 Organochlorine pesticides in black guillemot eggs (µg kg^{-1} lipid weight).

Year	Location		Lipids	Trans(α)-nonachlor	Cis(γ)-nonachlor	Oxy-chlordane	Mirex	HCB	β-HCH
			%	µg kg^{-1} lw					
2013	Koltur	*N*	7						
		mean	9.1	9.6	22.0	30.0	37.1	167.1	14.9
		median	**8.9**	**8.7**	**21.0**	**28.0**	**36.0**	**170.0**	**14.0**
		min	8.4	5.8	14.0	23.0	29.0	140.0	11.0
		max	10.0	14.0	29.0	39.0	49.0	190.0	19.0
		sd	0.6	2.7	5.5	6.1	7.2	16.0	3.0
2014	Koltur	*N*	6						
		mean	8.1	14.2	32.3	37.5	47.5	218.3	16.5
		median	**8.8**	**12.5**	**32.0**	**35.0**	**44.0**	**195.0**	**13.0**
		min	4.7	7.4	18.0	20.0	35.0	150.0	11.0
		max	11.0	27.0	53.0	65.0	74.0	340.0	27.0
		sd	2.4	7.4	14.2	18.1	14.2	73.1	6.4
	Skúvoy	*N*	10						
		mean	9.4	10.7	20.8	21.6	37.0	150.0	12.2
		median	**9.8**	**10.2**	**20.0**	**21.5**	**32.5**	**145.0**	**12.0**
		min	6.1	7.7	14.0	16.0	27.0	120.0	9.6
		max	11.0	18.0	28.0	26.0	52.0	210.0	15.0
		sd	1.6	3.1	4.8	3.2	8.8	24.9	1.6

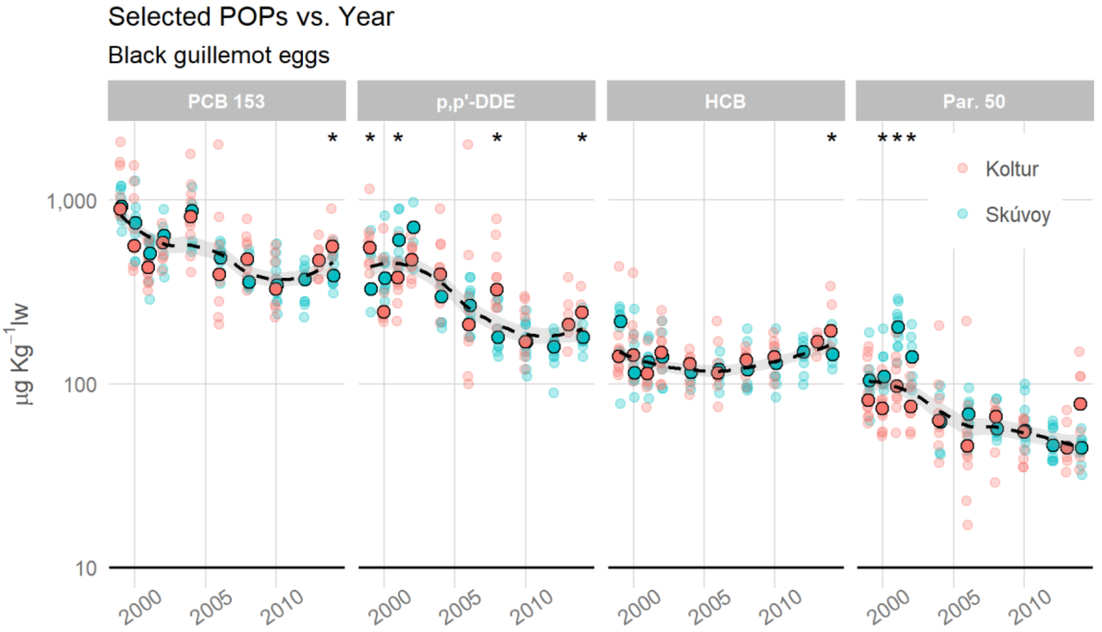

*Figure 4.1 Selected POPs (PCB 153, p,p'-DDE, HCB, and Par. 50) (on a log-scale) in black guillemot eggs from Koltur (red) and Skúvoy (blue) in the years 1998 – 2014. The larger data points with a black outline represent the median of that particular location per year. The data has been **robust** LOESS fitted and the 95 % confidence of the fit is also shown. The asteriks on the top indicates year where there is a signifivant (p<0.05, by Wilcoxon) difference between location concentrations.*

4.2 Cod

The cod livers from 2013, 2014, 2015, and 2016 were analysed for POPs. The summaries of selected POPs are shown in Table 4.4 and Table 4.5 and the individual POP results are given in Attachment E.

Analysis of selected POPs in cod from the Faroe Shelf has been carried out since 1994, the temporal data of PCB 153, p,p'-DDE, HCB, and par. 50 are plotted in Figure 4.2. Unlike in other species POP concentrations in cod liver have not shown a decreasing trend since 1994 and the concentrations have been very variable since 2010. Although the concentrations in 2014 and 2016 had low variability and the median concentrations were at the same level as in the years before 2010, the highest concentration of many of the POPs was in 2015 even the highest since 1994 for some of the POPs e.g. for PCB 153 and p,p'-DDE plotted in Figure 4.2.

Table 4.4 Selected PCBs, Toxaphene parlars and p,p-DDE in in cod liver (µg kg^{-1} lipid weight).

Year		Lipids %	Aroclor 1260	PCB 153	PCB 138	Par. 26	Par. 50	p,p'-DDE
			µg kg-1 lw					
2013	*N*	25 (13 individual, 2 pooled)						
	mean	37.4	453.2	60.6	26.2	16.7	28.0	48.5
	median	**41.0**	**460.0**	**61.0**	**27.0**	**15.0**	**27.0**	**47.0**
	min	7.4	230.0	31.0	13.0	9.6	15.0	29.0
	max	54.0	840.0	120.0	48.0	29.0	51.0	93.0
	sd	10.2	139.7	19.4	8.3	4.9	8.7	13.1
2014	*N*	25 (13 individual, 2 pooled)						
	mean	57.5	117.8	15.3	7.2	6.6	13.8	16.6
	median	**58.0**	**110.0**	**14.0**	**6.7**	**5.9**	**12.0**	**16.0**
	min	44.0	88.0	11.0	5.4	5.7	12.0	12.0
	max	67.0	215.0	28.0	13.0	10.5	21.5	28.0
	sd	3.6	26.5	3.6	1.6	1.3	2.8	3.5
2015	*N*	27 (16 individual, 2 pooled)						
	mean	22.9	661.9	84.6	42.0	19.0	25.9	85.4
	median	**22.0**	**630.0**	**81.0**	**39.0**	**18.5**	**22.0**	**79.0**
	min	2.7	140.0	19.0	8.7	6.6	8.4	25.0
	max	62.0	1500.0	190.0	100.0	46.0	79.0	200.0
	sd	10.5	310.3	38.8	19.9	6.5	13.5	35.3
2016	*N*	28 (15 individual, 3 pooled)						
	mean	50.3	117.3	14.5	8.1	6.3	11.7	18.4
	median	**49.0**	**115.0**	**14.5**	**8.1**	**6.0**	**11.0**	**17.8**
	min	36.0	82.5	10.0	5.4	4.9	9.2	13.5
	max	60.0	150.0	20.0	10.0	9.6	17.0	26.0
	sd	5.3	16.8	2.3	1.2	1.1	1.8	2.9

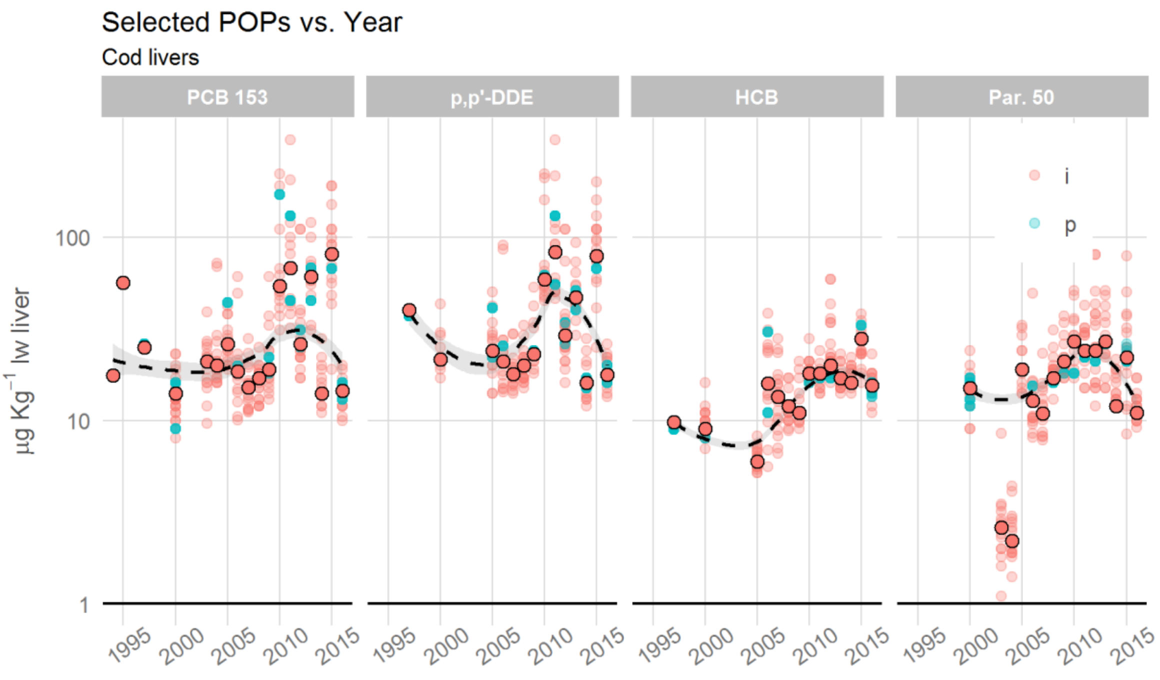

*Figure 4.2 Selected POPs (PCB 153, p,p'-DDE, HCB, and Par. 50) in cod livers from 1994 to 2016, red and blue point represent individual and pooled samples respectively. The larger red data points with a black outline represent the median of that particular year. The data has been **robust** LOESS fitted and the 95 % confidence of the fit is also shown.*

Table 4.5 Organochlorine pesticides in cod liver (µg µg kg^{-1} lipid weight).

Year		Lipids	Trans(α)-nonachlor	α-chlordane	Cis(γ)-nonachlor	Oxychlordane	Mirex	HCB*
		%			µg kg^{-1} lw			
2013	*N*	25 (13 individual, 2 pooled)						
	mean	37.4	25.7	7.4	11.4	7.8	5.2	17.2
	median	**41.0**	**26.0**	**7.1**	**12.0**	**7.6**	**5.4**	**17.0**
	min	7.4	14.0	4.5	6.4	4.5	2.5	14.0
	max	54.0	45.0	13.0	20.0	16.0	12.0	23.0
	sd	10.2	7.3	2.1	3.3	2.7	2.0	2.0
2014	*N*	25 (13 individual, 2 pooled)						
	mean	57.5	7.1	4.1	3.2	2.0	0.8	17.0
	median	**58.0**	**6.5**	**3.7**	**2.9**	**1.7**	**0.8**	**16.0**
	min	44.0	5.9	3.5	2.5	1.6	0.5	14.0
	max	67.0	13.0	6.3	5.5	3.3	1.4	22.0
	sd	3.6	1.7	0.7	0.8	0.5	0.2	1.8
2015	*N*	27 (16 individual, 2 pooled)						
	mean	22.9	34.7	8.7	14.9	8.2	5.5	27.7
	median	**22.0**	**35.0**	**8.2**	**14.0**	**8.1**	**5.5**	**28.0**
	min	2.7	8.1	3.5	3.4	3.1	1.7	16.0
	max	62.0	69.0	24.0	30.0	17.0	8.8	38.0
	sd	10.5	11.7	3.8	5.1	2.4	1.7	5.4
2016	*N*	28 (15 individual, 3 pooled)						
	mean	50.3	7.5	4.2	3.2	2.2	0.9	15.3
	median	**49.0**	**7.6**	**4.1**	**3.1**	**2.1**	**0.8**	**15.5**
	min	36.0	5.8	2.7	2.5	1.5	0.6	11.0
	max	60.0	9.8	6.4	4.4	3.2	1.4	23.0
	sd	5.3	1.0	0.8	0.5	0.4	0.2	2.3

* Some uncertainty about the 2015 and 2016 HCB results should be observed, as intercalibration revealed a tendency for slightly elevated HCB in fish matrixes.

4.3 Pilot whale

In pilot whales, as with other mammals, parameters like age and sex are important when assessing POP concentration. The age of pilot whales may be determined by analysis of the teeth, however, the age is correlated to length until they reach maturity (Bloch et al., 1993), which makes the juvenile whales the group of choice for analysis of possible trends in POPs concentrations. Thus, blubber from juvenile pilot whales was analysed for PCBs, DDTs, toxaphenes and other organochlorine pesticides. The Summaries of selected POPs are shown in Table 4.6 to Table 4.9 below, and the individual data and results are given in Attachment D.

Figure 4.3 shows the median PCB 7 (sum of PCBs 28, 52, 101, 118, 138, 153, and 180) concentrations in juvenile pilot whale samples from 1996 to 2016.

For the selected POPs plotted in Figure 4.4 and Figure 4.4 the robust LOESS fit suggests a decreasing trend for all of the POPs, however further statistical analysis are necessary to deem if these observations are statistically significant.

Table 4.6 PCBs in blubber from juvenile pilot whales from 2013 to 2016 (µg kg^{-1} lipid weight).

Year	Date		Lipids %	Aroclor 1260	PCB 153	PCB7*
				µg kg^{-1} lw blubber		
2013	30. jul	*N*	7 (1 female and 6 males)			
		mean	75	34429	3829	10857
		median	**76**	**21000**	**2400**	**6510**
		min	67	11000	1200	3620
		max	83	120000	13000	36896
		sd	6	38257	4105	11652
	08. aug	*N*	11 (5 females and 6 males)			
		mean	76	22173	2500	6936
		median	**77**	**12000**	**1400**	**3929**
		min	61	7900	900	2611
		max	86	60000	6700	18559
		sd	7	16070	1784	4805
2015	06. jun	*N*	11 (11 males)			
		mean	75	16619	1914	5445
		median	**77**	**13964**	**1649**	**4641**
		min	68	5826	667	1925
		max	82	40942	4627	12863
		sd	5	9885	1115	3081
	29. jun	*N*	7 (7 males)			
		mean	92	16303	1774	5247
		median	**93**	**10808**	**1193**	**3625**
		min	89	8430	927	2891
		max	95	31614	3301	9756
		sd	2	8678	908	2614
	23. jul	*N*	7 (7 males)			
		mean	82	16276	1840	5051
		median	**89**	**14175**	**1650**	**4437**
		min	32	6252	683	1922
		max	94	33043	3651	10119
		sd	22	9887	1103	3034
2016	06. jul	*N*	8 (8 males)			
		mean	87	17563	2003	5601
		median	**87**	**14214**	**1646**	**4614**
		min	83	9765	1103	3268
		max	90	41559	4632	12383
		sd	2	10480	1154	3060
	26. jul	*N*	12 (12 males)			
		mean	90	13243	1501	4193
		median	**91**	**11152**	**1274**	**3574**
		min	86	8660	980	2826
		max	94	21649	2395	6478
		sd	3	4545	504	1326
	07. nov	*N*	4 (4 males)			
		mean	88	9793	1110	3109
		median	**88**	**9343**	**1066**	**2988**
		min	86	6004	675	1994
		max	91	14484	1633	4465
		sd	2	3985	448	1183

* PCB7 is the sum of PCB 28, 52, 101, 118, 138, 153, and 180. Four individuals in the 30th July 2013 pod had either PCB 52 or PCB 28 and PCB 52 below LOQ, in these cases LOQ/2 was used in the calculations of the summary statistics.

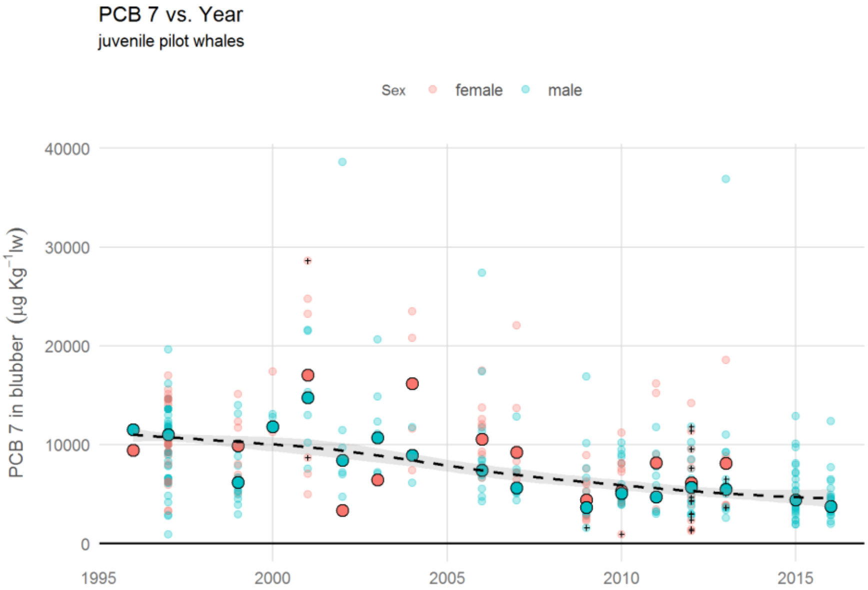

Figure 4.3 Time series of the PCB7 concentration in blubber of juvenile pilot whales from 1999 to 2016. Female and male whale are represented by red and blue respectively. The larger data points with a black outline represent the median of that particular year. The data has been ***robust*** *LOESS fitted (black dashed line) and the 95 % confidence of the fit is also shown. The data points with a black cross indicate sums where ½ of the LOQs have been used (upper bound limits).*

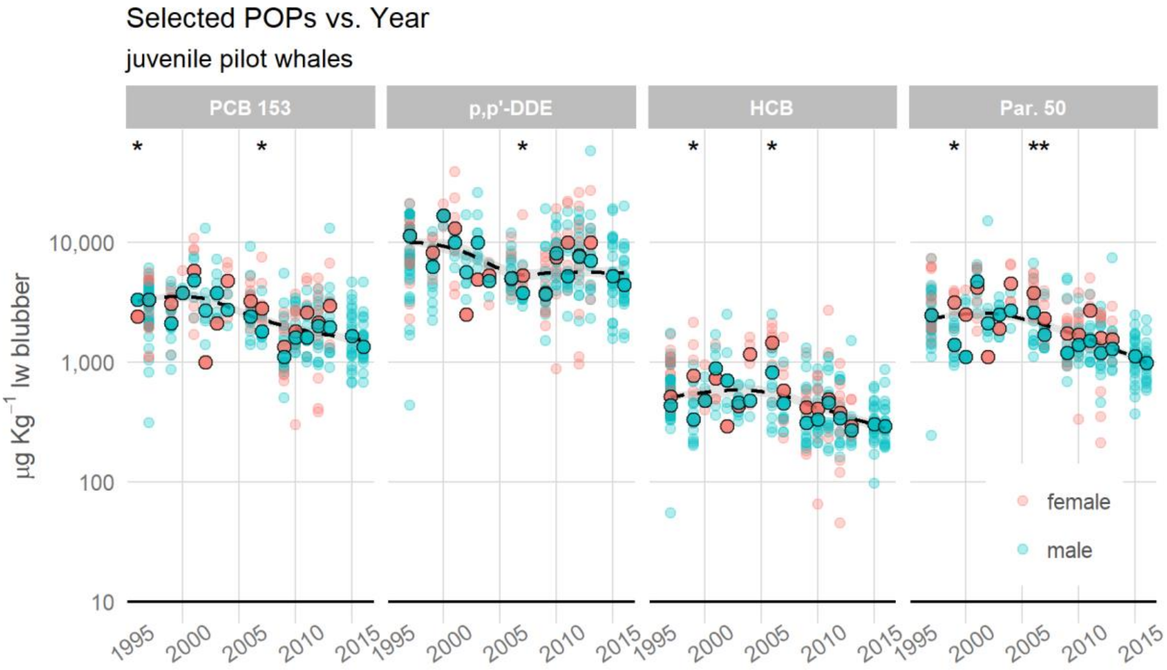

Figure 4.4 Selected POPs (PCB 153, p,p'-DDE, HCB, and Par. 50) (on a log-scale) in juvenile pilot whale blubber, female (red) and male (blue) whales from years years 1996 – 2016. The larger data points with a black outline represent the median of that particular year. The data has been ***robust*** *LOESS fitted and the 95 % confidence of the fit is also shown. The asteriks on the top indicates year where there is a significant (p<0.05, by Wilcoxon) difference between sexes.*

Table 4.7 PCBs in blubber from juvenile pilot whales from 2013 to 2016 (µg kg^{-1} lipid weight).

			Lipids	Aroclor 1260	PCB 153	PCB7*
Year	Date		%	µg kg^{-1} lw blubber		
2013	30. jul	*N*	7 (1 female and 6 males)			
		mean	75	34429	3829	10857
		median	**76**	**21000**	**2400**	**6510**
		min	67	11000	1200	3620
		max	83	120000	13000	36896
		sd	6	38257	4105	11652
	08. aug	*N*	11 (5 females and 6 males)			
		mean	76	22173	2500	6936
		median	**77**	**12000**	**1400**	**3929**
		min	61	7900	900	2611
		max	86	60000	6700	18559
		sd	7	16070	1784	4805
2015	06. jun	*N*	11 (11 males)			
		mean	75	16619	1914	5445
		median	**77**	**13964**	**1649**	**4641**
		min	68	5826	667	1925
		max	82	40942	4627	12863
		sd	5	9885	1115	3081
	29. jun	*N*	7 (7 males)			
		mean	92	16303	1774	5247
		median	**93**	**10808**	**1193**	**3625**
		min	89	8430	927	2891
		max	95	31614	3301	9756
		sd	2	8678	908	2614
	23. jul	*N*	7 (7 males)			
		mean	82	16276	1840	5051
		median	**89**	**14175**	**1650**	**4437**
		min	32	6252	683	1922
		max	94	33043	3651	10119
		sd	22	9887	1103	3034
2016	06. jul	*N*	8 (8 males)			
		mean	87	17563	2003	5601
		median	**87**	**14214**	**1646**	**4614**
		min	83	9765	1103	3268
		max	90	41559	4632	12383
		sd	2	10480	1154	3060
	26. jul	*N*	12 (12 males)			
		mean	90	13243	1501	4193
		median	**91**	**11152**	**1274**	**3574**
		min	86	8660	980	2826
		max	94	21649	2395	6478
		sd	3	4545	504	1326
	07. nov	*N*	4 (4 males)			
		mean	88	9793	1110	3109
		median	**88**	**9343**	**1066**	**2988**
		min	86	6004	675	1994
		max	91	14484	1633	4465
		sd	2	3985	448	1183

* PCB7 is the sum of PCB 28, 52, 101, 118, 138, 153, and 180. Four individuals in the 30th July 2013 pod had either PCB 52 or PCB 28 and PCB 52 below LOQ, in these cases LOQ/2 was used in the calculations of the summary statistics.

Table 4.8 Toxaphene and DDT in blubber from juvenile pilot whales from 2013-2016 (µg kg^{-1} lw).

Year	Date		Par. 26	Par. 32*	Par. 50	Par. 62	p,p'-DDD†	p,p'-DDE	p,p'DDT
			µg kg^{-1} lw blubber						
2013	30-jul	*N*	7 (1 females and 6 males)						
		mean	1680	6	2263	334	1237	15786	893
		median	**1100**	**4**	**1400**	**240**	**780**	**8000**	**630**
		min	540	2	840	180	540	4400	470
		max	5800	15	7400	990	3900	58000	2300
		sd	1834	4	2284	290	1190	18893	641
	08-aug	*N*	11 (5 females and 6 males)						
		mean	992	6	1469	306	743	8855	548
		median	**670**	**7**	**1200**	**300**	**600**	**4300**	**520**
		min	460	1	860	180	390	2300	360
		max	2400	10	2900	540	1700	27000	900
		sd	567	3	628	100	369	7627	156
2015	06-jun	*N*	11 (11 males)						
		mean	906	3	1310	234	778	7052	472
		median	**787**	**3**	**1265**	**235**	**645**	**5520**	**422**
		min	346	2	634	151	287	1806	205
		max	1923	4	2460	373	1536	19115	973
		sd	441	1	490	62	540	5045	220
	29-jun	*N*	7 (7 males)						
		mean	883	3	1143	205	921	8010	482
		median	**729**	**3**	**1074**	**206**	**928**	**4688**	**439**
		min	526	2	718	138	499	3797	347
		max	1548	5	1687	304	1336	18342	703
		sd	371	1	346	58	419	5360	140
	23-jul	*N*	7 (7 males)						
		mean	716	3	1029	156	513	5241	371
		median	**567**	**3**	**854**	**163**	**385**	**4461**	**336**
		min	219	2	369	83	296	1574	159
		max	1559	4	2046	242	859	10652	661
		sd	498	1	641	61	303	3483	211
2016	06-jul	*N*	8 (8 males)						
		mean	964	4	1337	249	561	7398	485
		median	**806**	**4**	**1165**	**212**	**565**	**5214**	**458**
		min	601	0	934	157	462	3409	340
		max	1684	7	2246	409	655	19978	695
		sd	427	2	484	97	97	5419	143
	26-jul	*N*	12 (12 males)						
		mean	620	3	934	170	509	5167	346
		median	**595**	**3**	**1030**	**167**	**510**	**3890**	**345**
		min	411	0	609	123	399	3172	222
		max	840	5	1219	247	619	9085	512
		sd	158	1	209	38	121	2214	92
	07-nov	*N*	4 (4 males)						
		mean	447	3	741	165	377	2686	270
		median	**445**	**3**	**740**	**168**	**431**	**2374**	**267**
		min	341	3	580	137	245	1580	204
		max	556	4	905	186	454	4416	341
		sd	107	1	140	24	115	1330	67

* Par. 32 concentrations were <LOQ for four individuals in the 30 jul. 2013 and one individual in the 08 Aug. 2013 pods, in these cases LOQ/2 was used in the calculations of the summary statistics.

† p,p'-DDD was only analysed in 50 % of the whales for years 2015 and 2016

Table 4.9 Summery of the chlorodanes and other pesticides in blubber of juvenile pilot whales.

Year	Date		Trans(γ)-nonachlor	γ-chlordane*	Cis(α)-nonachlor	α-chlordane	Oxychlordane	ΣCHL	Mirex	HCB	β-HCH
			µg kg-1 lw blubber								
2013	30. jul	*N*	7 (1 female and 6 males)								
		mean	2834	4.5	691	233	484	4247	154	419	45
		median	**2000**	**3.5**	**470**	**150**	**310**	**2955**	**110**	**250**	**25**
		min	940	3.0	280	110	130	1463	83	200	20
		max	8900	9.5	2100	720	1800	13530	420	1500	160
		sd	2730	2.3	630	216	585	4161	120	477	51
	08. aug	*N*	11 (5 females and 6 males)								
		mean	1787	4.9	445	174	255	2666	98	323	28
		median	**1100**	**5.1**	**340**	**170**	**180**	**1704**	**88**	**310**	**24**
		min	650	2.6	240	110	110	1156	50	210	20
		max	4700	7.4	1100	300	670	6777	180	490	53
		sd	1197	1.4	242	57	159	1637	43	90	10
2015	06. jun	*N*	11 (11 males)								
		mean	1517	4.3	411	168	218	2318	115	357	27
		median	**1289**	**4.0**	**377**	**163**	**200**	**1959**	**127**	**333**	**26**
		min	536	3.0	170	89	80	878	39	231	16
		max	3471	6.6	802	312	467	5059	217	628	48
		sd	827	1.1	181	65	108	1175	56	117	10
	29. jun	*N*	7 (7 males)								
		mean	1382	4.3	346	154	217	2103	123	303	28
		median	**1028**	**3.7**	**315**	**154**	**160**	**1660**	**102**	**302**	**26**
		min	785	3.2	253	117	119	1281	86	220	19
		max	2386	5.6	505	232	382	3510	168	418	41
		sd	615	1.0	90	42	102	835	36	62	9
	23. jul	*N*	7 (7 males)								
		mean	1131	3.2	310	126	169	1739	104	300	20
		median	**924**	**3.3**	**231**	**95**	**141**	**1394**	**98**	**272**	**15**
		min	435	2.3	115	52	53	658	53	97	6
		max	2325	4.0	607	235	389	3559	174	599	38
		sd	706	0.7	184	69	121	1077	42	178	13
2016	06. jul	*N*	8 (8 males)								
		mean	1388	4.7	383	180	210	2166	143	453	28
		median	**1140**	**4.0**	**355**	**156**	**161**	**1857**	**138**	**363**	**24**
		min	751	2.9	272	124	127	1316	114	275	18
		max	2962	9.1	575	268	440	4084	220	869	49
		sd	733	2.2	115	58	117	961	33	213	11
	26. jul	*N*	12 (12 males)								
		mean	991	2.9	277	125	145	1541	107	281	21
		median	**867**	**2.9**	**281**	**130**	**139**	**1440**	**106**	**279**	**21**
		min	661	2.1	168	70	93	1039	85	192	13
		max	1510	4.2	367	180	205	2186	136	439	31
		sd	294	0.7	70	35	42	419	20	78	5
	07. nov	*N*	4 (4 males)								
		mean	691	2.5	211	97	106	1107	52	244	19
		median	**650**	**2.5**	**211**	**96**	**104**	**1070**	**48**	**242**	**19**
		min	480	2.2	159	88	74	808	42	210	14
		max	983	2.9	262	109	140	1480	69	281	24
		sd	235	0.3	50	9	34	320	12	31	4

* The γ-chlordane concentration was below LOQ for four individuals from the 30th of July 2013 pod. LOQ/2 was used for the subsequent calcualtions of the summary statistics.

Table 4.10 The summary of the concentrations of selected PBDE homologues (47, 99, 100, 154) and the Σ$_6$PBDE (the sum of BDEs 47, 66, 99, 100, 154, and 153), given in ng g^{-1} lipid weigth liver.

		Length	BDE 47	BDE 99	BDE 100	BDE 154	Σ$_6$PBDE
Year		*cm*			*ng g^{-1} lw*		
2013	*N*	7					
	mean	352	347	70	68	58	570
	median	**356**	**210**	**42**	**44**	**41**	**369**
	min	290	118	24	31	30	215
	max	420	1170	237	196	180	1863
	sd	50	371	75	58	54	581
2015	*N*	5					
	mean	403	84	28	30	28	184
	median	**390**	**71**	**28**	**31**	**28**	**201**
	min	379	33	11	11	17	90
	max	439	156	53	50	41	257
	sd	24	52	16	15	9	67
2016	*N*	5					
	mean	401	172	36	46	34	303
	median	**400**	**173**	**38**	**45**	**37**	**311**
	min	396	118	23	31	22	205
	max	408	224	43	60	45	368
	sd	5	40	8	11	11	61

4.3.1 PBDE

Nine congeners of PBDEs (28, 47, 66, 100, 99, 85, 154, 153, and 183) were analysed in blubber samples from juvenile male pilot whales (with whale length as close to 400 cm as possible) from 2013, 2015 and 2016. Five individuals were analysed from each of these years, to add to a time-trend series established previously based mainly on pooled samples (Rotander et al., 2012b). PBDEs were detected in all of the samples. The summary PBDE results are stated in Table 4.10 and the individual concentrations are presented in Attachment D.

BDE 47 was the dominant BDE-congener in these recent samples, as in earlier ones (Figure 4.5b) making

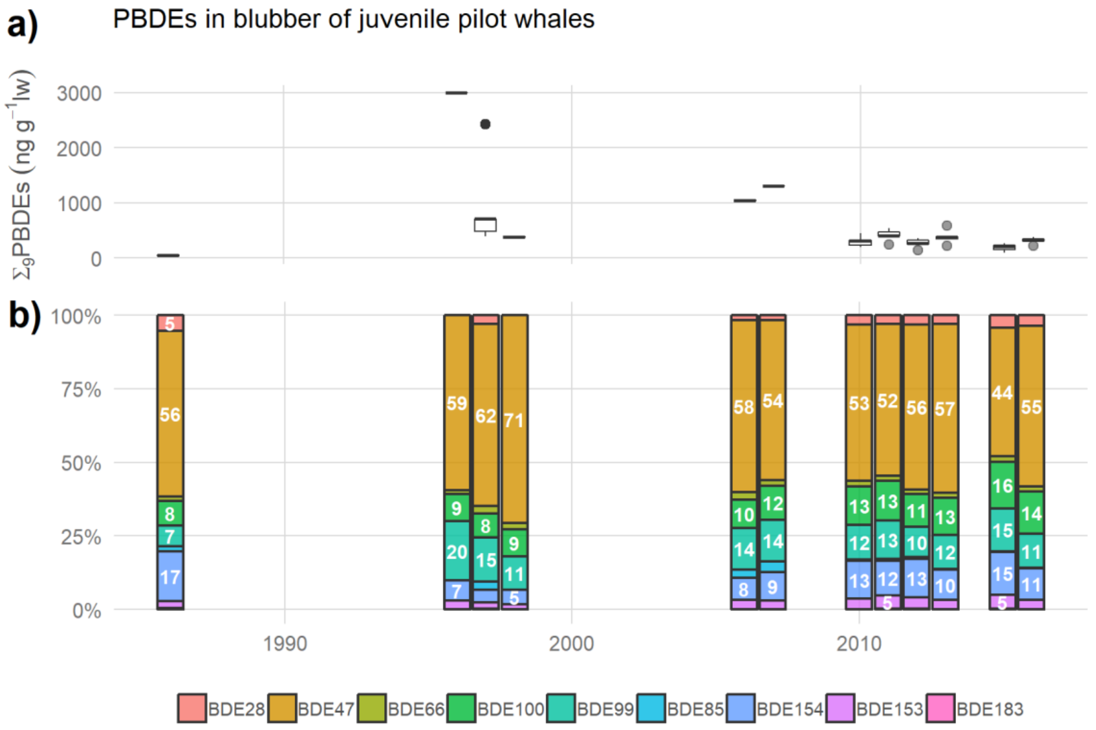

Figure 4.5 Temporal PBDE concentrations in juvenile pilot whale blubber between 1986 and 2016. a) shows a boxblot of the Σ$_9$PBDE (BDE congers 28, 47, 66, 100, 99, 154, 153, and 183) and b) shows the changing composition over time. The data are from: 1986, 1997, 2006 and 2007 (Rotander et al., 2012b)*, 1996* (Lindström et al., 1999)*, 1997, 1998* (van Bavel et al., 1999)*, 2010 - 2012* (Nielsen et al., 2014)*, and 2013 – 2016 is from this work.*

Table 4.11 PFASs measured in liver of juvenile male pilot whales, the concentrations are given as ng g^{-1} wet weigth liver.

Year		Length	L-PFOS	PFOSA	PFDA	PFUnDA	PFTrDA
		cm			*ng g^{-1} ww liver*		
2009	*N*	2					
	mean	390	41.8	6.8	14.1	49.2	32.7
	median	**390**	**41.8**	**6.8**	**14.1**	**49.2**	**32.7**
	min	380	38.7	5.9	13.8	48.4	27.7
	max	400	44.9	7.7	14.3	49.9	37.6
	sd	14	4.4	1.3	0.4	1.1	7.0
2010	*N*	2					
	mean	413	47.3	14.1	15.5	46.5	42.5
	median	**413**	**47.3**	**14.1**	**15.5**	**46.5**	**42.5**
	min	380	35.4	8.6	9.4	25.3	32.7
	max	445	59.2	19.6	21.5	67.7	52.3
	sd	46	16.8	7.8	8.6	30.0	13.9
2011	*N*	5					
	mean	407	73.0	16.0	19.7	52.5	42.9
	median	**434**	**53.4**	**17.5**	**15.4**	**46.3**	**38.7**
	min	356	25.4	12.3	5.0	17.8	20.5
	max	438	171.9	19.1	39.8	92.8	72.0
	sd	41	57.5	2.9	13.0	27.2	21.9
2012	*N*	4					
	mean	418	87.5	9.9	30.9	75.8	56.2
	median	**411**	**84.8**	**9.3**	**30.0**	**73.5**	**56.9**
	min	365	79.8	8.0	27.3	68.2	47.7
	max	485	100.7	13.1	36.3	88.2	63.3
	sd	49.7	9.2	2.4	4.1	8.8	7.2
2013	*N*	5					
	mean	377	51.2	12.2	14.0	36.2	23.7
	median	**360**	**58.4**	**12.8**	**12.9**	**30.3**	**22.7**
	min	342	23.1	7.7	5.4	18.0	15.8
	max	420	74.6	18.3	25.7	59.5	36.0
	sd	34	22.7	4.3	8.4	18.3	7.5
2015	*N*	4					
	mean	406	63.9	9.8	18.8	50.2	33.0
	median	**403**	**57.9**	**7.2**	**17.9**	**48.1**	**32.0**
	min	384	28.9	4.3	5.5	19.4	16.4
	max	435	110.7	20.5	34.0	85.3	51.6
	sd	24	34.5	7.5	11.8	27.4	14.6
2016	*N*	5					
	mean	401	63.8	9.9	21.6	50.5	24.5
	median	**400**	**66.5**	**7.3**	**19.4**	**53.2**	**25.8**
	min	396	16.5	6.1	3.5	13.0	10.9
	max	408	120.6	15.9	38.4	78.5	36.3
	sd	5	38.8	4.4	13.1	24.1	9.8

up, on average, 60% of the sum of the nine PBDE congeners.

4.3.2 PFAS

Livers from juvenile male pilot whales (with a full length as close to 400 cm as possible) from 2009, 2010, 2011, 2012, 2013, 2015 and 2016, were analysed for per- and polyfluorinated alkyl substances (PFASs). This was done to establish a time-series building on previously published results (Rotander et al., 2012b). The analysis consisted of perfluorinated carboxylic acids (C4, C6, C8- C12, C14, C16, C18 PFCAs), perfluorinated sulfonic acids (C4-C10, C12 PFSAs), fluorotelomer sulfonic acids (4:2, 6:2, 8:2 FTSAs), and perfluorinated sulfonamide acid (PFOSA). In total, eight PFCAs, three PFSAs, and one precursor compound (PFOSA) were detected.

The summary of the PFASs results are given in Table 4.11 while the individual concentrations can be found in Attachment D.

The previous analysis published in Rotander et al. (2012a) and Dam et al. (2011) where done on pooled liver samples of pilot whales sampled in years 1986/87, 2001/02, and 2006/07, with 3 pooles in each period and each pool comprising 2 – 7 individuals. Herein, the results from the year periods consisting of two years have been dived into the year of the sampled individuals of the pools, i.e. 2001/02 is plotted as 2001 and 2002 depending on the samling year of the whale.

From year 1986 to 2016 the PFASs detected in all of the samples where PFHxS, PFOS, PFOA, PFNA, PFDA, and PFUnDA. The sum of the these six PFASs denoted as Σ_6PFAS along with the average PFAS profile for each year are plotted in Figure 4.6.

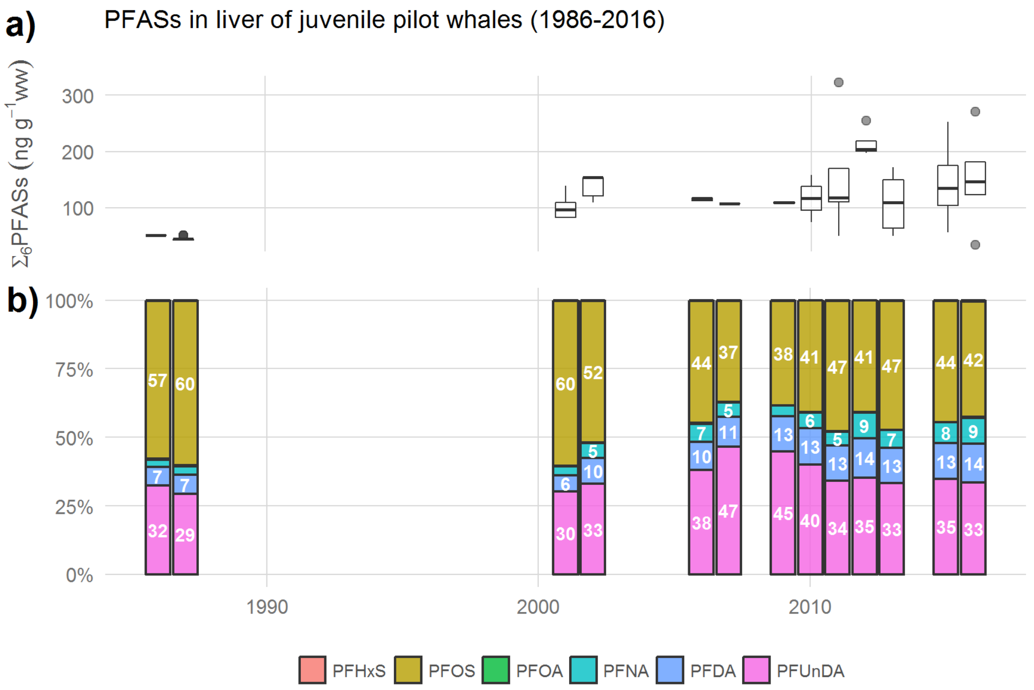

Figure 4.6 Temporal PFAS concentrations in juvenile pilot whale liver between 1986 and 2016. a) shows a boxblot of the ΣPFAS (PFOS, PFOA, PFNA PFDA, and PFUnDA) and b) shows the changing composition over time. The data are from: 1986, 1987, 2001, 2002, 2006 and 2007 (Dam et al., 2011)*, 2009 – 2016 is from this work.*

4.4 Arctic char and brown trout

Arctic char from lake á Mýrunum in 2014 and brown trout from two locations on Sandoy (Stóravatn and Lítlavatn) from 1999 and 2000 were analysed for POPs. The summary results of selected POPs are shown in Table 4.12 and Table 4.13. Individual results are given in Attachment F.

Figure 4.7 shows the concentrations of PCB 153, p,p'-DDE, HCB and Toxaphene Par. 50 from year 2000 – 2014 in Arctic char and 1999 – 2000 in brown trout. Figure 4.7 shows that there is a significant difference ($p < 0.05$, Wilcoxon) between the POP concentration in brown trout at the two different locations, Lítlavatn and Stóravatn, for all four plotted POPs, where the median concentrations are higher at Stóravatn compared to Lítlavatn.

Table 4.12 Selected PCBs, toxaphene parlars and p,p-DDE in Arctic char and brown trout (μg kg^{-1} lipid weight) muscle.

Species	Year		Lipids %	Aroclor 1260	PCB 153	PCB 187	par. 26*	par. 50**	p,p'-DDE
						μg kg^{-1}			
Brown trout	1999	*N*				10			
		mean	0.87	6568.0	766.0	80.2	19.3	42.6	623.0
		median	0.89	6400.0	750.0	83.0	18.0	38.0	625.0
		min	0.30	980.0	120.0	15.0	8.0	15.0	150.0
		max	2.00	17000.0	1900.0	180.0	36.0	89.0	1400.0
		sd	0.51	5472.8	619.8	58.7	9.8	26.7	434.3
	2000	*N*				5			
		mean	1.12	5900.0	692.0	70.0	20.2	47.4	536.0
		median	0.91	6000.0	700.0	73.0	21.0	46.0	490.0
		min	0.53	2600.0	320.0	37.0	13.0	33.0	290.0
		max	2.40	9000.0	1050.0	105.0	29.0	73.0	860.0
		sd	0.77	2343.1	266.8	24.9	6.1	15.4	208.0
Arctic char	2014	*N*				19			
		mean	1.3	199.9	24.1	7.6	1.6	4.4	23.2
		median	1.3	180.0	22.0	6.8	1.5	4.3	21.0
		min	0.7	98.0	12.0	3.3	1.0	1.5	15.0
		max	1.9	540.0	67.0	22.0	2.6	7.6	57.0
		sd	0.3	93.7	11.7	4.1	0.6	1.6	9.1

* Par. 26 concentrations where <LOQ for 11 Arctic chars
** Par. 50 concentrations where <LOQ for 2 Arctic chars
in these cases LOQ/2 was used in the calculations of the summary statistics.

Table 4.13 Organochlorine pesticides in Arctic char and brown trout (µg kg^{-1} lipid weight) muscle.

Species	Year		Lipids	Trans(α)-nonachlor	α-chlordane*	Cis(γ)-Nonachlor†	Oxy-Chlordane‡	Mirex§	HCB**
			%			µg kg^{-1}			
Brown trout	1999	*N*	10						
		mean	0.9	25.3	6.1	11.3	21.5	11.3	35.7
		median	0.9	26.5	5.2	10.7	20.0	11.4	34.5
		min	0.3	13.0	3.5	4.6	7.5	1.5	29.0
		max	2.0	38.0	9.9	22.0	45.0	28.0	47.0
		sd	0.5	8.7	2.4	6.0	13.1	9.3	5.4
	2000	*N*	5						
		mean	1.1	23.2	4.1	11.9	25.5	10.9	31.9
		median	0.9	22.0	3.5	11.0	25.0	10.0	30.0
		min	0.5	18.0	2.5	8.0	15.0	3.9	25.0
		max	2.4	30.0	6.0	17.5	40.5	17.5	44.5
		sd	0.8	4.5	1.6	3.5	9.6	5.1	7.4
Arctic char	2014	*N*	19						
		mean	1.3	5.4	1.3	1.7	1.6	<LOQ	25.8
		median	1.3	5.1	1.0	1.7	1.7		24.5
		min	0.7	4.3	0.5	1.0	1.0		21.0
		max	1.9	11.0	2.0	4.0	2.3		33.0
		sd	0.3	1.5	0.4	0.8	0.5		3.5

* concentrations were <LOQ for three and one brown trouts from 1999 and 2000 respectively and 14 Arctic chars
† concentrations were <LOQ for nine Arctic chars
‡ concentrations were <LOQ for 10 Arctic chars
§ concentrations were <LOQ for one brown trout from 1999 and all of the Arctic chars
in these cases LOQ/2 was used in the calculations of the summary statistics.
** The laboratory reported issues with elevated HCB in the intercalbration study, so these results must be regarded with caution.

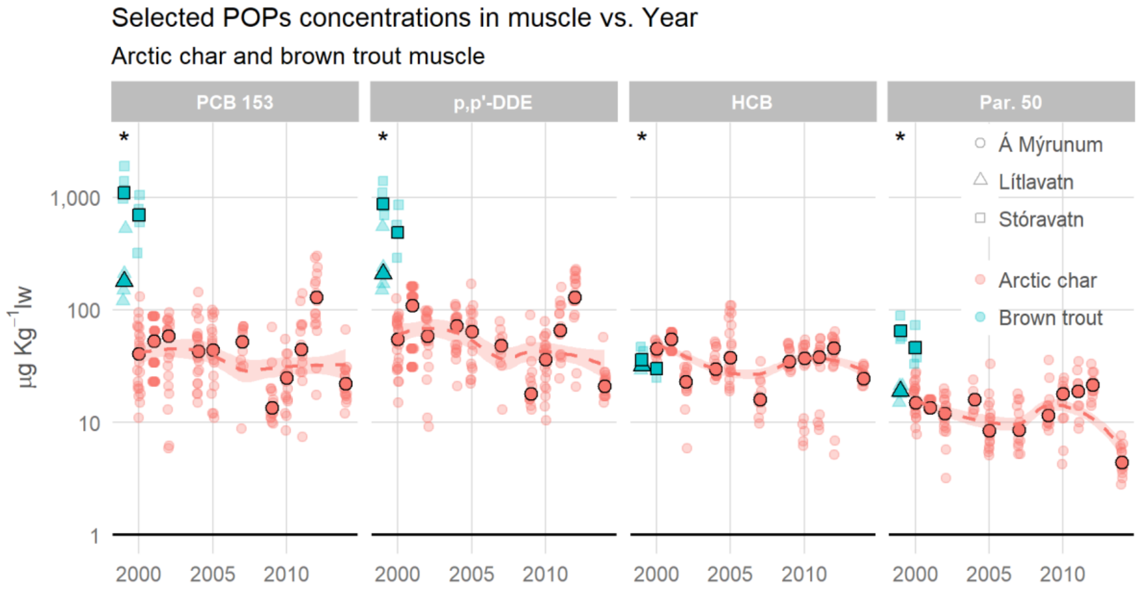

Figure 4.7 Selected POPs (PCB 153, p,p'-DDE, HCB, and Par. 50) in Arctic char (red) and Brown trout (blue) muscle from 1999 to 2014 The larger data points with a black outline represent the median of that particular year. The data has been ***robust*** *LOESS fitted and the 95 % confidence of the fit is also shown. The asteriks on the top indicates where there is a significant (p<0.05, by Wilcoxon) difference between locations (Lítlavatn and Stóravatn) concentrations of brown trout year 1999.*

4.5 Sheep

Pooled samples of tallow from sheep, both ewes and lambs, from 2013 and 2015 were analysed for POPs and the results of the compounds that were detected are shown in Table 4.14, and results from all analyses are shown in Attachment H.

As is common in ruminants which are low in the food chain, the POP concentrations in sheep tallow were low and most of them could not be detected at the detection limits defined in the tables in Attachment H.

Table 4.14 Selected POPs in sheep tallow from 2013 and 2015 (µg kg^{-1} lipid weight).

Year	Pooled samples	Lipids %	Aroclor 1260	CB 153	HCB	Trans-nona chlor	p,p'-DDE
2013	Juvenile	85	8.3	1.3	7.5	<0.4	2.6
	Juvenile	85	5.4	0.94	7.1	<0.4	1.6
	Adult female	87	<5	<0.5	4.5	<0.5	<1
	Adult female	85	<4	<0.4	4.9	<0.4	<1
2015	Juvenile	92	2.84	0.42	4.8	0.1	1.16
	Juvenile	89	3.27	0.45	4.4	0.11	0.97
	Adult female	88	3.97	0.65	6.6	0.14	1.5
	Adult female	85	9.71	1.43	7.6	0.11	1.75

The only compound that could be detected in all the pooled samples in both 2013 and 2015 was hexachlorobenzene, which was also the POP found at the highest concentrations (Table 4.14). In 2013 the juveniles had higher POP concentrations than the adult. This is what is generally found in mammals due to the maternal transfer of the lipophilic POPs from the mother to the offspring with the milk. However, in 2015 the POP concentrations in the juveniles were lower or at the same levels as in the adults. This indicates that with such low levels of POPs also parameters that are not taken into consideration in the above, eg. the ewe reproductive history, must be controlled in order to make detailed comparisons between groups. Still, a high degree of inter-correlation between POPs is apparent (not shown), and points to common sources of these.

5 Stable isotopes

The ratios of heavier to lighter isotopes of nitrogen and carbon can be used to examine the trophic relationship in food webs (Hobson and Welch, 1992). The heavier isotopes are enriched in animal tissue relative to diet, with the enrichment factors between tissue and diet being about 1‰ for the ^{13}C isotope and 3‰ for the ^{15}N isotope (Sagerup *et al.*, 2002; Fry, 1988). In the following, the isotope numbers are written in normal font numbers.

Tissue samples of pilot whale muscle, Arctic char muscle and black guillemot eggs were analysed for the fraction of stable isotopes of nitrogen ($^{15}N/^{14}N$) and carbon ($^{13}C/^{12}C$) at SINLAB in Canada.

The enrichment of the heavier isotopes is described by d^{15}N and d^{13}C, respectively, which are calculated as follows:

$$\delta X = \left(\frac{R_{sample}}{R_{standard}} - 1\right) \times 1000$$

where X is ^{13}C or ^{15}N and R is the corresponding ratio $^{13}C/^{12}C$ or $^{15}N/^{14}N$ in the sample and in the standard, respectively. The standard materials used are described in section 1.1.3.

The lipid level in the samples was highly variable. This has an influence on the C/N ratio as ^{13}C is discriminated against during lipid synthesis, leading to higher C/N ratio and lower $\delta^{13}C$ level when the lipid content is high. To avoid lipid discrimination towards $\delta^{13}C$, normalization of $\delta\,^{13}C$ (δ') was carried out using estimated lipid content (L) according to the equations from (McConnaughey and McRoy, 1979).

$$L = \frac{93}{1 + (0.246\, C/N - 0.775)^{-1}}$$

$$\delta' = \delta + D\frac{-0.207 + 3.90}{1 + \frac{287}{L}}$$

where L is % lipid, C/N is the carbon to nitrogen ratio in muscle and D is the depletion of ^{12}C (‰) relative to protein and assigned a value of 6‰ (McConnaughey and McRoy, 1979; Sagerup et al., 2002).

The $\delta^{15}N$ values versus normalised $\delta^{13}C'$ are shown in Figure 5.1 for all of the monitored species. The individual results are shown in Attachment I.

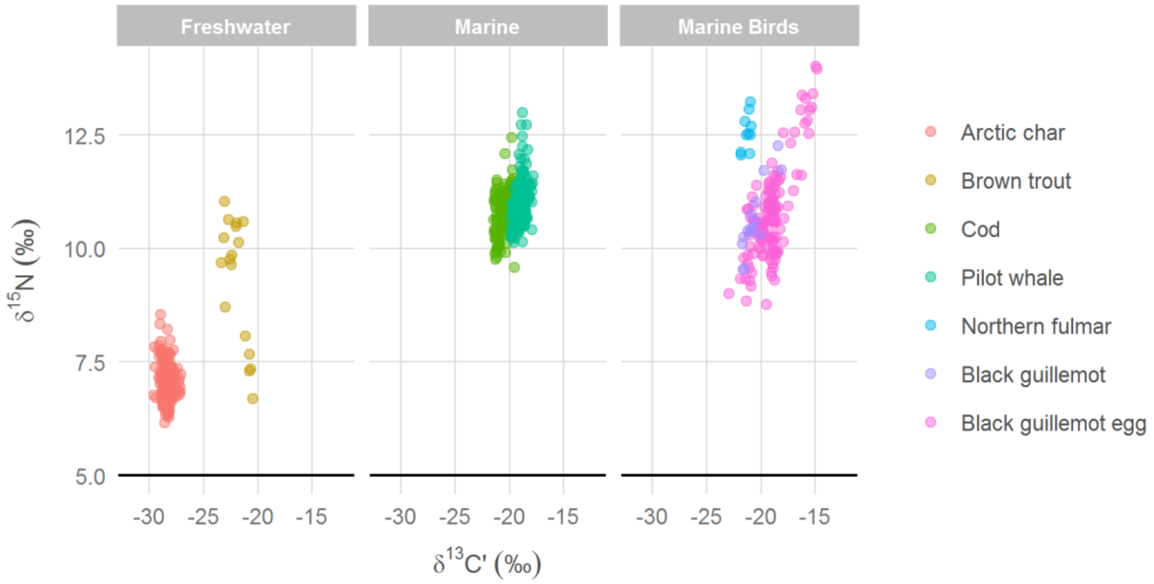

Figure 5.1 $\delta^{15}N$ versus $\delta^{13}C'$ (normalised) in the seven species monitored.

Table 5.1 Stable isotopes in black guillemot eggs collected in 2013, 2014 and 2016

			δ13C'					δ15N				
Year	Location	*N*	*mean*	*median*	*min*	*max*	*sd*	*mean*	*median*	*min*	*max*	*sd*
2013	Koltur	7	-19.93	-19.86	-20.22	-19.79	0.15	10.06	10.02	9.83	10.33	0.19
2014	Koltur	6	-20.93	-20.94	-21.08	-20.73	0.13	9.57	9.51	9.17	10.05	0.34
	Skúvoy	10	-20.66	-20.68	-21.06	-20.24	0.26	10.65	10.63	10.29	11.14	0.25
2016	Koltur	10	-21.44	-21.30	-22.97	-20.42	0.65	9.89	9.73	8.85	11.39	0.86

Table 5.2 Stable isotopes in muscle and liver tissue from black guillemot collected in 2015 and northern fulmar collected in 2016.

				δ13C'					δ15N				
Year	Species	Tissue	N	mean	median	min	max	sd	mean	median	min	max	sd
2015	Cepphus grylle	muscle	15	-20.56	-20.93	-21.68	-18.14	1.10	10.63	10.43	9.54	12.27	0.77
		liver	15	-20.17	-20.40	-21.57	-17.55	1.19	12.31	12.07	11.06	14.41	0.89
2016	Fulmarus glacialis	muscle	10	-21.25	-21.12	-21.84	-20.89	0.35	12.56	12.52	12.06	13.23	0.40
		liver	10	-21.30	-21.31	-21.75	-20.89	0.31	11.68	11.72	11.28	12.23	0.36

5.1 Black guillemot eggs

The summary of the analysed stable isotopes in black guillemot eggs are presented in Table 5.1. The stable isotopes in black guillemot eggs sampled in Koltur and Skúvoy have been analysed since 2002. Figure 5.2 shows a boxplot of stable isotope (δ^{15}N and δ^{13}C') versus year and split into the two different locations. The figure (panel a and b) indicates that there is a significant difference in the level of δ^{15}N found in the egg at the two different locations, with the median at Skúvoy being higher than at Koltur for 6 out of 7 years. The difference in δ^{13}C' levels at the two locations is not as prominent in the case of δ^{15}N, see Figure 5.2. The temporal trend of both δ^{15}N and δ^{13}C' seems to be decreasing, and a significant correlation is found between δ^{15}N and CB 153, indicating that some of the reduction in egg CB 153 concentration is due to trophic level changes. The correlation is however weak, with spearman r = 0.22 ($p < 0.05$) on log-transformed data and explains only a small part of the variation in CB 153.

5.2 Black guillemot and Northern fulmar

Northern fulmar is being introduced as a monitoring species and will partially replace black guillemot. This is done because it has proven increasingly difficult to procure young black guillemots. Thus, the future

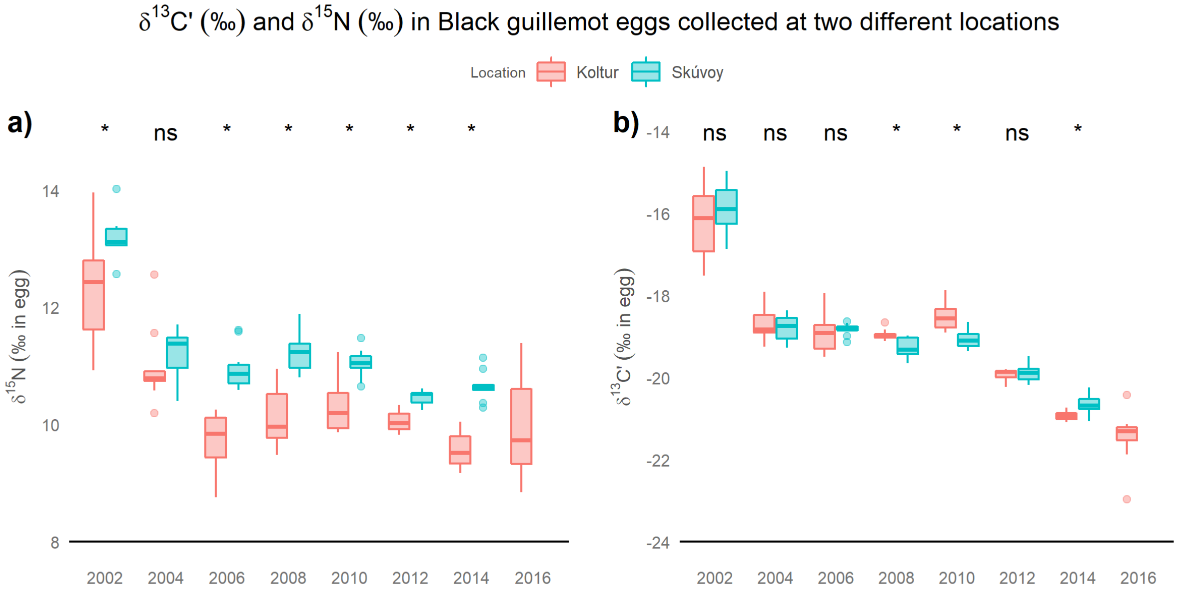

Figure 5.2 Boxplots of the stable isotopes (a) δ^{15}N and (b) δ^{13}C' from year 2002 to 2016, divided into the two sampling locations, Koltur and Skúvoy. Eggs collected in Koltur in year 2013 are plotted in year 2012, making a comparison to the Skúvoy eggs from 2012 possible. The asteriks on the top indicates where there is a significant ($p<0.05$, by Wilcoxon) difference between two locations, Koltur and Skúvoy. ns stands for not significant ($p>0.05$).

monitoring will most likely contain black guillemot eggs from Koltur and fledging fulmars, see section 2.2. Northern fulmar and black guillemot will be simultaneously monitored for a period at least, to establish a knowledgebase of the similarities and differences between the two species before possibly continuing with northern fulmar only.

In Figure 5.3 the stable isotopes δ^{13}C' and δ^{15}N in liver and muscle tissue from black guillemot and northern fulmar are compared. A significant ($p < 0.05$) linear correlation is found between δ^{15}N and δ^{13}C' in both

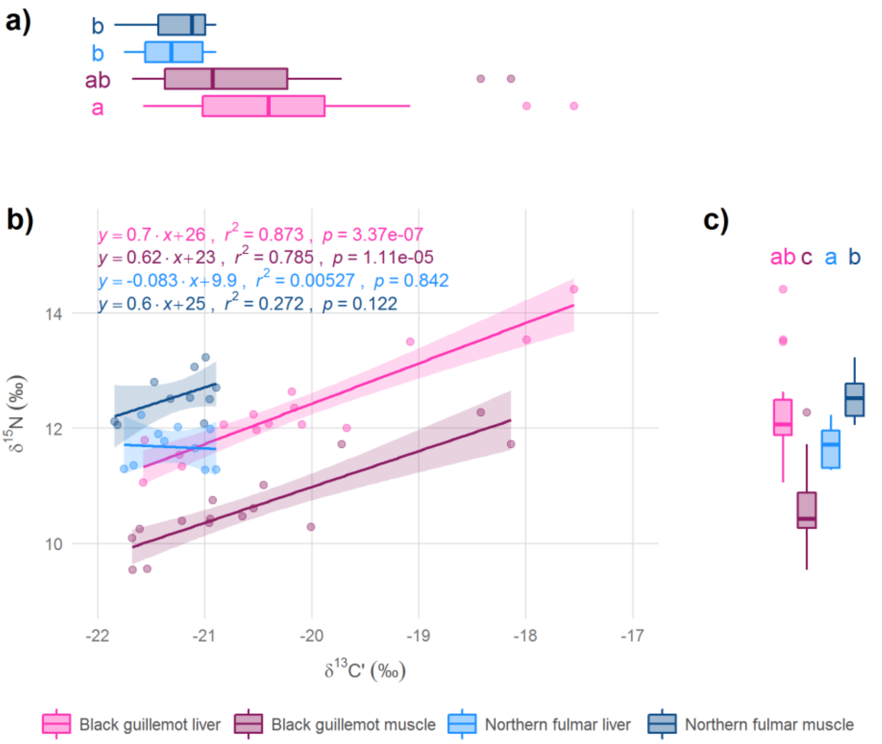

Figure 5.3 Comparing stable isotope results in liver and muscle tissue in black guillemot and northern fulmar, pinks and blues respectively. Boxblots show a) δ^{13}C' and c) δ^{15}N of the two tissue types liver and muscle in black guillemot and northern fulmar. Common letters above each boxplot indicates groups with no significant difference by post hoc analysis using Wilcoxon. b) Scatterplot of δ^{15}N versus δ^{13}C', with linear regression models fitted, the equation of each fit is also shown.

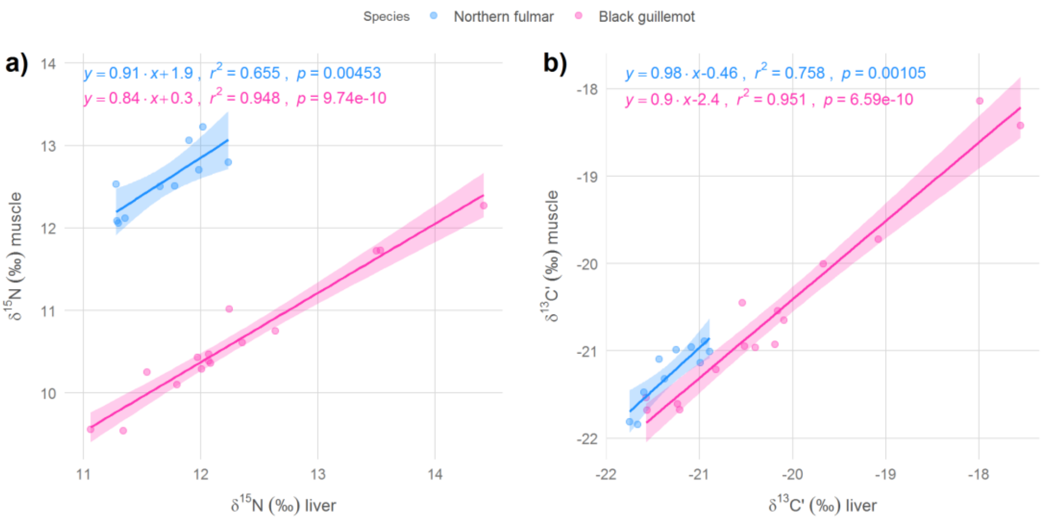

Figure 5.4 Scatterplots of δ^{15}N in muscle vs. liver (a) and δ^{13}C' in muscle vs. liver (b) in black guillemot and northern fulmar, pink and blue respectively. Linear regressions are fitted vith the 95 % CI shown, the equation of each regression is also stated.

liver and muscle tissue in black guillemot, but this is not the case for the northern fulmar results. When comparing the medians (Wilcox test) for each data group, the largest difference is found in the δ^{15}N results, where liver and muscle are significantly different within each species, see Figure 5.3c. This is not the case for δ^{13}C' where the different tissues, liver and muscle, are not significantly different within each species, see Figure 5.3a. Another thing to note is that the δ^{15}N enrichment in black guillemot liver is higher than in muscle, and the opposite is true for northern fulmar.

Olsen et al. (2015) studied stable isotope signatures in different tissues of cod as a response to dietary shifts in laboratory conditions. The study found that the increase in δ^{15}N enrichment was more pronounced in liver than in muscle, where the change in δ^{15}N in liver amounted to 2.05 ‰, whereas the muscle δ^{15}N increase was 0.63‰. An increase in δ^{15}N was seen in liver at the first sampling (26 days) whereas this was not the case in muscle where an increase was not detected until the second sampling (41 days), which could suggest that liver tissue is more responsive to dietary changes and has a faster isotopic turnover. The variance between individuals was much smaller in muscle tissue than in liver tissue.

Assuming that dietary changes also will reflect faster in birds livers than in muscle, the contrasting results in liver>muscle and muscle>liver in δ^{15}N content in black guillemot and northern fulmar, may be linked to feeding biology and seasonal changes in these including the different ages of the two species at the time of sampling (the fulmars are fledgelings whereas the young black guillemots have lived trough their first winter).

The rationale for including stable isotopes as supporting parameter for a pollutants monitoring program is that these reflect dietary changes which in turn will influence pollutants exposure. The results of the present analyses suggests that the choise of tissue for stable isotope measurments should be considered with respect to the nature of the pollutants to be assessed. Still, the linear relationship between the δ^{15}N and δ^{13}C' content in the two tissue types, muscle and liver, within each species, see Figure 5.4., assures that regardless of whish tissue is analysed, the results may be applied for intra-species comparisons.

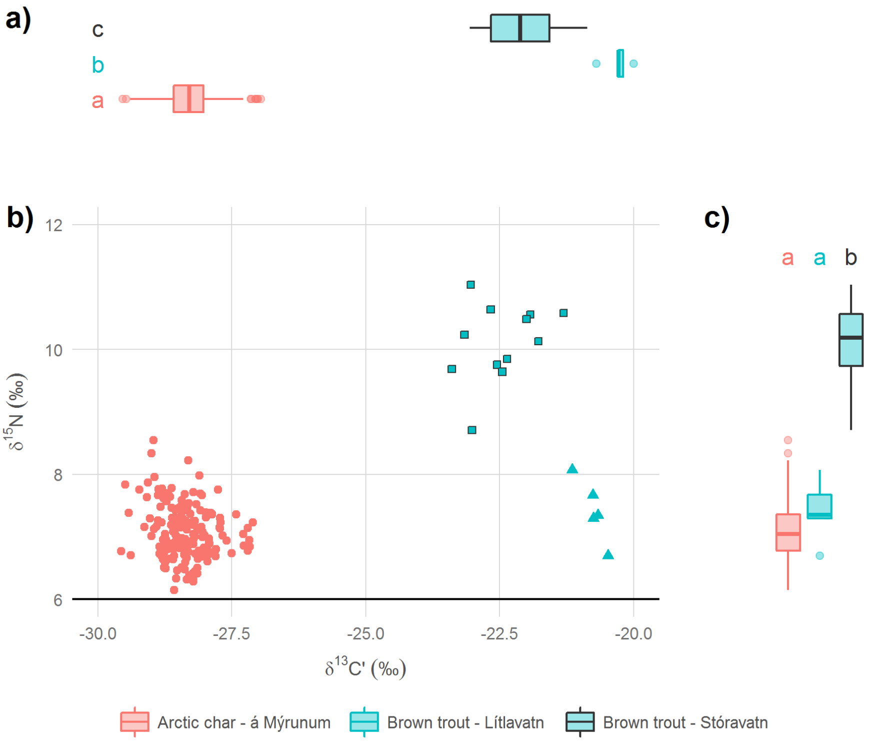

Figure 5.5 Boxblots show a) δ^{13}C' and c) δ^{15}N of Arctic char and brown trout at the two different locations. b) δ^{15}N versus δ^{13}C' (normalised) in muscle from Arctic char (á Mýrunum) and Brown trout (Lítlavatn and Stóravatn) coloured red and blue respectively. Common letters above each boxplot indicates groups with no significant difference by post hoc analysis using Wilcoxon.

Table 5.3 Stable isotopes in Arctic char and brown trout muscle.

			δ13C'					δ15N				
Species	Year	N	*mean*	*median*	*min*	*max*	*sd*	*mean*	*median*	*min*	*max*	*sd*
Salmo trutta	1999	12	-21.71	-21.54	-23.39	-20.48	1.01	9.12	9.72	6.70	11.04	1.58
	2000	5	-22.60	-22.45	-23.16	-22.00	0.48	9.78	9.85	8.71	10.48	0.69
Salvelinus alpinus	2014	19	-27.71	-27.72	-28.72	-27.11	0.49	6.97	6.95	6.42	7.43	0.24

Table 5.4 Stable isotopes in cod from 2013 to 2016

			δ13C'					δ15N				
Year	Date	*N*	*mean*	*median*	*min*	*max*	*sd*	*mean*	*median*	*min*	*max*	*sd*
2013	28-okt	25	-19.97	-19.93	-20.66	-19.55	0.29	10.92	10.97	9.91	11.54	0.39
2014	21-okt	25	-21.11	-21.12	-21.41	-20.87	0.17	10.15	10.19	9.77	10.64	0.21
2015	13-okt	27	-21.10	-21.18	-21.44	-19.77	0.34	11.06	11.06	9.98	12.45	0.48
2016	18-okt	28	-20.44	-20.45	-20.80	-19.89	0.17	10.90	10.89	10.12	11.42	0.30

Table 5.5 Stable isotopes in juvenile male pilot whales from 2013 to 2016

			δ13C'					δ15N				
Year	Date	*N*	*mean*	*median*	*min*	*max*	*sd*	*mean*	*median*	*min*	*max*	*sd*
2013	30. jul	6	-19.48	-19.46	-19.76	-19.26	0.20	10.89	10.91	10.81	10.98	0.07
	08. aug	6	-19.34	-19.40	-19.51	-19.00	0.19	10.63	10.73	10.23	10.96	0.27
2015	06. jun	11	-18.82	-18.78	-19.29	-18.54	0.21	11.02	11.08	10.62	11.45	0.30
	29. jun	6	-18.98	-18.96	-19.10	-18.91	0.07	10.79	10.80	10.51	11.13	0.22
	23. jul	7	-18.96	-19.06	-19.22	-18.58	0.26	11.18	11.18	10.82	11.46	0.25
2016	06. jul	9	-18.84	-18.85	-19.03	-18.70	0.11	10.81	10.79	10.46	11.17	0.22
	26. jul	12	-19.29	-19.30	-19.61	-18.89	0.24	10.57	10.56	10.14	10.84	0.19
	07. nov	4	-19.83	-19.81	-19.93	-19.76	0.08	10.42	10.37	10.23	10.72	0.21

5.3 Arctic char and brown trout

The summary of the stable isotope results in Arctic char and brown trout can be found in Table 5.3. All of the available isotopic data on Arctic char and brown trout is presented in a scatterplot in Figure 5.5, where the sampling locations are presented aswell. It can be observed that the Arctic chars are separated from the brown trouts by a more negative $\delta^{13}C'$ content (significant $p < 0.05$, Wilcoxon, see Figure 5.5a). The brown trouts from Lítlavatn and Stóravatn are on the same $\delta^{13}C'$ scale; however they do divide into two groups by differences in $\delta^{15}N$ content, where the brown trouts from Stóravatn have a significantly higher $\delta^{15}N$ enrichment than the ones sampled in Lítlavatn, which does suggest that the Stóravatn brown trouts forage at a higher trophic level, see Figure 5.5c.

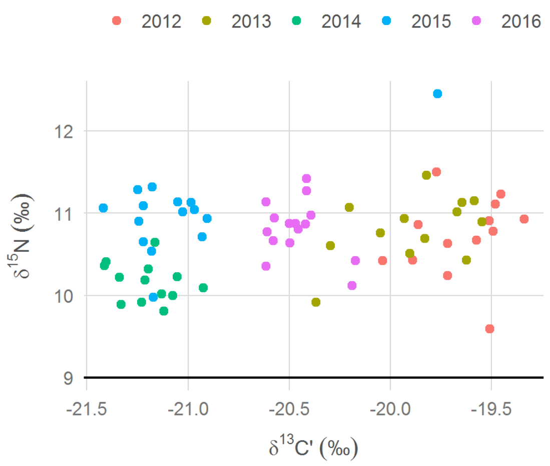

Figure 5.6 $\delta^{15}N$ versus $\delta^{13}C'$ (normalised) in muscle from cod in years 2012 – 2016.

5.4 Cod

The summary of the stable isotope results in cod from years 2013 – 2016 can be found in Table 5.4 and plotted in Figure 5.6. In cod muscle the $\delta^{15}N$ enrichment was more or less stable through these five years whereas the $\delta^{13}C'$ level differs by approximately 2‰ in 2012 compared to 2014 and 2015, with intermediate levels in 2016.

5.5 Pilot whale

The summary of the stable isotopes in juvenile pilot whale muscle from years 2013 – 2016 are given in Table 5.5 and FiguresFigure 5.7Figure 5.8. Stable

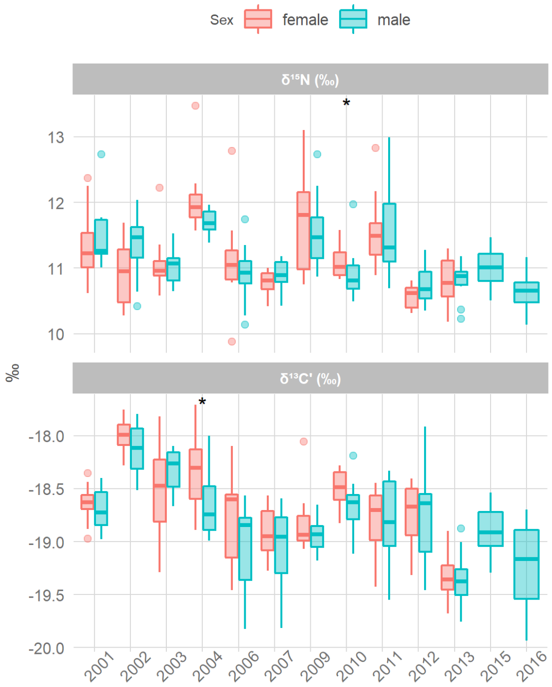

Figure 5.7 boxplots of δ^{15}N and δ^{13}C' (normalised) in juvenile female (red) and male (blue) pilot whale muscle in the years 2001 – 2016. The asteriks on the top indicates where there is a significant ($p<0.05$, by Wilcoxon) difference between the two sexes.

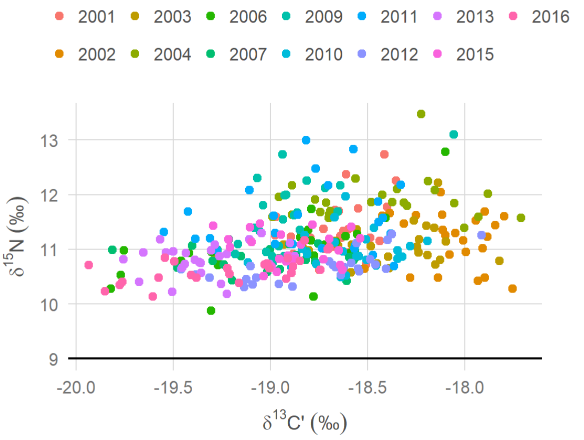

Figure 5.8 δ^{15}N versus δ^{13}C' (normalised) in muscle from pilot whales in years 2001 – 2016.

isotopes have been analysed in both juvenile male and female pilot whales since 2001 until 2013, and from 2014 onwards only in juvenile males. However, differences in means of both the δ^{13}C' and the δ^{15}N results where compared between female and male whales per year by means of Wilcoxon test (see Figure 5.7), and the difference was found to be non-significant for all years but one (2010 for δ^{15}N and δ^{13}C') (n years = 11).

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7 Appendices

Appendix A: Black Guillemot eggs

Mercury in black guillemot eggs from 2013-2016:

Species	ID	Location	Sampling date	Tissue	Full weight, g	Egg height, mm	Egg breadth, mm	Weight, yolk and white, g	Weight, shell, g	Egg shell thickness, µm separate readings, measured as near as equator as possible				Mean egg shell thickness	Hg, mg/kg ww	Dry matter g/100g
Cepphus grylle	Cg-0399	Koltur	June 2013	Egg	41.74	54.0	37.5	35.09	6.65	320	330	330	320	325	0.472	27.4
Cepphus grylle	Cg-0400	Koltur	June 2013	Egg	46.8	59.0	38.0	41.45	5.35	320	320	325	330	323.75	0.489	25.7
Cepphus grylle	Cg-0401	Koltur	June 2013	Egg	48.1	60.0	38.0	41.87	6.23	360	330	330	325	336.25	0.432	24.8
Cepphus grylle	Cg-0402	Koltur	June 2013	Egg	44.8	52.0	38.5	39.26	5.54	320	320	320	315	318.75	0.649	25.1
Cepphus grylle	Cg-0403	Koltur	June 2013	Egg	45.3	56.5	38.0	39.06	6.24	330	325	330	330	328.75	0.604	25.2
Cepphus grylle	Cg-0404	Koltur	June 2013	Egg	48.5	57.0	39.0	42.31	6.19	340	330	340	350	340	0.698	25.5
Cepphus grylle	Cg-0405	Koltur	June 2013	Egg	47.8	56.0	39.0	40.7	7.1	340	340	350	350	345	0.688	25.7
Cepphus grylle	Cg-0422	Skúvoy	June 2014	Egg	47.54	58.8	38.8	40.71	6.83	320	325	324	320	322.25	0.798	27.7
Cepphus grylle	Cg-0423	Skúvoy	June 2014	Egg	46.32	57.6	39.0	40.80	5.52	300	300	299	295	298.5	0.771	25.4
Cepphus grylle	Cg-0424	Skúvoy	June 2014	Egg	45.86	57.8	38.1	38.89	6.97	322	319	326	321	322	0.822	27.3
Cepphus grylle	Cg-0425	Skúvoy	June 2014	Egg	47.94	58.6	39.0	42.56	5.38	311	317	314	310	313	0.936	25.6
Cepphus grylle	Cg-0426	Skúvoy	June 2014	Egg	49.02	61.0	38.9	42.24	6.78	345	344	350	349	347	0.8	26.5
Cepphus grylle	Cg-0427	Skúvoy	June 2014	Egg	46.10	57.5	38.6	38.84	7.26	310	299	306	299	303.5	0.799	25.6
Cepphus grylle	Cg-0428	Skúvoy	June 2014	Egg	45.14	56.1	37.7	39.92	5.21	315	301	320	318	313.5	0.682	23.2
Cepphus grylle	Cg-0429	Skúvoy	June 2014	Egg	42.16	59.0	35.9	36.74	5.42	341	336	336	331	336	0.811	25.1
Cepphus grylle	Cg-0430	Skúvoy	June 2014	Egg	46.13	59.1	39.3	41.72	4.41	313	309	305	311	309.5	0.694	28.1
Cepphus grylle	Cg-0431	Skúvoy	June 2014	Egg	41.46	53.7	38.0	36.09	5.37	344	349	350	347	347.5	0.573	24.6
Cepphus grylle	Cg-0432	Koltur	June 2014	Egg	44.72	55.50	39.00	39.94	4.78	298	301	299	301	299.75	0.573	24.6
Cepphus grylle	Cg-0433	Koltur	June 2014	Egg	45.23	56.50	38.95	40.15	5.08	340	336	342	335	338.25	0.783	26.3
Cepphus grylle	Cg-0434	Koltur	June 2014	Egg	45.47	59.00	38.90	41.23	4.24	340	341	341	338	340.00	0.726	31.6
Cepphus grylle	Cg-0435	Koltur	June 2014	Egg	42.69	57.25	38.05	37.45	5.24	342	334	341	331	337.00	0.577	24.7
Cepphus grylle	Cg-0436	Koltur	June 2014	Egg	46.15	58.60	38.00	41.01	5.14	321	321	318	319	319.75	0.458	25.9
Cepphus grylle	Cg-0437	Koltur	June 2014	Egg	41.98	58.00	38.00	36.08	5.90	374	358	364	360	364.00	0.883	30.7
Cepphus grylle	Cg-0460	Koltur	June 2016	Egg	44.07	56	38.5	39.4	4.67	310	305	310	305	307.50	1.03	24.4
Cepphus grylle	Cg-0461	Koltur	June 2016	Egg	47.78	60.5	38	43.27	4.62	290	295	295	285	291.25	1.5	25.2
Cepphus grylle	Cg-0462	Koltur	June 2016	Egg	43.38	55	38	38.44	4.97	305	310	310	305	307.50	0.693	26.2
Cepphus grylle	Cg-0463	Koltur	June 2016	Egg	49.77	57.5	40	44.31	5.49	320	325	320	320	321.25	0.562	25.1
Cepphus grylle	Cg-0464	Koltur	June 2016	Egg	47.42	58	40	42.36	4.67	340	335	335	335	336.25	0.865	23.7
Cepphus grylle	Cg-0465	Koltur	June 2016	Egg	47.58	55	39.5	41.35	5.01	340	340	340	330	337.50	1.16	24.2

Species	ID	Location	Sampling date	Tissue	Full weight, g	Egg height, mm	Egg breadth, mm	Weight, yolk and white, g	Weight, shell, g	Egg shell thickness, µm separate readings, measured as near as equator as possible				Mean egg shell thickness	Hg, mg/kg ww	Dry matter g/100g
Cepphus grylle	Cg-0466	Koltur	June 2016	Egg	52.41	60.5	40	47.72	4.62	320	325	330	320	323.75	1.3	24.6
Cepphus grylle	Cg-0467	Koltur	June 2016	Egg	49.69	60.5	40	45.14	4.48	325	315	310	310	315.00	0.697	24.6
Cepphus grylle	Cg-0468	Koltur	June 2016	Egg	48.76	58	40	40.21	4.65	325	330	330	325	327.50	1.16	24.9
Cepphus grylle	Cg-0469	Koltur	June 2016	Egg	39.65	58	36	35.9	3.68	310	275	295	315	298.75	0.635	23.2

PCBs in black guillemot eggs from 2013-2014 (µg/kg of lipids):

ID	**Location**	**% of Lipids**	**PCB Aroclor 1260**	**CB 28**	**CB 52**	**CB 99**	**CB 101**	**CB 105**	**CB 118**	**CB 128**	**CB 138**	**CB 153**	**CB 156**	**CB 163**	**CB 170**	**CB 180**	**CB 183**	**CB 187**
Cg-0399	Koltur	10	2400	<9	<90	38	6.8	26	79	17	100	370	17	12	41	130	18	34
Cg-0400	Koltur	9.5	2500	<10	<100	42	8.8	27	87	19	120	370	18	14	42	130	18	41
Cg-0401	Koltur	9.5	2900	<9	<90	47	9.6	30	99	22	130	430	20	17	47	150	20	46
Cg-0402	Koltur	8.9	3600	<10	<100	56	13	34	110	28	170	530	25	19	63	190	27	51
Cg-0403	Koltur	8.4	3700	<10	<100	51	12	32	99	26	170	540	22	21	63	190	28	55
Cg-0404	Koltur	8.6	3200	<10	<100	45	11	28	88	23	140	470	21	19	56	170	25	48
Cg-0405	Koltur	8.9	4600	<10	<100	76	8.3	43	140	37	250	650	27	32	73	230	37	78
Cg-0422	Skúvoy	9.2	4300	<10	<100	60	11	32	120	36	230	600	24	27	76	220	37	66
Cg-0423	Skúvoy	9.9	2500	<9	<90	33	6.2	20	67	19	120	350	15	14	42	130	19	35
Cg-0424	Skúvoy	9.1	3100	<9	<90	39	3.4	22	77	22	140	450	21	16	60	180	25	43
Cg-0425	Skúvoy	9.6	3500	<10	<100	49	6.7	28	97	27	180	490	21	21	59	170	27	49
Cg-0426	Skúvoy	11	2100	<8	<80	26	4.3	16	53	15	96	310	14	11	39	130	17	31
Cg-0427	Skúvoy	11	2800	<8	<80	36	5.5	22	74	21	130	400	19	14	51	150	23	37
Cg-0428	Skúvoy	11	2700	<8	<80	36	5.8	21	71	22	140	380	16	18	46	140	21	44
Cg-0429	Skúvoy	6.1	3500	<20	<200	40	5.2	25	86	25	170	510	23	17	67	210	29	52
Cg-0430	Skúvoy	10	2300	<10	<100	31	3.4	20	66	16	100	350	16	10	43	130	18	30
Cg-0431	Skúvoy	7.3	2500	<10	<100	33	<4	20	65	19	120	360	16	15	44	130	19	31
Cg-0432	Koltur	9.7	2700	<9	<90	37	8.6	27	85	20	120	400	23	13	50	150	21	44
Cg-0433	Koltur	11	3500	<9	<90	50	8.2	30	100	27	180	490	23	22	58	170	26	47
Cg-0434	Koltur	4.7	4200	<20	<200	56	<7	34	110	29	190	610	27	24	73	220	30	55
Cg-0435	Koltur	9	4400	<10	<100	81	6.8	53	180	48	270	590	37	29	70	190	32	61
Cg-0436	Koltur	8.6	3600	<10	<100	49	11	36	110	26	160	530	32	18	67	210	29	60
Cg-0437	Koltur	5.8	6100	<20	<200	81	7.5	47	160	41	280	900	40	34	110	340	45	81

Organochlorinated pesticides and toxaphene in black guillemot eggs from 2013-2014 (µg/kg of lipids):

ID	Tissue % of Lipids	Alpha-Chlor-dane	Cis-Nona-chlor	Gamma-Chlor-dane	Hexa-chloro-benzene	Mirex	Oxy-Chlor-dane	p,p' -DDE	p,p'-DDT	ß-HCH	Trans-Nona-chlor	Toxaphene			
												Parlar no. 26	Parlar no. 32	Parlar no. 50	Parlar no. 62
Cg-0399	10	<0.9	14	<0.9	140	30	23	150	<3	11	5.8	9.8	2.7	33	8.7
Cg-0400	9.5	<1	19	<1	160	29	24	190	<3	12	8.5	13	3.5	38	12
Cg-0401	9.5	<0.9	21	<0.9	170	34	28	210	<3	14	10	16	3.6	45	13
Cg-0402	8.9	<1	17	<1	180	43	26	200	<3	15	7.8	10	3.2	38	11
Cg-0403	8.4	1.3	29	<1	180	39	39	270	<3	19	14	24	4.5	72	18
Cg-0404	8.6	<1	25	<1	170	36	34	240	<3	18	12	20	4.3	62	15
Cg-0405	8.9	<1	28	<1	160	49	35	380	<3	14	8.7	12	2.7	46	12
Cg-0422	9.2	<1	28	<1	150	52	25	260	<3	11	18	14	1.4	49	14
Cg-0423	9.9	<0.9	21	<0.9	120	30	20	160	<3	11	9.3	11	1.7	43	8.5
Cg-0424	9.1	<0.9	16	<0.9	140	46	16	180	<3	14	8.4	8.7	1.4	32	9.8
Cg-0425	9.6	<1	26	<1	130	40	22	210	<3	11	11	13	2.2	45	11
Cg-0426	11	<0.8	14	<0.8	150	30	18	140	<2	13	7.7	8.7	1	36	7.8
Cg-0427	11	<0.8	18	<0.8	140	33	20	170	<2	12	7.8	15	1.7	47	12
Cg-0428	11	<0.8	26	<0.8	170	32	23	180	<2	12	12	11	2.3	50	11
Cg-0429	6.1	<2	23	<2	150	48	26	190	<5	13	11	16	2.1	57	15
Cg-0430	10	<1	17	<1	210	32	21	180	<3	15	8.8	10	1.7	42	8.1
Cg-0431	7.3	<1	19	<1	140	27	25	170	<4	9.6	13	9.3	1.4	45	11
Cg-0432	9.7	<0.9	18	<0.9	160	38	21	190	<3	11	7.4	10	2.4	40	8.3
Cg-0433	11	1.8	41	<0.9	150	40	44	190	<3	13	27	36	4.3	110	21
Cg-0434	4.7	<2	39	<2	270	50	49	240	<7	22	14	27	4.4	110	13
Cg-0435	9	<1	18	<1	190	35	20	270	<3	13	7.9	9.2	2.9	34	7
Cg-0436	8.6	<1	25	<1	200	48	26	250	<4	13	11	15	4	55	13
Cg-0437	5.8	<2	53	<2	340	74	65	340	<5	27	18	38	5.8	150	23

Appendix B: Black Guillemot

Heavy metals in black guillemot from 2013-2015:

Species	ID	Location	Date	Gender	Sexstatus	Age	Total weigth, kg	Liver, g	Hg in feather, mg/kg	Hg in liver, mg/kg ww	Cd in liver, mg/kg ww	Se in liver, µg/g ww	% moisture in liver
Cepphus grylle	Cg-0406	Tíndholmur	03-05-2013	Male	Immat.	2K	361		3.44	0.963	0.984	1.6	68
Cepphus grylle	Cg-0407	Tindhólmur	03-05-2013	Male	Immat.	2K	445		6.64	1.17	0.311	1.8	68
Cepphus grylle	Cg-0408	Tindhólmur	03-05-2013	Male	Immat.	2K	416		2.83	1.06	0.735	2.1	67
Cepphus grylle	Cg-0409	Tindhólmur	03-05-2013	Male	Immat.	2K	447		2.63	1.46	0.399	1.5	68
Cepphus grylle	Cg-0410	Tindhólmur	03-05-2013	Male	Immat.	2K	407		3.29	1.18	0.368	2.6	67
Cepphus grylle	Cg-0411	Tindhólmur	03-05-2013	Male	Immat.	2K	394		2.9	1.04	0.35	1.5	65
Cepphus grylle	Cg-0412	Tindhólmur	03-05-2013	Male	Immat.	2K	386		3.03	1.22	0.555	2.5	67
Cepphus grylle	Cg-0413	Tindhólmur	03-05-2013	Male	Immat.	2K	410		2.82	0.779	0.549	2	66
Cepphus grylle	Cg-0414	Sveipur	26-03-2013	Male	Immat.	2K	421	27.43	3.12	0.82	0.325	2.2	70
Cepphus grylle	Cg-0415	Sveipur	26-03-2013	Female	Immat.	2K	446	27.58	3.89	1.15	0.597	2.1	68
Cepphus grylle	Cg-0416	Sveipur	26-03-2013	Female	Immat.	2K	470	29.54	4.72	1.22	0.358	2.5	69
Cepphus grylle	Cg-0417	Sveipur	26-03-2013	Male	Immat.	2K	400	21.76	4.29	1.32	0.29	2.4	67
Cepphus grylle	Cg-0418	Sveipur	26-03-2013	Male	Immat.	2K	464	24.14	4.29	1.32	0.321	2.2	68
Cepphus grylle	Cg-0419	Sveipur	26-03-2013	Male	Immat.	2K	380	20.05	3.75	1.14	0.546	2.2	70
Cepphus grylle	Cg-0420	Sveipur	26-03-2013	Male	Immat.	2K	436	27.47	3.05	0.992	0.333	2.4	71
Cepphus grylle	Cg-0421	Sveipur	26-03-2013	Female	Immat.	2K	424	28.94	3.07	0.977	0.441	2.2	68
Cepphus grylle	Cg-0444	Sveipur	24-03-2015	Male	Immat.	2K	440	30.62	3.94	1.16	0.402	1.87	65.4
Cepphus grylle	Cg-0445	Sveipur	24-03-2015	Female	Immat.	2K	400	25.67	2.07	1.45	0.47	2.51	66.1
Cepphus grylle	Cg-0446	Sveipur	14-04-2015	Male	Immat.	2K	440	25.98	2.96	1.22	0.403	1.84	65.8
Cepphus grylle	Cg-0447	Sveipur	14-04-2015	Female	Immat.	2K	400	24.54	3.14	1.4	0.515	2.25	67.9
Cepphus grylle	Cg-0448	Sveipur	14-04-2015	Female	Immat.	2K	400	26.90	3.18	1.59	0.364	2.22	65.5
Cepphus grylle	Cg-0449	Sveipur	14-04-2015	Male	Immat.	2K	420	26.41	2.07	1.58	0.381	2.06	66.5
Cepphus grylle	Cg-0450	Sveipur	14-04-2015	Female	Immat.	2K	460	33.66	3.71	1.37	0.349	2.2	66.1
Cepphus grylle	Cg-0451	Sveipur	14-04-2015	Female	Immat.	2K	440	30.88	3.96	1.09	0.344	1.49	67.1
Cepphus grylle	Cg-0453	Tíndholmur	02-05-2015	Female	Immat.	2K	370	21.48	3.13	2.59	0.712	1.91	66.9
Cepphus grylle	Cg-0454	Tindhólmur	02-05-2015	Male	Immat.	2K	380	24.78	3.19	2.38	0.569	1.79	66.3
Cepphus grylle	Cg-0455	Tindhólmur	02-05-2015	Male	Immat.	2K	420	23.94	2.49	1.07	1.26	0.894	69.5
Cepphus grylle	Cg-0456	Tindhólmur	02-05-2015	Male	Immat.	2K	440	23.77	7.67	3.28	0.869	2.32	66
Cepphus grylle	Cg-0457	Tindhólmur	02-05-2015	Male	Immat.	2K	420	23.41	3.21	1.94	0.591	2	67.5
Cepphus grylle	Cg-0458	Tindhólmur	02-05-2015	Male	Immat.	2K	410	25.66	1.78	1.59	0.43	1.68	69.7

Species	ID	Location	Date	Gender	Sexstatus	Age	Total weigth, kg	Liver, g	Hg in feather, mg/kg	Hg in liver, mg/kg ww	Cd in liver, mg/kg ww	Se in liver, µg/g ww	% moisture in liver
Cepphus grylle	Cg-0459	Tindhólmur	02-05-2015	Male	Immat.	2K	360	20.39	6.84	2.12	0.438	1.49	68.8

Appendix C: Northern Fulmar

Species	ID	Location	Date	Gender	Sexstatus	Total weigth, kg	Liver, g	Hg in feather, mg/kg	Hg in liver, mg/kg ww	Cd in liver, mg/kg ww	Se in liver, µg/g ww	% moisture in liver
Fulmarus glacialis	Fg-0339	Vestmanna	02-09-2016	Male	Pullus	863	16.77	0.779	0.329	0.20	2.49	71.0
Fulmarus glacialis	Fg-0340	Vestmanna	02-09-2016	Male	Pullus	778	9.02	0.634	0.177	0.203	2.93	69.4
Fulmarus glacialis	Fg-0341	Vestmanna	02-09-2016	Female	Pullus	855	12.43	0.873	0.328	0.268	1.84	69.1
Fulmarus glacialis	Fg-0342	Vestmanna	02-09-2016	Male	Pullus	890	13.05	0.825	0.281	0.096	2.08	70.1
Fulmarus glacialis	Fg-0343	Vestmanna	02-09-2016	Female	Pullus	551	8.71	0.738	0.258	0.506	1.70	71.3
Fulmarus glacialis	Fg-0344	Vestmanna	02-09-2016	Female	Pullus	807	13.79	0.659	0.195	0.148	2.32	69.9
Fulmarus glacialis	Fg-0345	Vestmanna	02-09-2016	Female	Pullus	906	17.09	1.02	0.481	0.186	2.58	71.5
Fulmarus glacialis	Fg-0346	Vestmanna	02-09-2016	Female	Pullus	777	16.87	0.984	0.479	0.137	4.06	72.6
Fulmarus glacialis	Fg-0347	Vestmanna	02-09-2016	Male	Pullus	911	16.71	0.415	0.096	0.239	1.61	72.4
Fulmarus glacialis	Fg-0348	Vestmanna	02-09-2016	Female	Pullus	951	17.07	0.728	0.297	0.306	2.92	69.9

Appendix D: Pilot Whale

Heavy metals in pilot whale muscle:

								Muscle		
Species	**ID**	**Date**	**Location**	**No.**	**Sex**	**Skinn**	**Length, cm**	**Hg, mg/kg ww**	**Se, µg/g ww**	**% Moisture**
Globicephala melas	300713-0003	30-07-2013	Fuglafjørður	3	F	5	357	2.23	0.95	71
Globicephala melas	300713-0007	30-07-2013	Fuglafjørður	7	M	3	291	1.45	0.77	70
Globicephala melas	300713-0008	30-07-2013	Fuglafjørður	8	M	11	518	2.66	0.81	73
Globicephala melas	300713-0009	30-07-2013	Fuglafjørður	9	M	5	360	1.93	1.3	67
Globicephala melas	300713-0011	30-07-2013	Fuglafjørður	11	M	8	435	2.13	0.82	74
Globicephala melas	300713-0013	30-07-2013	Fuglafjørður	13	F	8	402	4.88	1.1	73
Globicephala melas	300713-0018	30-07-2013	Fuglafjørður	18	M	11	482	2.62	1.04	70
Globicephala melas	300713-0019	30-07-2013	Fuglafjørður	19	M	7	405	1.65	0.9	70
Globicephala melas	300713-0020	30-07-2013	Fuglafjørður	20	M	11	505	3.54	0.73	71
Globicephala melas	300713-0022	30-07-2013	Fuglafjørður	22	F	7	393	2.62	1.0	70
Globicephala melas	300713-0028	30-07-2013	Fuglafjørður	28	M	14	530	2.77	0.95	71
Globicephala melas	300713-0030	30-07-2013	Fuglafjørður	30	M	7	420	2.02	1.1	67
Globicephala melas	080813-0001	08-08-2013	Sandavágur	1	F		315	0.908	1.2	71
Globicephala melas	080813-0003	08-08-2013	Sandavágur	3	M		356	1.81	0.79	71
Globicephala melas	080813-0005	08-08-2013	Sandavágur	5	F		337	1.56	0.8	70
Globicephala melas	080813-0006	08-08-2013	Sandavágur	6	M		470	2.42	0.9	69
Globicephala melas	080813-0007	08-08-2013	Sandavágur	7	F		365	1.75	0.75	71
Globicephala melas	080813-0010	08-08-2013	Sandavágur	10	M		393	1.77	1.1	71
Globicephala melas	080813-0011	08-08-2013	Sandavágur	11	F		325	1.19	1	71
Globicephala melas	080813-0016	08-08-2013	Sandavágur	16	F		379	2.13	0.75	60
Globicephala melas	080813-0019	08-08-2013	Sandavágur	19	M		290	1.15	1.1	74
Globicephala melas	080813-0021	08-08-2013	Sandavágur	21	M		530	2.11	1.15	69
Globicephala melas	080813-0024	08-08-2013	Sandavágur	24	F		342	1.38	1	71
Globicephala melas	080813-0026	08-08-2013	Sandavágur	26	M		359	1.56	1.3	68
Globicephala melas	080813-0027	08-08-2013	Sandavágur	27	M		342	1.41	1.3	70
Globicephala melas	060615-014	06-06-2015	Miðvágur	14	F		379	1.38	0.84	70.7
Globicephala melas	060615-016	06-06-2015	Miðvágur	16	F		377	1.12	0.92	70.6
Globicephala melas	060615-018	06-06-2015	Miðvágur	18	M		480	2.54	0.81	71.4
Globicephala melas	060615-021	06-06-2015	Miðvágur	21	F		366	1.01	0.68	70.4
Globicephala melas	060615-022	06-06-2015	Miðvágur	22	M		384	1.75	1.25	70.5

								Muscle		
Species	**ID**	**Date**	**Location**	**No.**	**Sex**	**Skinn**	**Length, cm**	**Hg, mg/kg ww**	**Se, µg/g ww**	**% Moisture**
Globicephala melas	060615-023	06-06-2015	Miðvágur	23	F		375	1.84	1.16	71.6
Globicephala melas	060615-031	06-06-2015	Miðvágur	31	M		305	1.49	0.96	70.7
Globicephala melas	060615-033	06-06-2015	Miðvágur	33	M		339	1.79	0.85	71.5
Globicephala melas	060615-040	06-06-2015	Miðvágur	40	M		435	1.77	1.11	71.1
Globicephala melas	290615-007	29-06-2015	Hvannasund	7	F	7	425	2.15	0.83	71.9
Globicephala melas	290615-008	29-06-2015	Hvannasund	8	F	7	440	5.31	1.64	73.7
Globicephala melas	290615-009	29-06-2015	Hvannasund	9	F	8	460	2.86	0.89	69.9
Globicephala melas	290615-012	29-06-2015	Hvannasund	12	F	7	450	2.91	0.65	72.0
Globicephala melas	290615-022	29-06-2015	Hvannasund	22	F	8	450	2.63	0.61	73.2
Globicephala melas	230715-059	23-07-2015	Tórshavn	59	F	5	375	2.22	0.91	72.3
Globicephala melas	230715-061	23-07-2015	Tórshavn	61	M	12	585	2.41	0.56	75.1
Globicephala melas	230715-064	23-07-2015	Tórshavn	64	M	5	405	2.94	0.76	71.0
Globicephala melas	230715-065	23-07-2015	Tórshavn	65	M	5	380	1.66	0.96	70.0
Globicephala melas	230715-066	23-07-2015	Tórshavn	66	F	7	405	3.37	1.11	72.0
Globicephala melas	230715-127	23-07-2015	Tórshavn	127	M	6	400	2.59	1.16	72.1
Globicephala melas	230715-128	23-07-2015	Tórshavn	128	M	8	460	3.33	0.85	71.6
Globicephala melas	230715-130	23-07-2015	Tórshavn	130	M	6	390	2.07	0.85	72.6
Globicephala melas	230715-132	23-07-2015	Tórshavn	132	M	14	570	3.29	0.66	71.9
Globicephala melas	230715-133	23-07-2015	Tórshavn	133	M	5	390	1.83	1.18	72.1
Globicephala melas	230715-134	23-07-2015	Tórshavn	134	M	2.5	245	1.16	1.16	69.5
Globicephala melas	060716-0002	06-07-2016	Hvannasund	2	M	7	460	2.82	0.59	73.0
Globicephala melas	060716-0008	06-07-2016	Hvannasund	8	M	3	302	0.96	0.69	74.1
Globicephala melas	060716-0011	06-07-2016	Hvannasund	11	M	3	275	0.70	0.71	74.8
Globicephala melas	060716-0013	06-07-2016	Hvannasund	13	M	4	324	1.68	0.57	73.4
Globicephala melas	060716-0022	06-07-2016	Hvannasund	22	M	8	465	2.79	0.61	72.1
Globicephala melas	060716-0023	06-07-2016	Hvannasund	23	M	4	360	2.00	0.62	73.2
Globicephala melas	060716-0026	06-07-2016	Hvannasund	26	M	3	310	1.64	0.65	73.4
Globicephala melas	060716-0027	06-07-2016	Hvannasund	27	M	5	350	1.93	0.64	73.3
Globicephala melas	060716-0043	06-07-2016	Hvannasund	43	M	4	345	1.65	0.72	73.3
Globicephala melas	260716-0059	26-07-2016	Hvannasund	59	M	8	440	1.69	1.02	70.1
Globicephala melas	260716-0070	26-07-2016	Hvannasund	70	M	7	410	1.58	0.74	72.6
Globicephala melas	260716-0077	26-07-2016	Hvannasund	77	M	7	408	1.53	0.97	71.3
Globicephala melas	260716-0078	26-07-2016	Hvannasund	78	M	7	424	2.02	0.88	70.9
Globicephala melas	260716-0099	26-07-2016	Hvannasund	99	M	6	396	1.88	0.98	70.9
Globicephala melas	260716-0102	26-07-2016	Hvannasund	102	M	6	396	1.93	0.97	68.8

								Muscle		
Species	**ID**	**Date**	**Location**	**No.**	**Sex**	**Skinn**	**Length, cm**	**Hg, mg/kg ww**	**Se, µg/g ww**	**% Moisture**
Globicephala melas	260716-0108	26-07-2016	Hvannasund	108	M	7	405	1.67	1.02	70.7
Globicephala melas	260716-0112	26-07-2016	Hvannasund	112	M	6	370	1.78	0.99	69.0
Globicephala melas	260716-0113	26-07-2016	Hvannasund	113	M	6	308	1.94	0.82	69.4
Globicephala melas	260716-0123	26-07-2016	Hvannasund	123	M	8	470	2.81	0.93	68.0
Globicephala melas	260716-0132	26-07-2016	Hvannasund	132	M	9	471	2.91	0.88	67.3
Globicephala melas	260716-0135	26-07-2016	Hvannasund	135	M	9	479	2.14	0.77	67.0
Globicephala melas	071116-0002	07-11-2016	Leynar	2	M	7	440	1.69	0.77	71.2
Globicephala melas	071116-0004	07-11-2016	Leynar	4	M	8	450	2.12	0.70	73.0
Globicephala melas	071116-0015	07-11-2016	Leynar	15	M	6	400	2.12	1.12	73.5
Globicephala melas	071116-0029	07-11-2016	Leynar	29	M	7	460	2.36	0.86	71.8

Heavy metals in pilot whale liver and kidney:

					Liver				**Kidney**	
Species	**ID**	**Sex**	**Skinn**	**Length, cm**	**Hg, mg/kg ww**	**Cd, mg/kg ww**	**% Moisture**	**Se, µg/g ww**	**Cd, mg/kg ww**	**% Moisture**
Globicephala melas	300713-0008	M	11	518	43.8	10.4	72	14	25.1	74.2
Globicephala melas	300713-0015	F	11	453	162.0	23.7	69	53	63.1	65.9
Globicephala melas	300713-0018	M	11	482	33.3	8.13	73	11	37.2	74.2
Globicephala melas	300713-0020	M	11	505	49.4	5.22	73	17	36.7	75.7
Globicephala melas	300713-0021	F	10	460	80.8	23.6	73	31	131	74.2
Globicephala melas	300713-0023	F	10	465	72.9	18.0	70	20	73.2	74.6
Globicephala melas	300713-0028	M	14	530	86.8	9.7	70	27	35.5	75.3
Globicephala melas	300713-0029	M	17	555	49.7	5.8	73	19	31.2	75.4
Globicephala melas	080813-0006	M	10	470	53.2	13.1	75	14	45.1	70.5
Globicephala melas	080813-0008	F	9	447	219.0	15.6	74	63	36.5	75.0
Globicephala melas	080813-0012	F	8	447	198.0	24.1	75	53	68.3	69.0
Globicephala melas	080813-0018	M	14	558	42.4	6.6	75	15	50.1	72.9
Globicephala melas	080813-0020	M	16	558	119.0	16.7	75	35.5	57.6	75.5
Globicephala melas	080813-0021	M	12	530	47.4	14.6	73	15	33.3	77.4
Globicephala melas	080813-0025	F	8	443	238.0	22.9	72	75	78.4	74.4
Globicephala melas	060615-003	M		520	53.1	22.0	70.5	23.0	-	-
Globicephala melas	060615-005	F		445	-	-	-	-	64.4	69.6
Globicephala melas	060615-006	M		541	67.5	26.5	70.6	36.3	63.4	75.3
Globicephala melas	060615-008	F		464	57.7	34.4	71.6	14.7	70.9	76.5
Globicephala melas	060615-018	M		480	27.0	11.6	73.3	11.7	54.2	77.0
Globicephala melas	060615-020	F		450	125.0	59.1	71.5	63.9	94.6	76.0
Globicephala melas	060615-027	M		486	35.2	11.4	70.2	16.2	31.7	77.2
Globicephala melas	060615-035	M		569	22.2	10.7	71.0	12.1	-	-
Globicephala melas	290615-004	M	10	515	125	26.4	71.7	54.2	71.0	77.9
Globicephala melas	290615-005	M	12	530	74.4	16.6	70.8	36.3	31.9	74.6
Globicephala melas	290615-009	F	8	460	160	29.9	71.0	71.8	96.7	77.4
Globicephala melas	290615-010	M	14	515	137	12.8	70.9	48.9	53.1	77.6
Globicephala melas	290615-011	M	11	500	42.3	12.7	71.3	19.2	26.8	79.1
Globicephala melas	290615-013	M	12	535	65.2	8.89	70.6	23.5	41.8	77.1
Globicephala melas	290615-015	M	14	520	75.9	19.3	70.9	35.0	47.6	78.7
Globicephala melas	290615-019	M	13	520	74.5	10.5	71.9	33.3	34.8	75.6
Globicephala melas	230715-061	M	12	585	-	-	-	-	40.1	73.1
Globicephala melas	060716-0003	M	13	558	102.0	38.57	71.90	42.10	72.20	67.40

					Liver				**Kidney**	
Species	**ID**	**Sex**	**Skinn**	**Length, cm**	**Hg, mg/kg ww**	**Cd, mg/kg ww**	**% Moisture**	**Se, µg/g ww**	**Cd, mg/kg ww**	**% Moisture**
Globicephala melas	060716-0004	F	6	405	59.7	27.70	73.70	23.40	61.91	64.10
Globicephala melas	060716-0005	F	6	470	282.0	49.83	71.40	87.40	76.67	77.40
Globicephala melas	060716-0015	M	10	502	104.0	51.33	73.10	38.80	90.11	73.50
Globicephala melas	060716-0018	F	7	440	140.0	46.23	73.40	57.80	80.02	75.60
Globicephala melas	060716-0020	F	6	410	47.7	22.04	71.60	19.90	57.91	76.70
Globicephala melas	260716-0063	M	9	500	51.9	16.63	73.80	18.00	60.05	68.70
Globicephala melas	260716-0100	M	10	515	66.7	11.89	73.00	23.00	48.60	69.20
Globicephala melas	260716-0109	M	11	525	109.0	39.71	72.60	41.40	50.58	67.90
Globicephala melas	260716-0115	M	10	503	73.8	30.66	72.50	26.70	55.14	73.40
Globicephala melas	071116-0001	F	8	460	113.0	41.33	74.30	34.40	138.80	76.80
Globicephala melas	071116-0019	F	6	420	19.0	21.24	72.30	6.23	44.57	73.20
Globicephala melas	071116-0022	F	9	480	201.0	26.85	75.50	50.10	76.95	66.50
Globicephala melas	071116-0034	F	8	450	120.0	34.77	74.70	40.20	110.00	67.00
Globicephala melas	071116-0037	F	9	480	252.0	71.09	70.80	83.50	75.03	70.60

PCBs in pilot whale blubber (µg/kg of lipids):

	PCB congeners (µg/kg lw)															
ID	**Aroclor 1260**	**CB 28**	**CB 52**	**CB 99**	**CB 101**	**CB 105**	**CB 118**	**CB 128**	**CB 138**	**CB 153**	**CB 156**	**CB 163**	**CB 170**	**CB 180**	**CB 183**	**CB 187**
300713-0003	28000	20	470	680	1000	310	1000	310	2200	3200	92	450	350	940	270	900
300713-0007	120000	96	2600	2800	3600	1300	4500	1300	9400	13000	340	1800	1400	3700	1000	3500
300713-0008	10000	<50	<500	280	400	140	410	120	790	1200	39	170	140	400	110	400
300713-0009	28000	48	560	770	1000	360	1100	390	2200	3100	120	540	450	1200	330	1100
300713-0011	18000	<70	<700	480	660	210	690	210	1400	2100	64	290	240	670	180	650
300713-0013	2000	<80	<800	<80	47	16	46	21	140	240	<8	30	67	220	52	170
300713-0018	15000	<60	<600	410	530	180	590	170	1200	1800	54	260	210	580	160	580
300713-0019	21000	<40	410	540	670	230	760	230	1600	2400	63	330	240	650	180	660
300713-0020	20000	<50	<500	570	670	280	820	250	1600	2300	98	320	310	860	230	730
300713-0022	2900	<60	<600	<60	70	29	78	33	210	350	NR	49	94	290	71	240
300713-0028	17000	<80	<800	420	580	210	620	200	1300	1900	66	270	260	750	200	690
300713-0030	11000	<60	<600	260	370	140	400	130	850	1200	49	190	170	470	130	450
080813-0001	27000	30	460	620	1000	320	1000	310	2100	3100	86	420	290	770	210	760
080813-0003	10000	28	180	270	400	140	410	130	780	1200	45	180	140	390	110	390
080813-0005	12000	19	210	290	410	140	440	140	960	1400	44	200	170	490	130	450
080813-0006	38000	23	440	760	860	280	910	390	3000	4200	110	520	560	1600	390	1400
080813-0007	12000	39	240	320	490	170	490	140	940	1300	45	200	140	360	100	370
080813-0010	30000	41	440	650	870	300	1000	310	2500	3400	99	430	350	990	250	850
080813-0011	60000	59	1100	1600	2100	660	2000	680	4800	6700	180	930	680	1800	480	1600
080813-0016	4600	<20	<200	69	94	33	97	47	340	540	20	70	110	330	84	270
080813-0019	7900	31	160	210	320	110	320	93	610	900	34	140	100	270	75	280
080813-0021	15000	27	230	350	510	170	530	170	1200	1700	56	230	200	570	150	510
080813-0024	25000	30	390	590	910	290	930	280	2000	2800	85	390	280	740	200	710
080813-0026	11000	30	230	300	440	160	470	140	850	1200	49	200	160	450	120	420
080813-0027	11000	46	220	300	460	160	470	140	840	1300	51	190	150	410	110	400
060615-004	12550	32	322	380	577	176	559	149	962	1451	46	266	146	443	121	448
060615-007	22095	28	425	598	750	254	836	245	1730	2519	68	422	262	800	215	757
060615-017	24389	49	525	664	936	302	999	278	1870	2821	83	524	295	909	249	870
060615-018	11262	24	225	299	427	138	437	124	852	1313	38	242	143	442	117	427
060615-022	6919	18	164	199	300	89	282	79	527	803	23	141	81	248	67	243
060615-027	13964	28	285	388	549	170	543	155	1036	1649	47	297	179	551	148	538
060615-029	15654	51	342	426	656	207	629	172	1166	1844	56	327	186	571	156	568

	PCB congeners (µg/kg lw)															
ID	**Aroclor 1260**	**CB 28**	**CB 52**	**CB 99**	**CB 101**	**CB 105**	**CB 118**	**CB 128**	**CB 138**	**CB 153**	**CB 156**	**CB 163**	**CB 170**	**CB 180**	**CB 183**	**CB 187**
060615-031	40942	44	666	1043	1295	422	1498	435	3246	4627	108	761	478	1487	396	1350
060615-033	11193	24	246	342	444	154	482	138	877	1275	40	241	122	353	95	340
060615-040	5826	19	113	156	221	72	228	68	453	667	21	118	73	223	59	211
060615-041	18013	26	337	446	639	200	668	187	1384	2080	57	355	229	763	191	709
290615-002	10808	34	245	243	411	133	428	112	885	1193	37	207	132	429	113	418
290615-014	8430	30	212	199	343	108	343	90	695	927	30	154	102	341	86	320
290615-016	10445	26	231	223	379	120	397	101	874	1135	32	187	124	410	108	393
290615-017	10143	21	221	226	346	110	360	104	834	1116	33	187	126	392	109	394
290615-018	31614	65	546	729	971	347	1079	350	2779	3301	85	532	337	1015	284	972
290615-020	20290	36	295	422	606	205	674	220	1575	2327	71	381	312	1000	264	937
290615-021	22391	70	399	493	726	264	834	244	1890	2416	76	417	274	869	230	817
230715-064	6252	10	80	116	151	54	176	63	519	683	21	104	95	303	76	257
230715-065	7672	18	122	148	221	74	240	79	626	850	25	133	98	304	80	275
230715-127	10066	18	164	217	296	100	317	110	768	1167	38	191	140	423	116	393
230715-128	14175	17	245	294	390	142	463	146	1076	1650	47	282	191	596	157	531
230715-130	17110	30	280	376	496	181	608	199	1349	1941	60	319	223	663	182	586
230715-133	33043	30	556	705	854	348	1201	369	2704	3651	100	566	385	1124	316	1022
230715-134	25617	29	500	543	732	268	908	278	1991	2936	80	528	306	880	252	843
060716-0002	14704	30	267	322	455	154	485	161	1137	1690	50	288	217	668	180	598
060716-0008	14442	46	280	303	458	157	491	148	1106	1672	50	284	202	621	168	600
060716-0011	22951	84	626	559	858	308	992	257	1794	2620	76	459	250	740	213	760
060716-0013	13986	44	279	311	471	158	497	143	1070	1619	48	277	178	576	151	532
060716-0022	11290	23	226	260	382	125	416	121	856	1315	38	234	155	491	133	468
060716-0023	11806	21	226	245	352	117	387	118	899	1371	37	225	165	518	142	493
060716-0026	41559	23	588	862	944	369	1275	455	3360	4632	101	691	506	1560	427	1340
060716-0027	9765	37	230	215	371	116	361	98	775	1103	34	196	122	392	104	382
260716-0059	21649	25	279	399	504	155	520	204	1768	2395	50	359	339	986	272	828
260716-0070	9551	29	180	209	334	104	333	97	743	1094	32	172	137	437	116	393
260716-0077	15123	35	307	369	583	181	594	172	1231	1678	49	299	167	484	141	497
260716-0078	8660	31	146	185	302	94	296	97	685	980	34	172	123	386	103	353
260716-0099	18023	23	247	378	527	187	634	189	1413	2053	55	326	213	677	179	624
260716-0102	11161	42	223	240	384	123	389	121	855	1291	41	217	157	518	134	454
260716-0108	11144	16	140	198	273	84	288	106	886	1257	31	189	160	496	134	442

ID	PCB congeners (µg/kg lw) Aroclor 1260	CB 28	CB 52	CB 99	CB 101	CB 105	CB 118	CB 128	CB 138	CB 153	CB 156	CB 163	CB 170	CB 180	CB 183	CB 187
260716-0112	10489	34	223	237	388	126	394	111	848	1169	36	191	124	390	105	368
260716-0113	10165	17	184	215	334	105	344	103	800	1155	34	196	135	419	115	403
260716-0123	20496	19	260	438	622	200	719	218	1611	2331	58	362	242	764	198	688
260716-0132	13348	41	227	294	481	155	492	149	1017	1550	49	259	196	614	164	567
260716-0135	9104	15	123	194	293	91	304	94	695	1056	32	172	120	385	101	357
071116-0002	11675	36	184	299	422	148	454	147	919	1327	52	264	135	385	110	383
071116-0004	7010	22	111	174	253	85	259	85	544	804	30	153	88	258	72	257
071116-0015	6004	21	111	157	254	76	248	70	480	675	23	118	66	206	55	204
071116-0029	14484	20	187	343	475	164	536	168	1152	1633	52	278	155	462	127	434

Organochlorinated pesticides and toxaphene in pilot whale blubber (µg/kg of lipids):

		Organochlorinated pesticides (µg/kg lw)								DDT isomers and metabolites (µg/kg lw)						Toxaphene (µg/kg lw)			
ID	% of Lipids	Alpha-chlordane	Gamma-chlordane	Cis-nona -chlor	Trans-nona-chlor	Hexa-chloro-benzene	Mirex	Oxy-chlor-dane	ß-HCH	p,p'-DDD	p,p'-DDE	p,p'-DDT	o,p'-DDD	o,p'-DDE	o,p'-DDT	Parlar no. 26	Parlar no. 32	Parlar no. 50	Parlar no. 62
300713-0003	74	150	3.4	510	2400	260	140	330	28	990	13000	870	210	150	730	1200	5.8	1400	210
300713-0007	83	720	9.5	2100	8900	1500	420	1800	160	3900	58000	2300	830	660	3100	5800	15	7400	990
300713-0008	70	120	<5	280	1000	230	77	160	19	500	4800	380	100	75	330	610	<5	920	200
300713-0009	79	190	4.5	630	2500	260	140	350	37	1100	13000	880	260	190	870	1300	6.3	1800	240
300713-0011	67	150	<7	460	1700	240	98	250	24	700	7800	560	130	97	450	970	<7	1400	230
300713-0013	81	36	<8	44	140	43	78	14	<20	69	450	92	<20	<20	43	75	<8	160	91
300713-0018	67	140	<6	390	1400	250	110	220	24	650	6300	540	95	75	360	850	<6	1400	250
300713-0019	79	170	4.8	470	2000	220	83	310	25	780	8000	630	200	150	750	1100	<4	1600	240
300713-0020	78	110	<5	410	1500	390	140	340	32	930	9500	780	120	93	510	1100	<5	1600	320
300713-0022	67	51	<6	83	240	56	120	26	<20	130	790	170	28	15	78	130	<6	280	130
300713-0028	73	120	<8	350	1600	290	140	240	28	670	7600	580	120	98	480	820	<8	1300	250
300713-0030	76	110	<6	280	940	200	87	130	20	540	4400	470	100	71	300	540	<6	840	180
080813-0001	83	230	6.5	540	2400	490	88	360	39	980	11000	580	190	140	650	1400	7.8	2200	370
080813-0003	61	110	2.6	270	830	310	79	150	22	490	3300	410	92	53	220	580	4	1000	220
080813-0005	77	120	3.8	310	1100	240	97	150	20	510	4300	410	110	70	260	620	4.4	1000	190
080813-0006	75	130	4	440	2600	210	180	270	22	710	17000	500	190	150	810	1100	4.9	1200	180
080813-0007	80	170	5.1	320	1000	330	54	180	24	510	3300	450	110	65	300	670	<1	1300	330
080813-0010	74	210	5.2	540	2400	320	100	290	35	830	12000	640	190	120	640	1300	7.5	1800	300
080813-0011	72	300	7.4	1100	4700	480	180	670	53	1700	27000	900	340	270	1400	2400	10	2900	540
080813-0016	72	44	3.9	83	300	78	80	31	6.1	130	1000	160	26	14	93	140	3.9	280	110
080813-0019	80	150	6.2	240	650	350	50	110	20	390	2300	360	89	48	210	460	6.5	860	290
080813-0021	75	98	3.4	290	1200	200	100	160	15	530	5400	480	100	76	360	590	3.9	810	170
080813-0024	79	190	5.5	490	1900	250	91	300	30	900	9100	700	160	110	540	1100	7.9	1700	340
080813-0026	86	130	3.6	310	1100	280	80	160	24	550	4100	520	100	70	340	640	4.7	1200	340
080813-0027	72	170	3.9	340	980	290	80	160	24	600	4000	560	120	72	310	640	7.7	1000	270
060615-004	79.3	165	3.0	377	1214	400	87	200	28		5203	407				769	2.8	1205	254
060615-007	79.2	186	5.3	496	1939	333	127	277	33		11193	586				1113	3.8	1459	243
060615-017	71.2	229	3.7	621	2282	428	152	326	38		10974	695				1336	4.3	1681	251
060615-018	76.6	123	4.0	300	1084	278	103	146	19	535	4609	382	70	66	265	614	2.7	975	199
060615-022	82.3	125	3.7	224	615	261	46	102	20		2101	205				472	2.4	884	201
060615-027	78.0	116	3.5	330	1289	335	133	196	24		5520	422				787	2.2	1265	226

		Organochlorinated pesticides (µg/kg lw)								DDT isomers and metabolites (µg/kg lw)						Toxaphene (µg/kg lw)			
ID	**% of Lipids**	**Alpha-chlordane**	**Gamma-chlordane**	**Cis-nonachlor**	**Trans-nonachlor**	**Hexachlorobenzene**	**Mirex**	**Oxychlordane**	**ß-HCH**	**p,p'-DDD**	**p,p'-DDE**	**p,p'-DDT**	**o,p'-DDD**	**o,p'-DDE**	**o,p'-DDT**	**Parlar no. 26**	**Parlar no. 32**	**Parlar no. 50**	**Parlar no. 62**
060615-029	77.4	213	4.6	449	1426	468	136	215	33	755	5563	501	100	104	355	972	3.6	1547	285
060615-031	68.0	312	6.6	802	3471	628	217	467	48	1536	19115	973	261	303	1142	1923	4.4	2460	373
060615-033	67.8	122	4.1	317	1175	231	50	175	16		3863	368				673	2.8	994	151
060615-040	69.9	89	3.3	170	536	258	39	80	16	287	1806	205	41	32	152	346	2.2	634	151
060615-041	80.3	163	5.5	432	1658	308	172	217	26		7623	448				960	3.8	1307	235
290615-002	93.0	154	3.6	315	1028	307	101	160	26		4688	439				729	1.9	1037	206
290615-014	93.5	119	3.7	253	785	220	86	119	19	499	3797	347	82	75	261	526	2.7	718	138
290615-016	94.4	165	5.1	290	931	302	102	143	19		4277	366				628	3.5	1074	232
290615-017	88.9	117	3.5	267	932	252	89	139	22		4520	356				586	2.6	810	170
290615-018	90.8	232	5.6	505	2386	324	156	382	41	1336	18342	703	309	313	1266	1548	3.1	1687	236
290615-020	90.2	174	5.1	391	1705	418	168	263	38		9542	597				1064	4.9	1478	304
290615-021	95.0	120	3.2	399	1905	296	159	314	34	928	10901	562	162	181	665	1098	2.1	1194	154
230715-064	91.8	52	2.8	115	435	97	70	53	6		1574	159				219	1.6	369	83
230715-065	90.3	74	2.5	160	544	169	53	75	11		2071	182				310	2.2	507	98
230715-127	88.7	78	2.3	191	656	212	76	86	13	296	3166	233	45	42	175	400	2.0	583	112
230715-128	87.8	95	4.0	231	924	275	127	141	15	385	4461	336	51	49	224	567	2.5	854	163
230715-130	93.0	166	3.9	382	1227	272	98	169	18		5660	368				747	3.3	1117	181
230715-133	93.7	235	3.3	607	2325	479	174	389	38		10652	661				1559	3.0	2046	214
230715-134	89.0	185	3.6	482	1806	599	127	267	37	859	9103	657	121	106	493	1207	3.7	1729	242
060716-0002	86.5	127	3.8	334	1239	307	142	154	20	565	6353	417	103	96	374	748	4.0	964	157
060716-0008	86.4	268	9.1	395	1177	676	134	168	29	655	5281	528	109	93	327	930	7	1441	389
060716-0011	83.4	266	7.1	575	1973	869	147	347	49		9738	695				1573	7	2246	409
060716-0013	89.5	198	3.1	377	1103	469	143	176	26		5148	500				864	4	1324	248
060716-0022	84.6	124	4.3	272	962	275	124	137	18		4828	340				626	4	934	167
060716-0023	88.0	156	4.5	303	937	301	121	127	21	462	4451	372	78	70	255	681	5	1006	202
060716-0026	89.8	146	2.9	533	2962	324	220	440	37		19978	683				1684	0	1832	200
060716-0027	88.6	156	3.2	275	751	402	114	131	19		3409	348				601	4	953	221
260716-0059	88.9	133	2.6	321	1234	287	136	162	25		8843	413				701	3	1024	170
260716-0070	91.6	141	3.4	254	755	303	108	118	21	410	3172	279	72	64	200	535	4	871	161
260716-0077	90.3	126	2.4	340	1285	295	88	205	31	619	6903	388	101	107	382	840	3	1053	164
260716-0078	92.5	91	2.6	192	661	199	85	98	14		3217	235				418	3	662	123
260716-0099	88.6	158	4.0	354	1348	270	111	204	24		7092	415				801	0	1176	192

		Organochlorinated pesticides (µg/kg lw)								DDT isomers and metabolites (µg/kg lw)						Toxaphene (µg/kg lw)			
ID	% of Lipids	Alpha-chlordane	Gamma-chlordane	Cis-nona -chlor	Trans-nona-chlor	Hexa-chloro-benzene	Mirex	Oxy-chlordane	ß-HCH	p,p'-DDD	p,p'-DDE	p,p'-DDT	o,p'-DDD	o,p'-DDE	o,p'-DDT	Parlar no. 26	Parlar no. 32	Parlar no. 50	Parlar no. 62
260716-0102	92.6	151	3.4	277	869	320	122	134	22		3748	327				565	3	1072	208
260716-0108	91.5	70	2.1	168	717	205	85	98	14		3780	222				426	2	704	137
260716-0112	94.0	157	3.2	286	856	395	98	143	24		3815	364				626	4	1045	201
260716-0113	91.7	91	2.1	232	864	192	104	121	17	399	3966	258	63	64	225	557	2	733	129
260716-0123	86.2	127	4.2	346	1510	267	135	200	20	610	9085	453	114	114	473	778	5	1036	185
260716-0132	86.6	180	3.1	367	1118	439	131	165	27		5032	512				783	4	1219	247
260716-0135	86.6	80	2.3	193	671	201	85	93	13		3347	288				411	3	609	129
071116-0002	91.2	109	2.7	245	779	256	52	129	24	454	3044	341	64	46	223	520	3	905	186
071116-0004	89.5	98	2.9	177	522	227	42	74	19		1704	223				370	4	684	185
071116-0015	85.6	88	2.3	159	480	281	45	79	14	245	1580	204	44	30	130	341	3	580	152
071116-0029	87.5	94	2.2	262	983	210	69	140	18	431	4416	310	66	62	268	556	3	795	137

PBDE in Pilot whale blubber samples (ng/g lipid weight):

ID	BDE 28	BDE 47	BDE 66	BDE100	BDE 99	BDE 85	BDE 154	BDE 153	BDE 183
300713-0007	57.5	1170	21.2	196.0	237.0	4.2	180.0	58.6	1.4
300713-0009	10.9	358	7.2	72.0	73.2	1.8	48.8	16.1	0.4
080813-0003	8.7	222	7.0	43.8	42.0	1.7	41.3	13.2	0.6
080813-0019	7.6	149	5.4	32.3	30.6	1.3	29.5	9.2	0.4
080813-0027	10.1	204	7.6	42.4	38.5	1.5	36.3	11.6	0.4
300713-0019	18.4	210	6.5	54.8	46.2	0.47	42.7	10.1	0.21
300713-0030	8.0	118	3.7	31.4	23.6	0.25	29.8	8.6	0.24
060615-007	9.0	156	3.3	31.3	30.3	0.39	28.4	7.8	0.25
060615-029	12.7	32.7	6.3	50.4	52.5	0.54	40.6	18.8	0.53
060615-041	8.5	117	3.9	35.1	28.1	0.33	33.1	8.4	0.25
290615-014	4.2	44.4	1.9	10.8	11.3	0.21	17.4	4.5	0.20
290615-018	6.4	71.1	3.2	24.1	17.8	0.30	22.0	6.4	0.36
260716-0077	9.9	190	4.4	42.3	38.0	0.46	44.6	13.0	0.26
260716-0099	11.2	173	5.9	45.0	42.2	0.51	21.7	10.1	0.35
260716-0102	11.3	224	4.9	49.3	42.5	0.36	37.3	10.4	0.29
260716-0108	13.5	154	8.2	60.4	34.9	0.53	43.6	10.1	<0.08
071116-0015	10.9	118	4.1	31.3	23.3	0.36	22.0	6.7	0.36

PFASs in Pilot whale liver (ng/g ww):

ID	Location	Year	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTDA	PFHxDA	PFHxS	PFHpS	PFOS	PFOSA
050909-011	Gøta	2009	<0.1	4.3	13.8	48.4	7.8	27.7	4.9	n.q.	0.2	<0.1	44.9	7.7
050909-020	Gøta	2009	0.1	4.0	14.3	49.9	7.3	37.6	4.7	<0.1	0.3	<0.1	38.7	5.9
230710-004	Tórshavn	2010	0.1	4.0	9.4	25.3	4.5	32.7	4.3	<0.1	0.1	0.1	35.4	19.6
230710-079	Tórshavn	2010	0.2	9.4	21.5	67.7	10.4	52.3	5.9	<0.1	0.3	0.1	59.2	8.6
020911-053	Vestmanna	2011	0.3	15.9	39.8	92.8	14.3	58.2	8.1	n.q.	1.7	0.6	171.9	19.1
020911-003	Vestmanna	2011	0.5	15.7	23.3	60.0	9.9	72.0	7.8	0.1	0.6	0.2	69.8	17.7
090211-002	Vestmanna	2011	<0.1	2.2	15.4	46.3	6.8	38.7	5.0	<0.1	0.2	<0.1	53.4	12.3
020911-069	Vestmanna	2011	<0.1	1.2	5.0	17.8	3.5	25.1	3.3	<0.1	0.4	0.1	25.4	13.5
100712-037	Klaksvík	2012	0.4	18.2	27.3	71.0	12.5	63.3	7.4	0.2	0.3	0.2	79.8	13.1
090211-029	Vestmanna	2012	0.1	4.2	14.9	45.8	6.7	20.5	5.1	n.q.	0.2	<0.1	44.7	17.5
090812-002	Hvannasund	2012	0.5	17.7	28.2	68.2	9.8	47.7	5.4	0.1	0.5	0.3	86.7	8.2
090812-030	Hvannasund	2012	0.3	14.6	31.9	75.9	11.3	52.8	6.5	0.1	0.5	0.2	82.8	8.0
090812-027	Hvannasund	2012	0.7	29.1	36.3	88.2	13.4	61.0	9.2	n.q.	0.3	0.2	100.7	10.4
300713-0030	Fuglafjordur	2013	0.2	10.4	18.9	51.2	8.3	22.7	4.3	n.q.	0.5	0.2	68.4	8.5
300713-0019	Fuglafjordur	2013	0.1	2.5	5.4	18.0	3.3	20.3	2.2	<0.1	0.2	<0.1	23.1	7.7
300713-0007	Fuglafjørður	2013	<0.5	4.8	6.9	25.2	5.1	20.0	2.5				26.6	23.0
300713-0009	Fuglafjørður	2013	<0.5	8.0	12.9	30.3	4.5	15.8	1.0				58.4	12.8
080813-0003	Sandavágur	2013	<0.5	2.9	7.2	22.0	3.7	23.8	1.8				31.7	18.3
080813-0019	Sandavágur	2013	<0.5	32.3*	82.1	196.0	22.8	21.1	0.32				282.0	29.3*
080813-0027	Sandavágur	2013	<0.5	11.9	25.7	59.5	7.9	36.0	2.5				74.6	13.7
060615-031	Midvágur	2015	0.7	34.0	36.1	80.8	12.9	27.4	n.q.	n.q.	0.4	0.2	121.8	7.5
060615-022	Midvágur	2015	0.2	9.0	15.9	42.8	6.9	34.6	3.4	<0.1	0.4	<0.1	51.7	9.4
290615-014	Hvannasund	2015	0.2	10.8	19.8	53.4	8.5	29.4	4.5	0.1	0.2	0.1	64.1	4.3
060615-040	Midvágur	2015	<0.1	1.9	5.5	19.4	4.1	16.4	3.2	n.q.	0.3	<0.1	28.9	20.5
290615-018	Hvannasund	2015	0.4	22.1	34.0	85.3	14.5	51.6	7.5	0.1	0.3	0.2	110.7	5.0
260716-0108	Hvannasund	2016	0.3	12.3	19.4	46.8	6.8	30.1	3.1	<0.1	0.6	0.2	66.5	7.3
260716-0102	Hvannasund	2016	0.8	31.7	38.4	78.5	10.5	36.3	4.7	0.1	1.0	0.4	120.6	13.4
260716-0077	Hvannasund	2016	0.4	8.9	17.8	53.2	7.8	19.6	3.2	n.q.	0.3	<0.1	42.2	6.1
260716-0099	Hvannasund	2016	0.3	17.2	28.9	61.1	8.1	25.8	3.5	<0.1	0.9	0.3	73.1	15.9
071116-0015	Leynar	2016	<0.1	0.8	3.5	13.0	2.2	10.9	1.1	<0.1	0.3	<0.1	16.5	6.9

*Recoveries between 20-50%

HBCDs in Pilot whale blubber (ng/g ww):

ID	Location	Year	Lipid %	Dry matter %	alpha HBCD	beta HBCD	gamma HBCD
110186-0057	Miðvágur	1986	88.66	85.53	39.59	0.31	0.58
110186-0075	Miðvágur	1986	84.52	80.59	32.31	0.28	0.43
110186-0097	Miðvágur	1986	83.31	82.72	35.16	0.22	0.53
110186-0192	Miðvágur	1986	89.09	87.84	30.27	0.17	0.39
091186-0103	Sandur	1986	88.78	90.00	24.17	0.12	0.34
280696-0289	Vestmanna	1996	88.56	85.43	43.63	0.22	0.61
280696-0282	Vestmanna	1996	86.56	82.28	42.91	0.24	0.55
280696-0297	Vestmanna	1996	86.30	80.48	55.39	0.25	0.70
280696-0266	Vestmanna	1996	88.82	82.68	42.12	0.13	0.35
280696-0275	Vestmanna	1996	87.95	83.21	55.57	0.32	1.35
310800-159	Hvannasund	2000	95.24	89.25	25.73	0.06	0.24
310800-128	Hvannasund	2000	86.68	90.29	40.13	0.09	0.35
310800-116	Hvannasund	2000	88.17	85.62	74.49	0.51	0.75
090900-016	Tórshavn	2000	87.26	81.68	60.97	0.68	1.09
090900-020	Tórshavn	2000	86.79	84.93	64.86	0.46	0.78
280806-0009	Hvannasund	2006	87.09	82.33	80.45	0.50	0.71
280806-0004	Hvannasund	2006	80.61	83.58	127.31	0.79	0.98
280806-0018	Hvannasund	2006	88.26	83.28	121.27	0.86	1.07
280806-0026	Hvannasund	2006	87.39	81.56	136.34	0.74	1.14
280806-0019	Hvannasund	2006	91.94	82.36	159.76	0.84	1.32
240610-0012	Vestmanna	2010	90.11	83.66	88.88	0.91	0.74
240610-0029	Vestmanna	2010	88.24	83.39	44.39	0.63	0.54
240610-0030	Vestmanna	2010	79.95	84.10	35.96	0.30	0.35
020710-0014	Sandagerði	2010	81.04	80.82	49.58	0.34	0.55
020710-0011	Sandagerði	2010	90.03	84.89	84.27	0.56	0.68
060615-022	Miðvágur	2015	78.88	85.76	55.66	0.35	0.50
060615-031	Miðvágur	2015	91.73	82.43	63.87	0.65	0.77
060615-040	Miðvágur	2015	92.86	86.40	35.68	0.13	0.37
290615-016	Hvannasund	2015	84.16	84.43	35.16	0.33	0.45
290615-018	Hvannasund	2015	93.96	83.16	47.54	0.23	0.31

Appendix E: Cod

Mercury in cod muscle:

ID	Species	Location	Date	Length, cm	Round weight, g	Whole liver, g	Gender	Gonad weight, g	Sample ID	Hg muscle, mg/kg	Dry matter %
Gm-0522	Gadus morhua	Mýlingsgrunnur	October 2013	44	1016	27.53	Male		Gm-0522	0.071	20.2
Gm-0523	Gadus morhua	Mýlingsgrunnur	October 2013	50.5	1352	36.93	Male		Gm-0523	0.081	19.7
Gm-0524	Gadus morhua	Mýlingsgrunnur	October 2013	46	876	11.93	Female		Gm-0524	0.209	18.4
Gm-0525	Gadus morhua	Mýlingsgrunnur	October 2013	50	1374	32.95	Female		Gm-0525	0.140	19.7
Gm-0526	Gadus morhua	Mýlingsgrunnur	October 2013	57	1710	38.76	Male		Gm-0526	0.078	19.7
Gm-0527	Gadus morhua	Mýlingsgrunnur	October 2013	53.5	1710	68.76	Female		Gm-0527	0.128	20.3
Gm-0528	Gadus morhua	Mýlingsgrunnur	October 2013	53	1348	24.97	Female		Gm-0528	0.154	19.7
Gm-0529	Gadus morhua	Mýlingsgrunnur	October 2013	57	1752	60.60	Female		Gm-0529	0.091	20.1
Gm-0530	Gadus morhua	Mýlingsgrunnur	October 2013	47.5	1022	20.67	Female		Gm-0530	0.070	20.5
Gm-0531	Gadus morhua	Mýlingsgrunnur	October 2013	56	1698	39.36	Female		Gm-0531	0.101	19.8
Gm-0532	Gadus morhua	Mýlingsgrunnur	October 2013	49.5	1248	16.70	Female		Gm-0532	0.060	19.5
Gm-0533	Gadus morhua	Mýlingsgrunnur	October 2013	48	1132	36.50	Male		Gm-0533	0.052	20.5
Gm-0534	Gadus morhua	Mýlingsgrunnur	October 2013	50	1126	29.00	Female		Gm-0534	0.054	19.8
Gm-0535	Gadus morhua	Mýlingsgrunnur	October 2013	52.5	1504				Gm-2013-1	0.073	20.3
Gm-0536	Gadus morhua	Mýlingsgrunnur	October 2013	55	1576						
Gm-0537	Gadus morhua	Mýlingsgrunnur	October 2013	42	784	17.20					
Gm-0538	Gadus morhua	Mýlingsgrunnur	October 2013	46	1026	28.10					
Gm-0539	Gadus morhua	Mýlingsgrunnur	October 2013	47.5	1014	19.60					
Gm-0540	Gadus morhua	Mýlingsgrunnur	October 2013	49	1164	37.10					
Gm-0541	Gadus morhua	Mýlingsgrunnur	October 2013	46	1052	45.30			Gm-2013-2	0.058	20.6
Gm-0542	Gadus morhua	Mýlingsgrunnur	October 2013	46	1076	38.50					
Gm-0543	Gadus morhua	Mýlingsgrunnur	October 2013	46.5	936	11.60					
Gm-0544	Gadus morhua	Mýlingsgrunnur	October 2013	53	1640	54.10					
Gm-0545	Gadus morhua	Mýlingsgrunnur	October 2013	44	872	18.10					
Gm-0546	Gadus morhua	Mýlingsgrunnur	October 2013	45	1000	22.60					
Gm-0547	Gadus morhua	Mýlingsgrunnur	October 2014	48.5	1186	56.76	Male		Gm-0547	0.030	20.8
Gm-0548	Gadus morhua	Mýlingsgrunnur	October 2014	50.5	1352	67.00	Female	6.42	Gm-0548	0.042	20.3
Gm-0549	Gadus morhua	Mýlingsgrunnur	October 2014	51.0	1490	73.79	Male		Gm-0549	0.038	20.3
Gm-0550	Gadus morhua	Mýlingsgrunnur	October 2014	51.0	1130	50.40	Male		Gm-0550	0.049	20.3

ID	Species	Location	Date	Length, cm	Round weight, g	Whole liver, g	Gender	Gonad weight, g	Sample ID	Hg muscle, mg/kg	Dry matter %
Gm-0551	Gadus morhua	Mýlingsgrunnur	October 2014	43.5	910	39.83	Male		Gm-0551	0.030	20.1
Gm-0552	Gadus morhua	Mýlingsgrunnur	October 2014	46.0	1090	34.90	Male		Gm-0552	0.036	21.6
Gm-0553	Gadus morhua	Mýlingsgrunnur	October 2014	51.0	1376	74.40	Female	6.07	Gm-0553	0.039	20.0
Gm-0554	Gadus morhua	Mýlingsgrunnur	October 2014	48.0	1140	29.48	Female	2.23	Gm-0554	0.038	20.0
Gm-0555	Gadus morhua	Mýlingsgrunnur	October 2014	42.5	842	29.75	Female	2.08	Gm-0555	0.022	21.1
Gm-0556	Gadus morhua	Mýlingsgrunnur	October 2014	45.0	1032	47.35	Male		Gm-0556	0.036	20.8
Gm-0557	Gadus morhua	Mýlingsgrunnur	October 2014	47.0	1158	46.20	Female	2.64	Gm-0557	0.021	20.3
Gm-0558	Gadus morhua	Mýlingsgrunnur	October 2014	51.0	1378	55.27	Male		Gm-0558	0.031	20.8
Gm-0559	Gadus morhua	Mýlingsgrunnur	October 2014	50.0	1404	55.60	Male		Gm-0559	0.033	21.4
Gm-0560	Gadus morhua	Mýlingsgrunnur	October 2014	48.5	1234	59.06	Male		Gm-2014-1	0.039	21.0
Gm-0561	Gadus morhua	Mýlingsgrunnur	October 2014	47.0	1186	43.56	Female	3.42			
Gm-0562	Gadus morhua	Mýlingsgrunnur	October 2014	52.0	1532	97.72	Male				
Gm-0563	Gadus morhua	Mýlingsgrunnur	October 2014	53.5	1794	102.47	Male				
Gm-0564	Gadus morhua	Mýlingsgrunnur	October 2014	49.5	1374	59.37	Female	4.72			
Gm-0565	Gadus morhua	Mýlingsgrunnur	October 2014	45.0	1062	38.69	Male				
Gm-0566	Gadus morhua	Mýlingsgrunnur	October 2014	45.0	1020	44.35	Male		Gm-2014-2	0.034	20.9
Gm-0567	Gadus morhua	Mýlingsgrunnur	October 2014	48.5	1248	56.74	Female				
Gm-0568	Gadus morhua	Mýlingsgrunnur	October 2014	49.5	1370	59.79	Male				
Gm-0569	Gadus morhua	Mýlingsgrunnur	October 2014	52.0	1662	78.88	Male				
Gm-0570	Gadus morhua	Mýlingsgrunnur	October 2014	48.0	1400	82.45	Male				
Gm-0571	Gadus morhua	Mýlingsgrunnur	October 2014	49.0	1254	59.67	Male				
Gm-0572	Gadus morhua	Mýlingsgrunnur	October 2015	49.5	1160	18.36	Male	-	Gm-0572	0.049	20.1
Gm-0573	Gadus morhua	Mýlingsgrunnur	October 2015	49.0	1300	45.35	Male?	-	Gm-0573	0.039	20.7
Gm-0574	Gadus morhua	Mýlingsgrunnur	October 2015	48.0	1160	13.82	Male?	-	Gm-0574	0.054	20.7
Gm-0575	Gadus morhua	Mýlingsgrunnur	October 2015	47.0	1000	13.68	Female	2.39	Gm-0575	0.042	20.4
Gm-0576	Gadus morhua	Mýlingsgrunnur	October 2015	50.0	1140	17.00	Male	-	Gm-0576	0.055	20.8
Gm-0577	Gadus morhua	Mýlingsgrunnur	October 2015	47.0	1180	22.16	Male	-	Gm-0577	0.046	20.5
Gm-0578	Gadus morhua	Mýlingsgrunnur	October 2015	50.0	1300	36.74	Male	-	Gm-0578	0.046	20.7
Gm-0579	Gadus morhua	Mýlingsgrunnur	October 2015	50.0	1140	22.86	Male	-	Gm-0579	0.042	20.9
Gm-0580	Gadus morhua	Mýlingsgrunnur	October 2015	47.0	1040	14.33	Female	1.99	Gm-0580	0.047	19.7
Gm-0581	Gadus morhua	Mýlingsgrunnur	October 2015	45.0	860	7.76	Male	-	Gm-0581	0.052	19.6
Gm-0582	Gadus morhua	Mýlingsgrunnur	October 2015	48.0	1160	14.56	Female	3.44	Gm-0582	0.061	20.0
Gm-0583	Gadus morhua	Mýlingsgrunnur	October 2015	53.5	1550	39.71	Male	3.49	Gm-0583	0.062	20.4
Gm-0584	Gadus morhua	Mýlingsgrunnur	October 2015	49.0	1140	16.55	Male	-	Gm-0584	0.051	19.8

ID	Species	Location	Date	Length, cm	Round weight, g	Whole liver, g	Gender	Gonad weight, g	Sample ID	Hg muscle, mg/kg	Dry matter %
Gm-0585	Gadus morhua	Mýlingsgrunnur	October 2015	47.0	1000	18.62	Male	-	Gm-0585	0.048	20.6
Gm-0586	Gadus morhua	Mýlingsgrunnur	October 2015	52.5	1300	15.29	Female	3.03	Gm-0586	0.042	19.6
Gm-0587	Gadus morhua	Mýlingsgrunnur	October 2015	49.5	1400	40.46	Female	3.30	Gm-2015-1	0.044	20.1
Gm-0588	Gadus morhua	Mýlingsgrunnur	October 2015	44.0	760	7.79	Male	-			
Gm-0589	Gadus morhua	Mýlingsgrunnur	October 2015	48.0	1100	17.67	Male	-			
Gm-0590	Gadus morhua	Mýlingsgrunnur	October 2015	51.0	1350	21.78	Female	3.59			
Gm-0591	Gadus morhua	Mýlingsgrunnur	October 2015	48.5	1300	24.13	Male	-			
Gm-0592	Gadus morhua	Mýlingsgrunnur	October 2015	44.0	900	10.22	Female	3.06			
Gm-0593	Gadus morhua	Mýlingsgrunnur	October 2015	47.5	1100	22.02	Female	2.88	Gm-2015-2	0.048	19.7
Gm-0594	Gadus morhua	Mýlingsgrunnur	October 2015	47.5	1180	12.01	Female	0.80			
Gm-0595	Gadus morhua	Mýlingsgrunnur	October 2015	51.0	1220	23.12	Female	3.60			
Gm-0596	Gadus morhua	Mýlingsgrunnur	October 2015	47.0	1090	18.30	Female	4.04			
Gm-0597	Gadus morhua	Mýlingsgrunnur	October 2015	49.0	1120	12.69	Female	3.38			
Gm-0598	Gadus morhua	Mýlingsgrunnur	October 2015	49.0	1200	22.97	Female	3.30			
Gm-0600	Gadus morhua	Mýlingsgrunnur	October 2016	48.5	1300	38.96	Male		Gm-0600	0.017	79.1
Gm-0602	Gadus morhua	Mýlingsgrunnur	October 2016	48	1400	69.56	Female	2.47	Gm-0602	0.022	78.7
Gm-0603	Gadus morhua	Mýlingsgrunnur	October 2016	47.5	1240	44.30	Female	3.90	Gm-0603	0.028	78.3
Gm-0604	Gadus morhua	Mýlingsgrunnur	October 2016	53.5	1800	96.97	Male		Gm-0604	0.021	78.5
Gm-0605	Gadus morhua	Mýlingsgrunnur	October 2016	52	1700	70.34	Male		Gm-0605	0.022	79.7
Gm-0606	Gadus morhua	Mýlingsgrunnur	October 2016	50.5	1550	68.73	Female	5.13	Gm-0606	0.028	79.4
Gm-0607	Gadus morhua	Mýlingsgrunnur	October 2016	51.5	1550	39.03	Male		Gm-0607	0.025	78.3
Gm-0608	Gadus morhua	Mýlingsgrunnur	October 2016	48	1350	81.56	Male		Gm-0608	0.022	79.0
Gm-0609	Gadus morhua	Mýlingsgrunnur	October 2016	49.5	1450	64.38	Female	4.46	Gm-0609	0.024	79.6
Gm-0610	Gadus morhua	Mýlingsgrunnur	October 2016	53	1650	58.35	Female	1.73	Gm-0610	0.040	78.3
Gm-0611	Gadus morhua	Mýlingsgrunnur	October 2016	45	1450	57.57	Male		Gm-0611	0.028	77.8
Gm-0612	Gadus morhua	Mýlingsgrunnur	October 2016	46.5	1220	54.78	Female	5.09	Gm-0612	0.032	78.8
Gm-0613	Gadus morhua	Mýlingsgrunnur	October 2016	48	1350	60.73	Female	3.84	Gm-0613	0.026	78.1
Gm-0614	Gadus morhua	Mýlingsgrunnur	October 2016	49.5	1750	143.49	Male		Gm-0614	0.044	78.2
Gm-0615	Gadus morhua	Mýlingsgrunnur	October 2016	55.5	2300	165.28	Male		Gm-0615	0.055	79.6
Gm-0616	Gadus morhua	Mýlingsgrunnur	October 2016	49.5	1450	50.54	Female	3.73	Gm-2016-1	0.034	79.6
Gm-0617	Gadus morhua	Mýlingsgrunnur	October 2016	50	1550	64.42	Male				
Gm-0618	Gadus morhua	Mýlingsgrunnur	October 2016	48	1300	44.11	Female	2.64			
Gm-0619	Gadus morhua	Mýlingsgrunnur	October 2016	54	2050	88.60	Male				
Gm-0620	Gadus morhua	Mýlingsgrunnur	October 2016	52	1700	74.95	Female	7.81			

ID	**Species**	**Location**	**Date**	**Length, cm**	**Round weight, g**	**Whole liver, g**	**Gender**	**Gonad weight, g**	**Sample ID**	**Hg muscle, mg/kg**	**Dry matter %**
Gm-0621	Gadus morhua	Mýlingsgrunnur	October 2016	48	1600	52.27	Male		Gm-2016-2	0.030	79.1
Gm-0622	Gadus morhua	Mýlingsgrunnur	October 2016	50	1500	32.66	Male				
Gm-0623	Gadus morhua	Mýlingsgrunnur	October 2016	51	1550	54.10	Female	4.82			
Gm-0624	Gadus morhua	Mýlingsgrunnur	October 2016	48.5	1500	53.76	Male				
Gm-0625	Gadus morhua	Mýlingsgrunnur	October 2016	51.5	1800	57.07	Female	5.96			
Gm-0599	Gadus morhua	Mýlingsgrunnur	October 2016	55.5	2050	91.08	Male		Gm-2016-3	0.070	79.5
Gm-0601	Gadus morhua	Mýlingsgrunnur	October 2016	56	2300	103.29	Female	14.82			
Gm-0626	Gadus morhua	Mýlingsgrunnur	October 2016	54.5	1900	52.01	Male				

PCBs in cod liver (µg/kg of lipids):

ID	**Sample ID**	**PCB Aroclor 1260**	**CB 28**	**CB 52**	**CB 99**	**CB 101**	**CB 105**	**CB 118**	**CB 128**	**CB 138**	**CB 153**	**CB 156**	**CB 163**	**CB 170**	**CB 180**	**CB 183**	**CB 187**
Gm-0522	Gm-0522	350	<2	<20	7.2	2.4	3.9	12	3.2	19	48	1.7	<0.2	4.5	13	2.2	1.3
Gm-0523	Gm-0523	440	<2	<20	9.7	6.1	4.9	15	4.3	26	58	2.3	NR	5.4	15	2.7	3.2
Gm-0524	Gm-0524	780	<10	<100	14	7.5	7.8	24	7.9	48	100	3.7	NR	12	35	6.3	8.9
Gm-0525	Gm-0525	480	<3	<30	9.1	2.3	5	15	4.9	28	65	2.9	<0.3	7.4	22	3.8	1.4
Gm-0526	Gm-0526	530	<2	<20	9.9	6.4	5.8	18	4.9	28	74	2.9	<0.2	7.1	19	3.3	3.3
Gm-0527	Gm-0527	440	<2	<20	8.8	3.1	4.6	15	4.3	26	58	2	<0.2	6.1	17	2.9	1.1
Gm-0528	Gm-0528	420	<7	<70	7.4	3.4	4.4	13	4.3	26	55	2.2	<0.7	6.6	20	3.4	2.3
Gm-0529	Gm-0529	250	<2	<20	5.4	3.6	3.1	9	2.6	15	33	1.4	NR	3.3	9.3	1.7	2.1
Gm-0530	Gm-0530	490	<2	<20	9.6	1.8	4.9	16	4.7	29	65	2.2	<0.2	6.4	18	3.2	1.3
Gm-0531	Gm-0531	460	<3	<30	7.9	4.3	4.7	14	4.6	27	61	2.3	<0.3	6.9	20	3.5	3
Gm-0532	Gm-0532	840	<4	<40	16	6	8.4	25	7.7	46	120	4.2	<0.4	11	31	5.3	4.4
Gm-0533	Gm-0533	230	<2	<20	5.4	4.2	2.7	7.9	2.4	13	31	1.1	1.2	2.8	7.8	1.4	3.1
Gm-0534	Gm-0534	520	<3	<30	10	3.7	5.5	19	4.8	30	70	2.4	<0.3	6.2	16	3.1	2.3
Gm-0535	Gm-2013-1	510	<3	<30	9.7	3.9	4.8	15	5	30	68	2.2	<0.3	7.2	21	3.8	2.2
Gm-0536																	
Gm-0537																	
Gm-0538																	
Gm-0539																	
Gm-0540																	
Gm-0541	Gm-2013-2	340	<2	<20	6.6	4.4	3.5	11	3.3	19	45	1.7	<0.2	4.3	12	2.3	2.9
Gm-0542																	
Gm-0543																	
Gm-0544																	
Gm-0545																	
Gm-0546																	
Gm-0547	Gm-0547	94	NR	NR	2	3.4	1.3	4	1	5.9	12	0.45	0.7	0.97	2.8	0.57	1.2
Gm-0548	Gm-0548	140	NR	NR	3.4	4.8	1.7	5.5	1.5	8.2	19	0.85	1.5	1.8	5	0.95	2.9
Gm-0549	Gm-0549	93	<1	<10	2	2.8	1.2	3.8	1	5.9	12	0.42	0.48	0.98	2.7	0.56	1
Gm-0550	Gm-0550	215	<2	<20	5.15	5.1	2.5	8.1	2.3	13	28	1.05	1.35	2.45	7.1	1.35	2.7
Gm-0551	Gm-0551	120	NR	NR	2	3	1.2	4.2	0.99	6.5	17	0.59	0.64	1.6	4.7	0.87	1.5
Gm-0552	Gm-0552	150	NR	NR	3.2	3.5	1.7	5.4	1.4	8	20	0.83	0.58	1.8	5.2	0.94	1.3
Gm-0553	Gm-0553	110	<2	<20	2	3.2	1.2	3.9	1	5.9	15	0.58	0.82	1.4	4	0.69	1.9

ID	**Sample ID**	**PCB Aroclor 1260**	**CB 28**	**CB 52**	**CB 99**	**CB 101**	**CB 105**	**CB 118**	**CB 128**	**CB 138**	**CB 153**	**CB 156**	**CB 163**	**CB 170**	**CB 180**	**CB 183**	**CB 187**
Gm-0554	Gm-0554	170	<2	<20	4.2	5.1	2.3	7.4	1.9	11	22	0.83	0.74	1.9	5.4	1.1	1.8
Gm-0555	Gm-0555	88	NR	NR	2	3.4	1.2	3.9	0.92	5.4	11	0.41	0.71	0.91	2.6	0.5	1.3
Gm-0556	Gm-0556	120	<2	<20	3	2.6	1.5	4.7	1.2	6.7	16	0.54	0.6	1.3	3.6	0.62	1.5
Gm-0557	Gm-0557	110	NR	NR	2	3.6	1.2	4.1	1.1	6.9	14	0.43	0.94	1.2	3.5	0.71	2
Gm-0558	Gm-0558	105	NR	NR	2	3.1	1.4	4.5	1.1	6.4	14	0.52	0.68	1.3	3.75	0.67	1.4
Gm-0559	Gm-0559	110	NR	NR	3	3.1	1.4	4.7	1.2	6.9	14	0.51	0.56	1.2	3.4	0.71	1.3
Gm-0560	Gm-2014-1	110	NR	NR	2	3.4	1.4	4.7	1.1	6.6	14	0.5	0.65	1.2	3.4	0.66	1.3
Gm-0561																	
Gm-0562																	
Gm-0563																	
Gm-0564																	
Gm-0565																	
Gm-0566	Gm-2014-2	110	NR	NR	3	3.2	1.5	5	1.2	7.1	14	0.54	0.76	1.2	3.5	0.66	1.4
Gm-0567																	
Gm-0568																	
Gm-0569																	
Gm-0570																	
Gm-0571																	
Gm-0572	Gm-0572	551	<5	<50	11.7	6.0	6.2	20.3	6.0	35.6	70.4	2.9	<0.5	5.9	19.6	3.8	1.8
Gm-0573	Gm-0573	142	<2	<20	3.6	3.4	1.9	5.3	1.6	8.7	18.6	1.0	1.4	1.9	6.0	0.9	3.2
Gm-0574	Gm-0574	1537	<10	<100	30.4	9.0	14.7	54.6	18.6	103.5	192.0	7.8	<1	16.5	53.1	11.6	2.7
Gm-0575	Gm-0575	1185	<10	<100	26.6	37.0	14.5	46.9	13.2	76.1	151.8	5.7	13.1	11.5	37.8	7.4	21.8
Gm-0576	Gm-0576	701	<8	<80	15.7	15.8	8.4	27.1	7.7	43.7	91.1	3.4	4.0	7.1	23.0	4.4	8.0
Gm-0577	Gm-0577	439	<7	<70	10.4	7.2	5.5	17.6	4.7	28.6	55.9	2.1	1.6	4.2	13.6	2.6	3.3
Gm-0578	Gm-0578	320	<3	<30	7.1	3.4	4.0	13.0	3.3	18.0	43.0	1.8	0.7	3.6	11.0	1.7	2.8
Gm-0579	Gm-0579	540	NR	NR	13.0	21.0	7.4	23.0	6.3	38.0	67.0	2.3	5.7	4.7	15.0	3.4	9.8
Gm-0580	Gm-0580	850	NR	NR	17.0	11.0	9.3	30.0	8.7	50.0	110.0	4.7	NR	10.0	33.0	5.7	5.1
Gm-0581	Gm-0581	1500	<40	<400	<40	12.0	14.0	46.0	16.0	92.0	190.0	7.2	NR	15.0	50.0	13.0	6.7
Gm-0582	Gm-0582	780	<4	<40	16.0	11.0	8.7	28.0	8.3	50.0	99.0	3.7	1.9	8.2	26.0	5.1	5.1
Gm-0583	Gm-0583	390	NR	NR	8.8	9.4	5.1	16.0	4.4	26.0	48.0	1.9	1.6	3.8	12.0	2.4	3.8
Gm-0584	Gm-0584	870	NR	NR	18.0	8.0	9.8	32.0	9.7	56.0	110.0	4.5	<0.6	9.3	29.0	6.1	2.4
Gm-0585	Gm-0585	480	NR	NR	12.0	14.0	6.3	20.0	5.7	33.0	60.0	2.2	2.8	4.4	14.0	3.1	5.7
Gm-0586	Gm-0586	740	<6	<60	18.0	16.0	9.4	33.0	8.8	51.0	91.0	4.2	1.5	6.9	22.0	4.7	4.0

ID	Sample ID	PCB Aroclor 1260	CB 28	CB 52	CB 99	CB 101	CB 105	CB 118	CB 128	CB 138	CB 153	CB 156	CB 163	CB 170	CB 180	CB 183	CB 187
Gm-0587	Gm-2015-1	515	NR	NR	10.25	6.6	6.0	18.5	5.6	32.0	67.5	2.8	1.2	5.8	18.0	3.4	3.4
Gm-0588																	
Gm-0589																	
Gm-0590																	
Gm-0591																	
Gm-0592																	
Gm-0593	Gm-2015-2	630	<5	<50	13.0	8.1	7.0	23.0	6.4	39.0	81.0	3.4	<0.5	7.1	23.0	3.9	3.2
Gm-0594																	
Gm-0595																	
Gm-0596																	
Gm-0597																	
Gm-0598																	
Gm-0600	GM-0600	150	<3	<30	3.4	5.0	1.8	5.9	1.6	10.0	19.0	0.74	0.92	1.50	4.80	0.93	1.60
Gm-0602	GM-0602	110	NR	NR	3.3	3.5	1.1	3.7	1.3	7.6	14.0	0.4	1.4	1.1	3.3	0.7	1.8
Gm-0603	GM-0603	150	<2	<20	3.6	3.7	1.7	5.6	1.6	9.6	20.0	0.8	0.8	1.7	5.7	1.0	1.5
Gm-0604	GM-0604	96	<2	<20	2.0	3.9	1.2	4.1	1.2	6.5	12.0	0.4	0.8	0.8	2.5	0.5	1.3
Gm-0605	GM-0605	94	<2	<20	2.0	3.2	1.1	3.7	1.0	6.3	12.0	0.4	0.7	0.8	2.7	0.6	1.2
Gm-0606	GM-0606	130	<2	<20	3.2	4.4	1.6	5.0	1.4	8.0	16.0	0.7	1.3	1.2	4.0	0.8	2.0
Gm-0607	GM-0607	110	<2	<20	3.0	3.8	1.4	4.4	1.2	7.9	14.0	0.5	1.1	1.0	3.0	0.6	1.8
Gm-0608	GM-0608	83	NR	NR	2.0	2.5	1.1	3.3	0.9	5.4	10.5	0.4	0.5	0.8	2.4	0.5	0.9
Gm-0609	GM-0609	100	<2	<20	2.0	2.6	1.2	3.8	1.1	7.1	12.0	0.4	0.7	0.9	2.9	0.6	1.1
Gm-0610	GM-0610	130	NR	NR	3.0	4.0	1.5	4.7	1.5	9.8	16.0	0.5	1.2	1.2	3.9	0.8	1.8
Gm-0611	GM-0611	130	<2	<20	3.0	3.7	1.4	4.7	1.3	8.6	17.0	0.6	1.2	1.3	4.2	0.8	1.9
Gm-0612	GM-0612	120	NR	NR	3.0	4.0	1.4	4.5	1.2	8.6	15.0	0.5	1.3	1.1	3.4	0.7	1.8
Gm-0613	GM-0613	110	NR	NR	3.0	4.5	1.5	4.6	1.3	8.1	14.0	0.4	1.4	0.9	2.9	0.6	2.1
Gm-0614	GM-0614	86	NR	NR	2.0	3.1	1.1	3.6	1.0	6.0	10.0	0.4	0.8	0.7	2.4	0.5	1.2
Gm-0615	GM-0615	110	NR	NR	2.0	3.4	1.3	4.1	1.1	7.3	13.0	0.4	0.9	0.9	3.0	0.6	1.4
Gm-0616	GM-2016-1	110	NR	NR	2.0	3.3	1.3	3.9	1.2	7.5	13.0	0.4	0.8	1.0	3.1	0.6	1.5
Gm-0617																	
Gm-0618																	
Gm-0619																	
Gm-0620																	
Gm-0621	GM-2016-2	130	NR	NR	2.0	3.7	1.6	5.1	1.4	9.2	16.0	0.5	1.0	1.2	3.8	0.8	1.6

ID	Sample ID	PCB Aroclor 1260	CB 28	CB 52	CB 99	CB 101	CB 105	CB 118	CB 128	CB 138	CB 153	CB 156	CB 163	CB 170	CB 180	CB 183	CB 187
Gm-0622																	
Gm-0623																	
Gm-0624																	
Gm-0625																	
Gm-0599	GM-2016-3	125	NR	NR	2.5	3.2	1.4	4.4	1.3	8.7	15.5	0.5	0.8	1.2	3.8	0.8	1.4
Gm-0601																	
Gm-0626																	

NR: No Result

Organochlorinated pesticides and toxaphene in cod livers (µg/kg of lipids):

ID	Tissue % of Lipids	Alpha-chlodane	Cis-nonachlor	Gamma-chlordane	Hexachlorobenzene	Mirex	Oxychlordane	o,p'-DDD	p,p'-DDD	o,p'-DDE	p,p'-DDE	o,p'-DDT	p,p'-DDT	ß-HCH	Trans-nonachlor	Toxaphene Parlar no. 26	Parlar no. 32	Parlar no. 50	Parlar no. 62
Gm-0522	44	4.5	8.7	0.25	15	4.2	6.7				43		3	<0.7	21	12	0.42	22	2.9
Gm-0523	41	12	13	0.63	16	4	9.2				47		7.1	<0.7	30	24	0.75	48	9.7
Gm-0524	7.4	11	19	<1	23	12	16				73		<4	<4	44	28	<1	37	<3
Gm-0525	37	4.6	10	0.31	15	6.7	6.9				54		2.5	<0.8	22	11	0.39	15	2.5
Gm-0526	42	8.1	12	0.48	19	5.9	7.6				64		4.2	<0.6	30	17	<0.2	29	5
Gm-0527	42	9.9	15	0.59	15	4.2	7.6				42		3.7	<0.7	30	22	0.5	42	6.5
Gm-0528	15	6.6	9.2	<0.7	14	6.4	7.6				41		<2	<2	23	13	<0.7	15	1.5
Gm-0529	53	5.6	6.4	0.62	15	3.1	4.5				35		2.6	0.67	14	9.6	0.46	17	3.8
Gm-0530	43	4.9	14	0.3	16	5.4	7.7				43		3	<0.7	29	14	0.47	23	2.4
Gm-0531	37	5.1	9.4	0.38	18	5.7	6.2				55		2.7	<0.8	21	13	0.41	23	2.6
Gm-0532	25	7.1	20	0.46	17	9	11				93		3.1	<1	45	19	0.47	27	2.3
Gm-0533	54	8.5	7.5	0.58	21	2.5	5.7				29		3.4	0.59	17	16	0.72	34	10
Gm-0534	32	13	15	0.54	21	5.1	16				47		3.9	<0.9	35	29	0.72	51	8.9
Gm-0535	34	7.2	12	0.43	17	5.7	7.6				51		1.7	<0.9	26	15	<0.3	26	3.2
Gm-0536																			
Gm-0537																			
Gm-0538																			
Gm-0539																			
Gm-0540																			
Gm-0541	43	6.8	8.9	0.48	17	3.8	6.3				40		2.4	<0.7	21	14	0.5	27	3.9
Gm-0542																			
Gm-0543																			
Gm-0544																			
Gm-0545																			
Gm-0546																			
Gm-0547	58	4.1	3.1	0.54	18	0.57	1.7	NR	3.2	NR	13	NR	1.4	NR	6.6	6.4	0.5	14	4.8
Gm-0548	58	4.5	3.6	0.58	17	0.99	2	0.87	3.7	NR	21	NR	1.5	NR	8	7.6	0.73	18	7.3
Gm-0549	67	3.6	2.6	0.48	14	0.64	1.7	0.48	2.5	NR	12	NR	NR	<0.4	5.9	6	0.57	12	4
Gm-0550	56.5	5.2	5.5	0.58	18	1.35	3.25	0.79	3.75	<0.4	28	<0.9	1.8	<0.6	13	10.5	0.625	21.5	5.85
Gm-0551	58	3.6	2.6	0.48	18	0.75	2.2	0.66	2.1	NR	17	NR	NR	NR	6.1	6.1	0.48	13	4.3
Gm-0552	60	5.2	3.6	0.64	20	1.3	3.1	0.54	3.1	NR	20	NR	NR	NR	8.3	8.9	0.65	17	6.8

ID	Tissue % of Lipids	Alpha-chlodane	Cis-nona-chlor	Gamma-chlordane	Hexa-chlorobenzene	Mirex	Oxy-chlordane	o,p'-DDD	p,p'-DDD	o,p'-DDE	p,p'-DDE	o,p'-DDT	p,p'-DDT	ß-HCH	Trans-nona-chlor	Toxaphene Parlar no. 26	Parlar no. 32	Parlar no. 50	Parlar no. 62
Gm-0553	57	4	2.5	0.55	15	0.99	1.6	1.1	2.2	NR	16	NR	NR	0.55	6.1	5.7	0.53	13	4.5
Gm-0554	44	6.3	5	0.68	22	1.3	2.7	1.1	4	<0.5	24	<1	<0.7	<0.7	11	9.3	0.66	19	4.5
Gm-0555	57	4.7	2.7	0.62	20	0.47	2.2	0.68	3	NR	13	NR	NR	NR	6.2	7	0.63	16	6.1
Gm-0556	60	3.9	4.5	0.39	19	0.76	2.9	0.85	2.1	NR	15	NR	NR	<0.5	10	8.4	0.36	19	4
Gm-0557	60	4.6	2.8	0.63	19	0.55	1.8	0.83	2.5	NR	17	NR	NR	NR	6.5	6.2	0.56	14	5
Gm-0558	59.5	3.7	2.55	0.49	16	0.88	1.95	0.67	2.4	NR	13.5	NR	NR	NR	5.9	5.9	0.56	13	4.6
Gm-0559	59	3.5	2.7	0.48	16	0.84	1.9	0.6	2.5	NR	14	NR	NR	0.56	6.5	5.9	0.64	12	4.2
Gm-0560	56	3.7	3	0.46	16	0.79	1.6	0.67	2.8	NR	15	NR	NR	NR	6.7	5.9	0.57	12	3.6
Gm-0561																			
Gm-0562																			
Gm-0563																			
Gm-0564																			
Gm-0565																			
Gm-0566	58	3.7	2.9	0.48	16	0.71	1.7	0.59	2.2	NR	17	NR	NR	NR	6.3	5.9	0.5	12	3.6
Gm-0567																			
Gm-0568																			
Gm-0569																			
Gm-0570																			
Gm-0571																			
Gm-0572	21.1	4.5	10.9	<0.5	19.3	4.6	5.6	<1	4.2	<0.9	73	<2	2.6	<1	23.8	11.2	<0.5	17.7	2.6
Gm-0573	61.5	3.5	3.4	0.25	15.6	1.7	3.1	<0.5	<0.8	<0.3	25	<0.8	1.7	0.66	8.1	6.6	<0.2	11.8	2.3
Gm-0574	7.8	7.0	23.6	<1	24.0	7.9	11.6	<4	10.2	<3	127	<6	<4	<4	48.4	19.0	<1	11.7	<3
Gm-0575	19.0	23.7	29.6	1.8	38.0	8.7	17.1	3.79	25.2	<2	200	<5	7.3	<3	69.3	45.7	<1	78.6	7.7
Gm-0576	26.3	11.5	17.4	<0.8	23.2	5.5	10.9	<2	10.7	<2	109	<4	3.8	<2	40.5	21.2	<0.8	32.5	2.8
Gm-0577	30.0	9.8	13.1	<0.7	23.4	4.1	9.1	<2	5.71	<1	60	<3	2.9	<2	30.6	21.3	<0.7	38.2	4.0
Gm-0578	33	5.5	7.7	0.36	35	3.9	6	<0.9	3.8	<0.6	41	<1	<0.9	<0.9	20	14	1	25	5.9
Gm-0579	31	13	17	1.3	30	3.8	9.3	NR	11	NR	97	NR	6	NR	38	25	1.1	50	14
Gm-0580	17	8.9	16	<0.6	27	7.5	8.3	NR	10	NR	110	NR	NR	NR	36	17	NR	24	NR
Gm-0581	2.7	6	21	<4	23	8.8	8.9	<10	<20	<7	160	<20	<10	<10	56	18	<4	8.4	<7
Gm-0582	23	7.2	18	<0.4	18	6.1	8.9	<1	8.1	<0.9	86	<2	1.8	<1	41	16	<0.4	20	<0.9
Gm-0583	33	7.6	11	0.55	24	3.5	6.7	NR	5.3	NR	57	NR	3.6	NR	24	14	0.65	22	4.5
Gm-0584	17	12	18	0.8	32	8.4	9	NR	8.3	NR	95	NR	2.5	NR	39	19	<0.6	30	4
Gm-0585	34	11	14	0.98	27	3.4	6.9	NR	8.3	NR	75	NR	4.7	<0.9	30	18	0.98	37	8.6

ID	Tissue % of Lipids	Alpha-chlodane	Cis-nona-chlor	Gamma-chlor-dane	Hexa-chloro-benzene	Mirex	Oxy-chlor-dane	o,p'-DDD	p,p'-DDD	o,p'-DDE	p,p'-DDE	o,p'-DDT	p,p'-DDT	ß-HCH	Trans-nona-chlor	Toxaphene Parlar no. 26	Parlar no. 32	Parlar no. 50	Parlar no. 62
Gm-0586	16	11	22	<0.6	23	5.9	8.3	<2	16	<1	110	<3	1.9	<2	46	21	<0.6	25	<1
Gm-0587	22	8.15	12.5	0.46	28	4.9	6.9	NR	11	NR	67	NR	1.5	NR	28	15.5	NR	21	1.4
Gm-0588																			
Gm-0589																			
Gm-0590																			
Gm-0591																			
Gm-0592																			
Gm-0593	19	7.1	14	<0.5	33	6	8.1	<1	6.8	<0.9	79	<2	<1	<1	34	17	<0.5	21	<0.9
Gm-0594																			
Gm-0595																			
Gm-0596																			
Gm-0597																			
Gm-0598																			
Gm-0600	36	6.4	4.4	0.88	23	1.2	2.5	0.94	4.2	<0.5	26	<1	<0.8	<0.8	9.8	9.6	1.3	17	8.4
Gm-0602	60	3.3	2.5	0.41	14	0.77	2.1	0.56	2.5	NR	23	NR	NR	0.5	7.8	5.6	0.58	10	3.9
Gm-0603	44	4	3.7	0.43	18	1.4	2.3	<0.7	2.7	<0.4	21	<1	<0.7	<0.7	8.8	7	0.71	13	3.5
Gm-0604	47	4.2	3.1	0.4	16	0.69	1.8	<0.6	2.9	NR	17	NR	NR	<0.6	7.3	6.5	<0.2	12	3.2
Gm-0605	53	3.5	2.8	0.44	14	0.6	1.9	<0.5	2.1	NR	16	NR	NR	0.59	6.4	5.4	0.59	10	3.9
Gm-0606	49	4.1	3.5	0.5	16	0.95	2.8	<0.6	2.7	NR	22	NR	NR	<0.6	8.1	7.2	0.98	13	3.9
Gm-0607	48	4.2	3.8	0.43	17	0.9	2.4	<0.6	2.9	<0.4	18	<1	<0.6	<0.6	8.3	7.3	<0.2	12	2.5
Gm-0608	56.5	2.65	2.6	0.33	14	0.7	2.3	NR	1.65	NR	13.5	NR	NR	0.53	5.8	5.25	0.53	9.9	2.85
Gm-0609	59	3.3	2.8	0.37	15	0.77	2.3	<0.5	2.3	<0.3	14	<0.9	<0.5	<0.5	6.1	5.7	0.38	11	2.7
Gm-0610	50	4.8	3.3	0.55	18	1.1	2.1	NR	2.9	NR	20	NR	NR	NR	8	6.3	NR	12	3
Gm-0611	52	4.6	3.2	0.58	16	0.94	2.1	NR	3.7	NR	22	NR	NR	<0.6	7.9	6.7	NR	13	3.5
Gm-0612	49	6	3.9	0.55	18	0.77	3.2	NR	3.1	NR	18	NR	1.3	NR	8.8	9	NR	17	3.6
Gm-0613	41	5.4	3.6	0.56	17	0.75	2.9	NR	3.4	NR	20	NR	NR	NR	8.3	7.3	NR	14	3.2
Gm-0614	49	3.3	2.9	0.4	11	0.63	1.6	NR	2	NR	15	NR	NR	NR	6.5	5	NR	9.2	1.9
Gm-0615	56	3.9	2.9	0.45	12	0.71	1.5	NR	2.7	NR	16	NR	NR	NR	6.7	4.9	0.6	11	2.4
Gm-0616	55	3.8	2.8	0.46	14	0.66	1.9	NR	2.5	NR	16	NR	0.99	NR	6.7	5.6	0.55	11	3.3
Gm-0617																			
Gm-0618																			
Gm-0619																			
Gm-0620																			

ID	Tissue % of Lipids	Alpha-chlodane	Cis-nonachlor	Gamma-chlordane	Hexachlorobenzene	Mirex	Oxychlordane	o,p'-DDD	p,p'-DDD	o,p'-DDE	p,p'-DDE	o,p'-DDT	p,p'-DDT	ß-HCH	Trans-nonachlor	Toxaphene			
																Parlar no. 26	Parlar no. 32	Parlar no. 50	Parlar no. 62
Gm-0621	48	4.4	3.7	0.44	16	0.97	2.4	NR	3.2	NR	20	NR	1	NR	8.4	6.6	NR	11	2.3
Gm-0622																			
Gm-0623																			
Gm-0624																			
Gm-0625																			
Gm-0599	47.5	4.1	3.1	0.41	13.5	1.05	1.9	NR	2.6	NR	17.5	NR	NR	NR	7	5.6	NR	11	2.65
Gm-0601																			
Gm-0626																			

NR: No Result

Appendix F: Arctic Char

Heavy metals in Arctic char muscle from 2014:

Species	ESB ID	Catching date	Length, cm	Weight, g	Liver, g	Condition index	Age	Gender	Hg in muscle mg/kg	% moisture	Se, µg/g ww
Salvelinus alpinus	Sa-0331	04-06-2014	23.5	144.6	2.23	1.11	5	F	0.206	75.7	1.87
Salvelinus alpinus	Sa-0332	04-06-2014	26.8	189.5	2.15	0.98		M	0.249	77.1	1.87
Salvelinus alpinus	Sa-0333	04-06-2014	29.2	195.6	2.47	0.79	6	F	0.266	78.0	1.80
Salvelinus alpinus	Sa-0334	04-06-2014	26.9	190.8	2.50	0.98		F	0.277	75.9	1.85
Salvelinus alpinus	Sa-0335	04-06-2014	23.2	165.2	1.98	1.32	5	M	0.161	76.3	1.73
Salvelinus alpinus	Sa-0336	04-06-2014	26.7	200.3	2.60	1.05	6	M	0.268	76.7	1.91
Salvelinus alpinus	Sa-0337	04-06-2014	23.0	158.8	2.72	1.31	5	F	0.188	77.5	1.88
Salvelinus alpinus	Sa-0338	04-06-2014	27.6	222.6	3.61	1.06	6	M	0.228	77.6	1.89
Salvelinus alpinus	Sa-0339	04-06-2014	23.2	155.9	2.33	1.25	5	F	0.209	76.7	2.23
Salvelinus alpinus	Sa-0340	04-06-2014	23.7	149.0	2.40	1.12	6	F	0.16	77.0	1.75
Salvelinus alpinus	Sa-0341	04-06-2014	21.8	124.5	1.69	1.20	5	M	0.149	69.4	1.82
Salvelinus alpinus	Sa-0342	04-06-2014	23.4	154.5	2.22	1.21	6	M	0.168	78.4	1.76
Salvelinus alpinus	Sa-0343	04-06-2014	20.9	108.0	1.50	1.18	5	M	0.141	77.0	1.83
Salvelinus alpinus	Sa-0344	04-06-2014	20.4	105.2	1.49	1.24	5	F	0.135	76.5	2.01
Salvelinus alpinus	Sa-0345	04-06-2014	24.0	169.1	2.19	1.22	5	M	0.152	76.5	1.94
Salvelinus alpinus	Sa-0346	04-06-2014	25.6	179.5	2.34	1.07	5	F	0.265	77.2	1.92
Salvelinus alpinus	Sa-0347	05-09-2014	33.0	266.0	3.75	0.74	8	F	0.344	79.4	1.92
Salvelinus alpinus	Sa-0348	05-09-2014	28.0	190.0	1.94	0.87	7	F	0.233	63.9	1.95
Salvelinus alpinus	Sa-0349	05-09-2014	24.5	150.0	1.92	1.02	5	F	0.188	76.1	1.87

PCBs in Arctic char muscle from 2014 (µg kg^{-1} wet weight):

ID	Aroclor 1260	CB 28	CB 52	CB 99	CB 101	CB 105	CB 118	CB 128	CB 138	CB 153	CB 156	CB 163	CB 170	CB 180	CB 183	CB 187
Sa-0331	150	<10	<100	<10	<4	<1	4.1	1.9	11	17	<1	2	2.7	7.4	1.6	4.8
Sa-0332	240	<20	<200	<20	<7	<2	5.3	3	17	29	<2	3.9	5.1	14	3.2	9.6
Sa-0333	250	<30	<300	<30	<10	<3	5.7	<3	18	30	<3	4.1	5.9	16	3.4	11
Sa-0334	180	<10	<100	<10	4.1	1.3	4.6	2.4	12	22	<1	3	3.8	10	2.3	6.9
Sa-0335	180	<20	<200	<20	<6	<2	4.4	2.4	13	22	<2	2.9	3.7	10	2.3	6.8
Sa-0336	230	<20	<200	<20	<5	<2	5	2.9	16	29	<2	3.9	5.2	14	3.1	9.8
Sa-0337	130	<10	<100	<10	<4	<1	3.5	1.6	9.1	15	<1	2	2.5	6.6	<1	4.4
Sa-0338	260	<30	<300	<30	<8	<3	6	3.4	19	31	<3	3.6	5.3	14	3.2	10
Sa-0339	130	<20	<200	<20	<6	<2	3.7	<2	9.6	16	<2	2.2	2.7	7	<2	5
Sa-0340	150	<20	<200	<20	<6	<2	4.4	<2	11	18	<2	2.5	2.9	7.5	<2	5.6
Sa-0341	220	<20	<200	<20	<6	<2	5.6	2.7	16	26	<2	3.5	4.3	12	2.6	8.2
Sa-0342	195	<20	<200	<20	<5	<2	4.95	2.35	13.5	23	<2	2.95	3.95	10.5	2.45	7.25
Sa-0343	150	<20	<200	<20	<7	<2	4.2	<2	11	18	<2	<2	2.8	7.7	<2	5.1
Sa-0344	98	<20	<200	<20	<6	<2	3.1	<2	7.2	12	<2	<2	<2	4.7	<2	3.3
Sa-0345	170	<20	<200	<20	<5	<2	4.8	2.2	12	20	<2	2.5	3.1	8.3	1.8	5.6
Sa-0346	170	<20	<200	<20	<6	<2	4.3	2.1	12	20	<2	2.6	3.5	9.6	2	6.1
Sa-0347	540	<40	<400	<40	<10	<4	12	6.4	37	67	<4	7.4	12	33	6.9	22
Sa-0348	210	<20	<200	<20	5.3	<2	5.8	2.8	15	26	<2	3.1	4.5	12	2.5	7.7
Sa-0349	145	<20	<200	<20	<5	<2	3.9	1.75	10.45	17.5	<2	2.25	2.85	7.85	1.6	5.1

Organochlorinated pesticides and toxaphene in Arctic char muscle from 2014 (µg kg^{-1} wet weight):

													Toxaphene			
ID	**% of Lipids**	**Alpha-chlordane**	**Cis-nonachlor**	**Gamma-chlordane**	**Hexa-chloro-benzene**	**Mirex**	**Oxy-chlor-dane**	**ß-HCH**	**Trans-nona-chlor**	**p,p'-DDD**	**p,p'-DDE**	**p,p'-DDT**	**Parlar no, 26**	**Parlar no, 32**	**Parlar no, 50**	**Parlar no, 62**
Sa-0331	1.7	1.6	1.8	<1	24	<1	1.9	<4	5.0	<7	17	<4	1.8	<1	4.4	<3
Sa-0332	1.0	<2	<2	<2	24	<2	<2	<7	4.6	<10	23	<7	<2	<2	3.2	<5
Sa-0333	0.71	<3	<3	<3	32	<3	<3	<10	4.6	<20	25	<10	<3	<3	<3	<7
Sa-0334	1.9	1.4	2.0	<1	21	<1	1.9	<4	5.5	<6	20	<4	1.6	<1	4.2	<3
Sa-0335	1.3	<2	<2	<2	23	<2	<2	<6	5.1	<9	20	<6	<2	<2	3.8	<4
Sa-0336	1.4	<2	<2	<2	21	<2	<2	<5	4.4	<9	20	<5	<2	<2	2.8	<4
Sa-0337	1.7	<1	1.7	<1	26	<1	1.9	<4	4.5	<7	15	<4	1.6	<1	4.1	<3
Sa-0338	0.89	<3	<3	<3	24	<3	<3	<8	5.2	<10	28	<8	<3	<3	<3	<6
Sa-0339	1.2	<2	<2	<2	24	<2	<2	<6	4.5	<10	17	<6	<2	<2	3.9	<4
Sa-0340	1.3	1.9	2.1	<2	29	<2	2.3	<6	5.6	<10	19	<6	2.5	<2	6.4	<4
Sa-0341	1.2	<2	2.5	<2	32	<2	2.2	<6	6.7	<10	26	<6	<2	<2	5.9	<4
Sa-0342	1.3	<2	1.9	<2	26	<2	1.9	<5	5.2	<9	21	<5	<2	<2	3.6	<4
Sa-0343	1.1	<2	<2	<2	26	<2	<2	<7	5.6	<10	24	<7	2.6	<2	6.2	<4
Sa-0344	1.3	2.0	<2	<2	27	<2	<2	<6	4.6	<10	17	<6	2.4	<2	5.4	<4
Sa-0345	1.4	2.0	2.3	<2	23	<2	1.9	<5	5.9	<9	24	<5	2.3	<2	5.4	<4
Sa-0346	1.3	<2	<2	<2	23	<2	<2	<6	4.9	<10	23	<6	<2	<2	4.6	<4
Sa-0347	0.68	<4	4.0	<4	33	<4	<4	<10	11.0	<20	57	<10	<4	<4	7.6	<7
Sa-0348	1.4	<2	2.2	<2	27	<2	1.9	<5	5.8	<9	28	<5	<2	<2	4.6	<3
Sa-0349	1.6	<2	1.7	<2	25	<2	1.7	<5	4.3	<8	17	<5	1.7	<2	4.3	<3

Appendix G: Brown Trout

PCBs in Brown trout muscle from 1999 and 2000 (µg/kg of lipids):

Species	ESB ID	Catching date	Location	Length, cm	Weight, g	Liver, g	Condition index	Age	Gender	Hg in muscle mg/kg ww	Se in muscle, mg/kg ww	% moisture
Salmo trutta	St-0069	11-06-1999	Stóravatn (Sandoy)	15	0.034	0.12	1.01	3		0.129	1.33	76.2
Salmo trutta	St-0070	11-06-1999	Stóravatn (Sandoy)	16.5	0.047	0.19	1.05	3		0.141	1.12	77.8
Salmo trutta	St-0071	11-06-1999	Stóravatn (Sandoy)	17	0.050	1.24	1.02	5	M	0.161	1.08	77.4
Salmo trutta	St-0072	11-06-1999	Stóravatn (Sandoy)	23	0.135	0.96	1.11	5	M	0.175	1.17	78.1
Salmo trutta	St-0073	11-06-1999	Stóravatn (Sandoy)	25.5	0.213	2.36	1.28	4	M	0.159	1.08	77.2
Salmo trutta	St-0074	11-06-1999	Stóravatn (Sandoy)	27	0.209	2.57	1.06	4	F	0.170	1.08	76.9
Salmo trutta	St-0075	11-06-1999	Stóravatn (Sandoy)	30	0.330	3.26	1.22	6	F	0.189	1.1	76.8
Salmo trutta	St-0076	17-06-2000	Stóravatn (Sandoy)	20	0.112	0.87	1.40	-	F	0.136	0.983	77.3
Salmo trutta	St-0077	17-06-2000	Stóravatn (Sandoy)	29	0.272	2.58	1.12	4	F	0.125	1.21	76.1
Salmo trutta	St-0078	17-06-2000	Stóravatn (Sandoy)	26.5	0.223	2.58	1.20	4	M	0.149	1.04	77.0
Salmo trutta	St-0079	17-06-2000	Stóravatn (Sandoy)	29	0.270	2.39	1.11	5	F	0.177	1.23	76.6
Salmo trutta	St-0080	17-06-2000	Stóravatn (Sandoy)	34	0.484	4.18	1.23	6	M	0.076	1.18	76.5
Salmo trutta	St-0081	12-06-1999	Lítlavatn (Sandoy)	19.5	0.095	0.88	1.28	3	M	0.048	1.12	76.8
Salmo trutta	St-0082	12-06-1999	Lítlavatn (Sandoy)	22	0.125	1.29	1.17	3	M	0.092	1.07	76.7
Salmo trutta	St-0083	12-06-1999	Lítlavatn (Sandoy)	24.5	0.173	1.49	1.18	-	F	0.076	1.29	77.2
Salmo trutta	St-0084	12-06-1999	Lítlavatn (Sandoy)	28	0.264	2.84	1.20	-	F	0.079	1.45	76.0
Salmo trutta	St-0085	12-06-1999	Lítlavatn (Sandoy)	24.5	0.212	1.80	1.44	3	M	0.090	1.34	77.6

PCBs in Brown trout muscle from 1999 and 2000 (µg kg^{-1} of lipids unless otherwise stated):

ID	Aroclor 1260	CB 28	CB 52	CB 99	CB 101	CB 105	CB 118	CB 128	CB 138	CB 153	CB 156	CB 163	CB 170	CB 180	CB 183	CB 187
St-0069*	10	<0.3	<3	<0.3	<0.1	0.087	0.33	0.074	0.77	1.2	0.039	0.1	0.08	0.31	0.079	0.13
St-0070	12000	<100	<1000	230	38	100	380	89	920	1400	43	120	90	340	90	150
St-0071	17000	<70	<700	310	50	140	510	120	1300	1900	54	160	110	420	120	180
St-0072*	28	<0.2	<2	0.5	0.08	0.21	0.81	0.2	2.1	3.3	0.094	0.24	0.21	0.79	0.21	0.32
St-0073	9200	<30	<300	160	29	78	290	65	700	1100	35	85	71	270	68	110
St-0074	9400	<80	<800	180	34	81	310	66	710	1100	34	84	70	260	69	110
St-0075	8100	<30	<300	130	30	65	250	54	580	970	28	77	59	230	67	100
St-0076	6800	<50	<500	120	21	57	200	48	510	790	20	54	48	180	50	76
St-0077	5100	<20	<200	91	19	46	170	35	370	600	18	48	37	140	36	59
St-0078	6000	<30	<300	110	21	50	180	40	450	700	20	56	41	150	45	73
St-0079	9000	<50	<500	175	31.5	82	300	62.5	665	1050	31	85.5	62.5	235	65	105
St-0080	2600	<10	<100	50	13	27	92	20	180	320	11	31	22	78	21	37
St-0081	1200	<30	<300	<30	14	10	33	11	85	150	4.1	13	12	43	12	21
St-0082	4700	<30	<300	66	17	47	180	45	370	530	24	43	46	150	37	66
St-0083	1400	<20	<200	<20	15	12	42	12	98	180	5.2	14	12	49	13	23
St-0084	980	<10	<100	14	12	8.2	29	8.6	69	120	3.6	9.2	8.5	32	8.4	15
St-0085	1700	<20	<200	<20	17	14	48	15	120	210	6.2	17	15	59	15	27

* Results expressed in µg/kg ww.

Organochlorinated pesticides and toxaphene in Brown trout muscle from 1999 and 2000 ($\mu g\ kg^{-1}$ of lipids unless otherwise stated):

																Toxaphene			
ID	**% of Lipids**	**Alpha-Chlordane**	**Cis-Nonachlor**	**Gamma-chlordane**	**Hexachlorobenzene**	**Mirex**	**Oxychlordane**	**ß-HCH**	**Trans-nonachlor**	**o,p'-DDD**	**p,p'-DDD**	**o,p'-DDE**	**p,p'-DDE**	**o,p'-DDT**	**p,p'-DDT**	**Parlar no, 26**	**Parlar no, 32**	**Parlar no, 50**	**Parlar no, 62**
St-0069*	<0.2	<0.03	<0.03	<0.03	<0.07	<0.03	<0.03	<0.1	0.04	<0.1	<0.2	<0.07	0.94	<0.2	<0.1	<0.03	<0.03	0.05	<0.07
St-0070	0.3	<10	17	<10	35	22	34	<30	35	<30	<50	<20	1100	<50	<30	27	<10	65	<20
St-0071	0.38	<7	22	<7	43	28	45	<20	38	<20	<30	<10	1400	<30	<20	36	<7	89	<10
St-0072*	0.2	<0.03	0.04	<0.03	0.08	0.05	0.06	<0.07	0.07	<0.07	<0.1	<0.05	2.4	<0.1	<0.07	0.05	<0.03	0.1	<0.05
St-0073	0.97	6.7	15	<3	36	16	32	<8	32	<8	<10	<5	830	<10	10	27	<3	65	9.1
St-0074	0.31	<8	14	<8	47	15	29	<20	30	<20	<40	<20	880	<40	<20	26	<8	58	<20
St-0075	0.92	9.9	15	<3	35	15	21	<8	29	<8	<10	<5	700	<10	<8	24	<3	55	7.4
St-0076	0.53	<5	11	<5	30	14	25	<10	25	<10	<20	<10	570	<20	<10	21	<5	47	<10
St-0077	1.2	6	12	<2	31	9.2	27	<6	22	<6	11	<4	470	<10	6.3	22	<2	46	5.7
St-0078	0.91	3.5	11	<3	29	10	20	<8	21	<8	<10	<5	490	<10	<8	16	<3	38	<5
St-0079	0.57	5.65	17.5	<5	44.5	17.5	40.5	<10	30	<10	<20	<9	825	<20	15	28.5	<5	71	<9
St-0080	2.4	3	8	<1	25	3.9	15	<3	18	NR	12	NR	290	NR	4.3	13	<1	33	3.5
St-0081	0.77	5.3	5.6	<3	32	<3	9.5	<10	16	<10	<20	<6	170	<20	<10	9.9	<3	18	<6
St-0082	0.85	8.4	7.4	NR	34	7.7	19	<9	24	<9	<10	<6	550	<10	<9	12	<3	21	<6
St-0083	1.2	4.3	6.2	<2	34	2.8	9.6	<6	18	<6	<10	<4	210	<10	<6	12	<2	21	<4
St-0084	2.0	4.5	4.6	<1	29	1.8	7.5	<4	13	NR	NR	NR	150	NR	<4	8	NR	15	NR
St-0085	1.0	9.4	6.5	<2	32	3.1	8.0	<7	18	<7	<10	<5	240	<10	<7	11	<2	19	<5

* Results expressed in µg/kg ww.

Appendix H: Sheep

Heavy metals in sheep liver:

Species	**ID**	**Date**	**Location**	**Sheep**	**Liver** **Hg, µg/kg ww**	**Cd, µg /kg ww**	**Se, µg/g ww**	**% Moisture**
Ovis aries	Oa-2013-1	October 2013	Norðradalur	Juvenile	<10.0	20	0.24	65
Ovis aries	Oa-2013-2	October 2013	Norðradalur	Juvenile	<10.0	20	0.49	66
Ovis aries	Oa-2013-3	October 2013	Norðradalur	Adult female	13.5	100	0.46	65
Ovis aries	Oa-2013-4	October 2013	Norðradalur	Adult female	16.7	120	0.52	68
Ovis aries	Oa-2015-1	October 2015	Norðradalur	Juvenile	<10	15.1	0.301	69.3
Ovis aries	Oa-2015-2	October 2015	Norðradalur	Juvenile	<10	23.5	0.33	68.6
Ovis aries	Oa-2015-3	October 2015	Norðradalur	Adult female	<10	127	0.453	69.1
Ovis aries	Oa-2015-4	October 2015	Norðradalur	Adult female	<10	58.9	0.438	68.9

PCBs in sheep tallow (µg/kg of lipids):

	PCB congeners (µg/kg lw)															
ID	**Aroclor 1260**	**CB 28**	**CB 52**	**CB 99**	**CB 101**	**CB 105**	**CB 118**	**CB 128**	**CB 138**	**CB 153**	**CB 156**	**CB 163**	**CB 170**	**CB 180**	**CB 183**	**CB 187**
Oa-2013-1	8.3	<4	<40	<4	<1	<0.4	<0.4	<0.4	<0.4	1.3	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Oa-2013-2	5.4	<4	<40	<4	<1	<0.4	<0.4	<0.4	<0.4	0.94	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Oa-2013-3	<5	<5	<50	<5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Oa-2013-4	<4	<4	<40	<4	<1	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Oa-2015-1	2.84	<0.9	<9	<0.9	<0.3	0.09	0.17	0.02	0.13	0.42	0.03	0.08	0.05	0.15	0.03	0.07
Oa-2015-2	3.27	<1	<10	NR	NR	0.09	0.19	0.03	0.18	0.45	0.03	0.08	0.04	0.17	0.03	0.08
Oa-2015-3	3.97	<1	<10	NR	NR	0.05	0.11	<0.1	0.11	0.65	0.03	0.11	0.05	0.18	0.03	0.04
Oa-2015-4	9.71	<1	<10	NR	NR	0.42	0.74	0.07	0.44	1.43	0.16	0.32	0.15	0.37	0.07	0.1

Organochlorinated pesticides and toxaphene in sheep tallow (µg/kg of lipids):

ID	**% of Lipids**	**Alpha-chlordane**	**Cis-nonachlor**	**Gamma-chlordane**	**Hexa-chloro-benzene**	**Mirex**	**Oxy-chlordane**	**ß-HCH**	**Trans-nonachlor**	**p,p'-DDE**	**p,p'-DDT**	**Toxaphene**			
												Parlar no, 26	**Parlar no, 32**	**Parlar no, 50**	**Parlar no, 62**
Oa-2013-1	85	<0.4	<0.4	<0.4	7.5	<0.4	<0.4	<1	<0.4	2.6	<1	<0.4	<0.4	<0.4	<0.9
Oa-2013-2	85	<0.4	<0.4	<0.4	7.1	<0.4	<0.4	<1	<0.4	1.6	<1	<0.4	<0.4	<0.4	<0.8
Oa-2013-3	87	<0.5	<0.5	<0.5	4.5	<0.5	<0.5	<1	<0.5	<1	<1	<0.5	<0.5	<0.5	<0.9
Oa-2013-4	85	<0.4	<0.4	<0.4	4.9	<0.4	<0.4	<1	<0.4	<1	<1	<0.4	<0.4	<0.4	<0.8
Oa-2015-1	92	NR	<0.09	NR	4.8	<0.09	<0.09	<0.3	0.1	1.16	<0.3	-	-	-	-
Oa-2015-2	89	NR	<0.1	NR	4.4	<0.1	<0.1	<0.3	0.11	0.97	NR	-	-	-	-
Oa-2015-3	88	NR	<0.1	NR	6.6	<0.1	0.36	<0.3	0.14	1.5	NR	-	-	-	-
Oa-2015-4	85	NR	<0.1	NR	7.6	<0.1	0.40	<0.3	0.11	1.75	NR	-	-	-	-

Appendix I: Stable isotopes

ID	Species	Tissue	Date	Weig. (mg)	CO2 amp	N2 amp	d13C	d13C’	d15N	%C	%N	C/N
Cod												
Gm-0522	Gadus morhua	Muscle	28-10-2013	1.228	3.966	8.196	-18.80	-19.93	10.94	44.14	13.75	3.21
Gm-0523	Gadus morhua	Muscle	28-10-2013	1.027	3.305	6.621	-18.75	-19.82	11.46	43.25	13.35	3.24
Gm-0524	Gadus morhua	Muscle	28-10-2013	1.197	3.790	7.986	-18.77	-20.05	10.76	43.25	13.82	3.13
Gm-0525	Gadus morhua	Muscle	28-10-2013	1.129	3.567	7.461	-18.32	-19.59	11.15	42.84	13.66	3.14
Gm-0526	Gadus morhua	Muscle	28-10-2013	1.235	3.671	7.922	-18.11	-19.55	10.89	40.41	13.25	3.05
Gm-0527	Gadus morhua	Muscle	28-10-2013	1.105	3.479	7.302	-18.30	-19.63	10.43	42.69	13.74	3.11
Gm-0528	Gadus morhua	Muscle	28-10-2013	1.198	3.758	7.865	-18.59	-19.83	10.69	42.62	13.53	3.15
Gm-0529	Gadus morhua	Muscle	28-10-2013	1.194	3.905	8.265	-18.36	-19.65	11.13	44.72	14.29	3.13
Gm-0530	Gadus morhua	Muscle	28-10-2013	1.012	3.064	6.225	-18.71	-19.90	10.51	40.55	12.77	3.18
Gm-0531	Gadus morhua	Muscle	28-10-2013	1.175	3.767	7.848	-18.46	-19.67	11.01	43.74	13.80	3.17
Gm-0532	Gadus morhua	Muscle	28-10-2013	1.069	3.369	7.059	-18.88	-20.20	11.07	42.45	13.66	3.11
Gm-0533	Gadus morhua	Muscle	28-10-2013	1.084	3.290	6.777	-19.12	-20.37	9.91	40.87	12.99	3.15
Gm-0534	Gadus morhua	Muscle	28-10-2013	1.108	3.573	7.486	-19.01	-20.30	10.60	43.72	13.99	3.12
Gm-0535	Gadus morhua	Muscle	28-10-2013	0.982	3.077	6.342	-18.40	-19.69	11.54	42.01	13.43	3.13
Gm-0536	Gadus morhua	Muscle	28-10-2013	1.122	3.451	7.127	-18.53	-19.77	11.33	41.58	13.19	3.15
Gm-0537	Gadus morhua	Muscle	28-10-2013	1.126	3.556	7.422	-18.88	-20.15	11.12	42.73	13.63	3.13
Gm-0538	Gadus morhua	Muscle	28-10-2013	1.272	4.173	8.853	-18.86	-20.09	11.20	44.98	14.25	3.16
Gm-0539	Gadus morhua	Muscle	28-10-2013	1.056	3.394	6.968	-18.83	-20.03	10.97	43.35	13.66	3.17
Gm-0540	Gadus morhua	Muscle	28-10-2013	1.269	3.983	8.349	-18.68	-19.89	11.32	42.86	13.52	3.17
Gm-0541	Gadus morhua	Muscle	28-10-2013	1.259	4.046	8.459	-18.76	-19.95	11.22	44.07	13.86	3.18
Gm-0542	Gadus morhua	Muscle	28-10-2013	1.053	3.212	6.685	-18.96	-20.27	10.48	40.98	13.16	3.11
Gm-0543	Gadus morhua	Muscle	28-10-2013	1.173	3.737	7.936	-19.33	-20.66	10.52	43.45	14.00	3.10
Gm-0544	Gadus morhua	Muscle	28-10-2013	1.093	3.449	7.074	-18.66	-19.84	11.37	42.58	13.37	3.18
Gm-0545	Gadus morhua	Muscle	28-10-2013	1.027	3.280	6.867	-19.13	-20.47	10.50	43.01	13.87	3.10
Gm-0546	Gadus morhua	Muscle	28-10-2013	1.192	3.724	7.852	-18.71	-20.01	10.88	42.57	13.65	3.12
Gm-0547	Gadus morhua	Muscle	21-10-2014	0.969	2.852	3.403	-19.86	-21.16	9.84	49.37	15.83	3.12
Gm-0548	Gadus morhua	Muscle	21-10-2014	1.132	3.166	3.863	-19.54	-20.93	10.09	47.41	15.42	3.07
Gm-0549	Gadus morhua	Muscle	21-10-2014	1.216	3.372	4.073	-19.78	-21.05	10.22	47.30	15.09	3.14
Gm-0550	Gadus morhua	Muscle	21-10-2014	1.218	3.353	3.937	-20.05	-21.16	10.64	46.92	14.57	3.22

ID	Species	Tissue	Date	Weig. (mg)	CO2 amp	N2 amp	d13C	d13C’	d15N	%C	%N	C/N
Gm-0551	Gadus morhua	Muscle	21-10-2014	1.163	3.199	3.683	-20.10	-21.12	9.81	46.77	14.29	3.27
Gm-0552	Gadus morhua	Muscle	21-10-2014	1.041	2.630	3.153	-19.84	-21.21	10.19	42.11	13.66	3.08
Gm-0553	Gadus morhua	Muscle	21-10-2014	1.137	3.116	3.898	-19.86	-21.40	10.41	46.33	15.46	3.00
Gm-0554	Gadus morhua	Muscle	21-10-2014	1.036	2.999	3.614	-20.07	-21.41	10.36	48.67	15.70	3.10
Gm-0555	Gadus morhua	Muscle	21-10-2014	0.939	2.723	3.174	-20.16	-21.34	10.22	48.25	15.15	3.19
Gm-0556	Gadus morhua	Muscle	21-10-2014	1.201	3.352	4.079	-19.90	-21.23	9.92	47.40	15.27	3.10
Gm-0557	Gadus morhua	Muscle	21-10-2014	0.972	2.788	3.290	-19.87	-21.13	10.02	47.90	15.25	3.14
Gm-0558	Gadus morhua	Muscle	21-10-2014	1.113	3.211	3.755	-20.06	-21.20	10.32	48.74	15.19	3.21
Gm-0559	Gadus morhua	Muscle	21-10-2014	1.031	2.968	3.597	-19.69	-21.07	10.00	48.25	15.68	3.08
Gm-0560	Gadus morhua	Muscle	21-10-2014	0.846	2.581	3.036	-19.67	-20.94	10.04	50.55	16.13	3.13
Gm-0561	Gadus morhua	Muscle	21-10-2014	0.990	2.988	3.426	-19.83	-20.87	10.42	50.62	15.53	3.26
Gm-0562	Gadus morhua	Muscle	21-10-2014	0.983	2.917	3.402	-19.86	-21.03	10.02	49.68	15.56	3.19
Gm-0563	Gadus morhua	Muscle	21-10-2014	1.121	3.132	3.836	-19.75	-21.17	10.36	47.14	15.41	3.06
Gm-0564	Gadus morhua	Muscle	21-10-2014	1.208	3.425	4.105	-20.04	-21.28	9.77	48.41	15.36	3.15
Gm-0565	Gadus morhua	Muscle	21-10-2014	1.148	3.328	3.757	-20.07	-20.97	10.03	49.26	14.73	3.34
Gm-0566	Gadus morhua	Muscle	21-10-2014	1.091	3.190	3.686	-19.89	-20.95	10.24	49.46	15.21	3.25
Gm-0567	Gadus morhua	Muscle	21-10-2014	1.264	3.624	4.344	-19.93	-21.12	10.26	49.33	15.52	3.18
Gm-0568	Gadus morhua	Muscle	21-10-2014	1.115	3.175	3.727	-19.97	-21.13	10.21	48.16	15.06	3.20
Gm-0569	Gadus morhua	Muscle	21-10-2014	0.995	2.823	3.345	-19.60	-20.87	9.93	47.32	15.09	3.14
Gm-0570	Gadus morhua	Muscle	21-10-2014	1.075	3.133	3.615	-19.82	-20.88	10.11	48.94	15.06	3.25
Gm-0571	Gadus morhua	Muscle	21-10-2014	1.092	3.129	3.767	-19.58	-20.90	10.32	48.13	15.48	3.11
Gm-0572	Gadus morhua	Muscle	11-10-2015	1.065	3.040	4.297	-19.68	-20.98	11.13	44.79	14.36	3.12
Gm-0573	Gadus morhua	Muscle	11-10-2015	1.001	2.865	4.008	-19.92	-21.18	11.32	44.78	14.25	3.14
Gm-0574	Gadus morhua	Muscle	11-10-2015	1.169	3.288	4.673	-18.50	-19.77	12.45	44.38	14.16	3.13
Gm-0575	Gadus morhua	Muscle	11-10-2015	1.093	3.011	4.214	-19.67	-20.91	10.93	43.15	13.69	3.15
Gm-0576	Gadus morhua	Muscle	11-10-2015	1.126	3.188	4.519	-19.67	-20.97	11.04	44.47	14.26	3.12
Gm-0577	Gadus morhua	Muscle	11-10-2015	0.998	2.819	3.920	-19.71	-20.93	10.71	44.13	13.96	3.16
Gm-0578	Gadus morhua	Muscle	11-10-2015	1.063	2.922	4.085	-19.95	-21.18	10.53	43.15	13.66	3.16
Gm-0579	Gadus morhua	Muscle	11-10-2015	1.06	2.28	3.88	-19.53	-21.05	11.14	42.76	14.22	3.01
Gm-0580	Gadus morhua	Muscle	11-10-2015	1.020	2.194	3.770	-19.66	-21.24	10.90	42.91	14.42	2.98
Gm-0581	Gadus morhua	Muscle	11-10-2015	1.053	2.287	3.938	-19.82	-21.42	11.06	43.10	14.52	2.97
Gm-0582	Gadus morhua	Muscle	11-10-2015	1.131	2.453	4.203	-19.69	-21.22	11.09	42.99	14.31	3.00
Gm-0583	Gadus morhua	Muscle	11-10-2015	1.078	2.330	3.957	-19.69	-21.17	9.98	42.80	14.14	3.03
Gm-0584	Gadus morhua	Muscle	11-10-2015	1.064	2.260	3.852	-19.69	-21.25	11.29	42.07	14.07	2.99
Gm-0585	Gadus morhua	Muscle	11-10-2015	1.028	2.167	3.659	-19.50	-21.03	11.02	41.70	13.88	3.00

ID	Species	Tissue	Date	Weig. (mg)	CO2 amp	N2 amp	d13C	d13C’	d15N	%C	%N	C/N
Gm-0586	Gadus morhua	Muscle	11-10-2015	1.000	2.168	3.668	-19.69	-21.22	10.65	43.10	14.34	3.00
Gm-0587	Gadus morhua	Muscle	11-10-2015	1.067	2.342	3.891	-20.00	-21.38	11.04	43.56	14.17	3.07
Gm-0588	Gadus morhua	Muscle	11-10-2015	1.085	2.171	3.694	-19.59	-21.13	11.51	39.58	13.22	2.99
Gm-0589	Gadus morhua	Muscle	11-10-2015	1.022	2.235	3.777	-19.63	-21.15	11.45	43.10	14.31	3.01
Gm-0590	Gadus morhua	Muscle	11-10-2015	1.107	2.421	4.097	-19.75	-21.25	10.39	43.10	14.29	3.02
Gm-0591	Gadus morhua	Muscle	11-10-2015	1.064	2.269	3.834	-19.86	-21.36	11.22	42.25	14.00	3.02
Gm-0592	Gadus morhua	Muscle	11-10-2015	1.071	2.231	3.772	-19.77	-21.26	11.13	41.26	13.65	3.02
Gm-0593	Gadus morhua	Muscle	11-10-2015	1.021	2.228	3.768	-19.97	-21.44	10.64	43.21	14.26	3.03
Gm-0594	Gadus morhua	Muscle	11-10-2015	1.023	2.253	3.788	-19.79	-21.25	11.09	43.38	14.28	3.04
Gm-0595	Gadus morhua	Muscle	11-10-2015	1.006	2.180	3.676	-18.93	-20.40	12.09	42.79	14.12	3.03
Gm-0596	Gadus morhua	Muscle	11-10-2015	1.03	2.23	3.77	-19.72	-21.22	10.91	42.86	14.19	3.02
Gm-0597	Gadus morhua	Muscle	11-10-2015	1.093	2.382	4.048	-19.66	-21.18	10.76	43.10	14.33	3.01
Gm-0598	Gadus morhua	Muscle	11-10-2015	0.992	2.167	3.633	-19.61	-21.05	11.20	43.18	14.19	3.04
Gm-0599	Gadus morhua	Muscle	18-10-2016	1.048	1.977	3.290	-18.45	-19.89	11.11	37.19	12.21	3.05
Gm-0600	Gadus morhua	Muscle	18-10-2016	1.084	2.321	3.851	-19.25	-20.61	10.35	42.15	13.67	3.08
Gm-0601	Gadus morhua	Muscle	18-10-2016	1.055	2.254	3.688	-18.99	-20.27	11.26	42.32	13.52	3.13
Gm-0602	Gadus morhua	Muscle	18-10-2016	1.010	2.175	3.660	-19.12	-20.58	10.67	42.45	13.96	3.04
Gm-0603	Gadus morhua	Muscle	18-10-2016	1.076	2.293	3.836	-19.21	-20.61	10.77	42.24	13.77	3.07
Gm-0604	Gadus morhua	Muscle	18-10-2016	1.012	2.102	3.508	-18.98	-20.39	10.98	41.01	13.39	3.06
Gm-0605	Gadus morhua	Muscle	18-10-2016	0.995	2.076	3.458	-19.08	-20.47	10.88	41.02	13.34	3.08
Gm-0606	Gadus morhua	Muscle	18-10-2016	1.122	2.364	3.900	-19.13	-20.41	11.42	41.60	13.31	3.13
Gm-0607	Gadus morhua	Muscle	18-10-2016	0.967	2.012	3.307	-19.27	-20.57	10.94	41.22	13.21	3.12
Gm-0608	Gadus morhua	Muscle	18-10-2016	1.118	2.362	3.942	-19.12	-20.50	10.87	42.03	13.66	3.08
Gm-0609	Gadus morhua	Muscle	18-10-2016	1.113	2.218	3.599	-19.19	-20.41	11.27	39.28	12.42	3.16
Gm-0610	Gadus morhua	Muscle	18-10-2016	1.045	2.139	3.616	-19.00	-20.50	10.64	40.37	13.36	3.02
Gm-0611	Gadus morhua	Muscle	18-10-2016	0.987	2.032	3.342	-19.30	-20.62	11.13	40.48	13.01	3.11
Gm-0612	Gadus morhua	Muscle	18-10-2016	1.032	2.144	3.551	-19.11	-20.45	10.81	41.01	13.24	3.10
Gm-0613	Gadus morhua	Muscle	18-10-2016	1.033	2.139	3.582	-19.00	-20.42	10.87	40.79	13.33	3.06
Gm-0614	Gadus morhua	Muscle	18-10-2016	1.081	2.279	3.799	-18.81	-20.19	10.12	41.73	13.55	3.08
Gm-0615	Gadus morhua	Muscle	18-10-2016	1.090	2.282	3.778	-18.82	-20.17	10.42	41.33	13.37	3.09
Gm-0616	Gadus morhua	Muscle	18-10-2016	1.01	2.10	3.23	-19.56	-20.50	10.58	41.00	12.34	3.32
Gm-0617	Gadus morhua	Muscle	18-10-2016	1.047	2.275	3.576	-19.44	-20.49	10.94	42.73	13.11	3.26
Gm-0618	Gadus morhua	Muscle	18-10-2016	1.021	2.109	3.500	-19.00	-20.40	10.86	40.82	13.30	3.07
Gm-0619	Gadus morhua	Muscle	18-10-2016	0.985	2.096	3.514	-19.04	-20.49	10.91	41.93	13.77	3.05
Gm-0620	Gadus morhua	Muscle	18-10-2016	1.060	2.233	3.723	-18.99	-20.34	11.06	41.78	13.50	3.09

ID	Species	Tissue	Date	Weig. (mg)	CO2 amp	N2 amp	d13C	d13C’	d15N	%C	%N	C/N
Gm-0621	Gadus morhua	Muscle	18-10-2016	1.002	2.065	3.446	-19.03	-20.44	11.13	40.58	13.25	3.06
Gm-0622	Gadus morhua	Muscle	18-10-2016	1.000	1.872	3.185	-18.89	-20.45	10.81	36.92	12.36	2.99
Gm-0623	Gadus morhua	Muscle	18-10-2016	1.101	2.277	3.829	-18.95	-20.39	11.00	40.87	13.42	3.05
Gm-0624	Gadus morhua	Muscle	18-10-2016	1.058	2.234	3.743	-18.89	-20.31	11.26	41.46	13.57	3.06
Gm-0625	Gadus morhua	Muscle	18-10-2016	0.986	1.877	3.092	-19.14	-20.50	11.35	37.41	12.11	3.09
Gm-0626	Gadus morhua	Muscle	18-10-2016	1.119	2.417	3.976	-19.51	-20.80	10.76	42.76	13.68	3.13
Black Guillemot												
Cg-0399	Cepphus grylle	Egg	18-6-2013	1.112	4.689	4.024	-22.05	-19.81	9.83	58.58	7.40	7.92
Cg-0400	Cepphus grylle	Egg	18-6-2013	1.018	4.293	3.903	-21.93	-19.86	10.17	57.81	7.84	7.37
Cg-0401	Cepphus grylle	Egg	18-6-2013	1.317	5.417	4.870	-22.05	-19.85	9.84	58.39	7.50	7.78
Cg-0402	Cepphus grylle	Egg	18-6-2013	1.110	4.587	4.221	-22.29	-20.22	10.02	57.33	7.80	7.35
Cg-0403	Cepphus grylle	Egg	18-6-2013	1.201	4.981	4.547	-22.13	-20.00	10.21	58.11	7.69	7.55
Cg-0404	Cepphus grylle	Egg	18-6-2013	1.154	4.803	4.385	-22.10	-19.99	10.00	58.01	7.77	7.47
Cg-0405	Cepphus grylle	Egg	18-6-2013	1.190	4.942	4.512	-21.92	-19.79	10.33	58.15	7.72	7.53
Cg-0422	Cepphus grylle	Egg	19-06-2014	1.226	4.293	2.352	-22.83	-20.74	10.95	61.97	8.36	7.41
Cg-0423	Cepphus grylle	Egg	19-06-2014	1.230	4.179	2.203	-22.40	-20.24	10.66	59.73	7.81	7.65
Cg-0424	Cepphus grylle	Egg	19-06-2014	1.294	4.453	2.347	-22.84	-20.64	10.62	61.60	7.90	7.80
Cg-0425	Cepphus grylle	Egg	19-06-2014	1.182	3.546	2.588	-21.60	-20.48	10.37	51.20	9.65	5.30
Cg-0426	Cepphus grylle	Egg	19-06-2014	1.161	3.732	2.370	-21.94	-20.35	10.58	55.31	8.96	6.17
Cg-0427	Cepphus grylle	Egg	19-06-2014	1.173	3.783	2.760	-21.82	-20.67	10.64	55.54	10.37	5.36
Cg-0428	Cepphus grylle	Egg	19-06-2014	1.225	4.200	2.393	-23.02	-21.06	10.29	60.24	8.55	7.04
Cg-0429	Cepphus grylle	Egg	19-06-2014	1.386	4.481	2.779	-22.47	-20.69	10.62	57.92	8.80	6.58
Cg-0430	Cepphus grylle	Egg	19-06-2014	1.189	3.644	2.145	-22.57	-20.77	11.14	52.53	7.92	6.63
Cg-0431	Cepphus grylle	Egg	19-06-2014	1.347	4.316	2.280	-23.15	-20.97	10.68	56.72	7.38	7.69
Cg-0432	Cepphus grylle	Egg	26-06-2014	1.124	3.674	2.373	-22.26	-20.73	9.88	56.09	9.32	6.02
Cg-0433	Cepphus grylle	Egg	26-06-2014	1.182	3.858	2.629	-22.44	-21.04	9.29	56.47	9.77	5.78
Cg-0434	Cepphus grylle	Egg	26-06-2014	1.144	3.671	2.703	-22.02	-20.91	9.17	54.65	10.34	5.28
Cg-0435	Cepphus grylle	Egg	26-06-2014	1.368	4.144	2.876	-22.24	-20.86	9.47	52.81	9.18	5.75
Cg-0436	Cepphus grylle	Egg	26-06-2014	1.276	4.189	3.098	-22.13	-20.96	10.05	57.46	10.66	5.39
Cg-0437	Cepphus grylle	Egg	26-06-2014	1.115	3.788	2.543	-22.51	-21.08	9.56	58.34	10.00	5.84
Cg-0460	Cepphus grylle	Egg	1.-7. June 2016	1.028	3.048	2.381	-23.03	-21.27	10.86	52.32	7.99	6.55
Cg-0461	Cepphus grylle	Egg	1.-7. June 2016	1.025	3.055	2.383	-22.90	-21.13	10.88	52.61	8.03	6.55
Cg-0462	Cepphus grylle	Egg	1.-7. June 2016	1.024	3.216	1.921	-23.75	-21.34	8.85	55.54	6.48	8.57
Cg-0463	Cepphus grylle	Egg	1.-7. June 2016	1.059	3.151	2.356	-23.27	-21.39	9.33	52.55	7.69	6.83
Cg-0464	Cepphus grylle	Egg	1.-7. June 2016	1.003	3.028	2.055	-25.10	-22.97	9.00	53.39	7.08	7.55

ID	Species	Tissue	Date	Weig. (mg)	CO2 amp	N2 amp	d13C	d13C’	d15N	%C	%N	C/N
Cg-0465	Cepphus grylle	Egg	1.-7. June 2016	1.033	3.210	2.130	-23.39	-21.21	9.66	54.87	7.12	7.71
Cg-0466	Cepphus grylle	Egg	1.-7. June 2016	1.116	3.346	2.547	-23.08	-21.23	9.86	53.06	7.88	6.74
Cg-0467	Cepphus grylle	Egg	1.-7. June 2016	1.107	3.338	2.356	-23.92	-21.87	9.32	53.54	7.35	7.28
Cg-0468	Cepphus grylle	Egg	1.-7. June 2016	1.071	3.153	2.494	-22.16	-20.42	11.39	52.04	8.03	6.48
Cg-0469	Cepphus grylle	Egg	1.-7. June 2016	1.109	3.344	2.302	-23.69	-21.57	9.79	53.46	7.11	7.52
Cg-0444	Cepphus grylle	Muscle	24-03-2015	1.054	2.452	3.525	-21.05	-21.61	10.25	45.77	12.82	3.57
Cg-0445	Cepphus grylle	Muscle	24-03-2015	1.040	2.346	3.386	-20.34	-20.95	10.43	44.26	12.52	3.53
Cg-0446	Cepphus grylle	Muscle	14-04-2015	1.056	2.370	3.491	-20.51	-21.21	10.39	44.56	12.84	3.47
Cg-0447	Cepphus grylle	Muscle	14-04-2015	0.992	2.175	3.326	-20.06	-20.96	10.36	43.42	12.99	3.34
Cg-0448	Cepphus grylle	Muscle	14-04-2015	1.020	2.275	3.222	-19.53	-20.01	10.29	44.15	12.17	3.63
Cg-0449	Cepphus grylle	Muscle	14-04-2015	1.045	2.331	3.470	-20.94	-21.68	10.10	44.03	12.78	3.45
Cg-0450	Cepphus grylle	Muscle	14-04-2015	1.022	2.295	3.372	-19.98	-20.65	10.47	44.65	12.79	3.49
Cg-0451	Cepphus grylle	Muscle	14-04-2015	1.00	2.26	3.20	-20.07	-20.54	10.61	44.62	12.31	3.63
Cg-0453	Cepphus grylle	Muscle	02-05-2015	1.026	2.283	3.409	-17.41	-18.14	11.73	44.11	12.78	3.45
Cg-0454	Cepphus grylle	Muscle	02-05-2015	1.019	2.264	3.273	-19.16	-18.42	11.72	43.93	12.34	3.56
Cg-0455	Cepphus grylle	Muscle	02-05-2015	1.019	2.311	3.355	-19.86	-19.72	11.02	44.63	12.60	3.54
Cg-0456	Cepphus grylle	Muscle	02-05-2015	1.013	2.279	3.353	-20.24	-20.45	10.75	44.23	12.71	3.48
Cg-0457	Cepphus grylle	Muscle	02-05-2015	1.024	2.282	3.293	-21.09	-20.93	9.54	43.97	12.39	3.55
Cg-0458	Cepphus grylle	Muscle	02-05-2015	1.022	2.277	3.275	-20.98	-21.68	9.56	44.06	12.36	3.57
Cg-0459	Cepphus grylle	Muscle	02-05-2015	0.980	2.185	3.220	-17.70	-21.54	12.27	43.93	12.71	3.46
Cg-0444	Cepphus grylle	Liver	24-03-2015	1.041	2.501	2.920	-21.65	-21.24	11.54	47.52	10.79	4.40
Cg-0445	Cepphus grylle	Liver	24-03-2015	0.993	2.291	2.761	-20.80	-20.52	11.97	45.50	10.68	4.26
Cg-0446	Cepphus grylle	Liver	14-04-2015	1.005	2.321	2.716	-21.22	-20.82	12.07	45.62	10.41	4.38
Cg-0447	Cepphus grylle	Liver	14-04-2015	1.013	2.280	2.909	-20.44	-20.40	12.08	44.63	11.07	4.03
Cg-0448	Cepphus grylle	Liver	14-04-2015	1.063	2.510	2.987	-20.01	-19.67	12.01	46.72	10.80	4.32
Cg-0449	Cepphus grylle	Liver	14-04-2015	1.013	2.302	3.068	-21.43	-21.56	11.80	44.93	11.56	3.89
Cg-0450	Cepphus grylle	Liver	14-04-2015	1.009	2.373	2.900	-20.33	-20.09	12.07	46.49	11.01	4.22
Cg-0451	Cepphus grylle	Liver	14-04-2015	0.999	2.319	2.906	-20.28	-20.16	12.35	45.84	11.17	4.10
Cg-0453	Cepphus grylle	Liver	02-05-2015	1.081	2.472	3.234	-17.92	-17.99	13.53	45.36	11.51	3.94
Cg-0454	Cepphus grylle	Liver	02-05-2015	1.061	2.417	3.098	-19.12	-17.55	13.50	45.06	11.16	4.04
Cg-0455	Cepphus grylle	Liver	02-05-2015	1.01	2.67	3.23	-20.76	-19.08	12.24	46.29	11.01	4.21
Cg-0456	Cepphus grylle	Liver	02-05-2015	0.990	2.638	3.133	-20.49	-20.54	12.64	47.04	10.98	4.28
Cg-0457	Cepphus grylle	Liver	02-05-2015	0.995	2.600	3.120	-21.47	-20.19	11.34	46.02	10.87	4.24
Cg-0458	Cepphus grylle	Liver	02-05-2015	1.018	2.667	3.489	-21.43	-21.21	11.06	45.97	11.85	3.88
Cg-0459	Cepphus grylle	Liver	02-05-2015	1.020	2.638	3.120	-17.85	-21.57	14.41	45.32	10.58	4.28

ID	**Species**	**Tissue**	**Date**	**Weig. (mg)**	**CO2 amp**	**N2 amp**	**d13C**	**d13C'**	**d15N**	**%C**	**%N**	**C/N**
Northern Fulmar												
Fg-0339	Fulmarus glacialis	Muscle	02-09-2016	1.115	2.850	3.411	-21.39	-21.10	13.07	45.04	10.54	4.27
Fg-0340	Fulmarus glacialis	Muscle	02-09-2016	1.057	2.949	2.958	-22.84	-21.84	12.12	49.21	9.61	5.12
Fg-0341	Fulmarus glacialis	Muscle	02-09-2016	1.068	2.899	3.166	-21.67	-21.01	12.09	47.62	10.17	4.68
Fg-0342	Fulmarus glacialis	Muscle	02-09-2016	1.032	2.791	3.036	-21.97	-21.32	12.51	47.44	10.17	4.67
Fg-0343	Fulmarus glacialis	Muscle	02-09-2016	1.031	2.654	3.007	-21.64	-21.14	12.53	45.18	10.05	4.50
Fg-0344	Fulmarus glacialis	Muscle	02-09-2016	1.022	2.723	3.053	-21.50	-20.96	12.50	46.90	10.32	4.54
Fg-0345	Fulmarus glacialis	Muscle	02-09-2016	0.966	2.594	3.079	-21.16	-20.89	12.70	46.97	11.06	4.25
Fg-0346	Fulmarus glacialis	Muscle	02-09-2016	1.031	2.538	3.061	-21.26	-20.99	13.23	47.79	11.25	4.25
Fg-0347	Fulmarus glacialis	Muscle	02-09-2016	1.010	2.495	2.879	-22.25	-21.81	12.06	47.99	10.84	4.43
Fg-0348	Fulmarus glacialis	Muscle	02-09-2016	1.063	2.689	3.011	-22.04	-21.47	12.80	49.20	10.77	4.57
Fg-0339	Fulmarus glacialis	Liver	02-09-2016	1.043	2.854	2.657	-22.68	-21.43	11.90	53.27	9.66	5.52
Fg-0340	Fulmarus glacialis	Liver	02-09-2016	1.058	2.820	2.808	-22.68	-21.67	11.35	51.88	10.08	5.14
Fg-0341	Fulmarus glacialis	Liver	02-09-2016	1.162	3.116	3.165	-21.88	-20.89	11.29	52.35	10.25	5.11
Fg-0342	Fulmarus glacialis	Liver	02-09-2016	1.078	2.943	2.709	-22.67	-21.38	11.78	53.08	9.49	5.60
Fg-0343	Fulmarus glacialis	Liver	02-09-2016	1.036	2.627	2.921	-21.60	-20.99	11.28	49.11	10.65	4.61
Fg-0344	Fulmarus glacialis	Liver	02-09-2016	1.081	2.991	2.571	-22.60	-21.09	11.65	53.74	8.95	6.00
Fg-0345	Fulmarus glacialis	Liver	02-09-2016	1.100	2.989	2.804	-22.18	-20.95	11.99	52.99	9.64	5.49
Fg-0346	Fulmarus glacialis	Liver	02-09-2016	0.999	2.715	2.566	-22.43	-21.25	12.02	52.60	9.74	5.40
Fg-0347	Fulmarus glacialis	Liver	02-09-2016	1.034	2.851	2.778	-22.84	-21.75	11.30	53.40	10.16	5.25
Fg-0348	Fulmarus glacialis	Liver	02-09-2016	1.128	3.103	2.699	-23.10	-21.60	12.23	53.91	9.01	5.98
Arctic char												
Sa-0331	Salvelinus alpinus	Muscle	04-06-2014	1.040	3.058	3.443	-26.56	-27.50	6.73	49.29	14.85	3.32
Sa-0332	Salvelinus alpinus	Muscle	04-06-2014	1.117	3.212	3.754	-26.16	-27.28	7.04	48.38	15.05	3.22
Sa-0333	Salvelinus alpinus	Muscle	04-06-2014	1.026	3.124	3.415	-27.24	-28.00	7.39	50.85	14.80	3.43
Sa-0334	Salvelinus alpinus	Muscle	04-06-2014	1.158	3.448	3.951	-26.76	-27.72	7.14	50.42	15.23	3.31
Sa-0335	Salvelinus alpinus	Muscle	04-06-2014	1.228	3.428	3.857	-26.30	-27.17	6.95	47.17	14.01	3.37
Sa-0336	Salvelinus alpinus	Muscle	04-06-2014	1.061	3.280	3.522	-26.53	-27.16	6.84	51.94	14.75	3.52
Sa-0337	Salvelinus alpinus	Muscle	04-06-2014	0.994	3.026	3.220	-27.41	-28.02	6.82	50.74	14.39	3.53
Sa-0338	Salvelinus alpinus	Muscle	04-06-2014	1.034	3.220	3.482	-26.51	-27.20	6.78	52.15	14.98	3.48
Sa-0339	Salvelinus alpinus	Muscle	04-06-2014	1.050	3.363	3.305	-27.12	-27.27	6.86	53.85	13.93	3.87
Sa-0340	Salvelinus alpinus	Muscle	04-06-2014	1.176	3.530	4.040	-26.26	-27.20	7.14	50.72	15.27	3.32
Sa-0341	Salvelinus alpinus	Muscle	04-06-2014	1.023	3.182	3.312	-27.75	-28.22	6.95	52.06	14.36	3.63
Sa-0342	Salvelinus alpinus	Muscle	04-06-2014	1.162	3.576	3.825	-27.82	-28.38	7.43	52.13	14.62	3.56
Sa-0343	Salvelinus alpinus	Muscle	04-06-2014	1.166	3.481	3.730	-27.43	-28.01	7.03	50.52	14.24	3.55

ID	Species	Tissue	Date	Weig. (mg)	CO2 amp	N2 amp	d13C	d13C’	d15N	%C	%N	C/N
Sa-0344	Salvelinus alpinus	Muscle	04-06-2014	1.178	3.611	3.732	-27.85	-28.23	6.42	51.99	14.07	3.69
Sa-0345	Salvelinus alpinus	Muscle	04-06-2014	1.154	3.461	3.610	-27.23	-27.68	7.02	50.62	13.89	3.64
Sa-0346	Salvelinus alpinus	Muscle	04-06-2014	1.036	3.150	3.499	-26.94	-27.79	6.80	50.52	14.95	3.38
Sa-0347	Salvelinus alpinus	Muscle	05-09-2014	1.189	3.863	3.960	-26.80	-27.11	7.23	55.49	14.80	3.75
Sa-0348	Salvelinus alpinus	Muscle	05-09-2014	1.211	3.686	4.166	-27.05	-27.92	6.89	51.53	15.30	3.37
Sa-0349	Salvelinus alpinus	Muscle	05-09-2014	1.075	3.428	3.387	-28.54	-28.72	6.96	53.51	13.91	3.85
Brown trout												
St-0069	Salmo trutta	Muscle	11-06-1999	1.080	2.655	3.562	-20.74	-21.78	10.13	38.46	11.81	3.26
St-0070	Salmo trutta	Muscle	11-06-1999	0.971	2.632	3.517	-21.47	-22.55	9.75	42.26	13.05	3.24
St-0071	Salmo trutta	Muscle	11-06-1999	1.018	2.596	3.487	-22.32	-23.39	9.69	39.80	12.26	3.25
St-0072	Salmo trutta	Muscle	11-06-1999	1.108	2.682	3.595	-21.99	-23.04	11.04	37.74	11.59	3.26
St-0073	Salmo trutta	Muscle	11-06-1999	1.027	3.132	3.639	-21.71	-21.93	10.56	47.98	12.57	3.82
St-0074	Salmo trutta	Muscle	11-06-1999	1.119	3.174	4.185	-21.78	-22.67	10.64	44.59	13.30	3.35
St-0075	Salmo trutta	Muscle	11-06-1999	1.058	3.091	3.843	-20.73	-21.31	10.58	45.88	12.91	3.55
St-0076	Salmo trutta	Muscle	17-06-2000	1.149	3.316	4.354	-22.32	-23.16	10.24	45.43	13.44	3.38
St-0077	Salmo trutta	Muscle	17-06-2000	1.153	3.468	4.476	-21.66	-22.45	9.64	47.44	13.89	3.42
St-0078	Salmo trutta	Muscle	17-06-2000	1.080	3.557	3.451	-22.95	-22.36	9.85	52.10	11.34	4.60
St-0079	Salmo trutta	Muscle	17-06-2000	1.254	3.778	4.600	-21.62	-22.00	10.48	47.96	12.97	3.70
St-0080	Salmo trutta	Muscle	17-06-2000	1.118	3.427	3.978	-22.83	-23.01	8.71	48.47	12.60	3.85
St-0081	Salmo trutta	Muscle	12-06-1999	1.070	2.892	3.762	-19.59	-20.48	6.70	42.27	12.61	3.35
St-0082	Salmo trutta	Muscle	12-06-1999	1.104	3.119	4.117	-19.76	-20.67	7.35	44.34	13.27	3.34
St-0083	Salmo trutta	Muscle	12-06-1999	1.055	2.862	3.376	-20.41	-20.76	7.67	42.59	11.47	3.71
St-0084	Salmo trutta	Muscle	12-06-1999	1.203	3.557	4.017	-20.70	-20.75	7.30	46.77	11.82	3.96
St-0085	Salmo trutta	Muscle	12-06-1999	1.145	3.033	3.681	-20.66	-21.14	8.07	41.49	11.47	3.62
Pilot whale												
080813-0001	Globicephala melas	Muscle	08-08-2013	1.055	3.858	7.064	-19.19	-19.68	10.41	49.86	13.80	3.61
080813-0003	Globicephala melas	Muscle	08-08-2013	1.036	3.653	7.229	-18.55	-19.50	10.96	47.91	14.44	3.32
080813-0005	Globicephala melas	Muscle	08-08-2013	1.250	4.374	8.871	-18.31	-19.23	10.18	48.31	14.49	3.33
080813-0006	Globicephala melas	Muscle	08-08-2013	1.096	4.066	6.825	-19.42	-19.44	10.73	50.85	12.78	3.98
080813-0007	Globicephala melas	Muscle	08-08-2013	1.148	4.189	7.453	-19.28	-19.57	11.18	50.25	13.34	3.77
080813-0010	Globicephala melas	Muscle	08-08-2013	1.113	3.958	7.683	-18.57	-19.36	10.75	48.78	14.30	3.41
080813-0011	Globicephala melas	Muscle	08-08-2013	1.217	4.288	8.368	-18.64	-19.37	10.77	48.48	14.04	3.45
080813-0016	Globicephala melas	Muscle	08-08-2013	1.154	4.074	8.160	-18.43	-19.36	10.57	48.44	14.56	3.33
080813-0019	Globicephala melas	Muscle	08-08-2013	1.111	3.919	7.858	-18.54	-19.51	10.23	48.19	14.58	3.31
080813-0021	Globicephala melas	Muscle	08-08-2013	1.090	4.018	6.605	-19.49	-19.44	10.93	50.54	12.48	4.05

ID	Species	Tissue	Date	Weig. (mg)	CO2 amp	N2 amp	d13C	d13C’	d15N	%C	%N	C/N
080813-0024	Globicephala melas	Muscle	08-08-2013	1.178	4.172	8.328	-18.56	-19.46	10.66	48.70	14.54	3.35
080813-0026	Globicephala melas	Muscle	08-08-2013	1.077	3.900	7.532	-18.50	-19.25	10.37	49.33	14.35	3.44
080813-0027	Globicephala melas	Muscle	08-08-2013	1.221	4.257	8.556	-18.10	-19.03	10.71	48.32	14.51	3.33
300713-0003	Globicephala melas	Muscle	30-07-2013	1.256	4.494	8.534	-18.64	-19.22	10.91	49.89	14.06	3.55
300713-0007	Globicephala melas	Muscle	30-07-2013	1.221	4.362	8.198	-19.09	-19.65	10.94	49.76	13.97	3.56
300713-0008	Globicephala melas	Muscle	30-07-2013	1.152	4.109	7.741	-18.67	-19.29	11.09	49.29	13.98	3.53
300713-0009	Globicephala melas	Muscle	30-07-2013	1.126	4.068	7.521	-18.73	-19.26	10.88	49.94	13.93	3.58
300713-0011	Globicephala melas	Muscle	30-07-2013	1.030	3.691	7.202	-18.66	-19.54	10.94	49.19	14.65	3.36
300713-0013	Globicephala melas	Muscle	30-07-2013	1.071	3.831	7.434	-18.07	-18.90	11.11	49.14	14.50	3.39
300713-0018	Globicephala melas	Muscle	30-07-2013	1.106	3.987	7.132	-18.92	-19.31	10.98	49.75	13.49	3.69
300713-0019	Globicephala melas	Muscle	30-07-2013	1.115	4.038	7.143	-19.44	-19.76	10.81	49.85	13.32	3.74
300713-0020	Globicephala melas	Muscle	30-07-2013	1.249	4.347	8.957	-18.05	-19.11	11.18	48.46	14.91	3.25
300713-0022	Globicephala melas	Muscle	30-07-2013	1.064	3.931	7.107	-18.61	-19.05	11.30	50.65	13.85	3.66
300713-0028	Globicephala melas	Muscle	30-07-2013	1.173	4.122	8.371	-17.85	-18.88	10.87	48.52	14.83	3.27
300713-0030	Globicephala melas	Muscle	30-07-2013	1.278	4.733	7.874	-19.48	-19.39	10.81	52.04	12.75	4.08
060615-004	Globicephala melas	Muscle	06-06-2015	1.173	3.469	4.659	-17.92	-18.87	10.82	46.59	14.07	3.31
060615-007	Globicephala melas	Muscle	06-06-2015	1.044	2.948	3.942	-17.62	-18.64	10.71	44.25	13.50	3.28
060615-017	Globicephala melas	Muscle	06-06-2015	1.001	2.571	3.196	-18.34	-18.99	10.69	40.09	11.45	3.50
060615-018	Globicephala melas	Muscle	06-06-2015	1.082	3.233	4.057	-17.93	-18.54	11.20	47.06	13.32	3.53
060615-022	Globicephala melas	Muscle	06-06-2015	1.077	3.173	4.239	-17.99	-18.95	11.26	46.45	14.02	3.31
060615-027	Globicephala melas	Muscle	06-06-2015	1.041	3.148	3.947	-18.09	-18.70	11.19	47.68	13.51	3.53
060615-029	Globicephala melas	Muscle	06-06-2015	1.267	3.507	4.870	-17.49	-18.63	10.62	43.74	13.65	3.20
060615-031	Globicephala melas	Muscle	06-06-2015	1.002	2.879	3.722	-17.90	-18.73	10.82	44.90	13.25	3.39
060615-033	Globicephala melas	Muscle	06-06-2015	1.125	3.388	4.495	-18.41	-19.29	11.43	47.57	14.17	3.36
060615-040	Globicephala melas	Muscle	06-06-2015	1.080	3.155	4.327	-17.68	-18.78	11.45	46.02	14.26	3.23
060615-041	Globicephala melas	Muscle	06-06-2015	1.142	3.513	4.414	-18.26	-18.84	11.08	48.53	13.68	3.55
290615-002	Globicephala melas	Muscle	29-06-2015	1.092	2.869	3.615	-18.41	-19.10	11.13	41.13	11.82	3.48
290615-016	Globicephala melas	Muscle	29-06-2015	1.028	3.102	3.993	-18.19	-18.95	10.83	47.31	13.80	3.43
290615-017	Globicephala melas	Muscle	29-06-2015	1.124	3.253	4.351	-17.96	-18.91	10.88	45.73	13.80	3.31
290615-018	Globicephala melas	Muscle	29-06-2015	1.058	2.636	3.515	-18.01	-19.03	10.51	39.17	11.97	3.27
290615-020	Globicephala melas	Muscle	29-06-2015	1.107	3.112	3.981	-18.16	-18.92	10.78	44.22	12.87	3.44
290615-021	Globicephala melas	Muscle	29-06-2015	0.990	3.008	3.968	-18.07	-18.97	10.59	47.74	14.27	3.34
230715-064	Globicephala melas	Muscle	23-07-2015	1.118	3.432	4.327	-18.50	-19.10	11.40	48.49	13.72	3.53
230715-065	Globicephala melas	Muscle	23-07-2015	1.139	3.414	4.284	-18.61	-19.21	11.04	47.18	13.34	3.54
230715-127	Globicephala melas	Muscle	23-07-2015	1.049	3.020	3.803	-17.96	-18.65	10.98	45.06	12.96	3.48

ID	Species	Tissue	Date	Weig. (mg)	CO2 amp	N2 amp	d13C	d13C’	d15N	%C	%N	C/N
230715-128	Globicephala melas	Muscle	23-07-2015	1.160	3.626	4.345	-18.24	-18.58	11.41	49.43	13.28	3.72
230715-130	Globicephala melas	Muscle	23-07-2015	1.106	3.277	4.398	-18.11	-19.06	11.46	46.72	14.08	3.32
230715-133	Globicephala melas	Muscle	23-07-2015	1.109	3.356	4.404	-18.40	-19.22	11.18	47.84	14.08	3.40
230715-134	Globicephala melas	Muscle	23-07-2015	1.118	3.423	4.234	-18.38	-18.89	10.82	48.38	13.43	3.60
060716-0002	Globicephala melas	Muscle	06-07-2016	1.072	3.419	3.899	-18.72	-18.85	10.79	50.26	12.91	3.89
060716-0008	Globicephala melas	Muscle	06-07-2016	1.105	3.336	4.351	-18.10	-18.91	10.83	47.56	13.98	3.40
060716-0011	Globicephala melas	Muscle	06-07-2016	1.028	3.052	4.084	-17.84	-18.82	11.17	46.72	14.17	3.30
060716-0013	Globicephala melas	Muscle	06-07-2016	1.176	3.525	4.566	-18.16	-18.88	10.69	47.68	13.81	3.45
060716-0022	Globicephala melas	Muscle	06-07-2016	1.058	3.232	4.123	-17.99	-18.70	11.04	48.05	13.85	3.47
060716-0023	Globicephala melas	Muscle	06-07-2016	1.114	3.327	4.198	-18.10	-18.74	10.62	47.17	13.44	3.51
060716-0026	Globicephala melas	Muscle	06-07-2016	1.010	2.983	3.749	-18.38	-19.03	10.72	46.41	13.25	3.50
060716-0027	Globicephala melas	Muscle	06-07-2016	1.016	3.084	3.889	-18.06	-18.71	11.00	47.98	13.68	3.51
060716-0043	Globicephala melas	Muscle	06-07-2016	1.088	3.369	4.109	-18.46	-18.92	10.46	48.89	13.44	3.64
260716-0059	Globicephala melas	Muscle	26-07-2016	1.128	3.493	4.271	-18.92	-19.38	10.48	49.03	13.48	3.64
260716-0070	Globicephala melas	Muscle	26-07-2016	1.041	3.120	3.991	-18.16	-18.89	10.57	47.24	13.68	3.45
260716-0077	Globicephala melas	Muscle	26-07-2016	1.029	3.115	4.021	-18.81	-19.57	10.48	47.65	13.91	3.43
260716-0078	Globicephala melas	Muscle	26-07-2016	1.127	3.573	3.939	-19.59	-19.54	10.84	50.26	12.42	4.05
260716-0099	Globicephala melas	Muscle	26-07-2016	1.037	3.173	3.921	-18.61	-19.16	10.38	48.04	13.45	3.57
260716-0102	Globicephala melas	Muscle	26-07-2016	1.118	3.498	3.813	-19.53	-19.41	10.53	49.59	12.08	4.10
260716-0108	Globicephala melas	Muscle	26-07-2016	0.990	2.984	3.670	-18.68	-19.22	10.65	47.29	13.21	3.58
260716-0112	Globicephala melas	Muscle	26-07-2016	1.091	3.325	4.036	-18.76	-19.21	10.54	48.03	13.18	3.64
260716-0113	Globicephala melas	Muscle	26-07-2016	1.104	3.363	4.202	-19.02	-19.61	10.14	48.00	13.52	3.55
260716-0123	Globicephala melas	Muscle	26-07-2016	1.123	3.459	4.145	-18.67	-19.02	10.74	48.74	13.10	3.72
260716-0132	Globicephala melas	Muscle	26-07-2016	1.011	3.227	3.522	-19.08	-19.00	10.66	50.22	12.34	4.07
260716-0135	Globicephala melas	Muscle	26-07-2016	1.052	3.355	3.486	-19.81	-19.49	10.78	50.29	11.71	4.29
071116-0002	Globicephala melas	Muscle	07-11-2016	1.091	3.298	4.280	-18.98	-19.76	10.40	47.45	13.88	3.42
071116-0004	Globicephala melas	Muscle	07-11-2016	1.137	3.527	4.277	-19.37	-19.78	10.34	48.99	13.33	3.68
071116-0015	Globicephala melas	Muscle	07-11-2016	1.166	3.488	4.382	-19.28	-19.85	10.23	47.34	13.30	3.56
071116-0029	Globicephala melas	Muscle	07-11-2016	1.085	3.341	4.098	-19.47	-19.93	10.72	48.69	13.41	3.63

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