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Supporting Online Material for

Food Web–Specific Biomagnification of Persistent Organic Pollutants

Barry C. Kelly, Michael G. Ikonomou, Joel D. Blair, Anne E. Morin,
Frank A. P. C. Gobas*

*To whom correspondence should be addressed. E-mail: gobas@sfu.ca

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1. Materials and Methods

1.1. Sample collections

During the months of May to September between 1999 and 2003 biological samples were collected along the eastern Hudson Bay coastline in close proximity to the Inuit village Umiujaq (64° 15′N 113° 07′ W), (Fig. S1). Biota samples included lichens (*Cladina rangiferina*), inter-tidal macro-algae (*Fucus gardneri*), blue mussels (*Mytilis edulis*), fish: Arctic cod (*Boreogadus saida*), capelin (*Mallotus villosus*) and sculpin (*Myoxocephalus scorpioides*), and tissues and organs of harvested common eider ducks (*Somateria mollissima sedentaria*) and marine mammals including beluga whales (*Delphinapterus lecuas*) and ringed seals (*Pusa hispida*). Samples of marine bottom sediments were collected using a petit ponar grab at between 25-80 meter depths. Tissue samples of sea ducks and marine mammals, including stomach contents, liver, muscle, blubber and/or milk, were collected as part of northern Quebec Inuit hunts. Beluga whale samples were collected from the E. Hudson Bay beluga stock summering habitat, in close proximity to the Nastapoka River estuary and the Inuit village of Umiujaq (64° 15′N 113° 07′ W) during the summer hunts. Ringed seal samples were obtained from locations across northern Quebec (Nunavik) and Labrador (Makovik). Extraordinary care was employed during field collections to avoid sample contamination. Samples were collected in individual 50 mL solvent-rinsed glass jars with aluminum foil lined caps (no plastics were used) and stored at –30 °C prior to chemical analysis. Tissue samples from fish and beluga whale tissues were excised using solvent-rinsed disposable surgical blades. Ringed seal blubber and sea duck liver and adipose tissue samples were graciously provided by D.C.G. Muir (Environment Canada's, National Water Research Institute, NWRI, Burlington, ON) and M. Kwan (Nunavik Research Centre, NvRC, Kuujuaq, Quebec). These were collected using plastic sampling bags and hence were not analyzed for plasticizers.

1.2. Contaminant analyses

Contaminant analyses were conducted at the Canadian Department of Fisheries and Ocean's Institute of Ocean Sciences (IOS) trace contaminants laboratory in Sidney, British Columbia, Canada. We performed our methodology for extraction, cleanup and quantification of target analytes (i.e. PCBs and pesticides) by gas chromatography/high resolution mass spectrometry (GC/HRMS) as described elsewhere (*S1-3*). Briefly, approximately 10 g wet wt for lichens, macro-algae and sediment, 5-15 g for fish, 5 g for liver tissue and 0.5 g for blubber were homogenized with approximately 20 g Na_2SO_4 with mortar and pestle. Extracted fish tissue consisted of excised muscle tissue (i.e., no skin), with the exception of capelin (which consisted of pooled whole fish). The homogenate powder was transferred to a glass extraction vessel, spiked with isotope labelled surrogate spiking standards (i.e., ^{13}C PCBs and Organochlorine Pesticides, Cambridge Isotope Laboratories, Andover, MA), then extracted with 30 mL of 1:1 (v/v) DCM/Hexane in a Branson 5210 ultrasonic water-bath (Branson Ultrasonics Co., CT) for 20 min. and repeated two more times with fresh solvent. The combined extracts were concentrated to ~ 2 mL with a gentle stream of high-purity nitrogen. Relatively low lipid samples (< 5% lipid w/w) such as cod and sculpin tissue were quantitatively transferred onto a 350 mm x 10 mm i.d. glass column packed with 8 g 100% activated florisil (60 -100 μm mesh, activated at 400ºC overnight). The columns were then eluted using 200 mL 50% DCM/hexane solution (V/V) and evaporated to a final volume of 100 μL. High lipid samples (>5% lipid w/w) such as blubber were first passed through a Gel Permeation Column (GPC) filled with 70 g of BioBeads, S-X33 (BioRad) in 50% DCM/hexane solution (V/V). The lipid fraction from the GPC (180 mL) was collected and discarded, while the remaining 300 mL of eluent from the GPC was collected evaporated to near dryness and solvent exchanged into hexane for further cleanup by Florisil. The final extracts (following Florisil) were spiked with isotope labeled (^{13}C) performance standards, then analyzed by GC/HRMS using two separate instrument conditions (*S4*). We utilized a DB-5 (60m x 0.25mm i.d., 0.1 μm film thickness) GC column. Analyte solution (1μl) was injected in splitless mode, at an injector temperature of 282ºC. The MS was operated with 10,000 resolution in the positive EI conditions (35eV energy). Data was acquired in the single ion resolving (SIR) mode, while monitoring two ions, M^+ and $(M+2)^+$. Chemical concentrations were calculated using mean relative response factors (RRFs) determined from calibration standard runs. Method blanks, consisting of Na_2SO_4, were processed according to the same procedure as samples and analyzed with every batch of twelve samples to check for contamination of the extracts. A method detection limit was determined as the mean concentration in the blanks plus 3 times the standard deviation of the mean concentration. Concentrations in samples below the method detection limit were considered non-detectable. The lipid content of the sample was determined gravimetrically on sub-samples of the extracts and reported as a percentage of the sample wet weight. Moisture content was determined by comparing the sample's wet and dry weights after oven-drying 1 g of sample at 125 º C for 24-48 hr.

1.3. Quality Assurance/Quality Control Measures

Our laboratory has rigorous QA/QC protocols and has previously participated in several inter-laboratory calibration initiatives. Each batch of twelve samples consists of 1 procedural blank, 1 certified reference material (Salmon CRM), 1 duplicate sample. Analytes were identified only when the GC/HRMS data satisfied all of the following criteria: (i) two isotopes of the analyte were detected by their exact masses with the HRMS operating at 10,000 resolution during the entire chromatographic run; (ii) the retention time of the analyte peak was within 3 seconds of the predicted time obtained from analysis of authentic compounds in the calibration standards (where available); (iii) the maxima for both characteristic isotopic peaks of an analyte coincided within 2 seconds; (iv) the observed isotope ratio of the two ions monitored per analyte were within 15% of the theoretical isotopic ratio; and (v) the signal-to-noise ratio resulting from the peak response of the two corresponding ions was ≥3 for proper quantification of the analyte. Analyte concentrations were calculated by the internal standard isotope-dilution method using mean relative response factors (RRFs) determined from calibration standard runs made before and after each batch of samples was analyzed. Recoveries of individual internal standards were between 40-120% for all analyses. Concentrations of analytes were corrected for percent recoveries of the internal standards. It is commonly known that more volatile PCB congeners (Cl_2 and Cl_3 PCBs) and pesticides (e.g. trichlorobenzenes) exhibit lower recoveries than higher chlorinated congeners following standard extraction and cleanup procedures. In the present study surrogates of these relatively volatile compounds (i.e., $^{13}C_{12}$-labeled CB15 and CB28 and $^{13}C_{12}$-labeled 1,2,3 trichlorobenzene), exhibited recoveries around 40%. All Cl_2 and Cl_3 and trichlorobenzene analytes were quantified using these three corresponding surrogate recoveries.

1.4. Data Analysis

To enable direct comparisons of chemical concentrations between various environmental media and organisms it is important to correct chemical concentration data to a common unit expression. Typically chemical concentrations of hydrophobic organic contaminants in biota are corrected to the lipid fraction of the sample (ϕ_L), expressing wet weight chemical concentrations (C_{WW}, $ng \cdot g^{-1}$) on a lipid weight basis (LW) by the equation: $C_{LW} = C_{WW}.\phi_L^{-1}$ in units of $ng \cdot g^{-1}$ lipid. However, organic contaminants can be absorbed in non-lipid organic matter (NLOM) phases of environmental and biological media having relatively low lipid contents. For example, organic carbon (OC) content is the primary determinant of the sorptive capacity of organic chemicals in soils and sediment (*S5*). Studies of contaminant uptake and distribution in vegetation and algae have consitently demonstrated that lipid contents are poor determinants of sorptive capacity of organic contaminants in those organisms (*S6-10*). For example, studies in vascular plants indicate plant leaves (0.5-1% lipids) exhibit approximately 5% lipid equivalent due to the additional sorptive capacity provided by NLOM (*S6*). Thus, non-lipid macronutrients such as proteins (P) and carbohydrates (C) appear to provide substantial sorptive capacity of organic contaminants in vegetation and algae. These other phases need to be considered to truly represent the freely dissolved chemical concentration in those organisms.

In the present study, measured chemical concentrations in sediments and biota samples were normalized to a lipid equivalent fraction (ϕ_{Leq}) using the equation $C_{Leq} = C_{WW}.\phi_{Leq}^{-1}$. Lipid equivalent fractions (ϕ_{Leq}) for sediments were determined following Seth et al. (*S5*) such that $\phi_{Leq} = \phi_L + 0.35.\phi_{OC}$, where the constant 0.35 represents findings that organic carbon has approximately 35% sorptive capacity of octanol. For biota, the lipid equivalent fraction was determined as the sum of lipid (ϕ_L), proteins (ϕ_P) and carbohydrates (ϕ_C) fractions following the equation: $\phi_{Leq} = \phi_L + 0.05\phi_P + 0.1\phi_C$ where the constants 0.05 and 0.1 represent that proteins exhibit 5 % the sorptive capacity of lipids and carbohydrates exhibit 10 % the sorptive capacity relative to lipid. These values are based on findings from previous studies of contaminant absorption in biological media (*S9*,*S11-13*). For lichens and algae, the lipid equivalent normalization is consistent with findings by Patterson et al. (*S6*), Komp et al. (*S7*), Bohme et al. (*S8*), Skoglund et al. (*S9*) and Axelman et al. (*S10*) who recognized that non-lipid organic matter (NLOM) such as carbohydrates and proteins in these organisms provide additional storage capacity for absorbing organic contaminants.

Because chemical concentrations exhibited log-normal distributions the data were transformed logarithmically to reduce variance heterogeneity. Geometric means (GM), geometric standard deviation (GSD) and 95% confidence limits (CL) were determined for individual compounds and chemical class summations for the various samples collected and analyzed as part of the present study (i.e., sediments, lichens, macro-algae, bivalves, fish, sea ducks, beluga whales and ringed seals). We also compiled previously reported contaminant concentrations from Canadian Arctic biomonitoring programs, including levels in Arctic air and seawater (*S14-20*), invertebrates (*S21*), walrus (*S22*) polar bears (*S23*), barren-ground caribou (*S14*,*S24*,*S25*), wolves (*S14*,*S24*) and breast milk from Inuit women (*S14,S26*). Following Boon et al. (*S27*), PCB congeners were categorized into five groups (i.e., Goups I, II, III, IV and V PCBs) of metabolic transformation potential on the basis of known metabolism by P450 enzymes.

Using lipid equivalent (*L*eq) corrected chemical concentrations in biota ($ng \cdot g^{-1}$ lipid equivalent) we calculated several evaluative parameters commonly used to assess chemical bioaccumulation potential. The first parameter is the trophic magnification factor (TMF), a marker of cumulative bioaccumulation across the entire food-web, was determined from the log-linear regression between $\log_{10}$ analyte concentrations in biota (C_B) and trophic level (TL):

$$\text{Log } C_B = (m \times \text{TL}) + b \quad (1)$$

where m and b are the empirical slope and y-intercept, respectively (*S28*). Following reference *S28*, TMFs are calculated as the antilog of the slope (m), (i.e., TMF $=10^m$). We determined separate TMFs for (i) water-respiring ectotherms (invertebrates and fish), (ii) air-breathing endotherms (birds and marine mammals) and (iii) the overall food web. TMFs > 1 indicate trophic transfer and step-wise amplification in the food web, while TMFs near or less than unity represent trophic dilution.

Also, we calculated predator/prey biomagnification factors (BMFs) and organism bioaccumulation factors (BAFs). BMF is the ratio of chemical concentrations in a given predator (C_B, ng·g^{-1}lipid equivalent) and its prey (C_D, ng·g^{-1} lipid equivalent), i.e., BMF = C_B/C_D. Species-specific BAFs are the ratio of the chemical concentration in the organism (C_B, mol·m^{-3} lipid equivalent) and the organism's surrounding ambient environment, which is generally expressed as freely dissolved seawater concentrations for water-respiring organisms (i.e., BAF = C_B/C_{WD} mol·m^{-3}) and as gas-phase air concentrations for air-breathing animals (BAF = C_B/C_{AG} mol·m^{-3}). Thus, BAFs for water-respiring ectotherms (e.g., sculpin, cod) were calculated using measured freely dissolved Arctic seawater concentrations (C_{WD} mol·m^{-3}) from references *S14-17,* while BAFs for air-breathing endotherms (e.g., sea ducks, belugas and ringed seals) were determined using measured vapor phase Arctic air concentrations (C_{AG} mol·m^{-3}) from references *S14,S18-20.*

1.5. Food web characterization and designation of organism trophic levels

Fig. S2 schematically illustrates common organisms and approximate trophic positions within the Arctic food web, including primary producers (i.e., lichens and macro algae), bivalves (blue mussels), fish (e.g., Arctic cod) and marine mammals such as beluga whales, ringed seals, walrus, polar bears, terrestrial mammals (caribou and wolves) and humans (Inuit population). Trophic levels (TL) of Canadian Arctic biota have previously been described by extensive ^{15}N and ^{13}C isotope enrichment analyses involving many species of invertebrates, fish, seabirds and marine mammals from the eastern Canadian Arctic (*S29*), resulting in the general equation of TL = 1 + (δ^{15}N -5.4)/3.8. More recent studies using δ^{15}N measurements to establish trophodynamics of several Arctic marine food webs include analyses of biota from the Barents Sea (*S30*), Northwater Polyna (*S31*,*S32*) and the Beaufort-Chukchi Seas (*S33*). Table S2 summarizes these previous δ^{15}N measurements and TL ranges for the various organisms within these Arctic marine food webs. While δ^{15}N values for the various marine organisms undoubtedly vary geographically (even between Arctic systems), the trophic level estimates based on δ^{15}N measurements are quite comparable between these Arctic marine food webs. For example, Arctic cod and sculpin occupy the trophic level range between 3.3 and 3.6. Similarly, fish-eating Arctic resident species such as ringed seals and beluga whales from across the Canadian Arctic have been determined to occupy a TL range of approximately 4.1 to 4.6. For the purpose of the current study we utilized TL determinations in references *S29*,*S31*,*S32* and assigned primary production matrices such as lichens and macro-algae a trophic level (TL) equal to 1.0 and Mollusca (i.e., bivalves) such as blue mussels were assigned a TL of approximately 2.0. Specifically, trophic levels of Arctic fish include Arctic cod (TL= 2.9), sculpin (TL = 3.6) and estuarine salmonids (TL = 3.9). Sea ducks included molluscivorous common eiders (TL= 2.8). Marine mammals include molluscivorous walrus (TL = 3.4), invertebrate/fish eating ringed seals (TL = 4.5) and beluga whales (TL = 4.1) and top-predator polar bears (TL = 5.4) that consume ~100% ringed seals. Inuit communities such as Umiujaq, Inukjuak and Akulivik substantially utilize coastal

E. Hudson Bay fish, birds and marine mammals for subsistence and hence likely occupy a TL somewhere between ringed seals and polar bears in the region (i.e., TL = 5). It should be noted that these assigned trophic levels are best estimates in absence of sample-specific $\delta^{15}N$ measurements for the E. Hudson Bay marine biota and hence should be used with caution. However, these assigned trophic levels are strongly supported by data from multiple Arctic marine systems and provides a general framework representing the trophodynamics of the E. Hudson Bay marine food web, including the algae → invertebrate → fish → avian/mammal trophic transfers.

1.6. Modelling Chemical Biomagnification in Organisms and Food Webs

1.6.1. Model Description

Key Processes. For organisms (invertebrates, fish, birds, reptiles, amphibians and mammals) the extent of overall bioaccumulation is primarily the effect of respiratory uptake and elimination kinetics (**bioconcentration**), gastrointestinal absorption and exchange kinetics (i.e., **biomagnification**) and metabolic transformation capacity (i.e., **biotransformation**). These processes are also influenced by a combination of physical-chemical properties and various biological factors related to organism physiology and taxa. For example, equilibrium partitioning of chemical between an organism's respiratory medium and respiratory membranes (i.e., bioconcentration *via* gills or lungs) is inherently different for water-respiring invertebrates and fish compared to air-breathing birds and mammals. Specifically, efficient respiratory elimination of organic chemicals in water-respiring organisms occurs when $K_{OW} < 10^5$ (*S11*,*S34*,*S35*), while respiratory elimination by air-respiring organisms can only occur for relatively volatile compounds (i.e., with chemical $K_{OA} < 6$), (*S36*). Chemical biomagnification is the process whereby chemical concentrations in an organism are elevated above the organism's diet due to dietary absorption. Inter-taxa differences in (i) food digestion/absorption efficiencies and (ii) chemical absorption efficiencies (E_D) are the primary reasons for wide ranging observations of biomagnification potential between organisms. For example, differences in the maximum biomagnification factors (BMF_{MAX}) between fish species (~5-10), birds and mammals (~50-100) are due to more efficient food and chemical assimilation in avian and mammalian species compared to fish (*S37*).

For the respiratory elimination route, it is important to distinguish between water-respiring and air-breathing organisms, as the respired media and hence elimination kinetics are markedly different. For aquatic water-respiring organisms, elimination to water (i.e., gill ventilation) is well known to be inversely related to the chemical's K_{OW}. Hence, an increase in K_{OW} (i.e., K_{OW}'s greater than 10^5) causes a slower rate of chemical elimination from the organism via respiration. Thus, for non-metabolizable chemicals with K_{OW}'s > 10^5, respiratory elimination is small compared to dietary uptake and biomagnification occurs. For air-breathing homeotherms, respiratory elimination is not to water but to alveolar air *via* lipid-air exchange dynamics in the lungs. Respiratory elimination *via* lipid-air exchange declines with increasing octanol-air partition coefficient (K_{OA}). If K_{OA} exceeds approximately 10^5, respiratory elimination is too small to effectively reduce the biomagnification effect in the gastrointestinal tract of air-breathing animals hence biomagnification can occur (*S36*). Only if the substance is rapidly eliminated to urine (e.g., log K_{OW} is less than approximately 2) or rapidly metabolized, can biomagnification be prevented. Our field and modelling studies (*S24*,*S36-38*) indicate that the bioaccumulation potential of organic chemicals in aquatic organisms is best assessed by K_{OW}, while bioaccumulation potential in air-breathing organisms is best anticipated by K_{OA} and K_{OW}. Czub and McLachlan (*S39*) recently presented a modelling study of POPs in the human food chain of southern Sweden that also demonstrates similar K_{OW} and K_{OA} thresholds for chemical bioaccumulation potential in humans. Thus, it appears that chemical K_{OA} can strongly influence the bioaccumulation potential in a variety of air-breathing wildlife (reptiles, amphibians, birds, terrestrial and marine mammals) as well humans.

Metabolic transformation ultimately plays a key role in the bioaccumulation potential of absorbed chemical. For readily metabolized compounds, the metabolic transformation rate constant k_M controls the rate biotransformation of the parent compound. Increased k_M ultimately reduces the biomagnification potential of chemicals but enhances the formation of metabolic by-products. Cahill et al. (*S40*) recently presented a generalized physiologically based pharmacokinetic (PBPK) model that includes metabolite formation and distribution within organisms.

The Fugacity Concept. Mackay and colleagues pioneered the application of chemical fugacity as a key measure of chemical potential in environmental and biological systems (*S11*,*S34*,*S41-44*). The thermodynamic-based fugacity approach has proven useful in modeling chemical transport in biological membranes and environmental systems because net passive diffusion of a chemical between different media (e. g., air, water, organisms) occurs in response to fugacity gradients, rather than differences in chemical concentration. The fugacity of a chemical (*f*, in units of Pascal) for a given phase is related linearly to its molar concentration (C in mol m^{-3}) by the fugacity capacity (Z, mol m^{-3} Pa^{-1}) of the phase in which the chemical is solubilized

$$f = C/Z \qquad (2)$$

where the fugacity capacity, sometimes referred to as a Z-value, is compound and phase specific and represents the ability of that phase to sorb (solubilize) and retain a given chemical within its matrix. Following the ideal gas law, the fugacity capacities for all compounds in air are equal (i.e., Z_A = 1/RT, where R is the gas constant and T is the temperature in Kelvin). The Z-value of a chemical in water (Z_W) is inversely proportional to the chemical's Henry's Law Constant (H, in units Pa m^3 mol^{-1}), i.e., $Z_W = 1/H$. The Z-value for a chemical in lipid (Z_L) is assumed to be equivalent to that of octanol (Z_O), which is calculated either as the product of Z_W and the octanol-water partition coefficient K_{OW} (i.e., $Z_O = K_{OW}Z_W$), or the product of Z_A and the octanol-air partition coefficient (i.e., $Z_O = K_{OA}Z_A$). The ratio of the fugacity capacities (Z) of two adjacent media or compartments *i* and *j* (i.e., Z_i/Z_j), can be viewed as a partition coefficient K_{ij}, which is equivalent to C_i/C_j at equilibrium. Thus, $K_{OW} = Z_O/Z_W = C_O/C_W$, while $K_{OA} = Z_O/Z_A = C_O/C_A$.

Ambient Concentrations in the Atmosphere. The base input for describing the accumulation of environmental contaminants in organisms and food webs is typically the ambient concentrations in the atmosphere and aquatic environment. The thermodynamically relevant measure of ambient environmental concentrations in air is the freely dissolved gas-phase concentration (C_{AG}). Measured concentrations of in the ambient environment are most often represented as total freely dissolved + particulate bound in air (C_{AT}) and water (C_{WT}). The fraction of total airborne chemical sorbed to aerosols (ϕ_{AP}) can be estimated using the Junge-Pankow model (*S45*,*S46*):

$$\phi_{AP} = c\theta / (VP_{SL} + c\theta) \qquad (3)$$

where θ is the aerosol surface area ($cm^2 \cdot cm^{-3}$ air) and c is the chemical adsorption parameter to aerosols (Pa-cm) and is approximately 17.2 Pa-cm for chlorinated hydrocarbons such as PCBs and organochlorine pesticides (*S45*) and VP_{SL} is the chemical's vapor pressure (Pa) of the supercooled liquid, which is related to temperature by the Clausius-Clapeyron equation:

$$\log VP_{SL} = a + b/T \tag{4}$$

where T is absolute temperature (Kelvin), a and b are experimentally derived and exist for most POPs (*S46*,*S47*). The atmospheric chemical concentration in the gas-phase (C_{AG}) and particulate bound concentration (C_{AP}) can then be calculated for a given ambient condition as:

$$C_{AG} = C_{AT} \cdot (1-\phi_{AP}) \quad \text{and} \quad C_{AP} = C_{AT} \cdot \phi_{AP} \tag{5}$$

where C_{AT} ($mol \cdot m^{-3}$) is the total chemical concentration measured in air (gas + particle). Following the fugacity approach, the chemical fugacity in ambient air is C_{AG}/Z_A.

Ambient Concentrations in Water. The thermodynamically relevant measure in aqueous environments is the freely dissolved chemical concentration in the water (C_{WD}). Organic contaminants in the water phase are present in freely dissolved form and sorbed to particulate and dissolved matter. The filtering or centrifugation method used to separate particles in water distinguishes between the suspended particulate matter with a larger diameter and dissolved matter, including particles with smaller diameters. Similar to atmospheric concentrations, the freely dissolved chemical concentration in water (C_{WD}) and the particulate bound concentration in water (C_{WP}) can be calculated as:

$$C_{WD} = C_{WT} \cdot (1-\phi_{WP}) \quad \text{and} \quad C_{WP} = C_{WT} \cdot \phi_{WP} \tag{6}$$

where ϕ_{WP} is the particulate bound fractions. The chemical fugacity (f_W) in water is subsequently determined as C_{WD}/Z_W.

Contaminant Bioaccumulation in Primary Producers. Several models have been developed to describe the bioaccumulation of organic chemicals in vegetation (*S6*,*S48-51*).Two dominant processes are typically used to describe the exchange of POPs between the atmosphere and vegetation. The first process is the air-to-vegetation partitioning of chemical in the gaseous form in the atmosphere. The second process is the direct deposition and erosion of chemical associated with particulate matter in the atmosphere. This can include both dry particulate fallout and wet deposition (e.g., rain or snow). This is a non-diffusive bioaccumulation mechanism and is particularly important for chemicals exhibiting very high K_{OA}'s such as PAHs, dioxins and highly chlorinated biphenyls because atmospheric concentrations of those substances are predominantly particulate-bound (*S45*). The following equation can be used to describe this model:

$$N_V = \frac{V_V Z_V df_V}{dt} = D_{AV}(f_A - f_V) + D_{SV} f_S + D_{PV} f_A - D_{RV} f_V \tag{7}$$

where V_V is the volume of vegetation (m^3), Z_V is the fugacity capacity in vegetation ($mol \cdot m^{-3} \cdot Pa^{-1}$), f_V is the chemical fugacity (Pa) in the vegetation, f_A is the chemical fugacity in air. The D-values represent chemical transport parameters ($mol \cdot Pa^{-1} \cdot d^{-1}$), include D_{AV} (air-vegetation exchange), D_{SV} (soil-vegetation uptake), D_{PV} (deposition of aerosol associated chemical) and D_{RV} (degradative reaction). Equations for the derivation of D-values are shown in Table S8.

To estimate the atmosphere-vegetation exchange of airborne contaminants it is necessary to quantify particle-gas partitioning and hence the phase distribution of chemical in ambient air. Gas-phase concentrations are required to assess air-to-vegetation partitioning, while particulate-bound concentrations aid the assessment of deposition rates and precipitation scavenging efficiencies (*S52*). The air-vegetation transport parameter (i.e., D_{AV}) is dependent on the vegetation-air partition coefficients $K_{VG,}$ which is dependent on the sorptive capacity of air and vegetation (Z_V). We utilized a three-phase partitioning model, which recognizes the sorptive capacities of the lipids (L), non-lipid organic matter (NLOM) such as proteins (P) and carbohydrates (C) and water (W) in vegetation, to estimate the partitioning of POPs in vegetation using the equation:

$$Z_V/Z_A = K_{VA} = (\nu_L + 0.05 \cdot \nu_P + 0.1 \cdot \nu_C) K_{OA} + \nu_W / K_{AW} \quad (8)$$

where ν_P is the protein content, ν_C is the carbohydrate content, ν_L is the lipid content and ν_W is the water content of the vegetation. Chemical K_{OA}, K_{OW} and K_{AW} are temperature dependent (*S53-56*). LogK_{OA} is very sensitive to temperature and is expressed as a function of temperature by the equation:

$$\log K_{OA}(T) = A_{OA} + B_{OA}/T \quad (9)$$

where T is absolute temperature (Kelvin) and A_{OA} and B_{OA} are compound specific parameters, documented for certain POPs in *S53,S54*. The effect of temperature on chemical K_{OW} (represented by equation 10) has been shown to be relatively minor for most POPs (*S55*):

$$\log K_{OW}(T) = A_{OW} - \Delta H_{OW}/2.303 \cdot RT \quad (10)$$

ΔH_{OW} is the enthalpy of phase transfer between octanol and water ($kJ \cdot mol^{-1}$), R is the gas constant ($J \cdot mol^{-1} \cdot K^{-1}$), and A_{OW} parameters are compound specific. The temperature dependence of K_{AW} is related to the chemical's Henry's Law constant (H, $Pa \cdot m^3 \cdot mol^{-1}$), as $K_{AW} = H/RT$. Henry’s Law Constants are sensitive to ambient temperature changes (*S56*) and are expressed as a function of temperature by the equation:

$$\log H(T) = A_H - B_H/T \quad (11)$$

where, A_H and B_H are derived for specific POPs (*S56*).

Generic Organism Bioaccumulation Model. The bioaccumulation of toxic substances in organisms ultimately involves the transfer and assimilation of energy, macronutrients and anthropogenic xenobiotic molecules. The universally accepted laws of thermodynamics pertaining to energy transfer and system dynamics are therefore key to understanding this process. Specifically, biological thermodynamics (bioenergetics) and chemical thermodynamics (chemical potential) are important fundamental concepts. In terms of bioenergetics, the second law of thermodynamics and the concept of entropy dictate that organisms require external energy to maintain molecular organization and function. For highly organized organisms, this energy is generally in the form of food. Energy flux ($kJ \cdot d^{-1}$) from consumption of food (*C*) can be (i) assimilated into the organism's tissues for production (*P*), (ii) provide basic energy expenditures such as respiration (*R*) or (iii) can be excreted as waste energy (*W*) in feces and urine. Organism growth can then be described as:

$$\frac{dW_B}{dt} = P = C - (R + W) \tag{12}$$

where W_B is the overall weight of the organism in kg. If the organism is no longer substantially growing $dW_B/dt = 0$ the organism consumes food at a rate to sustain life and hence at a steady state

$$C = (R + W) \tag{13}$$

The above bioenergetics model applies to all organisms. Organism specific parameters for use in a chemical bioaccumulation model, in part, are delineated by these underlying bioenergetic processes. Specifically, the organism's food consumption rate (G_D, $m^3 \cdot d^{-1}$), respiration rate (G_R, $m^3 \cdot d^{-1}$), fecal elimination rate (G_F, $m^3 \cdot d^{-1}$) and urinary excretion rate (G_U, $m^3 \cdot d^{-1}$) are inextricably linked to energy flow. Also, the degree of organism growth dW_B/dt is also used in modelling chemical accumulation in organisms. For example, an organism's rate of tissue growth (*g,* $m^3 \cdot d^{-1}$), derived from the underlying bioenergetics, is an important factor affecting chemical dynamics in organisms.

The conventional concentration-based model format for describing contaminant uptake in organisms is expressed as:

$$\frac{V_B dC_B}{dt} = k_{R1} C_R + k_D C_D - \left(k_{R2} + k_F + k_M + k_U + k_L + k_G\right) \cdot C_B \tag{14}$$

where V_B is the overall volume of the organism (m^3), C_R, C_D and C_B are the chemical concentrations in the respiratory medium, diet and organism tissues ($mol \cdot m^3$) and rate constants (*k*, d^{-1}) representing respiratory intake (k_{R1}), food consumption (k_D), respiratory loss (k_{R2}), fecal elimination (k_F), urinary excretion (k_U), lactation (k_L) and growth (k_G). Estimation methods for the determination of the various rate constants and partition coefficients in this model are discussed in detail elsewhere (*S36*, *S38*,*S57*).

While environmental contaminants are sorbed to an organism's food, these xenobiotic molecules are subject to movement and distribution based on thermodynamic gradients. Thus, in terms of the chemical thermodynamic processes, chemical fugacity models are extensively used to describe the uptake and elimination kinetics of contaminants in organisms. Fig. S3 is a conceptual illustration of the two-compartment diffusion model in fugacity format representing bioaccumulation of organic chemicals in a generic organism. Variations of this general organism model have been used sucessfully to simulate chemical bioaccumulation in aquatic piscivorous (*S11*), terrestrial wildlife (*S36*,*S58*) and human agricultural food chains (*S39*,*S59*). The model consists of a single uniform compartment for the gastrointestinal tract (GIT, subscript G) and the organism (subscript B).To express the bioaccumulation process in fugacity terms, advective fluxes and diffusive flows are expressed as transport parameters (or D values in units of $mol \cdot Pa^{-1} \cdot d^{-1}$) and concentrations are expressed as fugacities (in units of Pascals). The transport parameters (or D values) for advective and diffusive fluxes can be described as the product of the flow rate (G in $m^3 \cdot d^{-1}$) of a given medium and the fugacity capacity (Z in $mol \cdot m^{-3} \cdot Pa$) of that medium. For example, the transport parameter representing dietary intake (D_D) is the product of the dietary intake rate (G_D) and the fugacity capacity of the ingested food (Z_D). The chemical flux, representing uptake and elimination of chemical (in units of $mol \cdot d^{-1}$) are calculated as the product of the transport parameter of a given medium and the chemical fugacity of that medium. For example, chemical uptake by ingestion of food is expressed as $D_D f_D$ ($mol \cdot d^{-1}$).

In essence, the GIT compartment receives food at a rate of G_D ($m^3 \cdot d^{-1}$) and eliminates fecal matter at a rate of G_F ($m^3 \cdot d^{-1}$). The chemical flux into the GIT is $D_D f_D$ in $mol \cdot d^{-1}$ and chemical flux via fecal matter is eliminated at a rate of $D_F f_G$ ($mol \cdot d^{-1}$). The organism compartment is represented as a single well mixed compartment that receives chemical from contaminant flux between the GIT and organism ($D_{GB} f_G$), and uptake via the respiratory route ($D_R f_R$), i.e. uptake from water or air. Chemical depuration ($mol \cdot d^{-1}$) can occur through diffusive elimination from the organism to the digesta ($D_{BG}.f_B$) and subsequent fecal excretion, respiratory elimination ($D_R f_R$), urinary excretion ($D_U f_U$), reproductive transfer and lactation (D_L) and metabolic transformation D_M (equivalent to $k_M C_B V_B$) where k_M (d^{-1}) is the metabolic transformation rate constant of the chemical in the organism. Growth dilution ($D_G.f_B$) caused by an animal's increase in body storage volume (V_B) and lipid content (v_{LB}) over time, essentially dilutes internal chemical concentrations (C_B) while increasing storage capacity (i.e., Z_B). Conversely, depletion of an animal's fat reserves concentrates chemical residues while decreasing storage capacity (i.e., Z_B). Growth can be particularly important for nursing newborns and organisms that periodically undergo significant seasonal body condition changes (e.g., migrating or hibernating mammals). The D-value for growth (D_G) can be determined from the specific growth rate (g, $m^3 \cdot d^{-1}$) and the fugacity capacity of the organism, Z_B, (i.e., $D_G = gZ_B$). The transport of chemical into the GIT (V_G m^3) from food ingestion and chemical transport into the organism (V_G m^3) *via* intestinal absorption are represented by the following mass balance equations:

Food intake: $$N_G = \frac{V_G Z_G df_G}{dt} = D_D f_D + D_{BG} f_B - \left(D_{GB} + D_F\right) f_G \qquad (15)$$

Gastrointestinal uptake: $$N_B = \frac{V_B Z_B df_B}{dt} = D_{GB} f_G - \left(D_{BG} + D_R + D_M + D_U + D_L + D_G\right) f_B \qquad (16)$$

where D_{GB} is chemical uptake form GIT-to-organism and D_{BG} is elimination from organism-to-GIT. As food passes through the GIT, the process of digestion removes essential lipids and non-lipid organic matter (NLOM), such as proteins (subscript P) and carbohydrates (subscript C) which ultimately results in a reduced sorptive capacity of the GIT contents (i.e., Z_G) compared to that of the ingested food (Z_D). The extent of food digestion, characterized by the ratio Z_D/Z_G, can raise the chemical fugacity in the GIT of the organism.

Food absorption, which is characterized by the ratio of food intake to fecal excretion (G_D/G_F), results in a reduced substrate volume within the GIT. This increases the chemical's concentration in the GIT, causing an additional fugacity increase and hence chemical potential in the GIT. The combined effect of food digestion and food absorption result in a chemical fugacity in the GIT (f_G) that is elevated above the fugacity in the consumed food (f_D). The increased chemical potential (i.e., elevated fugacity) in the GIT allows for net passive diffusion of chemical from the GIT to the organism *via* blood perfusion. Diffusive flow occurs in both directions from GIT-to-organism (D_{GB}) and from organism-to-GIT (D_{BG}). In addition to chemical uptake from the GIT (equation 16), the organism can accumulate chemical from the ambient environment *via* respiration ($D_R f_R$ mol·d^{-1}).

The chemical fugacity in the GIT at steady state (i.e., $dN_G/dt = 0$) is equal to:

$$f_G = \frac{D_D f_D + D_{BG} f_B}{D_{GB} + D_F} \tag{17}$$

Substitution of equation 17 into equation 16 yields the net flux into the organism (N_B, in mol·d^{-1}):

$$N_B = \frac{V_B Z_B df_B}{dt} = D_R f_R + \left(\frac{D_D D_{GB}}{D_F + D_{GB}} \right) f_D - \left(\frac{D_F D_{BG}}{D_F + D_{GB}} \right) f_B - \left(D_{GB} + D_R + D_U + D_M + D_L + D_G \right) f_B \tag{18}$$

From equation 18, the term $D_{GB}/(D_{GB} + D_F)$ is the chemical's assimilation efficiency, E_D (no units) and represents the ability of an organism to transfer a given compound between the gastrointestinal lumen to the organism. Previous studies of dietary absorption efficiencies (E_D) for various organic chemicals observed in fish, birds and mammals, including humans, indicates that E_D declines for very hydrophobic chemicals with log K_{OW}'s exceeding approximately 7 (*S37*). In general, the magnitude of absorption efficiency values for POPs are ordered birds ~ humans > cows > fish. The diffusion model attributes the reduced E_D for chemicals with log $K_{OW} > 7$ to reduced mass transport of very hydrophobic compounds (i.e., $K_{OW} > 10^7$) across “unstirred” water layers (UWL) within the gastrointestinal tract. Equations used to estimate a chemical’s E_D for in various organisms are shown in Table S6.

The overall net flux of chemical into the organism can be written as:

$$N_B = \frac{V_B Z_B df_B}{dt} = D_R f_R + E_D D_D f_D - E_D D_F f_B - \left(D_{GB} + D_R + D_U + D_M + D_L + D_G \right) f_B \tag{19}$$

The model estimates an age dependent chemical fugacity (f_B) and concentration (C_B, mol·m^{-3}) in the organism’s tissues. Also a fugacity based or concentration based biomagnification factor is calculated relative to the organisms diet (i.e., $f_B(t)/f_D$ or $C_B(t)/C_D$). For reproducing female mammals, concentrations in the fetus are assumed to be at equilibrium with those in the pregnant female. This model identifies respiratory exchange processes and gastrointestinal magnification as the main driving forces for contaminant bioaccumulation, while urinary excretion, milk excretion, metabolic transformation and growth dilution counteract the bioaccumulation process. Elimination through air-exhalation, urine, maternal transfer and metabolic transformation combine to reduce the degree of biomagnification achieved by dietary absorption and digestion. Changes in the organism’s biomass are presented in the model as the time dependence of the weight of the animal, i.e. dV_B/dt in the time dependent version of the model. The model assumes that for continuously exposed animals in the field, concentrations of POPs among different tissues are at a chemical equilibrium and hence homogeneously distributed within the animal when expressed on a lipid normalized basis. Field observations (*S24*) and analyses using physiologically-based pharmacokinetic (PBPK) models (*S60*) support this simplification.

The extent of gastrointestinal magnification is represented by a gastrointestinal magnification factor (GIMF), calculated as:

$$\frac{f_G}{f_D} = \left(\frac{G_D Z_D}{G_F Z_F}\right) + D_{GB}\left(\frac{1 - D_{GB}}{D_R + D_U + D_M + D_L + D_G}\right) \qquad (20)$$

This equation illustrates that the chemical fugacity in the organism's tissues attempt to reach a chemical equilibrium with the high fugacity achieved in the GIT. As a result, the chemical fugacity in the organism (f_B) is elevated over the fugacity in the ingested food (f_D) (i. e., biomagnification) and is calculated as:

$$f_B = \frac{D_R f_R + D_{GB} f_G}{D_D + D_{BG} + D_U + D_L + D_M + D_R} \qquad (21)$$

The resulting fugacity-based biomagnification factor is therefore:

$$BMF = \frac{f_B}{f_D} = \frac{D_R\left(\frac{f_R}{f_D}\right) + D_D.E_D}{\left(D_G + D_M + D_R + D_U + D_L\right) + \left(\frac{D_{BG}}{D_{GB}}\right) D_F.E_D} \qquad (22)$$

An important toxicokinetic difference between air-breathing endotherms and water-respiring organisms is the respiring medium (air versus water). The chemical bioaccumulation factor (BAF) representing the bioaccumulation potential relative to the organism's surrounding environment (i.e., respiratory medium) is calculated as:

$$BAF = \frac{f_B}{f_R} = \frac{D_R + D_D.E_D\left(\frac{f_D}{f_R}\right)}{\left(D_G + D_M + D_L + D_U + D_R\right) + \left(\frac{D_{BG}}{D_{GB}}\right) D_F.E_D} \qquad (23)$$

Because respiration in organisms generally involves advection of large volumes of air or water, respiratory exchange processes can be an effective contaminant elimination route for organisms. For air-breathing organisms (including reptiles, amphibians, birds and mammals), the degree of chemical depuration via respiration is dependent on the chemical's octanol-air partition coefficient (K_{OA}). For water-respiring organisms (invertebrates and fish), the degree of chemical depuration via respiration is dependent on the chemical's octanol-water partition coefficient (K_{OW}). This study is focussed on the chemical dynamics associated with this respiratory elimination mechanism for a variety or air-breathing and water-respiring organisms.

1.6.2. Model Simulations

Chemical input parameters include physical-chemical properties (namely chemical K_{OW} and K_{OA}, Henry's Law Constants and Vapor pressure) and freely dissolved concentrations in water (C_{WD}) and air

(C_{AG}). The model was applied to Canadian Arctic terrestrial and marine food webs to predict steady state fugacities (*f*, Pa), concentrations (C, ng·g^{-1} lipid equivalent), biomagnification factors (BMFs) and bioaccumulation factors (BAFs) in various Arctic organisms. Model predictions were compared to our field study data. We also applied the model to a temperate food web (Great Lakes region of North America) and a Tropical food web (Great Barrier Reef/Australia) to evaluate chemical bioaccumulation potential in variety of water-respiring and air-breathing organisms. For model simulations of the Arctic indigenous human (Inuit) food chain, we assumed human consumption was the combination of Arctic fish and wildlife (meat from caribou, ringed seals, walrus and beluga whales) and agricultural products originating from southern Canada such as grains, beef, dairy. Chemical concentrations of those latter foods were determined from model simulations of agricultural food chains of the Great Lakes region.

1.6.3. Model Parameterization

Physical-chemical properties. A summary of the relevant chemical properties of the various organic compounds studied is shown in Table S3. Molecular weights (MW), vapor pressures (VP), K_{OW}'s, K_{OA}'s and Henry's Law Constants (*H*) were compiled from the literature (*S46*,*S47*,*S53-55*,*S61-63*). Physical-chemical properties were temperature corrected using equations 4, 9, 10 and 11. For example, in the model chemical K_{OA}'s calculated at 37 ºC were used for organism-air partitioning in warm-blooded animals, while chemical K_{OA}'s calculated at 4-25 ºC were used for ambient processes such as water-fish bioconcentration and air-plant partitioning.

Organism properties. Tables S4 and S5 summarize the various organisms and related biological properties used in the model. Biological parameters including organism body weights (W_B, kg), feeding rates (G_D, m^3·d^{-1}), respiration rates (G_R, m^3·d^{-1}), urinary excretion rates (G_U, m^3·d^{-1}), fecal excretion rates (G_F, m^3·d^{-1}), macronutrient and water extraction efficiencies (ε_L, ε_P, ε_C, ε_W) and body composition (ν_L, ν_P, ν_C, ν_W), were compiled from various sources in the literature (*S17*, *S36*,*S57*,*S60*,*S64*,*S59, 65-72*).

Z values and partition coefficients. Table S7 summarizes the various fugacity capacity or Z-value determinations in the model. In the model, an organism is viewed as consisting of four phases, (i) lipid, (ii) proteins (P), (iii) carbohydrates (C) and (iv) water (W). We assume that phase properties of lipids are adequately represented by octanol, and that non-lipid organic matter (i.e. all organic matter excluding the lipids) such as proteins and carbohydrates have a sorption affinity equal to 5% and 10% of that of octanol, respectively. In this way, the biota-to air partition coefficient K_{BA}, which represents the ratio of fugacity capacities (Z_B) in biota and air (Z_A) can be estimated as:

$$Z_B/Z_A = K_{BA} = C_B/C_{AG} = \nu_{LB}\, K_{OA} + 0.05\cdot\nu_{PB} K_{OA} + 0.1\cdot\nu_{PB} K_{OA} + \nu_{WB}/K_{AW} \quad (24)$$

where ν_{LB}, ν_{PB}, ν_{CB} and ν_{WB} are the lipid content (kg lipid/kg wet wt. organism), the protein content (kg P/kg wet wt. organism), the carbohydrate content (kg C/kg wet wt. organism) and the water content (kg water/kg wet wt. organism) of the predator organism. Partition coefficients for octanol-air (K_{OA}) and air-water (K_{AW}) are temperature corrected for internal body temperature (~ 37°C). K_{OA}, K_{OW} and K_{AW} (i.e., calculated at T = 310 K) using equations 9-11.

Following the same 4-phase partitioning model for intestinal contents, the organism-to-GIT partition coefficient K_{BG}, which represents the ratio of fugacity capacities (Z_B) in biota and air (Z_A) can be represented as:

$Z_B/Z_G = K_{BG} = C_B/C_G = (\nu_{LB} + 0.05\cdot\nu_{PB} + 0.1\cdot\nu_{CB} + \nu_{WB}/K_{OW})/$

$$(\nu_{LG} + 0.05\cdot\nu_{PG} + 0.1\cdot\nu_{CG} + \nu_{WG}/K_{OW}) \quad (25)$$

where ν_{LG}, ν_{PG} , ν_{CG} and ν_{WG} are the lipid content (kg lipid/kg wet wt. digesta), the protein content (kg P/kg wet wt. digesta), the carbohydrate content (kg C/kg wet wt. digesta) and the water content (kg water/kg wet digesta) of the gut contents and $\nu_{LG} + \nu_{PG} + \nu_{CG} + \nu_{WG} = 1$. They are dependent on the digestibility of the ingested diet, which can be expressed by the absorption efficiencies of lipid (ε_L), proteins (ε_P), carbohydrates (ε_C) and water (ε_W) according to:

$$\nu_{LG} = (1- \varepsilon_L) \cdot\nu_{LD} / \{(1- \varepsilon_L) \cdot\nu_{LD} + (1- \varepsilon_P) \cdot\nu_{PD} + (1-\varepsilon_C) \cdot\nu_{CD} + (1- \varepsilon_W) \cdot\nu_{WD} \quad (26)$$

$$\nu_{PG} = (1- \varepsilon_P) \cdot\nu_{PD} / \{(1- \varepsilon_P) \cdot\nu_{PD} + (1- \varepsilon_L) \cdot\nu_{LD} + (1-\varepsilon_C) \cdot\nu_{CD} + (1- \varepsilon_W) \cdot\nu_{WD} \quad (27)$$

$$\nu_{CG} = (1- \varepsilon_C) \cdot\nu_{CD} / \{(1- \varepsilon_C) \cdot\nu_{CD} + (1- \varepsilon_L) \cdot\nu_{LD} + (1-\varepsilon_P) \cdot\nu_{PD} + (1- \varepsilon_W) \cdot\nu_{WD} \quad (28)$$

$$\nu_{WG} = (1- \varepsilon_W) \cdot\nu_{WD} / \{(1- \varepsilon_L) \cdot\nu_{LD} + (1- \varepsilon_P) \cdot\nu_{PD} + (1-\varepsilon_C) \cdot\nu_{CD} + (1- \varepsilon_W) \cdot\nu_{WD} \quad (29)$$

where ν_{LD} , ν_{PD} , ν_{CD} and ν_{WD} are the lipid content (kg lipid/kg wet weight food), the protein content (kg P/kg wet wt. food), the carbohydrate content (kg C/kg wet wt. food)and the water content (kg water/kg wet wt. food) of the ingested diet and $\nu_{LD} + \nu_{PD} + \nu_{CD} + \nu_{WD} = 1$. The organism to urine partition coefficient K_{BU} and organism to milk partition coefficient (K_{BM}) are derived from K_{OW} and represented as:

$$Z_B/Z_U = K_{BU} = (\nu_{LB} + 0.05\cdot\nu_{PB} + +0.1\cdot\nu_{CB} + \nu_{WB}/K_{OW}) / (1/K_{OW}) \quad (30)$$

$$Z_B/Z_M = K_{BM} = (\nu_{LB} + 0.05\cdot\nu_{PB} + +0.1\cdot\nu_{CB} + \nu_{WB}/K_{OW})/ (\nu_{LM} + 0.05\cdot\nu_{PM} + 0.1\cdot\nu_{CM} + \nu_{WM}/K_{OW}) \quad (31)$$

where ν_{LM} is the lipid content, ν_{PM} is the protein content, ν_{CM} is the carbohydrate content and ν_{WM} is the water content of milk and $\nu_{LM} + \nu_{PM} + \nu_{CM} + \nu_{WM} = 1$.

2. Supplemental Figures

Fig. S1. Map of the Eastern Hudson Bay region of the Canadian Arctic where field sampling was conducted.

Fig. S2. Schematic illustration showing contaminant pathways, feeding interactions and trophic levels (TL) of organisms of the piscivorous (blue), terrestrial (green) and marine mammalian (red) food webs, which are part of the indigenous Inuit human food chain of the Canadian Arctic. Note: Arctic marine mammalian food web includes common eider ducks.

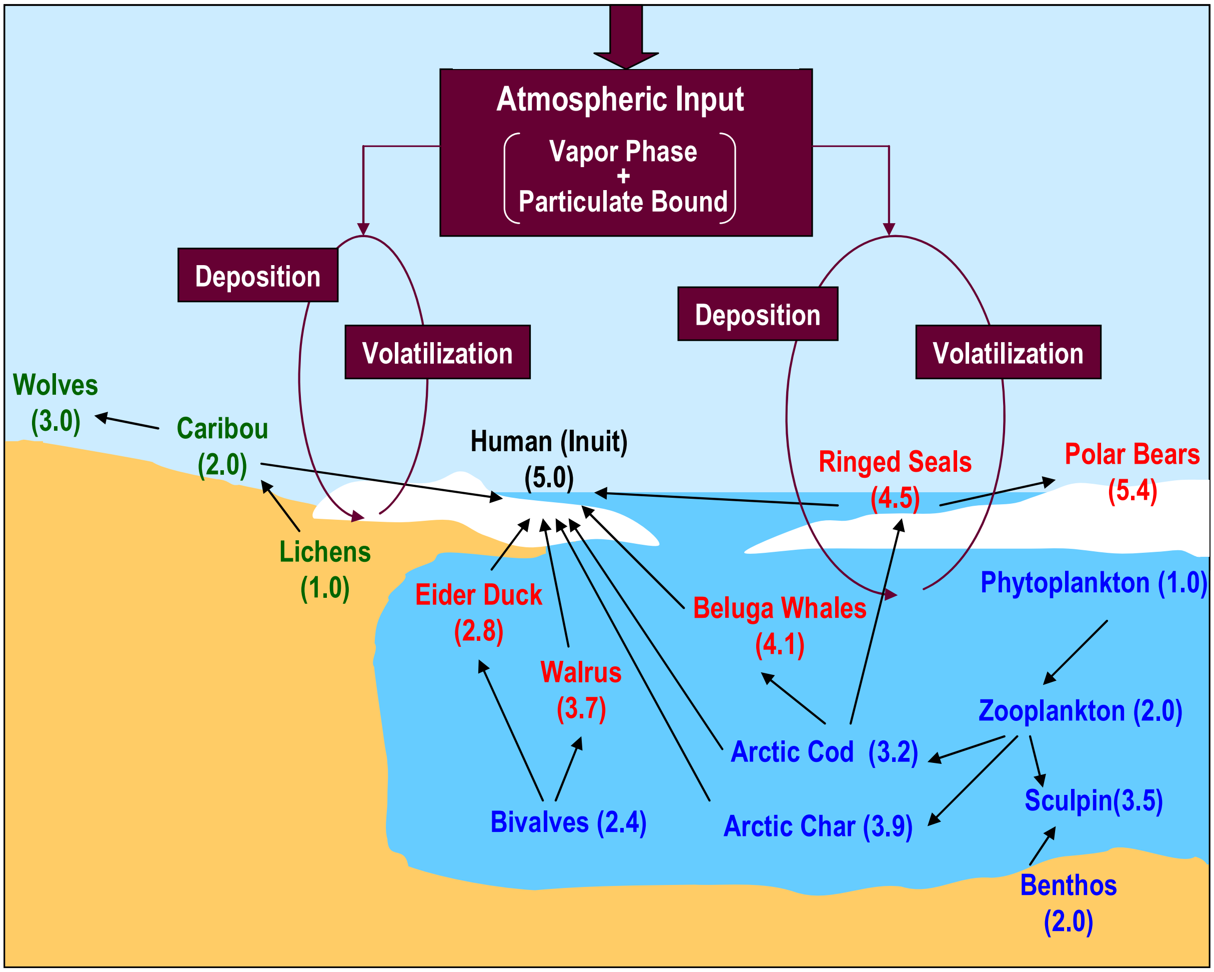


Fig. S3. Conceptual illustration of a two-compartment generic organism bioaccumulation model.

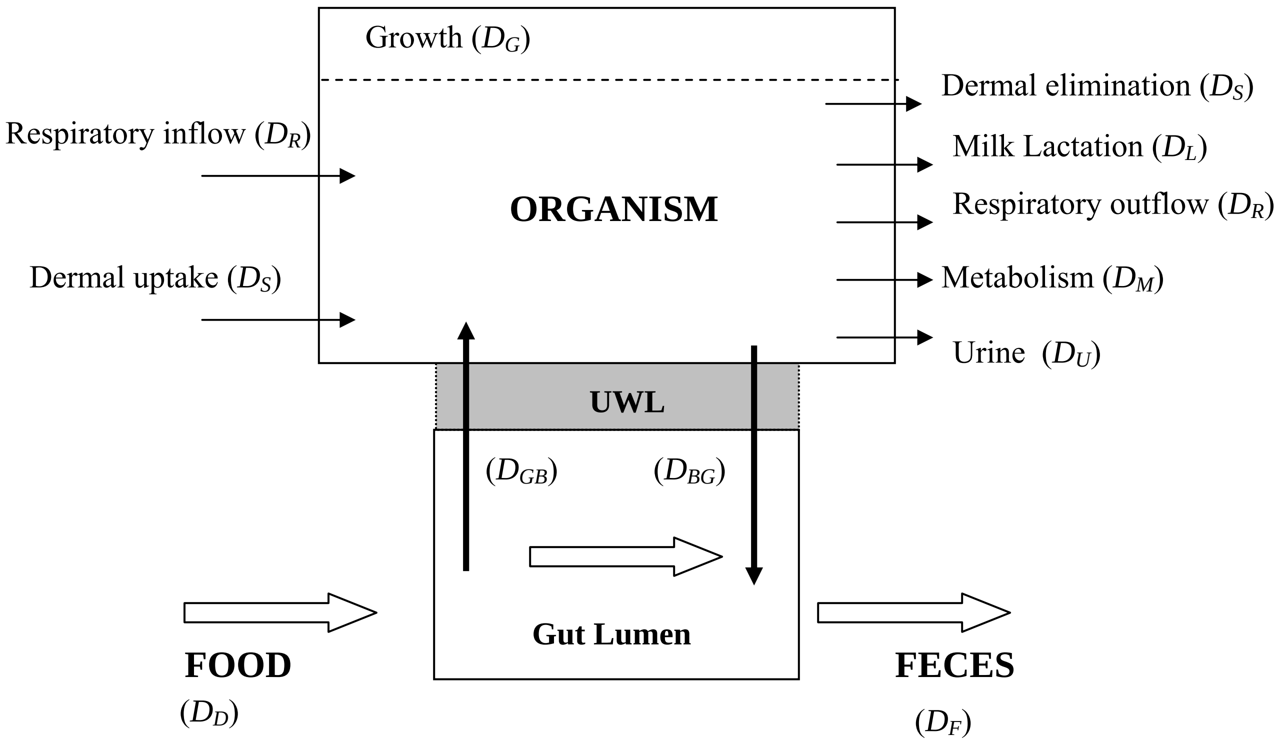


Fig. S4. Observed tissue residue concentrations in Arctic marine (blue) and terrestrial (green) organisms (ng·g^{-1} lipid equivalent) and trophic level (TL) for (A) PCB153, (B) Mirex, (C) *p,p′* DDE, (D) 1,2,4,5 Tetrachlorobenzene (TeCBz), (E) α-HCH and (F) β-HCH. Regression lines are as follows: Aquatic piscivorous food web (dashed blue), marine mammalian food web (solid blue) and terrestrial food web (solid green). With the exception of *p,p′* DDE in the terrestrial food chain (lichen-caribou-wolf), significant increases in chemical concentrations in organisms with increasing trophic level were observed for hydrophobic contaminants. PCB153 (r^2 = 0.7-0.9, P = 1×10^{-17}- 1×10^{-12}), Mirex (r^2 = 0.5-0.7, P = 1×10^{-7}- 3×10^{-3}) and *p,p'* DDE (r^2 = 0.7-0.8, P = 2.5×10^{-10}- 1.9×10^{-8}). Also, with the exception of α-HCH in the terrestrial food chain, magnification of less hydrophobic chemicals were observed but only in terrestrial and marine air-breathing animals. 1,2,4,5 TeCBz (r^2 = 0.6-0.8, P = 3×10^{-8}- 1×10^{-7}), α-HCH (r^2 = 0.4, P = 6×10^{-6}) and β-HCH (r^2 = 0.7-0.8, P = 2×10^{-17}- 3×10^{-16}).

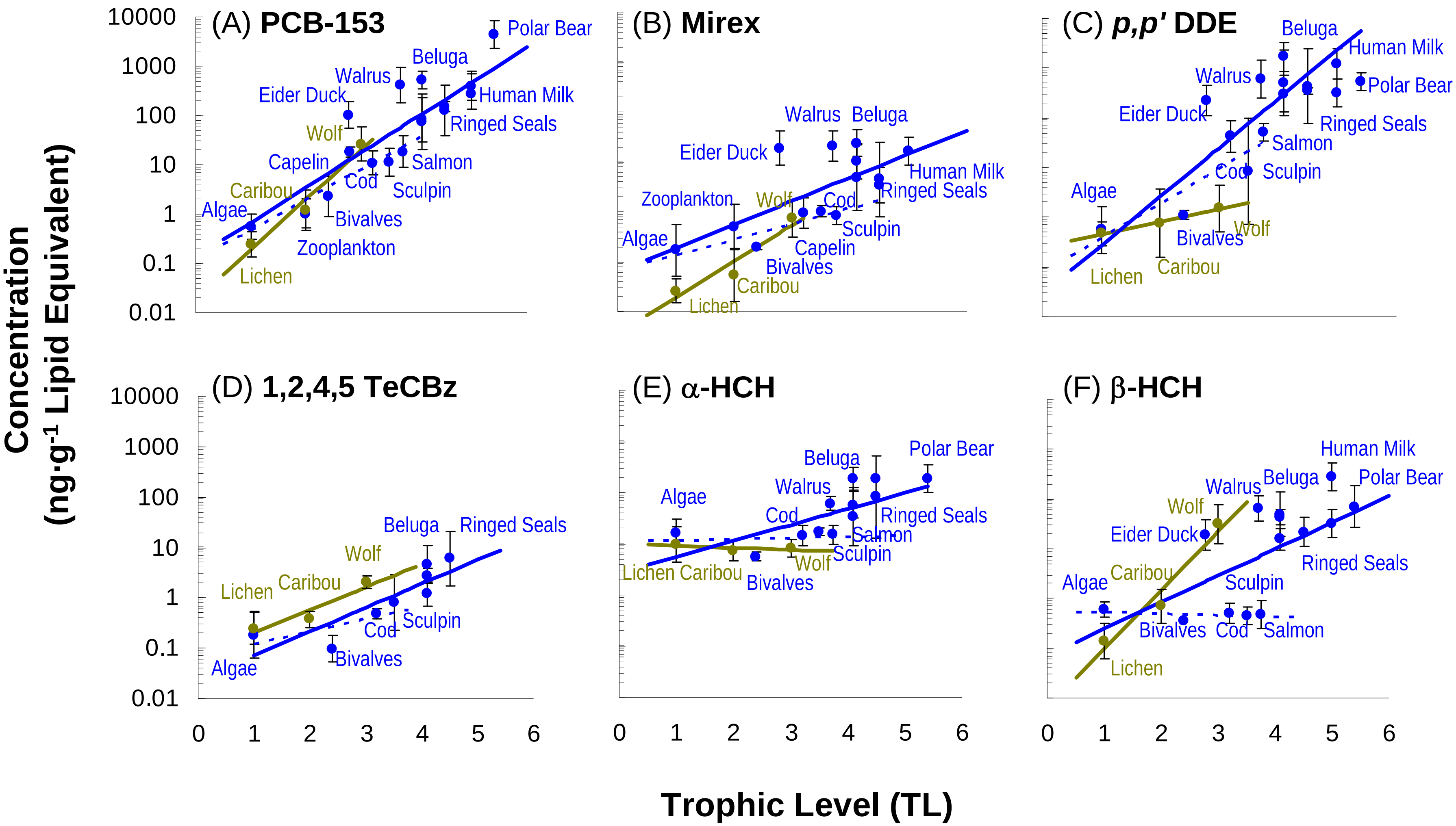


Fig. S5. Model calculated bioaccumulation factors BAFs (in units of L/kg lipid) of a hydrophilic semi-volatile organic chemical in various organisms of the Arctic, Temperate and Tropical ecosystems. For water-respiring and air-respiring organisms in Arctic, Temperate and Tropical food webs, the BAFs for a hydrophobic semivolatile chemical (e.g. PCB153) were high, with logBAFs ranging between 6-12. BAFs for a non-metabolizable hydrophilic semivolatile chemical (e.g., β-HCH) in water-respiring organisms is low and generally equivalent to the lipid-water equilibrium condition (i.e., BAFs = K_{OW}). However, predicted BAFs of that hydrophilic semivolatile compound in air-respiring animals is elevated well above the lipid-air equilibrium (i.e., BAFs > K_{OA}) and comparable to hydrophobic semivolatile contaminants.

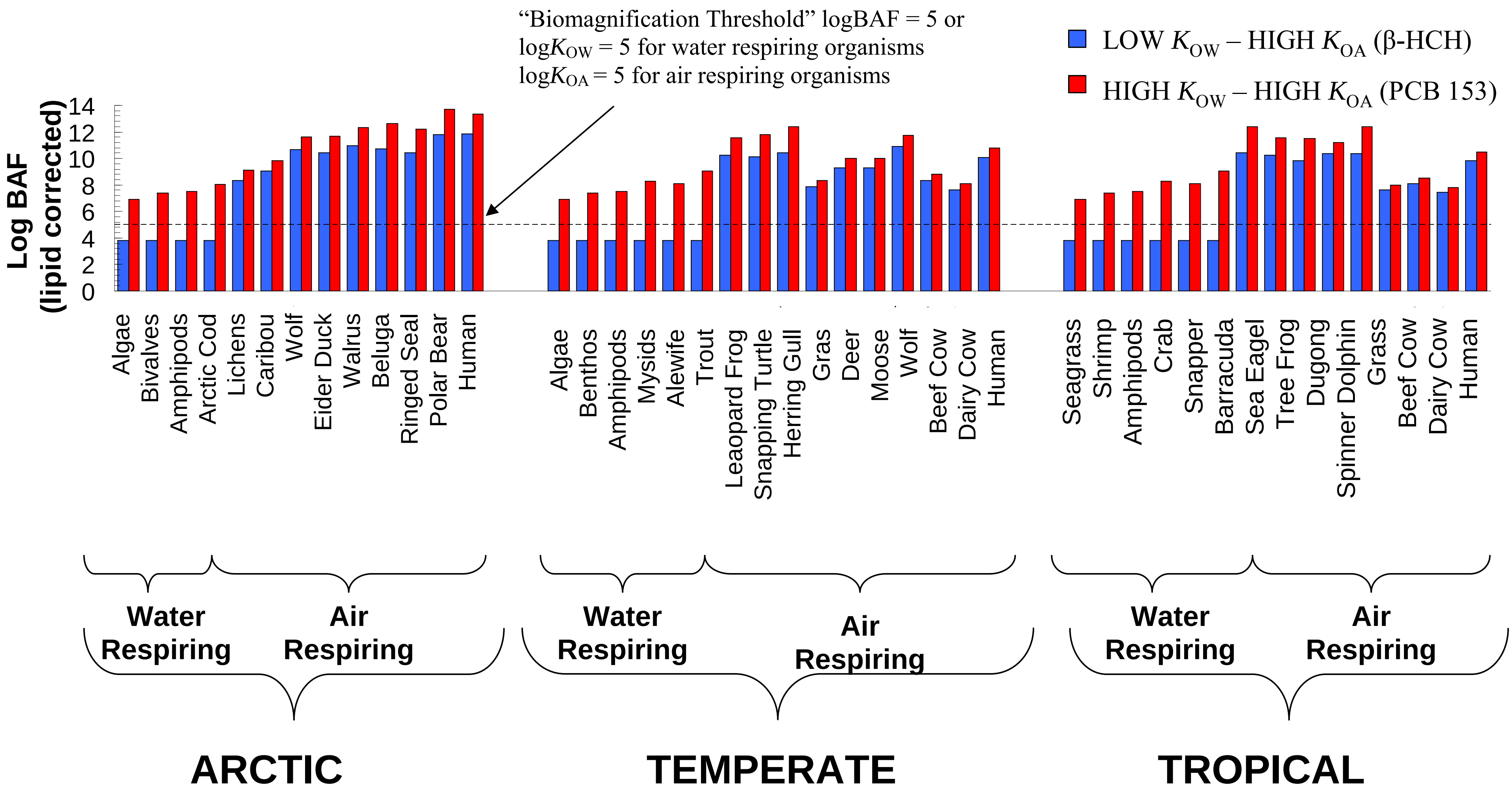
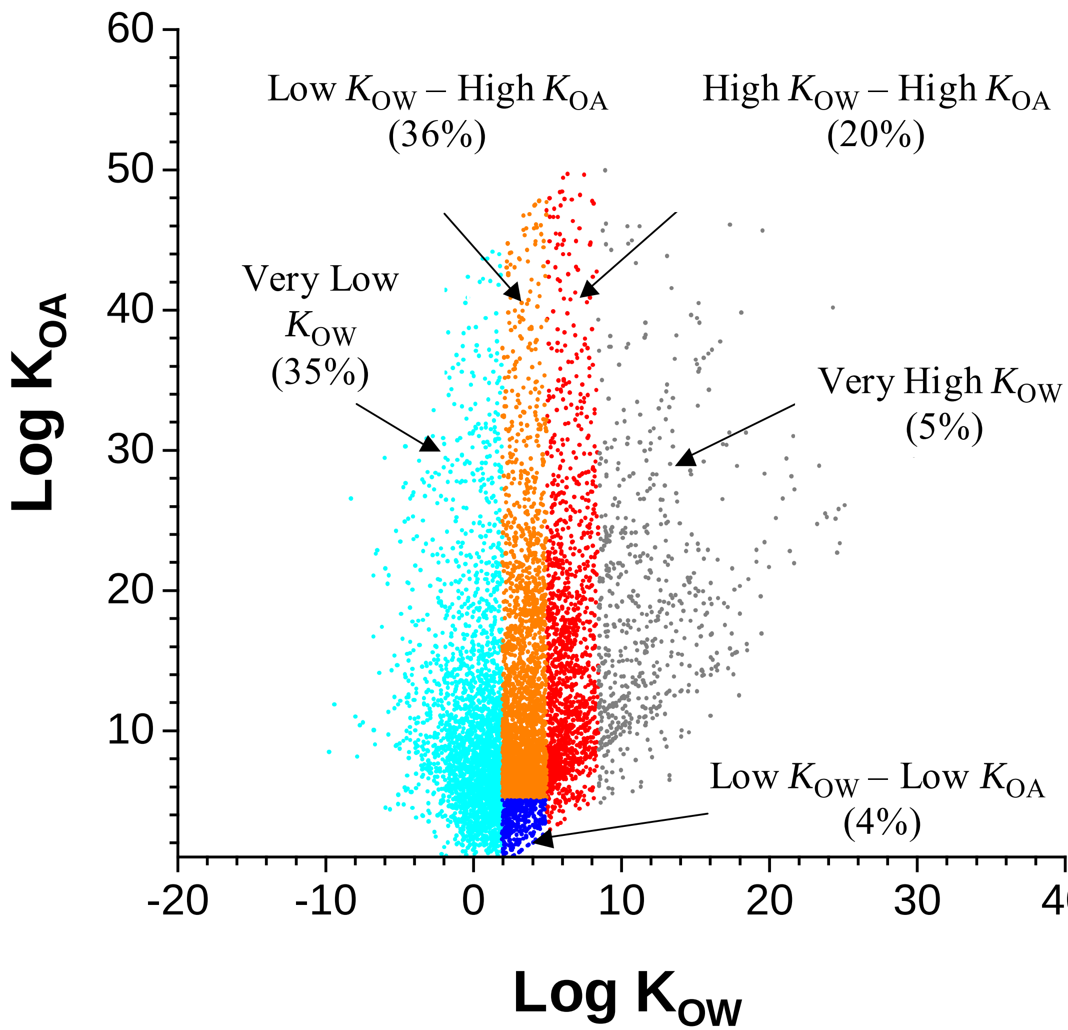


Fig. S6. Relationship between chemical K_{OW} and K_{OA} for approximately 12,000 organic chemicals on Canada's Domestic Substance List (DSL). The compounds are classified as either (i) Very Low K_{OW} (log $K_{OW} < 2.0$), (ii) Low K_{OW} − Low K_{OA} (log K_{OW} 2-5 and log $K_{OA} < 5$), (iii) Low K_{OW} − High K_{OA} (log K_{OW} 2-5 and log $K_{OA} \geq 5$), (iv) High K_{OW} − High K_{OA} (log $K_{OW} \geq 5$ and log $K_{OA} \geq 5$) or (v) Very High K_{OW} or Super-hydrophobic (log $K_{OW} > 9$). Low K_{OW} − High K_{OA} chemicals, which demonstrate a high degree of chemical magnification in food webs containing air-breathing animals, constitute 36% (over 4000 chemicals) of the substances on this list of current-use commercial chemicals.



Supplemental Tables

Table S1. National and International screening criteria for persistent organic pollutants, including long-range transport (LRT), environmental persistence (P), bioaccumulation (B) and toxicity (T).

	LONG-RANGE TRANSPORT (LRT) & PERSISTENCE (P)				**BIOACCUMUATION (B)**		**TOXICITY (T)**
	Half-Lives in						
	Air (days)	**Water (months)**	**Soil (months)**	**Sediment (months)**	**Aquatic Organism BAF or BCF** [f]	**Log K_{OW}**	**Criterion**
United States USEPA, TSCA (1998) [a]	2	6	-	-	BCFs 1000-5000 = 'bioaccumulative' BCFs ≥5,000 = 'very bioaccumulative'	-	Toxicity Data
Canada CEPA, TSMP (1999) [b]	2	6	6	12	BAF or BCF ≥ 5,000	5	CEPA Toxic
European Union UNECE-LRTAP (1998) [c]	2	2	6	6	BAF or BCF ≥ 5,000	5	Toxicity Data
European Union REACH (2001) [d]	-	2	6	6	BCFs ≥ 2000 = 'bioaccumulative' BCFs ≥ 5,000 'very bioaccumulative'	-	Toxicity Data
Stockholm Convention (2001) [e]	2	2	6	6	BAF or BCF ≥ 5,000	5	Adverse Effects

[a] United States Environmental Protection Agency in its Toxic Substances Control Act (TSCA) and Toxic Release Inventory (TRI)
[b] CEPA – Canadian Environmental Protection Act, 1999 (Government of Canada, 2000) and its Toxic Substance Management Policy (TSMP)
[c] United Nations Economic Cooperation Commission for Europe and its long-range transboundary air pollution protocol (UNECE-LRTAP)
[d] Registration, Evaluation and Authorisation of Chemicals (REACH) Annex XII (European Commission, 2001)
[e] Stockholm Convention of Persistent Organic Pollutants (UNEP, 2001)
[f] Bioconcentration factors (BCFs) and bioaccumulation factors (BAFs) in aquatic organisms are both determined as the ratio of the chemical concentration in the organism (C_B) and the freely dissolved concentration in water (C_{WD}), i.e., BCFs and BAFs = C_B/ C_{WD}. BCFs are generally determined under laboratory conditions in the absence of dietary exposure, while BAFs are determined in organisms in the field.

Table S2. Compilation of studies involving δ15N measurements and trophic level (TL, in brackets) estimates of Arctic biota.

	Lancaster Sound (Canada) Hobson and Welch (*S29*) $\delta^{15}N$ ‰ ± SD/ (TL)	**Northwater Polyna (Canada), Hobson and colleagues** (*S31*,*S32*) $\delta^{15}N$ ‰ ± SD/ (TL)	**Barents Sea (Norway) Hop et al.,** (*S30*) $\delta^{15}N$ ‰ ± SD/ (TL)	**Beaufort-Chukchi Seas, (Alaska, USA) Hoekstra et al,** (*S33*) $\delta^{15}N$ ‰ ± SD/ (TL)
Primary Producers				
Ice algae	7.5 ± 0.1 (1)	5.1 ± 0.3 (1)	-	-
L. solidungula (Kelp)	7.1 ± 1.3 (1)	-		-
L. longicruris (Kelp)	7.6 ± 0.9 (1)	-	-	-
Invertebrates				
Hiatella arctica (Bivalve)	9.8 ± 0.5 (2.2)	9.1 ± 0.7 (2.3)	-	-
Calanus sp. (copepod)	9.2 ± 0.5 (2.0)	7.7 ± 0.1 (2.0)	8.1 ± 0.1 (2.0)	9.8 ± 0.9 (2.0)
Parathemisto libellula (Pelagic amphipod)	11.7 ± 0.7 (2.7)	9.7 ± 0.1 (2.5)	7.1 (1.7)	-
Gammarus wilkitzkii (Ice amphipod)	11.5 ± 0.3 (2.6)	-	7.6± 0.3 (1.9)	-
Mysids	10.3± 0.3 (2.1)			-
Krill (*Thyanoessa sp.*)	-	-	8.5± 0.1 (2.1)	-
Fish				
Arctic Char (*Salvelinus sp.*)	-	-	-	13.8± 0.3 (3.1)
Arctic cod (*Boreogadus saida*)	15.2 ± 0.7 (3.6)	14.0 ± 0.2 (3.6)	13.0 ± 0.3 (3.3)	14.5 ± 0.4 (3.3)

	Lancaster Sound (Canada) Hobson and Welch (*S29*)	**Northwater Polyna (Canada), Hobson and colleagues** (*S31*,*S32*)	**Barents Sea (Norway) Hop et al.,** (*S30*)	**Beaufort-Chukchi Seas, (Alaska, USA) Hoekstra et al,** (*S33*)
Sculpin (*Myoxocephalus sp)*	15.2 (3.6)	-	-	15.4 ± 0.9 (TL=3.5)
Birds				
Brunnich's guillemot (*Uria lomvia*)	15.8 ± 0.7 (4.1)	14.1 ± 0.1 (4.0)	11.8 ± 0.2 (3.3)	-
Black guillemot (*Cepphus grylle*)	15.4 ± 0.7 (3.9)	13.7 ± 0.2 (3.9)	13.4 ± 0.2 (3.8)	
Kittiwake (*Rissa tridactyla*)	15.4 ± 0.9 (4.0)	13.7 ± 0.2 (3.9)	12.7 ± 0.2 (3.6)	-
Glaucous gull (*Larus hyperboreus*)	17.0 ± 0.9 (4.4)	16.2 ± 0.3 (4.6)	15.2 ± 0.1 (4.3)	-
Marine Mammals				
Walrus (*Odobenus rosmarus*)	12.5 ± 0.6 (2.9)	-	-	-
Bowhead Whale (*Balaena mysticetus*)	-	-	-	13.5 ± 0.1 (2.8)
Beluga whale (*Delphinapterus leucas*)	16.6 ± 0.6 (3.9)	16.0 ± 0.2 (4.1)	-	16.4 ± 0.1 (3.8)
Beareded Seal (*Erignathus barbatus*)	16.8 ± 0.2 (4.0)	-	-	16.6 ± 0.1 (3.8)
Ringed Seal (*Phoca hispida*)	17.3 ± 1.1 (4.1)	17.5 ± 0.2 (4.6)	14.5 ± 0.4 (3.8)	16.6 ± 0.1 (4.1)
Harp Seal (*Phoca groenlandica*)	-	-	13.6 ± 0.2 (3.4)	-
Polar Bear (*Ursus maritimus*)	21.1 ± 0.6 (5.1)	-	-	-

Table S3. Physical-chemical properties of various organic chemicals investigated.

Chemical Name	Formula	CAS #	Log K_{OW}	log K_{OA}	H (Pa.m^3. mol^{-1})	MW (g·mol^{-1})	Water Solubility (ng·L^{-1})	Vapour Pressure (Pa)
Chlorinated Biphenyls (CBs)								
Cl_3 (CB 31) 2,4',5	$C_{12}H_7Cl_3$	16606-02-3	5.67	8.45	20.27	257.54	1.8×10^5	1.5×10^{-2}
Cl_3 (CB 28)2,4,4'	$C_{12}H_7Cl_3$	7012-37-5	5.00	8.14	32.02	257.54	1.5×10^5	2.6×10^{-2}
Cl_3 (CB 21) 2,3,4	$C_{12}H_7Cl_3$	55702-46-0	5.49	8.13	21.30	257.54	1.6×10^5	2.7×10^{-2}
Cl_3 (CB 18) 2,2',5	$C_{12}H_7Cl_3$	37680-65-2	5.24	7.42	25.33	257.54	1.1×10^5	1.2×10^{-1}
Cl_4 (CB 52) 2,2',5,5'	$C_{12}H_6Cl_4$	35693-99-3	5.90	8.39	34.65	292.00	4.0×10^4	1.4×10^{-2}
Cl_5 (CB 95) 2,2',3,5',6	$C_{12}H_5Cl_5$	38379-99-6	6.26	8.98	24.87	326.43	2.1×10^4	3.5×10^{-3}
Cl_5 CB (101) 2,2',4,5,5'	$C_{12}H_5Cl_5$	35693-92-6	6.38	9.11	16.70	326.43	1.1×10^4	2.6×10^{-3}
Cl_5 (CB 99) 2,2',4,4',5	$C_{12}H_5Cl_5$	38380-01-7	6.38	9.36	21.68	326.43	3.7×10^3	1.5×10^{-3}
Cl_5 (CB 110) 2,3,3',4',6	$C_{12}H_5Cl_5$	38380-03-9	6.70	9.23	19.15	326.43	7.7×10^3	1.9×10^{-3}
Cl_5 (CB 118) 2,3',4,4',5	$C_{12}H_5Cl_5$	31508-00-6	6.74	8.24	23.10	326.43	5.6×10^3	1.9×10^{-2}
Cl_5 (CB 105) 2',3,3',4,4'	$C_{12}H_5Cl_5$	32598-14-4	5.81	9.56	90.98	326.43	7.7×10^3	1.9×10^{-3}
Cl_6 (CB 149) 2,2',3,4',5',6	$C_{12}H_4Cl_6$	38380-04-0	6.67	10.07	9.50	361.00	2.7×10^3	3.0×10^{-4}
Cl_6 (CB 153) 2,2',4,4',5,5'	$C_{12}H_4Cl_6$	35065-27-1	6.90	9.79	12.40	361.00	1.2×10^3	5.6×10^{-4}
Cl_6 (CB 138) 2,2',3,4,4',5'	$C_{12}H_4Cl_6$	35065-28-2	6.83	10.02	10.84	361.00	1.2×10^3	3.3×10^{-4}
Cl_7 (CB 180) ,2',3,4,4',5,5'	$C_{12}H_3Cl_7$	35065-29-3	7.49	9.83	1.02	395.32	3.1×10^2	5.1×10^{-4}
Cl_8 (CB 195) 2,2',3,3',4,4',5,6	$C_{12}H_2Cl_8$	52663-78-2	7.80	11.24	10.13	429.77	2.7×10^2	2.0×10^{-5}
Cl_8 (CB 194) 2,2',3,3',4,4',5,5'	$C_{12}H_2Cl_8$	35694-08-7	7.80	11.24	10.13	429.77	2.7×10^2	2.0×10^{-5}
Cl_9 (CB 206) 2,2',3,3',4,4',5,5',6	$C_{12}HCl_9$	40186-72-9	8.12	11.36	27.66	464.22	3.8×10^1	2.0×10^{-5}
Chlorobenzenes (CBz)								
1,3,5 TriCBz	$C_6H_3Cl_3$	108-70-3	3.80	5.84	192.50	181.45	8.4×10^6	3.0×10^1
1,2,4 TriCBz	$C_6H_3Cl_3$	120-82-1	4.70	5.81	145.00	181.45	3.3×10^7	2.8×10^1
1,2,3 TriCBz	$C_6H_3Cl_3$	81-61-6	4.46	6.50	147.00	181.45	1.9×10^7	1.1×10^1
1,2,3,5/1,2,4,5 TeCBz	$C_6H_2Cl_4$	95-94-3	4.50	8.17	122.00	216.00	5.6×10^5	7.2×10^{-1}
1,2,3,4 TeCBz	$C_6H_2Cl_4$	634-66-2	4.50	8.17	62.00	216.00	5.9×10^6	6.25
PeCBz	C_6HCl_5	608-93-5	5.03	8.17	139.00	250.00	3.9×10^5	2.1×10^{-1}
HCBz	C_6Cl_6	118-74-1	5.50	7.11	131.00	285.00	5.0×10^3	1.5×10^{-3}

Chemical Name	Formula	CAS #	Log K_{OW}	log K_{OA}	H (Pa.m^3.mol^{-1})	MW (g·mol^{-1})	Water Solubility (ng·L^{-1})	Vapour Pressure (Pa)
Hexachlorocyclohexanes (HCHs)								
α-HCH	$C_6H_6Cl_6$	319-84-6	3.89	10.53	0.87	290.85	1.01×10^7	8.7×10^{-1}
β-HCH	$C_6H_6Cl_6$	319-85-7	3.81	10.53	0.07	290.85	2.40×10^5	6.7×10^{-1}
γ-HCH	$C_6H_6Cl_6$	319-86-8	4.14	10.53	0.08	290.85	2.13×10^7	3.0×10^{-2}
Dichlordiphenyltrichloroethanes (DDTs)								
p,p'-DDT	$C_{14}H_9Cl_5$	50-29-3	6.91	10.75	1.31	354.50	1.0×10^{-3}	2.0×10^{-5}
o,p'-DDT	$C_{14}H_9Cl_5$	789-02-7	6.76	10.60	1.31	354.50	1.0×10^{-3}	2.0×10^{-5}
p,p'-DDE	$C_{14}H_8Cl_4$	72-55-9	6.96	9.44	7.95	318.04	1.7×10^5	4.4×10^{-2}
o,p'-DDE	$C_{14}H_8Cl_4$	3424-82-6	6.94	9.42	7.95	318.04	1.7×10^5	8.7×10^{-4}
p,p'-DDD	$C_{14}H_{10}Cl_4$	72-54-8	6.50	10.34	0.35	320.04	5.0×10^4	1.0×10^{-4}
o,p'-DDD	$C_{14}H_{10}Cl_4$	53-10-0	6.23	10.07	0.35	320.04	5.0×10^4	1.0×10^{-4}
Cyclodienes								
aldrin	$C_{12}H_8Cl_6$	309-00-2	6.50	10.53	4.46	364.91	1.7×10^4	9.0×10^{-4}
heptachlor	$C_{10}H_5Cl_7$	76-44-8	6.10	10.53	233.00	373.32	1.0×10^5	5.3×10^{-2}
heptachlor epoxide	$C_{10}H_5Cl_7O$	1024-57-3	5.40	10.53	65.50	391.00	1.0×10^5	9.7×10^{-3}
trans-chlordane	$C_{10}H_6Cl_8$	5103-74-2	6.22	10.10	0.26	409.78	5.0×10^4	1.3×10^{-4}
cis-chlordane	$C_{10}H_6Cl_8$	5103-71-2	6.10	10.10	0.34	409.78	5.0×10^4	1.3×10^{-4}
trans-nonachlor	$C_{10}H_5Cl_9$	39765-80-5	6.35	10.00	1.12	444.23	5.0×10^4	1.3×10^{-4}
cis-nonachlor	$C_{10}H_5Cl_9$	5103-73-1	6.08	8.38	12.00	444.23	5.0×10^4	1.3×10^{-4}
oxychlordane			6.02	10.53	6.60	389.00	-	-
α-endosulfan	$C_9H_6Cl_6O_3S$	115-29-7	3.40	10.29	1.31	391.00	5.3×10^5	2.0×10^{-5}
β-endosulfan	$C_9H_6Cl_6O_3S$	115-29-7	3.40	10.29	1.31	391.00	5.3×10^5	2.0×10^{-5}
endosulfan sulfate			3.20	5.18	16.00	391.00	1.0×10^{-3}	2.0×10^{-5}
dieldrin	$C_{12}H_8Cl_6O$	60-57-1	5.40	8.73	1.12	380.91	1.4×10^5	6.0×10^{-2}
mirex	$C_{10}Cl_{12}$	2385-85-5	7.50	7.96	839.40	545.50	1.3	2.2×10^{-4}

Table S4. List of common and scientific names of the various organisms of Arctic, temperate and tropical food webs used in model simulations.

Arctic Food Web	Temperate Food Web	Tropical Food Web
Algae *Fucus gardneri*	**Phytoplankton** *Diatoms*	**Seagrass** *Liliopsida*
Bivalves *Mytilis edulis*	**Benthos** *Oligochaete*	**Shrimp**
Amphipods *Gammarus spp.*	**Zooplankton** *Diporiea*	**Zooplankton**
Arctic Cod *Boreogadus saida*	**Mysids** *Mysis relicta*	**Crab** *Ranina ranina*
Lichen *Cladina Rangiferina*	**Alewife** *Alosa pseudoharengus*	**Snapper** *Pagrus auratus*
Caribou *Rangifer tarrandus*	**Lake Trout** *Salvelinus namaycush*	**Barracuda** *Sphyraena forsteri*
Wolf *Canis lupus*	**Northern Leopard Frog** *Rana pipiens*	**Sea Eagle** *Haliaeetus leucogaster*
Eider Duck *Somateria mollissima sedentaria*	**Common Snapping Turtle** *Chelydra serpentina serpentina*	**Green Sea Turtle** *Caretta caretta*
Walrus *Odobenus rosmarus*	**Herring Gull** *Larus argentatus*	**Dugong** *Dugong dugon*
Beluga *Delphinapterus leucas*	**Grass (***Poa spp***.)**	**Spinner Dolphin** *Stenella longirostris*
Ringed Seal *Pusa hispida*	**White Tailed Deer** *Odocoileus virginianus*	
Polar Bear *Ursus maritimus*	**Moose** *Alces alces*	
	Wolf *Canis lupus*	
	Beef Cow *Bovinae*	
	Dairy Cow *Bovinae*	

Table S5. Properties of organisms used in the food web bioaccumulation model simulations.

	Organism Body Weight W_B (kg)	Uptake and Elimination Transport Parameters: Food Intake G_D ($m^3 \cdot d^{-1}$)	Respiration Rate G_R ($m^3 \cdot d^{-1}$)	Urinary Excretion G_U ($m^3 \cdot d^{-1}$)	Fecal Excretion G_F ($m^3 \cdot d^{-1}$)	Extraction Efficiencies: ε_L	ε_P	ε_C	ε_W	Body Composition: ν_L	ν_P	ν_C	ν_W	ν_A [a]
Arctic Food Web														
Algae		-	-	-	-	-	-	-	-	0.01	0.19	0.40	0.40	0
Bivalves	1.0×10^{-4}	8.9×10^{-8}	3.4×10^{-4}	-	4.3×10^{-8}	0.40	0.75	0.60	0.25	0.03	0.32	0.15	0.50	0
Amphipods	5.7×10^{-6}	1.4×10^{-8}	5.3×10^{-5}	-	6.2×10^{-9}	0.75	0.75	0.75	0.25	0.04	0.26	0.20	0.50	0
Arctic Cod	1	3.5×10^{-5}	1.4×10^{-1}	1.0×10^{-5}	1.6×10^{-5}	0.80	0.80	0.80	0.25	0.04	0.36	0.00	0.60	0
Lichen	-	-	-	-	-	-	-	-	-	0.005	0	0.30	0.20	0.5
Caribou	140	2.8×10^{-3}	19	7.0×10^{-4}	3.3×10^{-4}	0.80	0.80	0.80	0.25	0.10	0.20	0	0.70	0
Wolf	90	2.7×10^{-3}	14	4.5×10^{-4}	1.4×10^{-3}	0.99	0.99	0.99	0.25	0.15	0.15	0	0.70	0
Eider Duck	3	2.1×10^{-4}	1.1	1.5×10^{-5}	8.4×10^{-5}	0.95	0.95	0.95	0.25	0.10	0.20	0	0.70	0
Walrus	600	1.8×10^{-2}	58	3.0×10^{-3}	2.6×10^{-2}	0.95	0.95	0.95	0.25	0.20	0.10	0	0.70	0
Beluga	800	2.4×10^{-2}	73	4.0×10^{-3}	1.1×10^{-2}	0.98	0.98	0.98	0.25	0.20	0.10	0	0.70	0
Ringed Seal	55	1.7×10^{-3}	9.8	2.8×10^{-4}	7.4×10^{-4}	0.95	0.95	0.95	0.25	0.20	0.10	0	0.70	0
Polar Bear	500	1.5×10^{-2}	51	2.5×10^{-3}	7.9×10^{-3}	0.99	0.99	0.99	0.25	0.20	0.10	0	0.70	0
Human Male	70	9.1×10^{-4}	11	3.5×10^{-4}	4.8×10^{-4}	0.99	0.99	0.99	0.25	0.15	0.15	0	0.70	0
Human Female	60	7.8×10^{-4}	11	3.0×10^{-4}	4.1×10^{-4}	0.98	0.98	0.98	0.25	0.15	0.15	0	0.70	0
Human Infant	10	1.3×10^{-4}	2.7	5.0×10^{-5}	2.2×10^{-5}	0.80	0.80	0.80	0.25	0.18	0.12	0	0.70	0
Temperate Food Web														
Algae	-	-	-	-	-	-	-	-	-	0.01	0.19	0.40	0.40	0
Benthos	5×10^{-6}	1.3×10^{-8}	4.8×10^{-5}	-	6.1×10^{-9}	0.40	0.75	0.60	0.25	0.03	0.32	0.15	0.50	0
Zooplankton	5.7×10^{-8}	6.9×10^{-10}	2.6×10^{-6}	-	3.1×10^{-10}	0.75	0.75	0.75	0.25	0.04	0.26	0.20	0.50	0
Mysids	1.2×10^{-5}	2.3×10^{-8}	8.6×10^{-5}	-	1.1×10^{-8}	0.75	0.75	0.75	0.25	0.05	0.60	0.15	0.20	0
Alewife	4.0×10^{-1}	1.9×10^{-5}	7.5×10^{-2}	1.0×10^{-5}	9.3×10^{-6}	0.80	0.80	0.80	0.25	0.04	0.36	0	0.60	0
Lake Trout	3	6.5×10^{-5}	2.5×10^{-1}	1.0×10^{-5}	3.1×10^{-5}	0.90	0.90	0.90	0.25	0.11	0.29	0	0.60	0

Northern Leopard Frog	0.5	1.0×10^{-5}	2.9×10^{-2}	2.5×10^{-6}	3.6×10^{-6}	0.90	0.90	0.90	0.25	0.07	0.23	0	0.70	0
Snapping Turtle	4	8.0×10^{-5}	6.9×10^{-1}	2.0×10^{-5}	3.4×10^{-5}	0.90	0.90	0.90	0.25	0.15	0.35	0	0.50	0
Herring Gull	3	2.1×10^{-4}	1.1	1.5×10^{-5}	9.8×10^{-5}	0.95	0.95	0.95	0.25	0.12	0.18	0	0.70	0
Grass	-	-	-	-	-	-	-	-	-	0.005	0	0.20	0.50	0.3
White Tailed Deer	80	1.6×10^{-3}	13	4.0×10^{-4}	1.8×10^{-4}	0.80	0.80	0.90	0.25	0.10	0.20	0	0.70	0
Moose	200	4.0×10^{-3}	25	1.0×10^{-3}	4.6×10^{-4}	0.80	0.80	0.90	0.25	0.10	0.20	0	0.70	0
Wolf	90	2.7×10^{-3}	14	4.5×10^{-4}	1.4×10^{-3}	0.99	0.99	0.99	0.25	0.15	0.15	0	0.70	0
Beef Cow	200	4.0×10^{-3}	26	1.0×10^{-3}	4.6×10^{-4}	0.80	0.80	0.90	0.25	0.10	0.20	0	0.70	0
Dairy Cow	200	4.0×10^{-3}	26	1.0×10^{-3}	4.6×10^{-4}	0.80	0.80	0.90	0.25	0.10	0.20	0	0.70	0
Tropical Food Web														
Seagrass	-	-	-	-	-	-	-	-	-	0.01	0.19	0.40	0.40	0
Shrimp	5×10^{-6}	1.3×10^{-8}	4.8×10^{-5}	-	6.1×10^{-9}	0.40	0.75	0.60	0.25	0.03	0.32	0.15	0.50	0
Zooplankton	5.7×10^{-8}	6.9×10^{-10}	2.6×10^{-6}	-	3.1×10^{-10}	0.75	0.75	0.75	0.25	0.04	0.26	0.20	0.50	0
Crab	1	3.6×10^{-5}	1.4×10^{-1}	-	1.7×10^{-5}	0.75	0.75	0.75	0.25	0.05	0.25	0.20	0.50	0
Snapper	1	3.5×10^{-5}	1.4×10^{-1}	1.0×10^{-5}	1.6×10^{-5}	0.80	0.80	0.80	0.25	0.04	0.36	0	0.60	0
Barracuda	4	8.8×10^{-5}	3.4×10^{-1}	1.0×10^{-5}	4.3×10^{-5}	0.90	0.90	0.90	0.25	0.11	0.29	0	0.60	0
Sea eagle	5	3.5×10^{-4}	1.6	2.5×10^{-5}	1.6×10^{-4}	0.95	0.95	0.95	0.25	0.10	0.20	0	0.70	0
Tree Frog	0.4	8.0×10^{-6}	2.4×10^{-2}	2.0×10^{-6}	2.9×10^{-6}	0.90	0.90	0.90	0.25	0.07	0.23	0	0.70	0
Sea Turtle	120	2.4×10^{-3}	8.8	6.0×10^{-4}	1.1×10^{-3}	0.80	0.80	0.80	0.25	0.15	0.35	0	0.50	0
Dugong	400	1.2×10^{-2}	44	2.0×10^{-3}	3.9×10^{-3}	0.95	0.95	0.95	0.25	0.20	0.10	0	0.70	0
Spinner Dolphin	100	3.0×10^{-3}	15	5.0×10^{-4}	1.4×10^{-3}	0.95	0.95	0.95	0.25	0.20	0.10	0	0.70	0

[a] Note: ν_A represents the volume fraction of air-filled space of an organism, which is only used for lichens and grasses in this analysis.

Table S6. Models for the dietary absorption efficiency (E_D) used in the model simulations.

Organism	Dietary Absorption Efficiency E_D equation	Empirical Data Reference
Invertebrates	$E_D = \left(\frac{1}{(5.3 \times 0^{-10} K_{OW}) + 2.3} \right)$	(*S57*,*S73*)
fish	$E_D = \left(\frac{1}{(5.3 \times 0^{-10} K_{OW}) + 2.3} \right)$	(*S57*,*S74*,*S75*)
Reptiles	$E_D = \left(\frac{1}{(1.9 \times 10^{-8} K_{OW}) + 1.2} \right)$	Set equal to terrestrial herbivore (in absence of data)
Amphibians	$E_D = \left(\frac{1}{(1.9 \times 10^{-8} K_{OW}) + 1.2} \right)$	Set equal to terrestrial herbivore (in absence of data)
Birds	$E_D = \left(\frac{1}{(2.4 \times 10^{-9} K_{OW}) + 1.04} \right)$	(*S76*)
Terrestrial Herbivore	$E_D = \left(\frac{1}{(1.9 \times 10^{-8} K_{OW}) + 1.2} \right)$	(*S58*)
Terrestrial Carnivore	$E_D = \left(\frac{1}{(1.55 \times 10^{-9} K_{OW}) + 1.01} \right)$	Set equal to humans (in absence of data)
Marine Mammals	$E_D = \left(\frac{1}{(1.55 \times 10^{-9} K_{OW}) + 1.01} \right)$	Set equal to humans (in absence of data)
Humans	$E_D = \left(\frac{1}{(1.55 \times 10^{-9} K_{OW}) + 1.01} \right)$	(*S59*,*S77-79*)

Table S7. Methods for the calculation of fugacity capacities (Z, mol·m^{-3}·Pa^{-1}).

Medium	**Fugacity Capacity or Z-values (mol·m^{-3}·Pa^{-1})**
Air	$Z_A = \left(\frac{1}{RT}\right)$
Atmospheric Particles	$Z_{AP} = 3.5 \cdot K_{OA} \cdot Z_A$
Water	$Z_W = \left(\frac{1}{H}\right)$
Sediments	$Z_{SED} = 0.35 \cdot K_{OW}$
Lipids	$Z_L = K_{OW} \cdot Z_W$
Proteins	$Z_P = 0.05 \cdot K_{OW} \cdot Z_W$
Carbohydrates	$Z_C = 0.1 \cdot K_{OW} \cdot Z_W$
Vegetation	$Z_V = \nu_{LV} Z_L + \nu_{PV} Z_P + \nu_{CV} Z_C + \nu_{WV} Z_W + \nu_A Z_A$
Diet	$Z_D = \nu_{LD} Z_L + \nu_{PD} Z_{PD} + \nu_{CD} Z_C + \nu_{WD} Z_W$
Organism	$Z_B = \nu_{LB} Z_L + \nu_{PB} Z_P + \nu_{CB} Z_C + \nu_{WB} Z_W$
Feces	$Z_G = \nu_{LG} Z_L + \nu_{PG} Z_P + \nu_{CG} Z_C + \nu_{WG} Z_W$
Milk (mammals)	$Z_M = \nu_{LM} Z_L + \nu_{PM} Z_P + \nu_{CM} Z_C + \nu_{WM} Z_W$

Table S8. Methods for the calculation of D-values (mol·d^{-1}·Pa^{-1})

Process	**Organism**	**D-value**	
Gaseous Deposition	Vegetation	D_{GaG}	$= \left(\frac{1}{k_{GA} A_{GA} Z_A}\right) + \left(\frac{1}{k_{GV} A_{GV} Z_V}\right)$
Particle Bound Deposition	Vegetation	D_{PG}	$= k_P A_{GP} Z_P VF$
Respiration	All Animals	D_R	$G_R Z_R$
Diet Intake	All Animals	D_D	$G_D Z_D$
Fecal Egestion	All Animals	D_F	$G_F Z_F$
Urine	All Animals	D_U	$G_U Z_U$
Metabolism	All Animals	D_M	$V_B k_M Z_B$
Lactation	All Animals	D_L	$G_L Z_M$
Gastrointestinal exchange	All Animals	D_{GB}	$BA_G Z_G$
Dermal Uptake	Reptiles only	D_S	$BA_G Z_A$

Table S9. Glossary of symbols used.

Chemical Properties	
R	Ideal gas constant in units of $J \cdot K^{-1} \cdot mol^{-1}$
T	Temperature (Kelvin)
H	Henry's Law Constant ($Pa \cdot mol \cdot m^{-3}$)
VP	Vapor Pressure (Pa)
B_W	Molecular Diffusivity in water ($m^2 \cdot d^{-1}$)
B_A	Molecular Diffusivity in air ($m^2 \cdot d^{-1}$)
ΔH_{OW}	Enthalpy of phase transfer between octanol and water ($kJ \cdot mol^{-1}$)
K_{OW}	Octanol-water partition coefficient
K_{AW}	Air-water partition coefficient
K_{OA}	Octanol-air partition coefficient
K_{OC}	Organic carbon-water partition coefficient
K_{BG}	Organism-Gut partition coefficient
Environmental and Biological Media (Subscripts)	
A	Air
W	Water
SED	Sediments
AP	Atmospheric particles
AG	Gaseous air phase
B	Biota/Organism
F	Fecal matter
G	Gastrointestinal contents
M	Milk
Processes (Subscripts)	
R	Respiration
D	Dietary Intake
F	Fecal Egestion
U	Urinary Excretion
L	Lactation
M	Metabolism

Table S10. Polychlorinated biphenyl (PCB) congener concentrations in biological tissue samples, including lichens, macro-algae, bivalves, fish, sea ducks and marine mammals (ng·g^{-1} lipid equivalent) collected from E. Hudson's Bay during May and September 1999-2002. Data are presented as geometric means (GM) along with 95% CL.

		LICHEN (*C. rangiferina*) **(tissue)** (*n* =11)		**MACRO ALGAE** (*F. gardneri*) **(tissue)** (*n* =11)		**SEDIMENTS** **(*n* ponar grabs)** (*n* =12)		**CAPELIN** (*M. villosus*) **(whole body)** (*n* =8)	
% OC ± *SD*		-		-		0.18 ± 0.10		-	
% Lipid ± *SD*		0.525 ± 0.065		0.845 ± 0.21		-		1.41 ± 0.15	
% Lipid Equivalent (L_{Eq}) ± *SD*		2.30 ± 0.01		1.63 ± 0.20		0.06 ± 0.04		1.41 ± 0.15	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl_2 (PCB 7/9)	III	0.04	*0.014-0.13*	0.28	*0.11-0.69*	1.16	*0.37-3.47*	-	-
Cl_2 (PCB 6)	III	0.06	*0.021-0.17*	0.42	*0.17-1.04*	1.79	*0.59-5.48*	-	-
Cl_2 (PCB 8/5)	III	0.28	*0.10-0.78*	0.95	*0.21-4.31*	7.08	*1.97-25.4*	1.25	*0.56-2.81*
Cl_2 (PCB 4/10)	IV	0.16	*0.060-0.43*	0.55	*0.12-2.51*	4.65	*1.50-14.4*	0.32	*0.16-0.65*
Cl_3 (PCB 23/34)	III	-	-	-	-	-	-	-	-
Cl_3 (PCB 29)	III	-	-	-	-	-	-	-	-
Cl_3 (PCB 26)	III	0.03	*0.013-0.082*	0.16	*0.070-0.38*	0.94	*0.31-2.86*	0.83	*0.37-1.88*
Cl_3 (CB 25)	III	0.02	*0.006-0.055*	0.08	*0.034-0.20*	0.44	*0.14-1.34*	0.31	*0.13-0.74*
Cl_3 (CB 31)	III	0.17	*0.064-0.456*	0.87	*0.30-2.53*	4.61	*1.39-15.25*	5.87	*2.55-13.56*
Cl_3 (CB 28)	III	0.26	*0.11-0.62*	0.75	*0.26-2.16*	4.95	*1.65-14.9*	5.82	*2.66-12.76*
Cl_3 (CB 21)	III	-	-	-	-	-	-	-	-
Cl_3 (CB 33/20)	III	-	-	-	-	-	-	2.04	*0.87-4.75*
Cl_3 (CB 19)	IV	0.04		0.28	*0.12-0.67*	-	-	-	-
Cl_3 (CB30)	IV	-	-	-	-	-	-	-	-
Cl_3 (CB 18)	IV	0.25	*0.098-0.63*	1.05	*0.27-4.16*	7.16	*2.12-24.19*	0.72	*0.33-1.60*
Cl_3 (CB 17)	IV	0.10	*0.037-0.25*	0.64	*0.25-1.61*	2.89	*0.87-9.62*	3.23	*1.55-6.74*
Cl_3 (CB 27/24)	IV	0.05	*0.021-0.10*	-	-			0.44	*0.089-2.18*
Cl_3 (CB 16/32)	IV	0.22	*0.089-0.56*	1.49	*0.58-3.83*	6.22	*1.99-19.50*	1.72	*0.76-3.89*
Cl_3 (CB 22)	III	-	-	-	-	-	-	1.62	*0.67-3.94*
Cl_4 (CB 54)	V	-	-	-	-	-	-	-	-
Cl_4 (CB 50)	V	-	-	-	-	-	-	-	-
Cl_4 (CB 53)	IV	-	-	-	-	-	-	0.35	*0.14-0.88*
Cl_4 (CB 51)	V	-	-	-	-	-	-	0.05	

		LICHEN (*C. rangiferina*) **(tissue)** (*n* =11)		MACRO ALGAE (*F. gardneri*) **(tissue)** (*n* =11)		SEDIMENTS **(*n* ponar grabs)** (*n* =12)		CAPELIN (*M. villosus*) **(whole body)** (*n* =8)	
% OC ± *SD*		-		-		0.18 ± 0.10		-	
% Lipid ± *SD*		0.525 ± 0.065		0.845 ± 0.21		-		1.41 ± 0.15	
% Lipid Equivalent (L_{Eq}) ± *SD*		2.30 ± 0.01		1.63 ± 0.20		0.06 ± 0.04		1.41 ± 0.15	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl_4 (CB 45)	V	-	-	-	-	-	-	0.34	*0.13-0.88*
Cl_4 (CB 46)	V	-	-	-	-	-	-	11.04	*4.52-27.01*
Cl_4 (CB 52)	IV	0.12	*0.047-0.31*	0.38	*0.11-1.25*	3.01	*0.99-9.08*	1.83	*0.74-4.55*
Cl_4 (CB 69)	IV	-	-	-	-	-	-	-	-
Cl_4 (CB 49)	IV	0.08	*0.029-0.21*	0.30	*0.10-0.87*	1.70	*0.54-5.34*	-	-
Cl_4 (CB 43)	IV	-	-	-	-	-	-	-	-
Cl_4 (CB 47/75/48)	IV	0.04	*0.018-0.093*	-	-	-	-	-	-
Cl_4 (CB 65)	IV	-	-	-	-	-	-	-	-
Cl_4 (CB 62)	IV	-	-	-	-	-	-	-	-
Cl_4 (CB 44)	IV	0.09	*0.035-0.24*	0.39	*0.14-1.13*	2.45	*0.76-7.84*	0.74	*0.34-1.64*
Cl_4 (CB 59/42)	IV	0.05	*0.021-0.14*	0.24	*0.089-0.65*	0.98	-	0.07	*0.027-0.19*
Cl_4 (CB 72)	III	-	-	-	-	-	-	-	-
Cl_4 (CB 71/41/64)	IV	0.15	*0.056-0.40*	0.57	*0.23-1.42*	2.97	*0.94-9.42*	0.21	*0.051-0.82*
Cl_4 (CB 68)	III	-	-	-	-	-	-	0.39	*0.048-3.14*
Cl_4 (CB 40)	IV	-	-	-	-	-	-	0.25	*0.11-0.56*
Cl_4 (CB 57)	III	-	-	-	-	-	-	0.05	
Cl_4 (CB 67)	III	-	-	-	-	-	-	0.11	*0.044-0.29*
Cl_4 (CB 58)	III	-	-	-	-	-	-	-	-
Cl_4 (CB 63)	III	-	-	-	-	-	-	0.25	*0.10-0.59*
Cl_4 (CB 61/74)	III	-	-	-	-	-	-	2.42	*0.99-5.92*
Cl_4 (CB 70/76)	III	-	-	0.13	-	-	-	4.07	*1.62-10.22*
Cl_4 (CB 66)	III	-	-	-	-	-	-	2.84	*1.15-7.03*
Cl_4 (CB 55)	III	-	-	-	-	-	-	0.05	
Cl_4 (CB 60/56)	III	-	-	-	-	-	-	0.80	*0.30-2.12*
Cl_5 (CB 104)	IV	-	-	-	-	-	-	-	-
Cl_5 (CB 96)	IV	-	-	-	-	-	-	-	-

		LICHEN (*C. rangiferina*) **(tissue)** (*n* =11)		**MACRO ALGAE** (*F. gardneri*) **(tissue)** (*n* =11)		**SEDIMENTS** **(*n* ponar grabs)** (*n* =12)		**CAPELIN** (*M. villosus*) **(whole body)** (*n* =8)	
% OC ± *SD*		-		-		0.18 ± 0.10		-	
% Lipid ± *SD*		0.525 ± 0.065		0.845 ± 0.21		-		1.41 ± 0.15	
% Lipid Equivalent (L_{Eq}) ± *SD*		2.30 ± 0.01		1.63 ± 0.20		0.06 ± 0.04		1.41 ± 0.15	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl_5 (CB 103)	IV	-	-	-	-	-	-	0.11	*0.050-0.24*
Cl_5 (CB 100)	II	-	-	-	-	-	-	0.06	
Cl_5 (CB 94)	V	-	-	-	-	-	-	0.12	*0.053-0.29*
Cl_5 (CB 95)	V	0.12	*0.041-0.37*	0.37	*0.12-1.14*	1.89	*0.61-5.88*	8.23	*3.24-20.9*
Cl_5 (CB 102/93)	V	-	-	-	-	-	-	-	-
Cl_5 (CB 98)	IV	-	-	-	-	-	-	-	-
Cl_5 (CB 88)	V	-	-	-	-	-	-	0.10	*0.037-0.25*
Cl_5 (CB 91)	V	-	-	-	-	-	-	0.58	*0.23-1.45*
Cl_5 (CB 121)	I	-	-	-	-	-	-	-	-
Cl_5 (CB 92/84)	V	0.06		-	-	-	-	-	-
Cl_5 CB (101)	IV	0.14	*0.041-0.49*	0.42	*0.16-1.10*	1.63	*0.53-4.95*	12.28	*5.26-28.7*
Cl_5 (CB 89)	V	0.06	*0.026-0.14*	-	-	-	-	1.67	*0.76-3.66*
Cl_5 (CB 99)	II	0.09	*0.028-0.26*	0.30	*0.14 -0.65*	0.95		9.01	*4.05 -20.03*
Cl_5 (CB 113)	IV	-	-	-	-	-	-	-	-
Cl_5 (CB 119)	II	-	-	-	-	-	-	0.57	*0.25-1.31*
Cl_5 (CB 112)	IV	-	-	-	-	-	-	-	-
Cl_5 (CB 109/83)	IV	-	-	-	-	-	-	0.44	*0.20-0.97*
l_5 (CB 97/86)	IV	0.06	*0.019-0.21*	-	-	-	-	2.43	*1.06-5.56*
Cl_5 (CB 116/125/117)	IV			-	-	-	-	-	-
Cl_5 (CB 115/87)	II	0.09	*0.024-0.32*	-	-	-	-	4.85	*2.16-10.91*
Cl_5 (CB 111)	III			-	-	-	-	-	-
Cl_5 (CB 85)	II	0.06	*0.021-0.18*	-	-	-	-	2.52	*1.13-5.60*
Cl_5 (CB 120)	III			-	-	-	-	-	-
Cl_5 (CB 110)	IV	0.22	*0.066-0.77*	0.30	*0.12 -0.74*	1.73	*0.79-3.83*	4.89	*2.11-11.33*
Cl_5 (CB 82)	IV	0.06		-	-	-	-	0.84	*0.375-1.88*
Cl_5 (CB 124)	III	-	-	-	-	-	-	0.26	*0.11-0.59*

		LICHEN (*C. rangiferina*) **(tissue)** (*n* =11)		MACRO ALGAE (*F. gardneri*) **(tissue)** (*n* =11)		SEDIMENTS **(*n* ponar grabs)** (*n* =12)		CAPELIN (*M. villosus*) **(whole body)** (*n* =8)	
% OC ± *SD*		-		-		0.18 ± 0.10		-	
% Lipid ± *SD*		0.525 ± 0.065		0.845 ± 0.21		-		1.41 ± 0.15	
% Lipid Equivalent (L_{Eq}) ± *SD*		2.30 ± 0.01		1.63 ± 0.20		0.06 ± 0.04		1.41 ± 0.15	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl_5 (CB 108/107)	III	-	-	-	-	-	-	1.01	*0.45 -2.29*
Cl_5 (CB 123)	III	-	-	-	-	-	-	9.93	*4.39-22.5*
Cl_5 (CB 118)	III	0.19	*0.058-0.62*	0.39	*0.151-1.01*	1.94	*0.66-5.72*	-	-
Cl_5 (CB 114)	III	-	-	-	-	-	-	-	-
Cl_5 (CB 122)	III	-	-	-	-	-	-	0.27	*0.14-0.54*
Cl_5 (CB 105)	III	-	-	-	-	-	-	2.60	*1.16-5.85*
Cl_6 (CB 155)	I	-	-	-	-	-	-	-	-
Cl_6 (CB 150)	V	-	-	-	-	-	-	-	-
Cl_6 (CB 152)	V	-	-	-	-	-	-	-	-
Cl_6 (CB 145)	V	-	-	-	-	-	-	-	
Cl_6 (CB 148)	I	-	-	-	-	-	-	1.59	*0.73-3.51*
Cl_6 (CB 136)	V	0.06	*0.015-0.26*	-	-	-	-	1.73	
Cl_6 (CB 154)	I	-	-	-	-	-	-	0.40	*0.16-0.99*
Cl_6 (CB 151)	V	0.05	*0.020-0.13*	0.29	*0.12-0.71*	0.81		4.66	*2.06-10.6*
Cl_6 (CB 135/144)	V	0.06	*0.015-0.27*	-	-	-	-	2.35	*0.98-5.64*
Cl_6 (CB 147)	II	-	-	-	-	-	-	0.30	*0.13-0.72*
Cl_6 (CB 149)	V	0.16	*0.036-0.71*	0.40	*0.12-1.35*	2.38	*0.82-6.92*	6.86	*2.61-18.0*
Cl_6 (CB 139/140)	II	-	-	-	-	-	-	0.09	
Cl_6 (CB-143/134)	V	-	-	-	-	-	-	0.52	*0.23-1.20*
Cl_6 (CB 142/131)	V	-	-	-	-	-	-	0.34	*0.14-0.82*
Cl_6 (CB 133)	I	-	-	-	-	-	-	0.10	
Cl_6 (CB 146/161)	I	0.06	*0.015-0.21*	0.18	-	-	-	2.89	*1.17-7.16*
Cl_6 (CB 165)	I	-	-	-	-	-	-	-	-
Cl_6 (CB 153)	I	0.24	*0.067-0.89*	0.56	*0.16-2.01*	3.19	*1.02-10.1*	18.04	*7.14-45.6*
Cl_6 (CB 168)	I	0.05	*0.015-0.19*	-	-	-	-	1.25	*0.53-2.93*
Cl_6 (CB 141)	IV	0.07	*0.016-0.27*	-	-	-	-	1.60	*0.69-3.65*

		LICHEN (*C. rangiferina*) **(tissue)** (*n* =11)		MACRO ALGAE (*F. gardneri*) **(tissue)** (*n* =11)		SEDIMENTS **(*n* ponar grabs)** (*n* =12)		CAPELIN (*M. villosus*) **(whole body)** (*n* =8)	
% OC ± *SD*		-		-		0.18 ± 0.10		-	
% Lipid ± *SD*		0.525 ± 0.065		0.845 ± 0.21		-		1.41 ± 0.15	
% Lipid Equivalent (L_{Eq}) ± *SD*		2.30 ± 0.01		1.63 ± 0.20		0.06 ± 0.04		1.41 ± 0.15	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl_6 (CB 137)	II	-	-	-	-	-	-	1.31	*0.59-2.92*
Cl_6 (CB 138)	II	0.24	*0.066-0.90*	0.51	*0.18-1.51*	2.69	*0.85-8.54*	15.80	*7.18-34.8*
Cl_6 (CB 130)	II	-	-	-	-	-	-	0.51	*0.22-1.18*
Cl_6 (CB 158)	II	0.07	*0.021-0.19*	-	-	-	-	0.74	*0.33-1.66*
Cl_6 (CB 129)	IV	-	-	-	-	-	-	0.24	*0.12-0.49*
Cl_6 (CB 166)	II	-	-	-	-	-	-	-	
Cl_6 (CB 159)	III	-	-	-	-	-	-	0.19	*0.085-0.44*
Cl_6 (CB 162)	IV	-	-	0.04	-	-	-	0.38	*0.043-3.34*
Cl_6 (CB 128)	II	0.06	*0.021-0.19*	-	-	-	-	1.50	*0.66-3.40*
Cl_6 (CB 167)	III	-	-	-	-	-	-	0.34	*0.15-0.77*
Cl_6 (CB 156)	III	-	-	-	-	-	-	0.44	*0.19-1.00*
Cl_6 (CB 157)	III	-	-	-	-	-	-	0.24	*0.11-0.52*
Cl7 (CB 188)	I	-	-	-	-	-	-	0.21	*0.068-0.64*
Cl_7 (CB 184)	I	-	-	-	-	-	-	0.14	*0.044-0.46*
Cl_7 (CB 179)	V	0.07	*0.017-0.29*	-	-	-	-	1.02	*0.44-2.38*
Cl_7 (CB 176)	V	-	-	-	-	-	-	0.30	*0.13-0.71*
Cl_7 (CB 186)	V	-	-	-	-	-	-	-	
Cl_7 (CB 178)	I	0.05		-	-	-	-	0.87	*0.38-1.99*
Cl_7 (CB 175)	I			-	-	-	-	0.16	*0.067-0.40*
Cl_7 (CB 187/182)	I	0.12	*0.032-0.42*	0.38	*0.14-1.04*	2.57	*0.78-8.41*	4.62	*2.02-10.5*
Cl_7 (CB 183)	I	0.06	*0.017-0.19*	-	-	-	-	1.27	*0.54-2.98*
Cl_7 (CB 185)	V	-	-	-	-	-	-	0.19	*0.071-0.52*
Cl_7 (CB 174/181)	V	0.09	*0.025-0.30*	0.24	*0.088-0.65*	1.40	*0.42-4.70*	1.60	*0.59-4.34*
Cl_7 (CB 177)	II	0.09		-	-	-	-	1.07	*0.43-2.62*
Cl_7 (CB 171)	II	0.05		-	-	-	-	0.37	*0.16-0.90*
Cl_7 (CB 173)	II	-	-	-	-	-	-	-	-

		LICHEN (*C. rangiferina*) **(tissue)** (*n* =11)		**MACRO ALGAE** (*F. gardneri*) **(tissue)** (*n* =11)		**SEDIMENTS** **(*n* ponar grabs)** (*n* =12)		**CAPELIN** (*M. villosus*) **(whole body)** (*n* =8)	
% OC ± *SD*		-		-		0.18 ± 0.10		-	
% Lipid ± *SD*		0.525 ± 0.065		0.845 ± 0.21		-		1.41 ± 0.15	
% Lipid Equivalent (L_{Eq}) ± *SD*		2.30 ± 0.01		1.63 ± 0.20		0.06 ± 0.04		1.41 ± 0.15	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl_7 (CB 192/172)	I	0.04		-	-			0.31	*0.13-0.73*
Cl_7 (CB 180)	I	0.13	*0.035-0.51*	0.34	*0.12-0.96*	2.08	*0.66-6.51*	3.21	*1.27-8.09*
Cl_7 (CB 193)	I	-	-	-	-	-	-	0.24	*0.10-0.57*
Cl_7 (CB 191)	I	-	-	-	-	-	-	0.11	*0.041-0.30*
Cl_7 (CB 170/190)	II	0.08	*0.019-0.30*	-	-	-	-	1.10	*0.44-2.78*
Cl_7 (CB 189)	III	-	-	-	-	-	-	0.27	*0.12-0.61*
Cl_8 (CB 202)	I	0.04		-	-	-	-	0.70	*0.29-1.66*
Cl_8 (CB 200)	I	-	-	-	-	-	-	0.66	*0.27-1.65*
Cl_8 (CB 204)	I	-	-	-	-	-	-	-	
Cl_8 (CB 197)	I	-	-	-	-	-	-	0.17	*0.066-0.45*
Cl_8 (CB 199)	V	-	-	-	-	-	-	0.12	*0.035-0.39*
Cl_8 (CB 198)	I	-	-	-	-	-	-	0.80	*0.31-2.06*
Cl_8 (CB 201)	I	0.06	*0.019-0.22*	-	-	-	-	0.81	*0.30-2.19*
Cl_8 (CB 203/196)	I	0.04	*0.015-0.12*	-	-	-	-	0.80	*0.28-2.31*
Cl_8 (CB 195)	II	-	-	-	-	-	-	0.14	*0.043-0.47*
Cl_8 (CB 194)	I	0.10		-	-	-	-	0.44	*0.16-1.22*
Cl_8 (CB 205)	I	-	-	-	-	-	-	0.04	
Cl_9 (CB 208)	I	-	-	-	-	-	-	0.13	*0.050-0.32*
Cl_9 (CB 207)	I	-	-	-	-	-	-	0.13	*0.054-0.32*
Cl_9 (CB 206)	I	-	-	-	-	-	-	0.23	*0.098-0.55*
Cl_{10} (CB 209)	I	0.03		-	-	1.32	*0.609-2.88*	0.13	*0.050-0.34*
$\sum Cl_2$		0.54	*0.19-1.48*	1.46	*0.26-8.13*	11.9	*2.74-51.3*	1.35	*0.58-3.15*
$\sum Cl_3$		1.06	*0.42-2.69*	3.03	*0.55-16.8*	24.9	*7.71-80.9*	18.4	*8.28-40.9*
$\sum Cl_4$		0.50	*0.18-1.36*	0.82	*0.14-4.68*	9.88	*3.28-29.7*	19.7	*6.29-61.5*
$\sum Cl_5$		0.85	*0.23-3.13*	0.95	*0.22-4.01*	4.30	*1.48-12.6*	62.5	*27.7-141*
$\sum Cl_6$		0.67	*0.15-2.93*	1.32	*0.32-5.47*	6.46	*1.85-22.6*	57.9	*25.4-132*

		LICHEN (*C. rangiferina*) **(tissue)** (*n* =11)		MACRO ALGAE (*F. gardneri*) **(tissue)** (*n* =11)		SEDIMENTS **(*n* ponar grabs)** (*n* =12)		CAPELIN (*M. villosus*) **(whole body)** (*n* =8)	
% OC ± *SD*		-		-		0.18 ± 0.10		-	
% Lipid ± *SD*		0.525 ± 0.065		0.845 ± 0.21		-		1.41 ± 0.15	
% Lipid Equivalent (L_{Eq}) ± *SD*		2.30 ± 0.01		1.63 ± 0.20		0.06 ± 0.04		1.41 ± 0.15	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
∑Cl_7		0.42	*0.096-1.82*	0.90	*0.34-2.39*	3.92	*1.07-14.4*	17.1	*7.17-40.6*
∑Cl_8		0.09	*0.016-0.55*	-	-	-	-	3.77	*1.48-9.58*
∑Cl_9		-	-	-	-	-	-	0.47	*0.19-1.15*
∑Cl_{10}		0.03		-	-	1.32	*0.61-2.88*	0.13	*0.050-0.34*
∑Di-ortho PCBs		3.12	*0.89-11.0*	4.12	*0.67-25.1*	42.4	*14.9-120*	140	*61.0- 322*
∑Mono-ortho PCBs		1.06	*0.40-2.81*	1.83	*0.28-11 9*	20.4	*6.07-68.5*	42.5	*18.7-96.9*
∑PCBs		4.22	*1.29-13.8*	5.97	*0.96-37.1*	63.2	*21.6-186*	183	*80.5-416*

		COD (*B. saida*) **(muscle)** (*n* = 12)		SCULPIN (*M. scorpioides*) **(muscle)** (*n* = 12)		SALMON (*Salmo sp.*) **(muscle)** (*n* = 7)		BIVALVES (*M. edulis*) **(muscle)** (*n* = 11)	
% Lipid ± *SD*		1.12 ± 0.05		1.24 ± 0.16		5.41 ± 0.27		0.6 ± 0.12	
% Lipid Equivalent (L_{Eq}) ± *SD*		1.12 ± 0.05		1.24 ± 0.16		5.41 ± 0.27		1.8 ± 0.12	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl_2 (PCB 7/9)	III	0.16	*0.064-0.39*	0.15	*0.065-0.34*			0.03	*0.010-0.066*
Cl_2 (PCB 6)	III	0.22	*0.085-0.55*	0.21	*0.093-0.48*			0.05	*0.020-0.10*
Cl_2 (PCB 8/5)	III	0.81	*0.27-2.44*	0.92	*0.32-2.67*	0.19	*0.078-0.46*	0.37	*0.097-1.43*
Cl_2 (PCB 4/10)	IV	0.37	*0.11-1.28*	0.49	*0.14-1.73*	0.09	*0.033-0.22*	0.20	*0.055-0.69*
Cl_3 (PCB 23/34)	III	-	-	-	-	-	-	-	-
Cl_3 (PCB 29)	III	-	-	-	-	-	-	-	-
Cl_3 (PCB 26)	III	0.11	*0.049-0.27*	0.11	*0.048-0.27*	0.19	*0.064-0.56*	0.03	
Cl_3 (CB 25)	III	0.05	*0.020-0.13*	0.04	*0.017-0.11*	0.09	*0.040-0.19*	-	-
Cl_3 (CB 31)	III	0.72	*0.27-1.89*	0.54	*0.19-1.49*	1.38	*0.458-4.14*	0.34	*0.087-1.29*
Cl_3 (CB 28)	III	0.81	*0.34-1.93*	0.84	*0.28-2.51*	1.67	*0.54-5.15*	0.41	*0.10-1.70*
Cl_3 (CB 21)	III	-	-	-	-	-	-	0.12	*0.051-0.27*
Cl_3 (CB 33/20)	III	0.33	*0.13-0.88*	0.39	*0.13-1.18*	0.42	*0.15-1.18*	0.38	*0.14-1.10*
Cl_3 (CB 19)	IV	0.13	*0.051-0.32*	0.11	*0.047-0.25*	-	-	0.02	-
Cl_3 (CB30)	IV	-	-	-	-	-	-	-	-
Cl_3 (CB 18)	IV	0.70	*0.24-2.08*	0.76	*0.26-2.27*	0.39	*0.11-1.37*	0.23	*0.095-0.58*
Cl_3 (CB 17)	IV	0.29	*0.10-0.85*	0.33	*0.13-0.87*	0.11	*0.032-0.39*	0.09	*0.032-0.25*
Cl_3 (CB 27/24)	IV	0.12	*0.050-0.28*	0.10	*0.041-0.23*	0.09	*0.013-0.58*	0.22	*0.025-1.90*
Cl_3 (CB 16/32)	IV	0.71	*0.25-1.99*	0.70	*0.26-1.93*	0.28	*0.10-0.81*	0.11	*0.011-1.24*
Cl_3 (CB 22)	III	0.23	*0.092-0.56*	0.20	*0.068-0.61*	0.33	*0.096-1.16*	0.10	*0.026-0.369*
Cl_4 (CB 54)	V	-	-	-	-	-	-	-	-
Cl_4 (CB 50)	V	-	-	-	-	-	-	0.01	

		COD (*B. saida*) **(muscle)** (*n* = 12)		SCULPIN (*M. scorpioides*) **(muscle)** (*n* = 12)		SALMON (*Salmo sp.*) **(muscle)** (*n* = 7)		BIVALVES (*M. edulis*) **(muscle)** (*n* = 11)	
% Lipid ± *SD*		1.12 ± 0.05		1.24 ± 0.16		5.41 ± 0.27		0.6 ± 0.12	
% Lipid Equivalent (L_{Eq}) ± *SD*		1.12 ± 0.05		1.24 ± 0.16		5.41 ± 0.27		1.8 ± 0.12	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl_4 (CB 53)	IV	0.08	*0.034-0.20*	0.07	*0.032-0.16*	0.11	*0.038-0.31*	0.06	*0.023-0.16*
Cl_4 (CB 51)	V	-	-	-	-	-	-	-	-
Cl_4 (CB 45)	V	0.10	*0.040-0.26*	0.08	*0.036-0.19*	0.08	*0.028-0.22*	0.03	*0.009-0.14*
Cl_4 (CB 46)	V	-	-	-	-	3.29	-	0.35	*0.017-6.91*
Cl_4 (CB 52)	IV	1.23	*0.43-3.52*	1.05	*0.21-5.35*	2.06	*0.30-14.2*	0.18	*0.063-0.51*
Cl_4 (CB 69)	IV	-	-	-	-	0.01	-	-	-
Cl_4 (CB 49)	IV	0.56	*0.21-1.48*	0.24	*0.073-0.78*	1.47	*0.34-6.311*	0.09	*0.036-0.23*
Cl_4 (CB 43)	IV	-	-	-	-	-	-		
Cl_4 (CB 47/75/48)	IV	0.34	*0.13-0.91*	0.28	*0.089-0.92*	0.63	*0.14-2.835*	0.03	*0.014-0.089*
Cl_4 (CB 65)	IV	-	-	-	-	-	-	0.08	*0.027-0.22*
Cl_4 (CB 62)	IV	-	-	-	-	-	-	-	-
Cl_4 (CB 44)	IV	0.42	*0.16-1.09*	0.26	*0.091-0.75*	1.45	*0.38 -5.53*	0.12	*0.048-0.32*
Cl_4 (CB 59/42)	IV	0.19	*0.067-0.51*	0.10	*0.041-0.25*	0.17	*0.020-1.50*	0.05	*0.019-0.12*
Cl_4 (CB 72)	III	-	-	-	-	-	-	0.04	*0.017-0.085*
Cl_4 (CB 71/41/64)	IV	0.52	*0.113-2.346*	0.26	*0.066-1.03*	0.06	*0.018-0.22*	0.10	*0.048-0.22*
Cl_4 (CB 68)	III	0.06	-	0.15	-	0.21	*0.036-1.23*	-	-
Cl_4 (CB 40)	IV	0.06	*0.023-0.18*	-	-	0.10	*0.031-0.30*	0.01	-
Cl_4 (CB 57)	III	-	-	-	-	0.01	-	-	-
Cl_4 (CB 67)	III	-	-	-	-	0.05	*0.014-0.16*	-	-
Cl_4 (CB 58)	III	-	-	-	-	-	-	-	-
Cl_4 (CB 63)	III	0.16	*0.048-0.54*	0.09	*0.042-0.19*	0.15	*0.039-0.54*	0.10	*0.042-0.26*
Cl_4 (CB 61/74)	III	0.86	*0.28-2.62*	0.68	*0.202-2.26*	2.09	*0.48-9.18*	0.18	*0.049-0.66*
Cl_4 (CB 70/76)	III	0.57	*0.180-1.837*	0.35	*0.121.03*	2.48	*0.66-9.31*	0.29	*0.083-1.05*

		COD (*B. saida*) **(muscle)** (*n* = 12)		SCULPIN (*M. scorpioides*) **(muscle)** (*n* = 12)		SALMON (*Salmo sp.*) **(muscle)** (*n* = 7)		BIVALVES (*M. edulis*) **(muscle)** (*n* = 11)	
% Lipid ± *SD*		1.12 ± 0.05		1.24 ± 0.16		5.41 ± 0.27		0.6 ± 0.12	
% Lipid Equivalent (L_{Eq}) ± *SD*		1.12 ± 0.05		1.24 ± 0.16		5.41 ± 0.27		1.8 ± 0.12	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl_4 (CB 66)	III	0.82	*0.26-2.56*	0.61	*0.18-2.06*	1.86	*0.50-6.91*	0.22	*0.067-0.72*
Cl_4 (CB 55)	III	-	-			0.02	*0.004-0.091*	0.01	
Cl_4 (CB 60/56)	III	0.29	*0.095-0.90*	0.24	*0.082-0.71*	0.43	*0.19-0.97*	0.10	*0.030-0.31*
Cl_5 (CB 104)	IV	-	-	-	-	-	-	-	-
Cl_5 (CB 96)	IV	-	-	-	-	-	-	-	-
Cl_5 (CB 103)	IV	0.09	*0.039-0.20*	0.10		0.06	*0.014-0.25*	0.00	
Cl_5 (CB 100)	II	0.09	*0.039-0.19*			0.05	*0.009-0.26*	0.00	
Cl_5 (CB 94)	V	0.25	*0.089-0.73*	0.14	*0.063-0.33*	0.05	*0.020-0.128*	0.08	*0.033-0.20*
Cl_5 (CB 95)	V	0.80	*0.27-2.33*	0.31	*0.080-1.20*	4.05	*0.93-17.6*	0.37	*0.082-1.63*
Cl_5 (CB 102/93)	V	-	-	-	-	0.05	*0.013-0.16*	0.02	-
Cl_5 (CB 98)	IV	-	-	-	-	-	-	0.00	-
Cl_5 (CB 88)	V	0.12	*0.060-0.25*	0.12	-	0.07	*0.015-0.33*	0.01	-
Cl_5 (CB 91)	V	0.17	*0.061-0.49*	0.25	-	0.38	*0.081-1.77*	0.04	*0.005-0.24*
Cl_5 (CB 121)	I	-	-	-	-	-	-	-	-
Cl_5 (CB 92/84)	V	0.57	*0.181-1.80*	0.22	*0.037-1.28*	-	-	-	-
Cl_5 CB (101)	IV	2.47	*0.74-8.26*	0.52	*0.098-2.77*	8.05	*1.96-33.11*	0.66	*0.13-3.26*
Cl_5 (CB 89)	V	0.14	*0.052-0.38*	-	-	0.50	*0.15-1.70*	0.04	-
Cl_5 (CB 99)	II	3.44	*1.06-11.22*	2.99	*0.71-12.57*	7.70	*1.80-33.46*	0.46	*0.079-2.66*
Cl_5 (CB 113)	IV	-	-	-	-	-	-	-	-
Cl_5 (CB 119)	II	0.22	*0.072-0.67*	0.16	*0.045-0.59*	0.32	*0.081-1.26*	0.01	
Cl_5 (CB 112)	IV			-	-	-	-	-	-
Cl_5 (CB 109/83)	IV			-	-	0.16	*0.046-0.55*	0.00	
l_5 (CB 97/86)	IV	0.21	*0.081-0.53*	0.18	*0.042-0.76*	0.80	*0.22-2.84*	0.14	*0.030-0.67*

		COD (*B. saida*) **(muscle)** (*n* = 12)		SCULPIN (*M. scorpioides*) **(muscle)** (*n* = 12)		SALMON (*Salmo sp.*) **(muscle)** (*n* = 7)		BIVALVES (*M. edulis*) **(muscle)** (*n* = 11)	
% Lipid ± *SD*		1.12 ± 0.05		1.24 ± 0.16		5.41 ± 0.27		0.6 ± 0.12	
% Lipid Equivalent (L_{Eq}) ± *SD*		1.12 ± 0.05		1.24 ± 0.16		5.41 ± 0.27		1.8 ± 0.12	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl_5 (CB 116/125/117)	IV	0.13	*0.044-0.37*	-	-	-	-	-	-
Cl_5 (CB 115/87)	II	0.78	*0.23-2.62*	0.30	*0.070-1.24*	1.99	*0.53-7.46*	0.18	*0.030-1.08*
Cl_5 (CB 111)	III	-	-	-	-	-	-	0.02	
Cl_5 (CB 85)	II	0.83	*0.25-2.71*	0.62	*0.17-2.27*	1.35	*0.35-5.18*	0.18	*0.037-0.90*
Cl_5 (CB 120)	III	-	-	-	-	-	-	-	-
Cl_5 (CB 110)	IV	1.14	*0.34-3.81*	0.25	*0.045-1.40*	1.92	*0.50-7.36*	0.30	*0.060-1.54*
Cl_5 (CB 82)	IV	0.09	*0.037-0.23*	-	-	0.22	*0.070-0.695*	0.01	-
Cl_5 (CB 124)	III	0.13	*0.053-0.30*	-	-	0.11	*0.032-0.42*	-	-
Cl_5 (CB 108/107)	III	0.26	*0.080-0.830*	0.15		0.53	*0.14-2.05*	0.02	*0.008-0.043*
Cl_5 (CB 123)	III	0.86	*0.073-9.99*	2.57	*0.49-13.55*	0.84	*0.048-14.6*	0.28	*0.015-5.31*
Cl_5 (CB 118)	III	2.93	*0.96-8.95*	2.78	*0.78-9.85*	8.21	*1.42-47.62*	0.66	*0.13-3.42*
Cl_5 (CB 114)	III	0.16	*0.064-0.43*	-	-	0.15	*0.035-0.66*	0.01	-
Cl_5 (CB 122)	III	-	-	-	-	-	-	-	-
Cl_5 (CB 105)	III	1.07	*0.32-3.58*	0.75	*0.21-2.67*	2.21	*0.52-9.35*	0.23	*0.054-1.02*
Cl_6 (CB 155)	I	0.23	*0.070-0.77*	0.24	*0.089-0.62*	-	-	-	-
Cl_6 (CB 150)	V	-	-	-	-	0.03	*0.007-0.16*		-
Cl_6 (CB 152)	V	-	-	-	-	-	-	-	-
Cl_6 (CB 145)	V	-	-	-	-	-	-	-	-
Cl_6 (CB 148)	I	0.17	*0.076-0.36*	0.16		0.38		0.04	
Cl_6 (CB 136)	V	0.13	*0.053-0.305*	0.11	*0.038-0.30*	0.60	*0.14-2.51*	0.10	*0.023-0.47*
Cl_6 (CB 154)	I	0.25	*0.070-0.88*	0.14	*0.060-0.33*	0.29	*0.071-1.21*	0.05	*0.008-0.29*
Cl_6 (CB 151)	V	0.97	*0.33-2.86*	0.39	*0.10-1.52*	2.77	*0.67-11.4*	0.27	*0.055-1.31*
Cl_6 (CB 135/144)	V	0.31	*0.11-0.86*	0.19	*0.046-0.77*	1.10	*0.29-4.12*	0.20	*0.043-0.91*

		COD (*B. saida*) **(muscle)** (*n* = 12)		SCULPIN (*M. scorpioides*) **(muscle)** (*n* = 12)		SALMON (*Salmo sp.*) **(muscle)** (*n* = 7)		BIVALVES (*M. edulis*) **(muscle)** (*n* = 11)	
% Lipid ± *SD*		1.12 ± 0.05		1.24 ± 0.16		5.41 ± 0.27		0.6 ± 0.12	
% Lipid Equivalent (L_{Eq}) ± *SD*		1.12 ± 0.05		1.24 ± 0.16		5.41 ± 0.27		1.8 ± 0.12	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl_6 (CB 147)	II	0.08	*0.031-0.21*	-	-	0.18	*0.043-0.76*	0.01	*0.004-0.053*
Cl_6 (CB 149)	V	1.35	*0.47-3.87*	0.39	*0.094-1.63*	3.93	*1.02-15.1*	0.66	*0.13-3.31*
Cl_6 (CB 139/140)	II	0.08	*0.035-0.18*	-	-	0.03	*0.006-0.18*	-	-
Cl_6 (CB-143/134)	V	0.17	*0.056-0.50*	0.14	-	0.21	*0.043-0.99*	0.03	*0.007-0.159*
Cl_6 (CB 142/131)	V	0.26	*0.085-0.77*	0.14	*0.063-0.32*	0.06	-	-	-
Cl_6 (CB 133)	I	0.12	*0.051-0.29*	0.06	-	0.02	-	-	-
Cl_6 (CB 146/161)	I	1.22	*0.38-3.98*	0.30	*0.056-1.61*	2.46	*0.54-11.17*	0.32	*0.064-1.57*
Cl_6 (CB 165)	I	0.26	*0.030-2.23*	0.08	*0.039-0.18*	0.03			
Cl_6 (CB 153)	I	10.85	*3.14-37.5*	11.48	*2.97-44.4*	18.33	*4.33-77.6*	2.30	*0.45-11.6*
Cl_6 (CB 168)	I	0.27	*0.096-0.77*	0.14	*0.037-0.550*	0.52	*0.16-1.72*	0.18	*0.071-0.48*
Cl_6 (CB 141)	IV	0.48	*0.16-1.45*	0.17	*0.037-0.74*	0.89	*0.21-3.79*	0.08	
Cl_6 (CB 137)	II	0.27	*0.072-1.00*	0.33	*0.082-1.31*	0.91	*0.22-3.73*	0.26	*0.10-0.66*
Cl_6 (CB 138)	II	0.24	*0.070-0.86*	0.21	*0.058-0.77*	0.54	*0.12-2.48*	0.05	
Cl_6 (CB 130)	II	5.81	*1.34-25.27*	5.47	*1.39-21.53*	15.44	*3.59-66.44*	1.55	*0.29-8.15*
Cl_6 (CB 158)	II	0.40	*0.11-1.44*	0.36	*0.087-1.49*	0.71	*0.16-3.18*	0.08	*0.014-0.44*
Cl_6 (CB 129)	IV	0.06	*0.009-0.44*	-	-	-	-	-	-
Cl_6 (CB 166)	II	0.05	*0.015-0.18*	-	-	0.09	*0.032-0.26*	-	-
Cl_6 (CB 159)	III	0.07	*0.027-0.19*	-	-	0.15	*0.035-0.65*	0.01	
Cl_6 (CB 162)	IV	0.51	*0.11-2.39*	0.42	*0.11-1.64*	0.10	*0.024-0.43*	0.05	*0.006-0.38*
Cl_6 (CB 128)	II	0.71	*0.22-2.36*	0.67	*0.18-2.46*	1.30	*0.30-5.67*	0.16	*0.029-0.895*
Cl_6 (CB 167)	III	0.20	*0.055-0.69*	0.21	*0.10-0.44*	0.39	*0.084-1.78*	0.08	*0.015-0.38*
Cl_6 (CB 156)	III	0.31	*0.091-1.04*	0.22	*0.059-0.83*	0.54	*0.12-2.50*	0.08	*0.016-0.38*
Cl_6 (CB 157)	III	0.23	*0.083-0.63*	0.17	*0.063-0.44*	0.22	*0.051-0.92*	0.09	*0.033-0.24*

		COD (*B. saida*) **(muscle)** (*n* = 12)		SCULPIN (*M. scorpioides*) **(muscle)** (*n* = 12)		SALMON (*Salmo sp.*) **(muscle)** (*n* = 7)		BIVALVES (*M. edulis*) **(muscle)** (*n* = 11)	
% Lipid ± *SD*		1.12 ± 0.05		1.24 ± 0.16		5.41 ± 0.27		0.6 ± 0.12	
% Lipid Equivalent (L_{Eq}) ± *SD*		1.12 ± 0.05		1.24 ± 0.16		5.41 ± 0.27		1.8 ± 0.12	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl7 (CB 188)	I	0.18	*0.054-0.61*	0.08	*0.022-0.29*	0.14	*0.027-0.67*	0.06	*0.024-0.17*
Cl_7 (CB 184)	I	0.16	*0.046-0.55*	0.15	*0.045-0.50*	0.11	*0.027-0.435*	0.06	-
Cl_7 (CB 179)	V	0.14	*0.048-0.42*	0.11	*0.035-0.35*	0.54	*0.14-2.09*	0.11	*0.027-0.48*
Cl_7 (CB 176)	V	0.08	-	-	-	0.14	*0.038-0.51*	0.05	*0.007-0.29*
Cl_7 (CB 186)	V	-	-	-	-	-	-	-	-
Cl_7 (CB 178)	I	0.44	*0.13-1.46*	0.40	*0.14-1.19*	0.80	*0.18-3.50*	0.11	*0.025-0.52*
Cl_7 (CB 175)	I	0.12	*0.040-0.34*			0.15	*0.034-0.64*	0.06	-
Cl_7 (CB 187/182)	I	1.46	*0.382-5.61*	0.42	*0.12-1.52*	4.45	*1.01-19.55*	0.57	*0.12-2.78*
Cl_7 (CB 183)	I	0.88	*0.27-2.89*	0.68	*0.19-2.40*	1.37	*0.23-6.29*	0.22	*0.044-1.08*
Cl_7 (CB 185)	V	0.09	*0.040-0.22*	-	-	0.12	*0.031-0.48*	-	-
Cl_7 (CB 174/181)	V	0.31	*0.11-0.93*	0.15	*0.051-0.47*	0.77	*0.201-2.96*	0.07	*0.010-0.49*
Cl_7 (CB 177)	II	0.12	*0.044-0.33*	0.11	*0.037-0.32*	0.73	*0.18-3.05*	0.15	*0.036-0.63*
Cl_7 (CB 171)	II	0.23	*0.073-0.75*	0.18	*0.057-0.57*	0.30	*0.067-1.33*	0.10	*0.022-0.44*
Cl_7 (CB 173)	II	-	-	-	-	-	-	-	-
Cl_7 (CB 192/172)	I	0.22	*0.070-0.67*	0.11	*0.050-0.25*	0.34	*0.075-1.52*	-	-
Cl_7 (CB 180)	I	2.28	*0.66-7.90*	2.41	*0.64-9.11*	3.76	*0.79-17.79*	0.23	*0.047-1.15*
Cl_7 (CB 193)	I	0.16	*0.047-0.55*	0.09	*0.028-0.31*	0.26	*0.057-1.17*	-	-
Cl_7 (CB 191)	I	0.10	*0.044-0.22*	-	-	0.08	*0.017-0.33*	-	-
Cl_7 (CB 170/190)	II	0.94	*0.27-3.26*	0.90	*0.22-3.60*	1.32	*0.28-6.25*	0.06	*0.009-0.38*
Cl_7 (CB 189)	III	0.04	-	-	-	0.08	*0.021-0.34*	0.003	-
Cl_8 (CB 202)	I	0.33	*0.11-1.06*	0.43	*0.14-1.33*	0.42	*0.11-1.68*	0.13	*0.031-0.57*
Cl_8 (CB 200)	I	0.28	*0.084-0.91*	0.13	*0.038-0.45*	0.44	*0.11-1.77*	0.14	*0.035-0.56*
Cl_8 (CB 204)	I	-	-	-	-	0.04	-	-	-

		COD (*B. saida*) **(muscle)** (n = 12)		SCULPIN (*M. scorpioides*) **(muscle)** (n = 12)		SALMON (*Salmo sp.*) **(muscle)** (n = 7)		BIVALVES (*M. edulis*) **(muscle)** (n = 11)	
% Lipid ± *SD*		1.12 ± 0.05		1.24 ± 0.16		5.41 ± 0.27		0.6 ± 0.12	
% Lipid Equivalent (L_{Eq}) ± *SD*		1.12 ± 0.05		1.24 ± 0.16		5.41 ± 0.27		1.8 ± 0.12	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl_8 (CB 197)	I	0.14	*0.040-0.459*	0.14	*0.040-0.51*	0.13	*0.031-0.53*	0.05	*0.014-0.18*
Cl_8 (CB 199)	V	-	-	-	-	0.04	*0.016-0.11*	0.002	-
Cl_8 (CB 198)	I	0.38	*0.13-1.10*	0.24	*0.079-0.74*	0.62	*0.15-2.62*	0.05	-
Cl_8 (CB 201)	I	0.40	*0.13-1.26*	0.19	*0.053-0.71*	-	-	0.004	-
Cl_8 (CB 203/196)	I	0.54	*0.17-1.77*	0.49	*0.15-1.58*	0.72	*0.16-3.21*	0.05	*0.008-0.324*
Cl_8 (CB 195)	II	0.10	*0.046-0.23*	-	-	0.08	*0.018-0.36*	0.001	-
Cl_8 (CB 194)	I	0.31	*0.10-0.98*	0.31	*0.10-0.93*	0.38	*0.077-1.86*	0.02	*0.005-0.133*
Cl_8 (CB 205)	I	0.04	*0.016-0.12*	-	-	0.04	*0.015-0.12*	0.0001	-
Cl_9 (CB 208)	I	0.21	*0.013-3.28*	0.09	*0.038-0.22*	0.14	*0.044-0.43*	-	-
Cl_9 (CB 207)	I	0.15	*0.046-0.49*	0.20	*0.054-0.75*	0.14	*0.041-0.45*	-	-
Cl_9 (CB 206)	I	0.23	*0.073-0.74*	0.44	*0.21-0.94*	0.28	*0.092-0.84*	-	-
Cl_{10} (CB 209)	I	0.27	*0.052-1.42*	0.47	*0.070-3.19*	0.06	*0.016-0.24*	0.03	*0.001-1.22*
∑Cl_2		1.35	*0.39-4.62*	1.60	*0.50-5.13*	0.28	*0.113-0.67*	0.62	*0.18-2.10*
∑Cl_3		3.67	*1.44-9.39*	3.61	*1.32-9.85*	4.82	*1.65-14.1*	1.73	*0.53-5.68*
∑Cl_4		4.38	*1.56-12.2*	3.05	*0.80-11.6*	11.4	*2.69-48.2*	1.73	*0.55-5.47*
∑Cl_5		14.2	*4.69-42.9*	8.37	*2.23-31.4*	40.2	*10.2-158*	3.11	*0.61-15.8*
∑Cl_6		23.8	*7.16-79.3*	19.9	*5.19-77.0*	52.1	*12.57-215*	5.73	*1.11-29.5*
∑Cl_7		7.27	*2.19-24.0*	5.53	*1.59-19.2*	15.5	*3.49-68.7*	1.46	*0.29-7.22*
∑Cl_8		1.72	*0.49-6.06*	1.26	*0.32-4.97*	2.84	*0.654-12.4*	0.26	*0.050-1.40*
∑Cl_9		0.54	*0.063-4.58*	0.27	*0.044-1.72*	0.55	*0.18-1.72*	-	-
∑Cl_{10}		0.27	*0.052-1.42*	0.47	*0.070-3.19*	0.06	*0.016-0.24*	0.03	*0.001-1.22*
∑Di-ortho PCBs		52.2	*15.7-173*	38.3	*10.6-138*	106	*26.46-424*	11.4	*2.44-53.1*
∑Mono ortho PCBs		7.81	*2.57-23.8*	6.75	*2.09-21.7*	23.0	*6.22-85.0*	3.49	*0.89-13.7*
∑PCBs		60.7	*19.0-194*	45.8	*13.3-159*	129	*32.8-508*	14.9	*3.33-67.3*

		MALE BELUGA (Age 16-35) (*D. leucas*) (Blubber) (n = 21)		FEMALE BELUGA (Age 5-35) (*D. leucas*) (Blubber) (n = 14)	
% Lipid ± *SD*		89.4 ± 0.53		89.7 ± 0.17	
% Lipid Equivalent (L_{Eq}) ± *SD*		89.4 ± 0.53		89.7 ± 0.17	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl_2 (PCB 7/9)	III	0.06	*0.023-0.14*	0.05	*0.020-0.15*
Cl_2 (PCB 6)	III	0.08	*0.037-0.18*	0.09	*0.033-0.23*
Cl_2 (PCB 8/5)	III	0.31	*0.099-0.95*	0.33	*0.10-1.09*
Cl_2 (PCB 4/10)	IV	0.10	*0.035-0.31*	0.10	*0.028-0.30*
Cl_3 (PCB 23/34)	III	0.02	*0.005-0.074*	0.01	*0.003-0.035*
Cl_3 (PCB 29)	III	0.01	*0.004-0.027*	0.01	*0.003-0.033*
Cl_3 (PCB 26)	III	0.30	*0.099-0.93*	0.24	*0.073-0.78*
Cl_3 (CB 25)	III	0.04	*0.014-0.12*	0.04	*0.012-0.12*
Cl_3 (CB 31)	III	5.06	*1.42-18.0*	2.63	*0.59-11.6*
Cl_3 (CB 28)	III	2.96	*0.94-9.29*	2.45	*0.86-6.93*
Cl_3 (CB 21)	III	0.0023	-	0.84	*0.22-3.26*
Cl_3 (CB 33/20)	III	0.71	*0.22-2.27*	0.49	*0.13-1.84*
Cl_3 (CB 19)	IV	0.25	*0.10-0.64*	0.05	*0.003-0.99*
Cl_3 (CB30)	IV	-	-	-	-
Cl_3 (CB 18)	IV	4.39	*1.47-13.1*	1.52	*0.37-6.29*
Cl_3 (CB 17)	IV	1.32	*0.42-4.14*	0.56	*0.14-2.19*
Cl_3 (CB 27/24)	IV	0.19	*0.051-0.72*	0.11	*0.034-0.37*
Cl_3 (CB 16/32)	IV	1.58	*0.49-5.02*	0.88	*0.24-3.24*
Cl_3 (CB 22)	III	0.06	*0.007-0.44*	0.20	*0.036-1.12*
Cl_4 (CB 54)	V	0.06	*0.026-0.13*	0.01	*0.004-0.046*
Cl_4 (CB 50)	V	0.06	*0.020-0.15*	0.02	*0.004-0.12*
Cl_4 (CB 53)	IV	2.72	*0.95-7.76*	0.26	*0.029-2.28*

		MALE BELUGA (Age 16-35) (*D. leucas*) (Blubber) (n = 21)		FEMALE BELUGA (Age 5-35) (*D. leucas*) (Blubber) (n = 14)	
% Lipid ± *SD*		89.4 ± 0.53		89.7 ± 0.17	
% Lipid Equivalent (L_{Eq}) ± *SD*		89.4 ± 0.53		89.7 ± 0.17	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl_4 (CB 51)	V	0.57	*0.212-1.54*	0.11	*0.025-0.51*
Cl_4 (CB 45)	V	2.68	*0.94-7.66*	0.54	*0.11-2.61*
Cl_4 (CB 46)	V	0.42	*0.15-1.18*	0.13	*0.031-0.53*
Cl_4 (CB 52)	IV	148	*49.7-437*	19.2	*3.20-115*
Cl_4 (CB 69)	IV	-	-	-	-
Cl_4 (CB 49)	IV	38.9	*12.4-121*	6.39	*1.08-37.6*
Cl_4 (CB 43)	IV	-	-	-	-
Cl_4 (CB 47/75/48)	IV	19.4	*6.62-56.9*	2.98	*0.53-16.9*
Cl_4 (CB 65)	IV	-	-	-	-
Cl_4 (CB 62)	IV	-	-	-	-
Cl_4 (CB 44)	IV	31.2	*10.4-92.6*	6.40	*1.26-32.3*
Cl_4 (CB 59/42)	IV	5.72	*1.63-20.0*	1.71	*0.34-8.66*
Cl_4 (CB 72)	III	-	-	0.98	*0.33-2.88*
Cl_4 (CB 71/41/64)	IV	0.64	*0.076-5.44*	0.37	*0.026-5.34*
Cl_4 (CB 68)	III	1.02	*0.025-41.1*	1.16	*0.41-3.25*
Cl_4 (CB 40)	IV	1.33	*0.45-3.94*	0.40	*0.093-1.72*
Cl_4 (CB 57)	III	0.02	*0.008-0.072*	0.01	*0.004-0.052*
Cl_4 (CB 67)	III	0.06	*0.021-0.17*	0.03	*0.009-0.13*
Cl_4 (CB 58)	III	0.01	*0.004-0.018*	0.01	*0.004-0.044*
Cl_4 (CB 63)	III	0.22	*0.055-0.86*	0.17	*0.042-0.71*
Cl_4 (CB 61/74)	III	36.7	*12.14-111*	6.97	*1.48-32.9*
Cl_4 (CB 70/76)	III	5.83	*1.79-18.8*	3.36	*0.90-12.5*

		MALE BELUGA (Age 16-35) (*D. leucas*) (Blubber) (n = 21)		FEMALE BELUGA (Age 5-35) (*D. leucas*) (Blubber) (n = 14)	
% Lipid ± *SD*		89.4 ± 0.53		89.7 ± 0.17	
% Lipid Equivalent (L_{Eq}) ± *SD*		89.4 ± 0.53		89.7 ± 0.17	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl_4 (CB 66)	III	20.8	*6.74-63.8*	6.07	*1.52-24.3*
Cl_4 (CB 55)	III	0.84	*0.27-2.61*	0.15	*0.023-0.90*
Cl_4 (CB 60/56)	III	1.63	*0.477-5.56*	1.13	*0.28-4.54*
Cl_5 (CB 104)	IV	0.08	*0.020-0.29*	0.02	*0.005-0.082*
Cl_5 (CB 96)	IV	0.61	*0.19-1.85*	0.10	*0.018-0.51*
Cl_5 (CB 103)	IV	1.87	*0.59-5.86*	0.28	*0.052-1.49*
Cl_5 (CB 100)	II	1.07	*0.33-3.44*	0.18	*0.038-0.80*
Cl_5 (CB 94)	V	0.50	*0.17-1.48*	0.16	*0.042-0.59*
Cl_5 (CB 95)	V	160	*51.9-491*	20.4	*3.65-115*
Cl_5 (CB 102/93)	V	2.54	*0.81-7.98*	0.28	*0.055-1.39*
Cl_5 (CB 98)	IV	-	-	0.23	-
Cl_5 (CB 88)	V	1.38	*0.41-4.61*	0.25	*0.042-1.41*
Cl_5 (CB 91)	V	19.0	*6.18-58.1*	2.45	*0.43-14.1*
Cl_5 (CB 121)	I	-	-	-	-
Cl_5 (CB 92/84)	V	80.4	*33.2-194*	6.04	*2.44-14.9*
Cl_5 CB (101)	IV	245	*83.33-721*	30.4	*5.06-182*
Cl_5 (CB 89)	V	15.4	*5.45-43.42*	2.25	*0.37-13.6*
Cl_5 (CB 99)	II	191	*64.21-571*	24.9	*4.31-144*
Cl_5 (CB 113)	IV	0.15	*0.050-0.43*	0.04	*0.005-0.28*
Cl_5 (CB 119)	II	9.70	*3.23-29.1*	1.34	*0.21-8.36*
Cl_5 (CB 112)	IV	0.17	*0.043-0.659*	0.04	*0.009-0.23*
Cl_5 (CB 109/83)	IV	4.83	*1.71-13.6*	0.63	*0.10-3.71*

		MALE BELUGA (Age 16-35) (*D. leucas*) (Blubber) (n = 21)		FEMALE BELUGA (Age 5-35) (*D. leucas*) (Blubber) (n = 14)	
% Lipid ± *SD*		89.4 ± 0.53		89.7 ± 0.17	
% Lipid Equivalent (L_{Eq}) ± *SD*		89.4 ± 0.53		89.7 ± 0.17	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl_5 (CB 97/86)	IV	24.3	*6.98-84.3*	4.78	*0.86-26.4*
Cl_5 (CB 116/125/117)	IV	0.23	*0.075-0.71*	0.05	*0.007-0.37*
Cl_5 (CB 115/87)	II	59.7	*19.1-186*	9.58	*1.64-54.45*
Cl_5 (CB 111)	III	-	-	-	-
Cl_5 (CB 85)	II	37.7	*12.1-116*	6.04	*1.10-32.9*
Cl_5 (CB 120)	III	0.33	*0.099-1.08*	0.04	*0.005-0.31*
Cl_5 (CB 110)	IV	48.0	*12.7-181*	10.3	*1.82-58.3*
Cl_5 (CB 82)	IV	5.64	*1.70-18.7*	1.16	*0.21-6.39*
Cl_5 (CB 124)	III	1.99	*0.64-6.16*	0.25	*0.032-2.01*
Cl_5 (CB 108/107)	III	2.77	*0.77-9.89*	1.42	*0.31-6.29*
Cl_5 (CB 123)	III	8.92	*1.88-42.3*	1.26	*0.21-7.48*
Cl_5 (CB 118)	III	171	*55.70-522*	24.2	*4.06-144*
Cl_5 (CB 114)	III	0.39	*0.11-1.29*	0.14	*0.012-1.73*
Cl_5 (CB 122)	III	4.18	*1.38-12.63*	0.53	*0.093-3.06*
Cl_5 (CB 105)	III	42.9	*14.08-130*	7.79	*1.31-46.1*
Cl_6 (CB 155)	I	3.21	*1.44-7.17*	-	-
Cl_6 (CB 150)	V	0.83	*0.282-2.470*	0.15	*0.029-0.730*
Cl_6 (CB 152)	V	0.34	*0.116-1.010*	0.06	*0.011-0.355*
Cl_6 (CB 145)	V	0.12	*0.041-0.364*	0.03	*0.005-0.137*
Cl_6 (CB 148)	I	8.62	*1.09-68.00*	-	-
Cl_6 (CB 136)	V	31.5	*11.1-89.12*	4.10	*0.68-24.62*
Cl_6 (CB 154)	I	8.80	*2.97-26.04*	1.46	*0.29-7.24*

		MALE BELUGA (Age 16-35) (*D. leucas*) (Blubber) (*n* = 21)		FEMALE BELUGA (Age 5-35) (*D. leucas*) (Blubber) (*n* = 14)	
% Lipid ± *SD*		89.4 ± 0.53		89.7 ± 0.17	
% Lipid Equivalent (L_{Eq}) ± *SD*		89.4 ± 0.53		89.7 ± 0.17	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl_6 (CB 151)	V	106	*37.9-300*	15.2	*2.59-89.0*
Cl_6 (CB 135/144)	V	44.1	*16.1-120*	5.95	*0.98-36.07*
Cl_6 (CB 147)	II	6.52	*2.31-18.38*	1.00	*0.17-5.67*
Cl_6 (CB 149)	V	217	-	29.0	*4.82-174*
Cl_6 (CB 139/140)	II	0.58	*0.15-2.11*	0.19	*0.039-0.88*
Cl_6 (CB-143/134)	V	7.66	*2.61-22.3*	1.16	*0.19-6.84*
Cl_6 (CB 142/131)	V	4.40	*0.69-27.7*	0.48	*0.049-4.73*
Cl_6 (CB 133)	I	0.92	*0.29-2.83*	0.34	*0.033-3.51*
Cl_6 (CB 146/161)	I	79.1	*27.4-227*	13.3	*2.41-73.5*
Cl_6 (CB 165)	I	0.56	*0.11-2.66*	0.36	*0.13-0.96*
Cl_6 (CB 153)	I	518	*172.8-1,550*	82.9	*14.6-468*
Cl_6 (CB 168)	I	35.3	*12.0-103*	4.12	*0.655-25.8*
Cl_6 (CB 141)	IV	14.1	*3.48-56.8*	3.64	*0.69-19.1*
Cl_6 (CB 137)	II	25.5	*8.86-73.2*	3.59	*0.70-18.2*
Cl_6 (CB 138)	II	16.4	*4.84-55.7*	2.91	*0.46-17.9*
Cl_6 (CB 130)	II	384	*125-1,170*	62.6	*11.4-343*
Cl_6 (CB 158)	II	19.7	*6.37-60.6*	3.20	*0.55-18.4*
Cl_6 (CB 129)	IV	2.29	*0.70-7.47*	0.61	*0.11-3.35*
Cl_6 (CB 166)	II	1.18	*0.37-3.69*	0.25	*0.047-1.30*
Cl_6 (CB 159)	III	4.05	*0.81-20.0*	1.25	*0.25-6.13*
Cl_6 (CB 162)	IV	1.48	*0.32-6.75*	0.57	*0.12-2.69*
Cl_6 (CB 128)	II	38.6	*11.9-124*	6.75	*1.24-36.6*

		MALE BELUGA (Age 16-35) (*D. leucas*) (Blubber) (n = 21)		FEMALE BELUGA (Age 5-35) (*D. leucas*) (Blubber) (n = 14)	
% Lipid ± *SD*		89.4 ± 0.53		89.7 ± 0.17	
% Lipid Equivalent (L_{Eq}) ± *SD*		89.4 ± 0.53		89.7 ± 0.17	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl_6 (CB 167)	III	6.51	*1.58-26.7*	1.24	*0.22-6.82*
Cl_6 (CB 156)	III	10.1	*2.91-34.7*	2.48	*0.48-12.7*
Cl_6 (CB 157)	III	3.85	*1.16-12.7*	0.91	*0.15-5.26*
Cl7 (CB 188)	I	2.45	*0.47-12.6*	0.76	*0.20-2.90*
Cl_7 (CB 184)	I	1.49	*0.29-7.64*	0.50	*0.12-1.91*
Cl_7 (CB 179)	V	21.3	*5.17-87.3*	4.11	*0.77-21.8*
Cl_7 (CB 176)	V	6.15	*1.47-25.6*	1.14	*0.20-6.18*
Cl_7 (CB 186)	V	0.04	*0.013-0.10*	0.01	*0.004-0.042*
Cl_7 (CB 178)	I	21.6	*5.29-88.3*	4.89	*1.00-23.6*
Cl_7 (CB 175)	I	3.17	*0.73-13.67*	0.70	*0.15-3.21*
Cl_7 (CB 187/182)	I	112	*25.4-500*	27.8	*5.91-130*
Cl_7 (CB 183)	I	37.4	*8.55-163.8*	8.64	*1.75-42.3*
Cl_7 (CB 185)	V	3.44	*0.77-15.3*	0.80	*0.16-3.83*
Cl_7 (CB 174/181)	V	29.6	*7.61-115*	5.10	*0.97-26.6*
Cl_7 (CB 177)	II	20.1	*5.99-67.4*	3.99	*0.76-20.7*
Cl_7 (CB 171)	II	10.7	*3.05-37.6*	2.14	*0.42-10.8*
Cl_7 (CB 173)	II	0.14	*0.035-0.57*	0.04	*0.01-0.14*
Cl_7 (CB 192/172)	I	9.02	*2.54-31.9*	2.29	*0.49-10.5*
Cl_7 (CB 180)	I	104	*28.8-375*	23.2	*4.73-113*
Cl_7 (CB 193)	I	6.66	*1.92-23.0*	1.53	*0.30-7.62*
Cl_7 (CB 191)	I	1.66	*0.502-5.46*	0.37	*0.07-1.85*
Cl_7 (CB 170/190)	II	41.9	*11.3-154*	8.89	*1.77-44.4*

		MALE BELUGA (Age 16-35) (*D. leucas*) (Blubber) (n = 21)		FEMALE BELUGA (Age 5-35) (*D. leucas*) (Blubber) (n = 14)	
% Lipid ± *SD*		89.4 ± 0.53		89.7 ± 0.17	
% Lipid Equivalent (L_{Eq}) ± *SD*		89.4 ± 0.53		89.7 ± 0.17	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl_7 (CB 189)	III	1.09	*0.31-3.75*	0.36	*0.085-1.49*
Cl_8 (CB 202)	I	14.4	*4.12-50.4*	4.14	*0.98-17.32*
Cl_8 (CB 200)	I	8.60	*2.22-33.2*	3.03	*0.76-11.97*
Cl_8 (CB 204)	I	0.24	*0.067-0.83*	0.07	*0.023-0.243*
Cl_8 (CB 197)	I	2.00	*0.478-8.33*	0.76	*0.194-3.011*
Cl_8 (CB 199)	V	0.69	*0.188-2.50*	0.23	*0.060-0.901*
Cl_8 (CB 198)	I	10.8	*1.72-68.3*	2.10	*0.214-20.56*
Cl_8 (CB 201)	I	20.2	*3.44-118*	5.43	*0.969-30.3*
Cl_8 (CB 203/196)	I	20.2	*5.69-71.4*	7.08	*1.61-31.09*
Cl_8 (CB 195)	II	1.83	*0.499-6.71*	0.69	*0.155-3.07*
Cl_8 (CB 194)	I	11.3	*2.96-43.2*	4.32	*0.933-19.9*
Cl_8 (CB 205)	I	0.42	*0.124-1.44*	0.18	*0.042-0.749*
Cl_9 (CB 208)	I	6.85	*0.163-287*	1.44	*0.100-20.5*
Cl_9 (CB 207)	I	1.29	*0.225-7.34*	0.33	*0.043-2.51*
Cl_9 (CB 206)	I	2.77	*0.477-16.0*	1.39	*0.238-8.15*
Cl_{10} (CB 209)	I	1.13	*0.268-4.79*	0.80	*0.195-3.26*
$\sum Cl_2$		0.42	*0.134-1.33*	0.45	*0.130-1.57*
$\sum Cl_3$		16.4	*5.61-47.7*	9.49	*2.73-32.8*
$\sum Cl_4$		318	*111-907*	60.0	*11.7-305*
$\sum Cl_5$		1080	*365-3,170*	153	*26.7-879*
$\sum Cl_6$		1600	*552-4,640*	249	*44.1-1,400*
$\sum Cl_7$		436	*115-1,650*	97.9	*20.16-475*
$\sum Cl_8$		74.5	*18.7-296.1*	25.7	*6.0-108*

		MALE BELUGA (Age 16-35) (*D. leucas*) (Blubber) (n = 21)		FEMALE BELUGA (Age 5-35) (*D. leucas*) (Blubber) (n = 14)	
% Lipid ± *SD*		89.4 ± 0.53		89.7 ± 0.17	
% Lipid Equivalent (L_{Eq}) ± *SD*		89.4 ± 0.53		89.7 ± 0.17	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*
∑Cl_9		19.2	*0.814-450*	3.51	*0.287-42.9*
∑Cl_{10}		1.13	*0.268-4.77*	0.80	*0.195-3.26*
∑Di-ortho PCBs		3360	*1,1204-10,020*	587	*117.5-2,930*
∑Mono ortho PCBs		314	*104-944*	71.2	*14.89-340.27*
∑PCBs		3690	*1,250-10,900*	661	*134-3,260*

		FEMALE RINGED SEALS (*P. hispida*) (Blubber) (*n* = 7)		MALE RINGED SEALS (*P. hispida*) (Blubber) (*n* = 11)		EIDER DUCKS (*S. mollissima*) (Liver) (*n* =6)		WHITE WINGED SCOTERS (*M. fusca*) (Liver) (*n* = 5)	
% Lipid ± *SD*		71.2 ± 2.81		73.4 ± 4.63		3.47 ± 0.81		5.65 ± 1.25	
% Lipid Equivalent (L_{Eq}) ± *SD*		71.2 ± 2.81		73.4 ± 4.63		3.47 ± 0.81		5.65 ± 1.25	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl_2 (PCB 7/9)	III	-	-	0.091	-	-	-	-	-
Cl_2 (PCB 6)	III	0.061	*0.029-0.126*	0.098	*0.036-0.268*	-	-	0.03	-
Cl_2 (PCB 8/5)	III	0.29	*0.106-0.790*	0.33	*0.111-0.973*	0.22	*0.032-1.460*	0.21	*0.078-0.562*
Cl_2 (PCB 4/10)	IV	0.11	*0.038-0.294*	0.12	*0.036-0.420*	0.23	-	0.03	-
Cl_3 (PCB 23/34)	III	0.006	-	0.008	*0.003-0.023*	-	-	-	-
Cl_3 (PCB 29)	III	-	-	0.003	*0.002-0.007*	-	-	-	-
Cl_3 (PCB 26)	III	0.27	*0.088-0.816*	0.23	*0.054-0.943*	0.25	-	0.06	-
Cl_3 (CB 25)	III	0.055	*0.024-0.125*	0.046	*0.014-0.152*	-	-	0.03	-
Cl_3 (CB 31)	III	3.87	*0.823-18.180*	2.26	*0.688-7.455*	-	-	-	-
Cl_3 (CB 28)	III	5.79	*1.522-22.022*	7.69	*2.709-21.806*	3.40	*0.755-15.321*	11.10	*2.183-56.479*
Cl_3 (CB 21)	III	0.24	*0.114-0.491*	0.35	*0.163-0.742*	-	-	-	-
Cl_3 (CB 33/20)	III	0.17	*0.077-0.387*	0.18	*0.058-0.552*	-	-	-	-
Cl_3 (CB 19)	IV	0.025	-	0.061	-	-	-	-	-
Cl_3 (CB30)	IV	-	-	-	-	-	-	-	-
Cl_3 (CB 18)	IV	0.22	*0.080-0.625*	0.26	*0.084-0.832*	0.16	*0.032-0.799*	0.22	*0.092-0.531*
Cl_3 (CB 17)	IV	0.085	*0.032-0.225*	0.096	*0.030-0.304*	0.10	*0.014-0.645*	0.10	*0.037-0.243*
Cl_3 (CB 27/24)	IV	0.031	*0.014-0.071*	0.033	*0.010-0.111*	-	-	0.03	-
Cl_3 (CB 16/32)	IV	0.24	*0.095-0.630*	0.29	*0.094-0.909*	0.30	*0.044-2.025*	0.26	*0.106-0.629*
Cl_3 (CB 22)	III	0.22	*0.068-0.679*	0.19	*0.050-0.745*	-	-	-	-
Cl_4 (CB 54)	V	-	-	-	-	-	-	-	-

		FEMALE RINGED SEALS (*P. hispida*) **(Blubber)** (*n* = 7)		MALE RINGED SEALS (*P. hispida*) **(Blubber)** (*n* = 11)		EIDER DUCKS (*S. mollissima*) **(Liver)** (*n* =6)		WHITE WINGED SCOTERS (*M. fusca*) **(Liver)** (*n* = 5)	
% Lipid ± *SD*		71.2 ± 2.81		73.4 ± 4.63		3.47 ± 0.81		5.65 ± 1.25	
% Lipid Equivalent (L_{Eq}) ± *SD*		71.2 ± 2.81		73.4 ± 4.63		3.47 ± 0.81		5.65 ± 1.25	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl_4 (CB 50)	V	0.047	-	-	-	-	-	-	-
Cl_4 (CB 53)	IV	0.021	*0.009-0.054*	0.017	*0.008-0.036*	-	-	-	-
Cl_4 (CB 51)	V	-	-	-	-	-	-	-	-
Cl_4 (CB 45)	V	0.017	*0.005-0.054*	0.014	*0.005-0.038*	0.13	-	0.08	-
Cl_4 (CB 46)	V	0.009	*0.004-0.018*	0.018	*0.006-0.055*	-	-	-	-
Cl_4 (CB 52)	IV	7.43	*1.765-31.291*	10.09	*3.641-27.984*	0.67	*0.140-3.189*	1.26	*0.271-5.904*
Cl_4 (CB 69)	IV	-	-	-	-	-	-	-	-
Cl_4 (CB 49)	IV	1.66	*0.436-6.351*	2.24	*0.792-6.356*	0.34	*0.081-1.388*	0.98	*0.242-3.980*
Cl_4 (CB 43)	IV					1.01	*0.148-6.818*	10.65	*5.275-21.520*
Cl_4 (CB 47/75/48)	IV	1.73	*0.380-7.889*	2.38	*0.924-6.140*	0.65	*0.217-1.968*	1.77	*0.599-5.251*
Cl_4 (CB 65)	IV	-	-	-	-	-	-	-	-
Cl_4 (CB 62)	IV	-	-	-	-	-	-	-	-
Cl_4 (CB 44)	IV	1.08	*0.361-3.244*	1.35	*0.445-4.122*	0.43	*0.106-1.722*	1.46	*0.135-15.640*
Cl_4 (CB 59/42)	IV	0.127	*0.043-0.369*	0.13	*0.046-0.366*	0.24	*0.045-1.304*	1.45	*0.135-15.610*
Cl_4 (CB 72)	III	-	-	-	-	-	-	-	-
Cl_4 (CB 71/41/64)	IV	0.30	*0.040-2.245*	0.26	*0.027-2.544*	0.79	*0.221-2.824*	6.87	*1.700-27.758*
Cl_4 (CB 68)	III	0.20	*0.066-0.607*	0.22	-		-	-	-
Cl_4 (CB 40)	IV	0.028	*0.007-0.103*	0.044	*0.021-0.094*	0.18	-	1.04	*0.069-15.695*
Cl_4 (CB 57)	III	0.012	*0.004-0.039*	0.015	-	-	-	-	-
Cl_4 (CB 67)	III	0.034	*0.014-0.082*	0.028	*0.009-0.086*	-	-	-	-
Cl_4 (CB 58)	III	0.005	*0.001-0.020*	0.007	-	-	-	-	-
Cl_4 (CB 63)	III	0.44	*0.066-2.938*	0.27	*0.031-2.257*	-	-	-	-

		FEMALE RINGED SEALS (*P. hispida*) **(Blubber)** (*n* = 7)		**MALE RINGED SEALS** (*P. hispida*) **(Blubber)** (*n* = 11)		**EIDER DUCKS** (*S. mollissima*) **(Liver)** (*n* =6)		**WHITE WINGED SCOTERS** (*M. fusca*) **(Liver)** (*n* = 5)	
% Lipid ± *SD*		71.2 ± 2.81		73.4 ± 4.63		3.47 ± 0.81		5.65 ± 1.25	
% Lipid Equivalent (L_{Eq}) ± *SD*		71.2 ± 2.81		73.4 ± 4.63		3.47 ± 0.81		5.65 ± 1.25	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl_4 (CB 61/74)	III	12.47	*2.438-63.747*	18.38	*6.649-50.784*	-	-	-	-
Cl_4 (CB 70/76)	III	2.89	*1.112-7.527*	2.98	*1.046-8.462*	-	-	-	-
Cl_4 (CB 66)	III	8.23	*1.866-36.324*	7.42	*1.566-35.195*	-	-	-	-
Cl_4 (CB 55)	III	0.009	*0.004-0.021*	0.017	*0.006-0.054*	-	-	-	-
Cl_4 (CB 60/56)	III	2.94	*0.741-11.640*	2.53	*0.629-10.174*	-	-	-	-
Cl_5 (CB 104)	IV	-	-	-	-	-	-	-	-
Cl_5 (CB 96)	IV	0.004	-	-	-	-	-	0.05	-
Cl_5 (CB 103)	IV	0.022	*0.006-0.077*	0.018	*0.004-0.076*	-	-	0.08	*0.016-0.352*
Cl_5 (CB 100)	II	0.013	*0.005-0.034*	-	-	-	-	0.04	-
Cl_5 (CB 94)	V	0.11	*0.044-0.270*	0.096	*0.042-0.219*	-	-	-	-
Cl_5 (CB 95)	V	1.61	*0.344-7.508*	1.82	*0.563-5.909*	0.77	*0.170-3.470*	5.64	*1.431-22.211*
Cl_5 (CB 102/93)	V	-	-	0.008	-	-	-	-	-
Cl_5 (CB 98)	IV	-	-	-	-	-	-	0.46	-
Cl_5 (CB 88)	V	0.19	*0.033-1.154*	0.22	*0.069-0.689*	0.24	*0.068-0.843*	0.38	*0.110-1.299*
Cl_5 (CB 91)	V	0.26	*0.063-1.096*	0.36	*0.139-0.906*	0.10	*0.024-0.412*	0.72	*0.106-4.933*
Cl_5 (CB 121)	I	-	-	-	-	-	-	-	-
Cl_5 (CB 92/84)	V	-	-	-	-	-	-	-	-
Cl_5 CB (101)	IV	26.84	*5.521-130.500*	36.22	*14.20-92.37*	1.90	*0.453-7.965*	21.33	*6.832-66.562*
Cl_5 (CB 89)	V	0.019	*0.008-0.046*	0.022	*0.006-0.072*	0.12	*0.023-0.606*	2.21	*0.181-27.012*
Cl_5 (CB 99)	II	33.49	*5.678-197.566*	42.10	*15.50-114.30*	17.54	*4.44-69.29*	119.10	*18.92-749.59*
Cl_5 (CB 113)	IV	0.013	-	-	-	-	-	-	-
Cl_5 (CB 119)	II	1.19	*0.231-6.191*	1.42	*0.525-3.846*	0.19	*0.047-0.765*	1.65	*0.441-6.176*

		FEMALE RINGED SEALS (*P. hispida*) **(Blubber)** (*n* = 7)		MALE RINGED SEALS (*P. hispida*) **(Blubber)** (*n* = 11)		EIDER DUCKS (*S. mollissima*) **(Liver)** (*n* =6)		WHITE WINGED SCOTERS (*M. fusca*) **(Liver)** (*n* = 5)	
% Lipid ± *SD*		71.2 ± 2.81		73.4 ± 4.63		3.47 ± 0.81		5.65 ± 1.25	
% Lipid Equivalent (L_{Eq}) ± *SD*		71.2 ± 2.81		73.4 ± 4.63		3.47 ± 0.81		5.65 ± 1.25	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl_5 (CB 112)	IV	0.008	-	-	-	0.08	-	0.10	*0.039-0.281*
Cl_5 (CB 109/83)	IV	0.070	*0.023-0.215*	0.061	*0.020-0.184*	-	-	1.60	
l_5 (CB 97/86)	IV	0.53	*0.191-1.484*	0.53	*0.180-1.579*	0.11	*0.039-0.319*	1.16	*0.064-21.039*
Cl_5 (CB 116/125/117)	IV	3.02	*0.755-12.087*	3.63	-	2.08	-	4.55	*0.095-217.230*
Cl_5 (CB 115/87)	II	4.45	*1.139-17.399*	6.33	*2.937-13.652*	2.73	*0.425-17.49*	9.12	*1.708-48.654*
Cl_5 (CB 111)	III	-	-	-	-	-	-	-	-
Cl_5 (CB 85)	II	3.36	*0.659-17.098*	4.34	*1.585-11.882*	1.52	*0.374-6.199*	14.58	*4.378-48.582*
Cl_5 (CB 120)	III	-	-	-	-	-	-	-	-
Cl_5 (CB 110)	IV	5.47	*1.640-18.227*	5.60	*1.840-17.031*	1.06	*0.324-3.470*	4.63	*0.447-48.065*
Cl_5 (CB 82)	IV	0.062	*0.024-0.156*	0.059	*0.020-0.170*	0.02	*0.001-0.353*	2.08	*0.210-20.726*
Cl_5 (CB 124)	III	0.058	*0.019-0.178*	0.077	*0.021-0.285*	-	-	-	-
Cl_5 (CB 108/107)	III	2.37	*0.486-11.551*	2.16	*0.551-8.493*	-	-	-	-
Cl_5 (CB 123)	III	0.983	*0.108-8.930*	4.49	*0.17-116.14*	-	-	-	-
Cl_5 (CB 118)	III	51.39	*11.421-231.19*	47.81	*13.81-165.46*	-	-	-	-
Cl_5 (CB 114)	III	0.92	*0.154-5.452*	1.04	*0.374-2.882*	-	-	-	-
Cl_5 (CB 122)	III	-	-	-	-	-	-	-	-
Cl_5 (CB 105)	III	11.40	*1.971-65.979*	13.13	*4.565-37.767*	-	-	-	-
Cl_6 (CB 155)	I	-	-	-	-	-	-	-	-
Cl_6 (CB 150)	V	0.003	-	-	-	-	-	-	-
Cl_6 (CB 152)	V	0.063	-	0.054	-	0.16	-	0.03	-
Cl_6 (CB 145)	V	-	-	-	-		-	-	-
Cl_6 (CB 148)	I	-	-	0.15	-	0.15	*0.033-0.637*	2.17	*0.343-13.677*

		FEMALE RINGED SEALS (*P. hispida*) **(Blubber)** (*n* = 7)		MALE RINGED SEALS (*P. hispida*) **(Blubber)** (*n* = 11)		EIDER DUCKS (*S. mollissima*) **(Liver)** (*n* =6)		WHITE WINGED SCOTERS (*M. fusca*) **(Liver)** (*n* = 5)	
% Lipid ± *SD*		71.2 ± 2.81		73.4 ± 4.63		3.47 ± 0.81		5.65 ± 1.25	
% Lipid Equivalent (L_{Eq}) ± *SD*		71.2 ± 2.81		73.4 ± 4.63		3.47 ± 0.81		5.65 ± 1.25	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl_6 (CB 136)	V	0.11	*0.037-0.314*	0.084	*0.027-0.262*	-	-	-	-
Cl_6 (CB 154)	I	0.67	*0.140-3.218*	0.64	*0.181-2.230*	-	-	-	-
Cl_6 (CB 151)	V	1.14	*0.270-4.780*	1.46	*0.493-4.331*	0.44	*0.105-1.858*	3.23	*0.977-10.712*
Cl_6 (CB 135/144)	V	0.76	*0.185-3.072*	0.82	*0.331-2.052*	0.31	*0.080-1.230*	2.60	*0.889-7.595*
Cl_6 (CB 147)	II	0.24	*0.044-1.245*	0.26	*0.092-0.737*	1.18	*0.378-3.691*	12.67	*1.025-156.581*
Cl_6 (CB 149)	V	7.31	*1.704-31.384*	7.74	*3.147-19.051*	4.01	*1.15-13.99*	31.91	*10.391-98.012*
Cl_6 (CB 139/140)	II	0.005	-	0.008	-	-	-	-	-
Cl_6 (CB-143/134)	V	2.25	-	1.91	*0.929-3.916*	-	-	-	-
Cl_6 (CB 142/131)	V	0.96	*0.188-4.871*	1.47	*0.508-4.220*	0.49	*0.127-1.861*	7.24	*1.028-51.011*
Cl_6 (CB 133)	I	0.49	*0.022-10.890*	0.32	*0.057-1.761*	0.15	*0.043-0.511*	0.59	*0.062-5.574*
Cl_6 (CB 146/161)	I	16.0	*2.477-103.277*	19.35	*7.559-49.538*	13.49	*3.783-48.115*	124.86	*16.705-933.291*
Cl_6 (CB 165)	I	0.13	-	-	-	-	-	0.19	
Cl_6 (CB 153)	I	126.71	*19.42-826.64*	153.46	*60.12-391.64*	102.77	*27.35-386.0*	841.44	*123.5-5,731.1*
Cl_6 (CB 168)	I	0.50	*0.104-2.439*	0.68	*0.268-1.725*	-	-	-	-
Cl_6 (CB 141)	IV	1.87	*0.365-9.591*	2.13	*0.689-6.597*	0.25	*0.064-1.013*	1.80	*0.488-6.636*
Cl_6 (CB 137)	II	3.09	*0.487-19.643*	3.55	*1.117-11.291*	1.31	*0.262-6.584*	7.65	*1.767-33.161*
Cl_6 (CB 138)	II	3.18	*0.458-22.093*	3.60	*1.462-8.883*	3.23	*1.022-10.17*	95.66	*23.522-389.05*
Cl_6 (CB 130)	II	61.72	*9.494-401.177*	82.95	*37.47-183.62*	63.79	*17.43-233.4*	508.52	*65.97-3,919.3*
Cl_6 (CB 158)	II	1.76	*0.291-10.634*	2.51	*1.046-6.020*	1.89	*0.536-6.675*	15.13	*2.432-94.073*
Cl_6 (CB 129)	IV	0.25	*0.036-1.711*	0.30	*0.118-0.780*	0.14	*0.045-0.439*	1.13	*0.253-5.021*
Cl_6 (CB 166)	II	0.23	*0.031-1.722*	0.20	*0.082-0.493*	0.25	*0.070-0.909*	1.00	*0.185-5.429*

		FEMALE RINGED SEALS (*P. hispida*) **(Blubber)** (*n* = 7)		MALE RINGED SEALS (*P. hispida*) **(Blubber)** (*n* = 11)		EIDER DUCKS (*S. mollissima*) **(Liver)** (*n* =6)		WHITE WINGED SCOTERS (*M. fusca*) **(Liver)** (*n* = 5)	
% Lipid ± *SD*		71.2 ± 2.81		73.4 ± 4.63		3.47 ± 0.81		5.65 ± 1.25	
% Lipid Equivalent (L_{Eq}) ± *SD*		71.2 ± 2.81		73.4 ± 4.63		3.47 ± 0.81		5.65 ± 1.25	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl_6 (CB 159)	III	0.42	*0.062-2.894*	0.57	*0.230-1.414*	-	-	-	-
Cl_6 (CB 162)	IV	0.43	*0.065-2.837*	0.43	*0.162-1.147*	-	-	-	-
Cl_6 (CB 128)	II	1.15	*0.181-7.247*	1.74	*0.601-5.057*	8.01	*2.05-31.20*	71.76	*8.306-619.951*
Cl_6 (CB 167)	III	0.74	*0.131-4.210*	0.56	*0.120-2.647*	-	-	-	-
Cl_6 (CB 156)	III	2.10	*0.329-13.391*	2.64	*1.080-6.466*	-	-	-	-
Cl_6 (CB 157)	III	0.89	*0.149-5.303*	1.02	*0.456-2.292*	-	-	-	-
Cl7 (CB 188)	I			0.003		2.18	*0.911-5.215*	1.18	*0.220-6.352*
Cl_7 (CB 184)	I	0.074	*0.014-0.392*	0.037	*0.010-0.147*	0.40	*0.108-1.453*	0.34	*0.122-0.952*
Cl_7 (CB 179)	V	0.067	*0.029-0.159*	0.067	*0.023-0.196*	0.20	*0.049-0.771*	0.89	*0.199-3.936*
Cl_7 (CB 176)	V	0.042	*0.017-0.100*	0.037	*0.014-0.094*	0.09	*0.026-0.300*	0.50	*0.149-1.657*
Cl_7 (CB 186)	V	-	-	-	-	-	-	-	-
Cl_7 (CB 178)	I	3.24	*0.435-24.210*	3.44	*1.23-9.60*	1.18	*0.287-4.834*	20.60	*3.348-126.796*
Cl_7 (CB 175)	I	0.058	*0.012-0.286*	0.087	*0.036-0.208*	1.13	*0.359-3.549*	4.16	*0.752-22.982*
Cl_7 (CB 187/182)	I	9.22	*1.330-63.932*	13.76	*5.468-34.631*	31.18	*8.71-111.5*	237.48	*36.4-1,549.1*
Cl_7 (CB 183)	I	4.91	*0.701-34.424*	7.02	*2.616-18.841*	9.27	*2.417-35.52*	71.11	*12.09-418.28*
Cl_7 (CB 185)	V	0.079	*0.018-0.352*	0.089	*0.027-0.295*	0.07	*0.019-0.25*	0.31	*0.113-0.845*
Cl_7 (CB 174/181)	V	0.62	*0.127-3.040*	0.48	*0.118-1.946*	0.71	*0.196-2.594*	3.79	*1.378-10.433*
Cl_7 (CB 177)	II	0.57	*0.092-3.528*	1.13	*0.356-3.613*	4.98	*1.47-16.83*	45.68	*6.181-337.59*
Cl_7 (CB 171)	II	0.81	*0.122-5.356*	1.18	*0.406-3.445*	2.15	*0.556-8.321*	21.84	*3.665-130.083*
Cl_7 (CB 173)	II	-	-	-	-	-	-	-	-
Cl_7 (CB 192/172)	I	1.46	*0.180-11.791*	1.77	*0.594-5.277*	1.47	*0.332-6.534*	7.79	*1.333-45.480*

		FEMALE RINGED SEALS (*P. hispida*) **(Blubber)** (*n* = 7)		MALE RINGED SEALS (*P. hispida*) **(Blubber)** (*n* = 11)		EIDER DUCKS (*S. mollissima*) **(Liver)** (*n* =6)		WHITE WINGED SCOTERS (*M. fusca*) **(Liver)** (*n* = 5)	
% Lipid ± *SD*		71.2 ± 2.81		73.4 ± 4.63		3.47 ± 0.81		5.65 ± 1.25	
% Lipid Equivalent (L_{Eq}) ± *SD*		71.2 ± 2.81		73.4 ± 4.63		3.47 ± 0.81		5.65 ± 1.25	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cl_7 (CB 180)	I	19.06	*2.55-142.260*	26.16	*8.598-79.566*	24.76	*5.39-113.59*	148.33	*27.89-788.67*
Cl_7 (CB 193)	I	1.25	*0.168-9.281*	1.76	*0.610-5.062*	1.84	*0.446-7.607*	11.10	*1.582-77.937*
Cl_7 (CB 191)	I	0.33	*0.048-2.271*	0.44	*0.154-1.236*	0.42	*0.102-1.708*	2.24	*0.389-12.865*
Cl_7 (CB 170/190)	II	6.30	*0.836-47.423*	9.23	*3.031-28.103*	7.19	*1.482-34.872*	52.91	*8.062-347.204*
Cl_7 (CB 189)	III	0.14	*0.027-0.707*	0.17	*0.061-0.449*				
Cl_8 (CB 202)	I	1.87	*0.249-14.024*	1.85	*0.684-5.029*	2.45	*0.672-8.914*	27.11	*3.828-191.941*
Cl_8 (CB 200)	I	0.023	*0.009-0.059*	0.019	*0.007-0.053*	3.90	*1.340-11.33*	13.63	*2.569-72.272*
Cl_8 (CB 204)	I	0.022		0.007	*0.001-0.030*	0.04	*0.012-0.129*	0.04	
Cl_8 (CB 197)	I	0.044	*0.007-0.291*	0.054	*0.018-0.164*	2.18	*0.620-7.677*	6.09	*1.344-27.563*
Cl_8 (CB 199)	V	0.011	*0.005-0.026*	0.009	*0.002-0.037*	0.04	*0.012-0.141*	0.18	*0.065-0.507*
Cl_8 (CB 198)	I	0.59	*0.039-9.127*	1.11	*0.073-16.853*	0.22	*0.056-0.866*	0.62	*0.129-3.036*
Cl_8 (CB 201)	I	3.12	*0.351-27.699*	1.50	*0.648-3.460*	5.60	*1.391-22.57*	33.33	*4.905-226.477*
Cl_8 (CB 203/196)	I	2.73	*0.266-28.104*	2.92	*0.956-8.935*	6.74	*1.48-30.67*	39.27	*7.443-207.239*
Cl_8 (CB 195)	II	0.363	*0.046-2.865*	0.48	*0.136-1.692*	1.07	*0.235-4.838*	7.62	*1.369-42.404*
Cl_8 (CB 194)	I	1.86	*0.221-15.628*	2.44	*0.704-8.454*	4.61	*0.875-24.23*	29.89	*4.893-182.627*
Cl_8 (CB 205)	I	0.20	*0.049-0.832*	0.12	*0.035-0.438*	0.33	*0.075-1.483*	1.46	*0.251-8.474*
Cl_9 (CB 208)	I	0.22	*0.028-1.703*	0.20	*0.062-0.616*	2.78	*0.59-13.018*	10.56	*1.673-66.612*
Cl_9 (CB 207)	I	0.032	*0.004-0.231*	0.062	*0.021-0.181*	2.84	*0.58-13.87*	5.47	*1.194-25.035*
Cl_9 (CB 206)	I	0.71	*0.076-6.544*	0.74	*0.206-2.656*	5.11	*0.87-29.76*	21.80	*3.701-128.419*
Cl_{10} (CB 209)	I	0.21	*0.024-1.779*	0.22	*0.076-0.650*	5.43	*0.994-29.71*	15.07	*2.496-90.971*
ΣCl_2		0.42	*0.150-1.162*	0.49	*0.142-1.652*	0.23	*0.030-1.81*	0.24	*0.105-0.525*
ΣCl_3		8.78	*3.023-25.470*	11.46	*3.89-33.64*	3.71	*0.81-16.97*	11.85	*2.520-55.671*
ΣCl_4		41.92	*10.262-171.20*	50.55	*17.17-148.76*	3.18	*0.780-12.96*	19.07	*5.075-71.634*

		FEMALE RINGED SEALS (*P. hispida*) (Blubber) (*n* = 7)		MALE RINGED SEALS (*P. hispida*) (Blubber) (*n* = 11)		EIDER DUCKS (*S. mollissima*) (Liver) (*n* =6)		WHITE WINGED SCOTERS (*M. fusca*) (Liver) (*n* = 5)	
% Lipid ± *SD*		71.2 ± 2.81		73.4 ± 4.63		3.47 ± 0.81		5.65 ± 1.25	
% Lipid Equivalent (L_{Eq}) ± *SD*		71.2 ± 2.81		73.4 ± 4.63		3.47 ± 0.81		5.65 ± 1.25	
Congener	**Group**	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
ΣCl_5		135.09	*26.550-687.29*	159.89	*57.9-441.5*	27.64	*7.25-105.35*	247.22	*76.9-794.3*
ΣCl_6		234.59	*37.06-1,484.84*	289.77	*120.3-697.8*	201.93	*55.21-738.4*	1698.89	*248.1-11,631*
ΣCl_7		48.65	*6.812-347.444*	67.23	*23.703-190.7*	89.39	*22.2-358.3*	640.56	*107.2-3,825.4*
ΣCl_8		8.41	*0.991-71.357*	10.32	*3.414-31.1*	27.64	*6.676-114.4*	163.85	*27.94-960.775*
ΣCl_9		0.97	*0.112-8.295*	0.96	*0.270-3.430*	10.77	*2.037-56.985*	37.99	*6.5-220.1*
ΣCl_{10}		0.21	*0.024-1.7*	0.22	*0.076-0.6*	5.43	*0.994-29.71*	15.07	*2.49-90.97*
ΣDi-ortho PCBs		390.64	*66.108-2,308.3*	486.25	*206.5-1,144.8*	372.74	*97.1-1,429.5*	2953.04	*517.1-16,86*
ΣMono-ortho PCBs		97.78	*20.825-459.0*	110.34	*36.6-332.38*				
ΣPCBs		492.74	*87.853-2,763.6*	602.32	*252.3-1,437.6*	372.74	*97.186-1,429.58*	2953.04	*517.12-16,863.34*

Table S11. Organochlorine pesticide (OCP) concentrations in biological tissue samples, including lichens, macro-algae, bivalves, fish, sea ducks and marine mammals (ng·g^{-1} lipid equivalent) collected from E. Hudson's Bay during May and September 1999-2002. Data are presented as geometric means (GM) and 95% CL.

	LICHEN (*C. rangiferina*) **(tissue)** (*n* =11)		**MACRO ALGAE** (*F. gardneri*) **(tissue)** (*n* =11)		**SEDIMENTS** **(*n* ponar grabs)** (*n* =12)		**CAPELIN** (*M. villosus*) **(whole body)** (*n* =8)	
% OC ± *SD*	-		-		0.18 ± 0.10		-	
% Lipid ± *SD*	0.525 ± 0.065		0.845 ± 0.21		-		1.41 ± 0.15	
% Lipid Equivalent (L_{Eq}) ± *SD*	2.30 ± 0.01		1.63 ± 0.20		0.06 ± 0.04		1.41 ± 0.15	
	GM	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Chlorobenzenes (CBz)								
1,3,5 TriCBz	0.09	*0.025-0.328*	1.07	*0.384-3.010*	0.44	*0.045-4.314*	-	-
1,2,4 TriCBz	0.08	*0.023-0.304*	3.73	*1.144-12.196*	79.40	*20.119-313.388*	-	-
1,2,3 TriCBz	0.09	*0.025-0.330*	1.53	*0.496-4.738*	1.84	*0.328-10.282*	-	-
1,2,3,5/1,2,4,5 TeCBz	0.24	*0.060-0.985*	0.67	*0.236-1.906*	1.15	*0.199-6.601*	-	-
1,2,3,4 TeCBz	1.00	*0.250-4.009*	0.98		0.78	*0.141-4.355*	-	-
PeCBz	2.57	*1.069-6.164*	0.44	*0.094-2.062*	1.17	*0.263-5.190*	-	-
HCB	27.20	*9.374-78.930*	0.29	*0.059-1.432*	3.33	*0.964-11.520*	-	-
∑CBz	32.28	*11.780-88.471*	8.41	*3.525-20.049*	97.49	*27.118-350.460*	-	-
Hexachlorocyclohexanes (HCHs)								
α-HCH	9.71	*2.164-43.593*	21.72	*7.576-62.246*	7.61	*2.436-23.747*	-	-
β-HCH	-	-	3.66	*1.455-9.206*	0.59	*0.196-1.748*	-	-
γ-HCH	4.08	*0.997-16.669*	4.76	-	1.23	*0.340-4.469*	-	-
∑HCHs	13.84	*3.160-60.644*	27.21	*10.114-73.225*	9.12	*2.934-28.357*	-	-
Dichlordiphenyl trichloroethanes (DDTs)								
p,p-DDT	0.63	*0.151-2.607*	-	-	2.15	*0.383-12.049*	-	-
o,p-DDT	0.51	*0.142-1.850*	-	-	1.65	*0.215-12.612*	-	-
p,p-DDE	0.46	*0.131-1.637*	0.93	*0.116-7.454*	1.99	*0.367-10.842*	-	-

	LICHEN (*C. rangiferina*) **(tissue)** (*n* =11)		MACRO ALGAE (*F. gardneri*) **(tissue)** (*n* =11)		SEDIMENTS **(*n* ponar grabs)** (*n* =12)		CAPELIN (*M. villosus*) **(whole body)** (*n* =8)	
% OC ± *SD*	-		-		0.18 ± 0.10		-	
% Lipid ± *SD*	0.525 ± 0.065		0.845 ± 0.21		-		1.41 ± 0.15	
% Lipid Equivalent (L_{Eq}) ± *SD*	2.30 ± 0.01		1.63 ± 0.20		0.06 ± 0.04		1.41 ± 0.15	
	GM	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
o,p-DDE	0.04	*0.012-0.122*	2.19	-	0.46	*0.033-6.335*	-	-
p,p-DDD	0.24	*0.059-0.951*	0.22	-	0.71	*0.158-3.233*	-	-
o,p-DDD	0.14	*0.035-0.563*	-	-	1.21	-	-	-
SUM DDTs	1.69	*0.414-6.866*	1.31	*0.101-16.906*	3.41	*0.563-20.629*	-	-
Cyclodienes								
aldrin	-	-	2.91	-	25.25	-	-	-
heptachlor	0.01	*0.003-0.011*	0.02	-	0.20	-	-	-
heptachlor epoxide	1.46	*0.582-3.676*	0.61	*0.200-1.892*	-	-	-	-
octachlorostyrene	0.09	*0.025-0.310*	-	-	0.08	*0.017-0.423*	-	-
trans-chlordane	-	-	3.22	-	37.47	-	-	-
cis-chlordane	0.23	*0.064-0.797*	-	-	1.03	*0.317-3.377*	-	-
trans-nonachlor	0.39	*0.089-1.745*	0.53	*0.018-15.573*	1.88	*0.297-11.911*	-	-
cis-nonachlor	0.24	*0.068-0.822*	0.04	-	0.37	*0.096-1.451*	-	-
oxychlordane	-	-	1.92	-	9.38	-	-	-
α-endosulfan	-	-	-	-	0.16	-	-	-
β-endosulfan	0.03	-	-	-	0.33	-	-	-
endosulfan sulfate	-	-	-	-	0.16	-	-	-
dieldrin	1.00	*0.321-3.117*	0.77	*0.254-2.323*	1.94	*0.702-5.362*	-	-
methoxychlor	-	-	-	-	-	-	-	-
mirex	0.03	*0.007-0.088*	0.39		0.32	*0.042-2.492*	-	-
∑Chlordanes	0.86	*0.208-3.542*	0.83	*0.021-32.549*	3.16	*0.501-19.943*	-	-

	COD (*B. saida*) **(muscle)** (*n* = 12)		SCULPIN (*M. scorpioides*) **(muscle)** (*n* = 12)		SALMON (*Salmo sp.*) **(muscle)** (*n* = 7)		BIVALVES (*M. edulis*) **(muscle)** (*n* = 11)	
% Lipid ± *SD*	1.12 ± 0.05		1.24 ± 0.16		5.41 ± 0.27		0.6 ± 0.12	
% Lipid Equivalent (L_{Eq}) ± *SD*	1.12 ± 0.05		1.24 ± 0.16		5.41 ± 0.27		1.8 ± 0.12	
	GM	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Chlorobenzenes (CBz)								
1,3,5 TriCBz	0.20	*0.054-0.747*	0.36	-	0.16	*0.016-1.579*	0.15	*0.060-0.378*
1,2,4 TriCBz	3.08	*1.205-7.858*	4.83	*1.274-18.300*	2.35	*0.601-9.188*	5.53	*2.227-13.718*
1,2,3 TriCBz	0.52	*0.184-1.486*	0.44	*0.071-2.757*	0.13	*0.021-0.842*	0.11	*0.036-0.344*
1,2,3,5/1,2,4,5 TeCBz	0.48	*0.193-1.197*	1.16	*0.167-8.059*	0.10	*0.025-0.439*	0.10	*0.027-0.351*
1,2,3,4 TeCBz	0.65	*0.259-1.627*	0.20	*0.032-1.243*	0.26	*0.064-1.028*	0.26	*0.074-0.885*
PeCBz	0.89	*0.400-2.001*	2.62	*0.543-12.635*	1.47	*0.424-5.130*	0.37	*0.114-1.204*
HCB	22.32	*8.280-60.164*	13.96	*5.107-38.173*	35.43	*11.870-105.754*	1.06	*0.408-2.749*
∑CBz	27.64	*11.296-67.623*	25.38	*10.471-61.513*	39.73	*13.449-117.368*	7.53	*3.077-18.418*
Hexachlorocyclohexanes (HCHs)								
α-HCH	14.46	*4.675-44.724*	18.2	*8.095-40.853*	14.91	*4.803-46.306*	5.647	*2.348-13.583*
β-HCH	0.84	*0.214-3.267*	1.25	*0.545-2.882*	0.47	*0.127-1.762*	3.660	-
γ-HCH	2.47	*0.800-7.601*	3.41	*1.490-7.814*	3.24	*1.000-10.473*	1.041	-
∑ HCHs	9.84	*1.532-63.151*	12.23	*1.704-87.702*	18.54	*5.976-57.540*	5.835	*2.273-14.980*
Dichlordiphenyltrichloroethanes (DDTs)								
p,p-DDT	2.84	*0.693-11.647*	2.54	*0.987-6.535*	6.86	*2.230-21.096*	-	
o,p-DDT	0.86	*0.218-3.37*	-	-	4.66	*1.460-14.864*	-	
p,p-DDE	42.14	*10.045-176.8*	24.63	*6.252-97.051*	51.12	*16.718-156.30*	1.110	*0.461-2.675*
o,p-DDE	0.15	*0.049-0.438*	-	-	0.13	*0.018-0.932*	-	-
p,p-DDD	4.39	*1.047-18.426*	1.04	*0.420-2.563*	8.05	*2.599-24.934*	-	-
o,p-DDD	0.92	*0.325-2.583*	0.52	-	2.68	*0.922-7.800*	-	-
∑DDTs	50.08	*12.1-206.2*	26.6836	*6.461-110.204*	73.92	*24.458-223.398*	1.110	*0.461-2.675*

	COD (*B. saida*) **(muscle)** (*n* = 12)		SCULPIN (*M. scorpioides*) **(muscle)** (*n* = 12)		SALMON (*Salmo sp.*) **(muscle)** (*n* = 7)		BIVALVES (*M. edulis*) **(muscle)** (*n* = 11)	
% Lipid ± *SD*	1.12 ± 0.05		1.24 ± 0.16		5.41 ± 0.27		0.6 ± 0.12	
% Lipid Equivalent (L_{Eq}) ± *SD*	1.12 ± 0.05		1.24 ± 0.16		5.41 ± 0.27		1.8 ± 0.12	
	GM	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Cyclodienes								
aldrin	-	-	-	-	0.07	*0.026-0.198*	-	-
heptachlor	0.02	-	-	-	0.03	-	-	-
heptachlor epoxide	4.85	*1.745-13.502*	3.89	*1.220-12.376*	-	-	-	-
octachlorostyrene	2.00	*0.448-8.946*	0.46	*0.184-1.170*	1.51	*0.469-4.865*	-	-
trans-chlordane	-	-	-	-	-	-	-	-
cis-chlordane	5.84	*1.703-20.050*	4.82	*1.631-14.244*	22.63	*6.317-81.030*	0.313	-
trans-nonachlor	12.80	*3.792-43.187*	24.42	*10.249-58.176*	53.60	*14.500-198.116*	1.678	*0.720-3.914*
cis-nonachlor	8.08	*2.018-32.371*	6.12	*1.761-21.243*	15.13	*5.108-44.841*	-	-
oxychlordane	8.58	*2.216-33.177*	5.74	*0.738-44.645*	-	-	0.168	*0.072-0.391*
α-endosulfan	-	-	-	-	0.41	-	-	-
β-endosulfan	2.91	*1.266-6.692*	-	-	0.85	-	-	-
endosulfan sulfate	-	-	-	-	0.18	-	-	-
dieldrin	8.74	*3.331-22.929*	8.45	*2.662-26.802*	15.92	*4.873-51.993*	2.303	*0.895-5.923*
methoxychlor	-	-	-	-	-	-	-	-
mirex	0.95	*0.240-3.757*	1.02	*0.376-2.759*	0.84	*0.276-2.559*	0.196	*0.085-0.450*
∑Chlordanes	21.48	*5.837-79.034*	20.32	*2.927-141.026*	29.30	*5.587-153.688*	1.764	*0.794-3.917*

	MALE BELUGA (Age 16-35) (*D. leucas*) (Blubber) (*n* = 21)		FEMALE BELUGA (Age 5-35) (*D. leucas*) (Blubber) (*n* = 14)	
% Lipid ± *SD*	89.4 ± 0.53		89.7 ± 0.17	
% Lipid Equivalent (L_{Eq}) ± *SD*	89.4 ± 0.53		89.7 ± 0.17	
	GM	*(95% CL)*	**GM**	*(95% CL)*
Chlorobenzenes (CBz)				
1,3,5 TriCBz	0.20	*0.041-1.017*	0.18	*0.042-0.802*
1,2,4 TriCBz	4.56	*1.201-17.310*	6.58	*2.007-21.603*
1,2,3 TriCBz	0.21	*0.054-0.808*	0.24	*0.071-0.789*
1,2,3,5/1,2,4,5 TeCBz	2.69	*0.953-7.594*	1.23	*0.343-4.401*
1,2,3,4 TeCBz	2.67	*0.846-8.403*	2.18	*0.582-8.180*
PeCBz	17.50	*5.604-54.619*	7.74	*1.993-30.084*
HCB	345.52	*133.31-895.55*	93.29	*24.34-357.55*
∑CBz	376.97	*148.62-956.15*	111.70	*30.11-414.32*
Hexachlorocyclohexanes (HCHs)				
α-HCH	34.11	*4.571-254.515*	57.50	*15.75-209.81*
β-HCH	42.26	*14.82-120.50*	15.55	*4.75-50.821*
γ-HCH	30.75	*8.921-105.962*	16.42	*5.29-50.93*
∑HCHs	119.32	*32.53-437.57*	95.20	*33.31-272.00*
Dichlordiphenyltrichloroethanes (DDTs)				
p,p-DDT	428.16	*97.11-1,887.7*	75.45	*17.32-328.55*
o,p-DDT	468.05	*121.3-1,805.9*	65.01	*14.31-295.16*
p,p-DDE	1702.1	*430.2-6,733.7*	305.71	*65.57-1,425.2*
o,p-DDE	3.68	*0.512-26.38*	0.60	*0.048-7.534*
p,p-DDD	294.42	*66.41-1,305.2*	54.12	*14.292-204.94*

	MALE BELUGA (Age 16-35) (*D. leucas*) (Blubber) (*n* = 21)		FEMALE BELUGA (Age 5-35) (*D. leucas*) (Blubber) (*n* = 14)	
% Lipid ± *SD*	89.4 ± 0.53		89.7 ± 0.17	
% Lipid Equivalent (L_{Eq}) ± *SD*	89.4 ± 0.53		89.7 ± 0.17	
	GM	*(95% CL)*	**GM**	*(95% CL)*
o,p-DDD	69.09	*11.874-401.98*	10.91	*3.069-38.790*
∑DDTs	2521.53	*695.0-9,147.8*	519.39	*119.5-2,255.9*
Cyclodienes				
aldrin	0.34	*0.041-2.809*	0.08	*0.010-0.613*
heptachlor	1.00	*0.214-4.720*	0.07	*0.019-0.269*
heptachlor epoxide	200.45	*70.58-569.21*	-	-
octachlorostyrene	4.42	*1.499-13.059*	2.43	*0.728-8.127*
trans-chlordane	7.75	-	11.55	*3.202-41.639*
cis-chlordane	168.92	*50.719-562.56*	57.87	*16.113-207.85*
trans-nonachlor	871.84	*289.7-2,623.7*	306.91	*82.6-1,139.91*
cis-nonachlor	119.30	*39.1-363.7*	56.45	*17.9-177.6*
oxychlordane	732.37	*281.0-1,908.7*	-	-
α-endosulfan	-	-	-	-
β-endosulfan	12.56	*4.504-35.053*	4.87	*1.232-19.213*
endosulfan sulfate	0.86	*0.212-3.514*	0.58	*0.113-3.000*
dieldrin	17.01	*0.862-335.570*	23.98	*0.596-964.243*
methoxychlor	-	-	0.16	-
mirex	23.79	*6.519-86.831*	10.30	*2.323-45.676*
∑Chlordanes	234.35	*10.0-5,472.2*	407.73	*114.9-1,446.8*

	FEMALE RINGED SEALS (*P. hispida*) (Blubber) (*n* = 7)		MALE RINGED SEALS (*P. hispida*) (Blubber) (*n* = 7)		EIDER DUCKS (*S. mollissima*) (Liver) (*n* =6)		WHITE WINGED SCOTERS (*M. fusca*) (Liver) (*n* = 5)	
% Lipid ± *SD*	71.2 ± 2.81		73.4 ± 4.63		3.47 ± 0.81		5.65 ± 1.25	
% Lipid Equivalent (L_{Eq}) ± *SD*	71.2 ± 2.81		73.4 ± 4.63		3.47 ± 0.81		5.65 ± 1.25	
	GM	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
Chlorobenzenes (CBz)								
1,3,5 TriCBz	0.17	*0.065-0.437*	0.20	*0.031-1.286*	-	-	-	-
1,2,4 TriCBz	10.20	*5.020-20.723*	6.75	*1.219-37.319*	-	-	-	-
1,2,3 TriCBz	0.21	*0.085-0.530*	0.22	*0.037-1.306*	17.47	-	-	-
1,2,3,5/1,2,4,5 TeCBz	8.05	*1.876-34.571*	6.10	*0.882-42.189*	4.09	*1.321-12.670*	1.04	*0.395-2.717*
1,2,3,4 TeCBz	0.91	*0.380-2.193*	1.65	*0.393-6.909*	13.27	*4.085-43.081*	0.96	*0.302-3.032*
PeCBz	6.12	*2.219-16.899*	8.60	*2.451-30.189*	1.65	*0.404-6.763*	2.82	*0.495-16.057*
HCB	14.18	*5.123-39.266*	31.02	*3.450-278.939*	98.53	*25.353-382.905*	79.59	*30.777-205.812*
∑CBz	*40.58*	*14.76-111.5*	78.11	*17.23-354.0*	62.09	*11.858-325.148*	83.89	*31.971-220.113*
Hexachlorocyclohexanes (HCHs)								
α-HCH	182.82	*48.08-695.0*	81.96	*6.50-1,032.62*				
β-HCH	12.88	*2.741-60.542*	21.88	*5.613-85.278*	19.11	*4.828-75.674*	10.16	*3.716-27.764*
γ-HCH	8.47	*2.380-30.137*	9.97	*1.845-53.857*	-	-	-	-
∑HCHs	204.32	*53.17-785.12*	145.33	*24.46-863.51*	19.11	*4.828-75.674*	10.16	*3.716-27.764*
Dichlordiphenyltrichloroethanes (DDTs)								
p,p-DDT	48.56	*4.943-477.102*	44.83	*9.574-209.945*	3.56	*1.357-9.357*	4.53	*1.953-10.527*
o,p-DDT	0.24	-	6.80	*0.03-1,558.21*	5.48	-	2.40	
p,p-DDE	426.16	*37.9-4,789.5*	347.91	*147.1-822.4*	224.21	*55.325-908.639*	645.66	*126.979-3,283.008*
o,p-DDE	0.05	*0.015-0.169*	0.21	*0.010-4.505*	0.60	-	-	-
p,p-DDD	6.40	*1.155-35.423*	12.53	*1.430-109.737*	7.69	*1.673-35.339*	9.90	*3.022-32.464*
o,p-DDD	-	-	3.38	*0.114-100.514*	-	-	1.66	*0.681-4.065*

	FEMALE RINGED SEALS (*P. hispida*) **(Blubber)** (*n* = 7)		**MALE RINGED SEALS** (*P. hispida*) **(Blubber)** (*n* = 7)		**EIDER DUCKS** (*S. mollissima*) **(Liver)** (*n* =6)		**WHITE WINGED SCOTERS** (*M. fusca*) **(Liver)** (*n* = 5)	
% Lipid ± *SD*	71.2 ± 2.81		73.4 ± 4.63		3.47 ± 0.81		5.65 ± 1.25	
% Lipid Equivalent (L_{Eq}) ± *SD*	71.2 ± 2.81		73.4 ± 4.63		3.47 ± 0.81		5.65 ± 1.25	
	GM	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*	**GM**	*(95% CL)*
∑DDTs	482.55	*44.0-5,291.2*	413.31	*174.121-981.0*	233.31	*57.048-954.173*	667.80	*135.7-3,285.5*
Cyclodienes								
aldrin	-	-	0.18	*0.022-1.496*	0.47	*0.236-0.953*	0.70	-
heptachlor	0.38	*0.050-2.938*	0.36	*0.103-1.275*	0.07	-	-	-
heptachlor epoxide	-	-	90.03	-	-	-	-	-
octachlorostyrene	2.43	*0.398-14.867*	0.39	*0.006-23.527*	4.68	*1.425-15.383*	2.03	*0.690-5.996*
trans-chlordane	10.21	*2.100-49.632*	6.90	*2.267-20.988*	-	-	-	-
cis-chlordane	36.28	*3.318-396.737*	23.93	*8.928-64.130*	3.75	-	3.82	-
trans-nonachlor	84.29	*9.177-774.178*	84.52	*18.33-389.4*	33.09	*15.050-72.748*	20.10	*7.552-53.517*
cis-nonachlor	10.26	*1.581-66.582*	9.37	*1.916-45.775*	15.24	*3.051-76.159*	7.01	*2.337-21.056*
oxychlordane			268.36	-	173.34	*76.081-394.917*	693.35	*304 -1,579*
α-endosulfan			0.30	*0.101-0.874*	2.32	-	-	-
β-endosulfan	3.02	*0.269-33.913*	2.26	*0.624-8.179*	-	-	-	-
endosulfan sulfate	0.19		0.32	*0.100-1.011*	-	-	0.87	-
dieldrin	125.84	-	54.64	*15.06-198.15*	194.36	*71.098-531.33*	109.38	*42.42-281.96*
methoxychlor	0.06	-	-	-	-	-		
mirex	4.45	*0.406-48.715*	3.46	*0.773-15.518*	18.95	*4.264-84.190*	11.02	*3.424-35.473*
∑Chlordanes	145.55	*16.40-1,291.3*	69.82	*7.058-690.644*	25.02	*4.089-153.030*	7.68	*0.723-81.542*

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