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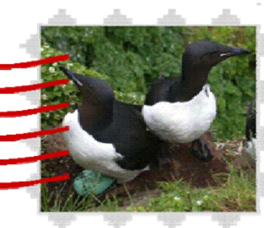

SEABIRD TISSUE ARCHIVAL AND MONITORING PROJECT: Egg Collections and Analytical Results for 2002-2005

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February 2009

Erratum: *Glaucous gull eggs were not collected from the Penny River delta, but rather at a colony approximately 24 km to the west-northwest in the Sinuk River delta. This correction does not affect the findings of the report.*

Table of Contents

List of Tables

List of Figures

List of Appendices

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Abbreviations

AMAP	Arctic Monitoring and Assessment Programme
ANOVA	Analysis of Variance
BDE	Brominated diphenyl ether
BIA-ARSB	Bureau of Indian Affairs - Alaska Regional Subsistence Branch
BLKI	Black-legged kittiwake, *Rissa tridactyla*
BuSn	Butyltin
CH_2Cl_2; DCM	Dichloromethane (Methylene chloride)
CM	Control material
COMU	Common murre, *Uria aalge*
DBT	Dibutyltin
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
EI	Electron impact
GC	Gas chromatography
GLGU	Glaucous gull, *Larus hyperboreus*
GWGU	Glaucous-winged gull, *Larus glaucescens*
HBCDD	Hexabromocyclododecane
HCB	Hexachlorobenzene
HCH	Hexachlorocyclohexane
HCl	Hydrochloric acid
HDBP	Halogenated dimethyl bypyrrole
Hg	Mercury
ID-CV-ICPMS	Isotope dilution cold vapor inductively coupled plasma mass spectrometry
iHG	Inorganic mercury
LOD	Limit of detection
LOQ	Limit of quantitation
MANOVA	Multivariate analysis of variance
MBT	Monobutyltin
MeHg	Monomethylmercury
MS	Mass spectrometry
NCI	Negative chemical ionization
NPRB	North Pacific Research Board
PBDE	Polybrominated diphenyl ether
PCA	Principal components analysis
PCB	Polychlorinated biphenyl
PFE	Pressurized fluid extraction
POP	Persistent Organic Pollutants
RSD	Relative standard deviation
SEC	Size exclusion chromatography
SID-GC/ICP-MS	Speciated isotope dilution and gas chromatography inductively coupled plasma mass spectrometry
SIM	Selected ion monitoring
Sn	Tin
$SnCl_2$	Tin chloride
SPE	Solid phase extraction
SRM	Standard reference material
STAMP	Seabird Tissue Archival and Monitoring Project
TASSC	The Alaska Sea Otter and Steller Sea Lion Commission
TBMU	Thick-billed murre, *Uria lomvia*
TBT	Tributyltin
THg	Total mercury
UNMU	Unidentified murre, *Uria* spp.
USFWS-AMNWR	United States Fish and Wildlife Service - Alaska Maritime National Wildlife Refuge
USGS-BRD	United States Geological Survey - Biological Resources Division

Abstract

The Seabird Tissue Archival and Monitoring Project (STAMP) has continued to collect and bank murre and gull eggs to obtain new information on chlorinated pesticides, polychlorinated biphenyls (PCBs), brominated flame retardants, mercury, and organotin (butyltin) compounds in Alaska's marine environments. Between 2002 and 2005 781 murre and gull egg clutches were banked at the National Institute of Standards and Technology's Marine Environmental Specimen Bank using established protocols. Analyses of 139 clutches confirmed the presence of geographic contaminant patterns in the Gulf of Alaska and Bering Sea. They also verified that persistent organic pollutant (POP) and mercury levels in Gulf of Alaska murre eggs differed from Bering and Chukchi sea levels, and suggested that POP patterns were similar in gull eggs (regional differences in mercury were not present in the gull eggs). Polybrominated diphenyl ethers (PBDEs) and organotins were documented in Alaskan seabird eggs for the first time. Evidence was found that some POPs (e.g., DDT) declined in murre eggs over the last 30 years and that others may also be declining (PCBs and HCB at St. Lazaria Island). Mercury levels in murre eggs were similar to values reported from other parts of the world. Geographic patterns in organotins in murre eggs differed from POPs and mercury patterns found in the same eggs. Levels were higher in the Gulf of Alaska and Chukchi Sea than in the Bering Sea. Organotin values in murre eggs were also about 2.5 times higher and less variable than the levels in gull eggs, a difference that probably reflects differences in foraging habitats and strategies.

Introduction

More than 95% of the seabirds breeding in the continental United States nest at colonies in the Bering and Chukchi seas and Gulf of Alaska (see USFWS 1992). In 1999, the U.S. Fish and Wildlife Service Alaska Maritime National Wildlife Refuge (USFWS-AMNWR), the U.S. Geological Survey Biological Resources Division (USGS-BRD), and the National Institute of Standards and Technology (NIST) implemented the Seabird Tissue Archival and Monitoring Project (STAMP) to monitor contaminants in Alaska's marine environments. The project was designed as an ongoing 100-year-long effort to track trends in environmental quality by collecting Alaskan seabird eggs using standardized protocols, processing and banking the contents under conditions that ensure chemical stability during long-term (decadal) storage, and analyzing subsamples of the stored material to determine current baseline levels of persistent bioaccumulative contaminants (e.g., chlorinated pesticides, polychlorinated biphenyls [PCBs], brominated flame retardants [polybrominated diphenyl ethers—PBDEs], butyltin compounds, and mercury).

Seabirds are an important group of upper trophic level marine organisms with potential for accumulating lipophilic contaminants. Analyses of seabird tissues, particularly eggs, have played important roles in temporal and spatial environmental monitoring of persistent organic pollutants (POPs—e.g., PCBs and chlorinated pesticides) and mercury in Canada and Europe.The Canadian Wildlife Service successfully documented temporal changes in PCBs, chlorinated pesticides, and PBDEs in the Great Lakes by analyzing herring gull (*Larus argentatus*) eggs that were collected and banked as part of its Wildlife Toxicology Program (see Wakeford and Kasserra 1997, Norstrom *et al.* 2002, Norstrom and Hebert 2006). Temporal changes in PCB, chlorinated pesticide, and mercury levels were documented in the eastern Canadian arctic by analyzing northern fulmar (*Fulmarus glacialis*), black-legged kittiwake (*Rissa tridactyla*), and thick-billed murre (*Uria lomvia*) eggs (see Braune *et al.* 2001), and in the Barents and Baltic seas by analyzing murre (*Uria* spp.) eggs (see Barrett *et al*. 1996 and Bignert *et al.* 1995, respectively). Also, a study designed to find 'new' environmental contaminants successfully used Vancouver Island Leach's storm petrel (*Oceanodroma leucorhoa*) eggs to identify a new family of biomagnifying halogenated organic compounds (halogenated dimethyl bypyrroles—HDBPs) that are produced naturally in marine systems (see Tittlemier and Norstrom 2004).

The international Arctic Monitoring and Assessment Programme (AMAP) identified eggs from the seabird family Alcidae (murres, murrelets, auklets, guillemots, puffins, dovekies, and razorbills—all diving species) as key tissues for circumpolar monitoring of POPs by all arctic nations (AMAP Scientific Experts Workshop, Girdwood, Alaska, April 1998). The AMAP report on the state of the arctic environment summarized information on POPs and mercury levels in seabirds inhabiting the northern regions of Canada and Scandinavia. Data in this report show that POP levels in seabird eggs were higher in the Scandinavian arctic than in the Canadian arctic, and, within Canada, levels were higher in the high eastern arctic regions than in the lower western arctic regions. Also, PCB levels approaching those known to affect hatching success were found in thick-billed murre, common murre (*U. aalge*), puffin (*Fratercula* spp.), black guillemot (*Cepphus grylle*), and black-legged kittiwake eggs from colonies in northern Canada and Norway (AMAP 1998).

Before STAMP was implemented, little was known about contaminants in Alaskan seabirds. POPs and mercury values cannot be extrapolated from the Canadian arctic database to Alaska, because sources and transport routes are different. Atmospheric and oceanic transport of contaminants from Southeast Asia eastward and northward into the Gulf of Alaska and southern Bering Sea, and oceanic transport eastward and southward along the northern and eastern coasts of Siberia into the western Chukchi and Bering seas probably influence overall contaminant patterns and levels in Alaskan seabirds. Local sources, including former and existing military installations, are also likely to play roles in Alaskan pollution patterns.

Prior to STAMP, information on contaminants in Alaskan seabirds consisted of data on a small number of organochlorine analytes in seabird eggs collected in the 1970s (see Ohlendorf *et al.* 1982) and chlordane levels in thick-billed murre tissues obtained in the North Pacific and Gulf of Alaska in 1980 and 1982 (see Kawano *et al.* 1988). More recently in 2000, the Alaska Sea Otter and Steller Sea Lion Commission (TASSC) analyzed gull eggs from five Alaskan communities (Kotzebue, Mekoryuk, Togiak, Unalaska, and Sitka) for POPs and heavy metals (see Jack and Martinez 2003), and a study of native subsistence foods obtained some information on POPs in unidentified murre eggs from St. Lawrence Island (see Pagano *et al.* 2003).

Numbers of seabird colonies and species targeted by STAMP have evolved since 1999. Criteria for selecting study sites and species now include the overall geographic distribution and regional importance of the nesting colonies; their location relative to onshore, nearshore, and offshore environments; the feasibility of collecting eggs at the colonies; the trophic position and foraging strategies of the birds; the foraging habitats used by the birds; and the use of the birds' eggs in rural subsistence diets. In 1999, STAMP began collecting common and thick-billed murre eggs, and in 2001, the program was expanded to include black-legged kittiwake eggs. In 2004, glaucous gull (*Larus hyperboreus*) and glaucous-winged gull (*L. glaucescens*) eggs were added to the project through partial funding from the Bureau of Indian Affairs Alaska Region Subsistence Branch (BIA-ARSB). Gulls were included because they not only feed on a wide variety of fish and invertebrates, they also scavenge on marine mammal carcasses and refuse in community dumps and land-fills, where they have opportunities to be exposed to relatively high levels of anthropogenic contaminants. These contaminants, if ingested, may be reflected in their eggs, which play important roles in many rural Alaskan subsistence diets. *Note: STAMP temporarily stopped collecting kittiwake eggs in 2005 to concentrate efforts on completing the murre and gull work.*

Since its inception, STAMP has considered murres to be the primary species of interest. Although both murre and gull eggs are harvested in many rural Alaskan coastal communities where they play important roles in local diets (e.g., see Iknokinok and Georgette 1997), murre eggs are particularly valuable for monitoring long-term trends in environmental quality. Both common and thick-billed murres feed at upper trophic levels and have the potential to accumulate and store contaminants in relatively large amounts, similar to many marine mammals (e.g., see Springer *et al.* 1984, 1986, 1987; Roseneau *et al.* 2000). However, some resource partitioning occurs between the two species that is probably reflected in contaminant loads. Both species take Pacific sand lance (*Ammodytes hexapterus*), capelin (*Mallotus villosus*), and small cod (e.g., walleye pollock, *Theragra chalcogramma*; Pacific cod, *Gadus macrocephalus*; saffron cod, *Eleginus gracilis*; Arctic cod, *Boreogadus saida*). However, thick-billed murres tend to forage farther from shore and at greater depths than common murres and they also feed on a variety of benthic species, including invertebrates, that they catch on or near the bottom (e.g., sculpins, Cottidae; pricklebacks, Stichaeidae; flatfish, Pleuronectidae; shrimp, including pandalids, hipploytids, and crangonids; and other invertebrates, including polychaetes; *Nereis* spp.). In contrast, common murres usually forage closer to shore at shallower depths on small mid-water fishes (e.g., see Swartz 1966, 1967, Springer *et al*. 1984, 1986, 1987; Roseneau *et al.* 2000).

Murres have several other attributes that make them desirable for tracking changes in contaminant levels in northern environments. In contrast to many species of birds, murres stay in northern latitudes year-round, and in Alaska, they winter in the Bering Sea and Gulf of Alaska (e.g., see Cramp 1985, Kaufman 1996, Hatch *et al.* 2000). As a consequence, murres accumulate POPs from relatively discrete regions and they only lay one egg per nesting season, which limits the effect of laying order on variability in contaminant loads (see Pastor *et al.* 1995). POP levels in the eggs represent the adult females at the time of laying (see Braune *et al.* 2001) and because murres arrive on their breeding grounds several weeks before they lay eggs (e.g., see Ehrlich *et al.* 1988, Gaston and Hipfner 2000), there is little doubt that the contaminants in their eggs represent these areas. Also, because murres are abundant and about 80% of the pairs that lose eggs early in the breeding season relay eggs within 15 days (e.g., see Tuck 1960, Cramp 1985), collecting small numbers of eggs does not detrimentally affect nesting populations. All of these factors were considered by the International Arctic Monitoring and Assessment Programme when they chose murre eggs as key tissues for long-term monitoring efforts in northern environments (see AMAP 1998).

In 2003, STAMP began focusing efforts on expanding the murre component of the project and creating a new gull module because of the importance of their eggs in many rural Alaskan subsistence diets. The gull component was initiated in May 2004, after the BIA-ARSB began funding egg collecting in some rural communities because several organizations and subsistence groups indicated that they wanted more information on contaminants in the eggs of these birds (e.g., Point Hope IRA Council Parks and Wildlife, Point Hope; Maniilaq Association Subsistence Division, Kotzebue; Natural Resources Division, Kawerak Inc., Nome; Native Village of Mekoryuk; St. George Traditional Council Island Sentinel Program; Togiak Traditional Council Environmental Program; Seldovia Village Tribe Environmental Program; Tatitlek IRA Council; and Sitka Tribe of Alaska).

Data from murre eggs obtained at colonies associated with deep oceanic habitats in the Bering and Chukchi seas and Gulf of Alaska have suggested that there are north-south and east-west geographical gradients in contaminant levels (see Christopher *et al.* 2002, Vander Pol *et al.* 2003, Vander Pol *et al.* 2004, Day *et al.* 2006). To help verify the presence of these trends, STAMP added more sampling sites to the project, including colonies in coastal mainland habitats (e.g., Cape Pierce, Cape Denbigh). Verifying geographic patterns is an important first step in identifying contaminant sources, transport routes, and pathways through marine food webs.

The original hypothesis was that there are geographic gradients in levels of POPs and mercury in Alaskan common murre eggs that are consistent through time.

Prediction 1: In common murre eggs, levels of POPs that have the lowest environmental mobility (e.g., PCBs, DDE) and mercury will be higher at colonies in the southeastern region of the state than at colonies in the western and northern regions of the state. This pattern will be similar at colonies influenced by deep oceanic habitats and colonies located in coastal mainland environments.

Prediction 2: In common murre eggs, levels of POPs that have the highest environmental mobility (e.g., hexachlorobenzene [HCB], and hexachlorocyclohexane [HCH]) will be higher at colonies in the northern and western regions of the state than at colonies in the southeastern regions of the state. This pattern will be similar at colonies influenced by deep oceanic habitats and colonies located in coastal mainland environments.

The project also compared data from thick-billed murre eggs obtained at one colony in the Chukchi Sea, two colonies in the Bering Sea, and one colony in Gulf of Alaska in 2002 with results from the common murre analyses to test a second hypothesis: that geographic differences in POPs and mercury are similar in the eggs of both species.

Because gull eggs are popular components of many subsistence diets, glaucous and glaucous-winged gull eggs obtained from two colonies in the Gulf of Alaska, four colonies in Bering Sea, and one colony in the Chukchi Sea were also analyzed for contaminants. Results from these analyses were compared with information from the murre eggs to test a third hypothesis: that geographic differences in POPs and mercury levels are similar in gull and murre eggs.

Information on organotin compounds in murre and gull eggs, specifically tributyltin (TBT) and two of its metabolites (dibutyl- and monobutyltin) is also reported here. The presence of TBT in marine ecosystems is largely the result of its use as a biocidal agent in antifouling paints used to keep vessel hulls free of algae and other organisms. TBT has been baaned in the US for boats smaller than 25 m since 1988, but is still allowed for large fishing and commercial vessels (FWS, 1992). The organotin data are the first to be reported from Alaskan seabirds, were used to test a fourth hypothesis: that geographic differences in organotin levels are similar to POPs and mercury in murre and gull eggs.

Methods

Study Area and Sampling Sites

Currently, the STAMP study area consists of 33 sampling sites in the Bering and Chukchi seas, Gulf of Alaska, and northeastern Pacific Ocean (see Fig. 1 and Table 1). Since 1999, 1189 egg clutches have been cryogenically banked at the Marine Enviornmental Specimen Bank (Marine ESB) located in the Hollings Marine Laboratory in Charleston, South Carolina (Table 2). Analytical results from 139 egg clutches collected from 21 of the locations in 2002-2005 are presented in this report (see Fig. 2 and Table 2). As time and funding did not allow all banked eggs to be analyzed, samples were chosen to help answer geographical, species, and temporal hypothesis. A sample size of 10 was originally used, but a power analysis revealed that an n of 5 was sufficient for murre eggs. The gull eggs were included to screen for contaminants, so only an n of 3 was used. Individual egg information for all samples collected is included in Appendix 1.

The presence of east-west gradients in contaminants in Gulf of Alaska common murre eggs was investigated by analyzing 30 eggs collected at St. Lazaria, Middleton, and East Amatuli islands in 2003, and 16 eggs obtained from St. Lazaria and Middleton islands in 2004, and comparing these data with information obtained from the St. Lazaria and East Amatuli island colonies in 1999-2001 (see Vander Pol *et al.* 2004 and Day *et al.* 2006). The combined data from St. Lazaria Island also provided temporal trend information for this colony over a five-year interval (1999-2004).

To help determine if the east-west gradients involved both offshore deep-water and coastal mainland colonies, 12 common murre eggs collected at Duck and Gull islands in 2004 were analyzed and compared with information obtained from St. Lazaria and Middleton islands in 2004 (see above). Because murre nesting chronology was unusually late and asynchronous in Kachemak Bay and Cook Inlet in 2004, only four eggs were obtained from Duck Island. However, in spite of the unusual circumstances, it was possible to obtain eight eggs at Gull Island in Kachemak Bay that could be used for this analysis.

To compare offshore and mainland nesting colonies 25 common murre eggs collected at Sledge Island (nearshore Norton Sound), Bluff (mainland Norton Sound), Cape Denbigh (mainland Norton Sound), Cape Pierce (mainland eastern Bering Sea), and Bogoslof Island (Aleutian Islands) were used for this analysis. Using these colonies was advantageous because it allowed another mainland colony to be included in the comparison, and it also allowed mainland murre colonies to be compared with mainland gull colonies in the same year (2005; see below).

Twenty-five (25) thick-billed murre eggs collected at Cape Lisburne and St. Lawrence, St. George, and St. Lazaria islands in 2002 were also analyzed to expand the database on contaminants in thick-billed murres and help determine if geographic patterns in egg contaminant levels were similar in both murre species. Also, over 130 glaucous (GLGU) and glaucous-winged (GWGU) gull eggs were collected at 11 nesting locations in 2005. Three clutches of eggs from seven of these sampling sites were selected for preliminary analysis to see if the geographic trends found in the murre eggs could also be detected in the gull eggs. Colonies included the Noatak River delta (GLGU, Kotzebue Sound), Penny River delta (GLGU, Norton

Sound), Hooper Bay (GLGU, northeastern Bering Sea), Shaiak Island (GWGU, nearshore western Bristol Bay), Ualik Lake (GWGU, coastal Bristol Bay), Middleton Island (GWGU, offshore Gulf of Alaska), and Viesokoi Rock (GWGU, nearshore southeastern Gulf of Alaska) (see Fig. 2).

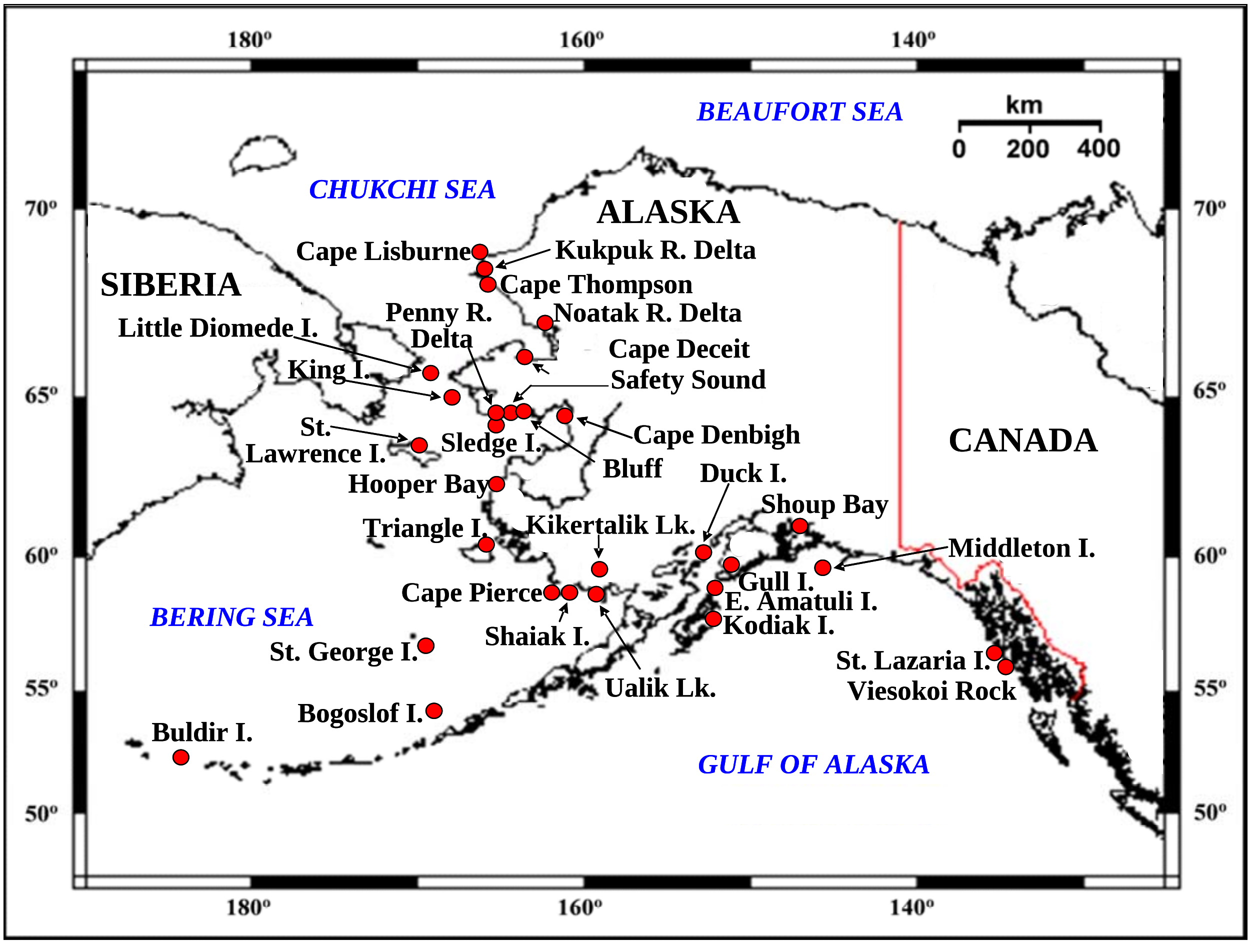

Figure 1. The 1999-2005 Seabird Tissue Archival and Monitoring Project (STAMP) seabird egg collection sites (see Table 1).

Table 1. The 1999-2005 Seabird Tissue Archival and Monitoring Project (STAMP) seabird egg collection sites (see Fig. 1).

Colony	Species Sampled
Cape Lisburne	Thick-billed Murre, Unidentified Murre
Kukpuk River delta	Glaucous Gull
Cape Thompson	Unidentified Murre
Noatak River delta	Glaucous Gull
Cape Deceit	Common Murre
Little Diomede Island	Unidentified Murre
King Island	Thick-billed Murre
Penny River delta	Glaucous Gull
Sledge Island	Common Murre
Safety Sound	Glaucous Gull
Bluff	Common Murre, Black-legged Kittiwake
Cape Denbigh	Common Murre
St. Lawrence Island	Common Murre, Thick-billed Murre
Hooper Bay	Glaucous Gull
Triangle Island	Glaucous Gull
Cape Peirce	Common Murre
Shaiak Island	Glaucous-winged Gull
Ualik Lake	Glaucous-winged Gull
Kikertalik Lake	Glaucous-winged Gull
St. George Island	Common Murre, Thick-billed Murre, Black-legged Kittiwake
Bogoslof Island	Common Murre, Thick-billed Murre
Buldir Island	Thick-billed Murre, Black-legged Kittiwake
Kodiak Island	Black-legged Kittiwake
Duck Island	Common Murre
Gull Island	Common Murre, Glaucous-winged Gull
East Amatuli Island	Common Murre
Shoup Bay	Black-legged Kittiwake
Middleton Island	Common Murre, Glaucous-winged Gull, Black-legged Kittiwake
St. Lazaria Island	Common Murre, Thick-billed Murre, Glaucous-winged Gull
Viesokoi Rock	Glaucous-winged Gull
Total Sampling Sites: 30	*Total Species Sampled: 5*

Table 2. Egg clutches banked by the Seabird Tissue Archival and Monitoring Project (STAMP) in the Marine Environmental Specimen Bank in Charleston, SC. *Note:* highlighted numbers indicate those analyzed for contaminants.

Colony	1999	2000	2001	2002	2003	2004	2005	Total	Water Body
Viesokoi Rock (Sitka) - GWGU						15	3 of 8	**23**	
St. Lazaria I. - COMU	10		10		10	8	7	**45**	
St. Lazaria I. - TBMU			10	8		5	6	**29**	
St. Lazaria I. - GWGU						6	8	**14**	
Middleton I. - BLKI			11	12	12	12		**47**	
Middleton I. - COMU					10 of 15	8 of 11	16	**42**	**Gulf of Alaska**
Middleton I. - GWGU						3	3 of 7	**10**	**356**
Shoup Bay - BLKI				9	12			**21**	
Gull I. - COMU						8 of 15	10	**25**	
Gull I. - GWGU						17	11	**28**	
Duck I. - COMU						4	15	**19**	
East Amatuli I. - COMU	11			7	10 of 15			**33**	
Chiniak Bay (Kodiak) - BLKI				8	12			**20**	
Buldir I. - BLKI					5			**5**	
Buldir I. - TBMU					1	11	12	**24**	
Bogoslof I. -COMU		9				10	5 of 11	**30**	
Bogoslof I. -TBMU		10				7	11	**28**	
St. George I. - BLKI				12	12			**24**	
St. George I. - COMU	11		1			15		**27**	
St. George I. - TBMU		7	12	10			9	**38**	
Kikertalik Lake (Bristol Bay) - GWGU							12	**12**	
Ualik Lake (Bristol Bay) - GWGU							3 of 8	**8**	
Shaiak I. - GWGU						13	3 of 36	**49**	
Cape Pierce - COMU							5 of 14	**14**	**Bering Sea**
Triangle I. (Nunivak) - GLGU						17		**17**	**460**
Hooper Bay - GLGU							3 of 19	**19**	
St. Lawrence I. - COMU				3				**3**	
St. Lawrence I. - TBMU				8	14			**22**	
Cape Denbigh - COMU						15	5 of 15	**30**	
Bluff - BLKI				6				**6**	
Bluff -COMU				11	12		5 of 14	**37**	
Safety Sound - GLGU						12	11	**23**	
Penny River delta - GLGU							3 of 6	**6**	
Sledge I. - COMU							5 of 14	**14**	
King I. - TBMU							15	**15**	
Little Diomede - UNMU	9							**9**	
Cape Deciet (Deering) - COMU						12		**12**	
Noatak River delta - GLGU							3 of 11	**11**	**Chukchi Sea**
Cape Thompson - UNMU				8			12	**20**	**76**
Cape Lisburne - TBMU				9				**9**	
Cape Lisburne - UNMU						24		**24**	
Total	**41**	**26**	**44**	**111**	**120**	**232**	**318**	**892**	

Species	Total
Black-legged Kittiwake (BLKI)	**123**
Common Murre (COMU)	**331**
Glaucous Gull (GLGU)	**76**
Glaucous-winged Gull (GWGU)	**144**
Murre Spp. (UNMU)	**53**
Thick-billed Murre (TBMU)	**165**

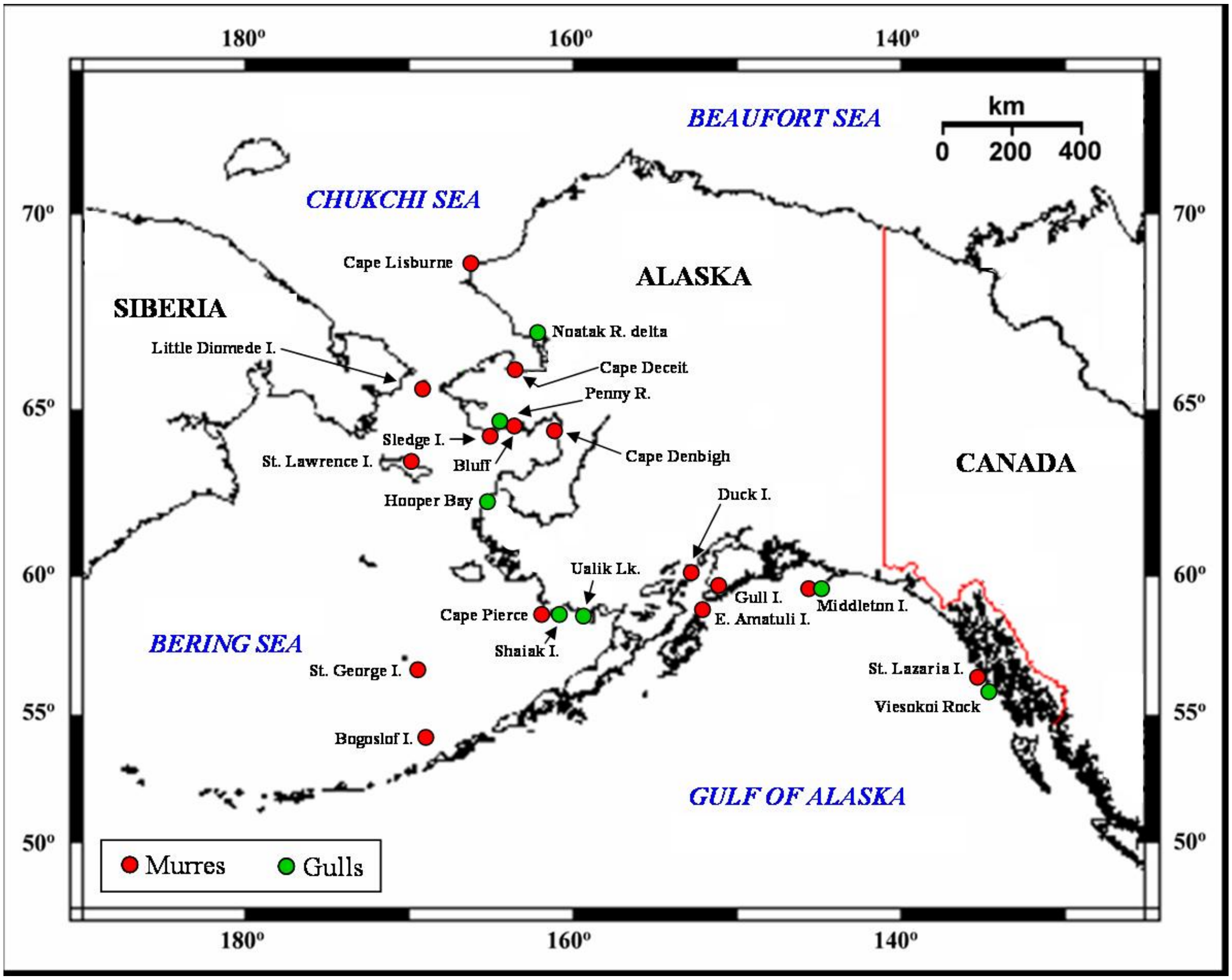

Figure 2. Murre and gull sampling sites compared in this study.

Collection Protocols and Egg Collecting Kits

STAMP developed protocols for collecting seabird eggs in 1999 (see York *et al.* 2001). In 2004, these protocols were revised to reflect new techniques for collecting, packaging, and transporting samples (see Appendices 2 and 3). Protocols will be revised again in 2008 to make them more user-friendly—about half of the written text will be replaced with laminated color photographs showing how to collect, bag, and package eggs.

Egg collection kits are shipped to participating partners' free-of-charge. Kits consist of Coleman 50-quart coolers or Rubbermaid Action Packers containing the collection protocols, all necessary state and federal permits, pre-printed shipping labels, several "keep upright – handle with care" and "keep cool – do not freeze" stickers, Ziploc bags, egg labels, disposable talc-free gloves, permanent markers and pencils, duct tape, and foam padding to protect the eggs (see Appendix 4). Murre kits also contain laminated photographs of common and thick-billed murres to help collectors identify these closely related species. STAMP pays return shipping costs.

Sample Processing and Banking

Eggs were processed at the Alaska Science Center in Anchorage, Alaska using previously devised protocols (see York *et al.* 2001). The eggs were cleaned with Type 1 water and measured (length, width, whole egg mass) before they were cut in half under a positive pressure laminar flow hood with a custom-made titanium knife. Murre eggs were processed individually and gull eggs from the same clutches were pooled. Egg shells were rinsed with Type 1 water, dried, weighed, placed in labeled Ziploc bags, and shipped to the University of Alaska Museum of the North in Fairbanks, Alaska for long-term storage.

Murre egg contents were poured into Teflon bags that were heat-sealed, weighed, put in labeled cardboard tubes, frozen, and shipped to the NIST Marine ESB in liquid nitrogen vapor dry shippers. At NIST they were removed from the tubes, broken into smaller pieces with Teflon-wrapped mallets, cryogenically homogenized (see Zeisler *et al.* 1983), and divided into 5 g aliquots. The samples were stored in labeled Teflon jars at -150°C in liquid nitrogen vapor freezers in the Marine ESB for later analysis.

The contents from each clutch of gull eggs were combined in a clean glass beaker and homogenized with a stainless steel kitchen hand blender (Oster 2614, Rye, New York). The blender blades and beaker were washed with soap and rinsed with Type 1 water, methanol, acetone, and hexane before they were used to process another clutch. Aliquots of the homogenized contents were put into Teflon jars and cryogenic polypropylene vials (Nunc International, Rochester, New York) and frozen before they were shipped to the NIST Marine ESB in liquid nitrogen vapor dry shippers. The samples were stored at -150^{o}C in liquid nitrogen vapor freezers at the Marine ESB for future analyses.

Analysis for Persistent Organic Pollutants (POPs)

Note: Methods for analyzing murre and gull eggs were almost identical (only the calibration and internal standard solutions used and gas chromatograph methods were different), so only the procedures used for murres are described below. Specific information on gull methods can be found in Vander Pol et al. (2009).

About 3 g of cryohomogenized egg contents were mixed with about 8 g of diatomaceous earth (this material was heated to 650 ^{o}C for 12 hours and then cooled in a desiccator before it was used). The mixture was transferred to a 33 mL pressurized fluid extraction (PFE) cell (ASE Dionex, Salt Lake City, Utah, NIST property tag number 582895). One half (0.5) mL of a mixed internal standard solution was added to the PFE cell using a gas-tight syringe that was weighed on a five-place analytical balance before and after dispensing the liquid into the cell. The internal standard solution contained ^{13}C labeled PCB congeners 28, 52, 118, 153, 180, 194, and 206; ^{13}C labeled 4,4-DDE, 4,4'-DDT, HCB, dieldrin, oxychlordane, *trans*-chlordane, *trans*-nonachlor, deuterated 4,4'-DDD (d_8); F labeled BDE congeners 47 and 160; and BDE 104. From 80 ng to 250 ng of each compound was added to the samples. Aliquots of standard reference material (SRM) 1946 (Lake Superior Fish Tissue) and murre egg homogenate control material (CM; see Vander Pol *et al.* 2007) were prepared using the same techniques.

One mL aliquots of six calibration solutions (A-F) were weighed in a gas-tight syringe and added to 11 mL PFE cells packed with clean diatomaceous earth. A small amount of diatomaceous earth was used to cover the calibration solution before adding 0.25 mL aliquots of 24 toxaphene congener calibration solutions (A-F) to the respective PFE cells. Another small amount of diatomaceous earth was added to cover the solution before adding the internal standard, and diatomaceous earth was also used to fill the remainder of the cells. The calibration solution contained SRMs 2257 (Brominated Diphenyl Ethers in Isooctane), 2258 (BDE 209 in Isooctane), and 2259 (Chlorinated Biphenyl Congeners in Isooctane), 2261 (Chlorinated Pesticides in Hexane), and 2275 (Chlorinated Pesticide Solution-II in Isooctane), and solutions of HBCDDs, octachlorostyrene, and pentachlorobenzene. Because the new SRMs 2257 and 2259 contain varying mass fractions that are generally higher than previously used SRMs, three stock solutions were created for (1) pentachlorobenzene, (2) SRM 2258, (3) SRM 2259, and (4) SRMs 2261, 2275, 2257, HBCDD, and octachlorostyrene to bracket the sample levels. The highest mass fraction stocks (labeled 1) for these four substances were gravimetrically combined to create Cal A, the middle mass fraction stocks (labeled 2) were combined for Cal B, and the lowest mass fraction stocks (labeled 3) were combined for Cal C. A portion of Cal A was diluted to make Cal D, Cal B was diluted to make Cal E, and Cal C was diluted to make Cal F. The final calibration curves ranged from 0.01 ng to 250 ng.

The samples, calibration solutions, and reference materials were extracted with CH_2Cl_2 using PFE. Conditions were as follows: cell temperatures 100 ^oC, equilibrations 5 minutes, static times 5 minutes, cell pressures 138 kPa, and three cycles using one-third of the solvent each time. The PFE tubing was rinsed with 8 mL of CH_2Cl_2 between every sample by selecting the "rinse" option and instructing the instrument to alternate between the solvent A and B channels (both vessels contained CH_2Cl_2).

Sample extracts were reduced to approximately 10 mL by evaporating them in a stream of purified N_2 using a Turbovap II (Zymark, Hopkinton, Massachusetts, NIST property tag numbers 582897 and 588387). Nonvolatile solvent extractable material ("lipid") analyses were run on the extracts and reference materials by gravimetrically weighing 2 mL of the extract into pre-weighed aluminum weighing dishes and allowing the solvent to evaporate before re-weighing. After the sample extracts were analyzed for lipids, they were reduced to 1 mL in the Turbovap. High molecular mass compounds were removed from the extracts by size exclusion chromatography (SEC) consisting of Phenogel 50 mm x 7.80 mm i.d; 10 µm particle size guard column (Phenomenex, Torrance, California, serial number 03B-2090-K0) coupled to a 600 mm x 21.2 mm (10 µm particle size with 100 Å diameter pores) Phenogel column (Phenomenex, Torrance, California, serial number 328-445-1) in series with a Phenogel 300 mm x 21.2 mm column (10 µm particle size with 100 Å diameter pores; Phenomenex, Torrance, California, serial number 328-080-1). A solvent of CH_2Cl_2 was delivered at 10 mL/minute. Absorbance was monitored at 254 nm using a UV/VIS detector (Linear, model 200, San Jose, California, NIST property tag number 587018). When the samples were injected, the first 162 mL of CH_2Cl_2 containing high molecular mass material was discarded. The next 83 mL, containing the analytes of interest, was collected and retained. The fractions were transferred to Turbovap tubes and reduced in volume, the solvents were replaced with iso-octane, and then the extracts were reduced again to 0.5 mL and transferred to amber GC autosampler vials.

Sample extracts were cleaned up using an automated solid phase extraction (SPE) cleanup step (Rapid Trace, Caliper Life Sciences, Hopkinton, Massachusetts, NOAA property tag number CD0001057862) utilizing 3 mL SPE cartridges. Alumina (50-200 µm; Arcōs Organics, Trenton, New Jersey) was activated by baking it at 650 °C overnight and then cooling it in a desiccator before it was used. The alumina was partially deactivated by adding 5% hexane-rinsed, deionized water (mass fraction). The deactivated substrate was packed between two frits at about 3.9 cm bed height in a 3 mL Bond Elut reservoir (Varian, Palo Alto, California). This produced about 1.8 g of alumina. The sample extracts were passed through the alumina columns and eluted with 9 mL of 35:65 dichloromethane (DCM):hexane (volume fraction) at 1.0 mL/minute. Before the samples were added to the columns, the columns were pre-eluted with 6 mL 50:50 DCM:hexane and 8 mL of hexane at 1.2 mL/minute. Between samples, the Rapid Trace performed a series of clean-up steps using DCM and hexane. The extracts were transferred to Turbovap tubes and reduced in volume, the solvents replaces with isooctane, and then the fractions were reduced again to 0.5 mL and transferred to amber GC autosampler vials.

Samples were analyzed using an electron impact (EI) GC/MS (Agilent 6890N/5975B, Palo Alto, California, serial number US62744375) operated in the selected ion monitoring mode (SIM) for selected chlorinated pesticides and all of the PCB and BDE congeners. The instrument was equipped with a 30 m x 0.18 mm x 0.18 µm i.d. DB-5MS column (J&W Scientific, serial number US6551723H) with a 5 m x 0.25 mm retention gap added to the beginning of the column. A PTV injector (Agilent 6850) was used to introduce the sample. The inlet was cooled with liquid nitrogen to 10 ^{o}C for 1.5 minutes during the injection of 20 µL (4 x 5 µL) of the sample, and the solvent vent flow rate was 65 mL/minute of nitrogen. The inlet was then heated at 720 ^{o}C/minute to the final transfer temperature of 250 ^{o}C with no hold time, and then ramped at 20 ^{o}C/minute to 280 ^{o}C and held for 10 minutes to bake off any remaining compounds from the liner. The GC oven was held at 80 ^{o}C for 1.5 minutes, ramped to 170 ^{o}C at 25 ^{o}C/minute, ramped to 270 ^{o}C at 2 ^{o}C/minute, then ramped to 325 ^{o}C at 25 ^{o}C/minute and held isothermally for 10 minutes (total run time 67.3 minutes). Helium was the carrier gas set at a constant flow rate of 0.7 mL/minute for the entire run. The quadrupole, source, and transfer line were maintained at 150 ^{o}C, 250 ^{o}C, and 300 ^{o}C, respectively. The samples were analyzed in two batches based on their collection dates (i.e., samples collected in 2003-2004 and samples collected in 2005).

Selected organochlorine pesticides were analyzed by GC/MS in the negative chemical ion (NCI) mode using SIM equipped with a 30 m x 0.18 mm x 0.18 µm i.d. DB-XLB column (J&W Scientific, serial number US3408013J) with a 5 m x 0.25 mm retention gap added to the beginning of the column. Methane was used as the reaction gas. The samples were injected using a PTV as detailed above. The GC oven was held at 120 ^{o}C for 1.0 minutes, ramped to 230 ^{o}C at 30 ^{o}C/minute, ramped to 260 ^{o}C at 10 ^{o}C/minute, ramped to 284 ^{o}C at 4.8 ^{o}C, and then ramped to 300 ^{o}C at 9.6 ^{o}C/minute and held isothermally for 1.67 minutes (16 minutes total run time). Helium was the carrier gas set at a flow rate of 1.5 mL/minute for 4.5 minutes, then increased to 50 mL/minute at 0.7 mL/minute for 8.5 minutes and 1.4 mL/minute for 3 minutes. The other conditions remained the same as the EI run. Samples were analyzed in 3 batches (separated by collection year).

Data were quantified by using at least 3 calibration points and allowing the intercept to float.

Analysis for Mercury (total, inorganic, and organic mercury)

Isotope dilution cold vapor inductively coupled plasma mass spectrometry (ID-CV-ICPMS) was used to determine total mercury (THg) levels in the egg samples. This technique has been described in detail elsewhere (see Christopher *et al.* 2002), and is only summarized here. Isotopically enriched ^{201}Hg spike solution (Oak Ridge National Laboratory) was prepared and calibrated using NIST SRM 3133 (Mercury Spectrometric Solution). The spike was then added quantitatively to a mass of sample (0.2 g to 1.0 g) to yield an isotopic ratio (^{201}Hg/^{202}Hg) that minimized random error propagation. Samples were then digested and equilibrated using microwave-assisted acid decomposition with high-purity nitric acid (Fisher Scientific, Suwanee, Georgia). Eggs collected before 2002 were digested in a Perkin-Elmer (Shelton, Connecticut) Multiwave microwave oven at the highest possible temperatures (up to 300 °C) and pressures (up to 8 MPa) using quartz microwave decomposition vessels and high-purity nitric acid. Egg samples collected in 2002 and in subsequent years were digested in a CEM Discover open-focus microwave programmed for a 15 watt ramp for 2 minutes, followed by a 70 watt ramp for 2 minutes, and a 70 watt hold for 8 minutes, resulting in typical digestion conditions of 100 ˚C and 15.5 kPa.

The digestant was mixed with a $SnCl_2$ and HCl reductant solution in a gas-liquid separator, allowing cold vapor transfer of the resulting Hg^0 in a stream of argon to the inductively coupled plasma mass spectrometer (ICPMS) injector. A VG Elemental Plasma Quad 3 ICPMS (Windsford, Cheshire, United Kingdom) using typical power and gas flow was used in time resolved analysis mode for measurement of isotope ratios.

Inorganic mercury (iHg) and monomethylmercury (MeHg) levels were determined by speciated isotope dilution and gas chromatography inductively coupled plasma mass spectrometry (SID-GC/ICP-MS) using a recently developed double-spike reaction transformation model (see Point *et al.* 2007a). This method was optimized to determine iHg and MeHg levels at ultratrace levels (pg Sn g^{-1}) in cryogenically archived fresh-frozen biological materials. About 1 g of sample material was weighed accurately into a clean 10 mL glass microwave extraction vessel, and spiked with ^{201}iHg (Oak Ridge National Laboratory, ORNL, Oak Ridge, Tennessee) and Me^{202}Hg (IRMM-670, Institute of Reference Materials and Measurements, Geel, Belgium). About 3 mL of tetramethylammonium hydroxide solution (25 % mass fraction in water, Alfa Aeser, Ward Hill, Massachusetts) was added to each sample. The samples were then digested in an Explorer open-focused microwave oven (CEM, Matthews, North Carolina) by applying 30 watts for 4.5 minutes. After extraction, the pH was adjusted to pH 5 using a sodium acetate/acetic acid buffer solution and the samples were derivatized using 1mL of hexane (Burdick and Jackson, Muskegon, Mississippi) and 0.1 mL of a 20 % (m/v) tetraethylborate solution (Alfa Aeser, Ward Hill, Massachusetts). The organic phase was collected and cleaned-up to remove lipids and proteins using Alumina solid phase extraction (SPE) cartridges. The organic phase was then analyzed by a Thermo Trace gas chromatograph (Austin, Texas) coupled to a Thermo Elemental X7 quadrupole ICP-MS (Winsford, United Kingdom) by a Thermo GC/ICP-MS commercial interface.

Detection limits were 9 and 22 pg Hg.g^{-1} for MeHg and iHg, respectively. Accuracy was tested against SRM 1947 and Egg Control Material QC04-ERM1 (see Vander Pol *et al.* 2007). Inorganic and MeHg levels measured in these materials were not significantly different from reference and certified mass fractions reported in the certificate of analysis and/or obtained by in-house precertification exercises.

Analysis for Organotin Compounds

Mono- (MBT), Di- (DBT) and Tributyltin (TBT) mass fractions were determined by speciated isotope dilution and gas chromatography inductively coupled plasma mass spectrometry (SID-GC/ICP-MS). This technique was optimized for the analysis and certification of BuSn compounds at ultratrace levels (pg Sn g^{-1}) in cryogenically archived fresh-frozen biological materials (see Point *et al.* 2007b). About 1 g of sample material was weighed accurately into a clean 10 mL glass microwave extraction vessel, and spiked with a ^{119}Sn-MBT, ^{119}Sn-DBT, ^{119}Sn-TBT Mix standard solution (ISC, Gijon, Spain). About 3 mL of a tetramethylammonium hydroxide solution (25 % mass fraction in water, Alfa Aeser, Ward Hill, Massachusetts) was added to each sample. The samples were then digested in an Explorer open-focused microwave oven (CEM, Matthews, North Carolina) by applying 30 watts for 4.5 minutes. After extraction, the pH was adjusted to pH 5 using a sodium acetate/acetic acid buffer solution and the samples were derivatized using 1mL of hexane (Burdick and Jackson, Muskegon, Mississippi) and 0.1 mL of a 20 % (m/v) tetraethylborate solution (Alfa Aeser, Ward Hill, tetramethylammonium hydroxide solution (25 % mass fraction in water, Alfa Aeser, Ward Hill, Massachusetts). The organic phase was collected and cleaned-up to remove lipids and proteins using Alumina solid phase extraction (SPE) cartridges. The organic phase was then concentrated to 0.1 mL under a N2 stream and analyzed by a Thermo Trace gas chromatograph (Austin, Texas) coupled to a Thermo Elemental X7 quadrupole ICP-MS (Winsford, United Kingdom) by a Thermo GC/ICP-MS commercial interface.

Detection limits were 1, 4 and 5 pg Sn g^{-1} for DBT, MBT and TBT, respectively. Accuracy was tested against CRM CE477 (IRMM, Geel, Belgium) and a newly issued matrix-match cryogenic biological material (SRM 1974b) displaying much lower BuSn reference mass fractions. BuSn mass fractions in these materials did not differ statistically from the certified values and their expanded uncertainty. Reproducibility was checked by analyzing 4 aliquots of homogenized eggs from one individual, yielding relative standard deviation (RSD) values of 1.3 %, 2.6 % and 6.9 % for MBT, DBT and TBT, respectively.

Statistical Methods

Statistical tests were conducted using commercially available software (SAS Institute, JMP 3.26, Cary, North Carolina). Individual one-way ANOVAs were run to identify differences among mercury and organotin levels, and pair-wise comparisons were made using Tukey-Kramer tests. Tests of assumptions for normality and equal variances were met. An overall ANOVA was performed including each sampling event (i.e. unique collection for a given species, location, and year) to look at variability within and among sampling events and allow inspection of temporal trends at colonies with repeat collections (Fig. 14). Subsequent ANOVA's grouped the collection events by species-region (Fig. 15), or by species-colony location within each region (Fig. 16).

For POPs, limits of detection (LODs) were calculated as the lowest observed calibration solutions divided by the sample masses, and limits of quantitation (LOQs) were calculated as the average blank values plus three times the standard deviations divided by the sample masses. Compounds below the maximums of the LOD or LOQ were assigned random numbers between zero and the LOD or LOQ values to derive the means, standard deviations, and errors for each colony.

For murres, multivariate analysis of variances (MANOVAs) were run on a lipid-mass basis for compounds that did not have values below detection limits (13 PCB congeners; congeners 28+31, 66, 99, 105, 118, 138, 146, 153+132, 163, 170, 180+193, 183, and 187 were summed because the degrees of freedom were constrained) for inshore-offshore differences within the Bering Sea and the Gulf of Alaska regions, and for temporal changes in the St. Lazaria common murre eggs, including the previously analyzed 1999 and 2001 samples (this was only done for compounds that had reference material values for all years). Temporal MANOVAs were also run on the 1999 East Amatuli and 2000 Bogoslof island eggs to allow them to be compared with results from this study. If differences were significant ($P < 0.05$), individual ANOVAs and Tukey-Kramer post-hoc tests were used to check for differences between colonies. A principal components analysis (PCA) was also run on the total percentages of compounds to help visualize patterns in the results.

In the case of gulls, degrees of freedom were also constrained, and MANOVAs were run on a lipid mass basis for major compound classifications by region and species. Compounds included ΣPCBs, ΣBDEs, ΣDDTs, ΣHCHs, Σchlordanes, heptachlor epoxide, HCB, dieldrin, and mirex. If differences were significant ($P < 0.05$), individual ANOVAs and Tukey-Kramer post-hoc tests were used to identify the compounds and species that were different. A principal components analysis was also run on a lipid mass basis for the percentages of total compounds with no samples that fell below detection limits (36 PCB congeners, 14 organochlorine compounds, and 5 BDE congeners).

Results

Persistent Organic Pollutants (POPs)

Reference materials were generally within expected ranges (see Appendices 5-7). Total extractable organic (percent lipid) values were about 10%, and this variable was significantly higher in the Cape Pierce 2005 murre eggs than in the 2003 Middleton Island murre eggs (see Fig. 3 and Appendix 5). Levels of POPs in common murre eggs collected during 2003-2005 varied from below detection limits to 286 ng g^{-1} wet mass for 4,4'-DDE in one egg collected at St. Lazaria Island in 2003 (see Appendices 8-25).

Significant geographic differences were found among the common murre eggs collected in the Gulf of Alaska in 2003 (Wilks' $\lambda = 0.0204$, $F_{32,24} = 4.50$, $P = 0.0002$; see Fig. 4 and Appendices 8-10 and 17-19). In general, the East Amatuli Island eggs contained the lowest contaminant levels, while the eggs from St. Lazaria Island contained the highest levels of the sum of 13 PCB congeners, 4,4'-DDE, BDE congener 47, DETOX-403 [Parlar 62], and DETOX-408 [Parlar 38]. The Middleton Island eggs contained the highest levels of α-HCH, HCB, and pentachlorobenzene.

Significant geographic differences were also present among the common murre eggs collected at the Gulf of Alaska colonies in 2004 (Wilks' $\lambda = 0.0399$, $F_{48,28} = 3.11$, $P = 0.0011$; see Fig. 4 and Appendices 11-13 and 20-22). Trends between the St. Lazaria and Middleton island eggs were similar to the 2003 findings, with the exception that levels of β-HCH, DETOX-453 (Parlar 44), heptachlor epoxide, and mirex were higher in the Middleton Island eggs. Levels of 4,4'-DDE, mirex, and DE-TOX 408 (Parlar 38) may have been higher at the offshore colonies than at the inshore colonies, because there were significant differences among these sampling sites and the eggs collected at the Bering Sea colonies in 2005 (see Figs. 4 and 5, and Appendices 8-25).

Significant geographical differences were also present among the thick-billed murre eggs collected in 2002 (Wilks' $\lambda = 0.00889$, $F_{36,30} = 3.32$, $P = 0.0006$; see Fig. 6 and Appendices 26-33). The St. Lazaria Island eggs contained the highest levels of 4, 4'-DDE, the sum of 13 PCB congeners, BDE 47, and the Cape Lisburne eggs contained the highest mirex, chlorobenzene (penta- and hexa-[HCB]), and octachlorostyrene values.

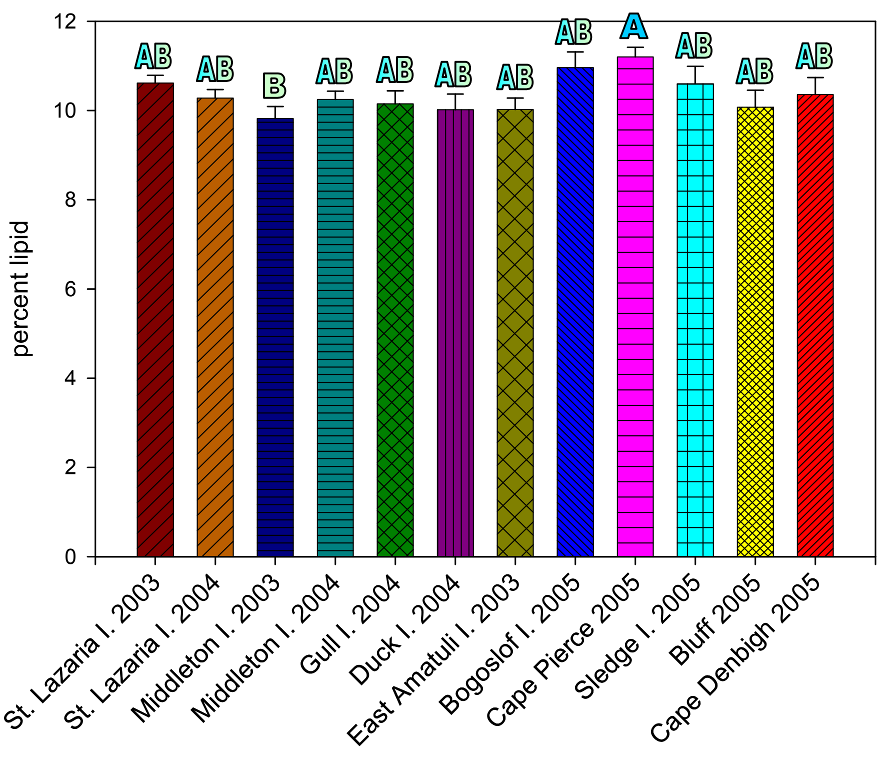

Figure 3. Percent lipid (mean ± one standard error) in common murre eggs collected at 10 Alaskan colonies. Significant differences ($P < 0.05$) among sites are shown by different letters (e.g., Cape Pierce 2005 [A] was different from Middleton Island 2003 [B]).

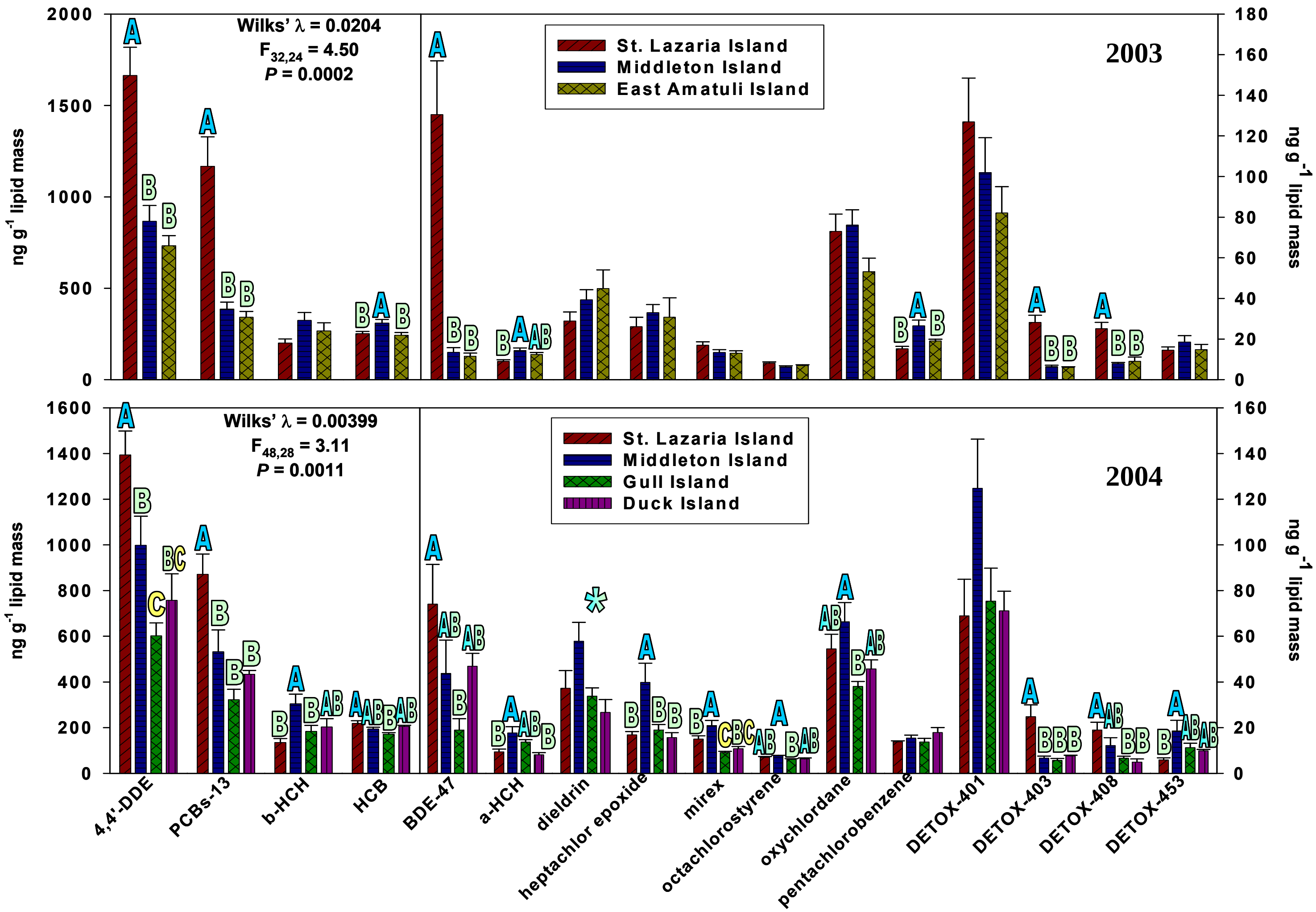

Figure 4. Mean mass fractions (± one standard error) of POPs in Gulf of Alaska common murre eggs collected in 2003 and 2004. Significant differences (P < 0.05) among sites are shown by different letters (e.g., for 4,4'-DDE in 2003, St. Lazaria Island [A] was different from Middleton and East Amatuli islands [B]). *Note: An ANOVA for dieldrin in the 2004 eggs was significant, but differences among colonies were not apparent.*

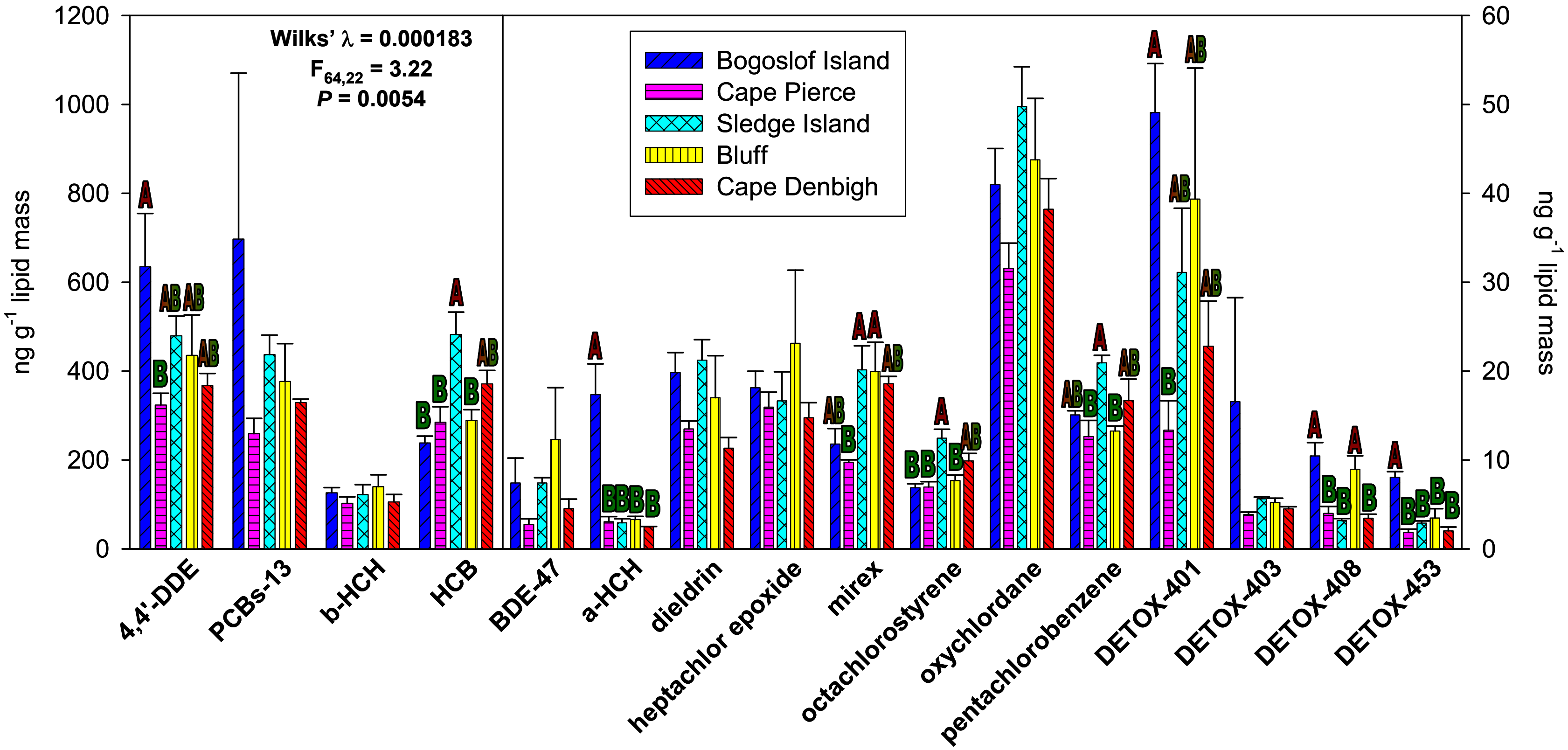

Figure 5. Mean mass fractions (± one standard error) of POPs in Bering Sea common murre eggs collected in 2005. Significant differences ($P < 0.05$) among sites are shown by different letters (e.g., for 4,4'-DDE, Bogoslof Island [A] was different from Bluff [B] and both of these colonies did not differ from the other three sites [AB]).

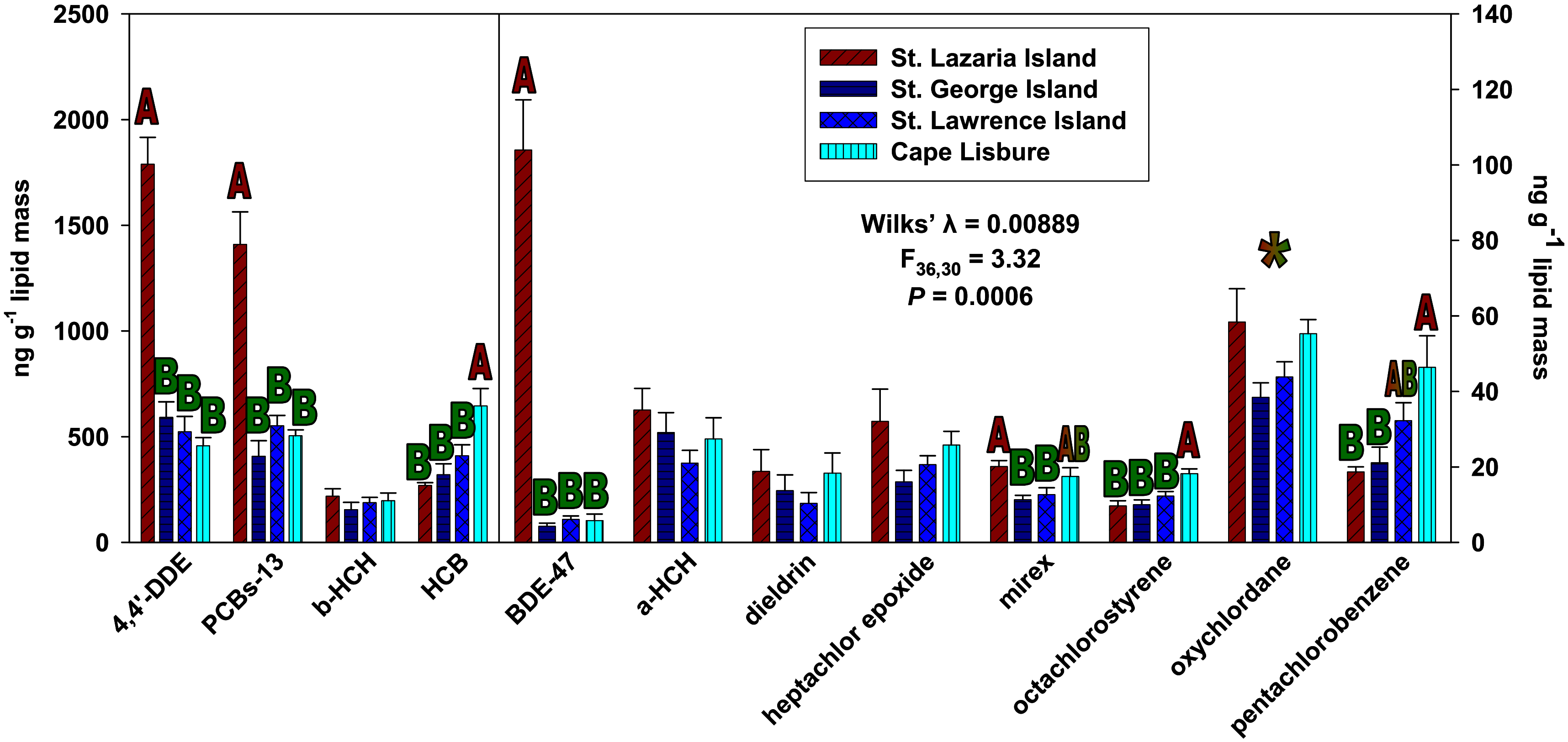

Figure 6. Mean mass fractions (± one standard error) of POPs in thick-billed murre eggs collected in 2002. Significant differences ($P < 0.05$) among sites are shown by different letters (e.g., for 4,4'-DDE, St. Lazaria Island [A] was different from the other colonies [B]). *Note: An ANOVA for oxychlordane was significant, but colony differences were not apparent.*

Some contaminants (4,4'-DDE, the sum of 13 PCB congeners, and HCB) declined over time in the St. Lazaria Island 1999-2004 common murre eggs (Wilks' $\lambda = 0.159$, $F_{27,77} = 2.48$, $P = 0.0010$; ANOVAs for these compounds were significant; see Fig. 7). These decreases and a decline in oxychlordane levels were also found in the East Amatuli Island eggs collected in 1999 and 2003 (Wilks' $\lambda = 0.0470$, $F_{8,12} = 30.3$, $P < 0.0001$). Differences were also found between the Bogoslof Island 2000 and 2005 samples (Wilks' $\lambda = 0.104$, $F_{8,5} = 5.37$, $P = 0.0403$); however, one compound - mirex - actually increased in these eggs (see Fig. 7). Eggs collected at Middleton Island in 2003 and 2004 did not differ from one another (Wilks' $\lambda = 0.0380$, $F_{16,1} = 1.57$, $P = 0.564$).

A principal components analysis showed a clear distinction between the Gulf of Alaska and Bering Sea common murre colonies, and it also demonstrated that St. Lazaria Island was separate from the other Gulf of Alaska nesting locations (see Fig. 8). Although there appeared to be some division along PC 1 between the 2003 and 2004 northern Gulf of Alaska eggs, separation was not apparent among years at St. Lazaria Island along either axis. In the Bering Sea, the 2005 Bogoslof Island eggs were clearly distinct, even after removing the outlier (Egg ID 863; see Fig. 8). Contaminant levels in the outlier egg were about 2-3 times higher than the values found in the other eggs from this colony (see Appendices 16 and 25).

Because Bogoslof Island Egg ID 863 was an outlier in the principal components analysis, Grubbs' tests were run to see if this egg was also an outlier, which in fact it was for 4,4'-DDE, the sum of 13 PCB congeners, BDE 47, and DE-TOX 403 ($P < 0.05$). As a consequence, the geographical and temporal ANOVAs and Tukey-Kramer post hoc tests were re-run without this egg and compared with previously reported values (see Fig. 9). Geographically, 4,4'-DDE was no longer significant; however, when the egg was excluded from the analysis, Bluff stood out from Cape Pierce for BDE 47. In the absence of the outlier, both 4,4'-DDE and the sum of the 13 PCB congeners were significantly lower in 2005, compared to 2000, a pattern that matched the declines identified at St. Lazaria and East Amatuli islands (see Fig. 7).

Another principal components analysis of thick-billed murre eggs collected in 2002 and common murre eggs collected in 1999 and 2000 demonstrated that both species on St. Lazaria Island were geographically distinct from their counterparts at the other Gulf of Alaska and Bering Sea colonies (see Fig. 10).

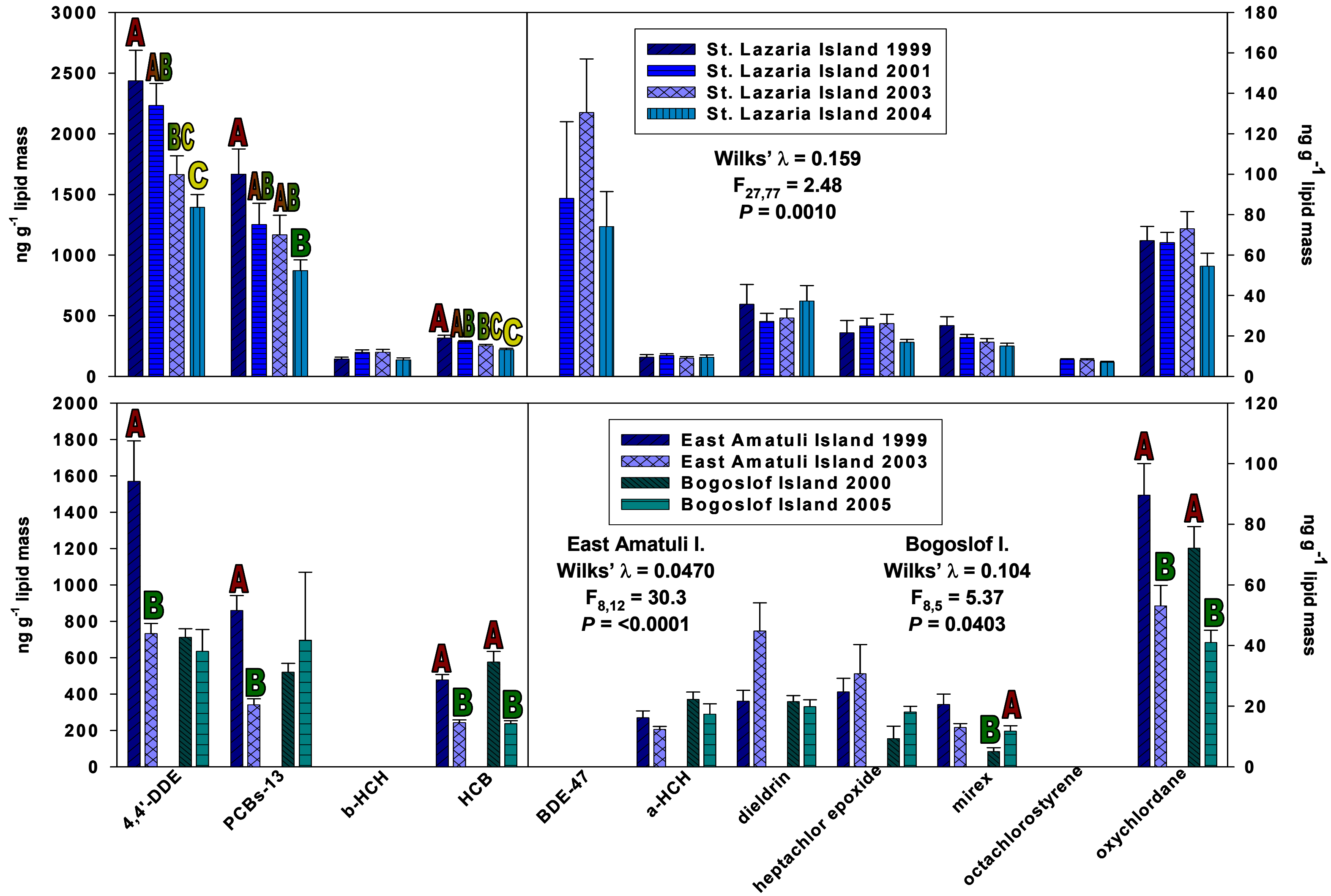

Figure 7. Mean mass fractions (± one standard error) of POPs in common murre eggs collected over several years at St. Lazaria, East Amatuli, and Bogoslof islands. Significant differences ($P < 0.05$) among sites are shown by different letters (e.g., for 4,4'-DDE, East Amatuli Island 1999 [A] was different from East Amatuli Island 2003 [B]).

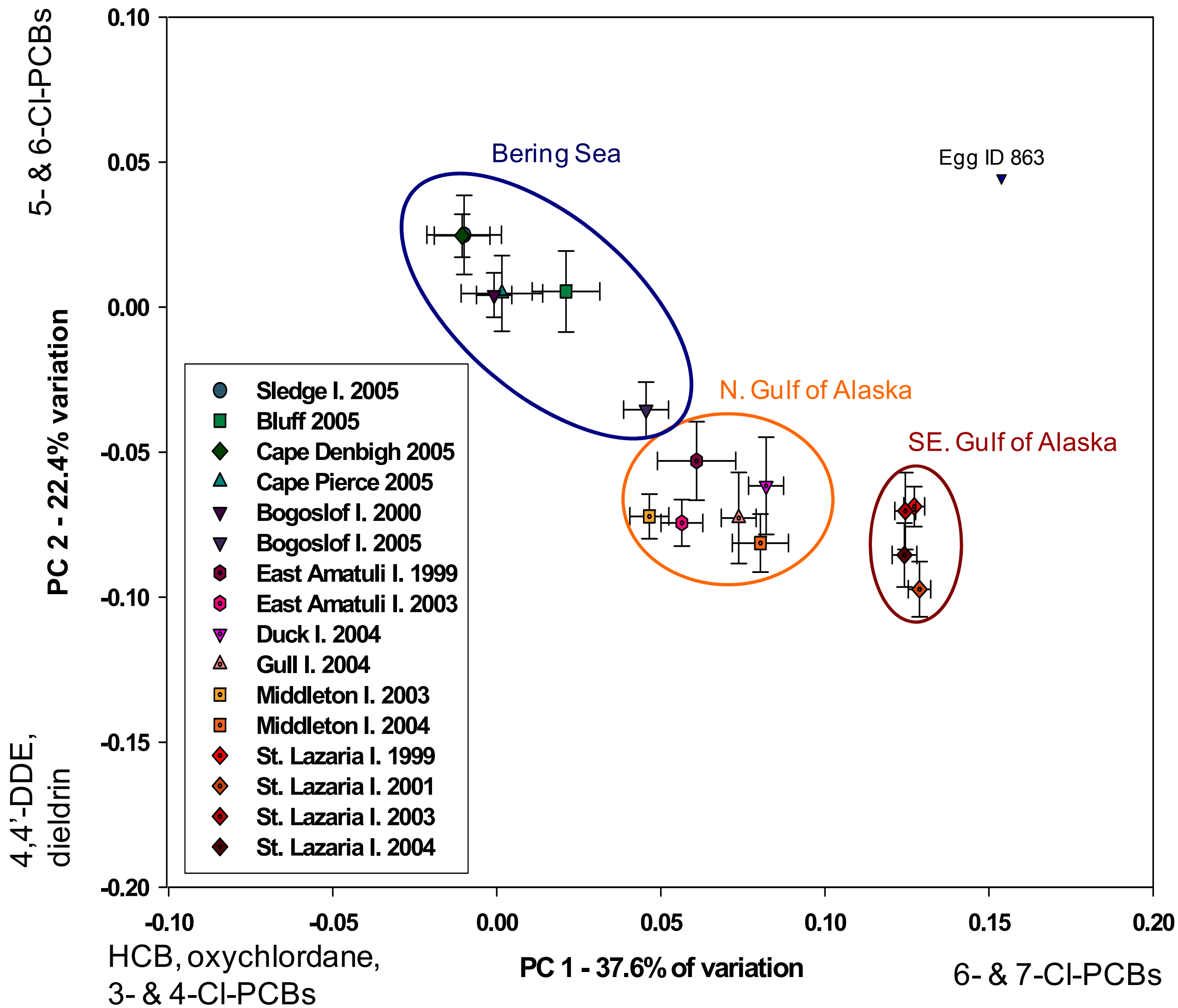

Figure 8. Principal components analysis (means and standard errors) for common murre eggs. Compounds contributing to loadings are shown along the axes. *Note: Egg ID 863 was an outlier and was not used in the 2005 Bogoslof Island calculations.*

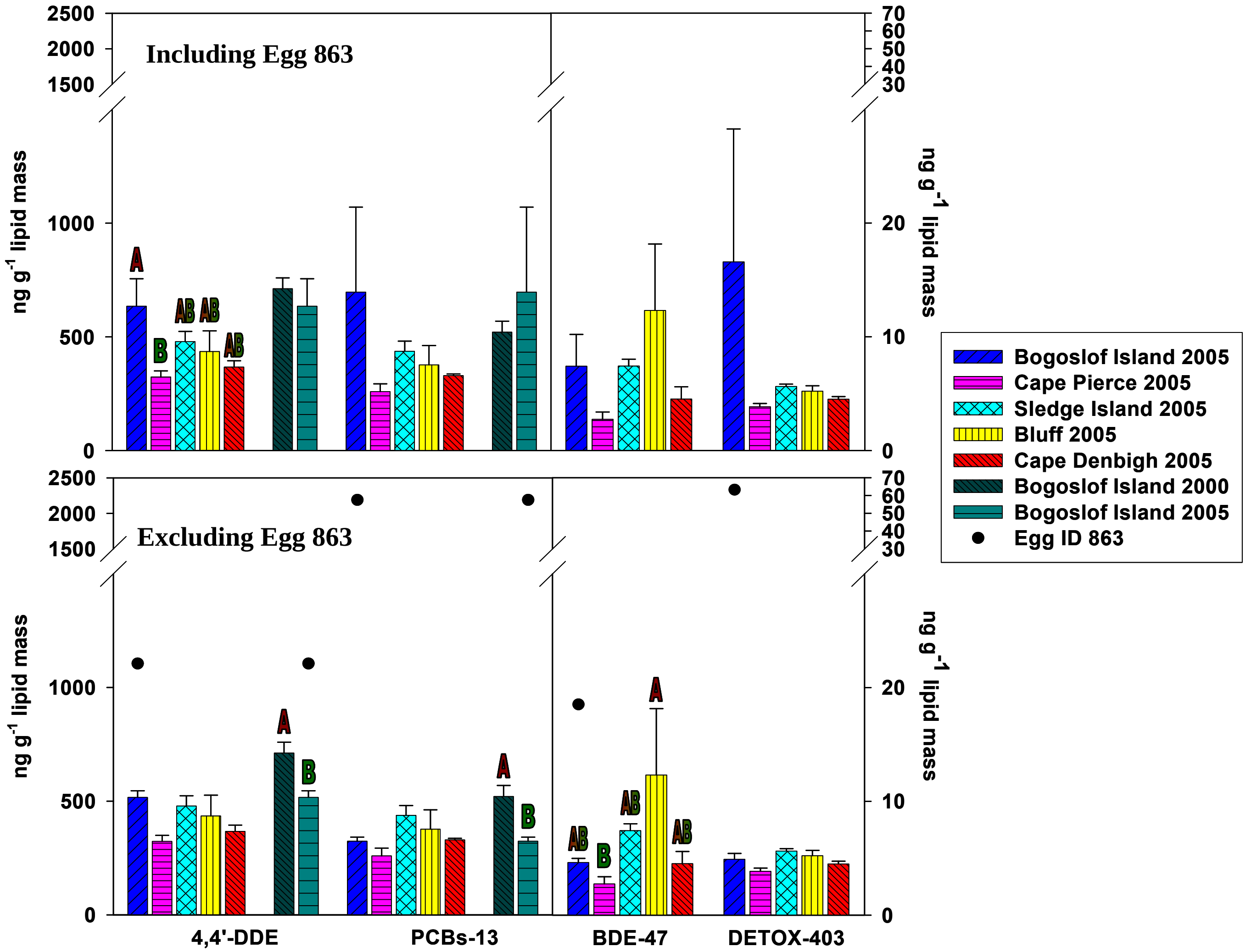

Figure 9. Mean mass fractions of POPs in the Bogoslof Island common murre eggs collected in 2005 with (top) and without (bottom) outlier Egg ID 863. The bars show the mean ± one standard error. Significant differences ($P < 0.05$) among sites are shown by different letters (e.g., for 4,4'-DDE, Bogoslof Island 2000 [A] was different from Bogoslof Island 2005 [B]).

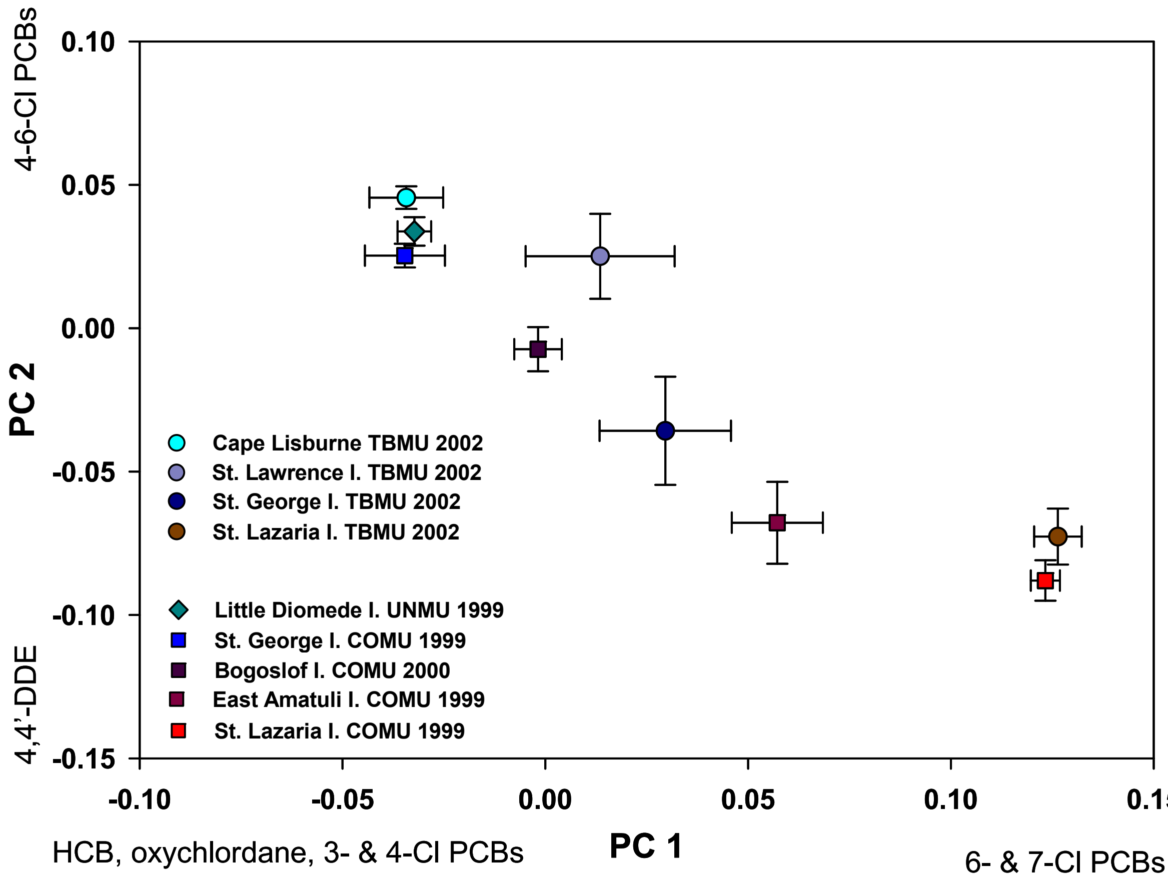

Figure 10. Principal components analysis (means and standard errors) for thick-billed (TBMU) and common murre (COMU) eggs. Compounds contributing to loadings are shown along the axes.

POP levels in gull eggs varied from below detection limits (0.1 ng g^{-1} wet mass) to 322 ng g^{-1} wet mass for 4,4'-DDE in an egg from Viesokoi Rock near Sitka in the Gulf of Alaska (see Fig. 11 and Appendices 34-41) and were similar to the values found in the murre eggs (see above). Gull egg lipids ranged from 5.7% to 10.2% and did not differ among colonies (see Table 3 and Appendices 38-41). To meet normality assumptions, all tests were run on a lipid mass basis, and all reference materials fell within previously reported ranges (see Appendices 6 and 7).

The MANOVA comparing region and species differences among POP levels in the gull eggs was significant (Wilks' λ = 0.0326, approximate $F_{27,26.9}$ = 2.25, P = 0.0212). Levels of ΣHCHs, HCB, and heptachlor epoxide were lower in the Gulf of Alaska than in the Bering and Chukchi seas (P < 0.05; see Table 3). POPs levels in the Middleton Island gull eggs were highly variable, and their PBDE values were higher than at any of the other gull colonies (see Fig 11 and Appendices 34-41).

Principal components analysis of the gull egg data did not show clear differences among contaminant patterns, species, and geographic regions (see Fig. 12). However, as observed in the murre eggs (see Figs. 8 and 10), there was a tendency for the Gulf of Alaska gull eggs to group to the lower right of the graph because of the high proportion of 4,4'-DDE and higher chlorinated PCBs. Also, the Bering and Chukchi sea gull eggs tended to group to the upper left of the graph because of the higher proportions of lower chlorinated PCBs and HCB. The north-south gradient seen in the Bering and Chukchi sea murre eggs (see Fig. 10) was not present in the gull eggs. The glaucous gull eggs from the Noatak River delta in Kotzebue Sound in the eastern Chukchi Sea grouped in the middle of the cluster, while the glaucous-winged gull eggs from Shaiak Island in the southeastern Bering Sea clustered at the farthest top-left of the graph (see Fig. 12).

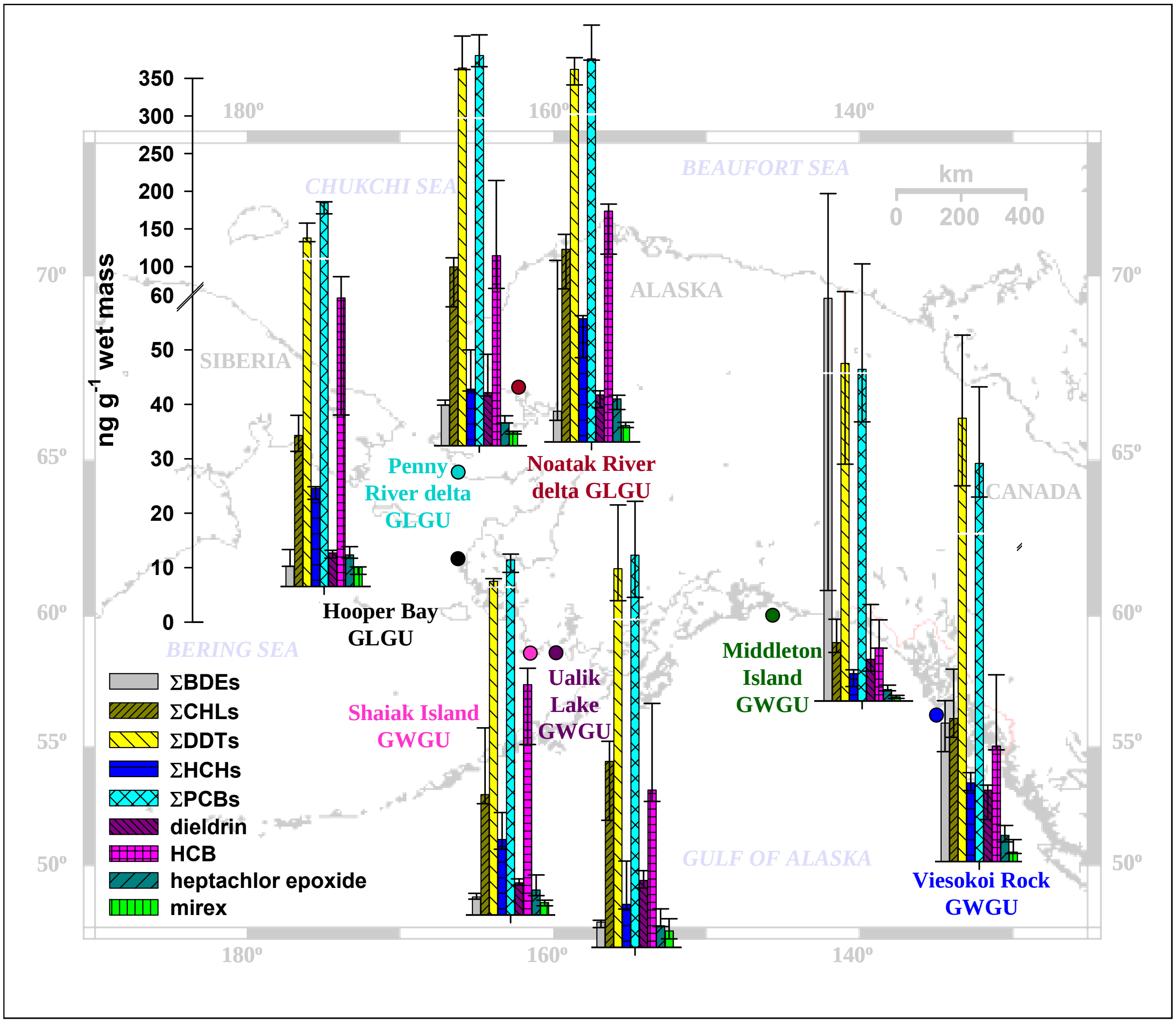

Figure 11. Mean mass fractions (± one standard error) of POPs in glaucous gull (GLGU) and glaucous-winged gull (GWGU) eggs collected in 2005. The bars show the mean ± one standard error.

Table 3. Mass fractions of POPs in glaucous gull (GLGU) and glaucous-winged gull (GWGU) eggs. Median values, with ranges shown in parentheses, are expressed as ng g^{-1} lipid corrected wet mass. ANOVA F ratios and probabilities are shown following significant MANOVA test (Wilks' $\lambda = 0.0326$, approximate $F_{27,26.9} = 2.25$, $P = 0.0212$). Groups with different letters were significantly different, based on Tukey-Kramer HSD post-hoc tests. Percent lipid values and statistics are shown for reference only.

	Chuckchi Sea	Bering Sea		Gulf of Alaska	F Ratio
Compound	**GLGU**	**GLGU**	**GWGU**	**GWGU**	**Probability**
Percent lipid	7.96 (7.24 - 8.34)	8.02 (5.90 - 10.2)	7.13 (5.70 - 8.23)	7.70 (7.00 - 8.84)	0.640 0.60
ΣBDEs	76.8 (59.5 - 470)	92.8 (51.1 - 142)	61.4 (47.2 - 99.2)	348 (243 - 4130)	2.49 0.096
ΣCHLs	330 (279 - 408)	287 (253 - 452)	308 (225 - 530)	180 (96.2 - 325)	2.62 0.084
ΣDDTs	1470 (1280 - 1910)	1590 (1040 - 2020)	1060 (893 - 3780)	1960 (594 - 3700)	0.357 0.79
ΣHCHs	278^{A} (194 - 313)	215^{AB} (98.3 - 274)	184^{AB} (85.6 - 243)	116^{B} (33.0 - 221)	3.40 0.0418*
ΣPCBs	1720 (1620 - 2500)	1690 (1580 - 2280)	1400 (1130 - 3870)	1710 (700 - 2920)	0.0345 0.99
Dieldrin	104 (78.8 - 130)	115 (60.2 - 164)	118 (78.4 - 247)	134 (78.0 - 221)	0.443 0.73
HCB	524^{A} (433 - 585)	588^{A} (342 - 758)	547^{A} (326 - 622)	216^{B} (133 - 388)	8.49 0.0011*
Heptachlor epoxide	94.8^{A} (74.4 - 119)	76.3^{AB} (40.8 - 88.2)	67.0^{AB} (46.3 - 98.2)	42.3^{B} (25.1 - 74.8)	4.48 0.0172*
Mirex	36.2 (33.3 - 49.6)	38.4 (25.7 - 43.5)	33.3 (19.0 - 92.0)	14.8 (5.96 - 45.3)	1.95 0.16

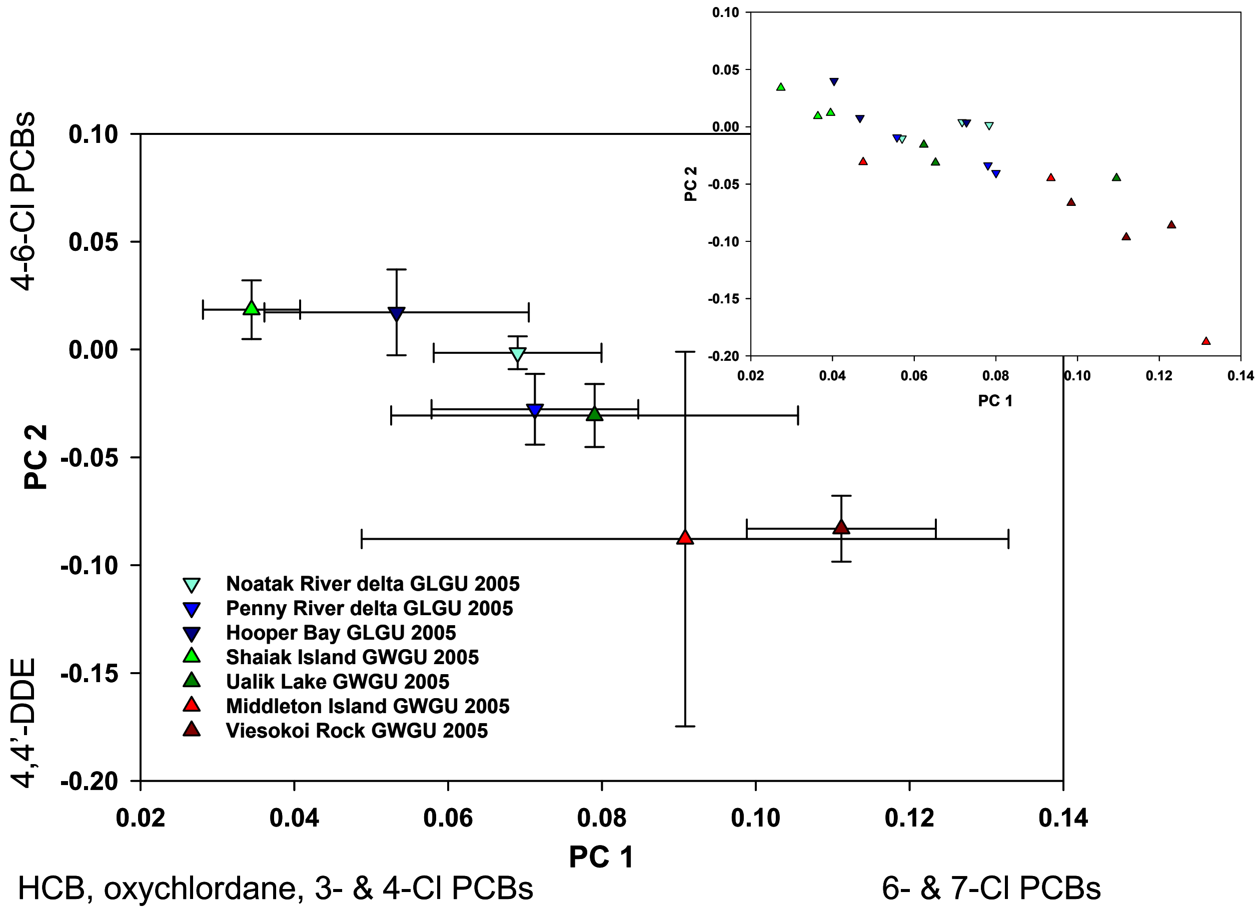

Figure 12. Principal components analysis (means and standard errors with individual eggs inset) for glaucous gull (GLGU) and glaucous-winged gull (GWGU) eggs. Compounds contributing to loadings are shown along the axes.

Mercury (including organomercury)

Because the mercury levels found in the murre and gull eggs were almost 100% methylmercury (see Fig. 13), only total mercury values are reported here. Mercury mass fractions ranged from 0.01 to 0.376 µg g^{-1}, with a grand mean of 0.124 µg g^{-1} (n = 216), and an overall RSD of 62 %. The average RSD among replicate eggs in each sampling event was 31 % (see Fig. 14 and Appendix 42). One-way ANOVAs for mercury levels vs. sampling events demonstrated that more than 71 % of the overall variability could be attributed to colonies, species, and years ($r^2 = 0.71$, $P < 0.0001$). Some temporal variability was found at colonies with multi-year collections. Pair-wise Tukey tests between years at these colonies found that the East Amatuli Island common murres varied significantly over time (i.e., mercury levels declined between 1999 and 2003). In contrast, temporal differences were not apparent in the four-year St. Lazaria Island common murre data set, or in the two-year data sets from Middleton Island (common murres), St. Lazaria Island (thick-billed murres), and St. George Island (common and thick-billed murres; see Fig. 14).

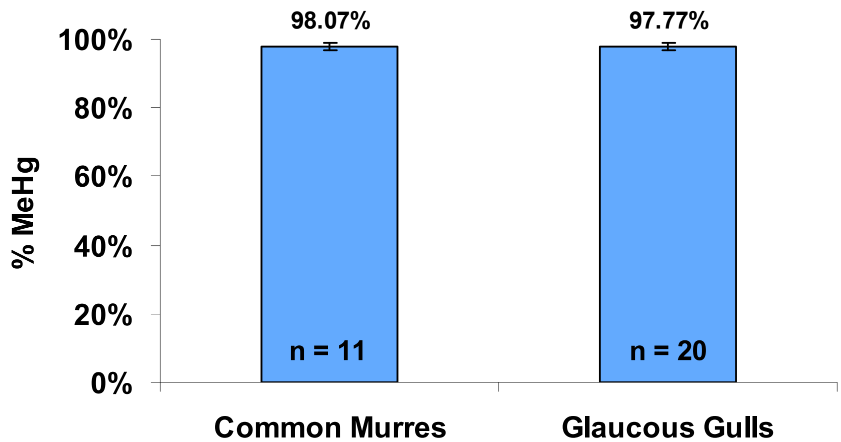

Figure 13. Percentages of methylmercury contributing to total mercury in murre and gull eggs. The bars show the mean ± one standard error.

Colonies were grouped by species and region and one-way ANOVAs were run to identify trends. Glaucous and glaucous-winged gulls were combined as “gulls”, and the Chukchi gull and murre colonies were pooled with the Bering Sea colonies. In the case of murres, most of the variability resulted from geographic location: egg mercury levels for both murre species were higher ($P < 0.05$) at the Gulf of Alaska colonies than at the Bering Sea colonies (see Fig. 15). In contrast, the gull colonies did not vary geographically. However, within the Bering Sea region, the gull egg mercury values were higher than the levels found in the murre eggs ($P < 0.05$).

All of the common and thick-billed murre eggs were pooled by species and two separate one-way ANOVAs were run to see if proximity to the mainland was responsible for variation among the colonies. Differences were not apparent in the Gulf of Alaska. However, in the Bering Sea, eggs from the coastal Norton Sound common murre colonies (Sledge Island, Bluff, and Cape Denbigh) contained significantly higher mercury levels ($P < 0.0001$) than the eggs from all of the other colonies (see Fig. 16).

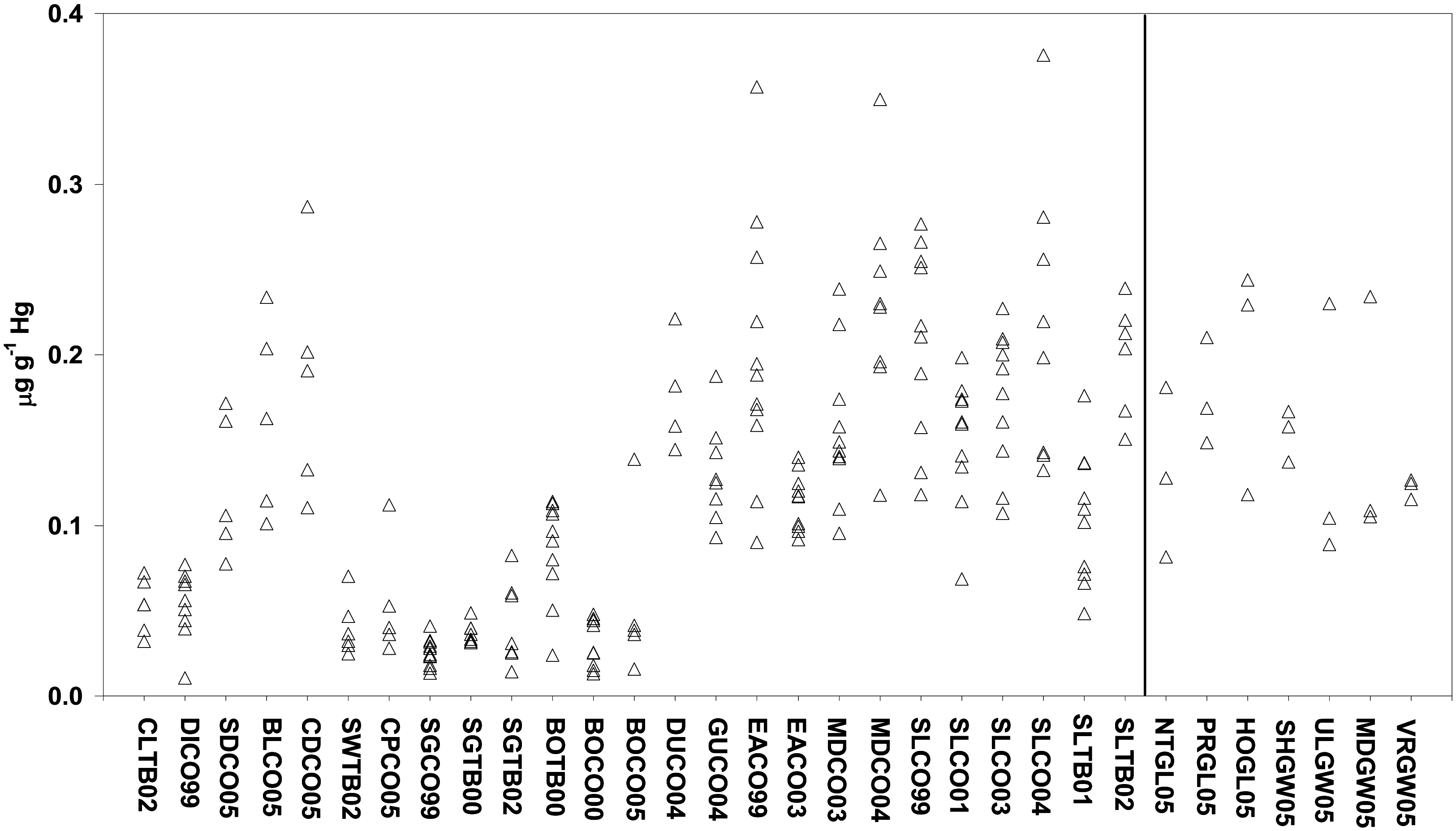

Figure 14. Mass fractions of mercury in individual murre and gull eggs. (CL = Cape Lisburne, DI = Little Diomede Island, SD = Sledge Island, BL = Bluff, CD = Cape Denbigh, SW = St. Lawrence Island, CP = Cape Pierce, SG = St. George Island, BO = Bogoslof Island, DU = Duck Island, GU = Gull Island, EA = East Amatuli Island, MD = Middleton Island, SL = St. Lazaria Island, NT = Noatak River delta, PR = Penny River delta, HO = Hooper Bay, SH = Shaiak Island, UL = Ualik Lake, MD = Middleton Island, and VR = Viesekoi Rock; TB = thick-billed murre, CO = common murre, GL = glaucous gull, GW = glaucous-winged gull).

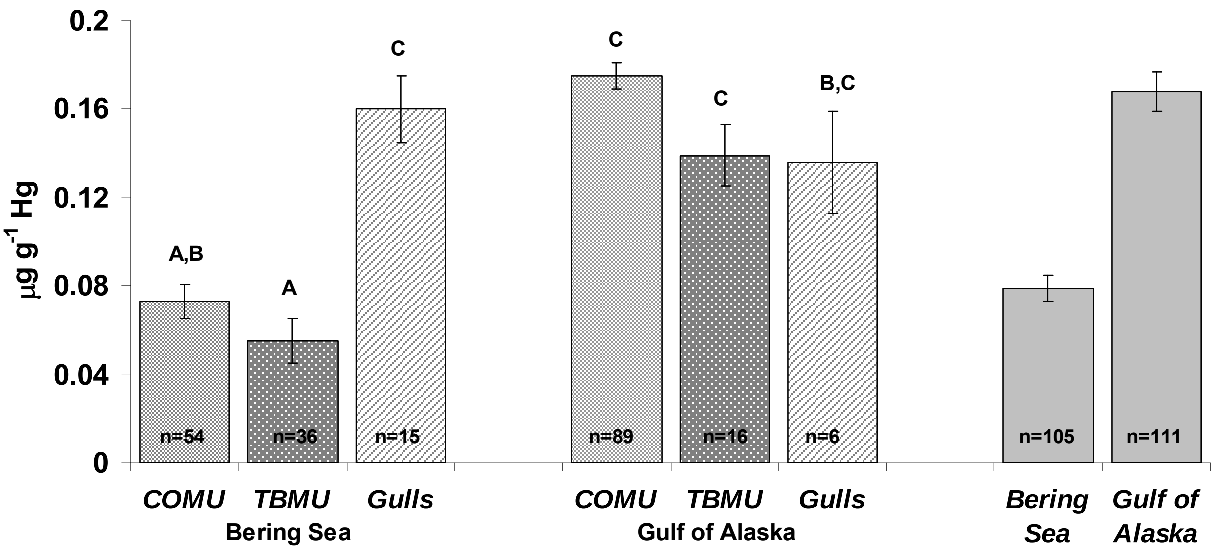

Figure 15. Mean mass fractions (± one standard error) of mercury in murre and gull eggs by species and geographic location.

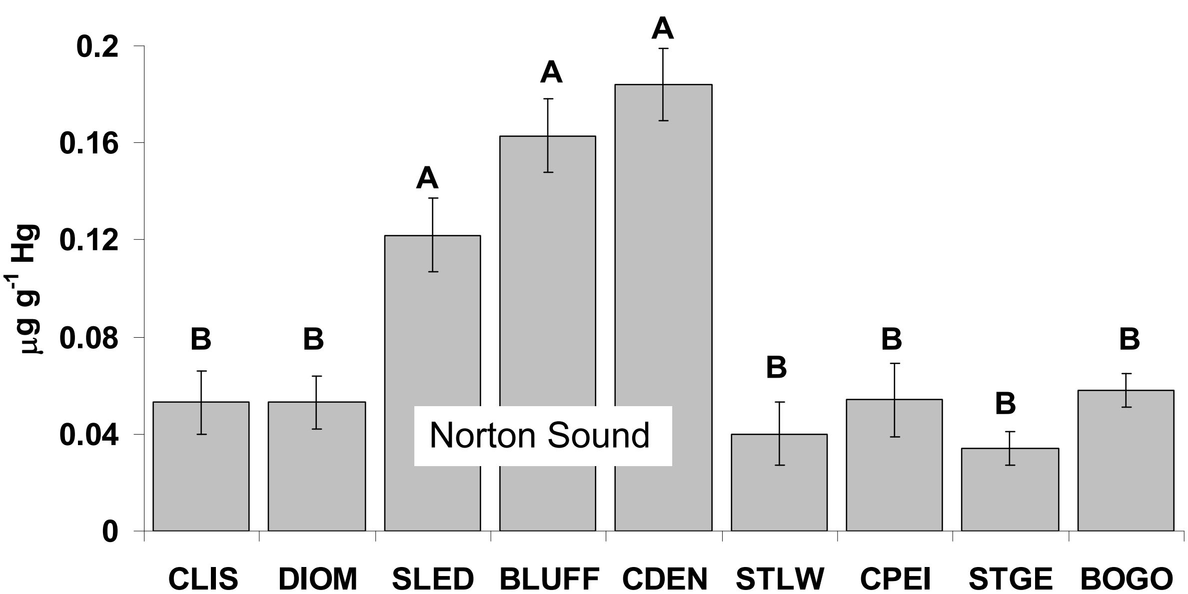

Figure 16. Mean mass fractionss (± one standard error) of mercury in common murre eggs collected in 2005 from coastal mainland colonies in Norton Sound compared with other mainland and coastal colonies in the Bering and Chukchi seas. (CLIS = Cape Lisburne, DIOM = Little Diomede Island, SLED = Sledge Island, BLUFF = Bluff, CDEN = Cape Denbigh, STLW = St. Lawrence Island, CPEI = Cape Pierce, STGE = St. George Island, and BOGO = Bogoslof Island).

Organotin Compounds

Levels of MBT, DBT, TBT and ∑BT (MBT+DBT+TBT) in the murre and gull eggs obtained from the Bering and Chukchi sea and Gulf of Alaska colonies during 1999-2005 were compared with brown pelican (*Pelecanus occidentalis*) eggs collected near Charleston, South Carolina in 2005 (see Table 4 and Appendix 43). Differences were apparent among the murre and gull eggs and geographical regions (see Fig. 17), and among the MBT, DBT, TBT, and ∑BT levels in the common and thick-billed murre eggs from the Gulf of Alaska colonies (see Fig. 18). Total butyltin (∑BT) values averaged 205 ± 107 pg Sn g^{-1} in the murre and gull eggs when all species and year data were combined. This value was lower ($P < 0.05$) than the values found in the pelican eggs (mean = 624 ± 352 pg Sn g^{-1}; see Table 4), which came from an area where ship and boat traffic are high. However, this difference may be smaller than it appears to be because of the difference in sample sizes (i.e., murres and gulls = 77 and pelicans = 8).

When data from the same colonies and years were used, the average RSD was significantly lower in murres than in gulls (29% vs. 52%, respectively). Average MBT, DBT, and TBT values were 76 ± 51 pg Sn g^{-1} (range = 3-254 pg Sn g^{-1}), 79 ± 46 pg Sn g^{-1} (range = 7-211 pg Sn g^{-1}) and 48 ± 25 pg Sn g^{-1} (range = 8-128 pg Sn g^{-1}), respectively, when data from murre and gull colonies and years were combined. The RSDs for MBT, DBT, and TBT in the eggs from the same murre species, colonies, and years equaled 39%, 36% and 30%, respectively. These values were lower ($P < 0.05$) than those found in the gull eggs, which averaged 54%, 53% and 68%, respectively (See Table 4).

Differences between ∑BT levels in the murre and gull eggs were highly significant ($P < 0.0001$) and accounted for most of the variation found in the samples (see Fig. 17). When data from all three Alaskan regions were combined, no differences were found between the common and thick-bill murre eggs (253 ± 16 vs. 263 ± 21 pg Sn g^{-1}, respectively; $P > 0.05$). However, the values were about 2.5 times higher than the gull egg levels (110 ± 20 pg Sn g^{-1}; $P < 0.05$). When data were broken down by BuSn species, the MBT and DBT patterns were the same: both compounds were higher in the murre eggs than in the gull eggs ($P < 0.05$). However, TBT values did not differ between murres and gulls ($P > 0.05$), and the metabolites of the parent compound displayed a different pattern. Relative fractions of TBT (% of ∑BT) were higher in the gull eggs (37.4% ± 2.4%) than in the common and thick-bill murre eggs (20.7% ± 1.7% and 23.1% ± 2.4%, respectively).

Geographic differences were not apparent among the gull eggs (see Fig. 17). However, the combined common and thick-billed murre data displayed clear regional differences in ∑BT levels ($P = 0.012$). Levels were higher in the Gulf of Alaska and Chukchi Sea than in the Bering Sea. When data were broken down by BuSn species, DBT did not differ among the regions. However, MBT was higher in the Chukchi Sea than in the Bering Sea and Gulf of Alaska ($P < 0.05$), and TBT was higher in the Gulf of Alaska than in the Bering and Chukchi seas ($P < 0.05$).

Table 4. Mean mass fractions (± one standard deviation) of MBT, DBT, TBT and ∑BT in common and thick-billed murre eggs and glaucous and glaucous-winged gull eggs collected in the Bering and Chukchi seas and Gulf of Alaska during 1999-2005, and brown pelican eggs obtained in the Charleston, South Carolina vicinity in 2005 (SD = standard deviation; detection limits = 1-8 pg Sn g^{-1}).

Species	Location	Year	n	MBT (pg Sn g^{-1})	DBT (pg Sn g^{-1})	TBT (pg Sn g^{-1})	∑BT (pg Sn g^{-1})
Glaucous Gull	Chukchi Sea (Noatak River delta)	2005	5	34±13	31±16	46±37	124±56
Glaucous-winged Gull	Bering Sea (Shaiak Island)	2005	6	22±21	28±9	39±23	90±52
Glaucous-winged Gull	Bering Sea (Hooper Bay)	2005	5	19±8	23±22	20±15	62±46
Glaucous-winged Gull	Gulf of Alaska (Sitka, Viesekoi Rocks)	2005	5	37±15	41±13	48±29	125±38
		Mean ± 1 SD	*21*	*(28±16)*	*(31±14)*	*(40±29)*	*(102±53)*
Common Murre	Chukchi Sea (Little Diomede Island)	1999	6	149±75	135±49	56±23	341±135
	Bering Sea (St George Island)	1999	6	81±26	85±24	48±9	213±32
	Gulf of Alaska (St Lazaria Island)	1999	6	138±41	109±14	58±14	305±58
		2001	6	66±26	72±30	46±14	184±66
		2003	5	93±61	67±34	32±17	192±74
	Gulf of Alaska (East Amatuli Island)	1999	6	64±21	80±30	43±12	186±50
		2003	4	44±8	61±27	52±15	157±32
		Mean ± 1 SD	*39*	*(92±55)*	*(88±38)*	*(46±17)*	*(226±94)*
Thick-billed Murre	Chukchi Sea (Cape Lisburne)	2002	5	104±52	117±62	52±11	273±111
	Bering Sea (St George Island)	2002	6	74±31	98±32	36±7	189±52
	Gulf of Alaska (St Lazaria Island)	2001	6	95±26	130±38	94±27	327±86
		Mean ± 1 SD	*17*	*(88±37)*	*(117±47)*	*(66±31)*	*(272±106)*
Brown Pelican	Atlantic Ocean (South Carolina)	*2005*	*8*	*285±98*	*228±161*	*147±89*	*624±352*

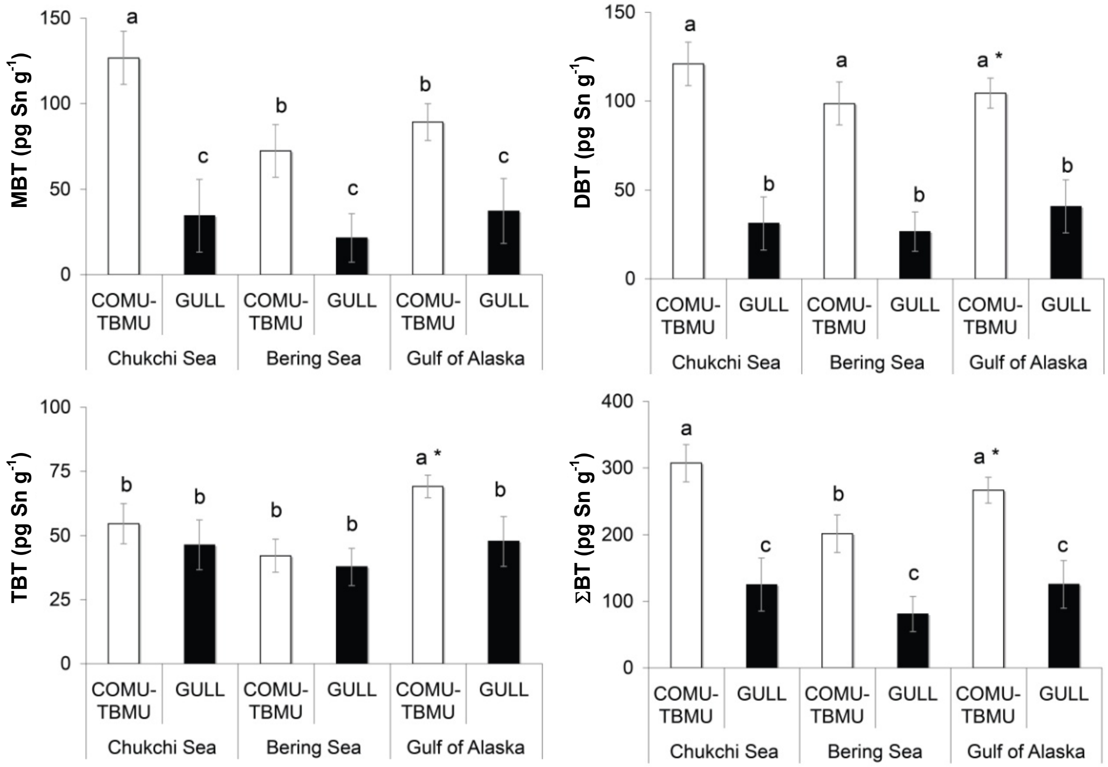

Figure 17. Mean mass fractions (± one standard error) of MBT, DBT, TBT and ∑BT in murre and gull eggs from colonies in the Bering and Chukchi seas and Gulf of Alaska. Different letters indicate significant differences ($P \leq 0.05$) and asterisks indicate there were differences between common (COMU) and thick-billed (TBMU) murres.

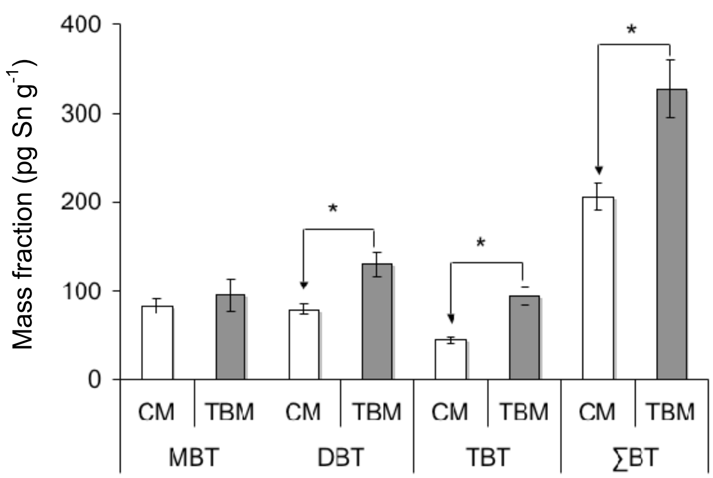

Figure 18. Mean BuSn mass fractions (± one standard error) in Gulf of Alaska common (CM) and thick-billed (TBM) murre eggs.

Discussion

Persistent Organic Pollutants (POPs)

The geographic differences among the Gulf of Alaska common murre colonies appeared to be relatively robust. POP levels at St. Lazaria Island were higher than the 1999 and 2003 East Amatuli Island values (see Vander Pol *et al.* 2004 and Fig. 4). STAMP chose St. Lazaria Island as the primary study site for collecting information on annual variation in contaminants in the Gulf of Alaska. However, because of the clear separation between this island and the other colonies in the region, at least one more location will have to be monitored in the Gulf of Alaska to obtain this information (see Figs. 4, 8, and 10).

The gull data generally followed the overall trend found in the Gulf of Alaska and Bering and Chukchi sea murre eggs (see Figs. 11 and 12). All of the murre and gull eggs showed increasing levels of the higher volatile compounds (i.e., HCB, pentachlorobenzene, and octachlorostyrene) with increasing latitude (see Figs. 5, 6, and 11 and Table 3), a trend that matched the global distillation/fractionation theory of Wania and Mackay (1996). In the case of murres, 4,4'-DDE, the sum of the PCBs, and the BDE 47 levels were higher in the Gulf of Alaska eggs than in the Bering Sea eggs (see Vander Pol *et al.* 2004 and Fig. 6), but this pattern was not apparent in the gull eggs (Table 3). The variation in the gull eggs may have resulted from laying order (see Verreault *et al.* 2006). It may also have resulted from variations in exposure to contaminants because gulls are highly opportunistic and the individuals laying the eggs that were analyzed may have fed on widely different food types (e.g., berries vs. bird eggs vs. fish vs. marine mammal carcasses vs. ship-board garbage). Based on this information, gull eggs may not be as good as murre eggs for monitoring contaminants, but they are still important in long-term monitoring programs because of their significant role in subsistence diets.

More data are needed to explain the variations in PBDE levels found in the Middleton Island gull eggs. Because these birds are opportunistic scavengers, some of the eggs may have come from individuals that were exposed to higher levels of flame retardants because they fed on marine mammal carcasses or refuse from the island's old garbage dump. Middleton Island is an old U.S. Air Force – Civil Aeronautics Authority (CAA) radar and White Alice communications site that has been upgraded and is currently being maintained by a few Federal Aviation Agency (FAA) employees that visit the site intermittently. Although current anthropogenic influences should be minimal, historical operations may still play a role in exposure to some types of contaminants (e.g., PBDEs leaching out of old dump sites).

Also, POP levels may have varied among first-, second-, and third-laid eggs (see Verreault *et al.* 2006), and this factor may help explain some of the Middleton Island variation (see Fig. 11) because two of the samples were from single eggs belonging to three-egg clutches (Appendix 1). However, if this factor played a role, greater variation should have occurred at several of the other colonies where only single eggs from multi-egg clutches were analyzed (the other eggs belonging to these clutches were broken in transit). *Note: a new series of gull eggs obtained from Middleton Island in 2006 will allow STAMP to investigate differences among eggs in multi-egg clutches.*

The 4,4’-DDE, mirex, and DE-TOX 408 (Parlar 38) values suggest that contaminant levels may be higher at offshore colonies than inshore colonies (see Figs. 4 and 5). If this difference is real, it may result from several factors, including latitudinal differences (global fractionation) and differences in deposition patterns (wet and dry). However, the Norton Sound colonies (Cape Denbigh, Bluff, and Sledge Island) did not show any clear trends (see Fig. 5). Also, contaminant patterns in the Sledge Island and Cape Denbigh eggs were nearly identical, but the eggs from Bluff, a colony located between these sites, were different (Fig. 8). This difference suggests POPs may not be evenly distributed in Norton Sound. It also confirms that murre eggs need to be collected from at least two locations in this area to monitor long-term contaminant trends (i.e., either Bluff and Sledge Island, or Bluff and Cape Denbigh). POP levels also varied more at Bluff, compared to the other locations (see Fig. 5 and Appendices 14-15 and 23-24), suggesting that common murre foraging strategies may be different at this mainland colony. Tracking breeding birds with satellite tags and conducting stable isotope analyses on egg contents would help clarify this issue.

Based on historical 1973 Bogoslof Island and 1976 Bluff and Middleton islands information, some POPs appear to have declined since the 1970s (see Fig. 19 and Ohlendorf *et al.* 1982). Although PCB data could not be compared because 1970s analytical techniques were different (packed column GC, Aroclor method; see Eagnhouse *et al.* 1991 and Turle *et al.* 1991), DDE levels were lower at these colonies (minimum 1970s values were generally greater than the maximum values found during this study). Similar declines in oxychlordane values were apparent at Bluff and Middleton Island, and also in HCB levels at Bluff. However, the historical levels of these two contaminants were lower and similar to the current values at Bogoslof Island (see Fig. 19).

In contrast, dieldrin and heptachlor epoxide values at Bogoslof and Middleton islands appeared to have been higher in the 1970s. However, historical variation was high suggesting that these changes might not be real. Data from Bluff supported this argument: 1976 levels of these compounds were considerably lower and similar to the values found during this study (see Fig. 19).

Average Middleton Island toxaphene levels were similar to the 1976 values; however again, historical deviations were large, casting doubt on this apparent change. As in the case of PCBs, historical methods for analyzing toxaphene differed from current techniques. Historical methods relied on one of several commercial standards, while the current methods use congeners. Given this difference, care must be exercised when comparing values.

Problems associated with attempts to compare historical data with contemporary information demonstrate the importance of specimen banks and standardized methods for collecting and storing samples for future research. If egg samples from the 1970s had been saved and properly banked, they could have been reanalyzed and compared directly with data generated during this study. Also, banked egg samples from the 1970s could have been analyzed for more recent contaminants of concern (e.g., PBDEs and organotins). For example, common murre eggs from Stora Karlsö in the Baltic Sea have been banked in the Swedish Environmental Specimen Bank since studies began in 1969. Jörundsdóttir *et al*. (2006) reanalyzed samples from these eggs and found that significant declines occurred in DDE, PCB congeners 101 and 153, and *trans-*

chlordane levels between 1971 and 2001. Their retrospective analyses also discovered that the declines were slower during the last decade, which supports the changes that have been found between the historical 1970s information and data generated by this study (see Fig. 19).

Sellström *et al.* (2003) used samples from the banked Swedish eggs to examine temporal trends in PBDEs. They found that levels increased during 1969-1985 and decreased during 1990-2001. These researchers also reported that restrictions on production and use of PBDEs began in Europe in 1986. In contrast, production of penta- and octa-BDE products did not stop in the U.S. until 2004, and only a handful of the 50 states regulate PBDEs to this day (Bromine Science and Environmental Forum 2007). So, in spite of the fact that current levels of these compounds are lower in Alaskan common murre eggs than those reported from Stora Karlsö (see Table 5), they may remain unchanged or even increase for several more years, given the estimated time lag for reduction of contaminants in arctic environments following declines in emissions (i.e., typically on the order of decades; see Gouin and Wania 2007). Levels of the other contaminants reported by Jörundsdóttir *et al*. (2006) were also higher, compared to this study (see Table 5), and have geographic patterns similar to those found during recent studies (e.g., see Vander Pol *et al.* 2004, Muir and Norstrom 2000).

PCB, DDT, and mirex levels in the glaucous and glaucous-winged gull eggs were generally lower than those reported in the literature (see Fig. 20; also see also see Barrett *et al.* 1996, Braune *et al.* 1999, Braune *et al.*2002, Elliott *et al.* 1989, Jack and Martinez 2003, Ohlendorf *et al.* 1982, Speich *et al.* 1992, and Verreault *et al.*2005). In contrast, HCB levels were generally higher than the literature values, with the exception of those found in the Canadian gull eggs. Other POP levels were similar to literature values, including those reported by Jack and Martinez (2003).

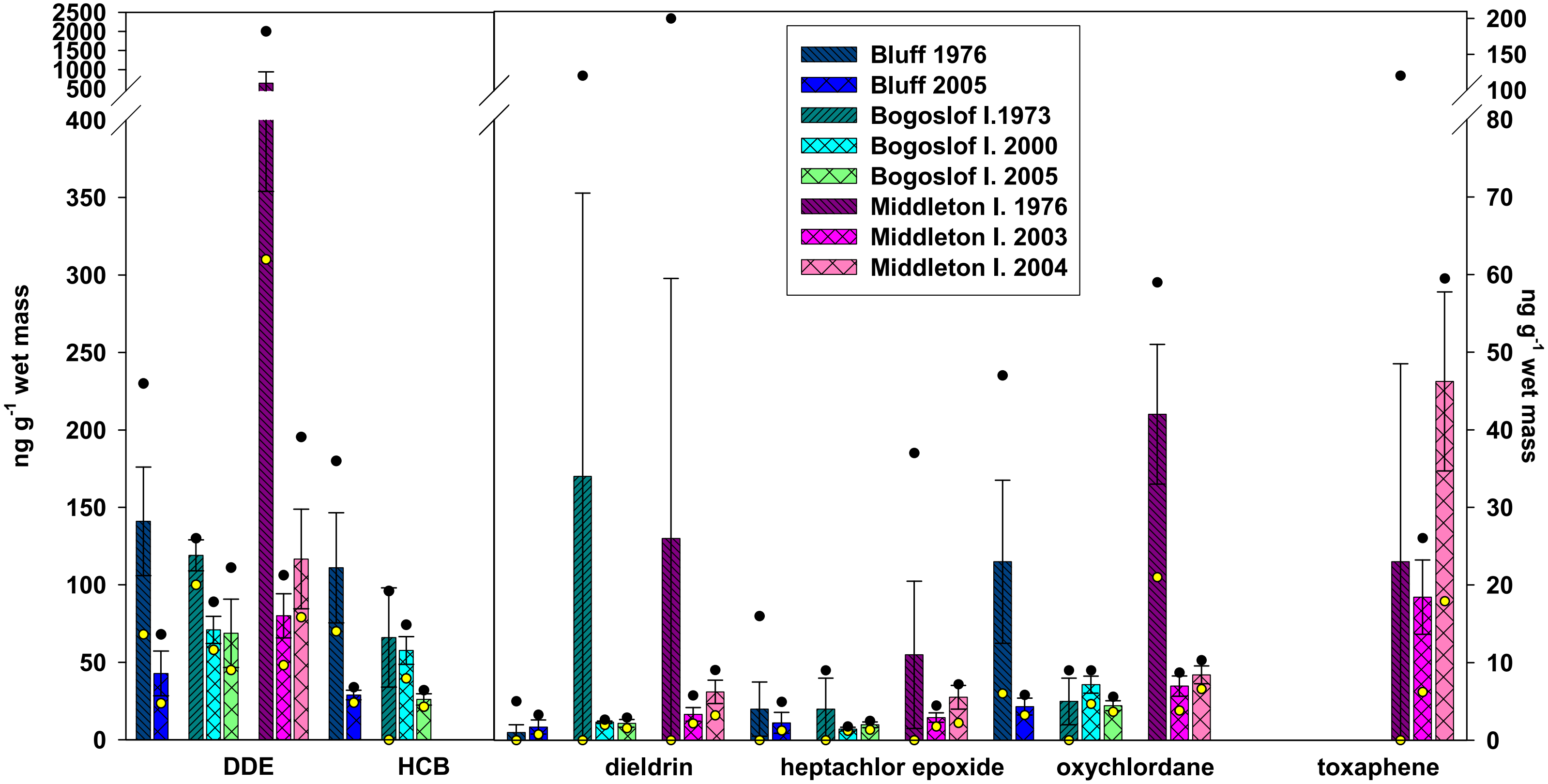

Figure 19. Mean mass frations of POPs in common murre eggs collected at Alaskan colonies during 2003-2005 and the 1970s (see Ohlendorf *et al.* 1982). Error bars show 95% confidence intervals and ranges are indicated by dots.

Table 5. Mass fractions (ng g^{-1} wet mass; means with ranges in parentheses) of selected organic contaminants in Alaskan common murre eggs compared to values reported from Stora Karlsö in the Baltic Sea (see Sellström *et al.* 2003 and Jörundsdóttir *et al*. 2006).

	Alaska 2003-2005	**Stora Karlsö 2001**	
Compound	**Current Results**	**Jörundsdóttir et al. (2006)**	**Sellström et al. (2003)**
PCB 101	4.57 (<0.3 - 95.7)	17 (60 - 86)	
PCB 153	142 (10.0 - 628)	2200 (940 - 4200)	
DDE	854 (240 - 2743)	10000 (7000 - 13000)	
***trans*-nonachlor**	1.59 (<0.07 - 2.47)	2.7 (<0.5 - 12)	
BDE 47	36.2 (1.17 - 303)		89 (28 - 360)
BDE 99	9.42 (<0.6 - 637)		12 (4.6 - 42)

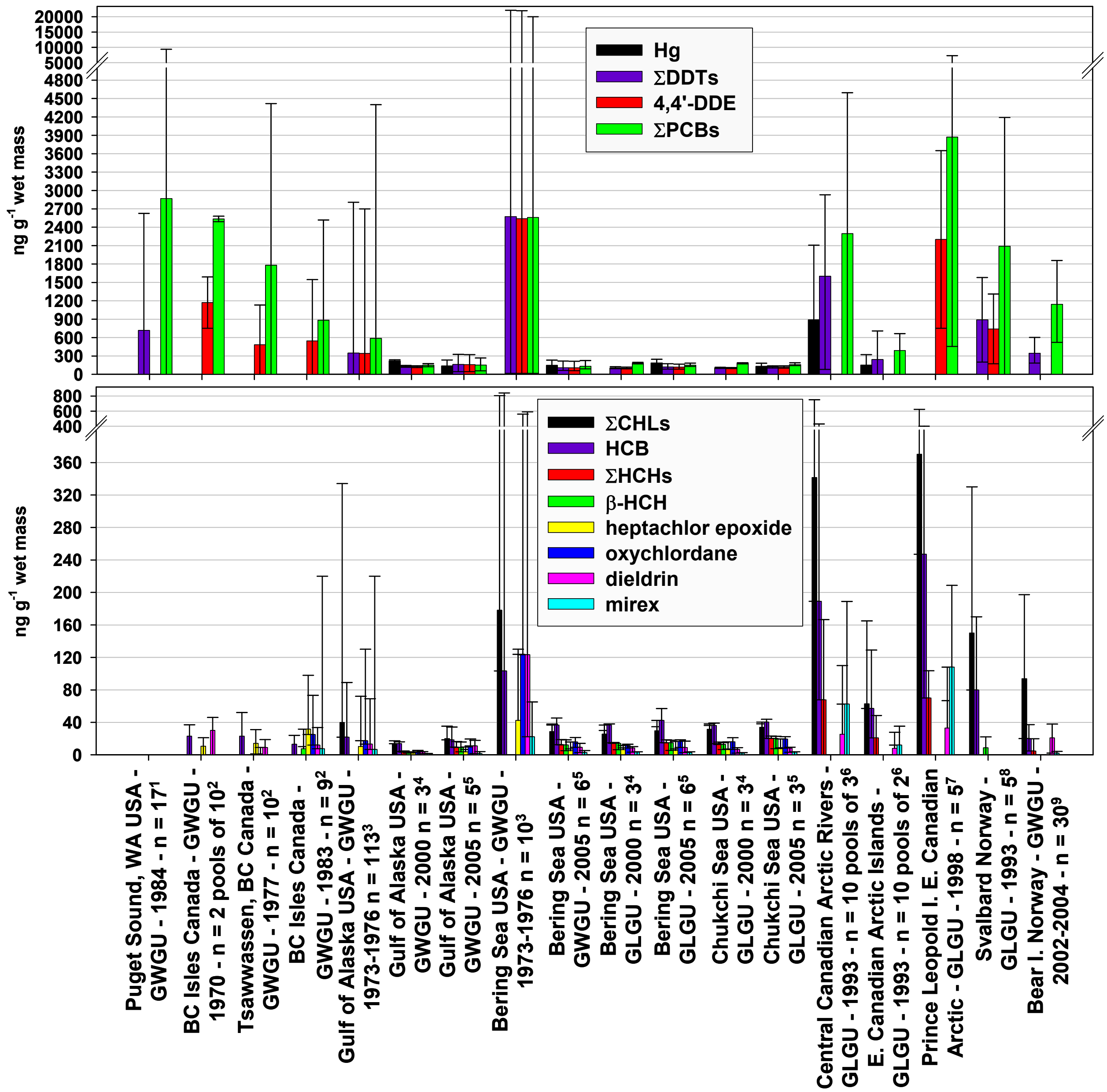

Figure 20. Mass frations of contaminants (means and ranges) in glaucous (GLGU) and glaucous-winged (GWGU) gull eggs reported in the literature and found during this study ([1]Speich *et al.* 1992, [2]Elliott *et al.* 1989, [3]Ohlendorf *et al.* 1982, [4]Jack and Martinez 2003, [5]this study, [6]Braune *et al.*2002, [7]Braune *et al.* 1999, [8]Barrett *et al.* 1996, [9]Verreault *et al.*2005).

Mercury (including organomercury)

Measuring sources and sinks of toxicants, assessing environmental risks, and understanding abiotic and biotic processes that influence pollutant levels are fundamental parts of describing spatial patterns in contaminants on local, regional, and global scales. The mercury levels found in murre eggs during this study were comparable to those reported from other regions of the world (see Table 6). Levels were higher in the Gulf of Alaska than in the Bering Sea (see Fig. 15) and this same geographic pattern has been reported in Pacific halibut (*Hippoglossus stenolepis*) and sablefish (*Anoplopoma fimbria*). Mercury levels increased in these benthic fish eastward from the Bering Sea to the Gulf of Alaska and then southward into the nearshore waters of southeastern Alaska (see Hall *et al.* 1976a, Hall *et al*. 1976b). This pattern in mercury contamination was similar to the POP patterns discovered in murre eggs during previous work (see Vander Pol *et al*. 2004) and verified during this study. It also complements the results of other studies showing that mercury levels tend to increase as one continues to move southward into British Columbia, Washington, Oregon, and California waters (e.g., see Sydeman and Jarman 1998; Hall *et al.* 1976a, 1976b; Anas 1974).

Data on transport and deposition rates of mercury are not available from the Bering and Chukchi seas and Gulf of Alaska. However, there is one obvious climatic difference between these regions: the much higher precipitation rates in the Gulf of Alaska, compared to the Bering and Chukchi seas (e.g., see Stabeno *et al.* 2004). Although the importance of dry atmospheric deposition of mercury has become increasingly clear (see Miller *et al.* 2005, Grigal 2002), it may be possible that precipitation enhances scavenging of mercury species, as air masses approach the Gulf's coast (see Sakata and Marumoto 2005). However, measurements of atmospheric mercury deposition are currently not available for any of Alaska's marine environments, but a model for predicting mercury deposition in the Arctic may be built using a recent publication (Jaffe and Strode, 2008). Coordinating STAMP sampling sites with future efforts to obtain this information and incorporating data from this work into the analyses of seabird eggs would markedly improve the value of the data sets.

Table 6. Mean mass frations of total mercury (μg g^{-1}, wet mass) in common murre (*Uria aalge*) and thick-billed murre (*U. lomvia*) eggs from Alaska, California, Norway, and Russia**.**

Species	Location	Year	Hg	%RSD	N	Reference
U. aalge	Alaska (St. Lazaria I.)	2004	0.218	36%	8	This study
U. aalge	Alaska (Gull I.)	2004	0.131	21%	8	This study
U. aalge	Alaska (Duck I.)	2004	0.176	16%	4	This study
U. aalge	Alaska (East Amatuli I.)	2003	0.114	14%	10	This study
U. aalge	Alaska (St. Lazaria I.)	2003	0.174	22%	10	This study
U. aalge	Alaska (St. Lazaria I.)	2001	0.150	24%	10	Day *et al.* 2006
U. aalge	Alaska (Bogoslof I.)	2000	0.031	44%	9	Day *et al.* 2006
U. aalge	Alaska (St. Lazaria I.)	1999	0.207	26%	10	Christopher *et al.* 2002
U. aalge	Alaska (Little Diomede I.)	1999	0.053	36%	9	Christopher *et al.* 2002
U. aalge	Alaska (St. George I.)	1999	0.026	30%	11	Christopher et *al.* 2002
U. aalge	Alaska (East Amatuli I.)	1999	0.200	36%	11	Christopher *et al.* 2002
U. aalge	California (Farallone Is.)	1994	0.165	37.3%	12	Jarman *et al.* 1996
U. aalge	California (Farallone Is.)	1993	0.196	n/a	15	Sydeman &Jarman 1998
U. aalge	Russia (Kola Peninsula)	1993	0.08	12.5%	5	Barrett *et al.*1996
U. aalge	Norway (Finmark)	1993	0.10	40%	5	Barrett *et al.*1996
U. aalge	Norway (E. Finmark)	1983	0.12	33.3%	10	Barrett *et al.*1985
U. aalge	Norway (W. Finmark)	1983	0.11	54.5%	9	Barrett *et al.*1985
U. aalge	Norway (Nordland)	1983	0.13	30.1%	7	Barrett *et al.*1985
U. aalge	Norway (Lofoten I.)	1983	0.08	12.5%	8	Barrett *et al.*1985
U. aalge	Northern Norway	1972	0.07	n/a	30	Fimreite *et al.* 1974
U. lomvia	Alaska (Cape Lisburne)	2002	0.053	27%	6	This study
U. lomvia	Alaska (St. Lawrence I.)	2002	0.400	38%	6	This study
U. lomvia	Alaska (St. George I.)	2002	0.045	54%	7	This study
U. lomvia	Alaska (St. Lazaria I.)	2002	0.199	15%	6	This study
U. lomvia	Alaska (St. George I.)	2000	0.037	15%	7	Day *et al.* 2006
U. lomvia	Alaska (Bogoslof I.)	2000	0.086	33%	10	Day *et al.* 2006
U. lomvia	Alaska (St. Lazaria I.)	2001	0.104	36%	10	Day *et al.* 2006

Table 6 (continued). Mean mass frations of total mercury (μg g^{-1}, wet mass) in common murre (*Uria aalge*) and thick-billed murre (*U. lomvia*) eggs from Alaska, California, Norway, and Russia**.**

Species	Location	Year	Hg	%RSD	N	Reference
U. lomvia	Canada (Coats I.)	1998	0.176	n/a	15	Braune *et al.* 2002
U. lomvia	Canada (Prince Leopold I.)	1998	0.332	n/a	15	Braune *et al.* 2002
U. lomvia	Canada (Coburg I.)	1993	0.423	n/a	15	Braune *et al.* 2002
U. lomvia	Canada (Digges I.)	1993	0.238	n/a	15	Braune *et al.* 2002
U. lomvia	Canada (Coats I.)	1993	0.237	n/a	15	Braune *et al.* 2002
U. lomvia	Canada (Prince Leopold I.)	1993	0.290	n/a	15	Braune *et al.* 2002
U. lomvia	Canada (Prince Leopold I.)	1988	0.258	n/a	9	Braune *et al.* 2001
U. lomvia	Canada (Prince Leopold I.)	1987	0.269	n/a	9	Braune *et al.* 2001
U. lomvia	Canada (Prince Leopold I.)	1977	0.150	n/a	9	Braune *et al.* 2001
U. lomvia	Canada (Prince Leopold I.)	1976	0.236	n/a	9	Braune *et al.* 2001
U. lomvia	Canada (Prince Leopold I.)	1975	0.188	n/a	9	Braune *et al.* 2001

Local biogeochemical processes that control the formation and bioaccumulation of methylmercury are often equally as important as mercury input in biological systems (e.g., see Mason *et al.* 2005). Although quantitative assessments have not been made, the proximity of colonies to mainland environments is probably an important factor. Erosion of natural mercury deposits (e.g., see AMAP 2002), mercury derived from snowmelt (e.g., see Loseto *et al.* 2004), strong freshwater discharges (see Stabeno *et al.* 2004), and estuaries and coastal wetlands that have favorable conditions for the methylation of mercury (e.g., see U.S.EPA 2000) may all contribute to the levels of mercury in seabird eggs. Although these factors appear to be more common in the Gulf of Alaska than in the Bering and Chukchi seas, they fail to explain all of the variation found in these regions. For example, in the Gulf of Alaska, mercury levels in common murre eggs from four nesting locations closely associated with mainland environments (Gull, Duck, East Amatuli, and St. Lazaria islands were similar to the values found at Middleton Island, a colony located about 120 km offshore in more oceanic waters. However, within the Bering Sea, mercury levels were significantly higher in the common murre eggs from three coastal colonies in Norton Sound (Cape Denbigh, Bluff, and Sledge Island) than they were at the offshore island locations (St. Lawrence, St. George, Bogoslof, and Little Diomede islands) and the other mainland locations in the Bering and Chukchi seas (Cape Pierce and Cape Lisburne, see Fig. 16). Indeed, the mercury levels found in the murre eggs at the Norton Sound colonies were quite similar to the relatively high Gulf of Alaska values (see Fig 14).

Two factors may help explain why mercury levels were high at the Norton Sound murre colonies. Norton Sound is strongly influenced by the freshwater outflow of the Yukon River (e.g., see Coachman *et al.* 1975, Springer *et al.* 1984), and its northern coast has a long history of placer mining dating from the 1899 Nome gold rush when liquid mercury (quicksilver) was first used to separate gold from slurries in sluice boxes, drainage tunnels, rockers, and other extraction devices (e.g., see Harrison 1905, Carlson 1947; also see Alpers and Hunerlach 2000 for information on the mercury amalgamation process). Mercury was used throughout most of the Seward Peninsula's river and creek drainages flowing into the Sound, including Daniels Creek near Bluff, where one of the richest gold deposits was found in 1900 (see Harrison 1905). In 1968-1971, old corroding 45 kg iron flasks of liquid mercury were still present at the old Bluff town site (D.G. Roseneau, pers. obs.), and high levels of this contaminant can still be found at most of the Peninsula's historical mining sites to this day. For example, in the mid-1980s, a public health study of a mining operation on the outskirts of Nome (Dry Creek) reported mercury levels as high as 85 ppm in soil samples from Steadman Field, a recreational facility built on a former gold mining site (see Middaugh *et al.* 1986; also see www.atsdr.cdc.gov/HAC/pha/alaskag/agc_pl.html). This same study also reported values as high as 144 $\mu g\ g^{-1}$ in waste tailings and 484,600 $\mu g\ g^{-1}$ in sediments at a mercury retort site near the city of Nome, and in the late 1980s, another research project found 1-2 ng/L of mercury in some surface seawater samples collected in Norton Sound near Nome (see Crecellus *et al.* 1990).

The other coastal colonies in the Bering and Chukchi seas (i.e., Cape Pierce and Cape Lisburne) are situated on promontories of land, and the mercury levels at these locations were closer to the values found at the offshore island colonies (i.e., Little Diomede, St. George, St. Lawrence, and Bogoslof islands). More information is needed on watershed-derived methylmercury and *in situ* production of this compound in coastal wetlands to understand local signatures. Analyzing eggs from other murre and gull colonies in the Norton and Kotzebue sound regions (e.g. King Island, the Brevig Mission – Teller – Imruk Basin vicinities, Cape Darby, Rocky Point, Shaktoolik, Besboro and Egg islands, and the Cape Espenburg – Goodhope River – Deering – Buckland vicinities) will provide new information that may help clarify this issue.

One of STAMP's primary goals is to collect and analyze seabird eggs for contaminants to determine current baseline levels, and another major goal is to bank these egg samples for future retrospective studies of long-term temporal trends and new analytes of interest. Since the project began in 1999, most efforts have focused on investigating geographic variations in contaminants and identifying sampling sites that could be used in a long-term monitoring program. However, the multi-year data that are now available from four colonies (St. Lazaria Island, common and thick-billed murres; Middleton Island, common murres; East Amatuli Island, common murres; and St. George Island, thick-billed murres) provided an opportunity to begin investigating temporal trends. When these data were analyzed for mercury, they showed that levels varied somewhat over the years at three of the sites and were significantly different at East Amatuli Island (see Fig. 14). Although the time interval was too short to begin inferring the presence of long-term changes, the information from these colonies demonstrated that annual variability must be taken into account when attempting to track long-term trends in contaminants. These data will be incorporated into a statistical power analysis to formally assess the ability of the current collection design to detect temporal and geographic trends, and modify collection size and frequency and necessary. This process will be periodically repeated as more data becomes available. Because murre diets vary annually and seasonally (e.g., see Springer *et al.* 1986, Springer *et al*. 1984, Carscadden *et al.* 2002), long-term monitoring efforts must also consider annual and seasonal changes in prey quality and availability. A study of forage fish used by seabirds in the northern Gulf of Alaska found high variability in energy density among species and positive correlations between lipid and protein content (see Anthony *et al.* 2000), which may be relevant to mercury levels. Given this information, it is clear that better information on short- and long-term shifts in food webs and climatic patterns must be obtained to help interpret temporal trends in contaminants.

Monitoring contaminant levels in air, sediments, and water is not sufficient to predict health risks to wildlife and humans. Also, matrices resulting from these efforts contain certain biases and limitations (see Mason *et al.* 2005). In contrast, using biota to monitor environmental contaminants can provide single data points that integrate exposure over time, space, and trophic levels. However, life-history differences (e.g., sex, age, winter and summer distribution, migration routes, and foraging strategies) among individuals and populations can facilitate variation. Using muscle or liver tissues that serve as long-term storage sites for mercury to monitor pollutants also has draw-backs because it is difficult to determine the spatial and temporal scales the tissues are using to integrate the contaminants. Given this information, it is clear that the species and matrices used in long-term monitoring programs have to be chosen with care.

Eggs are also vulnerable to the same biases; however, data from these tissues combined with information from other egg monitoring programs and experimental data suggest they may be effective for monitoring mercury because they more closely reflect discrete periods of mercury exposure, are geographically distinct, and have low sampling variability relative to other matrices. High analytical costs often result in sample sizes that are too small to address all of the variation in the system. In order to maximize abilities to detect environmental trends, long-term monitoring programs must balance these factors and use the best techniques available to reduce compounding environmental and analytical variability.

STAMP is beginning to address the potential influence of annual variability on abilities to detect long-term trends in contaminants by collecting murre eggs for longer periods of time (6-7 years) at three sampling locations: Cape Lisburne in the Chukchi Sea, St. George Island in the Bering Sea, and St. Lazaria Island in the Gulf of Alaska (i.e., one sampling site per region). Data from these colonies will be subjected to a power analysis to help determine overall monitoring design and provide balance between abilities to detect trends and costs of collecting and analyzing samples. Information developed during this study indicating that more sampling sites are needed in some areas to address annual variation will also be taken into account (e.g., see the POPs results for Norton Sound and the Gulf of Alaska).

Another STAMP objective is to monitor the effect of changing mercury emissions on mercury levels over decadal periods of time. The limited number of anthropogenic sources of mercury in Alaska makes it an attractive place to track changes in global levels. This fact and current concerns that polar environments may serve as global sinks for mercury make establishing long-term monitoring programs in Alaska a priority. Data obtained during this study have demonstrated that murre eggs are sensitive indicators of geographic and temporal trends in mercury and other contaminants. These data have also shown that better information on relationships among egg contaminant levels, seabird life histories, marine food webs, atmospheric deposition processes and rates, climatic patterns, and contaminant cycling rates is needed to accurately interpret the mechanisms driving the trends in mercury levels and other contaminants. Recently, STAMP finished analyzing 60 egg samples with a multicollector ICPMS, and data are currently being processed. Preliminary information from these new analyses indicates there may be subtle differences in patterns of stable mercury isotopes, which suggests there may be differences in sources or trophic transfer rates of mercury. Applying a more integrative approach to validate the interpretation of data and normalizing mercury measurements by covariates such as $\delta^{15}N$ or protein content in the samples will improve STAMP's abilities to compare data over long periods of time and maximize the value of the research.

Organotin Compounds

Antifouling paints have been a major source of tributytin (TBT) in marine environments. The biocidal and endocrine disruptor properties of this compound have been known since the late 1950s, and its use in vessel paints has detrimentally affected marine wildlife on a global scale - e.g., from gastropods and bivalves to apex predators, including marine mammals (See Tanabe *et al*. 1998, Hoch 2001, Uenoa *et al.* 2004). Prior to this study, data were not available on this important organometallic contaminant in Alaska's marine environments.

Common and thick-billed murre eggs contained ∑BT levels that were about 2.5 times higher and less variable, compared to those found in gull eggs (see Table 4 and Fig. 17). This difference was probably influenced by differences in foraging strategies and habitats. For example, gulls are surface feeders that tend to utilize nearshore environments. They also feed heavily on invertebrates in intertidal zones and scavenge on a variety of carcasses in both marine and terrestrial habitats. In contrast, murres are deep divers that feed primarily on fish, including both pelagic and demersal species, and they also forage in offshore environments up to 100-160 km from their nesting colonies. As a consequence, murres are better at integrating open ocean signatures over large areas. The differences in MBT and DBT levels in the murre and gull eggs suggest there may be differences in exposure to organotin sources and/or differences in how the birds metabolize these contaminants. Although murres and gulls may integrate BuSn signatures at different rates, data obtained from the gull eggs compliment information from sessile organisms, such as mussels and oysters, which are typically used to monitor these compounds.

Murre eggs from the Gulf of Alaska and Chukchi Sea contained higher ∑BT levels than murre eggs from the Bering Sea (see Table 4 and Fig. 17). In the Gulf of Alaska, thick-billed murre eggs had higher levels than common murre eggs (see Table 4 and Fig. 18). These differences are probably related to differences in foraging habitats and strategies. As previously mentioned, thick-billed murres tend to dive deeper, feed farther from shore, and consume larger numbers of benthic fish and invertebrates, compared to common murres. These basic differences between the species probably explain the higher BuSn and POPs levels found in the Gulf of Alaska thick-billed murre eggs. Similarities between the POP, mercury, and BuSn patterns also suggest similar routes of exposure. Hydrophobic compounds (e.g., DDT) tend to adsorb to particles that sink and accumulate in sediments and benthic food webs. Benthic foraging strategies and utilization of invertebrates are also consistent with the higher levels of TBT contamination found in the thick-billed murre eggs.

Based on the results of this study, it is clear that seabird eggs are effective matrices for monitoring organotin compounds in marine environments. Although lower intracolony variability in murre eggs (less than 40% vs. 80% in gulls) suggests they may be better suited for this task, it is also clear that gull eggs are valuable for tracking changes in this contaminant because these birds are widely distributed throughout northern marine ecosystems and function as scavenger-predators in a variety of different habitats.

Conclusions

1) We confirmed the presence of geographic patterns in contaminants in murre eggs. Levels of POPs with the lowest environmental mobility (PCBs, DDE) were higher in the Gulf of Alaska than in Bering Sea. This pattern appeared to be consistent over time and occurred at colonies located in coastal mainland habitats as well as colonies influenced by deep oceanic habitats.

2) Levels of POPs with the lowest environmental mobility (PCBs, DDE) were higher in the murre eggs from St. Lazaria Island in southeastern Alaska than the eggs from colonies in the northern Gulf of Alaska. More information will be needed to determine if the high St. Lazaria values are unique to this area or if they are similar to levels at nearshore nesting locations along the coasts of British Columbia, Washington, and Oregon. These findings also indicate that at least one more northern Gulf of Alaska sampling site will be needed to monitor long-term contaminant trends in this region.

3) Levels of HCB were higher in murre and gull eggs from the Bering Sea than eggs from the Gulf of Alaska. This was opposite to the pattern found in POPs with the lowest environmental mobility (PCBs, DDE), and probably reflects the greater volatility of HCB, which is rapidly transported through the atmosphere to the higher latitudes.

4) Geographic patterns of POPs were similar in the gull and murre eggs (i.e., the Gulf of Alaska was distinct from the Bering and Chukchi seas), but high variation in the gull eggs from Middleton Island reduced our confidence in the gull pattern. More gull eggs will have to be analyzed to determine if the geographic patterns for the two groups of seabirds are the same.

5) Levels of POPs appear to have declined at Alaskan murre colonies since the mid-1970s. However, historical data on PBDEs are not available, and analytical methods for detecting and measuring PCBs and toxaphene have improved substantially during the last 30 years, precluding temporal comparisons of these compounds.

6) Most POP values varied among years at murre colonies where 2-4 years of data spanning 4-6 year intervals were available (i.e., St. Lazaria, East Amatuli, and Bogoslof islands). The levels of 4,4’-DDE, PCBs, and HCB declined at all colonies (after removal of an outlier from Bogoslof Island), but the four years of information from St. Lazaria Island provided the best evidence of declines in these compounds.

7) Mercury levels in murre eggs were comparable to the levels reported from other parts of the

world.

8) Overall, mercury levels were higher in murre eggs from the Gulf of Alaska than from the Bering and Chukchi seas. The smaller data set on gulls showed no significant geographic variability.

9) Within the Gulf of Alaska there were no differences in mercury levels among colonies. However, within the Bering Sea, the three Norton Sound murre colonies had significantly higher values than all of the other colonies in the region. These data also suggest that there may be differences in POPs among the Norton Sound colonies. The elevated mercury levels may be the result of historical mining activities on the Seward Peninsula, natural inputs from the Yukon River and smaller drainages in the region, and/or natural methylation processes in the region's coastal wetlands.

10) Common and thick-billed murres showed no significant differences in mercury levels within regions. Gulls and murres did not differ significantly in the Gulf of Alaska, but in the Bering Sea, gull egg values were significantly higher than murre egg values.

11) Temporal variability in mercury levels was found at some murre colonies. However, additional data will be needed to determine if this just reflects annual variability or if it actually represents part of a long-term trend.

12) Organotin levels in murre eggs were about 2.5 times higher and less variable than the levels found in gull eggs. This difference probably reflects differences in foraging habitats and strategies.

13) Differences in levels of the TBT metabolites, MBT and DBT, in the murre and gull eggs suggested differences in exposure to organotin sources and/or differences in how these seabirds metabolically process these compounds.

14) The geographic pattern in organotin compounds in murre eggs was different from the POPs and mercury patterns found in the same eggs. Total organotin levels were higher at the Gulf of Alaska and Chukchi Sea murre colonies than at the Bering Sea colonies. In contrast, no differences in total organotin levels or its metabolites were found among the gull colonies in these regions. More murre and gull eggs will have to be analyzed to verify the presence or absence of these geographic trends in Alaska's marine environments.

Recommendations

1. More information should be obtained on mercury levels in eggs from seabird colonies in Norton Sound, where murre and gull eggs are important subsistence resources. Relatively high levels of mercury were found in the murre eggs from Sledge Island, Bluff, and Cape Denbigh. Analyzing murre and gull eggs from a larger set of Norton Sound colonies coupled with samples from other coastal nesting locations outside of Norton Sound near major river discharges would provide better information on the regional distribution of this element, help

identify patterns that could characterize possible sources, and provide valuable information to the region's subsistence users.

2. In addition to determining levels of mercury in seabird eggs from colonies in and around Norton Sound, the isotopic patterns of mercury should be identified by multicollector ICP-MS. This analytical method has the potential to use different isotopic patterns to better understand the propagation of this element in the food webs and to differentiate sources of mercury (e.g. Asian coal is isotopically distinct from North American coal, or imported mercury for gold mining versus natural mercury from stream sediments). Therefore, if coastal colonies are heavily influenced by mining activities or terrestrial cinnabar deposits, they may reflect different isotopic mercury patterns from colonies influenced by volcanic events or atmospherically derived mercury.

3. More information should be obtained on mercury and POPs gradients in seabird eggs in the Gulf of Alaska and Pacific Northwest. Analyzing eggs from the Cold Bay, King Cove, Kodiak Island, Prince William Sound, Yakutat, Glacier Bay, and Hydaburg-Craig vicinities in Alaska, Triangle Island in British Columbia, Tatoosh Island in Washington, and the Farallon Islands in California would refine information on the east-west and north-south gradients in the Gulf of Alaska and test the hypothesis that contaminant levels increase eastward and southward around the Gulf and down the west coast of North America.

4. More information should be obtained on organotins as well as other emerging contaminants in Alaska's marine environments. Analyzing larger numbers of banked gull eggs from previously established sampling sites and gull eggs obtained from several new locations in the Bering Sea and Gulf of Alaska would markedly expand the data base on these compounds and help identify geographic patterns in nearshore habitats.

5. Carbon and nitrogen stable isotope analysis of previously banked eggs, as well as future egg collections, will help explain the observed geographical, temporal and species comparisons. Enrichment of ^{15}N is generally used to differentiate trophic levels while enrichment in ^{13}C generally indicates inshore/benthic feeding vs. offshore/pelagic feeding.

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Appendix 1. Alaskan seabird eggs banked by STAMP in 2002-2005. BLKI = black-legged kittiwake (*Rissa tridactyla*), UNMU = unidentified murre species (*Uria spp.*), COMU = common murre (*U. aalge*), TBMU = thick-billed murre (*U. lomvia*), GLGU = glaucous gull (*Larus hyperboreus*), and GLGW = glaucous-winged gull (*L. glaucescens*).

ID								Mass (g)			
Number	**Storage**	**Field**	**Species**	**Colony**	**Latitude**	**Longitude**	**Date Collected**	**Whole Egg**	**Contents**	**Embryo**	**Eggshell**
112	ST04E112C	BLUF01COMU02	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	18-Jun-02	105.78	89.47		12.51
113	ST04E113C	BLUF02COMU02	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	18-Jun-02	111.39	83.87		13.94
114	ST04E114C	BLUF03COMU02	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	18-Jun-02	118.89	101.00		14.69
115	ST04E115C	BLUF04COMU02	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	18-Jun-02	103.85	86.59		13.24
116	ST04E116C	BLUF05COMU02	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	18-Jun-02	113.47	96.30		13.73
117	ST04E117C	BLUF06COMU02	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	18-Jun-02	100.54	82.77		12.78
118	ST04E118C	BLUF07COMU02	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	18-Jun-02	111.92	95.29		12.46
119	ST04E119C	BLUF08COMU02	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	18-Jun-02	124.74	103.49		15.80
120	ST04E120C	BLUF09COMU02	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	18-Jun-02	109.58	92.76		12.86
121	ST04E121C	BLUF10COMU02	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	18-Jun-02	117.80	56.07		14.86
122	ST04E122C	BLUF11COMU02	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	18-Jun-02	106.59	87.82		not measured
123	ST04E123C	STGE01TBMU02	TBMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	2-Jul-02	111.83	95.99		12.82
124	ST04E124C	STGE02TBMU02	TBMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	2-Jul-02	100.29	85.15		11.80
125	ST04E125C	STGE03TBMU02	TBMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	2-Jul-02	112.12	93.58		14.07
126	ST04E126C	STGE04TBMU02	TBMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	2-Jul-02	90.89	79.78		9.23
127	ST04E127C	STGE05TBMU02	TBMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	2-Jul-02	109.89	97.34		10.36
128	ST04E128C	STGE06TBMU02	TBMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	2-Jul-02	116.28	99.67		13.53
129	ST04E129C	STGE07TBMU02	TBMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	2-Jul-02	121.90	104.57		13.40
130	ST04E130C	STGE08TBMU02	TBMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	2-Jul-02	112.53	77.43		11.49
131	ST04E131C	STGE09TBMU02	TBMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	2-Jul-02	101.01	87.97		not measured
132	ST04E132C	STGE11TBMU02	TBMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	2-Jul-02	95.75	81.32		11.17
133	ST04E133C	STLA01TBMU02	TBMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	6-Jul-02	107.90	87.04		13.68
134	ST04E134C	STLA02TBMU02	TBMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	6-Jul-02	110.14	91.55		14.63
135	ST04E135C	STLA03TBMU02	TBMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	6-Jul-02	132.46	113.20		15.32
136	ST04E136C	STLA04TBMU02	TBMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	6-Jul-02	115.40	97.01		14.74
137	ST04E137C	STLA05TBMU02	TBMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	6-Jul-02	122.23	101.90		15.84
138	ST04E138C	STLA06TBMU02	TBMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	6-Jul-02	106.11	93.47		9.75
139	ST04E139C	STLA08TBMU02	TBMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	6-Jul-02	109.28	91.38		14.28
140	ST04E140C	STLA09TBMU02	TBMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	6-Jul-02	105.93	87.65		14.78
141	ST04E141C	STGE01BLKI02	BLKI	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	11-Jul-02	46.91	40.93		3.19
142	ST04E142C	STGE02BLKI02	BLKI	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	11-Jul-02	44.12	40.60		2.45
143	ST04E143C	STGE03BLKI02A STGE03BLKI02B	BLKI	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	11-Jul-02	49.78 49.71	90.17		2.95 3.20
144	ST04E144C	STGE04BLKI02A STGE04BLKI02B	BLKI	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	11-Jul-02	48.80 49.52	89.35		2.81 3.00
145	ST04E145C	STGE05BLKI02A STGE05BLKI02B	BLKI	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	13-Jul-02	49.41 45.74	78.90		3.27 3.88
146	ST04E146C	STGE06BLKI02A STGE06BLKI02B	BLKI	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	13-Jul-02	47.72 48.95	83.85		3.18 2.95
147	ST04E147C	STGE07BLKI02A STGE07BLKI02B	BLKI	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	13-Jul-02	54.39 54.90	98.15		3.55 3.66
148	ST04E148C	STGE08BLKI02	BLKI	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	13-Jul-02	55.71	50.06		3.58
149	ST04E149C	STGE09BLKI02A STGE09BLKI02B	BLKI	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	13-Jul-02	59.85 63.66	112.46		3.36 3.87

Appendix 1 (continued). Alaskan seabird eggs banked by STAMP in 2002-2005. BLKI = black-legged kittiwake (*Rissa tridactyla*), UNMU = unidentified murre species (*Uria spp.*), COMU = common murre (*U. aalge*), TBMU = thick-billed murre (*U. lomvia*), GLGU = glaucous gull (*Larus hyperboreus*), and GLGW = glaucous-winged gull (*L. glaucescens*).

	ID							Mass (g)					
Number	Storage	Field	Species	Colony	Latitude	Longitude	Date Collected	Whole Egg	Contents	Embryo	Eggshell	Length (cm)	Breadth (cm)
150	ST04E150C	STGE10BLKI02A STGE10BLKI02B	BLKI	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	13-Jul-02	52.97 60.52	100.08		3.68 3.69	5.70 6.04	4.23 4.43
151	ST04E151C	STGE11BLKI02A STGE11BLKI02B	BLKI	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	13-Jul-02	50.97 50.59	92.27		not measured not measured	5.56 5.74	4.20 4.09
152	ST04E152C	STGE12BLKI02A STGE12BLKI02B	BLKI	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	13-Jul-02	59.23 54.33	101.78		3.57 2.91	6.02 5.82	4.32 4.20
153	ST04E153C	BLUF01BLKI02	BLKI	Bering Sea, Bluff	64°34.22'N	163°45.15'W	18-Jun-02	47.62	42.97		2.77	5.60	4.01
154	AT04E154C	BLUF02BLKI02	BLKI	Bering Sea, Bluff	64°34.22'N	163°45.15'W	18-Jun-02	50.88	45.66		3.00	5.43	4.20
155	ST04E155C	BLUF04BLKI02	BLKI	Bering Sea, Bluff	64°34.22'N	163°45.15'W	18-Jun-02	48.68	41.57		3.28	5.79	4.02
156	ST04E156C	BLUF05BLKI02	BLKI	Bering Sea, Bluff	64°34.22'N	163°45.15'W	18-Jun-02	53.41	46.61		3.29	5.85	4.16
157	ST04E157C	BLUF06BLKI02	BLKI	Bering Sea, Bluff	64°34.22'N	163°45.15'W	18-Jun-02	51.74	46.20		3.12	5.69	4.12
158	ST04E158C	BLUF07BLKI02	BLKI	Bering Sea, Bluff	64°34.22'N	163°45.15'W	18-Jun-02	57.28	51.61		3.43	6.21	4.26
159	ST04E159C	MIDD01BLKI02	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	5-Jun-02	44.96	39.90		2.94	5.57	3.98
160	ST04E160C	MIDD02BLKI02A MIDD02BLKI02B	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	5-Jun-02	45.15 42.05	77.58		2.96 2.87	5.38 5.15	4.05 4.01
161	ST04E161C	MIDD03BLKI02	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	5-Jun-02	47.37	43.06		3.25	5.57	4.04
162	ST04E162C	MIDD04BLKI02	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	5-Jun-02	58.82	53.26		3.14	6.03	4.28
163	ST04E163C	MIDD05BLKI02A MIDD05BLKI02B	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	5-Jun-02	46.99 47.83	81.47		3.64 3.07	5.40 5.41	4.13 4.11
164	ST04E164C	MIDD06BLKI02A MIDD06BLKI02B	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	5-Jun-02	46.03 51.24	86.92		3.97 3.28	5.35 5.47	4.06 4.24
165	ST04E165C	MIDD07BLKI02A	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	5-Jun-02	42.16	38.67		2.63	5.44	3.96
166	ST04E166C	MIDD08BLKI02	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	5-Jun-02	48.90	43.69		3.27	5.58	4.12
167	ST04E167C	MIDD09BLKI02A MIDD09BLKI02B	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	5-Jun-02	50.41 51.83	93.54		2.91 3.12	5.60 5.60	4.12 4.20
168	ST04E168C	MIDD10BLKI02A MIDD10BLKI02B	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	5-Jun-02	44.50 40.19	75.15		3.24 2.99	5.30 4.91	4.06 3.94
169	ST04E169C	MIDD11BLKI02A MIDD11BLKI02B	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	5-Jun-02	48.82 46.68	84.55		3.11 3.23	5.62 5.55	4.09 4.07
170	ST04E170C	MIDD12BLKI02	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	5-Jun-02	50.38	44.91		3.03	5.78	4.08
171	ST04E171C	SHBY01BLKI02	BLKI	Gulf of Alaska, Shoup Bay	61°07.54'N	146°35.02'W	14-Jun-02	42.79	39.61		3.08	5.68	4.00
172	ST04E172C	SHBY02BLKI02A SHBY02BLKI02B	BLKI	Gulf of Alaska, Shoup Bay	61°07.54'N	146°35.02'W	14-Jun-02	53.55 51.73	94.97		3.31 3.29	6.12 6.05	4.11 4.10
173	ST04E173C	SHBY04BLKI02	BLKI	Gulf of Alaska, Shoup Bay	61°07.54'N	146°35.02'W	14-Jun-02	48.95	42.07		3.50	5.39	4.14
174	ST04E174C	SHBY05BLKI02A SHBY05BLKI02B	BLKI	Gulf of Alaska, Shoup Bay	61°07.54'N	146°35.02'W	14-Jun-02	50.44 43.78	83.79		3.49 3.00	5.80 5.48	4.07 3.92
175	ST04E175C	SHBY06BLKI02	BLKI	Gulf of Alaska, Shoup Bay	61°07.54'N	146°35.02'W	14-Jun-02	50.78	46.01		3.38	5.84	4.11
176	ST04E176C	SHBY07BLKI02B	BLKI	Gulf of Alaska, Shoup Bay	61°07.54'N	146°35.02'W	14-Jun-02	42.56	38.75		2.79	5.30	3.98
177	ST04E177C	SHBY08BLKI02	BLKI	Gulf of Alaska, Shoup Bay	61°07.54'N	146°35.02'W	14-Jun-02	52.17	46.86		3.36	5.73	4.14
178	ST04E178C	SHBY10BLKI02	BLKI	Gulf of Alaska, Shoup Bay	61°07.54'N	146°35.02'W	14-Jun-02	50.47	44.22		3.83	5.43	4.30
179	ST04E179C	SHBY11BLKI02	BLKI	Gulf of Alaska, Shoup Bay	61°07.54'N	146°35.02'W	14-Jun-02	53.00	47.55		3.23	5.66	4.19
180	ST04E180C	CLIS01TBMU02	TBMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	7-Jul-02	99.03	82.72		13.00	7.70	5.09
181	ST04E181C	CLIS02TBMU02	TBMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	7-Jul-02	99.56	85.57		11.17	8.18	4.92
182	ST04E182C	CLIS03TBMU02	TBMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	7-Jul-02	104.01	88.62		12.31	7.88	5.19

Appendix 1 (continued). Alaskan seabird eggs banked by STAMP in 2002-2005. BLKI = black-legged kittiwake (*Rissa tridactyla*), UNMU = unidentified murre species (*Uria spp.*), COMU = common murre (*U. aalge*), TBMU = thick-billed murre (*U. lomvia*), GLGU = glaucous gull (*Larus hyperboreus*), and GLGW = glaucous-winged gull (*L. glaucescens*).

ID								Mass (g)					
Number	Storage	Field	Species	Colony	Latitude	Longitude	Date Collected	Whole Egg	Contents	Embryo	Eggshell	Length (cm)	Breadth (cm)
183	ST04E183C	CLIS04TBMU02	TBMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	7-Jul-02	113.33	95.64		14.63	8.19	5.20
184	ST04E184C	CLIS06TBMU02	TBMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	7-Jul-02	104.03	89.76		11.27	7.92	5.01
185	ST04E185C	CLIS07TBMU02	TBMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	7-Jul-02	105.93	90.29		13.07	8.08	5.07
186	ST04E186C	CLIS08TBMU02	TBMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	7-Jul-02	94.67	78.91		12.41	7.22	5.00
187	ST04E187C	CLIS09TBMU02	TBMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	7-Jul-02	121.22	101.42		13.14	8.47	5.26
188	ST04E188C	CLIS12TBMU02	TBMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	7-Jul-02	98.06	84.92		11.06	7.71	5.02
189	ST04E189C	STLW01COMU02	COMU	Bering Sea, St. Lawrence I.	63°40.01'N	170°15.27'W	22-Jun-02	102.55	84.76		11.01	8.03	4.96
190	ST04E190C	STLW02COMU02	COMU	Bering Sea, St. Lawrence I.	63°40.01'N	170°15.27'W	22-Jun-02	110.94	89.20		14.22	7.98	5.19
191	ST04E191C	STLW03COMU02	COMU	Bering Sea, St. Lawrence I.	63°40.01'N	170°15.27'W	22-Jun-02	108.54	79.67		12.61	7.82	5.14
192	ST04E192C	STLW02TBMU02	TBMU	Bering Sea, St. Lawrence I.	63°40.01'N	170°15.27'W	20-Jun-02	116.68	99.35		12.96	7.98	5.22
193	ST04E193C	STLW03TBMU02	TBMU	Bering Sea, St. Lawrence I.	63°40.01'N	170°15.27'W	20-Jun-02	not measured	91.21		11.51	7.56	5.13
194	ST04E194C	STLW06TBMU02	TBMU	Bering Sea, St. Lawrence I.	63°40.01'N	170°15.27'W	20-Jun-02	113.42	88.31		15.94	8.27	5.11
195	ST04E195C	STLW08TBMU02	TBMU	Bering Sea, St. Lawrence I.	63°40.01'N	170°15.27'W	20-Jun-02	102.36	82.70		11.91	7.66	4.99
196	ST04E196C	STLW09TBMU02	TBMU	Bering Sea, St. Lawrence I.	63°40.01'N	170°15.27'W	20-Jun-02	117.96	100.09		14.13	8.37	5.21
197	ST04E197C	STLW10TBMU02	TBMU	Bering Sea, St. Lawrence I.	63°40.01'N	170°15.27'W	20-Jun-02	109.55	88.90		13.01	8.05	5.12
198	ST04E198C	STLW11TBMU02	TBMU	Bering Sea, St. Lawrence I.	63°40.01'N	170°15.27'W	20-Jun-02	136.57	115.41		14.95	8.91	5.44
199	ST04E199C	STLW12TBMU02	TBMU	Bering Sea, St. Lawrence I.	63°40.01'N	170°15.27'W	20-Jun-02	118.49	99.27		11.65	8.14	5.26
200	ST04E200C	CHBY02BLKI02	BLKI	Gulf of Alaska, Kodiak I.	57°42.47'N	152°21.21'W	22-Jun-02	60.26	43.45		3.04	not measured	not measured
201	ST04E201C	CHBY03BLKI02	BLKI	Gulf of Alaska, Kodiak I.	57°42.47'N	152°21.21'W	22-Jun-02	55.31	49.78		3.12	5.83	4.20
202	ST04E202C	CHBY04BLKI02	BLKI	Gulf of Alaska, Kodiak I.	57°42.47'N	152°21.21'W	22-Jun-02	51.73	44.05		3.28	5.40	4.29
203	ST04E203C	CHBY05BLKI02	BLKI	Gulf of Alaska, Kodiak I.	57°42.47'N	152°21.21'W	22-Jun-02	44.67	39.65		2.71	5.57	3.96
204	ST04E204C	CHBY06BLKI02	BLKI	Gulf of Alaska, Kodiak I.	57°42.47'N	152°21.21'W	22-Jun-02	53.41	47.87		3.29	5.97	4.20
205	ST04E205C	CHBY08BLKI02A CHBY08BLKI02B	BLKI	Gulf of Alaska, Kodiak I.	57°42.47'N	152°21.21'W	22-Jun-02	47.96 47.94	86.49		2.81 2.76	5.58 5.31	4.01 4.09
206	ST04E206C	CHBY11BLKI02	BLKI	Gulf of Alaska, Kodiak I.	57°42.47'N	152°21.21'W	22-Jun-02	51.44	46.60		2.96	6.01	4.03
207	ST04E207C	CHBY12BLKI02A CHBY12BLKI02B	BLKI	Gulf of Alaska, Kodiak I.	57°42.47'N	152°21.21'W	22-Jun-02	51.98 53.46	89.60		3.76 3.35	5.86 5.90	4.12 4.15
208	ST04E208C	CTOM02COMU02	UNMU	Chukchi Sea, Cape Thompson	68°08.38'N	165°58.40'W	12-Jul-02	107.49	89.77		13.05	8.08	5.16
209	ST04E209C	CTOM04COMU02	UNMU	Chukchi Sea, Cape Thompson	68°08.38'N	165°58.40'W	12-Jul-02	117.93	99.90		15.07	8.03	5.39
210	ST04E210C	CTOM05COMU02	UNMU	Chukchi Sea, Cape Thompson	68°08.38'N	165°58.40'W	12-Jul-02	91.13	75.76		10.98	7.34	4.86
211	ST04E211C	CTOM06COMU02	UNMU	Chukchi Sea, Cape Thompson	68°08.38'N	165°58.40'W	12-Jul-02	103.59	89.05		12.20	8.37	4.96
212	ST04E212C	CTOM08COMU02	UNMU	Chukchi Sea, Cape Thompson	68°08.38'N	165°58.40'W	12-Jul-02	104.09	89.51		11.99	8.14	5.01
213	ST04E213C	CTOM10COMU02	UNMU	Chukchi Sea, Cape Thompson	68°08.38'N	165°58.40'W	12-Jul-02	110.10	92.21		13.83	8.38	5.10
214	ST04E214C	CTOM11COMU02	UNMU	Chukchi Sea, Cape Thompson	68°08.38'N	165°58.40'W	12-Jul-02	99.29	84.48		11.00	7.72	5.15
215	ST04E215C	CTOM12COMU02	UNMU	Chukchi Sea, Cape Thompson	68°08.38'N	165°58.40'W	12-Jul-02	102.54	88.22		11.88	7.84	5.13
216	ST04E216C	EAAM01COMU02	COMU	Gulf of Alaska, East Amatuli I.	58°55.05'N	152°00.21'W	31-Jul-02	93.78	77.62		12.51	7.78	5.05
217	ST04E217C	EAAM02COMU02	COMU	Gulf of Alaska, East Amatuli I.	58°55.05'N	152°00.21'W	31-Jul-02	106.80	88.28		14.52	7.98	5.14
218	ST04E218C	EAAM03COMU02	COMU	Gulf of Alaska, East Amatuli I.	58°55.05'N	152°00.21'W	31-Jul-02	106.72	89.74		11.92	8.33	5.26
219	ST04E219C	EAAM06COMU02	COMU	Gulf of Alaska, East Amatuli I.	58°55.05'N	152°00.21'W	31-Jul-02	100.30	67.05		13.92	8.10	4.94
220	ST04E220C	EAAM07COMU02	COMU	Gulf of Alaska, East Amatuli I.	58°55.05'N	152°00.21'W	31-Jul-02	100.01	82.80		13.60	8.30	5.00
221	ST04E221C	EAAM12COMU02	COMU	Gulf of Alaska, East Amatuli I.	58°55.05'N	152°00.21'W	31-Jul-02	not measured	83.69		13.01	8.20	5.01
222	ST04E222C	EAAM13COMU02	COMU	Gulf of Alaska, East Amatuli I.	58°55.05'N	152°00.21'W	31-Jul-02	80.62	62.99		11.48	7.51	4.69
223	ST05E223C	SHBY01BLKI03A SHBY01BLKI03B	BLKI	Gulf of Alaska, Shoup Bay	61°07.54'N	146°35.02'W	12-Jun-03	45.29 46.15	83.11		2.86 3.06	5.51 5.48	3.97 3.99

Appendix 1 (continued). Alaskan seabird eggs banked by STAMP in 2002-2005. BLKI = black-legged kittiwake (*Rissa tridactyla*), UNMU = unidentified murre species (*Uria spp.*), COMU = common murre (*U. aalge*), TBMU = thick-billed murre (*U. lomvia*), GLGU = glaucous gull (*Larus hyperboreus*), and GLGW = glaucous-winged gull (*L. glaucescens*).

ID								Mass (g)					
Number	Storage	Field	Species	Colony	Latitude	Longitude	Date Collected	Whole Egg	Contents	Embryo	Eggshell	Length (cm)	Breadth (cm)
224	ST05E224C	SHBY02BLKI03A	BLKI	Gulf of Alaska, Shoup Bay	61°07.54'N	146°35.02'W	12-Jun-03	57.85	108.89		3.36	5.86	4.38
		SHBY02BLKI03B						59.43			3.58	6.05	4.41
225	ST05E225C	SHBY03BLKI03A	BLKI	Gulf of Alaska, Shoup Bay	61°07.54'N			48.07	89.96		2.89	5.83	3.97
		SHBY03BLKI03B						59.89			2.92	5.77	4.02
226	ST05E226C	SHBY04BLKI03A	BLKI	Gulf of Alaska, Shoup Bay	61°07.54'N	146°35.02'W	12-Jun-03	47.06	85.90		3.20	5.62	4.01
		SHBY04BLKI03B						47.56			3.32	5.82	3.99
227	ST05E227C	SHBY05BLKI03A	BLKI	Gulf of Alaska, Shoup Bay	61°07.54'N	146°35.02'W	12-Jun-03	47.18	84.77		3.49	5.48	4.09
		SHBY05BLKI03B						46.35			3.15	5.29	4.06
228	ST05E228C	SHBY06BLKI03A	BLKI	Gulf of Alaska, Shoup Bay	61°07.54'N	146°35.02'W	12-Jun-03	46.40	81.32		3.19	5.52	4.03
		SHBY06BLKI03B						42.91			3.05	5.39	3.92
229	ST05E229C	SHBY07BLKI03A	BLKI	Gulf of Alaska, Shoup Bay	61°07.54'N	146°35.02'W	12-Jun-03	46.39	85.15		2.97	5.60	3.97
		SHBY07BLKI03B						46.56			2.79	5.51	3.99
230	ST05E230C	SHBY08BLKI03A	BLKI	Gulf of Alaska, Shoup Bay	61°07.54'N	146°35.02'W	12-Jun-03	45.77	85.02		2.93	6.10	3.86
		SHBY08BLKI03B						46.66			2.84	5.91	4.01
231	ST05E231C	SHBY09BLKI03A	BLKI	Gulf of Alaska, Shoup Bay	61°07.54'N	146°35.02'W	12-Jun-03	37.47	69.97		2.39	5.13	3.75
		SHBY09BLKI03B						38.78			2.35	5.26	3.78
232	ST05E232C	SHBY10BLKI03A	BLKI	Gulf of Alaska, Shoup Bay	61°07.54'N	146°35.02'W	12-Jun-03	46.85	42.51		3.17	5.61	4.01
		SHBY10BLKI03B						44.68	39.79		3.29	5.87	3.93
233	ST05E233C	SHBY11BLKI03A	BLKI	Gulf of Alaska, Shoup Bay	61°07.54'N	146°35.02'W	12-Jun-03	44.11	80.99		2.68	5.30	3.91
		SHBY11BLKI03B						44.58			2.70	5.27	4.00
234	ST05E234C	SHBY12BLKI03A	BLKI	Gulf of Alaska, Shoup Bay	61°07.54'N	146°35.02'W	12-Jun-03	47.16	87.90		3.16	5.57	4.00
		SHBY12BLKI03B						49.57			3.30	5.66	4.09
235	ST05E235C	CHBY01BLKI03	BLKI	Gulf of Alaska, Kodiak I.	57°42.47'N	152°21.21'W	24-Jun-03	47.09	42.50		3.19	5.47	4.02
236	ST05E236C	CHBY02BLKI03A	BLKI	Gulf of Alaska, Kodiak I.	57°42.47'N	152°21.21'W	24-Jun-03	49.76	94.29		2.90	5.45	4.12
		CHBY02BLKI03B						52.68			3.09	5.72	4.20
237	ST05E237C	CHBY03DLKI03A	BLKI	Gulf of Alaska, Kodiak I.	57°42.47'N	152°21.21'W	24-Jun-03	47.74	87.97	1.04	2.84	5.59	4.08
		CHBY03DLKI03B						51.73		2.58	3.08	5.62	4.20
238	ST05E238C	CHBY04BLKI03A	BLKI	Gulf of Alaska, Kodiak I.	57°42.47'N	152°21.21'W	24-Jun-03	49.32	89.54		3.12	5.70	4.11
		CHBY04BLKI03B						49.03			3.02	5.88	4.01
239	ST05E239C	CHBY05BLKI03A	BLKI	Gulf of Alaska, Kodiak I.	57°42.47'N	152°21.21'W	24-Jun-03	52.55	92.25		3.03	2.89	4.18
		CHBY05BLKI03B						47.96			2.95	5.91	4.01
240	ST05E240C	CHBY06BLKI03A	BLKI	Gulf of Alaska, Kodiak I.	57°42.47'N	152°21.21'W	24-Jun-03	53.83	98.09	1.03	3.51	5.77	4.26
		CHBY06BLKI03B						54.93			3.49	5.69	4.28
241	ST05E241C	CHBY07BLKI03A	BLKI	Gulf of Alaska, Kodiak I.	57°42.47'N	152°21.21'W	24-Jun-03	58.83	108.17		3.36	5.67	4.45
		CHBY07BLKI03B						58.96			3.40	5.67	4.42
242	ST05E242C	CHBY08BLKI03A	BLKI	Gulf of Alaska, Kodiak I.	57°42.47'N	152°21.21'W	24-Jun-03	51.39	93.94		3.33	5.50	4.20
		CHBY08BLKI03B						51.98			3.38	5.63	4.21
243	ST05E243C	CHBY09BLKI03A	BLKI	Gulf of Alaska, Kodiak I.	57°42.47'N	152°21.21'W	24-Jun-03	44.43	74.72	3.84	2.52	5.54	3.98
		CHBY09BLKI03B						44.34		2.60	2.71	5.39	4.00
244	ST05E244C	CHBY10BLKI03A	BLKI	Gulf of Alaska, Kodiak I.	57°42.47'N	152°21.21'W	24-Jun-03	47.16	83.20	2.59	2.79	5.68	4.05
		CHBY10BLKI03B						47.43		1.56	2.74	5.33	4.10
245	ST05E245C	CHBY11BLKI03A	BLKI	Gulf of Alaska, Kodiak I.	57°42.47'N	152°21.21'W	24-Jun-03	49.96	95.08		3.07	5.51	4.11
		CHBY11BLKI03B						53.67			3.17	5.62	4.22
246	ST05E246C	CHBY12BLKI03	BLKI	Gulf of Alaska, Kodiak I.	57°42.47'N	152°21.21'W	24-Jun-03	46.32	42.27		2.95	5.71	3.96
247	ST05E247C	BLUF01COMU03	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	14-Jun-03	101.90	87.62		not measured	7.98	4.95
248	ST05E248C	BLUF02COMU03	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	14-Jun-03	100.11	84.38		not measured	7.82	4.83
249	ST05E249C	BLUF03COMU03	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	14-Jun-03	111.94	93.88		14.20	8.34	5.07

Appendix 1 (continued). Alaskan seabird eggs banked by STAMP in 2002-2005. BLKI = black-legged kittiwake (*Rissa tridactyla*), UNMU = unidentified murre species (*Uria spp.*), COMU = common murre (*U. aalge*), TBMU = thick-billed murre (*U. lomvia*), GLGU = glaucous gull (*Larus hyperboreus*), and GLGW = glaucous-winged gull (*L. glaucescens*).

ID								Mass (g)					
Number	Storage	Field	Species	Colony	Latitude	Longitude	Date Collected	Whole Egg	Contents	Embryo	Eggshell	Length (cm)	Breadth (cm)
250	ST05E250C	BLUF04COMU03	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	14-Jun-03	113.31	94.71		15.80	8.17	5.08
251	ST05E251C	BLUF05COMU03	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	14-Jun-03	106.93	89.50		14.72	8.01	5.05
252	ST05E252C	BLUF06COMU03	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	14-Jun-03	120.64	101.35		16.12	8.39	5.23
253	ST05E253C	BLUF07COMU03	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	14-Jun-03	112.68	94.53		14.77	8.10	5.10
254	ST05E254C	BLUF08COMU03	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	14-Jun-03	104.83	90.30		not measured	8.17	4.98
255	ST05E255C	BLUF09COMU03	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	14-Jun-03	128.76	108.87		16.36	8.55	5.37
256	ST05E256C	BLUF10COMU03	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	14-Jun-03	117.23	98.98		14.85	8.32	5.09
257	ST05E257C	BLUF11COMU03	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	14-Jun-03	109.96	91.61		15.15	7.97	5.03
258	ST05E258C	BLUF12COMU03	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	14-Jun-03	126.16	106.37		16.18	8.89	5.22
259	ST05E259C	STGE01BLKI03	BLKI	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	19-Jun-03	49.18	44.84		3.02	5.80	4.02
260	ST05E260C	STGE02BLKI03	BLKI	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	19-Jun-03	53.92	49.12		3.44	5.55	4.28
261	ST05E261C	STGE03BLKI03A STGE03BLKI03B	BLKI	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	19-Jun-03	51.67 49.51	93.33		3.15 2.92	6.02 5.83	4.04 4.00
262	ST05E262C	STGE04BLKI03A STGE04BLKI03B	BLKI	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	19-Jun-03	54.49 53.34	98.65		3.40 3.17	6.00 6.02	4.17 4.11
263	ST05E263C	STGE05BLKI03	BLKI	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	19-Jun-03	58.03	53.30		3.38	5.88	4.31
264	ST05E264C	STGE06BLKI03A STGE06BLKI03B	BLKI	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	19-Jun-03	44.32 46.96	80.42		2.68 2.56	5.30 5.38	4.02 4.07
265	ST05E265C	STGE07BLKI03	BLKI	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	19-Jun-03	54.81	50.45		2.83	6.17	4.11
266	ST05E266C	STGE08BLKI03	BLKI	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	19-Jun-03	55.06	50.08		3.48	5.99	4.22
267	ST05E267C	STGE09BLKI03	BLKI	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	19-Jun-03	59.84	55.30		3.31	6.20	4.31
268	ST05E268C	STGE10BLKI03	BLKI	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	19-Jun-03	58.50	53.39		3.85	5.97	4.30
269	ST05E269C	STGE11BLKI03	BLKI	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	19-Jun-03	51.28	46.98		3.04	6.00	4.03
270	ST05E270C	STGE12BLKI03A STGE12BLKI03B	BLKI	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	19-Jun-03	52.33 49.31	93.56		2.70 2.75	5.65 5.68	4.21 4.04
271	ST05E271C	STLW01TBMU03	TBMU	Bering Sea, St. Lawrence I.	63°40.01'N	170°15.27'W	22-Jun-03	127.64	109.79		14.75	8.49	5.30
272	ST05E272C	STLW02TBMU03	TBMU	Bering Sea, St. Lawrence I.	63°40.01'N	170°15.27'W	22-Jun-03	125.24	107.80		14.26	8.59	5.33
273	ST05E273C	STLW03TBMU03	TBMU	Bering Sea, St. Lawrence I.	63°40.01'N	170°15.27'W	22-Jun-03	132.33	111.96		16.78	8.80	5.44
274	ST05E274C	STLW04TBMU03	TBMU	Bering Sea, St. Lawrence I.	63°40.01'N	170°15.27'W	22-Jun-03	129.94	110.79		15.63	8.43	5.42
275	ST05E275C	STLW06TBMU03	TBMU	Bering Sea, St. Lawrence I.	63°40.01'N	170°15.27'W	22-Jun-03	13.13	98.01		12.40	8.07	5.18
276	ST05E276C	STLW07TBMU03	TBMU	Bering Sea, St. Lawrence I.	63°40.01'N	170°15.27'W	22-Jun-03	104.44	89.22		12.50	8.36	4.98
277	ST05E277C	STLW08TBMU03	TBMU	Bering Sea, St. Lawrence I.	63°40.01'N	170°15.27'W	22-Jun-03	110.68	93.74		13.55	8.30	5.08
278	ST05E278C	STLW09TBMU03	TBMU	Bering Sea, St. Lawrence I.	63°40.01'N	170°15.27'W	22-Jun-03	109.18	92.49		13.52	8.33	5.05
279	ST05E279C	STLW10TBMU03	TBMU	Bering Sea, St. Lawrence I.	63°40.01'N	170°15.27'W	22-Jun-03	128.16	107.65		16.49	8.58	5.41
280	ST05E280C	STLW11TBMU03	TBMU	Bering Sea, St. Lawrence I.	63°40.01'N	170°15.27'W	22-Jun-03	85.65	73.76		9.34	7.72	4.57
281	ST05E281C	STLW12TBMU03	TBMU	Bering Sea, St. Lawrence I.	63°40.01'N	170°15.27'W	22-Jun-03	106.06	91.39		10.91	8.37	4.95
282	ST05E282C	STLW13TBMU03	TBMU	Bering Sea, St. Lawrence I.	63°40.01'N	170°15.27'W	22-Jun-03	112.01	95.65		13.08	8.16	5.11
283	ST05E283C	STLW14TBMU03	TBMU	Bering Sea, St. Lawrence I.	63°40.01'N	170°15.27'W	22-Jun-03	89.93	76.61		10.39	7.48	4.76
284	ST05E284C	STLW15TBMU03	TBMU	Bering Sea, St. Lawrence I.	63°40.01'N	170°15.27'W	22-Jun-03	95.35	81.62		10.42	7.90	4.83
285	ST05E285C	MIDD01BLKI03A MIDD01BLKI03B	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	51.15 46.11	89.31		3.08 2.62	5.47 5.38	4.21 4.01
286	ST05E286C	MIDD02BLKI03A MIDD02BLKI03B	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	49.73 51.81	75.62	8.59 13.50	3.07 3.14	5.51 5.65	4.24 4.28
287	ST05E287C	MIDD03BLKI03A MIDD03BLKI03B	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	52.94 51.21	95.14		3.35 3.15	5.80 5.84	4.14 4.05

Appendix 1 (continued). Alaskan seabird eggs banked by STAMP in 2002-2005. BLKI = black-legged kittiwake (*Rissa tridactyla*), UNMU = unidentified murre species (*Uria spp.*), COMU = common murre (*U. aalge*), TBMU = thick-billed murre (*U. lomvia*), GLGU = glaucous gull (*Larus hyperboreus*), and GLGW = glaucous-winged gull (*L. glaucescens*).

ID								Mass (g)					
Number	Storage	Field	Species	Colony	Latitude	Longitude	Date Collected	Whole Egg	Contents	Embryo	Eggshell	Length (cm)	Breadth (cm)
288	ST05E288C	MIDD04BLKI03A	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	55.31	98.30		2.92	5.71	4.29
		MIDD04BLKI03B						51.55			3.23	5.51	4.20
289	ST05E289C	MIDD05BLKI03A	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	51.17	91.06		3.33	5.93	4.09
		MIDD05BLKI03B						49.08			3.11	5.66	4.07
290	ST05E290C	MIDD06BLKI03A	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	53.89	96.60		3.45	5.85	4.21
		MIDD06BLKI03B						51.47			3.30	5.92	4.10
291	ST05E291C	MIDD07BLKI03A	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	53.12	98.55		3.44	5.66	4.25
		MIDD07BLKI03B						54.53			3.48	5.57	4.29
292	ST05E292C	MIDD08BLKI03A	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	49.43	88.56	2.91	3.18	5.44	4.17
		MIDD08BLKI03B						50.30			3.22	5.69	4.16
293	ST05E293C	MIDD09BLKI03A	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	54.10	91.03	6.14	3.52	5.52	4.33
		MIDD09BLKI03B						54.98		3.00	3.45	5.57	4.36
294	ST05E294C	MIDD10BLKI03A	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	48.83	87.12		3.18	5.73	4.06
		MIDD10BLKI03B						46.77			2.93	5.70	3.92
295	ST05E295C	MIDD11BLKI03A	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	47.93	85.02		2.92	5.33	4.13
		MIDD11BLKI03B						45.51			2.78	5.49	3.99
296	ST05E296C	MIDD12BLKI03A	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	52.84	95.56		3.24	5.90	4.11
		MIDD12BLKI03B						51.46			3.10	5.87	4.09
297	ST05E297C	STLA01COMU03	COMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	4-Jul-03	126.90	107.43		16.18	8.46	5.38
298	ST05E298C	STLA02COMU03	COMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	4-Jul-03	119.42	103.46		12.75	8.62	5.18
299	ST05E299C	STLA03COMU03	COMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	4-Jul-03	106.83	92.99		11.19	8.23	5.08
300	ST05E300C	STLA04COMU03	COMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	4-Jul-03	119.49	101.12		15.30	8.51	5.22
301	ST05E301C	STLA05COMU03	COMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	4-Jul-03	124.14	105.05		16.25	8.74	5.22
302	ST05E302C	STLA06COMU03	COMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	4-Jul-03	95.19	82.72		10.71	7.70	4.91
303	ST05E303C	STLA07COMU03	COMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	4-Jul-03	111.35	94.13		14.63	8.20	5.09
304	ST05E304C	STLA08COMU03	COMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	4-Jul-03	115.29	98.00		14.00	8.38	5.06
305	ST05E305C	STLA09COMU03	COMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	4-Jul-03	128.02	109.77		15.14	8.79	5.32
306	ST05E306C	STLA10COMU03	COMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	4-Jul-03	123.78	105.99		15.19	8.50	5.32
307	ST05E307C	MIDD01COMU03	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	125.39	107.06		15.12	8.47	5.35
308	ST05E308C	MIDD02COMU03	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	108.75	93.56		12.59	8.04	5.10
309	ST05E309C	MIDD03COMU03	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	130.86	111.67		15.53	8.81	5.29
310	ST05E310C	MIDD04COMU03	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	111.21	93.34		14.54	8.09	5.16
311	ST05E311C	MIDD05COMU03	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	110.20	93.01		14.14	8.70	5.00
312	ST05E312C	MIDD06COMU03	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	117.44	99.48		14.90	8.95	5.06
313	ST05E313C	MIDD07COMU03	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	112.76	95.48		12.99	8.21	5.16
314	ST05E314C	MIDD08COMU03	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	112.70	94.41		14.36	8.28	5.10
315	ST05E315C	MIDD09COMU03	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	110.70	94.08		13.90	8.35	5.03
316	ST05E316C	MIDD10COMU03	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	128.16	108.00		16.47	8.84	5.29
317	ST05E317C	MIDD11COMU03	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	103.00	87.37		12.49	7.69	5.02
318	ST05E318C	MIDD12COMU03	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	117.03	99.14		14.34	8.62	5.16
319	ST05E319C	MIDD13COMU03	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	125.95	107.34		15.07	9.00	5.17
320	ST05E320C	MIDD14COMU03	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	122.22	103.30		14.73	8.72	5.22
321	ST05E321C	MIDD15COMU03	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	12-Jun-03	112.87	95.49		14.24	8.43	5.15
322	ST05E322C	EAAM13COMU03	COMU	Gulf of Alaska, East Amatuli I.	58°55.05'N	152°00.21'W	3-Aug-03	97.98	46.66	29.28	13.05	8.03	4.99
323	ST05E323C	EAAM14COMU03	COMU	Gulf of Alaska, East Amatuli I.	58°55.05'N	152°00.21'W	3-Aug-03	97.55	72.31		12.13	7.66	4.92

Appendix 1 (continued). Alaskan seabird eggs banked by STAMP in 2002-2005. BLKI = black-legged kittiwake (*Rissa tridactyla*), UNMU = unidentified murre species (*Uria spp.*), COMU = common murre (*U. aalge*), TBMU = thick-billed murre (*U. lomvia*), GLGU = glaucous gull (*Larus hyperboreus*), and GLGW = glaucous-winged gull (*L. glaucescens*).

ID								Mass (g)					
Number	Storage	Field	Species	Colony	Latitude	Longitude	Date Collected	Whole Egg	Contents	Embryo	Eggshell	Length (cm)	Breadth (cm)
324	ST05E324C	EAAM01COMU03	COMU	Gulf of Alaska, East Amatuli I.	58°55.05'N	152°00.21'W	3-Aug-03	109.77	62.12	35.62	12.41	8.88	5.11
325	ST05E325C	EAAM02COMU03	COMU	Gulf of Alaska, East Amatuli I.	58°55.05'N	152°00.21'W	3-Aug-03	106.37	90.12		12.57	8.31	not measured
326	ST05E326C	EAAM03COMU03	COMU	Gulf of Alaska, East Amatuli I.	58°55.05'N	152°00.21'W	3-Aug-03	105.05	71.02		12.98	8.18	5.05
327	ST05E327C	EAAM04COMU03	COMU	Gulf of Alaska, East Amatuli I.	58°55.05'N	152°00.21'W	3-Aug-03	113.63	94.96		14.39	8.38	5.19
328	ST05E328C	EAAM05COMU03	COMU	Gulf of Alaska, East Amatuli I.	58°55.05'N	152°00.21'W	3-Aug-03	114.76	92.68		12.20	8.37	5.22
329	ST05E329C	EAAM06COMU03	COMU	Gulf of Alaska, East Amatuli I.	58°55.05'N	152°00.21'W	3-Aug-03	106.30	62.00	14.24	13.81	8.11	5.11
330	ST05E330C	EAAM07COMU03	COMU	Gulf of Alaska, East Amatuli I.	58°55.05'N	152°00.21'W	3-Aug-03	110.24	82.77	9.56	13.95	8.16	5.22
331	ST05E331C	EAAM08COMU03	COMU	Gulf of Alaska, East Amatuli I.	58°55.05'N	152°00.21'W	3-Aug-03	107.17	91.14		11.13	8.20	5.04
332	ST05E332C	EAAM09COMU03	COMU	Gulf of Alaska, East Amatuli I.	58°55.05'N	152°00.21'W	3-Aug-03	110.47	78.09	14.82	13.88	7.98	5.22
333	ST05E333C	EAAM10COMU03	COMU	Gulf of Alaska, East Amatuli I.	58°55.05'N	152°00.21'W	3-Aug-03	102.58	79.86	5.21	12.55	8.24	5.06
334	ST05E334C	EAAM11COMU03	COMU	Gulf of Alaska, East Amatuli I.	58°55.05'N	152°00.21'W	3-Aug-03	106.57	84.28		13.26	8.31	4.94
335	ST05E335C	EAAM12COMU03	COMU	Gulf of Alaska, East Amatuli I.	58°55.05'N	152°00.21'W	3-Aug-03	108.69	92.13		12.36	8.32	5.01
336	ST05E336C	EAAM15COMU03	COMU	Gulf of Alaska, East Amatuli I.	58°55.05'N	152°00.21'W	3-Aug-03	102.20	86.68		12.15	8.09	4.99
337	ST05E337C	BULD09TBMU03	TBMU	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	18-Jun-03	101.75	86.89		10.79	7.83	4.99
338	ST05E338C	BULD01BLKI03A	BLKI	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	18-Jun-03	47.44	41.51		2.62	5.83	3.98
		BULD01BLKI03B						52.76	46.12		3.03	6.06	4.16
339	ST05E339C	BULD02BLKI03	BLKI	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	18-Jun-03	56.72	50.78		3.14	5.93	4.30
340	ST05E340C	BULD05BLKI03	BLKI	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	18-Jun-03	50.36	20.14	25.42	3.34	5.99	4.14
341	ST05E341C	BULD08BLKI03	BLKI	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	19-Jun-03	45.69	39.53		2.74	5.81	3.89
342	ST05E342C	BULD09BLKI03	BLKI	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	19-Jun-03	50.53	45.53		2.87	5.63	4.11
343	ST06E343C	SAFE01GLGU04	GLGU	Bering, Sea, Safety Sound	64°29.19'N	164°46.11'W	1-Jun-04	114.05	96.61		8.69	8.02	5.12
344	ST06E344C	SAFE02GLGU04	GLGU	Bering, Sea, Safety Sound	64°29.19'N	164°46.11'W	1-Jun-04	100.31	80.52		6.10	7.43	5.07
345	ST06E345C	SAFE03GLGU04	GLGU	Bering, Sea, Safety Sound	64°29.19'N	164°46.11'W	1-Jun-04	101.32	89.45		7.23	7.06	5.15
346	ST06E346C	SAFE04GLGU04	GLGU	Bering, Sea, Safety Sound	64°29.19'N	164°46.11'W	3-Jun-04	108.21	94.15		7.13	8.01	5.06
347	ST06E347C	SAFE05GLGU04	GLGU	Bering, Sea, Safety Sound	64°29.19'N	164°46.11'W	3-Jun-04	102.13	88.08		7.10	7.29	5.09
348	ST06E348C	SAFE06GLGU04	GLGU	Bering, Sea, Safety Sound	64°29.19'N	164°46.11'W	3-Jun-04	103.06	88.16		6.81	7.66	5.00
349	ST06E349C	SAFE07GLGU04	GLGU	Bering, Sea, Safety Sound	64°29.19'N	164°46.11'W	3-Jun-04	91.26	79.41		6.54	7.30	4.79
350	ST06E350C	SAFE08GLGU04	GLGU	Bering, Sea, Safety Sound	64°29.19'N	164°46.11'W	3-Jun-04	99.10	80.51		7.42	7.62	4.92
351	ST06E351C	SAFE09GLGU04	GLGU	Bering, Sea, Safety Sound	64°29.19'N	164°46.11'W	3-Jun-04	115.35	98.58		8.30	7.95	5.25
352	ST06E352C	SAFE10GLGU04	GLGU	Bering, Sea, Safety Sound	64°29.19'N	164°46.11'W	3-Jun-04	105.84	92.37		6.94	7.98	5.06
353	ST06E353C	SAFE11GLGU04	GLGU	Bering, Sea, Safety Sound	64°29.19'N	164°46.11'W	3-Jun-04	111.68	99.56		7.08	7.79	5.24
354	ST06E354C	SAFE12GLGU04	GLGU	Bering, Sea, Safety Sound	64°29.19'N	164°46.11'W	3-Jun-04	98.60	84.40		7.65	83.69	4.89
355	ST06E355C	TOGI01GWGU04A	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	29-May-04	94.01	82.35		7.30	7.14	4.97
		TOGI01GWGU04B						99.34	83.81		7.62	7.37	5.13
356	ST06E356C	TOGI02GWGU04A	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	29-May-04	96.34	85.41		6.69	7.38	5.00
		TOGI02GWGU04B						88.52	74.15		not measured	7.37	5.08
357	ST06E357C	TOGI03GWGU04A	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	29-May-04	96.92	85.71		6.85	7.53	4.88
		TOGI03GWGU04B						94.77	84.20		6.67	6.75	5.09
358	ST06E358C	TOGI04GWGU04A	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	29-May-04	91.27	73.93		7.14	7.63	4.99
		TOGI04GWGU04B						104.06	91.79		7.72	8.04	4.91
359	ST06E359C	TOGI05GWGU04A	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	29-May-04	102.44	90.74		7.95	7.18	5.52
		TOGI05GWGU04B						97.46	84.96		7.40	7.49	5.46
360	ST06E360C	TOGI06GWGU04A	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	29-May-04	114.45	102.30		6.97	7.30	5.42
		TOGI06GWGU04B						103.29	93.51		7.00	7.09	5.28
361	ST06E361C	TOGI07GWGU04	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	29-May-04	104.78	91.20		7.28	7.10	5.23

Appendix 1 (continued). Alaskan seabird eggs banked by STAMP in 2002-2005. BLKI = black-legged kittiwake (*Rissa tridactyla*), UNMU = unidentified murre species (*Uria spp.*), COMU = common murre (*U. aalge*), TBMU = thick-billed murre (*U. lomvia*), GLGU = glaucous gull (*Larus hyperboreus*), and GLGW = glaucous-winged gull (*L. glaucescens*).

ID								Mass (g)					
Number	Storage	Field	Species	Colony	Latitude	Longitude	Date Collected	Whole Egg	Contents	Embryo	Eggshell	Length (cm)	Breadth (cm)
362	ST06E362C	TOGI08GWGU04	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	29-May-04	91.09	78.59		6.32	7.64	4.96
363	ST06E363C	TOGI09GWGU04A TOGI09GWGU04B	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	29-May-04	97.42 98.46	79.60 85.68		not measured 7.61	not measured 7.23	not measured 5.14
364	ST06E364C	TOGI10GWGU04A TOGI10GWGU04B	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	29-May-04	110.84 91.00	97.00 81.10		8.18 6.45	7.65 7.37	5.20 4.91
365	ST06E365C	TOGI11GWGU04A TOGI11GWGU04B	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	29-May-04	98.82 97.82	86.92 86.59		6.73 7.00	7.55 7.40	4.98 5.21
366	ST06E366C	TOGI12GWGU04B TOGI12GWGU04C	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	29-May-04	not measured 95.37	50.05 84.85		6.01 6.68	not measured 7.44	not measured 4.97
367	ST06E367C	TOGI13GWGU04	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	29-May-04	104.11	91.67		6.84	7.05	5.21
368	ST06E368C	CDEN01COMU04	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	12-Jun-04	106.22	88.35		14.06	8.33	4.95
369	ST06E369C	CDEN02COMU04	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	12-Jun-04	117.41	100.45		13.12	8.31	5.51
370	ST06E370C	CDEN03COMU04	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	12-Jun-04	116.11	97.00		15.39	8.57	5.03
371	ST06E371C	CDEN04COMU04	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	12-Jun-04	129.70	102.94		16.21	8.72	5.33
372	ST06E372C	CDEN05COMU04	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	12-Jun-04	116.90	97.99		15.49	8.38	5.07
373	ST06E373C	CDEN06COMU04	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	12-Jun-04	120.46	101.77		14.94	8.33	5.24
374	ST06E374C	CDEN07COMU04	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	12-Jun-04	116.53	95.44		16.20	8.58	5.19
375	ST06E375C	CDEN08COMU04	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	12-Jun-04	116.84	97.64		15.47	8.93	5.04
376	ST06E376C	CDEN09COMU04	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	12-Jun-04	104.65	86.56		14.80	5.12	5.00
377	ST06E377C	CDEN10COMU04	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	12-Jun-04	127.26	108.55		14.60	8.63	5.38
378	ST06E378C	CDEN11COMU04	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	12-Jun-04	128.51	103.66		16.54	8.41	5.61
379	ST06E379C	CDEN12COMU04	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	12-Jun-04	114.14	95.92		14.82	8.37	5.11
380	ST06E380C	CDEN13COMU04	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	12-Jun-04	116.67	97.63		15.69	8.49	5.46
381	ST06E381C	CDEN14COMU04	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	12-Jun-04	124.11	103.50		16.15	8.82	5.61
382	ST06E382C	CDEN15COMU04	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	12-Jun-04	124.27	105.08		14.90	8.51	5.61
383	ST06E383C	STLA01GWGU04A STLA01GWGU04B	GWGU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	10-Jun-04	93.93 93.74	76.56 68.89	7.37 13.67	6.40 6.98	7.41 7.32	5.11 5.09
384	ST06E384C	STLA02GWGU04A STLA02GWGU04B	GWGU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	10-Jun-04	87.97 84.35	74.66 74.87		6.47 6.00	7.23 7.25	4.89 5.00
385	ST06E385C	STLA03GWGU04A STLA03GWGU04B	GWGU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	10-Jun-04	88.64 88.83	74.17 77.75		5.80 5.80	6.97 7.24	4.90 4.83
386	ST06E386C	STLA04GWGU04A STLA04GWGU04B	GWGU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	10-Jun-04	80.20 80.57	69.60 69.77		5.92 5.52	6.56 6.45	4.76 4.80
387	ST06E387C	STLA05GWGU04A STLA05GWGU04B	GWGU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	10-Jun-04	73.87 92.51	60.75 82.61		not measured 6.33	6.97 7.03	4.88 5.09
388	ST06E388C	STLA06GWGU04A STLA06GWGU04B	GWGU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	10-Jun-04	125.96 121.91	111.95 108.64		8.18 8.27	8.11 7.68	5.45 5.48
389	ST06E389C	NUNI01GLGU04A NUNI01GLGU04B	GLGU	Bering Sea, Triangle Island	60°20.58'N	165°45.20'W	30-May-04	102.99 106.37	86.92 86.85		7.82 7.34	7.59 7.39	5.12 5.26
390	ST06E390C	NUNI02GLGU04	GLGU	Bering Sea, Triangle Island	60°20.58'N	165°45.20'W	30-May-04	87.04	66.38		7.44	7.03	5.19
391	ST06E391C	NUNI03GLGU04A NUNI03GLGU04B	GLGU	Bering Sea, Triangle Island	60°20.58'N	165°45.20'W	31-May-04	107.38 102.29	91.10 89.14		7.30 7.75	7.99 7.79	5.19 5.13
392	ST06E392C	NUNI04GLGU04	GLGU	Bering Sea, Triangle Island	60°20.58'N	165°45.20'W	30-May-04	106.29	95.14		7.73	7.40	5.27
393	ST06E393C	NUNI05GLGU04	GLGU	Bering Sea, Triangle Island	60°20.58'N	165°45.20'W	30-May-04	114.17	98.85		8.20	7.82	5.60
394	ST06E394C	NUNI06GLGU04	GLGU	Bering Sea, Triangle Island	60°20.58'N	165°45.20'W	30-May-04	101.44	89.31		6.80	7.43	5.15
395	ST06E395C	NUNI07GLGU04	GLGU	Bering Sea, Triangle Island	60°20.58'N	165°45.20'W	30-May-04	95.89	57.74	26.68	7.20	7.44	5.20

Appendix 1 (continued). Alaskan seabird eggs banked by STAMP in 2002-2005. BLKI = black-legged kittiwake (*Rissa tridactyla*), UNMU = unidentified murre species (*Uria spp.*), COMU = common murre (*U. aalge*), TBMU = thick-billed murre (*U. lomvia*), GLGU = glaucous gull (*Larus hyperboreus*), and GLGW = glaucous-winged gull (*L. glaucescens*).

ID								Mass (g)					
Number	Storage	Field	Species	Colony	Latitude	Longitude	Date Collected	Whole Egg	Contents	Embryo	Eggshell	Length (cm)	Breadth (cm)
396	ST06E396C	NUNI08GLGU04	GLGU	Bering Sea, Triangle Island	60°20.58'N	165°45.20'W	30-May-04	101.38	82.74		7.48	7.42	5.43
397	ST06E397C	NUNI10GLGU04	GLGU	Bering Sea, Triangle Island	60°20.58'N	165°45.20'W	30-May-04	111.34	88.16		7.57	7.82	5.09
398	ST06E398C	NUNI12GLGU04	GLGU	Bering Sea, Triangle Island	60°20.58'N	165°45.20'W	30-May-04	92.27	77.33		7.76	7.71	4.92
399	ST06E399C	NUNI13GLGU04	GLGU	Bering Sea, Triangle Island	60°20.58'N	165°45.20'W	30-May-04	103.37	87.36		6.86	7.18	5.17
400	ST06E400C	NUNI14GLGU04A	GLGU	Bering Sea, Triangle Island	60°20.58'N	165°45.20'W	30-May-04	101.91	88.62		7.53	7.72	5.08
		NUNI14GLGU04B						91.85	79.99		6.41	7.29	4.93
401	ST06E401C	NUNI15GLGU04A	GLGU	Bering Sea, Triangle Island	60°20.58'N	165°45.20'W	30-May-04	91.95	82.65		6.38	6.89	5.04
		NUNI15GLGU04B						96.60	86.72		5.95	6.91	5.09
402	ST06E402C	NUNI16GLGU04A	GLGU	Bering Sea, Triangle Island	60°20.58'N	165°45.20'W	30-May-04	108.13	95.31		7.93	7.13	5.31
		NUNI16GLGU04B						109.56	96.25		7.50	7.62	5.23
403	ST06E403C	NUNI17GLGU04	GLGU	Bering Sea, Triangle Island	60°20.58'N	165°45.20'W	30-May-04	103.05	90.04		6.76	7.45	5.08
404	ST06E404C	NUNI09GLGU04	GLGU	Bering Sea, Triangle Island	60°20.58'N	165°45.20'W	30-May-04	104.69	92.36		7.56	7.37	5.24
405	ST06E405C	NUNI18GLGU04A	GLGU	Bering Sea, Triangle Island	60°20.58'N	165°45.20'W	30-May-04	99.88	86.79		7.45	7.45	5.14
		NUNI18GLGU04B						98.11	85.06		8.14	7.29	5.07
406	ST06E406C	STGE01COMU04	COMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	27-Jun-04	118.51	101.58		13.54	8.04	5.55
407	ST06E407C	STGE02COMU04	COMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	27-Jun-04	102.94	88.86		11.05	7.68	5.12
408	ST06E408C	STGE03COMU04	COMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	27-Jun-04	105.75	89.14		13.34	7.94	5.08
409	ST06E409C	STGE04COMU04	COMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	27-Jun-04	113.71	65.05	28.21	13.90	8.60	5.19
410	ST06E410C	STGE05COMU04	COMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	27-Jun-04	113.70	96.08		14.09	8.40	5.22
411	ST06E411C	STGE06COMU04	COMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	27-Jun-04	117.25	99.30		14.34	8.52	5.19
412	ST06E412C	STGE07COMU04	COMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	27-Jun-04	101.74	85.20		13.61	8.37	4.92
413	ST06E413C	STGE08COMU04	COMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	27-Jun-04	109.72	93.32		12.54	8.15	5.14
414	ST06E414C	STGE09COMU04	COMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	27-Jun-04	115.37	96.77		15.18	8.50	5.18
415	ST06E415C	STGE10COMU04	COMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	27-Jun-04	104.18	87.57		13.52	7.61	5.12
416	ST06E416C	STGE11COMU04	COMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	27-Jun-04	108.09	91.10		13.54	8.27	5.02
417	ST06E417C	STGE12COMU04	COMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	27-Jun-04	102.92	50.36		10.51	7.92	4.98
418	ST06E418C	STGE13COMU04	COMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	27-Jun-04	112.04	94.62		13.65	8.25	5.11
419	ST06E419C	STGE14COMU04	COMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	27-Jun-04	107.69	91.12		13.65	8.29	5.07
420	ST06E420C	STGE15COMU04	COMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	27-Jun-04	104.45	87.79		13.15	7.92	5.02
421	ST06E421C	MIDD01GWGU04A	GWGU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	8-Jun-04	88.11	78.99		not measured	7.13	5.19
		MIDD01GWGU04B						77.00	68.58		not measured	6.80	5.01
		MIDD01GWGU04C						77.37	66.36		not measured	6.75	4.90
422	ST06E422C	MIDD02GWGU04A	GWGU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	8-Jun-04	83.83	26.57	47.61	not measured	7.37	5.03
		MIDD02GWGU04B						87.96	33.91	42.71	not measured	7.37	5.06
		MIDD02GWGU04C						84.59	72.49		6.87	7.01	5.02
423	ST06E423C	MIDD03GWGU04A	GWGU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	8-Jun-04	106.96	88.36	7.66	7.44	7.42	5.60
		MIDD03GWGU04B						99.30	89.63		6.89	7.12	5.24
		MIDD03GWGU04C						96.61	87.65		6.73	7.21	5.16
424	ST06E424C	MIDD01BLKI04	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	9-Jun-04	44.31	34.34		3.80	5.50	4.31
425	ST06E425C	MIDD02BLKI04A	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	9-Jun-04	51.69	12.25	40.55	3.26	5.71	4.50
		MIDD02BLKI04B						49.70	22.98	17.89	3.79	6.08	4.38
426	ST06E426C	MIDD03BLKI04A	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	9-Jun-04	55.00	46.39		3.42	6.08	4.53
		MIDD03BLKI04B						50.33	41.79		3.49	5.84	4.43
427	ST06E427C	MIDD04BLKI04A	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	9-Jun-04	48.64	29.15	14.05	3.21	5.87	4.31
		MIDD04BLKI04B						47.64	40.52		3.48	5.67	4.30

Appendix 1 (continued). Alaskan seabird eggs banked by STAMP in 2002-2005. BLKI = black-legged kittiwake (*Rissa tridactyla*), UNMU = unidentified murre species (*Uria spp.*), COMU = common murre (*U. aalge*), TBMU = thick-billed murre (*U. lomvia*), GLGU = glaucous gull (*Larus hyperboreus*), and GLGW = glaucous-winged gull (*L. glaucescens*).

ID								Mass (g)					
Number	Storage	Field	Species	Colony	Latitude	Longitude	Date Collected	Whole Egg	Contents	Embryo	Eggshell	Length (cm)	Breadth (cm)
428	ST06E428C	MIDD05BLKI04A	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	9-Jun-04	51.30	45.83		not measured	5.82	4.21
		MIDD05BLKI04B						50.15	43.38		2.84	5.80	4.14
429	ST06E429C	MIDD06BLKI04A	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	9-Jun-04	51.95	46.64		2.86	5.69	4.28
		MIDD06BLKI04B						50.63	44.47		2.94	5.77	4.18
430	ST06E430C	MIDD07BLKI04A	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	9-Jun-04	48.63	43.43		2.75	5.65	4.12
		MIDD07BLKI04B						41.20	36.65		2.31	5.42	3.83
431	ST06E431C	MIDD08BLKI04A	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	9-Jun-04	not measured	37.82		not measured	not measured	not measured
		MIDD08BLKI04B						46.00	40.57		2.62	5.42	4.06
432	ST06E432C	MIDD09BLKI04A	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	9-Jun-04	54.52	48.23		2.99	5.64	4.38
		MIDD09BLKI04B						52.71	44.68		3.46	5.68	4.25
433	ST06E433C	MIDD10BLKI04A	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	9-Jun-04	49.87	44.92		3.04	5.75	4.14
		MIDD10BLKI04B						47.14	41.45		2.77	5.68	4.07
434	ST06E434C	MIDD11BLKI04A	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	9-Jun-04	38.13	33.77		2.36	4.95	3.90
		MIDD11BLKI04B						44.71	39.01		3.12	5.61	4.00
435	ST06E435C	MIDD12BLKI04A	BLKI	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	9-Jun-04	51.34	46.13		3.25	5.61	4.19
		MIDD12BLKI04B						48.08	43.57		not measured	5.41	4.16
436	ST06E436C	GULL01GWGU04	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	30-May-04	92.55	75.01		7.50	6.95	4.93
437	ST06E437C	GULL02GWGU04	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	30-May-04	113.89	92.86		7.37	7.70	5.27
438	ST06E438C	GULL03GWGU04	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	30-May-04	95.31	74.94		7.07	7.34	5.00
439	ST06E439C	GULL04GWGU04	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	30-May-04	92.94	81.34		6.49	7.36	5.07
440	ST06E440C	GULL05GWGU04A	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	30-May-04	82.25	64.36		7.05	6.79	4.84
		GULL05GWGU04B						89.35	73.18		7.40	6.71	5.01
441	ST06E441C	GULL06GWGU04	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	30-May-04	107.78	94.69		6.76	7.78	5.13
442	ST06E442C	GULL08GWGU04A	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	30-May-04	88.55	75.77		5.89	6.96	4.85
		GULL08GWGU04B						90.13	73.53		5.63	7.01	4.91
443	ST06E443C	GULL09GWGU04	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	30-May-04	99.76	86.95		7.14	7.09	5.08
444	ST06E444C	GULL10GWGU04	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	30-May-04	not measured	56.27		5.97	not measured	not measured
445	ST06E445C	GULL11GWGU04	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	30-May-04	95.82	81.14		7.04	7.51	4.96
446	ST06E446C	GULL12GWGU04A	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	30-May-04	96.49	82.61		7.07	7.21	5.01
		GULL12GWGU04B						96.11	81.70		6.67	7.23	4.99
447	ST06E447C	GULL13GWGU04	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	30-May-04	94.02	82.60		6.82	6.99	5.07
448	ST06E448C	GULL14GWGU04	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	30-May-04	100.97	86.53		6.49	7.42	5.04
449	ST06E449C	GULL15GWGU04A	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	30-May-04	not measured	76.92		7.48	not measured	not measured
		GULL15GWGU04B						104.42	82.69		6.78	7.08	5.29
450	ST06E450C	GULL16GWGU04A	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	30-May-04	106.96	94.90		7.43	7.30	5.27
		GULL16GWGU04B						106.21	91.33		7.64	7.39	5.23
451	ST06E451C	GULL17GWGU04A	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	30-May-04	100.59	87.68		6.99	7.41	5.08
		GULL17GWGU04B						not measured	90.60		6.87	7.85	5.07
452	ST06E452C	GULL18GWGU04	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	30-May-04	101.29	89.57		6.55	7.38	5.14
453	ST06E453C	BULD01TBMU04	TBMU	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	21-Jun-04	109.64	92.86		10.08	7.99	5.13
454	ST06E454C	BULD03TBMU04	TBMU	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	21-Jun-04	109.09	91.46		11.47	8.22	5.07
455	ST06E455C	BULD04TBMU04	TBMU	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	21-Jun-04	110.12	93.30		11.66	8.14	5.08
456	ST06E456C	BULD05TBMU04	TBMU	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	21-Jun-04	101.73	82.50		10.70	7.92	4.94
457	ST06E457C	BULD06TBMU04	TBMU	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	21-Jun-04	108.25	91.92		10.25	7.89	5.18
458	ST06E458C	BULD07TBMU04	TBMU	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	21-Jun-04	109.64	88.35		11.51	8.37	5.12
459	ST06E459C	BULD08TBMU04	TBMU	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	21-Jun-04	96.89	81.92		10.32	7.98	4.78

Appendix 1 (continued). Alaskan seabird eggs banked by STAMP in 2002-2005. BLKI = black-legged kittiwake (*Rissa tridactyla*), UNMU = unidentified murre species (*Uria spp.*), COMU = common murre (*U. aalge*), TBMU = thick-billed murre (*U. lomvia*), GLGU = glaucous gull (*Larus hyperboreus*), and GLGW = glaucous-winged gull (*L. glaucescens*).

ID								Mass (g)					
Number	Storage	Field	Species	Colony	Latitude	Longitude	Date Collected	Whole Egg	Contents	Embryo	Eggshell	Length (cm)	Breadth (cm)
460	ST06E460C	BULD09TBMU04	TBMU	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	21-Jun-04	100.38	84.40		9.36	7.66	5.13
461	ST06E461C	BULD11TBMU04	TBMU	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	21-Jun-04	100.93	83.28		10.78	7.68	5.03
462	ST06E462C	BULD12TBMU04	TBMU	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	21-Jun-04	97.67	81.34		10.79	7.88	4.88
463	ST06E463C	BULD13TBMU04	TBMU	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	21-Jun-04	103.93	90.85		10.19	8.06	5.06
464	ST06E464C	STLA01COMU04	COMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	9-Jul-04	139.80	112.56		16.23	8.89	5.53
465	ST06E465C	STLA02COMU04	COMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	9-Jul-04	116.62	94.84		16.29	8.48	5.16
466	ST06E466C	STLA03COMU04	COMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	9-Jul-04	137.65	116.38		15.96	9.13	5.64
467	ST06E467C	STLA04COMU04	COMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	9-Jul-04	123.43	104.56		not measured	8.60	5.32
468	ST06E468C	STLA05COMU04	COMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	9-Jul-04	111.86	93.91		12.36	8.60	5.08
469	ST06E469C	STLA08COMU04	COMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	9-Jul-04	110.62	90.41		14.07	8.48	5.05
470	ST06E470C	STLA09COMU04	COMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	9-Jul-04	123.51	101.79		14.97	8.38	5.36
471	ST06E471C	STLA10COMU04	COMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	9-Jul-04	110.23	87.10		14.83	8.37	4.96
472	ST06E472C	STLA02TBMU04	TBMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	9-Jul-04	121.39	103.31		13.93	8.71	5.57
473	ST06E473C	STLA03TBMU04	TBMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	9-Jul-04	121.60	101.81		13.95	8.62	5.36
474	ST06E474C	STLA04TBMU04	TBMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	9-Jul-04	112.91	93.03		13.42	8.26	5.13
475	ST06E475C	STLA07TBMU04	TBMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	9-Jul-04	117.64	97.66		14.50	8.26	5.25
476	ST06E476C	STLA09TBMU04	TBMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	9-Jul-04	115.03	95.72		14.62	8.36	5.08
477	ST06E477C	DEER01COMU04	COMU	Chukchi Sea, Cape Deceit	66°05.52'N	162°44.54'W	28-Jun-04	114.90	95.33		15.11	8.38	5.23
478	ST06E478C	DEER04COMU04	COMU	Chukchi Sea, Cape Deceit	66°05.52'N	162°44.54'W	28-Jun-04	121.49	97.95		not measured	8.60	5.30
479	ST06E479C	DEER05COMU04	COMU	Chukchi Sea, Cape Deceit	66°05.52'N	162°44.54'W	28-Jun-04	109.70	90.93		13.93	8.36	5.04
480	ST06E480C	DEER06COMU04	COMU	Chukchi Sea, Cape Deceit	66°05.52'N	162°44.54'W	28-Jun-04	108.12	88.60		11.93	8.10	5.05
481	ST06E481C	DEER07COMU04	COMU	Chukchi Sea, Cape Deceit	66°05.52'N	162°44.54'W	28-Jun-04	112.83	92.87		13.78	8.09	5.20
482	ST06E482C	DEER09COMU04	COMU	Chukchi Sea, Cape Deceit	66°05.52'N	162°44.54'W	28-Jun-04	101.52	80.99		11.14	7.93	5.02
483	ST06E483C	DEER10COMU04	COMU	Chukchi Sea, Cape Deceit	66°05.52'N	162°44.54'W	28-Jun-04	119.69	99.29		13.64	8.24	5.62
484	ST06E484C	DEER11COMU04	COMU	Chukchi Sea, Cape Deceit	66°05.52'N	162°44.54'W	28-Jun-04	121.48	103.06		11.97	8.45	5.57
485	ST06E485C	DEER12COMU04	COMU	Chukchi Sea, Cape Deceit	66°05.52'N	162°44.54'W	28-Jun-04	123.47	103.72		14.31	8.56	5.31
486	ST06E486C	DEER13COMU04	COMU	Chukchi Sea, Cape Deceit	66°05.52'N	162°44.54'W	28-Jun-04	103.45	86.94		10.72	7.88	5.08
487	ST06E487C	DEER14COMU04	COMU	Chukchi Sea, Cape Deceit	66°05.52'N	162°44.54'W	28-Jun-04	115.03	95.74		14.01	8.60	5.16
488	ST06E488C	DEER15COMU04	COMU	Chukchi Sea, Cape Deceit	66°05.52'N	162°44.54'W	28-Jun-04	128.44	102.77		not measured	8.55	5.49
489	ST06E489C	CHDU02COMU04	COMU	Gulf of Alaska, Duck I.	60°08.53'N	152°32.53'W	15-Jul-04	108.25	86.00		14.61	8.53	5.02
490	ST06E490C	CHDU04COMU04	COMU	Gulf of Alaska, Duck I.	60°08.53'N	152°32.53'W	15-Jul-04	120.05	98.16		14.94	8.32	5.27
491	ST06E491C	CHDU07COMU04	COMU	Gulf of Alaska, Duck I.	60°08.53'N	152°32.53'W	15-Jul-04	114.33	88.00		13.76	8.31	5.16
492	ST06E492C	CHDU10COMU04	COMU	Gulf of Alaska, Duck I.	60°08.53'N	152°32.53'W	15-Jul-04	111.78	89.29		13.86	8.38	5.12
493	ST06E493C	MIDD01COMU04	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	9-Jul-04	103.11	61.77	11.32	15.16	8.29	5.19
494	ST06E494C	MIDD02COMU04	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	9-Jul-04	99.08	59.30	20.54	not measured	8.27	4.99
495	ST06E495C	MIDD04COMU04	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	9-Jul-04	90.84	70.72		11.54	7.96	4.88
496	ST06E496C	MIDD05COMU04	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	9-Jul-04	110.11	74.05	13.49	16.00	8.31	5.37
497	ST06E497C	MIDD06COMU04	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	9-Jul-04	111.58	90.81		13.25	8.71	5.10
498	ST06E498C	MIDD07COMU04	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	9-Jul-04	96.21	69.58	10.88	12.67	8.26	5.12
499	ST06E499C	MIDD08COMU04	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	9-Jul-04	113.93	95.56		12.37	8.70	5.03
500	ST06E500C	MIDD09COMU04	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	9-Jul-04	110.89	59.50	30.94	14.31	8.88	5.23
501	ST06E501C	MIDD10COMU04	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	9-Jul-04	94.46	72.35	5.24	12.25	7.90	4.99
502	ST06E502C	MIDD11COMU04	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	9-Jul-04	91.59	42.93	33.18	not measured	8.13	4.96

Appendix 1 (continued). Alaskan seabird eggs banked by STAMP in 2002-2005. BLKI = black-legged kittiwake (*Rissa tridactyla*), UNMU = unidentified murre species (*Uria spp.*), COMU = common murre (*U. aalge*), TBMU = thick-billed murre (*U. lomvia*), GLGU = glaucous gull (*Larus hyperboreus*), and GLGW = glaucous-winged gull (*L. glaucescens*).

ID								Mass (g)					
Number	Storage	Field	Species	Colony	Latitude	Longitude	Date Collected	Whole Egg	Contents	Embryo	Eggshell	Length (cm)	Breadth (cm)
503	ST06E503C	MIDD12COMU04	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	9-Jul-04	106.03	40.85	46.79	not measured	8.38	5.32
504	ST06E504C	GULL03COMU04	COMU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	27-Jun-04	116.72	98.79		13.72	8.27	5.19
505	ST06E505C	GULL04COMU04	COMU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	27-Jun-04	122.84	103.03		15.73	8.58	5.26
506	ST06E506C	GULL05COMU04	COMU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	27-Jun-04	97.39	81.30		11.37	8.00	4.85
507	ST06E507C	GULL06COMU04	COMU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	27-Jun-04	116.51	98.43		14.12	8.37	5.16
508	ST06E508C	GULL07COMU04	COMU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	27-Jun-04	128.49	109.73		15.02	8.88	5.25
509	ST06E509C	GULL09COMU04	COMU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	27-Jun-04	108.26	91.44		13.00	8.40	4.93
510	ST06E510C	GULL10COMU04	COMU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	27-Jun-04	108.89	92.70		11.99	8.38	4.99
511	ST06E511C	GULL12COMU04	COMU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	27-Jun-04	113.54	96.22		13.24	8.12	5.19
512	ST06E512C	GULL13COMU04	COMU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	27-Jun-04	117.28	99.66		13.97	8.59	5.19
513	ST06E513C	GULL14COMU04	COMU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	27-Jun-04	118.45	99.83		14.51	8.61	5.15
514	ST06E514C	GULL16COMU04	COMU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	27-Jun-04	92.58	75.89		12.81	8.27	4.78
515	ST06E515C	GULL17COMU04	COMU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	27-Jun-04	113.42	96.03		13.14	7.85	5.25
516	ST06E516C	GULL19COMU04	COMU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	27-Jun-04	112.60	94.85		13.88	8.47	5.05
517	ST06E517C	GULL23COMU04	COMU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	27-Jun-04	129.86	108.91		15.95	8.72	5.40
518	ST06E518C	GULL25COMU04	COMU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	27-Jun-04	127.34	108.20		14.99	9.06	5.24
519	ST06E519C	BOGO02COMU04	COMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	19-Jul-04	107.29	40.21	48.77	not measured	8.89	5.17
520	ST06E520C	BOGO04COMU04	COMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	19-Jul-04	100.86	29.10	51.89	not measured	8.47	5.16
521	ST06E521C	BOGO05COMU04	COMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	19-Jul-04	112.68	34.31	57.22	not measured	8.47	5.44
522	ST06E522C	BOGO06COMU04	COMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	19-Jul-04	103.09	85.65		12.14	8.43	4.82
523	ST06E523C	BOGO08COMU04	COMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	19-Jul-04	107.63	64.32	26.96	13.06	8.07	5.34
524	ST06E524C	BOGO09COMU04	COMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	19-Jul-04	105.41	54.32	31.96	not measured	8.71	5.24
525	ST06E525C	BOGO10COMU04	COMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	19-Jul-04	98.86	47.60	32.42	not measured	8.06	5.07
526	ST06E526C	BOGO11COMU04	COMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	19-Jul-04	109.20	29.08	61.00	not measured	8.95	5.24
527	ST06E527C	BOGO12COMU04	COMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	19-Jul-04	107.99	89.36		13.75	7.88	5.13
528	ST06E528C	BOGO15COMU04	COMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	19-Jul-04	99.40	22.42	55.45	not measured	8.39	5.16
529	ST06E529C	SITK01GWGU04A	GWGU	Gulf of Alaska, Viesekoi Rocks	56°58.22'N	135°29.27'W	11-Jun-04	86.94	76.88		5.95	6.96	4.90
		SITK01GWGU04B						93.61	78.19		6.51	7.13	5.02
530	ST06E530C	SITK02GWGU04	GWGU	Gulf of Alaska, Viesekoi Rocks	56°58.22'N	135°29.27'W	11-Jun-04	90.29	76.59		7.38	7.04	4.91
531	ST06E531C	SITK03GWGU04	GWGU	Gulf of Alaska, Viesekoi Rocks	56°58.22'N	135°29.27'W	11-Jun-04	92.30	80.92		6.74	6.96	4.96
532	ST06E532C	SITK04GWGU04A	GWGU	Gulf of Alaska, Viesekoi Rocks	56°58.22'N	135°29.27'W	11-Jun-04	97.10	82.51		7.36	7.39	4.96
		SITK04GWGU04B						94.81	77.74		6.95	7.61	4.93
533	ST06E533C	SITK05GWGU04	GWGU	Gulf of Alaska, Viesekoi Rocks	56°58.22'N	135°29.27'W	11-Jun-04	85.49	75.04		5.45	7.01	4.77
534	ST06E534C	SITK06GWGU04A	GWGU	Gulf of Alaska, Viesekoi Rocks	56°58.22'N	135°29.27'W	11-Jun-04	88.11	79.39		5.35	7.05	4.85
		SITK06GWGU04B						91.60	79.50		not measured	7.28	4.88
535	ST06E535C	SITK07GWGU04	GWGU	Gulf of Alaska, Viesekoi Rocks	56°58.22'N	135°29.27'W	11-Jun-04	96.43	81.54		7.16	7.27	5.02
536	ST06E536C	SITK08GWGU04	GWGU	Gulf of Alaska, Viesekoi Rocks	56°58.22'N	135°29.27'W	11-Jun-04	88.30	75.17		6.66	7.22	4.78
537	ST06E537C	SITK10GWGU04	GWGU	Gulf of Alaska, Viesekoi Rocks	56°58.22'N	135°29.27'W	11-Jun-04	101.09	87.16		6.52	7.04	5.20
538	ST06E538C	SITK11GWGU04A	GWGU	Gulf of Alaska, Viesekoi Rocks	56°58.22'N	135°29.27'W	11-Jun-04	112.05	96.68		7.19	8.19	5.23
		SITK11GWGU04B						114.53	100.60		7.06	7.92	5.28
539	ST06E539C	SITK12GWGU04	GWGU	Gulf of Alaska, Viesekoi Rocks	56°58.22'N	135°29.27'W	11-Jun-04	88.69	77.45		6.84	7.23	4.80
540	ST06E540C	SITK13GWGU04A	GWGU	Gulf of Alaska, Viesekoi Rocks	56°58.22'N	135°29.27'W	11-Jun-04	86.27	62.50	9.38	6.63	7.56	4.89
		SITK13GWGU04B						85.06	54.81	18.29	not measured	7.26	5.07
541	ST06E541C	SITK14GWGU04	GWGU	Gulf of Alaska, Viesekoi Rocks	56°58.22'N	135°29.27'W	11-Jun-04	90.95	80.49		6.45	7.05	4.91

Appendix 1 (continued). Alaskan seabird eggs banked by STAMP in 2002-2005. BLKI = black-legged kittiwake (*Rissa tridactyla*), UNMU = unidentified murre species (*Uria spp.*), COMU = common murre (*U. aalge*), TBMU = thick-billed murre (*U. lomvia*), GLGU = glaucous gull (*Larus hyperboreus*), and GLGW = glaucous-winged gull (*L. glaucescens*).

ID								Mass (g)					
Number	Storage	Field	Species	Colony	Latitude	Longitude	Date Collected	Whole Egg	Contents	Embryo	Eggshell	Length (cm)	Breadth (cm)
542	ST06E542C	SITK15GWGU04	GWGU	Gulf of Alaska, Viesekoi Rocks	56°58.22'N	135°29.27'W	11-Jun-04	85.95	74.44		6.87	6.94	4.87
543	ST06E543C	SITK16GWGU04A SITK16GWGU04B	GWGU	Gulf of Alaska, Viesekoi Rocks	56°58.22'N	135°29.27'W	11-Jun-04	88.29 90.23	78.42 75.92		6.40 6.50	6.77 7.04	4.94 4.92
544	ST06E544C	BOGO01TBMU04	TBMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	19-Jul-04	87.20	72.52		9.97	7.63	4.87
545	ST06E545C	BOGO03TBMU04	TBMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	19-Jul-04	83.50	54.61		9.14	7.29	4.66
546	ST06E546C	BOGO04TBMU04	TBMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	19-Jul-04	104.42	70.02	20.30	not measured	8.10	5.21
547	ST06E547C	BOGO06TBMU04	TBMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	19-Jul-04	92.11	62.65	15.15	9.85	8.06	4.88
548	ST06E548C	BOGO07TBMU04	TBMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	19-Jul-04	104.69	80.23		not measured	7.71	5.13
549	ST06E549C	BOGO10TBMU04	TBMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	19-Jul-04	91.51	75.79		9.69	8.22	4.72
550	ST06E550C	BOGO12TBMU04	TBMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	19-Jul-04	102.86	86.23		10.62	7.88	5.06
551	ST06E551C	CLIS01UNKM04	UNMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	19-Jun-04	88.08	55.35		9.36	7.49	4.80
552	ST06E552C	CLIS02UNKM04	UNMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	19-Jun-04	104.78	89.43		11.66	8.19	5.04
553	ST06E553C	CLIS03UNKM04	UNMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	19-Jun-04	101.98	82.78		12.35	7.92	4.98
554	ST06E554C	CLIS04UNKM04	UNMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	19-Jun-04	89.55	76.69		10.21	7.38	4.88
555	ST06E555C	CLIS05UNKM04	UNMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	19-Jun-04	115.60	97.82		14.44	8.11	5.56
556	ST06E556C	CLIS06UNKM04	UNMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	19-Jun-04	115.03	97.79		13.91	8.34	5.19
557	ST06E557C	CLIS07UNKM04	UNMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	19-Jun-04	105.88	90.52		12.15	7.97	5.10
558	ST06E558C	CLIS08UNKM04	UNMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	19-Jun-04	85.25	71.81		11.03	7.07	4.80
559	ST06E559C	CLIS09UNKM04	UNMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	19-Jun-04	127.50	109.16		14.69	8.41	5.53
560	ST06E560C	CLIS10UNKM04	UNMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	19-Jun-04	119.73	103.06		13.34	8.34	5.20
561	ST06E561C	CLIS11UNKM04	UNMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	19-Jun-04	98.37	84.30		11.40	8.04	4.83
562	ST06E562C	CLIS12UNKM04	UNMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	19-Jun-04	108.49	91.41		13.36	8.17	5.10
563	ST06E563C	CLIS13UNKM04	UNMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	19-Jun-04	112.78	97.11		12.56	8.19	5.20
564	ST06E564C	CLIS14UNKM04	UNMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	19-Jun-04	not measured	71.19		14.10	not measured	not measured
565	ST06E565C	CLIS15UNKM04	UNMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	19-Jun-04	100.50	84.94		12.49	7.82	4.99
566	ST06E566C	CLIS16UNKM04	UNMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	19-Jun-04	103.74	88.34		11.68	7.88	5.07
567	ST06E567C	CLIS17UNKM04	UNMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	19-Jun-04	not measured	63.34		not measured	not measured	not measured
568	ST06E568C	CLIS18UNKM04	UNMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	19-Jun-04	108.19	87.55		11.77	7.94	5.16
569	ST06E569C	CLIS19UNKM04	UNMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	19-Jun-04	116.95	97.10		14.24	8.51	5.22
570	ST06E570C	CLIS20UNKM04	UNMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	19-Jun-04	98.90	82.75		12.77	8.32	4.73
571	ST06E571C	CLIS21UNKM04	UNMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	19-Jun-04	96.48	82.14		9.73	7.89	4.89
572	ST06E572C	CLIS23UNKM04	UNMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	19-Jun-04	112.84	95.59		13.83	8.03	5.25
573	ST06E573C	CLIS24UNKM04	UNMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	19-Jun-04	127.08	107.88		15.28	8.57	5.35
574	ST06E574C	CLIS25UNKM04	UNMU	Chukchi Sea, Cape Lisburne	68°52.52'N	166°12.36'W	19-Jun-04	108.34	91.76		11.78	7.79	5.18
575	ST07E575C	TOGI01GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	105.00	93.74		7.55	8.07	5.09
576	ST07E576C	TOGI02GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	91.32	80.90		6.66	7.23	4.87
577	ST07E577C	TOGI03GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	97.50	86.80		6.98	7.65	4.93
578	ST07E578C	TOGI04GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	97.20	87.40		6.16	6.97	5.12
579	ST07E579C	TOGI05GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	118.79	106.40		7.59	7.67	5.44
580	ST07E580C	TOGI06GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	99.16	89.00		7.11	7.26	5.07
581	ST07E581C	TOGI07GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	99.33	87.70		7.25	7.52	4.96
582	ST07E582C	TOGI08GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	99.76	90.20		6.70	7.69	4.99
583	ST07E583C	TOGI09GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	94.53	84.80		6.90	7.33	4.98
584	ST07E584C	TOGI10GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	101.06	91.70		7.04	6.94	5.23

Appendix 1 (continued). Alaskan seabird eggs banked by STAMP in 2002-2005. BLKI = black-legged kittiwake (*Rissa tridactyla*), UNMU = unidentified murre species (*Uria spp.*), COMU = common murre (*U. aalge*), TBMU = thick-billed murre (*U. lomvia*), GLGU = glaucous gull (*Larus hyperboreus*), and GLGW = glaucous-winged gull (*L. glaucescens*).

ID								Mass (g)					
Number	**Storage**	**Field**	**Species**	**Colony**	**Latitude**	**Longitude**	**Date Collected**	**Whole Egg**	**Contents**	**Embryo**	**Eggshell**	**Length (cm)**	**Breadth (cm)**
585	ST07E585C	TOGI11GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	124.02	112.00		8.48	8.22	5.41
586	ST07E586C	TOGI12GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	99.60	88.20		7.66	7.29	5.03
587	ST07E587C	TOGI13GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	101.03	89.80		7.66	7.50	5.04
588	ST07E588C	TOGI14GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	97.08	87.50		6.93	7.61	4.94
589	ST07E589C	TOGI15GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	98.25	89.00		6.74	7.27	5.12
590	ST07E590C	TOGI16GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	87.53	78.50		6.95	6.90	4.90
591	ST07E591C	TOGI17GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	103.66	93.20		7.98	7.25	5.19
592	ST07E592C	TOGI18GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	91.92	83.00		6.70	7.00	4.97
593	ST07E593C	TOGI19GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	102.00	92.00		7.22	7.15	5.17
594	ST07E594C	TOGI20GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	107.90	97.10		7.53	7.36	5.25
595	ST07E595C	TOGI21GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	102.18	92.30		7.03	7.35	5.12
596	ST07E596C	TOGI22GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	104.58	94.90		7.51	7.80	5.04
597	ST07E597C	TOGI23GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	104.37	94.00		7.44	7.47	5.10
598	ST07E598C	TOGI24GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	112.11	101.60		7.95	7.81	5.21
599	ST07E599C	TOGI25GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	113.63	102.70		8.22	7.70	5.31
600	ST07E600C	TOGI26GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	98.07	88.70		6.81	6.92	5.14
601	ST07E601C	TOGI27GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	123.87	111.90		8.51	7.71	5.48
602	ST07E602C	TOGI28GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	116.90	104.70		8.10	7.26	5.47
603	ST07E603C	TOGI29GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	83.70	66.50		6.06	7.03	4.72
604	ST07E604C	TOGI30GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	118.28	107.00		8.19	7.68	5.43
605	ST07E605C	TOGI31GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	109.65	99.10		7.74	7.48	5.25
606	ST07E606C	TOGI32GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	101.46	93.40		5.78	7.21	5.17
607	ST07E607C	TOGI33GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	115.09	104.50		7.65	7.17	5.50
608	ST07E608C	TOGI34GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	103.70	93.80		7.05	7.13	5.21
609	ST07E609C	TOGI35GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	107.02	89.80		8.08	6.92	5.36
610	ST07E610C	TOGI36GWGU05	GWGU	Bering Sea, Shaiak I.	58°33.31'N	161°39.56'W	11-May-05	103.02	89.00		7.40	7.20	5.16
611	ST07E611C	NOAT01GLGU05A	GLGU	Chukchi Sea, Noatak River Delta	66°59.47'N	162°29.00'W	1-Jun-05	92.96	81.56		8.00	7.35	4.88
		NOAT01GLGU05B						90.51	80.07		7.24	7.16	4.93
612	ST07E612C	NOAT02GLGU05A	GLGU	Chukchi Sea, Noatak River Delta	66°59.47'N	162°29.00'W	1-Jun-05	99.21	87.48		7.75	7.24	5.22
		NOAT02GLGU05B						110.48	99.47		8.30	7.46	5.41
		NOAT02GLGU05C						103.57	92.83		8.35	7.69	5.17
613	ST07E613C	NOAT03GLGU05A	GLGU	Chukchi Sea, Noatak River Delta	66°59.47'N	162°29.00'W	1-Jun-05	111.65	98.70		7.31	7.73	5.21
		NOAT03GLGU05B						99.78	86.60		7.65	7.26	5.12
614	ST07E614C	NOAT04GLGU05A	GLGU	Chukchi Sea, Noatak River Delta	66°59.47'N	162°29.00'W	1-Jun-05	105.01	93.00		7.24	7.26	5.20
		NOAT04GLGU05B						104.71	94.60		6.92	7.36	5.16
615	ST07E615C	NOAT05GLGU05A	GLGU	Chukchi Sea, Noatak River Delta	66°59.47'N	162°29.00'W	1-Jun-05	89.70	79.20		6.59	7.06	4.96
		NOAT05GLGU05B						95.62	85.70		7.11	7.08	5.12
		NOAT05GLGU05C						94.08	82.08		6.71	6.78	5.11
616	ST07E616C	NOAT06GLGU05A	GLGU	Chukchi Sea, Noatak River Delta	66°59.47'N	162°29.00'W	1-Jun-05	99.92	88.80		6.98	7.24	5.11
		NOAT06GLGU05B						111.54	101.50		6.78	7.95	5.16
617	ST07E617C	HOOP01GLGU05	GLGU	Bering Sea, Hooper Bay	61°29.31'N	165°56.00'W	29-May-05	87.12	78.40		6.13	7.62	4.61
618	ST07E618C	HOOP02GLGU05	GLGU	Bering Sea, Hooper Bay	61°29.31'N	165°56.00'W	29-May-05	94.07	82.00		7.47	7.46	4.87
619	ST07E619C	HOOP03GLGU05	GLGU	Bering Sea, Hooper Bay	61°29.31'N	165°56.00'W	29-May-05	106.20	94.70		7.52	7.51	5.12
620	ST07E620C	HOOP05GLGU05	GLGU	Bering Sea, Hooper Bay	61°29.31'N	165°56.00'W	29-May-05	125.73	112.90		9.04	8.44	5.24
621	ST07E621C	HOOP06GLGU05	GLGU	Bering Sea, Hooper Bay	61°29.31'N	165°56.00'W	29-May-05	114.60	103.00		8.21	8.70	4.95

Appendix 1 (continued). Alaskan seabird eggs banked by STAMP in 2002-2005. BLKI = black-legged kittiwake (*Rissa tridactyla*), UNMU = unidentified murre species (*Uria spp.*), COMU = common murre (*U. aalge*), TBMU = thick-billed murre (*U. lomvia*), GLGU = glaucous gull (*Larus hyperboreus*), and GLGW = glaucous-winged gull (*L. glaucescens*).

ID								Mass (g)					
Number	Storage	Field	Species	Colony	Latitude	Longitude	Date Collected	Whole Egg	Contents	Embryo	Eggshell	Length (cm)	Breadth (cm)
622	ST07E622C	HOOP07GLGU05	GLGU	Bering Sea, Hooper Bay	61°29.31'N	165°56.00'W	29-May-05	115.38	103.30		7.98	8.05	5.22
623	ST07E623C	HOOP08GLGU05	GLGU	Bering Sea, Hooper Bay	61°29.31'N	165°56.00'W	29-May-05	110.59	98.90		7.40	7.85	5.14
624	ST07E624C	HOOP09GLGU05	GLGU	Bering Sea, Hooper Bay	61°29.31'N	165°56.00'W	29-May-05	97.02	85.70		6.65	7.68	4.86
625	ST07E625C	HOOP10GLGU05	GLGU	Bering Sea, Hooper Bay	61°29.31'N	165°56.00'W	29-May-05	113.27	101.40		8.73	7.60	5.28
626	ST07E626C	HOOP11GLGU05	GLGU	Bering Sea, Hooper Bay	61°29.31'N	165°56.00'W	29-May-05	113.16	96.70		7.91	7.42	5.57
627	ST07E627C	HOOP12GLGU05	GLGU	Bering Sea, Hooper Bay	61°29.31'N	165°56.00'W	29-May-05	94.48	82.30		7.65	7.39	4.95
628	ST07E628C	HOOP13GLGU05	GLGU	Bering Sea, Hooper Bay	61°29.31'N	165°56.00'W	29-May-05	118.17	101.30		8.94	7.64	5.35
629	ST07E629C	HOOP14GLGU05	GLGU	Bering Sea, Hooper Bay	61°29.31'N	165°56.00'W	29-May-05	112.36	99.30		8.06	7.75	5.27
630	ST07E630C	HOOP15GLGU05	GLGU	Bering Sea, Hooper Bay	61°29.31'N	165°56.00'W	29-May-05	105.43	94.10		7.82	7.64	5.05
631	ST07E631C	HOOP16GLGU05	GLGU	Bering Sea, Hooper Bay	61°29.31'N	165°56.00'W	29-May-05	116.36	104.20		8.31	7.91	5.20
632	ST07E632C	NOAT07GLGU05A	GLGU	Chukchi Sea, Noatak River Delta	66°59.47'N	162°29.00'W	1-Jun-05	104.34	92.30		7.96	7.73	5.13
		NOAT07GLGU05B						104.71	88.10		7.49	7.40	5.24
		NOAT07GLGU05C						100.56	87.10		8.02	7.14	5.26
633	ST07E633C	NOAT09GLGU05A	GLGU	Chukchi Sea, Noatak River Delta	66°59.47'N	162°29.00'W	1-Jun-05	107.00	95.20		7.59	7.84	5.18
		NOAT09GLGU05B						106.79	96.30		7.52	7.70	5.20
634	ST07E634C	NOAT10GLGU05	GLGU	Chukchi Sea, Noatak River Delta	66°59.47'N	162°29.00'W	1-Jun-05	112.13	100.80		8.11	7.57	5.26
635	ST07E635C	NOAT11GLGU05A	GLGU	Chukchi Sea, Noatak River Delta	66°59.47'N	162°29.00'W	1-Jun-05	102.27	89.90		6.88	7.22	5.19
		NOAT11GLGU05C						101.45	91.80		6.40	7.26	5.16
636	ST07E636C	NOAT12GLGU05A	GLGU	Chukchi Sea, Noatak River Delta	66°59.47'N	162°29.00'W	1-Jun-05	91.11	82.00		6.70	6.97	5.09
		NOAT12GLGU05B						94.73	85.50		6.92	7.12	5.05
		NOAT12GLGU05C						86.43	77.30		6.39	6.88	4.90
637	ST07E637C	HOOP17GLGU05	GLGU	Bering Sea, Hooper Bay	61°29.31'N	165°56.00'W	29-May-05	105.85	93.60		8.11	7.35	5.17
638	ST07E638C	HOOP18GLGU05	GLGU	Bering Sea, Hooper Bay	61°29.31'N	165°56.00'W	29-May-05	117.00	105.50		8.13	8.36	5.11
639	ST07E639C	HOOP19GLGU05	GLGU	Bering Sea, Hooper Bay	61°29.31'N	165°56.00'W	29-May-05	108.97	96.40		8.18	7.80	5.16
640	ST07E640C	HOOP20GLGU05	GLGU	Bering Sea, Hooper Bay	61°29.31'N	165°56.00'W	29-May-05	128.81	112.50		8.35	5.42	8.80
641	ST07E641C	SITK01GWGU05A	GWGU	Gulf of Alaska, Viesekoi Rocks	56°58.22'N	135°29.27'W	4-Jun-05	80.58	71.40		5.59	6.83	4.69
		SITK01GWGU05B						87.37	78.60		6.32	7.06	4.88
		SITK01GWGU05C						81.53	72.40		6.01	6.87	4.83
642	ST07E642C	SITK02GWGU05A	GWGU	Gulf of Alaska, Viesekoi Rocks	56°58.22'N	135°29.27'W	4-Jun-05	88.71	78.80		6.44	7.27	4.88
		SITK02GWGU05B						97.62	87.60		6.90	7.51	5.01
		SITK02GWGU05C						91.76	82.60		6.84	7.20	4.90
643	ST07E643C	SITK03GWGU05A	GWGU	Gulf of Alaska, Viesekoi Rocks	56°58.22'N	135°29.27'W	4-Jun-05	100.10	90.80		6.65	6.88	5.22
		SITK03GWGU05B						94.43	85.60		6.17	6.72	5.12
		SITK03GWGU05C						99.04	88.20		6.57	7.03	5.15
644	ST07E644C	SITK04GWGU05A	GWGU	Gulf of Alaska, Viesekoi Rocks	56°58.22'N	135°29.27'W	4-Jun-05	91.11	81.00		5.83	7.06	4.92
		SITK04GWGU05B						94.75	83.90		6.71	7.30	4.94
		SITK04GWGU05C						95.28	82.90		6.20	7.20	4.98
645	ST07E645C	SITK05GWGU05A	GWGU	Gulf of Alaska, Viesekoi Rocks	56°58.22'N	135°29.27'W	4-Jun-05	99.45	89.30		6.94	7.14	5.16
		SITK05GWGU05B						98.77	87.00		7.21	7.32	5.07
646	ST07E646C	SITK06GWGU05A	GWGU	Gulf of Alaska, Viesekoi Rocks	56°58.22'N	135°29.27'W	4-Jun-05	96.81	86.30		6.63	7.33	4.96
		SITK06GWGU05B						95.96	84.50		6.55	7.25	5.03
647	ST07E647C	SITK07GWGU05	GWGU	Gulf of Alaska, Viesekoi Rocks	56°58.22'N	135°29.27'W	4-Jun-05	105.89	95.40		7.73	7.48	5.17
648	ST07E648C	SITK08GWGU05	GWGU	Gulf of Alaska, Viesekoi Rocks	56°58.22'N	135°29.27'W	4-Jun-05	111.50	97.86		7.44	7.23	5.34
649	ST07E649C	MIDD01COMU05	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	6-Jun-05	114.78	97.38		14.05	8.39	5.20
650	ST07E650C	MIDD02COMU05	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	6-Jun-05	99.77	84.22		12.53	8.07	4.90
651	ST07E651C	MIDD03COMU05	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	6-Jun-05	107.85	90.68		13.77	8.62	5.00
652	ST07E652C	MIDD04COMU05	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	6-Jun-05	110.35	91.99		14.19	8.06	5.11

Appendix 1 (continued). Alaskan seabird eggs banked by STAMP in 2002-2005. BLKI = black-legged kittiwake (*Rissa tridactyla*), UNMU = unidentified murre species (*Uria spp.*), COMU = common murre (*U. aalge*), TBMU = thick-billed murre (*U. lomvia*), GLGU = glaucous gull (*Larus hyperboreus*), and GLGW = glaucous-winged gull (*L. glaucescens*).

ID								Mass (g)					
Number	**Storage**	**Field**	**Species**	**Colony**	**Latitude**	**Longitude**	**Date Collected**	**Whole Egg**	**Contents**	**Embryo**	**Eggshell**	**Length (cm)**	**Breadth (cm)**
653	ST07E653C	MIDD05COMU05	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	13-Jun-05	89.56	75.18		10.94	7.60	4.76
654	ST07E654C	MIDD06COMU05	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	13-Jun-05	109.39	92.36		13.02	8.16	5.14
655	ST07E655C	UALK02GWGU05	GWGU	Bering Sea, Ualik Lake	59°05.40'N	159°26.08'W	12-Jun-05	91.27	79.65		5.70	7.14	6.89
656	ST07E656C	UALK03GWGU05A	GWGU	Bering Sea, Ualik Lake	59°05.40'N	159°26.08'W	12-Jun-05	91.15	77.97		5.75	6.54	5.10
		UALK03GWGU05B						90.90	81.91		5.73	7.03	5.04
657	ST07E657C	UALK04GWGU05C	GWGU	Bering Sea, Ualik Lake	59°05.40'N	159°26.08'W	12-Jun-05	85.94	73.89		5.17	6.71	4.87
658	ST07E658C	UALK05GWGU05C	GWGU	Bering Sea, Ualik Lake	59°05.40'N	159°26.08'W	12-Jun-05	87.69	74.53		5.53	6.87	4.90
659	ST07E659C	UALK06GWGU05C	GWGU	Bering Sea, Ualik Lake	59°05.40'N	159°26.08'W	12-Jun-05	81.56	65.38		5.30	6.68	4.78
660	ST07E660C	UALK08GWGU05C	GWGU	Bering Sea, Ualik Lake	59°05.40'N	159°26.08'W	12-Jun-05	105.74	89.39		7.48	7.00	5.39
661	ST07E661C	UALK09GWGU05A	GWGU	Bering Sea, Ualik Lake	59°05.40'N	159°26.08'W	12-Jun-05	112.86	94.62		8.01	7.80	5.28
		UALK09GWGU05B						109.04	95.79		6.95	7.19	5.35
662	ST07E662C	UALK10GWGU05A	GWGU	Bering Sea, Ualik Lake	59°05.40'N	159°26.08'W	12-Jun-05	118.82	88.34		7.35	7.52	5.31
663	ST07E663C	MIDD06GWGU05A	GWGU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	31-May-05	99.32	86.76		6.13	7.28	5.16
		MIDD06GWGU05B						95.09	81.14		5.99	7.21	5.00
		MIDD06GWGU05C						91.58	77.02		5.80	6.93	5.01
664	ST07E664C	MIDD07GWGU05C	GWGU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	31-May-05	96.26	82.09		6.36	7.12	5.17
665	ST07E665C	MIDD08GWGU05A	GWGU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	31-May-05	85.64	71.21		5.69	7.23	4.77
		MIDD08GWGU05B						86.56	74.43		5.61	7.38	4.83
666	ST07E666C	MIDD09GWGU05C	GWGU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	31-May-05	111.77	93.80		7.31	7.47	5.34
667	ST07E667C	MIDD10GWGU05C	GWGU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	31-May-05	88.36	76.99		6.03	6.77	5.10
668	ST07E668C	MIDD11GWGU05A	GWGU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	31-May-05	97.76	79.77		6.58	7.06	5.11
		MIDD11GWGU05B						94.36	81.06		6.73	7.09	5.02
		MIDD11GWGU05C						89.86	75.11		6.35	7.68	4.71
669	ST07E669C	MIDD11GWGU05A	GWGU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	31-May-05	91.19	79.42		6.20	6.99	4.98
		MIDD11GWGU05B						100.70	79.41		6.49	7.14	5.18
670	ST07E670C	NOME01GLGU05A	GLGU	Bering Sea, Penny River Delta	64°32.10'N	165°44.20'W	5-Jun-05	123.52	105.51		7.97	7.77	5.51
		NOME01GLGU05B						96.70	79.65		7.03	7.15	5.11
671	ST07E671C	NOME02GLGU05A	GLGU	Bering Sea, Penny River Delta	64°32.10'N	165°44.20'W	5-Jun-05	104.72	88.31		6.83	7.45	5.15
		NOME02GLGU05B						105.60	89.30		7.26	7.56	5.16
672	ST07E672C	NOME03GLGU05A	GLGU	Bering Sea, Penny River Delta	64°32.10'N	165°44.20'W	5-Jun-05	94.51	79.59		6.62	7.23	5.03
		NOME03GLGU05B						87.53	73.91		6.22	7.16	4.84
673	ST07E673C	NOME04GLGU05B	GLGU	Bering Sea, Penny River Delta	64°32.10'N	165°44.20'W	5-Jun-05	117.52	99.08		7.13	7.59	5.42
674	ST07E674C	NOME07GLGU05B	GLGU	Bering Sea, Penny River Delta	64°32.10'N	165°44.20'W	5-Jun-05	98.26	76.31		6.94	7.76	4.95
675	ST07E675C	NOME08GLGU05A	GLGU	Bering Sea, Penny River Delta	64°32.10'N	165°44.20'W	5-Jun-05	98.58	85.62		6.23	7.50	5.05
676	ST07E676C	CDEN01COMU05	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	26-Jun-05	117.14	99.72		14.46	8.48	5.11
677	ST07E677C	CDEN02COMU05	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	26-Jun-05	105.58	90.24		12.70	7.70	4.96
678	ST07E678C	CDEN03COMU05	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	26-Jun-05	120.45	102.51		13.98	8.54	5.21
679	ST07E679C	CDEN04COMU05	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	26-Jun-05	120.84	101.07		16.08	8.91	5.15
680	ST07E680C	CDEN05COMU05	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	26-Jun-05	110.38	94.21		13.08	8.37	5.12
681	ST07E681C	CDEN06COMU05	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	26-Jun-05	108.96	93.03		12.92	8.27	4.97
682	ST07E682C	CDEN07COMU05	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	26-Jun-05	121.06	102.29		15.02	8.52	5.20
683	ST07E683C	CDEN08COMU05	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	26-Jun-05	126.85	107.17		16.36	8.66	5.28
684	ST07E684C	CDEN09COMU05	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	26-Jun-05	131.92	111.36		17.29	8.65	5.42
685	ST07E685C	CDEN10COMU05	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	26-Jun-05	104.93	88.85		13.01	7.99	1.98
686	ST07E686C	CDEN11COMU05	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	26-Jun-05	96.23	81.78		11.11	7.45	4.93
687	ST07E687C	CDEN12COMU05	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	26-Jun-05	121.16	102.72		14.71	8.63	5.31

Appendix 1 (continued). Alaskan seabird eggs banked by STAMP in 2002-2005. BLKI = black-legged kittiwake (*Rissa tridactyla*), UNMU = unidentified murre species (*Uria spp.*), COMU = common murre (*U. aalge*), TBMU = thick-billed murre (*U. lomvia*), GLGU = glaucous gull (*Larus hyperboreus*), and GLGW = glaucous-winged gull (*L. glaucescens*).

ID								Mass (g)					
Number	Storage	Field	Species	Colony	Latitude	Longitude	Date Collected	Whole Egg	Contents	Embryo	Eggshell	Length (cm)	Breadth (cm)
688	ST07E688C	CDEN13COMU05	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	26-Jun-05	126.79	108.67		14.70	8.53	5.31
689	ST07E689C	CDEN14COMU05	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	26-Jun-05	119.18	101.61		14.09	8.72	5.21
690	ST07E690C	CDEN15COMU05	COMU	Bering Sea, Cape Denbigh	64°22.52'N	161°32.03'W	26-Jun-05	129.54	108.20		17.60	8.84	5.28
691	ST07E691C	SAFE01GLGU05A	GLGU	Bering, Sea, Safety Sound	64°29.19'N	164°46.11'W	29-Jun-05	100.68	90.00		7.34	8.21	4.99
		SAFE01GLGU05B						107.26	95.40		7.31	8.43	5.04
		SAFE01GLGU05C						109.90	94.50		7.55	8.43	5.04
692	ST07E692C	SAFE02GLGU05A	GLGU	Bering, Sea, Safety Sound	64°29.19'N	164°46.11'W	25-Jun-05	117.62	94.30		8.07	7.59	5.42
		SAFE02GLGU05B						118.92	104.30		7.86	7.75	5.37
693	ST07E693C	SAFE03GLGU05B	GLGU	Bering, Sea, Safety Sound	64°29.19'N	164°46.11'W	25-Jun-05	91.10	68.10		7.55	7.69	4.89
		SAFE03GLGU05C						80.84	59.40		6.59	7.13	4.81
694	ST07E694C	SAFE04GLGU05B	GLGU	Bering, Sea, Safety Sound	64°29.19'N	164°46.11'W	25-Jun-05	97.50	88.70		6.73	7.73	5.08
		SAFE04GLGU05C						94.62	86.10		6.67	7.51	5.08
695	ST07E695C	SAFE06GLGU05A	GLGU	Bering, Sea, Safety Sound	64°29.19'N	164°46.11'W	25-Jun-05	119.78	107.60		8.60	7.94	5.55
696	ST07E696C	SAFE07GLGU05A	GLGU	Bering, Sea, Safety Sound	64°29.19'N	164°46.11'W	25-Jun-05	91.13	82.30		6.36	7.31	5.01
		SAFE07GLGU05C						96.18	86.20		6.97	7.74	4.94
697	ST07E697C	SAFE08GLGU05A	GLGU	Bering, Sea, Safety Sound	64°29.19'N	164°46.11'W	25-Jun-05	96.70	87.90		7.07	8.01	4.89
		SAFE08GLGU05B						91.34	82.90		6.40	7.45	4.97
		SAFE08GLGU05C						99.64	90.40		7.55	8.34	4.94
698	ST07E698C	SAFE10GLGU05A	GLGU	Bering, Sea, Safety Sound	64°29.19'N	164°46.11'W	25-Jun-05	95.86	75.90		6.89	7.59	5.19
		SAFE10GLGU05C						92.92	83.80		7.06	7.70	4.88
699	ST07E699C	SAFE11GLGU05A	GLGU	Bering, Sea, Safety Sound	64°29.19'N	164°46.11'W	25-Jun-05	79.61	71.50		6.63	7.36	4.81
		SAFE11GLGU05B						78.57	70.70		6.52	7.09	4.72
700	ST07E700C	SAFE12GLGU05B	GLGU	Bering, Sea, Safety Sound	64°29.19'N	164°46.11'W	25-Jun-05	111.11	100.40		8.59	8.31	5.23
701	ST07E701C	SAFE13GLGU05A	GLGU	Bering, Sea, Safety Sound	64°29.19'N	164°46.11'W	25-Jun-05	103.76	92.20		8.74	7.95	5.25
		SAFE13GLGU05B						90.91	81.70		6.77	7.74	5.07
702	ST07E702C	STLA01GWGU05A	GLGU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	15-Jun-05	86.44	77.30		6.62	7.23	5.01
		STLA01GWGU05C						81.42	71.50		6.54	7.24	4.97
703	ST07E703C	STLA02GWGU05B	GLGU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	15-Jun-05	87.57	78.10		5.79	7.46	4.80
704	ST07E704C	STLA03GWGU05B	GLGU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	15-Jun-05	92.07	74.50		6.98	7.62	4.98
705	ST07E705C	STLA05GWGU05A	GLGU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	15-Jun-05	83.67	74.90		5.94	7.29	4.93
		STLA05GWGU05C						86.19	76.60		6.12	7.43	4.93
706	ST07E706C	STLA06GWGU05A	GLGU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	15-Jun-05	99.19	85.80		6.53	7.12	5.23
		STLA06GWGU05C						94.59	83.10		6.59	7.06	5.16
707	ST07E707C	STLA07GWGU05A	GLGU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	15-Jun-05	89.08	78.60		6.67	7.50	4.79
		STLA07GWGU05C						85.66	74.60		7.03	7.54	4.82
708	ST07E708C	STLA10GWGU05A	GLGU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	15-Jun-05	84.94	73.10		6.40	7.06	4.83
		STLA10GWGU05B						86.46	75.40		6.62	6.93	4.91
709	ST07E709C	STLA12GWGU05A	GLGU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	15-Jun-05	83.39	74.10		5.66	7.12	4.82
710	ST07E710C	BULD02TMBU05	TBMU	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	17-Jun-05	107.78	93.00		12.13	8.37	5.17
711	ST07E711C	BULD03TMBU05	TBMU	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	17-Jun-05	107.31	91.16		11.90	8.17	5.04
712	ST07E712C	BULD04TMBU05	TBMU	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	17-Jun-05	118.38	98.17		17.22	8.79	5.33
713	ST07E713C	BULD05TMBU05	TBMU	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	17-Jun-05	103.26	11.82		11.82	8.01	5.00
714	ST07E714C	BULD06TMBU05	TBMU	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	17-Jun-05	97.05	82.87		11.26	7.64	4.93
715	ST07E715C	BULD08TMBU05	TBMU	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	17-Jun-05	92.74	78.46		11.25	7.95	4.80
716	ST07E716C	BULD09TMBU05	TBMU	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	17-Jun-05	112.10	95.54		11.83	8.05	5.10
717	ST07E717C	BULD10TMBU05	TBMU	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	17-Jun-05	93.00	79.96		10.34	7.74	4.77
718	ST07E718C	BULD12TMBU05	TBMU	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	17-Jun-05	101.36	84.67		12.45	8.35	4.91

Appendix 1 (continued). Alaskan seabird eggs banked by STAMP in 2002-2005. BLKI = black-legged kittiwake (*Rissa tridactyla*), UNMU = unidentified murre species (*Uria spp.*), COMU = common murre (*U. aalge*), TBMU = thick-billed murre (*U. lomvia*), GLGU = glaucous gull (*Larus hyperboreus*), and GLGW = glaucous-winged gull (*L. glaucescens*).

ID								Mass (g)					
Number	Storage	Field	Species	Colony	Latitude	Longitude	Date Collected	Whole Egg	Contents	Embryo	Eggshell	Length (cm)	Breadth (cm)
719	ST07E719C	BULD13TMBU05	TBMU	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	17-Jun-05	115.02	97.28		15.03	8.68	5.21
720	ST07E720C	BULD14TMBU05	TBMU	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	17-Jun-05	124.16	107.24		14.03	8.72	5.43
721	ST07E721C	BULD15TMBU05	TBMU	Bering Sea, Buldir I.	52°21.29'N	175°55.29'W	17-Jun-05	116.61	97.62		16.15	8.95	5.14
722	ST07E722C	KING01TBMU05	TBMU	Bering Sea, King Island	64°58.30'N	168°03.35'W	25-Jun-05	118.99	100.88		14.66	8.29	5.21
723	ST07E723C	KING02TBMU05	TBMU	Bering Sea, King Island	64°58.30'N	168°03.35'W	25-Jun-05	116.73	102.35		11.32	8.44	5.15
724	ST07E724C	KING03TBMU05	TBMU	Bering Sea, King Island	64°58.30'N	168°03.35'W	25-Jun-05	118.40	98.92		14.98	8.58	5.20
725	ST07E725C	KING04TBMU05	TBMU	Bering Sea, King Island	64°58.30'N	168°03.35'W	25-Jun-05	106.14	90.00		12.71	8.09	5.05
726	ST07E726C	KING05TBMU05	TBMU	Bering Sea, King Island	64°58.30'N	168°03.35'W	25-Jun-05	118.62	101.24		14.17	8.40	5.22
727	ST07E727C	KING06TBMU05	TBMU	Bering Sea, King Island	64°58.30'N	168°03.35'W	25-Jun-05	116.77	98.08		14.97	8.62	5.16
728	ST07E728C	GULL01COMU05	COMU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	24-Jun-05	96.10	80.12		12.79	7.66	4.84
729	ST07E729C	GULL03COMU05	COMU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	24-Jun-05	116.78	98.61		14.52	8.36	5.16
730	ST07E730C	GULL04COMU05	COMU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	24-Jun-05	90.11	76.27		11.30	7.80	4.75
731	ST07E731C	GULL05COMU05	COMU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	24-Jun-05	83.72	73.23		6.61	7.19	4.76
732	ST07E732C	GULL07COMU05	COMU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	24-Jun-05	118.35	101.06		13.50	8.72	5.22
733	ST07E733C	GULL08COMU05	COMU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	24-Jun-05	114.85	98.02		13.40	8.28	5.25
734	ST07E734C	GULL09COMU05	COMU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	24-Jun-05	112.83	94.91		13.96	8.66	5.02
735	ST07E735C	GULL10COMU05	COMU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	24-Jun-05	109.89	92.84		13.56	8.29	5.09
736	ST07E736C	GULL11COMU05	COMU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	24-Jun-05	121.49	102.10		15.75	8.82	5.19
737	ST07E737C	GULL12COMU05	COMU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	24-Jun-05	100.88	84.70		12.81	8.23	4.86
738	ST07E738C	KING07TBMU05	TBMU	Bering Sea, King Island	64°58.30'N	168°03.35'W	25-Jun-05	114.33	95.92		15.46	8.51	5.14
739	ST07E739C	KING08TBMU05	TBMU	Bering Sea, King Island	64°58.30'N	168°03.35'W	25-Jun-05	98.28	84.46		10.65	7.95	4.82
740	ST07E740C	KING09TBMU05	TBMU	Bering Sea, King Island	64°58.30'N	168°03.35'W	25-Jun-05	103.39	88.47		12.39	7.87	5.00
741	ST07E741C	KING10TBMU05	TBMU	Bering Sea, King Island	64°58.30'N	168°03.35'W	25-Jun-05	115.09	98.64		13.52	8.83	5.15
742	ST07E742C	KING11TBMU05	TBMU	Bering Sea, King Island	64°58.30'N	168°03.35'W	25-Jun-05	115.73	97.19		15.68	8.65	5.10
743	ST07E743C	KING12TBMU05	TBMU	Bering Sea, King Island	64°58.30'N	168°03.35'W	25-Jun-05	103.82	86.98		13.30	7.69	5.07
744	ST07E744C	KING13TBMU05	TBMU	Bering Sea, King Island	64°58.30'N	168°03.35'W	25-Jun-05	113.03	95.42		13.62	8.16	5.04
745	ST07E745C	KING14TBMU05	TBMU	Bering Sea, King Island	64°58.30'N	168°03.35'W	25-Jun-05	116.95	99.11		13.66	8.43	5.24
746	ST07E746C	KING15TBMU05	TBMU	Bering Sea, King Island	64°58.30'N	168°03.35'W	25-Jun-05	106.15	89.31		12.49	8.04	5.01
747	ST07E747C	CPEI01COMU05	COMU	Bering Sea, Cape Pierce	58°39.45'N	161°22.6'W	10-Jul-05	107.74	91.02		13.47	8.33	5.22
748	ST07E748C	CPEI02COMU05	COMU	Bering Sea, Cape Pierce	58°39.45'N	161°22.6'W	10-Jul-05	106.86	90.68		12.93	8.06	5.14
749	ST07E749C	CPEI03COMU05	COMU	Bering Sea, Cape Pierce	58°39.45'N	161°22.6'W	10-Jul-05	119.49	101.72		14.59	8.22	5.33
750	ST07E750C	CPEI04COMU05	COMU	Bering Sea, Cape Pierce	58°39.45'N	161°22.6'W	10-Jul-05	83.75	71.64		10.23	7.97	4.77
751	ST07E751C	CPEI05COMU05	COMU	Bering Sea, Cape Pierce	58°39.45'N	161°22.6'W	10-Jul-05	87.72	74.38		10.96	7.88	4.67
752	ST07E752C	CPEI06COMU05	COMU	Bering Sea, Cape Pierce	58°39.45'N	161°22.6'W	10-Jul-05	87.13	73.00		11.15	8.28	4.79
753	ST07E753C	CPEI07COMU05	COMU	Bering Sea, Cape Pierce	58°39.45'N	161°22.6'W	10-Jul-05	88.50	75.50		10.56	8.16	4.70
754	ST07E754C	CPEI08COMU05	COMU	Bering Sea, Cape Pierce	58°39.45'N	161°22.6'W	10-Jul-05	99.48	83.65		12.86	8.08	5.01
755	ST07E755C	CPEI09COMU05	COMU	Bering Sea, Cape Pierce	58°39.45'N	161°22.6'W	10-Jul-05	88.81	74.83		11.93	7.81	4.81
756	ST07E756C	CPEI11COMU05	COMU	Bering Sea, Cape Pierce	58°39.45'N	161°22.6'W	10-Jul-05	103.42	87.39		13.38	7.91	5.15
757	ST07E757C	CPEI12COMU05	COMU	Bering Sea, Cape Pierce	58°39.45'N	161°22.6'W	10-Jul-05	104.26	87.24		14.39	8.13	5.28
758	ST07E758C	CPEI13COMU05	COMU	Bering Sea, Cape Pierce	58°39.45'N	161°22.6'W	10-Jul-05	104.28	88.15		13.47	7.87	5.16
759	ST07E759C	CPEI14COMU05	COMU	Bering Sea, Cape Pierce	58°39.45'N	161°22.6'W	10-Jul-05	104.58	88.51		13.80	8.77	5.07
760	ST07E760C	CPEI15COMU05	COMU	Bering Sea, Cape Pierce	58°39.45'N	161°22.6'W	10-Jul-05	104.48	87.55		14.96	8.09	5.19
761	ST07E761C	SLED02COMU05	COMU	Bering Sea, Sledge I.	64°29.06'N	166°12.12'W	28-Jun-05	107.68	87.86		13.96	8.71	4.91
762	ST07E762C	SLED03COMU05	COMU	Bering Sea, Sledge I.	64°29.06'N	166°12.12'W	28-Jun-05	119.74	94.68		14.25	8.69	5.22

Appendix 1 (continued). Alaskan seabird eggs banked by STAMP in 2002-2005. BLKI = black-legged kittiwake (*Rissa tridactyla*), UNMU = unidentified murre species (*Uria spp.*), COMU = common murre (*U. aalge*), TBMU = thick-billed murre (*U. lomvia*), GLGU = glaucous gull (*Larus hyperboreus*), and GLGW = glaucous-winged gull (*L. glaucescens*).

ID								Mass (g)					
Number	Storage	Field	Species	Colony	Latitude	Longitude	Date Collected	Whole Egg	Contents	Embryo	Eggshell	Length (cm)	Breadth (cm)
763	ST07E763C	SLED04COMU05	COMU	Bering Sea, Sledge I.	64°29.06'N	166°12.12'W	28-Jun-05	95.55	79.93		13.48	7.77	4.85
764	ST07E764C	SLED05COMU05	COMU	Bering Sea, Sledge I.	64°29.06'N	166°12.12'W	28-Jun-05	139.81	116.31		17.61	9.42	5.36
765	ST07E765C	SLED06COMU05	COMU	Bering Sea, Sledge I.	64°29.06'N	166°12.12'W	28-Jun-05	122.80	93.25		17.29	8.49	5.32
766	ST07E766C	SLED07COMU05	COMU	Bering Sea, Sledge I.	64°29.06'N	166°12.12'W	28-Jun-05	120.90	100.48		14.85	8.52	5.21
767	ST07E767C	SLED08COMU05	COMU	Bering Sea, Sledge I.	64°29.06'N	166°12.12'W	28-Jun-05	120.75	101.66		14.92	8.74	5.16
768	ST07E768C	SLED09COMU05	COMU	Bering Sea, Sledge I.	64°29.06'N	166°12.12'W	28-Jun-05	121.08	97.90		15.72	8.27	5.31
769	ST07E769C	SLED10COMU05	COMU	Bering Sea, Sledge I.	64°29.06'N	166°12.12'W	28-Jun-05	113.12	95.72		12.87	8.46	5.04
770	ST07E770C	SLED11COMU05	COMU	Bering Sea, Sledge I.	64°29.06'N	166°12.12'W	28-Jun-05	125.34	103.86		15.56	8.73	5.32
771	ST07E771C	SLED12COMU05	COMU	Bering Sea, Sledge I.	64°29.06'N	166°12.12'W	28-Jun-05	101.28	80.36		12.76	7.91	4.85
772	ST07E772C	SLED13COMU05	COMU	Bering Sea, Sledge I.	64°29.06'N	166°12.12'W	28-Jun-05	113.63	89.00		14.21	8.49	5.06
773	ST07E773C	SLED14COMU05	COMU	Bering Sea, Sledge I.	64°29.06'N	166°12.12'W	28-Jun-05	132.97	107.11		15.09	8.86	5.42
774	ST07E774C	SLED15COMU05	COMU	Bering Sea, Sledge I.	64°29.06'N	166°12.12'W	28-Jun-05	123.55	105.22		14.34	8.86	5.19
775	ST07E775C	BLUF01COMU05	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	25-Jun-05	112.12	94.00		14.66	8.55	4.99
776	ST07E776C	BLUF02COMU05	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	25-Jun-05	111.59	94.55		13.78	7.75	5.16
777	ST07E777C	BLUF03COMU05	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	25-Jun-05	114.70	97.48		13.54	8.57	5.04
778	ST07E778C	BLUF04COMU05	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	25-Jun-05	105.74	89.06		13.70	7.88	5.05
779	ST07E779C	BLUF05COMU05	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	25-Jun-05	99.24	85.82		10.72	7.54	4.94
780	ST07E780C	BLUF06COMU05	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	25-Jun-05	123.23	102.52		16.93	8.92	5.16
781	ST07E781C	BLUF07COMU05	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	25-Jun-05	104.06	87.69		13.37	8.47	7.32
782	ST07E782C	BLUF08COMU05	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	25-Jun-05	122.27	103.60		14.59	8.48	5.23
783	ST07E783C	BLUF09COMU05	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	25-Jun-05	111.53	94.95		13.23	8.03	5.12
784	ST07E784C	BLUF11COMU05	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	25-Jun-05	124.11	104.02		16.66	8.39	5.28
785	ST07E785C	BLUF12COMU05	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	25-Jun-05	108.05	93.77		11.49	8.36	4.95
786	ST07E786C	KIKL01GWGU05B	GWGU	Bering Sea, Kikertalik Lake	58°39.35'N	159°14.49'W	12-Jun-05	94.92	84.70		7.63	7.29	5.16
		KIKL01GWGU05C						88.79	79.50		6.92	7.29	5.15
787	ST07E787C	KIKL02GWGU05C	GWGU	Bering Sea, Kikertalik Lake	58°39.35'N	159°14.49'W	12-Jun-05	92.95	82.30		6.51	7.21	5.05
788	ST07E788C	KIKL03GWGU05B	GWGU	Bering Sea, Kikertalik Lake	58°39.35'N	159°14.49'W	12-Jun-05	98.65	87.30		6.92	7.54	5.25
		KIKL03GWGU05C						116.89	105.40		8.24	7.95	5.42
789	ST07E789C	KIKL04GWGU05A	GWGU	Bering Sea, Kikertalik Lake	58°39.35'N	159°14.49'W	12-Jun-05	104.32	94.20		6.72	7.54	5.25
		KIKL04GWGU05B						106.16	94.90		7.42	7.52	5.28
790	ST07E790C	KIKL05GWGU05A	GWGU	Bering Sea, Kikertalik Lake	58°39.35'N	159°14.49'W	12-Jun-05	90.95	82.40		6.25	7.04	5.14
		KIKL05GWGU05B						98.06	87.80		6.91	7.37	5.25
		KIKL05GWGU05C						102.08	92.40		7.37	7.62	5.22
791	ST07E791C	KIKL06GWGU05B	GWGU	Bering Sea, Kikertalik Lake	58°39.35'N	159°14.49'W	12-Jun-05	95.64	85.90		6.77	7.29	4.97
		KIKL06GWGU05C						92.46	83.90		6.59	7.19	4.94
792	ST07E792C	KIKL07GWGU05B	GWGU	Bering Sea, Kikertalik Lake	58°39.35'N	159°14.49'W	12-Jun-05	97.32	87.40		6.90	7.62	4.99
793	ST07E793C	KIKL08GWGU05A	GWGU	Bering Sea, Kikertalik Lake	58°39.35'N	159°14.49'W	12-Jun-05	84.77	73.40		7.69	7.25	5.17
		KIKL08GWGU05B						94.01	84.50		7.31	7.41	5.09
		KIKL08GWGU05C						95.65	86.10		7.39	7.47	5.06
794	ST07E794C	KIKL09GWGU05A	GWGU	Bering Sea, Kikertalik Lake	58°39.35'N	159°14.49'W	12-Jun-05	99.28	88.30		8.29	7.64	5.38
		KIKL09GWGU05B						96.91	84.90		8.72	8.11	5.13
		KIKL09GWGU05C						99.92	90.40		7.57	7.54	5.23

Appendix 1 (continued). Alaskan seabird eggs banked by STAMP in 2002-2005. BLKI = black-legged kittiwake (*Rissa tridactyla*), UNMU = unidentified murre species (*Uria spp.*), COMU = common murre (*U. aalge*), TBMU = thick-billed murre (*U. lomvia*), GLGU = glaucous gull (*Larus hyperboreus*), and GLGW = glaucous-winged gull (*L. glaucescens*).

ID								Mass (g)					
Number	Storage	Field	Species	Colony	Latitude	Longitude	Date Collected	Whole Egg	Contents	Embryo	Eggshell	Length (cm)	Breadth (cm)
795	ST07E795C	KIKL10GWGU05A	GWGU	Bering Sea, Kikertalik Lake	58°39.35'N	159°14.49'W	12-Jun-05	93.88	83.30		7.94	7.48	5.06
		KIKL10GWGU05B						97.32	87.10		7.41	7.72	5.03
		KIKL10GWGU05C						87.44	78.30		6.84	7.41	4.93
796	ST07E796C	KIKL11GWGU05A	GWGU	Bering Sea, Kikertalik Lake	58°39.35'N	159°14.49'W	12-Jun-05	94.89	84.60		7.69	7.51	4.92
		KIKL11GWGU05C						101.95	90.90		7.58	7.77	4.99
797	ST07E797C	KIKL12GWGU05A	GWGU	Bering Sea, Kikertalik Lake	58°39.35'N	159°14.49'W	12-Jun-05	110.64	99.30		7.97	7.72	5.30
		KIKL12GWGU05B						103.48	90.50		8.10	7.66	5.16
798	ST07E798C	DUCK01COMU05	COMU	Gulf of Alaska, Duck I.	60°08.53'N	152°32.53'W	15-Jul-05	103.40	84.01		14.12	8.28	4.90
799	ST07E799C	DUCK02COMU05	COMU	Gulf of Alaska, Duck I.	60°08.53'N	152°32.53'W	15-Jul-05	117.79	101.52		13.49	8.21	5.22
800	ST07E800C	DUCK03COMU05	COMU	Gulf of Alaska, Duck I.	60°08.53'N	152°32.53'W	15-Jul-05	106.91	90.70		13.08	8.36	4.93
801	ST07E801C	DUCK04COMU05	COMU	Gulf of Alaska, Duck I.	60°08.53'N	152°32.53'W	15-Jul-05	123.52	102.42		16.33	8.97	5.24
802	ST07E802C	DUCK05COMU05	COMU	Gulf of Alaska, Duck I.	60°08.53'N	152°32.53'W	15-Jul-05	97.90	83.50		11.80	7.92	4.90
803	ST07E803C	DUCK06COMU05	COMU	Gulf of Alaska, Duck I.	60°08.53'N	152°32.53'W	15-Jul-05	114.15	97.50		13.03	8.37	5.19
804	ST07E804C	DUCK07COMU05	COMU	Gulf of Alaska, Duck I.	60°08.53'N	152°32.53'W	15-Jul-05	95.58	80.54		12.17	7.76	4.86
805	ST07E805C	DUCK08COMU05	COMU	Gulf of Alaska, Duck I.	60°08.53'N	152°32.53'W	15-Jul-05	110.43	87.37		14.06	8.37	5.03
806	ST07E806C	DUCK09COMU05	COMU	Gulf of Alaska, Duck I.	60°08.53'N	152°32.53'W	15-Jul-05	117.26	96.41		15.91	8.53	5.26
807	ST07E807C	DUCK10COMU05	COMU	Gulf of Alaska, Duck I.	60°08.53'N	152°32.53'W	15-Jul-05	114.52	96.61		13.22	8.14	5.24
808	ST07E808C	DUCK11COMU05	COMU	Gulf of Alaska, Duck I.	60°08.53'N	152°32.53'W	15-Jul-05	111.36	95.49		12.92	8.58	5.11
809	ST07E809C	DUCK12COMU05	COMU	Gulf of Alaska, Duck I.	60°08.53'N	152°32.53'W	15-Jul-05	109.71	88.68		13.83	8.38	5.08
810	ST07E810C	DUCK13COMU05	COMU	Gulf of Alaska, Duck I.	60°08.53'N	152°32.53'W	15-Jul-05	116.68	98.90		14.33	8.39	5.22
811	ST07E811C	DUCK14COMU05	COMU	Gulf of Alaska, Duck I.	60°08.53'N	152°32.53'W	15-Jul-05	115.48	97.70		14.00	8.57	5.16
812	ST07E812C	DUCK15COMU05	COMU	Gulf of Alaska, Duck I.	60°08.53'N	152°32.53'W	15-Jul-05	113.54	97.19		12.67	8.28	5.15
813	ST07E813C	GULL01GWGU05A	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	8-Jun-05	80.58	63.70		5.85	6.91	4.81
		GULL01GWGU05C						80.58	63.70		6.09	6.73	4.74
814	ST07E814C	GULL02GWGU05A	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	8-Jun-05	102.26	88.10		7.47	7.59	5.06
		GULL02GWGU05B						94.83	82.70		6.88	7.36	4.90
		GULL02GWGU05X						100.29	89.60		7.65	7.59	4.99
815	ST07E815C	GULL03GWGU05A	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	8-Jun-05	107.48	93.10		6.99	7.09	5.34
		GULL03GWGU05C						101.50	90.30		6.47	7.05	5.20
816	ST07E816C	GULL04GWGU05A	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	8-Jun-05	103.98	88.40		7.47	7.53	5.11
		GULL04GWGU05B						108.18	93.60		7.78	7.52	5.23
		GULL04GWGU05C						96.08	84.30		6.97	7.13	4.99
817	ST07E817C	GULL05GWGU05A	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	8-Jun-05	72.83	63.10		5.21	6.47	4.55
818	ST07E818C	GULL06GWGU05A	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	8-Jun-05	93.72	84.00		6.35	7.42	4.86
		GULL06GWGU05B						99.75	85.30		7.02	7.62	4.95
		GULL06GWGU05C						97.28	83.30		6.60	7.36	4.98
819	ST07E819C	GULL07GWGU05B	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	8-Jun-05	100.98	88.40		7.03	7.26	5.07
		GULL07GWGU05C						105.25	91.30		7.77	7.79	5.06
820	ST07E820C	GULL08GWGU05A	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	8-Jun-05	86.48	76.50		6.10	7.35	4.82
		GULL08GWGU05B						80.16	70.00		5.94	6.95	4.69
		GULL08GWGU05C						78.75	69.70		5.46	7.33	4.65
821	ST07E821C	GULL09GWGU05A	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	8-Jun-05	89.39	78.50		6.90	7.30	4.85
		GULL09GWGU05B						91.26	79.20		6.70	7.36	4.92
		GULL09GWGU05C						83.17	67.70		6.24	6.97	4.74
822	ST07E822C	GULL10GWGU05C	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	8-Jun-05	84.78	72.50		5.76	6.72	4.85

Appendix 1 (continued). Alaskan seabird eggs banked by STAMP in 2002-2005. BLKI = black-legged kittiwake (*Rissa tridactyla*), UNMU = unidentified murre species (*Uria spp.*), COMU = common murre (*U. aalge*), TBMU = thick-billed murre (*U. lomvia*), GLGU = glaucous gull (*Larus hyperboreus*), and GLGW = glaucous-winged gull (*L. glaucescens*).

ID								Mass (g)					
Number	Storage	Field	Species	Colony	Latitude	Longitude	Date Collected	Whole Egg	Contents	Embryo	Eggshell	Length (cm)	Breadth (cm)
823	ST07E823C	GULL11GWGU05B	GWGU	Gulf of Alaska, Gull I.	59°32.22'N	151°19.42'W	8-Jun-05	98.38	83.00		6.46	7.17	5.10
		GULL11GWGU05C						90.65	78.90		6.32	7.19	4.83
824	ST07E824C	CTOM01UNKM05	UNMU	Chukchi Sea, Cape Thompson	68°08.38'N	165°58.40'W	27-Jun-05	109.09	93.26		13.28	7.83	5.24
825	ST07E825C	CTOM02UNKM05	UNMU	Chukchi Sea, Cape Thompson	68°08.38'N	165°58.40'W	27-Jun-05	101.51	87.42		11.55	7.66	4.98
826	ST07E826C	CTOM03UNKM05	UNMU	Chukchi Sea, Cape Thompson	68°08.38'N	165°58.40'W	27-Jun-05	107.35	90.42		12.24	8.25	5.10
827	ST07E827C	CTOM05UNKM05	UNMU	Chukchi Sea, Cape Thompson	68°08.38'N	165°58.40'W	27-Jun-05	109.06	93.85		11.94	8.22	5.16
828	ST07E828C	CTOM06UNKM05	UNMU	Chukchi Sea, Cape Thompson	68°08.38'N	165°58.40'W	27-Jun-05	108.99	93.03		12.86	8.08	5.14
829	ST07E829C	CTOM07UNKM05	UNMU	Chukchi Sea, Cape Thompson	68°08.38'N	165°58.40'W	27-Jun-05	110.14	93.87		13.21	8.12	5.19
830	ST07E830C	CTOM08UNKM05	UNMU	Chukchi Sea, Cape Thompson	68°08.38'N	165°58.40'W	27-Jun-05	103.11	86.93		12.30	7.68	5.06
831	ST07E831C	CTOM09UNKM05	UNMU	Chukchi Sea, Cape Thompson	68°08.38'N	165°58.40'W	27-Jun-05	104.57	91.17		10.16	7.79	5.05
832	ST07E832C	CTOM11UNKM05	UNMU	Chukchi Sea, Cape Thompson	68°08.38'N	165°58.40'W	27-Jun-05	97.31	83.09		11.66	7.62	5.00
833	ST07E833C	CTOM12UNKM05	UNMU	Chukchi Sea, Cape Thompson	68°08.38'N	165°58.40'W	27-Jun-05	103.76	89.40		11.42	7.97	5.09
834	ST07E834C	CTOM13UNKM05	UNMU	Chukchi Sea, Cape Thompson	68°08.38'N	165°58.40'W	27-Jun-05	105.97	73.25		12.06	7.48	5.25
835	ST07E835C	CTOM14UNKM05	UNMU	Chukchi Sea, Cape Thompson	68°08.38'N	165°58.40'W	27-Jun-05	114.58	100.01		11.80	8.45	5.17
836	ST07E836C	STLA01TBMU05	TBMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	8-Jul-05	118.93	97.29		16.11	8.58	5.20
837	ST07E837C	STLA02TBMU05	TBMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	8-Jul-05	110.24	94.51		12.56	8.02	5.15
838	ST07E838C	STLA04TBMU05	TBMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	8-Jul-05	100.56	84.35		12.92	8.14	5.04
839	ST07E839C	STLA06TBMU05	TBMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	8-Jul-05	113.56	94.12		16.00	8.49	5.14
840	ST07E840C	STLA07TBMU05	TBMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	8-Jul-05	128.38	106.45		16.20	8.49	5.49
841	ST07E841C	STLA08TBMU05	TBMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	8-Jul-05	115.72	97.05		14.63	8.40	5.05
842	ST07E842C	BLUF13COMU05	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	25-Jun-05	121.76	39.14		13.34	8.58	5.26
843	ST07E843C	BLUF14COMU05	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	25-Jun-05	107.56	90.70		13.80	7.79	5.16
844	ST07E844C	BLUF15COMU05	COMU	Bering Sea, Bluff	64°34.22'N	163°45.15'W	25-Jun-05	107.15	91.64		12.87	8.16	4.95
845	ST07E845C	STGE01TMBU05	TBMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	7-Jul-05	95.72	82.50		10.73	7.84	4.89
846	ST07E846C	STGE02TMBU05	TBMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	7-Jul-05	99.22	68.50		9.85	7.28	5.18
847	ST07E847C	STGE03TMBU05	TBMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	7-Jul-05	112.73	95.71		10.52	7.98	5.21
848	ST07E848C	STGE04TMBU05	TBMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	7-Jul-05	105.46	89.00		10.72	8.09	5.02
849	ST07E849C	STGE05TMBU05	TBMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	7-Jul-05	96.06	65.40		11.45	7.26	5.02
850	ST07E850C	STGE06TMBU05	TBMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	7-Jul-05	99.14	85.21		11.11	7.63	4.93
851	ST07E851C	STGE07TMBU05	TBMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	7-Jul-05	111.63	96.14		11.42	8.12	5.22
852	ST07E852C	STGE09TMBU05	TBMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	7-Jul-05	106.49	92.15		11.40	7.91	5.03
853	ST07E853C	STGE10TMBU05	TBMU	Bering Sea, St. George I.	56°36.00'N	169°32.30'W	7-Jul-05	104.70	89.81		11.40	8.14	4.97
854	ST07E854C	STLA01COMU05	COMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	8-Jul-05	97.50	83.52		11.07	8.37	4.91
855	ST07E855C	STLA03COMU05	COMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	8-Jul-05	126.37	100.59		16.50	8.63	5.32
856	ST07E856C	STLA04COMU05	COMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	8-Jul-05	113.62	94.32		15.54	8.29	5.20
857	ST07E857C	STLA05COMU05	COMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	8-Jul-05	124.81	104.73		15.51	8.14	5.39
858	ST07E858C	STLA06COMU05	COMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	8-Jul-05	103.61	86.56		13.67	8.33	4.90
859	ST07E859C	STLA11COMU05	COMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	8-Jul-05	124.12	104.38		15.93	8.54	5.33
860	ST07E860C	STLA12COMU05	COMU	Gulf of Alaska, St. Lazaria I.	56°59.14'N	135°42.17'W	8-Jul-05	129.82	108.81		16.54	9.24	5.25
861	ST07E861C	BOGO01COMU05	COMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	12-Jul-05	110.34	94.48		12.94	8.19	5.09
862	ST07E862C	BOGO04COMU05	COMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	12-Jul-05	106.40	89.88		13.12	8.33	5.01
863	ST07E863C	BOGO05COMU05	COMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	12-Jul-05	126.26	108.77		13.49	8.87	5.28
864	ST07E864C	BOGO07COMU05	COMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	12-Jul-05	110.72	94.10		14.20	8.19	5.26

Appendix 1 (continued). Alaskan seabird eggs banked by STAMP in 2002-2005. BLKI = black-legged kittiwake (*Rissa tridactyla*), UNMU = unidentified murre species (*Uria spp.*), COMU = common murre (*U. aalge*), TBMU = thick-billed murre (*U. lomvia*), GLGU = glaucous gull (*Larus hyperboreus*), and GLGW = glaucous-winged gull (*L. glaucescens*).

ID								Mass (g)					
Number	Storage	Field	Species	Colony	Latitude	Longitude	Date Collected	Whole Egg	Contents	Embryo	Eggshell	Length (cm)	Breadth (cm)
865	ST07E865C	BOGO08COMU05	COMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	12-Jul-05	97.80	83.66		11.55	8.20	4.97
866	ST07E866C	BOGO09COMU05	COMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	12-Jul-05	97.74	83.45		11.33	7.99	5.00
867	ST07E867C	BOGO10COMU05	COMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	12-Jul-05	105.04	89.87		12.35	8.39	5.05
868	ST07E868C	BOGO12COMU05	COMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	12-Jul-05	97.31	81.75		11.60	8.37	4.85
869	ST07E869C	BOGO13COMU05	COMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	12-Jul-05	92.42	77.63		11.78	7.84	4.88
870	ST07E870C	BOGO14COMU05	COMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	12-Jul-05	100.68	85.05		12.01	7.67	5.06
871	ST07E871C	BOGO15COMU05	COMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	12-Jul-05	81.14	68.92		9.80	7.44	4.62
872	ST07E872C	BOGO01TBMU05	TBMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	13-Jul-05	94.74	82.42		10.39	7.61	5.16
873	ST07E873C	BOGO02TBMU05	TBMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	13-Jul-05	100.46	87.09		11.00	8.13	5.24
874	ST07E874C	BOGO04TBMU05	TBMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	13-Jul-05	105.80	81.46		11.80	8.10	5.14
875	ST07E875C	BOGO05TBMU05	TBMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	13-Jul-05	86.64	71.35		9.76	7.54	4.75
876	ST07E876C	BOGO06TBMU05	TBMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	13-Jul-05	110.41	86.91		12.40	8.46	5.18
877	ST07E877C	BOGO07TBMU05	TBMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	13-Jul-05	94.48	77.97		9.51	7.75	4.92
878	ST07E878C	BOGO08TBMU05	TBMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	13-Jul-05	90.68	72.66		11.25	8.17	4.70
879	ST07E879C	BOGO10TBMU05	TBMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	13-Jul-05	100.43	80.93		10.42	7.75	5.17
880	ST07E880C	BOGO11TBMU05	TBMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	13-Jul-05	90.53	78.00		9.99	7.15	4.99
881	ST07E881C	BOGO12TBMU05	TBMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	13-Jul-05	98.77	80.63		11.10	7.69	5.03
882	ST07E882C	BOGO13TBMU05	TBMU	Bering Sea, Bogoslof I.	53°56.09'N	168°02.20'W	13-Jul-05	100.37	87.54		10.71	8.07	4.93
883	ST07E883C	MIDD07COMU05	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	13-Jun-05	121.04	98.23		14.43	8.81	5.16
884	ST07E884C	MIDD08COMU05	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	13-Jun-05	99.66	84.07		11.98	8.15	4.99
885	ST07E885C	MIDD09COMU05	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	21-Jun-05	106.50	89.51		13.99	8.27	5.05
886	ST07E886C	MIDD10COMU05	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	21-Jun-05	113.70	97.79		13.46	8.05	5.28
887	ST07E887C	MIDD11COMU05	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	21-Jun-05	111.83	95.50		13.34	8.33	5.16
888	ST07E888C	MIDD12COMU05	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	21-Jun-05	105.20	89.52		12.64	8.13	5.03
889	ST07E889C	MIDD13COMU05	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	28-Jun-05	112.98	96.52		12.91	8.45	5.11
890	ST07E890C	MIDD14COMU05	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	28-Jun-05	103.23	88.39		12.82	8.38	5.12
891	ST07E891C	MIDD15COMU05	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	28-Jun-05	110.92	92.56		15.74	8.74	5.12
892	ST07E892C	MIDD16COMU05	COMU	Gulf of Alaska, Middleton I.	59°26.10'N	146°19.44'W	28-Jun-05	95.71	81.17		10.94	7.73	4.88

Appendix 2. The Seabird Tissue Archival and Monitoring Project (STAMP) murre egg collection protocol. *Note*: Instructions are in non-SI (English) units so as to be understood by all collectors who may not have scientific training.

INSTRUCTIONS FOR COLLECTING MURRE EGGS

Welcome to the Seabird Tissue Archival and Monitoring Project (STAMP). We appreciate your participation in this long-term monitoring study of contaminants in northern marine ecosystems using murre eggs.

Each murre egg collection kit consists of 1 plastic Coleman cooler capable of holding 15 murre eggs. The coolers contain Ziploc bags and pre-printed labels for labeling the eggs. They also contain several layers of foam padding for packing the eggs, several pairs of clean disposable gloves for handling the eggs, tape for securely taping the coolers shut, pencils for filling out the egg labels, pre-printed shipping labels for shipping the coolers, some “keep upright-handle with care” and “keep cool-do not freeze” stickers for the outside of the coolers, copies of these instructions, a murre species identification guide, and the permits needed to collect the eggs.

How many eggs should I collect?

Collect 15 eggs from each murre species assigned to you. See the egg labels in the kits and the writing on the outside of the cooler lids to find out which species they are intended for. Please don’t take more than 15 eggs from each murre species (the maximum number the enclosed permit allows you to take).

When should I collect the eggs?

Try to collect the eggs as soon as you can after the birds have started laying eggs. If you can’t do that, please tell us when you collected them (for example, “about 2 weeks after they started laying eggs”).

How should I handle the eggs when I collect them?

When you pick the eggs up from the nest ledges, always wear one of the gloves that you’ll find in the collecting kit to make sure you don’t accidentally contaminate them with gasoline, oil, insect repellant, or some other substance that might be on your hands. As a general rule, always try to avoid touching the eggs with your bare hands, particularly if there’s any chance that there might be some residual outboard fuel, oil, or insect repellant on them (these substances can go right through the egg shells and contaminate the contents).
Bagging the Eggs: When you pick the eggs up, put them in the Ziploc bags that you’ll find in the collection kit. Please bag each egg in a separate bag (in other words, never put more than 1 egg in a single bag). After you’ve put an egg in a bag, please do the following:

(a) Gently squeeze the air out of the Ziploc bag before you close it and then gently wrap the closed the bag around the egg.

(b) Put the bagged egg into a second Ziploc bag along with one of the pre-printed labels after you've filled out the missing information in pencil (see below).
(c) Gently squeeze the air out of the second Ziploc bag before you close it and then gently wrap it around the egg. The double-bagged, labeled egg is now ready to be packed for shipping (see below). *Note: squeezing the air out of the bags before sealing them is important—it prevents the eggs from rolling around loose in bubbles of trapped air.*

How should I label the eggs when I collect them?

The collection kit contains pre-printed labels for the eggs. Please use the enclosed pencil to fill out one label for each murre egg you collect (please don't use ball point pens). When you fill out the labels, assign a number to each egg (in other words, 1-15), as shown below.

Collected by: ____________________

Date: ___________________________

Species: _____Common Murre_____

Location: ______Duck Island______

Egg No.: __________6____________

Comments: ______________________

In most cases, the species and location will be pre-printed on the labels. You only have to fill in the missing information (your name, the date the egg was collected, the number you gave the egg ["6" in the example shown above—please remember to assign a different number to each egg], and any comments you might have (for example, "collected late in the season", "did not use gloves", "eggs almost ready to hatch"). *Note: in some cases, your name may also be pre-printed on the labels.*

How should I pack the eggs for shipping?

Use the Coleman coolers as shipping containers for the eggs. Each cooler is designed to safely hold up to 15 murre eggs. If you're collecting both common and thick-billed murre eggs, use the cooler marked "COMU Egg Collection Kit" for the common murre eggs and the cooler marked "TBMU Egg Collection Kit" for the thick-billed murre eggs (check the egg labels in the kits—they also tell you which species the kit is for).

Each cooler contains 3 large loose pieces of foam padding about 4 inches thick labeled Layer #1, Layer #2, and Layer #3, and a foam block glued to the underside of the lid to fill the recessed cavity. Pack the bagged eggs in the coolers as described below.

(a) Remove foam Layers #1 and #2 from the cooler and leave Layer #3 in the bottom of the container.
(b) Lay 8 of the doubled-bagged eggs on their sides in the two grooves in layer #3 in the 8 marked spots. Don't let the eggs touch each other or the walls of the cooler—try to space them about 1 inch apart. If you have trouble keeping the bagged eggs in place in the grooves, put the small pieces of foam between them and use some tape to secure them in place.
(c) Put Layer #2 back in the cooler, grooved side up, and gently push it down onto the first layer of eggs to hold them firmly in place.
(d) Lay 7 of the doubled-bagged eggs on their sides in the two grooves in layer #2 in the 7 marked spots. Again, don't let the eggs touch each other or the walls of the cooler—try to space them at least 1 inch apart. If you have trouble keeping the bagged eggs in place in the grooves, put the small pieces of foam between them and use some tape to secure them in place.
(e) Put Layer #1 back in the cooler following the directions marked on it and gently push it down onto the second layer of eggs to hold them firmly in place. When you're finished, the top of Layer #1 should stick up a little above the lip of the cooler (about an inch or so). If it sticks up more than that, remove it and try to re-adjust Layer #2 (in other words, gently push it down a little more firmly onto the eggs in Layer #3).
(f) When you're ready to ship the cooler, fill out the enclosed collection form and lay it on top of Layer #1 in the container.
(g) Close the lid and tape the cooler shut by wrapping <u>4-5 layers</u> of tape <u>completely</u> <u>around</u> it about 6 inches in from each end, just like it was taped shut when you received it.
(h) Tape the pre-printed shipping label securely to the top of the lid, and stick the "Keep Cool" and "Handle with Care" labels on the top and sides of the containers. The cooler is now ready to ship (see shipping instructions below).

<u>How should I store the eggs if I have to keep them for awhile</u>?

Always try to ship the eggs to Homer as soon as you can after collecting them. However, if you have to keep the eggs for a few days before you can ship them, try to keep them as cool as you can (but <u>don't</u> freeze them). Keeping them in a refrigerator is best, but if you can't do that, keep them in the cooler and put it outside in a cool shady place.

<u>Who should I ship the eggs to</u>?

As mentioned above, the collection kits contain <u>pre-printed shipping labels</u>. Send the eggs to Dave Roseneau, USFWS Alaska Maritime National Wildlife Refuge, 95 Sterling Highway #1, Homer, Alaska 99603-7472.

<u>Who should I contact before I ship the eggs</u>?

Please contact <u>Dave Roseneau</u> at the Alaska Maritime National Wildlife Refuge in Homer <u>before</u> you send the eggs and tell him when you plan to ship them. Also give him the name of the air carrier you plan to use. After you ship the eggs, please contact Dave again to let him know when they were sent and give him the air carrier's airway bill number so he can track the shipment.

Dave can be contacted by phone (907-226-4613 or 907-235-6546), fax (907-235-7783), or e-mail (<dave_roseneau@fws.gov>). If you can't reach Dave, please contact Vern Byrd (phone 907-235-6546, fax 907-235-7783, e-mail <vernon_byrd@fws.gov>). He's Dave's backup. *Note: the government phone system will not accept collect calls. Please call direct, give them your number, and tell them to call you back.*

What shipper should I use to ship the eggs?

Always try to use the air carrier servicing your community that is willing to ship the eggs freight collect. If you have any problems shipping the eggs, call or e-mail Dave and he'll help you.

PLEASE REMEMBER TO CONTACT DAVE ROSENEAU or VERN BYRD BEFORE SHIPPING EGGS TO HOMER (see above).

Appendix 3. The Seabird Tissue Archival and Monitoring Project (STAMP) gull egg collection protocol. *Note*: Instructions are in non-SI (English) units so as to be understood by all collectors who may not have scientific training.

INSTRUCTIONS FOR COLLECTING GULL EGGS

Welcome to the Seabird Tissue Archival and Monitoring Project (STAMP). We appreciate your participation in this long-term monitoring study of contaminants in northern marine ecosystems using murre and seagull eggs.

This collection kit consists of 2 plastic Coleman coolers big enough to hold up to 18 gull eggs each for a total of 36 eggs. One of the coolers contains Ziploc bags and pre-printed labels for labeling the eggs. It also contains several layers of foam padding for packing the eggs, several pairs of clean disposable gloves for handling the eggs, duct tape for securely taping the cooler shut, pencils for filling out the egg labels, pre-printed shipping labels for shipping the coolers, some "fragile" and "this side up" stickers for the outside of the coolers, copies of these instructions, and copies of the permits needed to collect and transport the eggs.

Some kits also contain disposable cameras for taking pictures of nesting areas and birds. If you find a disposable camera in your collection kit, please use it to photograph the nesting area where you collected the eggs and some of your collecting activities. Try to get some close-ups of the birds—these pictures will help confirm the species for our long-term database. Please send the used camera back with the eggs when you ship them to us.

How many gull eggs should I collect?

Collect up to 36 gull eggs from a total of 12 nests. Please don't take eggs from more than 12 nests and please don't collect more than a total of 36 eggs, the maximum number you are allowed to take under the enclosed permit.

When should I collect the gull eggs?

Try to collect the eggs during the first 2 weeks of the laying season starting a few days after you're sure the birds have finished laying eggs and have completed their clutches. If that's not possible, collect the eggs when you can and let us know how early or late you think it was compared to when the birds first started laying eggs (for example, "right when they first started laying eggs", "about three weeks after they started laying eggs", "just before the eggs hatched", etc.).

Which nests should I collect the gull eggs from?

First Choice: When you go to the gull nesting area to collect the eggs, look for nests that have 3 eggs in them. If you're lucky enough to find 12 nests that have 3 eggs in each one of them and you collect all of the eggs, you will be done. In this particular case, the total number of eggs collected will be 36 (36 eggs from 12 nests containing 3 eggs each).

Second Choice: If you can't find 12 gull nests with 3 eggs in each one, take all of the eggs from as many 3-egg nests as you can find, and then look for nests that have 2 eggs in them. Then take all of the eggs from enough of the 2-egg nests to meet the sampling quota of 12 nests. For example, if you can only find 3 nests that contain 3 eggs each, you'll need to find 9 more nests that contain 2 eggs each to equal 12 nests. In this particular case, if you're successful in finding 9 nests containing 2 eggs each, the total number of eggs collected will be 27 (9 eggs from 3 nests containing 3 eggs each and 18 eggs from 9 nests containing 2 eggs each).

Third Choice: If you can't find any nests with 3 eggs, try to find 12 nests that have 2 eggs in each one of them, and if you do, collect all of these eggs. In this particular case, the total number of eggs collected will be 24 (24 eggs from 12 nests containing 2 eggs each).

Fourth Choice: If you can only find a few nests with 2 eggs, take all of the eggs from as many of them as you can find, and then look for nests that have 1 egg in them. Then take the eggs from enough of the 1-egg nests to meet the sampling quota of 12 nests. For example, if you can only find 5 nests that contain 2 eggs each, you'll need to find 7 more nests that contain 1 egg each to equal 12 nests. In this particular case, if you're successful in finding 7 nests containing 1 egg each, the total number of eggs collected will be 17 (10 eggs from 5 nests containing 2 eggs each and 7 eggs from 7 nests containing 1 egg each).

Fifth Choice: If it happens to be a year when nesting conditions are poor and some or all of the gulls only manage to lay 1 egg or less per pair, try to collect 12 eggs from 12 nests that contain 1 egg each. In this particular case, if you're successful in finding 12 nests that have 1 egg each, the total number of eggs collected will be 12 (12 eggs from 12 nests containing 1 egg each). *Note: if you can't find at least 6 nests that contain 1 egg each, don't collect any eggs and wait until the next year. Also, please let us know if the birds failed to lay a normal number of eggs.*

How should I handle the gull eggs when I collect them?

When you pick the eggs up from the nests, always wear one of the gloves that we have put in the collection kit to make sure you don't accidentally contaminate the eggs with gasoline, oil, or insect repellant that might be on your hands (all of these substances can go right through the egg shells and contaminate the contents). As a general rule, always try to avoid touching the eggs with your bare hands, particularly if there's any chance that there might be some residual outboard fuel, oil, or insect repellant on them.

Bagging the Eggs: When you pick the eggs up, put them in the Ziploc bags that you'll find in the collection kit. Please put each egg in a separate bag (in other words, never put more than 1 egg in a single bag). After you've put an egg in a bag, please do the following:

(a) Gently squeeze the air out of the Ziploc bag before you close it and then gently wrap the closed the bag around the egg.

(b) Put the bagged egg into a second Ziploc bag along with one of the pre-printed labels after you have written the number of the nest it came from on the label with a pencil (see below). *Note: if a nest contains more than one egg, always use the same nest number for each egg collected from that particular nest (see below). As an example, if you collect all of the eggs* *from a nest containing 3 eggs, you will have 3 separately bagged and labeled eggs that will have the same nest number written on their labels—this will tell us that all 3 of these eggs came from the* <u>*same nest*</u> *(in other words, they all belonged to the* <u>*same clutch*</u> *of eggs).*

(c) Gently squeeze the air out of the second Ziploc bag before you close it and then gently wrap it around the egg. The double-bagged, labeled egg is now ready to be packed for shipping (see below). *Note: squeezing the air out of the bags before sealing them is important—it prevents the eggs from rolling around loose in bubbles of trapped air.*

How should I label the eggs when I collect them?

The collection kit contains <u>pre-printed labels</u> for the eggs. Please use the enclosed pencil to fill out <u>one label</u> for <u>each egg</u> you collect (please don't use ball point pens). When you fill out the labels, <u>use a different number for each nest</u> you collect eggs from. To do this, simply number the nests from 1 to 12 and use these numbers to label the eggs. If more than 1 egg is present in a nest, use the <u>same nest number for each egg collected from that particular nest</u>. That way, we'll know that the eggs labeled with the same nest numbers came from the same clutch of eggs. Here's an example: If Nest No. 5 at the Kukpuk River contained 3 eggs and you collected all of them, <u>each one of the three separately bagged</u> <u>eggs</u> from that nest should have a label with the number "5" written on it like shown below).

Collected by: ____________________

Date: ____________________________

Species: _____<u>**Glaucous Gull**</u>______

Location: ______<u>**Kukpuk River**</u>____

Nest No.: _________<u>**5**</u>_____________

Comments: ______________________

The species and location will be pre-printed on the labels you receive. You only have to fill in the missing information (your name, the date you collected the eggs, the number you gave the nest ["5" in the example shown above—please remember to give a different number to each nest you collect eggs from!], and any comments you might have (for example, "collected late in the season", "did not use gloves", "eggs almost ready to hatch", etc.). *Note: in some cases, you may also find your name pre-printed on the labels.*

<u>How should I pack the eggs for shipping</u>?

Use the Coleman coolers for <u>shipping containers</u> and carefully pack the bagged eggs in them following the directions listed below.

The coolers are designed to safely hold up to 18 gull eggs each. Each cooler contains 3 large pieces of foam padding about 4 inches thick labeled layer #1, #2, and #3, and 1-2 smaller pieces of foam glued into the recessed cavity in the underside of the lid. Pack the eggs in the coolers as follows:

(i) Remove foam layers #1 and #2 from the cooler and leave layer #3 in the bottom of the container.
(j) Lay 10 of the doubled-bagged eggs on their sides in the two grooves in layer #3 in the 10 designated spots—don't let the eggs touch each other or the walls of the cooler—try to space them about 1 inch apart—if you have trouble keeping them in place, use pieces of tape to secure them to the foam).
(k) Put layer #2 back into the cooler, grooved side up, and gently push it down onto the first layer of eggs to hold them firmly in place.
(l) Lay 8 of the doubled-bagged eggs on their sides in the two grooves in layer #2 in the 8 designated spots—again, don't let the eggs touch each other or the walls of the cooler—try to space them at least 1 inch apart—if you have trouble keeping them in place, use a piece of tape to secure them to the foam.
(m) Put layer #1 back into the cooler following the directions marked on it and gently push it down onto the second layer of eggs to hold them firmly in place.
(n) Put the shipping form on top of layer #1.
(o) If you are sending a disposable camera back with the eggs, fit it into one of the gaps next to the foam glued to the underside of the lid and tape it in place.,
(p) Close the lid and tape it shut by wrapping <u>2-3 layers</u> of duct tape <u>completely</u> <u>around</u> the cooler about 6 inches in from each end, just like it was taped shut when you received it.
(q) Tape the pre-printed shipping label securely to the top of the lid, and stick the "Keep Cool" and "Handle with Care" labels on the top and sides of the container. The cooler is now ready for shipping (see shipping instructions below).

<u>How should I store the eggs if I have to keep them for awhile</u>?

Always try to ship the eggs to Homer as soon as you can after collecting them. However, if you have to keep the eggs for a few days before you can ship them, try to keep them as cool as you can (but <u>don't</u> freeze them). Keeping them in a refrigerator is best, but if you can't do that, keep them in the cooler and put it outside in a cool shady place.

<u>Who should I ship the eggs to</u>?

As mentioned above, the collection kits contain <u>pre-printed shipping labels</u>. Send the eggs to Dave Roseneau, USFWS Alaska Maritime National Wildlife Refuge, 95 Sterling Highway #1, Homer, Alaska 99603-7472.

<u>Who should I contact before I ship the eggs</u>?

Please contact <u>Dave Roseneau</u> at the Alaska Maritime National Wildlife Refuge in Homer <u>before</u> you send the eggs and tell him when you plan to ship them. Also give him the name of the air carrier you plan to use. After you ship the eggs, please contact Dave again to let him know when they were sentand give him the air carrier's airway bill number so he can track the shipment.

Dave can be contacted by phone (907-226-4613 or 907-235-6546), fax (907-235-7783), or e-mail (<dave_roseneau@fws.gov>). If you can't reach Dave, please contact Vern Byrd (phone 907-235-6546, fax 907-235-7783, e-mail <vernon_byrd@fws.gov>). He's Dave's backup. *Note: the government phone system will not accept collect calls. Please call direct, give them your number, and tell them to call you back.*

What air carrier should I use to ship the eggs?

Always try to use the air carrier servicing your community that is willing to ship the eggs freight collect. If you have any problems shipping the eggs, call or e-mail Dave and he'll help you.

PLEASE REMEMBER TO CONTACT DAVE ROSENEAU or VERN BYRD BEFORE SHIPPING EGGS TO HOMER (see above).

Appendix 4. A typical murre egg collecting kit used during this study.

Appendix 5. Percent lipid results for STAMP egg samples with SRM 1946 Lake Superior Fish Tissue and Murre Egg Control Material results compared to reference values.

	Egg CM (03-04)	Egg CM (05)	SRM1946
% lipid	11.3	11.2	9.07
Reference Value	11.8 ± 1.1	11.8 ± 1.1	10.17 ± 0.48

												Mean	**SD**	**RSD**
Sample	**297**	**298**	**299**	**300**	**301**	**302**	**303**	**304**	**305**	**306**		**STLA03**		
% lipid	11.0	10.4	11.1	10.0	10.4	11.4	10.7	11.2	9.75	10.2		**10.6**	0.54	5.1
Sample	**308**	**311**	**312**	**314**	**315**	**317**	**318**	**319**	**320**	**321**		**MIDD03**		
% lipid	8.45	8.52	10.8	10.2	9.42	10.6	10.7	10.0	9.39	10.1		**9.82**	0.85	8.7
Sample	**322**	**324**	**325**	**327**	**330**	**331**	**332**	**333**	**335**	**336**		**EAAM03**		
% lipid	9.09	11.4	10.7	10.2	9.62	9.48	9.25	11.2	9.94	9.31		**10.0**	0.84	8.4
Sample	**464**	**465**	**466**	**467**	**468**	**469**	**470**	**471**				**STLA04**		
% lipid	11.3	10.0	10.4	9.73	9.71	10.5	10.0	10.6				**10.3**	0.53	5.1
Sample	**489**	**490**	**491**	**492**								**CHDU04**		
% lipid	10.7	10.5	9.19	9.67								**10.0**	0.70	7.0
Sample	**493**	**494**	**495**	**496**	**497**	**498**	**500**	**501**				**MIDD04**		
% lipid	10.4	9.72	10.8	10.7	9.49	10.7	10.5	9.67				**10.2**	0.53	5.2
Sample	**505**	**506**	**507**	**508**	**509**	**510**	**511**	**513**				**GULL04**		
% lipid	9.18	10.7	10.5	11.2	9.24	10.9	10.3	9.17				**10.1**	0.83	8.2
Sample	**676**	**677**	**678**	**681**	**683**							**CDEN05**		
% lipid	10.9	11.0	10.9	9.06	9.94							**10.4**	0.85	8.2
Sample	**748**	**756**	**757**	**758**	**760**							**CPEI05**		
% lipid	11.0	12.0	10.7	11.2	11.1							**11.2**	0.47	4.2
Sample	**761**	**764**	**767**	**768**	**771**							**SLED05**		
% lipid	11.2	10.3	11.3	11.0	9.19							**10.6**	0.88	8.3
Sample	**777**	**780**	**782**	**783**	**844**							**BLUFF05**		
% lipid	10.3	9.82	8.86	10.2	11.2							**10.1**	0.84	8.3
Sample	**862**	**863**	**866**	**869**	**871**							**BOGO05**		
% lipid	10.3	10.0	11.1	11.8	11.6							**11.0**	0.77	7.1

Appendix 6. Pesticide and toxaphene congener mass fractions (ng g^{-1} wet mass) in SRM 1946 Lake Superior Fish Tissue and Murre Egg Control Material compared to reference values and maximum limits of detection or quantitation. Compounds in red were above reference value range, while those in blue were below; toxaphene congener reference values are from Kucklick *et al.* (2004).

Compound	SRM 1946 Certified or Reference Values	SRM 1946 Batch 1	SRM 1946 Batch 2	SRM 1946 Batch 3	Murre Egg CM Reference Values	Murre Egg CM Batch 1	Murre Egg CM Batch 2	Murre Egg CM Batch 3	Max LOD or LOQ
2,4'-DDD	**2.20 + 0.25**	1.18		1.16	**<0.100**	<LOD		<LOD	0.219
2,4'-DDE	1.04 + 0.29	1.14		1.07	**<0.7**	0.155		0.142	0.220
2,4'-DDT	22.3 + 3.2	23.0		23.1	**<1**; 0.108 ± 0.10	<LOD		<LOD	0.218
4,4,'-DDD	**17.7 + 2.8**	12.2		11.2	**<3**	<LOQ		<LOQ	3.23
4,4'-DDE	**373 + 48**	380		378	**69.5 ± 6.3**	66.5		66.4	0.220
4,4'-DDT	**37.2 + 3.5**	45.0		46.0	**<1**	<LOD		<LOD	0.218
α-HCH	**5.72 + 0.65**	5.83	5.86	5.99	**1.16 ± 0.18**	1.11	1.14	0.985	0.243
β-HCH		0.558	0.458	0.503	**24.9 ± 4.3**	21.1	25.2	23.3	0.241
γ-HCH	**1.14 + 0.18**	1.10	1.10	0.929	**<0.4**; 0.342 ± 0.024	<LOQ	<LOQ	<LOQ	0.862
cis-chlordane	**32.5 + 1.8**	33.3	32.7	32.3	**0.254 ± 0.024**	<LOQ	<LOQ	<LOQ	16.0
cis-nonachlor	**59.1 + 3.6**	58.4	62.4	55.3	**1.94 ± 0.48**	1.52	1.51	1.63	0.557
trans-chlordane	**8.36 + 0.91**	20.5	20.4	20.4	**<2**	<LOD	<LOD	0.0827	0.239
trans-nonachlor	**99.6 + 7.6**	105	103	106	**0.481 ± 0.1**	0.367	0.378	0.434	0.221
heptachlor		0.146		<LOD	**<0.100**	<LOD		<LOD	0.220
heptachlor epoxide	**5.50 + 0.23**	5.83	5.90	5.74	**4.41 ± 0.3**	4.11	4.11	4.21	1.71
oxychlordane	**18.9 + 1.5**	18.6	18.7	18.4	**7.16 ± 0.7**	7.76	7.57	7.38	3.99
aldrin		<LOD		<LOD	<0.100	<LOD		<LOD	0.220
dieldrin	**32.5 + 3.5**	32.6		33.8	**3.34 ± 0.36**	3.24		3.40	0.219
HCB	**7.25 + 0.83**	7.81	7.86	7.64	**34.0 ± 5.3**	39.3	39.7	38.5	0.289
mirex	**6.47 + 0.77**	6.57	6.54	6.53	**1.58 ± 0.16**	1.60	1.53	1.58	0.554
octachlorosytrene		4.06		4.15	**0.913 ± 0.087**	0.888		0.816	0.0406
pentachlorobenzene		0.253	0.291	0.289	**1.93 ± 0.5**	2.13	2.57	2.36	0.179
DETOX-401	31.0 + 3.7	51.4	50.5	45.9		11.2	11.0	10.0	0.118
DETOX-402	86.6 + 5.6	102	110	113		4.21	4.56	4.61	1.47
DETOX-403	54.6 + 4.1	13.1	14.5	13.3		0.525	0.499	0.504	0.353
DE-TOX-404		5.46	5.83	5.63		<LOQ	<LOQ	0.455	1.28
DETOX-408		34.3	30.5	31.7		0.635	0.684	0.731	0.169
DETOX-410		3.53	3.28	3.68		<LOQ	<LOQ	<LOQ	0.664
DETOX-411		11.6	11.7	9.80		0.116	0.110	0.110	0.174
DETOX-412		1.19	1.21	1.13		<LOQ	<LOQ	0.158	0.441
DETOX-414		3.49	3.29	3.47		0.155	0.162	0.155	0.166
DETOX-417		4.38	3.83	4.19		1.06	1.12	1.16	0.536
DETOX-418		6.06	6.14	6.53		<LOQ	<LOQ	0.147	0.400
DETOX-422a		0.282	0.277	0.321		<LOQ	<LOQ	<LOQ	0.408
DETOX-422b		0.254	0.261	0.229		<LOD	<LOD	<LOD	0.0534
DETOX-423		0.305	0.359	0.328		<LOQ	<LOQ	<LOQ	0.695
DETOX-439		41.9	42.1	43.2		2.45	2.44	2.25	1.58
DETOX-441		0.454	0.434	0.412		<LOD	<LOD	<LOD	0.133
DETOX-442		3.83	3.94	3.82		<LOQ	<LOQ	<LOQ	2.43
DETOX-444		9.92	9.12	10.6		<LOQ	<LOQ	<LOQ	0.409
DE-TOX-445		15.2	15.6	13.9		0.636	0.642	0.646	0.461
DETOX-448		0.903	0.919	1.03		<LOQ	<LOQ	<LOQ	0.175
DETOX-449		1.21	1.18	1.16		<LOQ	<LOQ	<LOQ	0.411
DETOX-453		28.3	29.4	25.0		1.70	1.78	1.60	0.131
DETOX-454		15.5	15.0	14.8		0.573	0.554	0.595	0.529
DETOX-455		11.5	11.2	10.6		<LOQ	<LOQ	<LOQ	0.325

Appendix 7. PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in SRM 1946 Lake Superior Fish Tissue and Murre Egg Control Material compared to reference values and maximum limits of detection or quantitation. Compounds in red were above reference value range, while those in blue were below.

Compound	SRM 1946 Certified or Reference Values	SRM 1946 Batch 1	SRM 1946 Batch 2	SRM 1946 Batch 3	Murre Egg CM Reference Values	Murre Egg CM Batch 1	Murre Egg CM Batch 2	Murre Egg CM Batch 3	Max LOD or LOQ
BDE 17	0.1	<LOD		<LOD		<LOD		<LOD	0.441
BDE 25	<0.2	0.0938		<LOD		<LOD		<LOD	0.255
BDE 28		0.834		0.888		<LOQ		<LOQ	0.507
BDE 30	<0.2	<LOD		<LOD		<LOD		<LOD	0.226
BDE 47	**29.9+2.3**	30.7		29.8	**0.771 ± 0.14**	0.777		0.795	0.222
BDE 49	1.10+0.23	0.942		0.967		<LOQ		<LOQ	2.59
BDE 66	**1.35+0.16**	2.00		2.08		<LOD		<LOD	0.298
BDE 71	<0.2	<LOD		<LOD		<LOD		<LOD	0.210
BDE 74		0.213		0.214		<LOD		<LOD	0.259
BDE 75	<0.2	<LOD		<LOD		<LOD		<LOD	0.244
BDE 85	<0.2	<LOD		<LOD		<LOD		<LOD	0.242
BDE 97+118		0.505		0.563		<LOD		<LOD	0.361
BDE 99	**18.5+2.1**	17.3		17.2	**0.530 ± 0.21**	<LOQ		<LOQ	1.70
BDE 100	**8.57+0.52**	8.23		8.43	**0.310 ± 0.13**	<LOQ		<LOQ	0.939
BDE 101		0.480		0.460		<LOD		<LOD	0.274
BDE 116	<0.2	<LOQ		<LOQ		<LOQ		<LOQ	0.494
BDE 119		0.364		0.337		<LOD		<LOD	0.293
BDE 138	<0.2	<LOQ		<LOQ	**0.644 ± 0.087**	<LOQ		<LOQ	0.494
BDE 139		<LOQ		<LOQ		<LOQ		<LOQ	0.323
BDE 153	**2.81+0.41**	2.83		2.98		<LOQ		<LOQ	2.51
BDE 154	**5.77+0.80**	5.21		5.45		<LOQ		<LOQ	1.65
BDE 155	0.51+0.11	0.517		0.494		<LOQ		<LOQ	0.955
BDE 156	<0.2	<LOQ		<LOQ		<LOQ		<LOQ	0.286
BDE 173+190	<0.2	<LOD		<LOD		<LOD		<LOD	0.918
BDE 181	<0.2	<LOD		<LOD		<LOD		<LOD	0.831
BDE 182		<LOD		<LOD		<LOD		<LOD	0.431
BDE 183	0.235+0.033	0.235		0.220		<LOQ		<LOQ	0.527
BDE 185		<LOD		<LOD		<LOD		<LOD	0.646
BDE 191	<0.2	<LOD		<LOD		<LOD		<LOD	0.606
BDE 196		<LOQ		<LOQ		<LOQ		<LOQ	28.1
BDE 198		<LOQ		<LOQ		<LOQ		<LOQ	11.7
BDE 203		<LOQ		<LOQ		<LOQ		<LOQ	10.3
BDE 204+197		<LOD		<LOD		<LOD		<LOD	11.8
PCB 8		<LOQ		<LOQ	<0.100	<LOQ		<LOQ	0.264
PCB 18	0.84 + 0.11	0.449		0.422	**<0.100**	<LOQ		<LOQ	0.0854
PCB 28+31	2.00 + 0.24; 1.46 + 0.20	2.80		2.76	**2.49 ± 0.51**	2.22		2.15	0.0582
PCB 29		<LOQ		<LOQ	**<0.100**	<LOQ		<LOQ	0.0646
PCB 44	**4.66 + 0.86**	3.41		3.20	**<0.100**	<LOD		<LOD	0.0249
PCB 45		2.45		2.53	**<0.100**	0.0482		<LOQ	0.0150
PCB 49	**3.8 + 0.39**	2.98		2.96	**<0.15**	0.0646		0.0516	0.0337
PCB 52	**8.1 + 1.0**	6.78		6.68	**0.234 ± 0.095**	0.134		0.127	0.0458
PCB 56	5.77 + 0.93	3.07		3.70	**0.746 ± 0.059**	0.545		0.535	0.0387
PCB 63	1.28 + 0.19	1.19		1.14	**<0.6**; 0.500 ± 0.043	<LOQ		<LOQ	1.65
PCB 66	**10.8 + 1.9**	7.94		7.98	**2.41 ± 0.12**	1.88		1.75	0.0605
PCB 70	**14.9 + 0.6**	10.5		9.94	**0.205 ± 0.018**	0.136		0.137	0.0205
PCB 74	**4.83 + 0.51**	4.09		4.24	**1.92 ± 0.061**	1.48		1.41	0.0821
PCB 79		0.0564		0.0354	0.165 ± 0.026	<LOQ		<LOQ	0.0670
PCB 82		0.115		0.122	<0.100	<LOD		0.0382	0.0301
PCB 87	**9.4 + 1.4**	9.82		10.2	**<0.15**; 0.106 ± 0.0051	0.101		0.0937	0.0345
PCB 92		8.18		7.55	<0.100	<LOQ		0.0155	0.0328
PCB 95+121	**11.4 + 1.3**	12.5		12.6	**<0.3**	0.0652		0.0643	0.0578
PCB 99	**25.6 + 2.3**	25.4		26.0	**3.93 ± 0.17**	3.77		3.96	0.119
PCB 101	**34.6 + 2.6**	32.2		31.8	**0.835 ± 0.7**	0.295		0.274	0.0880
PCB 105	**19.9 + 0.93**	19.0		19.2	**1.84 ± 0.47**	1.62		1.59	0.0564

Appendix 7 (continued). PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in SRM 1946 Lake Superior Fish Tissue and Murre Egg Control Material compared to reference values and maximum limits of detection or quantitation. Compounds in red were above reference value range, while those in blue were below.

Compound	SRM 1946 Certified or Reference Values	SRM 1946 Batch 1	SRM 1946 Batch 2	SRM 1946 Batch 3	Murre Egg CM Reference Values	Murre Egg CM Batch 1	Murre Egg CM Batch 2	Murre Egg CM Batch 3	Max LOD or LOQ
PCB 106		0.0165		0.00915	<0.100	<LOD		0.00624	0.0123
PCB 107	8.86 + 0.20	7.23		6.96	**<0.7**; 0.472 ± 0.022	0.373		0.369	0.0745
PCB 110	**22.8 + 2.0**	22.4		22.8	**<0.100**	0.0747		0.0551	0.0791
PCB 112		0.0758		0.0858		0.0109		0.0141	0.0187
PCB 114		1.42		1.56	**<0.5**; 0.271 ± 0.017	0.237		0.281	0.00634
PCB 118	**52.1 + 1.0**	48.9		47.6	**6.53 ± 1.1**	5.51		5.33	0.202
PCB 119		0.852		0.952	<0.100	0.0919		0.0971	0.0132
PCB 127		<LOD		<LOD	<0.100	<LOD		<LOD	0.0301
PCB 128	**22.8 + 1.9**	21.4		22.4	**0.809 ± 0.077**	0.709		0.724	0.0521
PCB 130		6.81		6.68	**0.298 ± 0.018**	0.305		0.313	0.0111
PCB 137		4.43		4.41	**<4**	0.187		0.197	0.00919
PCB 138	**115 + 13**	104		103	**5.76 ± 1.5**	4.51		4.43	0.293
PCB 146	**30.1 + 3.5**	26.9		26.8	**2.47 ± 0.022**	2.06		2.01	0.0683
PCB 149	**26.3 + 1.3**	25.4		25.1	**0.403 ± 0.1**	0.221		0.264	0.0840
PCB 151		8.34		8.40	**<0.2**	<LOQ		<LOQ	0.0739
PCB 153+132	**170 + 9**	167		167	**11.0 ± 0.26**	10.0		9.98	0.529
PCB 154		1.29		1.26	**<0.2**	0.0500		0.0573	0.0246
PCB 156	**9.52 + 0.51**	7.89		7.93	**0.557 ± 0.12**	0.473		0.438	0.0170
PCB 157		2.06		1.95	**0.210 ± 0.014**	0.130		0.117	0.0133
PCB 158	7.66 + 0.88	7.80		7.99	**0.317 ± 0.063**	0.297		0.299	0.0312
PCB 159		0.146		0.134	<0.100	<LOQ		<LOQ	0.0421
PCB 163	31.8 + 0.8	31.9		32.6	**2.00 ± 0.16**	1.98		1.92	0.123
PCB 165		0.229		0.232	0.117 ± 0.0090	0.0121		0.00662	0.00472
PCB 166		0.513		0.513	0.253 ± 0.023	0.0407		0.0589	0.00739
PCB 167		5.08		4.86	**0.468 ± 0.037**	0.328		0.310	0.0183
PCB 170	**25.2 + 2.2**	27.0		28.9	**1.47 ± 0.72**	0.863		0.831	0.110
PCB 172		7.18		6.80	**0.371 ± 0.028**	0.323		0.309	0.0148
PCB 174	9.3 + 1.3	8.44		7.96	**<0.100**	0.0284		0.0286	0.0250
PCB 175		1.55		1.43	0.266 ± 0.019	<LOQ		0.0818	0.205
PCB 176		0.569		0.527	**<0.2**	<LOD		0.00286	0.00733
PCB 177		13.7		13.8	**0.395 ± 0.092**	0.251		0.275	0.0308
PCB 178		9.85		9.98	**0.429 ± 0.020**	0.372		0.414	0.100
PCB 180+193	**74.4 + 4.0; 5.78 + 0.72**	73.6		74.1	**2.28 ± 0.18**	1.90		1.97	0.476
PCB 183	**21.9 + 2.5**	20.0		19.7	**0.838 ± 0.094**	0.633		0.641	0.0321
PCB 185		1.90		1.97	<0.100	0.0133		<LOD	0.0132
PCB 187	**55.2 + 2.1**	54.7		55.1	**2.94 ± 0.09**	2.74		2.93	0.205
PCB 188		0.301		0.305	**<0.3**; 0.194 ± 0.019	0.0150		0.0122	0.00403
PCB 189		1.29		1.33	**<0.100**	0.0435		0.0385	0.00475
PCB 191		0.863		0.781	<0.100	0.0146		0.00870	0.0147
PCB 194	**13.0 + 1.3**	12.4		12.3	**<0.6**; 0.316 ± 0.029	0.297		0.314	0.0292
PCB 195	**5.30 + 0.45**	4.48		5.14	**<0.3**; 0.148 ± 0.019	0.105		0.129	0.0201
PCB 196		19.4		19.0	**<1**; 0.724 ± 0.061	0.408		0.394	0.0612
PCB 197		1.37		1.38	0.148 ± 0.011	0.0473		0.0495	0.0175
PCB 199		60.2		60.9	**<1.5**; 0.631 ± 0.022	2.11		2.15	0.102
PCB 200		0.00815		0.00786	**<0.3**	<LOD		<LOD	0.00390
PCB 201	2.83 + 0.13	13.9		12.8	**<0.3**; 0.198 ± 0.017	0.526		0.489	0.0997
PCB 202		4.13		4.14	<0.100	0.0408		0.0271	0.0256
PCB 205		0.779		0.797	<0.100	0.0178		<LOD	0.0151
PCB 206	**5.40 + 0.43**	4.56		4.57	**<0.100**	0.0985		0.0633	0.0278
PCB 207		0.991		0.840	**<0.100**	0.0436		0.0325	0.0147
PCB 208		1.64		1.54	**<0.100**	0.0629		0.0640	0.140
PCB 209	**1.30 + 0.21**	0.973		1.00	**<0.100**	0.103		0.0878	0.0299

Appendix 8. Pesticide and toxaphene congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at St. Lazaria Island in 2003.

Compound	297	298	299	300	301	302	303	304	305	306	Mean	SD	RSD
2,4'-DDD	0.101	<LOD	0.0786	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**0.0402**	0.031	77
2,4'-DDE	0.218	0.456	0.153	0.316	0.686	<LOD	0.118	0.317	0.314	0.407	**0.305**	0.18	60
2,4'-DDT	0.129	<LOD	<LOD	<LOD	<LOD	0.0873	<LOD	0.0939	<LOD	0.103	**0.0603**	0.044	73
4,4,'-DDD	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
4,4'-DDE	150	286	148	151	172	195	121	173	133	233	**176**	50	28
4,4'-DDT	<LOD	<LOD	<LOD	0.184	0.462	<LOD	<LOD	<LOD	<LOD	<LOD	**0.0879**	0.14	160
α-HCH	0.941	0.845	0.925	0.839	1.39	0.910	0.518	1.16	0.948	1.10	**0.957**	0.23	24
β-HCH	14.2	26.6	26.4	26.7	18.9	28.1	8.56	22.4	10.2	29.9	**21.2**	7.8	37
γ-HCH	<LOQ	<LOQ	<LOQ	<LOQ	0.323	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**0.128**	0.10	80
cis -chlordane	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
cis -nonachlor	0.488	1.10	5.23	1.25	9.94	0.940	<LOQ	0.631	0.301	1.01	**2.10**	3.1	150
trans -chlordane	<LOD	<LOD	<LOD	<LOD	1.18	<LOD	<LOD	<LOD	<LOD	<LOD	**0.166**	0.36	220
trans -nonachlor	<LOD	0.0859	1.03	0.164	6.15	0.277	<LOD	<LOD	<LOD	<LOD	**0.790**	1.9	240
heptachlor	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
heptachlor epoxide	1.76	3.20	5.31	2.80	5.54	2.27	1.34	1.94	0.907	2.63	**2.77**	1.6	56
oxychlordane	5.99	11.2	8.46	7.53	9.70	10.0	3.83	6.24	3.42	11.1	**7.74**	2.8	36
dieldrin	2.96	2.58	2.81	3.09	4.87	3.67	0.901	3.70	0.850	5.28	**3.07**	1.4	47
HCB	25.7	31.9	25.0	26.4	22.8	31.4	20.6	31.3	20.4	31.6	**26.7**	4.6	17
mirex	1.51	1.99	1.98	1.91	2.20	3.04	1.00	1.60	0.897	1.95	**1.81**	0.61	34
octachlorosytrene	0.787	0.969	0.737	0.869	0.896	1.25	0.501	0.972	0.556	1.08	**0.862**	0.23	27
pentachlorobenzene	1.74	1.94	1.23	1.18	0.975	2.23	1.40	2.00	1.30	2.13	**1.61**	0.45	28
DETOX-401	11.0	13.3	17.2	15.0	27.2	15.3	2.06	9.25	5.56	18.5	**13.5**	7.1	53
DETOX-402	1.82	2.83	13.6	2.56	28.9	2.17	1.10	1.33	0.979	1.76	**5.71**	9.0	160
DETOX-403	4.04	4.25	2.84	3.47	3.25	1.61	1.22	4.96	1.83	2.47	**2.99**	1.2	41
DE-TOX-404	0.468	<LOQ	0.464	<LOQ	0.607	0.433	<LOQ	<LOQ	<LOQ	0.445	**0.341**	0.18	54
DETOX-408	2.51	3.89	2.54	3.03	4.36	2.10	1.31	3.48	1.38	1.98	**2.66**	1.0	39
DETOX-410	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-411	<LOQ	<LOQ	0.381	<LOQ	1.13	0.0634	<LOQ	<LOQ	<LOQ	<LOQ	**0.178**	0.35	200
DETOX-412	<LOQ	<LOQ	0.154	<LOQ	0.393	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**0.124**	0.10	82
DETOX-414	<LOD	<LOD	<LOD	<LOD	0.199	<LOD	<LOD	<LOD	<LOD	<LOD	**0.0464**	0.055	120
DETOX-417	0.945	1.19	0.806	1.03	0.938	1.27	0.661	1.11	0.748	1.16	**0.985**	0.20	21
DETOX-418	0.345	0.588	0.440	0.290	0.399	0.631	<LOQ	0.516	0.310	0.356	**0.389**	0.18	45
DETOX-422a	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-422b	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
DETOX-423	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-439	1.63	1.95	3.07	1.98	3.07	2.11	0.607	1.52	1.02	2.30	**1.93**	0.79	41
DETOX-441	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
DETOX-442	<LOQ	<LOQ	<LOQ	<LOQ	0.830	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**0.462**	0.27	58
DETOX-444	0.154	0.148	0.359	0.263	0.462	0.188	<LOQ	<LOQ	<LOQ	0.207	**0.206**	0.12	60
DE-TOX-445	0.341	0.462	0.456	0.390	1.45	0.294	0.162	0.477	0.213	0.321	**0.456**	0.36	80
DETOX-448	<LOQ	0.0774	<LOQ	<LOQ	0.0597	0.0672	<LOQ	<LOQ	<LOQ	<LOQ	**0.0408**	0.024	58
DETOX-449	0.210	0.188	0.208	0.184	0.301	0.143	<LOQ	0.220	0.149	0.165	**0.178**	0.074	41
DETOX-453	1.55	1.77	1.49	1.55	2.21	2.01	0.412	1.24	0.965	2.13	**1.53**	0.55	36
DETOX-454	0.229	0.247	1.06	0.305	3.02	0.231	<LOQ	0.214	<LOQ	<LOQ	**0.567**	0.91	160
DETOX-455	0.115	<LOQ	<LOQ	0.118	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**0.0728**	0.034	47

Appendix 9. Pesticide and toxaphene congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at Middleton Island in 2003.

Compound	308	311	312	314	315	317	318	319	320	321	Mean	SD	RSD
2,4'-DDD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
2,4'-DDE	0.187	0.196	<LOD	0.135	0.132	0.149	0.166	<LOD	0.137	0.136	**0.132**	0.054	41
2,4'-DDT	0.111	<LOD	<LOD	<LOD	<LOD	0.228	<LOD	<LOD	<LOD	<LOD	**0.0616**	0.065	110
4,4,'-DDD	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
4,4'-DDE	97.9	106	48.1	71.0	76.2	98.8	74.8	125	73.8	64.5	**83.6**	23	27
4,4'-DDT	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
α-HCH	1.47	1.79	1.08	1.30	1.69	0.940	1.80	1.06	1.11	1.64	**1.39**	0.33	24
β-HCH	55.1	27.0	18.0	31.8	36.9	17.5	37.4	29.9	25.1	32.4	**31.1**	11	35
γ-HCH	<LOQ	0.324	<LOQ	<LOQ	0.322	<LOQ	0.339	<LOQ	<LOQ	0.312	**0.191**	0.12	64
cis-chlordane	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
cis-nonachlor	1.31	0.512	<LOQ	0.678	0.618	0.364	0.952	1.53	0.252	0.752	**0.703**	0.46	65
trans-chlordane	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
trans-nonachlor	0.111	<LOD	0.0787	0.0890	0.111	<LOD	<LOD	0.126	0.664	0.101	**0.141**	0.19	130
heptachlor	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
heptachlor epoxide	4.46	2.84	1.74	2.93	2.59	2.03	4.06	5.40	2.36	3.49	**3.19**	1.2	36
oxychlordane	8.67	7.79	3.82	8.70	5.85	6.74	8.94	11.5	5.75	6.19	**7.39**	2.2	29
dieldrin	5.76	2.58	2.14	2.91	3.24	4.70	4.74	6.07	2.32	3.85	**3.83**	1.4	37
HCB	29.5	34.1	24.6	25.5	32.9	22.7	38.2	32.2	33.3	26.7	**30.0**	5.0	17
mirex	1.53	1.28	0.752	1.44	1.66	1.33	0.942	1.98	0.886	1.12	**1.29**	0.38	29
octachlorosytrene	0.705	0.668	0.482	0.554	0.892	0.687	0.504	0.583	0.550	0.431	**0.606**	0.14	22
pentachlorobenzene	2.47	3.04	2.19	1.85	3.28	1.73	3.95	2.00	3.42	1.68	**2.56**	0.81	31
DETOX-401	13.2	13.5	2.15	8.57	9.01	9.58	12.7	18.4	2.34	8.80	**9.82**	5.0	51
DETOX-402	2.99	1.60	1.15	1.76	2.05	1.58	2.35	4.45	1.12	1.99	**2.10**	0.99	47
DETOX-403	0.716	0.718	0.363	0.523	0.796	0.638	0.462	0.993	0.506	0.484	**0.620**	0.19	30
DE-TOX-404	0.543	0.461	<LOQ	0.442	0.556	<LOQ	<LOQ	0.493	<LOQ	0.448	**0.410**	0.13	31
DETOX-408	0.950	0.909	0.553	0.785	0.770	0.684	0.593	0.919	0.712	0.664	**0.754**	0.14	18
DETOX-410	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-411	0.0626	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.154	<LOQ	<LOQ	**0.0450**	0.042	93
DETOX-412	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-414	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
DETOX-417	0.741	0.720	0.568	0.623	1.09	0.793	0.587	0.778	0.695	0.582	**0.718**	0.15	22
DETOX-418	0.456	0.599	0.216	0.315	0.431	0.376	0.535	0.302	0.575	0.547	**0.435**	0.13	30
DETOX-422a	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-422b	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
DETOX-423	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-439	3.22	2.49	0.770	1.97	2.18	1.88	2.13	3.03	0.849	2.35	**2.09**	0.80	38
DETOX-441	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
DETOX-442	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-444	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DE-TOX-445	0.230	0.185	<LOQ	0.205	0.183	0.171	0.195	0.208	<LOQ	0.198	**0.176**	0.047	27
DETOX-448	0.0653	<LOQ	<LOQ	<LOQ	<LOQ	0.0679	<LOQ	<LOQ	<LOQ	<LOQ	**0.0413**	0.021	52
DETOX-449	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-453	2.53	2.37	0.440	1.54	1.89	1.53	1.89	3.41	0.512	1.65	**1.78**	0.89	50
DETOX-454	0.324	0.200	<LOQ	0.250	0.233	0.234	0.244	0.309	<LOQ	0.297	**0.216**	0.10	48
DETOX-455	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		

Appendix 10. Pesticide and toxaphene congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at East Amatuli Island in 2003.

Compound	322	324	325	327	330	331	332	333	335	336	Mean	SD	RSD
2,4'-DDD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
2,4'-DDE	0.201	<LOD	0.119	0.128	0.105	0.0950	0.0736	0.110	0.0741	<LOD	**0.0942**	0.054	57
2,4'-DDT	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
4,4,'-DDD	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
4,4'-DDE	78.4	69.6	60.6	107	90.2	63.1	53.9	94.1	66.0	51.0	**73.4**	19	25
4,4'-DDT	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
α-HCH	1.14	1.22	2.01	0.952	0.816	0.911	1.34	1.43	1.44	1.17	**1.24**	0.34	28
β-HCH	49.3	58.0	23.1	19.4	14.5	22.2	21.3	20.9	21.1	18.2	**26.8**	15	54
γ-HCH	<LOQ	0.399	0.371	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**0.185**	0.14	74
cis -chlordane	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
cis -nonachlor	8.00	3.57	0.690	0.395	0.252	0.347	0.442	0.239	0.414	0.230	**1.46**	2.5	170
trans -chlordane	1.30	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**0.165**	0.40	240
trans -nonachlor	4.08	0.809	<LOD	0.125	<LOD	<LOD	<LOD	<LOD	0.0783	<LOD	**0.539**	1.3	240
heptachlor	<LOD	0.0749	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**0.0418**	0.029	70
heptachlor epoxide	9.77	7.00	2.44	1.53	1.60	1.62	1.71	1.50	1.93	1.43	**3.05**	2.9	95
oxychlordane	8.99	9.37	4.97	5.92	4.84	4.42	3.87	3.85	3.81	3.17	**5.32**	2.2	41
dieldrin	10.9	7.72	4.98	2.59	3.20	3.11	3.32	2.85	2.74	3.14	**4.45**	2.7	62
HCB	30.0	31.1	19.4	21.8	18.2	24.7	24.5	30.0	21.6	22.0	**24.3**	4.6	19
mirex	2.06	1.94	1.39	1.29	0.894	0.983	1.07	1.27	1.19	0.924	**1.30**	0.40	31
octachlorosytrene	0.907	0.850	0.678	0.743	0.554	0.642	0.640	0.831	0.569	0.544	**0.696**	0.13	19
pentachlorobenzene	1.51	2.16	1.89	1.84	1.65	1.72	1.77	2.67	1.71	2.21	**1.91**	0.34	18
DETOX-401	15.0	17.1	6.56	7.32	7.61	5.75	6.52	5.69	6.11	4.69	**8.24**	4.2	51
DETOX-402	19.5	8.43	2.07	1.10	1.13	1.16	1.34	1.04	1.11	0.831	**3.77**	6.0	160
DETOX-403	0.699	0.649	0.587	0.700	0.494	0.541	0.524	0.599	0.755	0.434	**0.598**	0.10	17
DE-TOX-404	0.792	0.734	0.491	0.482	<LOQ	0.550	0.508	0.462	0.501	0.476	**0.528**	0.14	27
DETOX-408	2.43	1.55	0.894	0.745	0.652	0.527	0.659	0.472	0.406	0.595	**0.893**	0.63	70
DETOX-410	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-411	0.926	0.299	0.0759	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**0.148**	0.29	200
DETOX-412	0.348	0.150	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**0.101**	0.098	97
DETOX-414	0.590	0.150	0.0571	<LOD	<LOD	0.112	<LOD	0.0699	0.0657	<LOD	**0.115**	0.17	150
DETOX-417	0.964	0.845	0.807	0.756	0.579	0.707	0.840	0.863	0.725	0.688	**0.777**	0.11	14
DETOX-418	1.05	0.942	0.752	0.325	0.534	0.259	0.654	1.06	0.306	0.579	**0.646**	0.30	47
DETOX-422a	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-422b	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
DETOX-423	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-439	4.43	2.73	1.49	1.20	1.29	1.31	1.35	1.21	1.23	0.946	**1.72**	1.1	62
DETOX-441	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
DETOX-442	2.50	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**0.688**	0.67	98
DETOX-444	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DE-TOX-445	0.588	0.267	0.220	0.193	0.166	0.170	0.195	0.170	0.175	0.198	**0.234**	0.13	55
DETOX-448	0.163	0.102	<LOQ	0.0708	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**0.0551**	0.047	86
DETOX-449	0.184	0.188	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**0.0947**	0.062	65
DETOX-453	3.35	2.15	1.38	1.32	1.26	1.16	1.14	1.08	0.954	0.833	**1.46**	0.75	52
DETOX-454	3.40	0.831	0.269	<LOQ	0.191	0.183	0.215	<LOQ	0.179	0.180	**0.551**	1.0	190
DETOX-455	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		

Appendix 11. Pesticide and toxaphene congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at St. Lazaria and Duck Islands in 2004.

Compound	464	465	466	467	468	469	470	471	Mean	SD	RSD	489	490	491	492	Mean	SD	RSD
2,4'-DDD	0.0998	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**0.0482**	0.029	61	<LOD	<LOD	<LOD	<LOD	**<LOD**		
2,4'-DDE	0.227	0.298	0.129	0.242	0.194	0.0780	0.192	<LOD	**0.173**	0.090	52	0.123	0.0890	0.102	0.0976	**0.103**	0.014	14
2,4'-DDT	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	**<LOD**		
4,4,'-DDD	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
4,4'-DDE	130	205	129	134	134	159	130	120	**143**	28	19	82.4	61.9	99.2	56.8	**75.1**	20	26
4,4'-DDT	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	**<LOD**		
α-HCH	0.916	0.791	0.698	1.55	1.09	1.17	0.958	0.471	**0.957**	0.33	34	0.891	1.11	0.658	0.619	**0.819**	0.23	28
β-HCH	16.9	12.8	8.84	15.5	22.5	14.7	9.71	9.10	**13.7**	4.7	34	24.2	30.6	11.5	16.2	**20.6**	8.5	41
γ-HCH	<LOQ	<LOQ	<LOQ	0.391	0.287	0.413	<LOQ	<LOQ	**0.256**	0.12	48	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
cis-chlordane	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
cis-nonachlor	0.651	0.506	<LOQ	0.606	0.643	1.08	0.236	0.374	**0.533**	0.29	54	0.773	0.872	0.329	0.834	**0.702**	0.25	36
trans-chlordane	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	**<LOD**		
trans-nonachlor	<LOD	<LOD	<LOD	<LOD	<LOD	0.118	0.669	<LOD	**0.119**	0.23	190	<LOD	<LOD	<LOD	<LOD	**<LOD**		
heptachlor	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	**<LOD**		
heptachlor epoxide	1.87	1.62	1.24	1.60	1.98	2.20	2.18	1.13	**1.73**	0.40	23	1.78	2.22	1.04	1.30	**1.58**	0.52	33
oxychlordane	4.47	5.23	4.66	4.67	5.73	9.03	7.46	3.36	**5.58**	1.8	33	4.11	5.93	4.23	4.05	**4.58**	0.90	20
dieldrin	10.1	3.45	2.62	2.79	3.00	3.48	3.50	2.22	**3.90**	2.6	66	2.38	4.54	2.02	1.84	**2.70**	1.2	46
HCB	23.3	19.7	24.2	25.9	24.2	25.1	18.1	18.8	**22.4**	3.1	14	23.0	20.5	19.4	19.3	**20.6**	1.7	8.3
mirex	1.61	1.85	1.16	1.75	1.37	2.26	1.24	1.06	**1.54**	0.41	26	1.03	1.39	0.808	1.09	**1.08**	0.24	22
octachlorosytrene	0.788	0.716	0.610	0.775	0.639	0.916	0.736	0.563	**0.718**	0.11	16	0.581	0.662	0.570	0.703	**0.629**	0.064	10
pentachlorobenzene	1.62	1.37	1.59	1.47	1.33	1.19	1.43	1.32	**1.41**	0.15	10	1.64	2.20	2.03	1.26	**1.78**	0.42	24
DETOX-401	10.8	8.26	2.00	7.35	6.37	16.4	2.22	3.70	**7.14**	4.8	68	8.65	8.89	4.27	6.97	**7.20**	2.1	30
DETOX-402	1.06	1.19	1.10	1.11	1.26	2.17	2.47	0.846	**1.40**	0.59	42	1.29	1.58	0.723	1.28	**1.22**	0.36	29
DETOX-403	1.47	1.77	3.53	2.11	1.49	5.98	2.57	1.47	**2.55**	1.6	61	0.743	0.748	0.731	0.806	**0.757**	0.034	4.4
DE-TOX-404	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			0.427	0.453	<LOQ	<LOQ	**0.322**	0.18	55
DETOX-408	1.20	1.96	2.55	1.37	1.28	3.53	2.93	0.767	**1.95**	0.97	50	0.459	0.939	0.277	0.322	**0.499**	0.30	61
DETOX-410	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-411	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-412	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-414	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			0.0702	<LOD	<LOD	0.0723	**0.0556**	0.020	35
DETOX-417	0.814	0.917	0.738	1.02	0.827	1.09	0.876	0.689	**0.871**	0.13	15	0.802	0.735	0.712	0.769	**0.755**	0.039	5.2
DETOX-418	0.233	0.179	<LOQ	<LOQ	0.412	0.467	<LOQ	<LOQ	**0.187**	0.17	93	0.601	0.276	0.187	0.764	**0.457**	0.27	59
DETOX-422a	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-422b	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	**<LOD**		
DETOX-423	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-439	1.16	1.12	0.646	1.19	1.61	1.21	0.635	0.744	**1.04**	0.34	33	1.67	1.47	0.972	1.45	**1.39**	0.30	21
DETOX-441	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	**<LOD**		
DETOX-442	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-444	0.187	0.183	0.309	0.174	0.149	0.280	0.263	0.149	**0.212**	0.063	30	0.191	<LOQ	<LOQ	0.165	**0.140**	0.046	33
DE-TOX-445	0.278	0.237	0.172	0.185	0.295	0.295	0.197	0.163	**0.228**	0.056	24	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-448	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-449	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-453	0.674	0.578	0.308	0.531	1.07	0.860	0.328	0.443	**0.600**	0.26	44	1.15	1.08	0.745	0.986	**0.990**	0.18	18
DETOX-454	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.205	<LOQ	<LOQ	**0.0976**	0.071	73	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-455	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		

Appendix 12. Pesticide and toxaphene congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at Middleton Island in 2004.

Compound	493	494	495	496	497	498	500	501	Mean	SD	RSD
2,4'-DDD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
2,4'-DDE	0.252	0.175	0.402	0.238	<LOD	0.144	0.0780	0.131	**0.184**	0.11	61
2,4'-DDT	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
4,4,'-DDD	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
4,4'-DDE	78.8	105	195	116	87.5	83.2	72.2	83.7	**103**	40	39
4,4'-DDT	0.536	<LOD	0.771	0.525	<LOD	<LOD	<LOD	<LOD	**0.247**	0.31	130
α-HCH	2.39	1.07	3.26	2.83	1.10	1.38	1.64	1.03	**1.84**	0.87	48
β-HCH	42.5	29.0	52.3	33.1	36.4	24.9	14.5	17.2	**31.3**	13	41
γ-HCH	0.551	<LOQ	0.709	0.692	0.497	0.345	0.367	<LOQ	**0.427**	0.23	54
cis-chlordane	6.91	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**3.81**	2.0	51
cis-nonachlor	10.4	1.02	10.6	11.3	4.26	1.14	0.611	0.486	**4.98**	4.9	99
trans-chlordane	2.56	<LOD	1.52	1.63	<LOD	<LOD	<LOD	<LOD	**0.738**	1.0	140
trans-nonachlor	22.2	<LOD	7.88	9.97	0.342	0.285	<LOD	<LOD	**5.10**	8.0	160
heptachlor	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
heptachlor epoxide	6.76	2.22	7.20	7.19	4.28	2.06	1.59	1.58	**4.11**	2.6	63
oxychlordane	7.29	6.59	10.3	10.0	7.89	4.75	4.30	3.35	**6.82**	2.6	38
dieldrin	6.95	3.19	6.70	9.03	5.21	3.47	3.80	9.00	**5.92**	2.4	40
HCB	22.0	23.0	20.7	20.6	18.4	19.1	18.3	16.7	**19.8**	2.1	11
mirex	2.19	1.75	3.38	2.92	2.35	1.62	1.49	1.49	**2.15**	0.70	33
octachlorosytrene	0.784	0.683	0.794	0.811	0.820	0.764	0.777	0.813	**0.781**	0.044	5.6
pentachlorobenzene	1.76	2.05	1.65	1.32	1.03	1.62	1.22	1.91	**1.57**	0.35	22
DETOX-401	21.0	8.43	13.6	17.0	20.4	7.46	6.76	7.20	**12.7**	6.1	48
DETOX-402	18.5	1.75	16.0	19.1	8.63	1.30	1.41	0.980	**8.46**	8.2	97
DETOX-403	0.489	0.607	1.17	1.08	0.618	0.498	0.499	0.506	**0.683**	0.28	41
DE-TOX-404	0.741	0.518	0.974	0.725	1.08	0.540	0.505	0.469	**0.694**	0.23	33
DETOX-408	0.837	0.616	1.94	3.20	2.01	0.442	0.373	0.622	**1.25**	1.0	81
DETOX-410	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-411	0.544	<LOQ	0.145	0.463	0.356	<LOQ	<LOQ	<LOQ	**0.210**	0.21	100
DETOX-412	0.330	<LOQ	0.573	0.326	<LOQ	<LOQ	<LOQ	<LOQ	**0.203**	0.19	93
DETOX-414	0.580	0.0660	0.385	0.467	0.224	0.0799	0.0981	0.0913	**0.249**	0.20	81
DETOX-417	1.08	0.880	1.09	0.936	0.977	0.934	0.984	0.995	**0.984**	0.072	7.3
DETOX-418	1.52	1.43	2.05	2.17	2.26	0.382	0.438	0.373	**1.33**	0.82	62
DETOX-422a	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-422b	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
DETOX-423	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-439	3.67	1.99	4.04	2.91	3.75	1.40	1.11	1.14	**2.50**	1.2	49
DETOX-441	0.0850	<LOD	0.0980	0.0522	<LOD	<LOD	<LOD	<LOD	**0.0444**	0.033	74
DETOX-442	2.24	<LOQ	2.18	1.43	<LOQ	<LOQ	<LOQ	<LOQ	**0.947**	0.87	92
DETOX-444	0.209	<LOQ	0.185	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**0.132**	0.050	38
DE-TOX-445	2.57	0.213	0.251	1.91	1.12	0.189	0.176	0.174	**0.825**	0.95	120
DETOX-448	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-449	<LOQ	<LOQ	<LOQ	<LOQ	0.207	<LOQ	<LOQ	<LOQ	**0.0803**	0.060	75
DETOX-453	1.88	1.41	2.76	2.03	4.48	0.798	0.787	0.861	**1.88**	1.3	67
DETOX-454	3.22	<LOQ	2.07	3.43	0.903	<LOQ	<LOQ	<LOQ	**1.26**	1.4	120
DETOX-455	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		

Appendix 13. Pesticide and toxaphene congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at Gull Island in 2004.

Compound	505	506	507	508	509	510	511	513	Mean	SD	RSD
2,4'-DDD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
2,4'-DDE	<LOD	<LOD	0.117	0.162	0.118	0.203	0.0975	<LOD	**0.108**	0.055	51
2,4'-DDT	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
4,4,'-DDD	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
4,4'-DDE	44.5	54.4	62.9	57.2	58.0	105	66.4	43.5	**61.5**	19	31
4,4'-DDT	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
α-HCH	0.960	1.21	1.58	1.56	1.50	1.04	1.55	1.64	**1.38**	0.27	20
β-HCH	10.2	8.34	24.4	34.5	21.4	19.0	16.9	15.6	**18.8**	8.3	44
γ-HCH	<LOQ	0.303	0.380	0.372	0.369	<LOQ	0.315	0.337	**0.305**	0.092	30
cis -chlordane	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
cis -nonachlor	<LOQ	0.367	1.18	6.37	1.19	0.489	0.393	0.375	**1.31**	2.1	160
trans -chlordane	<LOD	<LOD	<LOD	1.46	<LOD	<LOD	<LOD	<LOD	**0.216**	0.50	230
trans -nonachlor	<LOD	<LOD	<LOD	6.76	0.100	<LOD	<LOD	<LOD	**0.894**	2.4	270
heptachlor	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
heptachlor epoxide	1.42	1.14	2.19	3.80	1.94	1.81	1.90	1.33	**1.94**	0.83	43
oxychlordane	2.87	3.47	3.84	5.35	4.30	4.22	3.79	3.14	**3.87**	0.77	20
dieldrin	2.77	2.06	3.60	4.81	3.87	5.04	3.64	1.88	**3.46**	1.2	34
HCB	16.1	17.0	16.7	18.0	14.3	21.3	17.1	18.3	**17.3**	2.0	12
mirex	0.774	0.758	0.950	1.11	1.10	0.940	0.876	0.867	**0.923**	0.13	14
octachlorosytrene	0.599	0.715	0.594	0.583	0.723	0.627	0.514	0.563	**0.615**	0.072	12
pentachlorobenzene	1.90	1.80	1.10	1.01	0.785	1.45	1.83	1.23	**1.39**	0.42	30
DETOX-401	1.93	3.78	9.55	16.7	9.96	7.90	6.75	5.62	**7.77**	4.5	58
DETOX-402	1.09	0.959	2.31	14.3	2.65	1.14	1.13	1.09	**3.08**	4.6	150
DETOX-403	0.435	0.373	0.772	0.614	0.730	0.839	0.168	0.653	**0.573**	0.23	40
DE-TOX-404	<LOQ	<LOQ	0.600	0.836	0.655	0.525	0.453	0.432	**0.468**	0.25	54
DETOX-408	0.612	0.303	1.03	1.13	0.416	0.569	0.680	0.662	**0.675**	0.28	42
DETOX-410	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-411	<LOQ	<LOQ	<LOQ	0.667	<LOQ	<LOQ	<LOQ	<LOQ	**0.112**	0.22	200
DETOX-412	<LOQ	<LOQ	<LOQ	0.279	<LOQ	<LOQ	<LOQ	<LOQ	**0.110**	0.079	72
DETOX-414	<LOD	<LOD	0.179	0.766	0.264	0.161	<LOD	0.0585	**0.198**	0.24	120
DETOX-417	0.764	0.970	0.705	0.672	0.844	0.818	0.674	0.757	**0.775**	0.10	13
DETOX-418	0.235	0.435	1.46	1.76	0.416	0.372	0.303	0.678	**0.708**	0.58	82
DETOX-422a	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-422b	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
DETOX-423	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-439	0.753	0.938	2.02	4.06	2.46	1.37	1.17	1.29	**1.76**	1.1	62
DETOX-441	<LOD	<LOD	<LOD	0.0720	<LOD	<LOD	<LOD	<LOD	**0.0340**	0.019	55
DETOX-442	<LOQ	<LOQ	<LOQ	2.50	<LOQ	<LOQ	<LOQ	<LOQ	**0.585**	0.81	140
DETOX-444	<LOQ	<LOQ	0.148	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**0.0979**	0.035	36
DE-TOX-445	0.209	<LOQ	0.198	3.18	0.173	0.183	0.271	0.160	**0.555**	1.1	190
DETOX-448	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-449	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-453	0.421	0.705	1.29	2.18	1.75	1.03	0.865	0.920	**1.15**	0.57	50
DETOX-454	<LOQ	<LOQ	0.286	2.67	0.372	<LOQ	<LOQ	<LOQ	**0.466**	0.90	190
DETOX-455	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		

Appendix 14. Pesticide and toxaphene congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at capes Denbigh and Pierce in 2005.

Compound	676	677	678	681	683	Mean	SD	RSD	748	756	757	758	760	Mean	SD	RSD
2,4'-DDD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
2,4'-DDE	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
2,4'-DDT	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
4,4,'-DDD	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
4,4'-DDE	36.3	51.6	41.2	28.2	34.5	**38.4**	8.7	23	35.1	37.8	45.3	32.5	29.9	**36.1**	5.9	16
4,4'-DDT	<LOD	<LOD	0.0755	<LOD	<LOD	**0.0409**	0.024	60	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
α-HCH	0.278	0.279	0.247	0.226	0.251	**0.256**	0.022	8.8	0.181	0.210	0.496	0.415	0.385	**0.338**	0.14	40
β-HCH	8.25	11.7	6.80	13.8	13.0	**10.7**	3.1	28	7.02	16.6	13.8	11.6	8.78	**11.6**	3.8	33
γ-HCH	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
cis -chlordane	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
cis -nonachlor	0.377	<LOQ	0.547	0.607	0.507	**0.412**	0.23	56	<LOQ	0.332	0.282	<LOQ	0.209	**0.208**	0.11	55
trans -chlordane	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	0.145	<LOD	**0.0618**	0.051	82
trans -nonachlor	0.0906	0.143	0.0922	0.107	0.0866	**0.104**	0.023	22	0.121	<LOD	<LOD	0.665	<LOD	**0.168**	0.28	170
heptachlor	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
heptachlor epoxide	1.28	1.89	1.18	1.81	1.40	**1.51**	0.32	21	1.92	2.00	1.44	2.35	1.23	**1.79**	0.45	25
oxychlordane	3.50	5.43	3.32	3.87	3.63	**3.95**	0.85	22	4.46	3.44	3.76	3.25	2.70	**3.52**	0.65	18
dieldrin	0.952	1.19	1.04	1.41	1.19	**1.16**	0.17	15	1.31	1.75	1.68	1.61	1.20	**1.51**	0.24	16
HCB	47.3	49.3	31.0	30.2	35.5	**38.6**	9.1	23	41.0	32.7	37.9	21.1	26.1	**31.8**	8.2	26
mirex	1.71	2.21	2.16	1.76	1.78	**1.92**	0.24	12	1.13	1.04	1.09	1.12	1.06	**1.09**	0.039	3.6
octachlorosytrene	1.21	1.35	0.955	0.669	0.996	**1.04**	0.26	25	0.938	0.729	0.895	0.682	0.635	**0.776**	0.13	17
pentachlorobenzene	1.70	2.69	1.22	1.12	1.97	**1.74**	0.63	36	1.70	1.29	1.94	0.903	1.19	**1.41**	0.41	29
DETOX-401	2.13	0.924	2.04	3.49	2.86	**2.29**	0.96	42	0.552	1.77	2.68	1.17	1.27	**1.49**	0.80	54
DETOX-402	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	1.38	<LOQ	**0.413**	0.56	140
DETOX-403	0.424	0.584	0.511	0.400	0.418	**0.467**	0.078	17	0.445	0.345	0.481	0.482	0.392	**0.429**	0.060	14
DE-TOX-404	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-408	0.452	0.495	0.314	0.336	0.206	**0.361**	0.12	32	0.580	0.351	0.515	0.615	0.159	**0.444**	0.19	43
DETOX-410	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-411	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-412	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-414	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
DETOX-417	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			0.242	<LOQ	<LOQ	<LOQ	0.201	**0.135**	0.095	71
DETOX-418	0.324	0.162	0.330	0.345	0.381	**0.309**	0.085	28	<LOQ	<LOQ	0.184	0.227	0.151	**0.160**	0.047	29
DETOX-422a	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-422b	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
DETOX-423	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-439	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	0.655	<LOQ	**0.260**	0.24	92
DETOX-441	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
DETOX-442	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-444	<LOQ	0.156	<LOQ	<LOQ	0.139	**0.0881**	0.069	79	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DE-TOX-445	0.439	0.737	0.513	0.404	0.424	**0.504**	0.14	27	0.719	0.418	0.599	0.730	0.510	**0.595**	0.13	23
DETOX-448	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-449	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-453	0.160	0.117	0.147	0.307	0.277	**0.202**	0.085	42	0.0944	0.308	0.278	0.242	0.126	**0.210**	0.095	45
DETOX-454	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	0.254	<LOQ	**0.116**	0.081	70
DETOX-455	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		

Appendix 15. Pesticide and toxaphene congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at Sledge Island and Bluff in 2005.

Compound	761	764	767	768	771	Mean	SD	RSD	777	780	782	783	844	Mean	SD	RSD
2,4'-DDD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
2,4'-DDE	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
2,4'-DDT	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
4,4,'-DDD	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
4,4'-DDE	53.6	40.8	73.6	46.3	41.1	**51.1**	14	27	44.6	23.5	68.0	44.1	33.9	**42.8**	17	39
4,4'-DDT	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
α-HCH	0.403	0.294	0.229	0.195	0.399	**0.304**	0.095	31	0.243	0.265	0.319	0.351	0.487	**0.333**	0.096	29
β-HCH	22.3	9.26	14.1	7.33	11.9	**13.0**	5.8	45	8.49	10.1	20.7	16.8	12.8	**13.8**	5.0	36
γ-HCH	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
cis -chlordane	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
cis -nonachlor	1.68	0.375	0.443	0.434	0.411	**0.668**	0.56	84	0.529	0.431	6.96	0.705	0.604	**1.85**	2.9	160
trans -chlordane	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	0.743	<LOD	<LOD	**0.176**	0.32	180
trans -nonachlor	0.257	<LOD	0.128	0.126	0.109	**0.131**	0.080	61	0.210	0.106	7.72	0.171	0.164	**1.67**	3.4	200
heptachlor	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
heptachlor epoxide	3.23	1.27	1.55	1.16	1.63	**1.77**	0.84	47	1.23	1.30	4.92	2.03	1.67	**2.23**	1.5	69
oxychlordane	7.45	4.17	5.21	5.51	4.18	**5.30**	1.3	25	3.22	3.52	5.84	5.49	3.56	**4.33**	1.2	29
dieldrin	3.05	1.81	1.94	2.90	1.63	**2.26**	0.66	29	0.738	0.937	2.07	3.29	1.41	**1.69**	1.0	61
HCB	64.2	39.2	43.2	68.8	41.1	**51.3**	14	27	28.4	23.9	33.9	28.2	29.8	**28.8**	3.6	12
mirex	3.38	1.45	2.13	2.20	1.61	**2.16**	0.76	35	1.68	1.33	2.74	2.45	1.65	**1.97**	0.60	30
octachlorosytrene	1.64	1.05	1.17	1.62	1.13	**1.32**	0.28	22	0.778	0.582	0.882	0.803	0.784	**0.766**	0.11	15
pentachlorobenzene	2.62	1.91	2.48	2.14	1.95	**2.22**	0.32	14	1.32	1.44	1.05	1.27	1.62	**1.34**	0.21	16
DETOX-401	6.54	2.11	3.42	1.95	2.63	**3.33**	1.9	57	1.98	2.59	8.52	3.94	1.82	**3.77**	2.8	74
DETOX-402	0.614	<LOQ	<LOQ	<LOQ	<LOQ	**0.258**	0.27	110	<LOQ	<LOQ	9.78	<LOQ	<LOQ	**2.11**	4.3	200
DETOX-403	0.677	0.503	0.656	0.659	0.495	**0.598**	0.091	15	0.500	0.397	0.605	0.579	0.520	**0.520**	0.081	16
DE-TOX-404	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-408	0.346	0.323	0.443	0.266	0.304	**0.336**	0.067	20	0.862	0.633	1.29	0.931	0.697	**0.883**	0.26	29
DETOX-410	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-411	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	0.224	<LOQ	<LOQ	**0.0702**	0.087	120
DETOX-412	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-414	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	0.0573	<LOD	<LOD	**0.0357**	0.019	52
DETOX-417	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-418	0.542	0.341	0.556	0.418	0.369	**0.445**	0.099	22	0.247	0.302	0.537	0.493	0.464	**0.409**	0.13	31
DETOX-422a	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-422b	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
DETOX-423	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-439	0.930	<LOQ	<LOQ	<LOQ	<LOQ	**0.362**	0.37	100	<LOQ	<LOQ	1.77	<LOQ	<LOQ	**0.458**	0.74	160
DETOX-441	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
DETOX-442	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	0.886	<LOQ	<LOQ	**0.553**	0.21	38
DETOX-444	0.229	0.141	0.168	0.190	0.154	**0.176**	0.035	20	0.192	<LOQ	0.193	0.191	<LOQ	**0.148**	0.067	45
DE-TOX-445	0.885	0.470	0.677	0.668	0.508	**0.642**	0.16	26	0.505	0.385	1.16	0.637	0.587	**0.654**	0.30	45
DETOX-448	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-449	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-453	0.398	0.298	0.267	0.249	0.306	**0.303**	0.058	19	0.272	0.212	0.671	0.309	0.217	**0.336**	0.19	57
DETOX-454	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	1.65	<LOQ	<LOQ	**0.371**	0.72	190
DETOX-455	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		

Appendix 16. Pesticide and toxaphene congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at Bogoslof Island in 2005.

Compound	862	863	866	869	871	Mean	SD	RSD
2,4'-DDD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
2,4'-DDE	<LOD	0.0790	<LOD	<LOD	<LOD	**0.0425**	0.027	63
2,4'-DDT	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
4,4,'-DDD	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
4,4'-DDE	45.0	111	56.8	67.4	63.3	**68.7**	25	37
4,4'-DDT	0.511	0.248	0.128	0.194	0.248	**0.266**	0.15	55.00
α-HCH	2.39	1.73	2.88	0.783	1.58	**1.87**	0.80	43
β-HCH	12.9	14.2	14.4	9.72	17.4	**13.7**	2.8	20
γ-HCH	0.472	0.382	0.559	<LOQ	0.320	**0.356**	0.19	54
cis-chlordane	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
cis-nonachlor	0.640	0.414	0.364	<LOQ	0.561	**0.399**	0.24	60
trans-chlordane	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
trans-nonachlor	0.551	0.177	0.129	<LOD	0.122	**0.210**	0.19	93
heptachlor	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
heptachlor epoxide	1.82	2.16	2.08	1.34	2.47	**1.97**	0.42	21
oxychlordane	4.08	5.58	4.62	3.66	4.27	**4.45**	0.72	16
dieldrin	1.54	2.37	2.38	1.66	2.90	**2.17**	0.56	26
HCB	21.3	25.1	32.0	28.2	23.8	**26.1**	4.1	16
mirex	1.08	1.80	1.16	0.877	1.46	**1.28**	0.36	28
octachlorosytrene	0.571	0.828	0.808	0.812	0.739	**0.752**	0.11	14
pentachlorobenzene	1.36	1.55	1.70	1.84	1.82	**1.65**	0.20	12
DETOX-401	4.81	6.19	5.27	3.60	6.82	**5.34**	1.2	23
DETOX-402	1.45	1.28	1.30	0.513	2.16	**1.34**	0.58	44
DETOX-403	0.660	6.35	0.475	0.492	0.548	**1.70**	2.6	150
DE-TOX-404	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-408	1.40	1.13	0.925	0.676	1.54	**113**	0.35	31
DETOX-410	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-411	0.0706	0.0929	0.0698	<LOQ	0.139	**0.0745**	0.050	67
DETOX-412	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-414	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
DETOX-417	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-418	0.396	0.315	0.357	0.276	0.465	**0.362**	0.073	20
DETOX-422a	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-422b	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
DETOX-423	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-439	1.24	1.44	1.07	0.636	1.56	**1.19**	0.36	30
DETOX-441	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
DETOX-442	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-444	0.146	1.70	<LOQ	<LOQ	<LOQ	**0.418**	0.72	170
DE-TOX-445	0.696	3.53	0.603	0.477	0.753	**1.21**	1.3	110
DETOX-448	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-449	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
DETOX-453	0.711	0.950	0.806	0.803	1.13	**0.880**	0.16	19
DETOX-454	0.319	0.345	0.222	<LOQ	0.307	**0.270**	0.077	29
DETOX-455	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		

Appendix 17. PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at St. Lazaria Island in 2003.

Compound	297	298	299	300	301	302	303	304	305	306	Mean	SD	RSD
BDE 17	1.28	0.492	0.223	0.331	0.181	0.393	<LOD	0.487	1.18	<LOD	**0.481**	0.42	87
BDE 25	0.397	0.223	0.279	<LOD	0.402	<LOD	<LOD	<LOD	0.397	0.392	**0.227**	0.17	74
BDE 28	<LOQ	0.297	<LOQ	0.346	0.577	<LOQ	<LOQ	0.220	<LOQ	0.237	**0.233**	0.15	63
BDE 30	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 47	13.4	31.6	8.15	20.9	14.7	7.02	1.51	20.8	7.71	11.9	**13.8**	8.7	63
BDE 49	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 66	0.160	0.230	0.118	0.253	0.434	0.128	<LOD	0.239	0.220	0.189	**0.203**	0.10	50
BDE 71	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 74	<LOD	<LOD	<LOD	<LOD	0.120	<LOD	<LOD	<LOD	<LOD	<LOD	**0.0658**	0.025	39
BDE 75	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 85	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 97+118	<LOD	<LOD	<LOD	<LOD	0.208	<LOD	<LOD	<LOD	<LOD	<LOD	**0.0808**	0.051	63
BDE 99	2.66	4.89	2.48	6.33	6.59	1.64	0.695	6.08	2.17	3.59	**3.71**	2.1	57
BDE 100	3.47	8.57	3.85	5.11	4.88	1.83	<LOQ	5.53	1.72	3.08	**3.80**	2.4	63
BDE 101	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 116	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 119	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 138	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 139	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 153	1.16	1.89	<LOQ	1.60	2.25	<LOQ	<LOQ	1.68	<LOQ	1.02	**1.04**	0.80	77
BDE 154	0.629	0.956	0.789	0.919	1.70	<LOQ	<LOQ	0.791	<LOQ	0.615	**0.692**	0.47	68
BDE 155	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 156	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 173+190	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 181	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 182	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 183	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 185	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 191	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 196	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 198	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 203	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 204+197	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 8	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 18	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 28+31	1.85	2.96	1.72	1.85	2.57	1.73	1.43	2.53	1.39	3.36	**2.14**	0.67	31
PCB 29	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 44	0.0346	<LOD	<LOD	0.0253	0.0650	<LOD	<LOD	<LOD	<LOD	<LOD	**0.0152**	0.021	140
PCB 45	<LOQ	<LOQ	0.0137	0.0191	0.0140	0.0201	<LOQ	0.00951	<LOQ	0.0712	**0.0157**	0.021	130
PCB 49	0.0709	0.0761	0.0118	0.115	0.811	0.0570	<LOD	0.0683	0.0300	0.0670	**0.131**	0.24	180
PCB 52	0.206	0.194	0.0579	0.250	0.818	0.0775	<LOD	0.141	0.0877	0.142	**0.199**	0.23	120
PCB 56	<LOD	0.0231	0.0165	<LOD	<LOD	<LOD	0.0172	<LOD	<LOD	<LOD	**0.0119**	0.0060	50
PCB 63	<LOQ	0.827	<LOQ	<LOQ	0.572	0.603	<LOQ	0.589	<LOQ	0.572	**0.492**	0.21	42
PCB 66	2.36	4.65	1.91	2.74	3.02	2.10	1.61	3.24	1.75	4.32	**2.77**	1.1	38
PCB 70	0.0668	0.0900	<LOD	0.134	0.425	<LOD	<LOD	0.0698	0.0416	0.0242	**0.0862**	0.13	150
PCB 74	1.84	3.58	1.68	2.14	2.48	1.84	1.43	2.55	1.33	3.39	**2.22**	0.77	35
PCB 79	<LOQ	<LOQ	<LOQ	0.0274	<LOQ	<LOQ	<LOQ	0.0294	<LOQ	<LOQ	**0.0161**	0.0088	54
PCB 82	<LOD	<LOD	0.0226	<LOD	0.120	0.0243	<LOD	<LOD	<LOD	0.0120	**0.0216**	0.035	160
PCB 87	0.0368	0.0856	0.0205	0.0844	0.397	0.0952	0.0231	0.0514	0.0299	0.0769	**0.0900**	0.11	120
PCB 92	0.0491	0.0679	0.0292	0.105	0.377	0.0223	<LOQ	0.0717	0.0306	<LOQ	**0.0763**	0.11	140
PCB 95+121	0.0367	0.0535	0.0568	0.0910	0.539	0.0547	0.0247	0.0230	0.0443	0.0205	**0.0944**	0.16	170
PCB 99	8.40	15.1	3.66	8.64	11.2	2.45	2.44	10.5	5.01	11.4	**7.89**	4.3	55
PCB 101	0.239	0.316	0.0676	0.452	6.01	0.155	<LOQ	0.235	0.174	0.330	**0.800**	1.8	230
PCB 105	3.72	6.61	2.97	3.66	3.54	4.15	2.40	5.09	2.35	4.53	**3.90**	1.3	33

Appendix 17 (continued). PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at St. Lazaria Island in 2003.

Compound	297	298	299	300	301	302	303	304	305	306	Mean	SD	RSD
PCB 106	0.0770	0.00721	0.0717	0.0154	0.134	0.0248	0.0420	0.0263	0.113	0.0683	**0.0580**	0.042	73
PCB 107	0.732	1.31	0.611	0.694	0.891	0.865	0.603	1.12	0.373	0.954	**0.816**	0.27	33
PCB 110	0.0624	0.0547	0.121	0.108	1.35	0.185	0.0371	0.0462	0.0381	0.0706	**0.207**	0.40	200
PCB 112	0.0128	<LOD	0.00712	0.00775	0.0101	<LOD	<LOD	0.00661	0.00663	0.0126	**0.00731**	0.0037	50
PCB 114	0.367	0.635	0.329	0.378	0.402	0.494	0.260	0.457	0.230	0.457	**0.401**	0.12	29
PCB 118	12.8	21.5	8.68	12.7	13.6	8.92	6.99	16.3	7.46	15.4	**12.4**	4.6	37
PCB 119	0.201	0.345	0.216	0.243	0.299	0.148	0.0401	0.280	0.115	0.263	**0.215**	0.092	43
PCB 127	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 128	1.88	3.47	2.11	2.46	2.67	1.90	0.964	2.61	0.904	2.37	**2.13**	0.78	37
PCB 130	0.933	1.72	1.23	1.20	1.61	1.02	0.589	1.25	0.394	1.12	**1.11**	0.41	37
PCB 137	0.494	0.926	0.211	0.639	0.966	0.193	0.112	0.633	0.239	0.645	**0.506**	0.31	61
PCB 138	16.0	24.9	4.69	18.8	19.3	3.93	4.87	22.3	7.83	18.0	**14.1**	7.9	56
PCB 146	7.81	11.2	4.57	7.38	6.82	3.76	3.11	10.1	4.06	7.76	**6.66**	2.7	41
PCB 149	0.415	0.631	0.721	0.601	3.62	0.709	0.138	0.488	0.339	0.562	**0.822**	1.0	120
PCB 151	0.0806	0.0920	0.191	0.0817	0.261	0.0812	0.0335	0.0598	0.0396	0.0556	**0.0975**	0.072	74
PCB 153+132	37.6	54.5	19.3	40.3	42.3	13.5	9.50	50.2	17.9	40.0	**32.5**	16	49
PCB 154	0.0668	0.130	0.152	0.125	0.519	0.0769	0.0393	0.0861	0.0675	0.119	**0.138**	0.14	100
PCB 156	1.77	2.51	1.22	1.67	1.32	1.29	0.767	2.58	1.03	1.67	**1.58**	0.59	37
PCB 157	0.345	0.548	0.286	0.345	0.296	0.383	0.198	0.470	0.209	0.380	**0.346**	0.11	31
PCB 158	0.843	1.31	1.16	1.45	1.46	0.723	0.345	1.28	0.360	1.03	**0.996**	0.42	42
PCB 159	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 163	7.28	10.2	6.51	7.61	6.68	5.53	3.74	10.1	3.40	7.18	**6.82**	2.3	33
PCB 165	0.0911	0.114	0.0647	0.0804	0.0767	0.0550	0.0262	0.0940	0.0251	0.0679	**0.0695**	0.029	41
PCB 166	0.0957	0.145	0.0762	0.0817	0.0990	0.0996	0.0580	0.128	0.0675	0.104	**0.0954**	0.027	28
PCB 167	1.14	1.47	0.613	1.03	1.02	0.531	0.392	1.52	0.616	1.07	**0.941**	0.39	41
PCB 170	7.40	7.41	5.13	7.03	5.47	3.36	2.14	11.1	3.18	5.83	**5.80**	2.6	45
PCB 172	2.09	2.17	1.25	1.70	1.26	1.00	0.668	2.79	1.05	1.62	**1.56**	0.65	41
PCB 174	0.0774	0.112	0.102	0.101	0.914	0.110	0.0370	0.101	0.0393	0.0854	**0.168**	0.26	160
PCB 175	0.371	0.430	0.322	0.384	0.472	0.222	0.135	0.547	0.177	0.312	**0.337**	0.13	39
PCB 176	0.00646	0.0102	0.0107	0.0105	0.0967	0.0162	<LOD	0.00994	0.00804	0.00907	**0.0178**	0.028	160
PCB 177	1.08	1.70	2.95	1.95	3.45	1.00	0.700	1.56	0.513	1.25	**1.62**	0.95	59
PCB 178	1.34	1.76	1.19	1.65	1.74	0.961	0.647	1.84	0.568	1.14	**1.29**	0.46	36
PCB 180+193	15.5	17.5	7.59	16.5	15.0	4.59	2.87	22.7	6.34	13.1	**12.2**	6.5	53
PCB 183	4.16	4.35	3.09	3.71	4.49	2.01	1.13	5.86	2.14	3.34	**3.43**	1.4	41
PCB 185	0.0723	0.0733	<LOD	0.124	0.236	<LOD	<LOD	0.0936	0.0398	0.0690	**0.0714**	0.071	100
PCB 187	14.9	19.5	12.3	14.9	13.2	8.42	6.20	20.3	6.33	13.1	**12.9**	4.9	38
PCB 188	0.0370	0.0608	0.0291	0.0333	0.0348	0.0412	0.0235	0.0497	0.0309	0.0369	**0.0377**	0.011	28
PCB 189	0.380	0.341	0.244	0.302	0.216	0.169	0.108	0.474	0.208	0.271	**0.271**	0.11	40
PCB 191	0.0948	0.122	0.150	0.147	0.217	0.0648	0.0287	0.167	0.0341	0.0920	**0.112**	0.060	54
PCB 194	3.73	3.58	2.03	2.88	2.09	1.21	0.932	4.96	1.85	2.58	**2.58**	1.2	48
PCB 195	1.24	1.20	0.676	1.00	0.690	0.404	0.314	1.85	0.638	0.862	**0.887**	0.46	51
PCB 196	3.65	4.03	2.13	3.02	2.67	1.21	0.872	5.07	1.67	2.65	**2.70**	1.3	48
PCB 197	0.245	0.281	0.174	0.210	0.205	0.110	0.0605	0.322	0.139	0.190	**0.194**	0.078	40
PCB 199	18.1	21.1	10.4	14.7	10.6	7.13	5.45	25.0	9.12	13.9	**13.5**	6.3	46
PCB 200	<LOD	<LOD	<LOD	<LOD	0.00154	<LOD	<LOD	<LOD	<LOD	<LOD	**0.000829**	0.00049	59
PCB 201	4.34	5.26	2.88	3.69	3.13	1.97	1.44	6.33	2.18	3.28	**3.45**	1.5	44
PCB 202	0.0653	0.0869	0.240	0.0969	0.579	0.0890	0.0672	0.0756	0.0810	0.0830	**0.146**	0.16	110
PCB 205	0.155	0.157	0.108	0.147	0.107	0.0846	0.0485	0.243	0.0947	0.126	**0.127**	0.053	42
PCB 206	1.11	1.41	0.614	0.856	0.742	0.408	0.282	1.37	0.653	0.803	**0.825**	0.38	46
PCB 207	0.220	0.260	0.137	0.174	0.163	0.120	0.0605	0.226	0.122	0.167	**0.165**	0.059	36
PCB 208	0.628	0.794	0.351	0.376	0.401	0.223	0.198	0.681	0.354	0.351	**0.436**	0.20	45
PCB 209	0.685	0.877	0.406	0.581	0.521	0.337	0.204	0.802	0.431	0.564	**0.541**	0.21	38

Appendix 18. PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at Middleton Island in 2003.

Compound	308	311	312	314	315	317	318	319	320	321	Mean	SD	RSD
BDE 17	0.167	<LOD	0.194	<LOD	0.538	0.333	<LOD	<LOD	0.609	<LOD	**0.225**	0.20	91
BDE 25	0.0992	<LOD	0.247	0.121	0.190	0.596	<LOD	0.115	0.189	<LOD	**0.171**	0.17	97
BDE 28	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 30	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 47	2.35	1.36	0.252	1.11	1.14	1.26	1.46	2.26	0.471	1.16	**1.28**	0.66	51
BDE 49	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 66	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 71	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 74	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 75	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 85	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 97+118	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 99	0.767	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**0.352**	0.22	64
BDE 100	0.697	0.455	<LOQ	0.427	0.565	0.428	0.412	0.811	<LOQ	0.440	**0.441**	0.23	53
BDE 101	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 116	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 119	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 138	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 139	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 153	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 154	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 155	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 156	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 173+190	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 181	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 182	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 183	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 185	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 191	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 196	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 198	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 203	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 204+197	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 8	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 18	0.0971	<LOQ	<LOQ	<LOQ	<LOQ	0.0568	<LOQ	0.0792	<LOQ	<LOQ	**0.0300**	0.035	120
PCB 28+31	2.87	2.62	1.37	1.83	2.18	2.32	2.70	2.26	2.06	1.92	**2.21**	0.45	20
PCB 29	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 44	0.0265	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	0.0258	<LOD	0.00998	**0.00817**	0.010	120
PCB 45	0.0346	0.0167	0.0134	0.0274	0.0102	0.0134	0.00953	0.0328	0.0200	<LOQ	**0.0180**	0.011	59
PCB 49	0.228	0.0434	0.0162	0.0729	0.0582	0.0822	0.0463	0.137	0.0375	0.0700	**0.0792**	0.062	78
PCB 52	0.336	0.0802	0.0156	0.111	0.120	0.132	0.0757	0.140	0.112	0.134	**0.126**	0.083	66
PCB 56	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 63	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 66	2.39	2.41	1.11	1.71	2.00	2.14	1.96	1.43	1.64	1.52	**1.83**	0.42	23
PCB 70	0.128	0.0546	0.0143	0.0543	0.0580	0.0280	0.0508	0.0273	0.0197	0.0718	**0.0507**	0.033	65
PCB 74	1.84	1.84	0.935	1.30	1.56	1.64	1.53	1.24	1.41	1.16	**1.45**	0.29	20
PCB 79	0.0295	<LOQ	<LOQ	<LOQ	<LOQ	0.0295	<LOQ	<LOQ	0.0307	<LOQ	**0.0120**	0.013	110
PCB 82	<LOD	<LOD	0.0105	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**0.00670**	0.0032	48
PCB 87	0.0565	0.0287	0.0265	0.0520	0.0330	0.0257	0.0285	0.0493	0.0407	0.0547	**0.0396**	0.013	32
PCB 92	0.0617	0.0171	0.0112	0.0249	0.0307	<LOQ	0.0138	0.0310	0.0768	0.0165	**0.0292**	0.023	78
PCB 95+121	0.0479	0.0286	<LOD	0.0240	0.0270	<LOD	<LOD	0.0725	0.116	0.0257	**0.0358**	0.035	98
PCB 99	4.92	4.62	1.36	3.31	4.31	4.41	4.01	1.55	2.38	3.46	**3.43**	1.3	37
PCB 101	0.202	0.0819	0.0733	0.109	0.0827	0.0958	0.110	0.0497	0.150	0.151	**0.111**	0.045	41
PCB 105	1.75	1.75	0.891	1.19	1.32	1.62	1.32	1.93	1.32	1.10	**1.42**	0.33	23

Appendix 18 (continued). PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at Middleton Island in 2003.

Compound	308	311	312	314	315	317	318	319	320	321	Mean	SD	RSD
PCB 106	0.0257	0.0158	0.0155	<LOD	0.0483	0.0260	0.0468	0.0557	0.0173	0.0376	**0.0289**	0.018	61
PCB 107	0.349	0.479	0.180	0.203	0.338	0.335	0.308	0.497	0.295	0.278	**0.326**	0.10	31
PCB 110	0.110	0.0480	0.0483	0.0497	0.0479	0.0504	0.0388	0.0872	0.0734	0.0610	**0.0615**	0.022	36
PCB 112	0.0136	0.00726	0.00645	0.00734	<LOD	0.00837	<LOD	0.00890	0.00866	<LOD	**0.00703**	0.0035	49
PCB 114	0.205	0.234	0.102	0.135	0.183	0.206	0.170	0.234	0.145	0.125	**0.174**	0.046	27
PCB 118	6.24	6.23	2.86	4.43	4.90	5.70	4.77	4.62	4.31	4.21	**4.83**	1.0	21
PCB 119	0.123	0.0964	0.0230	0.0720	0.0824	0.0907	0.0971	0.105	0.0384	0.0787	**0.0806**	0.030	37
PCB 127	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	0.0145	<LOD	**0.00524**	0.0041	78
PCB 128	0.848	0.662	0.355	0.502	0.582	0.579	0.524	0.970	0.539	0.474	**0.603**	0.18	30
PCB 130	0.452	0.366	0.204	0.267	0.316	0.303	0.245	0.546	0.416	0.302	**0.342**	0.10	30
PCB 137	0.289	0.248	0.0605	0.190	0.210	0.225	0.199	0.0755	0.116	0.202	**0.182**	0.074	41
PCB 138	6.12	5.30	1.87	3.93	4.72	4.83	4.02	1.48	3.05	3.98	**3.93**	1.5	37
PCB 146	2.60	2.60	1.14	1.87	2.20	2.24	1.87	2.07	1.71	1.66	**2.00**	0.45	22
PCB 149	0.213	0.133	0.0649	0.116	0.130	0.122	0.125	<LOD	0.360	0.144	**0.141**	0.093	66
PCB 151	0.0299	0.0312	0.0298	0.0291	0.0430	<LOQ	0.0263	0.0294	0.133	0.0295	**0.0386**	0.035	90
PCB 153+132	13.3	12.2	3.66	9.10	10.9	10.3	9.05	6.86	6.37	8.83	**9.06**	2.9	32
PCB 154	0.0568	0.0374	0.0223	0.0306	0.0422	0.0274	0.0344	0.0449	0.0720	0.0372	**0.0405**	0.015	36
PCB 156	0.480	0.507	0.251	0.330	0.360	0.407	0.329	0.581	0.345	0.275	**0.387**	0.11	27
PCB 157	0.125	0.132	0.0623	0.0787	0.0872	0.107	0.0878	0.149	0.127	0.0659	**0.102**	0.030	29
PCB 158	0.328	0.282	0.159	0.241	0.244	0.216	0.179	0.288	0.199	0.187	**0.232**	0.054	23
PCB 159	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 163	2.33	2.18	1.35	1.60	1.86	1.89	1.59	3.16	1.94	1.51	**1.94**	0.52	27
PCB 165	0.0313	0.0272	0.0174	0.0163	0.0246	0.0193	0.0163	0.0403	0.0298	0.0151	**0.0237**	0.0083	35
PCB 166	0.0356	0.0446	0.0303	0.0283	0.0436	0.0384	0.0199	0.0477	0.0518	0.0216	**0.0362**	0.011	30
PCB 167	0.360	0.363	0.154	0.256	0.303	0.324	0.257	0.246	0.206	0.221	**0.269**	0.068	25
PCB 170	1.11	0.998	0.549	0.704	1.01	0.817	0.685	1.49	0.813	0.599	**0.878**	0.28	32
PCB 172	0.368	0.406	0.225	0.297	0.355	0.334	0.265	0.502	0.301	0.230	**0.328**	0.085	26
PCB 174	0.0268	0.0259	0.0216	0.0156	0.0291	0.0208	0.0192	0.0255	0.0763	0.00902	**0.0270**	0.018	68
PCB 175	0.0776	0.0845	<LOQ	<LOQ	0.0826	<LOQ	<LOQ	0.122	0.0914	<LOQ	**0.0695**	0.029	42
PCB 176	<LOD	0.00498	<LOD	<LOD	0.00549	<LOD	<LOD	<LOD	0.0256	0.00301	**0.00481**	0.0075	160
PCB 177	0.322	0.167	0.178	0.159	0.209	0.160	0.144	0.482	0.293	0.174	**0.229**	0.11	47
PCB 178	0.367	0.281	0.230	0.223	0.269	0.236	0.260	0.656	0.308	0.187	**0.302**	0.13	44
PCB 180+193	2.89	2.60	0.776	1.97	2.38	2.12	1.70	1.93	1.55	1.73	**1.97**	0.59	30
PCB 183	0.735	0.681	0.320	0.495	0.748	0.598	0.503	0.973	0.522	0.448	**0.602**	0.19	31
PCB 185	0.0142	0.0160	<LOD	0.0107	0.0172	0.0133	0.00910	<LOD	0.0215	0.0109	**0.0120**	0.0058	48
PCB 187	3.68	3.27	2.00	2.47	3.22	2.81	2.20	4.99	3.15	2.14	**2.99**	0.90	30
PCB 188	0.0165	0.0245	0.0121	0.0140	0.0237	0.0154	0.0156	0.0203	0.0297	0.0141	**0.0186**	0.0057	31
PCB 189	0.0578	0.0657	0.0345	0.0439	0.0514	0.0384	0.0322	0.0794	0.0538	0.0318	**0.0489**	0.016	32
PCB 191	0.0164	0.0108	0.00924	0.00736	0.0168	0.0106	0.0115	0.0187	0.0230	0.00695	**0.0131**	0.0053	40
PCB 194	0.436	0.465	0.245	0.337	0.422	0.307	0.276	0.672	0.366	0.212	**0.374**	0.13	36
PCB 195	0.168	0.141	0.191	0.103	0.126	0.128	0.0750	0.186	0.109	0.142	**0.137**	0.037	27
PCB 196	0.486	0.538	0.245	0.372	0.508	0.380	0.291	0.697	0.456	0.268	**0.424**	0.14	33
PCB 197	0.0514	0.0523	0.0182	0.0328	0.0536	0.0411	0.0330	0.0792	0.0551	0.0300	**0.0447**	0.017	39
PCB 199	2.88	3.16	1.68	2.17	2.87	2.24	1.66	4.40	2.60	1.48	**2.52**	0.88	35
PCB 200	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 201	0.855	0.853	0.534	0.638	0.845	0.667	0.576	1.37	0.872	0.499	**0.771**	0.25	33
PCB 202	0.0360	0.0278	0.0312	0.0246	0.0360	0.0242	0.0233	0.0446	0.130	0.0238	**0.0401**	0.032	80
PCB 205	0.0323	0.0356	0.0277	0.0231	0.0386	0.0344	0.0258	0.0374	0.0378	0.0237	**0.0316**	0.0061	19
PCB 206	0.174	0.206	0.0989	0.144	0.145	0.120	0.0851	0.276	0.209	0.0909	**0.155**	0.062	40
PCB 207	0.0571	0.0633	0.0247	0.0429	0.0590	0.0536	0.0344	0.0897	0.0448	0.0356	**0.0505**	0.018	37
PCB 208	0.0810	0.109	<LOQ	0.0657	0.0748	0.0794	0.0588	0.199	0.187	<LOQ	**0.0909**	0.060	66
PCB 209	0.177	0.208	0.0885	0.142	0.0926	0.143	0.0710	0.274	0.167	0.0878	**0.145**	0.064	44

Appendix 19. PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at East Amatuli Island in 2003.

Compound	322	324	325	327	330	331	332	333	335	336	Mean	SD	RSD
BDE 17	0.911	<LOD	0.215	<LOD	<LOD	0.737	<LOD	0.282	<LOD	0.240	**0.263**	0.31	120
BDE 25	0.622	0.210	<LOD	<LOD	<LOD	0.147	0.112	0.0865	0.0872	<LOD	**0.139**	0.18	130
BDE 28	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 30	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 47	2.07	0.788	1.09	1.05	1.59	0.798	0.925	0.839	1.11	1.06	**1.13**	0.40	36
BDE 49	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 66	0.112	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**0.0593**	0.031	53
BDE 71	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 74	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 75	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 85	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 97+118	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 99	1.08	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**0.336**	0.32	95
BDE 100	0.793	0.474	0.426	0.474	0.373	0.370	0.429	0.364	0.489	0.334	**0.453**	0.13	29
BDE 101	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 116	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 119	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 138	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 139	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 153	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 154	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 155	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 156	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 173+190	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 181	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 182	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 183	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 185	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 191	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 196	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 198	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 203	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 204+197	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 8	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 18	<LOQ	0.0331	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**0.0156**	0.0079	51
PCB 28+31	2.56	1.36	1.42	1.62	1.92	1.98	1.41	1.95	1.43	1.32	**1.70**	0.40	23
PCB 29	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 44	0.0473	<LOD	0.0141	<LOD	<LOD	<LOD	0.00947	<LOD	<LOD	0.00838	**0.00898**	0.014	160
PCB 45	0.00754	0.0102	0.00723	0.0123	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**0.00553**	0.0037	68
PCB 49	0.582	0.0298	0.0385	0.0282	0.0387	0.0435	0.0403	0.0488	0.0303	0.0194	**0.0900**	0.17	190
PCB 52	0.437	0.0161	0.0853	0.0560	0.0743	0.0717	0.0760	0.0686	0.0663	0.0443	**0.0996**	0.12	120
PCB 56	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 63	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 66	2.23	0.982	1.30	2.00	1.82	1.68	1.20	1.93	1.45	1.12	**1.57**	0.42	27
PCB 70	0.289	0.0101	0.0389	0.0319	0.0384	0.0364	0.0439	0.0222	0.0361	0.0249	**0.0571**	0.082	140
PCB 74	1.74	0.845	1.02	1.41	1.38	1.29	0.911	1.27	1.07	0.836	**1.18**	0.29	25
PCB 79	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 82	0.0703	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**0.0102**	0.021	210
PCB 87	0.123	0.0622	0.0231	0.0258	0.0453	0.0365	0.0440	0.0340	0.0363	0.0207	**0.0451**	0.030	67
PCB 92	0.0927	<LOQ	0.0188	0.0127	<LOQ	0.0135	0.0180	0.0117	0.0184	<LOQ	**0.0195**	0.027	140
PCB 95+121	0.158	<LOD	<LOD	<LOD	0.0221	<LOD	<LOD	<LOD	<LOD	<LOD	**0.0260**	0.047	180
PCB 99	5.25	0.921	3.30	3.52	3.49	3.29	2.93	3.36	3.18	2.52	**3.18**	1.1	33
PCB 101	1.98	<LOQ	0.0709	0.0752	0.0561	0.0616	0.0624	0.0397	0.0572	0.0319	**0.245**	0.61	250
PCB 105	1.40	1.19	0.978	1.61	1.42	1.13	0.924	1.49	1.22	0.893	**1.23**	0.25	20

Appendix 19 (continued). PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at East Amatuli Island in 2003.

Compound	322	324	325	327	330	331	332	333	335	336	Mean	SD	RSD
PCB 106	0.0154	0.00650	0.0103	0.00552	0.0207	0.00468	0.00800	0.0146	0.0119	0.00940	**0.0107**	0.0050	47
PCB 107	0.495	0.342	0.220	0.223	0.311	0.232	0.191	0.254	0.199	0.193	**0.266**	0.095	36
PCB 110	0.236	0.0462	0.0377	0.0373	0.0457	0.0376	0.0432	0.0397	0.0343	0.0369	**0.0595**	0.062	100
PCB 112	<LOD	<LOD	0.00655	<LOD	0.00702	<LOD	<LOD	<LOD	<LOD	<LOD	**0.00416**	0.0018	42
PCB 114	0.172	0.141	0.112	0.185	0.156	0.148	0.114	0.172	0.126	0.108	**0.143**	0.028	19
PCB 118	5.77	2.72	3.81	5.19	4.83	3.86	3.27	4.56	4.13	2.96	**4.11**	0.99	24
PCB 119	0.134	0.0758	0.0693	0.0582	0.0748	0.0627	0.0588	0.0553	0.0660	0.0499	**0.0705**	0.024	34
PCB 127	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 128	0.962	0.730	0.469	0.518	0.507	0.441	0.401	0.388	0.475	0.319	**0.521**	0.19	36
PCB 130	0.576	0.518	0.283	0.269	0.217	0.211	0.196	0.206	0.222	0.136	**0.283**	0.15	51
PCB 137	0.450	0.0503	0.191	0.167	0.176	0.154	0.148	0.133	0.157	0.0921	**0.172**	0.11	62
PCB 138	6.81	0.883	3.82	4.41	4.01	3.55	3.24	3.38	4.19	2.63	**3.69**	1.5	40
PCB 146	2.44	1.32	1.78	2.24	1.94	1.67	1.49	1.94	2.09	1.32	**1.82**	0.38	21
PCB 149	0.749	0.139	0.0904	0.0791	0.0940	0.0691	0.0691	0.0715	0.0727	0.0505	**0.148**	0.21	140
PCB 151	0.726	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.0251	<LOQ	**0.0858**	0.23	260
PCB 153+132	14.7	4.18	9.14	10.0	8.96	7.95	7.33	8.01	9.89	6.01	**8.62**	2.8	32
PCB 154	0.214	0.0407	0.0334	0.0224	0.0222	0.0247	0.0267	0.0190	0.0269	0.0177	**0.0448**	0.060	130
PCB 156	0.366	0.323	0.298	0.490	0.405	0.318	0.266	0.395	0.425	0.236	**0.352**	0.078	22
PCB 157	0.0951	0.0863	0.0775	0.124	0.118	0.0982	0.0765	0.0977	0.0909	0.0660	**0.0929**	0.018	19
PCB 158	0.460	0.317	0.196	0.137	0.148	0.173	0.147	0.176	0.238	0.143	**0.214**	0.10	48
PCB 159	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 163	2.29	2.43	1.52	1.84	1.58	1.41	1.28	1.49	1.74	1.12	**1.67**	0.42	25
PCB 165	0.0172	0.0253	0.0162	0.0207	0.0213	0.0155	0.0134	0.0184	0.0213	0.0210	**0.0190**	0.0035	19
PCB 166	0.0356	0.0342	0.0239	0.0357	0.0294	0.0236	0.0239	0.0428	0.0317	0.0217	**0.0302**	0.0069	23
PCB 167	0.349	0.149	0.235	0.323	0.294	0.215	0.205	0.291	0.261	0.190	**0.251**	0.063	25
PCB 170	1.05	1.13	0.779	1.03	0.761	0.735	0.678	0.812	1.16	0.640	**0.877**	0.19	22
PCB 172	0.305	0.344	0.277	0.398	0.300	0.279	0.248	0.344	0.401	0.221	**0.312**	0.060	19
PCB 174	0.220	0.0318	0.0237	0.0233	0.0254	0.0170	0.0176	0.0281	0.0202	0.0246	**0.0432**	0.062	140
PCB 175	0.137	0.0867	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.0723	<LOQ	**0.0526**	0.039	75
PCB 176	0.0167	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**0.00279**	0.0049	180
PCB 177	0.878	0.726	0.179	0.127	0.119	0.139	0.157	0.0919	0.135	0.0993	**0.265**	0.29	110
PCB 178	0.544	0.480	0.243	0.241	0.251	0.209	0.205	0.207	0.291	0.193	**0.286**	0.12	43
PCB 180+193	3.35	1.25	2.02	2.24	1.78	1.68	1.68	1.72	2.62	1.32	**1.97**	0.63	32
PCB 183	1.12	0.743	0.573	0.711	0.523	0.510	0.492	0.663	0.762	0.462	**0.656**	0.20	30
PCB 185	0.0681	<LOD	0.0173	0.00755	0.00906	0.00644	0.0114	<LOD	<LOD	<LOD	**0.0130**	0.020	150
PCB 187	3.92	4.00	2.55	2.90	2.34	2.21	2.07	2.38	3.14	1.83	**2.73**	0.75	27
PCB 188	0.0145	0.0205	0.0156	0.0182	0.0184	0.0133	0.0131	0.0204	0.0169	0.0137	**0.0164**	0.0028	17
PCB 189	0.0441	0.0459	0.0379	0.0547	0.0438	0.0350	0.0347	0.0471	0.0583	0.0301	**0.0432**	0.0090	21
PCB 191	0.0425	0.0226	0.0115	<LOD	0.00816	0.0106	0.0141	0.00510	0.0129	<LOD	**0.0132**	0.012	91
PCB 194	0.321	0.403	0.315	0.436	0.309	0.311	0.289	0.402	0.608	0.248	**0.364**	0.10	28
PCB 195	0.296	0.137	0.0841	0.195	0.105	0.122	0.0860	0.128	0.257	0.0926	**0.150**	0.075	50
PCB 196	0.496	0.460	0.356	0.483	0.342	0.357	0.321	0.432	0.622	0.291	**0.416**	0.10	24
PCB 197	0.0484	0.0574	0.0375	0.0379	0.0383	0.0313	0.0238	0.0345	0.0527	0.0262	**0.0388**	0.011	28
PCB 199	2.39	2.81	2.05	2.97	2.14	2.00	1.89	2.66	3.63	1.83	**2.44**	0.58	24
PCB 200	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 201	0.854	0.969	0.635	0.790	0.633	0.582	0.582	0.676	0.921	0.576	**0.722**	0.15	21
PCB 202	0.162	0.0800	0.0305	0.0211	0.0224	0.0204	0.0249	0.0223	0.0220	0.0277	**0.0434**	0.045	110
PCB 205	0.0285	0.0305	0.0260	0.0322	0.0262	0.0248	0.0221	0.0308	0.0331	0.0216	**0.0276**	0.0041	15
PCB 206	0.131	0.135	0.105	0.178	0.124	0.111	0.109	0.146	0.228	0.0837	**0.135**	0.042	31
PCB 207	0.0427	0.0488	0.0350	0.0495	0.0391	0.0335	0.0298	0.0495	0.0647	0.0372	**0.0430**	0.010	24
PCB 208	0.0557	0.0962	<LOQ	0.0964	0.0857	0.0474	<LOQ	0.0751	0.134	0.0961	**0.0695**	0.042	60
PCB 209	0.119	0.0924	0.0861	0.152	0.117	0.0916	0.0697	0.158	0.195	0.0639	**0.114**	0.042	37

Appendix 20. PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at St. Lazaria and Duck islands in 2004.

Compound	464	465	466	467	468	469	470	471	Mean	SD	RSD	489	490	491	492	Mean	SD	RSD
BDE 17	<LOD	<LOD	0.226	<LOD	<LOD	<LOD	<LOD	<LOD	**0.0945**	0.067	71	0.263	<LOD	<LOD	<LOD	**0.122**	0.11	88
BDE 25	<LOD	0.138	<LOD	<LOD	0.0905	<LOD	<LOD	<LOD	**0.0698**	0.037	53	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 28	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 30	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 47	5.15	11.6	1.84	14.1	10.3	11.0	2.79	3.14	**7.49**	4.8	64	6.60	5.02	3.94	3.38	**4.74**	1.4	30
BDE 49	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 66	<LOD	0.159	<LOD	0.126	0.101	0.124	0.120	<LOD	**0.0876**	0.056	64	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 71	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 74	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 75	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 85	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 97+118	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 99	1.72	2.61	<LOQ	1.42	1.65	2.70	1.64	0.581	**1.60**	0.81	51	0.885	0.790	<LOQ	0.817	**0.706**	0.25	36
BDE 100	1.90	2.91	<LOQ	2.64	2.21	4.79	0.513	1.15	**2.05**	1.5	71	1.72	1.77	1.09	1.47	**1.51**	0.31	21
BDE 101	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 116	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 119	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 138	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 139	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 153	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 154	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.605	<LOQ	<LOQ	**0.255**	0.24	95	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 155	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 156	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 173+190	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 181	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 182	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 183	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 185	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 191	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 196	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 198	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 203	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 204+197	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 8	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 18	<LOQ	<LOQ	<LOQ	0.0703	<LOQ	<LOQ	<LOQ	<LOQ	**0.0247**	0.020	80	<LOQ	0.136	<LOQ	<LOQ	**0.0461**	0.061	130
PCB 28+31	1.65	1.58	1.42	1.94	1.74	1.52	1.12	0.741	**1.47**	0.38	26	1.56	1.35	1.44	1.18	**1.38**	0.16	12
PCB 29	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 44	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	0.0113	<LOD	**0.00576**	0.0044	76
PCB 45	<LOQ	<LOQ	0.321	0.271	0.0491	0.248	0.0632	<LOQ	**0.120**	0.14	110	<LOQ	<LOQ	0.00621	<LOQ	**0.00270**	0.0023	87
PCB 49	0.0400	0.0663	<LOD	0.0601	0.0496	<LOD	<LOD	0.0137	**0.0317**	0.025	80	0.0186	0.0482	0.0195	0.0235	**0.0275**	0.014	51
PCB 52	0.0949	0.127	<LOD	0.117	0.110	0.0200	0.0417	0.0252	**0.0679**	0.049	72	0.0649	0.111	0.0532	0.0606	**0.0723**	0.026	36
PCB 56	0.0189	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**0.00646**	0.0063	98	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 63	0.588	<LOQ	<LOQ	<LOQ	<LOQ	0.562	<LOQ	<LOQ	**0.386**	0.18	46	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 66	2.30	2.63	1.79	2.28	2.33	1.76	1.75	0.777	**1.95**	0.57	29	1.47	1.24	1.51	1.19	**1.35**	0.16	12
PCB 70	0.0491	0.0547	0.00736	0.0554	0.0526	0.00760	0.0115	0.00891	**0.0309**	0.024	77	0.0244	0.0504	0.0130	0.0278	**0.0289**	0.016	54
PCB 74	1.78	2.03	1.71	1.84	1.85	1.57	1.64	0.706	**1.64**	0.40	25	1.17	1.09	1.16	0.981	**1.10**	0.088	8.0
PCB 79	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 82	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 87	0.0959	0.130	0.0779	0.112	0.0644	0.0722	0.0928	0.0547	**0.0874**	0.025	29	0.0783	0.0818	0.0355	0.0345	**0.0575**	0.026	45
PCB 92	0.0256	0.0471	0.0160	0.0508	0.0299	0.0363	0.0436	<LOQ	**0.0315**	0.017	53	0.0239	0.0344	0.0224	0.0163	**0.0243**	0.0075	31
PCB 95+121	0.0309	0.0302	0.0209	0.0369	<LOD	0.0364	0.0498	<LOD	**0.0284**	0.014	48	0.0255	<LOD	0.0351	0.0197	**0.0248**	0.0075	30
PCB 99	5.00	9.06	3.19	7.60	6.09	2.17	3.00	0.958	**4.64**	2.8	60	4.37	4.41	3.72	3.29	**3.95**	0.54	14
PCB 101	0.152	0.191	<LOQ	0.198	0.109	0.0832	0.0801	0.0328	**0.108**	0.068	63	0.116	0.146	0.0600	0.0933	**0.104**	0.036	35
PCB 105	2.86	3.95	3.82	3.13	2.66	4.77	3.18	2.27	**3.33**	0.80	24	1.52	1.25	1.65	1.14	**1.39**	0.23	17

Appendix 20 (continued). PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at St. Lazaria and Duck islands in 2004.

Compound	464	465	466	467	468	469	470	471	Mean	SD	RSD	489	490	491	492	Mean	SD	RSD
PCB 106	0.0120	0.0545	0.0596	0.0863	0.0212	0.0440	0.0357	0.0306	**0.0430**	0.024	55	0.00819	0.0122	0.0395	0.0243	**0.0210**	0.014	67
PCB 107	0.634	0.615	0.917	0.755	0.621	0.938	0.538	0.390	**0.676**	0.19	28	0.292	0.276	0.296	0.284	**0.287**	0.0085	3.0
PCB 110	0.0374	0.0580	0.0398	0.0529	0.0475	0.0700	0.0712	0.0413	**0.0523**	0.013	25	0.0449	0.0475	0.0405	0.0428	**0.0439**	0.0030	6.8
PCB 112	0.0103	0.00791	<LOD	<LOD	0.00912	<LOD	0.00711	<LOD	**0.00634**	0.0030	48	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 114	0.266	0.388	0.378	0.298	0.257	0.439	0.295	0.237	**0.320**	0.073	23	0.156	0.144	0.186	0.131	**0.154**	0.023	15
PCB 118	9.13	12.7	11.0	10.4	8.71	9.62	9.20	4.19	**9.38**	2.5	26	4.87	4.70	4.89	3.80	**4.56**	0.52	11
PCB 119	0.136	0.198	0.0510	0.167	0.143	0.174	0.0510	0.0593	**0.122**	0.060	49	0.0893	0.0933	0.0637	0.0671	**0.0783**	0.015	19
PCB 127	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 128	1.39	1.92	1.85	1.57	1.37	2.89	1.79	0.858	**1.71**	0.59	35	0.691	0.770	0.556	0.576	**0.648**	0.10	16
PCB 130	0.695	0.894	1.11	0.704	0.637	1.49	1.37	0.418	**0.914**	0.38	41	0.355	0.402	0.209	0.279	**0.311**	0.085	27
PCB 137	0.353	0.507	0.151	0.429	0.363	0.152	0.161	0.0646	**0.273**	0.16	59	0.228	0.263	0.151	0.190	**0.208**	0.048	23
PCB 138	10.7	14.7	9.12	12.0	10.3	4.25	7.56	1.52	**8.77**	4.2	48	5.39	5.99	4.57	4.56	**5.13**	0.69	14
PCB 146	4.57	6.87	6.73	5.43	4.42	6.33	4.98	2.53	**5.23**	1.4	28	2.47	2.77	2.43	2.14	**2.45**	0.26	10
PCB 149	0.240	0.362	0.218	0.337	0.250	0.605	0.363	0.178	**0.319**	0.13	42	0.212	0.254	0.161	0.206	**0.208**	0.038	18
PCB 151	0.0487	0.0717	0.0456	0.0340	<LOQ	0.0571	0.195	0.0260	**0.0614**	0.057	92	<LOQ	<LOQ	0.0346	<LOQ	**0.0207**	0.0095	46
PCB 153+132	23.9	32.7	18.7	27.6	22.3	19.9	14.8	7.36	**20.9**	7.8	37	12.1	14.0	10.5	10.2	**11.7**	1.7	15
PCB 154	0.0358	0.0688	0.0341	0.0620	0.0607	0.0716	0.0580	0.0275	**0.0523**	0.017	33	0.0470	0.0536	0.0257	0.0401	**0.0416**	0.012	29
PCB 156	1.01	1.40	2.05	1.16	0.972	2.69	1.45	1.08	**1.48**	0.60	41	0.458	0.433	0.541	0.405	**0.459**	0.059	13
PCB 157	0.226	0.357	0.384	0.269	0.243	0.555	0.329	0.255	**0.327**	0.11	33	0.118	0.114	0.125	0.0997	**0.114**	0.011	9.4
PCB 158	0.665	0.829	0.702	0.682	0.592	1.10	0.572	0.298	**0.680**	0.23	33	0.347	0.531	0.222	0.231	**0.333**	0.14	43
PCB 159	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 163	4.41	6.10	9.10	4.99	4.05	11.1	7.48	3.68	**6.36**	2.7	42	2.02	2.34	1.89	1.85	**2.03**	0.22	11
PCB 165	0.0362	0.0776	0.0885	0.0563	0.0428	0.0852	0.0734	0.0420	**0.0627**	0.021	33	0.0235	0.0244	0.0268	0.0207	**0.0239**	0.0025	11
PCB 166	0.0476	0.0799	0.0776	0.0617	0.0627	0.0983	0.0858	0.0564	**0.0713**	0.017	24	0.0367	0.0339	0.0457	0.0311	**0.0369**	0.0063	17
PCB 167	0.579	0.864	0.778	0.767	0.600	0.767	0.564	0.280	**0.650**	0.19	29	0.323	0.323	0.326	0.248	**0.305**	0.038	13
PCB 170	3.47	4.39	7.88	4.12	3.04	11.4	5.14	3.07	**5.31**	2.9	55	1.40	1.66	1.38	1.42	**1.47**	0.13	8.8
PCB 172	0.871	1.26	2.22	1.15	0.862	2.75	1.48	1.06	**1.46**	0.68	47	0.484	0.527	0.503	0.478	**0.498**	0.022	4.4
PCB 174	0.0473	0.0623	0.0648	0.0613	0.0400	0.136	0.0985	0.0446	**0.0694**	0.033	47	0.0180	0.0372	0.0369	0.0345	**0.0317**	0.0092	29
PCB 175	0.179	0.257	0.382	0.209	0.174	0.490	0.337	0.147	**0.272**	0.12	44	0.0966	0.111	0.0885	0.0869	**0.0956**	0.011	11
PCB 176	<LOD	0.00388	<LOD	<LOD	<LOD	0.00766	0.0107	<LOD	**0.00341**	0.0038	110	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 177	0.758	0.878	1.48	0.785	0.750	2.01	3.78	0.334	**1.35**	1.1	83	0.325	0.416	0.167	0.303	**0.303**	0.10	34
PCB 178	0.693	1.09	1.56	0.920	0.721	1.82	1.89	0.432	**1.14**	0.55	48	0.429	0.457	0.297	0.329	**0.378**	0.077	20
PCB 180+193	7.86	10.0	8.41	9.19	6.85	11.1	5.59	3.39	**7.80**	2.5	32	3.35	3.99	2.67	3.06	**3.27**	0.56	17
PCB 183	1.85	2.61	3.22	2.45	1.77	5.17	2.23	1.85	**2.64**	1.1	43	0.995	1.08	1.03	0.950	**1.01**	0.055	5.4
PCB 185	0.0421	0.0518	<LOD	0.0525	0.0502	0.00861	0.0135	<LOD	**0.0278**	0.023	84	0.0346	0.0324	0.00872	0.0334	**0.0273**	0.012	45
PCB 187	7.77	11.4	16.1	9.15	7.02	19.2	13.9	5.77	**11.3**	4.8	42	3.72	4.61	3.21	3.45	**3.75**	0.61	16
PCB 188	0.0257	0.0397	0.0343	0.0312	0.0242	0.0417	0.0320	0.0255	**0.0318**	0.0066	21	0.0236	0.0197	0.0225	0.0155	**0.0203**	0.0036	18
PCB 189	0.149	0.201	0.431	0.191	0.147	0.542	0.274	0.185	**0.265**	0.15	55	0.0630	0.0655	0.0730	0.0601	**0.0654**	0.0055	8.4
PCB 191	0.0603	0.0685	0.0624	0.0712	0.0490	0.136	0.0685	0.0218	**0.0672**	0.032	48	0.0194	0.0215	0.0104	0.0196	**0.0177**	0.0050	28
PCB 194	1.33	1.92	4.07	1.84	1.28	5.43	2.73	1.68	**2.54**	1.5	59	0.580	0.623	0.687	0.628	**0.629**	0.044	7.0
PCB 195	0.468	0.662	1.34	0.619	0.447	1.81	0.884	0.522	**0.844**	0.49	58	0.221	0.234	0.220	0.223	**0.225**	0.0064	2.8
PCB 196	1.42	2.08	2.96	1.84	1.30	4.52	2.21	1.33	**2.21**	1.1	49	0.689	0.738	0.716	0.693	**0.709**	0.023	3.2
PCB 197	0.114	0.158	0.157	0.142	0.0995	0.294	0.122	0.0947	**0.148**	0.064	43	0.0603	0.0554	0.0534	0.0535	**0.0556**	0.0032	5.8
PCB 199	6.97	11.4	18.1	9.18	6.95	23.9	13.5	8.32	**12.3**	6.0	49	3.43	3.77	3.96	3.63	**3.70**	0.22	6.0
PCB 200	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 201	1.82	3.08	3.74	2.38	1.86	5.60	3.05	1.60	**2.89**	1.3	46	1.08	1.11	0.947	0.926	**1.02**	0.093	9.2
PCB 202	0.0439	0.0546	0.0641	0.0464	0.0443	0.0882	0.450	0.0233	**0.102**	0.14	140	0.0422	0.0385	0.0357	0.0346	**0.0377**	0.0034	8.9
PCB 205	0.0747	0.0956	0.177	0.0829	0.0563	0.251	0.130	0.0674	**0.117**	0.067	57	0.0355	0.0298	0.0388	0.0339	**0.0345**	0.0037	11
PCB 206	0.430	0.681	1.17	0.557	0.414	1.63	0.870	0.537	**0.787**	0.43	54	0.157	0.147	0.208	0.167	**0.170**	0.027	16
PCB 207	0.0991	0.152	0.131	0.114	0.0907	0.253	0.113	0.101	**0.132**	0.053	40	0.0369	0.0414	0.0448	0.0476	**0.0427**	0.0046	11
PCB 208	0.176	0.365	0.462	0.245	0.214	0.693	0.397	0.253	**0.350**	0.17	48	0.0689	0.0744	0.110	0.110	**0.0908**	0.022	25
PCB 209	0.330	0.484	0.730	0.394	0.269	0.998	0.589	0.309	**0.513**	0.25	49	0.0769	0.0783	0.137	0.0808	**0.0933**	0.029	31

Appendix 21. PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at Middleton Island in 2004.

Compound	493	494	495	496	497	498	500	501	Mean	SD	RSD
BDE 17	<LOD	<LOD	0.255	<LOD	<LOD	<LOD	<LOD	<LOD	**0.0845**	0.081	95
BDE 25	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 28	0.375	<LOQ	0.689	0.469	<LOQ	<LOQ	<LOQ	<LOQ	**0.250**	0.24	94
BDE 30	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 47	5.02	2.63	14.8	6.62	1.75	2.01	1.75	2.06	**4.58**	4.5	98
BDE 49	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 66	0.256	<LOD	0.219	0.134	<LOD	<LOD	<LOD	<LOD	**0.101**	0.093	92
BDE 71	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 74	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 75	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 85	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 97+118	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 99	1.36	0.571	2.24	1.80	<LOQ	<LOQ	<LOQ	<LOQ	**0.913**	0.78	86
BDE 100	0.997	0.642	2.77	1.97	0.713	0.537	0.459	0.442	**1.07**	0.85	80
BDE 101	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 116	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 119	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 138	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 139	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 153	<LOQ	<LOQ	0.991	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**0.388**	0.36	93
BDE 154	<LOQ	<LOQ	0.956	0.730	<LOQ	<LOQ	<LOQ	<LOQ	**0.392**	0.30	76
BDE 155	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 156	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 173+190	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 181	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 182	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 183	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 185	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 191	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 196	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 198	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 203	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 204+197	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 8	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.142	**0.0528**	0.049	92
PCB 18	<LOQ	0.0558	0.0408	0.0725	1.50	0.195	0.0751	0.126	**0.260**	0.50	190
PCB 28+31	2.01	1.94	3.17	2.17	1.08	1.41	1.48	1.28	**1.82**	0.67	37
PCB 29	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 44	0.0178	<LOD	<LOD	0.0242	<LOD	0.0171	0.0164	<LOD	**0.0115**	0.0086	75
PCB 45	0.0885	0.0973	0.473	0.0334	0.221	0.0515	0.249	0.183	**0.175**	0.14	82
PCB 49	0.406	0.0458	1.34	0.411	0.0198	0.0381	0.0356	0.790	**0.386**	0.47	120
PCB 52	1.31	0.112	1.59	0.602	<LOD	0.0815	0.105	0.0387	**0.481**	0.63	130
PCB 56	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 63	<LOQ	<LOQ	0.560	<LOQ	<LOQ	<LOQ	<LOQ	0.846	**0.283**	0.29	100
PCB 66	1.71	2.00	3.26	2.09	1.14	1.67	1.78	1.67	**1.91**	0.61	32
PCB 70	0.624	0.0460	0.0235	0.279	<LOD	0.0398	0.0605	0.0159	**0.136**	0.22	160
PCB 74	1.36	1.64	2.66	1.72	0.944	1.27	1.34	1.20	**1.52**	0.52	34
PCB 79	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 82	0.105	<LOD	0.0597	0.0949	0.0190	<LOD	0.0120	<LOD	**0.0391**	0.042	110
PCB 87	0.321	0.0753	2.11	0.252	0.0965	0.0648	0.0695	0.120	**0.388**	0.70	180
PCB 92	0.336	0.0251	0.252	0.173	<LOQ	0.0141	0.0363	<LOQ	**0.105**	0.13	120
PCB 95+121	0.537	0.0318	0.399	0.183	<LOD	<LOD	0.0348	<LOD	**0.151**	0.21	140
PCB 99	5.31	5.14	11.3	7.37	0.955	4.23	4.25	3.83	**5.29**	3.0	57
PCB 101	4.05	0.133	10.3	4.40	<LOQ	0.0681	0.102	0.141	**2.39**	3.7	150
PCB 105	1.36	1.74	3.60	2.07	1.56	1.42	1.52	1.97	**1.90**	0.73	38

Appendix 21 (continued). PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at Middleton Island in 2004.

Compound	493	494	495	496	497	498	500	501	Mean	SD	RSD
PCB 106	0.0329	0.0223	0.0145	0.0351	0.00417	0.0208	0.0121	0.0121	**0.0192**	0.011	56
PCB 107	0.356	0.466	0.733	0.528	0.371	0.292	0.361	0.354	**0.433**	0.14	33
PCB 110	0.563	0.0532	1.74	0.656	0.0411	0.0453	0.0530	0.0390	**0.399**	0.60	150
PCB 112	0.0153	0.00655	0.0199	0.0125	0.0103	<LOD	<LOD	<LOD	**0.00904**	0.0066	73
PCB 114	0.159	0.194	0.326	0.214	0.170	0.158	0.194	0.149	**0.195**	0.057	29
PCB 118	5.50	6.16	12.9	8.24	3.39	5.05	5.32	4.83	**6.42**	2.9	46
PCB 119	0.155	0.110	0.295	0.234	0.0839	0.0891	0.0954	0.0782	**0.143**	0.081	57
PCB 127	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 128	0.909	0.758	2.42	1.50	0.859	0.639	0.597	0.553	**1.03**	0.64	62
PCB 130	0.497	0.365	1.30	0.847	0.602	0.322	0.290	0.274	**0.563**	0.36	63
PCB 137	0.426	0.259	0.833	0.635	0.0610	0.230	0.211	0.180	**0.354**	0.26	74
PCB 138	6.35	5.89	15.9	10.6	0.982	5.03	4.78	4.24	**6.73**	4.6	68
PCB 146	2.31	2.60	5.95	3.77	1.53	2.16	2.47	2.12	**2.86**	1.4	49
PCB 149	1.26	0.174	2.34	2.02	0.133	0.112	0.133	0.0888	**0.783**	0.95	120
PCB 151	0.174	<LOQ	0.164	0.435	0.0309	<LOQ	<LOQ	<LOQ	**0.106**	0.15	140
PCB 153+132	13.8	12.7	33.9	22.8	4.99	11.1	11.0	9.84	**15.0**	9.1	61
PCB 154	0.208	0.0371	0.486	0.312	0.0419	0.0346	0.0305	0.0299	**0.148**	0.17	120
PCB 156	0.308	0.450	0.907	0.577	0.369	0.352	0.453	0.361	**0.472**	0.19	41
PCB 157	0.0858	0.109	0.257	0.146	0.107	0.0882	0.120	0.102	**0.127**	0.056	44
PCB 158	0.468	0.306	1.54	0.792	0.302	0.204	0.186	0.251	**0.506**	0.46	91
PCB 159	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 163	2.19	2.21	5.63	3.64	2.47	1.88	1.99	1.78	**2.72**	1.3	48
PCB 165	0.0260	0.0265	0.0606	0.0368	0.0278	0.0216	0.0267	0.0204	**0.0308**	0.013	42
PCB 166	0.0336	0.0327	0.0732	0.0362	0.0365	0.0321	0.0322	0.0387	**0.0394**	0.014	35
PCB 167	0.322	0.352	0.843	0.492	0.177	0.300	0.353	0.305	**0.393**	0.20	51
PCB 170	0.867	1.03	2.56	2.00	0.996	0.817	0.966	0.807	**1.25**	0.65	52
PCB 172	0.279	0.366	0.766	0.553	0.332	0.292	0.413	0.338	**0.417**	0.17	40
PCB 174	0.309	0.0203	0.491	0.358	0.0162	0.0184	0.0204	0.0248	**0.157**	0.20	130
PCB 175	0.140	0.0836	0.342	0.210	0.0900	<LOQ	0.0787	0.0720	**0.134**	0.097	73
PCB 176	0.0236	<LOD	0.0307	0.0425	<LOD	<LOD	<LOD	<LOD	**0.0127**	0.017	130
PCB 177	0.790	0.250	2.24	1.54	0.670	0.221	0.180	0.168	**0.758**	0.76	100
PCB 178	0.621	0.385	1.32	0.979	0.520	0.333	0.318	0.315	**0.599**	0.37	62
PCB 180+193	2.96	2.65	8.15	6.16	1.32	2.56	2.38	2.04	**3.53**	2.4	67
PCB 183	1.05	0.762	2.71	1.97	0.705	0.595	0.726	0.629	**1.14**	0.78	68
PCB 185	0.0833	0.0194	0.165	0.110	<LOD	0.0129	0.0142	0.0120	**0.0522**	0.060	120
PCB 187	3.69	3.55	10.1	6.66	3.82	3.44	3.21	2.76	**4.66**	2.5	54
PCB 188	0.0165	0.0191	0.0341	0.0253	0.0184	0.0175	0.0176	0.0185	**0.0209**	0.0060	29
PCB 189	0.0315	0.0481	0.0979	0.0843	0.0459	0.0379	0.0561	0.0429	**0.0556**	0.023	42
PCB 191	0.0312	0.0109	0.0825	0.0806	0.0224	0.0174	0.0135	0.0127	**0.0339**	0.030	89
PCB 194	0.245	0.384	0.887	0.668	0.333	0.289	0.445	0.325	**0.447**	0.22	49
PCB 195	0.0757	0.147	0.280	0.211	0.102	0.0811	0.138	0.106	**0.143**	0.071	49
PCB 196	0.392	0.483	1.44	0.942	0.377	0.370	0.495	0.418	**0.614**	0.38	62
PCB 197	0.0381	0.0438	0.134	0.0753	0.0508	0.0348	0.0433	0.0435	**0.0579**	0.033	57
PCB 199	1.88	2.75	6.88	4.31	2.37	2.18	3.23	2.45	**3.26**	1.6	51
PCB 200	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 201	0.759	0.944	2.27	1.46	0.831	0.798	0.926	0.838	**1.10**	0.52	47
PCB 202	0.192	0.0254	0.308	0.290	0.0760	0.0264	0.0241	0.0286	**0.121**	0.12	100
PCB 205	0.0190	0.0248	0.0507	0.0349	0.0206	0.0238	0.0333	0.0328	**0.0300**	0.010	34
PCB 206	0.0845	0.156	0.365	0.232	0.118	0.116	0.184	0.134	**0.174**	0.090	52
PCB 207	0.0404	0.0552	0.118	0.0794	0.0470	0.0462	0.0601	0.0471	**0.0616**	0.026	42
PCB 208	0.0481	0.0951	0.221	0.159	0.0609	0.0683	0.110	0.0899	**0.106**	0.058	54
PCB 209	0.0827	0.150	0.308	0.223	0.109	0.121	0.202	0.141	**0.167**	0.074	44

Appendix 22. PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at Gull Island in 2004.

Compound	505	506	507	508	509	510	511	513	Mean	SD	RSD
BDE 17	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 25	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 28	<LOQ	<LOQ	<LOQ	0.271	<LOQ	<LOQ	<LOQ	<LOQ	**0.0884**	0.091	100
BDE 30	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 47	0.272	0.728	3.14	4.74	2.29	2.70	0.344	1.52	**1.97**	1.6	79
BDE 49	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 66	<LOD	<LOD	<LOD	0.174	<LOD	<LOD	<LOD	<LOD	**0.0669**	0.051	76
BDE 71	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 74	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 75	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 85	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 97+118	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 99	<LOQ	<LOQ	0.866	1.93	0.778	0.801	<LOQ	<LOQ	**0.650**	0.61	93
BDE 100	<LOQ	0.326	1.00	1.56	0.873	1.01	<LOQ	0.605	**0.710**	0.49	69
BDE 101	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 116	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 119	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 138	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 139	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 153	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 154	<LOQ	<LOQ	<LOQ	0.587	<LOQ	<LOQ	<LOQ	<LOQ	**0.235**	0.19	82
BDE 155	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 156	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 173+190	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 181	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 182	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 183	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 185	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 191	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 196	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 198	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 203	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 204+197	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 8	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 18	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 28+31	1.05	1.11	1.20	1.73	1.11	1.33	1.06	1.10	**1.21**	0.23	19
PCB 29	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 44	<LOD	0.0111	<LOD	0.0342	<LOD	0.0234	<LOD	<LOD	**0.0102**	0.012	120
PCB 45	<LOQ	0.0955	0.0503	<LOQ	0.101	0.0671	0.0425	0.0415	**0.0506**	0.037	73
PCB 49	0.0503	0.0150	0.0509	0.600	0.0720	0.129	0.0343	0.0252	**0.122**	0.20	160
PCB 52	0.0498	0.0318	0.141	0.574	0.169	0.147	0.0614	0.0421	**0.152**	0.18	120
PCB 56	0.280	<LOD	<LOD	<LOD	<LOD	<LOD	0.179	<LOD	**0.0638**	0.11	170
PCB 63	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 66	0.848	1.21	1.24	1.39	1.19	1.65	0.549	1.01	**1.14**	0.34	30
PCB 70	0.0140	0.0221	0.0746	0.575	0.0926	0.0449	0.0174	0.0277	**0.109**	0.19	180
PCB 74	0.781	0.872	1.00	1.11	0.966	1.37	0.811	0.802	**0.964**	0.20	21
PCB 79	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 82	<LOD	<LOD	0.0118	0.0683	<LOD	0.0101	<LOD	<LOD	**0.0145**	0.022	150
PCB 87	0.0265	0.0311	0.0739	0.169	0.0789	0.128	0.0231	0.0411	**0.0715**	0.053	74
PCB 92	<LOQ	0.0140	0.0380	0.0924	0.0310	<LOQ	0.0109	<LOQ	**0.0250**	0.030	120
PCB 95+121	0.0231	<LOD	0.0358	0.158	0.0385	0.0441	0.0387	<LOD	**0.0462**	0.047	100
PCB 99	1.26	2.28	3.68	3.88	3.68	4.49	0.509	2.80	**2.82**	1.4	49
PCB 101	0.0331	0.0446	0.143	2.82	0.192	0.0669	0.0599	0.0544	**0.426**	0.97	230
PCB 105	0.938	1.02	1.24	1.12	1.13	1.98	0.0607	0.953	**1.06**	0.52	50

Appendix 22 (continued). PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at Gull Island in 2004.

Compound	505	506	507	508	509	510	511	513		Mean	SD	RSD
PCB 106	0.0328	0.00494	0.0258	0.0111	0.0132	0.00921		0.0162	).01	**61**	0.01	61
PCB 107	0.286	0.302	0.295	0.262	0.285	0.189		0.267	).03	**13**	0.036	13
PCB 110	0.0491	0.775	0.0598	0.0536	0.0447	0.0354		0.139	0.26	**190**	0.26	190
PCB 112	<LOD	0.00857	<LOD	0.0106	<LOD	<LOD		0.00433	.003	**82**	0.0035	82
PCB 114	0.134	0.0999	0.124	0.192	0.120	0.110		0.126	).02	**23**	0.029	23
PCB 118	4.42	4.24	4.19	5.91	1.22	3.19		3.63	1.4	**38**	1.4	38
PCB 119	0.0880	0.108	0.0908	0.0836	0.00710	0.0526		0.0623	).03	**59**	0.036	59
PCB 127	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		<LOD				
PCB 128	0.738	0.849	0.678	0.797	<LOD	0.443		0.534	0.28	**53**	0.28	53
PCB 130	0.357	0.440	0.335	0.355	0.0516	0.194		0.277	0.12	**44**	0.12	44
PCB 137	0.251	0.310	0.224	0.225	0.0217	0.147		0.165	0.10	**63**	0.1	63
PCB 138	5.39	5.95	5.25	5.94	0.149	3.68		3.87	2.1	**55**	2.1	55
PCB 146	2.11	1.93	2.13	3.05	0.401	1.68		1.76	0.76	**43**	0.76	43
PCB 149	0.199	1.49	0.202	0.136	0.128	0.0812		0.301	0.48	**160**	0.48	160
PCB 151	0.0303	0.0355	<LOQ	0.0256	0.0324	<LOQ		0.0214	).01	**58**	0.012	58
PCB 153+132	11.5	12.3	11.4	13.8	1.03	8.20		8.52	4.5	**53**	4.5	53
PCB 154	0.0522	0.181	0.0493	0.0316	0.0193	0.0222		0.0498	).05	**110**	0.055	110
PCB 156	0.386	0.320	0.358	0.589	0.255	0.311		0.345	0.11	**31**	0.11	31
PCB 157	0.108	0.0879	0.0918	0.146	0.0548	0.0667		0.0871	).02	**34**	0.029	34
PCB 158	0.332	0.398	0.295	0.281	0.0129	0.112		0.215	0.13	**61**	0.13	61
PCB 159	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		<LOQ				
PCB 163	1.94	1.96	1.92	2.62	1.66	1.45		1.79	0.42	**23**	0.42	23
PCB 165	0.0239	0.0158	0.0204	0.0273	0.0167	0.0169		0.0189	.004	**24**	0.0046	24
PCB 166	0.0302	0.0276	0.0238	0.0520	0.0309	0.0221		0.0302	.009	**31**	0.0094	31
PCB 167	0.297	0.245	0.281	0.384	0.0712	0.228		0.230	).09	**42**	0.097	42
PCB 170	1.35	1.11	1.22	1.66	0.290	0.992		1.01	0.42	**42**	0.42	42
PCB 172	0.375	0.271	0.337	0.526	0.324	0.296		0.335	).08	**25**	0.085	25
PCB 174	0.0256	0.274	0.0309	0.0328	0.0206	0.0127		0.0545	).08	**160**	0.089	160
PCB 175	0.0875	0.106	0.0862	0.109	<LOQ	0.0687		0.0802	).02	**25**	0.02	25
PCB 176	<LOD	0.0336	<LOD	<LOD	0.00454	<LOD		0.00592	).01	**190**	0.011	190
PCB 177	0.401	0.879	0.363	0.294	0.134	0.159		0.330	0.25	**74**	0.25	74
PCB 178	0.452	0.489	0.391	0.418	0.311	0.252		0.353	0.10	**29**	0.1	29
PCB 180+193	3.25	3.15	2.98	3.55	0.431	2.10		2.24	1.2	**52**	1.2	52
PCB 183	0.816	1.08	0.764	1.08	0.300	0.670		0.713	0.28	**39**	0.28	39
PCB 185	0.0298	0.0741	0.0233	0.0238	<LOD	0.0115		0.0213	).02	**110**	0.024	110
PCB 187	3.64	3.42	3.57	4.60	1.75	2.59		3.04	0.95	**31**	0.95	31
PCB 188	0.0164	0.0153	0.0183	0.0263	0.00812	0.0137		0.0158	.005	**33**	0.0052	33
PCB 189	0.0533	0.0341	0.0472	0.0835	0.0415	0.0352		0.0457	).01	**37**	0.017	37
PCB 191	0.0237	0.0459	0.0211	0.0279	<LOD	0.0127		0.0178	).01	**85**	0.015	85
PCB 194	0.549	0.373	0.430	0.809	0.422	0.413		0.461	0.16	**34**	0.16	34
PCB 195	0.187	0.151	0.160	0.306	0.0327	0.175		0.158	).07	**49**	0.077	49
PCB 196	0.591	0.500	0.482	0.847	0.172	0.444		0.460	0.20	**44**	0.2	44
PCB 197	0.0558	0.0440	0.0465	0.0603	<LOD	0.0442		0.0383	).01	**49**	0.019	49
PCB 199	3.11	2.13	2.66	4.74	2.54	2.35		2.74	0.88	**32**	0.88	32
PCB 200	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		<LOD				
PCB 201	0.902	0.734	0.871	1.20	0.0540	0.749		0.721	0.33	**46**	0.33	46
PCB 202	0.0381	0.149	0.0350	0.0301	0.0427	0.0219		0.0473	).04	**88**	0.042	88
PCB 205	0.0301	0.0242	0.0239	0.0438	0.0289	0.0218		0.0274	.007	**26**	0.0072	26
PCB 206	0.147	0.107	0.119	0.298	0.139	0.113		0.144	).06	**45**	0.065	45
PCB 207	0.0341	0.0296	0.0322	0.0598	<LOQ	0.0288		0.0297	).01	**54**	0.016	54
PCB 208	0.103	0.0551	0.0593	0.120	0.0796	0.0630		0.0704	).03	**47**	0.033	47
PCB 209	0.0720	0.0760	0.0598	0.210	0.0810	0.0619		0.0889	).05	**58**	0.051	58

Appendix 23. PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at Capes Denbigh and Pierce in 2005.

Compound	676	677	678	681	683	Mean	SD	RSD	748	756	757	758	760	Mean	SD	RSD
BDE 17	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 25	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 28	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 30	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 47	0.329	0.154	0.601	0.455	0.761	**0.460**	0.24	51	0.128	0.426	0.499	0.170	0.310	**0.307**	0.16	52
BDE 49	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 66	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 71	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 74	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 75	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 85	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 97+118	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 99	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 100	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 101	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 116	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 119	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 138	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 139	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 153	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 154	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 155	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 156	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 173+190	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 181	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 182	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 183	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 185	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 191	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 196	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 198	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 203	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 204+197	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 8	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 18	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 28+31	1.41	2.23	1.48	1.20	1.56	**1.58**	0.39	25	1.44	1.01	1.61	0.944	1.13	**1.23**	0.29	23
PCB 29	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 44	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	0.00966	<LOD	0.00911	**0.00554**	0.0040	72
PCB 45	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 49	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 52	0.0267	<LOD	0.0387	0.0249	0.0253	**0.0257**	0.0092	36	<LOD	<LOD	0.0378	0.0390	0.0396	**0.0261**	0.017	67
PCB 56	<LOD	<LOD	<LOD	0.0157	0.0326	**0.0121**	0.013	110	0.355	0.292	0.329	0.288	0.326	**0.318**	0.028	8.8
PCB 63	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 66	1.24	1.54	1.23	0.913	1.14	**1.21**	0.23	19	0.945	0.596	1.24	0.910	1.02	**0.941**	0.23	25
PCB 70	0.00800	<LOD	0.0142	<LOD	<LOD	**0.00693**	0.0051	73	0.00801	<LOD	0.0137	0.00732	0.0259	**0.0118**	0.0085	72
PCB 74	0.962	1.38	1.03	0.766	0.930	**1.01**	0.23	22	0.949	0.558	1.01	0.833	0.864	**0.842**	0.17	21
PCB 79	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 82	<LOD	<LOD	0.0447	<LOD	0.0470	**0.0218**	0.022	100	0.0430	0.0417	0.0420	0.0484	0.0419	**0.0434**	0.0028	6.5
PCB 87	0.0984	0.0509	0.0367	<LOD	0.0130	**0.0420**	0.036	85	0.0296	0.0234	0.0256	0.0224	0.0603	**0.0323**	0.016	49
PCB 92	0.0311	<LOQ	0.0198	0.0169	0.0147	**0.0171**	0.010	59	<LOQ	<LOQ	0.0113	<LOQ	0.0129	**0.00595**	0.0057	96
PCB 95+121	0.0489	0.0619	0.0430	0.0564	0.0521	**0.0525**	0.0072	14	0.0425	0.0555	0.0441	0.0417	0.0474	**0.0462**	0.0056	12
PCB 99	3.61	2.57	3.92	2.87	3.43	**3.28**	0.55	17	1.20	0.616	3.57	2.83	3.42	**2.33**	1.3	58
PCB 101	0.0770	<LOQ	0.0717	0.0858	0.0707	**0.0636**	0.029	46	<LOQ	<LOQ	0.0473	<LOQ	0.0560	**0.0300**	0.020	68
PCB 105	1.33	1.62	1.25	0.855	1.01	**1.21**	0.30	24	1.25	0.942	1.19	0.948	1.18	**1.10**	0.14	13

Appendix 23 (continued). PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at Capes Denbigh and Pierce in 2005.

Compound	676	677	678	681	683	Mean	SD	RSD	748	756	757	758	760	Mean	SD	RSD
PCB 106	<LOD	<LOD	<LOD	<LOD	0.00988	**0.00427**	0.0033	78	0.0115	0.00965	0.00597	0.00700	<LOD	**0.00731**	0.0035	48
PCB 107	0.278	0.300	0.225	0.192	0.203	**0.240**	0.047	20	0.245	0.225	0.300	0.231	0.295	**0.259**	0.036	14
PCB 110	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 112	0.0109	0.00765	0.0103	0.00976	0.0174	**0.0112**	0.0037	33	0.00843	0.00668	0.0135	0.0122	0.0141	**0.0110**	0.0033	30
PCB 114	0.174	0.240	0.216	0.185	0.204	**0.204**	0.026	13	0.196	0.171	0.194	0.157	0.170	**0.178**	0.016	9.3
PCB 118	4.18	4.88	4.39	2.99	3.50	**3.99**	0.75	19	3.64	1.92	4.13	3.70	3.93	**3.46**	0.89	26
PCB 119	0.0631	0.0456	0.0726	0.0703	0.0638	**0.0631**	0.011	17	0.0152	0.0614	0.0821	0.0718	0.0802	**0.0621**	0.028	44
PCB 127	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 128	0.568	0.762	0.703	0.550	0.632	**0.643**	0.090	14	0.561	0.543	0.618	0.631	0.628	**0.596**	0.041	6.9
PCB 130	0.152	0.305	0.204	0.169	0.175	**0.201**	0.061	30	0.304	0.203	0.219	0.291	0.179	**0.239**	0.055	23
PCB 137	0.140	0.0971	0.158	0.136	0.164	**0.139**	0.026	19	<LOD	<LOD	0.103	0.0987	0.113	**0.0636**	0.057	90
PCB 138	4.09	3.68	4.72	3.52	4.15	**4.03**	0.47	12	2.14	0.722	3.91	3.89	4.02	**2.94**	1.5	50
PCB 146	1.89	1.98	1.99	1.41	1.51	**1.76**	0.27	16	1.56	1.02	2.04	1.88	1.87	**1.67**	0.41	24
PCB 149	0.133	0.124	0.150	0.127	0.151	**0.137**	0.013	9.4	0.109	0.110	0.126	0.160	0.141	**0.129**	0.021	17
PCB 151	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 153+132	10.0	7.50	11.7	8.59	8.92	**9.35**	1.6	17	4.26	3.25	9.87	9.86	9.91	**7.43**	3.4	45
PCB 154	0.0296	0.0216	0.0287	0.0259	0.0307	**0.0273**	0.0037	13	0.0147	0.0200	0.0300	0.0485	0.0395	**0.0305**	0.014	45
PCB 156	0.429	0.466	0.365	0.280	0.315	**0.371**	0.077	21	0.308	0.278	0.307	0.272	0.290	**0.291**	0.016	5.6
PCB 157	0.0858	0.111	0.0830	0.0642	0.0639	**0.0815**	0.019	24	0.0824	0.0677	0.0881	0.0709	0.0873	**0.0793**	0.0094	12
PCB 158	0.230	0.284	0.210	0.233	0.216	**0.235**	0.029	12	0.157	0.123	0.192	0.245	0.237	**0.191**	0.052	27
PCB 159	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 163	1.63	2.42	1.87	1.49	1.49	**1.78**	0.39	22	2.19	1.72	1.61	1.83	1.68	**1.80**	0.23	13
PCB 165	0.00229	0.00673	0.00244	0.00322	0.00239	**0.00341**	0.0019	55	0.00978	0.00907	0.0106	0.0170	0.00767	**0.0108**	0.0036	33
PCB 166	0.0425	0.0629	0.0398	0.0119	0.0236	**0.0361**	0.019	54	0.0152	0.0172	0.0390	0.0270	0.0293	**0.0255**	0.0097	38
PCB 167	0.268	0.256	0.294	0.223	0.219	**0.252**	0.031	12	0.192	0.118	0.295	0.254	0.257	**0.223**	0.069	31
PCB 170	0.838	1.05	0.877	0.725	0.763	**0.850**	0.12	15	0.684	0.754	0.777	0.752	0.640	**0.721**	0.057	7.9
PCB 172	0.284	0.362	0.288	0.216	0.221	**0.274**	0.060	22	0.276	0.270	0.277	0.228	0.233	**0.257**	0.024	9.5
PCB 174	0.0442	0.0381	0.0506	0.0505	0.0238	**0.0414**	0.011	27	0.0312	0.0465	0.0469	0.0406	0.0443	**0.0419**	0.0065	15
PCB 175	0.0763	<LOQ	<LOQ	<LOQ	0.0695	**0.0475**	0.026	54	0.0747	0.0684	0.0924	0.0872	0.0799	**0.0805**	0.0096	12
PCB 176	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	0.00980	<LOD	0.00868	**0.00452**	0.0043	96
PCB 177	0.155	0.329	0.183	0.208	0.172	**0.209**	0.069	33	0.415	0.226	0.175	0.629	0.159	**0.321**	0.20	62
PCB 178	0.300	0.441	0.374	0.317	0.356	**0.357**	0.055	15	0.359	0.332	0.324	0.382	0.328	**0.345**	0.025	7.2
PCB 180+193	1.85	1.55	2.10	1.81	1.77	**1.82**	0.20	11	0.883	0.948	1.84	1.86	1.56	**1.42**	0.47	33
PCB 183	0.694	0.677	0.751	0.569	0.620	**0.662**	0.070	11	0.416	0.508	0.658	0.645	0.520	**0.549**	0.10	19
PCB 185	<LOD	<LOD	<LOD	0.0165	0.0244	**0.00995**	0.010	100	<LOD	<LOD	0.0140	<LOD	0.00525	**0.00491**	0.0053	110
PCB 187	2.31	3.94	2.73	2.20	2.18	**2.67**	0.75	28	3.81	2.81	3.00	3.54	2.66	**3.17**	0.49	15
PCB 188	0.0167	0.0225	0.0239	0.0191	0.00348	**0.0171**	0.0081	48	0.0140	0.0117	0.0230	0.00516	0.0205	**0.0149**	0.0071	48
PCB 189	0.0370	0.0515	0.0406	0.0199	0.0407	**0.0380**	0.011	30	0.0394	0.0363	0.0456	0.0402	0.0353	**0.0394**	0.0041	10
PCB 191	0.0103	<LOD	<LOD	<LOD	<LOD	**0.00351**	0.0041	120	<LOD	<LOD	0.0108	0.00952	0.0112	**0.00691**	0.0051	73
PCB 194	0.335	0.460	0.345	0.297	0.269	**0.341**	0.073	21	0.263	0.326	0.326	0.239	0.244	**0.279**	0.043	15
PCB 195	0.0751	0.165	0.0956	0.119	0.114	**0.114**	0.033	29	0.0538	0.0810	0.101	0.0887	0.0828	**0.0814**	0.017	21
PCB 196	0.467	0.501	0.537	0.395	0.399	**0.460**	0.062	14	0.350	0.377	0.421	0.373	0.419	**0.388**	0.031	8.0
PCB 197	0.0543	0.0380	0.0620	0.0378	0.0166	**0.0417**	0.018	42	<LOD	<LOD	0.0371	0.0297	0.0371	**0.0221**	0.017	79
PCB 199	2.33	3.24	2.32	2.01	1.96	**2.37**	0.52	22	2.29	2.27	2.17	1.79	2.11	**2.13**	0.20	9.6
PCB 200	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 201	0.725	0.751	0.687	0.582	0.683	**0.686**	0.064	9.4	0.601	0.619	0.557	0.588	0.578	**0.589**	0.023	4.0
PCB 202	0.0429	0.0363	0.0319	0.0390	0.0284	**0.0357**	0.0057	16	0.0263	0.0291	<LOD	0.0912	0.0556	**0.0419**	0.033	78
PCB 205	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 206	0.121	0.109	0.108	0.0912	0.0604	**0.0979**	0.023	24	0.0982	0.0682	0.0619	<LOD	0.0815	**0.0638**	0.034	53
PCB 207	0.0325	0.0112	0.0363	0.0354	0.0216	**0.0274**	0.011	39	0.0375	0.00629	0.0194	<LOQ	0.0188	**0.0174**	0.013	76
PCB 208	0.0503	<LOQ	0.0701	0.0535	<LOQ	**0.0444**	0.024	54	0.0731	<LOQ	0.0530	<LOQ	0.0499	**0.0364**	0.032	87
PCB 209	0.151	0.154	0.147	0.0761	0.0994	**0.125**	0.035	28	0.102	0.103	0.107	0.113	0.103	**0.106**	0.0046	4.3

Appendix 24. PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at Sledge Island and Bluff in 2005.

Compound	761	764	767	768	771	Mean	SD	RSD	777	780	782	783	844	Mean	SD	RSD
BDE 17	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 25	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	0.0983	0.161	<LOD	**0.0828**	0.050	61
BDE 28	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 30	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 47	1.03	0.723	0.898	0.600	0.684	**0.787**	0.17	22	0.535	0.665	3.15	0.850	0.635	**1.17**	1.1	96
BDE 49	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 66	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 71	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 74	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 75	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 85	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 97+118	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 99	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	1.15	0.806	<LOQ	**0.594**	0.38	64
BDE 100	0.327	<LOQ	0.363	<LOQ	<LOQ	**0.298**	0.052	17	0.421	0.350	0.917	0.426	0.377	**0.498**	0.24	47
BDE 101	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 116	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 119	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 138	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 139	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 153	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 154	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 155	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 156	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 173+190	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 181	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 182	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 183	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 185	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 191	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 196	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 198	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 203	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 204+197	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 8	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 18	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			0.0364	<LOQ	<LOQ	<LOQ	<LOQ	**0.0174**	0.014	81
PCB 28+31	2.42	1.31	2.04	1.83	1.59	**1.84**	0.43	23	1.01	0.997	1.53	1.30	1.42	**1.25**	0.24	19
PCB 29	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 44	0.0274	<LOD	<LOD	<LOD	<LOD	**0.00871**	0.011	120	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 45	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 49	0.0475	<LOD	<LOD	0.0354	<LOD	**0.0205**	0.020	97	<LOD	<LOD	0.292	0.0593	0.0252	**0.0779**	0.12	160
PCB 52	0.132	0.0210	0.0264	0.0799	<LOD	**0.0524**	0.053	100	0.0355	0.0369	0.172	0.143	0.0712	**0.0917**	0.063	68
PCB 56	0.733	0.380	1.05	0.595	0.403	**0.632**	0.27	43	0.328	0.225	0.447	0.425	0.327	**0.350**	0.089	25
PCB 63	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 66	2.08	1.26	1.91	1.67	1.36	**1.66**	0.35	21	0.680	0.753	1.73	1.19	1.02	**1.07**	0.42	39
PCB 70	0.0421	0.0110	<LOD	0.0204	0.00859	**0.0165**	0.016	97	<LOD	0.0105	0.128	0.0568	0.0298	**0.0461**	0.050	110
PCB 74	1.72	0.977	1.42	1.32	1.02	**1.29**	0.31	24	0.640	0.619	1.37	1.35	0.877	**0.971**	0.37	38
PCB 79	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 82	0.0406	0.0451	0.0411	0.0430	0.0449	**0.0430**	0.0021	4.8	0.0388	0.0423	0.0494	0.0473	0.0460	**0.0448**	0.0042	9.4
PCB 87	0.112	0.0298	0.164	<LOD	0.0310	**0.0674**	0.068	100	0.0209	0.0174	0.365	0.0512	0.0619	**0.103**	0.15	140
PCB 92	0.0345	0.0152	0.0132	<LOQ	<LOQ	**0.0140**	0.013	92	<LOQ	<LOQ	0.0728	0.0227	<LOQ	**0.0223**	0.029	130
PCB 95+121	0.0643	0.0390	0.0479	0.0529	0.0425	**0.0493**	0.0099	20	0.0460	0.0414	0.109	0.0443	0.0534	**0.0589**	0.029	48
PCB 99	7.24	3.46	4.99	4.99	3.76	**4.89**	1.5	30	1.34	2.34	6.08	4.21	3.44	**3.48**	1.8	52
PCB 101	0.200	<LOQ	0.0719	<LOQ	<LOQ	**0.0637**	0.080	130	0.0523	0.0967	1.98	0.166	0.149	**0.488**	0.83	170
PCB 105	2.01	1.19	1.70	1.83	1.24	**1.60**	0.36	23	1.06	0.708	1.67	1.23	0.942	**1.12**	0.36	32

Appendix 24 (continued). PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at Sledge Island and Bluff in 2005.

Compound	761	764	767	768	771	Mean	SD	RSD	777	780	782	783	844	Mean	SD	RSD
PCB 106	<LOD	0.00877	0.00492	0.0325	<LOD	**0.0101**	0.013	130	0.0115	<LOD	<LOD	0.00636	<LOD	**0.00505**	0.0041	82
PCB 107	0.283	0.242	0.301	0.253	0.280	**0.272**	0.024	8.8	0.201	0.164	0.262	0.173	0.167	**0.193**	0.041	21
PCB 110	0.0422	<LOD	<LOD	<LOD	<LOD	**0.0204**	0.016	77	0.0329	<LOD	0.504	<LOD	<LOD	**0.114**	0.22	190
PCB 112	0.0112	0.0141	0.00892	0.0124	<LOD	**0.00949**	0.0051	54	0.0125	0.00741	0.0156	0.0158	0.0117	**0.0126**	0.0034	27
PCB 114	0.332	0.231	0.236	0.294	0.233	**0.265**	0.046	17	0.256	0.118	0.109	0.245	0.132	**0.172**	0.072	42
PCB 118	7.48	3.98	5.62	5.70	4.16	**5.39**	1.4	26	2.49	2.39	6.24	4.54	3.53	**3.84**	1.6	42
PCB 119	0.193	0.0788	0.128	0.120	0.105	**0.125**	0.043	34	0.0830	0.0725	0.204	0.112	0.0750	**0.109**	0.055	51
PCB 127	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 128	1.19	0.586	0.797	0.720	0.608	**0.780**	0.24	31	0.566	0.441	1.26	0.617	0.583	**0.694**	0.32	47
PCB 130	0.354	0.144	0.246	0.146	0.152	**0.208**	0.092	44	0.207	0.168	0.462	0.257	0.202	**0.259**	0.12	45
PCB 137	0.347	0.156	0.195	0.179	0.156	**0.207**	0.080	39	0.0680	0.0964	0.398	0.204	0.176	**0.188**	0.13	69
PCB 138	8.27	4.32	5.74	5.51	4.34	**5.64**	1.6	29	1.60	2.78	8.55	5.47	4.19	**4.52**	2.7	59
PCB 146	3.20	1.76	2.46	2.60	1.96	**2.40**	0.57	24	1.23	1.21	2.61	2.31	1.76	**1.82**	0.63	34
PCB 149	0.238	0.103	0.154	0.124	0.101	**0.144**	0.057	39	0.181	0.126	1.09	0.199	0.183	**0.355**	0.41	120
PCB 151	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 153+132	20.6	9.52	13.1	13.4	10.4	**13.4**	4.4	33	5.60	6.71	18.4	13.3	9.93	**10.8**	5.2	48
PCB 154	0.0829	0.0260	0.0369	0.0523	0.0221	**0.0440**	0.025	56	0.0530	0.0402	0.225	0.0427	0.0508	**0.0823**	0.080	97
PCB 156	0.555	0.385	0.451	0.565	0.367	**0.465**	0.093	20	0.346	0.213	0.437	0.401	0.275	**0.334**	0.091	27
PCB 157	0.130	0.0883	0.119	0.116	0.102	**0.111**	0.016	14	0.0859	0.0540	0.123	0.0902	0.0739	**0.0853**	0.025	30
PCB 158	0.397	0.290	0.284	0.272	0.287	**0.306**	0.052	17	0.217	0.210	0.942	0.329	0.279	**0.395**	0.31	78
PCB 159	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**			<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 163	2.65	1.45	2.20	1.99	1.86	**2.03**	0.44	22	1.70	1.12	2.56	2.40	1.67	**1.89**	0.59	31
PCB 165	0.0177	0.00259	0.0207	<LOD	0.00691	**0.00963**	0.0091	95	0.00187	<LOD	0.0123	0.00883	0.00829	**0.00628**	0.0051	81
PCB 166	0.0532	0.0262	0.0409	0.0258	0.0258	**0.0344**	0.012	36	0.0385	<LOD	0.00399	0.00298	0.0281	**0.0151**	0.017	110
PCB 167	0.490	0.304	0.398	0.427	0.295	**0.383**	0.083	22	0.173	0.176	0.394	0.330	0.242	**0.263**	0.097	37
PCB 170	1.38	0.877	1.12	1.13	0.906	**1.08**	0.20	19	0.962	0.656	1.27	1.20	0.818	**0.982**	0.26	26
PCB 172	0.385	0.294	0.376	0.359	0.303	**0.344**	0.042	12	0.295	0.208	0.286	0.347	0.273	**0.282**	0.050	18
PCB 174	0.0464	<LOD	<LOD	<LOD	<LOD	**0.0122**	0.019	160	0.0575	0.0428	0.212	0.0680	0.0641	**0.0888**	0.069	78
PCB 175	0.0975	0.0683	0.0970	0.0819	0.0849	**0.0859**	0.012	14	0.101	0.0761	0.138	0.0844	0.0863	**0.0972**	0.025	25
PCB 176	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			0.00988	<LOD	0.00602	<LOD	<LOD	**0.00415**	0.0037	90
PCB 177	0.322	0.143	0.210	0.137	0.159	**0.194**	0.077	40	0.224	0.167	0.939	0.278	0.218	**0.365**	0.32	89
PCB 178	0.799	0.290	0.419	0.434	0.310	**0.450**	0.21	46	0.384	0.275	0.787	0.367	0.313	**0.425**	0.21	49
PCB 180+193	3.73	1.93	2.59	2.38	2.13	**2.55**	0.70	28	1.54	1.49	3.86	2.86	2.10	**2.37**	1.0	42
PCB 183	1.03	0.648	0.851	0.929	0.689	**0.830**	0.16	20	0.750	0.522	1.34	0.845	0.613	**0.814**	0.32	39
PCB 185	0.0331	0.0160	0.0114	<LOD	<LOD	**0.0131**	0.013	97	0.00874	<LOD	0.0685	<LOD	0.0195	**0.0208**	0.027	130
PCB 187	4.79	2.38	3.41	3.27	2.75	**3.32**	0.92	28	2.67	1.82	4.51	3.56	2.88	**3.09**	1.0	33
PCB 188	0.0241	0.0247	0.0247	0.0330	0.0242	**0.0261**	0.0038	15	0.0292	0.00191	0.0158	0.0116	0.0120	**0.0141**	0.0099	70
PCB 189	0.0594	0.0431	0.0590	0.0415	0.0355	**0.0477**	0.011	23	0.0586	0.0394	0.0543	0.0656	0.0505	**0.0537**	0.0097	18
PCB 191	0.0119	0.00532	0.0104	<LOD	0.0116	**0.00854**	0.0039	45	0.0164	<LOD	0.0282	0.00938	0.0144	**0.0140**	0.0097	69
PCB 194	0.475	0.376	0.436	0.457	0.411	**0.431**	0.039	9.1	0.385	0.288	0.366	0.404	0.294	**0.347**	0.053	15
PCB 195	0.128	0.153	0.136	0.146	0.141	**0.141**	0.0095	6.8	0.116	0.107	0.129	0.108	0.118	**0.116**	0.0090	7.7
PCB 196	0.735	0.499	0.616	0.652	0.556	**0.612**	0.090	15	0.539	0.352	0.699	0.677	0.454	**0.544**	0.15	27
PCB 197	0.0436	0.0334	0.0632	0.0521	0.0498	**0.0484**	0.011	23	0.0304	0.0216	0.0498	0.0479	0.0202	**0.0340**	0.014	42
PCB 199	3.53	2.28	3.23	2.93	2.79	**2.95**	0.47	16	2.73	1.69	2.83	2.88	2.24	**2.48**	0.51	20
PCB 200	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 201	1.06	0.652	0.919	0.810	0.722	**0.833**	0.16	20	0.727	0.527	0.695	0.692	0.652	**0.659**	0.078	12
PCB 202	0.0610	0.0279	0.0394	0.0243	0.0337	**0.0373**	0.014	39	0.0844	0.0144	0.220	0.0462	0.0171	**0.0764**	0.085	110
PCB 205	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**			<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 206	0.212	0.106	0.192	0.186	0.0832	**0.156**	0.057	37	0.130	0.0723	0.110	0.0894	0.0809	**0.0965**	0.023	24
PCB 207	0.0528	0.0234	0.0835	0.0682	0.0202	**0.0496**	0.028	56	0.0549	0.0177	0.0294	0.0147	0.0216	**0.0277**	0.016	59
PCB 208	0.112	<LOQ	0.145	0.117	0.0564	**0.0922**	0.047	51	0.100	0.0501	<LOQ	0.0592	<LOQ	**0.0512**	0.032	62
PCB 209	0.173	0.140	0.155	0.153	0.153	**0.155**	0.012	7.5	0.104	0.0742	0.142	0.133	0.131	**0.117**	0.028	24

Appendix 25. PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at Bogoslof Island in 2005.

Compound	862	863	866	869	871	Mean	SD	RSD
BDE 17	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 25	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 28	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 30	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 47	0.565	1.86	0.468	0.460	0.567	**0.783**	0.60	77
BDE 49	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 66	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 71	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 74	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 75	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 85	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 97+118	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 99	<LOQ	0.844	<LOQ	<LOQ	<LOQ	**0.351**	0.33	94
BDE 100	0.367	0.881	<LOQ	0.350	0.314	**0.422**	0.27	63
BDE 101	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 116	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 119	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 138	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 139	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 153	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 154	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 155	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 156	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 173+190	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 181	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 182	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 183	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 185	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 191	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
BDE 196	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 198	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 203	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
BDE 204+197	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 8	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 18	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 28+31	1.37	3.44	1.67	1.54	1.75	**1.96**	0.84	43
PCB 29	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 44	0.0114	<LOD	0.00836	<LOD	0.0247	**0.0104**	0.0089	85
PCB 45	0.0419	0.0574	0.187	0.161	0.0443	**0.0983**	0.070	71
PCB 49	0.0337	0.0249	0.0163	<LOD	0.0191	**0.0191**	0.012	62
PCB 52	0.188	0.125	0.106	0.0492	0.159	**0.126**	0.053	42
PCB 56	0.409	0.672	0.411	0.484	0.468	**0.489**	0.11	22
PCB 63	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 66	1.33	2.95	1.49	1.59	1.67	**1.81**	0.65	36
PCB 70	0.0991	0.0543	0.0548	0.0162	0.0893	**0.0627**	0.033	52
PCB 74	1.06	2.54	1.29	1.22	1.33	**1.49**	0.60	40
PCB 79	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	**<LOQ**		
PCB 82	0.0489	0.0402	0.0413	0.0404	0.0733	**0.0488**	0.014	29
PCB 87	0.0825	0.0503	0.0433	0.0386	0.0912	**0.0612**	0.024	39
PCB 92	0.0532	0.0187	0.0306	0.0258	0.0353	**0.0327**	0.013	40
PCB 95+121	0.159	0.0598	0.0662	0.0576	0.0692	**0.0823**	0.043	52
PCB 99	3.31	8.59	3.93	3.26	4.17	**4.65**	2.2	48
PCB 101	0.208	0.107	0.0482	0.0410	0.169	**0.115**	0.074	64
PCB 105	1.05	3.50	1.32	1.43	1.28	**1.71**	1.0	59

Appendix 25 (continued). PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in common murre eggs collected at Bogoslof Island in 2005.

Compound	862	863	866	869	871	Mean	SD	RSD
PCB 106	0.0120	<LOD	<LOD	<LOD	<LOD	**0.0386**	0.0047	120
PCB 107	0.165	0.174	0.117	0.119	0.169	**0.149**	0.028	19
PCB 110	0.0486	<LOD	<LOD	<LOD	0.0455	**0.0266**	0.019	72
PCB 112	0.0181	0.0209	0.00765	0.0221	0.0173	**0.0172**	0.057	33
PCB 114	0.216	0.640	0.257	0.262	0.237	**0.322**	0.18	55
PCB 118	3.70	13.8	4.56	4.40	4.81	**6.25**	4.2	68
PCB 119	0.0821	0.261	0.0867	0.0776	0.0989	**0.121**	0.079	65
PCB 127	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 128	0.562	2.64	0.521	0.488	0.696	**0.981**	0.93	95
PCB 130	0.202	0.884	0.208	0.169	0.281	**0.349**	0.30	87
PCB 137	0.180	0.586	0.181	0.128	0.203	**0.256**	0.19	73
PCB 138	4.10	25.1	4.39	3.52	5.17	**8.46**	9.3	110
PCB 146	1.63	9.99	1.77	1.83	2.12	**3.47**	3.6	110
PCB 149	0.378	0.251	0.141	0.138	0.264	**0.235**	0.10	43
PCB 151	0.116	<LOQ	<LOQ	<LOQ	<LOQ	**0.0310**	0.048	160
PCB 153+132	9.24	63.0	9.84	8.10	11.5	**20.3**	24	120
PCB 154	0.119	0.0516	0.00870	0.0280	0.0529	**0.0520**	0.042	80
PCB 156	0.286	32.1	0.335	0.374	0.327	**6.69**	14	210
PCB 157	0.106	0.352	0.0797	0.0834	0.0757	**0.139**	0.12	86
PCB 158	0.273	1.99	0.286	0.315	0.395	**0.651**	0.75	120
PCB 159	0.0185	<LOQ	<LOQ	<LOQ	<LOQ	**0.0836**	0.0065	77
PCB 163	1.39	11.8	1.58	1.25	1.76	**3.56**	4.6	130
PCB 165	0.0328	0.0175	0.00247	0.0110	0.00681	**0.0141**	0.012	84
PCB 166	0.0566	0.109	0.0169	0.0412	0.0264	**0.0499**	0.036	72
PCB 167	0.297	2.04	0.292	0.328	0.334	**0.659**	0.77	120
PCB 170	0.811	16.6	0.737	0.768	1.00	**3.98**	7.0	180
PCB 172	0.262	3.71	0.249	0.317	0.320	**0.972**	1.5	160
PCB 174	0.109	0.0817	0.0346	0.0666	0.00946	**0.0603**	0.039	65
PCB 175	0.125	0.472	<LOQ	0.0782	0.0865	**0.156**	0.18	120
PCB 176	0.0614	<LOD	<LOD	0.0134	0.00786	**0.0174**	0.025	140
PCB 177	0.247	1.38	0.187	0.153	0.261	**0.446**	0.53	120
PCB 178	0.334	2.09	0.262	0.222	0.297	**0.642**	0.81	130
PCB 180+193	2.42	32.8	1.92	1.74	2.50	**8.27**	14	170
PCB 183	0.693	6.72	0.527	0.630	0.661	**1.85**	2.7	150
PCB 185	0.0818	0.0939	<LOD	0.0290	<LOD	**0.0413**	0.044	110
PCB 187	3.12	21.4	2.59	2.35	3.45	**6.59**	8.3	130
PCB 188	0.0508	0.0350	0.0130	0.0195	0.0190	**0.0275**	0.015	56
PCB 189	0.0473	0.784	0.0372	0.0535	0.0418	**0.193**	0.33	170
PCB 191	0.0132	0.162	0.00746	<LOD	0.00814	**0.0390**	0.069	180
PCB 194	0.449	6.07	0.222	0.372	0.332	**1.49**	2.6	170
PCB 195	0.0850	2.48	0.0940	0.116	0.0994	**0.575**	1.1	190
PCB 196	1.07	5.21	0.353	0.457	0.459	**1.51**	2.1	140
PCB 197	0.0928	0.265	<LOD	0.0423	0.0330	**0.0871**	0.10	120
PCB 199	5.24	21.0	1.93	2.96	2.52	**6.74**	8.1	120
PCB 200	<LOD	<LOD	<LOD	<LOD	<LOD	**<LOD**		
PCB 201	1.18	3.34	0.474	0.843	0.606	**1.29**	1.2	91
PCB 202	0.508	0.0243	<LOD	0.0326	0.0328	**0.120**	0.22	180
PCB 205	<LOD	0.279	<LOD	0.00541	<LOD	**0.0585**	0.12	210
PCB 206	0.502	1.20	0.108	0.116	0.0419	**0.393**	0.48	120
PCB 207	0.200	0.150	0.0736	0.0797	0.00558	**0.102**	0.075	74
PCB 208	0.388	0.327	0.126	0.131	<LOQ	**0.202**	0.15	74
PCB 209	0.194	0.422	0.102	0.196	0.0777	**0.198**	0.14	69

Appendix 26. Pesticide and PBDE mass fractions (ng g^{-1} wet mass) with percent lipids in thick-billed murre eggs collected at St. Lazaria Island in 2002.

Compound	133	134	135	136	137	139	Mean	SD	RSD
percent lipid	10.8	10.3	9.93	9.69	11.6	10.0	10.4	0.70	6.7
2,4'-DDD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
2,4'-DDE	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
2,4'-DDT	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
4,4,'-DDD	0.687	0.636	0.684	1.28	4.84	0.820	1.49	1.7	110
4,4'-DDE	230	172	128	204	205	177	186	36	19
4,4'-DDT	<LOD	<LOD	<LOD	<LOD	0.160	<LOD	<LOD		
α-HCH	3.02	2.00	2.88	3.43	7.00	3.81	3.69	1.7	47
β-HCH	27.8	17.3	14.9	26.4	39.6	12.1	23.0	10	45
γ-HCH	0.399	0.488	0.458	0.521	1.28	0.523	0.612	0.33	54
cis -chlordane	0.170	0.395	0.209	0.306	0.410	0.273	0.294	0.097	33
cis -nonachlor	0.451	0.903	0.191	0.471	13.8	1.34	2.86	5.4	190
trans -chlordane	<LOD	<LOD	0.103	0.112	1.54	0.141	0.333	0.59	180
trans -nonachlor	<LOD	<LOD	0.154	0.351	5.52	0.171	1.06	2.2	210
heptachlor epoxide	2.22	3.26	1.10	2.21	8.23	3.51	3.42	2.5	73
oxychlordane	7.38	8.39	2.66	4.08	9.13	5.28	6.15	2.6	42
dieldrin	0.842	4.03	<LOD	1.53	2.38	2.94	1.96	1.5	74
HCB	29.6	24.9	30.0	26.5	34.8	22.8	28.1	4.3	15
mirex	2.12	2.57	1.35	2.24	2.31	1.93	2.09	0.42	20
octachlorosytrene	1.64	1.18	0.541	0.762	0.980	0.954	1.01	0.38	37
pentachlorobenzene	2.54	1.54	1.56	1.83	2.02	2.15	1.94	0.38	20
BDE 28	<LOQ	<LOQ	<LOQ	<LOQ	0.180	<LOQ	<LOQ		
BDE 47	13.0	9.29	4.27	12.2	14.6	11.8	10.9	3.7	34
BDE 66	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
BDE 99	2.73	2.67	0.820	1.59	7.33	2.35	2.91	2.3	78
BDE 100	3.35	5.89	0.294	2.34	4.46	2.88	3.20	1.9	60
BDE 138	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		
BDE 153	0.738	0.621	0.558	0.469	0.872	0.671	0.655	0.14	22
BDE 154	0.323	<LOQ	0.267	0.344	0.613	0.315	0.323	0.17	54

Appendix 27. Pesticide and PBDE mass fractions (ng g^{-1} wet mass) with percent lipids in thick-billed murre eggs collected at St. George Island in 2002.

Compound	123	124	125	126	127	128	130	Mean	SD	RSD
percent lipid	12.1	9.89	12.6	13.2	10.4	12.2	10.2	11.5	1.3	11
2,4'-DDD	<LOD	0.163	0.435	<LOD	<LOD	<LOD	<LOD	0.118	0.15	130
2,4'-DDE	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
2,4'-DDT	<LOD	0.454	0.152	0.133	<LOD	<LOD	<LOD	0.130	0.15	120
4,4,'-DDD	2.41	3.74	37.3	0.730	0.683	0.757	0.675	6.61	14	210
4,4'-DDE	71.2	90.3	52.8	72.1	81.4	45.7	52.3	66.5	17	25
4,4'-DDT	0.137	0.156	4.68	0.176	0.118	<LOD	<LOD	0.773	1.7	220
α-HCH	4.39	5.35	4.10	2.46	2.46	3.34	1.11	3.32	1.4	43
β-HCH	38.9	14.2	17.1	10.7	9.39	27.9	8.01	18.0	11	63
γ-HCH	0.680	0.711	0.825	0.350	0.454	0.501	0.165	0.527	0.23	43
cis -chlordane	0.540	0.580	0.426	0.464	0.264	0.298	0.214	0.398	0.14	36
cis -nonachlor	0.970	0.465	0.335	0.569	0.715	0.442	<LOQ	0.514	0.28	54
trans -chlordane	0.144	0.137	0.118	0.106	0.101	0.105	0.110	0.117	0.017	14
trans -nonachlor	0.301	0.873	0.596	0.149	0.104	<LOD	0.165	0.322	0.30	94
heptachlor epoxide	3.90	1.51	1.29	1.53	1.15	2.50	1.14	1.86	1.0	54
oxychlordane	7.09	4.33	4.17	4.10	3.30	4.80	3.14	4.42	1.3	30
dieldrin	4.51	1.66	1.07	0.785	0.822	1.31	0.862	1.57	1.3	85
HCB	60.7	38.4	40.9	23.4	25.0	55.8	14.6	37.0	17	46
mirex	1.64	1.54	1.02	1.10	1.18	1.69	0.831	1.29	0.33	26
octachlorosytrene	1.82	0.874	1.02	0.962	0.973	1.74	0.702	1.16	0.44	38
pentachlorobenzene	4.46	2.61	2.41	1.77	0.993	3.88	1.04	2.45	1.3	54
BDE 28	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		
BDE 47	0.810	0.569	0.707	0.707	0.196	0.428	0.103	0.503	0.27	54
BDE 66	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
BDE 99	0.781	0.586	0.251	0.700	0.123	0.386	<LOQ	0.417	0.28	67
BDE 100	<LOQ	0.541	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.122	0.19	150
BDE 138	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		
BDE 153	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		
BDE 154	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		

Appendix 28. Pesticide and PBDE mass fractions (ng g^{-1} wet mass) with percent lipids in thick-billed murre eggs collected at St. Lawrence Island in 2002.

Compound	193	194	195	196	197	198	Mean	SD	RSD
percent lipid	10.3	10.4	9.87	9.07	12.2	10.3	10.4	1.0	10
2,4'-DDD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
2,4'-DDE	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
2,4'-DDT	0.186	<LOD	<LOD	<LOD	<LOD	0.476	0.142	0.17	120
4,4,'-DDD	36.7	47.2	0.690	0.601	0.806	38.9	20.8	22	110
4,4'-DDE	74.5	33.1	46.9	55.2	40.0	70.4	53.4	17	31
4,4'-DDT	0.109	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
α-HCH	3.06	2.73	2.51	0.964	1.25	2.42	2.15	0.85	39
β-HCH	22.0	27.1	15.4	12.4	30.1	11.5	19.7	7.8	40
γ-HCH	0.491	0.463	0.350	0.157	0.250	0.366	0.346	0.13	37
cis -chlordane	0.317	0.313	0.381	0.294	0.190	0.236	0.289	0.067	23
cis -nonachlor	0.550	0.366	0.262	0.248	0.794	0.697	0.486	0.23	47
trans -chlordane	0.122	0.164	<LOD	<LOD	0.116	0.124	0.109	0.042	39
trans -nonachlor	0.489	0.397	0.146	0.106	0.166	0.253	0.259	0.15	59
heptachlor epoxide	2.27	2.89	2.19	1.13	2.95	1.53	2.16	0.72	34
oxychlordane	5.82	4.09	3.38	3.97	6.65	3.56	4.58	1.3	29
dieldrin	2.04	0.824	0.613	<LOD	1.89	1.24	1.12	0.76	68
HCB	38.6	56.0	33.4	44.6	62.3	21.1	42.6	15	35
mirex	1.55	0.984	0.914	0.764	2.43	1.42	1.34	0.61	46
octachlorosytrene	1.35	1.43	0.940	1.00	2.06	0.961	1.29	0.43	34
pentachlorobenzene	3.36	3.11	4.05	4.40	3.15	1.60	3.28	0.97	30
BDE 28	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		
BDE 47	0.410	0.781	0.639	0.844	0.415	0.590	0.613	0.18	30
BDE 66	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
BDE 99	0.554	0.592	<LOQ	0.611	0.203	0.339	0.391	0.23	60
BDE 100	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		
BDE 138	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		
BDE 153	<LOQ	<LOQ	0.217	<LOQ	<LOQ	<LOQ	<LOQ		
BDE 154	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		

Appendix 29. Pesticide and PBDE mass fractions (ng g^{-1} wet mass) with percent lipids in thick-billed murre eggs collected at Cape Lisburne in 2002.

Compound	180	181	182	183	184	185	Mean	SD	RSD
percent lipid	10.8	11.3	11.8	11.1	9.51	10.2	10.8	0.811	7.5
2,4'-DDD	<LOD	<LOD	<LOD	<LOD	0.233	<LOD	<LOD		
2,4'-DDE	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
2,4'-DDT	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
4,4,'-DDD	0.685	1.97	4.82	7.62	0.773	0.576	2.74	2.9	110
4,4'-DDE	37.9	70.0	50.2	54.5	44.4	39.2	49.4	12	24
4,4'-DDT	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
α-HCH	1.32	2.86	3.73	5.21	3.25	1.42	2.96	1.5	50
β-HCH	12.9	28.8	39.7	24.0	10.5	14.5	21.7	11	52
γ-HCH	0.179	0.426	0.650	0.644	0.377	0.207	0.414	0.20	49
cis-chlordane	0.242	0.308	0.251	0.258	0.361	0.327	0.291	0.048	17
cis-nonachlor	0.416	0.364	1.12	0.530	0.490	0.518	0.573	0.28	48
trans-chlordane	<LOD	0.128	0.119	0.133	0.109	<LOD	0.112	0.018	17
trans-nonachlor	0.143	0.143	0.301	0.497	0.114	<LOD	0.202	0.17	84
heptachlor epoxide	1.91	2.36	4.94	2.28	2.86	2.40	2.79	1.1	39
oxychlordane	5.23	6.41	8.05	5.67	5.98	4.49	5.97	1.2	20
dieldrin	0.914	1.12	5.12	1.52	2.01	1.37	2.01	1.6	78
HCB	38.8	94.6	102	75.0	63.7	47.5	70.2	25	36
mirex	1.06	2.23	2.60	2.26	2.10	1.08	1.89	0.65	35
octachlorosytrene	1.62	2.45	2.12	2.09	2.04	1.44	1.96	0.37	19
pentachlorobenzene	1.91	8.20	6.93	6.34	4.06	2.98	5.07	2.5	49
BDE 28	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		
BDE 47	0.217	1.20	1.32	<LOQ	0.431	0.536	0.631	0.51	82
BDE 66	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
BDE 99	0.184	1.07	1.44	0.491	0.224	0.126	0.590	0.54	92
BDE 100	<LOQ	<LOQ	0.149	<LOQ	<LOQ	<LOQ	<LOQ		
BDE 138	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		
BDE 153	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		
BDE 154	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		

Appendix 30. PCB congener mass fractions (ng g^{-1} wet mass) in thick-billed murre eggs collected at St. Lazaria Island in 2002.

Compound	133	134	135	136	137	139	Mean	SD	RSD
PCB 18	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		
PCB28+31	3.36	2.06	1.69	2.36	3.53	2.93	2.66	0.73	28
PCB 44	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 49	<LOD	<LOD	<LOD	<LOD	0.725	<LOD	0.168	0.27	160
PCB 52	<LOD	<LOD	0.111	0.219	0.634	0.247	0.220	0.22	99
PCB 56	1.55	1.39	0.930	1.00	1.08	1.17	1.19	0.24	20
PCB 63	0.602	0.607	0.437	0.557	0.527	0.586	0.553	0.064	12
PCB 66	5.59	2.79	2.38	3.54	3.80	3.90	3.67	1.1	30
PCB 70	0.125	<LOD	<LOD	0.115	0.271	0.146	0.129	0.079	61
PCB 74	3.83	2.49	1.86	2.51	3.14	3.15	2.83	0.69	24
PCB 95	<LOD	<LOD	<LOD	<LOD	0.655	<LOD	0.146	0.25	170
PCB 99	11.8	2.15	5.16	9.42	17.1	11.1	9.45	5.3	56
PCB 105	5.40	5.80	2.59	4.08	4.23	3.96	4.34	1.1	26
PCB 107	1.06	1.30	0.363	0.775	1.21	0.928	0.939	0.34	36
PCB 110	<LOD	<LOD	<LOD	<LOD	1.16	<LOD	0.232	0.46	200
PCB 114	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 118+106	20.1	14.3	9.03	15.0	20.6	16.8	16.0	4.3	27
PCB 119	0.242	0.188	1.09	0.117	1.61	0.272	0.586	0.62	110
PCB 130	0.706	1.37	<LOD	0.497	1.34	0.721	0.777	0.51	66
PCB 132	<LOD	<LOD	<LOD	<LOD	0.732	<LOD	0.161	0.28	180
PCB 137	0.510	0.144	0.164	0.339	1.08	0.622	0.477	0.35	74
PCB 138	23.9	5.08	8.06	16.4	25.6	19.5	16.4	8.3	51
PCB 146	11.8	8.20	4.44	8.01	9.36	7.36	8.20	2.4	30
PCB 149	0.242	0.258	0.234	0.565	4.40	0.416	1.02	1.7	160
PCB 151	<LOQ	<LOQ	<LOQ	<LOQ	0.306	<LOQ	<LOQ		
PCB 153	53.6	25.8	19.6	37.0	53.8	41.2	38.5	14	37
PCB 154	<LOD	<LOD	<LOD	<LOD	0.777	0.108	0.183	0.29	160
PCB 156	2.59	3.40	0.941	1.52	1.24	1.15	1.81	0.97	54
PCB 157	0.496	0.628	0.238	0.384	0.432	0.349	0.421	0.13	32
PCB 158	1.26	1.90	0.893	1.25	2.80	1.46	1.60	0.68	43
PCB 159	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		
PCB 163	9.80	13.5	3.65	6.56	7.95	6.28	7.95	3.4	43
PCB 165	0.148	0.126	<LOD	0.156	0.134	<LOD	0.125	0.027	22
PCB 166	0.133	<LOD	0.123	<LOD	0.602	0.105	0.179	0.21	120
PCB 167+128	4.52	4.78	1.45	3.23	6.72	3.68	4.06	1.8	43
PCB 170	9.22	13.8	3.03	6.40	6.39	5.40	7.37	3.7	50
PCB 172	2.33	2.82	1.07	1.54	1.55	1.22	1.76	0.68	39
PCB 174	<LOD	0.115	<LOD	<LOD	1.10	0.219	0.269	0.41	150
PCB 175	0.384	0.500	0.231	0.286	0.248	0.281	0.321	0.10	32
PCB 176	<LOD	<LOD	<LOD	<LOD	0.310	0.185	0.125	0.11	86
PCB 177	1.02	2.58	0.313	0.759	5.02	1.64	1.89	1.7	91
PCB 178	1.98	2.84	0.497	1.45	3.20	1.45	1.90	0.99	52
PCB 180+193	18.8	13.7	5.93	12.1	18.5	12.8	13.6	4.8	35
PCB 183	5.86	6.19	2.24	3.41	6.20	3.06	4.49	1.8	40
PCB 185	<LOD	<LOD	<LOD	<LOD	0.282	<LOD	<LOD		
PCB 187	19.1	21.8	6.15	12.4	17.5	12.0	14.8	5.7	38
PCB 188	0.107	<LOD	<LOD	<LOD	0.107	0.108	<LOD		
PCB 189	0.413	0.528	0.152	0.232	0.250	0.255	0.305	0.14	45
PCB 191	<LOD	<LOD	<LOD	<LOD	0.268	<LOD	<LOD		
PCB 194	5.35	6.76	2.64	2.99	3.44	2.55	3.96	1.7	43
PCB 195	2.21	2.52	1.43	1.17	1.44	1.37	1.69	0.54	32
PCB 197	0.473	0.464	0.130	0.137	0.274	0.388	0.311	0.15	50
PCB 199	9.50	10.4	3.64	5.04	4.29	5.06	6.32	2.9	46
PCB 200	<LOD	<LOD	<LOD	<LOD	0.357	<LOD	<LOD		
PCB 201	1.07	1.09	<LOD	0.700	0.248	0.689	0.639	0.43	67
PCB 206	1.60	1.92	1.34	0.991	1.62	1.02	1.41	0.37	26
PCB 207	0.264	0.234	0.128	0.122	0.136	0.210	0.182	0.062	34
PCB 208	0.536	0.729	<LOQ	0.120	0.232	0.446	0.357	0.26	72
PCB 209	1.26	1.51	0.664	0.688	1.01	0.953	1.02	0.33	33

Appendix 31. PCB congener mass fractions (ng g^{-1} wet mass) in thick-billed murre eggs collected at St. George Island in 2002.

Compound	123	124	125	126	127	128	130	Mean	SD	RSD
PCB 18	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		
PCB28+31	4.22	2.51	1.42	2.25	1.82	3.24	1.63	2.44	0.99	41
PCB 44	<LOD	<LOD	0.114	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 49	<LOD	<LOD	<LOD	0.131	<LOD	<LOD	<LOD	<LOD		
PCB 52	0.273	0.231	0.159	0.189	<LOD	<LOD	<LOD	0.134	0.10	78
PCB 56	1.09	0.664	0.846	0.951	1.01	1.04	0.923	0.932	0.14	15
PCB 63	1.25	0.711	0.367	0.461	0.469	0.546	0.465	0.610	0.30	50
PCB 66	3.05	1.78	1.16	2.65	2.47	2.48	2.10	2.24	0.62	28
PCB 70	0.106	0.112	<LOD	0.113	<LOD	<LOD	<LOD	<LOD		
PCB 74	2.38	1.60	1.30	2.11	1.84	2.00	1.86	1.87	0.35	19
PCB 95	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 99	6.44	9.94	0.987	5.51	1.53	4.31	1.82	4.36	3.2	74
PCB 105	1.99	1.50	1.66	2.17	1.89	2.00	1.66	1.84	0.24	13
PCB 107	0.493	0.430	0.497	0.379	0.265	0.349	0.341	0.393	0.085	22
PCB 110	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 114	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 118+106	7.94	8.03	3.35	7.49	5.43	6.17	4.87	6.18	1.8	28
PCB 119	<LOD	<LOD	0.104	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 130	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 132	<LOD	0.544	<LOD	<LOD	<LOD	<LOD	<LOD	0.105	0.19	190
PCB 137	0.225	0.392	<LOD	0.211	<LOD	0.105	<LOD	0.153	0.13	85
PCB 138	7.09	7.21	1.56	6.62	2.06	5.35	3.14	4.72	2.4	52
PCB 146	2.73	2.86	1.22	2.37	1.44	2.34	1.33	2.04	0.69	34
PCB 149	0.427	0.364	0.568	0.167	0.103	<LOD	0.143	0.262	0.19	73
PCB 151	<LOQ	<LOQ	0.195	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		
PCB 153	15.5	31.2	6.25	17.0	8.03	11.8	5.78	13.7	8.9	65
PCB 154	<LOD	0.159	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 156	0.311	0.432	0.226	0.287	0.294	0.314	0.258	0.303	0.065	21
PCB 157	<LOD	0.288	0.151	0.117	<LOD	<LOD	<LOD	0.110	0.088	80
PCB 158	0.416	0.724	0.191	0.465	0.221	0.435	0.194	0.378	0.19	51
PCB 159	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		
PCB 163	2.68	2.56	1.82	2.19	1.47	2.42	1.84	2.14	0.45	21
PCB 165	<LOD	0.169	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 166	<LOD	0.304	<LOD	0.115	<LOD	<LOD	<LOD	0.107	0.090	85
PCB 167+128	0.973	<LOD	<LOD	0.969	<LOD	0.156	<LOD	0.333	0.44	130
PCB 170	1.13	0.842	0.826	0.921	0.709	0.954	0.662	0.863	0.16	18
PCB 172	0.327	0.248	0.354	0.360	0.309	0.356	0.201	0.308	0.061	20
PCB 174	<LOD	0.444	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 175	<LOQ	0.260	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		
PCB 176	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 177	0.385	<LOQ	0.113	0.214	<LOQ	0.169	0.124	0.158	0.12	75
PCB 178	0.492	0.665	0.266	0.439	0.305	0.315	0.240	0.389	0.15	39
PCB 180+193	2.68	3.96	1.29	2.69	0.991	2.04	1.14	2.11	1.1	51
PCB 183	0.830	1.46	0.600	0.709	0.441	0.585	0.304	0.704	0.38	53
PCB 185	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 187	3.34	3.75	2.37	3.09	1.34	2.64	1.96	2.64	0.83	32
PCB 188	<LOD	0.565	<LOD	<LOD	<LOD	<LOD	<LOD	0.110	0.20	180
PCB 189	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 191	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 194	0.113	0.439	<LOD	0.255	0.314	<LOD	0.355	0.229	0.15	66
PCB 195	0.174	<LOQ	<LOQ	<LOQ	0.106	<LOQ	0.144	<LOQ		
PCB 197	<LOD	0.574	<LOD	0.109	0.144	<LOD	<LOD	0.143	0.20	140
PCB 199	0.645	0.791	0.392	0.999	0.654	0.974	0.734	0.741	0.21	28
PCB 200	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 201	<LOD	0.222	0.112	0.121	<LOD	<LOD	<LOD	0.100	0.062	62
PCB 206	0.385	1.04	0.473	<LOD	<LOD	0.206	<LOD	0.367	0.37	100
PCB 207	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.101	<LOQ	<LOQ		
PCB 208	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		
PCB 209	0.369	0.796	0.425	0.450	0.367	0.451	0.346	0.458	0.16	34

Appendix 32. PCB congener mass fractions (ng g^{-1} wet mass) in thick-billed murre eggs collected at St. Lawrence Island in 2002.

Compound	193	194	195	196	197	198	Mean	SD	RSD
PCB 18	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		
PCB28+31	3.27	2.28	2.25	2.97	2.78	1.79	2.56	0.55	22
PCB 44	0.103	0.217	<LOD	<LOD	<LOD	0.177	0.113	0.071	63
PCB 49	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 52	0.336	0.235	0.119	<LOD	0.102	0.177	0.175	0.096	55
PCB 56	1.12	0.861	0.865	0.916	1.14	0.876	0.962	0.13	14
PCB 63	0.514	0.476	0.429	0.493	0.589	0.562	0.511	0.058	11
PCB 66	3.54	1.77	2.19	2.43	2.56	2.46	2.49	0.59	24
PCB 70	0.126	<LOD	0.121	<LOD	0.113	0.128	0.102	0.031	31
PCB 74	2.66	1.68	1.82	1.90	2.29	1.99	2.05	0.36	17
PCB 95	0.163	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 99	8.78	4.69	4.82	4.88	5.68	6.69	5.92	1.6	27
PCB 105	3.73	1.76	2.04	2.53	2.08	2.34	2.41	0.70	29
PCB 107	0.501	0.256	0.303	0.304	0.350	0.391	0.351	0.087	25
PCB 110	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 114	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 118+106	13.4	5.99	7.19	8.11	7.15	8.08	8.33	2.6	32
PCB 119	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 130	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 132	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 137	0.324	<LOD	0.274	0.168	0.162	0.269	0.208	0.099	48
PCB 138	9.46	4.58	5.91	5.11	6.78	6.94	6.46	1.7	27
PCB 146	3.54	2.26	2.02	2.17	3.02	2.72	2.62	0.59	22
PCB 149	0.560	0.491	0.194	0.111	0.142	0.389	0.314	0.19	61
PCB 151	0.119	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		
PCB 153	21.3	14.5	12.4	16.8	15.9	16.3	16.2	3.0	18
PCB 154	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 156	0.969	0.142	0.544	0.594	0.315	0.190	0.459	0.31	67
PCB 157	0.345	0.251	0.127	0.222	<LOD	<LOD	0.173	0.12	69
PCB 158	0.539	0.424	0.343	0.583	0.402	0.408	0.450	0.091	20
PCB 159	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		
PCB 163	2.98	2.24	2.16	1.96	2.65	1.97	2.33	0.41	18
PCB 165	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 166	<LOD	<LOD	<LOD	0.130	<LOD	<LOD	<LOD		
PCB 167+128	1.86	0.731	0.719	0.886	0.359	0.799	0.893	0.51	57
PCB 170	1.41	0.879	1.07	1.17	0.927	1.01	1.08	0.19	18
PCB 172	0.557	0.372	0.261	0.438	0.272	0.279	0.363	0.12	32
PCB 174	0.120	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 175	<LOQ	0.125	<LOQ	0.119	<LOQ	0.108	<LOQ		
PCB 176	<LOD	0.127	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 177	0.487	0.347	0.207	0.104	0.123	0.366	0.272	0.15	56
PCB 178	0.481	0.482	0.296	0.298	0.357	0.466	0.397	0.090	23
PCB 180+193	3.14	1.90	2.58	2.34	2.34	2.55	2.48	0.41	16
PCB 183	0.925	0.675	0.721	0.709	0.741	0.658	0.738	0.096	13
PCB 185	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 187	3.64	2.99	2.56	2.52	3.54	3.16	3.07	0.47	16
PCB 188	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 189	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 191	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 194	0.279	0.238	0.500	0.867	0.523	<LOD	0.415	0.28	67
PCB 195	0.208	0.373	0.353	0.498	0.229	0.184	0.308	0.12	40
PCB 197	<LOD	<LOD	<LOD	0.121	<LOD	<LOD	<LOD		
PCB 199	1.51	0.161	0.751	1.41	1.25	0.146	0.873	0.62	71
PCB 200	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 201	<LOD	<LOD	<LOD	<LOD	0.118	<LOD	<LOD		
PCB 206	0.170	0.311	0.110	0.223	0.308	0.307	0.238	0.085	36
PCB 207	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	0.139	<LOQ		
PCB 208	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		
PCB 209	0.472	0.358	0.622	0.666	0.495	0.300	0.486	0.14	29

Appendix 33. PCB congener mass fractions (ng g^{-1} wet mass) in thick-billed murre eggs collected at Cape Lisburne in 2002.

Compound	180	181	182	183	184	185	Mean	SD	RSD
PCB 18	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		
PCB28+31	2.44	3.70	3.31	3.06	2.55	2.33	2.90	0.55	19
PCB 44	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 49	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 52	<LOD	<LOD	0.180	0.270	<LOD	<LOD	0.107	0.10	96
PCB 56	1.14	0.932	0.903	1.03	0.944	0.861	0.968	0.10	10
PCB 63	0.530	0.513	0.500	0.537	0.476	0.481	0.506	0.025	5.0
PCB 66	2.88	2.69	2.34	2.39	2.06	2.17	2.42	0.31	13
PCB 70	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 74	2.29	2.13	2.02	2.00	1.67	1.88	2.00	0.21	11
PCB 95	<LOD	0.244	3.57	0.199	<LOD	<LOD	0.699	1.4	200
PCB 99	4.11	7.49	6.51	7.28	2.45	4.31	5.36	2.0	38
PCB 105	1.99	2.40	2.09	2.58	1.81	1.90	2.13	0.30	14
PCB 107	0.262	0.168	0.456	0.306	0.241	0.178	0.268	0.11	39
PCB 110	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 114	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 118+106	6.21	8.92	7.46	7.69	5.29	6.13	6.95	1.3	19
PCB 119	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 130	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 132	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 137	0.124	<LOD	<LOD	0.140	<LOD	0.124	0.105	0.049	47
PCB 138	5.67	6.55	6.70	6.64	2.53	5.43	5.59	1.6	28
PCB 146	2.16	3.66	3.15	3.35	2.06	2.05	2.74	0.73	27
PCB 149	0.101	0.208	0.329	0.531	<LOD	0.113	0.221	0.18	83
PCB 151	<LOQ	<LOQ	<LOQ	0.160	<LOQ	<LOQ	<LOQ		
PCB 153	12.0	18.4	17.6	18.6	19.2	15.1	16.8	2.8	17
PCB 154	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 156	0.341	0.588	0.116	0.289	0.538	0.363	0.372	0.17	46
PCB 157	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 158	0.301	0.309	0.174	0.341	0.227	0.327	0.280	0.065	23
PCB 159	<LOQ	0.105	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		
PCB 163	2.46	2.17	2.06	3.11	1.85	2.06	2.29	0.45	20
PCB 165	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 166	<LOD	0.106	0.124	<LOD	<LOD	<LOD	<LOD		
PCB 167+128	0.115	0.571	0.757	0.497	<LOD	0.400	0.400	0.27	67
PCB 170	0.775	1.37	1.34	1.24	0.789	0.795	1.05	0.29	28
PCB 172	0.229	0.501	0.452	0.533	0.355	0.233	0.384	0.13	35
PCB 174	<LOD	<LOD	0.105	<LOD	<LOD	0.115	<LOD		
PCB 175	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		
PCB 176	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 177	<LOQ	0.179	0.210	0.195	<LOQ	0.140	0.132	0.080	60
PCB 178	0.230	0.527	0.614	0.641	0.438	0.316	0.461	0.16	36
PCB 180+193	1.71	2.98	2.53	2.78	1.13	2.03	2.19	0.70	32
PCB 183	0.458	1.02	1.27	1.12	0.684	0.546	0.848	0.33	39
PCB 185	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 187	2.46	4.14	4.49	4.34	1.96	2.59	3.33	1.1	34
PCB 188	<LOD	<LOD	<LOD	0.110	<LOD	<LOD	<LOD		
PCB 189	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 191	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD		
PCB 194	0.250	0.236	0.496	0.235	0.325	0.241	0.297	0.10	35
PCB 195	0.165	0.368	0.458	<LOQ	0.410	0.262	0.293	0.14	49
PCB 197	<LOD	<LOD	<LOD	<LOD	<LOD	0.188	0.119	0.098	83
PCB 199	0.776	0.618	0.585	0.540	0.408	0.879	0.634	0.17	27
PCB 200	<LOD	<LOD	<LOD	<LOD	<LOD	0.125	<LOD		
PCB 201	<LOD	<LOD	<LOD	0.124	<LOD	0.116	<LOD		
PCB 206	<LOD	0.545	0.741	0.827	<LOD	<LOD	0.380	0.37	97
PCB 207	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		
PCB 208	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ		
PCB 209	0.302	0.385	0.477	0.317	0.366	0.334	0.363	0.063	17

Appendix 34. PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in glaucous-winged gull eggs collected in the Gulf of Alaska in 2005.

	Viesekoi Rocks						Middleton I						Gulf of Alaska GWGU		
Compound	**641**	**642**	**644**	**Mean**	**SD**	**RSD**	**664**	**666**	**669**	**Mean**	**SD**	**RSD**	**Mean**	**SD**	**RSD**
PCB 18	<LOQ	<LOQ	<LOQ	<LOQ			1.61	<LOQ	<LOQ	0.566	0.90	160	0.289	0.65	220
PCB 28+31	1.37	2.93	1.45	1.92	0.88	46	13.9	0.268	0.296	4.82	7.9	160	3.37	5.3	160
PCB 44	<LOD	<LOD	0.264	0.0992	0.14	140	0.100	<LOD	<LOD	0.0396	0.052	130	0.0694	0.10	150
PCB 49	0.331	0.348	0.364	0.348	0.017	4.7	0.622	0.419	0.309	0.450	0.16	35	0.399	0.12	29
PCB 52	1.01	1.30	1.35	1.22	0.18	15	6.48	0.950	0.580	2.67	3.3	120	1.95	2.2	120
PCB 56	0.183	0.111	<LOD	0.107	0.078	72	0.144	0.286	0.132	0.187	0.086	46	0.147	0.085	58
PCB 63	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
PCB 66	3.99	4.77	2.41	3.72	1.2	32	12.7	0.956	1.07	4.91	6.7	140	4.32	4.4	100
PCB 70	<LOD	0.129	<LOD	0.0435	0.074	170	<LOD	<LOD	<LOD	<LOD			0.0289	0.049	170
PCB 74	2.81	4.16	1.65	2.87	1.3	44	7.06	0.512	0.568	2.71	3.8	140	2.79	2.5	90
PCB 87	0.184	0.425	0.344	0.318	0.12	39	0.304	0.303	0.174	0.260	0.075	29	0.289	0.096	33
PCB 92	0.217	0.339	0.530	0.362	0.16	44	0.734	<LOQ	<LOQ	0.253	0.42	160	0.308	0.29	94
PCB 95	0.292	0.409	0.428	0.376	0.074	20	0.449	0.267	0.181	0.299	0.14	46	0.338	0.11	32
PCB 99	10.7	15.0	6.69	10.8	4.2	38	8.33	2.78	2.77	4.63	3.2	69	7.71	4.7	61
PCB 101	2.21	1.43	1.49	1.71	0.43	25	5.05	1.31	0.270	2.21	2.5	110	1.96	1.6	83
PCB 105	4.17	5.85	2.43	4.15	1.7	41	5.61	1.12	1.17	2.63	2.6	98	3.39	2.1	63
PCB 107	<LOQ	0.415	<LOQ	0.180	0.20	110	<LOQ	<LOQ	<LOQ	<LOQ			0.0972	0.16	160
PCB 110	3.16	2.27	2.26	2.56	0.52	20	4.17	0.836	0.768	1.92	1.9	100	2.24	1.3	59
PCB 114	0.494	0.512	0.344	0.450	0.092	20	0.633	0.190	0.339	0.387	0.23	58	0.419	0.16	38
PCB 118	14.1	21.1	9.08	14.8	6.0	41	14.7	4.12	3.85	7.56	6.2	82	11.2	6.7	60
PCB 119	0.362	0.496	0.126	0.328	0.19	57	0.360	<LOD	0.103	0.158	0.18	110	0.243	0.19	78
PCB 128	2.87	4.42	1.73	3.01	1.4	45	3.22	0.906	0.901	1.68	1.3	80	2.34	1.4	60
PCB 130	0.877	1.24	0.431	0.849	0.41	48	1.11	0.144	0.235	0.496	0.53	110	0.673	0.47	69
PCB 137	1.70	2.48	1.32	1.83	0.59	32	1.66	1.02	0.968	1.22	0.39	32	1.52	0.56	37
PCB 138	17.7	29.7	12.2	19.9	8.9	45	15.8	6.83	5.21	9.28	5.7	61	14.6	8.9	61
PCB 146	6.33	10.4	4.31	7.01	3.1	44	4.80	2.63	1.81	3.08	1.5	50	5.05	3.1	61
PCB 149	2.27	2.07	1.74	2.03	0.27	13	2.29	0.529	0.534	1.12	1.0	91	1.57	0.83	53
PCB 151	<LOQ	0.164	0.291	0.176	0.11	62	0.172	<LOQ	0.339	0.195	0.13	69	0.186	0.11	59
PCB 153+132	33.8	60.8	23.9	39.5	19	48	24.8	13.0	9.34	15.7	8.1	51	27.6	18	67
PCB 154	0.741	1.03	0.598	0.790	0.22	28	0.597	0.406	0.394	0.466	0.11	24	0.628	0.24	38
PCB 156	0.933	1.64	0.622	1.07	0.52	49	1.56	0.359	0.345	0.755	0.70	92	0.910	0.58	63
PCB 157	0.216	0.590	0.105	0.304	0.25	84	0.496	0.243	0.142	0.294	0.18	62	0.299	0.20	66
PCB 158	5.67	9.22	4.15	6.35	2.6	41	6.14	3.10	1.81	3.68	2.2	60	5.02	2.6	52
PCB 159	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
PCB 163	2.91	5.42	1.97	3.43	1.8	52	3.05	1.13	1.00	1.73	1.1	66	2.58	1.6	63
PCB 165	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
PCB 166	0.738	0.673	0.650	0.687	0.046	6.6	0.722	0.625	0.672	0.673	0.049	7.2	0.680	0.043	6.3
PCB 167	0.588	1.18	0.219	0.662	0.48	73	0.739	<LOD	<LOD	0.254	0.42	170	0.458	0.46	100
PCB 170	3.03	5.87	2.30	3.73	1.9	51	4.62	1.41	1.26	2.43	1.9	78	3.08	1.8	60

Appendix 34 (continued). PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in glaucous-winged gull eggs collected in the Gulf of Alaska in 2005.

	Viesekoi Rocks						Middleton I						Gulf of Alaska GWGU		
Compound	**641**	**642**	**644**	**Mean**	**SD**	**RSD**	**664**	**666**	**669**	**Mean**	**SD**	**RSD**	**Mean**	**SD**	**RSD**
PCB 172	0.652	1.43	0.472	0.851	0.51	60	0.992	0.250	0.128	0.457	0.47	100	0.654	0.49	75
PCB 174	0.435	0.371	0.378	0.395	0.035	8.9	0.324	<LOD	<LOD	0.114	0.18	160	0.254	0.19	76
PCB 175	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
PCB 176	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
PCB 177	1.14	1.71	0.802	1.22	0.46	38	1.72	0.319	0.468	0.836	0.77	92	1.03	0.60	59
PCB 178	0.930	1.18	0.747	0.952	0.22	23	1.09	0.269	0.164	0.508	0.51	100	0.730	0.43	58
PCB 180+193	9.97	22.2	7.77	13.3	7.8	58	15.2	4.62	3.26	7.69	6.5	85	10.5	7.1	68
PCB 183	3.19	6.55	2.45	4.06	2.2	54	3.94	1.23	1.13	2.10	1.6	76	3.08	2.0	66
PCB 185	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
PCB 187	7.50	12.6	5.99	8.70	3.5	40	8.44	8.64	3.78	6.95	2.8	40	7.83	3.0	38
PCB 188	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
PCB 189	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
PCB 191	0.114	0.229	<LOD	0.114	0.11	100	0.191	<LOD	<LOD	0.0696	0.11	150	0.0920	0.10	110
PCB 194	1.05	2.46	0.881	1.46	0.87	59	4.00	0.625	0.609	1.74	2.0	110	1.60	1.4	85
PCB 195	1.07	1.39	1.00	1.15	0.21	18	1.70	0.958	0.919	1.19	0.44	37	1.17	0.31	26
PCB 196+203	1.80	3.80	1.56	2.39	1.2	52	6.25	1.26	1.20	2.90	2.9	100	2.65	2.0	76
PCB 197	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
PCB 199	1.18	2.95	0.907	1.68	1.1	66	4.46	1.26	0.466	2.06	2.1	100	1.87	1.5	82
PCB 200	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
PCB 201	<LOD	0.104	<LOD	0.0689	0.030	44	0.247	<LOD	<LOD	0.134	0.098	73	0.101	0.074	73
PCB 202	0.177	0.303	<LOD	0.162	0.15	92	0.273	<LOD	<LOD	0.0971	0.15	160	0.130	0.14	110
PCB 206	0.395	0.752	0.298	0.482	0.24	50	2.61	0.450	0.439	1.17	1.3	110	0.824	0.89	110
PCB 207	<LOQ	<LOQ	<LOQ	<LOQ			0.343	<LOQ	<LOQ	0.119	0.19	160	0.0632	0.14	220
PCB 208	<LOQ	<LOQ	<LOQ	<LOQ			0.405	<LOQ	<LOQ	0.169	0.21	120	0.103	0.15	150
PCB 209	<LOD	<LOD	<LOD	<LOD			0.202	<LOD	<LOD	0.0711	0.11	160	0.0454	0.077	170
BDE 28	<LOQ	1.32	0.592	0.783	0.47	60	3.08	<LOQ	0.922	1.47	1.4	97	1.13	1.0	90
BDE 33	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
BDE 47	15.3	18.9	12.0	15.4	3.5	22	60.6	7.54	153	73.7	74	100	44.6	57	130
BDE 49	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
BDE 66	0.592	0.543	0.600	0.578	0.031	5.3	1.19	0.488	1.23	0.969	0.42	43	0.774	0.34	44
BDE 99	4.92	3.38	3.42	3.91	0.88	22	62.4	7.28	108	59.2	50	85	31.6	44	140
BDE 100	2.31	2.96	1.89	2.39	0.54	23	13.3	1.79	20.8	12.0	9.6	80	7.18	8.0	110
BDE 138	<LOQ	<LOQ	<LOQ	<LOQ			0.855	<LOQ	0.608	0.631	0.21	34	0.414	0.29	69
BDE 153	<LOQ	<LOQ	<LOQ	<LOQ			13.8	<LOQ	10.8	8.69	6.4	74	5.00	5.7	120
BDE 154	<LOQ	<LOQ	<LOQ	<LOQ			4.98	<LOQ	6.00	3.71	3.1	85	2.21	2.6	120
BDE 155	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
BDE 183	<LOQ	<LOQ	<LOQ	<LOQ			3.34	<LOQ	<LOQ	1.30	1.8	140	0.766	1.3	170

Appendix 35. PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in glaucous-winged gull eggs collected in the Bering Sea in 2005.

	Ualik Lake						Shaiak I						Bering Sea GWGU		
Compound	655	658	661	Mean	SD	RSD	576	578	579	Mean	SD	RSD	Mean	SD	RSD
PCB 18	<LOQ	<LOQ	0.902	0.320	0.50	160	<LOQ	<LOQ	<LOQ	<LOQ			0.187	0.35	190
PCB 28+31	1.68	2.61	2.06	2.12	0.47	22	2.57	2.21	2.35	2.38	0.18	7.6	2.25	0.35	15
PCB 44	<LOD	0.139	<LOD	0.0561	0.072	130	<LOD	<LOD	<LOD	<LOD			0.0362	0.051	140
PCB 49	0.391	0.379	0.321	0.364	0.037	10	0.366	0.521	0.324	0.404	0.10	26	0.384	0.073	19
PCB 52	1.48	2.81	1.14	1.81	0.88	49	0.953	1.57	0.609	1.04	0.49	47	1.43	0.76	53
PCB 56	<LOD	<LOD	0.117	0.0510	0.057	110	0.635	0.101	0.153	0.296	0.29	99	0.174	0.23	130
PCB 63	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
PCB 66	2.61	4.19	5.32	4.04	1.4	34	2.69	2.55	3.34	2.86	0.42	15	3.45	1.1	32
PCB 70	<LOD	<LOD	<LOD	<LOD			0.110	0.178	<LOD	0.0963	0.089	93	0.0546	0.073	130
PCB 74	1.85	3.03	3.80	2.89	0.98	34	1.94	1.76	2.13	1.94	0.19	9.5	2.42	0.82	34
PCB 87	0.183	0.240	<LOD	0.145	0.12	83	0.219	0.402	0.181	0.267	0.12	44	0.206	0.13	61
PCB 92	0.239	0.482	0.114	0.278	0.19	67	0.141	0.207	<LOQ	0.125	0.091	72	0.202	0.16	77
PCB 95	0.549	0.884	0.303	0.579	0.29	50	0.450	0.504	0.282	0.412	0.12	28	0.495	0.22	44
PCB 99	6.57	11.0	14.4	10.7	3.9	37	7.33	6.07	8.46	7.29	1.2	16	8.97	3.2	36
PCB 101	1.35	2.11	1.43	1.63	0.42	26	0.571	2.52	0.426	1.17	1.2	100	1.40	0.82	59
PCB 105	2.43	3.77	4.97	3.72	1.3	34	2.51	1.97	2.42	2.30	0.29	13	3.01	1.1	38
PCB 107	<LOQ	<LOQ	<LOQ	<LOQ			0.124	0.121	<LOQ	0.106	0.029	27	0.0812	0.033	41
PCB 110	1.62	2.30	2.87	2.26	0.63	28	0.790	1.92	1.28	1.33	0.57	43	1.80	0.74	41
PCB 114	0.461	0.394	0.578	0.478	0.093	19	0.382	0.333	0.359	0.358	0.025	6.8	0.418	0.089	21
PCB 118	8.76	13.2	19.4	13.8	5.3	39	9.65	7.29	9.56	8.83	1.3	15	11.3	4.4	39
PCB 119	0.265	0.384	0.449	0.366	0.093	25	0.243	0.200	0.241	0.228	0.024	11	0.297	0.097	33
PCB 128	1.54	2.65	3.70	2.63	1.1	41	1.47	1.29	1.71	1.49	0.21	14	2.06	0.94	45
PCB 130	0.577	0.774	1.05	0.800	0.24	30	0.264	0.228	0.214	0.235	0.026	11	0.518	0.34	67
PCB 137	1.29	1.64	2.25	1.73	0.49	28	1.23	1.07	1.28	1.19	0.11	9.2	1.46	0.43	29
PCB 138	9.97	16.5	24.7	17.1	7.4	43	10.4	8.48	11.5	10.1	1.5	15	13.6	6.1	45
PCB 146	3.73	6.24	9.68	6.55	3.0	46	4.06	2.99	4.68	3.91	0.85	22	5.23	2.4	47
PCB 149	1.44	1.94	2.53	1.97	0.55	28	0.654	1.06	0.799	0.838	0.21	25	1.40	0.72	51
PCB 151	0.165	0.317	<LOQ	0.171	0.14	84	<LOQ	0.106	<LOQ	0.0661	0.042	64	0.118	0.11	93
PCB 153+132	19.0	33.4	52.7	35.0	17	48	22.5	16.7	26.1	21.8	4.7	22	28.4	13	47
PCB 154	0.591	0.419	0.894	0.635	0.24	38	0.558	0.500	0.626	0.561	0.063	11	0.598	0.16	27
PCB 156	0.507	0.737	1.59	0.945	0.57	60	0.691	0.402	0.594	0.562	0.15	26	0.754	0.43	57
PCB 157	0.142	0.310	0.482	0.311	0.17	55	0.205	0.213	0.386	0.268	0.10	38	0.290	0.13	44
PCB 158	2.95	4.33	7.43	4.90	2.3	47	3.37	2.51	3.69	3.19	0.61	19	4.05	1.8	44
PCB 159	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
PCB 163	1.40	2.99	4.16	2.85	1.4	49	1.67	1.35	1.80	1.61	0.23	14	2.23	1.1	50
PCB 165	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
PCB 166	0.716	0.710	0.736	0.721	0.014	1.9	0.720	0.632	0.726	0.693	0.053	7.6	0.707	0.038	5.3
PCB 167	0.253	0.576	1.26	0.696	0.51	74	0.175	<LOD	0.273	0.153	0.13	87	0.425	0.45	110
PCB 170	1.40	2.18	4.32	2.63	1.5	57	1.59	1.08	1.62	1.43	0.30	21	2.03	1.2	58

Appendix 35 (continued). PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in glaucous-winged gull eggs collected in the Bering Sea in 2005.

	Ualik Lake						Shaiak I						Bering Sea GWGU		
Compound	**655**	**658**	**661**	**Mean**	**SD**	**RSD**	**576**	**578**	**579**	**Mean**	**SD**	**RSD**	**Mean**	**SD**	**RSD**
PCB 172	0.272	0.485	1.21	0.656	0.49	75	0.337	0.132	0.310	0.260	0.11	43	0.458	0.39	84
PCB 174	<LOD	<LOD	0.348	0.123	0.20	160	<LOD	<LOD	<LOD	<LOD			0.0681	0.14	200
PCB 175	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
PCB 176	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
PCB 177	0.537	0.661	1.10	0.766	0.30	39	0.175	0.243	0.230	0.216	0.036	17	0.491	0.36	72
PCB 178	0.267	1.03	0.677	0.658	0.38	58	0.422	0.358	0.308	0.363	0.057	16	0.510	0.29	57
PCB 180+193	4.22	7.15	16.8	9.39	6.6	70	4.79	3.25	5.15	4.40	1.0	23	6.89	5.0	73
PCB 183	1.70	2.79	5.06	3.18	1.7	54	1.73	1.33	1.98	1.68	0.33	20	2.43	1.4	57
PCB 185	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
PCB 187	5.26	7.25	10.2	7.57	2.5	33	5.13	4.28	5.69	5.03	0.71	14	6.30	2.1	34
PCB 188	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
PCB 189	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
PCB 191	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
PCB 194	0.275	0.633	1.84	0.916	0.82	90	0.721	0.392	0.612	0.575	0.17	29	0.746	0.56	75
PCB 195	0.917	0.940	1.12	0.992	0.11	11	1.01	0.897	0.962	0.956	0.057	5.9	0.974	0.081	8.3
PCB 196+203	0.931	1.29	2.76	1.66	0.97	58	1.26	0.889	1.25	1.13	0.21	19	1.40	0.69	49
PCB 197	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
PCB 199	0.455	0.835	1.84	1.04	0.72	69	0.626	0.342	0.555	0.508	0.15	29	0.776	0.55	71
PCB 200	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
PCB 201	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
PCB 202	<LOD	0.182	<LOD	0.0662	0.10	150	<LOD	<LOD	<LOD	<LOD			0.0388	0.070	180
PCB 206	0.253	0.302	0.508	0.354	0.14	38	0.329	0.203	0.248	0.260	0.064	25	0.307	0.11	35
PCB 207	<LOQ	<LOQ	0.111	0.0383	0.063	170	<LOQ	<LOQ	<LOQ	<LOQ			0.0209	0.044	210
PCB 208	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
PCB 209	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
BDE 28	0.540	0.629	2.83	1.33	1.3	97	0.572	<LOQ	<LOQ	0.511	0.052	10	0.922	0.94	100
BDE 33	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
BDE 47	0.600	1.76	1.16	1.17	0.58	49	0.551	0.825	0.828	0.735	0.16	22	0.954	0.45	47
BDE 49	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
BDE 66	<LOD	<LOD	0.467	0.299	0.15	49	<LOD	<LOD	<LOD	<LOD			0.217	0.15	69
BDE 99	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
BDE 100	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
BDE 138	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
BDE 153	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
BDE 154	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
BDE 155	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
BDE 183	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		

Appendix 36. PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in glaucous gull eggs collected in the Bering Sea in 2005.

	Hooper Bay						Penny River Delta						Bering Sea GLGU		
Compound	**617**	**619**	**622**	**Mean**	**SD**	**RSD**	**670**	**673**	**674**	**Mean**	**SD**	**RSD**	**Mean**	**SD**	**RSD**
PCB 18	0.258	<LOQ	<LOQ	0.103	0.13	130	<LOQ	<LOQ	<LOQ	<LOQ			0.0621	0.097	160
PCB 28+31	2.97	1.85	2.45	2.42	0.56	23	2.15	3.19	2.94	2.76	0.54	20	2.59	0.53	20
PCB 44	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	0.163	0.0594	0.090	150	0.0352	0.063	180
PCB 49	0.344	0.346	0.335	0.342	0.0059	1.7	0.675	0.269	0.752	0.565	0.26	46	0.454	0.20	45
PCB 52	0.422	1.51	1.04	0.991	0.55	55	1.34	0.830	2.83	1.67	1.0	62	1.33	0.83	62
PCB 56	0.413	0.690	0.269	0.457	0.21	47	0.153	0.136	<LOD	0.102	0.074	72	0.280	0.24	86
PCB 63	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
PCB 66	3.67	2.80	3.92	3.46	0.59	17	3.82	5.23	4.98	4.68	0.75	16	4.07	0.90	22
PCB 70	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	0.159	0.0598	0.086	140	0.0352	0.061	170
PCB 74	2.87	2.34	3.07	2.76	0.38	14	2.78	3.68	3.55	3.34	0.49	15	3.05	0.50	16
PCB 87	<LOD	0.250	0.174	0.152	0.11	72	0.697	0.179	0.786	0.554	0.33	59	0.353	0.31	88
PCB 92	<LOQ	0.275	0.189	0.160	0.13	83	0.232	0.335	0.652	0.406	0.22	54	0.283	0.21	74
PCB 95	0.205	0.203	0.219	0.209	0.0087	4.2	0.421	0.275	0.800	0.499	0.27	54	0.354	0.23	66
PCB 99	11.6	8.82	10.5	10.3	1.4	14	9.63	12.3	13.2	11.7	1.9	16	11.0	1.7	15
PCB 101	0.655	2.45	1.74	1.62	0.90	56	4.41	0.146	5.76	3.44	2.9	85	2.53	2.2	86
PCB 105	3.21	2.93	3.50	3.21	0.29	8.9	3.67	4.99	4.62	4.43	0.68	15	3.82	0.81	21
PCB 107	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	0.283	0.113	0.15	130	0.0744	0.10	140
PCB 110	0.918	1.15	1.14	1.07	0.13	12	3.05	1.93	4.27	3.08	1.2	38	2.08	1.3	64
PCB 114	0.376	0.357	0.411	0.381	0.027	7.2	0.419	0.516	0.494	0.476	0.051	11	0.429	0.064	15
PCB 118	12.4	10.9	13.4	12.2	1.3	10	12.8	16.0	17.0	15.3	2.2	14	13.8	2.3	17
PCB 119	0.365	0.302	0.223	0.297	0.071	24	0.340	0.367	0.376	0.361	0.019	5.2	0.329	0.058	18
PCB 128	2.27	2.05	2.09	2.14	0.12	5.5	2.26	2.74	2.91	2.64	0.34	13	2.39	0.35	15
PCB 130	0.443	0.390	0.327	0.387	0.058	15	0.489	0.710	1.09	0.763	0.30	40	0.575	0.28	49
PCB 137	1.63	1.53	1.52	1.56	0.061	3.9	1.65	1.76	1.85	1.75	0.10	5.7	1.66	0.13	7.8
PCB 138	15.5	13.6	13.5	14.2	1.1	7.9	14.2	16.7	17.9	16.3	1.9	12	15.2	1.8	12
PCB 146	5.58	4.61	5.90	5.36	0.67	13	4.89	5.62	6.43	5.65	0.77	14	5.51	0.66	12
PCB 149	0.595	0.794	0.983	0.791	0.19	25	2.19	1.59	3.72	2.50	1.1	44	1.65	1.2	71
PCB 151	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	0.456	0.159	0.26	160	0.0881	0.18	210
PCB 153+132	35.3	28.5	34.2	32.7	3.7	11	26.5	30.4	33.7	30.2	3.6	12	31.4	3.5	11
PCB 154	0.766	0.657	0.626	0.683	0.074	11	0.676	0.713	0.803	0.731	0.065	8.9	0.707	0.067	9.5
PCB 156	0.727	0.765	0.873	0.788	0.076	9.6	0.784	0.926	0.984	0.898	0.10	11	0.843	0.10	12
PCB 157	<LOD	<LOD	<LOD	<LOD			0.216	0.198	0.401	0.272	0.11	41	0.139	0.16	120
PCB 158	4.95	4.16	4.68	4.60	0.40	8.7	4.28	4.94	5.85	5.02	0.79	16	4.81	0.61	13
PCB 159	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
PCB 163	1.87	2.51	2.24	2.21	0.32	15	2.22	2.26	2.81	2.43	0.33	14	2.32	0.32	14
PCB 165	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
PCB 166	0.749	0.706	0.694	0.716	0.029	4.0	0.739	0.714	0.746	0.733	0.017	2.3	0.725	0.023	3.2
PCB 167	0.436	0.406	0.452	0.431	0.023	5.4	0.474	0.574	0.638	0.562	0.083	15	0.497	0.090	18
PCB 170	2.19	2.21	2.16	2.19	0.025	1.2	1.91	2.22	2.35	2.16	0.23	10	2.17	0.14	6.7

Appendix 36 (continued). PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in glaucous gull eggs collected in the Bering Sea in 2005.

	Hooper Bay						Penny River Delta						Bering Sea GLGU		
Compound	**617**	**619**	**622**	**Mean**	**SD**	**RSD**	**670**	**673**	**674**	**Mean**	**SD**	**RSD**	**Mean**	**SD**	**RSD**
PCB 172	0.416	0.409	0.556	0.460	0.083	18	0.371	0.425	0.512	0.436	0.071	16	0.448	0.070	16
PCB 174	<LOD	<LOD	<LOD	<LOD			0.294	<LOD	0.498	0.266	0.25	93	0.141	0.21	150
PCB 175	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
PCB 176	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
PCB 177	0.334	0.284	0.319	0.312	0.026	8.2	0.674	0.727	1.28	0.894	0.34	38	0.603	0.38	64
PCB 178	0.509	0.652	0.725	0.629	0.11	17	0.577	0.898	1.07	0.848	0.25	29	0.739	0.21	29
PCB 180+193	7.62	7.52	7.53	7.56	0.055	0.73	6.05	6.97	7.52	6.85	0.74	11	7.20	0.61	8.5
PCB 183	2.95	2.66	2.62	2.74	0.18	6.6	2.11	2.47	2.80	2.46	0.35	14	2.60	0.29	11
PCB 185	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
PCB 187	6.60	5.67	6.79	6.35	0.60	9.4	6.14	6.76	8.06	6.99	0.98	14	6.67	0.81	12
PCB 188	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
PCB 189	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
PCB 191	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
PCB 194	0.782	0.661	0.780	0.741	0.069	9.4	0.559	0.705	0.626	0.630	0.073	12	0.686	0.088	13
PCB 195	1.06	0.950	0.971	0.994	0.058	5.9	0.951	1.02	0.985	0.985	0.035	3.5	0.990	0.043	4.4
PCB 196+203	1.63	1.40	1.42	1.48	0.13	8.6	1.16	1.26	1.31	1.24	0.076	6.1	1.36	0.16	12
PCB 197	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
PCB 199	0.928	0.689	0.881	0.833	0.13	15	0.624	0.712	0.978	0.771	0.18	24	0.802	0.15	18
PCB 200	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
PCB 201	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
PCB 202	0.126	<LOD	<LOD	0.0519	0.064	120	<LOD	<LOD	0.160	0.0561	0.090	160	0.0540	0.070	130
PCB 206	0.341	0.262	0.324	0.309	0.042	13	0.246	0.272	0.274	0.264	0.016	5.9	0.287	0.037	13
PCB 207	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
PCB 208	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
PCB 209	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
BDE 28	<LOQ	<LOQ	0.608	0.305	0.27	87	<LOQ	<LOQ	<LOQ	<LOQ			0.263	0.18	69
BDE 33	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
BDE 47	1.27	0.746	0.967	0.994	0.26	26	2.55	2.99	2.71	2.75	0.22	8.1	1.87	0.99	53
BDE 49	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
BDE 66	<LOD	<LOD	<LOD	<LOD			0.486	0.494	0.484	0.488	0.0053	1.1	0.319	0.19	60
BDE 99	<LOQ	<LOQ	<LOQ	<LOQ			1.94	2.23	<LOQ	1.85	0.43	23	1.13	0.86	76
BDE 100	<LOQ	4.16	<LOQ	1.97	1.9	97	<LOQ	<LOQ	<LOQ	<LOQ			1.31	1.4	110
BDE 138	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
BDE 153	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
BDE 154	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
BDE 155	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
BDE 183	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		

Appendix 37. PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in glaucous gull eggs collected in the Chukchi Sea in 2005.

	Noatak River Delta, Chukchi Sea GLGU					
Compound	**611**	**614**	**616**	**Mean**	**SD**	**RSD**
PCB 18	<LOQ	<LOQ	<LOQ	<LOQ		
PCB 28+31	2.63	2.29	2.87	2.60	0.29	11
PCB 44	<LOD	<LOD	<LOD	<LOD		
PCB 49	0.378	0.401	0.357	0.379	0.022	5.8
PCB 52	2.70	0.685	1.73	1.71	1.0	59
PCB 56	0.119	<LOD	0.495	0.212	0.25	120
PCB 63	<LOQ	<LOQ	<LOQ	<LOQ		
PCB 66	3.28	3.63	3.78	3.56	0.26	7.2
PCB 70	0.123	<LOD	<LOD	0.0471	0.066	140
PCB 74	2.51	2.78	3.15	2.81	0.32	11
PCB 87	0.252	0.191	0.348	0.264	0.079	30
PCB 92	0.411	<LOQ	0.350	0.262	0.21	79
PCB 95	0.547	0.328	0.375	0.417	0.12	28
PCB 99	10.6	9.84	13.3	11.2	1.8	16
PCB 101	1.82	2.50	1.65	1.99	0.45	23
PCB 105	3.51	3.41	3.85	3.59	0.23	6.4
PCB 107	<LOQ	<LOQ	0.176	0.0774	0.089	110
PCB 110	1.83	2.18	2.14	2.05	0.19	9.3
PCB 114	0.432	0.415	0.371	0.406	0.031	7.8
PCB 118	13.1	12.6	15.4	13.7	1.5	11
PCB 119	0.308	0.261	0.360	0.310	0.050	16
PCB 128	2.33	2.34	2.97	2.55	0.37	14
PCB 130	0.455	0.508	0.591	0.518	0.069	13
PCB 137	1.71	1.53	2.03	1.76	0.25	14
PCB 138	15.3	15.4	22.3	17.7	4.0	23
PCB 146	5.22	5.23	7.06	5.84	1.1	18
PCB 149	1.35	1.80	1.56	1.57	0.23	14
PCB 151	<LOQ	<LOQ	<LOQ	<LOQ		
PCB 153+132	30.6	32.0	43.7	35.4	7.2	20
PCB 154	0.696	0.642	0.761	0.700	0.060	8.5
PCB 156	0.884	0.773	1.11	0.922	0.17	19
PCB 157	0.439	<LOD	0.102	0.184	0.23	120
PCB 158	4.24	4.67	6.47	5.13	1.2	23
PCB 159	<LOQ	<LOQ	<LOQ	<LOQ		
PCB 163	2.11	2.23	3.47	2.60	0.75	29
PCB 165	<LOD	<LOD	<LOD	<LOD		
PCB 166	0.723	0.714	0.749	0.729	0.018	2.5
PCB 167	0.505	0.368	0.592	0.488	0.11	23
PCB 170	2.11	2.10	3.31	2.51	0.70	28

Appendix 37 (continued). PBDE and PCB congener mass fractions (ng g^{-1} wet mass) in glaucous gull eggs collected in the Chukchi Sea in 2005.

	Noatak River Delta, Chukchi Sea GLGU					
Compound	**611**	**614**	**616**	**Mean**	**SD**	**RSD**
PCB 172	0.417	0.347	0.731	0.498	0.20	41
PCB 174	<LOD	0.142	<LOD	0.0587	0.072	120
PCB 175	<LOQ	<LOQ	<LOQ	<LOQ		
PCB 176	<LOD	<LOD	<LOD	<LOD		
PCB 177	0.441	0.674	0.570	0.562	0.12	21
PCB 178	0.597	0.516	0.821	0.645	0.16	25
PCB 180+193	7.53	7.01	12.0	8.85	2.7	31
PCB 183	2.56	2.65	4.00	3.07	0.81	26
PCB 185	<LOD	<LOD	<LOD	<LOD		
PCB 187	6.30	6.58	7.75	6.88	0.77	11
PCB 188	<LOD	<LOD	<LOD	<LOD		
PCB 189	<LOD	<LOD	<LOD	<LOD		
PCB 191	<LOD	<LOD	0.142	0.0513	0.079	150
PCB 194	0.766	0.615	1.21	0.864	0.31	36
PCB 195	1.00	0.954	1.12	1.02	0.086	8.4
PCB 196+203	1.35	1.38	2.25	1.66	0.51	31
PCB 197	<LOD	<LOD	<LOD	<LOD		
PCB 199	0.657	0.871	1.27	0.933	0.31	33
PCB 200	<LOD	<LOD	<LOD	<LOD		
PCB 201	<LOD	<LOD	<LOD	<LOD		
PCB 202	<LOD	<LOD	0.151	0.0544	0.084	150
PCB 206	0.248	0.298	0.458	0.335	0.11	33
PCB 207	<LOQ	<LOQ	<LOQ	<LOQ		
PCB 208	<LOQ	<LOQ	<LOQ	<LOQ		
PCB 209	<LOD	<LOD	<LOD	<LOD		
BDE 28	0.851	0.588	<LOQ	0.512	0.38	75
BDE 33	<LOQ	<LOQ	<LOQ	<LOQ		
BDE 47	0.909	1.67	13.6	5.39	7.1	130
BDE 49	<LOQ	<LOQ	<LOQ	<LOQ		
BDE 66	<LOD	0.503	0.466	0.405	0.14	34
BDE 99	<LOQ	<LOQ	12.7	4.78	6.9	140
BDE 100	<LOQ	<LOQ	2.65	1.25	1.3	100
BDE 138	<LOQ	<LOQ	<LOQ	<LOQ		
BDE 153	<LOQ	<LOQ	<LOQ	<LOQ		
BDE 154	<LOQ	<LOQ	<LOQ	<LOQ		
BDE 155	<LOQ	<LOQ	<LOQ	<LOQ		
BDE 183	<LOQ	<LOQ	<LOQ	<LOQ		

Appendix 38. Pesticide mass fractions (ng g^{-1} wet mass) with percent lipids in glaucous-winged gull eggs collected in the Gulf of Alaska in 2005.

	Viesekoi Rocks						Middleton I						Gulf of Alaska GWGU		
Compound	**641**	**642**	**644**	**Mean**	**SD**	**RSD**	**664**	**666**	**669**	**Mean**	**SD**	**RSD**	**Mean**	**SD**	**RSD**
percent lipid	7.39	8.84	8.58	8.27	0.77	9.3	8.02	7.00	7.32	7.45	0.52	7.0	7.86	0.74	9.4
2,4'-DDD	<LOD	<LOD	1.48	0.581	0.78	130	<LOD	<LOD	0.226	0.162	0.061	38	0.371	0.55	150
2,4'-DDE	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
2,4'-DDT	<LOD	0.421	<LOD	0.243	0.15	64	<LOD	<LOD	<LOD	<LOD			0.168	0.14	81
4,4,'-DDD	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
4,4'-DDE	215	322	122	220	100	46	74.9	167	43.0	95.0	64	68	157	100	65
4,4'-DDT	1.16	3.32	2.26	2.25	1.1	48	0.947	3.72	<LOD	1.62	1.9	120	1.93	1.4	73
α-HCH	0.361	0.266	0.338	0.322	0.050	15	0.386	0.334	0.394	0.371	0.033	8.8	0.347	0.046	13
β-HCH	15.9	14.1	12.6	14.2	1.7	12	1.77	5.33	4.51	3.87	1.9	48	9.04	5.9	65
γ-HCH	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
cis -chlordane	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
cis -nonachlor	1.42	2.17	1.86	1.82	0.38	21	1.57	0.686	0.621	0.959	0.53	55	1.39	0.62	45
trans -chlordane	1.87	2.41	1.39	1.89	0.51	27	1.31	0.859	0.989	1.05	0.23	22	1.47	0.58	39
trans -nonachlor	2.86	4.07	5.21	4.05	1.2	29	3.57	1.53	1.38	2.16	1.2	57	3.10	1.5	48
heptachlor epoxide	3.57	6.61	4.77	4.98	1.5	31	2.91	2.06	1.84	2.27	0.57	25	3.63	1.8	50
oxychlordane	16.0	19.4	8.60	14.7	5.5	38	4.95	5.11	<LOQ	3.92	1.9	49	9.29	7.0	75
dieldrin	13.1	7.69	14.0	11.6	3.4	29	17.7	5.46	7.63	10.3	6.5	64	10.9	4.7	43
HCB	20.5	34.3	21.2	25.3	7.8	31	14.9	9.70	9.73	11.4	3.0	26	18.4	9.3	50
mirex	1.71	4.00	1.46	2.39	1.4	59	1.01	0.696	<LOQ	0.679	0.34	50	1.53	1.3	85
pentachlorobenzene	0.438	1.18	0.579	0.732	0.39	54	0.638	<LOQ	0.351	0.384	0.24	62	0.558	0.35	62

Appendix 39. Pesticide mass fractions (ng g^{-1} wet mass) with percent lipids in glaucous-winged gull eggs collected in the Bering Sea in 2005.

	Ualik Lake						Shaiak I						Bering Sea GWGU		
Compound	**655**	**658**	**661**	**Mean**	**SD**	**RSD**	**576**	**578**	**579**	**Mean**	**SD**	**RSD**	**Mean**	**SD**	**RSD**
percent lipid	8.23	7.20	5.70	7.04	1.3	18	7.06	6.98	7.73	7.26	0.41	5.7	7.15	0.85	12
2,4'-DDD	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
2,4'-DDE	0.350	<LOD	<LOD	0.213	0.12	56	<LOD	<LOD	<LOD	<LOD			0.184	0.091	49
2,4'-DDT	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
4,4,'-DDD	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
4,4'-DDE	87.0	130	213	143	64	45	74.3	59.7	70.5	68.2	7.6	11	106	58	55
4,4'-DDT	0.264	<LOD	2.13	0.868	1.1	130	<LOD	1.90	<LOD	0.686	1.1	150	0.777	0.97	120
α-HCH	0.288	0.264	<LOD	0.216	0.10	49	0.413	0.524	0.334	0.424	0.095	23	0.320	0.14	45
β-HCH	6.71	15.5	7.68	9.96	4.8	48	13.3	11.4	18.4	14.4	3.6	25	12.2	4.5	37
γ-HCH	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
cis -chlordane	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
cis -nonachlor	1.71	2.38	1.99	2.03	0.34	17	1.12	1.50	1.58	1.40	0.25	18	1.71	0.43	25
trans -chlordane	1.18	2.30	1.86	1.78	0.56	32	1.12	1.33	1.55	1.33	0.22	16	1.56	0.45	29
trans -nonachlor	4.70	4.97	4.06	4.58	0.47	10	2.64	3.88	2.95	3.16	0.65	20	3.87	0.93	24
heptachlor epoxide	3.81	7.07	3.96	4.95	1.8	37	4.56	3.53	7.32	5.14	2.0	38	5.04	1.7	34
oxychlordane	10.3	20.3	21.3	17.3	6.1	35	10.5	11.3	20.3	14.0	5.4	39	15.7	5.5	35
dieldrin	12.3	10.9	14.1	12.4	1.6	13	5.90	5.47	6.62	6.00	0.58	9.7	9.22	3.7	40
HCB	26.8	44.8	28.9	33.5	9.8	29	42.3	31.3	45.3	39.6	7.4	19	36.6	8.5	23
mirex	1.56	3.01	5.24	3.27	1.9	57	2.24	1.66	2.70	2.20	0.52	24	2.74	1.4	49
pentachlorobenzene	1.00	1.69	1.05	1.25	0.38	31	1.17	0.811	0.956	0.979	0.18	18	1.11	0.31	28

Appendix 40. Pesticide mass fractions (ng g^{-1} wet mass) with percent lipids in glaucous gull eggs collected in the Bering Sea in 2005.

	Hooper Bay						Penny River Delta						Bering Sea GLGU		
Compound	**617**	**619**	**622**	**Mean**	**SD**	**RSD**	**670**	**673**	**674**	**Mean**	**SD**	**RSD**	**Mean**	**SD**	**RSD**
percent lipid	8.26	5.90	8.67	7.61	1.5	20	7.79	6.42	10.2	8.14	1.9	24	7.88	1.6	20
2,4'-DDD	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
2,4'-DDE	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
2,4'-DDT	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
4,4,'-DDD	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
4,4'-DDE	85.5	89.0	109	94.5	13	13	121	129	163	138	22	16	116	29	25
4,4'-DDT	0.231	1.47	1.16	0.954	0.64	68	5.67	<LOD	7.64	4.45	4.0	89	2.70	3.2	120
α-HCH	<LOD	<LOD	<LOD	<LOD			<LOD	<LOD	<LOD	<LOD			<LOD		
β-HCH	17.8	15.8	18.1	17.2	1.3	7.3	10.1	17.3	9.82	12.4	4.2	34	14.8	3.8	26
γ-HCH	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
cis -chlordane	<LOQ	<LOQ	<LOQ	<LOQ			<LOQ	<LOQ	<LOQ	<LOQ			<LOQ		
cis -nonachlor	1.08	1.41	1.76	1.42	0.34	24	1.41	1.97	2.82	2.07	0.71	34	1.74	0.61	35
trans -chlordane	1.76	1.47	1.43	1.55	0.18	12	1.33	2.41	1.59	1.78	0.56	32	1.67	0.39	24
trans -nonachlor	2.67	2.78	2.90	2.78	0.12	4.1	3.21	5.86	4.82	4.63	1.3	29	3.71	1.3	36
heptachlor epoxide	7.28	5.17	5.82	6.09	1.1	18	4.22	5.49	4.17	4.63	0.75	16	5.36	1.2	22
oxychlordane	18.4	13.8	15.6	15.9	2.3	15	14.9	18.2	18.4	17.2	2.0	11	16.6	2.0	12
dieldrin	6.65	6.14	5.22	6.00	0.72	12	9.76	9.13	16.8	11.9	4.3	36	8.95	4.2	47
HCB	53.0	31.5	56.9	47.1	14	29	28.9	48.7	34.9	37.5	10	27	42.3	12	28
mirex	3.59	2.22	3.50	3.10	0.77	25	2.12	2.52	2.63	2.42	0.27	11	2.76	0.63	23
pentachlorobenzene	0.754	0.575	1.09	0.806	0.26	32	0.869	1.52	1.03	1.14	0.34	30	0.973	0.33	34

Appendix 41. Pesticide mass fractions (ng g^{-1} wet mass) with percent lipids in glaucous gull eggs collected in the Chukchi Sea in 2005.

	Noatak River Delta, Chukchi Sea GLGU					
Compound	**611**	**614**	**616**	**Mean**	**SD**	**RSD**
percent lipid	7.96	8.34	7.24	7.85	0.56	7.1
2,4'-DDD	<LOD	<LOD	<LOD	<LOD		
2,4'-DDE	<LOD	<LOD	<LOD	<LOD		
2,4'-DDT	<LOD	<LOD	<LOD	<LOD		
4,4,'-DDD	<LOQ	<LOQ	<LOQ	<LOQ		
4,4'-DDE	100	119	136	118	18	15
4,4'-DDT	1.80	3.31	1.71	2.27	0.90	40
α-HCH	<LOD	0.438	0.284	0.245	0.22	88
β-HCH	15.2	22.7	22.3	20.1	4.2	21
γ-HCH	<LOQ	<LOQ	<LOQ	<LOQ		
cis -chlordane	<LOQ	<LOQ	<LOQ	<LOQ		
cis -nonachlor	1.62	1.31	1.70	1.54	0.21	13
trans -chlordane	1.65	1.20	1.72	1.52	0.28	19
trans -nonachlor	4.61	2.16	3.67	3.48	1.2	36
heptachlor epoxide	5.92	7.90	8.59	7.47	1.4	19
oxychlordane	13.9	22.5	22.0	19.5	4.8	25
dieldrin	6.27	8.63	9.39	8.10	1.6	20
HCB	34.5	43.7	42.4	40.2	5.0	12
mirex	2.65	3.02	3.59	3.09	0.47	15
pentachlorobenzene	1.41	1.24	1.37	1.34	0.089	6.6

Appendix 42. Total mercury mass fractions (μg g^{-1}) in seabird eggs arranged by egg storage ID. COMU= common murre; TBMU = thick-billed murre; GLGU = glaucous gull; GWGU = glaucous-winged gull; DIOM = Little Diomede Island; STLA = St. Lazaria Island; STGE = St. George Island; EAAM = East Amatuli Island; BOGO = Bogoslof Island; STLW = St. Lawrence Island; CLIS = Cape Lisburne; MIDD = Middleton Island; DUCK = Duck Island; GULL = Gull Island; SHKI = Shaiak Island; NOAT = Noatak River delta; HOOP = Hooper Bay; VIRK = Viesekoi Rocks; UALK = Ualik Lake; PNRD = Penny River delta; CDEN = Cape Denbigh; CPEI = Cape Pierce; SLED = Sledge Island; BLUF = Bluff; BOGO = Bogoslof Island

DIOMCOMU99		**STLACOMU99**		**STGECOMU99**		**EAAMCOMU99**		**STGETBMU00**		**BOGOTBMU00**		**BOGOCOMU00**		**STLACOMU01**	
ID	***Hg***	***ID***	***Hg***	***ID***	***Hg***	***ID***	***Hg***	***ID***	***Hg***	***ID***	***Hg***	***ID***	***Hg***	***ID***	***Hg***
1	0.056	10	0.255	20	0.033	31	0.195	42	0.049	49	0.072	59	0.025	68	0.141
2	0.077	11	0.118	21	0.028	32	0.357	43	0.036	50	0.107	60	0.015	69	0.179
3	0.051	12	0.277	22	0.023	33	0.159	44	0.040	51	0.024	61	0.013	70	0.160
4	0.070	13	0.131	23	0.029	34	0.171	45	0.032	52	0.109	62	0.026	71	0.114
5	0.044	14	0.266	24	0.018	35	0.219	46	0.033	53	0.091	63	0.044	72	0.198
6	0.039	15	0.189	25	0.013	36	0.168	47	0.031	54	0.113	64	0.041	73	0.174
7	0.065	16	0.211	26	0.032	37	0.188	48	0.040	55	0.050	65	0.018	74	0.161
8	0.010	17	0.251	27	0.041	38	0.114			56	0.080	66	0.045	75	0.069
9	0.067	18	0.217	28	0.016	39	0.090			57	0.097	67	0.048	76	0.134
		19	0.158	29	0.023	40	0.257			58	0.114			77	0.173
				30	0.024	41	0.278								
Mean	0.053		0.207		0.026		0.200		0.037		0.086		0.031		0.150
Stdev	0.019		0.054		0.008		0.072		0.006		0.028		0.013		0.036
RSD	36%		26%		30%		36%		15%		33%		44%		24%

STLATBMU01		**STLATBMU02**		**STGETBMU02**		**CLISTBMU02**		**STLWTBMU02**		**STLACOMU03**		**MIDDCOMU03**		**EAAMCOMU03**	
ID	***Hg***	***ID***	***Hg***	***ID***	***Hg***	***ID***	***Hg***	***ID***	***Hg***	***ID***	***Hg***	***ID***	***Hg***	***ID***	***Hg***
78	0.071	133	0.220	123	0.025	180	0.072	193	0.047	297	0.192	308	0.140	322	0.101
79	0.137	134	0.239	124	0.059	181	0.054	194	0.032	298	0.177	311	0.218	324	0.099
80	0.066	135	0.213	125	0.031	182	0.039	195	0.036	299	0.116	312	0.110	325	0.092
81	0.076	136	0.151	126	0.026	183	0.054	196	0.030	300	0.227	314	0.095	327	0.120
82	0.137	137	0.204	127	0.082	184	0.067	197	0.025	301	0.207	315	0.144	330	0.136
83	0.116	139	0.167	128	0.014	185	0.032	198	0.070	302	0.107	317	0.139	331	0.125
84	0.110			130	0.060					303	0.161	318	0.158	332	0.140
85	0.176									304	0.200	319	0.174	333	0.117
86	0.102									305	0.144	320	0.239	335	0.117
87	0.048									306	0.209	321	0.149	336	0.096
Mean	0.104		0.199		0.043		0.053		0.040		0.174		0.157		0.114
Stdev	0.037		0.031		0.023		0.014		0.015		0.039		0.042		0.016
RSD	36%		15%		54%		27%		38%		22%		27%		14%

Appendix 42 (continued). Total mercury mass fractions (µg g^{-1}) in all seabird eggs arranged by egg storage ID. COMU = common murre; GLGU = glaucous gull; GWGU = glaucous-winged gull; DIOM = Little Diomede Island, STLA = St. Lazaria Island; STGE = St. George Island; EAAM = East Amatuli Island; BOGO = Bogoslof Island; STLW = St. Lawrence Island; CLIS = Cape Lisburne; MIDD = Middleton Island; DUCK = Duck Island; GULL = Gull Island; SHKI = Shaiak Island; NOAT = Noatak River delta; HOOP = Hooper Bay; VIRK = Viesekoi Rocks; UALK = Ualik Lake; PNRD = Penny River delta; CDEN = Cape Denbigh; CPEI = Cape Pierce; SLED = Sledge Island; BLUF = Bluff; BOGO = Bogoslof Island

STLACOMU04		**DUCKCOMU04**		**MIDDCOMU04**		**GULLCOMU04**		**SHKIGWGU05**		**NOATGLGU05**		**HOOPGLGU05**		**VIRK0WGU05**	
ID	***Hg***	***ID***	***Hg***	***ID***	***Hg***	***ID***	***Hg***	***ID***	***Hg***	***ID***	***Hg***	***ID***	***Hg***	***ID***	***Hg***
464	0.143	489	0.182	493	0.230	505	0.125	576	0.167	611	0.128	617	0.229	641	0.115
465	0.220	490	0.145	494	0.265	506	0.116	578	0.137	614	0.181	619	0.244	642	0.125
466	0.198	491	0.158	495	0.193	507	0.105	579	0.158	616	0.081	622	0.118	644	0.127
467	0.376	492	0.221	496	0.350	508	0.151								
468	0.132			497	0.118	509	0.143								
469	0.281			498	0.228	510	0.093								
470	0.256			500	0.249	511	0.127								
471	0.141			501	0.196	513	0.187								
Mean	0.218		0.176		0.229		0.131		0.154		0.130		0.197		0.122
Stdev	0.079		0.029		0.062		0.028		0.012		0.041		0.056		0.005
RSD	36%		16%		27%		21%		8%		31%		28%		4%

UALKGWGU05		**MIDDGWGU05**		**PNRDGLGU05**		**CDENCOMU05**		**CPEICOMU05**		**SLEDCOMU05**		**BLUFCOMU05**		**BOGOCOMU05**	
ID	***Hg***	***ID***	***Hg***	***ID***	***Hg***	***ID***	***Hg***	***ID***	***Hg***	***ID***	***Hg***	***ID***	***Hg***	***ID***	***Hg***
655	0.089	664	0.234	670	0.169	676	0.133	748	0.053	761	0.095	777	0.233	862	0.139
658	0.104	666	0.105	673	0.149	677	0.110	756	0.040	764	0.161	780	0.163	863	0.036
661	0.230	669	0.109	674	0.210	678	0.191	757	0.036	767	0.078	782	0.203	866	0.016
						681	0.202	758	0.028	768	0.172	783	0.114	869	0.038
						683	0.287	760	0.112	771	0.106	844	0.101	871	0.041
Mean	0.141		0.149		0.176		0.184		0.054		0.122		0.163		0.054
Stdev	0.063		0.060		0.026		0.062		0.030		0.037		0.051		0.043
RSD	45%		40%		15%		33%		56%		30%		31%		80%

Appendix 43. Organotin levels in selected seabird eggs. COMU = common murre; TBMU = thick-billed murre; GLGU = glaucous gull; GWGU= glaucous-winged gull; BRPE = brown pelican.

Species	Sample Number	Location	MBT (pg Sn g^{-1})	U (k = 2)	DBT (pg Sn g^{-1})	U (k = 2)	TBT (pg Sn g^{-1})	U (k = 2)
COMU	DIOM01COMU99	Little Diomede Island	194	± 10	211	± 12	67	± 11
COMU	DIOM02COMU99	Little Diomede Island	186	± 10	147	± 9	45	± 7
COMU	DIOM03COMU99	Little Diomede Island	57	± 4	88	± 5	36	± 6
COMU	DIOM04COMU99	Little Diomede Island	84	± 5	121	± 7	40	± 7
COMU	DIOM05COMU99	Little Diomede Island	119	± 6	80	± 5	51	± 8
COMU	DIOM06COMU99	Little Diomede Island	254	± 13	170	± 10	94	± 16
COMU	STGE01COMU99	St. George Island	82	± 5	126	± 7	52	± 9
COMU	STGE02COMU99	St. George Island	118	± 6	60	± 4	56	± 9
COMU	STGE03COMU99	St. George Island	67	± 4	97	± 6	46	± 8
COMU	STGE04COMU99	St. George Island	102	± 6	69	± 4	47	± 8
COMU	STGE05COMU99	St. George Island	72	± 4	90	± 5	30	± 5
COMU	STGE06COMU99	St. George Island	42	± 3	68	± 4	57	± 9
COMU	EAAM01COMU99	East Amatuli Island	40	± 3	40	± 3	22	± 4
COMU	EAAM02COMU99	East Amatuli Island	55	± 4	101	± 7	26	± 4
COMU	EAAM03COMU99	East Amatuli Island	77	± 5	43	± 3	28	± 5
COMU	EAAM04COMU99	East Amatuli Island	47	± 4	97	± 6	38	± 6
COMU	EAAM05COMU99	East Amatuli Island	64	± 4	85	± 5	31	± 5
COMU	EAAM06COMU99	East Amatuli Island	99	± 6	97	± 6	57	± 9
COMU	EAAM09COMU03	East Amatuli Island	36	± 3	66	± 3	60	± 10
COMU	EAAM01COMU03	East Amatuli Island	28	± 3	100	± 6	68	± 11
COMU	EAAM02COMU03	East Amatuli Island	48	± 3	38	± 2	33	± 5
COMU	EAAM04COMU03	East Amatuli Island	43	± 3	58	± 3	45	± 7
COMU	STLA01COMU99	St. Lazaria Island	154	± 8	98	± 6	56	± 9
COMU	STLA02COMU99	St. Lazaria Island	210	± 11	118	± 7	87	± 14

Appendix 43 (continued). Organotin levels in selected seabird eggs. COMU = common murre; TBMU = thick-billed murre; GLGU = glaucous gull; GWGU = glaucous-winged gull; BRPE = brown pelican.

Species	Sample Number	Location	MBT (pg Sn g^{-1})	U (k = 2)	DBT (pg Sn g^{-1})	U (k = 2)	TBT (pg Sn g^{-1})	U (k = 2)
COMU	STLA03COMU99	St. Lazaria Island	112	± 6	113	±7	49	± 8
COMU	STLA04COMU99	St. Lazaria Island	91	± 5	119	± 7	47	± 8
COMU	STLA05COMU99	St. Lazaria Island	134	± 7	122	± 7	56	± 9
COMU	STLA06COMU99	St. Lazaria Island	129	± 7	85	± 5	53	± 9
COMU	STLA01COMU01	St. Lazaria Island	68	± 4	56	± 3	56	± 10
COMU	STLA02COMU01	St. Lazaria Island	117	± 6	126	± 7	69	± 12
COMU	STLA03COMU01	St. Lazaria Island	54	±3	78	± 5	43	± 6
COMU	STLA04COMU01	St. Lazaria Island	46	± 3	44	± 3	32	± 5
COMU	STLA05COMU01	St. Lazaria Island	51	± 3	64	± 4	32	± 5
COMU	STLA06COMU01	St. Lazaria Island	61	± 4	72	± 4	45	± 7
COMU	STLA01COMU03	St. Lazaria Island	162	± 8	47	± 3	19	± 3
COMU	STLA02COMU03	St. Lazaria Island	32	± 3	40	± 2	29	± 4
COMU	STLA03COMU03	St. Lazaria Island	45	± 3	40	± 2	15	± 2
COMU	STLA04COMU03	St. Lazaria Island	115	± 6	108	± 6	48	± 8
COMU	STLA05COMU03	St. Lazaria Island	164	± 8	51	± 3	21	± 3
COMU	STLA06COMU03	St. Lazaria Island	43	± 3	115	± 7	59	± 10
TBMU	CLIS02TBMU02	Cape Lisburne	83	± 5	45	± 3	38	± 6
TBMU	CLIS03TBMU02	Cape Lisburne	57	± 4	111	± 6	65	± 11
TBMU	CLIS04TBMU02	Cape Lisburne	178	± 9	ND	± 12	51	± 9
TBMU	CLIS06TBMU02	Cape Lisburne	99	± 5	113	± 7	56	± 10
TBMU	STGE02TBMU02	St. George Island	98	± 5	91	± 6	30	± 4
TBMU	STGE03TBMU02	St. George Island	81	± 5	113	± 7	ND	ND
TBMU	STGE05TBMU02	St. George Island	30	± 3	50	± 3	34	± 5

Appendix 43 (continued). Organotin levels in selected seabird eggs. COMU = common murre; TBMU = thick-billed murre; GLGU = glaucous gull; GWGU = glaucous-winged gull; BRPE = brown pelican.

Species	Sample Number	Location	MBT (pg Sn g^{-1})	U (k = 2)	DBT (pg Sn g^{-1})	U (k = 2)	TBT (pg Sn g^{-1})	U (k = 2)
TBMU	STGE06TBMU02	St. George Island	91	± 3	121	± 7	44	± 7
TBMU	STLA01TBMU01	St. Lazaria Island	148	± 6	197	± 10	148	± 24
TBMU	STLA02TBMU01	St. Lazaria Island	139	± 7	176	± 11	126	± 21
TBMU	STLA03TBMU01	St. Lazaria Island	77	± 4	76	± 4	54	± 9
TBMU	STLA04TBMU01	St. Lazaria Island	100	± 5	112	± 5	100	± 27
TBMU	STLA05TBMU01	St. Lazaria Island	70	± 4	123	± 7	80	± 19
TBMU	STLA06TBMU01	St. Lazaria Island	77	± 4	ND	± 7	ND	± 2
GLGU	NOAT02GLGU05	Noatak River delta	53	± 5	ND*	±5	83	± 14
GLGU	NOAT04GLGU05	Noatak River delta	34	± 5	26	± 5	27	± 4
GLGU	NOAT05GLGU05	Noatak River delta	23	± 5	48	± 5	91	± 15
GLGU	NOAT06GLGU05	Noatak River delta	27	± 5	26	± 5	14	± 2
GLGU	HOOP02GLGU05	Hooper Bay	17	± 4	7	± 4	8	± 2
GLGU	HOOP05GLGU05	Hooper Bay	27	± 5	48	± 5	38	± 6
GLGU	HOOP07GLGU05	Hooper Bay	12	± 4	15	± 4	14	± 2
GWGU	TOGI01GWGU05	Shaiak Island (Togiak)	62	± 5	37	± 5	77	± 13
GWGU	TOGI02GWGU05	Shaiak Island (Togiak)	24	± 5	34	± 5	51	± 9
GWGU	TOGI03GWGU05	Shaiak Island (Togiak)	26	± 5	36	± 5	46	± 8
GWGU	TOGI04GWGU05	Shaiak Island (Togiak)	3	± 4	15	± 4	13	± 2
GWGU	TOGI05GWGU05	Shaiak Island (Togiak)	9	± 4	22	± 4	22	± 3
GWGU	TOGI06GWGU05	Shaiak Island (Togiak)	12	± 4	23	± 4	25	± 4
GWGU	SITK02GWGU05	Viesekoi Rocks (Sitka)	29	± 5	57	± 5	100	± 16
GWGU	SITK03GWGU05	Viesekoi Rocks (Sitka)	45	± 5	43	± 5	41	± 7
GWGU	SITK04GWGU05	Viesekoi Rocks (Sitka)	49	± 5	42	± 5	59	± 10

Appendix 43 (continued). Organotin levels in selected seabird eggs. COMU = common murre; TBMU = thick-billed murre; GLGU = glaucous gull; GWGU = glaucous-winged gull; BRPE = brown pelican.

Species	Sample Number	Location	MBT (pg Sn g^{-1})	U (k = 2)	DBT (pg Sn g^{-1})	U (k = 2)	TBT (pg Sn g^{-1})	U (k = 2)
GWGU	SITK05GWGU05	Viesekoi Rocks (Sitka)	14	± 4	21	± 4	14	± 2
GWGU	SITK06GWGU05	Viesekoi Rocks (Sitka)	48	± 5	40	± 5	24	± 4
BRPE	BP001CRAB05	Charleston Crab Bank	306	± 15	131	± 8	90	± 15
BRPE	BP002CRAB05	Charleston Crab Bank	359	±18	204	± 12	113	± 19
BRPE	BP003CRAB05	Charleston Crab Bank	90	± 5	93	± 5	51	± 9
BRPE	BP004CRAB05	Charleston Crab Bank	333	± 17	471	±28	254	± 42
BRPE	BP004CRAB05	Charleston Crab Bank	343	± 17	482	± 28	279	± 46
BRPE	BP006CRAB05	Charleston Crab Bank	349	± 17	220	± 13	204	± 34
BRPE	BP016MARS05	Charleston Marsh Island	218	± 11	140	± 8	137	± 23

*ND = no data.