

## CURRICULUM VITAE - Robert James Letcher

Birth Place: Barrie, Ontario, Canada

Citizenship: Canadian

### *Professional Affiliations, Location and Contact:*

Senior Research Scientist (SE-RES-04 Level)

Head of the Organic Contaminants Research Laboratory (OCRL)

National Wildlife Research Centre

Wildlife Toxicology Section

Ecotoxicology and Wildlife Health Division

Wildlife and Landscape Science Directorate

Science and Technology Branch

Environment Canada

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<http://www.scf-cws.ec.gc.ca/nwrc-nrf/default.asp?lang=en&n=D7051272>

<http://www.carleton.ca/chem/people/faculty.html>

### DEGREES

- 1996 **Doctor of Philosophy**, environmental/analytical chemistry and ecotoxicology  
 Department of Chemistry, Carleton University / Canadian Wildlife Service  
*Supervisor:* Dr. R.J. Norstrom (adjunct professor)  
*Thesis:* The ecological and analytical chemistry of chlorinated hydrocarbon contaminants and methyl sulfonyl- (MeSO<sub>2</sub>-) containing metabolites of PCBs and 4,4'-DDE in the polar bear (*Ursus maritimus*) food chain
- 1991 **Master of Science**, synthetic inorganic and organic chemistry  
 Department of Chemistry, Carleton University  
*Supervisor:* Dr. R.J. Crutchley (associate professor)  
*Thesis:* (1,3-Bis(2'-pyridylimino)isoindolinato)nickel(II) complexes of phenylcyanamido ligands: crystal structure and spectroscopic properties
- 1987 **Bachelor of Science (honours)**, focus: organometallic chemistry  
 Department of Chemistry, University of Toronto

### AREAS OF SCIENTIFIC EXPERTISE

Xenobiotics, Organic Pollutants, Organohalogenes, Environmental Chemistry, Analytical and Bioanalytical Chemistry, Ecological Chemistry, Ecotoxicology, Xenobiotic-Metabolizing Enzymes, Metabolism and Biotransformation, Liquid and Gas Chromatographic systems (e.g., mass spectrometry-coupled) and methods, Cell Culturing, *In vitro/In Vivo* Toxicology, Bioassays, Environmental Proteomic Biomarkers, Oxidative Stress, Contaminant Pharmacokinetics and Toxicokinetics, Endocrine Disruption, Aquatic Ecology, Marine Wildlife and Ecosystems, Arctic, Gene-Contaminant Interactions, Organic Pollutants, Aquatic/Marine Vertebrates, Environmental Chemistry, Analytical and Bioanalytical Chemistry, Ecotoxicology, Bioavailability, Metabolism

and Biotransformation, Organic Spectroscopic Instrumentation, *In vitro/In Vivo* Toxicology, Biomarkers, Oxidative Stress, Endocrine Disruption

### **ACADEMIC APPOINTMENTS**

2009 - present	<i>Associate (Carleton) Coordinator, Ottawa-Carleton Collaborative Chemical and Environmental Toxicology Program</i>
2004 – present	<i>Research Scientist, Head of Environmental/Analytical Chemistry Research Group, NWRC/CWS, Environment Canada</i>
2005 - present	<i>Adjunct professor, Department of Chemistry, Carleton University, Ottawa, ON, Canada</i>
2005 - present	<i>Adjunct Professor, Great Lakes Institute for Environmental Research, University of Windsor, Windsor, ON, Canada</i>
2003 - present	<i>Associate Faculty, Department of Environmental Biology, University of Guelph, Guelph, ON, Canada</i>
2004 - 2009	<i>Adjunct Faculty, Great Lakes Institute for Environmental Research, University of Windsor, Windsor, ON, Canada</i>
2000 – 2004	<i>Assistant Professor and Core Researcher, Great Lakes Institute for Environmental Research (GLIER), University of Windsor, Canada</i>
2000 – 2004	<i>Assistant Professor (cross-appointed), Department of Chemistry &amp; Biochemistry, University of Windsor</i>
2000 – 2004	<i>Member of the Graduate Faculty, University of Windsor</i>
1998 – 2000	<i>Research Associate, Research Institute for Toxicology, Utrecht University, Utrecht, The Netherlands</i>
1997 – 1998	<i>Post Doctoral Fellow, Research Institute for Toxicology (RITOX), Utrecht University, Utrecht, The Netherlands</i>
1997 – 1999	<i>Post Doctoral Fellow / Visiting Scientist, Toxicology Research Group, Wageningen Agricultural University, Wageningen, The Netherlands</i>
1997 - 2000	<i>Post Doctoral Fellow / Visiting Scientist, Department of Marine Biogeochemistry &amp; Toxicology, Netherlands Institute for Sea Research (NIOZ), Texel, The Netherlands</i>
1996	<i>Post Doctoral Fellow, Wildlife Toxicology Research Division, Canadian Wildlife Service, Environment Canada, Hull, Québec</i>
1993	<i>Researcher, Faculty of Pharmaceutical Sciences, University of British Columbia, Vancouver, B.C., Canada</i>

### **OTHER RESEARCH APPOINTMENTS**

1993	<i>Field Research Assistant, Churchill Northern Studies Centre, Churchill, Manitoba, Canada</i>
1992	<i>Researcher, Wallenberg Laboratory, Stockholm University, Stockholm, Sweden</i>
1991	<i>Research Scientist, Advanced Materials Division, Northern Telecom, Ottawa, Canada</i>
1988	<i>Research Assistant, Department of Chemistry, Carleton University, Ottawa, Canada</i>
1987	<i>Research Scientist, Materials Research Laboratory, Indusmin Corp., Toronto, Canada</i>

### **HONOURS AND AWARDS**

2011	Citation of Excellence in Science, Environment Canada, Teamwork, Partnership and Innovation
2009	Recognition award for organization of the 2009 Workshop on Brominated Flame Retardants
2007	Annual Excellence in Review Award, ACS journal <i>Environmental Science &amp; Technology</i>
2003	University of Windsor Recognition Award for Research and Scholarship Excellence
2002	University of Windsor Recognition Award for Research and Scholarship Excellence
2002	Canada Research Chair (Tier II) in Environmental Chemistry and Toxicology
2002	Ontario Distinguished Researcher Award (ODRA) in Environmental Chemistry and Toxicology
2001	Premier's (Ontario) Excellence Research Award (PREA), Round 7
2001	University of Windsor Recognition Award for Research and Scholarship Excellence
1997/98	Post Doctoral Fellowship; M&T Graduate School (environmental toxicology and chemistry), Wageningen Agricultural University, Utrecht University and Nijmegen University
1996	Candidate for the NSERC Doctoral Prize in Science, Carleton University
1996	Post Doctoral Fellowship, Carleton University/Environment Canada
1996	Senate Medal for Outstanding Academic Achievement at the Ph.D. Level, Carleton University
1994	Travel Award, Society of Environmental Toxicology and Chemistry
1993	Travel Award, Society of Environmental Toxicology and Chemistry
1993	Travel award, U.S.-EPA-sponsored, International Symposium on the Ecological Effects of Arctic Airborne Contaminants
1993	Field Studies Award, Northern Studies Training Program, Department of Indian and Northern Affairs (Canada)
1991	Graduate Scholarship Award (declined), Department of Chemistry, Queen's University

**RESEARCH FUNDING** (**Grants and Contracts**; received or currently held in CDN \$ unless specified otherwise)

<u>Year</u>	<u>Source</u>	<u>Purpose</u>	<u>Co-Grantees</u>	<u>Amount (CDN)</u>
2013-2014	United States Fish and Wildlife Service (USFWS) - U. of Maryland	collaborative contract	W. Bowerman	\$75,000
2012-2017	NSERC operating (Discovery) grant PI: R.J. Letcher	research	Solo	\$140,000
2007-2012	NSERC operating (Discovery) grant PI: R.J. Letcher	research	Solo	\$86,600
2007-2011	Molson Foundation PI: R.J. Letcher	research	Solo	\$100,000
2007-2009	Canadian IPY Secretariat	research	R.J. Letcher & others	\$250,000

2006-2010	PI: R.J. Letcher Best in Science Ministry of the Environment (Ontario)	research	R.J. Letcher & others	\$70,000
2007-2011	PI: C.D. Metcalfe Environment Canada Chemicals Management Plan (CMP)	research	R.J. Letcher & others	\$400,000
2006-2012	PI: R.J. Letcher Dept. Indian & Northern Aff. Canada Northern Contam. Program (NCP)	research	R.J. Letcher & others	\$175,000
2006-2009	PI: R.J. Letcher United States Geological Survey (USGS)	research/ contract	C. Henny	\$100,000
2006-2009	Norwegian Polar Institute	research	G. Gabrielsen	\$35,000
2005-2006	PI: R.J. Letcher NSERC operating (Discovery) grant	research	Solo	\$30,000
2004-2008	PI: R.J. Letcher Canadian Found. For Innovation (CFI)	research infrastr. (Large lake ecosystems)	B. Fryer, R.J. Letcher & others	\$1,966,420
2004-2005	PI: B. Fryer Dept. Indian & Northern Aff. Canada Northern Contam. Program (NCP)	research	R.J. Letcher & others	\$9,000
2003-2004	PI: R.J. Letcher Canadian Wildlife Service	research	R.J. Letcher & others	\$22,500
2001-2005	PI: K. Fernie Canadian Found. For Innovation (CFI) PI: R.J. Letcher	research infrastr. (GC-MSD(EI/CI), ultracentrifuge, ultralow balance, renovations)	Solo	\$199,696
2001-2005	Ontario Innovation Trust (OIT) PI: R.J. Letcher	research infrastr. (GC-MSD(EI/CI), ultracentrifuge, ultralow balance, renovations)	Solo	\$199,696
2001-2004	NSERC operating (Discovery) grant PI: R.J. Letcher	research	Solo	\$140,000
2001	NSERC research tools grant GC-ECD/FID system PI: R.J. Letcher	research infrastr.	& others	\$45,000
2001	NSERC research tools grant	research infrastr.	& others	\$14,200

	rotoevaporation system				
2001	PI: R.J. Letcher NSERC research tools grant research vehicle	research infrastr.	R.J. Letcher & others	\$30,000	
2001-2002	PI: R.J. Letcher Species at Risk Assessment (SARA) Dept. Fish. & Oceans Canada	research	R.J. Letcher	\$5,000	
2002-2003	PI: P.S. Ross World Wildlife Fund	research	P. Béland	\$20,000	
2001-2003	PI: R.J. Letcher Environ. Canada/ Nat. Environ. Res. Inst. of Denmark	research	R.J. Letcher & others	\$44,250	
2002-2004	PI: D.C.G. Muir Water Environ. Res. Found. (WERF)	research	R.J. Letcher & others	\$65,000 (US)	
2002-2003	PI: G.D. Haffner Dept. Indian & Northern Aff. Canada Northern Contam. Program (NCP)	research	R.J. Letcher & others	\$40,000	
2002-2003	PI: A. Fisk Dept. Indian & Northern Aff. Canada Northern Contam. Program (NCP)	research	R.J. Letcher	\$15,500	
2001-2004	PI: G. Tomy Premier's Res. Excellence Award (PREA)	research	Solo	\$150,000	
2002-2007	PI: R.J. Letcher Canada Res. Chair Tier II / ODRA	research	Solo	\$500,000	
2002-2003	PI: R.J. Letcher CRC – CFI PI: R.J. Letcher	research infra. (HPLC-MS/MS, fluorescence/UV-vis/chemiluminescence plate reader systems, various equipment, renovations)	Solo	\$128,393	
2002-2003	CRC - OIT PI: R.J. Letcher	research infra. (HPLC-MS/MS, fluorescence/UV-vis/chemiluminescence plate reader systems, various equipment, renovations)	Solo	\$128,393	
2002-2003	Acad. Subvention Dept. Fish. & Oceans Canada	research	Solo	\$15,000	

2003-2004	PI: R.J. Letcher Arctic Research Init. research Norwegian Pollution Authority	G. Gabrielsen	\$25,669
2000-2001	PI: R.J. Letcher University of Windsor research start-up funds	Solo	\$65,000
1997/98	PI: R. Letcher Netherlands Scientific research Advisory Commission	M. vandenBerg	\$20,000
1999-2000	PI: R.J. Letcher European Commission research Environment Directorate E: Industry and the Environment	R.J. Letcher & others	\$77,000
1998-2000	PI: M. vandenBerg Various Ministries research of the Netherlands PI: M. vandenBerg	R.J. Letcher & others	\$50,000

### **SCHOLARLY AND PROFESSIONAL ACTIVITIES**

#### ***Conference/Workshop Organization, Session Chairpersonship and Invited Participation***

- 2014 Co-Chair: Session on, “*Environmental Chemistry, Fate and Effects of Contaminants of Emerging Concern in the Great Lakes System*”, 57<sup>th</sup> Conference on Great Lakes Research, Internat. Assoc. for Great Lakes Research (IAGLR), May 12-17, Hamilton, ON, Canada
- 2013 Co-Chair: Session on, “*Organic Flame Retardants Beyond PBDEs: What New Have We Learned?*”, 34<sup>th</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 21-25, Nashville, TN, U.S.A.
- 2012 Co-Chair: Session on, “*Analytical Chemistry and Environmental Levels of Flame Retardants*”, 14<sup>th</sup> Workshop on (Brominated) Flame Retardants (BFR’2012), June 4-6, Winnipeg, MB, Canada.
- 2012 Co-Chair: Session on, “*Contaminants in Polar Regions*”, International Polar Year (IPY) 2012 Conference: From Knowledge to Action. April 22-27, Montreal, QC, Canada
- 2011 Co-Chair: Session on, “*Alternate and Replacement Flame Retardants in the Environment*”, 32<sup>nd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 11-15, Boston, MA, U.S.A.
- 2011 Co-Chair: Session on, “*POPs in Terrestrial Wildlife: Sources, Fate and Trends*”, 31<sup>st</sup> International Symposium on Halogenated Environmental Pollutants and POPs (Persistent Organic Pollutants) (DIOXIN’2011), Brussels, Belgium
- 2011 Chair: Session on, “*Analytical Chemistry and Environmental Levels of Flame Retardants*”, 13<sup>th</sup> Workshop on Brominated and Other Flame Retardants in the Environment (BFR’2011), June 6-7, Boston, MA, U.S.A.
- 2010 Co-Chair: Special Session on, “*Environmental Exposure, Fate and Trends of Flame Retardant Chemicals*”, 31<sup>th</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 17-21, Portland, OR, U.S.A.
- 2009 Co-Chair: Special Session on, “*Environmental Fate and Exposure of Brominated Flame Retardants*”, 30<sup>th</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 19-23, New Orleans, LA, U.S.A
- 2009 Workshop Co-organizer: 11<sup>th</sup> Workshop on Brominated Flame Retardants in the Environment (BFR’2009), May 19-20, Ottawa, ON, Canada

- 2008 Co-chair: Session on, “*Persistent Organic Pollutant Chemistry: Monitoring*”, 5<sup>th</sup> Society of Environmental Toxicology and Chemistry (SETAC) World Congress, Aug. 3-7, Sydney, Australia
- 2008 Co-chair: Session on, “*Persistent Organic Pollutant Chemistry: Monitoring and Trends in Aquatic Biota*”, 5<sup>th</sup> Society of Environmental Toxicology and Chemistry (SETAC) World Congress, Aug. 3-7, Sydney, Australia
- 2008 Co-chair: Session on, “*Ecotoxicology of Emerging and Persistent Chemicals: Molecular and Receptor Signalling Interactions*”, 5<sup>th</sup> Society of Environmental Toxicology and Chemistry (SETAC) World Congress, Aug. 3-7, Sydney, Australia
- 2008 Co-chair: Session on, “*Persistent Organic Pollutants: Abiotic Environments and Sources*”, 5<sup>th</sup> Society of Environmental Toxicology and Chemistry (SETAC) World Congress, Aug. 3-7, Sydney, Australia
- 2008 Scientific Committee Member: 10<sup>th</sup> Workshop on Brominated Flame Retardants in the Environment (BFR’2008), June 3-4, Victoria, BC, Canada
- 2008 Co-chair: Session on, “*Advances in the Analysis of BFRs and Metabolites*”, 10<sup>th</sup> Workshop on Brominated Flame Retardants in the Environment (BFR’2008), June 3-4, Victoria, BC, Canada
- 2007 Co-chair: Session on, “*Ecotoxicology and Biomarkers*”, 28<sup>st</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 11-14, Millwaukee, WI, U.S.A.
- 2007 International Advisory Board Member: 4<sup>th</sup> International Workshop on Brominated Flame Retardants in the Environment (BFR’2007), April 24-27, Amsterdam, The Netherlands
- 2007 Co-chair: Session on, “*Brominated Flame Retardants Alternatives*”, 4<sup>th</sup> International Workshop on Brominated Flame Retardants in the Environment (BFR’2007), April 24-27, Amsterdam, The Netherlands
- 2006 Co-Chair: Session on, “*Brominated Compounds: Chemistry and Transformation*”, 26<sup>th</sup> International Symposium on Halogenated Environmental Pollutants and POPs (Persistent Organic Pollutants) (DIOXIN’2006), Oslo, Norway
- 2006 Co-Chair: Special Session on, “*Biotransformation and Degradation of Brominated Flame Retardants in the Environment*”, 27<sup>st</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 5-9, Montreal, QC, Canada
- 2005 National Organizing Committee Member and Co-Chair: Session on, “*Sources and Fate of POPs in the Great Lakes*”, 25<sup>th</sup> International Symposium on Halogenated Environmental Pollutants and POPs (Persistent Organic Pollutants) (DIOXIN’2005), Toronto, ON Canada
- 2004 Steering Committee Member: Canada-United States Workshop, “*State of the Strait (Detroit River)*”, December 2, University of Windsor, Windsor, ON Canada
- 2004 Invited organizer to the Health Canada/Environment Canada sponsored Workshop, “*Toward a Monitoring Network: A Technical Workshop for Pharmaceuticals and Personal Care Products in the Environment*”, March 28-30, Niagara-on-the-Lake, Ontario.
- 2004 Co-Chair: Session on, “*Pharmaceuticals and Personal Care Products in the Environment*”, EnviroAnalysis 2004 conference, May, Toronto, ON Canada
- 2003 Co-Chair: Sessions on, “*Brominated Flame Retardants (BFRs) in the Environment*”, 23<sup>th</sup> International Symposium on Halogenated Environmental Pollutants and POPs (Persistent Organic Pollutants) (DIOXIN’2003), Aug. 24-29, Boston, MA U.S.A
- 2003 Co-Chair: Special Session on, “*Bioaccumulation and Biotransformation of Persistent Organic Pollutants (POPs)*”, 24<sup>st</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 9-13, Austin, TX, U.S.A

- 2003 Co-Chair: Special Session on, “*Evaluating the Movement and Effects of Persistent Organic Pollutants (POPs)*”, 24<sup>st</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 9-13, Austin, TX, U.S.A
- 2002 Steering Committee Member: Canada-United States Workshop, “*Evaluating ecosystem results of PCB control measures within the Detroit River-Western Lake Erin basin*”, June 17-18, University of Windsor, Windsor, ON Canada
- 1996 Assistant Organizer: *EnviroAnalysis* 1996 conference, Ottawa, ON Canada

### **Editorial Boards**

- 2012 - present Associate/Senior Editor: *Bulletin of Environmental Contamination and Toxicology*
- 2005 - present Editorial Board Member: Canadian Wildlife Service (CWS) reports and publications
- 2002 - present Review Editor: *Environment International Journal*, and *Progress in Environmental Science Journal* (Elsevier Science)
- 2000 - present Editorial Board Member: *Environment International Journal*, and *Progress in Environmental Science Journal* (Elsevier Science)
- 2009 - 2010 Editorial Board Member: *Chemosphere*
- 2008 - 2011 Editorial Board Member: *The Open Environmental Pollution & Toxicology Journal*
- 2004 - 2006 Editorial Board Member: *Journal of Environmental Toxicology and Chemistry* (ET&C), Society of Environmental Toxicology and Chemistry (SETAC)
- 2002 - 2003 Guest Editor: special review issue of *Environment International*, “*Brominated Flame Retardants in the Environment*”

### **Faculty Memberships, Committees and Other External Activities**

- 2013 Student Presentation Reviewer: 34<sup>th</sup> Annual SETAC 2013 Meeting, Nashville, TN, U.S.A.
- 2013 Student Presentation Reviewer: 56<sup>th</sup> Conference on Great Lakes Research, Internat. Assoc. for Great Lakes Research (IAGLR), West Lafayette, IN, U.S.A.
- 2013 Student Presentation Reviewer and Judging Board Member: 6<sup>th</sup> International Symposium on Flame Retardants (BFR'2013), San Francisco, CA, U.S.A.
- 2012 Student Presentation Reviewer: 33<sup>rd</sup> Annual SETAC 2012 Meeting, Long Beach, CA, U.S.A.
- 2012 Student Presentation Reviewer: 55<sup>th</sup> Conference on Great Lakes Research, Internat. Assoc. for Great Lakes Research (IAGLR), Cornwall, ON, Canada
- 2012 – 2013 Past-President, International Association of Great lakes Research (IAGLR)
- 2011 – 2012 President, International Association of Great lakes Research (IAGLR)
- 2011 Student Presentation Reviewer: 54<sup>th</sup> Conference on Great Lakes Research, Internat. Assoc. for Great Lakes Research (IAGLR), Duluth, MN, U.S.A.
- 2011 Student Presentation Reviewer: 31<sup>st</sup> DIOXIN'2011 Symposium, Brussels, Belgium
- 2011 Student Presentation Reviewer: 32<sup>th</sup> Annual SETAC 2011 Meeting, Boston, MA, U.S.A.
- 2010 – 2013 Co-Chair, Conference Committee, International Association of Great lakes Research (IAGLR)
- 2010 – 2011 Vice-President, International Association of Great lakes Research (IAGLR)
- 2010 – 2011 Chair, Conference Committee, International Association of Great lakes Research (IAGLR)
- 2010 – 2011 Co-Chair, Nomination Committee, International Association of Great lakes Research (IAGLR)



- 2010 Student Presentation Reviewer: 53<sup>th</sup> Conference on Great Lakes Research, Internat. Assoc. for Great Lakes Research (IAGLR), Toronto, ON, Canada
- 2010 Student Presentation Reviewer: 30<sup>st</sup> DIOXIN'2010 Symposium, San Antonio, TX, U.S.A.
- 2010 Student Presentation Reviewer: 31<sup>th</sup> Annual SETAC 2010 Meeting, Portland, OR, U.S.A.
- 2009 – present Board of Directors Member, International Association of Great lakes Research (IAGLR)
- 2009 – present Co-Chair, Membership Committee, International Association of Great lakes Research (IAGLR)
- 2009 – present Associate Coordinator, Ottawa-Carleton University, Joint Program in Chemical and Environmental Toxicology
- 2009 Student Presentation Reviewer: 30<sup>th</sup> Annual SETAC 2009 Meeting, New Orleans, LA, U.S.A.
- 2008 Student Presentation Reviewer: 5<sup>th</sup> SETAC 2008 World Congress, Sydney, NSW, Australia
- 2006 Student Presentation Reviewer: 26<sup>th</sup> DIOXIN'2006 Symposium, Oslo, Norway
- 2005 – present Adjunct Professor, Dept. of Chemistry / Ottawa-Carleton Chemical Institute (OCCI), Carleton University, Ottawa, ON
- 2005 - present Adjunct Professor: Great Lakes Institute for Environmental Research (GLIER), University of Windsor, Windsor, ON Canada
- 2005 Student Presentation Reviewer: 25<sup>th</sup> DIOXIN'2005 Symposium, Toronto, ON, Canada
- 2003 - present Associate Graduate Faculty Member: Department of Environmental Biology, University of Guelph, Guelph, ON Canada
- 2003 – 2005 Board Member, OGS Scholarship Selection (University of Windsor, Chemistry & Biochemistry), Ministry of Training, Colleges and Universities Ontario
- 2003 Student Presentation Reviewer: 24<sup>th</sup> Annual SETAC 2003 Meeting, Austin, TX, U.S.A.
- 2000 - 2004 Faculty Member: Department of Chemistry & Biochemistry, University of Windsor
- 2001 - 2004 Graduate Faculty Member: Department of Biology Sciences, University of Windsor
- 2003 Student Presentation Reviewer: 46<sup>th</sup> Conference on Great Lakes Research, Internat. Assoc. for Great Lakes Research (IAGLR), Chicago, IL U.S.A.
- 2002 Student Presentation Reviewer: 44<sup>th</sup> Conference on Great Lakes Research, Internat. Assoc. for Great Lakes Research (IAGLR), Green Bay, WI U.S.A.
- 2000 – present Students Career Mentoring and Networking: Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting

### ***Scholarly Activities in Academia and Government***

- 2006 - 2007 Organizer of the National Wildlife Research Centre (NWRC) seminar series
- 2005 - present Board Member (Environment Canada): NSERC Visiting Fellows in a Government Laboratory Program
- 2002 - 2003 5-Year Plan Committee, Great Lakes Inst. for Environmental Research (GLIER)
- 2002 – 2004 building space committee, GLIER
- 2003 – 2004 building space committee, Department of Chemistry and Biochemistry, U. of Windsor
- 2003 Postdoctoral Award Committee, GLIER

- 2002 U. of Windsor Workshop to incoming Nursing students: The involvement of the GLIER and GLIER researchers in human and wildlife health issues with respect to pollutant exposures and cancer
- 2000 - 2002 Member of the GLIER Postdoctoral Fellow Grant committee
- 2001 Organizer of seminar series (Winter 2002) for guest lecturers at the GLIER
- 2001 Faculty Search Committee Member for GLIER Executive Director
- 2001 Faculty Search Committee Member for GLIER Environmental Toxicologist
- 2000 Faculty Search Committee Member for GLIER Ecotoxicologist
- 2000 - 2004 Faculty member on the GLIER Executive Council
- 2002 Undergraduate Councillor, Department of Chemistry & Biochemistry
- 2001 - 2002 Member of the Ecological Discussion Group, Department of Biological Sciences
- 2001 – 2004 Faculty Representative on the School of Physical Sciences Executive Council (Chemistry and Biochemistry)

***Invited Plenary, Platform and Lecture Presentations*** (1996-2013; TOTAL = 63)

- 2013 Invited speaker, Zoology Seminar Series, Southern Illinois University, November 22, 2013, Carbondale, IL, U.S.A. "*Spatial and temporal trends, fate and sources of emerging flame retardant contaminants in wildlife and their food webs from the Great Lakes basin*".
- 2013 Invited speaker, Environment Canada-Health Canada, Chemicals Management Plan Monitoring and Surveillance Results Workshop, Oct. 23, Ottawa, ON, Canada. "*CMP Monitoring and Surveillance: Status of the Wildlife Component (2013-2014)*".
- 2013 Invited speaker, 20th Annual Workshop of the Northern Contaminants Program (NCP), Sept. 24-25, Ottawa, ON, Canada. "*Temporal trends in fish and wildlife: How climate change may affect statistical analysis power ...or what are the trends really telling us?*".
- 2013 Plenary speaker, Environmental Applications session, 59<sup>th</sup> ICASS (International Conference on Analytical Sciences and Spectroscopy), June 26-28, 2013, Mont-Tremblant, Québec, Canada.
- 2013 Plenary speaker, Flame Retardant Dilemma Symposium, April 12, 2013, University of California at Berkeley, Berkeley, CA, U.S.A.
- 2012 Plenary speaker, 2<sup>nd</sup> SETAC Australasia Conference, July 4-6, 2012, Brisbane, Queensland, Australia. "*Emerging contaminants and the influence of biotransformation and degradation on bioaccumulation, fate and effects in model wildlife and fish*".
- 2012 Plenary speaker, 13<sup>th</sup> Workshop on Brominated and Other Flame Retardants (BFR 2012), June 4-5, 2012, Winnipeg, Manitoba, Canada. "*Old to new generation flame retardants: Chemical instability affects environmental persistence and bioaccumulation*".
- 2012 Invited speaker, 55<sup>th</sup> Annual Conference on Great Lakes Research (IAGLR 2012), May 13-17, Cornwall, ON, Canada. "*The Great Lakes Herring Gull Monitoring Program (GLHGMP): The complex cocktail of emerging contaminants and comparative spatiotemporal changes, sources and fate across the Great Lakes*".
- 2011 Plenary speaker, 31<sup>st</sup> Symposium of Dioxin and Related Compounds, Brussels, Belgium. "*Current species models of wildlife toxicology and effects of emerging organohalogen substances*".
- 2010 18th Annual Workshop of the Northern Contaminants Program (NCP), Whitehorse, Yukon, Canada. "*Levels, trends and processes of mercury in ringed seal and polar bear*".

- 2010 18th Annual Workshop of the Northern Contaminants Program (NCP), Whitehorse, Yukon, Canada. "New contaminants in Arctic biota".
- 2010 30<sup>th</sup> International Symposium on Halogenated Persistent Organic Pollutants (DIOXIN 2010), Sept. 12-17, San Antonio, TX, U.S.A. "*Isomers of dechlorane plus in the eggs of four species of gulls (Larids) from colonies across Canada and the influence of diet on spatial distribution*".
- 2010 XIII International Congress of Toxicology Conference. July 19-23, Barcelona, Spain, "*HBCD levels in the environment, biota and humans: Stereoisomeric paradox*".
- 2010 US EPA-Sponsored Perfluoroalkyl Acids (PFAA) Days III Workshop. June 8-10, Research Triangle Park, NC, U.S.A., "*Perfluoroalkyl acids (PFAAs) in wildlife and fish worldwide*".
- 2010 Environment Canada Peanut Butter Club Seminar Series, April 8, Gatineau, QC, Canada, "*Exposure to emerging organohalogen contaminants is a changing and complex cocktail in Canadian aquatic wildlife and ecosystems: Case studies from the Great Lakes*".
- 2010 Environment Canada, Science and Technology Branch, National Capital Region Science Forum, Jan. 26-27, Gatineau, QC, Canada, "*Contaminants and trends over two decades in polar bears from western Hudson Bay: Climate change, sea ice conditions and diet shifts*".
- 2009 QUASIMEME Workshop on Analysis of Perfluorinated Compounds (PFCs). 14-15 October 14-15, Amsterdam, The Netherlands, "*Challenges and relevance of isomer-specific determination of perfluorinated carboxylates and sulfonates and their precursors in environmental matrices:*".
- 2009 SETAC Laurentian Annual General Meeting. June 19-20, Ottawa, ON, Canada, "*Is there a case of thyroid hormone-related effects in wildlife exposed to persistent organohalogen contaminants or metabolites?*".
- 2008 Integrated Toxicology & Environmental Health Program Seminar Series, Duke University, April 18, "*Comparative toxicokinetics of chlorinated and brominated contaminants in captive Greenland sled dogs and potential as a surrogate for wild polar bears*".
- 2008 10<sup>th</sup> Workshop on Brominated Flame Retardants (BFR'2008), June 3-4, Victoria, BC, Canada, "*Eggs of Great Lakes herring gulls (Larus argentatus) are a Pandora's box of brominated flame retardants: Identification, fate and trends*".
- 2008 28<sup>st</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 11-14, Milwaukee, WI, U.S.A., "*Hexabromocyclododecane isomers and degradation products over the past two decades in the eggs of herring gulls (Larus argentatus) from across the Great Lakes*".
- 2007 28<sup>st</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 11-14, Milwaukee, WI, U.S.A., "*Comparative toxicokinetics of organohalogen contaminants in top Arctic carnivores: Captive sledge dogs and wild polar bears in Greenland*".
- 2007 4<sup>th</sup> International Workshop on Brominated Flame Retardants (BFR'2007), April 24-27, Amsterdam, The Netherlands, "*Organobromine, organochlorine and metabolically-derived contaminants in Norwegian Arctic glaucous gulls: Associations with whole body constituents*".
- 2006 27<sup>nd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC), Montreal, QC, Canada, November 5-9; Session, "*Cellular, Organismal and Population Biomarkers Used In Wildlife*".
- 2006 27<sup>nd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC), Montreal, QC, Canada, November 5-9; Session, "*Exposure of Beluga Whale to Contaminants and Toxic Effects*".

- 2006 Department of Biology Seminar Series, University of Trondheim (NTNU), Trondheim, Norway
- 2006 49<sup>th</sup> Conference of the International Association for Great Lakes Research (IAGLR), Windsor, ON, Canada, May 22-26; Session, "*Emerging Chemicals in the Great Lakes*".
- 2006 41<sup>st</sup> Central Canadian Symposium on Water Quality Research, Burlington, ON, Canada, February 13-14; plenary speaker
- 2005 Northern Contaminants Results Workshop (DIAND), Victoria, BC, Canada, Sept. 26-29
- 2005 26<sup>nd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC), Baltimore, Maryland, U.S.A., November 13-17; Session, "*Avian Sentinels of Environmental Contaminants*".
- 2005 26<sup>nd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC), Baltimore, Maryland, U.S.A., November 13-17; Session, "*Point and Non-Point Sourced Pollution in Aquatic Environments*".
- 2005 25<sup>th</sup> International Symposium on Halogenated Environmental Pollutants and POPs (Persistent Organic Pollutants) (DIOXIN'2005), Aug. 21-26, Toronto, ON Canada; Session. "*Emerging Contaminants and Metabolites in the Environment*".
- 2005 7<sup>nd</sup> Annual Workshop in Brominated Flame Retardants in the Environment, Gaithersburg, Maryland, U.S.A., June 13-15; plenary presenter.
- 2004 Woods Hole Oceanographic Institute (WHOI), Woods Hole, MA, U.S.A., Oct. 18, "*Biotransformation and the presence of chlorinated and brominated phenolics in marine and aquatic vertebrates*".
- 2004 Institute For Ocean Sciences, Department of Fisheries and Oceans Canada, Sidney, BS, Sept. 3., "*Persistent hydroxylated organohalogens are important circulating contaminants in marine and aquatic wildlife: Sources and implications of exposure*".
- 2004 7<sup>th</sup> Annual Meeting of the International Society for the Study of Xenobiotics (ISSX). August 29-Sept. 2, Vancouver, British Columbia, "*Biotransformation and persistent metabolites of organohalogen contaminants in model marine and aquatic wildlife*".
- 2004 3<sup>rd</sup> International Workshop on Brominated Flame Retardants. June 6-9, U. of Toronto, Toronto, Ontario, "*New case examples of biotransformation and elimination of polybrominated diphenyl ethers in aquatic and marine wildlife*".
- 2004 *EnviroAnalysis 2004*, The 5<sup>th</sup> Biennial Conference on Monitoring and Measurement of the Environment, May 17-21, Toronto, Ontario, "*Seasonal and spatial concentration trends of major pharmaceuticals in waters of the upper Detroit River*".
- 2004 U. of Connecticut, Dept. of Pathobiology, Storrs, CT, "*Biotransformation potential of beluga whale (*Delphinaterus leucas*) and the metabolism of model halogenated aromatic contaminants*".
- 2003 24<sup>st</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 9-13, Austin, TX, U.S.A; Session, "*Bioaccumulation and Biotransformation of Persistent Organic Pollutants (POPs)*"
- 2003 23<sup>th</sup> International Symposium on Halogenated Environmental Pollutants and POPs (Persistent Organic Pollutants) (DIOXIN'2003), Aug. 24-29, Boston, MA U.S.A ; Session. "*Persistent Organic Pollutants (POPs) in Marine Mammals*"
- 2003 Canadian Arctic Contaminants Assessment Symposium, Northern Contaminants Program (DIAND), Ottawa, Canada, March 4-7
- 2003 Canadian Wildlife Service, National Wildlife Research Centre (NWRC), NWRC Seminar Series, March 3
- 2002 US-EPA-sponsored Workshop, "*Emerging Chemical Contaminants in the Chesapeake Bay*", Chesapeake Biological Lab, University of Maryland, October 18

- 2002 Institute for Environmental Toxicology, Michigan State University, East Lansing, Michigan, Sept. 22
- 2002 PCB Workshop – Detroit River-Western Lake Erie Basin, Great Lakes Institute, University of Windsor, June 17/18
- 2002 University of Waterloo, Department of Biology, Waterloo, Ontario, Canada, March 28
- 2002 Canadian Wildlife Service Annual Meeting, Ottawa, Ontario, Canada, Feb. 27-28
- 2002 Arctic Monitoring and Assessment Programme (AMAP), Institute for Polar Research, Tromsø, Norway, January 22-26
- 2001 Chesapeake Biological Lab, University of Maryland, Solomons, Maryland, Dec. 8
- 2001 22<sup>nd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC), Baltimore, Maryland, U.S.A., November 11-14.
- 2001 Institut Maurice-Lamontagne, Department of Fisheries and Oceans Canada, Mont-Joli, Québec, November 9
- 2001 Aquatic Toxicology Workshop (ATW), Winnipeg, Manitoba, Canada, September 30 – October 3
- 2001 Third North American Workshop on Brominated Flame Retardants in the Environment, National Water Research Institute, Burlington, Ontario, Canada, August 22 and 23
- 2001 Second International Workshop on Brominated Flame Retardants, Stockholm University, Sweden, May 14-16
- 2001 Great Lakes Environmental Research Laboratory, National Ocean And Aquatic Administration (NOAA), Ann Arbor, Michigan, U.S.A., January 10
- 2000 Atlantic Coast Contaminant Workshop - Endocrine Disruptors in the Marine Environment: Impacts on Marine Wildlife and Human Health, Bar Harbour, Maine, U.S.A., June 14-16
- 1999 Queen's University, Department of Chemistry Lecture Series, December 13
- 1999 University of Windsor/Great Lakes Institute of Environmental Research, Seminar Series, December 15/16
- 1999 University of Toronto Lecture Series in Chemistry, Departments of Chemistry (Lash Miller Bldg.) and University of Toronto at Scarborough, January 14/15
- 1998 19<sup>th</sup> Annual Meeting of the Society of Environmental Toxicology and Chemistry (SETAC), Charlotte, North Carolina, U.S.A., November 15-19
- 1997 National Wildlife Research Centre Seminar Series, Canadian Wildlife Service, Hull, Québec, Canada, June 16
- 1996 Toxicology Seminar Series, Department of Environmental Toxicology, Uppsala University, Sweden, August 7

### **Public-Scientific Activities**

- 2013 Feature story in the Danish "EurekAlert", " Perfluorinated compounds enter the brain tissue of polar bears"; based on a *Environmental Toxicology and Chemistry* paper (Greaves et al. 2013).
- 2013 Cover paper and second most cited paper in 2012 in *Environmental Toxicology and Chemistry*, "Influence of carbon and lipid sources on variation of mercury and other trace elements in polar bears (*Ursus maritimus*) (Routti et al., 2012).
- 2012 Cover paper in *Journal of Environmental Monitoring*, "Flame retardants in eggs of American kestrels and European starlings from southern Lake Ontario region (North America)"; based on *Journal of Environmental Monitoring* paper (Chen et al. 2012).
- 2012 Feature story in *Great Lakes Echo Magazine*, " Chemicals removed from consumer products found in Great Lakes birds"; based on *Journal of Environmental Monitoring* paper (Gebbinck et al. 2012).

- 2011 Feature story in *Chemical & Engineering News (C&EN)*, " *New Brominated Chemicals Detected In Gull Eggs Environmental Pollutants: The contaminants may be degradation products of flame retardants*" (posted on-line Oct. 11, 2011); based on *Environmental Science and Technology* paper.
- 2011 Feature story in *Discovery Magazine News*, " *Has a Sustainable Strategy Backfired?: A new class of flame-retardants were designed to be more sustainable may be getting into wild animals*" (posted on-line Oct, 14, 2011); based on *Environmental Science and Technology* paper.
- 2011 Feature story in *Discovery Magazine News*, " *Novel brominated substances in Great Lakes herring gulls*" (Oct. 2011)
- 2011 Feature story in *Chemical & Engineering News (C&EN)*, " *Novel brominated substances in Great Lakes herring gulls*" (Oct. 2011)
- 2010 Featured in news story *ScienceWatch (Fast Moving Front Commentary)*, " *Robert J. Letcher on the Concerns of Flame Retardant Additives in Wildlife & Their Ecosystems*"; September 2010
- 2009 Featured in news story in *University of South Florida News*, " *Researchers Discover Chemical Pollution In Brains of Beached Marine Animals*"; May 2009
- 2009 Featured in news story in *Terra Daly: News about the Planet*, " *Contaminants In Marine Mammals' Brains*"; May 2009
- 2009 Featured in news story in the *Woods Hole Oceanographic Institute, News and Multimedia*, " *Skip This Cocktail Party: Contaminants in Marine Mammals' Brains*"; May 2009
- 2009 Featured in news story in the *Environews* section of the journal, *Environ. Health Perspect.*, " *Climate Change Linked to Arctic Contaminants*"; July 2009
- 2009 Featured article in *Nature History Magazine* on contaminants in polar bears
- 2008 Featured in news story in the Journal, *Environ. Sci. Technol.*, " *Glut of Information on "New" Brominated Flame Retardant in the Environment*"; Jan. 2009
- 2001 – present Member: Great Lakes Research Consortium
- 2001 – present Member: Citizens Environ. Alliance of southwestern Ontario and eastern Michigan
- 2004 CBC Radio (Windsor), April 27, Interview regarding solvent spill in St. Clair River and related water quality issues in the Lake Huron-Lake Erie corridor
- 2004 Windsor Star (feature article) and National post (May 26) on contaminants and endocrine disruption in snapping turtles in the lower Great Lakes
- 2003 Interview with CBC television (Windsor) for science segment on, " *Water Quality and Chemical Pollution in the Great Lakes*"
- 2002 Research Featured in, " *Ontario Success Stories*", an annual publication prepared by the Ontario Council of Universities for the Minister of Enterprise, Innovation and Opportunity
- 1997 Feature article in *Audubon magazine* (May issue), R. Norstrom, R. Letcher, I. Stirling and M.A. Ramsay, " *Arctic pollution and the persistence and effects of contaminants in the biology of polar bear*"
- 1996 Feature in *Animal Watch Magazine* (Canadian Wildlife Service, Sept./Oct. issue), R.J. Letcher and R.J. Norstrom, " *Contaminants in Polar Bears*"
- 1996 Feature in Environment Canada's *Let's Talk Green magazine* (Nov./Dec. issue), " *Letcher's Legacy: Organochlorine contamination in the Canadian Arctic*"

### **Scientific Reviewerships**

- 2007-2009 Review/selection committee member for NSERC Strategic Grants Panel, “*Healthy Environments and Ecosystems*”
- 2007 - present Environmental consultant for GlobalTox Environmental Consulting Inc.
- 2005 - present Reviewer and Board Member (Environment Canada): NSERC Visiting Fellows in a Government Laboratory Program
- 2002 - present Discovery Grant Proposal Reviewer: Natural Sciences and Engineering Research Council (NSERC) of Canada
- 2004 - present Grant Proposal Reviewer: U.S. Environmental Protection Agency (EPA), Office of Research and Development
- 2003 - present Grant Proposal Reviewer: Canadian Foundation for Innovation (CFI)
- 2003 - 2005 Grant Proposal Reviewer: Postdoctoral Research Program, Health Canada
- 2002 - 2005 Grant Proposal Reviewer: Research Corporation (U.S.A) foundation for the advancement of science, Tucson, AZ U.S.A.
- 2006 - present Journal Reviewer: *New Zealand Journal of Marine and Freshwater Research*
- 2003 - present Journal Reviewer: *Journal of Toxicology and Environmental Health* (Taylor & Francis)
- 2003 - present Journal Reviewer: *Analytical Chemistry* (American Chemical Society (ACS))
- 2001 - present Journal Reviewer: *Environmental Science and Technology* (ACS)
- 2000 - present Journal Reviewer: *Science of the Total Environment* (Elsevier Sciences, Ltd.)
- 2000 - present Journal Reviewer: *Environmental Pollution* (Elsevier Sciences, Ltd.)
- 2000 - present Journal Reviewer: *Toxicology In Vitro* (Elsevier Sciences, Ltd.)
- 2004 - present Journal Reviewer: *Toxicological Sciences* (Society of Toxicology)
- 1999 - present Journal Reviewer: *ACS Monograph Series*
- 1998 - present Journal Reviewer: *Environmental Health Perspectives* (National Institute of Health, U.S.A.)
- 1998 - present Journal Reviewer: *Ambio* (Royal Swedish Academy of Sciences)
- 1998 - present Journal Reviewer: *Archives of Environmental Contamination and Toxicology* (Springer-Verlag, Inc.)
- 1998 - present Journal Reviewer: *Marine Environmental Research* (Elsevier Sciences, Ltd.)
- 1997 - present Journal Reviewer: *Environmental Toxicology and Chemistry* (ET&C; Society of Environmental Toxicology and Chemistry (SETAC) Press)
- 1997 - present Journal Reviewer: *Chemosphere* (Elsevier Sciences, Ltd.)

### ***Professional Memberships***

- 2002 - present International Association for Great Lakes Research (IAGLR)
- 2002 – 2008 International Society for the Study of Xenobiotics (ISSX)
- 2001 – present Society of Toxicology (SOT)
- 1998 - present Assoc. Chemical Profession of Ontario, Chartered Chemist (*C.Chem.*)
- 1987 - present CIC (Canadian Institute of Chemistry), *MCIC*
- 1993 – present Canadian Polar Specialists Directory, published by the DIAND
- 1992 - present Society of Environmental Toxicology and Chemistry (SETAC)
- 1992 - present Association of Official Analytical Chemists (AOAC)
- 1991 - present Canadian Geographic Society
- 1987 – 1992 American Chemical Society

### **ACADEMIC-UNIVERSITY LEVEL INSTRUCTION**

#### ***Course Instruction***

Total number of individual courses taught or co-taught 1997-2013: 23

**Graduate Courses:**

- 2013 Ecotoxicology (graduate course; taught three, 3 hour course segments), Ottawa and Carleton University, Joint Program of Chemical and Environmental Toxicology
- 2012 Ecotoxicology (graduate course; co-coordinator; taught three, three 3 hour course segments), Ottawa and Carleton University, Joint Program of Chemical and Environmental Toxicology
- 2007 Advanced Analytical Approaches to Chemical Problems: Advanced Chromatography-Mass Spectrometric (Bio)Analysis in Environmental Problems (graduate course) (1 time), Department of Chemistry, Carleton University, Ottawa, Canada
- 2006 Advanced Analytical Approaches to Chemical Problems: Advanced Chromatography-Mass Spectrometric (Bio)Analysis in Environmental Problems (graduate course) (1 time), Department of Chemistry, Carleton University, Ottawa, Canada
- 2001-2003 Special Topics in Analytical Chemistry: *Advanced Analytical/Bioanalytical Spectroscopy* (3 times), Department of Chemistry & Biochemistry, University of Windsor, Canada

**Undergraduate Courses:**

- 2006 Advanced Analytical Chemistry II (4<sup>th</sup> year undergraduate), (1 time), Department of Chemistry, Carleton University, Ottawa, Canada
- 2001- 2003 *Analytical Chemistry* (3<sup>rd</sup> year undergraduate) (3 times), Department of Chemistry & Biochemistry, University of Windsor, Canada  
Note: Includes development and coordination of both lecture and laboratory components of the course.
- 2001- 2004 *Principles of Instrumental Analysis* (3<sup>rd</sup> year undergraduate) (4 times), Department of Chemistry & Biochemistry, University of Windsor, Canada  
Note: Includes development and coordination of both lecture and laboratory components of the course. Practical and relevant application in *Environmental Chemistry* is an important component of the course.
- 2001- 2003 *Ecotoxicology Field Course*, 3<sup>rd</sup> year undergraduate course with field component (3 times), Great Lakes Institute for Environmental Research (GLIER), University of Windsor, Canada  
Note: My component covers *Environmental Toxicology and Toxicokinetics in Aquatic Organisms and Humans*.
- 2003 *Biochemical and Molecular Toxicology* (section of Biotransformation and Metabolism), 4<sup>th</sup> year undergraduate course (1 time), Department of Biological Sciences University of Windsor, Canada  
Note: My component covers *Environmental Toxicokinetics and Toxicodynamics in Biota and Humans*.
- 1999 - 2000 *Biochemical Toxicology* (co-Instructor), 3<sup>rd</sup> year undergraduate course (2 times), Institute for Risk Assessment Sciences, Utrecht University, The Netherlands
- 1999 - 2000 *Modeling of Contaminant Fate and Avian Bioenergetics* (co-Instructor), requisite 3<sup>rd</sup> year course (3 times), Faculty of Veterinary Sciences, Utrecht University, The Netherlands

**Student Supervision or Co-supervision**



Undergraduate (n=12)

Name	Dates	Title of Research Project	Present Position
<b>Lennart Trouborst</b> (Carleton U.; summer student and 4 <sup>th</sup> year thesis project)	2013 – present (in progress)	TDBDPB flame retardant and debromination by-products in Great Lakes sediment	Undergraduate Student, Dept. of Chemistry, Carleton U.
<b>Lisa Mattioli</b> (Carleton U.; summer student and 4 <sup>th</sup> year thesis project)	2008 – 2009 (completed B.Sc., Carleton U.)	Isomer-specific determination and bioisomerization of hexabromocyclododecane flame retardant <i>in vivo</i> in avian and amphibian model species	Research Assistant, Orebro U., Sweden
<b>Ahmad Hamaed</b> (U. of Windsor; summer student and 4 <sup>th</sup> year thesis project)	2004 – 2005 (completed B.Sc., U. of Windsor)	Tetrabromobisphenol A flame retardants and degradation products in western Lake Erie/Detroit River sediment	Ph.D. candidate, Dept. of Chemistry, U. of Windsor
<b>Andrei Lezau</b> (U. of Windsor; summer student and 4 <sup>th</sup> year thesis project)	2004 – 2005 (completed B.Sc., U. of Windsor)	Hepatic phase I (cytochrome P450) and phase II (uridine diphosphoglucuronosyl (UDPGT)) enzyme activity in Great Lakes fish	Law School, U. of Ottawa
<b>David Frenkel</b> (U. of Windsor; summer student and 4 <sup>th</sup> year thesis project)	2003 – 2004 (completed B.Sc., U. of Windsor)	DNA damage in relation to exposure and metabolism of polycyclic aromatic hydrocarbons in captive brown bullhead	Law School, U. of Windsor
<b>Juliana Li</b> (U. of Windsor; summer NSERC student and 4 <sup>th</sup> year thesis project)	2002 – 2003 (completed B.Sc., U. of Windsor)	PBDE uptake, metabolism and elimination in dietary exposed lake trout and common carp	Medical School, U. of Western Ontario
<b>Gianfranco Scipione</b> (U. of Windsor; summer student and 4 <sup>th</sup> year thesis project)	2002 – 2003 (completed B.Sc., U. of Windsor)	PCBs and PBDEs in narwhal and beluga whale from the Canadian Arctic	Research Assistant, U.S.-Canada International Joint Commission Office (Windsor, ON)
<b>Greg Sandala</b> (U. of Windsor; summer student and 4 <sup>th</sup> year thesis project)	2001 – 2002 (completed B.Sc., U. of Windsor)	PCB fate and metabolite formation in adipose and plasma tissue from Greenland polar bears ( <i>Ursus maritimus</i> )	Ph.D candidate, National University of Australia
<b>Karl Hauschild</b>	2001 – 2002	PCB/DDT biotransformation and	Ph.D.

(U. of Windsor; summer NSERC student and 4 <sup>th</sup> year thesis project)	(completed B.Sc., U. of Windsor)	metabolites in Green and Leopard frogs from Ontario populations	candidate, U. of Wisconsin at Madison
<b>Selene Tyndale</b> (U. of Windsor; summer NSERC student and 4 <sup>th</sup> year thesis project)	2001 – 2002 (completed B.Sc., U. of Windsor)	Characterization and determination of carotenoids in the eggs of Pacific coast salmon	Lab technician, Lab technician, U. of Oregon
<b>Jessica MacLachlan</b> (U. of Windsor; summer student and 4 <sup>th</sup> year thesis project)	2000 – 2002 (completed B.Sc., U. of Windsor)	Lab assistant	Ph.D. candidate, U. of Western Ontario
<b>Greg Chisholm</b> (U. of Windsor; summer student and 4 <sup>th</sup> year thesis project)	2002-2003 (completed B.Sc., U. of Windsor)	Lab assistant	Unknown

Graduate (n=23)

Name	Dates	Title of Thesis Research Project	Present Position
<b>Katie Wooding</b> (Carleton U., Dept. of Biology (to co-supervise with W. Willmore), MSc candidate)	2013 – (in progress)	Structure-activity relationships and kinetics of a suite of emerging halogenated flame retardants and competitive binding with thyroid hormones on human and avian albumin and transthyretin transport proteins	Carleton U., Dept. of Chemistry, MSc candidate
<b>Lisa Mattioli</b> (Carleton U., Dept. of Chemistry, MSc candidate)	2013 – (in progress)	MeO-PBDPB and source as flame retardant degradation products in the herring gull food web in the Great Lakes	Carleton U., Dept. of Chemistry, MSc candidate
<b>Alana Greaves</b> (Carleton U., Dept. of Chemistry, PhD candidate)	2012 – (in progress)	Organophosphate flame retardant bioaccumulation, fate and metabolism in avian species from the Great Lakes	Carleton U., Dept. of Chemistry, PhD candidate
<b>Hattan El-Harbi</b> (Carleton U., Dept. of Biology (co-supervised with P. Mineau),	2010-2012 (completed)	Pesticides and migratory songbirds	U. of Saskatchewan, Toxicol. Ctr., Ph.D. candidate

M.Sc. candidate)			
<b>Alana Greaves</b> (Carleton U., Dept. of Chemistry, M.Sc. candidate)	2010-2012 (completed)	Whole body and brain distribution and mass balance of perfluoroalkyl acids and precursors in polar bears from East Greenland	Carleton U., Dept. of Chemistry, Ph.D. candidate
<b>Wouter Gebbink</b> (Carleton U., Dept. of Chemistry, Ph.D. candidate)	2007- 2011 (completed)	Perfluorinated and polyfluoroalkyl contaminants and degradation products in Great Lakes herring gulls	Postdoctoral Fellow, Stockholm University, Sweden
<b>Melissa McKinney</b> (Carleton U., Dept. of Chemistry, Ph.D. candidate)	2006-2010 (completed)	Brominated and chlorinated contaminants and metabolites in polar bears: Levels, patterns, spatiotemporal trends and the relationships to diet	Postdoctoral Fellow, Dalhousie U. + U. of Windsor
<b>Francisco-Javier Ucan-Marin</b> (Carleton U., Dept. of Chemistry, Ph.D. candidate)	2005-2009 (completed)	Halogenated phenolic compounds and metabolites and thyroid hormone-dependent effects in top Arctic predators	Research Consultant, Consulting firm in Ottawa
<b>Lewis Gauthier</b> (Carleton U., Dept. of Chemistry, M.Sc. candidate)	2005-2007 (completed)	Characterization and temporal/spatial trends of current-use flame retardants in Great lakes herring gulls	Chemical technician, Environment Canada
<b>Min Song</b> (co-supervision with Dr Rajesh Seth, Civil and Environ. Eng., U. of Windsor, M.Sc. candidate)	2002-2004 (completed)	Dynamics, fate and mass balance modeling of polybrominated diphenyl ethers in a wastewater treatment system (Little River WTP, Windsor, ON)	Unknown (in China)
<b>Jonathan Verreault</b> (co-supervision under Dr. Geir Gabrielsen, U. of Tromsø, Norway, Ph.D. candidate)	2002-2006 (completed)	Effects of organic contaminants and their metabolites on endocrine functions, metabolic rate, and enzyme activity in Arctic breeding glaucous gulls ( <i>Larus hyperboreus</i> )	Assistant Professor (Canada Research Chair), UQAM, Montreal, QC
<b>Gianfranco Scipione</b> (U. of Windsor, Dept. of Chemistry, M.Sc. candidate)	2003-2006 (completed)	Bioaccumulation and biotransformation of chlorinated and brominated organohalogenes and metabolites in a deepwater sculpin ( <i>Myoxocephalus</i>	Research Assistant, U.S.- Canada International Joint Commission Office, Windsor,

		<i>thompsoni</i> ) food chain from Lake Huron	ON
<b>Wouter Gebbink</b> (Carleton U., Dept. of Chemistry, M.Sc. candidate)	2004-2006 (completed)	Bioaccumulation and toxicokinetics of brominated and chlorinated contaminants in East Greenland polar bears ( <i>Ursus maritimus</i> )	Carleton U., Dept. of Chemistry, Ph.D. candidate
<b>Melissa McKinney</b> (U. of Windsor, Dept. of Chemistry, M.Sc. candidate)	2002-2004 (completed)	PBDE and PCB biotransformation and the immunochemical and catalytic characterization of cytochrome P450 and Phase II enzymes in Canadian beluga whales	Carleton U., Dept. of Chemistry, Ph.D. candidate
<b>Wenyi Hua</b> (U. of Windsor, Dept. of Chemistry, M.Sc. candidate)	2002-2004 (completed)	Major pharmaceuticals and personal care products, s-triazine herbicides in surface and treated waters of the upper Detroit River	Lab technician, Ministry of the Environment Ontario, Toronto, ON
<b>Selene Tyndale</b> (co-supervision with Dr. D.D. Heath, Dept. of Biol. Sci. U. of Windsor, M.Sc. candidate)	2002-2005 (completed)	Tissue distribution, egg transfer and fate of carotenoids in relation to early life survival and immune function of Pacific Chinook salmon ( <i>Oncorhynchus tshawytscha</i> )	Lab technician, U. of Oregon
<b>Bas Bokkers</b>	1999-2000 (completed M.Sc equivalent, Inst. Risk Assess. Sci. Utrecht U., NL)	(Anti)estrogenic activity of bisphenol A and several diphenylalkane analogues on vitellogenin production in the carp ( <i>Cyprinus carpio</i> ) hepatocyte assay	IRAS, Utrecht U., NL
<b>Minna Heringa</b>	2000-2005 (completed Ph.D., Inst. Risk Assess. Sci., Utrecht U., NL)	Polybrominated and polychlorinated dibenzo- <i>p</i> -dioxins and dibenzofurans: Ah receptor interaction, cytochrome P450 enzymes induction and estrogenic processes	Research Toxicologist, KIWA, The Netherlands
<b>Marjoke Heneweer</b>	2000-2005 (completed Ph.D., Inst.	Effects of 2-chloro-s-triazines and their metabolites on aromatase (CYP19) and side chain cleavage (CYP11a) in	PDF, Inst. Of Food Safety, Wagenigen U.,

	Risk Assess. Sci. Utrecht U., NL)	human adrenocortical carcinoma cells and on vitellogenin production in carp ( <i>Cyprinus carpio</i> ) hepatocytes	The Netherlands
<b>Rikkert Hansler</b>	1997-1998 (completed M.Sc. equivalent, Inst. Risk Assess. Sci., Utrecht U., NL)	Methylsulfone PCB and 4,4'-DDE metabolites in seals and cetaceans from the North Sea and Atlantic ocean	Unknown
<b>Ilonka Meerts</b> (advisory role with Dr. A. Brouwer)	1997-2001 (completed Ph.D., Wageningen Agricultural U., NL)	<i>In vitro</i> and <i>in vivo</i> thyroidogenic, estrogenic and dioxin-like activity of polychlorinated diphenyl ethers (PBDEs) and other brominated flame retardants	NOTOX Environ. Res. B.V., Den Bosch, NL
<b>Tanya Rouhani</b> (advisory role with M van den Berg, Institute for Risk Assessment Sciences (IRAS), Utrecht U., The Netherlands)	1999-2004 (completed Ph.D., Inst. Risk Assess. Sci. Utrecht U., NL)	The development of bioassays to detect the estrogenic activity of xenobiotics in amphibians	Research Scientist, Syntho Pharmaceuticals, The Netherlands
<b>Courtney Sandau</b> (advisory role with Dr. R. Norstrom)	1995-2000 (completed Ph.D., Dept. of Chem., Carleton U., Canada)	Hydroxylated metabolites of PCBs and other phenolic organochlorines in Canadian Wildlife and Humans	Research Assoc., Ctr. for Disease Control, Atlanta

Postdoctoral Fellows (n=8)

Name	Dates	Research Project	Present Position
<b>Dr. Guanyong Su</b> (Carleton U., Dept. of Chemistry)	2013 – in progress	Sources, food web pathways and effects of tetradecabromodiphenylbenzene (TDBDPB) flame retardants and degradation products in the avian-aquatic food web of Lakes Ontario and Huron	Postdoctoral Fellow (Carleton U.)
<b>Dr. Da Chen</b> (Carleton U., Dept. of Chemistry)	2010-2012	Novel halogenated phosphate flame retardants in avian biomonitoring species from aquatic ecosystems	Ass. Prof., Southern Illinois U., Carbondale, IL, USA
<b>Dr. Shaogang</b>	2007-2008	Perfluorinated and polyfluoroalkyl	Research Mass

<b>Chu</b> (Carleton U., Dept. of Chemistry)		contaminants in a captive, multi-generational dietary study with West Greenland sledge dogs	Spectrometry Chemist, Environment Canada
<b>Dr. Jonathan Verreault</b> (Carleton U., Dept. of Chemistry)	2007-2009	Organohalogen metabolism in a captive, multi-generational dietary study with West Greenland sledge dogs	Assistant Professor, University of Quebec at Montreal
<b>Dr. Soheila Shahmiri</b> (Carleton U., Dept. of Chemistry)	2005-2007 (PDF completed)	Phenolic metabolites and degradation products of organohalogen contaminants in Great Lakes birds and turtles	Research Chemist, Pharmaceutical firm, Brandon, Manitoba
<b>Dr. Karlis Valters</b> (U. of Windsor, Great Lakes Institute for Environmental Research)	2002-2004 (PDF completed)	Characterization, exposure kinetics and carcinogenicity of free and conjugated metabolites of PAHs in brown bullhead fish from Detroit River populations	Environmental Advisor, Nordic Council of Ministers, Riga, Latvia
<b>Dr. Hongxia Li</b> (U. of Windsor, Great Lakes Institute for Environmental Research)	2001- 2003 (PDF completed)	Development and application of methods and in vitro bioassays, and HPLC-MS techniques to assess PCB and PBDE metabolism and phenolic metabolites in fish and marine mammals	Lab Manager, Water Quality Centre, Trent U., Peterborough, ON
<b>Dr. Shaogang Chu</b> (U. of Windsor, Great Lakes Institute for Environmental Research)	2003-2005 (PDF completed)	Determination, dynamics and fate of current use pesticides and herbicides, and brominated flame retardants bird and reptile species in the Great Lakes watershed	Research Mass Spectrometry Chemist, Environment Canada

Technicians (n=11)

Name	Dates	Responsibilities	Present Position
<b>David Blair</b>	2010 – (in progress)	Ultratrace determination of brominated and brominated compounds in Greenland polar bears	NWRC Chemical Technologist (contract)

<b>Eric Pelletier</b>	2009-2012 (completed)	Ultratrace determination of halogenated halogenated compounds in wildlife	NWRC Chemical Technologist (contract)
<b>Shaogang Chu</b>	2007-present	Head mass spectrometry and analytical; development chemist in Organics Research Group	EC-NWRC Mass Spectrometry Chemist
<b>Lewis Gauthier</b>	2007-present	GC-MS analysis of non-PBDE brominated flame retardants and fatty acids in biological tissues	EC-NWRC Research Technician
<b>Luke Periard</b>	2006-present	Ultratrace determination of organic, halogenated compounds in wildlife tissue matrices	EC-NWRC Chemical Technologist
<b>Catherine Corrigan</b>	2007-2008 (completed)	LC-MS analysis of perfluorinated contaminants in wildlife tissues	NWRC Research Technician
<b>Suzanne Trudeau</b>	2005-2006 (completed)	General coordination of NWRC research lab, biomarker specialist, operators of HPLC-MS-MS system	NWRC Mass Spectrometry Chemist
<b>Erin Bennett</b>	2001-2002 (completed)	Research lab and personal management, development, validation and student training of analytical methods, special projects	Environmental contractor, Boston, MA, U.S.A.
<b>Greg Sandala</b>	2002-2003 (completed)	Special projects, contaminant and metabolite analysis in polar bear tissues	Ph.D candidate, National University of Australia
<b>Wouter Gebbink</b>	March 2003- March 2004 (completed)	Research lab management, development and validation of analytical methods, analyte contract analysis and special projects	Research Assistant, Environment Canada, Ottawa, ON
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(external thesis examiner) **Sarah O'Rourke**, Dept. of Biological Sciences, University of Windsor, Canada (thesis successfully defended May 2004); supervisor: Dr. Ken Drouillard

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(external thesis examiner) **Samar Mazloum**, Dept. of Civil and Environ. Engineering, University of Windsor, Canada (thesis successfully defended Sept. 2002); supervisor: Dr. Saad Jasim

(external thesis examiner) **Kevin Granshorn**, Dept. of Biological Sciences, University of Windsor, Canada (thesis successfully defended Aug. 2002); supervisor: Dr. Jan Ciborowski

(external thesis examiner) **Mary-Kate Gilbertson**, Dept. of Biological Sciences, University of Windsor, Canada (thesis successfully defended July 2001); supervisor: Dr. Brian Dixon

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## PUBLICATION LIST - Robert James Letcher

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### **Books/Journal Issues Edited**

- [1] R.J. Letcher, P.A. Behnisch. 2003. Environment International and Progress in Environmental Science, Special issue on, “The State-of-Science and Trends of Brominated Flame Retardants in the Environment”, Guest Editors: R.J. Letcher and P.A. Behnisch, Elsevier Inc. (Pergamon Press), 2003, Volume 19, Number 6, pp. 663-885.

### **Chapters in Books**

- [9] P. Kurt-Karakus, D.C.G. Muir, B. Braune, T. Brown, R.J. Letcher, L. Loseto, P. Ross, K. Reimer. M. Wayland. 2013. Biological Environment: Spatial and Temporal Trends of Contaminants, Chapter 4. In: *Canadian Assessment on Contaminants in the Arctic – Persistent Organic Pollutants*, in press.
- [8] P. Ross, L. Loseto, B. Braune, T. Brown, R.J. Letcher, D.C.G. Muir, K. Reimer. 2013. Biological Effects of Halogenated Organic Contaminants, Chapter 5. In: *Canadian Assessment on Contaminants in the Arctic – Persistent Organic Pollutants*, in press.
- [7] R. Dietz, C. Sonne, R.J. Letcher, B.M. Jenssen. 2013. Polar bear (*Ursus maritimus*) circumpolar health assessment in relation to chemical pollutants and climate change. In: *From Pole to Pole: Polar Environmental Research during the International Polar Year 2007 – 2009* (eds. R. Kallenborn), Springer-Verlag (Heidelberg, Germany) (2013), in review.
- [6] M. Gamberg, M. Evans, D. Depew, R. Anderson, B. Braune, L. Champoux, A. Gladen, K. Gantner, R. Letcher, L. Loseto, M. Lucotte, D. Muir, P. Outridge, G. Stern. 2013. Mercury in Terrestrial and Aquatic Biota across Canada: Temporal Variation. In: *Temporal Trends of Mercury in Biota in the Canadian Mercury Science Assessment*. In review.
- [5] J. Chételat, M. Amyot, B. Braune, T. Brown, A. Fisk, A. Gaden, C. Girard, A. Hare, J. Kirk, I. Lehnerr, R. Letcher, L. Loseto, R. Macdonald, B. McMeans, D. Muir, A. Poulain, K. Reimer, T. Sheldon, G. Stern. 2013. Marine Environment, Chapter 6. In: *Canadian Assessment on Contaminants in the Arctic - Mercury*, pp. 159-211.

- [4] M.S. Ross, R.J. Letcher, M.A. McKinney, C. Sonne, R. Dietz, C.S. Wong. 2011. Comparison of the enantiomer distribution of chiral organochlorine contaminants in captive sled dogs (West Greenland) and polar bears from the northern and southern Canadian subpopulations in Baffin Bay. In: *Chiral Pesticides: Stereochemistry and Its Consequences* (eds. A.W. Garrison, J. Gan, W. Lin), American Chemical Society Symposium Series 1085, 45-63.
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- [2] R.J. Letcher, E. Klasson-Wehler, Å. Bergman. 2000. Methylsulfone and hydroxylated metabolites of polychlorinated biphenyls, J. Passivita (ed), In: *The Handbook of Environment Chemistry: New Types of Persistent Halogenated Compounds* (ISBN: 3-540-65838-6), Springer-Verlag (Heidelberg, Germany) (2000), vol. 3, Part K, pp. 315-360.
- [1] R.J. Norstrom, R.J. Letcher. 1997. Role of biotransformation in bioconcentration and bioaccumulation. D. Sijm, J. de Bruijn, P. de Voogt and W. de Wolf (eds), In: *Biotransformation in Environmental Risk Assessment* (ISBN: 90-5607-008-8), (Society of Environmental Toxicology and Chemistry Press) (1997), Annex 1, pp. 103-113.

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- [13] A. Scheuhammer, B. Braune, L.H.M. Chan, H. Frouin, A. Krey, R.J. Letcher, L. Loseto, M. Noël, S. Ostertag, P. Ross, M. Wayland. 2013. Biological effects of mercury in Canadian Arctic fish and wildlife: A review. In preparation for *Sci. Total Environ.*
- [12] B. Braune, J. Chételat, M. Amyot, T. Brown, M. Evans, A. Fisk, A. Gaden, C. Girard, A. Hare, J. Kirk, I. Lehnher, R.J. Letcher, L. Loseto, R. Macdonald, B. McMeans, D. Muir, A. Poulain, K. Reimer, G. Stern. 2013. Mercury in the marine environment of the Canadian Arctic: A review of recent data *Sci. Total Environ.* Submitted.
- [11] S.B. Gewurtz, A.O. de Silva, L. Ahrens, A. Armellin, S.M. Backus, K. Barclay, M. Evans, M. Gledhill, P. Guerra, T. Harner, H. Hung, M. King, S.C. Lee, R.J. Letcher, P. Martin, C. Marvin, D.J. McGoldrick, M. Pelletier, J. Pomeroy, M. Rondeau, M.-C. Sauve, M. Sekela, M. Shoeib, D. W. Smith, S.A. Smyth, D. Spry, J. Struger, J. Syrgiannis, J. Waltho. 2013. Perfluoroalkyl contaminants in the Canadian environment: Multi-media assessment of current status and trends. *Environ. Internat.* 59:183-200.
- [10] R. Dietz, C. Sonne, N. Basu, B. Braune, T. O'Hara, R.J. Letcher, T. Scheuhammer, M. Andersen, C. Andreasen, D. Andriashek, G. Asmund, A. Aubail, H. Baagøe, E.W. Born, L.H.M. Chan, A.E. Derocher, P. Grandjean, K. Knott, M. Kirkegaard, A. Krey, N. Lunn, F. Messier, M. Obbard, M.T. Olsen, S. Ostertag, E. Peacock, A. Renzoni, F.F. Rigét, J.-U. Skaare, G. Stern, I. Stirling, M. Taylor, Ø. Wiig, S. Wilson, J. Aars. 2013. What are the toxicological effects of mercury in Arctic biota? *Sci. Total Environ.* 443:775-790.
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- biomonitoring polar bear health in Greenland: A review. *Acta Veterinaria Scandinavica* **54** (Suppl 1):S15.
- [8] F.F. Rigét, B.M. Braune, A. Bignert, S. Wilson, J. Aars, M. Andersen, G. Asmund, A. Aubail, M. Dam, R. Dietz, M. Evans, T. Evans, M. Gamberg, N. Gantner, N. Green, H. Gunnlaugsdóttir, K. Kannan, R.J. Letcher, D.C.G. Muir, K. Ólafsdóttir, A. Renzoni, P. Roach, C. Sonne, G. Stern, Ø. Wiig. 2011. Temporal trends of Hg in Arctic biota: An update. *Sci. Total Environ.* 409:3520-3526.
- [7] M. Houde, A.O. De Silva, D.C.G. Muir, R.J. Letcher. 2011. An updated review of monitoring and accumulation of perfluorinated compounds in aquatic biota. *Environ. Sci. Technol.* 45:7962-7973.
- [6] R.J. Letcher, J.-O. Bustnes, R. Dietz, B.M. Jenssen, E.H. Jørgensen, C. Sonne, J. Verreault, M. Vijayan, G.W. Gabrielsen. 2010. Exposure and Effects assessment of persistent organic pollutants in Arctic wildlife and fish. *Sci. Total Environ.* 408(15):2995-3043.
- [5] M. Houde, J.W. Martin, R.J. Letcher, K.R. Solomon, D.C.G. Muir. 2006. Environmental and biological monitoring of polyfluoroalkyl compounds: A critical review. *Environ. Sci. Technol.* 40:3463-3473.
- [4] B. Braune, D.C.G. Muir, G. Stern, P.F. Hoekstra, R. Dietz, M. Kwan, F.A.C. Gobas, R. Kelly, R.J. Letcher, R.J. Norstrom, N. Burgess, Z.Z. Kuyuk, P. Outridge. 2005. Spatial and temporal trends of mercury and POPs in Canadian arctic biota. *Sci. Total Environ.* 351-352:4-56.
- [3] A.T. Fisk, C.A. de Wit, M. Wayland, Z.Z. Kuyuk, N. Burgess, R.J. Letcher, B. Braune, R.J. Norstrom, S. Polischuk-Blum, C.D. Sandau, E. Lie, H. Jørgen, S. Larsen, J.-U Skaare, D.C.G. Muir. 2005. An assessment of the toxicological significance of anthropogenic contaminants in Canadian arctic wildlife. *Sci. Total Environ.* 351-352:57-93.
- [2] H. Hakk, R.J. Letcher. 2003. Metabolism in the toxicokinetics and fate of brominated flame retardants – A review. *Environ. Internat.* 29(6):801-826.
- [1] R.J. Letcher, P. Behnisch. 2003. The state-of-the-science and trends of brominated flame retardants in the environment: Present knowledge and future directions. *Environ. Internat.* 29(6):663-664.

#### **Research Papers in Refereed Journals (Accepted, In Press or Published)**

- [220] R.J. Letcher, S.C. Martenson, K.J. Fernie. 2013. Dietary exposure of male American kestrels (*Falco Sparverius*) to decabromodiphenyl ether (BDE-209) flame retardant: Uptake, distribution, debromination and enzyme induction. *Environ. Internat.* Accepted November 2013.
- [219] T.T. Gilchrist, R.J. Letcher, P. Thomas, K.J. Fernie. 2013. Polybrominated diphenyl ethers and multiple stressors influence the reproduction of free-ranging tree swallows (*Tachycineta bicolor*) nesting at wastewater treatment plants. *Sci. Total Environ.* Accepted October 2013.

- [218] S.G. Chu, R.J. Letcher. 2013. High sensitivity determination of several environmental halogenated phenolic compounds in plasma and serum by solid phase extraction, dansylation derivatization and liquid chromatography-positive electrospray ionization-tandem quadrupole mass spectrometry. *J. Chromatogr. A* Accepted October 2013.
- [217] B.M. Braune, A.J. Gaston, K.H. Elliott, J.F. Provencher, K.J. Woo, M. Chambellant, S.H. Ferguson, R.J. Letcher. 2013. Organohalogen contaminants and total mercury in forage fish preyed upon by thick-billed murrelets in northern Hudson Bay. *Marine Pollut. Bull.* Accepted October 2013.
- [216] D. Chen, P. Martin, N.M. Burgess, L. Champoux, J.E. Elliott, D.J. Forsyth, A. Idrissi, R.J. Letcher. 2013. European starlings (*Sturnus vulgaris*) suggest that landfills are an important source of bioaccumulative flame retardants to Canadian terrestrial ecosystems. *Environ. Sci. Technol.* In press, ASAP online, Sept. 23, 2013 (dx.doi.org/10.1021/es403383e).
- [215] K.M. Sullivan, S.C. Martenson, R.J. Letcher, D. Bird, L. Shutt, K.J. Fernie. 2013. Changes in the incubation by American kestrels (*Falco sparverius*) during exposure to the polybrominated diphenyl ether (PBDE) mixture DE-71. *J. Toxicol. Environ. Health, Part A*. 76:978-989.
- [214] S. Pellerin-Plourde, R. Moreau, R. J. Letcher, J. Verreault. 2013. Are bone structure and metabolism parameters associated with halogenated flame retardants in ring-billed gulls breeding in a pollution hotspot in the St. Lawrence River, Canada? *Chemosphere* In press, online Sept. 6, 2013.
- [213] H. A. Currier, R.J. Letcher, T.D. Williams, J.E. Elliott. 2013. An assessment of *in ovo* toxicity of the flame retardant 1,2-dibromo-4-(1,2-dibromoethyl) cyclohexane (TBECH) in the zebra finch. *Bull. Environ. Contam. Toxicol.* 91:455–459.
- [212] T.Ø. Bechshøft, C. Sonne, F.F. Riget, R.J. Letcher, M.A. Novak, E. Henchey, J.S. Meyer, I. Eulaers, V.L.B. Jaspers, A. Covaci, R. Dietz. 2013. Polar bear stress hormone cortisol fluctuates with the North Atlantic Oscillation climate index. *Polar Biol.* 36:1525–1529.
- [211] R. Dietz, F.F. Rigét, C. Sonne, E.W. Born, T. Bechshøft, M.A. McKinney, D.C.G. Muir, R.J. Letcher. 2013. Three decades (1983-2010) of contaminant trends in East Greenland polar bears (*Ursus maritimus*). Part 2: Brominated flame retardants. *Environ. Internat.* 59:494-500.
- [210] R. Dietz, F.F. Rigét, C. Sonne, E.W. Born, T. Bechshøft, M.A. McKinney, R.J. Letcher. 2013. Three decades (1983-2010) of contaminant trends in East Greenland polar bears (*Ursus maritimus*). Part 1: Legacy organochlorine contaminants. *Environ. Internat.* 59:485-493.
- [209] A.K. Greaves, R.J. Letcher. 2013. Linear and branched perfluorooctane sulfonate (PFOS) isomer patterns differ among several tissues and blood of polar bears. *Chemosphere* 93:574-580.

- [208] C. Sonne, R. Dietz, R.J. Letcher. 2013. Chemical cocktail party in East Greenland: A first time evaluation of human organohalogen exposure from consumption of ringed seal and polar bear tissues and possible health implications. *Toxicol. Environ. Chem.* 95:853-859.
- [207] A. Farhat, D. Crump, S. Chiu, K.L. Williams, R.J. Letcher, L.T. Gauthier, S.W. Kennedy. 2013. *In ovo* effects of two organophosphate flame retardants on pipping success, development, mRNA expression and thyroid hormone levels in Leghorn chicken embryos. *Toxicol. Sci.* 134:92-102.
- [206] C. Sonne, T.Ø. Bechshøft, F.F. Rigét, H.J. Baagøe, A. Hedayat, M. Andersen, J.-E. Bech-Jensen, L. Hyldstrup, R.J. Letcher, R. Dietz. 2013. Size and density of East Greenland polar bear (*Ursus maritimus*) skulls: Valuable bio-indicators of environmental changes? *Ecol. Ind.* 34:290-295.
- [205] S.E. Erdmann, R. Dietz, C. Sonne, T.Ø. Bechshøft, K. Vorkamp, R.J. Letcher, M. Long, E.C. Bonefeld-Jørgensen. 2013. Xenoestrogenic and dioxin-like activity in blood of East Greenland Polar Bears (*Ursus maritimus*). *Chemosphere* 92:583-591.
- [204] M.A. McKinney, S.J. Iverson, A.T. Fisk, E.W. Born, C. Sonne, R.J. Letcher, A. Rosing-Asvid, R. Dietz. 2013. Long-term diet change in East Greenland polar bears assessed by quantitative fatty acid signature analysis. *Global Climate Change* 19: 2360-2372.
- [203] K. McPhedran, R. Seth, M. Song, S.G. Chu, R.J. Letcher. 2013. Fate and mass balances of triclosan (TCS), tetrabromobisphenol A (TBBPA) and tribromobisphenol A (tri-BBPA) during the municipal wastewater treatment process. *Water Qual. Res. J. Canada* 48:255-265.
- [202] C.D. Metcalfe, S. Kleywegt, R.J. Letcher, E. Topp, P. Wagh, V.L. Trudeau, T. W. Moon. 2013. A multi-assay screening approach for assessment of endocrine-active contaminants in wastewater effluent samples. *Sci. Total Environ.* 454-455:132-140.
- [201] Chabot-Giguère, R.J. Letcher, J. Verreault. 2013. *In vitro* biotransformation of BDE-209 and Dechlorane-Plus flame retardants: A case study of ring-billed gull breeding in a pollution hotspot in the St-Lawrence River, Canada. *Environ. Internat.* 55:101-108.
- [200] A. Arukwe, M.V. Cangialosi, R.J. Letcher, E. Rocha, A.S. Mortensen. 2013. Changes in morphometry and association between whole-body fatty acids and steroid hormone profiles in relation to bioaccumulation patterns in salmon larvae exposed to perfluorooctane sulfonic or perfluorooctane carboxylic acids. *Aquat. Toxicol.* 130–131:219-230
- [199] A.K. Greaves, R.J. Letcher, C. Sonne, R. Dietz. 2013. Brain region distribution and patterns of bioaccumulative perfluoroalkyl carboxylic and sulfonic acids in highly exposed East Greenland polar bears (*Ursus maritimus*). *Environ. Toxicol. Chem.* 32:713-722.
- [198] D. Chen, R.J. Letcher, L.T. Gauthier, S.G. Chu. 2013. Tetradecabromodiphenoxybenzene flame retardant undergoes photolytic debromination. *Environ. Sci. Technol.* 47:1373-1380.

- [197] B.M. Braune, R.J. Letcher. 2013. Perfluorinated sulfonate and carboxylate compounds in eggs of seabirds breeding in the Canadian Arctic: Temporal trends (1975-2011) and inter-species comparison. *Environ. Sci. Technol.* 47:616-624.
- [196] M.L. Eng, J.E. Elliott, R.J. Letcher, T.D. Williams. 2013. Individual variation in body burden, lipid status and reproductive investment affects maternal transfer of a brominated diphenyl ether (BDE-99) to eggs in the zebra finch. *Environ. Toxicol. Chem.* 32:345–352.
- [195] V. Winter, J.E. Elliott, R.J. Letcher, T.D. Williams. 2013. Validation of an egg-injection method for embryotoxicity studies in a small, model songbird, the zebra finch (*Taeniopygia guttata*). *Chemosphere* 90:125-131.
- [194] V.I. Cooper, R.J. Letcher, R. Dietz, C. Sonne, C.S. Wong. 2012. Quantification of achiral and chiral methylsulfonyl polychlorinated biphenyl metabolites by two-dimensional liquid chromatography-atmospheric pressure photoionization-tandem mass spectrometry. *J. Chromatogr. A.* 1268:64-73.
- [193] H. Routti, R.J. Letcher, E.W. Born, M. Branigan, R. Dietz, T.J. Evans, M.A. McKinney, E. Peacock, C. Sonne. 2012. Influence of carbon and lipid sources on variation of mercury and other trace elements in polar bears (*Ursus maritimus*). *Environ. Toxicol. Chem.* 31:2739–2747.
- [192] A.K. Greaves, R.J. Letcher, C. Sonne, R. Dietz, E.W. Born. 2012. Perfluoroalkyl carboxylate and sulfonate, and select precursor concentrations and patterns are highly contrasting in tissues and blood of East Greenland polar bears. *Environ. Sci. Technol.* 46:11575–11583.
- [191] D. Chen, R.J. Letcher, P.A. Martin. 2012. Flame retardants in eggs of American kestrels and European starlings from southern Lake Ontario region (North America). *J. Environ. Monit.* 14:2870-2876.
- [190] M.-L. Gentes, R.J. Letcher, É. Caron-Beaudoin, J. Verreault. 2012. Novel flame retardants in urban-feeding ringed-billed gulls from the St. Lawrence River, Canada. *Environ. Sci. Technol.* 46:9735-9744.
- [189] S.G. Chu, L.T. Gauthier, R.J. Letcher. 2012. Alpha- and beta-isomers of tetrabromoethylcyclohexane (TBECH) flame retardant: Depletion and metabolite formation *in vitro* using a model rat microsomal assay. *Environ. Sci. Technol.* 46:10263-10270.
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#### **Peer-Reviewed Presentations**

- [293] A.K. Greaves, R.J. Letcher. 2013. Tissue distribution and *in ovo* transfer of bioaccumulative organophosphate flame retardants in Great Lakes herring gulls (*Larus argentatus*). 34<sup>th</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 17-21, Nashville, TN, U.S.A.
- [292] R.J. Letcher. 2013. Forensic discoveries, trends and sources of targeted emerged, emerging and/or re-emerging halogenated substances in Great Lakes herring gulls. 34<sup>th</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 17-21, Nashville, TN, U.S.A.
- [291] A.K. Greaves, R.J. Letcher, C. Sonne, R. Dietz, E. Born. 2013. Tissue and intra-brain distribution of perfluoroalkyl carboxylates and sulfonates, and select precursors and isomers in East Greenland polar bears. 5<sup>th</sup> International Workshop on Fluorinated Compounds in materials, humans and the environment, October 27-29, Copenhagen, Denmark.
- [290] W.A. Gebbink, U. Berger, R.J. Letcher. 2013. Polyfluoroalkyl phosphate esters in an avian top predator: Identification of mono- and di-PAPs in herring gull tissues, blood and eggs from the North American Great Lakes. 5<sup>th</sup> International Workshop on Fluorinated Compounds in materials, humans and the environment, October 27-29, Copenhagen, Denmark.
- [289] T.Ø. Bechshøft, F.F. Rigét, C. Sonne, R.J. Letcher, D.C.G. Muir, M.A. Novak, E. Henchey, J.S. Meyer, I. Eulaers, V. Jaspers, A. Covaci, R. Dietz. 2013. Cortisol in polar bear hair: Results and applications. 22<sup>nd</sup> International Conference on Bear Research and Management, September 15-20, Provo, UT, U.S.A.

- [288] M. Gamberg, M.S. Evans, M.R. Anderson, B. M. Braune, N.M. Burgess, L. Champoux, D.C. Depew, A. Gaden, R.J. Letcher, L.L. Loseto, M. Lucotte, D.C.G. Muir, P.M. Outridge, G.A. Stern. 2013. Canadian Science Mercury Assessment: Temporal trends in biota. 11<sup>th</sup> ICMGP International Conference on Mercury as a Global Pollutant, July 28-August 1, Edinburgh, Scotland. U.K.
- [287] N.M. Burgess, D.C. Depew, M. Gamberg, J. Chételat, L.M. Campbell, M. Clayden, S. Dorn, M.S. Evans, M. LeBeuf, R.J. Letcher, L.L. Loseto, D.C.G. Muir, M. Power, G.A. Stern, . 2013. National assessment of geographical variation of mercury in biota across Canada. 11<sup>th</sup> ICMGP International Conference on Mercury as a Global Pollutant, July 28-August 1, Edinburgh, Scotland. U.K.
- [286] R.J. Letcher. 2013. Using advanced separation and mass spectrometric approaches to identify and quantify emerging flame retardants and related contaminants in complex environmental matrices. 2013. 59<sup>th</sup> ICASS Conference, June 26-28, Mont Tremblant, QC, Canada.
- [285] R.J. Letcher, P.A. Martin, D. Chen. 2013. Comparison of organic flame retardants including organophosphates in eggs of European starlings and herring gulls from sites in the Great Lakes. 56<sup>th</sup> Annual Conference on Great Lakes Research (IAGLR 2013), June 2-6, West Lafayette, IN, U.S.A.
- [284] A.K. Greaves, R.J. Letcher. 2013. Organophosphate flame retardants are maternally transferred *in ovo* in herring gulls (*Larus argentatus*). 56<sup>th</sup> Annual Conference on Great Lakes Research (IAGLR 2013), June 2-6, West Lafayette, IN, U.S.A.
- [283] L. Bestvater, G. Tomy, C. Marvin, G. MacInnis, S. Backus, D. Muir, R.J. Letcher, T. Johnson, E. Sverko. 2013. Organophosphorous flame retardants in components of a Lake Ontario food web. 9<sup>th</sup> Annual Workshop on LC/MS/MS Applications in Environmental Analysis and Food Safety / Eastern Canada Trace Organic Workshop (ECTOW), May 6-9, Burlington, ON, Canada.
- [282] D. Chen, P.A. Martin, N.M. Burgess, L. Champoux, J.E. Elliott, D.J. Forsyth, I. Idrissi, R.J. Letcher. 2013. European starlings (*Sturnus vulgaris*) indicate landfills are an important source of bioaccumulative flame retardants to Canadian terrestrial ecosystems. 9<sup>th</sup> Annual Workshop on LC/MS/MS Applications in Environmental Analysis and Food Safety / Eastern Canada Trace Organic Workshop (ECTOW), May 6-9, Burlington, ON, Canada.
- [281] M. Levin, E. Gebhard, L. Jasperse, R. Dietz, C. Sonne, R. Bossi, R.J. Letcher, S. De Guise. 2013. East Greenland polar bear and ringed seal immune functions: Effects upon *in vivo* and *in vitro* toxicant exposure. 44<sup>th</sup> **Annual Conference of the International Association for Aquatic Animal Medicine (IAAAM 2013)**, April 21-26, Sausalito, CA, U.S.A.
- [280] L. Shen, K. Jobst, P.A. Helm, E. Reiner, G.T. Tomy, R.J. Letcher, R. McCrindle. 2013. Identification and determination of dechlorination products of dechlorane 602 in Great Lakes fish and arctic biota. 6<sup>th</sup> International Symposium of Flame Retardants (BFR'2013), April 7-10, San Francisco, CA, U.S.A.
- [279] S.C. Martenson, R.J. Letcher, K.J. Fernie. 2013. Courtship and aggressive behavior are increased in breeding American kestrels by their exposure to the brominated flame

- retardants  $\beta$ -TBECH. 6<sup>th</sup> International Symposium of Flame Retardants (BFR'2013), April 7-10, San Francisco, CA, U.S.A.
- [278] D. Chen, P.A. Martin, N.M. Burgess, L. Champoux, J.E. Elliott, D.J. Forsyth, I. Idrissi, R.J. Letcher. 2013. European starlings (*Sturnus vulgaris*) indicate landfills are an important source of bioaccumulative flame retardants to Canadian terrestrial ecosystems. 6<sup>th</sup> International Symposium of Flame Retardants (BFR'2013), April 7-10, San Francisco, CA, U.S.A.
- [277] R.J. Letcher, D. Chen. 2013. Comparative photolytic debromination of decabromodiphenyl ether, decabromodiphenyl ethane and tetradecabromodiphenoxy benzene flame retardants and environmental considerations. 6<sup>th</sup> International Symposium of Flame Retardants (BFR'2013), April 7-10, San Francisco, CA, U.S.A.
- [276] K.J. Fernie, S.C. Martinson, L. Graham, S. Kimmons, V.P. Palace, I. Ritchie, L. Gauthier, R.J. Letcher. 2012. The flame retardant  $\beta$ -1,2-dibromo-4-(1,2-dibromoethyl)cyclohexane ( $\beta$ -TBECH): Fate, fertility and reproduction in American kestrels (*Falco sparverius*). 33<sup>rd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 11-15, Long Beach, CA, U.S.A.
- [275] M.L Eng, T.D. Williams, R.J. Letcher, J. Elliott. 2012. Effects of early exposure to BDE-99 on growth, thyroid hormones, and photo-induced reproductive development in European starlings. 33<sup>rd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 11-15, Long Beach, CA, U.S.A.
- [274] H. Al-Harbi, R.J. Letcher, P. Mineau. 2012. Selected organophosphate pesticide isolation, identification and determination in the feet of migratory songbirds. 33<sup>rd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 11-15, Long Beach, CA, U.S.A.
- [273] A. Fathat, D. Crump, S. Chiu, K. Williams, R.J. Letcher, L. Gauthier, S. Kennedy. 2012. *In ovo* effects of tris(1-chloro-2-propyl) phosphate (TCPP) and tris(1,3-dichloro-2-propyl) phosphate (TDCPP) on lethality, development, thyroid hormone levels and mRNA expression in chicken embryos. 33<sup>rd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 11-15, Long Beach, CA, U.S.A.
- [272] R.J. Letcher, S.G. Chu, S.R. de Solla, A.O. de Silva. 2012. Perfluoroethylcyclohexanesulfonate (PFECBS) and perfluorinated sulfonates and carboxylates in snapping turtles from southern Ontario, Canada. 33<sup>rd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 11-15, Long Beach, CA, U.S.A.
- [271] A.K. Greaves, R.J. Letcher, C. Sonne, R. Dietz, E.W. Born. 2012. Tissue and intra-brain distribution of perfluoroalkyl carboxylates and sulfonates, and select precursors and isomers in East Greenland polar bears. 33<sup>rd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 11-15, Long Beach, CA, U.S.A.
- [270] R.J. Letcher, D. Chen, S. Backus, D. McGoldrick, L.T. Gauthier. 2012. Spatio-temporal trends of organophosphate flame retardants in Great Lakes herring gulls, as well as Lake trout and their convergent aquatic food webs. 33<sup>rd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 11-15, Long Beach, CA, U.S.A.

- [269] S. de Solla, A.O. de Silva, R.J. Letcher. 2012. Contamination of Perfluorooctane Sulfonate and Other Perfluorinated Compounds Downstream of an International Airport, Hamilton, Ontario. 39<sup>th</sup> Aquatic Toxicity Workshop. Sept. 30 – Oct. 3, Sun Peaks, B.C., Canada.
- [268] D. Chen, R.J. Letcher, L.T. Gauthier, S.G. Chu, R. McCrindle, 2012. Retrospective temporal trends of methoxylated polybrominated diphenoxybenzenes and dietary isotope tracers in the eggs of herring gulls from the North American Great Lakes. 2<sup>nd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Australasia Conference, July 4-6, Brisbane, QLD, Australia.
- [267] R.J. Letcher, H. Routti, E.W. Born, M. Branigan, R. Dietz, T.J. Evans, M.A. McKinney, E. Peacock, C. Sonne. 2012. Food web influence on spatial variation of mercury and other trace elements in polar bears from Alaska, Canada and East Greenland. 2<sup>nd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Australasia Conference, July 4-6, Brisbane, QLD, Australia.
- [266] R.J. Letcher. 2012. Old to new generation flame retardants: Chemical instability affects environmental persistence and bioaccumulation. 14<sup>th</sup> Workshop on (Brominated) Flame Retardants (BFR'2012), June 4-6, Winnipeg, MB, Canada.
- [265] D. Chen, R.J. Letcher, L.T. Gauthier, S.G. Chu. 2012. Photocatalytic and thermal degradation of SAYTEX 120 brominated flame retardant. 14<sup>th</sup> Workshop on (Brominated) Flame Retardants (BFR'2012), June 4-6, Winnipeg, MB, Canada.
- [264] K.J. Fernie, S.C. Martinson, L. Graham, S. Kimmins, G. Tomy, V.P. Palace, I.J. Ritchie, L.T. Gauthier, D.M. Bird, R.J. Letcher. 2012. Reproductive effect of exposure to an emerging flame retardant,  $\beta$ -1,2-Dibromo-4-(1,2-dibromoethyl)cyclohexane ( $\beta$ -TBECH) in American Kestrels (*Falco sparverius*). 14<sup>th</sup> Workshop on (Brominated) Flame Retardants (BFR'2012), June 4-6, Winnipeg, MB, Canada.
- [263] D.J. McGoldrick, B.M. Braune, S. Fraser, C.E. Hebert, R.J. Letcher, S.M. Backus. 2012. The role of environmental specimen banking in contaminant risk assessment and management in Canada. 6<sup>th</sup> World Congress of the Society of Environmental Toxicology and Chemistry (SETAC), May 20-24, Berlin, Germany.
- [262] S. de Solla, D.V.C. Weseloh, C.E. Hebert, R.J. Letcher. 2012. Reconcilable differences: The use of standard reference material to reduce methodological artifacts in the reporting of organochlorine pesticides and PCBs. 55<sup>th</sup> Annual Conference on Great Lakes Research (IAGLR 2012), May 13-17, Cornwall, ON, Canada.
- [261] J. Verreault, M.L. Gentes, E. Caron-Beaudoin, J.F. Helie, J.F. Giroux, R.J. Letcher. 2012. GPS-Based biotelemetry and stable isotope profiling meets ecotoxicology: A novel approach for understanding the exposure of avian species to organohalogen contaminants. 55<sup>th</sup> Annual Conference on Great Lakes Research (IAGLR 2011), May 13-17, Cornwall, ON, Canada.
- [260] R.J. Letcher, D.V.C. Weseloh, D. Chen, C.E. Hebert, W.A. Gebbink, L.T. Gauthier. 2012. The Great Lakes Herring Gull Monitoring Program (GLHGMP): The complex cocktail of emerging contaminants and comparative spatiotemporal changes, sources and fate

- across the Great Lakes. 55<sup>th</sup> Annual Conference on Great Lakes Research (IAGLR 2012), May 13-17, Cornwall, ON, Canada
- [259] T. Bechshøft, C. Sonne, J.S. Meyer, M.A. Novak, E. Henchey, F.F. Rigét, I. Eulaers, V. Jaspers, A. Covaci, R.J. Letcher, R. Dietz. 2012. Cortisol in polar bear hair: Results and applications. IPY 2012 Conference: From Knowledge to Action. April 22-27, Montreal, QC, Canada
- [258] R. Dietz, F.F. Rigét, C. Sonne, K. Gustavson, T.Ø. Bechshøft, R. Bossi, E.W. Born, P. Grandjean, D.C.G. Muir, M.A. McKinney, R.J. Letcher. 2012. The East Greenland polar bear (*Ursus maritimus*) as a messenger of global temporal contaminant trends. IPY 2012 Conference: From Knowledge to Action. April 22-27, Montreal, QC, Canada
- [257] H. Routti, R.J. Letcher, E.W. Born, M. Branigan, R. Dietz, T.J. Evans, M.A. McKinney, E. Peacock, C. Sonne. 2012. Diet-related factors can influence spatial variation of mercury and other bioaccumulative trace elements in polar bears (*Ursus maritimus*). IPY 2012 Conference: From Knowledge to Action. April 22-27, Montreal, QC, Canada
- [256] A.K. Greaves, R.J. Letcher, C. Sonne, R. Dietz, E.W. Born. 2012. Perfluoroalkyl Acid Tissue Distribution and Perfluorooctane Sulfonate Isomer Patterns in East Greenland Polar Bears (*Ursus maritimus*). IPY 2012 Conference: From Knowledge to Action. April 22-27, Montreal, QC, Canada
- [255] H. Routti, A. Arukwe, B.M. Jenssen, G.W. Gabrielsen, R.J. Letcher, M. Nyman. 2012. Contaminant effects on multiple endpoints in ringed seals - conclusions from a 5 year study. IPY 2012 Conference: From Knowledge to Action. April 22-27, Montreal, QC, Canada
- [254] M.A. McKinney, S.J. Iverson, F.F. Rigét, C. Sonne, E.W. Born, T. Bechshøft, D.C.G. Muir, R.J. Letcher, A. Rosing-Asvid, R. Dietz. 2012. Long-term trends in East Greenland polar bear diets and the consequences for exposure to persistent organic pollutants. IPY 2012 Conference: From Knowledge to Action. April 22-27, Montreal, QC, Canada
- [253] T. Bechshøft, C. Sonne, R. Dietz, J. Jakobsen, J.S. Meyer, M.A. Novak, E. Henchey, F.F. Rigét, E.W. Born, I. Eulaers, V. Jaspers, A. Covaci, R.J. Letcher. 2011. Biomarkers of POP exposure in East Greenland polar bears (*Ursus maritimus*). 19<sup>th</sup> Biennial Conference on the Biology of Marine Mammals, Nov. 26-Dec. 2, Tampa, FL, USA.
- [252] R. Dietz, F.F. Rigét, C. Sonne, E.W. Born, R. Bossi, K. Gustavson, T.Ø. Bechshøft, P. Grandjean, M.A. McKinney, D.C.G. Muir, R.J. Letcher. 2011. The East Greenland polar bear as a messenger of global temporal contaminant trends. 19<sup>th</sup> Biennial Conference on the Biology of Marine Mammals, Nov. 26-Dec. 2, Tampa, FL, USA.
- [251] M. Eng, T. Williams, J.E. Elliott, R.J. Letcher. 2011. Impact of exposure level and condition on the maternal transfer of BDE-99 in zebra finches. 32<sup>nd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 11-15, Boston, MA, U.S.A.
- [250] L. Champoux, R. Lavoie, J.-F. Rail, P. Martin, R.J. Letcher. 2011. PBDE and HBCD flame retardants in colonial aquatic birds of the St. Lawrence River. 32<sup>nd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 11-15, Boston, MA,

U.S.A.

- [249] M.-L. Gentes, J. Giroux, R.J. Letcher, M. Patenaude-Monette, J. Verreault. 2011. GPS-Based biotelemetry meets ecotoxicology: A novel approach for understanding the exposure of avian species to organohalogen contaminants. 32<sup>nd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 11-15, Boston, MA, U.S.A.
- [248] B. Chabot-Giguère, R.J. Letcher, J. Verreault. 2011. Biotransformation of emerging flame retardants: A case study of ring-billed gulls breeding in a pollution hotspot in the St. Lawrence River, Canada. 32<sup>nd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 11-15, Boston, MA, U.S.A.
- [247] É. Caron-Beaudoin, J-F. Hélie, M-L. Gentes, J-F. Giroux, J. Verreault, R.J. Letcher. 2011. Emerging halogenated flame retardants in ring-billed gulls from the St. Lawrence River: Associations between ecological tracers and diet. 32<sup>nd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 11-15, Boston, MA, U.S.A.
- [246] D. Chen, R.J. Letcher, S.G. Chu, L.T. Gauthier, D. Potter. 2011. Spatio-temporal trends and possible sources of methoxylated polybrominated diphenoxybenzene congeners in herring gull eggs from the Laurentian Great Lakes of North America. 32<sup>nd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 11-15, Boston, MA, U.S.A.
- [245] A.K. Greaves, R.J. Letcher, C. Sonne, R. Dietz, E.W. Born. 2011. Brain region and tissue distribution and patterns of bioaccumulative perfluoroalkyl acids (PFAAs) in highly exposed East Greenland polar bears. 2011. 32<sup>nd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 11-15, Boston, MA, U.S.A.
- [244] R.J. Letcher, D. Chen, W.A. Gebbink, S.G. Chu, L.T. Gauthier, P.A. Martin, C.E. Hebert, D.V.C. Weseloh. 2011. Recently identified and emerging organohalogen contaminants and comparative spatiotemporal trends in herring gulls from the Great Lakes. 32<sup>nd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 11-15, Boston, MA, U.S.A.
- [243] A.M. Wågbo, M.V. Cangialosi, R.J. Letcher, G. Dugo, A. Arukwe. 2011. Modulation of hepatocellular lipid levels and cellular homeostatic and apoptotic responses in primary culture of Salmon hepatocytes is a novel aspect of perfluorooctane sulfonamide (PFOSA) toxicity. 32<sup>nd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 11-15, Boston, MA, U.S.A.
- [242] A.O. de Silva, C. Spencer, S. de Solla, R.J. Letcher, D. Muir, B. Scott, S. Gewurtz, S. Backus, P.V. Hodson. 2011. Perfluoroethylcyclohexane sulfonate and other perfluorinated surfactants in the aquatic ecosystem of the Great Lakes. 32<sup>nd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 11-15, Boston, MA, U.S.A.
- [241] C.G. Cassone, V. Vongphachan, S. Chiu, E. Pelletier, R.J. Letcher, C.L. Yauk, D. Crump, S.W. Kennedy. 2011. The neurotoxic potential of emerging perfluoroalkyl compounds (PFCs) in developing chicken embryos. 32<sup>nd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 11-15, Boston, MA, U.S.A.

- [240] W.A. Gebbink, R.J. Letcher, C.E. Hebert, D.V.C. Weseloh. 2011. Temporal changes over twenty years of perfluoroalkyl sulfonates and carboxylates in herring gull eggs from sites across the Laurentian Great Lakes. 32<sup>nd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 11-15, Boston, MA, U.S.A.
- [239] M.A. McKinney, R.J. Letcher, R. Dietz, C. Sonne, S.J. Iverson, A.T. Fisk, B.C. McMeans, A. Morris, G.T. Tomy, D.C.G. Muir, S.A. Ferguson, E. Peacock, E.W. Born, M. Branigan, N.J. Lunn, I. Stirling, T.J. Evans, J. Aars, G.W. Gabrielsen. 2011. Using trophic tracers to interpret contaminant levels, patterns and trends in polar bears and arctic marine food webs. International Symposium on Advanced Studies by Young Scientists on Environmental Pollution and Ecotoxicology, Aug. 4-7, Matsuyama, Japan.
- [238] C. Sonne, R.J. Letcher, T.Ø. Bechshøft, F.F. Rigét, D.C.G. Muir, P.S. Leifsson, E.W. Born, L. Hyldstrup, N. Basu, M. Kirkegaard, R. Dietz. 2011. Two decades of biomonitoring polar bear health in Greenland: A review. NKVet Symposium, Oct. 6-7, Helsinki, Finland.
- [237] R.J. Letcher. 2011. Current species models of wildlife toxicology and the effects of emerging organohalogen substances. 31<sup>th</sup> International Symposium on Halogenated Persistent Organic Pollutants (DIOXIN 2011), Aug. 21-25, Brussels, Belgium.
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- [235] R.J. Letcher, D. Chen, S.G. Chu, L.T. Gauthier. 2011. Organophosphate triester flame retardants and phosphoric acids diester metabolite analysis and spatial and temporal trends in herring gulls from the North American Great lakes. 31<sup>th</sup> International Symposium on Halogenated Persistent Organic Pollutants (DIOXIN 2011), Aug. 21-25, Brussels, Belgium.
- [234] D. Chen, R.J. Letcher, L.T. Gauthier, S.G. Chu, R. McCrindle, D. Potter. 2011. Novel methoxylated polybrominated diphenoxybenzene congeners and possible sources in herring gulls from the Laurentian Great Lakes of North America. 31<sup>th</sup> International Symposium on Halogenated Persistent Organic Pollutants (DIOXIN 2011), Aug. 21-25, Brussels, Belgium.
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- [232] Fernie et al. 2011. 31<sup>th</sup> International Symposium on Halogenated Persistent Organic Pollutants (DIOXIN 2011), Aug. 21-25, Brussels, Belgium.
- [231] M.V. Cangialosi, R.J. Letcher, A. Arukwe. 2011. Fatty acid levels, oxidative stress and bioaccumulation patterns in salmon embryo exposed to perfluorooctane sulfonic and perfluorooctane carboxylic acids. 16<sup>th</sup> Conference on Pollutant Responses in Marine Organisms (PRIMO), May 15-18, Long Beach, CA, U.S.A.



- [230] R.J. Letcher, D. Chen, S.G. Chu, L.T. Gauthier. 2011. Organophosphate flame retardants in herring gulls from the Laurentian Great Lakes. 13<sup>th</sup> Workshop on (Brominated) Flame Retardants (BFR'2011), June 6-7, Boston, MA, U.S.A.
- [229] D. Chen, R.J. Letcher, L.T. Gauthier, S.G. Chu, R. McCrindle, D. Potter, B. Chittim. 2011. Novel and unusual brominated contaminants in herring gull eggs from the Laurentian Great Lakes of North America. 13<sup>th</sup> Workshop on (Brominated) Flame Retardants (BFR'2011), June 6-7, Boston, MA, U.S.A.
- [228] R.J. Letcher, D. Chen, S.G. Chu, L.T. Gauthier, 2011. Current-use flame retardants in Great Lakes herring gulls: (Non)Halogenated organophosphates and other surprise findings. 54<sup>th</sup> Annual Conference on Great Lakes Research (IAGLR 2011), May 30-June 3, Duluth, MN, U.S.A.
- [227] R.J. Letcher, M.A. McKinney, G.T. Tomy, S.G. Chu, R. Dietz, C. Sonne, D.C.G. Muir, C.M. Butt, S. De Guise. 2011. Differential perfluorooctane sulfonate (PFOS) levels in Arctic marine top predators and the influence of biotransformation of PFOS precursors (or "PreFOS"). Arctic Monitoring and Assessment Program (AMAP) conference, "*The Arctic as a Messenger for Global Processes – Climate Change and Pollution*", May 4-6, Copenhagen, Denmark.
- [226] H. Routti, R.J. Letcher, E.W. Born, M. Branigan, R. Dietz, T.J. Evans, A.T. Fisk, M.A. McKinney, E. Peacock, C. Sonne. 2011. Selected trace elements in polar bears (*Ursus maritimus*) from Alaska, Canada and Greenland: Spatio-temporal trends and role of biological factors. Arctic Monitoring and Assessment Program (AMAP) conference, "*The Arctic as a Messenger for Global Processes – Climate Change and Pollution*", May 4-6, Copenhagen, Denmark.
- [225] C. Sonne, R.J. Letcher, M.A. McKinney, F.F. Rigét, P.S. Leifsson, L. Hyldstrup, T.Ø. Bechshøft, N. Basu, E.W. Born, D.C. G. Muir, R. Dietz. 2011. Monitoring the health of East Greenland polar bears (*Ursus maritimus*): 1999-2010. Arctic Monitoring and Assessment Program (AMAP) conference, "*The Arctic as a Messenger for Global Processes – Climate Change and Pollution*", May 4-6, Copenhagen, Denmark.
- [224] T. Bechshøft, C. Sonne, R. Dietz, J. Jakobsen, J.S. Meyer, M.A. Novak, E. Henchey, F.F. Riget, E.W. Born, A. Covaci, I. Eulaers, V. Jaspers, R.J. Letcher. 2011. Biomarkers of POP exposure in East Greenland polar bears (*Ursus maritimus*). Arctic Monitoring and Assessment Program (AMAP) conference, "*The Arctic as a Messenger for Global Processes – Climate Change and Pollution*", May 4-6, Copenhagen, Denmark.
- [223] R.J. Letcher, M.A. McKinney, J. Aars, E.W. Born, M. Branigan, E. Choy, R. Dietz, T.J. Evans, G.W. Gabrielsen, D.C.G. Muir, E. Peacock, C. Sonne. 2011. Subpopulation-Specific Influence of Diet and Other Factors on the Spatial Trends of Chlorinated, Brominated and Fluorinated POPs in Polar Bears (*Ursus maritimus*). Arctic Monitoring and Assessment Program (AMAP) conference, "*The Arctic as a Messenger for Global Processes – Climate Change and Pollution*", May 4-6, Copenhagen, Denmark.
- [222] R. Dietz, F.F. Rigét, C. Sonne, E.W. Born, R. Bossi, T.Ø. Bechshøft, P. Grandjean, D.C.G. Muir, R.J. Letcher. 2011. Temporal trends of chlorinated, brominated and fluorinated POPs and mercury, in East Greenland polar bears (*Ursus maritimus*) within the last four decades. Arctic Monitoring and Assessment Program (AMAP) conference,

- “*The Arctic as a Messenger for Global Processes – Climate Change and Pollution*”, May 4-6, Copenhagen, Denmark.
- [221] M.A. McKinney, R.J. Letcher, I. Stirling, N. Lunn, E. Peacock. 2011. Sea-Ice conditions and the influence of diet and on temporal trends (1991-2007) of organohalogen contaminants in western Hudson Bay polar bears (*Ursus maritimus*). Arctic Monitoring and Assessment Program (AMAP) conference, “*The Arctic as a Messenger for Global Processes – Climate Change and Pollution*”, May 4-6, Copenhagen, Denmark.
- [220] A.D. Morris, D.C.G. Muir, K.R. Solomon, R.J. Letcher, A.T. Fisk, G.T. Tomy, C. Teixeira, J. Epp, X. Wang. 2010. Current use pesticide bioaccumulation and trophodynamics in Canadian Arctic marine mammal food webs. 31<sup>st</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 7-11, Portland, OR, U.S.A.
- [219] S. Smith-Edwards, P. Martin, G. Barrett, J. Link, R.J. Letcher, B. Park, S. Bursian. 2010. Effects of bis(2,4,6-tribromophenoxy)ethane (BTBPE) in Mink (*Mustela vison*). 31<sup>st</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 7-11, Portland, OR, U.S.A.
- [218] A.S. Mortensen, R.J. Letcher, S.G. Chu, A. Arukwe. 2010. Tissue bioaccumulation patterns and effects on xenobiotic biotransformation system in salmon fed a diet containing perfluoroactane sulfonic or perfluorooctane carboxylic acids. 31<sup>st</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 7-11, Portland, OR, U.S.A.
- [217] D. Chen, R.J. Letcher, L.T. Gauthier, S.G. Chu. 2010. Isomer-specific levels and spatial patterns of tris(bromocresyl)phosphate flame retardants in herring gulls from the Laurentian Great Lakes. 31<sup>st</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 7-11, Portland, OR, U.S.A.
- [216] R.J. Letcher, M.A. McKinney, I. Stirling, N.J. Lunn, E. Peacock. 2010. The role of diet on longer-term concentration and pattern trends of brominated and chlorinated contaminants in western Hudson Bay polar bears. 31<sup>st</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 7-11, Portland, OR, U.S.A.
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- [214] R.A. Grove, C.J. Henny, J.L. Kaiser, B.L. Johnson, C. Furl, R.J. Letcher. 2010. Ospreys and PBDEs from Columbia River Basin, USA, 2002-2009. 31<sup>st</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 7-11, Portland, OR, U.S.A.
- [213] T.T. Gilchrist, R.J. Letcher, K.J. Fernie. Exposure to brominated flame retardants via wastewater treatment plant effluent and changes in the reproductive success of tree swallows (*Tachycineta bicolor*). **30<sup>th</sup> International Symposium on Halogenated Persistent Organic Pollutants (DIOXIN 2010)**, Sept. 12-17, San Antonio, TX, U.S.A.

- [212] S.C. Martenson, S. Kimmins, R.J. Letcher, D.M. Bird, I.J. Ritchie, K.J. Fernie. Evidence of endocrine disruption and testicular changes in male American kestrels (*Falco sparverius*) exposed to technical HBCD. 30<sup>th</sup> International Symposium on Halogenated Persistent Organic Pollutants (DIOXIN 2010), Sept. 12-17, San Antonio, TX, U.S.A.
- [211] K.J. Fernie, S.C. Martenson, D.M. Bird, I.J. Ritchie, R.J. Letcher. Changes in reproduction and behavior of American kestrels (*Falco sparverius*) associated with exposure to environmentally relevant concentrations of technical HBCD. 30<sup>th</sup> International Symposium on Halogenated Persistent Organic Pollutants (DIOXIN 2010), Sept. 12-17, San Antonio, TX, U.S.A.
- [210] R.J. Letcher, N. Burgess, L. Champoux, J.E. Elliott, C.E. Hebert, P.A. Martin, M. Wayland, D.V.C. Weseloh, L. Wilson. 2010. Isomers of Decchlorane Plus in the eggs of four species of gulls (*Larids*) from colonies across Canada and the influence of diet on spatial distribution. 30<sup>th</sup> International Symposium on Halogenated Persistent Organic Pollutants (DIOXIN 2010), Sept. 12-17, San Antonio, TX, U.S.A.
- [209] G.A. MacInnis, R.J. Letcher, M.A. McKinney, G.T. Tomy, M. Lebeuf, J. Fång, Å Bergman, C.H. Marvin. 2010. Investigation of HBCD metabolism in marine mammals using a hepatic microsomal *in vitro* assay. 30<sup>th</sup> International Symposium on Halogenated Persistent Organic Pollutants (DIOXIN 2010), Sept. 12-17, San Antonio, TX, U.S.A.
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- [207] R.J. Letcher. 2010. Hexabromocyclododecane (HBCD) flame retardant in the environment, biota and humans: Stereoisomeric paradox. XII International Congress of Toxicology (IUTOX 2010), July 19-23, Barcelona, Spain.
- [206] R.J. Letcher. 2010. Perfluoroalkyl acids (PFAAs) in wildlife and fish worldwide. US EPA-Sponsored Perfluoroalkyl Acids (PFAA) Days III, June 8-10, Research Triangle Park, NC, U.S.A.
- [205] M.A. McKinney, D. Andriashek, E.W. Born, M. Branigan, R. Dietz, T.J. Evans, G.W. Gabrielsen, N. Lunn, E. Peacock, C. Sonne, I. Stirling, R.J. Letcher. 2010. Regional differences, temporal trends and the influence of diet in organohalogen contaminants in polar bears. International Polar Year-Oslo Science Conference. June 8-12, Oslo, Norway.
- [204] C. Sonne, R.J. Letcher, JO. Bustnes, R. Dietz, B.M. Jenssen, E.H. Jørgensen, J. Verreault, M.M. Vijayan, G.W. Gabrielsen, E.W. Born, N. Basu. 2010. An overview of the potential health effects from long-range transported pollutants in Arctic wildlife and fish. International Polar Year-Oslo Science Conference. June 8-12, Oslo, Norway.
- [203] P. Martin, N. Burgess, L. Champoux, J.E. Elliott, R.J. Letcher, M. Wayland, D.V. Chip Weseloh, L. Wilson. 2010. Brominated flame retardants in the eggs of four gull species and two terrestrial avian species spanning Atlantic to Pacific Canada. 20<sup>th</sup> Annual

- Meeting of the Society of Environmental Toxicology and Chemistry (SETAC) Europe, May 23-27, Seville, Spain.
- [202] K.J. Fernie, R.J. Letcher, L. Graham. 2010. Contaminants and reproductive and developmental changes in tree swallows (*Tachycineta bicolor*) at sewage treatment plants in Canada. 20<sup>th</sup> Annual Meeting of the Society of Environmental Toxicology and Chemistry (SETAC) Europe, May 23-27, Seville, Spain.
- [201] W.A. Gebbink, R.J. Letcher. 2010. Linear and branched PFOS isomers in herring gull eggs from colonies across the Laurentian Great Lakes. 20<sup>th</sup> Annual Meeting of the Society of Environmental Toxicology and Chemistry (SETAC) Europe, May 23-27, Seville, Spain.
- [200] M.J. van den Heuvel-Greve, P.E.G. Leonards, R.J. Letcher, A.D. Vethaak, K. Borgå. 2010. Food web accumulation of PCBs, PBDEs, PFCs and OTCs in estuarine food webs of the Westerschelde, the Netherlands. 20<sup>th</sup> Annual Meeting of the Society of Environmental Toxicology and Chemistry (SETAC) Europe, May 23-27, Seville, Spain.
- [199] W.A. Gebbink, C.E. Hebert, D.V.C. Weseloh, R.J. Letcher. 2010. Spatial trends of perfluorinated carboxylates and sulfonates and precursor compounds in eggs of colonial herring gulls and the influence of dietary and food web sources. 53<sup>rd</sup> Annual Conference on Great Lakes Research (IAGLR 2010), May 17-21, Toronto, ON, Canada.
- [198] R.J. Letcher, L.T. Gauthier, S.G. Chu, C.E. Hebert, D.V.C. Weseloh. 2010. Brominated flame retardants (BFRs) are increasingly complex in eggs of Great Lakes herring gulls: Tetrabromobisphenol-S and tetrabromobisphenol-A derivatives and other new BFRs. 53<sup>rd</sup> Annual Conference on Great Lakes Research (IAGLR 2010), May 17-21, Toronto, ON, Canada.
- [197] B.M. Jenssen, G.D. Villanger, E.I. Smette, R.J. Letcher, C. Sonne, R. Dietz. 2010. Identification of testosterone disrupting organohalogenated compounds in polar bears (*Ursus maritimus*) (*Ursus maritimus*). 3<sup>rd</sup> Norwegian Environmental Toxicology Symposium, April 14-16, Bergen, Norway.
- [196] C.S. Wong, M.S. Ross, R.J. Letcher; M.A. McKinney, C. Sonne, R. Dietz. 2010. Comparison of the enantiomer distribution of chiral organochlorine contaminants in captive West Greenland sledge dogs and East Greenland polar bears. Annual 2010 Meeting of the American Chemical Society, March 21-25, San Francisco, CA, U.S.A.
- [195] R.J. Letcher, M.A. McKinney, I. Stirling, E. Peacock, N.J Lunn, D. Andriashek. 2010. Organohalogen contaminant trends in polar bears from western Hudson Bay are influenced by temporal changes in climate, sea ice conditions and diet. IPY Canada Early Results Workshop, Feb. 16-18, Ottawa, ON, Canada.
- [194] A.D. Morris, D.C.G. Muir, K.R. Solomon, C. Teixeira, J. Epp, X. Wang, R.J. Letcher, A.T. Fisk. 2009. Flame retardants and pesticides in Canadian Arctic seawater and ringed seal (*Phoca hispida*) food webs. 6<sup>th</sup> ArcticNet Annual Meeting, Dec. 8-11, Victoria, BC, Canada.
- [193] M.L. Eng, J.E. Elliott, R.J. Letcher. 2009. Long-term neurological effects of early exposure to a brominated flame retardant (BDE-99) in zebra finches. 30<sup>th</sup> Annual Society

- of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 19-23, New Orleans, LA, U.S.A.
- [192] E.W. Montie, C.M. Reddy, W.A. Gebbink, K.E. Touhey, M.E. Hahn, R.J. Letcher, 2009. Organohalogen contaminants and metabolites in cerebrospinal fluid and cerebellum gray matter in marine mammals from the western North Atlantic. 30<sup>th</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 19-23, New Orleans, LA, U.S.A.
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- [188] R.J. Letcher, K.J. Fernie, L.C. Mattioli, S.G. Chu, D.M. Bird, I.J. Ritchie, L.J. Shutt. 2009. Uptake, depuration and fate of hexabromocyclododecane (HBCD) and BDE-209 flame retardants in dietary exposed American kestrels (*Falco sparverius*). 30<sup>th</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 19-23, New Orleans, LA, U.S.A.
- [187] F. Ucán-Marín, A. Arukwe, W.A. Gebbink, R.J. Letcher. 2009. Competitive binding of perfluorinated compounds and complex mixtures with thyroid hormones on gull and human albumin and transthyretin proteins. 30<sup>th</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 19-23, New Orleans, LA, U.S.A.
- [186] K.M. Sullivan, K.J. Fernie, D.M. Bird, J.I. Ritchie, J.L. Shutt, R.J. Letcher. 2009. Effects of environmentally-relevant levels of the PentaBDE mixture, DE-71, on hormonal levels (retinol and thyroid) of American kestrels. 30<sup>th</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 19-23, New Orleans, LA, U.S.A.
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- [184] K.J. Fernie, T.T. Gilchrist, R.J. Letcher. 2009. *In ovo* exposure to brominated flame retardants associated with changes in the growth and thyroid hormones of nestling tree swallows. 30<sup>th</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Meeting, Nov. 19-23, New Orleans, LA, U.S.A.

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- [106] J. Verreault, R.J. Letcher, C. Bech, E. Ropstad, E. Dahl and G.W. Gabrielsen. 2006. Hormone status and metabolic rate of Arctic-breeding glaucous gulls exposed to high levels of organohalogen contaminants. 16<sup>th</sup> Annual Meeting of SETAC-Europe, May 7-11, The Hague, The Netherlands.
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- [83] Fernie, K., L. Shutt, R.J. Letcher, K. Drouillard and D.M. Bird. 2004. Polybrominated diphenyl ethers: an emerging threat to raptors. 3<sup>rd</sup> Annual Meeting Wildlife Disease Association, Middle East/Africa Section, Dec. 11-14, Abu Dhabi (Invited speaker).
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- [81] K.J. Fernie, G. Mayne, L. Shutt, R.J. Letcher, K. Drouillard. 2004. Changes in growth and thyroid function of American kestrels exposed to environmentally-relevant



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- [73] S.T. Tyndale, R.J. Letcher and D.D. Heath. 2004. Carotenoids and fitness in the eggs and fry of red- and white-fleshed races of chinook salmon (*Oncorhynchus tshawytscha*): Evolution of egg resource allocation tradeoffs. Evolution Conference, June 6-9, Denver, Colorado, U.S.A.
- [72] R.J. Letcher, H.M. Stapleton, K.J. Fernie, J. Verreault, M.A. McKinney, G. Scipione, G. Gabrielsen, S. Chu, K. Valters. 2004. New case examples of biotransformation and elimination of polybrominated diphenyl ethers in aquatic and marine wildlife. 3<sup>rd</sup> International Workshop on Brominated Flame Retardants. June 6-9, U. of Toronto, Toronto, Ontario (Invited speaker).

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- [70] K. Valters, G.D Haffner, K.G. Drouillard and R.J. Letcher. 2004. Enzyme induction and fluorescent metabolites in bile of brown bullheads (*Ameiurus nebulosus*) exposed in laboratory to PAH-contaminated sediment and diet. 47<sup>th</sup> Annual Conference on Great Lakes Research (IAGLR), May 22-26, U. of Waterloo, Waterloo, Ontario, Canada.
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- [58] S.Y. Jasim, W. Hua, R.J. Letcher, L. Schweitzer, F. Lemieux, S. Mazloum, G. Krantzberg and M. Burrows. 2003. The presence of endocrine disrupting chemicals (EDCs) in water supplies and effect of treatment process on removal: A Great Lakes region concern. American Water Works Association-Water Quality Technology Conference (AWWA-WQTC), Nov. 2-6, Philadelphia PA, U.S.A.
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- [55] M. Alaei, I. E.R. Bennett and R.J. Letcher. 2003. Levels of Triclosan and methyl-Triclosan in the plasma of fish from the Detroit River. 23<sup>th</sup> International Symposium on Halogenated Environmental Pollutants and POPs (DIOXIN'2003), Aug. 24-29, Boston, U.S.A.; *Organohalogen Compounds* (Published Aug. 2003, *Organohalogen Cpds.* Vol. 62:136-139).
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- [24] R.J. Letcher. 2000. The endocrine-disrupting potential of methyl sulfone and hydroxylated metabolites in marine wildlife and humans. Atlantic Coast Contaminants Workshop. *Endocrine Disruptors in the Marine Environment: Impacts on Marine Wildlife*

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- [23] I.A.T.M. Meerts, R.J. Letcher, S. Hoving, I. van Leeuwen-Bol, E.A.C. Luijks, Å. Bergman and A. Brouwer. 2000. *In Vitro* Thyroidogenic, Estrogenic and Dioxin-Like Activity of Polychlorinated Diphenyl Ethers (PBDEs). Society of Environmental Toxicology and Chemistry (SETAC), World Congress, May 21-25, Brighton, U.K.
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- [11] K. Wiberg, R.J. Letcher, C. Sandau, R.J. Norstrom and T. Bidleman. 1997. Enantioselective analysis of organochlorines in an Arctic food chain. 18<sup>th</sup> Annual SETAC meeting, Nov 16-20, San Francisco, California. U.S.A.
- [10] K. Wiberg, R.J. Letcher, C. Sandau, J. Duffe, R.J. Norstrom and T. Bidleman. 1997. Enantioselective separation of methyl sulfonyl PCBs using chiral GC-MS with application to Arctic biota. 18<sup>th</sup> Annual SETAC meeting, Nov 16-20, San Francisco, California, U.S.A.
- [9] R.J. Letcher, D.C.G. Muir, R.J. Norstrom, R. Michaud and P. Béland. 1997. PCB biotransformation and methyl sulfone PCB metabolites in beluga whale (*Delphinapterus leucas*) from the St. Lawrence river estuary and western Hudson Bay. *Organohalogen Compounds* 33:290-295. 17<sup>th</sup> International Symposium on Halogenated Environmental Pollutants (DIOXIN'1998), Aug. 25-29, Indianapolis, Indiana, U.S.A.
- [8] R.J. Letcher, R.J. Norstrom and P. Béland. 1996. Methyl sulfone-PCB and -4,4'-DDE metabolites in beluga whale from the St. Lawrence estuary and western Hudson Bay. 17<sup>th</sup> Annual SETAC meeting, Nov 17-21, Washington, D.C., U.S.A.
- [7] R.J. Letcher, R.J. Norstrom and D.C.G. Muir. 1996. The bioaccumulation and metabolic formation of methyl sulfone PCB and 4,4'-DDE metabolites in the polar bear food chain. *Organohalogen Compounds* 28:500-505. 16<sup>th</sup> International Symposium on Halogenated Environmental Pollutants (DIOXIN'1996), Aug. 12-16, Amsterdam, The Netherlands.
- [6] S.M. Bandiera, S.M. Torok, R.J. Letcher and R.J. Norstrom. 1995. Immunoquantitation of cytochromes P450 1A and 2B and comparison with chlorinated hydrocarbon levels in



- archived polar bear liver samples. *Organohalogen Compounds* 25:303-308. 15<sup>th</sup> International Symposium on Halogenated Environmental Pollutants (DIOXIN'1995), Aug. 12-16, Edmonton, Alberta, Canada.
- [5] R.J. Letcher, R.J. Norstrom, S.M. Bandiera and M.A. Ramsay. 1994. Polar bear (*Ursus maritimus*) hepatic cytochrome P450 monooxygenase immunoquantitation and EROD/PROD catalytic activity and chlorinated hydrocarbon contaminants. 15<sup>th</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) meeting, Oct.30-Nov. 3, Denver, Colorado, U.S.A.
- [4] R.J. Letcher, R.J. Norstrom, S.M. Bandiera and M.A. Ramsay. 1994. Polar bear hepatic cytochrome P450 1A1 and 1A2 proteins: immunoquantitation, EROD/PROD activity and PCB levels. *Organohalogen Compounds* 20:553-558. 14<sup>th</sup> International Symposium on Halogenated Environmental Pollutants (DIOXIN'1994), Sept. 17-21, Kyoto, Japan.
- [3] R.J. Letcher, R.J. Norstrom and Å. Bergman. 1994. A column chromatography approach to PCB and DDT methyl sulfone metabolite isolation from biological matrices. *Organohalogen Compounds* 20:441-446. 14<sup>th</sup> International Symposium on Halogenated Environmental Pollutants (DIOXIN'1994), Sept. 17-21, Kyoto, Japan.
- [2] S.C. Polischuk, R.J. Letcher, R.J. Norstrom, S.A. Atkinson and M.A. Ramsay. 1994. Relationship between PCB concentration, body burden and percent body fat in female polar bears while fasting. *Organohalogen Compounds* 20:535-539. 14<sup>th</sup> International Symposium on Halogenated Environmental Pollutants (DIOXIN'1994), Sept. 17-21, Kyoto, Japan.
- [1] R.J. Letcher, R.J. Norstrom, Å. Bergman and D.C.G. Muir. 1992. Methyl sulfonyl-PCB and -DDE metabolites in polar bears: comparison to parent compounds in the diet. *Organohalogen Compounds* 20:535-539. 13<sup>th</sup> International Symposium on Halogenated Environmental Pollutants (DIOXIN'1992), Sept. 12-16, Tampere, Finland.

### ***Non-Peer-Reviewed Presentations***

- [50] R.J. Letcher. 2012. Are emerging flame retardant compounds really new to the environment and are they environmentally stable?: Cases of newly discovered brominated and organophosphate contaminants in Great Lakes biota. Natural Sciences Colloquium Series, Colgate University, Nov. 30, Hamilton, NY, USA.
- [49] R.J. Letcher, P.A. Martin, A. Idrissi. 2012. Chemicals Management Plan monitoring and surveillance: Wildlife (2012-2013). CMP M&S Results Workshop, Oct. 18, Ottawa, ON, Canada.
- [48] R.J. Letcher. 2012. North American emerging issues/substances surrounding Great Lakes pollution. Chemicals Management Plan (CMP) Monitoring and Surveillance (M&S): Working Group Meeting, Oct. 17, Gatineau, QC, Canada.
- [47] R.J. Letcher. 2012. Emerging Contaminants and the Influence of Biotransformation and Degradation on Bioaccumulation, Fate and Effects in Model Wildlife. 2<sup>nd</sup> Annual Society of Environmental Toxicology and Chemistry (SETAC) Australasia Conference, July 4-6, Brisbane, QLD, Australia.

- [46] R.J. Letcher, D. Chen. 2012. New and Emerging Organophosphorus and Brominated Flame Retardants and Degradation Products in Herring Gulls and Their Ecosystems From the Great Lakes. Environmental Chemistry Laboratory Seminar Series, California Department of Toxic Substances Control, Feb. 8, Berkley, California, U.S.A.
- [45] R.J. Letcher, K.J. Fernie, C.E. Hebert, P.A. Martin, S. de Solla, D.V.C. Weseloh, Shutt, J.L. 2012. *Characterization, Food Web Dynamics and Organism Level Effects of Brominated Flame Retardants and Other CMP Priority Brominated Substances in Avian, Mammalian and Reptilian Wildlife from the Great Lakes*. CMP I Research Results Workshop, Feb. 2, Ottawa, ON, Canada.
- [44] R.J. Letcher, C.E. Hebert, P.A. Martin, S. de Solla, D.V.C. Weseloh, D. Crump, S.W. Kennedy. 2012. Polyfluoroalkyl Compounds (PFCs): Analytical Methods and Characterization, Bioaccumulation, Fate and Food Web Dynamics in Canadian Bio-Indicator Wildlife. CMP I Research Results Workshop, Feb. 2, Ottawa, ON, Canada.
- [43] R.J. Letcher. 2011. Influence of diet and food web on spatial and temporal trends of organohalogen and mercury contaminants in polar bears (*Ursus maritimus*) from circumpolar subpopulations. Department of Biology Seminar Series, Université du Québec à Montréal (UQAM), Dec. 7, Montréal, QC, Canada.
- [42] R.J. Letcher, S. Backus, N. Burgess, L. Champoux, J.E. Elliott, C.E. Hebert, A. Idrissi, P.A. Martin, D. McGoldrick, M. Wayland, D.V.C. Weseloh. 2011. Chemicals Management Plan (CMP) Monitoring and Surveillance (M&S): Wildlife. CMP M&S Results Workshop, Oct. 19, Ottawa, ON, Canada.
- [41] R.J. Letcher, H. Routti, M. Branigan, A. Coxon, A. Fisk, M.A. McKinney, E. Peacock. 2011. Mercury and other bioaccumulative metals: Spatial and temporal trends in polar bears from Canadian subpopulations. 19<sup>th</sup> Annual Results Workshop of the Northern Contaminant Program (NCP), Canadian Arctic Contaminants Assessment Symposium, Sept. 20-21, Victoria, BC, Canada.
- [40] D.C.G. Muir, R.J. Letcher. 2010. Levels, trends and processes of mercury in ringed seal and polar bear. 18<sup>th</sup> Annual Results Workshop of the Northern Contaminant Program (NCP), Canadian Arctic Contaminants Assessment Symposium, Sept. 28-30, Whitehorse, Yukon, ON, Canada.
- [39] R.J. Letcher, G.T. Tomy, M.A. McKinney, S. Chu, D.C.G. Muir, C. Butt. 2010. *In vitro* biotransformation of precursors of perfluorooctane sulfonate (PFOS) using liver of polar bear, ringed seal and beluga whale. 18<sup>th</sup> Annual Results Workshop of the Northern Contaminant Program (NCP), Canadian Arctic Contaminants Assessment Symposium, Sept. 28-30, Whitehorse, Yukon, ON, Canada.
- [38] R.J. Letcher, G.T. Tomy. 2010. New contaminants in Arctic biota. 18<sup>th</sup> Annual Results Workshop of the Northern Contaminant Program (NCP), Canadian Arctic Contaminants Assessment Symposium, Sept. 28-30, Whitehorse, Yukon, ON, Canada.
- [37] R.J. Letcher. 2010. Exposure to emerging organohalogen contaminants is a changing and complex cocktail in Canadian aquatic wildlife and ecosystems: Case studies from the Great Lakes. Environment Canada Peanut Butter Club Seminar Series, April 8, Gatineau, QC, Canada.

- [36] R.J. Letcher. 2010. Contaminants and trends over two decades in polar bears from western Hudson Bay: Climate change, sea ice conditions and diet shifts. Environment Canada, Science and Technology Branch, National Capital Region Science Forum, Jan. 26-27, Gatineau, QC, Canada.
- [35] R.J. Letcher, M.A. McKinney, E. Peacock, M. Branigan, D.C.G. Muir. 2009. Core monitoring of spatial and temporal trends of legacy and emerging contaminants in polar bears from Canadian populations. 17<sup>th</sup> Annual Results Workshop of the Northern Contaminant Program (NCP), Canadian Arctic Contaminants Assessment Symposium, Sept. 29-30, Ottawa, ON, Canada.
- [34] R.J. Letcher. 2009. Is there a case of thyroid hormone-related effects in wildlife exposed to persistent organohalogen contaminants or metabolites?. SETAC Laurentian Annual General Meeting. June 19-20, Ottawa, ON, Canada.
- [33] M.A. McKinney, E. Peacock, M. Branigan, T.J. Evans, G.W. Gabrielsen, R. Dietz, C. Sonne, F.F. Riget, R.J. Letcher. 2009. Chemical contaminants in polar bears can be influenced by location, time and the diet they eat. Nunavut Wildlife Symposium, March 19-20, Rankin Inlet, Nunavut.
- [32] W.A. Gebbink, C.E. Hebert and R.J. Letcher. 2008. Spatial distribution of bioaccumulative polyfluoroalkyl compounds in herring gull eggs from the Laurentian Great Lakes of North America. NWRC Seminar Series, Carleton University, Ottawa, Canada.
- [31] M.A. McKinney, E. Peacock, R.J. Letcher. 2008. Climate change, sea ice-associated variation in diet and the influence the temporal trends of organohalogen concentrations in Western Hudson Bay polar bears. NWRC Seminar Series, Carleton University, Ottawa, Canada.
- [30] R.J. Letcher. 2008. The current state of contaminants monitoring and research in polar bears from Canadian and other circumpolar populations. 16<sup>th</sup> Annual Results Workshop of the Northern Contaminant Program (NCP), Canadian Arctic Contaminants Assessment Symposium, Sept. 22-25, Yellowknife, NT, Canada.
- [29] R.J. Letcher. 2008. Comparative toxicokinetics of chlorinated and brominated contaminants in captive Greenland sled dogs and potential as a surrogate for wild polar bears. Integrated Toxicology & Environmental Health Program Seminar Series, April 18, Duke University, Durham, NC, U.S.A.
- [28] R.J. Letcher, S.W. Kennedy and M. Bonnell. 2007. Research in environmental chemistry, toxicology and modeling to support the assessment of chemicals under CEPA. Environment Canada, Science and Technology Branch, National Capital Region Science Forum, Oct. 22, Lord Elgin Hotel, Ottawa, ON, Canada.
- [27] R.J. Letcher. 2007. Contaminant exposure and effects in top predator arctic mammalian wildlife: Polar bears and surrogates. 15<sup>th</sup> Annual Results Workshop of the Northern Contaminant Program (NCP), Canadian Arctic Contaminants Assessment Symposium, Oct. 2-5, Lake Louise, AB, Canada.

- [26] B. Braune, M. Evans, M. Gamberg, R.J. Letcher, D.C.G. Muir and G. Stern. 2007. Monitoring of the legacy organochlorines and mercury in Canadian arctic biota: An NCP perspective. 15<sup>th</sup> Annual Results Workshop of the Northern Contaminant Program (NCP), Canadian Arctic Contaminants Assessment Symposium, Oct. 2-5, Lake Louise, AB, Canada.
- [25] D.C.G. Muir, R.J. Letcher, G.T. Tomy and B. Braune. 2007. New contaminants in arctic biota: Are they important? 15<sup>th</sup> Annual Results Workshop of the Northern Contaminant Program (NCP), Canadian Arctic Contaminants Assessment Symposium, Oct. 2-5, Lake Louise, AB, Canada.
- [24] R.J. Letcher, S.-G. Chu, E. Peacock, M. Dyck, M.A. McKinney, C. Sonne and R. Dietz. 2007. Preliminary results on the spatial and temporal trends of perfluorinated carboxylic and sulfonic acids in polar bears from Canadian and East Greenland populations. 15<sup>th</sup> Annual Results Workshop of the Northern Contaminant Program (NCP), Canadian Arctic Contaminants Assessment Symposium, Oct. 2-5, Lake Louise, AB, Canada.
- [23] M.A. McKinney, E. Peacock, M. Dyck, G.W. Gabrielsen, C. Sonne, R. Dietz and R.J. Letcher. 2007. Recent findings on the spatial and temporal trends of legacy chlorinated and recent-use/current-use brominated contaminants in polar bears. 15<sup>th</sup> Annual Results Workshop of the Northern Contaminant Program (NCP), Canadian Arctic Contaminants Assessment Symposium, Oct. 2-5, Lake Louise, AB, Canada.
- [22] W.A. Gebbink, C. Sonne, R. Dietz, M. Kirkegaard, F.F. Riget, E.W. Born and R.J. Letcher. 2006. Chlorinated and brominated contaminants and metabolic/degradation products: Bioaccumulation and tissue composition in East Greenland polar bears and ringed seals. Northern Contaminant Program (NCP) Results Workshop (Department of Indian and Northern Affairs), Canadian Arctic Contaminants Assessment, Dec. 1-3, Victoria, BC, Canada.
- [21] R.J. Letcher. 2005. Temporal and spatial trends of legacy and emerging halogenated contaminants in polar bears. Northern Contaminant Program (NCP) Results Workshop (Department of Indian and Northern Affairs), Canadian Arctic Contaminants Assessment, Sept. 27-30, Victoria, BC, Canada.
- [20] J. Verreault, D.C.G. Muir, R.J. Norstrom, I. Stirling, A.T. Fisk, G.W. Gabrielsen, A.E. Derocher, T.J. Evans, R. Dietz, C. Sonne, G.M. Sandala, W. Gebbink, F.F. Riget, E.W. Born, M.K. Taylor, J. Nagy and R.J. Letcher. 2004. Circumpolar spatial trends of chlorinated hydrocarbons and metabolites in polar bears (*Ursus maritimus*) from Alaska, Canada, East Greenland and Svalbard: 1996-2002. Northern Contaminant Program (NCP) Results Workshop (Department of Indian and Northern Affairs), Canadian Arctic Contaminants Assessment, Sept. 28-30, White Rock, BC, Canada.
- [19] M.A. McKinney, A. Arukwe, D. Martineau, A.D. Dallaire, P. Béland, S. De Guise, M. LeBeuf and R.J. Letcher. 2003. Characterization and comparison of immunochemically determined phase I and II enzymes in hepatic microsomes of beluga whale (*Delphinapterus leucas*) from the St. Lawrence estuary and the Canadian arctic. 12<sup>th</sup> meeting on Pollutant Responses in Marine Organisms (PRIMO), May. 9-13, Tampa Bay, Florida, U.S.A.

- [18] M.A. McKinney, A. Arukwe, P. Béland, S. De Guise, D. Martineau and R.J. Letcher. 2003. Microsomal cytochrome p450 enzyme activity in ringed seal (*Phoca hispida*), beluga whale (*Delphinapterus leucas*) and polar bear (*Ursus maritimus*) from the Canadian arctic. 12<sup>th</sup> meeting on Pollutant Responses in Marine Organisms (PRIMO), May. 9-13, Tampa Bay, Florida, U.S.A.
- [17] R.J. Letcher, G. Sandala, A.T. Fisk, R.J. Norstrom, N. Lunn, B. Braune, M. Taylor, J. Nagy, M. Branigan, I. Stirling, M. Obbard, B. Wakeford and D.C.G. Muir. 2003. Spatial and temporal trends (2001-2002) of polychlorinated biphenyl (PCBs), methyl sulfone PCBs and organochlorine pesticides in polar bears (*Ursus maritimus*) from Canadian arctic populations. The Northern Contaminant Program, Canadian Arctic Contaminants Assessment Symposium, March 4-7, Ottawa, ON, Canada.
- [16] R.J. Letcher, G. Scipione, G. Sandala, E. Braekevelt, G. Stern, T. Halderson, O. Nielsen and G. Tomy. 2003. Polychlorinated biphenyls (PCBs) and PCB metabolites in the liver and blood of beluga whale (*Delphinapterus leucas*) and narwhal (*Monodon monoceros*) from northern Hudson Bay. The Northern Contaminant Program, Canadian Arctic Contaminants Assessment Symposium, March 4-7, Ottawa, ON, Canada.
- [15] S.T. Tyndale, R.J. Letcher and D.D. Heath. 2003. Egg carotenoids and early life disease resistant in Chinook salmon (*Oncorhynchus tshawytscha*). Canadian Conference for Fisheries Research, Jan. 2-5, Ottawa, ON, Canada
- [14] R.J. Letcher. 2001. Methyl Sulfone and Hydroxylated Metabolites of Polychlorinated Biphenyls and in Marine Wildlife and Their Endocrine Disruption Potential. Great Lakes Environmental Research Laboratory, National Ocean and Aquatic Administration (NOAA), January 10, Ann Arbor, Michigan, U.S.A.
- [13] R.J. Letcher, and M. van den Berg. 1998. The human placental JEG-3 choriocarcinoma cell line: aromatase (CYP19) activity and cytotoxicity effects *in vitro* from exposure to various environmentally persistent organochlorines and their metabolites. M&T Graduate School Progress Report Meeting, May 20, 1998, Wageningen, The Netherlands.
- [12] van der Burght, H.-J. Drenth, R.J. Letcher, J. Smeets, M. Tysklind and M. van den Berg. 1998. Predictive *in vitro* methods for the effects of environmental Contaminants on species higher in the food chain. Canadian Wildlife Service, National Wildlife Research Centre (NWRC) Seminar Series, Jan. 23, Hull, Québec, Canada.
- [11] R.J. Letcher, R.J. Norstrom and D.C.G. Muir. 1996. The relative importance of metabolic formation, accumulation and retention of methyl sulfone PCB and 4,4'-DDE metabolites in the polar bear food chain. 23<sup>rd</sup> Aquatic Toxicology Workshop, Oct. 6-10, Calgary, Alberta, Canada.
- [10] R.J. Norstrom, R.J. Letcher, S.C. Polischuck, M.A. Ramsay, S.M. Bandiera and S. Lin. 1996. Contaminant trends and effects in polar bear. Northern Contaminants Workshop, Arctic Environmental Strategy, Jan. 20-24, Calgary, Alberta, Canada.
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