

# **CURRICULUM VITAE**

## **Graham C. van Aggelen**

### **EDUCATION**

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1976-1979                      BSc. in Biological Science, Zoology, Brandon University, Manitoba

### **WORK EXPERIENCE**

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#### **Head, Environmental Toxicology Section**

*Pacific Environmental Science Centre, Water, Science & Technology,  
Environment Canada, 2645 Dollarton Highway, North Vancouver, B.C.*

April 2000 to present:

- Head of Environmental Toxicology Section and Laboratory for Pacific and Yukon Region of Environment Canada.
- Responsible for management and programme delivery of laboratory and other aquatic toxicological requirements for priority federal, provincial and territorial programs.
- Extensive knowledge and experience in the theories and principals associated with environmental science including, toxicology, risk assessments, genomics and chemistry.
- Extensive knowledge and experience in developing methods (e.g. toxicogenomics fish, daphnia, amphibians) and selection of relevant species for aquatic toxicological testing (fish, amphibian, crustacean, echinoids).
- Extensive knowledge and experience in the operation of scientific laboratories, in particular Pacific Environmental Science Centre.
- Extensive knowledge and experience with the toxicology of chemicals or complex mixtures and associated industrial processes to aquatic organisms.
- Extensive knowledge and experience in conducting or leading investigations into toxicological testing of chemical compounds and complex mixtures in fresh and marine environments.
- Extensive knowledge in conducting and leading teams in legal analysis and report preparation and court testimony.
- Project management of multi partnered and funded science programmes.
- Establishment of collaborative opportunities with academic centre, Provincial & municipal governments and other government departments
- Management and supervision of multi-disciplinary science initiatives.
- Extensive experience in developing cooperative agreements and partnerships with academic centres (UBC, SFU, UofVic) and other Federal laboratories, NWRI-Burlington, NWRI-Sask, WTC-Burlington, ETC-River Road Ottawa, St. Lawrence Centre-Montreal; US: UofWestern Wash-Shannon Point, Wash. Dept of Ecology, UofFlorida-Gainesville.
- Management of highly skilled and educated personnel work teams
- Management of human resources for section
- Managing financial resources for section, budget allocations, forecasting and drafting of Business Plan for section and the Science Centre.
- Marketing and promoting the services and expertise of the Science Centre
- Member PESC management team.
- Completed training in TB modern comptroller ship and management
- Working with Manager of PESC to deliver Laboratory Sciences Division's branch requirements; Acting Manager, as required, of Pacific Environmental Science Centre.
- Extensive knowledge and experience with the operational requirements of complex laboratory infrastructure.

- Collaborates with external researchers and funding agencies to negotiate, develop proposals and promote partnerships and agreements for toxicological and chemical testing.
- Conducts research in Toxicology and publishes research.
- Lectures and presents results, opinions and recommendations to various professional and technical personnel
- Appears as Expert Witness on matters related to environmental toxicology
- Keeps current of latest trends and directions in the field of toxicology by attending or speaking at workshops and symposiums.
- Environment Canada's toxicological representative on CAEAL technical advisory board (Cdn. Assoc. of Env. Anal. Labs).
- 12 years experience with Pacific Environmental Science Centre's mechanical operations and maintenance.

**Head (Acting) -Scientific Support Section**

*Pacific Environmental Science Centre, Environmental Conservation Branch,  
Environment Canada, 2645 Dollarton Highway, North Vancouver, B.C.*

January 1998-March 2000:

- Acting Head of the Scientific Support Section
- Management of overall policies and strategies of the Scientific Support Section.
- Collaborated with PESC manager, drafted technical appendices and provided recommendations on Canada/BC laboratory agreement.
- Liaised with private sector laboratories to provide services as required under the Canada/BC laboratory agreement.
- Responsible for managing human and financial resources of the section.
- Responsible for contract management for all external scientific analysis
- Responsible for quality control for Science Centre and CAEAL accreditation.
- Responsible for facilities management of the Science Centre
- Member PESC management team
- Member of Environment Canada Laboratory Coordinating Committee (LMC).

**Associate Head-Aquatic Toxicology Section**

*Pacific Environmental Science Centre, Environmental Conservation Branch,  
Environment Canada, 2645 Dollarton Highway, North Vancouver, B.C.*

January 1996-December 1998:

- **Associate Section Head responsible for managing overall policies and strategies for the section, responsible for toxicological testing methods, quality control and results validation.**
- **Management and coordination of all laboratory toxicological requirements for the B.C. Ministry of Environment under Canada/BC laboratory agreement.**
- Program management and supervision of multi-disciplinary science initiatives.
- Collaboration with external researchers and agencies to negotiate, develop proposals and promote partnerships and agreements for toxicological testing.
- Conducts research in Toxicology and publishes research.
- Lectures and presents results, opinions and recommendations to various professional and technical personnel
- Managing human and financial resources for section.
- Appears as Expert Witness on matters related to environmental toxicology
- Keeps current of latest trends and directions in the field of toxicology by attending or speaking at workshops and symposiums.

- Member PESC management team.

**Senior Laboratory Scientist-Toxicology**

*B.C. Ministry of Environment, Lands and Parks.  
Pacific Environmental Science Centre, Environmental Conservation Branch,  
Environment Canada, 1805 Welch Street and 2645 Dollarton Highway, North  
Vancouver, B.C.*

December, 1981 to Dec. 1995:

- Head of Aquatic Toxicological testing laboratory for B.C. Ministry of Environment.
- Management of human and financial resources of the section
- Collaborating with Environment Canada laboratory services
- Aided in Canada/BC laboratory agreement
- Conducting of routine aquatic toxicological bioassays
- Toxicological test methods development
- Supervised and conducted both regulatory (legal) and non regulatory fish bioassays for government agencies.
- Testified in courts of law to provide expert and direct information respecting the toxicity of liquid effluents to fish.

**Laboratory Scientist**

***B.C. Ministry of Environment  
Environmental Laboratory  
2650 Wesbrook Mall, Vancouver  
B.C. Research Building***

November 1979-December 1981

- General analytical chemistry bench duties
- Conducted routine chemistry on air and water samples in laboratory
- Quality control and assurance of air samples

**Field Biologist**

*Manitoba Department of Environment and Natural Resources*

April, 1979 to Sept. 1979

- Collection of lake samples for determination of potential impacts from industrial and recreational use.
- Conducted routine chemistry on samples in laboratory
- Responsible for the operation and supervision of field laboratory

**ADDITIONAL EDUCATION AND TRAINING**

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September 1986-89	Postgraduate studies University of B.C./Simon Fraser University (incomplete)
March 1994	Transport of Dangerous Goods
October 1993	Training Course for Environmental Trials: 'Expert Witness', (sponsored by Environment Canada, Fisheries and Oceans and Ministry of Environment, Lands and Parks), Vancouver, BC, Canada.
October 1985	Legal Sampling Workshop, West Vancouver, B.C.
November 1998	Media Training for Government Scientists-Toronto
2002-ongoing	Canadian School for Management Development- Modern Management Leadership and management courses: Value and Ethics-completed 2004 Risk Management in Public Sector-Completed 2004

Leadership for New Challenges-Completed-2002  
Leading Diverse Work Teams-Completed-2002  
May2006 Society of Environmental Toxicology and Chemistry Meeting, The Hague, Netherlands.  
May 2007 Society of Environmental Toxicology and Chemistry Meeting, Oporto, Portugal  
Invited lecturer University of Averoio-Portugal.

\*Completed all mandatory internal courses required of middle managers and supervisors.

### **SPECIAL DESIGNATIONS**

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February 12, 1990 Analyst, Fisheries Act  
June 30, 1988 Analyst, Canadian Environmental Protection Act

### **COURT EXPERIENCE AS AN EXPERT WITNESS IN AQUATIC TOXICOLOGY**

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- Regina v. Crestbrook Forest Ind. Ltd. (Prov Court, Cranbrook, Feb 1984)
- Regina v. VanDev. (Prov. Court, Vancouver., 1983)
- Regina v. Carolin Mines Ltd. (Prov Court, Langley, Sep 1983)
- Regina v. Alcan Smelters (Prov. Court, Kitimat, May 1996)
- Regina v. Louisiana Pacific-Dawson Creek (Prov. Court Dawson Ck. (1996)
- Regina v. Richmond Landfill (Prov. Court Burnaby 1996)
- Regina v Antossen (Prov. Court, Burnaby 1997)
- Regina v. C.P. Railway ( Prov. Court, Port Coquitlum 2006)
- Regina v. Boonstra (Prov. Court, Smithers 2006)
- Legal Opinion Reports:
  - Eurocan Pulp Line Breakage-Feb. 2008
  - Cheakamus R. Caustic Soda Spill 2007
  - Fleetwood Properties 2006
  - West Fraser Sawmill (Eurocan) 2006
  - Pennask Creek 2004
  - Boonstra Farm 2004
  - **Skeena Cellulose 2001**

### **ASSOCIATIONS/PROFESSIONAL ACTIVITIES/GRANTS**

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October 1994 to 2006  
1990 - Present

- Chairperson Intergovernmental Ecotoxicological Testing Group
- Member, Expert Working Group on Pulp and Paper Toxicology-Environmental Effects Monitoring)
- Member, Canadian Association of Environmental Analytical Laboratories (CAEAL)
- Member Standards Council of Canada-Canadian (SCC) Advisory Committee on International Organisation for Standardisation (ISO)-Toxicology.

January 1994-1997  
Member expert review committee for Canadian Centre for Mineral and Energy Technology (CANMET), Aquatic Effects Technology Evaluation (AETE) Programme for metal mining.

December 1997-Present  
Member Society of Environmental Toxicology and Chemistry

December 1997-2000  
Member Environment Canada Expert Technical Advisory on Sublethal Toxicology for Metal Mining Liquid Effluent Regulation

January 1997-Present	Lecturer-Scientific Expert Witness Course
January 1997-Present	Organized CALA auditor training sessions and course content
September 1998-Present	Guest Lecturer –Western Washington University (Toxicology)
September 1998-Present	External Referee for Journal of Water Pollution and Toxicology
December 1999	Guest Lecturer-Montevideo, Uruguay (Dept. of Environment)-IDRC- Canada sponsored.
December 1999/2005	Co-recipient of Natural Sciences and Engineering Research Council of Canada-Strategic Research Grants
January 2000	Member of U.S. Standard Methods-For Examination of Water and Wastewater-American Public Health Association, Washington, D.C. Toxicological Working Committee for Microscale Testing.
March 2000-present	Board member on Technical Advisory committee to CAEAL for Toxicology
March 2000-present	Member Environment Canada's Science Committee- Pulp and Paper and Metal Mining EEM.
January 2001	Recipient of Genome Canada/BC funding for gene arrays
April 2001	Recipient of STAGE funds (strategic technologies for advancement of genomics in the environment). Renewed each of the last 3 years.
June 2000-2002	Organisational Chairperson for Aquatic Toxicity Workshop (ATW 2002), Whistler B.C. 400+ delegates.
June 2000-2003	Board member Aquatic Toxicity Workshop
Sept 2003-2006	Canadian Institutes of Health Research Grant
September 2003-2006	Co-recipient of Natural Sciences and Engineering Research Council of Canada-Strategic Research Grant
March-2004	Recipient Science Horizons Grant
June 2005	Recipient of Environment Canada Citation of Excellence for Leadership in Development and Application of Toxicogenomics.
September 2005	Invited participant and co-author of book Chapter, at Society of Environmental Toxicology and Chemistry (SETAC) expert working group on Application of Genomic Tools for Regulatory Use. Pellston, Michigan, USA.
September 2006	Member Genome British Columbia-expert working group for application of environmental genomics.
April 2008	Host and Assistant Chairperson- North American meeting of National Environmental Research Council (UK) Fish Genomics Expert Working Group.
May 2008	Member Genome Canada Strategic Position Paper Writing Team-Ecosystem Health and Wealth
June 2008	Health Canada- Principal Investigator-New Substances Assessment and Control Bureau Grant
September 2008	Genome BC-Science Opportunities Funds-Collaborator Grant
October 2008	Environment Canada-Chemical Management Plan Grant; Collaborative investigator-Toxicogenomic Amphibian study
October 2008	Natural Sciences and Engineering Research Council of Canada-Strategic Grant- 3year funding
October 2008	Pacific Salmon Forum-Research Grant Emamectin Benzoate

## PUBLICATIONS

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- Bishop CA, Ashpole SL, Edwards AM, van Aggelen GC, Elliott JE. Hatching success and pesticide exposures in amphibians living in agricultural habitats of the South Okanagan valley, British Columbia, Canada (2004-2006). 2008. Environ.Toxicol. Chem, Submitted.
- De Jong Westman, A, Elliott, J, Cheng, K, van Aggelen, GC, Bishop CA.2009a. Impact of Endosulfan, Diazinon and Azinphos-methyl on Development and Survivorship of the Great Basin Spadefoot (*Spea intermontana*) and the Pacific Chorus Frog (*Pseudacris regilla*). MSc. University of British Columbia, 106 pp.
- De Jong Westman A, Elliott J, Cheng K, van Aggelen GC, Bishop CA.2009a. Impact of Endosulfan, Diazinon and Azinphos-methyl on Development and Survivorship of the Great Basin Spadefoot (*Spea intermontana*) and the Pacific Chorus Frog (*Pseudacris regilla*). Part II. Eight-day Exposure of Young Tadpoles. Env. Toxicol. Chem., submitted.
- De Jong Westman A, Elliott J, Cheng K, van Aggelen GC, Bishop CA.2009 b. Effects of environmentally relevant concentrations of Endosulfan, Azinphos-methyl and Diazinon on Great Basin Spadefoot (*Spea intermontana*) and Pacific Treefrog (*Pseudacris regilla*).Part I. Embryo and Early Stage Larval Survivorship. Env. Toxicol. Chem., submitted.
- Cancilla, D.A., Martinez, J., van Aggelen G.C. Detection of Aircraft Deicing/Antiicing Fluid Additives in A Perched Water Monitoring Well at an International Airport. Environmental Science and Technology, volume 32, No. 23, 1998.
- Eichkoff, C.V, van Aggelen, G.C., Niimi A, (Editors). Proceedings of the 29<sup>th</sup> Annual Aquatic Toxicity Workshop: October 21-23, 2002, Whistler, B.C. Canadian Technical Report of Fisheries Aquatic Sciences 2438.
- Gagne, F., Blaise, C., van Aggelen, G.C., Bovin, P. etal Intercalibration Study in the Evaluation of Toxicity with Rainbow Trout Hepatocytes. Environmental Toxicology 14: 429-437. 1999.
- Imber, B.E., Beatty-Spence, J, Chan, van Aggelen, G.C. Temporal Variation in Hepatic Mixed-Function Oxidase Induction in Rainbow Trout Exposed to Industrial Effluent. Environmental Pollution Bulletin. 1994
- Tyler C.R., Filby, A.L. Iquchi, T., Kramer, V.J., Larsson, D.G., van Aggelen, G.C., van Leeuwen, K., Vian, M.R., Tillitt, D. Chapter 3 Application of Genomicc to Tiered Testing. In: Genomic in Regulatory Ecotoxicology. Edit: Ankley, G.T., Miracle, A.L., Perkins, E.J., and Daston, G.P. SETAC Press, Pensacola Florida, 2008.
- Van Aggelen, G.C. Results of Aquatic Toxicological Testing Related to Aircraft Deicing Fluids at Canadian Airport. SETAC, Philadelphia, Pa, November 1999.
- Van Aggelen, G.C. Lynch, A., Guidelines for the Collection of Legal Samples. B.C. Ministry of Environment, 1993. Pg 40
- Van Aggelen,G.C. Section C –Bioassays: Sample Collection Plus In-situ Tests. In British Columbia Field Sampling Manual, 1996 Edition Permittee. ED: M.J.R. Clark, B.C. Ministry of Environment. Nov. 1996
- Van Aggelen,G.C. Section C –Bioassays: Sample Collection Plus In-situ Tests. In British Columbia Field Sampling Manual, 1996 Edition Permittee. ED: M.J.R. Clark, B.C. Ministry of Environment. Nov. 1996

- Wan, M.T, **van Aggelen, G.C.**, Cheng, W., Buday C., Validation of the Acute Toxicity of Inorganic Chloramines to the Fresh Water Invertebrate *Daphnia magna*. Bull. Environ. Contam. Toxicol (2000) 64:213-220
- Wan, M.T., **van Aggelen, G.C.**, Cheng, W., Watts, R.W., Acute Toxicity of Chlorine-Produced Oxidants (CPO) to the Marine Invertebrates *Amphiporeia virginiana* and *Eohaustorius washingtonianus*. Bull. Environ. Contam. Toxicol (2000) 64:205-212  
Von Schalburg, K.R. **van Aggelen, G.C.** Vijayan, M.M., Mommsen, T.P. Endocrine and Developmental Disruption by Nonylphenol and Estradiol in Early Life of Rainbow Trout.. (In press)
- Helbing, Caren, **van Aggelen, Graham**, Mommsen, T.P. Presentation at the University of Rhode Island, Gordon Conference. Results toxicological tests using endocrine disrupters on Amphibians. June 2000.
- **van Aggelen, Graham**, Osachoff H., Bruno J, Fish and Chips- Endocrine Disruption to Rainbow as a result of exposure to Pulp and Paper Effluent using Gene array technology. Oral presentation, Environmental Effects Monitoring symposia, University of New Brunswick. March 2003.
- Veldhoen, N, Skirrow, Rachel, Osachoff H, Wigmore H., Clapson, D., Gunderson, M., **van Aggelen, G.C.**, Helbing, C. The bacterial agent triclosan modulates thyroid hormone-associated gene expression and disrupts postembryonic anuran development. Aquatic Toxicology (2006), doi 10.1016/j.aquatox.2006.08.010

#### **Posters**

Skirrow, R.C., Bruno, J.B., Osachoff, H.L., Schroeder, G.R., Buday, C.W., Mommsen, T.P., and van Aggelen, G.C. 2006. Genomic Responses of Underyearling Rainbow Trout to Effluent from Nine Pulp Mills in British Columbia. SETAC North America 27<sup>th</sup> Annual Meeting. Montreal, QC, Canada.

Bruno, J.B., Osachoff, H., Skirrow, R.C., Mommsen, T., Kennedy, C. and Graham van Aggelen. 2006. Comparing the Toxicogenomic Effect of Effluent from a Municipal Waste Water Treatment Plant on Juvenile Chinook Salmon (*Oncorhynchus tshawytscha*) at Two Yearly Timepoints. SETAC North America 27<sup>th</sup> Annual Meeting. Montreal, QC, Canada.

Bruno, J.B., Tremblay, A., Osachoff, H., Skirrow, R.C., and Graham van Aggelen. 2006. "Fish & Chips"-Environmental Toxicogenomic Tools for Emerging Environmental Stressors. International *Daphnia* Genomics Consortia Meeting, Bloomington, Indiana and World Microarray Congress, Vancouver, BC.

Van Aggelen, G., Osachoff, H.L., Skirrow, R.C., Tremblay, A.T., and J.B. Bruno. 2005. "Fish and Chips" – Environmental Toxicogenomic Tools for Emerging Environmental Stressors. Student Biotechnology Network and Genome BC 3<sup>rd</sup> Annual Research Exchange

#### **Presentations (Presenter in bold)**

**Bruno, J.B**, Skirrow, R., Osachoff, H., vanAggelen, G.C. 2007. An update on fish and chips and the utility of these and other genomic tools. Platform presentation presented at the 34th Annual Aquatic Toxicity Workshop, Halifax, Nova Scotia

**Bruno, J.B., Skirrow, R., Osachoff, H., van Aggelen, G.C.** 2007. Development and application of toxicogenomics to aquatic toxicology. Platform presentation presented at the 34th Annual Aquatic Toxicity Workshop, Halifax, Nova Scotia

**Skirrow, R.C., Jackman, P., Doe, K. and G. van Aggelen.** 2007. Assessing Toxicity of Commercial Pesticide Formulations using Native Amphibian Tadpoles. Pesticide Information Exchange. Vancouver, BC, Canada.

**Osachoff, H.L., Bruno, J., Skirrow, R.C., Mommsen, T.P., Kennedy, C. and G. van Aggelen.** 2007. Estrogenicity of Municipal Sewage: Toxicogenomic Studies with Chinook Salmon (*Oncorhynchus tshawytscha*). 2007 Georgia Basin Puget Sound Research Conference. Vancouver, BC, Canada.

**Van Aggelen, G., McPherson, B., and R. Skirrow.** Pharmaceuticals and Personal Care Products: Biological & Chemical Effects – Georgia Basin Case Study. 2007. Science & Technology Forum. Vancouver, BC, Canada.

Bruno, J.B., Skirrow, R.C., **Osachoff, H.L.**, Vijayan, M.M., Helbing, C.C., Mommsen, T.P. and G.C. van Aggelen. 2005. Rainbow trout cDNA microarray : a tool for assessing contaminants in the aquatic environment. SETAC North America 26<sup>th</sup> Annual Meeting. Baltimore, Maryland, USA.

Bruno, J.B., Skirrow, R.C., Osachoff, H.L. and **G.C. van Aggelen.** 2005. Toxicogenomic evaluation of salmon exposed to municipal waste water effluents discharged into the Pacific Ocean. SETAC North America 26<sup>th</sup> Annual Meeting. Baltimore, Maryland, USA.

Bruno, J.B., **Tremblay, A.**, Osachoff, H., Skirrow, R.C., and Graham van Aggelen. 2005. Toxicogenomics as a tool for linking metal toxicity and xenoestrogenic effects in Coho salmon (*Oncorhynchus kisutch*). 32nd Annual Aquatic Toxicity Workshop, Waterloo, Ontario.

**Bruno, J.B.,** Skirrow, R., Osachoff, H. and G.C. van Aggelen (2005) Fish and Chips. 32nd Annual Aquatic Toxicity Workshop, Waterloo, Ontario

Bruno, J.B., Osachoff, H., R. Skirrow and **G.C. van Aggelen.** 2005. Application of Genomic Tools for the Determination of Molecular Level Effects of Xenoestrogens to Salmonids. 40th Central Canadian Symposium on Water Quality Research, Burlington, Ontario.

\* Numerous internal departmental reports and publications.