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June 29, 1998

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Mr. Damien Hughes  
U.S. Environmental Protection Agency  
290 Broadway  
20th Floor  
New York, New York 10007-1866

**RE: Contract No. 68-W6-0022, Work Assignment No. 3-12**

Dear Mr. Hughes:

ERG is pleased to present the names of the seven experts ERG has selected to peer review the Phase 2 report entitled *Preliminary Model Calibration Report*. ERG selected these individuals after screening peer review candidates for any potential conflicts of interest in performing work under this work assignment. I have enclosed one copy of each expert's resume.

- Ellen Bentzen, Ph.D., Research Scientist, Department of Environmental and Resource Studies, Trent University, Peterborough, Ontario
- Miriam Leah Diamond, Ph.D., Associate Professor, Department of Geography, University of Toronto, Toronto, Ontario
- James W. Gillett, Director, Superfund Basic Research and Education Program, and Professor of Ecotoxicology, Cornell University, Ithaca, New York
- Gordon Douglas Haffner, Ph.D., Professor, Department of Biological Sciences, University of Windsor, Windsor, Ontario
- Alan W. Maki, Ph.D., Environmental Advisor, Exxon Company USA, Houston, Texas
- Thanos Nicolas Papanicolaou, Ph.D., Assistant Professor, Department of Civil Engineering, Washington State University, Pullman, Washington
- Frank Wania, Ph.D., Independent Research Scientist, WECC Wania Environmental Chemists Corp., Toronto, Ontario

If you have any questions, please contact me at (781) 674-7369.

Sincerely,

  
Arlene Levin  
Vice President

cc: Cathy Turner, EPA Project Officer  
Jeff Cantin, ERG Deputy Project Manager  
Heidi Schultz, ERG Task Manager

Corporate Headquarters:  
110 Hartwell Avenue  
Lexington, MA 02173-3134  
Phone 781-674-7200  
Fax 781-674-2851

2200 Wilson Boulevard  
Suite 400  
Arlington, VA 22201-3324  
Phone 703-841-0500  
Fax 703-841-1440

14555 Avion Parkway  
Suite 200  
Chantilly, VA 20151-1102  
Phone 703-633-1600  
Fax 703-263-7280

900 Perimeter Park (Lab)  
P.O. Box 2010  
Morrisville, NC 27560-2010  
Phone 919-461-1419  
Fax 919-461-1579

1600 Perimeter Park (Office)  
P.O. Box 2010  
Morrisville, NC 27560-2010  
Phone 919-461-1419  
Fax 919-461-1418

Dept. of Environmental and Resource Studies  
Trent University  
Peterborough, Ontario  
CANADA K9J 7B8  
work: (705) 748-1645  
FAX: (705) 748-1569  
email: ebentzen@trentu.ca

Home Address:

[REDACTED]

Birthdate: [REDACTED]  
Languages: English, French

Citizenship: [REDACTED]  
C.V. date: [REDACTED]

### Education

Ph.D. 1986-1990 Aquatic Ecology, University of Waterloo, Waterloo, Ontario.  
M.Sc. 1983-1986 Aquatic Ecology, University of Waterloo, Waterloo, Ontario.  
B.Sc. 1979-1982 Honours Marine Ecology, McGill University, Montreal, Quebec.

### Scholarships and Academic Awards

1990 University of Waterloo Science Incentive Program Scholarship  
1989 University of Waterloo Scholarship  
1989 Award of Excellence in Undergraduate Teaching, Univ. Waterloo  
1988 University of Waterloo Scholarship  
1988 Am. Soc. Limnology & Oceanography Conference Travel Award  
1986-1988 Natural Sciences and Engineering Research Council Scholarship  
1985 University of Waterloo Scholarship  
1985 Award of Excellence in Undergraduate Teaching, Univ. Waterloo  
1985 Graduate Student Seminar Award, Univ. Waterloo  
1982 Tropical Field Ecology Award, McGill  
1982 Penhallow Award in Biology, McGill

### Academic & Work Related Experience

03/91 - 04/93 Ontario Ministry of Environment sports fish contaminants data analysis, with Dr. D. Lean, Trent University.  
05/93 - 10/93 Aquatic food web/contaminants dynamics, with Dr. D. Lean, Trent.  
11/93 - 11/94 Food web and contaminant models, Dr. D. Mackay, Univ. Toronto.  
12/94 - 08/95 Great Lakes University Research Fund: Lake Erie food web, Dr. W.D. Taylor, Univ. Waterloo, Dr. D. Lean, Environment Canada.  
09/95 - 03/98 Contaminant bioaccumulation models, with Dr. D. Mackay, Trent.; aquatic food web/contaminants, with Dr. D. Lean, U. Ottawa. (04/97- 10/97; 6 month maternity leave)  
03/98 Environment Canada: reviewer for sediment quality guideline draft documents (DDTs, toxaphene, pesticides)  
04/98 - 06/98 Canadian Chlorinated Chemical Council (C4): Review of PCBs & DDTs in Lake Ontario Biota, with Dr. D. Mackay  
07/98- C4: review of PCBs in St. Lawrence River biota, with Dr. D. Mackay

**Research Funding**

- 1997-98 NSERC Small University Grant (Trent; \$3500), held with B. Hickie  
 1995-96 NSERC Small University Grant (Trent; \$4000), held with B. Hickie  
 1993-94 Great Lakes University Research Fund (GLURF; 30K), held with Drs. Taylor, Lean, Hickie, Lasenby and Pick.

**Teaching Experience**

- Lecturer: Applied Limnology II, Sir Sandford Fleming College, Winter 1996  
 Lecturer: Vertebrate Zoology, Trent, Winter 1995  
 Lecturer: Design and Statistical Analysis of Experiments in Biology, Trent, Fall 1992, 4th year undergraduate and graduate course.  
 Lab Instructor: Comparative Vertebrate Zoology, Trent Univ., 1995/1996, 1997.  
 Guest Lectures: at Trent: Fate of Contaminants, Applied Ecology, Pollution Ecology, Geochemistry of Natural Waters, Environmental Methods; Applied Limnology, Fish & Wildlife (Sir Sandford).  
 Tutorial Instructor: Applied Ecology, Trent 1993/94, 1994/95.  
 Senior Laboratory Instructor: Animal Anatomy, University of Waterloo, Fall 1988.  
 Teaching Assistant: variety of courses (vertebrate & invertebrate zoology, marine field course, toxicology, physiology), Waterloo

**Student Supervision**

I co-supervise(d) (with Dr. Hickie) two M.Sc. students at Trent (G. Paterson, defended June '96; B. DeLuca, defending spring 1998) and have assisted in supervision of Dr. D. Lean's Trent students. I have supervised four Honours Thesis students and a reading course student.

**Publications**

- Mackay, D. and E. Bentzen. 1997. The role of the atmosphere in Great Lakes contamination. *Atmospheric Environment* 31: 4045-4047.  
 Cotner, J.B., J.W. Ammerman, E.R. Peele and E. Bentzen. 1997. Nutrient-limited bacterioplankton growth in the Sargasso Sea. *Aquatic Microbial Ecology* 13: 141-149.  
 Bentzen, E., D.R.S. Lean, W.D. Taylor and D. Mackay. 1996. Role of food web structure on lipid and bioaccumulation of organic contaminants by lake trout (*Salvelinus namaycush*). *Can. J. Fish. Aquat. Sci.* 53: 2397-2407.  
 Almond, M.J., E. Bentzen, and W.D. Taylor. 1996. Size-structure and species composition of plankton communities in deep Ontario lakes with and without *Mysis relicta* and planktivorous fish. *Can. J. Fish. Aquat. Sci.* 53: 315-325.  
 Bentzen, E., W.D. Taylor and E.S. Millard. 1992. The importance of dissolved organic phosphorus to phosphorus uptake by limnetic plankton. *Limnol. Oceanogr.* 37: 217-231.  
 Bentzen, E. and W.D. Taylor. 1991. Estimating Michaelis-Menten parameters and lakewater phosphate by the Rigler bioassay: importance of fitting technique, plankton size and substrate range. *Can. J. Fish. Aquat. Sci.* 48: 73-83.  
 Bentzen, E. and W.D. Taylor. 1991. Estimating organic P utilization by freshwater plankton using [<sup>32</sup>P]ATP. *J. Plankton Res.* 13: 1223-1238.  
 Bentzen, E. 1990. Epilimnetic algal and bacterial utilization of phosphorus in lakes. Ph.D. Thesis, University of Waterloo. 103 pp.  
 Bentzen, E. 1986. The influence and interaction of zooplankton and nutrients on algal communities in lakes. M.Sc. Thesis, University of Waterloo. 114 pp.

- Cumie, D.J., E. Bentzen, and J. Kalff. 1986. Does algal-bacterial phosphorus partitioning occur in lakes? A comparative study of orthophosphate uptake and alkaline phosphatase activity in freshwater. *Can. J. Fish. Aquat. Sci.* 43: 311-318.
- Kalff, J. and E. Bentzen. 1984. A method for the analysis of total nitrogen in natural waters. *Can. J. Fish. Aquat. Sci.* 41: 815-819.

#### Submitted publications

- Bentzen, E., D. Mackay, D.R.S. Lean. Sources of lake to lake variation in mercury bioaccumulation in lake trout (*Salvelinus namaycush*): diet, DOC and lake morphometry. submitted to *J. Aquatic Ecosystem Stress and Recovery*, Nov. 1997.
- Howard, S., D.R.S. Lean, E. Bentzen and A. Mazumder. Heterotrophic microbial response to manipulations of nutrients (N,P) and planktivorous fish abundance. *under revision*, for *Can. J. Fish. Aquat. Sci.*

#### Manuscripts in preparation:

- Bentzen, E., D. Mackay and D.R.S. Lean. Temporal trend in persistent organic pollutants in the Lake Ontario food web (for submission to *Environmental Reviews*, July 1998)
- Bentzen, E., D.R.S. Lean, L. Milford and D. Mackay. Temporal trends in PCBs and DDTs in St. Lawrence River biota (for submission to *CJFAS* Sept. 1998).
- Paterson, G., E. Bentzen, B.E. Hickie, D.R.S. Lean and W.D. Taylor. Organic contaminant distributions and lipid content in zooplankton and the freshwater shrimp, *Mysis relicta*, in Ontario lakes (for submission to *Environ. Toxicol. Chem.*, July 1998).
- Hickie, B.E., E. Bentzen, D. Mackay, D.R.S. Lean, D. Lasenby and G. Paterson. A bioenergetics fugacity based bioaccumulation model for the freshwater benthic-pelagic invertebrate, *Mysis relicta*. (for submission to *Environ. Sci. & Technol.*, summer 1998).
- Bentzen, E., D. Mackay, B.E. Hickie, D.R.S. Lean, D. Muir and M. Paterson. A fugacity-based contaminant accumulation model for application to lakes with contrasting food web structures (for submission to *Environ. Sci. Technol.* fall 1998).

#### Invited Presentations

- Bentzen, E. 1996. Aquatic food webs and contaminant fate: where fat fits in. University of Ottawa, Ottawa, Ontario, May, 1996.
- Bentzen, E. 1995. Top-down and bottom-up forces in Ontario inland lakes and Lake Erie: Implications for aquatic food web structure and contaminant fate. Ont. Min. Natural Resources at Maple, Toronto, Ontario.
- Bentzen, E. 1995. Fish, food and contamination: the role of aquatic food web structure on contamination of lake trout by PCBs and DDTs. Fairy and Peninsula Lakes Cottage Associations and Min. Natural Resources.
- Bentzen, E. 1993. Top-down effects on aquatic food web structure: Influence on bioaccumulation of organic contaminants in lake trout in Ontario lakes. University of Windsor, Windsor, Ontario.
- Bentzen, E., D.R.S. Lean, W.D. Taylor and J. Almond. 1993. Role of aquatic food webs in the bioaccumulation of organic contaminants in lake trout: model and field program. Society for Canadian Limnology, Peterborough, Ontario.
- Bentzen, E. 1993. Use of sports fish organic contaminant bioaccumulation models to identify role of aquatic food webs in contaminant transfer. Texas A&M Univ.

- Bentzen, E. 1993. Use of organic contaminant bioaccumulation models for lake trout for identification of food web structure in lakes. The New York Botanical Garden Institute for Ecosystem Studies.
- Bentzen, E., D.R.S. Lean and W.D. Taylor. 1992. Ecological considerations of P concentrations and P uptake kinetics. ASLO Aquatic Sci. Meeting, Santa Fe, New Mexico.
- Bentzen, E. 1990. Epilimnetic bacterial and algal utilization of organic and inorganic phosphorus. Université de Montréal, Montréal, P.Q.
- Bentzen, E. 1989. The contribution of dissolved organic phosphorus to phosphorus uptake by limnetic plankton: Report on a new assay. Inst. Maurice-Lamontagne, Fish. Oceans, Mont. Joli, P.Q.
- Bentzen, E. 1989. The importance of dissolved organic phosphorus to total phosphorus cycling and to algal phosphorus demand. McGill University, Montreal, P.Q.
- Bentzen, E. and W.D. Taylor. 1989. The contribution of dissolved organic phosphorus to phosphorus uptake by limnetic plankton. Intern. Assoc. for Great Lakes Research, Madison, WI.

### Presentations

- Mackay, D., E. Bentzen, B. Hickie and E. Webster. 1998. A synoptic indicator of contaminant levels in the Great Lakes Basin, Int. Assoc. Great Lakes Res., Hamilton, ON.
- Hickie, B.E., E. Bentzen, D. Mackay, G. Paterson and D. Lasenby. 1997. A bioenergetics fugacity based bioaccumulation model for the freshwater benthic-pelagic invertebrate, *Mysis relicta*. Soc. Environ. Toxicol. Chem., San Francisco, CA.
- Mackay, D. and E. Bentzen. 1997. The role of mass balance modelling in "virtual elimination" of toxicants. Int. Assoc. Great Lakes Res., Buffalo, N.Y.
- Bentzen, E., D. Mackay, B.E. Hickie and D. Lasenby. 1996. Application of a contaminant accumulation model to lakes with contrasting food web structure. Soc. Environ. Toxicol. Chemistry, Washington, DC.
- Mackay, D., B. Hickie and E. Bentzen. 1996. The case for developing, validating, and applying mass balance models describing contaminant fate in the environment. Soc. Environ. Toxicol. Chemistry, Washington, DC.
- Bentzen, E., D.R.S. Lean, D. Mackay and M. Amyot. 1996. Mercury in Ontario lake trout: role of food webs and watershed characteristics. Am. Soc. Limnol. Oceanogr. Milwaukee, Wisconsin.
- Bentzen, E., B. Hickie, D. Mackay, G. Paterson and D. Lasenby. 1996. Mysids: role in contaminant fate (the good, the bad and the ugly). Int. Assoc. Great Lakes Res. Mississauga, Ontario.
- DeLuca, B., E. Bentzen, B. Hickie, D.R.S. Lean and M. Fox. 1996. Bioavailability of organic contaminants related to DOC in lakes. Int. Assoc. Great Lakes Res. Mississauga, Ontario.
- Paterson, G., B. Hickie, E. Bentzen and D.R.S. Lean. 1996. Contaminant and lipid content of freshwater mysid shrimp (*Mysis relicta*) and zooplankton. Int. Assoc. Great Lakes Res. Mississauga, Ontario.
- Mackay, D., J. Campfens and E. Bentzen. 1996. A comprehensive model of contaminant fate in an aquatic food web. Int. Assoc. Great Lakes Res. Mississauga, Ontario.
- Bentzen, E., D.R.S. Lean and W.D. Taylor. 1995. Current and past nutrient status of Lake Erie plankton. Int. Assoc. Great Lakes Res. Ann Arbor, MI.
- Bentzen, E., D.R.S. Lean, W.D. Taylor, J. Almond and S. Howard. 1995. Top-down, bottom-up, or in the middle? Nutrient and zooplankton regulation of P dynamics and photosynthesis. Am. Soc. Limnol. Oceanogr. Reno, Nevada.

- Deluca, B., E. Bentzen, B.E. Hickie, D.R.S. Lean and M. Fox. 1995. Role of DOC on bioavailability of organic contaminants in lakes. Int. Assoc. Great Lakes Res., Ann Arbor, MI.
- Keppel-Jones, K., B. Goebel, E. Bentzen, B.E. Hickie, T. Metcalfe, C.D. Metcalfe. 1995. Hiding from mysids-epilimnetic refugia for zooplankton: Consequences on partitioning of PCBs in zooplankton. Int. Assoc. Great Lakes Res., Ann Arbor, MI.
- Paterson, G., B.E. Hickie, E. Bentzen, D.R.S. Lean and M. Fox. 1995. Variability in lipid content of freshwater mysid shrimp (*Mysis relicta*) populations from southern Ontario lakes. Int. Assoc. Great Lakes Res., Ann Arbor, MI.
- Guy, M., M.J.R. Almond, W.D. Taylor, E. Dirschka and E. Bentzen. 1995. Lipid content of plankton communities in deep Ontario lakes with and without *Mysis* and lake herring (*Coregonus artedii*). Soc. Can. Limnology, Ottawa ON.
- Howard, S.M., E. Bentzen and D.R.S. Lean. 1995. Factors affecting heterotrophic bacteria activity in lakes. Soc. Can. Limnology, Ottawa ON.
- Lean, D., E. Bentzen, S. Howard, S. Perin, N. Scully, R. Rae, I. Laurion, A. Ferguson, P. Hamilton and D. Hessen. 1995. Role of ultraviolet radiation on microbial processes in lakes. Am. Soc. Limnology and Oceanography, Reno, Nevada.
- Ammerman, J.W., M.J.D. MacRae, E. Bentzen, E.R. Peele, J.B. Cotner and W.H. Jeffrey. 1994. Phosphorus cycling at the Bermuda Time-Series Station: An Overview. Ocean Sciences Meeting, San Diego, CA.
- Cotner, J.B., E.R. Peele, J.W. Ammerman and E. Bentzen. 1994. Phosphorus-limited plankton growth in the Sargasso Sea (BATS) and implications for the pelagic food web. Ocean Sciences Meeting, San Diego, CA.
- Peele, E.R., J.W. Ammerman, E. Bentzen and J.B. Cotner. 1994. Microbial hydrolysis and utilization of dissolved organic phosphorus compounds at the Bermuda time-series station. Ocean Sciences Meeting, San Diego CA.
- Bentzen, E. and D.R.S. Lean. 1993. Patterns in the bioaccumulation of organic contaminants in lake trout: Identifying contribution of atmospheric loading and the role of aquatic food webs. Soc. Environ. Toxicol. Chem., Houston, Texas.
- Ammerman, J.W., E.R. Peele, E. Bentzen, J.-S. Kim, M.J.D. MacRae, R.H. Sada Ruvalcaba, and K. Elardo. 1993. Microbial phosphorus cycling at the Bermuda time-series station (BATS). Oceanography Soc. Meeting, Seattle, WA.
- Bentzen, E., D.R.S. Lean, C. Hauschild and W. Scheider. 1992. Temporal changes of PCBs in Lake Ontario fish and the role of lipids in PCB bioconcentration. Int. Assoc. Great Lakes Res., Waterloo, Ontario.  
plus 11 presentations between 1984 to 1991.

### Reviews

Sediment quality guideline documents for Environment Canada (DDT, toxaphene, pesticides)

Research Proposal for the Hudson River Institute (1997)

Research Proposal for the Israel Science Foundation (1996)

Manuscript reviews for:

Canadian J. Fisheries & Aquatic Sciences; J. Great Lakes Research; Limnology & Oceanography; Environmental Science & Technology; Environmental Toxicology & Chemistry; J. Phycology; Water, Air & Soil Pollution; Transactions American Fisheries Society; Hydrobiologia

May 26, 1998

**MIRIAM LEAH DIAMOND - CURRICULUM VITAE****A. BIOGRAPHICAL INFORMATION****1. PERSONAL**

**Name:** Miriam Leah Diamond

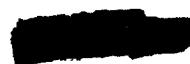
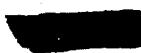
**University address:** Department of Geography  
University of Toronto  
100 St. George St.  
Toronto, Ontario M5S 3G3 CANADA

**Phone:** (416)978-1586

**FAX:** (416)978-6729

**Email:** diamond@geog.utoronto.ca

**Web:** www.geog.utoronto.ca/deptinfo/mlid.html

**Home address:****Phone:****Date of birth:****Citizenship:****Marital Status:****2. DEGREES****B.Sc., (4 yr). 1976. Biology. University of Toronto, Toronto, Ontario****M.Sc., 1980, Zoology, University of Alberta, Edmonton, Alberta**"Plumage variability in redpolls (*Carduelis flammea* and *C. hornemanni*, L): A test of Rohwer's status signalling hypothesis".

Thesis supervisor: W.A. Fuller.

**M.Sc.Eng., 1984, Mining Engineering, Queen's University, Kingston, Ontario**

"An environmental investigation of the Kognak River at Cullaton Lake Gold Mine".

Thesis supervisor: J.A. Meech

**Ph.D., 1990, Chemical Engineering and Applied Chemistry, University of Toronto, Toronto, Ontario**

"Modelling the fate and transport of arsenic and other inorganic chemicals in lakes".

Thesis supervisor: D. Mackay

### 3. EMPLOYMENT

- 1997-present Associate Professor, University of Toronto, Department of Geography. Sabbatical 1998.
- 1993-1997 Assistant Professor, University of Toronto, Department of Geography.
- 1992-present Associate Member-Limited Term, School of Graduate Studies.
- 1992-present Cross-appointment to Graduate Faculty of the Department of Chemical Engineering and Applied Chemistry.
- 1991-1993 Assistant Professor, University of Toronto, Innis College and Department of Geography.
- 1995-1997 Public Health Associate, City of Toronto Department of Public Health.
- 1990-1991 Research Associate, University of Toronto, Institute for Environmental Studies.
- 1990 Post-Doctoral Fellow, University of Toronto, Institute for Environmental Studies.
- 1989 Lecturer, University of Toronto, Institute for Environmental Studies.
- 1985-present Consultant, Self-Employed:
- Environment & Ecology, Inc.; Technical Advisor and subcontractor for Carson River Superfund Site, Spring 1993-present.
  - Minnesota Pollution Control Agency, 1993-1994, 1995-1996.
  - Technical advisor to project funded by the Ontario Min of the Environment, Bay of Quinte RAP.
  - Ontario Ministry of Environment, Water Resources Branch, 1989-1990.
  - City of Toronto, Environmental Protection Office, 1990, 1991.
  - Environment Canada, National Water Research Institute, 1989-1990.
  - Environment Canada, National Water Research Institute, 1989.
  - Environment Canada, Inland Waters Directorate April-June, 1988.
  - Cominco Limited, 1987.
  - Federal Department of Energy, Mines and Resources, Canada Centre for Remote Sensing, 1985.
- 1984 Limnologist, Ontario Ministry of Natural Resources, Ontario Geological Survey, Geophysics/Geochemistry Section, Toronto, Ontario.
- 1983-1984 Project Manager, Queen's University, Department of Mining Engineering.

Note that I was on maternity leave Sept to Dec 1991, and Feb to May 1995.

### 4. HONOURS AND AWARDS

- 1990 Ontario Ministry of the Environment Excellence in Research Award to Students.
- 1989-1990 George Burwash Langford Prize for distinctive contributions to environmental research and services to the Institute for Environmental Studies.

- 1988 John Brown Memorial Prize for Research in Environmental Science and Occupational Health, University of Toronto.
- 1984 Northern Research Travel Grant, Department of Indian and Northern Affairs.
- 1982-1984 Graduate Student Scholarships, Queen's University.
- 1981-1982 Max Bell Scholarship for Northern Studies, McGill University.
- 1977-1978 Boreal Institute Grant-in-Aid, University of Alberta.
- 1976 Innis College Medal.

## 5. PROFESSIONAL AFFILIATIONS AND ACTIVITIES

### Current Memberships:

International Association for Great Lakes Research  
 Society of Environmental Toxicology and Chemistry  
 International Association on Water Quality  
 Canadian Association on Water Quality  
 Institute for Environment and Health of University of Toronto and McMaster University

### Activities:

- 1998-present Member of Canadian Standards Association Committee on Canadian Raw Materials Data Base.
- 1998 present Member of Steering Committee, "How Healthy is the Moira?". In conjunction with the Frost Centre and Environment and Resource Management Dept. of Trent University.
- 1998-present Member of Science Review Panel, Lake Michigan Mass Balance Model Project. Sponsored by U.S. EPA.
- 1997-present Member of Publications Committee, International Association for Great Lakes Research
- 1996-present Member of Working Group on Fate and Exposure Modeling sponsored by SETAC.
- 1996 Invited participant in 26th Pellston Workshop "Reassessment of Metals Criteria for Aquatic Life Protection: Priorities for Research and Implementation", Society of Environmental Toxicology and Chemistry, Pensacola, Florida, Feb 10-14, 1996.
- 1994-present Associate Editor of *Water Quality Research Journal of Canada*.
- 1994-1998 Vice-Chair, Canadian Standards Association Committee on Life Cycle Impact Assessment of Pulp & Paper Production Phase.
- 1993-1994 Member of Working Group on Site Remediation, Waterfront Regeneration Trust.
- 1993-1994 Member of Technical Advisory Committee, International Association of Great Lakes Research.
- 1992 Invited participant in "ASEAN Conference on Women and Technology", Sponsored by CIDA, Bangkok, Thailand.
- 1991-present Board Member of the Canadian Environmental Law Association.
- 1991-1992 Member of "Gender, Science and Development", an international working group of IFIAS.

### Co-organizer of the following workshops:

- 1996 Life Cycle Assessment of Site Remediation Options - A Review of the Generic Approach and Case Study. Funded by Ministry of Environment and Energy. Held at Dept. of Geography, Toronto.
- 1992 Lake Superior Mass Balance Workshop. Funded by the International Joint Commission and Atmospheric Environment Service of Environment Canada, Toronto.
- 1991 Great Lakes Research Day. Sponsored by the Institute for Environmental Studies, Toronto.

- 1991 Great Lakes Mass Balance Workshop. Funded by the International Joint Commission, Niagara-on-the-Lake.
- 1990 Workshop to develop a regional model of mercury accumulation in sport fish. Held at the Institute for Environmental Studies, Toronto.

## B. ACADEMIC HISTORY

### 6. a. RESEARCH ENDEAVOURS

Fate and transport of inorganic and organic contaminants in the environment.

1. Field, experimental and mass balance modelling analysis of the fate and transport of arsenic in Moira Lake, focusing on role of contaminated sediments.
2. Experimental analysis of sediment-water exchange processes (related to 1 and 3).
3. Assessing contaminant emissions, multimedia fate, and processes governing chemical fate in urban areas, notably Don River watershed, Hamilton, and urban wetlands and detention ponds.
4. Mass balance modelling of mercury fate and transport in lakes (Great Lakes, shield lakes), contaminated systems (Lahontan Reservoir, Nevada), and multi-media environment (State of Minnesota).\*
5. Mass balance modelling of contaminants and nutrients in arctic and subarctic lakes and food webs. Collaborator in the Amituk Lake Project, Northern Contaminants Program of the Arctic Environmental Strategy, Dept. of Indian Affairs and Northern Development.
6. Mass balance modelling of contaminants in Great Lakes "Areas of Concern": Bay of Quinte, Hamilton Harbour and Spanish Harbour. Contributor to development of Remedial Action Plans (RAPs).\*
7. Developing multimedia mass balance models for decision making purposes, e.g., for transportation related impacts (State of Minnesota).
8. Evaluating environmental and health impacts of site remediation processes.\*
9. Life cycle assessment, developing a methodology to evaluate impacts of site remediation processes (related to 7.). In collaboration with Environmental Protection Office, City of Toronto.
10. Mass balance modelling of toxic chemicals in the Great Lakes.\*

\* Currently inactive

### 6. b. RESEARCH AWARDS AND CONTRACTS

#### Awards:

- |              |  |
|--------------|--|
| 1995-2000    | NSERC Operating Grant, "Contaminant fate and dynamics in aquatic systems", \$13,000 per year.  |
| 1995-1997    | Ontario Ministry of Environment & Energy, "Full cycle assessment of environmental and health impacts of site remediation options", \$50,000.                 |
| 1995-1996    | Ontario Ministry of Environment & Energy, "Quantifying chemical release from in-place pollution", \$18,000.  |
| 1995-present | Friends of the Spanish River, "Spanish Harbour sediment mass balance study - enhanced application of the QWASI fugacity/aquivalence model", \$25,000         |
| 1993, 94, 97 | Department of Indian and Northern Affairs, student travel grant, \$1,500; \$2,000, \$1900.   |
| 1993         | Dean's Instructional Initiative Grant, "Development of environmental science curriculum for non-science students", \$1,000.                                  |
| 1993         | NSERC Equipment Award to J. Desloges (V.R. Timmer, J. Gerits, M. Diamond).   |
| 1993         | Ontario Ministry of the Environment, "Hamilton Harbour sediment mass balance study: enhanced application of the QWASI fugacity/aquivalence model", \$10,000. |

- 1992-present Department of Indian and Northern Affairs, "Modelling inorganic and organic contaminants in Arctic freshwater lakes", 1992, \$22,000; 1993, \$23,000; 1994 \$28,000; 1995 \$9,000; 1996, \$24,000, \$1997 \$20,000.
- 1992-1995 NSERC Operating Grant, "Study of the fate and transport of contaminants in aquatic systems", \$19,000 per year.
- 1992, 1993 Environmental Youth Corps, \$4,000 each year. 1993 jointly held with E. Fawcett, Dept. of Physics.
- 1991-1993 Connaught Fund, University of Toronto, Phase I New Staff Grant, \$10,000.
- Contracts:**
- 1995-present Ecology & Environment Inc., "Development of mercury mass balance model for the Lahontan Reservoir, Nevada", \$US20,000
- 1993-94,95-96 Minnesota Pollution Control Agency, "Extension of the Minnesota fugacity/aquivalence model to treat multiple, interconverting species", US\$11,950; US\$5,000.
- 1991 City of Toronto, Environmental Protection Office, Assist with development of methodological for constructing historical landuse database, \$3,000. Contract held with S. MacRitchie.
- 1990 City of Toronto, Environmental Protection Office, "Review of potential environmental and health effects of site remediation technologies", \$5,000. Contract held with S. MacRitchie.
- 1989-90,90-91 Ontario Ministry of the Environment, "Development of a mass balance model for the Bay of Quinte", \$37,000, \$28,000. Contract held with D. Mackay, Institute for Environmental Studies, U of T.
- 1989,1990 Environment Canada, National Water Research Institute, "Review and modelling of sediment-water exchange processes", \$6,000, \$12,000.
- 1988 Environment Canada, Inland Waters Directorate "Assessing the feasibility of using evaluative models in the development of Canadian Sediment Quality Guidelines", \$5,000. Contract held with T. Clark. MCM Consulting.

## C. SCHOLARLY AND PROFESSIONAL WORK

### 7. REFEREED PUBLICATIONS

#### 7. a. Articles

DIAMOND, M.L. Development of a simple and general model of mercury dynamics in a small lake. *Water Air and Soil Pollution*. Accepted for publication 2/10/97.

LAW, N. and M.L. DIAMOND. The role of organic films and its effect on hydrophobic organic compound distribution in urban areas: An hypothesis. *Chemosphere* 36:2607-2620.

DIAMOND, M.L., C.A. PAGE, M. CAMPBELL, S. MCKENNA 1997. Life cycle framework for assessment of site remediation options: Investigation of six remedial options. Proceedings of Air & Waste Management Assoc. 90<sup>th</sup> Annual Meeting, Toronto, Ontario.

FREITAS, H., M. DIAMOND, R. SEMKIN and D. GREGOR. Contaminant fate in high Arctic lakes: development and application of a mass balance model. *Science of the Total Environment* 201:171-187.

HELFIELD, J.M. and M.L. DIAMOND. 1997. Use of constructed wetlands for urban stream restoration: a critical analysis. *Environmental Management*. 21(3):329-341.

DIAMOND, M.L. and H.W. LING-LAMPRECHT. 1996. Loadings, dynamics and response time of seven metals in Hamilton Harbour: results of a mass balance study. *Water Quality Res. J. Canada*. 31(3): 623-641.

FAYE, M.S. and M.L. DIAMOND. 1996. The role of phytoplankton in the removal of arsenic by sedimentation from surface waters. *Hydrobiologia* 324: 117-123.

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CAMPBELL, M., S. MACRITCHIE, M. DIAMOND and S. MCKENNA. 1995. A framework for assessing environmental and health concerns associated with site remediation technologies. *Environ. Health Rev.* 39(2): 32-37.

DIAMOND, M.L. 1995. Application of a mass balance model to assess in-place arsenic pollution. *Environ. Sci. Technol.* 28(1): 29-42.

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DIAMOND, M.L., D. MACKAY, R.J. CORNETT and L. CHANT. 1990. A model of the exchange of inorganic chemicals between water and sediments. *Environ. Sci. Tech.* 24: 713-722.

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#### 7. b. Chapters

BARRIE, L., R. MACDONALD, T. BIDDLEMAN, M. DIAMOND, D. GREGOR, R. SEMKIN, W. STRACHAN, M. ALAEE, S. BACKUS, M. BEWERS, C. HALSALL, C. BOGEIL, J. HOFF, A. LI, L. LOCKHART, D. MACKAY, J. PUDYKIEWICZ, K. RIEMER, J. SMITH, G. STERN, W. SCHROEDER, R. WAGEMANN, F. WANIA and M. YUNKER. 1997. Arctic contaminants: Five years of progress in understanding sources, occurrence and pathways. In: Canadian Arctic Contaminants Assessment Report, J. Jensen, K. Adare and R. Shearer (eds.), Indian and Northern Affairs Canada,, Ottawa. Chapter 2, pp. 25-181.

CAMPBELL, M., J. CAMPBELL, S. MCKENNA, S. MACRITCHIE and M. DIAMOND. 1997. Public health perspective and urban soil contamination. In: *Environmental Geology of Urban Areas*. N. Eyles (ed.), Geological Association of Canada, Geotext 3, St. John's, Newfoundland. pp.383-393.

SCHNOOR, J.L., J.P. CONNOLLY, D.M. DI TORO, M. DE ROOIJ, M. DIAMOND, R.S. KINERSON JR., D.B. PORCELLA, W.L. RICHARDSON, J.F. STINE. 1997. Environmental fate and transport. In: *Resassessment of Metals Criteria for Aquatic Life Protection*. H.L. Bergman and E.J. Dorward-King (eds.), SETAC Press, Pensacola, FL. Chapter 6, pp. 71-80.

MACKAY, D., M.L. DIAMOND and W. STIVER. 1991. The case for modelling sediment-water interactions in aquatic and marine systems. Chapter 3. In: *Organic Substances and Sediments in Water: Volume 3, Biological*. R. Baker (ed.), Lewis Publ., Chelsea, MI. pp.383-393.

## 8. NON-REFEREED PUBLICATIONS

### 8. a. Articles

DIAMOND, M.L. 1998. Modelling inorganic and organic contaminants in arctic freshwater lakes. In: *Synopsis of Research Conducted Under the 1995/97 Northern Contaminants Program*. Department of Indian Affairs and Northern Development, Environmental Studies No. 74, QS-8573-000-EF-A1, Cat. No. R71-19/74-1997E. pp. 55-64.

PAGE, C.A., M.L. DIAMOND, M. CAMPBELL and S. MCKENNA. Life cycle framework for investigating site remediation options. *Chem. Eng. Prog.* Anticipated date of publication is spring 1998.

DIAMOND, M.L., H. FREITAS and M. KAWAI. 1996. Modelling inorganic and organic contaminants in arctic lakes and food chains. In: *Synopsis of Research Conducted Under the 1994/95 Northern Contaminants Program*. Department of Indian Affairs and Northern Development, Environmental Studies No. 73, QS-8519-000-EF-A1, Cat. No. R71-19/73-1995E. pp.119-130.

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DIAMOND, M.L. 1994. Modelling inorganic and organic contaminants in arctic lakes and food chains. In: *Synopsis of Research Conducted Under the 1993/94 Northern Contaminants Program*. Department of Indian Affairs and Northern Development, Environmental Studies No. 72, QS-8500-000-EF-A1, Cat. No. R71-19/72-1994E, pp. 128-137.

DIAMOND, M.L. 1994. Sustainable development: its origins and interpretations. *Horizons* 3(4):3-4.

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DIAMOND, M. 1993. Modelling the fate and transport of metals in lakes: certainties and uncertainties. Proc. of 9th Int. Conf. of Heavy Metals in the Environment, Vol.1, Sept. 1993, Toronto, Ontario. pp.44-47

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SMITH, V.H., F.H. RIGLER, O. CHOULIK, M. DIAMOND, S. GRIESBACH and D. SKRABA. 1984a. Effects of phosphorus fertilization on phytoplankton biomass and phosphorus retention in subarctic Quebec lakes. *Verh. Internat. Verein. Limnol.* 22:673-687.

#### *8. b. Reports*

DIAMOND, M., C. PAGE, M. CAMPBELL and S. MCKENNA. Life Cycle Framework for Contaminated Site Remediation Options. Final report submitted to the Ontario Ministry of the Environment and Energy.

DIAMOND, M. and M. GANAPATHY. 1996. Mercury dynamics in the Lahontan Reservoir: Application of QWASI fugacity/aquivalence multispecies model. Report submitted to Ecology & Environment, Inc. as a subcontract to, and reviewed by U.S. Environ. Protection Agency.

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MACRITCHIE, S.M. and M.L. DIAMOND. 1991. Identification of potential environmental and health concerns of soil remediation technologies. Technical Report, City of Toronto, Environmental Protection Office. 240 pp.

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DIAMOND, M.L. and A. MUDROCH. 1990. Review of techniques for quantifying the transfer of contaminants and nutrients from bottom sediments. Environment Canada, National Water Research Institute, Burlington, Ontario. Contribution No.90-43. 106 pp.

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SMITH, V.H., F.H. RIGLER, O. CHOULIK, M. DIAMOND, S. GRIESBACH and D. SKRABA. 1984b. A manual for eutrophication control in the subarctic. Final report to the Dept. of Indian and Northern Affairs, Ottawa. Environ. Studies No. 33, QS-8360-000-EE-A1, Cat. No. R71-19/33-1985E. 32 pp.

## 9. MANUSCRIPTS SUBMITTED OR IN PREPARATION

DIAMOND, M.L., M. GANAPATHY, S. PETERSON and C. MACH. Mercury dynamics in the Lahontan Reservoir, Nevada: Application of QWASI fugacity-equivalence multispecies model. *Water Air and Soil Pollution*. Accepted with minor revisions 12/2/98.

DIAMOND, M.L., C.A. PAGE, M. CAMPBELL, S. MCKENNA, R. LALL and G. CASTONGUAY. Life cycle framework for assessment of site remediation options: Methodology and generic survey. *Environ. Toxicol. Chem.* Resubmitted after minor revisions. 1/6/98.

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DIAMOND, M.L. and L. GIBBS. Assessing the importance of seasonal variability in modelling chemical fate and transport. *Water Resources Research*. In prep.

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LAPOSA, R., M.L. DIAMOND, B. HICKLE, R. SEMKIN, P. HELM, B. KOENIG and M. FOX. The bioaccumulation of persistent organic pollutants through a high arctic food chain. In prep.

**10 PAPER PRESENTATIONS, including published abstracts**

GINGRICH, S.E., M.L. DIAMOND, B.E. MCCARRY, G.A. STERN, D.C.G. MUIR, K. FERTUCK, K. and T.D. YAGER. The composition and teratogenic effects of urban organic films collected from impervious surfaces. Abstract submitted for presentation at Soc. Environ. Toxicol. Chem. (SETAC), 19th Annual Meeting, North Carolina, November 1998.

DIAMOND, M.L., and N.L. LAW. A multimedia model of chemical fate in urban areas. Abstract submitted for presentation at Soc. Environ. Toxicol. Chem. (SETAC), 19th Annual Meeting, North Carolina, November 1998.

HELM, P.A., M.L. DIAMOND, R. SEMKIN and T.F. BIDLEMAN. Enantioselective degradation of  $\alpha$ -hexachlorocyclohexane in a high arctic watershed. Abstract submitted for presentation at Soc. Environ. Toxicol. Chem. (SETAC), 19th Annual Meeting, North Carolina, November 1998.

HICKLE, B.E., R. LAPOSA, P.A. HELM, M.L. DIAMOND and R. SEMKIN. Simple food web model for biota in a high arctic lake. Abstract submitted for presentation at Soc. Environ. Toxicol. Chem. (SETAC), 19th Annual Meeting, North Carolina, November 1998.

MONABBATI, M., and M.L. DIAMOND. A mathematical model to predict the effect of salinity on the sediment-water exchange of arsenic. Abstract submitted for presentation at Soc. Environ. Toxicol. Chem. (SETAC), 19th Annual Meeting, North Carolina, November 1998.

◆DIAMOND, M.L., N.L. LAW and S.E. GINGRICH. 1998. Quantifying atmospheric contaminant loads from urban areas: results from a multi-media model of Toronto. Paper presented at 41th Conf. of Internat. Assoc. for Great Lakes Research, Hamilton, Ontario.

◆GINGRICH, S.E., M.L. DIAMOND, B.E. MCCARRY and G.A. STERN. 1998. Contaminant exchange between air and impervious surfaces in urban areas. Paper presented at 41th Conf. of Internat. Assoc. for Great Lakes Research, Hamilton, Ontario.

MONABBATI, M., M.L. DIAMOND and K. BOLTON. 1998. Effect of organic matter content on the sediment-water exchange of arsenic. Paper presented at 41th Conf. of Internat. Assoc. for Great Lakes Research, Hamilton, Ontario.

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◆HELM, P., M. DIAMOND, and R. SEMKIN. 1997. Factors affecting enantioselective degradation of  $\alpha$ -Hexachlorocyclohexane in arctic watersheds. Paper presented at Soc. Environ. Toxicol. Chem. (SETAC), 18th Annual Meeting, San Francisco, CA.

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GANAPATHY, M. and M.L. DIAMOND. 1997. A multi-media model of the fate of mercury in the Lahontan Reservoir, Nevada. Paper presented at Soc. Environ. Toxicol. Chem. (SETAC), 18th Annual Meeting, San Francisco, CA.

MONABBATI, M. and M.L. DIAMOND. 1997. Effect of salinity and organic matter on arsenic mobility in sediment-water systems. Poster presented at Soc. Environ. Toxicol. Chem. (SETAC), 18th Annual Meeting, San Francisco, CA.

DIAMOND, M.L. and C. PAGE. 1997. Life cycle framework for assessment of site remediation options: Evaluation of six remedial options. Paper presented at Air and Waste Management Association's 90th Annual Meeting and Exhibition, Toronto.

DIAMOND, M.L. and W. TAN. 1997. Assessing the response time of aquatic systems to changes in loadings. Paper presented at 40th Conf. of Internat. Assoc. for Great Lakes Research, Buffalo, N.Y.

LAW, N.L. and M.L. DIAMOND. 1997. Using a mass balance approach to characterize urban areas as chemical sources to the Great Lakes. Paper presented at 40th Conf. of Internat. Assoc. for Great Lakes Research, Buffalo, N.Y.

MONABBATI, M. and M.L. DIAMOND. 1997. The influence of secondary factors on sediment-water exchange. Paper presented at 40th Conf. of Internat. Assoc. for Great Lakes Research, Buffalo, N.Y.

GOMES, G. and M.L. DIAMOND. 1997. A simple model of multimedia chemical fate in a wet detention pond. Paper presented at 32nd Central Canadian Symp. Water Pollution Research, Burlington, Ontario.

DIAMOND, M.L., C.A. PAGE, M. CAMPBELL AND S. MCKENNA. 1997. Using a Life Cycle Assessment approach for assessing contaminated site remediation options. Paper presented at 32nd Central Canadian Symp. Water Pollution Research, Burlington, Ontario.

EATON, S. and M.L. DIAMOND. 1997. Use of a mass balance model to evaluate remedial options for a contaminated urban lake. Paper presented at 32nd Central Canadian Symp. Water Pollution Research, Burlington, Ontario.

DIAMOND, M.L. and M. GANAPATHY. 1996. Mercury dynamics in the Lahontan Reservoir - Application of QWASI fugacity/aquivalence multispecies model. Paper presented at Soc. Environ. Toxicol. Chem. (SETAC), 17th Annual Meeting, Washington, D.C.

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LAW, N.L. and M.L. DIAMOND. 1996. Modeling the distribution of organic contaminants in an urban watershed. Paper presented at Soc. Environ. Toxicol. Chem. (SETAC), 17th Annual Meeting, Washington, D.C.

◆DIAMOND, M.L. and N. LAW. 1996. A conceptual model for evaluating the role of impervious surfaces in stormwater runoff. Workshop: Recent Improvements in Understanding Characteristics of Stormwater Runoff, Stormwater BMPs, and receiving waters. Sponsored by Ontario Ministry of Transportation, Toronto.

- GIBBS, L. and M.L. DIAMOND\*. 1996. Remedial action planning: projecting the response time of Spanish Harbour sediments to loading reductions. Paper presented at 39th Conf. of Internat. Assoc. for Great Lakes Research, Mississauga, Ontario. p.36.
- HELFIELD, M.J. and M.L. DIAMOND\*. 1996. Implications of wetland restoration in an urban watershed. Paper presented at 39th Conf. of Internat. Assoc. for Great Lakes Research, Mississauga, Ontario. p.54.
- LAW\*, N. and M.L. DIAMOND. 1996. Using a fugacity approach to model the distribution of organic contaminants in an urban watershed. Paper presented at Stormwater & Water Quality Management Modeling Conference, Toronto.
- ◆DIAMOND\*, M.L., H.M. FREITAS, M. KAWAI and R. LAPOSA. 1995. Organochlorine dynamics in arctic and subarctic lakes. Invited paper in Workshop. Second SETAC World Congress, Vancouver.
- ◆DIAMOND, M.L. 1995. Atmospheric contributions to whole lake contaminant dynamics: from the Great Lakes to the Arctic. National Atmospheric Deposition Program (NRSP-3), Technical Committee Meeting, Toronto.
- HELFIELD\*, J. M. and M.L. DIAMOND. 1995. Marsh restoration: Potential consequences for water quality and the aquatic community of the Lower Don River, Toronto, Ontario. Paper No. 54, Internat. Conf. Society for Ecological Restoration, Seattle, Washington.
- FREITAS\*, H.M. and M.L. DIAMOND. 1994. Estimating the fate of organochlorines in Arctic lakes. Paper presented at Soc. Environ. Toxicol. Chem., 15th Annual Meeting, Denver, Colorado.
- GIBBS\*, L., M. FAYE, M.L. DIAMOND and M. SCROGGIE, 1994. Seasonal changes in arsenic dynamics in a contaminated lake in eastern Ontario. Paper presented at Soc. Environ. Toxicol. Chem., 15th Annual Meeting, Denver, Colorado.
- DIAMOND, M.L. and F. OLIAEI. 1994. Application of the Minnesota Fugacity/Aquivalence Model to Mercury. Poster presented at Soc. Environ. Toxicol. Chem., 15th Annual Meeting, Denver, Colorado.
- FREITAS\*, H.M., R.R. LAPOSA and M.L. DIAMOND. 1994. A Model of Contaminant Movement and Bioaccumulation in Arctic Lakes. Paper presented at 37th Conf. of Internat. Assoc. for Great Lakes Research, Windsor, Ontario.
- FAYE, M.S. and M.L. DIAMOND. 1994. Temporal variation in the sedimentation of arsenic in a temperate lake. Poster presented at 37th Conf. of Internat. Assoc. for Great Lakes Research, Windsor, Ontario.
- DIAMOND, M.L. 1993. Quantifying sediments as sources of contaminants using mass balance models. Paper presented at Interactions between Sediments and Water, Sixth International Symposium, Santa Barbara, California.
- FREITAS, H., R. LAPOSA and M.L. DIAMOND. 1993. A model of mercury movement and bioaccumulation in Arctic lakes. Poster presented at 9th International Conf. of Heavy Metals in the Environment, Toronto.

LING, H., M. DIAMOND\* and D. MACKAY. 1993. Application of the QWASI fugacity/aquivalence model to assessing the fate of trace metals in the water and sediments of Hamilton Harbour. Paper presented at 9th International Conf. of Heavy Metals in the Environment, Toronto.

MACKAY\*, D., S. SANG, M.L. DIAMOND, P. VLAHOS, D. DOLAN and E. VOLDNER. 1993. Virtual elimination of toxic and persistent chemicals from Lake Superior, a mass balance study. 36th Conf. of Internat. Assoc. for Great Lakes Research, DePere, Wisconsin.

LING\*, H., M. DIAMOND and D. MACKAY. 1993. Application of the QWASI fugacity/aquivalence model to assessing the fate of contaminants in the water and sediments of Hamilton Harbour. 36th Conf. of Internat. Assoc. for Great Lakes Research, DePere, Wisconsin.

DIAMOND\*, M.L., D. MACKAY and S. SANG. 1993. A mass balance view of mercury in Lakes Ontario and Superior. 36th Conf. of Internat. Assoc. for Great Lakes Research, DePere, Wisconsin.

DIAMOND\*, M.L. and S. SANG. 1992. A model of the fate and transport of mercury in Lake Ontario. Paper presented at Soc. Environ. Toxicol. Chem., 13th Annual Meeting, Cincinnati, Ohio.

LAPOSA, R., H. FREITAS and M.L. DIAMOND\*. 1992. Contaminant behaviour in Arctic lakes. Paper presented at CAGONT, Toronto.

DIAMOND\*, M.L. and D. MACKAY. 1992. Modelling the fate and transport of mercury in lakes: application of the fugacity/aquivalence approach. Paper presented at Mercury as a Global Pollutant, Monterey, California.

MACKAY\*, D., M. DIAMOND, S. SANG, F. GOBAS and D. DOLAN. 1992. Mass balancing as a strategy for virtual elimination. Paper presented at 35th Conf. of Internat. Assoc. for Great Lakes Research, Waterloo, Ontario.

MACRITCHIE\*, S.M. and M.L. DIAMOND. 1991. Identification of potential environmental and health concerns of soil remediation technologies. Paper presented at Canadian Waste Management/WasteTech '91 Conference, Toronto.

DIAMOND\*, M.L., D. MACKAY, D. POULTON and F. STRIDE. 1991. Modelling organic and inorganic chemicals in the Bay of Quinte. Paper presented at 34th Conf. of Internat. Assoc. for Great Lakes Research, Buffalo, New York.

MACKAY\*, D. and M. DIAMOND. 1991. The role of mass balancing in Great Lakes management of toxic chemicals. Paper presented at 34th Conf. of Internat. Assoc. for Great Lakes Research, Buffalo, NY.

DIAMOND\*, M.L. and D. MACKAY. 1990. Quantifying chemical sources and fate in the Bay of Quinte: An application of mass balance models. Paper presented at Soc. Environ. Toxicol. Chem., 11th Annual Meeting, Arlington, Virginia.

DIAMOND\*, M.L., M. COQUERY and P.M. STOKES. 1990. Development of a regional model of mercury accumulation in sport fish. Paper presented at Internat. Conf. Mercury as an Environmental Pollutant, Gavle, Sweden.

**DIAMOND\***, M.L. and D. MACKAY. 1990. Modelling seasonal variations in contaminant dynamics in a small lake. Paper presented at 33rd Conf. of Internat. Assoc. for Great Lakes Research, Windsor, Ontario.

**DIAMOND\***, M.L. and D. MACKAY. 1990. Modelling arsenic dynamics in a small lake: An examination of seasonal influences. Paper presented at 10th Annual SLANT/TRESLA Conference, Quebec City, Quebec.

**MACKAY\***, D., M.L. DIAMOND and W. STIVER. 1990. Modelling sediment-water interactions. Paper presented at Symp. on Organic Substances in Sediments and Water, Amer. Chem. Soc. Meeting, Boston, Mass.

**DIAMOND\***, M.L., W. STIVER and D. MACKAY. 1989. The Linear Additivity Principle and its use for assessing chemical contributions from contaminated sediments. Paper presented at Soc. Environ. Toxicol. Chem., 10th Annual Meeting, Toronto.

**MACKAY\***, D., W.Y. SHIU and M.L. DIAMOND. 1989. Characteristics of contaminant condensation in cold climates. Paper presented at Soc. Environ. Toxicol. Chem., 10th Annual Meeting, Toronto.

**DIAMOND\***, M.L. and D. MACKAY. 1989. Extending the fugacity approach to inorganic chemical behaviour in lakes: estimating contributions from contaminated sediments. Paper presented at 40th Amer. Inst. Biol. Sci. Meeting, Toronto.

**DIAMOND\***, M.L. and D. MACKAY. 1989. Modelling chemicals in the Great Lakes: Applying a novel equilibrium criterion, "equivalence". Paper presented at 32nd Conf. of Internat. Assoc. for Great Lakes Research, Madison, Wisconsin.

**MACKAY\***, D., M.L. DIAMOND and W. STIVER. 1989. A simple method for estimating chemical profiles in sediments. Paper presented at 32nd Conference of Internat. Assoc. for Great Lakes Research, Madison, Wisconsin.

**MACKAY\***, D. and M.L. DIAMOND. 1988. Equivalence: A "new improved" substitute for fugacity in environmental modeling and interpretation. Paper presented at Soc. Environ. Toxicol. Chem., 9th Annual Meeting, Arlington, Virginia.

**DIAMOND\***, M.L., D. MACKAY, S. LANDSBERGER, and A.G. CHENG. 1988. Modelling arsenic dynamics in a contaminated lake. Paper presented at Internat. Conf. Trace Metals in Lakes, Hamilton.

**DIAMOND\***, M.L. and D. MACKAY. 1988. Modelling the movement of inorganic chemicals in lakes. Paper presented at 31st Conf. of Internat. Assoc. for Great Lakes Research, Hamilton, Ontario.

**DIAMOND\***, M.L., D. MACKAY, D. PHALP and S. LANDSBERGER. 1988. First a sink, then a source: arsenic dynamics in Moira Lake sediments. Paper presented at Conf. Can. Soc. Limnol., Ottawa.

**DIAMOND\***, M.L., R.J. CORNETT and D. MACKAY. 1986. Modelling the fate of arsenic in lakes. Poster presented at Technology Transfer Conf., Ontario Ministry of the Environment, Toronto.

\* author presenting the paper

◆ invited presentation

## 11. INVITED LECTURES

- 1997 Multi-media chemical distribution in urban areas: the role of organic films. State University of New York at Albany, Department of Environmental Health and Toxicology, School of Public Health.
- 1997 An overview of multi-media modelling and its use as a decision-making tool. Minnesota Department of Transportation.
- 1997 Mercury in aquatic systems. Invited presentation at "Mercury elimination and reduction symposium", Organized by Pollution Probe. Toronto, Ontario.
- 1997 Mercury cycling in the environment and its toxicological implications. Environment and Health Seminar Series, Institute for Environmental Studies and Gage Occupational and Environmental Health Unit, University of Toronto.
- 1996 Can we build habitable cities without damaging the environment? Public forum on "Mitigation of Environmental Impacts of Urban Development". Co-sponsored by the York Chapter, Professional Engineers Organization and the Rotary Club of Richmond Hill.
- 1996 Mercury: what models can tell us. Seminar sponsored by: Severson Environmental Services, Inc., Dept. of Civil Engineering, Great Lakes Program and NYS Center for Hazardous Waste Management, University of Buffalo.
- 1994 Contaminants in Arctic Lakes: Behaviour and Fate. Ecology Seminar Series, Co-sponsored by Departments of Botany and Zoology, University of Toronto.
- 1992 A simple model of mercury dynamics in a lake. Ontario Hydro, Research Division, Toronto.
- 1976 A hypothesis to explain plumage variability in redpolls (*Carduelis flammea* and *C. hornemannii*). Invited lecture, National Zoo, Smithsonian Institute, Washington, D.C.

## D. LIST OF COURSES

### 12. a. UNDERGRADUATE COURSES TAUGHT

- 1997-98 GGR 299Y RESEARCH OPPORTUNITY PROGRAM. Diane Leal and John Roppa.
- 1994, 1996-present GGR 233Y ENVIRONMENTAL MANAGEMENT FOR SUSTAINABLE DEVELOPMENT. Spring term. Co-lectured with J. Newton in 1994. Enrolment starts at 300, with about 250 finishing. Responsible for lectures, supervising T.A.s, assignments and final exam (marked part thereof). The course introduces students in the Environment and Resource Management Program with the scientific (basic and applied) basis of environmental issues. The course uses Life Cycle Analysis (LCA) to acquaint students with an understanding of an important and emerging quantitative and semi-quantitative assessment tool. The LCA framework is also used to unify topics in environmental science.

- 1994-95 GGR 491Y INDEPENDENT RESEARCH I. Lisa Sumi (co-supervised with J. Gerits and M. Alae, National Water Research Institute).
- 1997-98 Katina Kominos.
- 1993-present ENV 221Y APPROACHES TO ENVIRONMENTAL ISSUES I. Team taught with Prof. F. Cunningham as Course Coordinator. My component is 6 weeks. Enrolment 60 to 85. Provides students with the approaches taken to environmental issues by various disciplines, using a case study as a unifying theme. I teach the environmental science/physical geography component, discussing the scientific concepts and approaches specific to the case study (the latter changes every few years).
- 1993 present ENV 200Y ASSESSING GLOBAL CHANGE: SCIENCE AND THE ENVIRONMENT. Prof. A. Zimmerman coordinates and lectures for most of the course, with my component being 2 to 3 weeks. Enrolment about 300. Science breadth course. Goal is to expose non-science students with the science behind environmental issues.
- 1995-96 ENV 498Y INDEPENDENT RESEARCH IN ENVIRONMENT. Jean-Guy Pageau.  
1997-98 Kirsten Fertuck.
- 1993-94 INI 491Y INDEPENDENT STUDY. Tullo Bugada, Steve Dresher, Steven Ogilvie.
- 1993-94 CHE 499Y THESIS (CHEMICAL ENGINEERING). Alan Teare.
- 1992-present GGR 409F CONTAMINANTS IN THE ENVIRONMENT. Enrolment starts at 20, with 15 finishing. From 1993 to present, physical science course. Responsible for all components of course. Lectures are supplemented with tutorials to provide students with a scientific understanding of the processes and factors controlling contaminant behaviour in the environment. Problem sets introduce quantitative methods to estimate chemical fate, including simple mathematical modelling.
- 1992 (spring), 1992-93 INI 220Y ENVIRONMENTAL FACTORS AND DECISION MAKING. Enrolment 100. Responsible for lectures, supervising T.A.s, assignments and final exam (marked the latter). Provided students with tools for environmental assessment and sectoral impacts. Included guest lectures.
- 1992, 1993 INI 320Y CANADIAN ENVIRONMENTAL ISSUES. Spring term. Enrolment 80. Responsible for lectures, course organization, supervising T.A.s and marking portion of student reports. Co-taught with Dr. Beth Savan in 1992-93. Using principles of adult education, students were guided through two research projects in the term, addressing various environmental issues.
- 1992-93 GGR 491Y RESEARCH PROJECT. Andrew Rodie (co-supervised with J. Gerits);
- 1992-93 INI 491Y INDEPENDENT STUDY. Neil Banerjee (co-supervised with S.D. Scott, Geology, Geotechnical Engineering); Maria Terra (co-supervised with L. Grima).
- 1991-92 INI 491Y INDEPENDENT STUDY. Leslie Meyson (co-supervised with K. Shimizu, Institute for Environmental Studies), Michelle Perera.

**12. b. GRADUATE COURSES TAUGHT**

- 1996-97 GGR 1212S FATE OF CONTAMINANTS IN LAND AND WATER. Co-taught with K. Bolton. Physical science course covering contaminant-soil interactions (Bolton) and multi-media contaminant dynamics (Diamond).
- 1995-96 GGR 1400H CURRENT RESEARCH APPROACHES IN ENVIRONMENTAL GEOGRAPHY. Directly supervised 2 students (Gomes and Eaton). Introduction to research methods, and development and vetting of research proposal.
- 1995-96 GGR 1149H READINGS IN SELECTED TOPICS. Judy Fedorowick, Sherry Eaton.
- 1994-95 GGR 1400H CURRENT RESEARCH APPROACHES IN ENVIRONMENTAL GEOGRAPHY. Co-coordinator (with R. Jaakson), enrolment about 10.
- 1993-94 GGR 1400H CURRENT RESEARCH APPROACHES IN ENVIRONMENTAL GEOGRAPHY. Course coordinator.
- 1992-present JPG 1312H CONTAMINANTS IN THE ENVIRONMENT. Offered in conjunction with GGR 409 in 1992-93 and 1994-95, 1995-96 (science version), offered as stand-alone social science course in 1993-94 and 1995-96. Enrolment varies from 5 to 11. Course first catered to all graduate students, now intended for social science and planning students, introducing scientific concepts behind environmental concerns and then discussing policy and scientific aspects of selected environmental topics.
- 1990-91 ESE 1008S ENVIRONMENTAL MANAGEMENT II: REMEDIAL ACTION PLANS IN THE GREAT LAKES. Course coordinator and lecturer, co-designed course (with G. Krantzberg).
- 1989 ESE 1014F AQUATIC CHEMISTRY. developed and coordinated course, lectured and evaluated students.
- 1989 ESE 1006S MAN-ENVIRONMENT THEORY II. Co-coordinator. Lectured and provided project supervision.

*Guest Lectures in University Courses:*

- 1987- present PCL 473/JNP 1014Y Interdisciplinary Toxicology.
- 1990,92,94, 97 JNP 1016S Graduate Seminar in Toxicology.
- 1992-1993 GGR 1200H Physical Geography Core Course.
- 1992 ESE 1014S Aquatic Chemistry.
- 1990 POL 102 Introduction to Issues in Canadian Politics.
- 1990 CHE 201F Physico-Chemical Principles I.

**12. c. THESES SUPERVISION**

*Department of Geography, Ph.D. Theses:*

- 1996-1998 Neely Law. Transferred Ph.D. to University of North Carolina.

*Department of Geography, M.Sc., Theses:*

- 1998-present Sheryl Law. The enantioselective degradation of  $\alpha$ -hexachlorocyclohexane in high arctic watersheds.
- 1997-present Shannon Vickers. Contaminant status in an urban wetland. 1997-. Co-supervised with K. Bolton.
- 1997-present Fei Chan. Chemical dynamics of cationic metals in contaminated urban sediments. 1997-. Co-supervised with K. Bolton.
- 1997-present Sarah Gingrich. Examining the hypothesis of organic film development in urban areas. 1997-.
- 1996 Neely Law. Developing a simple model of chemical distribution in an urban watershed. 1994-96.
- 1993 Helen Wen Ling. Application of the QWASI fugacity/aquivalence model to assessing the fate of contaminants in the water and sediments of Hamilton Harbour. D. Mackay, co-supervisor. 1991-93.

*Department of Geography, M.Sc., Research Papers:*

- 1996 Glynn Gomes. The fate of organic contaminants in wet water detention ponds. 1995-96.
- 1996 Sherry Eaton. Application of the QWASI fugacity model to selected PAHs in Mohawk Lake, Brantford: An assessment of contaminant dynamics and system recovery. 1993-96, part time; 1994-96\*.
- 1996 Judy Fedorowick. A multi-media inventory of pollutant loadings to the Don River watershed. 1992-96, part time; 1994-96\*.
- 1996 Virginia Hoffernan. Estimating *in situ* degradation rates for petroleum products in the Lower Don Lands, Toronto, Ontario. 1993-96. Leave of absence 6/94-1/95; 1/95-1/96, part time.
- 1995 Peter Jackson. Weekday-weekend variations of tropospheric ozone in the Metropolitan Toronto Region. 1993-95. 5/94-1/95, part time.
- 1994 James Helfield. Evaluating the use of wetlands in the Lower Don Lands. 1993-94.
- 1994 Margaret Paye. The role of primary production in the removal of arsenic from the waters of Moira Lake. 1992-94.

*Department of Geography, M.A., Research Papers:*

- 1993 Fredrick Bernard. Regulatory framework pertaining to toxics in Canada -- Southern Ontario in-service PCB case study. 1989-93, part time; 1992-93\*.

*Department of Geography, M.Sc.Pl.:*

- 1997 Mark James. Analysis of the PCB destruction program at the contaminated site of General Electric in City of Toronto.
- 1993 Yvette Ali. A strategy for integrated pollution prevention and planning for Ontario.
- 1993 Rita Mezei. Site remediation planning process in Ontario: the need for reform. J. Whitney, co-supervisor.

*Department of Chemical Engineering and Applied Chemistry, Ph.D. Theses:*

- 1994-present Mehran Monabbati. Chemical release from contaminated sediments: an examination of chemical exchange at the sediment-water interface. Completed M.A.Sc. bypass oral in 8/96.

*Department of Chemical Engineering and Applied Chemistry, M.A.Sc. Theses:*

- 1996-present Paul Helm. Contaminant dynamics in a high arctic lake ecosystem.

- 1997 Murali Ganapathy. Modelling mercury dynamics in the Lahontan Reservoir, Nevada. 1995-97.
- 1994 Hilary Freitas. Modelling organic and inorganic chemicals in Arctic lakes. 1992-94.

*Department of Chemical Engineering and Applied Chemistry, M. Eng. Papers:*

- 1995 Makoto Kawai. A preliminary model to estimate chemical behaviour in lakes of the Upper Yukon River Basin. 1993-95; 1994-95\*.
- 1994 Lennox Gibbs. A seasonal model for arsenic dynamics in Moira Lake. 1993-94; 1994\*.
- 1994 Rochmi Widajanti. Developing environmentally sound technology for the palm oil industry. 1991-94; 1993-94\*.

\* Time under my supervision.

**Additional Graduate Related Activities:**

*Ph.D. Supervisory Committees*

- 1997 Tom Harner. Dept. of Chemical Engineering. Member of examination committee.
- 1997-present Jonathan Schwartz. Dept. of Political Science. Member of reading committee.
- 1997-present Chris Desousa, Dept. of Geography. Member of reading and comprehensive exam comm.
- 1996-present James Smith, Dept. of Geography. Member of reading and comprehensive exam comm.
- 1996 Steven Young, Dept. of Material Science and Metallurgy. Member of reading and examination committee, Internal examiner for Senate oral.
- 1994-present Annemeiki Farenhorst, Dept. of Geography. Member of reading and exam. committee.
- 1995-present Cathy Cottrell. Dept. of Chemical Engineering. Member of reading committee.
- 1995-present Edwin Tam. Dept. of Civil Engineering. Member of reading and comprehensive exam committee.
- 1994 Frank Wania, Dept. of Chemical Engineering. Member of Dept. and Senate oral committees.
- 1993 Kathleen Jagger. Dept. of Geography. Member of oral comprehensive examination committee.

*Master's Committees, Dept. of Geography*

- 1997 James Sterling, M.Sc.  
Anastasia Svirejava, M.Sc.  
Dan Fitzgerald, M.Sc.  
Eric Krause, M.A.  
Sue Asprey, M.Sc.Pl.
- 1996 Heather Alexander, M.A.  
Keilly Griffiths, M.Sc.Pl.  
Neil Mallen, M.Sc.Pl.  
Andrew Rodie, M.Sc.
- 1994 Sue Dickson, M.Sc.  
Claire Woolveridge, M.A.  
Larry Dufay, M.A.  
Val Aloe, M.Sc.Pl.
- 1993 Sarah Cowell, M.Sc.  
Simon Benger, M.Sc.  
Sean Ledgerwood, M.A.
- 1992 Huang Zhen, M.Sc.  
Kerry Lakatos-Hayward, M.Sc.Pl.

*Master's Committees, Dept. of Chemical Engineering and Applied Chemistry*

1994 Penny Vlahos. M.A.Sc.  
1993 Shirley Thompson. M.Eng.  
1991 Robert Caron. M.A.Sc.

*Master's Committees, other departments*

1992 Fereshteh Hashemi, Dept. of Botany. M.Sc.

**Additional Supervisory Activities:**

*Research Associates*

1995-97 Cynthia Page, M.A.Sc.  
1994 Lennox Gibbs, M.Eng.  
1994 Hilary Freitas, M.A.Sc.  
1993-1994 Helen Ling, M.Sc.

*NSERC Undergraduate Research Award Recipients*

1994 Ilan Keiman, Department of Chemical Engineering and Applied Chemistry.  
1993 Rebecca Laposa, Department of Geography.

*Undergraduate Summer Assistants*

1997 Julie Phillips\*  
1996 Wilfred Tan\*, Judy Josefowicz (part-time)  
1995 Judy Josefowicz (part-time)  
1994 Martha Scroggie (part-time)  
1993 David Tu\*, Martha Scroggie, Melissa Fotiadis  
1992 Andrew Rodie\*, Hilary Freitas, Rebecca Laposa, Michelle Perera  
\* Environmental Youth Corps

*Ontario Work-Study Plan Students*

1995-1996 Laura Aliante  
1992-1993 Andrew Rodie

**12. d. OTHER TEACHING AND LECTURES**

1996 Science Outreach. Lecture for girls 9 to 14 on research and career opportunities.  
1992 Saturday Morning Seminar Series for Secondary School Students. Lecture on Great Lakes water quality.  
1988 Tutorial Assistant, University of Toronto, Dept. of Chemical Engineering  
1980-1981 Tutorial Assistant, McGill University, Dept. of Biology  
1976-1979 Tutorial Assistant, University of Alberta, Dept. of Zoology

**E. ADMINISTRATIVE POSITIONS**

**13. a. SERVICE ON COMMITTEES AND ORGANIZATIONS**

*Initiatives:*

1997 Organized and chaired "Research Day" of Institute for Environmental Studies.

- 1997 Organized "The Great Debate" with Ruth Grier and Michael Bliss.  
 1996 Organized "Physical Geography Research Day" series to be held twice yearly as a forum for faculty and graduate students.  
 1994-present Involved with initiative to develop analytical facilities at University of Toronto. Member of ad hoc committee for ANALEST (Analytical Laboratory for Environmental Teaching).  
 1994 Developed M.Sc. Thesis option for Dept. of Geography and IFS Collaborative Program.  
 1993 Initiated change of undergraduate program from "Physical Geography" to "Physical and Environmental Geography"

**Major:**

- 1997 Chair of the Weigand Lecture committee. Organized and hosted seminars for two invited speakers.  
 1996 Physical Geography Research Day. Organized and chaired first of on-going series.  
 1994 Discover Science. Organized volunteers for demonstration in Physical Geography.  
 1994 Search Committee, Hydrology position at Erindale College.  
 1994 Science Options. Organized Dept. of Geography Information Booth. Rewrote information sheet on "Programs in Physical Geography"  
 1994 Member of Environmental Protection Subcommittee on Grounds/Water Use/Biodiversity.  
 1993-1996 Women in Science Committee, Faculty of Arts and Science  
 Related activities:  
 • Women in Science Faculty Advisor, Dept. of Geography;  
 • Panelist, "Challenges and Solutions: Balancing an academic career and family responsibilities", Workshop for Women Faculty and Librarians, April 15, 1997.  
 • "Women in Science" luncheons. Co-organized and moderated discussions. Co-sponsored by Dept. of Geography and Faculty of Arts and Science. 1996, 1994;  
 • Forum on Women in Science, "Graduate School and Beyond". Moderated panel discussion. April, 1993.  
 1992-1993 Division of the Environment, Science Subcommittees.  
 1992 WHMIS and laboratory safety seminar. Co-organizer of seminar for Dept. of Geography.  
 1991-1993 Innis College Environmental Programme Committee.

**Minor:**

- 1997-present Arctic Working Group  
 1996-present Environmental Engineering Faculty Council  
 1995-present Toxicology Program Committee.  
 1994-present Graduate Committee, Dept. of Geography.  
 1994 Ranking NSERC and OGS applications.  
 1994 Mathematics Sciences Review Committee.  
 1994 Ranking NSERC Undergraduate Student Research Awards from "non-NSERC" departments.  
 1992-1993 Undergraduate Committee, Dept. of Geography.

**F. OTHER**

**Workshop Participant:**

- 1998 "Wolf Creek Research Workshop". Sponsored by Environment Canada, Whitehorse.  
 1997 "Environmental Resource Group Meeting for the PSL2 Assessment of releases from copper and zinc smelters and refineries". Sponsored by Environment Canada, Ottawa.  
 1997 "Arctic Archipelago Project Planning Meeting". Sponsored by Dept. Sponsored by Dept.

- of Indian Affairs and Northern Development, Iqaluit, Nunavik.
- 1997 "Nunavik and Northern Labrador Contaminants Action Plan Meeting". Sponsored by Dept. of Indian Affairs and Northern Development, Kuujuaq, Nunavut.
- 1997 "Northern Contaminants Research Results Workshop". Sponsored by Dept. of Indian Affairs and Northern Development, Victoria 1997, Calgary 1996, Winnipeg 1994, Burlington 1993.
- 1994 Yukon Contaminants Workshop. Organized by Yukon Contaminants Committee. Whitehorse, Yukon.
- 1993 "Evaluating the Benefits of Water Quality Improvements". Sponsored by the Ontario Ministry of Environment and Energy.
- 1990 & 1991 "Bay of Quinte Remedial Action Plan Workshop". Two workshops sponsored by the Ontario Ministry of Environment.

***Referee for Reports:***

- 1994 "Lower Don Lands Site Characterization and Remedial Options Study". Review for the Waterfront Regeneration Trust.
- 1993 "Niagara River (Ontario) Stage I RAP Report". Review for the Great Lakes Regional Office, International Joint Commission. Review included oral presentation at public information meeting in Niagara Falls, Ontario.
- 1991 "Arsenic and its Compounds, Priority Substances List Assessment Report". Review for Government of Canada, Health and Welfare Canada and Environment Canada under the Canadian Environmental Protection Act (CEPA).

***Referee for Journals and Monographs:***

Environmental Science and Technology  
 Science of the Total Environment  
 Journal of Great Lakes Research  
 Water Environment Federation  
 Mercury as a Global Pollutant: Towards Integration and Synthesis.

***Referee for Grant Proposals:***

- 1997 Minnesota Sea Grant College Program
- 1997 Hudson River Foundation
- 1996 National Science Foundation.
- 1993 Great Lakes Research Fund.

***Miscellaneous:***

- 1997 Judge for Chandler-Misener Award, International Association for Great Lakes Research.
- 1997 Co-chair, "Modeling chemicals in the Great Lakes: What have we learned? Where do we go from here?" International Association for Great Lakes Research 1997 Conference, Buffalo, N.Y.

**James W. Gillett Director**

Superfund Basic Research and Education Program (NIEHS)  
Professor of Ecotoxicology, Department of Natural Resources  
216 Rice Hall, Cornell University, Ithaca, NY 14853-30116

8527

(607) 255-2163 or 255-7004 [FAX] (607) 255-0238 [E-Mail] jwg3@cornell.edu

(607) 257-2447

Born: Sept. 18, 1933, Kansas City, Kansas

Education B.S. in Chemistry (Honors)  
Ph.D. in Biochemistry

University of Kansas  
University of California, Berkeley

1955  
1962

Positions Held

1992-pres. Director, Superfund Basic Research and Education Program, Cornell Univ.  
1986-1992 Director, Institute for Comparative and Environmental Toxicology, Cornell University  
1983-pres. Professor of Ecotoxicology, Department of Natural Resources, Cornell University  
1974-1983 Research Ecologist and Research Environmental Scientist, Corvallis Environmental Research Laboratory, USEPA  
1969-1974 Associate Professor, Department of Agricultural Chemistry, Oregon State University  
1964-1969 Assistant Professor, Department of Agricultural Chemistry, Oregon State University  
1962-1964 Post-graduate Research Chemist, Department of Entomology and Parasitology, University of California, Berkeley  
1955-1961 Research and teaching assistant, Department Biochemistry, University of California, Berkeley  
1957-1958 NSF Pre-doctoral Fellow, University of California  
1954-1955 Research assistant, Blood Fractionation Laboratory, University of Kansas

Professional Associations

Presently I am a member of the Graduate Fields of Environmental Toxicology and of Natural Resources at Cornell.  
I have been a member of the following societies:

Society of Environmental Toxicology and Chemistry [Board of Directors (1984-88); Editorial Board of *Environmental Toxicology and Chemistry* (1981-84); Editor, *Hazard Assessment* (1988-92); Special Technical Editor (1992-94); By-Laws Committee (1978-9); Pres., N.E. North American Regional chapter (1985-6); Chrm., Regional Activities Committee (1985-89)]; American Association for the Advancement of Science, American Chemical Society (Agrochemicals Div.), New York Academy of Sciences, Controlled Release Society, Sigma Xi (honorary research), Phi Lambda Upsilon (honorary chemistry), Alpha Chi Sigma (professional chemistry)

Honors and Awards

Summerfield Scholar, American Institute of Chemists' Medal, University of Kansas (1955); National Science Foundation Pre-doctoral Fellowship, University of California (1957-58); Outstanding Faculty Research Award, Dept. of Agricultural Chemistry, Oregon State University (1969); Faculty Development Award, Oregon State University (1971); Listed in *American Men and Women of Science* (1970), *Who's Who in Authors* (1971), and *Who's Who in the East* (1985); Scientific and Technological Achievement Award in Ecological Research, 1984-Office of Research and Development/USEPA [*Environ. Toxicol. Chem.* 2:463-476 (1983)]; Elected Faculty Council of Representatives, Cornell University (1984-86; 1988-91; 1992- ); Science Advisory Group on Water Quality Standards, New York State Department of Environmental Conservation (1985- ); Science Advisory Panel on Environmental Biology (1988-91) and Science Advisory Board, Scientific and Technological Achievement Awards Committee (1986-1991)/Office of Research and Development /USEPA; Urban Environmental Protection Task Force (Chrm.), National Association of State Universities and Land Grant Colleges (1988-93); Biotechnology Science Advisory Committee/USEPA (1989-91); Committee on Remedial Action Priorities for Hazardous Waste Sites/Board on Environmental Science and Toxicology/National Academy of Science (1991-94); SETAC-ESA Committee on Workshop for "Sustainability-based Environmental Management."

Present Consultations (last five years)

Cornell-Community Waste Management Advisory Council\*; Abt Associates, Inc.; RCG Hagler, Bailley Inc.; Paulson and Cooper, PC.; 3M Company, Center for Environmental Information; \*Akwesasne Health Services (Mohawk Tribal Council); \*NYS Dept of Environmental Conservation; US Environmental Protection Agency/Office of Toxic Substances, Office of Research & Development; US Fish and Wildlife Service; University of Missouri; Louisiana State University; \*National Science and Engineering Research Council (Canada); Monsanto; \*FMC Corp.; \*Center for Great Lakes Research; McNeil

Laboratories; The Cadmus Group; Chemical Manufacturers Assn; Research & Evaluation Associates, Inc; Eastern Research Group, Inc.; American Newspaper Publishers Assn; University of California; Blackwell Scientific Publ.; PEER Consultants, P.C.; expert witness (plaintiffs) for four trials *re* chlordane and aldrin contamination from termiticide use; \*frequent reviewer of MSS for *Science* and other journals † = pro bono).

#### Cornell University Service

Freshman Soccer Coach (1983-84); Ecosystems Research Center Internal Advisory Comm (1983-90); Dept Safety Officer and CALS Safety Comm (1984-87; 1989-93; 1995- ); Environmental Affairs Comm., Chrm., and State-wide Advisory Comm., American Indian Program (1984-1993); AIP Steering Committee (1993-95); Dept Curriculum Comm (1984-86); University Health Careers Evaluation Comm (1987-91); Review Comm for Cornell Inactive Chemical Disposal Site (1989-92); CALS Financial Aid and Scholarship Comm (1989-91; chair 1990-91); Univ. Comm on Academic Freedom and Professional Status of the Faculty (interim: Sp'90, elected 1993-1996; chair, 1995-1996); Executive Committee of the Faculty Council of Representatives (1995-1996); Center for the Environment Advisory Council (1991- ); President's Academic Leadership Program (1993-1997); University Library Comm. (1996-1999); Radiation Disposal Site Science Advisory Comm. (1996- ); Governor's Ecological Risk Reduction Work Group (1996- ); CALS Comm. on Academic Diversity & Resources (1997-01) numerous ad hoc committees for reviews of promotion and/or tenure.

#### **BIBLIOGRAPHY (with comment)**

##### **Books and Major Reports**

- Gillett, J.W. (1962). "Synthesis and Properties of L-glycero-Tetrolucose 1-Phosphate (L-Erythrulose 1-Phosphate) and Some Studies on Myoinositol and Myoinositol Phosphates", under the direction of C.E. Ballou, University of California, Berkeley, CA 188pp. [Ph.D. thesis]
- Gillett, J.W. (ed and publisher) (1970). *The Biological Impact of Pesticides in the Environment* (Proceedings of the symposium held June, 1969, at Oregon State University). Environmental Health Sciences Series No. 1, Oregon State University, Corvallis, OR. 210pp. [sold out 2500 copies]
- Gillett, J.W., J. Hill, IV, A.W. Jarvenin, and W.P. Schoor (1974). *A Conceptual Model for Movement of Pesticides through the Environment*, Ecological Research Series EPA-660/3-74-024. National Ecological Research Laboratory - National Environmental Research Center, U.S. Environmental Protection Agency, Corvallis, OR. 79pp. [Most requested reprint, >7500 copies distrib. on request]
- Witt, J.M., J.W. Gillett, and C.J. Wyatt (eds.) (1979). *Terrestrial Microcosms and Environmental Chemistry* (Proceedings of the colloquia at Corvallis, OR., June, 1977). NSF/RA-70-0026. National Science Foundation, Washington, DC. 1478pp.
- Gillett, J.W., and J.M. Witt (eds.) (1979). *Terrestrial Microcosms* (Proceedings of the workshops at Otter Crest and Portland, OR., in June and Dec., 1977). NSF-RA-79-0034. National Science Foundation, Washington, DC. 34pp.
- Gillett, J.W., S.A. Levine, M.A. Harwell, M. Alexander, D.A. Andow, and A.M. Stern (eds.) (1985). *Potential Impacts of Environmental Release of Biotechnology Products: Assessment, Regulation, and Research Needs*. ERC-075. Ecosystems Research Center, Cornell University, Ithaca, NY. 241pp. [see also, J.W. Gillett (ed.), *Environ. Management* 10:433-566 (1986)].
- Lewis, R.A., J. Gillett, J.C. Van Loon, J.M. Hushon, J.L. Ludke, and A.P. Watson (eds.) (1985). *Richtlinien fuer den Einsatz von Umweltprobenbanken in der Bundesrepublik Deutschland auf oekologischer Grundlage. Umweltforschungsplan des Bundesministers des Innern*. [Guidelines for the Role of Environmental Specimen Banking in the Federal Republic of Germany on an Ecologic Basis. Environmental Research Plan of the Ministry of the Interior.], Universitaet des Saerlandes, Saarbruecken, W. Germany.
- Gillett, J.W. (ed.) (1987). *Prospects for Physical and Biological Containment of Genetically Engineered Organisms* (Proceedings of the Shackleton Point Workshop, Bridgeport, NY, Oct. 1985). ERC-114. Institute for Comparative and Environmental Toxicology, Cornell University, Ithaca, NY. 135 pp.
- Lynch, B.D., and J.W. Gillett (1990). *Right to Know: Opportunity to Learn* (Proceedings of the CUPCET Symposium IV, Albany, NY, Oct. 1989) Institute for Comparative and Environmental Toxicology, Cornell University, Ithaca, NY.
- Gillett, J.W. et al. (1991). *Peer Review of "Land Disposal of Sludge from Paper and Pulp Mills Using Chlorine and Chlorine-Bleaching Processes: Proposed Rule" for Human Dietary and Ecological Risks*. Report to U.S. Environmental Protection Agency. Peer Consultants, Rockville, MD.

**Reviews and General Papers**

- Gillett, J.W. (1971). Induction in different species, IN A. Tabori (ed.), *Proceedings of the Second International Congress of Pesticide Chemistry*, Vol. II. Science Publishers, Inc. New York, NY. pp. 197-235.
- Gillett, J.W., J.R. Harr, F.T. Lindstrom, D.A. Mount, A.D. St. Clair, and L.J. Weber (1972). Evaluation of human health hazards on use of dichlorvos (DDVP), especially in resin strips. *Residue Rev.* 44:115-160. [Early use of chemodynamic modelling in health risk assessment]
- Gillett, J.W., J.R. Harr, A.D. St. Clair, and L.J. Weber (1972). Comment on the distinction between hazard and safety in evaluation of the human health hazard on use of dichlorvos (DDVP), especially in resin strips. *ibid.* 161-180.
- Gillett, J.W. (1978). Terrestrial laboratory microcosms: Relationship to water resources. IN P. Klingman (ed.), *Toxic Materials in the Aquatic Environment*, WR-024-078. Water Resources Research Institute, Oregon State University, Corvallis, OR. pp. 17-42.
- Gillett, J.W. (1980). Terrestrial microcosm technology in assessing fate, transport, and effects of toxic chemicals, Chapter 17. IN R. Hague (ed.), *Dynamics, Exposure, and Hazard Assessment of Toxic Chemicals*, Ann Arbor Press, Ann Arbor, MI. pp. 231-50.
- Gillett, J.W., and J.M. Witt (1980). Chemical evaluation: Projected application of microcosm technology, IN J.P. Giesy, Jr. (ed.), *Microcosms in Ecological Research*. (Proceedings of the Symposium in Augusta, GA., in Aug., 1979). U.S. Department of Energy Symposium Series No. 52. (CONF-781101). U.S. Technical Information Service, Springfield, VA. pp. 1008-34.
- Gillett, J.W. (1981). Model ecosystems in fate and movement of toxicants, IN M. Beroza (ed.), *Test Protocols for Environmental Fate and Movement of Toxicants*, (Proceedings of the Symposium, 94th annual meeting in Arlington, VA). Association of Official Analytical Chemists, Arlington, VA. pp. 214-232.
- Mount, D., and J.W. Gillett (1982). Impact of pollution on wildlife and habitat resources, IN W.T. Mason (ed.), *Research on Fish and Wildlife Habitat*, EPA-600/8-82-022. U.S. Environmental Protection Agency, Washington, DC. pp. 143-164.
- Gillett, J.W. (1985). Annex A: The role of microcosms in specimen banking and monitoring, IN R.A. Lewis, J. Gillett, J.C. Van Loon, J.M. Hushon, J.L. Ludke, and A.P. Watson (eds.), *Richtlinien fuer den Einsatz von Umweltprobenbanken in der Bundesrepublik Deutschland auf oekologischer Grundlage. Umweltforschungsplan des Bundesministers des Innern*. [Guidelines for the Role of Environmental Specimen Banking in the Federal Republic of Germany on an Ecologic Basis. Environmental Research Plan of the Ministry of the Interior.], Universitaet des Saarlandes, Saarbruecken, W. Germany. pp. A-1-9.
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- Gillett, J.W. (1985). Risk assessment methodologies for biotechnology impact assessment. Chapter VI. IN J.W. Gillett et al. (eds.), *Potential Impacts of Environmental Release of Biotechnology Products: Assessment, Regulation, and Research Needs*, ERC-075. Ecosystems Research Center, Cornell University, Ithaca, NY. pp. 137-171. [see also *Environ. Management* 10:515-532 (1986)].
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- Gillett, J.W. (1990). Possibilities and limitations of short-term tests for ecotoxicologic effects: Terrestrial approaches. Chapter 19. *ibid.* pp. 313-324.

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- Gillett, J.W. (1968). No-effect level of DDT in induction of microsomal epoxidation. *J. Agric. Food Chem.* 16:295-7.
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- Gillett, J.W. (1969). Microsomal epoxidation: Effect of age and duration of exposure to dietary DDT on induction. *Bull. Environ. Contam. Toxicol.* 4:159-68.
- Gillett, J.W., and G.H. Arscott (1969). Microsomal epoxidation in Japanese quail: Induction by dietary dieldrin. *Comp. Biochem. Physiol.* 30: 580- 600.
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- Gillett, J.W., and J.D. Gile (1975). Progress and status report on in-house system, IN L. Axelrod (ed.) *Substitute Chemicals Program - First Year of Progress*. Office of Pesticide Programs, U.S. Environmental Protection Agency, Washington, DC.
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- Gillett, J.W., and J.D. Gile (1976). Pesticide fate in terrestrial laboratory ecosystems. *Intern. J. Environ. Sci.* 10:15-22.
- Haefner, J.W., and J.W. Gillett (1976). Aspects of mathematical modeling and microcosm research, IN *Environmental Modeling and Simulation*, W.R. Ott (ed.). EPA 600/9-76-016. U.S. Environmental Protection Agency, Washington, DC. pp. 624-9.
- Gile, J.D., and J.W. Gillett (1979). The fate of <sup>14</sup>C-dieldrin in a simulated terrestrial ecosystem. *Arch. Environ. Contam. Toxicol.* 8: 107-24.
- Gile, J.D., and J.W. Gillett (1979). Terrestrial microcosm evaluations of substitute chemicals, IN J.M. Witt et al. (eds.), *Terrestrial Microcosms and Environmental Chemistry*, (Proceedings of the Colloquia held at Corvallis, OR., June, 1977). NSF/RA 79-0026. National Science Foundation, Washington, DC. pp. 75-85.
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- Gile, J.D., J.W. Gillett, and J.C. Collins (1980). Fate of selected herbicides in a terrestrial laboratory microcosm. *Environ. Sci. Technol.* 14: 1124-8.
- Gile, J.D., J.C. Collins, and J.W. Gillett (1980). Fate of selected fungicides in a terrestrial laboratory ecosystem. *J. Agric. Food Chem.* 27: 1159-64.
- Gile, J.D., and J.W. Gillett (1981). Transport and fate of organophosphate insecticides in a terrestrial laboratory ecosystem. *J. Agric. Food Chem.* 29:616-21.
- Gile, J.D., J.C. Collins, and J.W. Gillett (1982). Fate and impact of selected wood preservatives in a terrestrial model ecosystem. *J. Agric. Food Chem.* 30:295-301.
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- Gillett, J.W., M.B. Knittel, E. Jolma, and R. Coulombe (1983). Application of microbial toxicity assays to assessment problems. *Environ. Toxicol. Chem.* 2:185-93.
- Gillett, J.W. (1983). A comprehensive pre-biologic screen for ecotoxicologic effects. *Environ. Toxicol. Chem.* 2:463-76. [STAA/USEPA award, 1984]
- Shirazi, M.A., B. Lighthart, and J.W. Gillett (1984). A method for scaling biological response of soil microcosms. *Ecol. Modeling* 23:203-26.
- Lipton, J., and J.W. Gillett (1991). Uncertainty in ocean dumping health risks: Influence of bioconcentration, commercial fish landings and seafood consumption. *Environ. Toxicol. Chem.* 10:967-976.
- Lipton, J., and J.W. Gillett (1992). Uncertainty in risk assessment: Exceedence frequencies, acceptable risk, and risk-based decision making. *Regulat. Toxicol. Pharmacol.* 15:51-62.
- Ram, R.N. and J.W. Gillett (1992). An aquatic/terrestrial foodweb model for polychlorinated biphenyls (PCBs). IN: J. Hughes, W. Landis and M. Lewis (eds) *Environmental Toxicology and Risk Assessment*. First ASTM Symposium on Ecological Risk Assessment, Atlantic City, NJ. American Society for Testing and Materials, Philadelphia, PA. pp. 192-212.
- Ram, R.N. and J.W. Gillett (1993). Comparison of alternative models to predict the uptake of chlorinated hydrocarbons by oligochaetes. *Ecotoxicol. Environ. Safety* 26:166-180.
- Keating, G.A., T.E. McKone, and J.W. Gillett (1997). Measured and estimated air concentrations of chloroform in showers: effects of water temperature and aerosols. *Atmos. Environ.* 31:123-130.

#### Miscellaneous Papers and Reports

- Gillett, J.W., J.B. Miaullis, J. Karinen, J. Lambertson, R.D. Schonbrod and L.C. Terriere (1967). *Metabolism of Mobam<sup>TM</sup> in rats, bean plants, and houseflies*. Tech. report to Mobil ChemCo., Rahway, N.J. 65pp.
- Witt, J.M., and J.W. Gillett (1970). Pesticides, pollution, and regulation. IN *The Biological Impact of Pesticides in the Environment*, J.W. Gillett (ed.). (Proceedings of the Symposium held June, 1969, at Oregon State University). Environmental Health Sciences Series No.1, Oregon State University, Corvallis, OR. pp. 204-5.
- Gillett, J.W., J.R. Harr, F.T. Lindstrom, D.A. Mount, and A.D. St. Clair (1971). *Evaluation of human health hazards on use of dichlorvos resin strips*, Task Force Report to the Environmental Health Science Center, Oregon State University, Corvallis, OR. 71pp.

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- Gillett, J.W. (1979). Terrestrial microcosm program, IN J.M. Witt et al. (eds.) *Terrestrial Microcosms and Environmental Chemistry*, (Proceedings of the Colloquia held at Corvallis, OR., June, 1977). NSF/RA-79-0026. National Science Foundation, Washington, DC. pp55-6.
- Gillett, J.W., and S.S. Jasanoff (1987). Preparing expert testimony *The Scientist* 1:14,28.
- Gillett, J.W. et al. (1989). Protecting the urban environment. Report of task force to National Association of State Universities and Land Grant Colleges, Washington, DC.
- Gillett, J.W., and N. Mondy (1990). Natural toxicants in food *IS Agric. Life Sci. Quarterly* 19(3):19-23.
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- Gillett, J.W. (1990). Dwelling on danger (editorial) *Environ. Toxicol. Chem.* 9:401-2.
- Gillett, J.W., S.M. Fetter, J.H. Hartig and F.B. Taub (1993). Sustainability-based urban environmental management, IN L. Barnhouse, ed. *Sustainability-Based Environmental Management* (Workshop sponsored by Ecological Society of America and Society of Environmental Toxicology & Chemistry, Pellston, MI, Aug. 25-30, 1993).
- Keating, G.W. and J.W. Gillett (1994). Dermal and inhalation exposure to volatile organic compounds in contaminated shower water. Environmental Protection Contract 4810-100-187040-36 Report to New Jersey Department of Environmental Protection and Energy, Trenton, NJ. 25 pp.
- Suter, G.W. II, J.W. Gillett and S. Norton. (1994) Characterization of Exposure, IN W.Wood, ed. *Ecological Risk Assessment Issue Papers*. EPA63/R-94/009. Risk Assessment Forum. US Environmental Protection Agency, Washington, DC.
- Edick, R. and J.W. Gillett (1997). Ecological risk at Superfund sites: Not present or not assessed? NIEHS Symposium: Superfund Basic Research Program: A decade of improving health through multi-disciplinary research. Raleigh, NC., Feb. 24, 1997.

#### Computer Programs

- Gillett, J.W., and D.T. Sedlak (1987). PBS (Ver 2.0). Instructions and documentation of the Pre-Biologic Screen for Ecotoxicologic Effects. (In IBM BasicA, with database and graphics).

#### Workshops and Symposia Managed

- Biological Impact of Pesticides in the Environment*. Oregon State University, Corvallis Or. Sponsored by OSU Environmental Health Sciences Center. (1969)
- Modelling Pesticide Fate in the Environment*. U.S. Environmental Protection Agency, Corvallis, OR. Sponsored by USEPA/Alternative Chemicals Program. (1974)
- Terrestrial Microcosms and Environmental Chemistry*. U.S. Environmental Protection Agency, Corvallis, Otter Crest and Portland, OR. Sponsored by NSF and USEPA. (1977)
- Prospects for Physical and Biological Containment of Genetically Engineered Organisms*: Cornell University, Ithaca and Bridgeport, NY. Sponsored by USEPA, Dow, DuPont, CIBA Geigy, and others. (1985)
- Right-to-Know: Opportunity to Learn*: Cornell University and Albany, NY. Sponsored by ATSDR, DuPont, Texaco, Mobil, 3M, and Hercules. (1989)
- Plant/Soil/Contaminant Interactions*. Cornell University. Sponsored by Superfund Basic Research & Education Program [NIEHS], Texaco, Bristol Myers Squibb (1994).

Updated 10/30/97

## CURRICULUM VITAE

### *Gordon Douglas Haffner*

Professor - Department of Biological Sciences  
Biology Building, Rm. 36  
University of Windsor  
Windsor, Ontario N9B 3P4

Phone: (519) 253-4232, Ext. 3449

Fax: (519) 971-3616

E-Mail - haffner@uwindsor.ca

#### POST SECONDARY EDUCATION:

Degree	University	Field	Year
B.Sc.	Queen's University	Biology/Chemistry	1967-71
Ph.D.	London (U.K.)	Biology	1971-74

#### EMPLOYMENT HISTORY:

1992-Present - Professor, University of Windsor, Dept. of Biological Sciences  
1992-1997 - Director, Great Lakes Institute for Environmental Research, Univ. of Windsor  
1986-1992 - Associate Professor, University of Windsor, Dept. of Biological Sciences  
1986-1992 - Associate Director, Great Lakes Institute for Environmental Research,  
University of Windsor

#### HONOURS AND AWARDS:

1992 Ontario Research Excellence Award in Water Quality  
1974-75 NSERC Postdoctoral Fellowship  
1971-74 Natural Environmental Research Council (England) Studentship

#### SCHOLARLY AND PROFESSIONAL ACTIVITIES

1997 Develop Toxicology Graduate Program, Pandajaran Univ. Bandung, Indonesia  
1997 Detroit River Heritage Committee  
1996-97 Essex Region Conservation Authority, Non-point Source Committee  
1993-97 Science Advisor, Limnological Research Centre Indonesia  
1995-97 NSERC Marine Sciences Workgroup  
1995 Session Chair, SETAC, Vancouver  
1994-96 Member Science Advisory Board, International Joint Commission  
1994 Conference Chair, International Association for Great Lakes Research/Estuarine  
Research Federation, Windsor, Ontario

1991-1994	Member, Council Great Lakes Research Managers, International Joint Commission
1989-1992	President, International Association for Great Lakes Research
1991-1994	NSERC National Committee (GLURF)
1990-1991	Chair, Detroit River Remedial Action Program
1990	Conference Chair, International Assoc. for Great Lakes Research, Windsor, ON
1986-1991	Canadian Representative, UNESCO IHP-IV Program

### RESEARCH FUNDING

Applicants	Proposed Title & Funding Source	Amount Per year	Total	Years
HAFFNER, G.D.	Organic contaminants in fish. DFO	\$16,000	\$16,000	1997
HAFFNER, G.D.	DDE in ospreys, NBS Oregon	\$24,000	\$24,000	1997
HAFFNER, G.D.	Trophodynamics of contaminants NSERC	\$21,000	\$84,000	1997
HAFFNER, G.D.	MNR-EYC - Decline of Amphibians in SW Ontario	\$ 13,765.00	\$ 13,765.00	1996
HAFFNER, G.D.	MNR-EYC - Causes of Amphibian Decline in SW Ontario	\$ 11,583.00	\$ 11,583.00	1995
HAFFNER, G.D.	MOEE-EYC - Ecotoxicology of Zebra Mussels	\$ 10,154.00	\$ 10,154.00	1994
HAFFNER, G.D. with others	NSERC-GLURF - \$597,000/yr Principle Investigator - Lake Erie Study	\$ 60,000.00	\$ 60,000.00	94-95
HAFFNER, G.D. H. MacIsaac	MOE-RAC Zebra Mussels & Contaminant Dynamics	\$ 50,000.00	\$ 50,000.00	93-94
HAFFNER, G.D. K. Adeli	NSERC-GLURF (Genotoxicity in the Detroit River)	\$ 60,000.00	\$ 60,000.00	93-94
HAFFNER, G.D.	NSERC-Operating	\$ 17,100.00	\$ 51,300.00	92-95
HAFFNER, G.D. C. Metcalfe	NSERC-GLURF Ecotoxicology of Coplanar PCBs	\$ 75,000.00	\$225,000.00	92-95
HAFFNER, G.D.	MNR-EYC Contaminant in Zebra Mussels	\$ 21,000.00	\$ 21,000.00	92
HAFFNER, G.D.	NSERC-GLURF			

R. Thomas	Walpole Island	\$ 60,000.00	\$120,000.00	91-92
HAFFNER, G.D.	NSERC-Environment Canada Principle Investigator - Genotoxicity In the Detroit River	\$100,000.00	\$200,000.00	91-93
HAFFNER, G.D. C. Metcalfe	NSERC-Environment Canada Coplanar PCBs	\$ 75,000.00	\$150,000.00	91-92
HAFFNER, G.D.	NSERC - Operating	\$ 10,000.00	\$ 30,000.00	89-92
HAFFNER, G.D.	MOE - Long Term Biomonitoring	\$200,000.00	\$600,000.00	89-92
HAFFNER, G.D.	NSERC - Pelagic-Benthic Coupling	\$ 10,000.00	\$ 10,000.00	89

**GRANTS FOR CONTRACT RESEARCH:**

Year	Grantor	Amount
1996-98	City of Windsor (Organic Pollutants in Sewers) - Analytical	\$ 40,000.00/yr
1996-98	City of Windsor (Biomonitoring in Detroit River) - Analytical	\$ 11,988.00/yr
1996-97	Great Lakes Prot. Fund (Biomonitoring in St. Clair River - Analytical	\$ 18,000.00/yr
1995-96	Chippewas of Sarnia (Environmental Health Monitoring - Res/Anal.	\$147,000.00/yr
1995-96	National Biological Survey, Corvallis, Oregon - Analytical	\$ 99,000.00/yr
1995-96	Northwest Territories - Analytical	\$ 2,500.00/yr
1995-96	Canada Wildlife Service - Analytical	\$ 5,000.00/yr
1995-96	Environment Canada - Analytical	\$ 5,000.00/yr
1994-95	Environment Canada (PCB Congeners) - Analytical	\$ 23,800.00/yr
1994-95	Parks Canada (Point Pelee, Analysis of Marsh Fauna) - Research	\$ 19,700. 00/yr
1994-95	ADM-AGRI Industries - Research and Analytical	\$ 2,000.00/yr
1994-95	Northwest Territories - Analytical	\$ 72,300.00/yr
1994-95	Fisheries and Oceans Canada - Research	\$ 18,000. 00/yr
1994-95	Canadian Wildlife Service - Analytical	\$ 25,000.00/yr
1993-94	City of Windsor (Biomonitoring) - Research	\$ 24,000.00/yr
1993-94	Canadian Wildlife Service - Analytical	\$ 75,000.00/yr
1992-93	Northwest Territories - Analytical	\$ 93,000.00/yr
1992-93	MOEE - Environment Canada Detroit River Study - Research	\$ 24,000.00/yr
1992	Northwest Territories - Analytical	\$ 73,000.00/yr
1991-93	Canada Wildlife Services - Analytical	\$ 50,000.00/yr
1989-92	City of Windsor - MOEE - Research	\$ 70,000.00/yr
1990-91	Ontario Ministry of Natural Resources (PCBs in Wildlife) - Research	\$ 35,000.00/yr
1990-91	Ontario Ministry of Natural Resources (Contaminants in Wildlife) - Res	\$ 28,000.00/yr
1990-91	Environment Canada, National Water Research Institute - Research	\$ 28,000.00/yr

1990	Ontario Ministry of Natural Resources (Mobility of Contaminants In Wetlands) - Research	\$ 9,000.00/yr
1989-90	Ontario Ministry of Natural Resources (Coplanar PCB Study in Mink) Research	\$ 35,000.00/yr
1988-89	Ontario Ministry of Natural Resources (Contaminants in <i>In Situ</i> Waterfowl) - Research	\$ 19,500.00/yr
1988-89	Canada Wildlife Service, (Contaminants in Wildlife) - Analytical	\$ 30,000.00/yr
1988	Employment Immigration Canada - Training/Educational	\$ 95,000.00/yr

**PUBLICATIONS (Lifetime)**

Books	2
Chapters in Books	3
Papers in Refereed Journals	50
Papers in Refereed Conference Proceedings	15
Technical Reports	21
Abstracts and/or papers Delivered	90
Other Publications	4

**UNDERGRADUATE COURSES TAUGHT AT THE UNIVERSITY OF WINDSOR:**

55-344 (Limnology) Aquatic Ecology II	Winter	1996	
55-334 Ecotoxicology	Fall	1995	
55-334 Ecotoxicology	Winter	1995	
55-334 Ecotoxicology	Fall	1994	
55-334 Ecotoxicology	Winter	1994	
Sabbatical	Fall	1993	
	Winter	1993	
55-334 Ecotoxicology	Fall	1992	
55-235 Great Lakes Systems	Fall	1992	
55-234 Great Lakes Field Biology	Intersession	1992	
55-200 Applied Ecology	Fall	1991	
55-235 Great Lakes Systems	Fall	1991	
55-234 Great Lakes Field Biology	Intersession	1991	
55-235 Great Lakes Systems	Fall	1990	
55-234 Great Lakes Field Biology	Intersession	1990	
55-400 Undergraduate Research	Winter		1990 &
	Fall	1989	
55-480 Great Lakes Field Biology	Intersession	1989	
55-200 Applied Ecology	Fall	1989	
55-480 Great Lakes Field Biology	Intersession	1989	
55-480 Great Lakes Field Biology	Intersession	1988	
55-480 Great Lakes Biology	Intersession	1989	
55-400 Undergraduate Research	Winter		1989
55-400 Undergraduate Research	Fall	1988	
55-480 Great Lakes Biology	Intersession	1988	

55-438 Great Lakes Field Biology  
 55-344 Limnology (with P. Hebert)  
 56-400 Problems Course Botany

1988

**400 Undergraduate Research**

- Epplett, Tara. 1996. Trophic dilution of contaminants.  
 Gillan, Katherine. 1996. Genotoxicity in amphibian populations.  
 Starcevic, Richard. 1993. Use of *Dreissena polymorpha* as a potential biomonitor of environmental contaminants: Lake St. Clair.  
 Drouillard, Ken G. 1993. Uptake of organochlorines by the mayfly *Hexagenia* using sequential and simultaneous harvest techniques.  
 Laviolette, D. 1992. Factors regulating contaminant distributions in aquatic food webs of wetland habitats.  
 Leadley, T. 1992. Re-examination of the feeding strategies and the extent of habitat partitioning in forage fish.  
 A. Fisk. 1991. Toxicokinetics in zebra mussels.  
 E. Mazak. 1991. Bioaccumulation in forage fish.  
 S. Coristine. 1991. Toxicokinetics of forage fish.  
 T. Yankovitch. 1991. Invasion rates of *Dreissena polymorpha*.

**GRADUATE COURSES TAUGHT AT THE UNIVERSITY OF WINDSOR:**

55-601 Ecotoxicology	Winter	1996
55-602 Ecotoxicology	Fall	1996
55-797 Thesis Research	Winter	1996 &
	Fall	1995
55-601 Ecotoxicology	Winter	1995
55-602 Ecotoxicology	Fall	1995
55-797 Thesis Research	Winter	1995 &
	Fall	1994
55-601 Ecotoxicology	Winter	1994
55-602 Ecotoxicology	Fall	1994
55-797 Thesis Research	Winter	1994 &
	Fall	1993
55-797 Thesis Research	Winter	1993 &
	Fall	1992
55-601 Special Topics - Ecotoxicology	Fall	1992
55-797 Thesis Research	Winter	1992 &
	Fall	1991
55-602 Special Topics - Ecotoxicology	Winter	1991
55-797 Thesis Research	Winter	1991 &
	Fall	1990

**THESES SUPERVISED:**

**Students Completed**

H. Morrison, Ph.D., May 1996 - Food web models for contaminants.  
 T. Leadley, M.Sc., April 1996 - Tumors in brown bullheads.  
 R. Russell, Ph.D., April 1996 - Contaminant dynamics in aquatic ecosystems.  
 S. Coristine, M.Sc., Aug. 1995 - Dynamics of PCBs.  
 A. Vamvakas, M.Sc., Oct. 1995 (with Dr. Dufresne) - AHH Induction.  
 S. Koslowski, M.Sc., Aug. 1993 - Trophic enrichment of coplanar PCBs in aquatic food webs.  
 Bedard, D.C., M.Sc. 1990 - Factors influencing the bioaccumulation of chlorinated hydrocarbons by *Hexagenia* nymphs using laboratory toxicokinetic studies and field biomonitoring.  
 Hebert, C., M.Sc., 1990 - Factors regulating organochlorine contaminant levels in forage fish from the Huron-Erie corridor.  
 Gray, I., M.Sc., Mar. 1987 - Factors Regulating Phytoplankton Abundance.

#### THESES CO-READ:

Evans, H., Ph.D. 1991. Univ. of Toronto, completed.  
 Dunnigan, M., M.Sc. 1991. Periphyton as a resource base for stream macro-invertebrates.  
 Kovats, Z., M.Sc. 1990. Biomonitoring protocols for adult aquatic insects. University of Windsor.  
 Ferguson, M., M.Sc. 1989. University of Trent, Peterborough.  
 Craig, S., Ph.D. 1986. Queen's University. Picoplankton ecology in a meromictic lake.

#### POSTDOCTORAL FELLOWS

Dr. J. Whyte, 1997 -98  
 Dr. R. Russell, 1996 - 97  
 Dr. B. Hasspieler, 1994-1996 - Continuing  
 Dr. Y. Couillard, 1994-1996 - now with INRS-EAU, Quebec. Collaborative work continuing  
 Dr. F. Gobas, 1988-1991 - (now Chair, Renewable Res. Dept., Simon Fraser University)

#### INTERNATIONAL RESEARCH

1991-1997	Indonesian Institute of Science (LIPI). Environmental assessment and toxicological study in the Malili Lakes District. Program will develop estimates of lake production, limnological status and toxicological stress (due to mining).
1986-1990 Netherlands/France.	UNESCO. Flow Regimes and Environmental Network Data.
1976	UNESCO. Tejo Estuary Study, Portugal.

#### LIST OF PUBLICATIONS

Books Edited or Co-edited

- Haffner, G. D. and J. Chacko. 1991. Societal Impact of International Water Management. Centre for Canadian-American Studies, University of Windsor. ISBN0-919498-24-8. 237 p.
- Chacko, J. and Haffner, D. 1989. Trans-boundary Air Quality. Centre for Canadian-American Studies. University of Windsor. ISSN 0284-1103 129 p.

#### Chapters Contributed to Books

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- Hebert, C.E., Haffner, G.D. and Muncaster, B.W. 1988. Factors affecting contaminant levels in forage fish species. IAGLR Conf. Great Lakes Res. McMaster, Hamilton, Ont.
- Bedard, D.C., Haffner, G.D. and Ciborowski, J.H. 1988. Dynamics of 14<sub>c</sub>-hexachlorobenzen<sub>c</sub> in the burrowing may fly, *Hexagenia limbata* after exposure to contaminated water and sediment. IAGLR Conf. Great Lakes Res. McMaster, Hamilton, Ontario.
- Haffner, G.D. 1988. Factors regulating community structure in epilimnetic and metalimnetic phytoplankton assemblages. Br. Phycol. Soc. Lancaster England.
- Haffner, G.D., Weis, M. and Montour, L. 1987. Organochlorinated compounds in resident and migration duck populations of Walpole Island. In. Assoc. Great Lakes Res. Ann Arbor, Michigan.
- Innes, D., Muncaster, B., Hebert, P. and Haffner, G.D. 1987. Use of the freshwater mussel as a biomonitor. Tech. Conf. Proc. MOE. Toronto, Ont.
- Haffner, G.D. 1987. A summary of the air quality issue in Canada. Can. Am. Seminar. Univ. of Windsor, Windsor, Ont.
- Haffner, G.D. 1987. The development and use of water quality objectives. Wat. Qual. Seminar. Windsor, Ont.
- Haffner, G.D. 1987. Foodweb dynamics and contaminants. MOE Workshop on Foodwebs. Toronto, Ontario.
- Innes, D., Muncaster, B., Hebert, P. and Haffner, G.D. 1987. Use of the freshwater mussel as a biomonitor. Tech. Conf. Proc. MOE. Toronto Ont.
- Haffner, G.D. 1986. A Water Quality Branch Strategy for the assessment of the quality of aquatic environments. I.W.D. Scientific Series, Hull, Quebec. 45 pp.

- Haffner, G.D. 1986. Biomonitoring in perspective. Biological Monitoring Workshop. Environment Canada. Burlington, Ontario.
- Blachford, D. and Haffner, G.D. 1985. The role of sediments in water quality assessments. IWD Workshop. Environment Canada. Ottawa, Canada.
- Haffner, G.D. 1985. The role of sediments in water quality assessments. IWD Workshop. Environment Canada. Ottawa, Canada.
- Haffner, G.D. 1983. The Great Lakes; Heritage and Legacy. Great Lakes Tomorrow Conference. Windsor, Ontario.
- Haffner, G.D. and Gray, I. 1980. Phosphate uptake dynamics in tundra ponds. Limnol. Oceanogr. Conf. Wisconsin.
- Haffner, G.D. 1979. Temporal and spatial patterns of phytoplankton succession in the Laurentian Great Lakes. Freshwater Jubilee Symp., Lancaster University, July 1979.
- Haffner, G.D. and M.K. Jarai. 1977. Phytoplankton production in unstable water columns. Limnol. & Oceanogr. Conf., Lansing, Michigan.
- Haffner, G.D. and J.H. Evans. 1977. Phytoplankton ecology in Thames Valley Reservoirs. Br. Phycol. Soc. Royal Holloway College. Abstract Br. Phycol. J. 12, 1977.
- Haffner, G.D. and M.D. Palmer. 1975. Artificial Mixing of Hamilton Harbour. Limnol. & Oceanogr., Savannah, Georgia.
- Haffner, G.D. and J.H. Evans. 1973. Phytoplankton distribution. Br. Phycol. Soc., January 1973.

#### Other Papers Published

- Haffner, G.D. and Lovett Doust, L. 1990. Lake St. Clair fish contaminant study. Spec rpt to MOE

#### Gov't or Contract Research Reports

- Haffner, G.D. 1992. Little River comprehensive stream assessment. City of Windsor. Pollution Control Division. 101 pp.
- Haffner, G.D. and Mazak, E. 1991. Contaminant mobility in Seaway Island. Prepared for the National Water Research Institute, Env. Canada, Burlington, Ont.
- Haffner, G. D. and E. Mazak. Assessment of mobility of contaminant at the Seaway Island Confined Disposal Facility, Lake St. Clair, Ontario. National Water Research Institute. Env. Canada. Burlington. 67 pp.
- Haffner, G.D. and F.A.P.C. Gobas. 1990. Biological monitoring of organic contaminants in Lake St. Clair and the St. Clair River. MOE Final Report Oct. 1990.
- Haffner, G.D. and F.A.P.C. Gobas. 1990. Long term biomonitoring in the Huron-Erie Corridor. MOE. Oct. 1990. 106 pp.
- Haffner, G.D. and L. Lovett Doust. 1990. Contaminants in fish populations of Lake St. Clair. Oct. 1990. 90 pp.
- Haffner, G.D. 1990. Contaminants in Wildlife. C.W.S. Tech. Report.
- 1987 Organochlorinated compounds in duck populations of Walpole Island. Great Lakes Inst. Tech. Report.
- 1987 Toxic Contaminants in the Great Lakes Ecosystem. Int. Joint Commission. Great Lakes Regional Office. Windsor, Ontario.
- 1987 Pesticide Usage in the Great Lakes Basin. Int. Joint Commission.
- 1987 Water Quality Issues in Canada. UNESCO. 14pp.

- 1985 The Water Quality Branch Strategy for the Assessment of the Quality of Aquatic Environments. 19 pp. IWD, Hull, Quebec.
- 1980 Biologically available forms of phosphorus in natural waters. Rpt. of Science Advisory Bd., I.J.C. Windsor, Ontario.
- 1980 Great Lakes International Surveillance Plan. International Joint Commission. Windsor, Ontario.
- 1979 Appendix B. Report of the Surveillance Subcommittee to the Great Lakes Water Quality Board. I.J.C.
- 1978 Appendix B. Report of the Surveillance Subcommittee to the Great Lakes Water Quality Board. I.J.C.
- 1978 Artificial Mixing of Hamilton Harbour. Ont. Min. of the Env., Toronto, Ontario.
- 1978 The Hamilton Harbour Study 1976. Ont. Min. of the Env., Toronto, Ontario.
- 1975 Dredging Impact of the Lower Great Lakes. Prepared for Chemex Labs Ltd., Calgary, Alberta.
- 1971a Ecological Survey of Killbear Provincial Park. Ontario Ministry of Natural Resources, Toronto, Ontario.
- 1971b Ecological Survey of the Round Lake District, Parry Sound. Ontario Ministry of Natural Resources, Toronto, Ontario.

#### **Invited Addresses**

- 1996 Spatial and Temporal Trends of Contaminants in Lake Erie, Univ. of Toronto, ON
- 1996 Food Web Dynamics of toxic chemicals. Erindale College, Mississauga, Ontario
- 1994 Lake Erie Ecotoxicology SUNY Brockport.
- 1994 Great Lakes Res. University of Buffalo.
- 1994 Research Consortium, Keynote address. Ohio State University.
- 1993 Issues in Limnology. Indonesian Society for Limnology.
- 1993 Issues in Limnology. Indonesian Society for Limnology.
- 1992 Dynamics and Effects of Coplanar PCBs. NWRI Seminar Series. Burlington, ON.
- 1992 PCBs in aquatic ecosystems. Univ. of Michigan.
- 1990 Contaminant in food webs. Queen's University.
- 1990 Contaminants in Food Webs. Trent University Graduate Seminar Series. Oct.
- 1988 Challenges for Joint Water Management. Binational Conference on Societal Impact of International Water Management. Univ. of Windsor. 30th Annual Conference Centre for Canadian-American Studies.
- 1987 Water Quality Liaison Committee Seminar. Water Quality Objectives.
- 1987 Centre for Canadian-American Studies. Transboundary Air Quality. May 22.

#### **Workshops Offered**

- 1994 International Association for Great Lakes Res. Univ. of Windsor.
- 1991 Red River-Quappelle Study: Winnipeg, Manitoba.
- 1991 Biomonitoring in the Souris River. WQB-Env. Can. Souris River Workshop. Feb.
- 1990 Conference Chairman, Int. Assoc. Great Lakes Research, University of Windsor, May.
- 1985 Workshop on Water Quality Monitoring Statistics. October 1985. NWRI-WQB. In Press.

1977 Coastal Processes Conference. Sundridge, Ontario. Int. Assoc. Great Lakes Res. -  
Ontario Ministry of the Environment. Toronto, Ontario. Canada.

#### **CREATIVE ACTIVITY:**

Developed and implemented Great Lakes Biology Co-operative Program. (1988-92).

#### **RESEARCH DEVELOPMENTS:**

Developed with Dr. K. Adeli a novel *in vitro* assay to quantify human health effects of environmental chemicals.

Development and participation in the Genotoxicity Research Group, University of Windsor.

Calibrating trophic enrichment of coplanar PCBs. Determining process and rate of chemical uptake via food.

#### **UNIVERSITY INVOLVEMENT:**

1991-92 Member, Iona College Environmental Committee. 1991-92.  
1991 Principal Investigator on behalf of the University of Windsor for Green Plan Eco-Research Program.  
Lead for developing Research Chair in Ecosystem Studies at Univ. of Windsor

#### **SERVICE TO THE PROFESSION:**

Session Chair: 1995 SETAC Conference.  
Member: 1993-1996 Science Advisory Board. International Joint Commission.  
Organizer: 1994 Conference of In. Assoc. Great Lakes Res.  
Member: Council of Great Lakes Research Managers. International Joint Commission.  
Member: NSERC Representative to G.L.U.R.F. (National Review Team).  
Chair: Ontario Universities Great Lakes Research Network. (N.B. in 1990 this group developed the Great Lakes University Research Fund; \$1,000,000/yr.) 1991-present.  
President: IAGLR. Elected May 1989-1993 (1100 Scientific Members).  
Member: International Joint Commission Connecting Channels work group.  
Canadian Representative to UNESCO IHP Project on Experimental Research Basins.

#### **PROFESSIONAL/NON-PROFESSIONAL SERVICE TO THE COMMUNITY:**

1996 Key Note Speaker: Project Green's Industrial, Commercial and Institutional Program. Windsor, Ontario.  
1996 Panelist: "Education and Business, Partners for Progress and Survival"

1994 Windsor & District Chamber of Commerce, Windsor, Ontario  
Organizer: Citizens Forum on Lake Erie. Univ. of Windsor.  
1991-93 Member, Great Lakes Strategic Advisory Committee. Env. Can.  
1989-90 Chair, Detroit River Binational Public Advisory Committee  
1986-90 Member, of Windsor-Essex Environmental Advisory Committee.  
1988-92 Member, Detroit River Binational Public Advisory Committee  
1988-89 Member of Windsor-Essex Environmental Advisory Committee.  
1987-88 Member of Windsor-Essex County Water Quality Liaison Committee.  
Member of Walpole Island Boundary Negotiation Team.  
Member of the Int. Joint Commissions Work Group on Connecting Channels.  
Consulting Editor, Cobblestone Vol. 9. (5). 1988.

**RESUME**

**ALAN WALTER MAKI**

**Business  
Address:**

Exxon Company, U.S.A.  
600 Jefferson St., Suite 943  
Houston, Texas 77002

**Home  
Address:**

[REDACTED]

**Telephone:**

[REDACTED]

**Personal:**

[REDACTED]

**Career  
Goals:**

To provide a scientifically sound data base for environmental decision-making, guide ecologically sound resource development, and provide guidance for environmental policy in private and governmental sectors. Research Interests: The design of research programs to assess and predict the consequences of man's activities on the structure, function and productive capacity of natural ecosystems.

**Education:**

Ph.D. - 1974, Aquatic Biology  
Michigan State University; East Lansing, Michigan 48823  
Thesis: The Effects and Fate of Introduced Lampricide  
(3-trifluormethyl-4-nitrophenol) in the Lotic Environment

M.S. - 1971, Aquatic Biology  
North Texas State University; Denton, Texas 76203  
Thesis: Influence of Sublethal Pesticide Levels on Respiratory  
Activity of Selected Aquatic Animals

B.S. - 1969, Fisheries Biology  
University of Massachusetts; Amherst, Massachusetts 01002

**Experience:** February 1990 - Present

Environmental Advisor for Exxon Company U.S.A., Houston, Texas.

**Responsibilities:** Scientific study design and integrity of the environmental damage assessment studies for the Exxon Valdez oil spill. Identify and obtain key expert witnesses. Guide development of database system to manage environmental data resulting from the assessment studies. Integration of all biological and chemical data taken throughout the program. Interpret ecological significance of findings for Corporate management. Provide expert witness testimony for Congressional committees and for Alaska Oil Spill Commission. Develop plans with expert witnesses for data interpretation, write-up, preparation of expert witness testimony, and eventual publication of study results.

March 1989 - February 1990

Program Manager - Exxon Valdez oil spill, Valdez and Anchorage, Alaska.

**Responsibilities:** Design and manage the ecological damage assessment program for the Exxon Valdez oil spill. Identification, mobilization, and management of a staff of over 350 environmental professionals and technicians to collect and analyze data describing the ecological impacts of the spill. Mobilize and manage the wildlife rescue and rehabilitation program for the spill impact areas. Provide ecological guidance to spill clean-up program including design, testing, and implementation of new clean-up technology and environmental assessment of alternatives. Conduct negotiations with State and federal agency staff and management concerning all ecological aspects of the spill and clean-up program.

January 1986 - March 1989

Senior Environmental Scientist, Exxon Company U.S.A., Alaska Operations, Anchorage, Alaska

**Responsibilities:** Assignment involved the total range of environmental consultation support to ensure long-term compatibility of oil development interests with a sensitive Arctic environment. Management and review of ecological research and monitoring programs concerning impacts of oil field development on arctic fish, caribou, waterfowl and marine mammals. Program includes permit negotiations for oil field production and expansion operations. Environmental monitoring, research and review of federal regulatory programs, toxicological support for groundwater contamination problems, hazardous waste disposal, regulatory permitting of new projects and environmental cleanup of abandoned sites, environmental assessments of air and water discharges and general toxicology consultation.

**Experience:  
(continued)**

September 1984 - January 1986

Toxicology Unit Head, Research and Environmental Health Division, Exxon Corporation, East Millstone, New Jersey.

**Responsibilities:** Supervision and management of staff of four senior staff toxicologists. Responsibilities include program administration, budget preparation and stewardship for toxicology program responsive to Corporate needs and current issues. Program includes research into new methods for predictive toxicology, review and response to OECD and EEC regulatory initiatives, new product PMN reviews, expert witness testimony and wide variety of toxicological assessments and professional reviews.

October 1983 - September 1984

Toxicology Associate, Research and Environmental Health Division, Exxon Corporation, East Millstone, New Jersey.

**Responsibilities:** Increased responsibility for scientific toxicological representation of oil industry interests within trade organizations - Chemical Manufacturers Association, American Petroleum Institute and within U.S. and International regulatory forums. Direct and provide guidance to Senior Corporate Management concerning health and environmental issues impacting business practices.

December 1981 - October 1983

Senior Toxicologist, Research and Environmental Health Division, Exxon Corporation, East Millstone, New Jersey.

**Responsibilities:** Develop Research Guidance Study defining priority and scope of Corporate environmental research and safety function. Implement a program providing for predictive assessments regarding environmental impacts of Corporate business practices. Provide guidance and liaison with state, federal and international regulatory agencies concerned with the development of efficient, effective environmental regulations and legislation.

July 1978 - December 1981

Section Head, Environmental Safety Department, Procter & Gamble Company, Cincinnati, Ohio.

**Responsibilities:** Supervision and management of a staff of 12 professionals. Research activities include methods development and methods application concerning the investigation of fate and effects of introduced substances in the aquatic environment. Specific programs include laboratory and field toxicological investigations, on-site production plant impact analyses, microbiology of waste-water treatment and microbial toxicity, biodegradation methodology, physical and mathematical modeling of waste-water treatment systems and natural receiving waters.

**Experience:**  
**(continued)**

1974 - July 1978

Program Manager, Environmental Safety Department, Procter & Gamble Company, Cincinnati, Ohio.

**Responsibilities:** Design and construction of aquatic toxicology and environmental testing laboratory facility. Acute and chronic test method development for macroinvertebrate and fish species. Use of fish physiological responses to predict chronic toxicity. Development of model ecosystem test methods to assess the effects of chemical substances on the structure and function of aquatic communities. Computer modeling of stress-related effects on aquatic ecosystems.

1972 - 1974

Graduate Research and Teaching Assistant, Department of Fisheries & Wildlife, Michigan State University

**Responsibilities:** Developed a research proposal leading to a contract with the Bureau of Sport Fisheries & Wildlife to investigate the toxicology of the larval lampricide, TFM (3-trifluoromethyl-4-nitrophenol) in the lotic environment on non-target stream species.

1969 - 1971

Graduate Research and Teaching Assistant, Department of Biological Sciences, North Texas State University -

**Responsibilities:** Designed and constructed flowing water polarographic respirometer for research in field of toxicant effects on respiration and physiology of aquatic invertebrates and fish.

1970 - 1971

Consulting for Owens-Illinois Paper Company; Orange, Texas. Evaluation of kraft mill effluent on benthic invertebrates and water chemistry of Sabine River.

1967 - 1969

Biologist Aid, Massachusetts Cooperative Fisheries Unit, University of Massachusetts; Amherst, MA.

**Grants:**

1984

Co-investigator on API and EPA grant to organize, conduct and publish a workshop: Influence on sediments on the fate and effects of chemicals in the aquatic environment.

1982

Co-investigator on API, EPRI, CMA and EPA grant to organize and conduct a workshop: Environmental Hazard Assessment of Effluents, August 1982.

**Grants:  
(continued)**

1981

Co-investigator on EPA grant to organize and conduct a workshop: Modeling the Fate of Chemicals in the Aquatic Environment, August 1981.

1972 - 1974

Research Contract with Fish Control Laboratory, Bureau of Sport Fisheries & Wildlife, LaCrosse, WI.

1971

Environmental Protection Agency, FWQA, Pre-doctoral Traineeship, Michigan State University.

1969 - 1971

Environmental Protection Agency, FWQA, Master's Traineeship, North Texas State University, and Graduate Teaching Assistantship.

1967 - 1969

Office of Water Resources Research Grant, Massachusetts Cooperative Fisheries Unit, University of Massachusetts.

**Memberships:**

<u>Society</u>	<u>Member</u>	<u>Officer</u>
Society of Environmental Toxicology and Chemistry	1980	Executive Board 1981 - 84 Vice President, 1982 President, 1983
American Fisheries Society	1968	Assoc. Editor 1978-79
American Society of Limnology and Oceanography	1975	
North American Benthological Society	1970	Executive Committee 1978 - 79
American Institute of Biological Sciences	1975	
Sigma Xi	1974	

**Editorial  
Responsibilities:**

Journal of Environmental Pathology, Toxicology and Oncology.  
Associate Editor, 1979-93.

Environmental Toxicology and Chemistry, Editorial Board,  
1982-84.

Transactions of the American Fisheries Society, Associate Editor,  
1977-79.

**Advisory and  
Committee  
Activities:**

Member USEPA Science Advisory Board, Executive Committee, 1994  
to present.

Member USEPA Science Advisory Board, 1992-1994.

Appointed to National Academy of Sciences Committee on Risk  
Assessment Methodology, May 1990 - May 1993.

Consultant to USEPA Science Advisory Board, 1991-1992.

Co-chairman: National Research Council Workshop on Ecological  
Risk Assessment, Airlie, Va., February 26 - March 1, 1991 (co-chaired  
with L. W. Barnhouse and D. Warner North).

Invited peer-review participant. Review of ecological risk assessment  
research within EPA. May 20-22, 1991, Calloway Gardens, GA.

Invited peer review participant and chairman. Environmental  
toxicology program review. USEPA Laboratory - Duluth, Minnesota.  
June 12-14, 1989.

Appointed to Environmental Committee, 1987-1989, Alaska Oil and  
Gas Association.

Appointed to National Science Foundation Consultative Workshop  
Panel: "Arctic Five-Year Research Plan", November, 1986 to April,  
1987. Anchorage, Alaska. Topic: Health and ecosystem research  
needs.

Appointed chairman: Environmental Risk Assessment Subcommittee,  
1987, Oil Field Production Waste Committee, Alaska Oil and Gas  
Association via American Petroleum Institute.

**Advisory and  
Committee**

**Activities:  
(continued)**

Appointed chairman: 1986-1989, Biological Resources Subcommittee, Alaska Oil and Gas Association.

Appointed chairman: 1986-1989, Caribou Task Group, Alaska Oil and Gas Association.

Appointed to National Research Council/National Academy of Sciences panel on "Ecological Research and Environmental Protection" convened in Krakow, Poland, October, 1987, and Washington, D.C., November, 1988. Topic: Environmental toxicology and waste management.

Industry Representative, Arctic Fisheries Coordinating Committee, 1987-88, U.S. Minerals Management Service (MMS).

Industry Representative, Bowhead Whale Task Group, 1986-present, Alaska Oil and Gas Association.

Chairman: Interface of offshore oil development with Arctic fish populations and nearshore water quality. American Fisheries Society Symposium, Annual Meeting, Fairbanks, Alaska, November, 1987.

Rene Dubos Invited Forum Series. Managing Water Resources. Invited forum participant and proceedings editor. February 21-22, 1985. New York Academy of Medicine, NY.

EPA Advisory Workgroup member and reviewer. Technical support document for water quality-based toxics control, EPA Office of Water, Washington, D.C., September, 1985. 74 pp.

Co-chairman, Workshop on the Role of Sediments in Regulating the Fate and Effects of Chemicals in Aquatic Environments. August 13-17, 1984, Florissant, Colorado. Jointly funded by USEPA and American Petroleum Institute. Proceedings in press, co-chaired by K. Dickson, North Texas State University and W. Brungs, EPA, Narragansett, Rhode Island.

Invited peer review participant. Water quality program. USEPA Laboratory - MERL, Cincinnati, Ohio. March 13-14, 1984.

**Advisory and  
Committee  
Activities:  
(continued)**

Co-chairman: Workshop on Environmental Hazard Assessment of Effluents, Cody, Wyoming, August 22-27, 1982. Jointly funded by USEPA, Electric Power Research Institute and Chemical Manufacturers Association. Proceedings published by Pergamon Press. Co-chaired with H. Bergman, University of Wyoming and R. Kimerle, Monsanto Co. Workshop series has been instrumental in defining and providing guidance for EPA policy regarding predictive assessments of toxic substances in the environment.

Chairman, Extra-mural Toxicology Peer Review Panel, U.S. EPA Gulf Breeze Environmental Research Laboratory, Florida, June, 1983.

Panel member, Toxicology Review Panel, U.S. EPA Corvallis Environmental Research Laboratory, Corvallis, Oregon, April, 1983.

Chairman, American Petroleum Institute (API), Water Quality Criteria Task Force, 1982 - 1986.

Member, Working Party on Natural Environmental Effects, International OECD Hazard Assessment Project, 1981-82.

Chairman, Aquatic Toxicology Peer Review Committee, U.S. EPA Gulf Breeze Environmental Laboratory, Gulf Breeze, Florida, 1981.

Program Chairman, Second Annual Meeting of the Society of Environmental Toxicology and Chemistry, "Research and Decision Criteria in Environmental Risk Assessment," Arlington, Virginia, November, 1981.

Member, Society of Environmental Toxicology and Chemistry (SETAC), Board of Directors, 1981-83.

Member, Chemical Industry Institute of Toxicology (CIIT), Expert Panel on Aquatic Toxicology and Environmental Sciences, 1981.

American Fisheries Society, Environmental Concerns Committee, 1978-80. Author: AFS Policy Statement, "Toxic Substances in the Environment."

Microcosm Scientific Advisory Group, U.S. EPA Athens, Georgia Laboratory, 1978.

**1998NAME:** Thanos Nicolas Pyplanicolaou, Ph.D.

[REDACTED]  
Tel: [REDACTED] (H)  
Tel: [509]-335-2144 (O)  
E-mail: *apapanic@wsu.edu*

**EDUCATION:**

- Ph.D. 1997** Virginia Polytechnic Institute and State University,  
Department of Civil and Environmental Engineering
- M.S. 1993** Virginia Polytechnic Institute and State University,  
Department of Civil and Environmental Engineering
- B.S. 1990** Aristotle's University of Thessaloniki, Greece,  
Department of Civil Engineering

**POSITIONS:**

- 8/97-present** Assistant Professor, Department of Civil Engineering, WSU
- 1/94-7/97** Research Assistant, Department of Civil Engineering, VPI&SU
- 8/91-12/93** Teaching and Research Assistant, Department of Civil Engineering, VPI&SU
- 9/89-12/90** Field Engineer, Themeliodomi Engineering Company, Thessaloniki, Greece

**AREA OF EXPERTISE:**

Sediment transport; transport of pollutants; Computational Fluid Dynamics; Image analysis;  
Experimental hydraulics

**HONORS/AWARDS:**

- United States Geological Survey research fellowship (Virginia Tech research grant), 1992-1996  
Fellowship from the International foundation Alexander S. Onassis, 1994-1997  
Fellowship from the N.A.T.O. Science Fellowships, 1990-1992  
Travel Funds Award from The Graduate Student Assembly of Virginia Tech, 1991-1992  
National Dean's List, 1992-1993  
Lifetime member of the National Civil Engineering Honor Society, Chi Epsilon  
Award from the Technical Chamber of Greece, 1988-1989  
First individual overall, Aristotle's University of Thessaloniki, 1984-1989  
Scholarship from the Greek Foundation for State Scholarships, 1984-1989

## **SERVICE:**

- Reviewer for the Journal of Hydraulic Engineering, ASCE, 1994-present
- EIT Instructor
- Advisor of graduate /undergraduate students (One of his undergraduate students won the best research paper award throughout the University (WSU)).

## **AFFILIATIONS:**

- Member of the American Society of Civil Engineers (ASCE)
- Member of the American Geophysical Union (AGU)
- Member of the Greek Society of Civil Engineers
- Member of the Greek Engineering Chamber
- Member of the American Water Resources Association (AWRA)
- Member of the ASCE Hydraulics probabilistic Modeling committee
- Member of the ASCE Turbulent committee

## **PUBLICATIONS:**

Diplas, P. and A. Papanicolaou. *Batch analysis of slurries in zone settling regime*. Journal of Environmental Engineering, ASCE, Vol. 123, No. 7, pp.659-667, 1997.

Papanicolaou, A. and P. Diplas. *Numerical solution of a non - linear model for self-weight solids settlement*. Journal of Applied Mathematical Modeling, pp. 343-349, No. 21998.

Dancey, C., M. Balakrishnan, P. Diplas, and A. Papanicolaou. *The Spatial Inhomogeneity of Turbulence above a Fully-Rough Surface in Open Channel Flow*. Accepted for publication at the Journal of Experiment in fluids, ASME.

Dancey, C., M. Balakrishnan, P. Diplas, and A. Papanicolaou. *The Spatial Inhomogeneity of Turbulence above a Fully-Rough Surface in Open Channel Flow*. Accepted for (refereed) publication in the Proceedings of the ASME Fluids Engineering Summer Meeting, Washington, D.C. June 21-25, 1988.

Papanicolaou, A., P. Diplas, M. Balakrishnan, and C.L. Dancey. *Computer Vision Techniques for Sediment Transport*. Journal of Computing in Civil Engineering, ASCE.

Papanicolaou, A. and P. Diplas. *A Critical Review of Existing Zone Settling Modes*. Published at the Proceedings of the ASCE Hydraulics Engineering sessions at Water Forum, August 1992. Baltimore, pp. 735-740.

Papanicolaou, A. and P. Diplas. *Parameters Influencing Solids - Liquid Separation in*

***Suspensions of High Solids Concentration.*** Published at the Proceedings of the 1992 Annual Conference of KRIKOS Organization. Restoration and Protection of the Environment in the 90's, August 1992. Thessaloniki, Greece, pp. 107-113.

**Diplas, P. and A. Papanicolaou.** *Design of Thickening Ponds Operating in the Zone Settling Regime.* Published at the Proceedings of the International Symposium. Land Reclamation: Advances in Research and Technology, ASAE, December 1992. Nashville, Tennessee, pp.105-109.

**Papanicolaou, A. and P. Diplas.** *Development of a Visual Method to Track the Movement of Solid Particles in a Laboratory Flume.* Published at the Proceedings of the 1994 ASCE Symposium on Fundamentals and Advancements in Hydraulic Measurements and Experimentation in Buffalo, NY. pp. 213-218.

**Papanicolaou, A., Balakrishnan, M., Diplas, P. and C.L. Dancy.** *Effects of particle packing on bedload motion.* Published at the Proceedings of the International Conference of the ASCE in San Antonio, TX, pp.712-715.

**Papanicolaou, A. and P. Diplas.** *Numerical solution of a non-linear model for self-weight solids settlement,* published at the 2nd National Congress on Computational Mechanics, June 26-28, 1996, pp.502-509.

**Papanicolaou, A., Balakrishnan, M., Diplas, P., and C.L. Dancy.** *A Note on the Incipient Motion of River Sediment Particles,* published at the proceedings of the 11th ASCE Engineering Mechanics Conference in Florida, May19-22, 1996, pp.657-660.

**Balakrishnan, M., Dancy, C.L., Papanicolaou, A. and P. Diplas.** *The spatial distribution of Reynolds stress above a packed bed of spherical particles in open channel flow,* published at the proceedings of the 11th ASCE Engineering Mechanics Conference in Florida, May19-22,1996, pp. 665-668.

**Papanicolaou, A. and P. Diplas.** *Effects of turbulent flow on stream ecology,* published at the proceedings of the International conference KRIKOS in Greece, August 28 - 30, 1996, pp. 132-138

**Papanicolaou, A. and P. Diplas.** *The use of imaging tools in bedload motion,* Abstract presented at the 1996 AGU Spring meeting in Baltimore, May 20-23, 1996.

**Diplas, P., A. Papanicolaou and J. Fripp.** *Bedload Transport in Gravel - Bed Streams at Low Shear Stresses.* Presented in the Fifth International Sedimentation Conference in Germany, 1991.

**Balakrishnan, M., A. Papanicolaou, C.L. Dancy, and P. Diplas.** *Single point Reynolds stress pdf's in fully-rough open channel flow,* presented at the Turbulence Symposium, organized by the ASME/ASCE/SES, in Evanston, IL, 1997.

**Papanicolaou, A., P. Diplas, M. Balakrishnan, and C.L. Dancy.** *The Role of Turbulent Stresses in the Initiation of Sediment Motion,* Abstract accepted for publication at the Proceedings of the ASCE Hydraulics Engineering sessions at Water Forum, August 1998, Memphis TN.

Papanicolaou, A., Barber M., and B. Trent. *Grate Hydraulic Performance*. To be submitted to the Journal of Experimental Techniques.

Papanicolaou, A. and P. Diplas. *The Role of Clusters in the Entrainment Process of Sediment*. Accepted for publication at the Proceedings of the conference Protection and Restoration of the Environment IV, Halkidiki, Greece

Papanicolaou, A., P. Diplas. *Non-linear Settlement of Solids Due to Their Self-Weight*. Abstract accepted for publication at the Proceedings of the ASCE Hydraulics Engineering sessions at Water Forum, August 1998, Memphis TN.

Diplas, P., A. Papanicolaou, P. Kanellopoulos. *A Unified Criterion for the Initiation of Motion of Sediment Particles*. Submitted to the 6<sup>th</sup> International Sedimentation conference (*Invited paper*).

Dancey, C., M. Balakrishnan, P. Diplas, and A. Papanicolaou. *Correlation between the incipient Motion of a Single ball and Instantaneous Fluid Velocity in a Turbulent Open Channel Flow*. Abstract accepted for publication at the Proceedings of the ASCE Hydraulics Engineering sessions at Water Forum, August 1998, Memphis TN.

Papanicolaou, A. *A Discussion on the Incipient Motion Criteria*. Abstract submitted to the conference and annual meeting of the Society for Ecological Restoration: Turning the Tide, October 28-30, 1998.

Papanicolaou, A., Muhunthan, B., and P. Diplas. *Numerical model for non linear self-weight consolidation of soils*. Abstract accepted for publication at the proceedings of the 35<sup>th</sup> Annual Technical Meeting, Society of Engineering Science, September 27-30, 1998.

Papanicolaou, A. and W. Vanderwaal. *Hydraulic Design of Fish Passages*. Abstract submitted to the conference and annual meeting of the Society for Ecological Restoration: Turning the Tide, October 28-30, 1998.

Papanicolaou, A. and A. Schuyler. *Formation of Clusters in gravel Bed Streams*. Abstract submitted to the conference and annual meeting of the Society for Ecological Restoration: Turning the Tide, October 28-30, 1998.

Schuyler, A., A. Papanicolaou, and M. Barber. *Critical review of Bridge Scouring Processes*. Abstract submitted to the conference and annual meeting of the Society for Ecological Restoration: Turning the Tide, October 28-30, 1998.

#### OTHER PUBLICATIONS:

Papanicolaou, A., P. Diplas, M. Balakrishnan, and C.L. Dancey. *The Role of Turbulent Shear Stresses on Bedload Motion in Gravel Bed Streams*. Report prepared for the United States Geological Survey, Blacksburg, VA, July, 1997.

**WORK IN PREPARATION:**

**Papanicolaou, A., P. Diplas, M. Balakrishnan, and C.L. Dancey** *A Stochastic Incipient Motion Criterion*, To be submitted to the Journal of Fluid Mechanics.

**Balakrishnan, M., C.L. Dancey, A. Papanicolaou, and P. Diplas** . *The Role of Bursting Events on the Entrainment of a Single Sphere*, To be submitted to the Journal of Fluid Mechanics.

**Balakrishnan, M., C.L. Dancey, A. Papanicolaou, and P. Diplas** *Comparison of Turbulent Flows over smooth and rough surfaces*, To be submitted to the Journal of Experiments in Fluids.

**COLLABORATORS:**

- Dr. Panos Diplas, Civil and Environmental Engineering, Virginia Tech
- Dr. B. Muhunthan, Civil Engineering, Washington State University
- Dr. Pete Scariatos, Ocean Engineering, Florida Atlantic University
- Dr. Pierre Julien, Civil Engineering, Colorado State University
- Dr. C.L. Dancey, Mechanical Engineering, Virginia Tech
- Dr. David Stock, Mechanical Engineering, Washington State University
- Dr. Patrick Flynn, Computer Science, Washington State University

**ADVISEE:**

-Paul Kanellopoulos (M.Sc.); Bryan Trent; Adam Schuyler (M.Sc.), Chin King Hong (M.Sc.), Bill Vanderwaals.

**CURRENT AND PENDING SUPPORT:**

[REDACTED]

## Frank Wania

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**Born**

**Address**

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### University Degrees

- June 1995** Ph.D. in Chemical Engineering and Applied Chemistry, University of Toronto, Toronto, Canada.
- April 1989** "Hauptdiplom In Geoökologie" (undergraduate degree in geoecology), University of Bayreuth, Germany.
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### Details of Higher Education and Professional Experience

- since 1/1997** Independent research scientist, WECC Wania Environmental Chemists Corp. and part-time postdoctoral fellow at the Institute for Environmental Studies at the University of Toronto
- Research projects on modelling contaminant fate in the environment under contract from industry, government, NGOs and academia (for detail see below).
- 11/1994 - 12/1996** Research scientist at NILU, the Norwegian Institute for Air Research, Tromsø Department and affiliation with the Polar Environmental Center.
- Research projects on modelling the transport and accumulation of persistent organic contaminants globally and in polar regions, on the development, use and evaluation of a computer model of the behaviour of PCBs in the Baltic Sea, and on the snow surface area change and organic contaminant behaviour during snow pack metamorphosis.
- 9/1990 - 10/1994** Graduate studies at the Department of Chemical Engineering and Applied Chemistry, University of Toronto.
- Research project on measuring physical-chemical properties (vapour pressure, air-snow partition coefficients) of organochlorinated contaminants at low temperatures and model simulations of their global transport and arctic accumulation. Courses in environmental chemistry, atmospheric pollution and arctic ecology.
- Ph.D. thesis: "Temperature and Chemical Behaviour in the Environment - Towards an Understanding of the Global Fate of Persistent Organic Chemicals" under the supervision of Prof. D. Mackay.

5/1989 - 8/1990

**Research assistant at the Institute for Biochemical Plant Pathology at the "GSF - Forschungszentrum für Umwelt und Gesundheit" (Research Center for the Environment and Health) in München-Neuherberg, Germany.**

Involved in field and chamber simulation experiments performed to investigate aspects of the forest decline phenomenon widely observed in Central Europe.

10/1983 - 4/1989

**Undergraduate studies in "Geoökologie" (geo-ecology) at the University of Bayreuth, Germany.**

Specialised in environmental chemistry and toxicology, acquired skills in environmental analytical chemistry, concepts of contaminant fate and behaviour in the environment.

Completed courses in the basic sciences (chemistry, physics, biochemistry, ecology, mathematics), physical geography (hydrology, soil science, meteorology, geochemistry, geology) and scientific methodology (statistics, cartography, computer programming).

"Diplomarbeit" (thesis project): "Copper- and Flyash-Promoted Reactions of Polybrominated Dibenzo-para-Dioxins" under the supervision of Prof. O. Hutzinger.

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### **Additional Experience**

#### **Organisational:**

Co-organising of NMR-workshop on Assessment of the Sources, Atmospheric Fluxes, Environmental Cycling, Effects and Sinks of Persistent Organic Pollutants, Preston, U.K., April 30 - May 1, 1998.

Chairing of session on "Persistent, bioaccumulative and toxic substances PBTs" at the Annual SETAC meeting in Washington, November 1996, jointly with Dr. C. Cowan of Procter & Gamble.

Initiating, organising and chairing of special symposium "Global Fate of Persistent Organic Chemicals" at the Second SETAC World Congress, Vancouver, November 1995.

Initiating, organising and chairing of the internal seminar series within the Polar Environmental Centre, Tromsø, Norway, October 1995 - December 1996.

#### **Field work:**

Lancaster University field trip led by Prof. K.C. Jones for the sampling of vegetation and peat cores and installing of passive air sampling devices for persistent organic compounds along a latitudinal transect in Norway, Summer 1994.

Environment Canada field trip led by Dr. D.J. Gregor for the sampling and solvent extraction of snow and ice for persistent organic compounds in the Canadian Arctic Archipelago, Spring 1991.

#### **Teaching:**

Lecturer, graduate level course "Environmental Pathways", Institute for Environmental Studies, University of Toronto, spring term 1998, jointly with Prof. D. Mackay.

Supervision of J. Persson, Ph.D. student with Prof. D. Broman at Stockholm University, since August 1997.

Lecturer, summer school on the "Multidisciplinary Assessment of Contaminants in the Environment and of Risks for Human Health", Certosa di Pontignano, Italy, July 3-17, 1998.

Substitute Lecturer, undergraduate level course "Introductory Chemistry", Faculty of Engineering, University of Toronto, 1994.

Teaching Assistant, graduate level course "Occupational Hygiene Laboratory", Department of Chemical Engineering and Applied Chemistry, University of Toronto, 1991-1993.

**Professional:**

Member of the Editorial Board, AMBIO a Journal of the Human Environment, published by the Royal Swedish Academy of Sciences, starting spring 1998.

Member, North American Expert Advisory Panel on Continental Pollutant Pathways, Spring 1997.

Invited participant, Workshop on the Interactions of Nutrients and Toxicants in the Food Chain of Aquatic Ecosystems, Zeist, The Netherlands, September 16-17, 1996.

Invited participant, EU-MAST/NILU Workshop on Sea-Air Exchange Processes and Modelling, Kjeller, Norway, June 11-13, 1997.

Invited participant, International Workshop on Scaling of Trace Gas Fluxes Between Terrestrial and Aquatic Ecosystems and the Atmosphere, Bennekom, The Netherlands, January 18-22, 1998.

Regular referee for Environmental Science and Technology since 1995.

<b>Citizenship</b>	German. Canadian landed immigrant status.
<b>Marital Status</b>	Married.
<b>Languages</b>	Fluent in English and German. Proficient in Norwegian.
<b>Memberships</b>	American Chemical Society (ACS) Society of Environmental Toxicology and Chemistry (SETAC) Verband für Geoökologie in Deutschland e.V. (VGÖD)

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### **Scholarships and Awards**

1990/91	DAAD (German Academic Exchange Service) Scholarship
1990/91	Gertrud-Davis-Fellowship, University College, University of Toronto
1991-94	Scholarship by the Gottlieb Daimler-und-Carl Benz-Stiftung
1991-93	Resident Junior Fellowship, Massey College, University of Toronto
1994	John R. Brown Memorial Prize, University of Toronto
1994	Young Scientist Award, Society of Environmental Toxicology and Chemistry - Europe
1995	Nomination for Governor General's Gold Medal, University of Toronto

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### **Selected Projects**

In the following research projects I was or presently am principal investigator:

- Snow Surface Area and Snow Pack Behaviour of Persistent Organic Pollutants. Norwegian Research Council.
- Modelling the Seasonal Environmental Fate of Persistent Organic Pollutants. Nordic Council of Ministers.
- Identifying Sources, Quantifying Pathways, and Predicting Trends of HCHs and DDT in the Arctic Using Global Models. Department of Indian Affairs and Northern Development, Government of Canada.
- Quantifying the Atmospheric Delivery of Organic Contaminants into the High Arctic Marine Ecosystem as Influenced by Snow and Ice. Department of Indian Affairs and Northern Development, Government of Canada.
- Substantiating Criteria for Long Range Atmospheric Transport Potential and Persistence of Semi-Volatile Organic Chemicals Using Model Calculations. The Procter & Gamble Company.
- Interaction of Eutrophication and the Fate of Hydrophobic Organic Compounds in Aquatic Systems - A Modelling Approach. Swedish Environmental Protection Agency.
- Modelling the Behaviour of Persistent Organic Pollutants in the Gulf of Riga. Swedish Environmental Protection Agency.

In the following project I am presently project leader for the modelling component of the project:

- POPCYCLING-Baltic: Environmental Cycling of Selected Persistent Organic Pollutants (POPs) in the Baltic Region. European Union, Environment and Climate Research Programme.

## List of Publications and Selected Presentations

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### Refereed Publications

1. F. Wania, D. Lenoir, Copper-Promoted Reactions of Polybrominated Dibenzo-*para*-dioxins. *Chemosphere* 21, 417-432, (1990).
2. F. Wania, D. Mackay, Global Fractionation and Cold Condensation of Low Volatility Organochlorine Compounds in Polar Regions. *Ambio* 22, 10-18 (1993).
3. F. Wania, D. Mackay, An Approach to Modelling the Global Distribution of Toxaphene: A Discussion of Feasibility and Desirability. *Chemosphere* 27, 2079-2094, (1993).
4. F. Wania, Shiu, W.Y., D. Mackay, Measurement of the Vapor Pressure of Several Low Volatility Organochlorine Chemicals at Low Temperatures with a Gas Saturation Method. *Journal of Chemical and Engineering Data* 39, 572-577 (1994).
5. F. Wania, D. Mackay, A Global Distribution Model for Persistent Organic Chemicals. *Science of the Total Environment* 160/161, 211-232 (1995).
6. D. Mackay, F. Wania, Transport of Contaminants to the Arctic: Partitioning, Processes and Models. *Science of the Total Environment* 160/161, 25-38 (1995).
7. D. Mackay, F. Wania, W.H. Schroeder, Prospects for Modelling the Behavior and Fate of Mercury, Globally and in Aquatic Systems. *Water, Air and Soil Pollution* 80, 941-950 (1995).
8. J.T. Hoff, F. Wania, D. Mackay, R. Gilham, Sorption of Non-Polar Organic Vapors by Ice and Snow. *Environmental Science and Technology* 29, 1982-1989 (1995).
9. F. Wania, Spatial Variability in Compartmental Chemical Fate Modelling: Towards Linking Fugacity Models and Geographical Information Systems. *Environmental Science and Pollution Research* 3, 39-46 (1996).
10. F. Wania, D. Mackay. Tracking the Distribution of Persistent Organic Pollutants. *Environmental Science and Technology* 30, 390A- 396A, (1996).
11. W.Y. Shiu, F. Wania, H. Hung, D. Mackay. Temperature Dependence of Aqueous Solubility of Selected Chlorobenzenes, Polychlorinated Biphenyls and Dibenzo-furan. *Journal of Chemical and Engineering Data* 42, 293-297 (1997).
12. F. Wania, Speculations on the Vulnerability of Polar Ecosystems Towards Persistent Organic Pollutants: An Attempt at Polar Ecotoxicology. Accepted for publication in: R.G. Shearer (Ed.) *Global Significance of the Transport and Accumulation of Polychlorinated Hydrocarbons in the Arctic*, Plenum Press (1997).
13. F. Wania. Modelling the Behaviour of Non-Polar Organic Chemicals in an Ageing Snow Pack. *Chemosphere* 35, 2345-2363 (1997).
14. F. Wania, J. M. Pacyna, D. Mackay. Global Fate of Persistent Organic Pollutants, *Toxicological and Environmental Chemistry*, in press, 1997.

15. J. T. Hoff, D.J. Gregor, D. Mackay, F. Wania, C. Q. Jia. Measurement of the Specific Surface Area of Snow with the Nitrogen Adsorption Technique. *Environmental Science and Technology* 32, 58-62 (1998)
16. J.-E. Haugen, F. Wania, N. Ritter, M. Schlabach. Hexachlorocyclohexanes in Air in Southern Norway. Temporal Variation, Source Allocation, and Temperature Dependence. *Environmental Science and Technology* 32, 217-224 (1998).
17. F. Wania, J.-E. Haugen, Y. D. Lei, D. Mackay. Temperature Dependence of Atmospheric Concentrations of Semi-Volatile Organic Compounds. *Environmental Science and Technology* 32, 1013-1021 (1998).
18. F. Wania, D. Broman, J. Axelman, C. Näf, C. Agrell. A Multi-Compartmental, Multi-basin Fugacity Model Describing the Fate of PCBs in the Baltic Sea. In: Wulff, F., Larsson, P., and Rahm, L. (Eds.) *A Systems Analysis of the Changing Baltic Sea*, Springer-Verlag, in press.
19. F. Wania, J. Axelman, D. Broman. A Review of Processes Involved in the Exchange of Persistent Organic Pollutants Across the Air-Sea Interface. Accepted for publication in *Environmental Pollution*, January 1998.
20. F. Wania, J. T. Hoff, C. Q. Jia, D. Mackay. The Effects of Snow and Ice on the Environmental Behaviour of Hydrophobic Organic Chemicals. Accepted for publication in *Environmental Pollution*, January 1998.
21. E. Webster, D. Mackay, F. Wania. Evaluating Environmental Persistence. Accepted for publication in *Environmental Toxicology and Chemistry*, February 1998.
22. F. Wania. Multi-compartmental models of contaminant fate in the environment. *Biotherapy*, in press, 1998.

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#### Publications Presently Submitted

23. F. Wania, A. Strand. Introducing Atmospheric Layering in a Global Distribution Model for Persistent Organic Pollutants Based on the Fugacity Approach. Submitted to *Environmental Toxicology and Chemistry*, February 1998.
24. F. Wania, D. Mackay, Y.-F. Li, T.F. Bidleman. Global Chemical Fate of  $\alpha$ -Hexachlorocyclohexane. 1. Evaluation of a Global Distribution Model. Submitted to *Environmental Toxicology and Chemistry*, February 1998.
25. F. Wania, D. Mackay, Global Chemical Fate of  $\alpha$ -Hexachlorocyclohexane. 2. Use of a Global Distribution Model for Mass Balancing, Source Apportionment, and Trend Predictions. Submitted to *Environmental Toxicology and Chemistry*, February 1998.
26. F. Wania, R. Semkin, J.T. Hoff, D. Mackay, Modelling the Fate of Non-Polar Organic Chemicals During Snowpack Metamorphosis. Submitted to *Hydrological Processes*, April 1998.

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#### Published Conference Contributions (Proceedings)

27. F. Wania, D. Mackay, Temperature and the Global Distribution of Low Volatile Organic Compounds, In: A. Niimi, M. Taylor (Ed.), *Proceedings of the Eighteenth*

- 06/14/1998 10:51 4183774333
- Annual Aquatic Toxicity Workshop: September 30-October 3, 1991, Ottawa, Ontario.* Can. Tech. Rep. Fish. Aquat. Sci. 1863, 245-252.
28. F. Wania, D. Mackay, Revisiting the Cold Condensation Effect. In: N.Z. Heidam (Ed.), *Proceedings of the 5th International Symposium on Arctic Air Chemistry, Copenhagen, Denmark, September 8-10, 1992.* National Environmental Research Institute. NERI Technical Report No. 70, 1993.
  29. F. Wania, D. Mackay, S. Paterson, A. Di Guardo, N. Mackay, Compartmental Models in Environmental Science. In: A.A.M. Del Re, E. Capri, S.P. Evans, P. Natali, M. Trevisan (Ed.), *Proceedings of the IX. Symposium on Pesticide Chemistry - Mobility and Degradation of Xenobiotics, Piacenza, Italy, October 11-13, 1993.* Edizione G. Biagini, Lucca, 221-242.
  30. D. Berger, F. Wania, D. Mackay, Pathways of Toxic Substances in the Canadian Environment, *Proceedings of the 6th Conference on Toxic Substances, Montréal, Québec, Canada, May 10-11, 1994,* 279-293.
  31. D. Mackay, C. Q. Jia, J. T. Hoff, D. J. Gregor, F. Wania, The Behaviour of Organic Chemicals in Snow. In: E.C. Wolff, R.C. Bales (Ed.), *Chemical Exchange between the Atmosphere and Polar Snow,* Springer Verlag, Berlin, 587-593.
  32. F. Wania. Modelling the Interaction of Eutrophication and Hydrophobic Organic Contaminant Behaviour in Aquatic Systems. In: P.R.G. Kramer, D.A. Jonkers, L. van Liere (Eds.) *Interactions of Nutrients and Toxicants in the Food Chain of Aquatic Ecosystems.* RIVM report no. 703715001. National Institute of Public Health and the Environment, Bilthoven, The Netherlands.
  33. F. Wania, D. Mackay, Y.-F. Li. Persistent Organic Pollutants in the Arctic: Identifying Sources, Quantifying Pathways, and Predicting Trends. In: *The AMAP International Symposium on Environmental Pollution in the Arctic, Tromsø, June 1-5, 1997.* Extended Abstracts, 24-27.
  34. J. T. Hoff, C. Q. Jia, F. Wania, D. Mackay. Scavenging of Organic Vapors from the Arctic Atmosphere by Falling Snow Flakes. In: *The AMAP International Symposium on Environmental Pollution in the Arctic, Tromsø, June 1-5, 1997.* Extended Abstracts, 242-243.
  35. E. S. Heimstad, R. Kallenborn, F. Wania. Snow Surface Area and the Fate of Persistent Organic Pollutants in a Seasonal Snow Pack. In: *The AMAP International Symposium on Environmental Pollution in the Arctic, Tromsø, June 1-5, 1997.* Extended Abstracts, 400.
  36. F. Wania. What is Feasible with Respect to Atmospheric Transport Modelling of Persistent Organic Pollutants? A Call for Caution. In: *Report and Proceedings of the Workshop on the Assessment of EMEP Activities Concerning Heavy Metals and Persistent Organic Pollutants and Their Further Development, Moscow, Russian Federation, September 24-26, 1996,* World Meteorological Organization, Global Atmospheric Watch No. 117. Pp. 261-265.
  37. F. Wania. Modelling Sea-Air Exchange of Persistent Organic Pollutants: Focus on Temperature and Other Seasonal Parameters. In: Pacyna, J.M., Broman, D., and Lipiatou, E. (Eds.). *Sea-Air Exchange: Processes and Modelling.* Scientific report of

a workshop held in Kjeller, Norway, June 11-13, 1997. European Commission EUR17660, 1998, pp. 161-190.

38. F. Wania, Obstacles to Deriving Critical Loads for Persistent Organic Pollutants. In: *Proceedings of the Workshop on Critical Limits and Effect-Based Approaches for Heavy Metals and Persistent Organic Pollutants, Bad Harzburg, Germany, Nov. 3-7, 1997*. Umweltbundesamt, Texte 5/98, Berlin 1998, pp. II-39 - II-43.

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#### Technical Reports

39. J. M. Pacyna, E. Brorström-Lundén, J. Paasivirta, E. Runge, F. Wania, Emissions and Behaviour of Selected Persistent Organic Pollutants (POPs) in the Northern Environment, Part I: Development of the Cycling Model and Emission and Environmental Data Bases. NILU-Report OR17/96 (1996).
40. F. Wania, D. Mackay, The Global Fractionation of Persistent Organic Chemicals, NILU-Report TR10/96 (1996).
41. L. Barrie, R. MacDonald, T. Bidleman, M. Diamond, D. Gregor, R. Semkin, W. Strachan, S. Backus, M. Bowers, C. Halsall, C. Gobeil, J. Hoff, A. Li, L. Lockhart, D. Mackay, J. Pudykiewicz, K. Reimer, J. Smith, G. Stern, W. Schroeder, R. Wagemann, F. Wania, M. Yunker, Arctic Contaminants: Five Years of Progress in Understanding Sources, Occurrence and Pathways, Chapter 2 of the Canadian Arctic Contaminants Assessment Report, April 1997.
42. F. Wania, T. F. Bidleman, D. C. G. Muir. Persistent Organic Pollutants: General Characteristics and Continental Pathways in North America. In: Meeting the Challenges of Continental Pollutant Pathways: Volume II Case Studies. Draft Interim Report to the Secreteriate of the Commission for Environmental Cooperation, (1997).
43. K.A. Kidd, R.E. Heckey, R. Alatorre, J.E. Baker, R. Barra, D.C.G. Muir, D.L. Swackhamer, F. Wania. *Interrelationship among climatic variation, climatic change and persistent organic pollutant cycling in the Americas*. Workshop Proceedings. National Water Research Institute, Burlington, Canada, NWRI Contribution No. 98-128, 115 pp. (1998)
44. D. Mackay, F. Wania, W.Y. Shiu. Development of models describing the distribution of organic chemicals into cold ecosystems. In: J.L. Murray, R.G. Shearer (Eds.) *Synopsis of Research Conducted under the 1993/4 Northern Contaminants Program*. Department of Indian Affairs and Northern Development, Environmental Studies No. 72, Ottawa, Canada, pp. 53-61 (1994).
45. D. Mackay, F. Wania, C.Q. Jia, K. Qiang, J.T. Hoff. Development of models describing the distribution of organic chemicals into cold ecosystems. In: J.L. Murray, R.G. Shearer, S.L. Han (Eds.) *Synopsis of Research Conducted under the 1994/5 Northern Contaminants Program*. Department of Indian Affairs and Northern Development, Environmental Studies No. 73, Ottawa, Canada, pp. 39-44 (1996).
46. D. Mackay, J.T. Hoff, F. Wania, D. Callcott, E. Webster, W.Y. Shiu, C.Q. Jia, A. Di Guardo. Development of models describing the long-range global fate of persistent organic chemicals, and studies of the interactions between organic contaminants and snow. In: J. Jensen (Ed.) *Synopsis of Research Conducted under the 1995-97*

**Northern Contaminants Program.** Department of Indian Affairs and Northern Development, Environmental Studies No. 74, Ottawa, Canada, pp. 97-106 (1998).

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### Popular Scientific Articles

47. F. Wania, D. Mackay. The Transport of Contaminants to Polar Regions: Distillation on a Global Scale. *Our Planet. UNEP Magazine for Sustainable Development*. April 1997.

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### Selected Presentations

48. F. Wania, D. Mackay, S. Paterson, Environmental Exposure Assessment using Fugacity Models. Presentation at the OECD Workshop on the Application of Simple Models for Environmental Exposure Assessment, Berlin, Germany, December 11-13, 1991.
49. F. Wania, D. Mackay, W.Y. Shiu, Understanding the Transfer of Low Volatility Organic Compounds into Arctic Regions. Platform presentation at the 13th Annual SETAC Meeting, Cincinnati, Ohio, U.S.A., November 8-12, 1992.
50. F. Wania, D. Mackay, Modelling the Effect of Temperature on the Global Distribution of Low Volatility Organic Compounds. Invited seminar at the US-EPA laboratory in Corvallis, Oregon, U.S.A., April 5, 1993. (also presented at Oregon Graduate Institute, Beaverton, Oregon, April 1993).
51. F. Wania, D. Mackay, Modelling the Cold Condensation/Global Distillation Effect. Invited platform presentation at the International Nordic Symposium on Chemicals in the Arctic-Boreal Environment, Helsinki, Finland, May 12-14, 1993. (also presented at the Department of Zoology, Stockholm University, Sweden, May 1993).
52. F. Wania, D. Mackay, A Global Distribution Model for Persistent Organic Chemicals. Invited seminar at the Atmospheric Environment Service, Downsview, Ontario, November 25, 1993.
53. F. Wania, D. Mackay, The Global Fate of Persistent Organic Contaminants - Model Calculations and Controlling Parameters. Platform presentation at the Fourth SETAC Europe Congress, Brussels, Belgium, April 11-14, 1994.
54. F. Wania, Bioaccumulation of Persistent Organic Contaminants in the Arctic - Speculations, Illustrations and Preliminary Model Calculations. Poster presentation at the 5th SETAC Europe Congress, Copenhagen, Denmark, June 25-28, 1995.
55. F. Wania, D. Broman, A Compartmental Mass Balance Model for Persistent Organic Contaminants in the Baltic Sea. Platform presentation at the 5th SETAC Europe Congress, Copenhagen, Denmark, June 25-28, 1995.
56. F. Wania, Compartmental Mass Balance Modelling for Persistent Organic Contaminants in the Baltic Sea. Invited lecture at the EUCON research meeting, Kristineberg Marine Research Station, Fiskebäckskil, Sweden, October 17-18, 1995. (also presented at the Department of Ecology at Lund University, Sweden, October 1995).

57. F. Wania, D. Mackay, Towards an Understanding of the Global Distribution of Persistent Organic Contaminants. Platform presentation at the Second SETAC World Congress, Vancouver, November 5-9, 1995.
58. B. Bailey, F. Wania, Long Range Transport of Persistent Chemicals, Platform presentation at the Conference on "The Future Uses of Chlorine: Issues in Education, Research and Policy", Cambridge, Massachusetts, June 12-13, 1996.
59. F. Wania, Multi-Compartmental Models of Contaminant Fate in the Environment. Lecture at the summer school on the "Multidisciplinary Assessment of Contaminants in the Environment and of Risks for Human Health", Certosa di Pontignano, Italy, July 3-17, 1996.
60. F. Wania. Modelling the Behaviour of Non-Polar Organic Chemicals in an Ageing Snow Pack. Poster presentation at the 17th Annual SETAC Meeting in Washington, D.C., USA, November 17-21, 1996.
61. F. Wania, D. Mackay, B. Bailey, Y.F. Li, A. Strand, Calculating Global Chemical Fate: Recent Results for Selected Organic Contaminants. Platform presentation at the 17th Annual SETAC Meeting in Washington, D.C., USA, November 17-21, 1996.
62. F. Wania, A. Di Guardo, D. Calamari, D. Broman, J. M. Pacyna. Cycling of Persistent Organic Pollutants in the Environment. Presentation at the First Annual ELOISE Conference, Arcachon, France, May 21-23, 1997.
63. J. Paasivirta, S. Sinkkonen, T. Rantio, F. Wania. Estimation of Vapour Pressure and Aqueous Solubilities of Persistent Organic Pollutants at Environmental Temperatures. Poster presentation at the First Annual ELOISE Conference, Arcachon, France, May 21-23, 1997.
64. F. Wania, J. T. Hoff, D. Mackay. Prospects for Modelling Contaminant Dynamics in a High-Latitude Ecosystem. Presentation at the Archipelago Workshop, Iqaluit, N.W.T., July 24-27, 1997.
65. F. Wania, D. Mackay. Conceptual and Numerical Models of Global Organic Contaminant Cycling. Presentation at the Workshop on the Interrelationship of Climate Change and Organic Contaminant Cycling, Burlington, Ontario, Sept. 8-11, 1997.
66. F. Wania, Y. D. Lei, J. E. Haugen, D. Mackay. Analyzing the Temperature Dependence of Atmospheric Concentrations of Semi-Volatile Organic Compounds (SOCs). Presentation held at the 18<sup>th</sup> Annual meeting of SETAC, San Francisco, CA, November 16-20, 1997.
67. F. Wania, J. Persson, D. Broman, J. Axelman. Modelling the Fate of Hydrophobic Organic Compounds in Eutrophic vs. Oligotrophic Aquatic Systems. Presentation held at the 18<sup>th</sup> Annual meeting of SETAC, San Francisco, CA, November 16-20, 1997.
68. D. Mackay, E. Webster, F. Wania. Can meaningful persistence criteria be defined for persistent, toxic and bioaccumulative chemicals? Presentation held at the 18<sup>th</sup> Annual meeting of SETAC, San Francisco, CA, November 16-20, 1997.
69. W.A. Lead, K. C. Jones, H. F. Prest, E. Steinnes, F. Wania. Assessing Potential for Global Fractionation of Persistent Organic Pollutants: Results from the Norwegian

- Arctic. Presentation held at the 18<sup>th</sup> Annual meeting of SETAC, San Francisco, CA, November 16-20, 1997.
70. W.A. Lead, K. C. Jones, H. F. Prest, E. Steinnes, F. Wania. Towards an Understanding of the Global Atmospheric Distribution of PCBs: Deployment and Calibrations of SPMDs. Presentation held at the 18<sup>th</sup> Annual meeting of SETAC, San Francisco, CA, November 16-20, 1997.
  71. F. Wania, A. Di Guardo, D. Calamari, D. Broman, J.M. Pacyna. Modelling the Sea-Air Exchange of Selected Persistent Organic Pollutants in the Baltic Sea Region. Platform presentation at the SETAC-Europe Meeting, Bordeaux, France, April 14-18, 1998.
  72. F. Wania, M.S. McLachlan and D. Mackay. The potential role of forests in the global distribution behaviour of POPs. Platform presentation at POPs in the Environment: Sources, Environmental Fate and Significance, Lancaster, UK, April 28-29, 1998.
  73. F. Wania. Environmental Modelling of POPs. Presentation at the Workshop on the Assessment of Sources, Atmospheric Fluxes, Environmental Cycling, Effects and Sinks of persistent Organic Pollutants, Preston, UK, April 30 - May 1, 1998.
  74. F. Wania. On the Origin of Elevated Levels of Persistent Chemicals in the Environment. Invited platform presentation at symposium "Hot Topics in Environmental Chemistry", Kloster Banz, Germany, June 3-5, 1998.

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#### Forthcoming Presentations

75. F. Wania, D. Mackay. The Evolution of Modelling Persistent Organic Pollutants in the Environment. Invited platform presentation at IEP'98, Issues in Environmental Pollution, Denver, Colorado, USA, August 23-26, 1998.
76. F. Wania, J.T. Hoff and D. Mackay. Modelling Studies of the Fate of Non-Polar Organic Chemicals During Snowfall and Snowpack Metamorphosis. Platform presentation at the International Conference on Snow Hydrology, Vermont, USA, October 6-9, 1998.



# CONSULTING AND RESEARCH SERVICES, INC.

P.O. BOX 10295, COLLEGE STATION, TX 77842-0295 TEL: (409) 845-4516 FAX (409) 845-6156

HAWAII OFFICE  
721, SOUTH ALU ROAD, WAILUKU, HI 96793-1569 TEL: (808) 242-2954 FAX: (808) 242-2954

**Dr. John B. Herblich**  
*Vice President*

## BIOGRAPHICAL DATA

**Citizenship:** U.S.

**S.S. No.:** [REDACTED]

**Professional Interests:** Coastal and Ocean Engineering  
Dredging Engineering  
Offshore Facilities Design  
Hydraulic Engineering

### EDUCATION:

Post-doctoral work: Wave Mechanics, University of California (Berkeley), 1964; Water Resources, Utah State University, 1966.  
Ph.D., Civil Engineering, Pennsylvania State University, 1963.  
M.S., Hydromechanics, Soil Mechanics and Mathematics, The University of Minnesota, 1957.  
B.Sc., Civil Engineering, The University of Edinburgh, Scotland, 1949.  
Matriculation Certificate, Mathematical-Physical Lyceum, Scotland, 1941.

### EXPERIENCE:

#### Educational

W. H. Bauer Professor Emeritus; Director Emeritus, Center for Dredging Studies; Professor Emeritus, Civil and Ocean Engineering, Texas A&M University, 1992.  
Professor, Civil and Ocean Engineering, Texas A&M University, 1967-1992.  
Graduate Faculty Member, Texas A&M University, 1967-1992.  
Visiting Professor, Coastal Engineering Research Center, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS, September 1987-August 1988.  
Head, Ocean and Hydraulic Engineering Group, 1967-83.  
Head, Ocean Engineering Program, 1971-1983.  
Special Consultant, United Nations, Ocean Engineering Short Course, Pune, India, December 1983-January 1984.  
Lecturer, Facultad de Ingenieria, University of Buenos Aires, Argentina, June 1981.  
Lecturer, Pan American Course on Dredging Technology, Maracaibo, Venezuela, November 1980.  
Special Lecturer, Topics in Ocean Engineering, Dalian Institute of Technology, Dalian, China, July-August 1980.  
Visiting Professor, Dalian Institute of Technology, China, July-August 1980.  
Special Consultant, United Nations, Organizer and Lecturer, Environmental Aspects of Coastal Engineering Short Course, Poona, India, May-June 1976.  
Special Consultant, United Nations, Organizer and Lecturer, Hydraulic Dredging Short Course, Poona, India, December 1974-75.  
Special Consultant, United Nations, Organizer and Lecturer, Coastal Engineering Short Course, Poona, India, 1973.

Professor (1965); Associate Professor (1960); Assistant Professor (1957); Head, Hydraulic and Sanitary Engineering Division, Lehigh University, 1965-67.  
Research Fellow, St. Anthony Falls Hydraulic Laboratory, University of Minnesota, 1953-57.

### **Industrial**

Visiting Research Engineer, Coastal Engineering Research Center, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS, September 1987-August 1988.

Consulting Engineer - Chevron Oil Co.; Timewealth Corp.; Ocean Pollution Control, Inc.; McClelland Engineers; Shell Oil Company; Bechtel International Co.; Harvey Industries; Great Lakes Dredge and Dock Co.; El Paso Gas Company; Bultema Dredge and Dock Co.; Fluor Ocean Services; C.F. Bean, Inc.; Hale Fire Pump Co.; Pekor Iron Works, Inc.; Bethlehem Steel Co.; Baltimore Gas and Electric Co.; Dragon Cement Co.; Pennsylvania Department of Highways, Office of the Govern; Hughes Tool Co.; United Nations; U.S. Dept. of Justice; Government of South Korea; U.S. Navy; Espey-Huston and Associates, Inc.; Martech International, Inc.; Korean Dredging Corporation; Southwest Research Institute; Ontario Ministry of the Environment, Canada; Weeks Dredging and Contracting Co.; Vulcan Materials Company; AMOCO Production Co.; Swanson, Hiester, Wilson and Claycomb; Dalian Institute of Technology, Dalian, PRC; Anglo-American Corporation of S.A.; Gaffrey, Cline and Associates; Western Services, International; National University of Singapore; Madras Institute of Technology, Madras, India; Raymond Technical Facilities, Inc.; United Nations Development Programme; Bernard Johnson, Inc.; Sand Mining, Inc.; Martec, Ltd.; Raymond Kaiser Engineers, Inc.; The County of Galveston; Jacques/McClelland Geosciences, Inc.; Century Engineering, Inc.; CONOCO; Mobil Oil Co.; K.W. Brown and Associates, Inc.; Gadsby & Hannah, Inc.; Hudson Engineering, Inc.; Nasr and Associates, Inc.; INTEC Engineering, Inc.; Tippets-Abbott-McCarthy-Stratton; Sydney M. Johnson & Assoc.; L.M. Krazynski & Assoc.; Henry, Lowerre, Hess & Frederick; William W. Kerr, Consulting Engrs.; Century Engineering, Inc.; K.W. Dearborn, PS; Beach Mining, Inc.; The International Tanker Owners Pollution Federation, Ltd.; Aluminum Company of America; Wartsila Diesel, Inc.; Cadwalader, Wickersham & Taft; etc. 1957-Present.

Project Manager - United Nations, Development of a Coastal Engineering Research Center and the Hydraulic Instrumentation and Data Bank Center, Poona, India, 1972-73.

Intermediate Engineer - Civil Engineering, Concrete, Soil Mechanics, Aluminum Co. of Canada, Ltd., Chute-du Diable, Quebec, 1950-52, Kitimat, British Columbia, 1952-53.

Research Engineer, Coastal Engineer, Technical University of Delft, The Netherlands, 1949-50.

Field Engineer, John Laing & Son, Ltd., London, England, 1948.

Expert Witness - U.S. Department of Justice; Great Lakes Dredge and Dock Co.; Bechtel International Co.; Baltimore Gas and Electric Co.; Royston, Rayzor, Vickery & Williams, Attorneys at Law, Houston, Texas; Transocean Contractors, Inc., Morgan City, Louisiana; Martin, Craig, Chester & Sonnenschein, Attorneys at Law, Chicago, Illinois; Shell Oil Company; Wildman, Harrold, Allen, Dixon & McDonnell, Attorneys at Law, Memphis, Tennessee; Paul, Weiss, Wharton & Garrison, New York, NY; MORGAS Company; Lewis & McKenna, Saddle River, N.J.

### **Military**

Polish Army under British Command and British Army. Attained rank of 2nd Lt., Active duty, 1940-45, Reserve, 1945-48. Honorable discharge.

**PROFESSIONAL LICENSES:**

Registered Professional Engineer, Texas No. 26757

**SOCIETY MEMBERSHIPS:**

American Society of Civil Engineers  
International Association for Hydraulic Research  
Marine Technology Society  
Permanent International Association of Navigation Congresses  
World Dredging Association  
Phi Kappa Phi Honor Society  
Chi Epsilon, National Honorary Civil Engineering Fraternity  
Sigma Xi, The Scientific Research Society  
Phi Beta Delta, Honor Society for International Scholars

**HONORS, AWARDS, LISTING AND PATENTS:**

Recipient of the 1995 Dredger of the Year Award, Western Dredging Association, Member of the World Organization of Dredging Associations, May 25, 1995.  
Recipient of the 1993 International Coastal Engineering Award, American Society of Civil Engineers, October 27, 1993.  
W.H. Bauer Professor of Dredging Engineering, Texas A&M University, May 15, 1989-February 1, 1994.  
Fellow and Life Member, American Society of Civil Engineers, November 1, 1986.  
Karl Emil Hilgard Hydraulic Prize, American Society of Civil Engineers, 1966.  
NSF Science Faculty Fellow, Hydraulic and Sanitary Division, Civil Engineering, University of California, Berkeley, Summer 1964.  
NSF Science Faculty Fellow, Hydraulics Laboratory, Civil Engineering, Pennsylvania State University, April-December 1963.  
Ford Foundation Fellow, Hydraulics Laboratory, Civil Engineering, Pennsylvania State University, January-March 1963.  
Hydraulic and Pneumatic Breakwaters, Patent, 1953 (turned over to U.S. Navy).  
Wave Filters and Absorbers, Patent, 1952 (turned over to U.S. Navy).  
Listed in "Engineers of Distinction", published by the Engineers Joint Council; "Who's Who in the South and Southwest"; "American Men and Women of Science, Dictionary of International Biography"; "Who's Who in America".

**COMMITTEE MEMBERSHIPS:****Professional Societies**

Director, Western Dredging Association (WEDA) Board of Directors, 1987-1992.  
Member, Subcommittee on Marine Mining and Deepwater Dredging Technology, Offshore Technology Conference, 1978-1984.  
U.S. Delegate, Working Group of Permanent Association of Navigation Congresses on "Navigation in Silt-laden Ship Channels," 1981-1984.  
Member, Organizing Committee, International Coastal Engineering Conference, 1984.  
Member, Organizing Committee, ASCE Specialty Conference, Dredging, 1984.  
Member, Coastal Engineering Council of the American Society of Civil Engineers, 1965.

### **State and Federal Government**

- Member, Committee on Contaminated Marine Sediments, Marine Board, National Research Council, 1987-1990.
- Vice-Chairman, Committee on National Dredging (Ports) Issues, Marine Board, National Research Council, 1982-1986.
- Delegate, Eighth U.S.-Japan Experts Meeting on "Management of Bottom Sediments Containing Toxic Substances," Jacksonville, FL, 1983.
- Chairman, Panel on Criteria for Depths of Dredged Shipping Channels, Marine Board, National Research Council, 1981-1983.
- Participant, First U.S.-Netherlands Meeting on Dredging Technology, New Orleans, LA, 1982.
- Expert, Sixth U.S.-Japan Experts Meeting on "Management of Bottom Sediments Containing Toxic Substances," Tokyo, Japan, 1981.
- Member, Panel on Port/Harbor Entrances, Marine Board, National Research Council, Academy of Sciences, 1980-81.
- Member, Dredge Disposal Committee, Interagency Council on Natural Resources and the Environment, Office of the Governor, Texas.
- Member, Panel on Mining of Minerals from the Ocean, Marine Board, National Research Council.
- Member, Panel on Marine Mining, National Oceanographic and Atmospheric Administration (NOAA).

### **OTHER SERVICES:**

- Associate Editor, Ports and Dredging Abstracts, BHRA, 1983-1993.
- Associate Editor, Journal of Pipelines, Pergamon Press, England, 1981-1992.
- Faculty Advisor to Catholic Students' Association, Texas A&M University, 1979-1983.
- Editor, Offshore, 1976-1978.

### **PUBLICATIONS:**

#### **Significant Reports and Published Papers**

- "Chek Lap Kok Airport for the Next Century," *Proceedings of the WEDA XVI Technical Conference, 28th Texas A&M University Annual Dredging Seminar and the University of Wisconsin Sea Grant Program Workshop*, Minneapolis, MN, CDS Report 343, May 23-26, 1995, pp. 93-104.
- "Innovative Technologies for Dredging and Disposing Contaminated Dredged Material," with Ram K. Mohan, *Ports '95, Specialty Conference on Port Engineering and Development for the 21st Century*, ASCE, Tampa, FL, March 12-15, 1995.
- "Removal of Contaminated Sediments. Equipment and Recent Field Studies," *ASTM Symposium on Dredging, Remediation, Containment of Contaminated Sediments, ASTM STP 1293*, K.R. Demars, G.N. Richardson, R.N. Young and R.C. Chaney, Eds., American Society for Testing and Materials, Philadelphia, 1995, pp.77-111.
- "Feasibility of Capping Industrial Waste Disposal Sites with Dredged Material," with R. Krishnamohan and F.S. Williams, *Proceedings of the WEDA XV Technical Conference and 27th Texas A&M Annual Dredging Seminar*, San Diego, CA, CDS Report No. 336, May 18-20, 1994.
- "Dredging Equipment for the Removal of Contaminated Sediment State-of-the-Art," *Proceedings of the 6th International Symposium on the Interactions between Sediments and Water*, Santa Barbara, CA, Dec. 5-8, 1993, 35 pp.

- "Defining the Safe Navigable Depth of the Calcasieu River Ship Channel, Louisiana," with G.L. Wilkinson, Coastal Engineering Considerations in Coastal Zone Management, *Proceedings of the 8th Symposium on Coastal and Ocean Management*, sponsored by the American Shore and Beach Preservation Association/ASCE, New Orleans, LA, July 19-23, 1993, pp. 69-92.
- "A Model Study of Articulated Mat Stability," with T. Sasaki, Texas A&M Research Foundation, COE Report No. 329, June 1993, 129 p.
- "Shore Protection Studies for the Ras-Elbar Areas, Egypt," with G. El Saeed, Texas Engineering Experiment Station, COE Report No. 330, June 1993, 77 p.
- "Design of Navigation Channels for Safety," with B.L. Edge, CDS Report No. 331, 1993, 30 p.
- "Review of New Bedford Harbor Pilot Study - Removal of Contaminated Sediments," *Proceedings of the 26th Annual Dredging Seminar/WEDA XIV Conference*, Atlantic City, NJ, May 26, 1993, CDS Report No. 327, 317 p.
- "Geo-Environmental Monitoring Techniques Used for Investigating Options for the Closure of a Bauxite Residue Disposal Area," with R. Krishnamohan, L.R. Hossner, F.S. Williams, *Proceedings of An International Bauxite Tailings Workshop*, Perth, Western Australia, November 2-6, 1992, pp. 281-291.
- "Evaluation of Laboratory and Field Studies of Offshore (Detached) Breakwaters," with K. Krafft and D. Trivedi, *Proceedings of 23rd International Conference on Coastal Engineering*, Venice, Italy, October 4-9, 1992.
- "Dredged Material Placement Techniques - A Review of Its Past, Present and Future," with R. Krishnamohan, *Proceedings Ports '92 Conference*, ASCE, Seattle, WA, July 20-22, 1992.
- "Bibliography on Dredging," 5th Edition, with D. Trivedi, CDS Report No. 324, College Station, TX, June 1992, 633 pp.
- "Vegetational Reclamation of Bauxite Residue Coastal Disposal Areas by Alkaline-Tolerant Plant Species Established on Dredged Material Capping Layer," with R. Krishnamohan, L. Hossner, J.C. Mayfield, *Proceedings XIIIth World Dredging Congress*, Bombay, India, April 7-10, 1992.
- "Should the U.S. Accept the Concept of Navigable Depth?" with D. Trivedi, G. Wilkinson, A. Teeter, *Proceedings of Coastal Engineering Conference*, ASCE, Long Beach, CA, March 9-13, 1992.
- "Environmental Aspects of Vegetational Reclamation of Bauxite Residue Disposal Areas," with R. Krishnamohan, L. Hossner and F.S. Williams, *Proceedings AIME '92 Conference*, San Diego, CA, March 1-5, 1992.
- Proceedings of the First through Twenty-Seventh Annual Dredging Seminars*, Editor, Center for Dredging Studies, 1961-1992.
- "Study of Tidal Inlet Stability," with J.L. Machemehl and C.H. Jo, *Journal of Waterway, Port, Coastal and Ocean Engineering*, Vol. 117, No. 6, Nov/Dec 1991.
- "Feasibility of Capping Bauxite Residue Coastal Disposal Areas with Dredged Material," with R. Krishnamohan, L.R. Hossner and J.C. Mayfield, *Proceedings of the Marine Technology Society, MTS '91*, New Orleans, LA, November 10-14, 1991.
- "Literature Review and Technical Evaluation of Sediment Resuspension During Dredging," with S.B. Brahme, Contract Report HL-91-1, U.S. Army Corps of Engineers, Washington, DC 20314-1000, January 1991, 87 pp.
- "Inventory of Open Water Disposal Sites," with D. De Hert, K. Krafft, G.L. Wilkinson, D. Trivedi, prepared for USAE Waterways Experiment Station, Vicksburg, MS, CDS Report 315-B, February 1990.
- "Evaluation of the Accuracy and Reliability of Production Meters," with J.Y. Lee and D. Trivedi, prepared for USAE Waterways Experiment Station, Vicksburg, MS, CDS Report 313, 1992.

- "Definition of Navigable Depth in Fine-Grain Sediments," with R. Darby, G. Wilkinson, K. Krafft and D. De Hert, prepared for USAE Waterways Experiment Station, Vicksburg, MS, CDS Report 312, June 1989.
- "Developments in Equipment Designed for Handling Contaminated Sediments," (1989) in *Contaminated Marine Sediments - Assessment and Remediation*, Marine Board, National Research Council, National Academy Press, 2101 Constitution Avenue, N.W., Washington, DC.
- "Shoreline Changes Due to Offshore Breakwaters," paper presented at the International Association for Hydraulic Research XXIII Congress, Ottawa, Canada, August 21-25, 1989.
- "Generation of Resuspended Sediment at the Cutterhead," with C. Andrassy, *The Dock and Harbour Authority*, Vol. 68, No. 797, pp. 207-216, January 1988.
- "Review of Events to the Passage of Public Law 99-662 (HR6), the Water Development Act of 1986," with F. Pages, *The Dock and Harbour Authority*, Vol. 68, No. 795, pp. 153-159, November 1987.
- "The Influence of Dimensionless Cutterhead Dredge Operating Parameters on Sediment Resuspension at the Cutterhead," with C.J. Andrassy, Texas Engineering Experiment Station Report No. COE-295, August 1987.
- "Scour About a Single, Cylindrical Pile Due to Combined Random Waves and a Current," with R.W. Eadie, IV, *Proceedings 20th Coastal Engineering Conference*, ASCE, 1987.
- "Transmission of Random Waves Through Pile Breakwaters," with C. Truitt, *Proceedings 20th Coastal Engineering Conference*, ASCE, 1987.
- "Generation of Suspended Sediment at the Cutterhead," with C. Andrassy, *Proceedings 20th Dredging Seminar and Western Dredging Association Technical Conference*, Toronto, Canada, 1987.
- "Review of Events Leading to the Passage of Public Law 99-662 (H.R. 6), the Water Development Act of 1986," with F. Pages, *Proceedings 20th Dredging Seminar and Western Dredging Association Technical Conference*, Toronto, Canada, 1987.
- "Hydraulic Model Studies for Suction Cutterheads," with S.B. Brahme, *Journal of Waterway, Port, Coastal and Ocean Engineering*, Vol. 112, No. 5, September 1986.
- "Effects of Breakwater Spacing on Sand Entrapment," with M.M. Harris, *Proceedings of Symposium on Scale Effects in Modelling Sediment Transport Phenomena, SYMPOSIUM '86*, International Association for Hydraulic Research, Toronto, Canada, August 25-28, 1986.
- "Effects of Breakwater Spacing on Sand Entrapment," with M.M. Harris, *Journal of Hydraulic Research*, Vol. 24, No. 5, 1986.
- "National Port Issues," *Proceedings of Specialty Conference on Innovations in Port Engineering and Development*, WR/ASCE, May 1986.
- "Hydromechanics of Submarine Pipelines: Design Patterns," *Canadian Journal of Civil Engineering*, 12, pp. 863-87, 1985.
- (340 other reports and papers published prior to 1985, not listed)

## **Books**

- Developments in Coastal and Ocean Engineering*, Editor, Gulf Publishing Company, Houston, Texas (in print).
- Handbook of Dredging Engineering*, McGraw-Hill Book Company, New York, NY, April 1992.
- Handbook of Coastal and Ocean Engineering*, Volumes 1, 2, and 3, Editor, Gulf Publishing Company, Houston, Texas, 1990-1992.
- The Encyclopedia of Climatology*, Contributor, Van Nostrand Reinhold Company, New York, 1987.
- Seafloor Scour, Design Guidelines for Ocean-Founded Structures*, Marcel Dekker, Inc., New York, Basel, 1984.
- The Encyclopedia of Beaches and Coastal Environments*, Contributor, Hutchinson Ross, Stroudsburg, Pennsylvania, 1982.
- Offshore Pipelines: Design Elements*, Marcel Dekker, Inc., New York, Basel, 1981.
- Studies in Marine Environmental Pollution*, Contributed two chapters, Elsevier Publishing Company, 1980.
- Coastal and Deep Ocean Dredging*, Gulf Publishing Company, Houston, Texas, 1975.