



LAKE WINNIPEG FOUNDATION

Science Advisory Council



Genevieve Ali

B.Sc. Honours, Université de Montréal; PhD., Université de Montréal

Area of expertise: Watershed hydrology and biogeochemistry, conceptual and numerical hydrological modelling

Areas of specialization: Watershed-scale water, sediment and nutrient connectivity; phosphorus dynamics in soils; geochemical tracer studies (major ions); isotope biogeochemistry; hydrometric data monitoring; water-quality monitoring; environmental modelling (including precipitation-runoff modelling, soil water and groundwater modelling and geospatial modelling); landscape classification

Current research: Sustainable forest and agro-ecosystems in across Canada, the United States and elsewhere. Special focus on hydrobiogeochemical consequences of artificial drainage (surface ditches and subsurface tiles); agricultural water retention; conservation and restoration of wetland hydrological and biogeochemical function; hydrologic predictions in ungauged or data-poor regions; best management practice (BMP) scenario modelling; and environmental change scenario modelling.



Pascal Badiou

B.Sc. University of Manitoba (Environmental Science) 1998; PhD University of Manitoba (Wetland Ecology) 2005

Area of expertise: Wetland/watershed ecology; biogeochemistry; hydrology

Areas of specialization: Phosphorus dynamics in drained and intact wetlands. Impacts of wetland loss on watershed hydrology and nutrient export. Carbon sequestration and GHG emissions of prairie wetlands. Impacts of invasive species on freshwater wetlands.

Current research: Pascal's research focuses on the ecology of wetlands and shallow lakes. He is particularly interested in how multiple stressors such as droughts, eutrophication, nonindigenous species and pesticides interact to affect the ability of wetlands to enhance water quality and regulate greenhouse gas emissions. Currently, Pascal is working in a number of prairie watersheds where he and his team are examining the impacts of wetland management practices (drainage and restoration) on hydrology and water quality at large scales.



Greg Brunksill

BA, Augustana College, Sioux Falls, So. Dak., 1963; PhD., Cornell University, Ithaca, New York, 1968

Areas of expertise: Limnology, chemical oceanography, sedimentation history, radiochemistry, biogeochemistry

Areas of specialization: Lake Winnipeg in 1969-74, ELA, Mackenzie River runoff chemistry and erosion rates into the Beaufort Sea, Chemical oceanography and sedimentation in coastal regions, salt pans, and wetlands of northern Australia, Papua New Guinea and Indonesia.

Field of interest: Since retiring in 2006, Greg has been taking care of his tropical fruit trees, vegetable gardens, laying hens and trying to avoid scientific responsibilities.



Nora Casson

BSc Hons (Biology) - University of Western Ontario, MSc (Biology and Environmental Science) - University of Western Ontario, PhD (Environmental and Life Sciences) - Trent University. Nora is currently an associate professor at the University of Winnipeg and the Canada Research Chair in Environmental Influences on Water Quality

Area of expertise: Hydrology, biogeochemistry, water quality

Areas of specialization: Impacts of human activities (e.g. climate change, pollution) on water and nutrient cycling, and transport in watersheds.

Current research: Nora currently researches the relationship between water and nutrient cycling to understand how patterns and processes vary across the landscape, and how human activities impact the surface waters that drain ecosystems. Using an interdisciplinary, collaborative approach, her research is informing management decisions to protect ecosystems and water quality.



Matthew Gale

B.Env.Sci. Honours, University of Manitoba; M.Sc (biological oceanography), University of Manitoba; MEnvSc, Institution of Environmental Sciences

Area of expertise: Aquatic ecosystem impacts, environmental assessment

Area of specialization: Phytoplankton bloom dynamics.

Current research: Currently working as environmental impact specialist with a focus on human health: recreational and drinking water, noise, air quality, radiological impacts and country foods. Interested in ports and industrial development and their interactions with the aquatic environments.



Gordon Goldsborough

PhD (Aquatic Ecology) University of Manitoba; member of the International Society of Limnology and the Society of Wetland Scientists

Area of expertise: Wetland ecology

Areas of specialization: Impacts of altered hydrology; invasive species; chemical contaminants on the algae and plant communities of freshwater coastal wetlands.

Current research: Response of Delta Marsh to large-scale exclusion of Common Carp; use of floating cattail platforms for phosphorus sequestration; morphometric analysis of change over time in Netley-Libau Marsh; chemical and physical correlates with algal toxins in Lake Winnipeg.



Stephanie Guildford

B.Sc. Dalhousie University, MSc, PhD University Manitoba

Area of expertise: Phytoplankton ecology

Area of specialization: Physical, chemical and biological factors controlling the growth of algae in large lakes

Fields of interest: Retired professor from the Large Lakes Observatory (University Minnesota Duluth); currently co-editor of the *Journal of Great Lakes Research*. Past research focused on the Laurentian and African Great Lakes.



Geoffrey Gunn

B.Sc. Honours (Geography), University of Regina; M.Sc. (Environment and Geography), University of Manitoba. Currently, Geoff is the Policy Advisor – Data and Technology for IISD-Experimental Lakes Area

Area of expertise: Geography

Areas of specialization: Earth observation; geographic information science; prairie issues; science-to-policy.

Current research: Using new technologies (or old technologies in a new way) to answer environmental questions at the right scale for communities and policy makers.



Brenda Hann

PhD.; Professor, Department of Biological Sciences, University of Manitoba

Area of expertise: Limnology and aquatic invertebrate biology

Areas of specialization: Taxonomy of Cladocera, zooplankton, benthos and littoral zone ecology of invertebrates.

Current research: Taxonomy of Cladocera, zooplankton, benthos and littoral zone ecology of invertebrates.



Caleb Hasler

B.Sc.H, M.Sc., Queen's University; PhD., Carleton University; Member of the American Fisheries Society

Area of expertise: Fish biology

Areas of specialization: Organismal responses to environmental change, conservation physiology, fish telemetry.

Current research: Bycatch in the Lake Winnipeg fishery; the effects of abrupt and extreme environmental changes on fish biology; repeatability in swimming performance.



Robert Hecky

B.Sc. Kent State University, PhD Duke University; McKnight Endowed Presidential Professor of Lake Ecology, University of Minnesota (Emeritus); Currently editor of the *Journal of Great Lakes Research*

Area of expertise: Lake ecology

Area of specialization: Algal ecology and productivity and food-web dynamics.

Field of Interest: Ecology and limnology of Great Lakes.



Ray Hesslein

BA Columbia University, New York, NY. 1971; PhD, Geology, Columbia University, New York, NY. 1976

Areas of expertise: Biogeochemistry and limnology

Area of specialization: Geochemistry, physics, biology of lakes, stable isotopes, dynamic modeling and greenhouse gases.

Current Research: Carbon and other nutrient cycling, whole lake modeling, and greenhouse gas production in lakes, rivers and reservoirs.



Scott Higgins

PhD University of Waterloo, 2005; M.Sc. University of Waterloo, 1999; B.Sc. University of Manitoba, 1996

Area of expertise: Limnology

Areas of specialization: Algal ecology and metabolism, aquatic invasive species and ecosystem ecology.

Current research: The use of autonomous sensors for assessing water quality and ecosystem metabolism, the effects of climate change on boreal lake ecosystems and the effects of nanosilver on lake metabolism.



Darshani Kumaragamage

BSc Hons, MPhil. (Agriculture), University of Peradeniya, Sri Lanka; PhD (Soil Science) University of Manitoba

Area of expertise: Soil chemistry

Areas of specialization: Agricultural nutrient management, phosphorus losses from soils, chemistry of flooded soils.

Current research: Flooding-induced phosphorus release from soils; soil amendments to reduce phosphorus losses from soils to waterways; and urease and nitrification inhibitors to reduce gaseous losses of nitrogen.



Hedy Kling

B.Sc. University of Brandon, 1969; M.Sc. in Botany, University of Manitoba 1997; numerous international workshops and courses on phytoplankton, cyanobacteria, diatom, chlorophyte and chrysophyte taxonomy

Areas of expertise: Phytoplankton and algal taxonomy and ecology

Areas of specialization: Phytoplankton in lakes, reservoirs and rivers in central Canadian lakes, Great Lakes and the central arctic – particularly species of Chrysophytes, planktonic diatoms and cyanobacteria.

Current Research: Hedy works as a freelance consultant and owns a small consulting company, Algal Taxonomy and Ecology Inc. She is specifically interested in phytoplankton taxonomy, the ecology of different species and their role as indicators of the health of the lake or aquatic ecosystem.



Nancy Loadman

B.Sc. Hons.; M.Sc.; Instructor in the biology department at the Richardson College for the Environment, University of Winnipeg for 32 years; has taught undergraduate courses in ecology, vertebrate zoology, phycology, wetland ecology and limnology

Area of expertise: Limnology

Area of specialization: Zooplankton ecology.

Current research: Her past research has involved studying zooplankton communities of Prairie lakes, ageing of larval walleye, cannibalistic behaviour in cultured larval fish and aquaculture of larval walleye. At the moment, her research focuses on the effects of multiple stressors on life history traits of *Daphnia magna*.



Lyle Lockhart

B.Sc. from the University of Western Ontario, 1965; M.Sc. in Zoology from the University of Western Ontario, 1967; PhD in Biochemistry from the University of Western Ontario in 1971

Area of expertise: Trace contaminants in water, animals, and sometimes plants; evolution, toxicology and biochemistry

Areas of specialization: The presence of mercury in the fish, other organisms and sediments.

Field of interest: Lyle is interested in developing the mercury story in Lake Winnipeg. At the moment, he is consumed with cottage carpentry, basement renovations, trying to read *Ulysses* and trying (pretty unsuccessfully so far) to photograph bumble bees.



Greg McCullough, Chair

B.Sc. and PhD in Geography

Areas of expertise: Nutrient and sediment transport in, and remote sensing of fresh and marine waters; river-lake and freshwater-marine interactions

Areas of specialization: Freshwater-marine interactions in subarctic estuarine environments; climate-freshwater-ice interactions in subarctic and

arctic marine waters; phosphorus transport dynamics; remote sensing in fresh and marine waters (phytoplankton).

Current research: Over the last decade, Greg has also done research related to the growing eutrophication of Lake Winnipeg by developing sensing tools used for monitoring algae and studying the effects of people, climate and flooding on nutrient loading to the lake.



Selena Randall

B.Sc. (Hons) Zoology with Marine Zoology, University of Wales, 1990; M.Sc. Natural Resources Management, University of Leicester, 1992; PhD Freshwater Ecology, University of Leicester, 1998. Worked in government department in UK researching, developing and implementing policy to protect air, land and water from agricultural practices, with Agriculture and Agri-Food Canada AAFC on the Red-Assiniboine Project, and with the University of Manitoba as research development coordinator for the Watershed Systems Research Program.

Areas of expertise: Watershed management, development and implementation of beneficial management practices, policy development, knowledge translation

Areas of Specialization: Beneficial management practices – research, policy development and implementation.

Fields of interest: Policy development, knowledge translation and beneficial management practices, to protect water and mitigate climate change. Links between environment and health.



Michael Rennie

Associate Professor, Department of Biology, Lakehead University; Research Fellow, IISD-Experimental Lakes Area

Area of expertise: Aquatic ecology and fisheries

Areas of specialization: Fish movement ecology and behaviour; fish bioenergetics; food web ecology; invasive species

Current research: Documenting long-term changes in the offshore food web of Lake Simcoe associated with Dreissenid invasion; movement

patterns and behaviour of fishes; spatial patterns in trophic transfer efficiency in large lakes; impacts of invasive invertebrates on inland fisheries; impacts of physical and chemical disturbance on fish populations; climate change impacts on fisheries



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Alex Salki

B.Sc. (U of M); M.Sc. (U of M); DFO Research Biologist & Experimental Lakes Area Research Team (1968-2007); Author/reviewer of peer-reviewed scientific books, articles, reports; Lake Winnipeg Research Consortium co-founder & science program coordinator (1999-2009); Lake Winnipeg Stewardship Board member (2003-2006); Climate Change Connection Steering Committee member (2002-2005); Manitoba Schools Science Symposium judge (10 years); Manitoba Envirothon judge/instructor.

Area of expertise: Limnology, freshwater biology and ecology, and crustacean zoogeography

Areas of specialization: Freshwater and marine crustacean taxonomy and ecology; investigating responses of zooplankton communities to natural and human impacts (e.g. aquatic invasive species, eutrophication, mercury, river diversions/flooding, lake impoundment/drawdown, endocrine disruptors, climate change, trout aquaculture).

Current research: While employed with DFO, Alex studied zooplankton in hundreds of Canadian lakes. Currently, as principal biologist with Salki Consultants Inc, he provides laboratory analyses and consulting services to government and industry.



Karen Scott

B.Sc. in Chemistry & Physical Geology; PhD Microbiology, University of Manitoba

Area of expertise: Limnology; Lake Winnipeg

Area of specialization: Generalist, communicating science to non-scientists.

Field of interest: Mercury bioavailability and biogeochemistry (boreal and arctic).



Michael Stainton

Chemist with the DFO's Freshwater Institute; Experimental Lakes Area (ELA) research team

Area of expertise: 1968 (Bradbury) to present (Namao) involved in Lake Winnipeg scientific research. Networking with current scientific community working on Lake Winnipeg.

Current Research: The impact of flooding and land use practice on nutrient loss from agricultural lands, monitoring the algal productivity that these nutrients produce in Lake Winnipeg using remote sensing and shipboard instrumentation.



Hank Venema

Professional engineer (Ontario); B.Sc. Civil engineering (Manitoba); MSc Water Resources Engineering (Ottawa); PhD Systems Design Engineering (Waterloo)

Area of expertise: Water resources engineering and watershed management.

Areas of specialization: Operations research, systems modelling and optimization.

Current research: Bioeconomic approaches to Lake Winnipeg basin management.