## Dr. Robert Gillham

Executive Director, the Water Institute
Distinguished Professor Emeritus, Department of Earth and Environmental Sciences, University of Waterloo

rwgillha@uwaterloo.ca

Dr. Gillham holds the following academic degrees:

- PhD, Soil Physics, University of Illinois, U.S.A., 1973
- MSc., Soils, University of Guelph, Canada, 1968
- BSc., General Science, University of Toronto, Canada, 1963

Dr. Gillham's major area of research concerns the transport of contaminants in soils and groundwater, with a particular emphasis on reactive solutes. Recent research has focused on groundwater remediation, with a particular emphasis on the use of granular iron for degradation of halogenated organic contaminants.

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## Dr. Xianshe Feng

Professor, Department of Chemical Engineering, University of Waterloo

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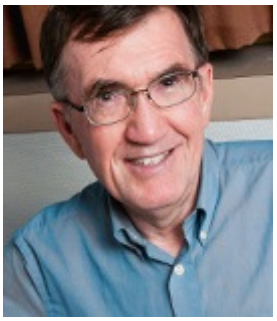
Dr. Feng holds the following academic degrees:

- PhD, Chemical Engineering, University of Waterloo, Canada, 1995
- MASc, Chemical Engineering, University of Ottawa, Canada, 1990
- MSc, Chemical Engineering, Dalian Institute of Chemical Physics, Academia Sinica, China, 1987
- BSc, Chemical Engineering, Hebei Institute of Chemical Technology, China, 1984

Dr. Feng's research interests are primarily in the area of membrane science and technology, including membrane formation and characterization, transport studies, module design, and process development. The following projects are currently being carried out, and some of them are undertaken in collaboration with our research partners:

- Development of hollow fiber membranes and membrane modules;
- Synthesis, modification and characterization of asymmetric/composite membranes;
- Reverse osmosis, nanofiltration and ultrafiltration for wastewater treatment;
- Pervaporation, gas separation, and membrane distillation;
- Membrane reactors; membrane-modulated absorbers, adsorbers, and spargers;
- Synergetic integration of membranes with traditional separation processes;
- $CO_2$ separation for greenhouse gas emission control;
- Separation of Volatile Organic Compounds (VOCs) from gaseous and liquid waste streams;
- Membranes for bio-separations.



## Dr. Peter Huck

NSERC Chair in Water Treatment
Professor, Department of Civil and Environmental Engineering, University of Waterloo

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Dr. Huck holds the following academic degrees:

- PhD, Chemical Engineering, McMaster University, Canada, 1977
- MASc, Civil Engineering, University of Waterloo, Canada, 1973
- BASc, Civil Engineering, University of Waterloo, Canada, 1971

Dr. Huck's research interests are primarily in the areas of:

- Advancing Treatment, which includes research on understanding and optimizing biofiltration, membrane filtration, chemical contaminant removal, and conventional treatment performance;
- Sustainable Water Systems, which is investigating potential applications and strategies for municipal water reuse;
- Risk-based Decision Making, which is developing tools that utilities can use for assessing and quantifying treatment in terms of identified health risks.

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## Dr. Walter Illman *(CRAES and Hohai only)*

Professor
Department of Earth and Environmental Sciences, University of Waterloo

willman@uwaterloo.ca

Dr. Illman holds the following academic degrees:

- PhD, Hydrology with minor in Applied Mathematics, University of Arizona, U.S.A., 1999
- BSc. with Honors, Geological Sciences, University of Washington, U.S.A., 1994

Dr. Illman's research includes:

- Field and laboratory experimental investigations of fluid flow and solute (contaminant) transport in porous and fractured geologic media;
- Hydraulic tomography;
- Dense Non Aqueous Phase Liquid (DNAPL) source zone and plume characterization and monitoring;
- Geostatistical (stochastic) inverse modeling of pumping and tracer test data;
- Mathematical modeling (analytical and numerical) of fluid flow and contaminant transport;
- Unsaturated zone hydrology;
- Performance assessment of bioremediation and natural attenuation of organic contaminants.

## Dr. Juewen Liu

Associate Professor
Department of Chemistry, University of Waterloo

liujw@uwaterloo.ca

Dr. Liu holds the following academic degrees:

- PhD, Department of Chemistry, University of Illinois at Urbana-Champaign, Urbana, Illinois, U.S.A., 2005
- B.S., Department of Chemistry, University of Science & Technology of China, Hefei, China, 2000

Dr. Liu is interested in detecting heavy metal ions and organic contaminants in water. His group performs combinatorial DNA selection experiments to isolate functional DNA molecules (e.g. aptamers and DNAzymes) to selectively bind target analytes. Then these DNA molecules are engineered into fluorescent or colorimetric biosensors. Another research front is to develop nanomaterials and surfaces as well as hydrogels that can selectively adsorb contaminants in water, and these materials can then be used for environment remediation applications. Aside from these applied studies, the Liu lab also explores fundamental sciences in terms of metal coordination by DNA, enzyme mechanisms, and adsorption mechanisms, including:

- In vitro selection of lanthanide ion and thiophilic metal ion dependent DNAzymes and related biosensor development;
- Molecularly imprinted polymers for organic contaminants;
- Metal oxide nanoparticles for anion adsorption;
- Combining detection and remediation in a single system.

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## Dr. Ed Sudicky *(Hohai only)*

Professor
Department of Earth and Environmental Sciences, University of Waterloo

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Dr. Sudicky's research includes:

- Mathematical modelling of groundwater flow and contaminant transport in hydrogeologic systems by numerical and analytical methods;
- Groundwater remediation;
- Stochastic analysis of flow and mass transport in heterogeneous porous and fractured geologic media;
- Field-scale tracer dispersion tests, groundwater hydraulics and statistical characterization of spatial variability of material properties at field sites;
- Theory and modelling of surface/subsurface flow, solute and energy transport from the watershed to the continental scale.

## Dr. William Taylor

Interim Chair, Department of Earth and Environmental Sciences
Distinguished Professor Emeritus, Department of Biology, University of Waterloo

wdtaylor@uwaterloo.ca

Dr. Taylor holds the following academic degrees:

- PhD, Zoology, University of Toronto, Canada, 1978
- BSc, University of Toronto, Canada, 1973

Dr. Taylor's basic research interests are within aquatic ecology and include the phosphorus cycle, lake food webs, and the fate of contaminants. Applied aspects of his research include eutrophication, effects of contaminants, biomagnification, and the fate of pathogens. He has worked on the Laurentian Great Lakes their tributaries, the African Great Lakes, small lakes, and wetlands. He and Water Institute colleague Philippe Van Cappellen have been involved recently in research on the Three Gorges Reservoir with colleagues at University of Windsor in Ontario and Southwest University in Chongqing.

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## Dr. Bryan Tolson *(Wuhan, Southwest and CRAES only)*

Associate Professor
Department of Civil and Environmental Engineering, University of Waterloo

btolson@uwaterloo.ca

Dr. Tolson holds the following academic degrees:

- PhD, Civil and Environmental Engineering, Cornell University, U.S.A., 2005
- MASc, Civil Engineering, University of British Columbia, Canada, 2000
- BSc (Env), Environmental Science, University of Guelph, Canada, 1998

Dr. Tolson's current research interests include the field of environmental and water resources systems analysis, the development and testing of heuristic algorithms for efficient single- and multiple-objective optimization, and uncertainty estimation as well as risk-based or probabilistic assessment of environmental and water resources systems. These research interests have been applied to a variety of application areas including hydrologic model calibration, water distribution network calibration and optimal design and Great Lakes water level management.

## Dr. Philippe Van Cappellen

Canada Excellence Research Chair in Ecohydrology
Professor, Department of Earth and Environmental Sciences, University of Waterloo

pvc@uwaterloo.ca

Dr. Van Cappellen holds the following academic degrees:

- PhD, Geochemistry, Yale University, U.S.A., 1991.
- MSc, Geology & Mineralogy, Free University of Brussels, Belgium, 1981.
- BSc, Geology & Mineralogy, Free University of Brussels, Belgium 1981.

Dr. Van Cappellen's research focuses on the biogeochemistry of soils, sediments and aquatic ecosystems, the cycles of water, carbon, nutrients and metals, global change, geobiology, chemical hydrology, water-rock interactions and environmental modeling, and includes:

- Geomicrobiology: microbial degradation of organic matter, redox and acid-base dynamics of natural waters, geomicrobiology of metals, interfacial chemistry of microorganisms.
- Mineral-water interactions: surface chemistry of minerals, kinetics of mineral nucleation, growth and dissolution, biomineralization.
- Reactive transport modeling: numerical models of multicomponent reactive transport in sediments, soils, surface waters, hydrothermal systems and aquifers.
- Water and elemental cycles, global change, sustainability: carbon and nutrient cycles, land-ocean transition, coastal ecosystems, groundwater-surface water interactions.
- Biogeochemical complexity: dynamics of coupled geomicrobial reaction networks, competition and feedbacks among metabolic and abiotic reaction pathways.