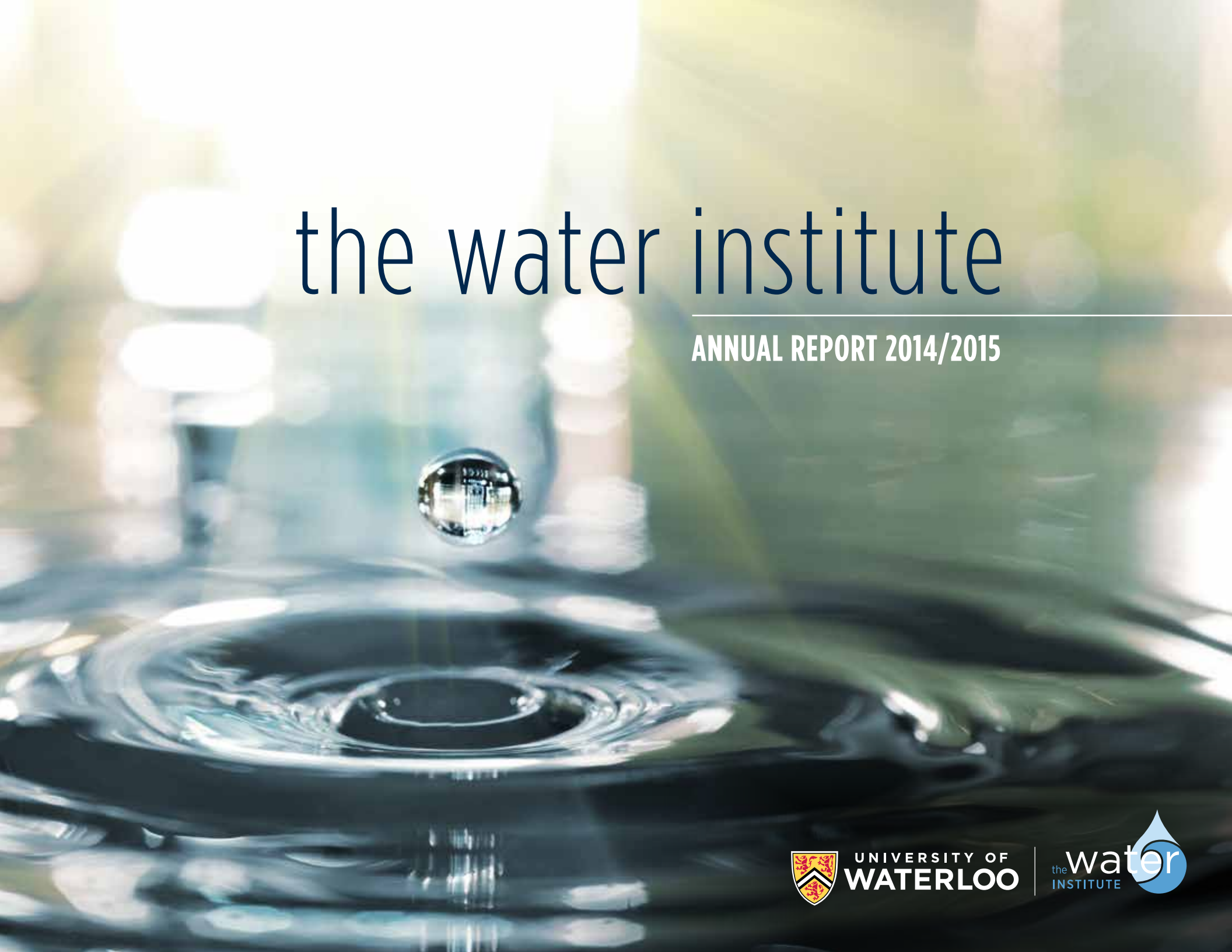


the water institute

ANNUAL REPORT 2014/2015

UNIVERSITY OF WATERLOO | the water INSTITUTE

our vision

To be a global leader that substantially advances the sustainable use and management of water for the benefit of the environment, economy and society.

our mission

To facilitate collaboration, support excellence and promote innovation in interdisciplinary research and education, and to promote knowledge exchange in addressing complex water challenges.

strategic goals

1. Promote and support relevant, collaborative, interdisciplinary water research.
2. Strengthen global networks and partnerships with leading water organizations and researchers.
3. Promote interdisciplinary perspectives in water-related education.
4. Strengthen the capacity of water resources professionals.

Photo by Katie McCann

WATERLOO

MESSAGE FROM THE CHAIR OF THE EXTERNAL ADVISORY BOARD

The Water Institute's External Advisory Board was established in 2012/2013 to provide an independent perspective on the Institute's progress towards its goals, and to offer recommendations on how it might make a greater impact. Each year, the Board's report is prefaced by a "headline" that aims to capture the essence of conversations with senior university administrators, Institute researchers and staff and the graduate students.

Our 2012/2013 report was prefaced with *"the Water Institute is an exciting initiative with tremendous potential"*. The 2013/2014 report said *"the next 12 to 18 months represent a critical juncture, a tipping point, for the future of the Water Institute."* The report applauded the Institute's new strategic plan, its renewal by the University and the launch of the Collaborative Water Program, while providing recommendations on leadership succession planning and the establishment of a research agenda.

The Board's recent 2014/2015 report is prefaced with *"the coming year will be all about taking the Water Institute to the next level."* As a group, we were impressed with progress against the strategic plan over the past year, and in particular the identification of research challenges and the increased participation and commitment demonstrated by faculty members. It appears that the upcoming year will be very exciting for the Water Institute with an anticipated leadership change and implementation of the research agenda.

In closing, and on behalf of the External Advisory Board, I offer sincere congratulations to Dr. Bob Gillham for his role in establishing and leading the Water Institute through its formative years. It is because of Bob's commitment that the Institute is indeed poised for bigger and better things.

TONY MAAS
Principal, Maas Strategies, Kitchener, Ontario

MESSAGE FROM THE EXECUTIVE DIRECTOR

Activities of the Water Institute over the past year were largely directed at implementing our revised and updated strategic plan. As part of this process, three priority research areas were identified (pg. 4). This will be helpful in organizing and coordinating research projects, but will be particularly useful in bringing an identity to the Institute. Of the several other initiatives, a greater focus on international opportunities is a significant priority. The enthusiastic reception that our delegation received in China (pg. 7) was particularly encouraging. With many large water-related problems and an increasing commitment of the Chinese government to the environment, we look forward to increasing opportunities for collaboration in China.

Recruitment of the next Executive Director was a critical activity of the past year. Following an exhaustive international search, Dr. Roy Brouwer was selected as my successor. Dr. Brouwer is currently Head of the Department of Environmental Economics at VU University in Amsterdam, the Netherlands. He will bring new perspectives, a wealth of international experience and renewed energy to the position. Dr. Brouwer will take up his duties in January 2016.

As the outgoing Executive Director, I would characterize the past four years as both challenging and rewarding. Though not all goals were achieved, I believe there is now a strong foundation for continued growth and success. I am particularly grateful for the consistent support and encouragement provided by the University, the cooperation of the membership and, of course, the exceptional commitment and service of the Institute staff. It has been a fascinating four years.

DR. ROBERT W. GILLHAM
Executive Director, the Water Institute

"Transformational research that transcends traditional disciplinary boundaries has deep roots at Waterloo. The Water Institute serves as a catalyst for interdisciplinary collaboration in addressing "grand challenges" confronting the sustainable use and management of water".

– DR. GEORGE DIXON
Vice-President, University Research, University of Waterloo

Studying water at the nanoscale in Frank Gu's lab.

what we do

The University of Waterloo established the Water Institute in 2009, building on four decades of excellence in water-related research, education and innovation. The Institute includes about 145 faculty and 400 graduate students from across all six university academic faculties (Applied Health Sciences, Arts, Engineering, Environment, Mathematics and Science) and 18 departments.

Waterloo's water research programs are diverse, and collectively comprehensive, with core disciplinary expertise in areas such as:

» Hydrological (groundwater, surface water) science and engineering,
» Water/wastewater treatment,
» Ecohydrology,
» Aquatic ecology and ecotoxicology,
» Water governance and management,
» Water and health,
» Instrumentation.

A primary objective of the Water Institute is to facilitate interdisciplinary research and education to address increasingly complex water issues.

The Water Institute provides its members with a range of services, including:

RESEARCH

» Identify funding opportunities and secure incremental funding,
» Identify and introduce researchers with common areas of interest,
» Establish and support researcher working groups and clusters,
» Solicit letters of support for research projects,
» Provide review and advice on research proposals,
» Provide in-kind support to research projects.

EDUCATION

» Co-ordination and support of the Collaborative Water Graduate Program,
» Develop and administer graduate student scholarship program,
» Support and enable the Water Institute's graduate students chapter (SWIGS).

PARTNERSHIPS

» Cultivate industrial, governmental, civil society and other partners,
» Host academic delegations at Waterloo,
» Manage faculty delegations to other countries,
» Facilitate and support international collaborations and partnerships,
» Serve as a central point of contact.

KNOWLEDGE EXCHANGE

» Support and organize:
  - Seminars,
  - Workshops,
  - Research Symposia,
  - Public and Distinguished Lectures,
» Publish the triannual *Splash Pad* newsletter,
» Promote and profile researchers through various communications activities,
» Facilitate and support media relations.

by the numbers

145 FACULTY MEMBERS
- 6 FACULTIES
- 18 DEPARTMENTS

6 FELLOWS OF THE ROYAL SOCIETY OF CANADA

WI MEMBERS WERE CITED OVER **22,000** TIMES BETWEEN 2004 AND 2013

SPONSORED WATER-RELATED RESEARCH GREW FROM $14M IN 2009/10, TO **$31 million** IN 2013/2014

1 CANADA EXCELLENCE RESEARCH CHAIR

18 RESEARCH CHAIRS

WI MEMBERS PUBLISHED **1,650** PAPERS BETWEEN 2004 AND 2013

1 COLLABORATIVE WATER GRADUATE PROGRAM

STUDENTS OF THE WATER INSTITUTE GRADUATE SECTION (SWIGS) HAS OVER **400** MEMBERS

WI HAS OVER **70** EXTERNAL PARTNERS

10th BEST WATER RESEARCH INSTITUTION IN THE WORLD

SOURCE: Lux Research Inc., Top Academics and Institutions in Water Research 2013, *www.luxresearchinc.com/news-and-events/ press-releases/168.html*

20th MOST PROLIFIC RESEARCH INSTITUTE IN THE WORLD

SOURCE: Stockholm International Water Institute and Elsevier, The Water and Food Nexus: Trends and Development of the Research Landscape, August 2012.

Nearshore groundwater-lake water quality monitoring: Lake Ontario.

looking forward

In 2013/2014, and in preparation for the second five-year term of the Water Institute, a significant effort was devoted to updating the Institute's strategic plan. The revised Vision, Mission and Goals are included on the inside cover of this report. In addition, specific objectives and implementation activities were developed in three areas — research, education and profile. Over the past year, implementation of the strategic plan, with particular attention to the objectives for research and education, has guided much of the activity. Progress towards these objectives in summarized in the following discussion.

RESEARCH

The promotion of relevant, collaborative inter-disciplinary research is core to the mission of the Water Institute.

RESEARCH CHALLENGES

An important strength of the Water Institute is the breadth of experience and expertise of its researchers. The 2014 strategic plan noted that the identification of common, Institute-level research challenges was important to address large and persistent problems, to promote interdisciplinary investigation and to encourage development of innovative solutions. From mid-2014 to mid-2015, Water Institute researchers engaged in a participatory process to identify areas of research where Institute-led teams would have the capacity to make significant contributions. Based on this process, the following three areas of activity were identified as strategic research priorities:

1. Watershed Processes and Management
2. Safe Water
3. Water and Global Change

Identification of these areas/challenges has proven to be particularly helpful in guiding the formation of inter-disciplinary teams and in the development of research projects.

SEED GRANTS PROGRAM

Over the past four years, the Water Institute administered an Interdisciplinary Workshop program where modest grants were made available to Waterloo faculty to catalyze new research. The program generated important outputs, for example, Derek Armitage, Rob de Loë and Roland Hall's publication *Science-policy Processes for Transboundary Water Governance*. In 2014/2015, the Institute expanded the Workshop program to a new Seed Grants Program. The purpose of the new program is to stimulate interdisciplinary collaboration, to facilitate interaction with national and international authorities, and to encourage the development of research proposals. The inaugural competition awarded a total of $100,000 to six wide-ranging projects:

John Smol delivers a Water Institute Lecture.

- *Monsoon Harvests in rapidly changing landscapes: Understanding the role of the ancient tank irrigation systems in increasing climate change adaptability* (N. Basu, Earth and Environmental Sciences, Civil and Environmental Engineering)
- *Empowering women through WaSH across the lifecourse* (S. Elliott, Geography and Environmental Management)
- *Comparative indicators of socio-ecological resilience and restoration of aquatic ecosystems* (S. Murphy, Environment and Resource Studies)
- *Microbiology of Archaean ocean analogues within the Experimental Lakes Area: Implications for cyanobacterial blooms, mercury cycling, and beyond!* (J. Neufeld, Biology)
- *Incorporating wetlands for water management in reclamation of post-mined landscapes* (J. Price, Geography and Environmental Management)
- *Capacity building in hydrobiogeophysics at the University of Waterloo* (F. Rezanezhad, Earth and Environmental Sciences)

In 2015/2016, a total of $150,000 will be made available through the Seed Grants Program. The program is valuable in that it requires interdisciplinary collaboration, but it also provides stimulus for creative and unconventional thought.

RBC VISITING FELLOWS PROGRAM

The purpose of the Water Institute's RBC Visiting Fellows Program is i) to enrich the learning experience of Collaborative Water Program students specifically, and the broader graduate and undergraduate water student population more generally, and ii) to stimulate discussion and the exploration of collaborative research opportunities with Water Institute faculty. The fellows program, launched in 2014/2015, aims to attract recognized national and international water researchers, thought leaders or professionals with experience in using inter-disciplinary approaches to addressing water challenges.

The first RBC Visiting Fellow, Dr. Nigel Watson from Lancaster University in the United Kingdom, was welcomed to the Institute in late-2014. Dr. Watson's fellowship was exceptionally well received by students, as he successfully mentored students, and shared his experiences in multi-party water collaboration as the basis for policy making.

SEMINARS AND LECTURES

Consistent with our mandate to facilitate knowledge sharing, in 2014/2015, as in past years, the Institute organized seminars coincident with visits to the University be water researchers or professionals. Also in 2014/2015, the Institute launched its new *WaterTalks* lecture series which features high-profile, invited speakers. These events were very well-attended, and were livestreamed and videotaped, allowing users to view the lectures "on-demand", or professors to use the lectures in courses. The 2014/2015 *WaterTalks* lecturers included:

- **THOMAS HARTER**, *University of California Davis*
  Future of Groundwater Management in California
- **SHEILA OLMSTEAD**, *University of Texas at Austin*
  Water Resources and Climate Change Adaptation:
  An Economist's Perspective
- **DAVID SCHINDLER**, *University of Alberta*
  Canada's Freshwater in the 21st Century
- **JOHN SMOL**, *Queens University*
  Exploring the Past to Protect Our Future:
  Using Lake Sediments to Study Water Quality Issues
- **CHARLES VÖRÖSMARTY**, *City University of New York*
  Water in the 21st Century: Sources of Pessimism, Sources of Optimism

These talks are available for viewing on the Water Institute YouTube channel.

EXTERNAL PARTNERS PROGRAM

The Water Institute launched its External Partners Program in 2013 to facilitate partnerships between researchers and members of the private sector, government, civil society or other organizations that have a particular interest in the water sector. Four levels of membership are available to our partners — Platinum, Gold, Silver and Bronze — with commensurate benefits. During 2014/2015, the Institute added 24 new external partners.

Depending upon the membership level, External Partners Program benefits can include:

- Water-related information and news,
- Invitations to the Water Institute's seminar series,
- Introductions to relevant Waterloo researchers to discuss opportunities for collaboration,
- Invitations to the annual Water Institute Research Symposium and Distinguished Lecture,
- Support for student recruiting activities, such as World Water Day booths and Employment Forums,
- Recognition through Water Institute graduate scholarships (Platinum members only),
- Recognition and acknowledgment of membership and scholarship support on the Water Institute website and at our Research Symposium.

In late-2014, the program was enhanced through the offering of Employment Forums for its Platinum, Gold and Silver Partners. The forums allowed partners to introduce their respective companies and discuss potential employment opportunities with Waterloo students.

Platinum Level

AECOM

Golder Associates

RBC Foundation

Stantec

Gold Level

ch2m:

Matrix Solutions Inc.
ENVIRONMENT & ENGINEERING

The City of Waterloo

Kitchener

Silver Level

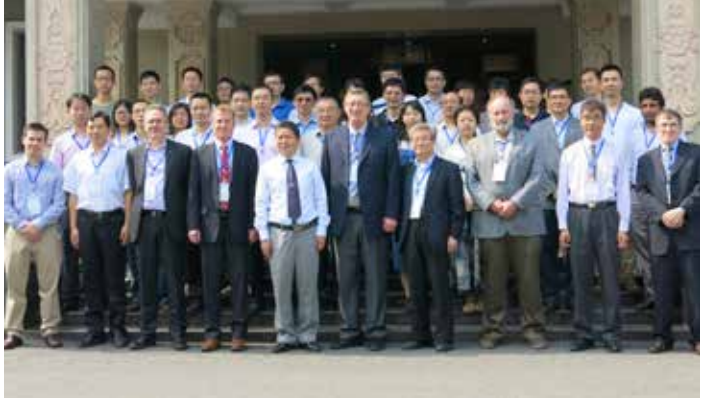
Geosyntec consultants
engineers | scientists | innovators

Peterborough Utilities Group

"AECOM is a proud partner of the Water Institute. This collaboration has proven beneficial in linking AECOM professionals with Institute researchers, and as a conduit to Waterloo's talented water graduates intent on entering the workforce."

— MR. ROBERT LEECH
Principal Consultant, Environment, AECOM, Toronto, Ontario

Peter Huck and Bob Gillham were among the Water Institute China mission delegates.



The Water Institute workshop in Wuhan, China: Workshop delegates from the Water Institute, Wuhan University and the China University of Geosciences.

INTERNATIONALIZATION

Two countries of particular strategic importance to the University of Waterloo are China and Israel. In 2014/2015, the Water Institute strengthened relationships and collaboration with researchers in both of these countries.

In mid-2014, the Water Institute organized a 3-day visit by Technion — Israel Institute of Technology, which included a joint workshop to explore research programs and collaborative opportunities. The visit followed signing of an institutional agreement between Waterloo and Technion aimed at advancing joint research in water, quantum computing and nanotechnology, and the earlier visit to Technion by several Water Institute faculty members. In early 2015, Waterloo and Technion announced a $1.6-million gift from The Gerald Schwartz and Heather Reisman Foundation to enable joint research. Assisted by this funding, two Water Institute faculty members are currently participating in joint research projects in the areas of membranes for water treatment and the monitoring of vadose zone processes.

In late-2014, the Water Institute received a grant from Waterloo International to conduct a series of workshops with leading Chinese water research and education institutions. A delegation of ten Water Institute researchers travelled to China in May 2015, and over a ten-day period participated in four joint workshops involving five Chinese institutions:

- Wuhan University,
- China University of Geosciences at Wuhan,
- Southwest University,
- Chinese Research Academy of Environmental Sciences,
- Hohai University.

The delegation was received enthusiastically, and a strong desire to develop collaborative projects was expressed. The Institute is currently working with counterpart organizations to match researchers with complementary research interests.

RESEARCH CHAIRS

The Water Institute has 17 members who currently hold prestigious research chairs:

CANADA EXCELLENCE RESEARCH CHAIR

DR. PHILIPPE VAN CAPPELLEN
Ecohydrology

CANADA RESEARCH CHAIRS

DR. DAVID BLOWES
Groundwater Remediation

DR. PU CHEN
Nano-Biomaterials

DR. BRIAN DIXON
Fish and Environmental Immunology

DR. FRANK GU
Advanced Target Delivery Systems

DR. JOHN HEIKKILA
Stress Protein Gene Research

DR. JANUSZ PAWLISZYN
New Analytical Methods and Technologies

DR. MARK SERVOS
Water Quality Protection

DR. ED SUDICKY
Quantitative Hydrogeology

DR. ALEXANDER WONG
Medical Imaging Systems

DR. JOHN YEOW
Micro and Nanodevices

INDUSTRIAL RESEARCH CHAIRS

DR. PETER HUCK
Water Treatment

DR. JANUSZ PAWLISZYN
New Analytical Methods and Technologies

UNIVERSITY RESEARCH CHAIRS

DR. ROB DE LOË
Water Policy and Governance

DR. SHERRY SCHIFF
Watershed Biogeochemistry

DR. DANIEL SCOTT
Global Change and Tourism

DR. MICHAEL TAM
Functional Colloids and Nanomaterials

CENTRE FOR GOVERNANCE AND INNOVATION RESEARCH CHAIR

DR. THOMAS HOMER-DIXON
Global Systems

Experiential learning in WATER 602.

EDUCATION

The promotion of inter-disciplinary perspectives in water-related education is a second core purpose of the Water Institute.

COLLABORATIVE WATER PROGRAM

The University of Waterloo's Collaborative Water Program (CWP) was launched in 2014 to promote interdisciplinary perspectives on water. This innovative program, jointly offered by ten academic Departments, is co-ordinated and supported by The Water Institute. Students of the Collaborative Water Program complete their specialist training in their respective home departments, while working with colleagues from a variety of other departments in two, new interdisciplinary courses (WATER 601 and WATER 602).

During 2014/2015, the first cohort (2013/2014) of 24 CWP students completed the inaugural offering of WATER 602. The course used the Grand River Watershed as a "living laboratory", and included a mix of field trips, group work and individual work. Students completed CWP-specific requirements by presenting their research at the Water Institute's Research Symposium.

Also during 2014/2015, the second cohort (2014/2015) of 29 CWP students was introduced to the program through participation in the inaugural CWP Leadership Retreat. The two-day retreat was held at Waterloo's Summit Centre for the Environment in Huntsville, and included a variety of team-building and collaboration exercises. The cohort then completed WATER 601, a case-study oriented course that used peer-to-peer learning in exploring water issues from a variety of perspectives.

The CWP is a major achievement for the Water Institute in support of its goal to promote interdisciplinary education. With an estimated third cohort (2015/2016) of 45 to 50 students, the CWP is gaining momentum as faculty, students and employers recognize the value in training "broad-minded specialists".

Currently, Departments or Schools participating in the CWP are:

- Applied Mathematics,
- Architecture,
- Biology,
- Chemical Engineering,
- Civil and Environmental Engineering,
- Earth and Environmental Sciences,
- Economics,
- Environment and Resource Studies,
- Environment, Enterprise and Development,
- Geography and Environmental Management.

Collaborative Water Program students at the fall Leadership Camp.

Peer-to-peer learning in WATER 601.

STUDENTS OF THE WATER INSTITUTE, GRADUATE SECTION

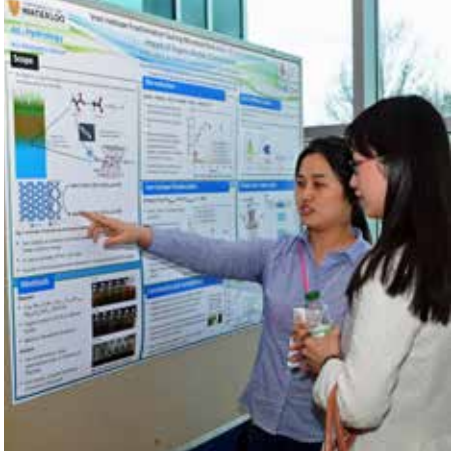
The Students of the Water Institute, Graduate Section (SWIGS) was established in 2010 to promote interdisciplinary water research and learning among graduate students from the various academic faculties. By 2014/2015, SWIGS had over 400 student members from across all six faculties. Under the leadership of the SWIGS executive, a variety of academic, social and outreach events focused on water-related themes were successfully organized and well attended. Of particular note, was the annual World Water Day Graduate Research Fair organized and co-hosted by the Water Institute, SWIGS and Wilfrid Laurier University. This event featured graduate student posters, industry booths, keynote speakers, and a networking reception.

The 2014/2015 SWIGS Executive team included:

» **SONDRA EGER**, Chair, Geography and Environmental Management
» **KRISTEN LEAL**, Vice Chair Academic, Earth and Environmental Sciences
» **MARICOR ARLOS**, Vice Chair Conference, Biology
» **ARUN RAJ**, Vice Chair Operations, Environment, Enterprise and Development
» **VICTORIA CHENNETTE**, Vice Chair Outreach, Civil and Environmental Engineering
» **EHSAN PASHA**, Vice Chair Social, Earth and Environmental Sciences

"Traditionally universities produce graduates who have exceptional expertise within their own discipline, but limited knowledge of related disciplines. In this new innovative program, we are creating opportunities for students to gain an appreciation for other water-related disciplines, and to be better prepared to work in teams of professionals with diverse backgrounds."

— **DR. MARK SERVOS**
Collaborative Water Program Director



Research Symposium 2015: Poster session; External Partners and WI members mingle over lunch.

2015 RBC Distinguished Lecturer Sunita Narain.

RESEARCH SYMPOSIUM AND RBC DISTINGUISHED LECTURE

The Water Institute held its third annual research symposium on April 30, 2015 with approximately 170 people attending — our largest gathering to-date. The symposium is designed to showcase the breadth of Waterloo's water research programs, focusing on areas of particular interest to our External Partners, and to provide an opportunity for Partners to interact with researchers and students.

Research Symposium 2015 included plenary presentations and a roundtable discussion on *Water Security for First Nations*, and featured speakers from the Assembly of First Nations, the University of Alberta and the Centre for Indigenous Environmental Resources in Winnipeg. Subsequent breakout sessions showcased multi-disciplinary research related to specific themes or issues; specifically Cold Regions, the Waterloo Region, Urbanization and Nanotechnology. A particular highlight of the day, was the presentation of graduate student water scholarships and several "three-minute thesis" presentations by students of SWIGS.

The symposium was followed by our RBC Distinguished Lecture, graduate student poster session and reception. The Water Institute was honoured to present Dr. Sunita Narain, Director General of the Centre for Science and Environment in New Delhi, India as its 2015 Distinguished Lecturer. Dr. Narain is a Stockholm Water Prize laureate, a writer and an environmentalist. Dr. Narain's lecture, *Challenges for Water Security in the Poor's World,* explored how risks associated with climate change are affecting water management decision making, and, in particular, challenges facing the sustainable management ofwater quantity and quality in India's agricultural and growing industrial and urban sectors.

"It is important that the South and North work together to jointly address water security challenges. I am very impressed with the Water Institute's approach to research, education and collaboration, promoting interdisciplinary, global perspectives to help understand the complexities of water and to identify affordable, sustainable solutions".

— **DR. SUNITA NARAIN**
Director General, Centre for Science and Environment, New Delhi, India

Collecting velocity and discharge measurements in the rain.

priorities for 2015/2016

Several goals and objectives have been established for 2015/2016 as we continue efforts to implement the renewed strategic plan. Within this context, the following activities will receive attention in 2015/2016:

- Development of new interdisciplinary research teams,
- Assist in the development of major research initiatives and proposals,
- Administration of the Seed Grants Program,
- Promotion and management of the RBC Visiting Fellows Program,
- Organization of the *WaterTalks* lecture series,
- Management of the External Partners Program,
- Strengthen international partnerships and collaboration,
- Design, promotion and execution of the Research Symposium and RBC Distinguished Lecture,
- Co-ordination and support of the Collaborative Water Program.

WATER INSTITUTE SCHOLARSHIP RECIPIENTS 2014/2015

We are most grateful to the Platinum members of our External Partners Program for their generous contributions in the form of graduate student scholarships.

AECOM

KAI LIU *Earth and Environmental Sciences*

GREGORY LUI *Chemical Engineering*

GOLDER ASSOCIATES

MARICOR ARLOS *Biology*

COLIN MCCARTER *Geography and Environmental Management*

STANTEC

YE ZHOU *Civil and Environmental Engineering*

RBC WATER SCHOLARS

A major portion of the RBC Foundation grant in support of the Collaborative Water Program is committed to entrance scholarships. The 2014/2015 RBC Water Scholars include:

AARON COUTINO *Applied Mathematics*

AURLEIA ADAMS *Architecture*

JESSICA LEUNG *Biology*

KATIE MCCANN *Biology*

EVELYN WORTHINGTON *Biology*

HONGLI LIU *Civil and Environmental Engineering*

LORENZO SIMONETTI *Civil and Environmental Engineering*

JANIS RACHEL BALDWIN *Earth and Environmental Sciences*

TATJANA MILOJEVIC *Earth and Environmental Sciences*

MD ABDUS SABUR *Earth and Environmental Sciences*

LAUREN SMITH *Environment, Enterprise and Development*

NICOLE BALLISTON *Geography and Environmental Management*

CATHERINE BROWN *Geography and Environmental Management*

BEHRAD GHAREDAGHLOO *Geography and Environmental Management*

The Technion — Israel Institute of Technology delegation presented their research interests to Water Institute members.

VISITING DELEGATIONS 2014/2015

- DHAN Foundation, India
- University of Bordeaux, France
- Environment Canada/Chinese Research Academy of Environmental Sciences
- Wageningen University, the Netherlands
- Technion — Israel Institute of Technology
- El Basque University, Colombia
- Government of the Northwest Territories
- Water Research Foundation, U.S.A.
- BCEG, China
- Dow Chemical, U.S.A.
- INCAS3, Netherlands
- Hohai University, China

WATER INSTITUTE SEMINARS AND LECTURES

JUNE 18, 2014

DAVID SCHINDLER, University of Alberta
Canada's freshwater in the 21st Century YouTube

OCTOBER 3, 2014

RYAN MULLIGAN, Queen's University
Coastal responses to hurricane forcing from beaches to estuaries

OCTOBER 20, 2014

MOHAMED ABDRABO, Alexandria University
Policy-oriented climate change adaptation research center: The Nile Delta experience

NOVEMBER 20, 2014

NIGEL WATSON, Lancaster University
Learning at Loweswater: An experiment in interdisciplinary water science and collaborative catchment management YouTube

NOVEMBER 26, 2014

MARK REDWOOD, International Development Research Centre
Water, development and our uncertain future

DECEMBER 11, 2014

ALTHEA GRUNDLING, Agricultural Research Council — Institute for Soil, Climate and Water
South African peatlands

JANUARY 29, 2015

THOMAS HARTER, University of California Davis
Future of groundwater management in California YouTube

MARCH 5, 2015

JOHN SMOL, Queens University
Exploring the past to protect our future: Using lake sediments to study water quality issues YouTube

MARCH 12, 2015

CHARLES VÖRÖSMARTY, City University of New York
Water in the 21st Century: Sources of pessimism, sources of optimism YouTube

MARCH 17, 2015

SHEILA OLMSTEAD, University of Texas at Austin
Water resources and climate change adaptation: An economist's perspective YouTube

EXTERNAL ADVISORY BOARD

The purpose of the External Advisory Board of the Water Institute is to provide an independent and external evaluation of the progress of the Institute and to provide recommendations and support to help meet its goals. The Board held its annual meeting on May 12, 2015 and reported findings to the Water Institute's Senior Management Committee. Current members of the External Advisory Board are:

- **TONY MAAS** (Chair), Principal
  Maas Strategies, Kitchener, Ontario
- **JOHN COBURN**, Managing Director
  XPV Capital, Toronto, Ontario
- **ROBERT LEECH**, Environment Practice Lead
  AECOM, Toronto, Ontario
- **MICHAEL MURRAY**, Chief Administrative Officer,
  Region of Waterloo, Kitchener, Ontario
- **JEFFREY MCDONNELL**, Professor, School of Environment and Sustainability; Assistant Director
  Global Institute for Water Security, University of Saskatchewan, Saskatoon, Saskatchewan
- **MERRELL-ANN PHARE**, Executive Director/Legal Counsel
  Centre for Indigenous Environmental Resources, Winnipeg, Manitoba
- **GEORG TEUTSCH**, Scientific Director
  Helmholtz Centre for Environmental Research — UFZ, Leipzig, Germany

WATER INSTITUTE SENIOR MANAGEMENT COMMITTEE

Pearl Sullivan
Chair, Dean, Faculty of Engineering
James Rush
Dean, Faculty of Applied Health Sciences
Jean Andrey
Dean, Faculty of Environment
Terry McMahon
Dean, Faculty of Science
George Dixon
VP University Research
James Craig
Chair, WI SPC Communications and Marketing Committee
Robert Gillham
WI Executive Director
Kevin Boehmer
WI Managing Director

WATER INSTITUTE STRATEGIC PLANNING COMMITTEE

Robert Gillham
Chair, WI Executive Director
James Craig
Faculty of Engineering
Don Burn
Faculty of Engineering
Martin Ross
Faculty of Science
Mark Servos
Faculty of Science
Merrin Macrae
Faculty of Environment
Larry Swatuk
Faculty of Environment
Kevin Lamb
Faculty of Mathematics
Shannon Majowicz
Faculty of Applied Health Sciences
Margaret Insley
Faculty of Arts
Mark Knight
Centre for Advancement of Trenchless Technologies (CATT)
Ellsworth LeDrew
Canadian Cryospheric Information Network (CCIN)
Stephen Murphy
Centre for Ecosystem Resilience and Adaptation (ERA)
Andre Unger
Institute for Groundwater Research (WIGR)
Sondra Eger
Student, Chair SWIGS
George Dixon
VP University Research
Kevin Boehmer
WI Managing Director

WATER INSTITUTE MEMBERS

Paulo Alencar
Computer Science
William A. Anderson
Chemical Engineering
William B. Anderson
Civil and Environmental Engineering
William Annable
Civil and Environmental Engineering
Ramon Aravena
Earth and Environmental Sciences
Derek Armitage
Environment and Resource Studies
Gladimir Baranoski
Computer Science
James Barker
Earth and Environmental Sciences
Nandita Basu
Earth and Environmental Sciences; Civil and Environmental Engineering
Ila Berman
Architecture
David Blowes
Earth and Environmental Sciences
Niels Bols
Biology
Alexander Brenning, *Geography and Environmental Management*
Neil Brisley, *Accounting and Finance*
David Brush, *Civil and Environmental Engineering*
Donald Burn, *Civil and Environmental Engineering*
Barbara Butler, *Biology*
Giovanni Cascante, *Civil and Environmental Engineering*
Robert Case
Social Development Studies, Renison University College
Trevor Charles
Biology
John Chatzis
Chemical Engineering
Pu Chen
Chemical Engineering
Zhongwei Chen
Chemical Engineering
David Clausi
Systems Design Engineering
Brewster Conant Jr.
Earth and Environmental Sciences
Simon Courtenay
Environment and Resource Studies
Don Cowan
Computer Science
James Craig
Civil and Environmental Engineering
Serge D'Alessio
Applied Mathematics
Rob de Loë
Environment and Resource Studies
Peter Deadman
Geography and Environmental Management
Brian Dixon
Biology
George Dixon
Biology
Heather Douglas
Philosophy
Claude Duguay
Geography and Environmental Management
Hans Dürr
Earth and Environmental Sciences
Maurice Dusseault
Earth and Environmental Sciences
Susan Elliott
Geography and Environmental Management
Monica Emelko
Civil and Environmental Engineering
Anthony Endres
Earth and Environmental Sciences
Elizabeth English
Architecture
Steve Evans
Earth and Environmental Sciences
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Geography and Environmental Management
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Computer Science
Shaun Frape
Earth and Environmental Sciences
Emil Frind
Earth and Environmental Sciences
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Chemistry
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Civil and Environmental Engineering
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Chemical Engineering
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Environment and Resource Studies
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Public Health and Health Systems
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Civil and Environmental Engineering
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Environment and Resource Studies
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Civil and Environmental Engineering
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Civil and Environmental Engineering
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Systems Design Engineering
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Earth and Environmental Sciences
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Earth and Environmental Sciences
Horatiu Rus
Economics; Political Science
Simarjeet Saini
Electrical and Computer Engineering
Sherry Schiff
Earth and Environmental Sciences
Andrea Scott
Systems Design Engineering
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Geography and Environmental Management
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Civil and Environmental Engineering
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Marek Stastna
Applied Mathematics
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Geography and Environmental Management
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Larry Swatuk
Environment, Enterprise and Development
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Civil and Environmental Engineering
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Chemical Engineering
Shirley Tang
Chemistry
William Taylor
Earth and Environmental Sciences
Neil Thomson
Civil and Environmental Engineering
Bryan Tolson
Civil and Environmental Engineering
André Unger
Earth and Environmental Sciences
Philippe Van Cappellen
Earth and Environmental Sciences
Michele Van Dyke
Civil and Environmental Engineering
Michael Waite
Applied Mathematics
Johanna Wandel
Geography and Environmental Management
Barry Warner
Earth and Environmental Sciences
Olaf Weber
Environment, Enterprise and Development
Mary Wells
Mechanical and Mechatronics Engineering
Jonathan Witt
Biology
Sarah Wolfe
Environment and Resource Studies
Alexander Wong
Systems Design Engineering
Lingling Wu
Earth and Environmental Sciences
John Yeow
Systems Design Engineering
Youngki Yoon
Electrical and Computer Engineering
Aiping Yu
Chemical Engineering

Photo by Louise Dawe

WETSKILLS WATER CHALLENGE

Wetskills water challenge is a Dutch-led initiative that organizes international workshops where students work in multi-disciplinary teams to develop innovative concepts to address various water issues. In 2014, the Water Institute supported the participation of SWIGS students Arun Raj and Eduardo Cejudo in Wetskills Water Challenge Canada held at Ryerson University in Toronto. Arun and his teammates were matched with the Dutch company INCAS3 and Canadian company CanNorth and were challenged to advance monitoring in difficult environments. The team presented a proposal for *Smart Monitoring: Heavy Metal Detection in Mine Effluent*, and was subsequently invited to Amsterdam to present their idea at a company summit.

Raj and his teammates continued to refine the concept, and later in 2015, entered the Future Technologies for Water Competition at the University of North Carolina at Chapel Hill. The competition received over 70 applications from teams in 27 countries. Raj's team was short-listed to present their concept at the competition, and ultimately won their event category and was awarded a $15,000 start-up grant to further develop their concept. The current plan is for the team to use the grant to test their technology at the University of Waterloo. Based on the results of testing, Raj and his teammates want to quantify the potential economic benefit of the technology before deciding next steps.

CONTACT INFORMATION

ROBERT W. GILLHAM
Executive Director, the Water Institute
519-888-4567, ext. 84658 | rwgillham@uwaterloo.ca

KEVIN BOEHMER
Managing Director, the Water Institute
519-888-4567, ext. 32643 | kboehmer@uwaterloo.ca

MARY ANNE HARDY
Administrative Associate, the Water Institute
519-888-4567, ext. 32658 | mahardy@uwaterloo.ca

OFFICE ADDRESS

Research Advancement Centre, Room 2127
David Johnston Research + Technology Park
475 Wes Graham Way
Waterloo, Ontario N2L 6R2
Canada

MAILING ADDRESS

the Water Institute
University of Waterloo
200 University Avenue West
Waterloo, Ontario N2L 3G1
Canada

water.uwaterloo.ca

the water INSTITUTE

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