BRINGING WATER SCIENTISTS AND CANADIAN POLICY-MAKERS TOGETHER

WATER DAY ON THE HILL 2020 REPORT

WATER DAY ON THE HILL

In partnership with Canada's Chief Science Advisor, the Global Institute for Water Security at the University of Saskatchewan brought water scientists from 14 institutions across Canada on March 10, 2020 to Ottawa to meet with Parliamentarians and senior federal officials to raise awareness about issues around water security for Canada, and share information on how scientific knowledge can inform decision making.

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BACKGROUND

Water Day on the Hill 2020 marked the beginning of an exciting connection between water scientists and policymakers in Canada. With the unprecedented global pandemic situation, water has become more crucial than ever in saving lives. One in nine people lacks access to improved water supply, while one in three lacks access to sanitation. Climate change is not making the situation any easier.
Canada has the largest amount of renewable fresh water in the world, but it is not in the most accessible and secure form. New science is revealing that Canada is not as water secure as we would like to think: water is part of a dynamic system, the rules of which are changing swiftly. The scope and pace of these changes are putting Canada's people, environment and agricultural productivity at great risk. Climate change is resulting in rapid changes that Canada must prepare for: an increasing intensity of extremes of flooding, drought and wildfire; shrinking snowpack, melting glaciers and permafrost; and resulting changes in streamflow and groundwater that will increase the risk of summer water shortages. Reliable access to appropriate water for all intended uses is a local issue for every constituency in Canada, while managing the broader water system is a national issue. Our nation's water scientists are keen to share their knowledge with government officials as they work through important decisions necessary for Canada to be best prepared for a more complicated water future. Water scientists around Canada have been exploring different aspects of water, from municipal water supply and wastewater treatment to groundwater depletion. Research by the scientific community is critical for policymakers to make evidence-based decisions about sustainable water management. Water Day on the Hill was an effort to enhance the exchange of information between Canada's government leaders and its water scientists.

Photo: Participants of Water Day on the Hill, March 9, 2020, the Rideau Club, Ottawa.

EVENT PROGRAMME

RECEPTION

The Water Day on the Hill event kicked off with a reception for the scientists on March 9 at the Rideau Club, hosted by the Office of Chief Science Advisor and Global Institute for Water Security (GIWS). The reception focused on providing introductory training about engagement with public policymakers and also to encourage dialogue among the participants. GIWS Executive Director, Jay Famiglietti provided opening remarks. Paul Dufour, from PaulicyWorks, provided the group with an overview of how to communicate with policymakers and why events like this are crucial for scientists. He focused on "*following up as a post-event action*" as an important way to ensure the message is received.

Photo: Water Day on the Hill scientists attend presentation by Paul Dufour, Principal, PaulicyWorks. March 9, 2020, the Rideau Club, Ottawa.

TESTIMONY

Water Day on the Hill participants were invited to be witnesses before the Parliamentary Standing Committee on Environment and Sustainable Development and to brief them on Canada's Water Security. Three scientists - from across Canada Jay Famiglietti, David Rudolph and Amina Stoddart – testified, giving statements about the state of water security in Canada, followed by 30 minutes of questions from the Committee. Testimony covered the breadth of water science and Canada's geography: Jay Famiglietti spoke about surface water and climate change; David Rudolph spoke about groundwater; and Amina Stoddart drinking water and wastewater. The recording of the session is available here.

Photo: From left to right - MP Brad Redekopp, Saskatoon West, Dr. Amina Stoddart, Dr. Jay Famiglietti and Dr. David Rudolph. House of Commons, March 10, 2020, Ottawa.

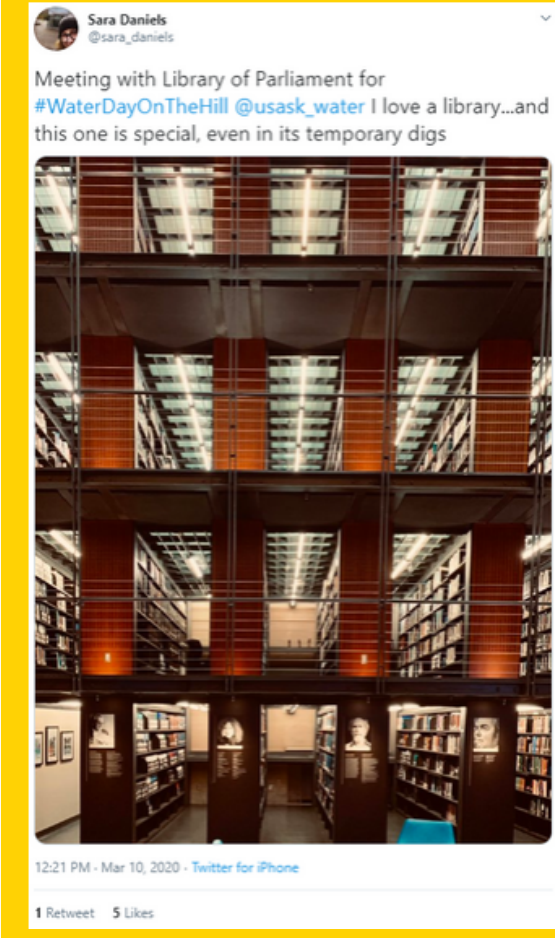
LUNCHEON

Canada's Chief Science Advisor, Dr. Mona Nemer, hosted a luncheon for all of the Water Day on the Hill scientists. Will Amos, Parliamentary Secretary to the Minister of Innovation Science and Industry (Science) and Terry Duguid, Parliamentary Secretary to the Minister of Environment and Climate Change (Canada Water Agency) gave passionate remarks about the importance of water science and water security for Canada. Also in attendance were Dr. Roseanne Runte, President and CEO of the Canada Foundation for Innovation, Dr. Danika Goosney, Vice-President, Research Grants and Scholarships Directorate at the Natural Sciences and Engineering Research Council (NSERC), as well as the Assistant Deputy Ministers for Environment and Climate Change Canada (ECCC), Agriculture and Agri-Food Canada, and Western Economic Diversification Canada. Departmental Science Advisors from Health and ECCC were also in attendance. Graduate students and post-docs presented their research, followed by an animated discussion session. It was an very positive atmosphere and a wonderful opportunity for the junior scientists and future water leaders.

Photo: Water Day on the Hill Luncheon attendees. Office of the Chief Science Advisor, March 10, 2020, Ottawa.

NSERC

Water scientists took part in a conversation with NSERC as part of their Water Day on the Hill event in Ottawa following the luncheon. The conversation provided an overview of NSERC's mandate, funding mechanisms and processes. NSERC Vice President Danika Goosney stated , *"We are grateful to have had the opportunity to meet with you all today, and proud to support water research across the country!"*



LIBRARY OF PARLIAMENT

Some of the Water Day on the Hill scientists met with a group of librarians and analysts at the Library of Parliament. The main source of information for MPs, Senators and standing committees is the Library of Parliament. The Library of Parliament group discussed their methods for producing research documents in response to official requests, which the researchers found illuminating. Both the groups found the interaction to be extremely valuable and expressed interest in further engagement.

MEETINGS

Water scientists emphasized the value of water and shared their stories of research with the Parliamentarians. Twenty four meetings with Parliamentarians took place around the hill in the heart of Ottawa. Jay Famiglietti, Executive Director of GIWS noted, *"The crucial work of water scientists is not always well-understood by the general public, and the event presented an opportunity to raise awareness about water security itself."* He and his colleagues also emphasized the need for an integrated and collaborative Canadian Water Agency. Thanks to the event, Parliamentarians are now hopefully better equipped to consider the perspective of scientists when making decisions that affect the Canadians across the country.

Dr. Mona Nemer
@ChiefSciCan

I had a great time hosting scientists from across 🇨🇦 along w/ senior federal officials at a lunchtime discussion on #waterscience for #WaterDayontheHill. @usask_water @JayFamiglietti #WDOTH2020 @WillAAmos @TerryDuguid

2:11 PM · Mar 10, 2020 · Twitter for iPhone

13 Retweets **69** Likes

Nancy Hamzawi
@NancyHamzawi

The rain didn't stop this esteemed group of scientists sharing their brilliant advice on water issues. Un gros merci à ces jeunes chercheurs...des perles canadiennes. #WaterDayOnTheHill @ECCCSciTech

Translate Tweet

12:09 PM · Mar 10, 2020 · Twitter for iPhone

4 Retweets **21** Likes

Ali Nazemi
@AliRNazemi

Great meeting and inspiring discussion with @KirstyDuncanMP today. With colleague Julie Theriault of UQAM, we talked about #precipitation near 0 degree C, thawing north and the importance of science advocacy. Take home message: Communication matters!
#WDOTH2020 #waterscience

Gina Cody School of Engineering & Computer Science and 3 others

8:42 PM · Mar 10, 2020 · Twitter Web App

4 Retweets **37** Likes

Markus Brinkmann
@BrinkmannMarkus

What an exciting #WaterDayontheHill today! Very productive and insightful meetings with MPs @WayneEaster and @MelArnoldMP on water quality and related fisheries issues. Thank you, @ChiefSciCan and @JayFamiglietti for hosting this event! @usask @usask_water @GWFutures

2:03 PM · Mar 10, 2020 · Twitter for iPhone

1 Retweet **13** Likes

Future Goals

Building on the success of Water Day on the Hill 2020, the goal is to organize annual or biennial event and extend into two days of engagement and advocacy about the value of Canadian water and water research. The following will remain strategic goals for GIWS:

1. Promote establishment of an integrated and collaborative Canadian Water Agency
2. Create synergy between policymakers and water scientists
3. Provide a platform for early career scientists to engage with decision-makers
4. Emphasize the value of supporting water research

WATER SCIENCE BRIEFS

SCIENCE CONTRIBUTIONS TO CANADA'S WATER SECURITY

Science is showing us that Canada's water cycle is rapidly changing. Flooding and drought are becoming more frequent and intense. The timing and patterns of precipitation are changing, impacting water availability for people and for agriculture. Warmer temperatures are leading to shorter snow and ice cover seasons, including earlier spring peak streamflow, thinning glaciers and thawing permafrost. Changing water patterns bring significant challenges to sustainably managing Canada's water future for its people, agriculture, economic growth and environment.

CANADA'S CHALLENGES AHEAD

Freshwater availability throughout the year is changing, with an increased risk of summer water supply shortages for people and for agriculture

Weather extremes will intensify in the future, including risks of flooding, drought and wildfire

Changing hydrology requires new levels of local, regional and national cooperation and collaboration

WATER SCIENTISTS IN CANADA ARE

Working with government partners to track rates of change of rainfall, streamflow and evapotranspiration; snowpack, snow and ice melt; and changes to soil moisture and groundwater storage

Providing an integrated hydrologic modeling platform that includes natural and human components (e.g. dams, reservoir operations, irrigation, diversions) for forecasting, prediction and decision making in Canada's major river basins

University water researchers are co-developing a national flood forecasting system with Environment and Climate Change Canada

Modernizing flow measurement and estimation methodologies, while developing big data, remote sensing and drone technologies

WATER DAY ON THE HILL

The Office of the Chief Science Advisor of Canada and the Global Institute for Water Security are jointly organizing 'Water Day on the Hill' in March 2020. For more information, please contact:

Sara Daniels
sara.daniels@usask.ca

This note was prepared by the Global Institute for Water Security, University of Saskatchewan

NEW AND EMERGING TECHNOLOGIES TO MONITOR CANADA'S WATERS AND CLIMATE

WATER SCIENTISTS ARE

Analysing increasing trends in the magnitude and frequency of extremes of flooding and drought

Using satellites to estimate water-driven risks to agricultural productivity

Modernizing streamflow measurement methods, while developing big data, remote sensing and drone technologies

Developing interactive maps to assess the past, current and future states of Canadian lakes, and providing new tools for lake assessments ranging from genetic markers to remote sensing approaches

Using isotopes to monitor groundwater quality and study the age of water in storage systems

Studying river-ice and developing methods to predict ice-jam floods in cold region rivers

SPECIFIC PROJECT EXAMPLES

Faculty from University of Northern British Columbia are measuring seasonal snowpack and glacial melt in of western Canada using space- and airborne remote sensing with funding from NSERC and CRC programs

Funded by the Winnipeg Foundation, Researchers at IISD Experimental Lake Area are determining the impact of microplastics on freshwater

eDNA project, funded by the GWF program, is using environmental DNA (eDNA) and next-generation sequencing (NGS) to provide a prompt status of aquatic systems by classifying the full spectrum of biological diversity, including the presence of unique and endangered species

Formbloom project is examining mitigation measures and improving the use of new technologies to mitigate risks of algae blooms i.e. cyanobloom, which can be fatal to humans

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INNOVATING SOLUTIONS TO ADDRESS WATER CONTAMINATION IN CANADA

WATER SCIENTISTS ARE

Developing solutions, grounded in our understanding of Canadian agriculture, lakes and environment, to control nutrient export and bloom risk

Assessing legacy impacts from Canada's energy industry and proposing new methods to protect the nation's groundwater

Characterizing links between groundwater and surface water, including the speeds at which groundwater contaminants are transported to surface water bodies, to better protect our water supplies

Understanding how Canada's changing water cycle will affect drinking water treatability

Developing improved, cost-effective, socially acceptable strategies for managing mine wastes and mitigating contamination

Providing new knowledge regarding the impacts of different forest management strategies on drinking water source quality and treatability to assess their suitability for source water protection across the major ecological/forest regions of Canada

SPECIFIC PROJECT EXAMPLES

NSERC's Lake Pulse program is working to address the question "What is the health status of Canadian lakes, how has it changed, and how will it likely change in the future?"

The NSERC-funded forWater program is designing and deploying forest management technologies across Canada's major ecozones, studying their impacts on water quality and quantity at watershed scales, and evaluating their direct and indirect environmental, social and economic costs versus benefits

Catalyzed by long-term monitoring of Environment and Climate Change Canada, Agricultural Water Futures (funded by the GWF program) has demonstrated that targeted efforts to control phosphorus inputs can have immediate benefits to water quality without impacting crop yields

Global Water Futures' Old Meets New project is examining impacts to groundwater from the oil and gas industry and will allow for better protection of groundwater resources and prioritizing of remediation projects

The Improved Source Water Protection project funded at U. Guelph is applying advanced high resolution characterization and monitoring techniques to prevent municipal groundwater supplies from contamination

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Sara Daniels
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TOWARDS EQUITABLE WATER ACCESSIBILITY AND MANAGEMENT IN INDIGENOUS AND REMOTE COMMUNITIES

WATER SCIENTISTS ARE

Gaining more understanding of the complementarity of Indigenous and western sciences

Learning to respectfully blend and bond diverse knowledge systems

Rethinking how water resources management can benefit ecosystem productivity and human wellbeing in the holistic sense

Developing a culturally responsive evaluation framework for assessing innovative technologies, services, regulations and policies that enhances understanding of barriers and solutions

Co-creating sensors, data analysis and culturally relevant tools to build long-term and sustained community capacity to address current and future uncertainties in water quality

SPECIFIC PROJECT EXAMPLES

Co-Creation of Indigenous Water Quality Tools project is working with two distinct communities, Six Nations of the Grand River (Ontario) and Lubicon Cree Nation of Little Buffalo (northern Alberta), to capture the range of water challenges in Indigenous communities and co-create sensors, data analysis and culturally relevant tools

RESEAU is propagating the first-ever Canadian Framework for Ethical Water health Innovation based on synthesized stakeholder knowledge and experience to guide Indigenous+Non-Urban water/community health improvement projects and processes, with funding from the NCE

The SSHRC-funded Water Economics, Policy and Governance Network is connecting community-based water monitoring with environmental management and stewardship in Canada

The Decolonizing Water project is building a sustainable water and ecological monitoring program to increase indigenous water security and water governance via a SSHRC Partnership Grant

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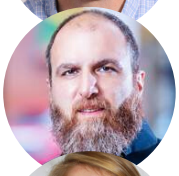
SCIENTIST PROFILES

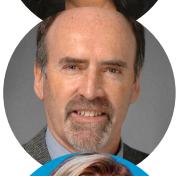
Aaron Berg
Professor
University of Guelph



Ali Nazemi
Assistant Professor
Concordia University

Amina Stoddart
Assistant Professor
Dalhousie University

Chinchu Mohan
Post-Doctoral Fellow
University of Saskatchewan



David Rudolph
Professor
University of Waterloo

Elmira Hassanzadeh
Assistant Professor
Polytechnique Montréal

François-Nicolas Robinne
Post-Doctoral Fellow
University of Alberta

Graham Gagnon
Professor
Dalhousie University

Grant Ferguson
Associate Professor
University of Saskatchewan

Jay Famiglietti
Professor
University of Saskatchewan

Jeffrey McKenzie
Associate Professor
McGill University

John Pomeroy
Professor
University of Saskatchewan

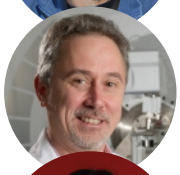
Julie Thériault
Professor
Université du Québec à Montréal

Lori Bradford
Assistant Professor
University of Saskatchewan

Markus Brinkmann
Assistant Professor
University of Saskatchewan

Nandita Basu
Associate Professor
University of Waterloo

Philip Marsh
Professor
Wilfrid Laurier University



Philippe Van Cappellen
Professor
University of Waterloo

Qianyu Chang
Masters Student
University of Guelph

Roger Beckie
Professor
University of British Columbia

Scott Higgins
Research Scientist
IISD Experimental Lakes Area

Xander Huggins
PhD Student
University of Saskatchewan/
University of Victoria

Zoe Li
Assistant Professor
McMaster University

Aaron Berg
Professor
University of Guelph

Aaron Berg is a Canada Research Chair (Tier II) and Professor in the Department of Geography, Environment, and Geomatics at the University of Guelph. Dr. Berg leads a research program that is broadly focused on the observation, modeling, and analysis of soil moisture anomalies using hydrological models and satellite observations from several remote-sensing platforms (e.g. RADARSAT-2 and passive microwave sensors). More recently his research program has explored the use of Unmanned Aerial Vehicle (UAV) platforms using variety of sensors (multispectral, LiDAR, hyperspectral and thermal) for applications in agricultural remote sensing.

Ali Nazemi
Assistant Professor
Concordia University

Ali Nazemi is an Assistant Professor in the Department of Building, Civil and Environmental Engineering at Concordia University in Montreal. Prior to this, he worked shortly as a Senior Hydrologist for the Saskatchewan Water Security Agency and provided science support to the provincial government on regional water resource management and operation. He is a member of the Global Institute for Water Security and holds an Adjunct Professorship with the School of Environment and Sustainability at the University of Saskatchewan. His area of expertise is in hydrology, water resources engineering and climate change impact assessment. Dr. Nazemi's research focuses on developing new tools and methodologies for addressing water security challenges, under climate and anthropogenic changes. He is committed to communicating research findings with public and providing high-quality training to the next generation of water security experts in Canada and elsewhere.

Amina Stoddart
Assistant Professor
Dalhousie University

Amina Stoddart is an Assistant Professor in the Department of Civil and Resource Engineering at Dalhousie University. She received her PhD in Civil Engineering from Dalhousie University in 2017 and began her academic appointment at Dalhousie University in 2018. Dr. Stoddart's research focuses on the development and optimization of treatment and monitoring technologies for the water and wastewater industry. She enjoys partnering with municipalities, individual communities and the private sector to address water and wastewater treatment challenges. Dr. Stoddart's notable achievements include a Standards Development Award from ASTM International for her work developing a new ASTM Standard Method that applies green chemistry to measure water quality in 2017 and an NSERC Discovery Grant and Launch Supplement in 2019. Dr. Stoddart aspires to advance wastewater treatment and monitoring technologies that are less energy and chemical intensive to support more sustainable water and wastewater treatment.

Chinchu Mohan
Post-Doctoral Fellow
University of Saskatchewan

Chinchu Mohan is a groundwater hydrologist specialized in climate change-groundwater-food nexus. She did her PhD from the University of Melbourne, Australia in which she evaluated the global groundwater depletion due to irrigated food production. She also worked as a Post-Doctoral Fellow at the same university in collaboration with the Australian Federal Department of Environment, Land, Water, and Planning, evaluating Australian droughts. Recently, she joined the Global Institute for Water Security as a Post-Doctoral Researcher.

David Rudolph
Professor
University of Waterloo

David Rudolph, PhD, PEng. is a Professor in the Department of Earth and Environmental Sciences at the University of Waterloo. Dr. Rudolph's areas of research include field investigation and modeling related to groundwater flow and contaminant transport with a focus on regional groundwater flow systems and vulnerability assessment. He has participated with municipal and provincial authorities both nationally and internationally in the development of groundwater protection and management strategies and has provided science-based advice in the formulation of related policy tools. Rudolph has led nation-wide research teams working on prioritizing risk to water quality from agricultural practices and evaluating performance of beneficial management practices. He recently served as the founding Executive Director of the Water Institute at the University of Waterloo. Rudolph was the 2010 recipient of NGWA's M. King Hubbert Award for contributions to the field of hydrogeology and the 2013 NGWA Darcy Lecturer in Ground Water Science.

Elmira Hassanzadeh
Assistant Professor
Polytechnique Montréal

Elmira Hassanzadeh is an Assistant Professor in the Department of Civil, Geological and Mining Engineering at Polytechnique Montréal since 2018. Her research focuses on managing water resources systems under changing natural and anthropogenic conditions. Before joining Polytechnique, Elmira worked as a Research Associate at McGill University and did a Post-Doctoral Fellowship at the University of Saskatchewan. She completed her PhD in Civil Engineering at the University of Saskatchewan, where she proposed new methodologies to support water management in uncertain futures. Her research has been published in leading journals and has attracted the interest of the scientific community, including her article on the modeling of Lake Urmia, in Iran, which is the most cited article on this lake to date.

François-Nicolas Robinne
Post-Doctoral Fellow
University of Alberta

François-Nicolas began studying wildfire risks in Southern France, both in the Mediterranean basin and the Pyrenees Mountains, where changes in traditional fire use coupled with expanding wildland-society interfaces have been leading to increasing fire danger. After his MSc in 2007, he spent several years as a remote-sensing analyst and GIS specialist for forest resource management in the private sector in France. In 2013, he started his PhD at the University of Alberta, focusing on the assessment of wildfire risks to global water security. He is now working as a Post-Doctoral Fellow at the Canadian Partnership for Wildland Fire Science, under the Global Water Futures research initiative. His current research mainly focuses on the study of wildfire risks to hydrologic ecosystem services and water security in Canada.

Graham Gagnon
Professor
Dalhousie University

Graham Gagnon is the Associate Vice President Research at Dalhousie University, where he also serves as the NSERC - Halifax Water Industrial Research Chair in Water Quality & Treatment in the Centre for Water Resources Studies. Dr. Gagnon's research engages many community concerns with drinking water quality. His particular research in Indigenous drinking water quality has contributed to the support of the Atlantic First Nation Water Authority – a unique First Nation-owned and operated organization that is focused on ensuring safe water in its supporting communities.

Grant Ferguson
Associate Professor
University of Saskatchewan

Grant Ferguson holds a B.Sc. in Honours Geology from the University of Waterloo and a PhD in Civil Engineering from the University of Manitoba. He is a Centennial Enhancement Chair and Associate Professor in the Department of Civil, Environmental and Geological Engineering and School of Environment and Sustainability at the University of Saskatchewan and an Adjunct Associate Professor at the University of Arizona. His research focuses on hydrogeology and hydrogeochemistry of regional groundwaters systems and the interplay between energy and water resources. He was the 2019 recipient of the Global Institute for Water Security's Research Excellence Award and is the past president of the International Association of Hydrogeologists – Canadian National Chapter.

Jay Famiglietti
Professor
University of Saskatchewan

Jay Famiglietti is a Professor of Hydrology and Executive Director of the Global Institute for Water Security at the University of Saskatchewan (USask), where he holds the Canada 150 Research Chair in Hydrology and Remote Sensing. Before moving to USask, Famiglietti served as the Senior Water Scientist at NASA's Jet Propulsion Laboratory at the California Institute of Technology. His research group uses satellites and develops advanced computer models to track how freshwater availability is changing around the globe. Their work has affected water policy changes from California to India. A Fellow of the American Geophysical Union and the Geological Society of America, Famiglietti is a regular advisor to state, provincial and federal government officials on water security issues.

Jeffrey McKenzie
Associate Professor
McGill University

Jeffrey McKenzie is an Associate Professor and Chair of the Department of Earth and Planetary Sciences at McGill University. Jeffrey is a hydrogeologist with research focused on understanding the 'science behind groundwater resources'. Much of his research focuses on how climate change is impacting groundwater in cold regions, such as high mountains and Northern Canada. Jeffrey received a B.Sc. from McGill University, and a PhD from Syracuse University. He was a Byrd Polar Research Fellow at The Ohio State University before becoming a faculty member at McGill University.

John Pomeroy
Professor
University of Saskatchewan

John Pomeroy is the Director of the Global Water Futures Programme – the largest university-led freshwater research project in the world. At the University of Saskatchewan, Dr. Pomeroy is the Canada Research Chair in Water Resources and Climate Change, Distinguished Professor of Geography, and Associate Director of the Global Institute for Water Security. He is a Fellow of the Royal Society of Canada, the American Geophysical Union and the Royal Geographical Society and is the 2019 recipient of the Miroslaw Romanowski Medal from the Royal Society of Canada. He leads the International Network for Alpine Research Catchment Hydrology project of the World Climate Research Programme. Dr. Pomeroy has authored over 350 research articles and several books that have been cited over 15,000 times on the impact of land use and climate change on hydrology and water resources.

Julie Thériault
Professor
Université du Québec à Montréal

Julie Thériault is a Professor at the Department of Earth and Atmospheric Sciences at the Université du Québec à Montréal and has a Canadian Research Chair in Extreme Winter Weather Events. She is known for her research on the formation processes of winter precipitation types such as freezing rain and ice pellets, rain-snow transitions as well as snow measurements. She also utilizes state-of-the-art approach such as high resolution atmospheric and climate models as well as results from targeted field projects.

Lori Bradford
Assistant Professor
University of Saskatchewan

Lori Bradford is an interdisciplinary scientist specializing in community-engaged participatory research on water, health and wellbeing in Indigenous and non-Indigenous rural communities. A social psychologist by training, and methodologist, she focuses on enhancing coping skills, promoting adaptation, and co-developing solutions for complex problems in communities. Dr. Bradford bring skills in negotiating community-based research and co-creating culturally harmonized research programs that bring Indigenous groups and Western scientists together to address socially significant problems, for example, water security and governance, shared resource use, and urban migration. She facilitates the creation of interdisciplinary training opportunities for students, art-science collaborations, evidence-based and culturally relevant policy recommendations and action plans, and translation of results into best practices for enhancing biopsychosocial health.

Markus Brinkmann
Assistant Professor
University of Saskatchewan

Markus Brinkmann received his PhD from Aachen University in Germany and is currently an Assistant Professor in Exposure and Risk Assessment Modelling in the School of Environment and Sustainability at USask. He is a member of the Toxicology Centre, the Global Institute for Water Security, and the Centre for Hydrology. Dr. Brinkmann's research focuses on the movement of chemical contaminants through the aquatic environment and the process by which these contaminants are taken up and cause harmful effects in aquatic organisms. He combines expertise from toxicology, environmental chemistry, and hydrology, and uses computational models that are informed by experimental and field data. Some of his recent projects have focused on assessing the environmental impacts of storm water and municipal wastewater effluents in cities across Canada, measuring sediment contamination in the Saskatchewan River, quantifying risks associated with oil sands developments, and improving the prospective environmental risk assessments of chemicals.

Nandita Basu
Associate Professor
University of Waterloo

Nandita Basu is an Associate Professor and University Research Chair, jointly appointed in the Departments of Civil and Environmental Engineering and Earth and Environmental Sciences at the University of Waterloo. She is also the Director of the Collaborative Water Program at the University of Waterloo, Member of the Royal Society of Canada, College of New Scholars, and Editor-in-Chief of Journal of Hydrology. Nandita is a watershed hydrologist and biogeochemist, and her research interests span a broad range of issues related to water in human-impacted environments. From problems of nutrient pollution of surface and groundwater in intensively farmed regions in Canada and US, to drought in water-stressed areas of India to urban water pollution and water quality effects of wildfire, Nandita uses tools from environmental science, engineering and the social sciences to improve our ability to sustainably manage water resources.

Philip Marsh
Professor
Wilfrid Laurier University

While a Research Scientist with ECCC and a Professor at Laurier, Philip Marsh has focused entirely on the water resources of the Canadian Arctic. This research has developed a fundamental understanding of, and ability to predict, the hydrology of the Arctic. Dr. Marsh has applied this research to understand the environmental impacts of highways, hydroelectric dams, hydrocarbon development, and pipelines across the north. In collaboration with various Indigenous organizations, understanding the impacts of climate change has become the focus of his research. He initiated climate and water measurements in the western Canadian Arctic in 1991 and now has the longest set of climate and water data in the Canadian Arctic, providing us with a unique viewpoint of ongoing changes. This research facility has attracted collaboration with colleagues from ECCC, and many other Universities and scientists from the USA, Germany and the UK. Dr. Marsh is also one of the Canadian representatives on the International Arctic Science Committee.

Philippe Van Cappellen
Professor
University of Waterloo

Philippe Van Cappellen joined the University of Waterloo as the Canada Excellence Research Chair in Ecohydrology on June 1, 2011. He was previously the Georgia Research Alliance Eminent Scholar in Global Environmental Studies at the Georgia Institute of Technology in Atlanta, USA, and a Professor of Geochemistry at Utrecht University in the Netherlands. Van Cappellen is a Fellow of the Royal Society of Canada and a Fellow of the Geochemical Society. Dr. Van Cappellen's research combines detailed laboratory studies with field observations and theoretical modeling to better understand and predict how natural processes and human activity control water quality and the environmental flows of nutrients and contaminants from the local to global scale. His work encompasses investigations of the environmental health of soils, rivers, lakes, and coastal environments, the cycles of water, carbon, nutrients and metals, water quality risks and nature-inspired solutions, and global environmental change.

Qianyu Chang
Masters Student
University of Guelph

Qianyu Chang is a Master of Science candidate in the Department of Geography, Environment and Geomatics at the University of Guelph, under the supervision of Dr. Aaron Berg. Qianyu is passionate about understanding climate change impacts on Arctic ecosystems using remote sensing tools. Her MSc project evaluates the use of satellite images for mapping shrub biomass in the Arctic tundra and estimating shrub rainfall interception, an important component in Northern water cycles.

Roger Beckie
Professor
University of British Columbia

Roger Beckie is a groundwater hydrogeologist, Professor and former Head of Earth, Ocean and Atmospheric Sciences at the University of British Columbia. His scholarly interests include: i) understanding the impacts of shale-gas development on near-surface groundwater in northeast British Columbia, ii) the hydrology and geochemistry of drainage from waste rock at mine sites, iii) groundwater contamination and remediation related to oil spills, methane leaks and industrial solvents such as creosote. He is problem driven, using laboratory and field studies interpreted with process-based models. He has substantial field experience in NE BC, in Peru at the Antamina mine, in South Asia studying the biogeochemistry of naturally occurring arsenic in groundwater, and in the Lower Mainland of British Columbia studying the fate of creosote-derived contamination in anaerobic deltaic aquifers.

Scott Higgins
Research Scientist
IISD-ELA

Scott Higgins is a Research Scientist at the International Institute for Sustainable Development Experimental Lakes Area (IISD-ELA), a Canadian research-based non-profit organization. The IISD-ELA operates a globally unique research facility; one of only a few research facilities in the world where whole ecosystem experiments are permitted to address threats to our freshwater resources. Dr. Higgins and other researchers from the IISD-ELA collaborate extensively with academic and government researchers from Canada, the United States, and other countries on experiments to examine: the effects and most effective cleanup technologies for oil (diluted bitumen) spills to freshwater; how to most effectively manage toxic algal blooms and reduce threats to drinking water; and the effects of microplastics, prescription medicines (e.g. the diabetes drug metformin) and effluent from cannabis grow operations on Canada's lakes and rivers. Dr. Higgins is also using the IISD-ELA's long-term (>50 years) datasets to evaluate the effects of climate change on lake ecosystems.

Xander Huggins
PhD Student
University of Victoria

Xander Huggins is a PhD student at the University of Victoria and University of Saskatchewan. His research investigates the socioeconomic and ecological impacts of changes in global freshwater availability, water security metrics, groundwater sustainability, and groundwater-surface water interactions, and environmental flow policy. Prior to beginning his PhD, Xander's research collaborated with a British Columbian environmental data science firm to develop methods for an online water management decision support tool to enable the conjunctive management of groundwater and surface water resources. He holds a Bachelor of Engineering degree in Water Resources Engineering with Distinction from the University of Guelph.

Zoe Li
Assistant Professor
McMaster University

Zhong (Zoe) Li is an Assistant Professor of Civil Engineering at McMaster University. Her research focuses on hydro-environmental modeling and climate impact assessment. As an early career researcher, she has published over 40 peer-reviewed journal papers and has been the sole Principal Investigator of over 10 research grants/projects. She also served as a United Nations Development Programme (UNDP) project advisor during 2014-2016. The stochastic simulation, uncertainty quantification, optimization, and risk assessment techniques that she proposed have been used by her peers in water resources and environmental engineering in Canada and abroad.

LIST OF MEETINGS

LEONA ALLESLEV

MP, Conservative Party, Ontario
Met with: Jay Famiglietti, John Pomeroy, Palash Sanyal, Sara Daniels

LUC BERTHOLD

MP, Conservative Party, Quebec
Met with: Nandita Basu, Philip Marsh

PAUL MANLY

MP, Green Party, British Columbia
Met with: Roger Beckie

JEREMY PATZER

MP, Conservative Party, Saskatchewan
Met with: John Pomeroy

DAMIEN KUREK

MP, Conservative Party, Alberta
Met with: Grant Ferguson, Francois-Nicolas Robinne

HON. WAYNE EASTER

MP, Liberal Party, PEI
Met with: Philippe Van Cappellen, Markus Brinkmann, Scott Higgins

BOB BRATINA

MP, Liberal Party, Ontario
Met with: Ali Nazemi, Graham Gagnon

BRIAN MASSE

MP, New Democratic Party, Ontario
Met with: Jay Famiglietti, John Pomeroy, Xander Huggins, Chinchu Mohan, Palash Sanyal

MEL ARNOLD

MP, Conservative Party, British Columbia
Met with: Philip Marsh, Markus Brinkmann

CHRIS LEWIS

MP, Conservative Party, Ontario
Met with: Scott, Higgins

ANDY FILLMORE

MP, Liberal Party, Nova Scotia
Met with: Amina Stoddart, Graham Gagnon

NEIL ELLIS

MP, Liberal Party, Ontario
Met with: Jay Famiglietti, John Pomeroy

RANDY HOBACK

MP, Conservative Party, Saskatchewan
Met with: Lori Bradford, Elmira Hassanzadeh

MARC DALTON

MP, Conservative Party, British Columbia
Met with: Roger Beckie

FRANCIS SCARPALEGGIA

MP, Liberal Party, Quebec
Met with: Grant Ferguson, Jeff McKenzie

KEVIN WAUGH

MP, Conservative Party, Saskatchewan
Met with: Jay Famiglietti, Xander Huggins, Chinchu Mohan

HON. KIRSTY DUNCAN

MP, Liberal Party, Ontario
Met with: Ali Nazemi, Julie Thériault

LLOYD LONGFIELD

MP, Liberal Party, Ontario
Met with: Aaron Berg, John Pomeroy, Qianyu Chang

DAVID WALLIS

Office of MP Raj Saini, Liberal Party, Ontario
Met with: Zoe Li, Francois-Nicolas Robinne

SENATRICE LUCIE MONCION

Senator, Ontario
Met with: Philippe Van Cappellen, Julie Thériault

SENATOR PATTI LABOUCANE-BENSON

Senator, Alberta
Met with: Lori Bradford, Elmira Hassanzadeh

EMERSON VANDENBERG

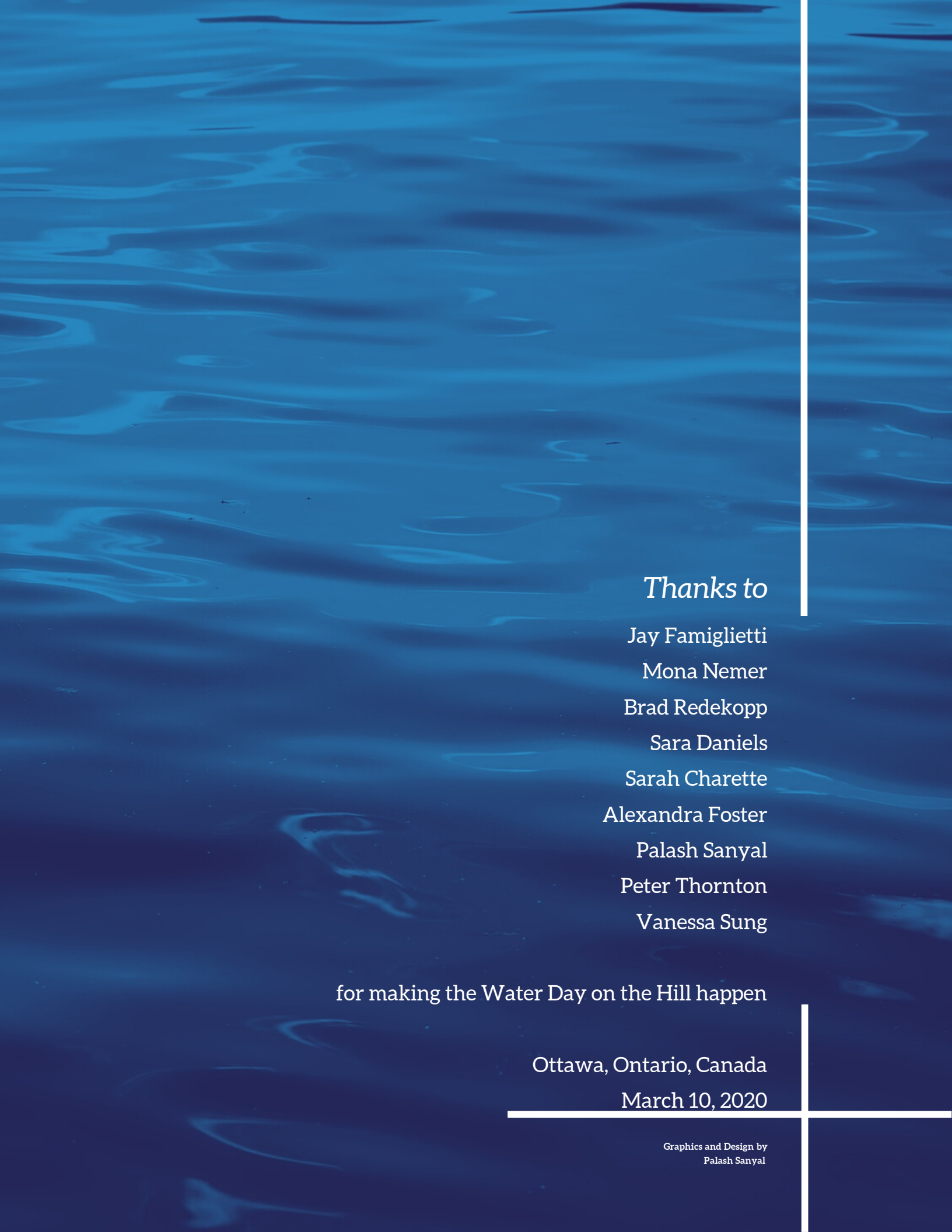
Policy Advisor, Office of the Minister of Natural Resources
Met with: Aaron Berg, Qianyu Chang, Zoe Li

KEVIN MASON

Office of Senator Douglas Black
Met with: Amina Stoddart, Nandita Basu

SENATOR ROSA GALVEZ

Senator, Quebec
Met with: Amina Stoddart, Graham Gagnon



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Ottawa, Ontario, Canada

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National Hydrology Research Centre
11 Innovation Boulevard
Saskatoon SK S7N 3H5

For inquiries, please contact
palash.sanyal@usask.ca, 306-966-7924