



Welcome

FROM HOWARD WHEATER

Welcome to the first edition of the Global Institute for Water Security (GIWS) newsletter *Water News*. As we enter our second year as an official institute at the University of Saskatchewan, I'm proud of the progress made to date and the collaborative nature of our research theme working groups. The talent and dedication demonstrated by researchers here at the U of S and in Saskatoon is impressive and is a key component to the success of our research programs.

Student engagement and research is also key to our success. In December, we invited all graduate students working with our research theme working group members to join us for a social evening at the Faculty Club. The evening was intended as a way to introduce graduate students to GIWS, and also to communicate any events, activities and research opportunities that may interest them. Over 35 students were in attendance from a diverse range of academic departments and units.

2012 brings many exciting initiatives for GIWS. We have completed recruitment of our faculty team and will have two new faculty joining us in the months to come. The full slate of talent is introduced in this edition of *Water News*. We are rapidly expanding and enhancing our expertise. In addition, we are currently hiring over a dozen graduate student and post-doctoral fellows for positions studying and working at our research sites across western Canada. I look forward to the year ahead.



Regards,

Howard Wheeler

*Canada Excellence Research Chair
in Water Security*

*Director,
Global Institute for Water Security*



The working group for the Boreal Forest team on a field trip in May 2011. Photo supplied by Ali Nazemi, post-doctoral fellow, Department of Civil and Geological Engineering and GIWS.

Join us! GIWS membership coming soon

To expand our reach, build a GIWS community and encourage the involvement of a wide range of those active in water-related research and activities, GIWS membership criteria have been established. Those who collaborate with the Institute are diverse and come from varying backgrounds, disciplines and locations. Due to this diversity, there are multiple membership categories.

Over the next month we will begin communicating to our current research theme working group colleagues about the advantages and the responsibilities their membership brings. We will also be opening up our membership to those whom are interested. A full listing of the membership category details and the application details will be listed shortly on our website. Please stay tuned.

Building a talented team

Since Howard Wheater's arrival in October 2010, the Canada Excellence Research Chair in Water Security (CERC) program has been hard at work recruiting faculty for a number of positions. GIWS is pleased to announce that all six remaining positions have been filled by candidates with excellent skills and abilities in their respective fields. All positions listed below hold their primary appointments in the School of Environment and Sustainability (SENS).



Andrew Ireson
Assistant Professor,
Sub-surface hydrology and
water quality modelling

Prior to joining GIWS in 2011, Andrew Ireson was a post-doctoral research associate at Imperial College London. His research focuses on how to model subsurface hydrological and geochemical processes in diverse and complex regions, including the Prairies, Boreal Forest and Rocky Mountains. Andrew holds a PhD in hydrology from Imperial College London. He is jointly appointed with the Department of Civil and Geological Engineering.



Karl-Erich Lindenschmidt
Associate Professor, Surface
water quality assessment and
modelling

Karl-Erich Lindenschmidt joins GIWS from the Department of Water Stewardship, Government of Manitoba, where he has been working as hydrologic modelling research engineer since 2009. He holds a PhD in environmental engineering and a habilitation degree in water resources management, and has extensive experience in lake and river water quality monitoring and hydrological modelling. His appointment begins February 1, 2012.



Naveed Khaliq
Associate Professor,
Statistical hydrology and
stochastic processes

Naveed Khaliq joined GIWS on January 3, 2012 from the Adaptation and Impacts Research Section of Environment Canada where he was physical scientist. He holds a PhD in engineering hydrology and has experience in statistical hydrology and computer modelling.



Helen Baulch
Assistant Professor, Hydro-
ecological assessment

Helen Baulch joined GIWS on November 1, 2011 from the University of Wisconsin Centre for Limnology where she was a post-doctoral fellow. She is a biogeochemist whose work focuses on aquatic nutrient dynamics. Helen holds a PhD in environmental and life sciences.



Laxmi Sushama
Associate Professor,
Hydrometeorology and
climate science

Laxmi Sushama joins GIWS from the Université du Québec à Montréal where she held a Canada Research Chair in Regional Climate Modelling in the Department of Earth and Atmospheric Sciences. She has extensive expertise in hydrometeorology and climate science. Laxmi's appointment began on January 23, 2012.

New faculty appointments enhance U of S water expertise

Grant Ferguson, Associate Professor, Department of Civil and Geological Engineering
Grant joined the U of S last fall from St. Francis Xavier University. He is a recognized expert in modelling permafrost impacts in groundwater systems. He brings his expertise to the Climate Change and Water Security, and Land – Water Management and Environmental Change research theme working groups.



Tim Jardine, Assistant Professor, Toxicology Centre

Tim joined the U of S this January from the Australian Rivers Institute at Griffith University. He is a stable isotope specialist whose research focuses on river, floodplain and riparian food chains. Tim will join the Land – Water Management and Environmental Change, and Sustainable Development of Natural Resources research theme working groups.



Breaking news: Jeffrey McDonnell to join GIWS

GIWS is pleased to announce that Jeffrey McDonnell, world-renowned isotope hydrology specialist, will be joining the Institute this summer.

“Jeff is an internationally respected scientist and a recognized leader in hydrology whose appointment will help increase our understanding of water resource systems in the Saskatchewan River Basin,” said Howard Wheater. “His dedication to collaborative research that bridges disciplines and his ability to attract the brightest students and researchers to work with him speak to his strengths as a scientist, mentor and leader. He is an outstanding addition to the Global Institute for Water Security.”

Jeff is currently distinguished professor of hydrology and Richardson Chair in watershed science at Oregon State University (OSU). His research specialties include watershed hydrology, runoff processes and modelling and isotope hydrology. He is also the director of the Institute for Water and Watersheds at OSU. In 2011, he was chosen as the Birsdsall Dreiss Distinguished Lecturer by the Geological Society of America.



At Jeffrey McDonnell's Hillslope and Watershed Hydrology Lab at OSU, his team is developing new ways of measuring, understanding and predicting runoff generation in gauged and ungauged basins.



CWN grant expands GIWS research program into Manitoba

On December 7, GIWS successfully secured a research grant from the Canadian Water Network (CWN). The grant will support research to understand the effects of beneficial agricultural management practices on hydrology, water quality and aquatic ecosystem health in the Red River Valley and Lake Winnipeg Basin.

The proposal, titled *Monitoring and assessment of beneficial management practices: insights from the Tobacco Creek Watershed*, will be funded for three years. The research team consists of Howard Wheeler, John Pomeroy and Helen Baulch. Tobacco Creek is a 1,000 km² subwatershed located in south-central Manitoba which is part of the agriculture-dominated drainage system of the Lake Winnipeg Basin.

The Tobacco Creek Model Watershed (TCMW) is part of a national research program that spans five different region-specific consortium nodes, with a goal of establishing regional monitoring frameworks to improve cumulative effects assessment. TCMW was formed as a partnership of stakeholders (community members, farmers, agriculture industry, and government) and scientific researchers.

Did You Know?

The U of S has one of the highest concentrations of faculty working in water research world wide. More than 70 faculty specialise in water – from aquatic toxicology to hydrology to water policy.

AGU Fall Meeting - Awards and accolades

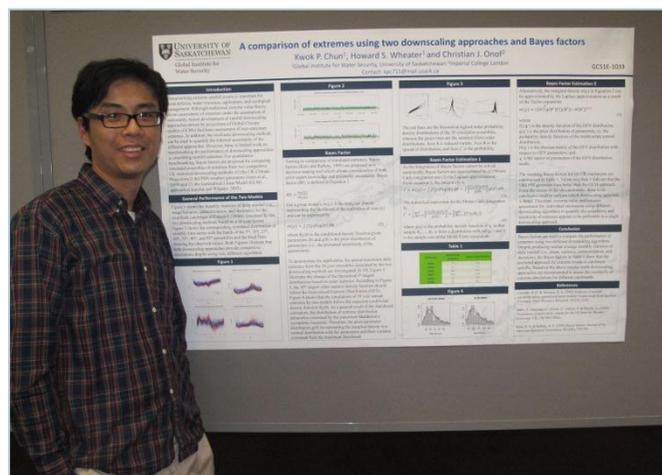
The American Geophysical Union (AGU) held its annual Fall Meeting in San Francisco, December 5 – 9. Many researchers from the U of S and Environment Canada were present. The AGU Fall Meeting is the largest geophysical sciences conference in the world, attracting nearly 20,000 scientists, educators, students and policy makers.



Congratulations to Centre for Hydrology PhD student Nicholas Kinar (top left) who was a recipient of the prestigious AGU Horton Research Grant. Philip Marsh (bottom left), Environment Canada research scientist at the National Hydrology Research Centre, was also honoured as co-author of one of the top five papers of the year in the journal *Water Resources Research*.



GIWS presented two posters at the conference – one by Wheeler and Gober titled 'Towards a new paradigm of Socio-Hydrology: insights from the Saskatchewan River Basin' that detailed the socio-hydrology research program of our Institute, and the other by Chun, Wheeler et al. titled 'A comparison of extremes using two downscaling approaches and Bayes factors' which demonstrated alternative downscaling approaches for benchmarking extreme rainfall events.



Sun Chun, post-doctoral fellow with the School of Environment and Sustainability and GIWS, presents his poster during the meeting.

Upcoming events and important dates

January 25, NHRC Seminar Series: Can we adapt to non-stationarity in water management without getting sea sick?, seminar presentation by Harvey Hill, National Hydrology Research Centre, 10:00 – 10:30 a.m.

February 11, Canadian Geophysical Union Hydrology Section Western Student Conference, University of Saskatchewan.

February 16 – 20, American Association for the Advancement of Science Annual Meeting, Vancouver, BC. Howard Wheater will give a presentation titled 'Integrating Science and Social Science Dimensions of Water Security'. He will also participate in an event with other Canada Excellence Research Chairs.

March 2, Invitational Drought Tournament, University of Saskatchewan. GIWS will be submitting multiple student teams to this event hosted by Agriculture and Agri-Food Canada.

March 22, World Water Day

For up-to-date event listings and more information, we encourage you to visit www.usask.ca/water regularly. Event listings are updated on a weekly basis.

New faces at GIWS

Dell Bayne, Research Technician: Dell will be gathering data at the Boreal Ecosystem Research and Monitoring Sites and the Brightwater Creek flux tower site.

Amanda Burke, Masters student, SENS: Amanda is studying under the supervision of Howard Wheater and Gordon Putz. Her research will look at the cumulative impact of human development on water quality within the South Saskatchewan River Basin.

Kathryn Hearson, PhD student: Studying under the supervision of Howard Wheater and Lee Barbour, Kathryn's research will focus on oil sands reclamation leading to proposed monitoring and regulatory considerations for industry.

Branko Zdravkovic, Data Manager: Branko holds degrees in systems engineering and physical geography. He will be responsible for developing and implementing a coherent data management strategy for GIWS.



Research spotlight on Sibbald Creek

The beaver is an important Canadian symbol and icon, showing up on everything from currency to clothing. What many may not realize is that beavers play a significant role in the movement of water through a wetland and its hydrology. GIWS-funded research is hoping to determine just how significant the beaver's role as a hydrological agent is in the front ranges of the Canadian Rocky Mountains.

Sibbald Research Wetland, an Institute experimental site located in Kananaskis Country, has large peat deposits and many beavers active in the area. Beaver dams impede upstream flows and flood adjacent riparian areas. Ponds created by beaver dams function as efficient sediment traps, filling with sediment and organic materials, which can remain in the pond area even after dams are abandoned. Once abandoned, dams degrade and the water table recedes, leaving behind a "beaver meadow", which becomes buried by more peat.

"Through our research, we hope to determine how present and historical beaver ponds affect modern-day peat characteristics and hydrology. This will help us model how different climate futures will affect these important source areas for the Saskatchewan River Basin," says Cherie Westbrook, research program lead. "Questions we hope to explore include determining how important mountain peatlands are in maintaining the low flow regime of the South Saskatchewan River and if changes could potentially release large amounts of greenhouse gases and nutrients into the streamflow."

With funding from GIWS, Cherie is currently recruiting a PhD or Masters student to join her interdisciplinary research team. She can be reached at cherie.westbrook@usask.ca for more information.