



## NEWSLETTER

## FALL 2017 ISSUE 1

### Message From the Project Lead

Friends and Colleagues,

I am delighted to introduce the first newsletter as part of the Wilfrid Laurier University-led Global Water Futures (GWF) program, Northern Water Futures (NWF). The overarching goal of NWF is to support adaptation planning in the face of rapid climate warming and associated environmental change. NWF was inspired by key user-driven needs identified through consultation with a range of partners in the Northwest Territories (NWT) and will work toward an ambitious set of goals pertaining to improved research and monitoring capacity in the NWT relating to community health and well-being, transboundary water issues, energy resources and infrastructure. The NWF team comprises an interdisciplinary group of researchers ready to tackle these complex problems in an integrative way and I am tremendously excited about this collaborative effort.

Though still early in the project, we are rapidly gaining momentum and have had many exciting advances. The summer was an active field season for the project in which teams of researchers were deployed across the Territory including site reconnaissance visits in the Sahtú and Tłı̨chǫ. NWF researchers took part in On-the-Land camps in the Dehcho and Tłı̨chǫ in support of community-driven research questions that are critical to this project. The Laurier Yellowknife office officially opened providing a home-base for YK-based GWF staff and NWF researchers, facilitating much closer relationships of our research teams with communities and governments. We are still in the process of hiring many NWF personnel and we are looking to continue to build relationships and projects that leverage this momentum.

On behalf of the NWF researchers I wish to extend our appreciation of your support for this exciting initiative. I look forward to moving this project forward together.

Sincerely,

Jennifer Baltzer  
Project Lead - Northern Water Futures  
Wilfrid Laurier University



# What Is Northern Water Futures?



Northern Water Futures is a major multi-disciplinary, multi-institutional research project led by Wilfrid Laurier University. The multi-year project aims to take a leading role in sustainable development in the North through science-based environmental prediction models, decision support tools and mitigation strategies that will lead to prudent investment and knowledge-based community adaptation.

The overarching goal of Northern Water Futures is to deliver risk management solutions – informed by leading-edge water science and supported by innovative decision-making tools – to manage water futures in Canada and other cold regions where global warming is changing landscapes, ecosystems, and the water environment.

NWF will focus on four main research themes:

## Northern Water Resources and Security

Climate warming-induced changes to precipitation, ice/snow cover, permafrost, river and stream flows, and lake levels severely challenge our ability to predict northern water futures. NWF will synthesize existing data; initiate new, targeted interdisciplinary studies; develop new monitoring capacity including new monitoring tools; and apply new technologies for monitoring and predicting changes to ecosystems and water resources.

## Integrated Ecosystem Change and Human Health

Partners have identified the need to better understanding how climate change will affect safety and security of drinking water and traditional foods. NWF will construct mechanisms of interaction and knowledge sharing that ensure communities can draw on scientific data in ways that support their own needs and decision-making processes to ensure community health and well-being.

## Energy Security and Impacts of Industrial Development on Water Resources

The development of energy resources within the NWT (i.e. oil, gas, biofuels) provides the simultaneous opportunities of enhancing economic prosperity and energy security. NWF will focus on the major challenges facing energy stakeholders and concerned communities pertaining to climate warming and the uncertainty concerning the ability of terrestrial and aquatic ecosystems to support these activities.

## Impacts of Climate Warming on Infrastructure

Climate warming directly challenges infrastructure. NWF will develop the tools to improve regional climate change predictions such as extreme flows and terrain sensitivity in order to construct and maintain safe, reliable and cost-effective infrastructure for the 21st century.

## Introduction to Global Water Futures

Northern Water Futures is a project funded through Global Water Futures: Solutions to Water Threats in an Era of Global Change, a University of Saskatchewan-led research program funded in part by a \$77.8-million grant from the Canada First Research Excellence Fund. Specifically, it is funded through Pillar 3: Designing User Solutions, the first of the three science pillars of the program to announce funded projects.



Global Water Futures (GWF) is led by the Global Institute for Water Security at the University of Saskatchewan in partnership with University of Waterloo, McMaster University and Laurier and is the largest university-led water research program ever funded worldwide and one of the largest water science collaborations in the world. It aims to position Canada as a global leader in water science for cold regions and will address the strategic needs of the Canadian economy in adapting to change and managing risks of uncertain water futures and extreme events. End-user needs will be our beacon and will drive strategy and shape our science.



---

## Laurier Opens Yellowknife Office

Wilfrid Laurier University opened a research office in Yellowknife, Northwest Territories (NWT), which will allow it to further develop its national and international leadership in cold regions research. The office hosted a grand opening on Sept. 25, as well as a panel discussion on Laurier's northern research at the Prince of Wales Northern Heritage Centre.

The office, which is located in the W.H. Bromley Building in downtown Yellowknife, is home to year-round staff, primarily research associates and postdoctoral fellows. It also provides a workspace to visiting faculty, students and staff. It is a base for Laurier's research activities in the North and for liaising with partners, including various levels of government and Indigenous communities.



## Marian Watershed Stewardship Program

Laurier's James Telford (MSc candidate) and Ana Sniderhan (GWF Research Associate) travelled to Hislop Lake (appx. 170 km northwest of Yellowknife) for the yearly on-the-land sampling trip of the Marian Watershed Stewardship Program (MWSP). The MWSP is a Tłıchǫ community-led aquatic monitoring program, with the goal of integrating western science knowledge systems and sampling processes into the strong traditional knowledge of the Tłıchǫ people. In particular, the Tłıchǫ community is concerned about future mining development within the Marian watershed and potential for pollution, as well as the more general concerns about the implications of climate change in the North. The Tłıchǫ community identified the need of a western science-based approach to enhance their monitoring program, which is how Laurier got involved.

On this year's MWSP trip to Hislop Lake, there were 14 participants. In addition to Telford and Sniderhan from Laurier, nine community members including elders, Tłıchǫ environmental monitors, and guides, as well as a fish biologist, a representative from the Wek'èezhì Land and Water Board, and a representative from the Tłıchǫ government. Participants travelled from Yellowknife to Hislop Lake by float plane, setting up a camp on an island location well-known and frequented by the community. Over the course of five days, the participants quickly became at home on the island, sharing experiences of time on the land and enjoying the warm campfires, clear starry skies, and dancing auroras reflecting on the still lake.



James Telford demonstrating sediment core sampling with community members at Hislop Lake as part of the Marian Watershed Stewardship Program.

Telford began working with the community on monitoring initiatives starting in 2015 as part of his MSc research, and this was his third annual sampling trip with the MWSP. With two years of prior water and sediment sampling, Telford's work established long-term baselines of hydroecological conditions and lake sediment metal concentrations to better inform continued monitoring through contemporary sampling. On

this trip, Telford worked with the Tłıchǫ environmental monitors to collect sediment and water samples in Hislop Lake and the Marian River. Telford also collected two sediment cores which will be used by the MWSP to establish local baselines for the Hislop catchment.

This was Sniderhan's first trip with the MWSP. The community had previously identified concerns about changes of the terrestrial environment, particularly in regard to the increased intensity and severity of forest fires in the region as well as the effects of permafrost thaw on the landscape. As Sniderhan's research background is in many aspects of forest and plant ecology in the Northwest Territories, she came on the trip to develop ideas for how to help address the community's concerns about the terrestrial environment. On this trip, she collected tree core samples from four species of trees (quite a lot by boreal standards), and will be analyzing these to identify patterns in growth over time. Ana also used her time on this trip to learn more about the traditions and history of the Tłıchǫ people.



Ana Sniderhan demonstrating tree core sampling with community members at Hislop Lake as part of the Marian Watershed Stewardship Program

Telford and Sniderhan felt that this was an important trip to maintain and continue the strong partnership between the Tłıchǫ and researchers from Laurier. On this trip, we were able to give demonstrations to the community members about our approaches to monitoring change including sample collection and how we obtain information from these samples. This monitoring initiative organized by the Tłıchǫ government provides the opportunity for many community members to return to the lands which are culturally and sentimentally significant, while giving us as scientists an incredible amount of instantaneous insight onto the history of the lands and waters that we study. Building these relationships can lead to greater potential for community-directed research projects, and in turn, strengthen the relationship between Tłıchǫ knowledge and western science.

## On-the-Land Research in Kakisa

Kakisa is a hub of research and a major focus of NWF. The Territory's smallest community boasts a strong network of researchers that work to address community-defined issues related to everything from food security and waste management, to ecosystem health, water quality and forest fires. Much of the success of these collaborations is the drive and desire of Melaine Simba, the Ka'a'gee Tu First Nation's Environmental Coordinator, to address issues the community is concerned about.



Melaine Simba. KTFN Environmental Coordinator.

"Melaine is a very important research partner" says Dr. Heidi Swanson, University of Waterloo and NWF researcher. "We could not do the work we do in the area without her commitment to the research, and the role she plays as a link between researchers and the community".

Part of Simba's vision is not only to see research done in the region, but to also engage and involve youth in the community. "The youth are our future. We need to give them opportunities to learn about the land and how it's changing," Simba said.

To realize that goal, Laurier GWF Knowledge Mobilizer, Andrew Spring, who has worked on issues of climate change adaptation and food security in the community, helped the KTFN to obtain funding from the NWT On the Land Collaborative to host an On-the-Land camp for youth in the Dehcho Region this past summer. The aim of the camp was to provide an opportunity for youth to connect to the land, culture and each other. With participation from community Elders, youth learned about the land and history through storytelling around traditional place names, as well as through games and activities. There were also opportunities for participants to gain hands-on experience in research and monitoring the health of the land. Laurier graduate students, Kaitlin Kok and Michelle Malandra helped facilitate the camp and demonstrated GPS and mapping tools through activities with the youth. The camp also provided an ideal opportunity for Swanson and her field sampling crew to both engage with the community and collect samples for her NWF research.

Swanson's team, which included Mike Low from the Aboriginal Aquatic Resource and Oceans Management (AAROM) program, worked with community members to catch fish on the lake but worked with the youth to help process the fish for research. After sampling, the youth enjoyed the fish at meals, and other fish was brought back to the community for the Elders. The youth also helped in collecting and sorting of insects. An activity that they really enjoyed.

"Having researchers come and teach our youth a bit about what they do is really important. It shows the youth the importance of monitoring the land, and gives them an opportunity to get involved," says Simba. "I think everyone really enjoyed the camp."



Mike Low (AAROM) demonstrated fish sampling with youth in Kakisa.

## Meet the New Hires

### MEGHAN BROCKINGTON, NWF Project Coordinator



Meghan works with the NWF team as the Project Coordinator. She holds a MSc in Global Health, which focused on impacts of offshore drilling on Canadian Marine Arctic food security. She brings a wide range of research and project management experience both in Canada and Internationally, working with academic, non-governmental, and consulting organizations to her position.

Contact Meghan at [info@northernwaterfutures.ca](mailto:info@northernwaterfutures.ca)

## ANNA COLES, NWF Postdoctoral Researcher



Anna, a physical geographer and hydrologist, is joining us from the Global Institute for Water Security at the University of Saskatchewan, where her PhD research (2012-2016) focused on fundamental questions of snowmelt- and rainfall-runoff delivery on the Canadian Prairies, and her recent postdoctoral work (2016-2017) applied this understanding in the design of soil covers for mine reclamation in northern Alberta. Anna joined Northern Water Futures in October as a postdoctoral researcher in Subarctic Data Synthesis, based in Yellowknife. She will be working collaboratively on data sets from across the Northwest Territories to help understand the complexity of changes occurring in high latitude ecosystems.

## RYAN CONNOR, GWF Hydrometeorology Research Associate

Ryan works with the GWF team as a Research Associate in Hydrometeorology and am based out of the Yellowknife office. He completed my PhD in July, 2017 which examined changing runoff pathways in response to thawing permafrost, and how changing hydrological connectivity affects the basin water balance. Ryan is looking forward to working with NWF collaborators to further our understanding of the cycling and storage of water in permafrost catchments and to improve our predictive capacity in remote, ungauged basins.



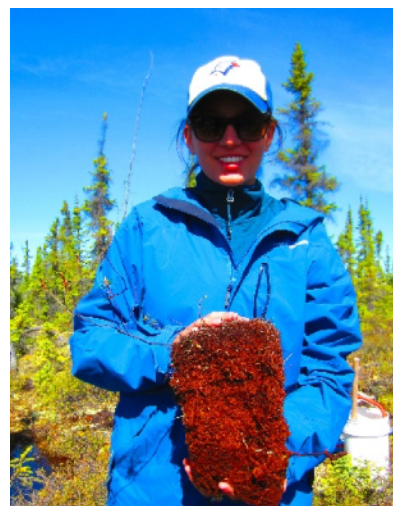
## HEATHER DIXON, GWF Biomonitoring Research Associate

Heather moved from the UK to Canada in 2011 to pursue a PhD at the University of Waterloo, where she investigated Atlantic salmon marine feeding using stable isotopes and gut contents analyses. After completing her PhD, Heather worked at the Atlantic Salmon Federation in New Brunswick, researching Atlantic salmon survival during their migration to the ocean using acoustic telemetry. As the Research Associate in Biomonitoring in the Global Water Futures programme, Heather is looking forward to investigating contaminant levels and trophic interactions in the food webs of subarctic lakes in The Northwest Territories, and linking these with abiotic and biotic factors



### JENNIFER HICKMAN, GWF Water Quality Research Associate

Based out of Wilfrid Laurier University's Yellowknife Research Office, Jennifer supports researchers studying the impact of environmental changes and resource development on water quality in the NWT. Hickman completed her MSc at Wilfrid Laurier studying the effects of changing subarctic peatland hydrology on discontinuous permafrost loss and dissolved organic matter quality and export. As a member of Laurier's core GWF team, she presently works on hydrology and water quality related projects, one of which examines the hydrological mass balance of unregulated sub-basins in the Snare River watershed.



### ASHLEY RUDY, GWF Permafrost Research Associate

Ashley received her PhD from Queen's University where she examined landscape patterns of permafrost degradation using a combination of field mapping, remote sensing and geospatial analyses. As the Permafrost Research Associate, Ashley's work will investigate permafrost changes in key regions of the NWT and link observations to changes in climate, as well as infrastructure and resource development in order to understand permafrost landscape sensitivity.



### ANA SNIDERHAN, GWF Ecosystem Resilience Research Associate



Ana is a PhD candidate at Wilfrid Laurier University, studying the growth dynamics of black spruce in northwestern boreal forests. Her research primarily used tree-ring records to determine how these iconic boreal trees have changed their growth patterns over recent history, but she also performed experiments with black spruce seedlings to help predict the resilience of the black spruce to a changing environment. As the Ecosystem Resilience Research Associate, Ana will continue to work on questions concerning the broader plant community and changes the terrestrial environment is facing in the Northwest Territories.

## ANDREW SPRING, GWF Knowledge Mobilizer Researcher



Andrew is a PhD candidate in the Department of Geography and Environmental Studies at Wilfrid Laurier University. Andrew's research looks at food security and climate change in the Northwest Territories and is part of the Laurier Centre for Sustainable Food Systems. As the Research Associate, Northern Canada Knowledge Networks, Andrew's work will focus on building a broad network of communities, NGOs, and government agencies in support of Laurier's northern research initiatives and develop tools to effectively mobilize knowledge to stakeholders.

## Job Opportunities

There are still Postdoctoral and Graduate student positions available with NWF and our partners. Consult the NWF website for more information. We also encourage interested students and volunteers to directly contact the faculty members involved in Northern Water Futures and ask about opportunities to assist with their research.

## Upcoming Events

NWF researchers will be involved in these events. Good opportunities to meet and learn more.

November 22-23	NWT Water Stewardship Strategy. Chief Drygeese Centre, Dettah, NT.
December 1	Laurier's Cold Regions Research Centre Student Symposium. Wilfrid Laurier University, Waterloo, ON.
December 11-15	Arctic Change 2017, Quebec City Convention Centre, Québec City, QC.
January 22-23, 2018	Global Water Futures Inception Meeting. Wilfrid Laurier University, Waterloo, ON.

---

## Connect With Us

Web	<a href="http://www.northernwaterfutures.ca">www.northernwaterfutures.ca</a>
Email	<a href="mailto:info@northernwaterfutures.ca">info@northernwaterfutures.ca</a>
Facebook	NorthernWaterFutures
Twitter	NWF_Research

