

CREATE H2O and Water Rights Conference

June 25 and 26, 2014
Robson Hall, University of Manitoba



Rosseau Rapids, Manitoba

Photo taken by Katelin Neufeld

**With confirmed guest speakers:
Legal scholar Aimée Craft and
Anishinaabe knowledge holders**

For more information, visit: create-h2o.ca/Node/976

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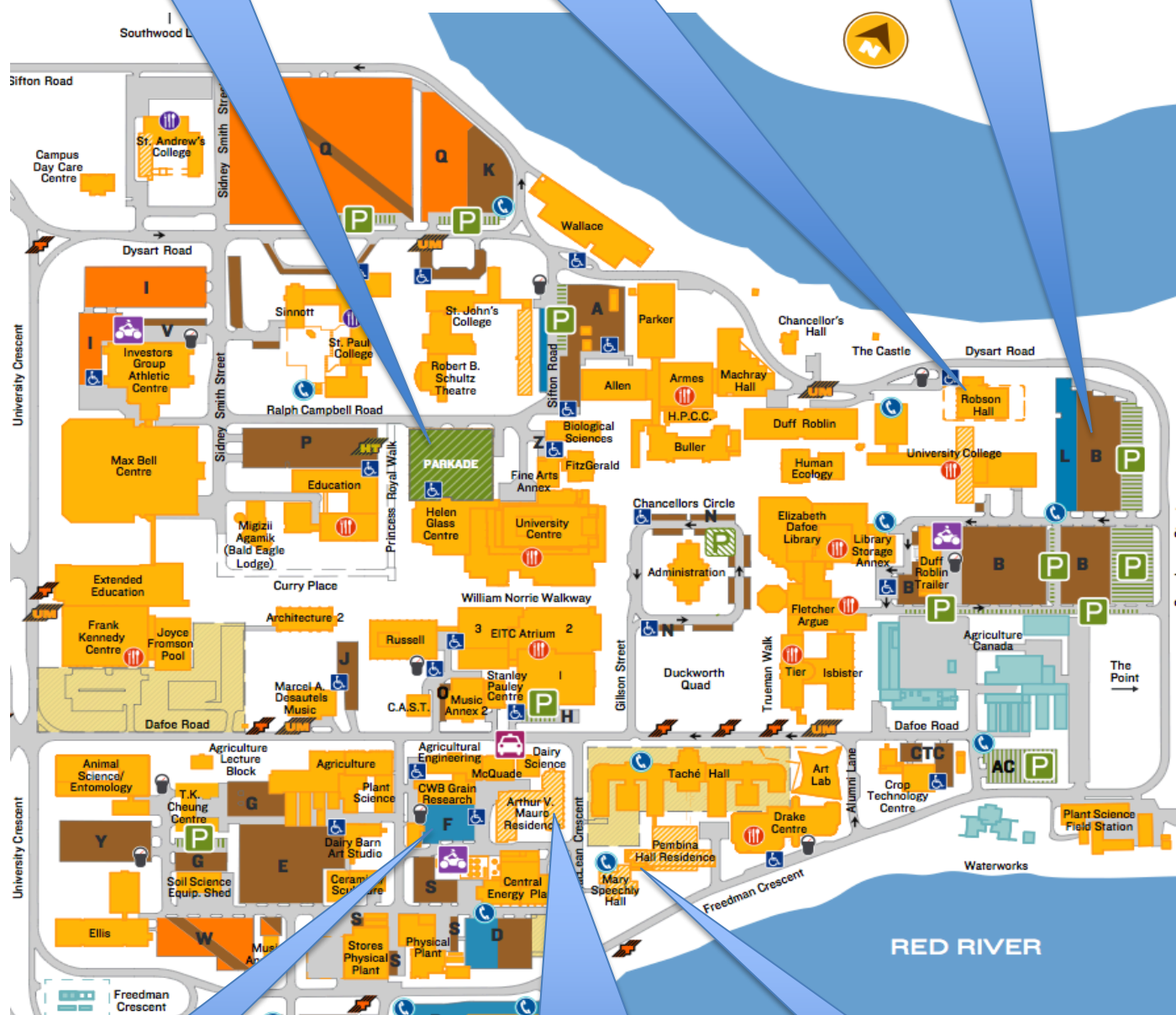
MAP TO CREATE H2O Conference

University of Manitoba – Fort Garry Campus

University of Manitoba parkade.

Conference in the Robson Hall law school. Signs will be posted upon entering building.

Parking is available behind law school if you request a parking pass in advance from Pepper.



Parking lot "F" for guests staying in residence.

Guests staying in residences must check-in/out at Arthur V. Mauro residence. Check-in after 3 p.m. Check-out before 10 a.m.

Residences – Mary Speechly and Pembina Hall.

Wednesday June 25, 2014

Location	Moot Court A, Main Floor – Robson Hall, 224 Dysart Rd., University of Manitoba
8:30 – 9:00	Registration and coffee - Common Room (across from Moot Court)
9:00 – 9:30	Elder's Opening Prayer Opening Remarks – Annemieke Farenhorst, Chris Metcalfe and Karen Busby
9:30 – 10:15	Aimée Craft and Knowledge Keepers – Anishinaabe Nibi Law Chair: Pepper Pritty
10:15 – 10:30	BREAK
10:30 – 11:10	Katelin Neufeld, Matthew Quesnel – Psychology of Social Change Chair: Erin Braun-Janzen
11:10 – 11:35	Ken Mattes, Manitoba First Nations Circuit Rider Training Program Chair: Johanna Theroux
11:35 – 12:00	Peter Schueler – Chlorine and Cisterns Chair: Rick Herman
12:00 – 1:00	NETWORKING LUNCH – Common Room
1:00 – 2:00	Jared Wheeler, Will Steinburg, Tiffany Monkman and Myra Tait – Legal Perspectives Chair: Karen Busby
2:00 – 2:45	Irving LeBlanc, AFN – National and Regional Perspectives Chair: Vanja Karpisek
2:45 – 3:00	BREAK
3:00 – 3:30	Laura Funk and Michelle Gorea – Attitudes of Canadians Chair: Khan Islam
3:30 – 4:30	Pat Linklater, Nisichawayasihk Nana Ama Addae, Behnaz Alimohammadisagvand and Khan Islam – Economic Perspectives Chair: Melanie O’Gorman

Thursday June 26, 2014

Location	Moot Court A
8:30 – 9:00	Registration and coffee - Common Room
9:00 – 9:45	Heather MacKenzie, Neegan Burnside – Water and Wastewater Systems Chair: Charles Goss
9:45 – 10:15	Charles Goss – Trichloromethanes Vanja Karpisek – Wastewater and Wetlands Geethani Arachchilage – Chlorine and Cisterns Chair: Rick Herman
10:15 – 10:30	BREAK
10:30 – 10:45	Rick Herman – Working with Ontario First Nations Chair: Ru Li
10:45 – 11:30	Johanna Theroux and Jonathan Challis – Building Relationships with Norway House Cree Nation Chair: Geethani Arachchilage
11:30 – 1:00	NETWORKING LUNCH – Common Room H2O steering committee (Room 204) & SSHRC governance committee (Room 205) meetings from 12-12:45
1:00 – 1:30	Katherine Morrisseau-Sinclair – Lake Winnipeg Water Walk 2014 Chair: Tiffany Monkman
1:30 – 2:15	Shirley Thompson, Stewart Hill, Nora Whiteway, Victor Harper – Watershed Protection in NE Manitoba Communities Cheryl Moosetail – Pine Creek First Nation Chair: Ahmed Oyegunle
2:15 – 3:00	Pepper Pritty and Frank Cook – Working with Manitoba First Nations (Grassy Narrows and Sapotaweyak) Chair: Elizabeth Harries
3:00 – 3:30	BREAK
3:30 – 3:45	Ayush Kumar – Microbiology Chair: Chelsea Lobson
3:45 – 4:00	Ru Li – Microbiology Chair: Ruidong Mi
4:00 – 5:00	Katherine Starzyk, Melanie O’Gorman, Brenda Elias – Interdisciplinary Research
	Elder’s Closing

FEATURED SPEAKERS

Aimée Craft

Aimée is an Indigenous lawyer with expertise in Anishinaabe and Canadian Aboriginal law and an assistant professor of law at the University of Manitoba. Her award-winning 2013 book *Breathing Life Into the Stone Fort Treaty* focuses on understanding and interpreting treaties from an Anishinaabe inaakonigewin (legal) perspective.

Heather MacKenzie

Heather is an engineer with more than 24 years of experience working on water and wastewater infrastructure projects for both municipalities and First Nation communities throughout Ontario and western Canada. Based out of Neegan Burnside's Winnipeg office, Heather lends her expertise in the management of multi-disciplinary teams of professionals on larger, more complex projects.

Katherine Morrisseau-Sinclair

Katherine is the founder and lead walker of the Lake Winnipeg Water Walk 2014. She is an Anishinaabe woman from Southern Manitoba whose name is Animkiiquay (Thunder Woman). Her strong connection to Midewiwin teachings as well being a proud wife, mother, sister, aunt, and grandmother drove her to do something about the destitute state of Lake Winnipeg. She is a mentor and spiritual teacher to young women in her community and is a renowned advocate for the health of water.

Irving Leblanc

Irving is the associate director of housing, infrastructure and emergency issues management at the Assembly of First Nations. He represents the AFN on initiatives related to housing, infrastructure, water, wastewater, source water protection and emergency management. Prior to joining the AFN, Irving was the service centre manager for the Ontario First Nations Technical Services Corporation. He received his civil engineering degree from the University of Waterloo and is an Odawa and a member of Wikwemikong Unceded Indian Reserve located on Manitoulin Island, Northern Ontario.

Ken Mattes

Ken is senior instructor for the Manitoba First Nations Circuit Rider Training Program run through the West Region Tribal Council. He is also past president of Canada's Circuit Rider Trainer Professional Association. Mattes and his First Nations staff teach water and wastewater plant operation and maintenance techniques and diagnose water and sewer problems on Manitoba First Nations 24 hours a day, often jumping in a truck or on a plane to prevent emergencies by troubleshooting in person. Because of this program, Manitoba has fewer drinking water advisories than other provinces.

JUNE 25 PRESENTATIONS

9:00 AM – Opening Remarks

Dr. Annemieke Farenhorst is a professor of soil science at the University of Manitoba and the principal investigator of the CREATE H2O program for water and sanitation security in First Nations.

Dr. Chris Metcalfe is the director of the Institute for Watershed Science at Trent University and a member of the CREATE H2O steering committee.

Prof. Karen Busby is a law professor and director of the University of Manitoba Centre for Human Rights Research. She is principal investigator for a SSHRC-funded partnership development grant on the Right to Clean Water in First Nations.

10:30 AM – Katelin Neufeld – *Master's candidate in psychology, Universities of Manitoba and Winnipeg*: People are often motivated to resist social change – particularly at the local level – and maintain the status quo (Kay et al., 2009); we propose that reminders of community connection are one solution to this issue. In two studies, people who thought about how they are connected to their communities were most morally outraged at the lack of clean running water in Canadian First Nations' communities and were least likely to endorse relocation as a solution. These studies extend emerging literature on the link between prosocial action and evoking a psychological sense of community (e.g., Marcus, Omoto, & Winter, 2011).

10:30 AM – Matthew Quesnel – *Master's candidate in social psychology, University of Manitoba*: This study explores how peoples' openness to persuasive appeals can be influenced based on the social group that they identify as belonging to. Past research has found that individuals are generally less persuaded by arguments made by members of outgroups compared to members of groups to which they belong (Wyer, 2010). This proposed study investigates the effects that multicultural and colour-blind ideologies might have on Caucasian Canadians' openness to persuasive appeals made by First Nations members to support initiatives that promote an increase of governmental funding to provide clean running water and wastewater systems to First Nations communities. Caucasian Canadians exposed to multicultural or colour-blind ideologies will read persuasive appeals coming from an ingroup (Caucasian) or outgroup (First Nations) member and their support will be measured.

11:35 AM – Peter Schueler is an engineer and general manager of Wawatay Limited Partnership, Opaskwayak, Manitoba, which is connected to the Swampy Cree Tribal Council.

1:00 PM – Jared Wheeler – *Undergraduate law student, University of Manitoba*: Jared has a BA from the University of Winnipeg with a double major in conflict resolution and international development studies. Currently he is a research assistant with law

professors Karen Busby and Aimée Craft on a project about Anishinaabe nibi inaakonigewin, exploring Anishinaabe water law through gatherings with Elders.

1:00 PM – Will Steinburg – *recent graduate, University of Manitoba law school:*

A fair and generous interpretation of treaty rights based on mutual intentions must include rights to use and manage water. These rights are clearly implied within the numbered treaties by provisions that guarantee rights to hunt, trap, and fish. Water is fundamental for the exercise of these rights; to conclude that the use of water is not included in the treaties would be absurd. Treaties also granted rights related to agricultural development of reserve lands.

To date there has been no court ruling that equivocally affirms or denies Aboriginal rights to water. However, there is no legislation that provides a clear and plain intention to extinguish any Aboriginal rights with respect to water, including those embedded in treaties. Test cases tentatively demonstrate that Aboriginal rights to water are legally enforceable and must be met with consultation or negotiation. In addition to these rights, it is likely that riparian rights were incidentally granted to First Nations along with reserve land. The common intention that reserve land would be set aside for agricultural development naturally requires that reserves be provided with enough clean water to meet their domestic and development needs. There is a strong argument to be made that First Nations reserves are owed a minimum amount of quality water needed to sustain themselves—a principle similar to the *Winters* doctrine. Riparian rights can also be used to deter pollution or changes to flow and quality of water by providing a basis for damages and injunctions.

1:00 PM – Tiffany Monkman – *Metis law student, University of Manitoba:* This study investigates the importance of Cree women's roles in relation to water through working with Elders. In situating the topic from a legal perspective, a comprehensive comparison will be made that identifies the distinct differences between ideal Western and Cree roles of women. These differences will be discussed within the context of women's roles in protecting the right to water. This presentation will outline the process of ethics application and working with First Nation Elders.

1:00 PM – Myra Tait – *Master's student in law, University of Manitoba:* Water Law and Indigenous Governance: This paper offers a legal analysis of Canada's newly enacted *Act respecting the safety of drinking water on First Nation lands* (Bill S-8), and argues that self-governance must form the basis of effective water management. In order to assess its potential to meet the needs of First Nations communities, key provisions are compared with the *Northwest Territories Waters Act*, the *Ontario Safe Drinking Water Act*, and the *Canada Water Act*.

3:00 PM – Dr. Laura Funk – *Sociology professor, University of Manitoba.*

3:00 PM – Michelle Gorea – *Master's student in sociology, University of Manitoba:*

In a qualitative interview project, Funk and Gorea explored how non-Indigenous Canadians interpret the problem of First Nations access to clean running water, and how

they explain their own involvement or interest in this issue. A purposive sample of 22 non-Indigenous Canadians was recruited from Winnipeg through community posters and a newspaper advertisement. The researchers interviewed participants in person and analyzed transcribed data using coding and constant comparative techniques. Participants' interest in and understanding of challenges faced by First Nations communities varied widely. In this presentation, we focus on what we have learned that can help in the development of public advocacy strategies targeted to non-Indigenous Canadians.

3:30 PM – Pat Linklater – *Band councillor and water treatment operator for Nisichawayasihk Cree Nation*. Pat is currently working with the community to address their need for updated infrastructure by advocating for a new water treatment plant.

3:30 PM – Nana Ama Addae – *Master's of development practice student, University of Winnipeg*. She is a research assistant for Dr. O'Gorman on water rights projects.

3:30 PM – Behnaz Alimohammadisagvand – *Master's student in environmental resource and development economics, University of Winnipeg*. She is studying the trade-off between air pollution and water pollution as a result of biofuels production in Manitoba.

3:30 PM – Khan Islam – *Economics PhD candidate, University of Manitoba*: This session will discuss a range of issues related to the financing of water and sanitation infrastructure. Pat Linklater will first discuss the experience of Nisichawayasihk Cree Nation with ensuring safe drinking water and sanitation, and with acquiring funding for a new water treatment plant. Khan Islam will discuss his analysis of the Aboriginal Peoples Survey (Statistics Canada), in which he is investigating the link between access to improved water and sanitation and socio-economic conditions such as physical and mental health, income, employment and education. Behnaz Alimohammadisagvand will discuss a range of options for financing water and sanitation infrastructure, ranging from federal government funding to public-private partnerships. Nana Ama Addae will wrap up the session by discussing how different advocacy strategies have been used already in the Canadian context, and what alternative strategies could be used to expedite federal funding for clean and accessible water for First Nations communities.

JUNE 26 PRESENTATIONS

9:45 AM – Charles Goss – *PhD student in civil engineering, University of Manitoba:* Surface waters contain natural organic matter (NOM) that can react with chlorine during disinfection to form carcinogenic disinfection byproducts (DBPs). A particular fraction of NOM, the aquatic humic substances (AHS) fraction, is of particular concern due to the high reactivity of this fraction to the formation DBPs. The currently accepted method for isolating the AHS fraction, the XAD method, is tedious to conduct, limiting its use to research scenarios. This study investigated the use of solid phase extraction (SPE) as a simpler method for the isolation of AHS, with the objective that SPE could be developed as a standard test method for water treatment plants to monitor the concentration and composition of NOM in source waters.

9:45 AM – Vanja Karpisek – *PhD student in engineering, University of Manitoba:* 14 wastewater treatment systems in Manitoba First Nations use wetlands as an effluent receiver environment. Existing lagoons provide effluents that may not satisfy the stringent effluent discharge standards that are in place to protect the public's health and environment. In addition, population growth in many First Nations communities has outpaced upgrades to local infrastructure, which impacts the effectiveness of the treatment of domestic wastewater and the protection of local source waters. After a preliminary assessment of the systems, Vanja aims to research the passive wastewater management systems of lagoons plus natural wetlands to investigate if this would be an economical option to treat wastewater in cold climate regions.

9:45 AM – Geethani Eragoda Arachchilage – *Agriculture PhD student, University of Manitoba:* Cisterns, which are commonly used to hold drinking water in rural areas and First Nations communities in Canada, can pose risks to water quality since water sits in the tank for a long time, reacts with the chemicals in the water and with the tank walls, and involves transport processes. However, no comprehensive research has been conducted on cistern water quality as affected by source water quality and water treatment process. The specific objectives of the proposed research are: (1) study and model the seasonal variation of chlorine decay and free chlorine levels in water distribution systems and cisterns over time; (2) characterize natural organic matter and organic and inorganic composition in source and drinking water and identify their effects on trihalomethane (THM) formation; (3) investigate the impact of free and residual chlorine contents on bacteriological growth in drinking water; and (4) determine the potential for THM precursor release from lake sediments.

10:30 AM – Rick Herman – *Master's of science student, Trent University:* Due to global warming, stratification of the Great Lakes can be used to better manage wastewater clarification in the epilimnion and to protect deep benthic drinking water intakes. Lake Ontario is known to form a summer thermocline at 10 m. In West Bay, Manitoulin, in Lake Huron, the lagoon wastewater discharge is at 10 m as is the drinking water intake. By using passive samplers, artificial sweetener will be traced to characterize the plume of the wastewater discharge and assess how it disperses around the thermocline

anticipated at 10 m. Engineering recommendations may be made to have wastewater discharged above the thermocline into the epilimnion and have drinking water intakes drawing from below the epilimnion .

10:45 AM – Johanna Theroux – *Master of environmental science student, University of Manitoba*: Norway House Cree Nation is located on the confluence of the Nelson River and Lake Winnipeg. The development of the 2- and 8-mile channels near the community for hydropower development has caused concerns about increases in sedimentation leading to source water contamination. This study aims to quantify turbidity in waters surrounding the community, including the inlet and outlet of the 2-mile channel, to determine which areas are being impacted. Secondly, sediment fingerprinting techniques will be used to determine where sediments originate. This information can help the community implement mitigation measures to ensure their source water is not being impacted by industry and can help reduce costs associated with water treatment.

10:45 AM – Jonathan Challis – *PhD student in chemistry, University of Manitoba*: Passive samplers are widely used for characterization of many inorganic chemicals (e.g., trace metals) and polar organic contaminants (POCs – pharmaceuticals and pesticides) in natural waters. While passive sampling technologies for metals are well established and reliable, passive sampling of POCs is less so. Polar passive sampling techniques are highly sensitive to the hydrologic flow of an aquatic system, making their applicability under changing flow conditions significantly reduced. Work to modify a current passive sampler design to effectively and consistently uptake POCs across surface waters of varying flow conditions is ongoing in our laboratory, with promising results. Ultimately, field-validation of these modified polar passive samplers will take place in Norway House Cree Nation. This northern community treats its wastewater passively via sewage lagoons, which are subsequently released into nearby river systems. Both classic and modified samplers will be used to characterize trace metal and pharmaceutical and pesticide concentrations, respectively, in these impacted river systems. Understanding the occurrence and distribution of POCs and metals in impacted systems is paramount to an effective risk assessment and management program.

1:30 PM – Dr. Shirley Thompson – *Natural Resources Institute professor, University of Manitoba*: Food insecurity rates in remote northern Manitoba communities are disproportionately higher compared to the rest of Manitoba. Dr. Thompson's research is designed to address inequities by conducting participatory community development studies that explore initiatives such as country foods programs, youth gardening programs and value-added fish sales. Elders **Victor Harper** and **Nora Whiteway** will also present with Dr. Thompson. Nora was schooled on the land in Wasagamack, which provided a rich learning environment, while her brothers and sisters went to residential school. Nora is a water walker, walking in the winter around island lake with others to pray for the health of people and the land. She is an Elder going back to school in the fall to finish her social work degree at the University of Manitoba.

1:30 PM – Stewart Hill – *PhD student in natural resources, University of Manitoba*: Stewart grew up in God's Lake and speaks his language fluently. He spent 20 years

working in the service of First Nations in the areas of natural resources research, environmental management, treaty land entitlement, community self-government consultations, Swampy Cree cultural and historical research, environmental assessments, First Nations engagement in the resource development sector, and traditional area land use planning. Stewart has considerable experience with Traditional Knowledge studies in the form of mapping, interviews and workshops and considers traditional knowledge to be his area of expertise. For his PhD project, Stewart is working with his community of Manto Sakahikan and the neighboring communities of Manto Sipi Cree Nation (God's River) and Bunibonibee Cree Nation (Oxford House), exploring water in conjunction with land use planning, utilizing both science and traditional knowledge.

1:30 PM – Cheryl Moosetail – *Undergraduate arts student at University College of the North*: Cheryl is working with Pine Creek First Nation on investigating the ecosystem, particularly the water sources, to determine if contaminants are present that will have potential negative health consequences for humans and wildlife.

2:15 PM –Pepper Pritty – *RN and Indigenous, interdisciplinary graduate student, University of Manitoba (Faculties of Medicine, Environment and Science) and co-ordinator of the CREATE H2O program*: She has studied undergraduate perspectives of First Nation water issues by discipline and microbial contaminants in Tootinaowaziibeeng Anishinaabe First Nation.

Current Project: Health Implications of Mercury Toxicity in Grassy Narrows First Nation
First Nations treaty lands continue to be targeted by industry and government as desirable locations to exploit natural resources. This comes with significant costs to human health, disruption to the traditional lifestyles that maintained social stability, as well as negative consequences to the fish and wildlife that share the ecosystem. This project includes the development of a community health assessment survey and an analysis of water and soil. The data will identify the current health status of the Grassy Narrows community and the long-term negative health consequences of mercury contamination. The analysis will determine what parameters increase the risk ratio of mercury toxicity in humans and the long-term health and social implications for people who live in environments affected by mercury contamination.

This presentation will also discuss the process for conducting research in First Nations communities, including proposal writing, community consultation, the history of unethical research in Indigenous communities and a brief overview of the Ownership Control Access and Possession principles for working with First Nations.

2:15 PM – Frank Cook – *Manager of the Sapotaweyak Cree Nation water treatment facility. Leader of the First Nation's 2012 youth water project, in partnership with several students and professors now involved with CREATE H2O.*

3:30 PM – Dr. Ayush Kumar – *Microbiology professor, University of Manitoba*: The purpose of this study is to analyze the prevalence of antibiotic resistance-encoding genes from the urbanized near-shore zone of Lake Ontario in Southern Ontario. Water samples were collected on three different days from each of the six different sites in the

Durham Region and total DNA extracted. Samples were analyzed for the presence of genes encoding resistance to β -lactams (*ampC*), methicillin (*mecA*), tetracycline (*tetA* and *tetB*), and vancomycin (*vanA*). Our data shows that *tetA* and *ampC* were the most prevalent resistance genes in all of the six water samples, *vanA* was found in five out of six sites, and *tetB* in four out of six sites. *mecA*, the gene encoding methicillin resistance, was not detected from any of the sites. The highest prevalence of antibiotic resistance genes was observed in samples collected from a wetland site within the city, highlighting the potential of urban run-off to select for resistance gene(s), most likely due to the presence of various chemicals with antimicrobial properties.

3:45 PM – Ru Li – *Postdoctoral fellow in soil science, University of Manitoba:*

Unacceptable levels of microbiological contaminants are among the main reasons why drinking water poses a safety risk in First Nations communities. Genomic DNA-based techniques can detect water-borne pathogens but unfortunately could not differentiate between vital (live) and dead cells, which could lead to false positive results for pathogenic microbes. The development of a method for detection of vital versus dead cells in bacterial communities has gained considerable interest over the last years. Propidium monoazide (PMA) can selectively penetrate into membrane-compromised dead cells and intercalate into their DNA, and therefore inhibit the downstream DNA techniques. PMA has been used to discriminate vital and dead pathogens in selected water spiked with both Gram-positive and Gram-negative bacterial species. However, PMA-DNA techniques have been less successful when applied to natural water samples because of the interference of natural constituents (e.g. humic substances) with the penetration of PMA into cells. RNA is only produced by metabolically active cells, making RNA suitable to detect live bacterial cells. An RNA-based quantitative PCR detection method has also been used to assess the presence of live cells of microbial communities in water. The objective of this study is to compare the efficiency and sensitivity of PMA-based 16S rDNA versus 16S rRNA Illumina sequencing in quantifying the diversity and richness of live cells of microbial communities in water.

4:00 PM – Dr. Katherine Starzyk – *Psychology professor, University of Manitoba. She leads the public advocacy research for the Right to Clean Water in First Nations project.*

4:00 PM – Dr. Melanie O’Gorman – *Economics professor, University of Winnipeg. She leads the economics work for the Right to Clean Water in First Nations project.*

4:00 PM – Dr. Brenda Elias – *Community health sciences professor, University of Manitoba. Former co-director of the Manitoba First Nations Centre for Aboriginal Health Research. She was principal investigator of a CIHR grant on Cherishing Water and Claiming Health:* This session will explore the need for and benefits of interdisciplinary research, especially for dealing with complex social problems such as insufficient water and sanitation in First Nations communities. We will discuss the barriers to interdisciplinary research within our organizations and institutions, and our own disciplinary biases. We will then discuss the need for “cultural competence” for any interdisciplinary endeavor to be effective.