

Sustainability Newsletter



THUNDER BAY PLACED AS #1 COMMUNITY IN ONTARIO FOR COMMUTER CHALLENGE

Commuter Challenge is a friendly, national competition that encourages daily commuters to choose sustainable modes of transportation for the benefit of their health and the environment. It's also a fun way of building leadership and camaraderie in our workplace.

From June 3 – June 9, hundreds of employees across Thunder Bay cycled, walked, ran, bused, carpooled or telecommuted their way to work.

The Office of Sustainability would like to thank the 71 employees who participated in Commuter Challenge Week. It was a resounding success!

Thanks in part to Lakehead University's participation, Thunder Bay placed as the number one community in Ontario for Commuter Challenge this year. We are excited to announce that in Thunder Bay, we won in the category of workplace participation for our employee category (500+ employees).

This was our best performance year ever! In fact, we increased our participation rate by 1320%. This is thanks to all of your hard work.

We won a free bike rack donated by the City of Thunder Bay. Your ambition and dedication to commuting alternatively to work helped to increase alternative transportation infrastructure on campus. Thank you!

**HAVE SUSTAINABILITY RELATED RESEARCH,
INITIATIVES, OR NEWS YOU WANT TO SHARE?
CONTACT US AT:**

coordinator.sustainability@lakeheadu.ca

COMMUTER CHALLENGE SPOTLIGHT:

OUR IMPACT

OVER
4299
KILOMETERS
TRAVELLED

OVER
314
LITRES OF FUEL
SAVED

OVER
628
KILOGRAMS OF
CO2 AVOIDED

OUR TEAM

EMPLOYEE WITH THE MOST KILOMETERS CYCLED

Cindy Haggerty (291 km)

EMPLOYEE WITH THE MOST MODES

Joshua Armstrong & Leanne Smith
(transit, carpool, bike, telecommute,
drive)

EMPLOYEE WITH THE MOST UNUSUAL COMMUTE

Michelle Borgal & Stephen Fratpietro
(rollerblade)

EMPLOYEE WITH THE MOST CO2 AVOIDED

Cindy Haggerty (72.87 kg)

EMPLOYEE WITH THE MOST KILOMETERS TOTAL

Leanne Smith (414 km)

Sustainability Research and Teaching

Sustainability Research and Teaching in Orillia

In March, the Research Centre for Sustainable Communities, located on the Orillia campus, hosted its first community workshop that showcased research in the areas of environmental sustainability, political economy, and social justice. The workshop brought a diversity of people together, including students, staff, faculty, and community members.

In particular, the workshop highlighted the research of graduate students in the Environmental Sustainability/Biology Programs. Graduate research presented included:

Ryan Stevens

“Understanding Red Pine (*Pinus Resinosa*) and White Pine (*Pinus Strobus*) Plantations as Hosts for *Armillaria* Ssp. and *Heterobasidion* Spp.”

Hannah Hancock

“Assessing the Habitat Associations of Fish Species with a Lacustrine Life History in Nunavut and the Northwest Territories”

Katelynn Crawford

“The Isolation and Characterization of Phosphate Solubilizing Bacteria Along the Northwestern Shore of Lake Simcoe”

Sustainability Sciences has been a flagship of the Orillia campus, and the one-day workshop was a great opportunity to hear about some of the innovative sustainability research going on there.

Expanding their specialization in sustainability research and teaching, the Department of Sustainability Sciences, Lakehead Orillia launched a Certificate in Environmental Sustainability program in May 2018. This certificate program is a five-course, completely online program for professionals and practitioners who want to enhance their skills, knowledge base, and expertise in the field



of environmental sustainability. This program can be completed within one year.

“Environmental sustainability has become a very in-demand field,” says Dr. Sree Kurissery, Chair, Department of Sustainability Sciences at Lakehead Orillia. “The program prepares graduates for a diverse and growing field in both the public and private sector, where they will enjoy many opportunities to research and come up with scientifically-based solutions for environmental issues.”

The Department of Sustainability Sciences also has a co-op program, a concurrent education program, as well as a combined degree/diploma program in Environmental Sustainability.

For more information on the Research Centre for Sustainable Communities, please contact Nanda Kanavillil, Director and Professor in Biology and Sustainability Sciences (nkanavil@lakeheadu.ca). For more information about the Certificate in Environmental Sustainability, please contact Sree Kurissery, Professor and Chair of Sustainability Sciences (skurisse@lakeheadu.ca).

Indigenous Workshops

By Dr. Amy Farrell-Morneau

DYNAMIC AND ENGAGING INDIGENOUS WORKSHOPS

Along with the Indigenous Course Requirement at Lakehead University, there is an increasing interest in incorporating Indigenous content across faculties and departments. As Lakehead University's Indigenous Curriculum Specialist, I offer a wide range of workshops that support integrating and applying Indigenous content knowledge in many fields. These dynamic workshops offer historical information and create contemporary connections. They also help instructors illustrate the cultural relevancy of material in their courses and provide helpful resources. I also offer some workshops that are purely experiential, creating opportunities for hands-on creation of appropriately informed Indigenous arts and crafts.

New and upcoming workshops include:

- Indigenous Research and Ethical Protocols
- Indigenous Clay Pottery
- Indigenous Ethnobotany and Medicinal Plants
- STEM in Indigenous Games and Pastimes
- Introduction to Incorporating Indigenous Content

Workshop information can be found on the Teaching Commons' home page at teachingcommons.lakeheadu.ca and are also announced in the Communications Bulletin.

Be sure to also check out the Teaching Commons' Indigenous Resources collection of articles and other materials at teachingcommons.lakeheadu.ca/IndigenousResources

Workshops are offered throughout the year, and all are welcome to attend. I also appreciate recommendations on workshop topics, and I invite all faculty and instructors to get in touch. I'm happy to work with you, to share resources, and to provide recommendations on a variety of Indigenous curricula, topics, issues, and pedagogical support.

You can reach me at alfarrel@lakeheadu.ca or ext. 8748. Miigwech!



Dr. Amy Farrell-Morneau.

Walking the Labryinth

By Dr. David Greenwood, Canada Research Chair of Environmental Education and Professor in Education

PRACTICING SUSTAINABILITY FROM THE INSIDE OUT

On October 6, 2017, a group of 15 faculty, staff, students, and community members painted, in cobalt blue, a beautiful, 24-foot diameter canvas labyrinth.

Over the last year, along with PhD student Devon Lee (Faculty of Education), I have been convening labyrinth walks for diverse members of the Lakehead University community. While these walks provide a wide range of benefits to participants, they are also part of a worldwide movement to integrate contemplative practices into higher education contexts.¹ A central feature of this work at Lakehead has been the establishment of a Labyrinth Learning Community, which meets regularly during the academic year to walk the labyrinth and to explore the impact of contemplative practice on our work. The canvas labyrinth also travels. This past May, Devon and I facilitated a walk for nearly forty participants in the 2018 Workshop on Regional Centres and the Sustainability of Canada's Rural and Northern Landscapes. Facilitated walks are planned to support the particular purposes of events, such as workshops, programs, and individual courses. Walks are currently planned as an inaugural experience in two different Lakehead programs: one at the graduate and another at the undergraduate level.

For thousands of years, the labyrinth has helped guide seekers on diverse life-paths. As a contemplative practice, labyrinth walking is a symbolic form of pilgrimage that connects the complex "inner" landscapes of "self-awareness" with the complex "outer" landscapes of "social reality." It is a walking meditation where one follows a clearly marked path from the outside of the circle into a symbolic centre. It is not a maze where one can get lost.



Walking the labyrinth at the Agora | Photo credit: Melissa Kastern



Photo credit: Melissa Kastern

¹ See the Association for Contemplative Mind in Higher Education: <http://www.contemplativemind.org/programs/acmhea>

Stormwater Management

DESIGNING AND INSTALLING A RAIN GARDEN ON CAMPUS



Julia Prinselaar demonstrates rain garden site assessment skills.



Students and staff show off their rain garden designs.

Extensive flooding in 2012 prompted the City of Thunder Bay to declare a state of emergency. The 2012 storm was labeled a “one hundred year weather event,” and one of three floods that has impacted the city in the past decade. Heavy downpours are a symptom of our changing climate, and many experts say we can expect this trend to increase.

Stormwater management is a growing strategy to adapt to the expected increase in extreme weather events as a result of human-caused climate change. With stormwater infrastructure upgrades and repair costs on the rise, green infrastructure such as rainwater harvesting, rain gardens, low impact development, constructed wetlands, and bioswales are being used to mimic the natural water cycle by managing rain close to where it falls. These infrastructures slow the flow of stormwater from paved surfaces into the watershed, while also filtering pollutants.

Dr. Lindsay Galway (Assistant Professor in Health Sciences) and Ledah McKellar (University Sustainability Coordinator) received funding from the Ministry of Environment, Conservation, and Parks’ Great Lakes

Guardian Fund to design and install a rain garden on the Thunder Bay campus, in collaboration with Julia Prinselaar of EcoSuperior.

A group of ten university students participated in a three-part workshop series facilitated by EcoSuperior where they learned about stormwater management, rain garden site assessment, and native plants, and then applied these skills to contribute to the design of the Braun Building rain garden. Students and staff were also involved in the installation of the rain garden, which took place on one of the hottest days of the year!

The new rain garden is located across from the Paterson Library, outside the Braun Building. This site was identified by the Director of Physical Plant, Hugh Briggs as a site with symptoms of pooling water. It is located in the heart of campus.

The site features a rain garden to reduce stormwater runoff, protect water quality, and provide habitat for pollinators. It will also feature interpretive signage to raise awareness about the importance of rain gardens as tools

for improving stormwater management, and promote student and community engagement. A precipitation gauge will also be installed to enable experiential learning opportunities for students.

Shortly after excavation of the site, an overnight storm sent 50 mm of rain on Thunder Bay, causing our yet-to-be-installed rain garden 'hole' to turn into a pond. However, the silver linings present themselves, and the workplace camaraderie that emerged to help remediate the garden site was a wonderful example of collaboration in the effort to advance sustainability. Now that the installation is complete, we are assured in the knowledge that this little act of ecological restoration will help our campus adapt to future impacts of climate change, like downpours.

The site will be integrated into the existing Lakehead University Sustainability Tour and the EcoSuperior Self Guided Community Rain Garden Tour, thus working to educate and inspire a future generation of Great Lakes Guardians in the Lake Superior watershed.

The Office of Sustainability would like to thank Physical Plant for excavating and removing materials at the rain garden site, in addition to donating large feature boulders and providing construction oversight. This in-kind donation is appreciated and a great example of utilizing our infrastructure and operations for multidisciplinary student learning and applied research that contributes to understanding and advancing campus sustainability challenges. Interdepartmental partnerships like the rain garden are key to achieving sustainability.

For more information on this project, please contact Dr. Lindsay Galway, Assistant Professor in Health Sciences (lgalway@lakeheadu.ca) or Ledah McKellar, Sustainability Coordinator (coordinator.sustainability@lakeheadu.ca)



Dr. Lindsay Galway discovers the flooded excavation site.



Chris St. Amand, Groundswoker, excavates.



Braun building rain garden.

VPRI Strategic Research Fund

SUSTAINABILITY STUDIES RESEARCH GRANT

In 2015, and again in 2017, the Office of the Vice-President Research and Innovation demonstrated its ongoing commitment to deepen its role in sustainability stewardship. The Sustainability Studies Research Grant was created to “promote interdisciplinary research activity that leads to finding innovative solutions to sustainability challenges.”

This research fund prioritized research projects that:

- Were interdisciplinary;
- Had a relationship to the broad themes of sustainability as represented by the Sustainability Tracking, Assessment, and Rating System (STARS); and
- Involved the community.

In 2017, four research projects were awarded up to \$5,000 each. Two of the projects are showcased in this Fall’s Sustainability Newsletter and the remaining two will be featured in the Winter’s Newsletter.

Reduction Of CO₂ Emission To Atmosphere By Reverse Water Gas Shift Reactions

DR. EBRAHIM REZAEI, ASSISTANT PROFESSOR IN CHEMICAL ENGINEERING

Dr. Rezaei's research project expands on his post-doctoral work at the University of Ottawa. It responds to one of the critical challenges of climate change: the detrimental amount of CO₂ being added to our atmosphere. Although in the early stages, this particular research project will be a building block of a larger project attempting to discover selective catalysts to transform carbon dioxide into value added products. This research is focused on the hydrogenation of carbon dioxide into what is called "synthesis gas," a mixture of carbon monoxide and hydrogen that can be used to make fuels such as gasoline or methanol, thus closing the carbon loop. Dr. Rezaei is searching for the best catalyst to produce synthesis gas using the reverse water gas shift (rWGS) reaction. The next step in the research project will be to model and optimize the process so it can be replicated at a large scale.

Funds from the Sustainability Studies Research Grant are being used to hire a graduate student to model a membrane reactor for the rWGS reaction. The student is working on increasing the efficiency of the rWGS reaction by in situ removal of water produced from the hydrogenation of CO₂. Carbon dioxide is a stable molecule, and it is challenging to turn it into something usable. To do this, the reaction requires a lot of energy, as well as hydrogen, and is therefore a very expensive process. Dr. Rezaei wants to find a way to make the process more efficient.

This project was also the basis for a capstone project for undergraduate students who had to find a way to produce methanol from hydrogen and CO₂. This

teaching is part of what Dr. Rezaei sees as a mandate of engineers: to protect the public and safeguard the environment. He believes there is an ethical obligation both as an engineer and as a citizen to reduce global warming. With energy demands increasing alongside rising populations, Dr. Rezaei says we have a responsibility to find sustainable ways to maintain the earth for future generations.

For more information on this project, or previous research initiatives, please contact Dr. Rezaei at erezaei@lakeheadu.ca.



Dr. Geshnizgani

Monitoring Lichen Flora on Campus

By Mallory Vanier

DR. MALEK, PROFESSOR IN BIOLOGY

Even after retiring from teaching in 2016, Dr. Ladislav (Lada) Malek continues to be active with the Biology Department at Lakehead University. A former professor of cell biology and plant physiology, Dr. Malek has an extensive history of plant-based research including analysis of the stress response of plants and the transformation of natural products and waste into beneficial materials. Dr. Malek's teaching and research experience have made him a valuable resource to members of the Lakehead community.

Malek's grant is supporting his project on lichen on the Thunder Bay campus. In general, lichens are an important food source for caribou as well as an indicator of ecosystem health due to their sensitivity to pollution. Through his project, Dr. Malek aims to increase public awareness and understanding of these unique species in both the University and the Thunder Bay area because he argues for greater understanding of lichens is needed now and in the future. He also is seeking to enhance the campus herbarium's current collection of local lichen that can be analyzed.

There are two main components to the project. First, the research initiative will collect baseline lichen data within the target area to better understand the current status of local lichen species, and monitor changes in those species over time. Information about and images of these lichen species will be compiled in a publicly accessible website. Dr. Malek is working with several other individuals and departments as part of this project including Dr. David Greenwood (Education) and Dr. Kamil Zaniewski (Geography and the Environment). Additional partners in the Faculty of Natural Resources Management and external organizations have also lent their expertise to the project thus far. Dr. Malek is also grateful to Hanna Dorval for helping with the lichen searches and identifications and Sasha Dorval for



Dr. Malek | Photo credit: Kristina Malek

programming the lichen walk website and app. Without them, he says, the project would not have happened. While Dr. Malek anticipates an early form of the website will be completed by Fall 2018, the future of the project will depend on interest and support from additional collaborators, including funders. If you would like to get involved or would like more information on this project or other research initiatives, please contact Dr. Malek at lmalek@lakeheadu.ca.

Staff Spotlight: Hugh Briggs

“Sustainability is more than just recycling and waste reduction,” says Hugh Briggs, Director of Physical Plant. “Sustainability is training minds to create a better world for future generations.”

While the word “sustainability” may not appear directly in Briggs’ job title, he has been a silent champion of sustainability initiatives at the University over the past three decades. Briggs started working at Lakehead University in 1990. Today, his primary role is to manage the facility and grounds programs of the University, programs that intersect with multiple sustainability areas including but not limited to grounds, water, energy, waste, and yes, at times even academics.

In the 1990s, universities were focused on reducing, reusing, and recycling waste. In the beginning of his career here, Briggs forged early relationships with Habitat for Humanity to set up a process to recycle items from major renovation projects. Briggs was also involved in the Zero Waste Action Team that was focused on reducing waste in Thunder Bay. This group formed the early underpinnings of what is now an influential environmental agent in the region: the City of Thunder Bay’s EarthCare unit.

Today, as Briggs noted, sustainability is a globally recognized concept with increased governmental regulations across diverse areas. Energy and greenhouse gas reductions are at the forefront of contemporary sustainability efforts being encouraged by governments in his line of work, but health and wellness and Indigenous rights are just a few other areas that he understands need to be included under the sustainability umbrella.

Briggs is most proud of his role in making Lakehead a leading university in energy reduction. Over the past decade energy use has been reduced at the University by 45% in natural gas and 22% in electricity - a major accomplishment that he suspects few in

our community are aware. This substantial decrease in energy use exceeds the 2030 carbon reduction targets set by the province, and is mainly attributed to the switch in 2006 on the Thunder Bay campus from a central steam plant to a central hot water plant through a district heating system. Central hot water is substantially more energy efficient than steam. At the time, the switch from steam to hot water was forward thinking, and other universities in Ontario were not making this shift. With mounting pressure on universities from the province to reduce energy use, Briggs has become sought after to speak at conferences to describe Lakehead’s successes in energy reduction and many are excited to learn that the project had a projected 20-year payback, but managed to pay itself off in eleven. In the last few years, other universities have begun to follow Lakehead’s lead by switching to hot water plants.



Hugh Briggs | Photo credit: Darren McChristie

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VISIT LAKEHEADU.CA/ABOUT/SUSTAINABILITY

Among other projects under Briggs' sustainability profile was his involvement in designing the Orillia campus to meet LEED¹ platinum standards. This too was a progressive decision on the University's part given that it was made when LEED only had official designations for individual buildings, not campuses as a whole. Lakehead Orillia now supports two platinum buildings and one silver building, as well as a "greenfield²." The University's current Sustainable Building Policy came as a result of these initial successes at the Orillia campus, which states that all new buildings at Orillia will be constructed to LEED Platinum standards, and on the Thunder Bay campus, which had the challenge of preexisting buildings, to LEED Gold. Sustainable features of the Orillia campus include a geothermal field, solar shading tinted windows, and extensive daylighting.

Hugh is actively involved with the Office of Sustainability. He is the current Chair of the Operations Working Group, a subcommittee of the Sustainability Stewardship Council. In this role, he helps support and realize the University Sustainability Action Plan recommendations. One recent successful initiative of this group has been to pilot cigarette recycling on the Thunder Bay campus.

Over the years, he has had many ideas for improvements, some of which have been achieved more easily than others. For example, Briggs received funding for an industrial composter in the past, but this project ran into some roadblocks. Setbacks don't faze him, however. He says he is not afraid to try things in the effort to be more sustainable; indeed, he argues that we need to be willing to take risks to implement change. When asked what is next on the roster for sustainability, Briggs said, "More engagement from students and faculty on the teaching, outreach, and engagement front of sustainability. That's where Lakehead is really heading, which is a good thing." His role in providing in-kind donations to the recent rain garden built on campus demonstrates how sustainability has grown in the time he has been here. If we can use our infrastructure and work with operations for experiential learning that contributes to understanding and advancing campus sustainability challenges, the benefits are many.

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- 1 "LEED, or Leadership in Energy and Environmental Design, is the most widely used green building rating system in the world." For more information, see: new.usgbc.org/leed
 - 2 The U.S. Green Building Council defines a greenfield as an area that has not been graded, compacted, cleared, or disturbed and that supports (or could support) open space, habitat, or natural hydrology.

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