

McMASTER UNIVERSITY

Sustainability Report

202021

BRIGHTER WORLD





McMaster PhD student Alanna Bodo, stands amongst tree sensors at Turkey Point. Bodo's research aims to shed light on how the changing climate is affecting forests.

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LAND ACKNOWLEDGMENT

McMaster University recognizes and acknowledges that it is located on the traditional territories of the Mississauga and Haudenosaunee nations, and within the lands protected by the Dish With One Spoon wampum agreement.

Sunshine on McMaster's campus.

President's Letter

McMaster is a university focused on impact.

We are ranked among the top 70 universities globally and, through our cutting-edge research and world-class teaching and learning, we are working to advance human and societal health and well-being – in our community and around the world.

Our goal is to address some of the most pressing challenges facing our communities and our planet, including climate change and sustainability.

This goal matters deeply to the McMaster community. During the consultation process that informed the university's new vision statement and strategic plan, I heard fears for the future of our planet and a strong desire for McMaster to be a driving force in addressing climate change and enabling a more sustainable, less carbon-dependent future. This extended from waste reduction on our campus to engaging our community in promoting sustainable practices, reviewing the university's investment portfolios and strategies, including calls for divestment, as well as undertaking research to address food and water insecurity and enhance our understanding of the impacts of climate change.

Sustainability — in all its forms — matters to the McMaster community.

As a university, it is incumbent on us to lead by example, to support our local and global communities, and to enable the meaningful change that can help create a brighter world for all.

David Farrar

President and Vice-Chancellor



David Farrar, President and Vice-Chancellor at McMaster University.

Our Sustainability Commitment: Introduction to the Report

At McMaster, the focus on environmental sustainability runs through every part of the university, from innovative teaching and research, to the campus environment and operations. The United Nations' Sustainable Development Goals (SDGs) are at the core of many student activities and academic programs, increasingly reflected in a range of research and academic programs.

As Canada's most research-intensive university, McMaster works across disciplines to find creative solutions to complex problems, helping to improve people's lives and build a brighter future for all.

This inaugural university-wide 2021 Sustainability Report was prepared by the Office of Sustainability, in partnership with a working group from across campus, to provide an overview of McMaster's collective measures to advance environmental sustainability efforts within the institution, the communities that surround us and around the world.

It draws on examples from across the university, in all faculties and multiple departments and units to demonstrate how McMaster is delivering on its ambitions and goals around environmentally sustainable actions. While this report does not capture all of the sustainability focused activities, it provides a glimpse into much of the work being done.

While sustainability is a comprehensive term encompassing social, environmental, political and economic factors, this inaugural Sustainability Report focuses on the actions that protect the planet. Numerous reports on sustainability more broadly have already been created throughout McMaster University, such as the **McMaster University Sustainable Development Goals Report 2020**, the **Hospitality Services Wellness and Sustainability Report**, the **Office of Community Engagement Impact Report** and the **Academic Sustainability Programs Office 2020/21 Annual Report**.

This report has narrowed its focus to three key pillars:

1. **Natural Resources:** Showcases McMaster's commitment to the protection and conservation of natural resources, as well as its efforts to contribute to a sustainable food system and address food insecurity on campus.
2. **Reducing Our Environmental Footprint:** Highlights how McMaster builds and operates its campus sustainably, including water, energy, GHG emissions and waste reduction initiatives.
3. **Student Learning and Research:** Explores McMaster's efforts to integrate sustainability into its students' academic experiences through innovative interdisciplinary programs and community-based and experiential learning, as well as the many research activities supporting the achievement of the SDGs.

McMaster hopes this report serves as a prompt to engage with its students, faculty, staff and community on the university's approach to sustainability. In the coming years, McMaster will prepare a Sustainability Plan which will refine the university-wide sustainability goals and allow for reporting on established metrics.

Initiatives included in this report are mapped to the SDGs. For more information on McMaster's alignment to the SDGs, see the SDG Index Table on page (30) of this report, visit McMaster's **Sustainable Development Goals site** and download the **McMaster University Sustainable Development Goals Report 2020**.





PILLAR 1:

Natural Resources



Karen Kidd, the Stephen A. Jarislowsky Chair in Environment and Health, researches the effects of human activities on the health of freshwater and marine ecosystems.



PILLAR 1: Natural Resources

Key Facts:



Approximately

5000
TREES

are located on
McMaster's

300-acre
main campus with
new plantings
added
every year



115 ACRES and **950** SPECIES are
permanently protected through McMaster Forest



Designated as

one of 14
BEE CITY
CAMPUSES
by **Bee City Canada**



39%
of
FOOD PRODUCE
purchased locally
in **2019**



Students participate in Sustainability Day at McMaster by planting trees.

Howard P. Whidden, McMaster University Chancellor 1927-1941, wrote in 1941 that the Westdale property's "beautiful surrounding and natural settings" were one of the most important reasons for McMaster moving to Hamilton.

Biodiversity and Conservation

Conserving and protecting natural resources in a way that promotes the resilience of ecosystems and maintains ecological diversity and viability.

McMaster University sits adjacent to Cootes Paradise, a 600-hectare nature sanctuary owned and operated by Royal Botanical Gardens (RBG) and is also bordered by the Hamilton Conservation Authority. McMaster is one of nine partner organizations in the Cootes to Escarpment EcoPark System, a collaborative initiative to protect, restore and connect more than 3,900 hectares of natural lands at the western end of Lake Ontario. The university's main campus comprises over 300 acres and contains approximately 5,000 trees, excluding woodland property, with new plantings added each year. McMaster recognizes its responsibility to maintain the ecological diversity and integrity of the natural lands and waters that surround it. The university aims to meet this responsibility through research, student engagement and ecological conservation initiatives and partnerships.

McMaster Sustainability Week: Tree Planting

In order to combat the prevalent issue of deforestation around the world, SUSTAIN students coordinated educational tree-planting events at McMaster. The goal of this project was to address the issue of tree decline by involving the Hamilton community in rehabilitation practices such as tree-planting and to educate individuals on the importance of long-term sustainability. Student, staff, faculty and community volunteers planted 80 trees during McMaster's 2019 Sustainability Week. In 2020, a total of 100 trees were planted with the support of Nature at McMaster, Facility Services, Trees for Hamilton and the Academic Sustainability Programs Office.

Nature at McMaster

In 2016, the university launched **Nature at McMaster**, a university-wide resource for outreach, management and education on issues concerning natural lands, the environment, wildlife and sustainability both in and around McMaster University. Nature at McMaster runs stewardship and educational events across campus and assists Facility Services with the management of McMaster's natural lands including McMaster Forest.

McMarsh and Watershed Trust

The **McMarsh** project was initiated several years ago as a university-wide collaboration aimed at restoring an ecologically sensitive wetland located on Parking Lot M in the west campus.

McMarsh is a further expansion of a 30-metre buffer that was established around Parking Lot M in 2017 when 140 native trees and shrubs were planted where paving was removed to reduce the amount of runoff into nearby Coldwater Creek.

McMarsh is now part of a larger project which is reimagining a broader portion of the west campus. The Watershed Trust is currently being co-led by the Faculty of Humanities and the Faculty of Science and allows for opportunities for experiential learning and integrated campus-community projects in this area of the campus. Plans for McMarsh are currently being reviewed and the Watershed Trust initiative will be explored in more detail through the Campus Master Planning process to begin in 2021.

McMaster Forest

McMaster Forest is a permanently protected 115-acre plot of land owned by McMaster University in Ancaster. It is home to over 950 recorded species and approximately 25,000 trees currently being inventoried by students. In 2015, the McMaster University Senate and Board of Governors officially designated the property an environmentally significant natural land to be used for ecologically sensitive teaching, research and recreation purposes. Primary researchers include students and faculty from the McMaster Department of Biology, as well as members of the Hamilton Naturalist's Club.



SPOTLIGHT: Meet the Bee Team

Since 2019, cohorts of students in the SUSTAIN 3S03 course have partnered with McMaster University Facility Services staff to protect vital pollinators as part of the Solitary Bee Project on campus.

Solitary bees, who do not live in hives, can be found laying eggs in the over 50 bee homes that students and Facility Services team members installed throughout campus in 2019. In 2020, the student cohort could not be physically together on campus during the COVID-19 pandemic. Through the power of social media, the entire community was invited to follow along as the facility services team planted 100-plus native trees and shrubs close to the bee houses. Also in 2020, the students successfully applied for McMaster to be designated a **Bee City Campus**.

“It was not until we filled out the application for McMaster to become a Bee City Campus that we really started seeing this was so much more than a grassroots project,” says Callum Hales, a commerce undergraduate student.

“Protecting pollinators like solitary bees also aligns with the United Nation’s Sustainable Development Goals related to zero hunger, life on the land, and sustainable cities.”

Facility Services team members (Top from left: Dwayne Massey, carpenter, Adam Chiaravalle, student, Robert Stevens, carpenter and Craig MacDonald, director of maintenance services), collaborate with Simran Jolly (bottom left), secondary school student founder of The Solitary Bee Project, and Abbie Little (bottom right), community relations coordinator and Academic Sustainability Program students (not pictured) to install 50-plus bee houses on McMaster University’s campus in 2019. Chiaravalle, who passed away in 2020, is remembered for his advocacy and promotion of sustainability projects on campus. Photo by: Reta Meng



Hospitality Services aims to increase the total amount of local produce purchased.

Responsible Food Sourcing and Consumption

Leveraging McMaster's purchasing power to further support a sustainable food system on campus and improving food security and nutrition for the McMaster community.

McMaster recognizes the importance of sustainability as it relates to food consumption on campus. The university also recognizes the intersection between sustainability and food security. The following highlights showcase efforts to support a sustainable food system on campus, as well as actions combating food insecurity for the McMaster community.

Sustainable Food Purchasing

Hospitality Services recognizes the purchasing power it has to further support a sustainable food system on campus. Hospitality Services aims to increase the total amount of annual local produce and products purchased, cease uncertified fish purchases, ensure primary suppliers follow an ethical code of conduct and increase the total amount of socially responsible coffee purchased. In 2019, Hospitality Services decided to no longer support the purchase of fish that was not sustainably sourced. Acceptable fish products include Aquaculture Stewardship Council (ASC), Marine Stewardship Council (MSC) and Ocean Wise certified products. In addition, over 1500 lbs of sustainable coffee was purchased and 39% of produce purchased was locally sourced.

For more information visit the **Hospitality Services 2019 Wellness & Sustainability Report**.

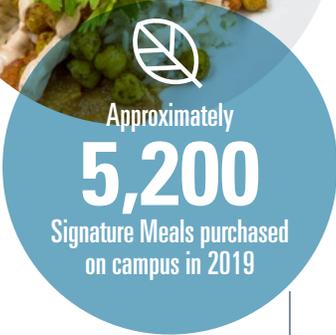
MSU Food Collective Centre

The student-run **Food Collective Centre** is McMaster's on campus food bank and food security resource. Dedicated to ensuring food is always accessible, the Food Collective Centre aims to cultivate stronger food systems in the McMaster and surrounding community, advocates for practices to improve food security and addresses the inequities related to accessible food as a natural resource. A number of support resources are offered to students, alumni, staff and Hamilton Community Partners. The Good Food Box is a non-profit project run by the MSU Food Collective Centre in partnership with Grace Lutheran Church to provide affordable, fresh produce to the McMaster Community with monthly boxes available for order and pick up, right on campus.



Hospitality Services' Signature Meals Program

The Signature Meals initiative was implemented by Hospitality Services in response to student feedback and recent evidence around food security rates among students. Food is a natural resource which may not always be accessible due to a range of societal inequities. Therefore, the Signature Meals program provides meals at a lower price point than market rate to increase access for all students who may be experiencing financial limitations during the school year.





SPOTLIGHT: McMaster Teaching and Community Garden celebrates a decade of growing relationships

In 2012, students from the Integrated Science Program (iSci) collaborated with Facility Services and the McMaster Students Union to open a vegetable garden on the North Side of the General Science Building. That summer, and every summer since, the McMaster Teaching & Community Garden promotes local food production and provides teaching and learning opportunities for the McMaster community.

In the summer of 2020, students were not permitted on campus due to pandemic restrictions and Facility Services team members continued with planting and upkeep. As the buds burst marking the start of the tenth growing season for the community garden, Facility Services began exploring new partnerships with student groups to plant vegetables and reinvigorate the garden for the start of another decade of learning and growing on campus.



The McMaster Teaching and Community Garden promotes local food production and provides teaching and learning opportunities for the community.



PILLAR 2:

Reducing Our Environmental Impact



Employees touring the greenhouse on campus during orientation.



PILLAR 2: Reducing Our Environmental Impact

Key Facts:



Committed to the **Okanagan Charter**, a framework for universities to embed **health and well-being** into all aspects of **campus culture**, including **strengthening ecological sustainability**.



52%
of **WASTE**
diverted from
landfill
in 2019, a
16%
INCREASE
in **waste diversion**
since 2012



200
water stations
on campus
diverting over
20 million
plastic bottles
from landfill



61%
REDUCTION
in **water**
consumption
per student per year
between
2002 to 2018



13
electric vehicles
and over
24
charging stations
at McMaster's locations



All new buildings designed to a minimum **LEED® Silver** certification standard. **2 LEED® Gold** Certified buildings. **6 LEED® Silver** Certified buildings.



McMaster's David Braley Health Sciences Centre has received a prestigious honour from the world architecture community. The 192,000 square-foot LEED® Gold-certified building, is one of five international projects that has won a World Architecture Award.



Facilities

Taking a resource-conscious approach to urban design and building in ways that limit McMaster's impacts on the environment and becoming a net zero carbon campus no later than 2050.

McMaster University is committed to designing and operating its campus and facilities sustainably and is mindful of the affects its actions have on the environment. In 2005, McMaster became the first university in Ontario to develop and implement a **Sustainable Building Policy**. This policy states that every new building on campus will have a minimum of Leadership in Energy and Environmental Design (LEED®) Silver Certification in accordance with the Canada Green Building Council. Reducing water and energy consumption, emissions and waste are just a few ways McMaster can continue to achieve a more sustainable built environment.

LEED® Certified Buildings at McMaster

Since the Sustainable Building Policy was adopted in 2005, McMaster has built eight new buildings and completed three extensive renovations of existing buildings, all of which have been LEED® certified. The David Braley Health Sciences Centre, built in 2014, is an example of how McMaster implements sustainability during design and construction. This building features green roofs, recycled material content such as concrete, silicone and woods, a cistern and grey water system, as well as bicycle share, car share, and electric vehicle parking spaces. The facility also includes water use reduction and efficiency systems, optimized energy performance, measurement and verifications, and during construction employed waste management and divergent strategies along with the use of low-emitting off gassing materials to achieve a LEED® Gold Certification.

Sustainable Infrastructure Training

In partnership with the Faculty of Engineering's W Booth School of Engineering Practice and Technology, the Canadian Society for Civil Engineering is developing a Sustainable Infrastructure Training Program and certificate. The program and partnership recently received provincial funding to train up to 150 technologists and engineers to design, construct, operate and maintain infrastructure that is sustainable and resilient to climate change. The project is one of the first to be approved through Ontario's \$115 million Skills Development Fund. The program provides participants with the critical skills and knowledge to fill in-demand jobs and will help to address an expected shortage of construction workers in the Hamilton community, further supporting economic growth in the province.





Sundial in front of the General Science Building on campus.

Rainwater Harvesting

Rainwater harvesting is the collection and storage of rain, rather than allowing it to run off. Rooftops are the most viable location for collection to avoid water contamination. Currently, McMaster has a number of rainwater collectors spread across campus. McMaster's Facility Services Energy Management Plan outlines a proposed project to install new pipelines and pumps to extract rainwater to be used for irrigation. The project is currently being researched and is estimated to save 648 cubic metres of water annually.



Water System Retrofit in the Life Sciences Building Fish Tank Room

The Life Sciences Building has a fish research room which currently utilizes a significant amount of potable water, approximately 40,000 m³, through fish tanks and drains it to the sewage system, at an annual cost of \$140,000 at current water rates. In order to decrease McMaster's water consumption, a project is in its final stages which involves implementing best practices from fish research labs at the University of Guelph and Environment Canada. The project includes a filtration and circulation system which will reduce water consumption of the fish tanks by approximately 80%, equivalent to 16 Olympic-size swimming pools of water. The project is McMaster's most significant initiative to reduce water consumption and is expected to be completed in July 2021.




 McMaster aims to reduce water consumption by **5%** annually over the next five years



Life Sciences Building at McMaster University.



A London Plane tree on McMaster University's main campus.



Energy and Emissions

Reducing McMaster's energy consumption, implementing conservation programs and promoting energy efficiency.

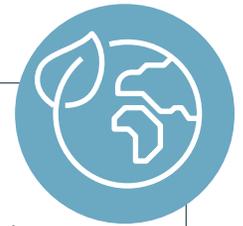
McMaster understands the need for climate action and the important role it can play in addressing climate change through all its sustainability efforts. Climate change was identified by the McMaster community as a priority area through the President's Strategy Planning consultations and in the 2020 Shape the Future survey. A key opportunity to address this challenge is through McMaster's energy and emissions reductions initiatives across campus.

McMaster has made significant investments in sustainable energy projects since 2013 in order to meet its greenhouse gas (GHG) emission targets and reduce its carbon footprint. To date, over 22 projects have been completed and an additional 15 are currently in progress campus-wide. These projects are the outcome of McMaster's Energy Action Plan, which seeks to reduce overall energy consumption to decrease McMaster's carbon footprint and energy costs. Current and planned initiatives incorporate three of the 17 United Nations SDGs; Affordable and Clean Energy, Industry, Innovation and Infrastructure and Climate Action.

In addition to reduction initiatives, McMaster is conducting innovative research related to energy, emissions and climate change. For more information see the McMaster Centre for Climate Change (MCC), the McMaster Institute for Energy Studies (MIES) and the McMaster Automotive Resource Centre (MARC) under the Student Learning and Research Pillar of this report.



For more information on how McMaster is reducing its carbon footprint see the **Facility Services Energy Management Plan 2021/2022.**



McMaster's Net Zero Carbon Roadmap

As part of McMaster's commitment to a safe and sustainable campus, the university performed a study in 2020 to provide an analysis of the main campus carbon emissions and develop a plan for reaching the goal of net zero carbon emissions by 2050.

The study proposed McMaster reduce campus emissions by 75% by 2030 and by 90% by 2050, with the potential of purchasing carbon credits or installing additional renewable energy generation capacity to account for the remaining 10% of emissions reductions.

The **Net Zero Carbon Roadmap** explores reducing greenhouse gas emissions and proposes altering methods of power generation, energy conservation measures for our buildings, electrification and heat recovery projects, and fleet transition to electric vehicles. Design element strategies for new construction projects include high-performance building envelopes, efficient ventilation, and LED lighting with occupancy sensors. Renewable energy production using photovoltaic installations and carbon capture strategies are also potential future elements of the plan.

The plan for McMaster's path to achieve a net zero carbon footprint by 2050 is in its early stages of implementation.

By 2030, McMaster will reduce greenhouse gas emissions on campus by 75%.

This is a reduction of 30,300 tonnes of carbon dioxide equivalent (CO2e) annually, or the amount of greenhouse gases emitted every year by 9,283 gas-powered cars.

LED Lighting Retrofits

Since the inception of the Energy Management Plan in 2013, McMaster has decreased its electricity consumption and GHG emissions through various projects and programs, including LED lighting retrofits across campus. The lighting in many of McMaster's residence buildings for example, has been replaced with LED lighting. LED lighting offers the promise of better quality lighting, energy savings and long life with low replacement costs. In 2018 the majority of the outdoor lighting fixtures were also replaced with new energy efficient LED lighting, including Parking Lot M and in indoor areas in MDCL, Burke Sciences Building and Hamilton Hall. Most recently, Facility Services replaced 72 halogen and fluorescent lights in the Nuclear Research Building with energy-efficient LEDs. This will save over 75,000 kilowatt hours of electricity annually or the equivalent amount of electricity used by six Canadian households.



**BRIGHTER
WORLD**

McMaster
University 

Responsible Investment at McMaster

McMaster is a signatory to the UN Principles for Responsible Investment (PRI).



McMaster University's invested asset pools each use a responsible investment strategy. Responsible investing integrates environmental, social, and governance (ESG) considerations into investment manager hiring and product monitoring processes. Environmental considerations involve assessing how a company within an invested product have an operational impact on physical natural resources and wildlife and how those impacts are stewarded. Social considerations incorporate how human capital is involved in or impacted by the company's operations. Finally, governance involves the evaluation of a company's corporate behaviours, including its complete, relevant, accurate and transparent disclosures to enable effective ESG assessments.

The **Investment Pool** is committed to a 45 per cent reduced carbon intensity by 2030 and carbon neutral by 2050 based on its 2018 decarbonization strategy inception. A 33 per cent reduction has been achieved three years into this plan. The Pool also tracks its clean technology transition investments and has 24 per cent allocated to this category with the objective to grow this figure over the next two years.

In March 2021, President David Farrar asked the Board of Governors to develop a fossil fuel divestment plan for the Investment Pool as soon as possible. Decisions about divestment are made by McMaster's Board of Governors. This plan will build upon the decarbonization strategy underway and accelerate McMaster's carbon neutral timeline. The carbon underground top 200 oil and coal reserve holding companies represent 2.1 per cent of invested assets at April 2020, down 53 per cent from 2018.

In addition to the Investment Pool decarbonization strategy, both the salaried and hourly pools are included in McMaster's adoption of the Task Force Recommendations for Climate-related Financial Disclosures, meaning each asset pool will have transparent carbon measures and reporting available to the public. Further, McMaster is a member of the Canadian Climate Charter, involving 15 universities, to sign UN Principles for Responsible Investment (PRI), measure and reduce carbon, and include carbon reduction goals in investment manager performance assessments. Additionally, the Pools assets are all integrated into the University Network for Investor Engagement, an advocacy and engagement group focused on increased company climate commitments.

For information on research related to responsible investment see the Responsible Investing Research under the Student Learning and Research Pillar of this report.



Carlos Figueira manages campus waste for Facility Services. Similar to many residential recycling and composting programs, McMaster's waste continues to be divided into several different streams. Photo by Sarah Janes.



Waste Management

Protecting the natural environment from degradation by reducing, reusing and recycling waste and continuing to increase the percentage of waste diverted from landfill.

McMaster's dedication to reducing its environmental footprint includes the way in which waste is managed. McMaster aims to develop and promote initiatives which focus on reuse and recycling, composting and reducing single-use plastic. Numerous programs have been implemented on campus, including increasing the number of recycling and composting bins, switching to compostable products in campus eateries, eliminating single-use plastic bags at the Campus Store, and the IT and electronic waste reuse, recycle and disposal initiatives.



For more details on McMaster's waste management see the **2019 Solid Non-Hazardous Waste Audit**.

In 2019: McMaster diverted approximately 52% of materials from landfill, an 18% increase from the baseline waste diversion rate in 2012.

25% of materials on campus were recycled or reused | **26.9%** of materials on campus were composted

Waste and Recycling Bin Labelling

To continue to increase the percentage of campus waste diverted from landfill, McMaster developed a new waste labelling system aimed at enhancing waste diversion and reducing cross-contamination between different types of recycled waste. In the coming years, the waste and recycling bins will be relabelled, phasing out "this, that and the other" wording in favour of clearer "bottles & cans," "paper" and "trash" along with photo illustrations and descriptions of what belongs in each.

McMaster Campus Store Eliminates Single-Use Plastic Bags

Previously the Campus Store was selling over 20,000 plastic bags annually. In order to reduce the amount of waste generated at McMaster, the Campus Store collaborated with the Office of Sustainability and developed a plan to remove plastic bags altogether. As of August 2019, there are only donated or reusable bags available at the cash register. The Campus Store plans to work closely with SUSTAIN students and the university to make the store more sustainable going forward. This includes, reusing packing materials when shipping online orders, encouraging buying and selling of used books to reduce emissions from shipping and production and highlighting sustainable products for sale in the Campus Store.



The Campus Store has eliminated single-use plastic bags. Photo by Tyler Mah.



SPOTLIGHT: Students pitch signs that make the green choice clear on campus

Students aiming to make environmentally sustainable choices at campus disposal bins sometimes miss the mark, unintentionally placing recyclables in the trash and non-biodegradable products into organic waste bins.

As part of an Advocating for Sustainability course at McMaster University, a group of four students decided to conduct research to learn if signage at the bins impacted disposal behaviour and decided to take a closer look by surveying students on McMaster's waste sorting.

They discovered that almost 40 per cent of students surveyed identified 'unclear signage or instructions' as their main barrier to proper waste disposal and recycling.

With support from their project partner in Hospitality Services, the students recommended to McMaster's Sustainability Advisory Council that waste and recycling signage be standardized, with simple messaging and larger pictures, to be more effective. Facility Services will begin phasing in the standardized signage this summer.

"McMaster's continued commitment to creating a living laboratory where students, faculty, and staff from across campus come together to promote sustainability is one of our many strengths, of which we should be very proud," says Kate Whalen, council co-chair and senior manager of McMaster's Academic Sustainability Programs Office, which oversees the SUSTAIN courses.



Students in the Advocating for Sustainability course came up with ideas for clearer signage on McMaster's waste bins, to make it easier for people to toss their garbage and recycling in the appropriate spot. Photo credit: Georgia Kirkos, McMaster University

Promoting Reusable Bottles Through Campus Water Filling Stations



McMaster recognizes the need for responsible consumption, which includes a reduction in single-use plastics. To meet this challenge, over 200 water fountains and filling stations are available across campus. This allows people to refill reusable water bottles to reduce the use of disposable plastic bottles. Each fountain is equipped with a sensor showing the number of plastic water bottles diverted from landfill.

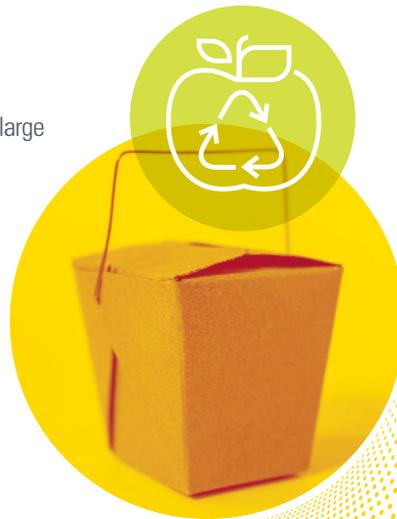
Campus Water Filling Stations have eliminated the use of over 20 million water bottles since 2010.

Some Faculties have taken the next step from reduction of plastic bottles to elimination.

Due to the water fountains availability on campus, the School of Rehabilitation Science (SRS) was easily able to implement a proposal to eliminate the use of plastic bottles. As of March 2019, plastic bottles are no longer used by SRS and they have been replaced with reusable jugs and glasses.

Compostable Products

Takeout containers and packaging contribute to be a large percentage of McMaster's waste as they travel from restaurant to landfill. In 2019, **Hospitality Services** implemented compostable cutlery and take-out packaging across campus. The update will replace single-use plastics, annually saving 1.3 million pieces of take-out plastic cutlery and 120,000 plastic straws from landfill. In addition, 194,000 compostable coffee cups were added. Diners can dispose of compostable products in organic food waste bins across campus.



Students who led communications for IT waste collection day for Trash to Treasure. From left: Shunmathi Shanmugam, Mehran Janatyani, and Claire Logeaison. Photo credit: Grace Kuang

From Trash to Treasure

Created by a team of students enrolled in SUSTAIN 3S03, the aim of the Trash to Treasure project was to reduce IT waste and donate refurbished electronics within the local community. In 2020 the student-run project was the recipient of the Climate Change and Health – Innovation Award through McMaster's Academic Sustainability Programs Office

Trash to Treasure is now piloting a furniture reuse project where surplus university-owned furniture can be reused directly between McMaster departments and student groups. Before disposing of the furniture, students, staff and faculty are encouraged to post it to the Trash to Treasure Furniture Reuse Group on Facebook. Facility Services is responsible for the pickup and transfer of (university-owned) items posted on the group at no cost.

1,000 kilograms of IT waste diverted through collection, refurbishment and community donation

More than **100** computers collected from across campus

70 computers sanitized, refurbished and donated to local children in need in collaboration with local non-profit organization greenBYTE



PILLAR 3:

Student Learning and Research



Biology professor Pat Chow-Fraser (front), a member of McMaster's Centre for Climate Change, conducts water quality research with a student at Long Point, Ontario.



PILLAR 3: Student Learning and Research

Key Facts:



Ranked as **Canada's Most Research-Intensive university** for the **fourth consecutive year** by *Research Infosource*, a leading source of ranking information on research universities



RANKED
14th
globally
for impact and
1st
in **Canada** for
Good Health and
Well-being by the
**Times Higher
Education Impact
Rankings**



RANKED
69th
in the **world**
in the **Times
Higher Education
World University
Ranking**



OVER
1000
students
ENROLLED
in the
**Sustainable
Future Program**



OVER
115
students
have declared an
**Interdisciplinary
Minor** in
Sustainability



The **First Canadian University** to be accepted into the
GRAND CHALLENGES SCHOLARS PROGRAM



Jordan Sullivan participated in MacChangers as a Chemical Engineering and Society student. Sullivan's team project focused on creating solutions to social inequalities found in Hamilton's transportation system. Photo by: Jin Lee



Student Learning

Enhancing and expanding experience-based learning and providing innovative, varied approaches to teaching and learning that focus on skills development, application and reflection. Educating and nurturing McMaster students to be the sustainability leaders of the future.

McMaster is dedicated to enhancing its students' ability to drive real, sustainable change in the face of 21st century challenges. Through its innovative programs, McMaster prepares students to make a positive impact on the world they will inherit. McMaster's graduating students go on to make, advocate for and support sustainable change in their communities.

At McMaster, students are active partners in sustainability on campus. This is witnessed through students' active engagement in student groups such as those run through the McMaster Students Union and the Student Sustainability Ambassadors Program (SSAP), which seeks to generate student awareness of and engagement in sustainability, foster student leadership in sustainability through collaborative and active learning and supports students in their pursuit of sustainable action.

The following are highlights from McMaster's experiential learning programs which promote sustainability, interdisciplinary learning and innovative thinking.

MacChangers

Supported by the Faculty of Engineering and the Office of Community Engagement, **MacChangers** is a co-curricular experiential learning program at McMaster. Students from all Faculties are given the opportunity to propose innovative solutions to the most pressing problems confronting society as identified in the UN SDGs and **Our Future Hamilton** long-term community vision. Recent projects include reducing paper receipts in local business in Hamilton, designing a new bike lane in the city's core on Cannon Street and an online resource to address housing needs.

Sustainable Future Program

The Sustainable Future Program consists of a suite of undergraduate courses that provide students with the opportunity for interdisciplinary, student-led, community-based education focused on sustainability. Through the Sustainable Future Program, students engage in experiential learning by developing and implementing real-world sustainability initiatives such as collaborating with the McMaster Campus Store to eliminate single-use plastic bags and coordinating educational tree-planting days on campus. The Sustainable Future Program aims to build reciprocal relationships between students, community members and McMaster University to engage all stakeholders in the journey towards a sustainable future.



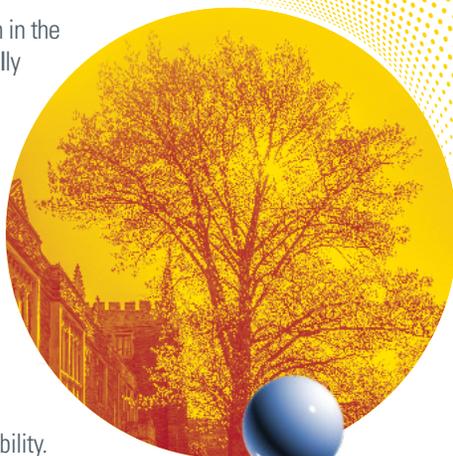
For more information on the Sustainable Future Program and associated student projects see McMaster's **Academic Sustainability Programs Office 2019/20 Annual Report**.

CityLAB

McMaster partners with **CityLAB Hamilton**, an innovation hub that brings together student, academic and civic leaders to co-create a better city for all. Offered each fall semester, CityLAB Semester in Residence is a 15-unit course designed for passionate, motivated, and enthusiastic students seeking to learn from their community and apply their studies to enact real world change. Students and staff from the City of Hamilton co-create and design innovative projects to address existing challenges in the community. In 2020 CityLAB Semester in Residence students developed a set of recommendations to aid the development of a horizon scan for Hamilton's Climate Resiliency Program. Their report will support Hamilton's first Climate Change Resilience Strategy. Since inception, 106 projects related to healthy neighborhoods, climate change and municipal excellence have been created at CityLAB Hamilton and over 39,000 student hours have been contributed to the projects' success.

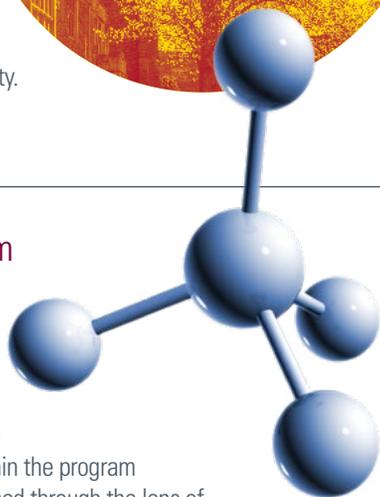
Environmentally Responsible Art

For nearly two decades, the Studio Art program in the School of the Arts has prioritized environmentally responsible art. The program was an early pioneer in shifting environmental attitudes and practices in art. Students, instructional assistants and faculty are committed to an ongoing questioning and revision of material selection, technical processes and studio practices with the aim of safeguarding individual and environmental health. A course devoted to environmentally responsible art and to understanding eco art is offered to all students on campus as part of McMaster's Interdisciplinary Minor in Sustainability.



Sustainable Chemistry Program

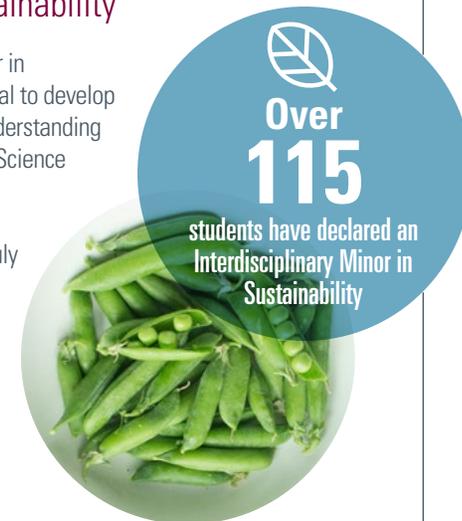
Administered by the Faculty of Science, McMaster's Honours Sustainable Chemistry program provides students with an integrated and inquiry-based approach to research and problem solving in chemistry and chemistry-related areas. Within the program traditional practices of chemistry are examined through the lens of sustainability, with the objective to develop students who can identify and implement better ways to practice chemistry. This can include developing processes that are fundamentally more efficient, increasingly using renewable feedstocks, employing water as an environmentally friendly solvent, generating less waste and ensuring that waste is non-toxic and can be naturally absorbed by the environment.



Students from the Millennials at the Market project, part of the Leadership in Sustainability course, pose with collaborators at the farmer's market in downtown Hamilton. From left: Melissa Downey, Natalie Ciancone, Bill Slowka, Josephine Agueci, Elly Bowen, Molly Parker. Photo Credit: Kierin GorlitzLee

Interdisciplinary Minor in Sustainability

McMaster created the Interdisciplinary Minor in Sustainability in September 2014 with the goal to develop students' interdisciplinary knowledge and understanding of sustainability. Administered by the Arts & Science Program, the Minor provides opportunities to meaningfully engage with communities both within and outside of McMaster. To gain a truly interdisciplinary perspective of sustainability, students can now choose from over 76 courses offered from all Faculties across campus, with a requirement to take courses from two or more. The wide selection of courses enables students to tailor a minor that compliments their major and choose the sustainability emphasis that is right for them.





Vanessa Watts, the Paul R. MacPherson Chair in Indigenous Studies, is leading efforts to centre Indigenous knowledge in research, working with communities, organizations and Knowledge Keepers on issues of local and national importance in a fast-changing world.



Research and Scholarship

Playing a key role in solving the big issues facing the world and making use of the transformative power of knowledge to create a more sustainable future for everyone locally, regionally and globally.

McMaster aims to have a positive impact at the local, regional and global level. McMaster's research ranges from pandemic preparedness to climate change, social justice and Indigenous Ways of Knowing. The impact of research and scholarship, particularly as it relates to the UN Sustainable Development Goals, is a key focus area across campus.

The following highlights showcase the university's research on climate change, global water challenges, environmental health and sustainable energy.



To explore McMaster's full range of research areas, visit the **Research & Innovation** webpage.

McMaster Centre for Climate Change (MCCC)

McMaster recognizes that climate change is one of the most pressing challenges facing society today. The Faculty of Science's, **McMaster Centre for Climate Change (MCCC)** promotes and facilitates education, research activities and collaboration in order to understand the impacts of climate change on the environment, ecosystems, water resources and human health and deliver solutions. In addition to climate-related research, MCCC is engaging with local communities through partnership with the City of Hamilton and ongoing outreach activities. MCCC is educating future generations about the challenges associated with climate change through high school outreach where local students visit McMaster's campus for Climate Day and graduate students and professors visit schools across the city and region.

Responsible Investing Research

Researchers from the DeGroote School of Business are currently conducting a study to explore the challenges and successes of advisors and investors in making responsible investments. Responsible investing helps investors earn financial returns while accounting for social and environmental issues. The goal is to understand if and how financial advisors adopt responsible investing, the challenges they face in engaging clients with responsible investing and the journey that responsible investors undertake in their efforts to obtain applicable financial advice. Ultimately, the study will help understand if and how the retail market for socially responsible investing is being created.

Additionally, the AVP (Administration) and CFO is involved in a national study, partnered with Western University, examining Responsible Investment integration across Canadian universities in contrast to other global jurisdictions. Study results, policy guidance, and carbon measure and disclosure guidance has been shared nationally in 2020. Additional ESG-Integration research is underway to translate the work of the United Nations Environment Programme Finance Initiative (UNEP FI), UN PRI, and CFA Institute case studies into practical change guidance for investment consultant and investment manager hiring and monitoring processes.

Electric Vehicle Research at McMaster Automotive Resource Centre (MARC)

Located at the McMaster Innovation Park, the McMaster Automotive Resource Centre is one of Canada's leading research facilities in electric and hybrid vehicles. Together, teams of engineers, scientists, social scientists and their students are developing sustainable energy-efficient solutions for the automotive industry from advanced electric motors, power electronics, energy management systems, and controls to electrified powertrains, electric vehicles and autonomous systems. In 2020, MARC received the Natural Sciences and Engineering Research Council of Canada (NSERC) Synergy Award for Innovation for McMaster's ongoing collaboration with Fiat Chrysler Auto to develop the next generation of electric and hybrid vehicles.



SPOTLIGHT: The Co-Creation of Indigenous Water Quality Tools

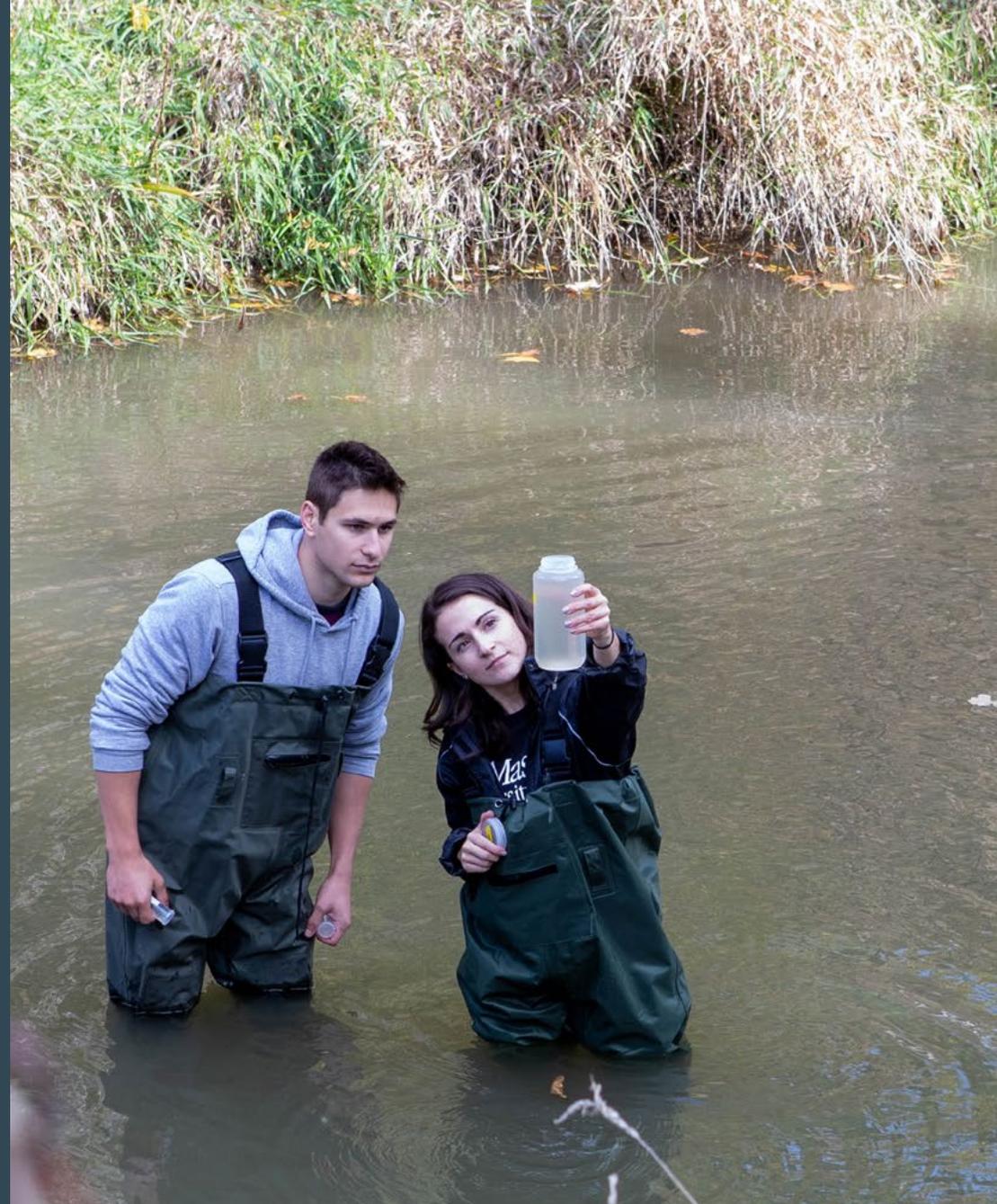
Researchers from the Faculty of Engineering and the Indigenous Studies Program are working with two communities, the Six Nations of the Grand River (Ontario) and Lubicon Cree Nation of Little Buffalo (Northern Alberta), to identify and understand the range of water challenges faced by Indigenous communities.

The project uses an innovative research framework to facilitate sharing and integration of contemporary science and Indigenous and Local Knowledge to monitor source water with continuous environmental sensors, investigate the cause of health issues related to contaminated water and develop appropriate place-based solutions.

The results will help build long-term and sustained community capacity to address current and future uncertainties in water quality. Many other Indigenous communities across Canada will benefit from the knowledge, experience and expertise gained from this project.



Dawn Martin Hill,
Associate Professor,
Department of Anthropology
and Indigenous Studies Program,
heads Ohneganos, a massive
community-driven research project
focused on helping Indigenous
communities regain access
to clean, safe water.



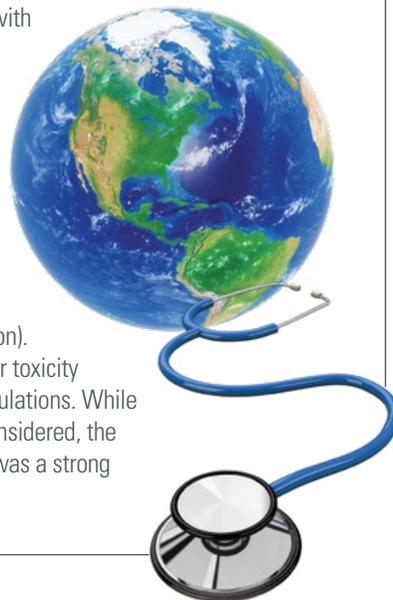
Alana Tedeschi and Panagiotis Papangelakis measure water quality at the Mackenzie Creek. They are part of an interdisciplinary group of McMaster researchers co-developing solutions to the ongoing water-quality issues at Six Nations of the Grand River.



Andrea Baumann, Associate Vice-President of Global Health, Director of the WHO Collaborating Centre in Primary Care and Health Human Resources and Fellow in the Canadian Academy of Health Sciences.

McMaster Global Health Office (GHO)

The **Global Health Office (GHO)** collaborates with the Faculty of Health Sciences to strengthen capacity in health care research, education and delivery. In 2020 the GHO conducted a simulation exercise, an interactive form of training that required students in the MSc Global Health program to collaborate with peers to navigate a global health problem and develop a solution. The exercise was designed around the UN SDGs, specifically Goal 6 (Clean Water and Sanitation) and Goal 13 (Climate Action). The simulation explored the implications of water toxicity and its potential impacts on human and seal populations. While many global health issues and concerns were considered, the group decided on this simulation because there was a strong consensus to focus on the environment.



McMaster Water Network (MWN)

The **McMaster Water Network (MWN)** is a group of students and faculty as well as community partners and stakeholders with a common interest in water. Each year the MWN hosts McMaster's Water Week to showcase the incredible water research going on at the university. The group aims to use a transdisciplinary approach to connect water research with policy, practice and people to deliver local and global impacts. The McMaster Water Network Student Chapter (MWN-SC) empowers students to engage in community- and student-based projects that are focused on water leadership, advocacy and sustainability.

Faculty of Social Sciences: Self-Reporting SDG Research

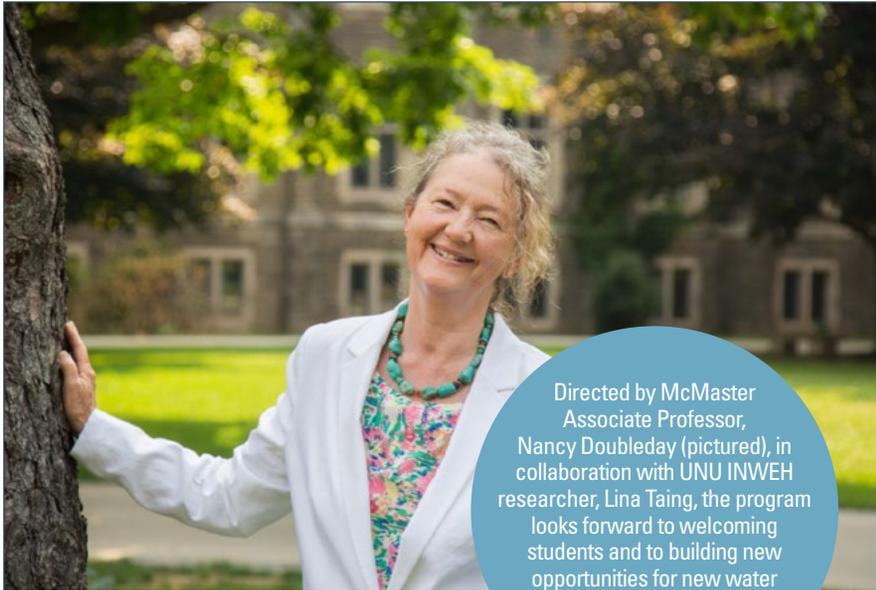
In line with McMaster's commitment to achieving the United Nations Sustainable Development Goals, the Faculty of Social Sciences initiated an annual survey for faculty members to self-report research related to any of the 17 SDGs. In 2019, of the 86 faculty members that participated in the study, over 87 per cent of researchers were involved in research relating to one or more of the SDGs.

McMaster Indigenous Research Institute (MIRI)

The **McMaster Indigenous Research Institute (MIRI)** is a world-class institute recognized for its leadership in the field of Indigenous research. The overarching priority of MIRI is to foster research excellence and best practices for all Indigenous related research across McMaster. In 2020, MIRI coordinated an Indigenous Community Health and Research conference (ICHR) in partnership with the McMaster Indigenous Health Movement Student Group and the Faculty of Health Sciences. The ICHR conference was launched at The Gathering Place by the Grand on Six Nations and explored health and equity of Indigenous peoples as well as intersections with environmental health and climate change.



Bernice Downey, who has led the Faculty of Health Sciences' Indigenous Health Initiative since 2017, and is the faculty's associate dean of Indigenous Health, co-led the organization of the ICHR conference.



Directed by McMaster Associate Professor, Nancy Doubleday (pictured), in collaboration with UNU INWEH researcher, Lina Taing, the program looks forward to welcoming students and to building new opportunities for new water professionals across the McMaster campus.

Water Without Borders: An International Collaboration: McMaster University and the United Nations University Institute of Water, Environment and Health

Water Without Borders (WWB) is a Joint Graduate Diploma Program of **UNU Institute for Water, Environment and Health** and McMaster University.

Taken in conjunction with a graduate degree in a “home program” at the masters or doctoral level, WWB offers students unique global reach through UN-centric learning experiences linking the human right to water and the Sustainable Development Goals. Supported by the research expertise of UNU-INWEH and McMaster, students learn and apply water policy fundamentals.



James S. Cotton, Professor, Department of Mechanical Engineering and McMaster Institute for Energy Studies (MIES) in the Thermal Management Research Lab (TMRL) basement of The Gerald Hatch Centre, a space for engineering undergraduate students to participate in experiential learning.

McMaster Institute for Energy Studies (MIES)

The **McMaster Institute for Energy Studies (MIES)** is dedicated to developing sustainable energy practices and technologies to meet the growing demands of the world around us. It encourages and fosters an interdisciplinary systems approach to solving energy problems; its research mission emphasizes the economic and environmental impacts of all stages in the energy process. MIES is conducting ground breaking research in solar, wind and nuclear energy, as well as fuel cell technology. Ongoing research projects include the Integrated Community Energy and Harvesting Systems (ICE-Harvest) which uses a whole-systems thinking approach to integrate thermal and electrical energy production, storage, redistribution and consumption while significantly reducing greenhouse gas (GHG) emissions.



Cyclist biking toward University Hall Arch on campus.

Concluding Statement

A Message from Debbie Martin,
Assistant Vice-President and Chief Facilities Officer

An abundance of initiatives are occurring across McMaster by students, faculty members and employees to promote sustainability. In this inaugural university-wide Sustainability Report, we are only able to highlight some of this effort, offering a glimpse into our collective ambition to create a more sustainable campus and world.

The initiatives featured in the report are in alignment with the UN's Sustainable Development Goals (SDGs), and you can find a map of how the SDGs are related to initiatives in this report on the following page. Collectively, the exemplary initiatives featured in this report align with our **President's vision of advancing societal health and well-being**.

In the coming year there is a lot of work to do to continue to promote sustainability at McMaster. The Office of Sustainability will engage with the **McMaster Sustainability Advisory Council**, which was formed in 2019 to better coordinate sustainability programs campus wide, and will be working to develop a Sustainability Plan for our campus. To create the plan, we will be seeking perspectives and inputs from students, faculty members and staff across McMaster. In future, this report will feature progress on this plan.

I would like to acknowledge the many individuals who contributed to developing this inaugural report, including the members of the working group, the Sustainability Advisory Council and many campus partners who supported the creation of this report.

McMaster's continued commitment to collaboration across the entire campus to promote sustainability is one of our many strengths. We hope this report inspires more individuals from McMaster's community to get involved in protecting natural resources, building a greener campus and designing environmentally focused experiential learning opportunities that foster partnerships between students, faculty members and employees.

If you would like to learn more about how to participate in sustainability initiatives on campus or contribute to next year's Sustainability Report, please connect with us by emailing sustainability@mcmaster.ca

Debbie Martin
Assistant Vice-President & Chief Facilities Officer



SDG Index Table:

Please note that the initiatives highlighted in this report are non-exhaustive. For more information on how McMaster is addressing all 17 of the Sustainable Development Goals, visit [McMaster's Sustainable Development Goals site](#) and download the [McMaster University Sustainable Development Goals Report 2020](#).

United Nations Sustainable Development Goals

McMaster Initiatives covered in this report



- Sustainable Future Program
- Interdisciplinary Minor in Sustainability
- MacChangers
- CityLAB
- Sustainable Infrastructure Training
- Sustainable Chemistry Program
- Faculty of Social Sciences: Self-Reporting SDG Research



- United Nations University – Institute for Water, Environment and Health (UNU-INWEH)
- McMaster Water Network (MWN)
- Water Filling Stations
- Indigenous Water Quality Improvement Project
- McMaster Watershed Trust
- McMaster Centre for Climate Change (MCCC)
- McMaster Global Health Office (GHO)
- Rainwater Harvesting
- Water Systems Retrofit in the Life Science Building Fish Tank Room
- Promoting Reusable Bottles Through Campus Water Filling Stations



- McMaster Institute for Energy Studies (MIES)
- Electric Vehicle Research at McMaster Automotive Resource Centre (MARC)
- McMaster's Net Zero Carbon Roadmap
- LED Lighting Retrofits



- Sustainable Infrastructure Training Program
- LEED® Certified Buildings at McMaster
- Electric Vehicle Research at McMaster Automotive Resource Centre (MARC)



- Sustainable Infrastructure Training Program
- LEED® Certified Buildings at McMaster
- MacChangers
- CityLAB

United Nations Sustainable Development Goals

McMaster Initiatives covered in this report



- Sustainable Food Purchasing
- Waste and Recycling Bin Labelling
- McMaster Campus Store Eliminates Single-Use Plastic Bags
- Promoting Reusable Bottles Through Campus Water Filling Stations
- Compostable Products
- From Trash to Treasure
- McMaster Teaching and Community Garden (MTCG) Celebrates a Decade of Growing Relationships
- Sustainable Future Program
- Students Pitch Signs That Make the Green Choice Clear on Campus
- Environmentally Responsible Art
- McMaster Sustainability Week: Tree Planting
- Sustainable Chemistry Program



- McMaster's Net Zero Carbon Roadmap
- McMaster Institute for Energy Studies (MIES)
- McMaster Centre for Climate Change (MCCC)
- Responsible Investment at McMaster
- Responsible Investment Research
- McMaster Indigenous Research Institute (MIRI)
- Electric Vehicle Research at McMaster Automotive Resource Centre (MARC)
- LEED® Certified Buildings at McMaster
- CityLAB



- Sustainable Food Purchasing
- McMaster Watershed Trust
- Indigenous Water Quality Improvement Project
- Nature at McMaster
- Water Systems Retrofit in the Life Science Building Fish Tank Room



- Nature at McMaster
- McMaster Forest
- McMaster Watershed Trust
- McMaster Sustainability Week: Tree Planting
- Sustainable Future Program
- Meet the Bee Team



- Sustainable Future Program
- Interdisciplinary Minor in Sustainability
- MacChangers
- United Nations University – Institute for Water, Environment and Health (UNU-INWEH)