



McMaster's Academic Sustainability Programs Office

Annual Report 2020-2021



BRIGHTER WORLD

Year in Review 2020/2021

Addressing Sustainability in our society poses complex challenges that require interdisciplinary solutions.

Our mission in the Academic Sustainability Programs (ASP) Office is to inspire in all students a desire for continued learning and inquiry through experiential education. We have achieved this mission through our various curricular and co-curricular programs, in which students are provided with unique opportunities for interdisciplinary, student-led, community-based, and experiential learning about the complex issues of sustainability.

Now, in its seventh year, the Interdisciplinary Minor in Sustainability is the fifth largest minor by number of graduates.* Since our last reporting in the fall of 2020, there have been six courses added to the Minor Course List, 55 more graduates with the Minor, and greater student representation and leadership on the Student Minor Committee. Although the growth of the Minor is noteworthy, I am particularly inspired by the collaboration between staff, faculty, and students to implement positive changes for the Minor.

The Sustainable Future Program has also seen substantial growth since the first course was offered in the winter of 2013. In response to continued demand, we expanded enrolment capacity in the Program and added two new courses. With this expansion, we anticipate that over 1,200** students, representing all Faculties, will successfully complete a SUSTAIN course in the 2021/22 academic year.

Through supporting two more students this year, the Sustainability Internship Program has supported 54*** students to date in their self-directed learning. Through program reevaluation, we expanded our Internship Program to include graduate students previously supported through our Graduate/Undergraduate Collaboration in Experiential Learning (GUCEL) program.

Finally, this year we launched the Student Sustainability Ambassador Program (SSAP), which saw engagement from over 150 students and representation from every Faculty, all levels of study, and 12 affiliated clubs. The mission and governance of this program was directed by students, demonstrating the impact and importance of student leadership.

To support our students' community-based experiential learning, we continue to develop our relationships within the university and broader community through our focus on collaboration, reciprocity, continuity, and active engagement.

Within the pages to follow, you will read about the growth and evolution of our programs, demonstrating resilience during the COVID-19 pandemic. Highlights are found in the quotes given and project summaries written by our students. As you read through this report, I hope that you see the passion, determination, and collaborations formed by the students as they tackled complex problems and strived to make positive, sustainable change.



Dr. Kate Whalen, PhD
Senior Manager
Academic Sustainability Programs Office

Note: This report is primarily the work of our students. Content not attributed to student authors is the work of Dr. Kate Whalen and Abbie Little of the ASP Office; we take responsibility for any errors or omissions.

* Based on Registrar Office June 2021

**Based on the number of seats available

***Includes Sustainability Internship students and GUCEL students

Land acknowledgement: McMaster's Academic Sustainability Programs Office recognizes that it is located on the traditional territories of the Mississauga and Haudenosaunee nations, within the lands protected by the Dish with One Spoon Wampum agreement. It is integral to our work that we practice anti-racism and anti-colonialism, as we cannot achieve sustainability without centering climate justice and actively engaging in reconciliation efforts with Indigenous nations.

Timeline

Our Year at a Glance



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About Us

McMaster's Academic Sustainability Programs Office

Mission

Inspire in all students a desire for continued learning and inquiry through experiential education about sustainability.

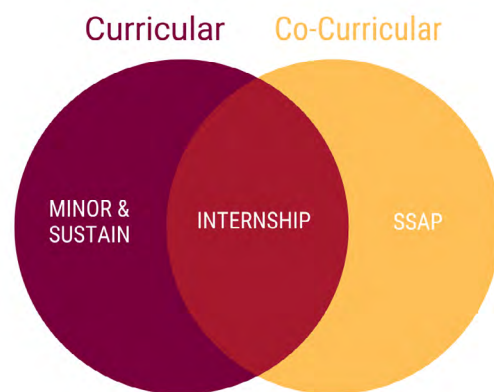
Objectives

To realize our mission, we strive to provide all McMaster students with the opportunity to take part in interdisciplinary, student-led, community-based, and experiential learning about sustainability.

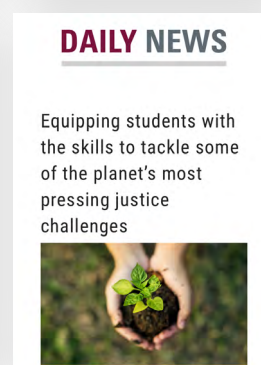
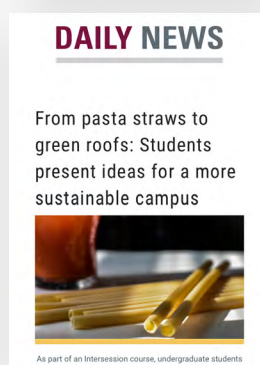
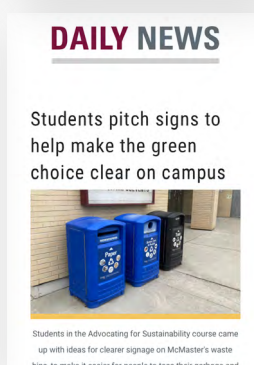
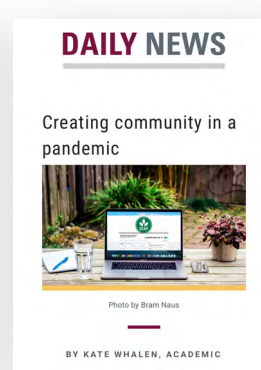
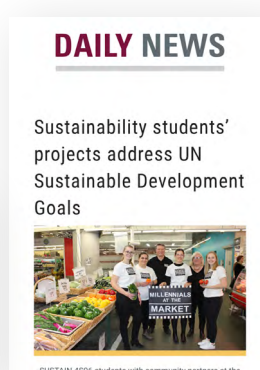
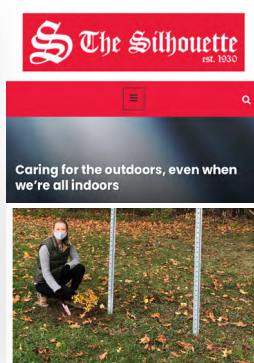
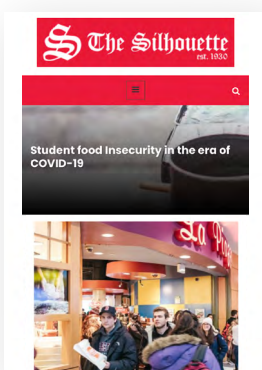
Priority Programs

Key to achieving our objectives and inspiring lifelong learning is developing and fostering strong connections, both within the University and the broader community, and supporting students to develop the knowledge, skills, and abilities to be successful in their learning. We aim to do this through our four main programs:

- **Interdisciplinary Minor in Sustainability:** An opportunity for undergraduate students to choose from sustainability courses from Faculties across campus and tailor a minor that complements their degree and education.
- **Sustainable Future Program:** A suite of undergraduate courses focused on sustainability. Courses are open to all students, independent of their home Faculty, and count towards the Minor.
- **Sustainability Internship Program:** An opportunity for undergraduate and graduate students to receive academic credit (undergraduates) or recognition (graduate students) for their self-directed learning.
- **Student Sustainability Ambassador Program (SSAP):** A co-curricular program and community hub for sustainability-minded undergraduate and graduate students and clubs aimed to foster collaboration.



Our Work in the News



Our Team

The Academic Sustainability Programs Office

Administrative Team



Dr. Kate Whalen
Senior Manager



Abbie Little
Community Relations
Coordinator



Grace Kuang
Communications
Assistant



Erik Jurriaans
SSAP Coordinator

Faculty Team



Dr. Greg Zilberbrant
SUSTAIN 1S03 Instructor



Dr. Kelsey Leonard
SUSTAIN 2IS3 Instructor



Peter Topalovic
SUSTAIN 2S03 Instructor



Dr. John Boakye-Danquah
SUSTAIN 2SD3 Instructor



Sarah Precious
SUSTAIN 2SS3 Instructor



Dr. Michael Mikulak
SUSTAIN 3S03 Instructor



Peter Topalovic
SUSTAIN 3SS3 Instructor



Dr. Kate Whalen
SUSTAIN 4S06 Instructor

Interdisciplinary Minor in Sustainability, Co-Chairs



Dr. Kate Whalen
Senior Manager
Academic Sustainability
Programs Office



Dr. Brent McKnight
Associate Professor
Degroote School of Business

Our Teaching Assistants



Dylan Matsuda
SUSTAIN 1S03



Emilia Nietresta
SUSTAIN 1S03



Rama Arafa
SUSTAIN 1S03



Shunmathi Shanmugan
SUSTAIN 1S03



Stefania Abbatangelo
SUSTAIN 1S03



Kyle Fernandes
SUSTAIN 1S03



Shobica Sritharan
SUSTAIN 1S03



Lauren Chan
SUSTAIN 2IS3



Erin Nunn
SUSTAIN 2S03



Gabrielle Gonsalves
SUSTAIN 2S03 + 2SS3



Hargun Grewal
SUSTAIN 2S03 + 2SS3



Keerat Grewal
SUSTAIN 2S03



Atiya Iqbal
SUSTAIN 2S03 + 3SS3



Kunwar Karim
SUSTAIN 2SD3 + 3S03



Titi Huynh
SUSTAIN 2SS3



Kiran Bassi
SUSTAIN 2SS3



Nava Najafabadipoor
SUSTAIN 3S03



Natalie Ciancone
SUSTAIN 4S06

A Focus on the UN Sustainable Development Goals

McMaster's commitment to sustainability is evident in its consistent placement in the top tier in international rankings to assess university impact related to the UN's Sustainable Development Goals (SDGs). McMaster ranked 14th in the world in the 2021 Impact Rankings by Times Higher Education. The university performed well across key SDG categories, including Good Health and Well-Being, Decent Work and Economic Growth, and Partnerships for the SDGs, placing first among Canadian universities in all three.

The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future.¹

United Nations, Department of Economic and Social Affairs

As part of our ongoing commitment to the Goals, we have indicated the SDGs that align with each project in this report, which you will see depicted in the pages to follow. Listed below are the 17 Goals and a brief description of each.



1 NO POVERTY
End poverty in all its forms everywhere.



2 ZERO HUNGER
End hunger, achieve food security and improved nutrition and promote sustainable agriculture.



3 GOOD HEALTH AND WELL-BEING
Ensure healthy lives and promote well-being for all at all ages.



4 QUALITY EDUCATION
Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.



5 GENDER EQUALITY
Achieve gender equality and empower all women and girls.



6 CLEAN WATER AND SANITATION
Ensure availability and sustainable management of water and sanitation for all.



7 AFFORDABLE AND CLEAN ENERGY
Ensure access to affordable, reliable, sustainable and modern energy for all.



8 DECENT WORK AND ECONOMIC GROWTH
Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.



10 REDUCED INEQUALITIES
Reduce inequality within and among countries.



11 SUSTAINABLE CITIES AND COMMUNITIES
Make cities and human settlements inclusive, safe, resilient and sustainable.



12 RESPONSIBLE CONSUMPTION AND PRODUCTION
Ensure sustainable consumption and production patterns.



13 CLIMATE ACTION
Take urgent action to combat climate change and its impacts.



14 LIFE BELOW WATER
Conserve and sustainably use the oceans, seas and marine resources for sustainable development.



15 LIFE ON LAND
Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation and halt biodiversity loss.



16 PEACE, JUSTICE AND STRONG INSTITUTIONS
Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable, and inclusive institutions at all levels.



17 PARTNERSHIPS FOR THE GOALS
Strengthen the means of implementation and revitalize the global partnership for sustainable development.

Interdisciplinary Minor in Sustainability

An opportunity for undergraduate students to choose from a list of sustainability courses from Faculties across campus and tailor a minor that complements their degree and education.

McMaster created the Interdisciplinary Minor in Sustainability in September 2014 with the goal to develop students' interdisciplinary knowledge and understanding of sustainability.

PROGRAM OBJECTIVES

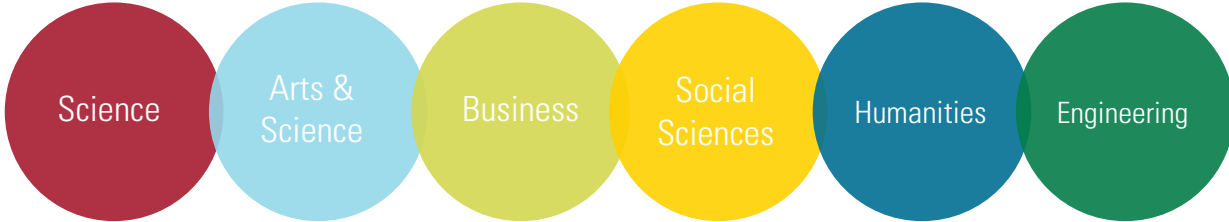
-  Encourage opportunities for student experiential learning about sustainability
-  Provide opportunities to meaningfully engage with communities both within and outside of McMaster
-  Offer a wide selection of courses to enable students to choose the sustainability emphasis that is right for them and to pursue courses that will further their individual learning objectives
-  Foster engagement among students, faculty, and staff across campus, facilitating interdisciplinary learning

Interdisciplinary Minor in Sustainability

Year in Review

Interdisciplinarity

Students from each of the following Faculties and the Arts & Science Program have graduated with the Minor this year:



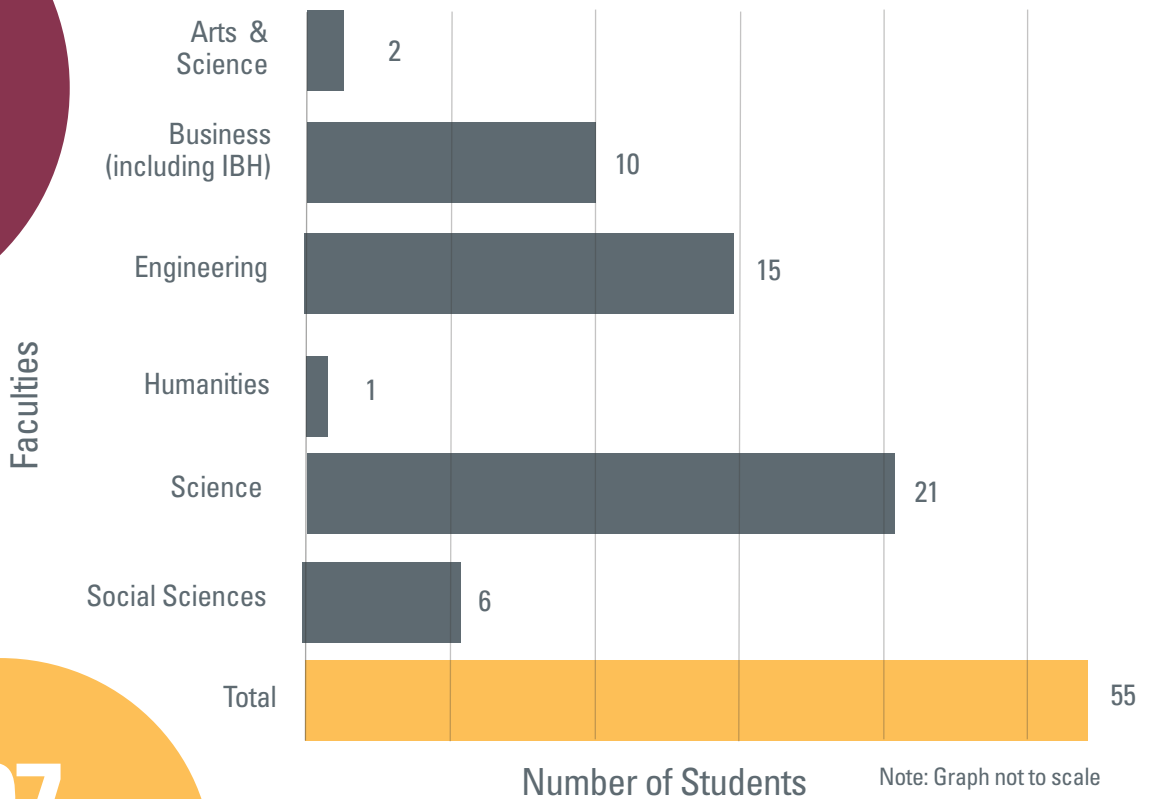
Collaborators

First and foremost, we recognize the **Arts & Science Program** for providing integral support for the implementation and development of the Minor — specifically, Arts & Science Director, Jean Wilson, and Academic Program Advisors, Shelley Anderson and Rebecca Bishop. The Minor would not be possible without the hard work and dedication of the past and current members of the Interdisciplinary Minor in Sustainability Committee, including the Student Committee; the faculty members who have opened their courses for inclusion and helped communicate the Minor; the staff members, including academic advisors, who have provided advice and guidance throughout; and the dozens of students who have shown their support by taking the Minor and working with us through its development and continued enhancement.

74

courses are available for students to choose from across all Faculties

Figure 1: 2020/2021 Minor in Sustainability Graduates



197

students have achieved the Interdisciplinary Minor in Sustainability

2020/2021 Interdisciplinary Minor in Sustainability Committee

Kate Whalen (Co-Chair) - Senior Manager, Academic Sustainability Programs Office

Brent McKnight (Co-Chair) - Associate Professor, DeGroote School of Business, Faculty of Business

Shelley Anderson - Academic Program Advisor, Arts & Science Program

Luc Bernier - Assistant Professor, School of Earth, Environment and Society, Faculty of Science

Aubrey Cannon - Professor, Anthropology, Faculty of Social Sciences

Cameron Churchill - Director, Engineering and Society Program, Faculty of Engineering

Carlos Filipe - Professor/Chair, Chemical Engineering, Faculty of Engineering

Chad Harvey - Associate Professor, School of Interdisciplinary Science, Faculty of Science

Judy Major-Girardin - Professor, School of the Arts, Faculty of Humanities

Beth Marquis - Associate Professor, Arts & Science and School of the Arts

Dean Mountain - Professor, DeGroote School of Business, Faculty of Business

Susie O'Brien - Professor and Chair, Department of English and Cultural Studies, Faculty of Humanities

Maureen Padden - Associate Professor, School of Earth, Environment, and Society, Faculty of Science

Sandra Preston - Assistant Professor, School of Social Work, Faculty of Social Sciences

Stacey Ritz - Assistant Dean of Education Services, Faculty of Health Sciences

2020/2021 Interdisciplinary Minor in Sustainability Student Committee

Kate Whalen - Student Committee Liason - Academic Sustainability Programs Office

Abbie Little - Student Committee Coordinator - Academic Sustainability Programs Office

Cassandra Dumouchel - Science

Fairuz Karim - Science

Fiona Sharpe - Social Sciences

Gabriel Lonuzzo - Engineering

Grace Kuang - Health Sciences

Lindsay Lee - Engineering

Lynda Dong - Humanities

Madison Hough - Business

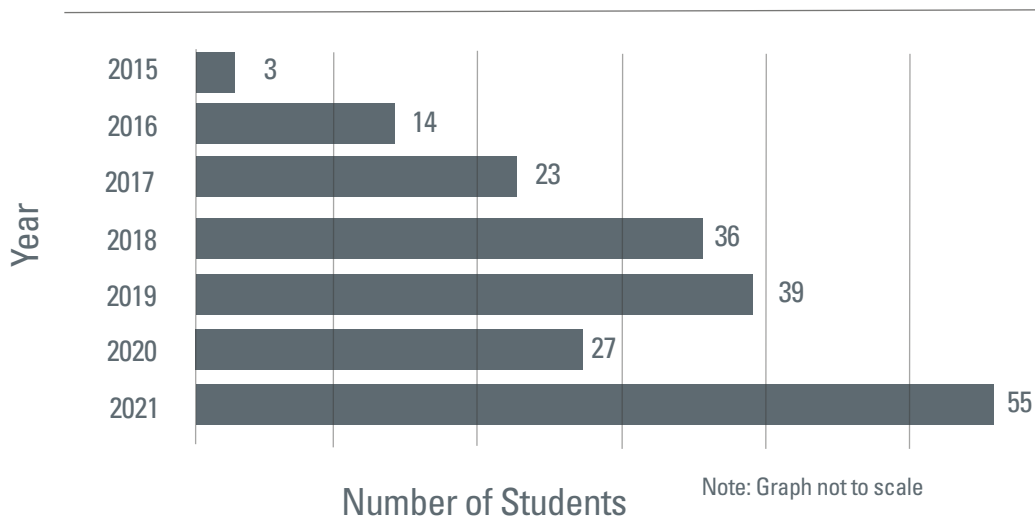
Shunmathi Shanmugam - Arts & Science

Yambakam Nyangani - Science

The Interdisciplinary Minor
in Sustainability has been
in operation for

7 years

Figure 2: Minor in Sustainability Graduates by Year



In April 2015, three students graduated with an Interdisciplinary Minor in Sustainability followed by 14 students in 2016, 23 students in 2017, 36 students in 2018, 39 in 2019, 27 in 2020, and 55 in 2021.

Interdisciplinary Minor in Sustainability

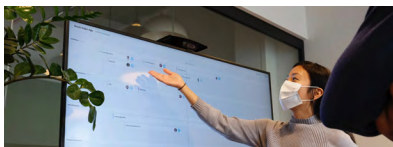
Interdisciplinary Minor in Sustainability Student Committee

Student Authors: Cassandra Dumouchel, Fairuz Karim, Fiona Sharpe, Gabriel Lonuzzo, Grace Kuang, Lindsay Lee, Lynda Dong, Madison Hough, Shunmathi Shanmugam, Yambakam Nyangani

Since the launch of the Interdisciplinary Minor in Sustainability in September 2014, the ASP Office has been exploring various avenues for student engagement. In September 2018, the Interdisciplinary Minor in Sustainability Student Committee was created and has expanded its reach and impact every year since.

The goal of the Student Committee is twofold: one is to generate awareness of the Interdisciplinary Minor in Sustainability, and the second is to create a community amongst students pursuing the Minor. The following objectives were of primary focus for the 2020-2021 Student Committee members:

Objectives



1

Promote the Minor through class talks and events



2

Increase the Minor's online presence through active participation on social media



3

Bring students together through co-hosting fun sustainability events

Reporting

The 2020-2021 Student Committee consisted of 10 undergraduate students representing each Faculty and the Arts & Science Program at McMaster. Coordinated by Abbie Little, the Committee met weekly to put their ideas into action.

- Due to COVID-19 closures, the Committee focused on creating content that could be shared virtually. Committee members created, recorded, and circulated a [two-minute video](#) that discussed what the Minor is and how it can benefit students' educational careers. The Committee members collectively emailed 41 course instructors to ask if they could play the video for their students during class. The instructors were chosen because they taught a course on the Minor Course List. In total, the video was shared with over 2,200 students.
- The Committee hosted and collaborated on four virtual events, which reached ~ 190 students in total. While fewer students were reached through the virtual events, compared to the video distribution, Committee members were able to engage in valuable dialogue with students through this process. Students shared information about barriers to pursuing the Minor and how to best connect with them going forward.
- The Committee's first co-hosted event was an Advocacy Letter Writing Workshop, facilitated by advocacy expert Jamie Stuckless. The free event was 'sold out' with a total of 30 active participants.
- To align with the launch of two new SUSTAIN courses, the Committee led a panel discussion on the related course topics of *intersectionality* and *sustainable development*. The panel consisted of the two course instructors and a group of 20 highly engaged student attendees.
- An overview of outreach events that took place from September 2020 to March 2021 is shown in Figure 2.

Collaborators

This was a year of incredible growth, overcoming challenges, and perseverance, and the Committee is grateful for the individuals who helped through the journey. A special thank you goes to the Coordinator, Abbie Little, for making each meeting a joy to attend, for inspiring the committee to dream bigger, and for being a great mentor and leader. Thank you to Dr. Kate Whalen and Dr. Brent McKnight, Minor Committee Co-Chairs, for their guidance and support as well as the entire Minor Committee, the Office of Sustainability, and the McMaster Students Union. Thank you to the following individuals and groups for their collaboration on events including Jamie Stuckless, Zero Waste McMaster, Facility Services, Hospitality Services, the Student Sustainability Ambassadors Program, Nature at McMaster, and Engineers Without Borders. Thank you to the 41 instructors who supported the Committee's work by playing the video for their students. Last but not least, thank you to the students who attended events, engaged with us, and provided their feedback to enhance the Minor.

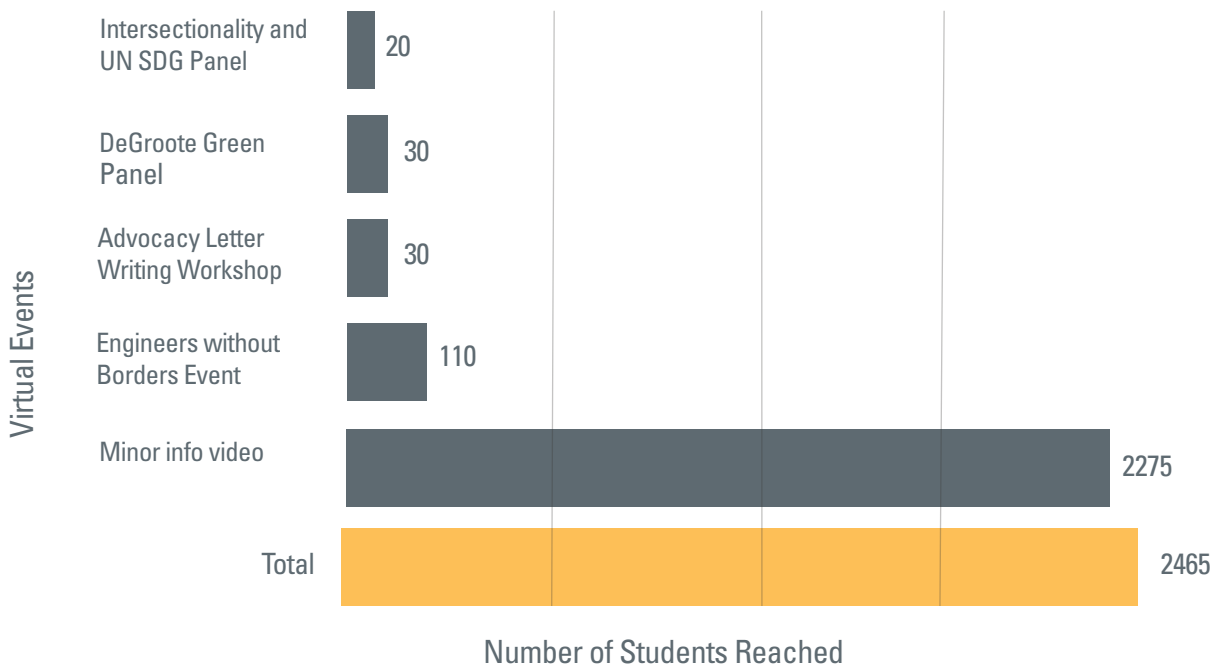


Figure 2: Sustainability Outreach 2020-2021



Figure 3: The Interdisciplinary Minor in Sustainability Student Committee.

From top to bottom, left to right - Shunmathi Shanmugam, Fiona Sharpe, Maddi Hough, Abbie Little, Lynda Dong, Gabriel Lonuzzo, Grace Kuang, Fairuz Karim, Lindsay Lee, Cassandra Dumouchel. Not pictured: Yambakam Nyangani. A full list of members and their Faculties can be found on page 11.

Photo Credit: Abbie Little

Sustainable Future Program

A suite of undergraduate courses focused on sustainability. Courses are open to all students, independent of their home Faculty, and count towards the Minor.

Developed in 2013, the Sustainable Future Program was created to provide students with opportunities for interdisciplinary, student-led, community-based, and experiential education about sustainability.

PROGRAM OBJECTIVES



Teach students about sustainability from an interdisciplinary perspective



Provide opportunities for self-directed, interdisciplinary, and experiential learning



Support student learning within the University and local community



Engage undergraduate students to take part in meaningful, experiential research



Foster opportunities for students to place local knowledge and local action within a global context

Sustainable Future Program

Year in Review

McMaster developed the Sustainable Future Program for students interested in learning about sustainability while having the opportunity to tackle complex sustainability challenges through real-world experiential learning.

The Sustainable Future Program aims to build reciprocal relationships between students, community members, and McMaster University to engage all parties in the journey towards a sustainable future.

Reporting

Since launching the first course in the winter of 2013, which had an enrolment of 97 students, the Sustainable Future Program has grown to include eight courses and support more than 1,000* students as of the 2020/2021 academic year. The Program continues to grow each year, and enrolment is anticipated to exceed 1,200** students in 2021/2022.

Annual Program growth has taken place through expanding current courses and adding new courses. New SUSTAIN courses include *SUSTAIN 2IS3 – Intersectionality and Sustainable Development* and *SUSTAIN 2SD3 – Exploring the United Nations Sustainable Development Goals*. The courses were first offered during the Intersession semester – a condensed, four-week semester that takes place during the month of May and supports flexibility for students who want to take courses outside of the traditional academic semesters.¹ The popularity of each course led to a second offering that will take place during the Winter 2022 semester. A description of each course can be found on the following pages.

Students from SUSTAIN 2SS3, 3S03, 3SS3, and 4S06 produced a total of 33 projects that contributed to sustainability on campus and/or in the community. Combined, these students collaborated with over 600 individuals to learn about sustainability through leadership and action. A sample of projects from SUSTAIN 2SS3, 3S03, 3SS3, and SUSTAIN 4S06 are reported on starting on page 21.

Collaborators

We thank the faculty and staff members, course teaching assistants, and community partners for supporting students enrolled in the SUSTAIN courses, as well as for supporting continuous course and program development. Our sincerest appreciation extends to the hundreds of students who have contributed by taking courses and providing feedback for continuous improvement. We extend a special thanks to the Faculty of Engineering and the Engineering & Society Program for providing administrative support for the Sustainable Future Program. Specific individuals who supported our students' experiential learning projects are highlighted in the pages to follow.

*based on number seats available

**estimation based on 90 per cent of course enrolment capacity

SUSTAIN 2IS3

INTERSECTIONALITY IN SUSTAINABLE DEVELOPMENT

SUSTAIN 2IS3 explores complex dimensions of sustainability through a lens of intersectionality — how our individual identities shape our life experiences — with a focus on environmental injustices. Includes interdisciplinary teamwork, simulated case studies and UN Sustainable Development Goals.

Dr. Kelsey Leonard
Course Instructor



"SUSTAIN 2IS3 is a course that offered a lot of insight on how intersectionality and sustainability interact and are connected. I benefitted greatly having these concepts taught by Dr. Leonard, an Indigenous woman with invaluable lived experience."

Ember Woodcox
SCIENCE

SUSTAIN 2IS3

Intersectionality and Sustainable Development

As one of our two newest SUSTAIN courses, *SUSTAIN 2IS3 – Intersectionality and Sustainable Development*, was offered for the first time in May of 2021 during the Intersession semester.

SUSTAIN 2IS3 was taught by Dr. Kelsey Leonard, a water scientist and protector whose work focuses on Indigenous water justice and its climatic, territorial, and governance underpinnings for our shared sustainable future. In her class, Dr. Leonard discusses various forms of injustice that all shape our understanding of intersectionality and sustainable development, such as: poverty status, gender, religion, race and ethnicity, sexual orientation, caste and social class, varying abilities and cognitive differences, literacy and level of instruction, etc.

A total of 25 students from the Faculties of Business, Engineering, Humanities, Science, and Social Sciences developed essential skills to examine sustainability through the lens of intersectionality while advancing real life applications for solutions to some of the planet's most pressing justice challenges, such as the climate crisis, food insecurity, environmental racism, gender inequality, water insecurity, and ocean exploitation.

For their final assignment, students worked to develop and pitch an idea for a podcast. Students included their vision for the podcast, and how it would address one of the course themes on Intersectionality, Sustainability, Justice, and the UN Sustainable Development Goals.

Students' Podcast Ideas

The following is a summary of the proposed podcast topics students developed and presented in class:

- ReZilient Generation – a podcast where we discuss issues surrounding sustainability and intersectionality from an Indigenous perspective.
- Alter Eco – a monthly podcast that focuses on the position of gender roles within the sustainability and environmentalist movement.
- World of Waste – where we reduce, reuse, and rethink our consumption, a podcast that covers environmental injustices related to human produced waste (food waste, plastics, technology waste, landfills, littering, etc.).
- 17 Little Things – Achieving the SDGs using simple techniques and practices will make people aware of common human activities that can positively affect the world, environment, and its people.
- Crip Quips – a podcast providing a disabled perspective on sustainability and climate justice.
- Staying Afloat – a podcast investigating ocean injustices and ensuring the Ocean has a fighting chance. Let's help our Ocean Stay Afloat.

Acknowledgements

We express our gratitude to Dr. Kelsey Leonard and teaching assistant, Lauren Chan, for their leadership, innovation, and creativity in implementing a successful course. We thank Debbie Martin, Michael Moore, and Giancarlo Da-Re from Facility Services; Mary Taws and Megan Biekse from University Advancement; Wayne Terryberry from Natural Lands and Outdoor Engagement; and Liana Bontempo from Hospitality Services for their contribution to student-centred learning and student engagement. We are grateful for SUSTAIN 2IS3 students, class of 2021, for their participation in this course and engagement in its important content.

SUSTAIN 2SD3

EXPLORING THE UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS

In SUSTAIN 2SD3, students learn the breadth of sustainability by engaging with each of the 17 United Nations Sustainable Development Goals. Through interdisciplinary teamwork, students tackle complex issues of sustainability through simulations, debates and games.

Dr. John Boakye-Danquah
Course Instructor



"By enrolling in SUSTAIN 2SD3, I was able to acquire an extensive understanding of the United Nations SDGs and the importance of taking action to create an impactful change."

Mann Badami
HEALTH SCIENCES

SUSTAIN 2SD3

Exploring the United Nations Sustainable Development Goals

One of our two newest SUSTAIN courses, *SUSTAIN 2SD3 – Exploring the UN Sustainable Development Goals*, was offered for the first time in May of 2021 during the Intersession semester.

Course Instructor, Dr. John Boakye-Danquah, has over a decade of active engagement in research and teaching topics of sustainability and human dimensions of environmental change. Dr. Boakye-Danquah believes that education is the most enduring way to engage social transformation. Thus, he guides his students to focus on solutions, rather than problems, engaging students to take action to address complex problems. Dr. Boakye-Danquah facilitates interactive group learning and reflection to guide students' learning while providing them with resources and opportunities to unleash their creative abilities.

A total of 20 students from the Faculties of Business, Engineering, Humanities, Science, Social Sciences and Health Science tackled complex issues of sustainability and learned the importance of partnership to achieving the 17 SDGs through group exercises, simulations, debates, and games. The students worked in small interdisciplinary groups to investigate McMaster's commitments, efforts, and ambitions to achieving the SDGs on campus and propose initiatives to advance the Goals at McMaster. Students considered potential stakeholders, challenges, and SDGs that would be impacted by their proposed ideas.

To conclude the semester, the student teams presented their research and proposed initiatives to members of McMaster's administration. Leaders from Facility Services, Hospitality Services, Natural Lands and Outdoor Recreation, and University Advancement listened, asked questions, and offered their insights on implementing the students' ideas.

Students' Proposed Campus Sustainability Initiatives

Zero Hunger (SDG 2)

- A credit system where student cards can be used to charge food to their student account.
- A community fridge run by students and for students.

Good Health and Well-Being (SDG 3)

- A chat option dedicated towards students needing support with substance abuse.
- Resources for substance abuse self-help techniques.

Industry, Innovation and Infrastructure (SDG 9)

- Green roofs on campus.
- More 'do-it-yourself' bike repair stations on campus and in the surrounding community.

Reduced Inequalities (SDG 10)

- Donations of business wear to disadvantaged community members, along with resume and interview support.
- Additional LGBTQ training for staff.

Sustainable Cities and Communities (SDG 11)

- A farmers' market with fresh and culturally diverse foods with consideration of dietary restrictions.
- Adoption of 'WELL' healthy-building standards to complement LEED building certification.

Responsible Consumption and Production (SDG 12)

- A mask recycling program on campus in collaboration with McMaster researchers.
- Integration of heat recovery system in McMaster campus buildings to conserve energy and reduce heat waste.

Life Below Water (SDG 14)

- A sustainability-focused course about the stewardship of local bodies of water.
- Manufacturing and use of biodegradable pasta straws on campus.

Acknowledgements

We express our gratitude to Dr. John Boakye-Danquah and teaching assistant, Kunwar Karim, for their leadership, innovation, and for running an engaging and successful course, as well as to SUSTAIN 2SD3 students, class of 2021, for their participation, engagement, and valuable recommendations to enhancing sustainability at McMaster.

SUSTAIN 2SS3

ADVOCATING FOR SUSTAINABILITY

In SUSTAIN 2SS3, students gain knowledge, skills, and abilities to effectively communicate and influence decisions, which they apply to current sustainability issues within the community.

Sarah Precious
Course Instructor



"Sustain 2SS3 was an excellent course that allows students to deliberate on community challenges and propose sustainable solutions while providing a platform for self-improvement and reflection."

Tevin C.G. Wellington
ENGINEERING

Paving a Path to Clean Energy at McMaster University

Student Authors

Krista Henshaw, Business | **Michelle Quan**, Business
Ahmed Ayman, Science | **Hassan Jan**, Science

Community Project Champion

Erik Jurriaans, Sustainabus Co-Creator



Wind turbines in a field in France
Photo Credit: Thomas Reaubourg via Unsplash



Overview

Since 1950, the percentage of renewable energy sources used to meet the global energy demand has risen from less than 5 per cent to nearly 20 per cent.¹ However, despite the rise in sustainable energy sources, the International Energy Agency reports that this growth is not enough to offset global carbon emissions.² Climate experts say that increasing our use of sustainable energy sources is one of the most effective tools to offset carbon emissions. Further, shifting towards clean energy will provide future generations with sustainable power that continues to mitigate the impacts of climate change. The goal of our project was to support McMaster University's pursuit and attainment of affordable and clean energy on campus.

Objectives

1. Explore McMaster's completed and proposed actions to achieve Sustainable Development Goal (SDG) 7: Affordable and Clean Energy³
2. Understand how McMaster compares to other universities in achieving SDG 7
3. Present recommendations for how McMaster can work towards achieving SDG 7

Reporting

We began by reviewing McMaster's completed sustainable energy projects.⁴ Since 2013, McMaster has completed 22 sustainable energy projects, one of which had a direct connection to SDG 7.⁵ As of May 2020 there were three ongoing projects and 12 proposed projects; two of which are directly connected to SDG 7.⁶

We then reviewed the energy initiatives implemented by universities leading in SDG 7 and found that McMaster does not rank among the top universities.⁷ Researching the sustainable energy initiatives of other universities provided comparison for potential clean energy initiatives.

Next we highlighted recommendations for achieving SDG 7. These included incorporating a sustainable learning framework across courses, the establishment of a Campus Energy Centre to undertake energy conservation research projects, and divestment from fossil fuels. We also provided recommendations for individual behaviour change, which included the use of programmable thermostats, unplugging idle electronics, and using natural light whenever possible.

We concluded by presenting our findings to the Manager of Sustainability, Urban Design & Space Planning, and the Director of Engineering Operations from McMaster's Facility Services. Through dialogue and gaining their valuable perspectives, we identified future opportunities for collaboration between Facility Services and sustainability students to heighten the awareness of and contribution to the University's clean energy strategy.

Collaborators

We would like to thank our Community Project Champion, Erik Jurriaans, for his unwavering support and guidance throughout this project and beyond. We would also like to thank Sarah Precious, Dr. Kate Whalen, Jenn Cross and MacGreenInvest, Joe Emberson, Michael Moore, and our classmates for their contributions, fact checking, ideas, and questions that helped shape our understanding of the challenges and potential paths to achieving affordable and clean energy at McMaster.



LGBTQA2S+ Sexual Health Workshop Framework

Student Authors

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Lauren Lee, Science | **Larissa Shular**, Humanities

Community Project Champions

Olivia Hubert, Public Health Nurse, Brant County Health Unit
Alissa Schure, Public Health Nurse, Brant County Health Unit



Cover page of the LGBTQA2S+ Sexual Health Workshop Framework Document
Photo Credit: Lauren Lee

Overview

For decades, sexual health education has been geared towards heterosexual people and relationships. This has created troubling physical, emotional, and mental impacts for individuals who identify with sexual orientations and gender identities aside from heterosexual or cisgender (i.e. LGBTQA2S+).^{1,2} It has also put LGBTQA2S+-identifying individuals at a greater risk for health problems, such as mental illnesses and sexually transmitted infections (STIs), due to an overall lower use of healthcare services and preventative measures.³

Our goal was to develop a workshop framework that encompasses the mental, physical, and emotional aspects of sexual health within the LGBTQA2S+ community, which could be used by various organizations to develop a workshop to inform students between the ages 12 and 20.

Objectives

1. Identify gaps in knowledge that influence interactions with the LGBTQA2S+ community
2. Understand best practices for sexual health education of LGBTQA2S+ individuals
3. Develop a workshop framework focused on LGBTQA2S+ sexual health

Reporting

By reviewing the current Ontario Health and Physical Education curriculum and various articles, we found that members of the LGBTQA2S+ community experience several barriers in accessing healthcare. Barriers including stigma, discrimination, and healthcare provider insensitivities, resulting in an overall lower use of healthcare services and preventative measures.^{4,5} These effects are compounded through the education system, as disparities exist between the public and Catholic school boards, as well as in the material that is presented by educators.^{6,7}

Next, we conducted extensive research on inclusive sexual health education specific to the LGBTQA2S+ community, which included approximately 48 sources. Our research included topics such as: the history of heteronormative education, the importance of inclusive language and terminology, safe space creation, and aspects of safe sex including preventative measures, risks of STIs, and resources for testing.

We then compiled all relevant information into an accessible, visually-pleasing, and easy-to-follow sexual health workshop framework. This framework provides information on topics that should be included in the workshop, as listed above; methodology for delivery; information on the presenter; as well as missing resources and materials that should be addressed. As LGBTQA2S+ sexual health is an extensive and ever-evolving topic, we have also included next steps for future SUSTAIN 2SS3 students, local organizations, or local public health units to consider when developing and delivering the workshop. Working with LGBTQA2S+ groups to update the framework and/or co-develop a workshop will be vital in creating a resource that truly benefits and reflects the voice of the LGBTQA2S+ community.

Collaborators

We would like to thank our Community Project Champions, Olivia Hubert and Alison Schure, for their continuous support, assistance, and guidance throughout the course of this project. We would also like to extend our thanks to our instructor, Sarah Precious, and Teaching Assistant, Titi Huynh, for supporting us and providing constructive feedback for our group throughout our project. Thank you for encouraging us to continue pursuing our passions and to make a difference!

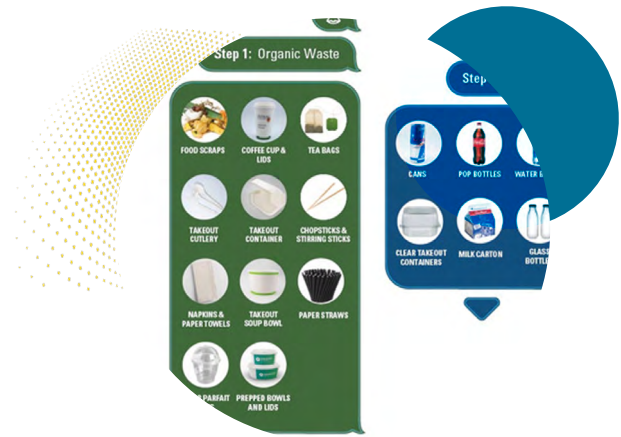
Advocating for Effective Waste Sorting Signage at McMaster University

Student Authors

Hannah Christie, Science | **Emma Darrach**, Business
Belvina Mao, Science | **Mahimah Reancy**, Science

Community Project Champions

Liana Bontempo, Wellness and Sustainability Manager,
Hospitality Services
Dr. Kate Whalen, Senior Manager, Academic Sustainability Programs Office



Signage favoured by 68 per cent of survey respondents and aligns with the criteria found for effective signage

Photo Credit: Hospitality Services

Overview

Canada produces 31 million tonnes of garbage annually, which is more than any other country per capita¹ and contributes to the climate crisis. To encourage proper waste disposal, the Ministry of the Environment set a provincial standard in 2019 of reaching and maintaining a 60 per cent waste diversion rate. McMaster University currently has a 52 per cent diversion rate.² One factor for this may be the multiple variations of waste signage on campus. The goal of our project was to advocate for improvements to McMaster's waste and recycling program, based on feedback from members of the campus community.

Objectives

1. Compare McMaster's current waste sorting system to other successful programs
2. Survey staff and students about McMaster's current waste sorting system
3. Share findings and recommendations with members of the McMaster community

Reporting

We began by researching McMaster's waste sorting system and analyzing McMaster's waste audit reports. We found that McMaster uses three different signage schemes to guide recycling and waste disposal. By studying other successful campaigns and reviewing best practices for waste signage, we recognized that improving signage is an area of opportunity. Specifically, our research suggests that the use of text and images, having a consistent colour scheme and design, and the inclusion of key examples of waste produced by the organization are most effective for accurate sorting.

To achieve our second objective and test our proposed hypothesis that improved signage would support proper sorting, we surveyed 81 students and staff about their perceptions. Our survey prompted participants to rate their reliance on signage to properly sort their waste, rank and provide feedback on each signage scheme, and test their knowledge on proper recycling and waste disposal. In total, 55.6 per cent of respondents rely on signs to sort their waste and 37 per cent of respondents identified unclear signage as the main barrier to proper waste sorting. Finally, 68 per cent of respondents prefer for the signs used by Hospitality Services, which also closely aligns with the best practices described above.

We presented our findings and recommendations to McMaster's Sustainability Council, a recording of which has also been made available [online](#).³ We are thrilled to report that the Council supported our recommendation to align signage to support effective recycling behaviour on campus. The outcomes of our collaboration were also highlighted in the [McMaster Daily News](#).⁴

Collaborators

We extend a special thanks to our collaborators as follows: Dr. Kate Whalen and Liana Bontempo, our Community Project Champions, for their continuous support and guidance throughout this project; Sarah Precious and Titi Huynh, our professor and teaching assistant, for equipping us with the required knowledge and skills to advocate for change in an area that we are all very passionate about; members of McMaster's Sustainability Council for allowing us the opportunity to present our findings and providing insightful feedback; Megan Bieksa, Debbie Martin, and staff of McMaster Daily News for sharing our story; the many student groups that helped distribute our survey; and all the students and staff who participated in the survey and have watched our [video](#).⁵

SUSTAIN 3S03

IMPLEMENTING SUSTAINABLE CHANGE

SUSTAIN 3S03 engages students in exploring agency, leadership, and strategy effectiveness within the context of sustainability. The course includes interdisciplinary perspectives, experiential learning and community engagement projects.

Dr. Michael Mikulak

Course Instructor



"Implementing change in the community gave me a deep understanding of sustainable concepts in SUSTAIN 3S03"

Callum Hales
BUSINESS

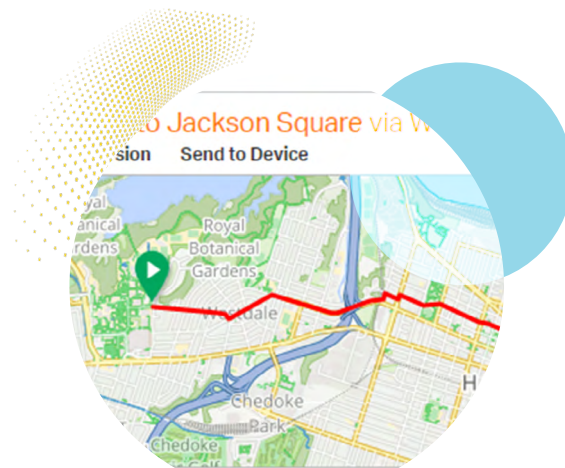
McMaster Bike Buddies: Barriers and Online Resources

Student Authors

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Amandeep Sandhu, Science | **Salina Rezene**, Science

Community Project Champions

Elise Desjardins, PhD candidate, School of Earth, Environment & Society, McMaster University; Vice-Chair of McMaster's Multi-Modal Transportation Committee
Vikram Hardatt, Program Manager, Smart Commute Hamilton



One of the cycle routes created with the Ride with GPS app from McMaster University to Jackson Square
Photo Credit: Salina Rezene



Overview

Cycling is a sustainable mode of transportation growing in popularity due to the current worsening climate.¹ Despite the environmental and health benefits, cycling is not widely adopted among students at McMaster University and other campuses.²

Studies have found that best practices for promoting biking include having cycle infrastructure that connects the campus to different locations and bike share accessibility.³ A solution to this problem has been initiated by starting a Bike Buddy program but requires further action to promote biking and inspire sustainable habits. With the success of the Bike Buddy pilot program at McMaster in 2019,⁴ the goal of our project was to further increase engagement of McMaster University students.

Objectives

1. Identify barriers to cycling that McMaster students experience
2. Identify local destinations McMaster students would like to reach by bicycle
3. Create a virtual experience visualizing a safe cycling route to destinations in Hamilton
4. Share results, recommendations, and resources with McMaster University's Multi-Modal Transportation Committee

Reporting

We began by conducting an online survey to understand students' perceived barriers to cycling. The results indicated that all 39 respondents felt unsafe biking and were unfamiliar with safe biking routes. We then examined students' desired, bikeable destinations in Hamilton. We chose the top six popular destinations to target: Jackson Square, Locke Street, Dundas, Westdale, Bayfront, and General Hospital.

To achieve our third objective, we developed six [maps](#), one for each location, using an app called Ride with GPS. We also created a bike along video, in which one of our group members cycled the Westdale route and highlighted safety tips. The bike along [video](#) was posted on the Student Wellness Centre Instagram page and was viewed 709 times, as of February 2021.

For our fourth objective, we sent follow up surveys to students who replied to our initial survey to gain feedback on the maps and video we created. We received 11 responses, and nine respondents strongly agreed that the video and maps were helpful and easy to follow. Subsequently, our group collected all of our data and presented our recommendations to our Community Project Champions (CPCs) and McMaster's Multi-Modal Transportation Committee that they should continue to develop more maps and videos. We are encouraged that they have committed to continue this initiative.

Collaborators

We are beyond grateful for our CPCs, Elise Desjardins and Vikram Hardatt, for their guidance and helping us create our informative destination biking video. We would also like to thank Taryn Aarssen and Gabriella Christopher for promoting the cycling maps online. We would like to extend our gratitude to Dr. Michael Mikulak, Kunwar Karim, and Nava Najafabadipoor for their dedicated guidance and support during this project. Moreover, we are grateful to Dr. Kate Whalen, and Abbie Little from McMaster's Academic Sustainability Programs Office for their expertise, mentorship, and advice on our project.



Bee-coming a Bee City Campus

Student Authors

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Community Project Champions

Abbie Little, Community Relations Coordinator, Academic Sustainability Programs Office
Craig MacDonald, Director of Maintenance Services, Facility Services



The plaque that was installed on campus at one of the Solitary bee homes
Photo Credit: Georgia Kirkos

Overview

Bees are one of the most important pollinators essential to sustain life on Earth, and the majority of bees in Canada are solitary bees.¹ However, there has been a significant decline in solitary bees as a result of pesticides and habitat loss.²

McMaster has been contributing to increasing biodiversity of bee species on campus. In 2019, McMaster installed 50 solitary bee homes at 10 locations on campus. The goal of our project was to further support solitary bee populations on campus through increasing biodiversity and educating the community about their importance.

Objectives

1. Inform individuals about the importance of and threats to solitary bees
2. Research native vegetation and help facilitate its planting during a virtual planting event
3. Apply for McMaster to become a Bee City Campus with Bee City Canada

Reporting

To achieve our first objective, we facilitated a Zoom event, hosted an Instagram takeover on @macsustain, published an article in the [Hamilton Spectator](#), and were interviewed by [The Silhouette](#). For our Zoom event, we invited bee expert Noah Stegman to participate and help raise awareness about the importance of this issue and strategies to reduce our impact, such as through responsible use of fertilizers, which can be harmful to bees and the environment. We had 15 engaged participants join our event. Our Instagram takeover engaged over 380 viewers through quizzes, polls, and information on the importance of solitary bees.

To achieve our second objective, we collaborated with the Trees student team (p. 28) to compile a list of native vegetation to be planted around the bee homes on campus. The list was confirmed with McMaster bee experts Noah Stegman and Sebastian Irazusta. With help from Abbie Little and the Grounds department, a total of 100 native flowering shrubs were planted across campus as part of McMaster Sustainability Week in October 2020. An Instagram story with information about the benefits of the planting and a step-by-step guide was posted and received over 145 views.

To achieve our final objective, we completed the application to become a Bee City Campus. This involved forming a Pollinator Team of students, professors, and university staff to ensure bees are properly supported; revising the application several times; and receiving approval by senior staff to submit the application. In February 2021, we received confirmation from Bee City Canada that the University not only meets but exceeds requirements for certification, proudly making McMaster the 14th [Canadian Campus](#) to become a Bee City Campus.

Collaborators

This project could not have been accomplished without the support of the following collaborators: our Community Project Champions, Abbie Little and Craig MacDonald; Dr. Kate Whalen; Sebastian Irazusta; Noah Stegman; Wayne Terryberry; McMaster Grounds department; members of the Trees team (p. 28); Dr. Brent McKnight; Dr. Susan Dudley; Grace Kuang; Fairuz Karim; the Hamilton Spectator; Dr. Michael Mikulak; and Kunwar Karim.

Increasing Waste Diversion at St. Peter's Hospital

Student Authors

Alyssa Minhas, Science | **Michael Paul**, Science
Nicole Chong, Business | **Victor Nguyen**, Science

Community Project Champions

Kimberley Gutt, Waste Management Coordinator, St. Peter's Hospital
Morgan Richardson, Volunteer Resource Coordinator, St. Peter's Hospital



St. Peter's Hospital competition initiative logo
Photo Credit: Victor Nguyen



Overview

Hospitals accumulate approximately 5 million tons of waste per year and account for at least one per cent of all non-residential landfill waste nationally.¹ Among Hamilton Health Sciences Hospitals, St. Peter's Hospital (SPH) has the lowest waste diversion rate. In March 2020, 12 out of 16 bags of recycling could not be recycled and needed to be reclassified as landfill waste because they were contaminated with non-recyclables.² Most of the identified contamination pertained to misplaced PPE, coffee cups, and dirty food containers. The goal of our project was to increase awareness and engagement towards positive recycling habits among St. Peter's Hospital staff.

Objectives

1. Provide educational material to inform SPH staff on the significance of positive recycling habits
2. Implement an incentive-based competition to increase proper recycling
3. Develop a proposal for an efficient labeling system for recycling and waste bins

Reporting

To achieve our first objective, we sent weekly emails educating SPH staff about appropriate recycling habits. The emails included a comprehensive infographic and animated video based on academic literature to promote hospital recycling guidelines.

To achieve our second objective, we created an incentive-based competition called Keep Calm Recycle On, between hospital wards that was based on the material within the weekly emails. To increase quiz participation amongst staff, we implemented a pizza-party reward for the ward with the highest participation rate.

As a result, we had a total of 140 quiz participants between October to December 2020, with over 50 per cent of participants achieving a 100 percent score on the first quiz. Additionally, we received 94 views on our animated video explaining the process of waste contamination. The data suggests that the initiative was fostering engagement among SPH staff.

To achieve our final objective, we conducted research on the efficacy of labeling systems on recycling and waste bins. From our research, we proposed a new labelling system that included colour coding items to match the respective bins that the materials must be disposed in. To continue this project, we recommend a prototype of the labelling system be implemented and monitored within the SPH cafeteria to measure its effectiveness.

Collaborators

Our team would like to give a special thanks to our Community Project Champions: Kimberley Gutt and Morgan Richardson. Their continual guidance and support enabled us to successfully achieve our project objectives and engagement throughout the hospital. We would also like to thank the SUSTAIN 3S03 instructional team: Dr. Mikulak, Dr. Whalen, Kunwar Karim, and Nava Najafabadipoor for providing us the knowledge, guidance, and constructive feedback throughout our project.



Increasing Biodiversity & Sustainability Awareness by Planting Trees at McMaster University

Student Authors

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Neale Berube, Business | **Malik Nakua**, Humanities

Community Project Champions

Abbie Little, Community Relations Coordinator, Academic Sustainability Programs Office
Noah Stegman, Coordinator, Nature at McMaster



Photograph depicting large trees on McMaster University Campus
Photo Credit: McMaster Student Success Center

Overview

On March 18th, 2019, the City of Hamilton declared a climate emergency in response to the climate change crisis.¹ Largely caused by the excess amount of carbon dioxide in the air, planting trees can significantly aid in mitigating the effects of climate change and improving Hamilton’s climate state. Trees are integral to the well-being of our environment, providing oxygen, preventing soil erosion, reducing pollution, and more.² The absence of trees amplifies issues like greenhouse gases and lack of wildlife habitats, disrupting ecosystem balance and shelter for dependent native species.³ The goal of our project was to increase biodiversity and sustainability awareness through a virtual tree planting event at McMaster.

Objectives

1. Research and plant 100 native species at McMaster University as part of Sustainability Week
2. Raise awareness on the importance of trees and biodiversity
3. Encourage future iterations of this project by creating a transition package

Reporting

We began our project by extensively researching the existing natural landscape at McMaster University and considering which native species would best suit the landscape. Working alongside the Solitary Bee Project group (p. 26) and reviewing our findings with our Community Project Champions, we created a list of 10 species of plants that would enhance the campus’ ecosystem, were financially viable, native to Hamilton and Ontario, and would also benefit the solitary bee population.

In October 2020, as part of Sustainability Week, we helped facilitate the planting of 100 native plant species on campus and showcased the virtual event through an Instagram takeover on the @macsustain account. Following the event, we were highlighted in an article by [The Silhouette](#) that focused on our experiential learning project and the importance of biodiversity and tree planting.

To achieve our second objective, we created educational content that was shared on the @macsustain Instagram account, including stories and interactive polls. Our stories reached over 400 accounts with nearly 60 people directly participating in our polls. Our post advertising our virtual tree planting event reached over 600 accounts with nearly 90 people directly engaging through liking, commenting, and sharing.

We concluded our project with the creation of a transition package that can be used by future SUSTAIN 3S03 groups. Given the unique circumstances we undertook to complete this project virtually, we documented our lessons learned in the hopes of aiding future groups. Our package included all our planning notes, research, and personalized advice towards improving future iterations of this project.

Collaborators

We would like to thank our Community Project Champions, Abbie Little and Noah Stegman, for their insight, guidance, and endless support throughout this initiative. We would also like to thank Myles Sergeant, from Trees for Hamilton, and the McMaster Grounds Crew for funding the project and planting the trees. We also extend our gratitude to Wayne Terryberry, Kate Whalen, Grace Kuang, Michael Mikulak, and Kunwar Karim for making this project such a success. Finally, we would like to thank those who engaged with and shared our educational posts. It would not have been possible without everyone to make McMaster a greener and more sustainable place.

Sustainabook: A Sustainable Learning Workbook for Everyday Life

Student Authors

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Wyatt Croucher, Social Sciences | **Izah Mabanza**, Social Sciences

Community Project Champions

Erik Jurriaans, Sustainabus Co-Creator
Kolina Tavares, Sustainabus Co-Creator



Top to bottom, left to right, meet the Sustainabook team: Izah, Kate, Wyatt, and Michael
Photo Credit: Izah, Kate, Wyatt, and Michael



Overview

Human impact plays a significant role in climate change with consequences increasing in severity, in different regions across the world.¹ If everyone consumed as much as Canadians, we would need four Earths to sustain ourselves.² Modifying the average individual's consumption and lifestyle habits is one of the most accessible ways to noticeably reduce one's effect on climate change. The goal of our project, Sustainabook, was to create a comprehensive and accessible workbook that compiled everyday sustainable lifestyle choices to lower an individual's impact on climate change.

Objectives

1. Research and identify sustainable living habits that were accessible to the average Canadian household
2. Create a workbook consisting of steps and resources to reduce waste, shop sustainably, make your house more eco-friendly, and reduce your energy consumption

Reporting

In order to achieve objective one, our group completed research on sustainable living habits that the average Canadian household struggles with. Our general interests, educational background, and passion for the environment each drove us to research four different topics.

To successfully achieve objective two, we individually researched average household statistics, unsustainable lifestyle practices, and simple solutions accessible to the average individual. We combined our ideas, diagrams, charts, and resources into a document for a peer-review by our classmates. Additionally, we collected feedback from our Community Project Champions (CPCs) throughout the process to ensure we were upholding their sustainable values and reaching our weekly goals.

We started by creating step-by-step guides and collecting resources for our readers. We then planned our page layouts on Canva which allowed us to work simultaneously to complete the workbook. After multiple rounds of editing, we shared the Sustainabook on Instagram through a Google Drive link, allowing anyone with the link to view, share, or download the document for free. Since the release of the workbook, the @sustainablebook account has gained 191 followers and 51 workbook readers.

Collaborators

We would like to thank our CPCs, Erik Jurriaans and Kolina Tavares, from Sustainabus, for their mentorship and continued assistance in the creation of the Sustainabook. We would also like to thank the SUSTAIN 3S03 teaching team, including Dr. Kate Whalen and Abbie Little from McMaster's Academic Sustainability Programs Office, our professor Dr. Michael Mikulak, and our teaching assistants Nava Najafabadipoor and Kunwar Karim for their assistance in revision and advice in all stages of our project. Thank you to our classmates and everyone else who made this project a success.



Flip the Switch at the Hamilton Farmers' Market

Student Authors

Iqra Javid, Engineering | **Sandra Alexander**, Science
Sasha Pinto, Science | **Masooma Zaidi**, Science

Community Project Champions

Elly Bowen, Board Member of the Hamilton Farmers' Market,
Citizen Representative

Bill Slowka, Market Manager, Hamilton Farmers' Market

Eric Miller, Board Member of the Hamilton Farmers' Market,
Citizen Representative



The beautiful Hamilton Farmers' Market located at York Blvd in Hamilton, Ontario.
Photo Credit: @hamontmarket on Instagram

Overview

Energy consumption from human activities, including electricity production, contributes to 78 per cent of global greenhouse gas (GHG) emissions and 82 per cent of Canada's GHG emissions.¹ In 2019, the annual lighting energy consumed by the Hamilton Farmers' Market was 806,400 kW because of their compact fluorescent light (CFL) bulbs. The goal of our project was to investigate the alternative of light emitting diode (LED) technology at the Market.

Objectives

1. Determine formulas to calculate the energy consumption and efficiency of various lighting options available for the Market to use
2. Research lightbulb alternatives to determine the most energy efficient and cost-effective option
3. Present findings to Market's Board members and gather recommendations to implement the proposed changes

Reporting

For our first objective, it was important to consider that the Market is lit for approximately 2,496 hours each year. We researched and identified three main formulas needed to evaluate various types of lighting for energy consumption and efficiency. To check our work, all our calculations were approved by an accredited McMaster electrical engineering professor.

To achieve our second objective, we researched and compared different light bulbs. We discovered that LED light bulbs would be a more energy-efficient option to replace the 32W CFL bulbs. We found that the 15W LED light bulb is 53.31 per cent more efficient than the current bulb. In terms of energy savings, this was equivalent to charging 2,560,525 smartphones² in one year.

Our final objective was achieved through a final presentation to our Community Project Champions from the Market Board. We highlighted that, if purchased in bulk, the LED bulbs were comparable in price to the CFL bulbs. Based on their efficiency, switching to LED bulbs would save the Market 29,702.4 kWh, 890,000 grams of CO₂e,² and approximately \$1,173 each year on energy consumption alone. Over the lightbulb's lifespan, this would be a saving of approximately \$24,000. Another added benefit is that the LED bulbs last as much as three times the length of CFL bulbs. Considering the lifespan, purchase cost of the bulbs, and associated costs, the savings would increase to 281,400 kWh.

We presented our findings and recommendations to the Market Manager who agreed to take our findings forward for the City's consideration in the Fall of 2021.

Collaborators

This project would not have been possible without the following individuals: our community partners, Elly Bowen, Bill Slowka, Eric Miller; Professor, Omid Beik; our SUSTAIN 3S03 instructor, Dr. Michael Mikulak, and TA, Kunwar Karim; and the Academic Sustainability Programs Office team, Dr. Kate Whalen, Abbie Little, and Grace Kuang.

SUSTAIN 3SS3

FOSTERING SUSTAINABLE COMMUNITIES THROUGH 100IN1DAY HAMILTON

In SUSTAIN 3SS3, students gain knowledge, skills and abilities to support collaborative approaches to making positive, sustainable change within the community. They apply their learning through involvement in 100in1Day Hamilton.

Peter Topalovic

Course Instructor



"What I really love about the SUSTAIN 3SS3 course is working with the students to get real-life experience in the community. It's very satisfying to actually help people in the community with what they are working on."

Peter Topalovic
COURSE INSTRUCTOR

Encouraging Small Acts of Kindness in Hamilton

Student Author
Trystan Cull, Science



Post created to promote the 100In1ActsofKindness Instagram account.
 Photo Credit: Trystan Cull

Overview

Sexual violence includes any sexual act or act that targets sexuality or gender, whether the act is committed, threatened, or attempted against a person without their consent.¹ The COVID-19 pandemic has simultaneously exacerbated sexual violence and prevented individuals from using in-person emergency services.² For this reason, it is critical to ensure that people affected by sexual violence during the pandemic have access to free and remote mental health resources.³ The Sexual Assault Centre of Hamilton and Area (SACHA) and McMaster’s Sexual Violence Prevention and Response Office (SVPRO) are two organizations in Hamilton that aim to remotely support survivors of sexual violence and informed parties. Social media can extend and support existing resources, while improving self-advocacy.⁴ The goal of my intervention was to create a sense of community and self-advocacy online, in addition to spreading awareness about resources such as SACHA and SVPRO, by promoting their events and educational content.

Objectives

1. Build an Instagram platform to spread education about sexual violence, foster a sense of community, and encourage self-advocacy
2. Support SACHA and SVPRO by promoting their resources, educational content, and events
3. Create and post infographics to break barriers that prevent people from accessing help, and inspire small actions for the change and prevention of sexual violence

Reporting

To achieve my first objective, I revived the Instagram platform @100in1actsofkindness to foster this previously established online community and continue their message. On this platform, people were encouraged to have open discussions about mental health, stay informed about virtual community events, and exchange ideas involving the cultivation of positivity during the COVID-19 pandemic. Overall, this project received 48 submissions of artwork and ideas for mental health relief, in addition to hundreds of likes and comments, indicating that it was helpful and offered a sense of community to those who participated.

To achieve my second and third objectives, I connected with SACHA and SVPRO to learn about the ways people are affected by sexual violence, what useful information could be given to them, and how the platform could be used to support their organizations. From the information they shared with me, I chose to focus on creating content to break the barriers that prevent people from seeking out help from SACHA and SVPRO. To achieve this, I created a collection of infographics to communicate credible research and spread information. This involved addressing misconceptions related to ‘reporting’ and ‘disclosing’ sexual violence, discussing helpline confidentiality, spreading awareness about these organizations’ events and resources, and collaborating with similar online initiatives to increase the reach of my intervention. In addition, these infographics referred to links for several free mental health relief resources that 54 people viewed during this project.

Ultimately, this intervention has effectively created a sense of community, spread educational information about sexual violence regionally, and has played a role in removing barriers that often prevent people from getting help.

Collaborators

I would like to first express my sincerest gratitude to Gabrielle Gonsalves and Thalia Quelal for giving me the opportunity to continue this intervention, which they started in 2020. I would also like to thank William Fujarczuk, the Education Coordinator from SVPRO, and Miranda Jurilj, the Community Education Coordinator from SACHA - two passionate experts who were kind enough to share valuable knowledge with me during this project. I would also like to thank Peter Topalovic, my course instructor; Atiya Iqbal, my Teaching Assistant; and Abbie Little, from McMaster’s Academic Sustainability Programs Office for their mentorship and feedback throughout this process. Finally, I would like to extend my appreciation to everyone who engaged and followed this project.

SUSTAIN 4S06

LEADERSHIP IN SUSTAINABILITY

SUSTAIN 4S06 is a final-year course where students gain leadership skills and apply them by working in interdisciplinary teams to develop and implement a sustainability-focused project within the community.

Dr. Kate Whalen
Course Instructor



"SUSTAIN 4S06 was a memorable experience of collaborating with the Hamilton community as well as being able to tackle local social and environmental issues within a small diverse team"

Titi Huynh
SOCIAL SCIENCES

From Farm to Food Bank

Student Authors

Anna Abu-Jazar, Social Sciences | **Fairuz Karim**, Science
Lauren Mascarenhas, Science | **Shelby Seymour**, Social Sciences

Community Project Champions

Dr. Kate Whalen, Senior Manager, Academic Sustainability Programs Office



SUSTAIN 4S06 student research team meeting over Zoom. From left to right: Shelby Seymour, Anna Abu-Jazar, Lauren Mascarenhas, Fairuz Karim
 Photo Credit: Shelby Seymour

Overview

Food insecurity is a pressing issue globally, with achieving food security being one of 17 Sustainable Development Goals established by all member states of the United Nations.¹ In Canada, almost one in seven households experience food insecurity.² In Hamilton, Ontario, a local student-led nonprofit organization, Meals with Purpose (MWP), has partnered with the Hamilton Farmers’ Market (HFM) to deliver surplus food from vendors to the YWCA Hamilton. Their partnership currently operates under limited capacity, with opportunity for expansion. This study aims to understand the perspectives and attitudes of MWP on further developing a sustainable food recovery and donation program. The goals of this study were to: (1) gain insight from MWP on recovering food from and facilitating a partnership with the HFM, and (2) present findings to inform evidence-based program evolution and growth.

Objectives

1. Identify perceptions of nonprofits on food recovery and sustainable partnerships
2. Research food recovery strategies of similar organizations
3. Share findings with project champions and stakeholders

Reporting

To fulfill our first objective, five members from MWP were recruited and interviewed on their experiences with food recovery and their partnership with the HFM. Our second objective was met through conducting an environmental scan of relevant food recovery programs within the Greater Toronto Hamilton Area.

Through qualitative thematic analysis, we identified one key theme of Supply and Demand, with two sub-themes of (1) Facilitating Supply of Food Recovery and (2) Facilitating Demand for Food Donations. These sub-themes highlight how a balance between supply of recovered food and demand of food donations is necessary for the development of a sustainable food program, which is described in further detail:

- 1. Facilitating Supply of Food Recovery:** eighty per cent of interviewees discussed effective communication, funding, vendor partnerships, and a strong volunteer base as key components for facilitating a sustainable supply of recovered food.
- 2. Facilitating Demand for Food Donations:** Meeting the demand for food donations and ensuring donated food is not wasted was brought up by 60 per cent of interviewees. They felt that increasing donation partnerships within the community and enhancing community accessibility were important for facilitating sustainable demand of food donations.

To achieve our third objective, we presented the findings to the executive team of MWP. Additionally, our group and the Vendor Student Group (p. 35) developed a collaborative presentation to share with MWP, CityLab Hamilton, and the Hamilton Farmers’ Market. This allowed for in-depth discussion to support the growth and evolution of the MWP and HFM food

Collaborators

Thanks to the MWP team for their continued guidance and participation in this study. It is because of their mentorship, constant feedback, and time commitment throughout this project that we were successful. We would also like to thank Dr. Kate Whalen, our instructor, community project champion, and the Senior Manager of the McMaster Academic Sustainability Programs Office. This project has been an enriching experience for all our group members and has filled us with a sense of pride that we are able to give back to the Hamilton community knowing it has given so much to us as students.

Market Vendors' Views on Food Waste and Food Donation

Student Authors

Maiura Muralitharan, Science | **Titi Huynh**, Social Sciences
Farnaz Keshavarz, Social Sciences | **Sara Tamjidi**, Science
Garwane McIntosh, Science

Community Project Champions

Bill Slowka, Hamilton Farmers' Market Manager
Elly Bowen, Hamilton Farmers' Market Board of Directors



Fresh produce from one of the vendors in the Hamilton Farmers' Market.

Photo Credit: Picture Retrieved from Facebook. Hamilton Farmers' Market

Overview

Canadians waste nearly \$31 billion of food annually,¹ yet foodbank usage in Canada has increased.² As of March 2019, Downtown Hamilton was experiencing the second-highest per capita food bank usage in Ontario.³ Increasing the availability of local nutritious food, and addressing food insecurity, are Hamilton's priorities.⁴ Hamilton Farmers' Market (HFM) is home to over 50 small businesses and is a central location for food distribution.⁵ The HFM Board articulated vendors' difficulty with selling all their products, inevitably resulting in increased food waste.⁶ This issue was exacerbated by the city's COVID-19 lockdown, which resulted in reduced foot traffic in the market. Undertaking a food recovery program at the HFM would help reduce food waste and food insecurity in Hamilton. As such, we aimed to identify Market vendors' views on food waste and donation and share our findings with stakeholders to support the continued efforts of co-developing a sustainable food recovery program.

Objectives

1. Understand Market vendors' perceptions towards food waste and food donation
2. Identify key themes in the data regarding opportunities and barriers
3. Share findings to support food recovery in Hamilton

Reporting

To satisfy our first objective, we collaborated with the HFM to recruit and interview three Market vendors about their perceptions. We learned that vendors acknowledged the importance of addressing food waste and food insecurity within the Hamilton community.

We identified two, overarching key themes through our interviews. First, vendors highlighted short shelf-life and inconsistent demand as realities contributing to food waste and food donation. Shelf-life references how long food items remain fresh and emphasizes the time constraint in being able to donate items before they become waste. Similarly, inconsistent demand creates added food waste, which stems from decreased foot traffic due to situations such as inclement weather and COVID-19 lockdowns. Second, vendors emphasized the importance of proper transportation and storage, as it determines whether the fresh food will become waste or food donations. In summary, shelf-life and inconsistent demand are uncontrollable and recurring complications that the vendors will face, while transportation and storage of the food can be actionable strategies to influence whether this food is donated or wasted.

We shared our findings with our HFM project champions and other stakeholders. We hope that our findings are valuable in supporting continued discussions and collaborations, which are fundamental to addressing food waste and food insecurity in our community.

Collaborators

Thank you to our community project champions, Bill Slowka and Elly Bowen, for their support, guidance, and input from project inception to the study's end. Thank you to our course instructor, Dr. Kate Whalen, without whose words of encouragement, guidance, and continued constructive criticism, we would not have been successful in seeing the successful completion of this project. Her mentorship throughout the term to each group member was invaluable and greatly appreciated by each of us. Finally, we thank all the Hamilton Farmers' Market vendors who participated in the study and took the time to engage with our group and provide their thoughts and perspectives to benefit the Hamilton Farmers' Market and their local community.



Sustainability Internship Program

An opportunity for undergraduate and graduate students to receive academic credit (undergraduates) or recognition (graduate students) for their self-directed learning

McMaster's Sustainability Internship Program was created in 2009 in collaboration with students and faculty members aiming to support students in the practical application of their theoretical knowledge. The program was expanded in 2021 to include graduate students.

PROGRAM OBJECTIVES



Support all Faculties in providing opportunities for undergraduate students to gain academic credit for experiential learning



Foster collaboration between students, faculty, staff, and the broader community



Highlight the achievements of students who have successfully completed their sustainability internship



"The Sustainability Internship felt like a gift. I was able to work with inspiring student leaders, learn from passionate supervisors, connect academic theory to meaningful action, and experience the benefits of deep self-reflection."

Shunmathi Shanmugan
ARTS & SCIENCE

Sustainability Internship Program

Year in Review

Reporting

The Sustainability Internship was originally developed to support the functions of academic departments across campus in their efforts to support their undergraduate students' self-directed, experiential learning. Undergraduate students pursuing independent study, capstone, experiential placement, and inquiry courses, to name a few, can obtain additional support from the ASP office.

This past year, we expanded the program to include graduate students. While not receiving academic credit like undergraduate students do, graduate students have a similar opportunity to engage in supported independent study, produce meaningful work, and receive a letter of reference. Expanding the Internship Program to include graduate students also satisfies our previous efforts to better integrate our intentions of the previous Graduate/Undergraduate Collaboration in Experiential Learning Program.

Through annual revision and enhancement, the Sustainability Internship Program has evolved over the past 11 years and has supported more than 54* students in their experiential learning at McMaster.

This past year, two students took part in the Sustainability Internship Program:

- **Shunmathi Shanmugan** focused her 4th-year Arts & Science thesis on understanding how to advocate for systemic climate action through meaningful community engagement. Findings from Shunmathi's experiential learning are included on page 38.
- **Jordan Sullivan** focused his 4th-year Engineering & Society Inquiry project on understanding how climate model accuracy correlated with climate change policy in Canada. Findings from Jordan's project are available upon request.

Collaborators

The Sustainability Internship Program is made possible through collaboration with Faculties from across campus, and with support from faculty, staff, community members, and especially the students who devote their time and energy into self-directed, community-based, and experiential learning about sustainability.

The individual student interns designed, developed, and created fantastic work through their self-directed learning. Integral support was provided by their respective academic departments, as well as the students' academic supervisors, community project champions, and project mentors.



Brighter world banner located on campus along Scholars Rd
Photo Credit: Georgia Kirkos

* Includes Sustainability Internship students and GUCEL students.

Systemic Climate Action through Meaningful Community Engagement

Student Authors

Shunmathi Shanmugan, Arts & Science

Academic Supervisors

Dr. Jim Quinn, Professor, Department of Biology

Dr. Kate Whalen, Senior Manager, McMaster's Academic Sustainability Programs Office



Poster announcing MacDivest's first community-building session.
Photo Credits: Caroline Bredin & Bethel Samson

Overview

Climate change is the single largest threat to our society, and it is caused in large part by the extraction and burning of fossil fuels.¹ Fossil fuel divestment (FFD) emerged as a global movement to help address climate change.² While some groups present other investment approaches to address climate change, this project focuses on divestment advocacy and importance given the recent interest in FFD among students, staff, and faculty in higher education institutions (HEIs), including McMaster.³ In response to calls for FFD, McMaster initiated a FFD advisory group*, joined responsible investing partnerships, and more.⁴ To support university administration in creating and committing to a clear divestment and reinvestment plan, and to promote a positive and justice-centered understanding of FFD, McMaster advocates are working to inform students about FFD. The goal of my project was to create positive spaces for students to learn, collaborate, and act.

Objectives

1. Research best practices for FFD in HEIs
2. Enhance student engagement in FFD and climate justice
3. Build student community bonds on climate justice through intentional events

Reporting

I began this project by reviewing case studies of FFD in HEIs, which revealed that institutional connections to the fossil fuel industry and preferences for business-as-usual are common barriers to divestment.⁵ Keys to success are the persistent advocacy efforts of students, such as building a FFD-aware student culture and escalated, peaceful demonstrations, with a call for intentional and deliberate divestment.⁶

To achieve my second objective, I focused on collaboration to help build a FFD-aware student culture. I supported existing student and faculty groups working in this space. I led the planning and facilitation for three events - a community building session, a Q&A panel discussion with MacGreenInvest faculty members, and a town hall pre-demonstration event.

To enhance my experiential learning and achieve my third objective, I volunteered as the Research and Community Coordinator for MacDivest and Co-lead for the McMaster Climate Strike event planning team. I worked with student leaders to add intentionality to events through practices such as establishing group guidelines, actively engaging participants, and following accessibility recommendations. Through my experiential learning, I achieved my goal of building positive spaces for students to learn, collaborate, and act by supporting and building upon the important work of existing communities. My future goal is to help build bridges between stakeholders with differing perspectives and competing interests so that we can work together to address the societal threat of global climate change.

Collaborators

Thank you to my thesis supervisor, Dr. James Quinn, and my Sustainability Internship supervisor, Dr. Kate Whalen, for their support and guidance. Dr. Quinn taught me unique lessons on grassroots advocacy and resilience in climate justice work. Dr. Whalen helped me leverage my curiosity and experience for deep and meaningful learning. Thank you to the professors of MacGreenInvest for advocating for FFD and green reinvestment at McMaster and supporting students. Thank you to the student leaders of MacDivest, Mac Climate Advocates, Mac Climate Strike Core Team, and the other environmental student clubs for advocating for FFD, climate justice, and student inclusion. Thank you also to Deidre Henne for your contributions, insights, and perspectives.

* President's Advisory Committee on Fossil Fuel Divestment

Student Sustainability Ambassadors Program (SSAP)

A co-curricular program and community hub for sustainability-minded undergraduate and graduate students and clubs aimed to foster collaboration.

Created in 2020, SSAP is led by students in collaboration with the Academic Sustainability Programs Office and Hospitality Services to centralize sustainability initiatives on campus.

PROGRAM OBJECTIVES



Generate student awareness of and engagement in academic sustainability



Foster student leadership in sustainability through collaborative and active learning



Support students in their pursuit of sustainable action



"SSAP is McMaster's beating heart of students pushing for a just, carbon-neutral future."

Giancarlo Da-Ré
MSU President

Student Sustainability Ambassador Program (SSAP)

Year in Review



Authors: Abbie Little, Community Engagement Coordinator and SSAP Co-advisor, Academic Sustainability Programs Office, and Liana Bontempo, Wellness and Sustainability Manager and SSAP Co-advisor, Hospitality

Reporting

To foster collaboration amongst sustainability-minded students, the Academic Sustainability Programs Office and Hospitality Services worked with students and student clubs to develop SSAP.

We obtained funding to hire a student coordinator, Erik Jurriaans, who created, launched, and monitored the SSAP Facebook group from September 2020 to April 2021. To generate student awareness and engagement, Erik facilitated online discussions, personal communications with students and club executives, shared content with McMaster social media accounts, presented in classes, and spoke to first year students through Archway. As a result, the SSAP Facebook group grew to over 150 students, representing every Faculty and the Arts & Science program and every level of study.

To foster student leadership, three virtual collaboration events were planned and implemented to bring together student club executives, as well as the general SSAP community. These events brought together over 15 different student organizations, which improved the understanding between groups of each other's work and roles on campus.

To support students in their pursuit of sustainable action, SSAP led two events. In February, SSAP co-hosted a political advocacy letter writing workshop for 17 students. In March, Erik interviewed the Director of Engineering Operations so SSAP members could better understand McMaster's carbon footprint, a recording of which was viewed over 70 times. These events were created to provide students with a greater understanding of sustainability and provide them with skills to act in their communities.

Thanks to a McMaster Students Union (MSU) grant, SSAP provided Special Project Funding, which was available to SSAP members. McMaster Climate Advocates (MCA) and the Cooperative of Indigenous Students Studies & Alumni (CISSA) successfully applied for funding to host a workshop on Indigenous waters, climate, and advocacy. SSAP's funding supported these two student groups in their leadership and sustainable action.

Looking forward, SSAP will work to expand on the community it has created in its first year. SSAP will continue to grow its student membership and facilitate collaboration between student groups. The team's vision is that SSAP will be a hub for students to connect, collaborate, share resources, and grow as sustainability leaders in their communities.

Collaborators

The launch and growth of SSAP this year has been incredibly rewarding. The successes of the program would not be possible without the amazing engagement of our student members and campus stakeholders. We thank the faculty and staff members for supporting SSAP as well as for supporting continuous program development. Our sincerest appreciation extends to the students who have contributed by joining the community and providing feedback for continuous improvement. Thank you to the McMaster Okanagan Charter Committee, Facilities Services, the MSU, and Eco Canada for funding this program in its inaugural year - SSAP would not have been possible without your generous support. Finally, a special thank you to Erik Jurriaans, for bringing this initiative to life and laying the foundation for the next group of SSAP leaders.



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SUSTAIN 2SS3

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SUSTAIN 3S03

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SUSTAIN 3SS3

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SUSTAIN 4S06

From Farm to Food Bank

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