McGill's Living Lab

A database of sustainability-focused
Applied Student Research (ASR) projects

From Footprints to Action: McGill Living Laboratory Project

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TD Go Green Challenge

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Introduction: Culture of Urgency

Just over a month ago, the delegation of the 15th United Nations Climate Change Conference met to discuss our collective carbon footprint. With the nations of the world gathered in Copenhagen, the sceptics were quick to point out that the level of international cooperation required to address an issue like climate change is without precedent. The future climate change scenarios are highly uncertain, the potential costs are enormous and inequitably distributed among regions, and the effectiveness of a top-down policy intervention is unknown.

As the critics predicted, the meeting in Copenhagen experienced the same unfortunate outcome of many previous international meetings. Over a decade after Kyoto, a political stalemate has resulted from pursuing the same, stale questions: What emission reduction targets should be set, and how will they be monitored? Who should take the economic and political responsibility for decarbonising the world economy, and how will it be delegated?

A month has passed since the summit, and with practically no effective policy to show for it, the faults of the international treaty process have been underlined yet again. When dealing with environmental 'collective action' problems, it seems that our political institutions are insufficiently effective and participatory. Their choice of policy tool - a top-down global agreement – assumes that mitigation can be achieved by setting time-specific and mutually verifiable reductions, similar to those used in the Montreal Protocol to address the problem of atmospheric ozone depletion (Prins & Ranyer, 2007). More specifically, the Montreal Protocol set the framework for controlling ozone depletion through a straightforward technical solution; an agreement with the corporation which owned the intellectual property rights for the substitute for the CFCs in question. The Protocol is rightfully regarded as one of the most effective international environmental treaties ever formulated. Despite this resounding success, it is naïve to assume that the effectiveness of these accords is easily transferable to our current predicament, as our global carbon footprint is not nearly as easy to isolate. As Prins & Rayner (2007) point out:

> "Climate change is not amenable to an elegant solution because it is not a discrete problem. It is better understood as a symptom of a particular development path and its globally interlaced supply-system of fossil energy. Together they form a complex nexus of mutually reinforcing, intertwined patterns of human behaviour, physical materials and the resulting technology. It is impossible to change such a complex systems in desired ways by focusing on just one thing."

In light of this challenge, the top-down reforms typically associated with the international treaty process no longer seem appropriate. Despite the international political stalemate, a groundswell of support has started emerging among citizens around the globe. In an investigation of public support for a 'carbon pollution reduction scheme' in Australia, Akter et al. demonstrated that the political support required to mitigate the effects of climate change does not rely on how severe the impacts will be if nothing is done to prevent it. Instead, "it depends on the extent to which the impacts can be prevented if mitigation measures are put in place" (Akter et al., 2009). Simply put, citizens are more likely to support political policy and actions to mitigate our carbon footprint if they believe it will work.

Having recently turned the corner on a new decade, this proposal has stemmed from what can only be described as a culture of urgency amongst my peers. While closely following the Copenhagen discussions from our university campus, the reaction from my student peers to our political leaders' actions was fraught with pessimism. Facing gridlock in the international realm, we were filled with overwhelming scepticism surrounding the international treaty process and a burning desire to make up for it by taking immediate action ourselves.

So this is what we are left with: The future scenario under climate change is complex and riddled with uncertainty. With no historical precedent, policy effectiveness is largely unknown. **Political leaders are looking for successful precedents that are politically tractable, but tried and true examples are difficult to find. Being critical of our elected officials, students like myself are eager to make up for a process that they perceive to be insufficiently effective, participatory and transparent; whereas the general public is motivated more so by the likelihood of our efforts being successful than the risks involved in not acting.**

The most important thing to note is that these perspectives are not isolated to the issue of our carbon footprint; rather, they are directly applicable to our ecological footprint as a whole. Instead of treating environmental sustainability as a static outcome, it must be taken on as a process, wherein institutions (in the broadest sense) with trusted and proven experience are given the opportunity to continuously set the example at a scale that will be effective.

The Project

When thinking about social change, t*he* issue of reducing our ecological footprint *in Canada* is particularly difficult as a result of *distantiation*, the process whereby technological progress has made distance/ has distanced the consequences of our lifestyle in both time and space. Whereas many developing countries predominately depend on sources of fuel and energy that have an immediate effect on human health at locally sale (e.g. burning of biomass, dung), our hydro-electric dams are thousands of miles away, our oil tens of thousands, and the consequences (e.g. climate change, exceeding global carrying capacity) are not in our back yard; they are global. Beyond these spatial distances, there is also a considerable time lag between these technologies and their impacts. Although some regional consequences of our energy sources are very much present today (tarsand-indigenous and hydro-indigenous relationships come to mind), the larger and more global outcomes will be brought to bear predominately on future generations.

As an aggregate measure, the ecological footprint was designed to resolve the effects of distantiation. In many ways, it has become an effective tool for communicating the required amount of natural resources to uphold a given standard of living. However, it can be difficult to sustain human motivations of 'doing less bad'. Instead, this project aims to connect people's decisions with their subsequent ecological impact, while producing fulfilling experience that also contributes to a profound social purpose. More specifically, this project seeks to develop an ever-improving relationship with our natural world through a dynamic process of teaching, learning and action, while reducing Canada's ecological footprint.

Broken into three discreet but connected parts, our vision is to create a process that people want: a concrete example of a project and process that works, which can then be exported to communities across the country.

Phase One: The Living Laboratory

Our vision is to have students, faculty and community partners from a variety of complementary backgrounds re-design a campus building and its surrounding landscape into a model sustainable living and learning environment. Thus, the first phase requires the revitlization of the Glenaladale building on McGill's MacDonald Campus, retrofitting the unused space into a 21st century LEED or equivalent certified sustainable dwelling. Bringing together the schools of architecture, urban planning, and environment at McGill, the initial phase would be a learning process in it of itself, using an innovative pedagogical technique known as applied student research (ASR) to unleash the creative powers of McGill's students in the innovative and exciting design project.

Broadly defined, ASR refers to:

> "research that (a) is conducted ... with the goal of informing and affecting school, community, and/or global problems and issues and (b) contributes to the positive development of a variety of academic, social, and civic skills [in students]" (Rubin and Jones 2007, 363).

More specifically, ASR is "a collaborative approach to inquiry or investigation that provides people with the means to take systematic action to resolve specific problems" (Stringer, 2007, 8).

Built in 1907, the Glenaladale building is currently vacant and collecting dust on the McGill's MacDonald Campus. Propelled by students in what will become an applied student research project, the design and retrofitting process will contribute to the development of hard skills in sustainable design for students in their respective academic departments. The process thus exhibits a dynamic learning opportunity in which students can both further their own learning about sustainability and create a building which will reflect these same values to its future occupants and visitors.

In addition, master students and professors from the environmental impact department would be tasked to design a method of monitoring the nature-culture interactions of daily life in the building. Designing a system to include energy, water and electricity consumption, as well as social factors such as recycling and composting rates, masters students and professors will be tasked to create an accessible means of witnessing one's ecological impacts, real-time. Serving as a motivating force for the eventual occupants, all of this data will be accumulated and presented on strategically placed virtual dashboards (screens) throughout the building. Encouraging environmentally sustainable behaviour, real-time access will help to reduce the effects of distantiation in one's day-to-day actions. To ensure this information has maximal impact, consumption rates will be made available online, allowing the global community to have real-time access.

After completing the designs, the proposals would then be presented to the relevant university and municipal bodies responsible for the area surrounding Glenaladale, and adapted accordingly. As a result of the recently instituted Bill 17, an act respecting contracting by public bodies, the construction phase would have to go out to public bid and is therefore not discussed in this proposal.

It is important to reiterate how the method will ensure indefinite reductions to Canada's ecological footprint. By allowing students the opportunity to apply their environmental expertise in a meaningful project, the enthusiasm and empowerment that can result should not be underestimated. Building momentum for the environmental initiatives of the future, students will build a sense of capacity required to take on the large societal changes that we now must face.

Phase 2: Urban Sustainability - From footprint to action

Once the retrofitting process is complete, the next step would be to establish an annual field study semester in which students and visiting professors would live and learn in the newly revived building. The foundation of the field study semester would be a 15-credit intensive project-based learning course, entitled "Urban Sustainability: From Footprint to Action". Similar to the design process explored in phase 1, the course would be founded in the values of ASR, allowing student to see learning and action as one fluid and mutually supportive process.

The course designers will use one guiding question to ensure success: How can we create a fulfilling experience for participating students that also contributes to the profound social purpose of reducing society's ecological footprint?

For this to occurs, the course will be built on 4 major principles. (1) *Attunement* –Striking a balance between scope and success, students will be encouraged to think big, while working on meaningful projects within that are within their collective capacity to influence. (2) *Autonomy* – Students will be given the opportunity to practice their creative potential in realizing practical solutions, while establishing a clear relationship between actions and results, a vital factor ensuring that one's efforts contribute to one's sense of fulfillment. (3) *Consistency* - Students will have the opportunity to unite theory and action (made simple by the conscious design plans explained in phase 1) and will be provided the opportunity to live by their environmental principles full-time as opposed to just when it is convenient. And (4) students will learn to be *dynamic*, providing students with the ability to adapt to the realities of constant change.

Course design:

At the beginning of the semester, students would take a few short intensive courses, followed by an internship experience. Both the courses and the internships would be geared towards fuelling the collaborative ASR project throughout the semester. This project would be used to investigate a specific environmental issue in the university community, and would be expected to significantly reduce the ecological footprint of the area in concern. To maintain a degree of focus, the projects will be designed to be client-based, meaning that students would work extensively on specific parts of the university community each year, slowly but surely redirecting the entire campus towards its aspirations for sustainability. With the annual projects building off of one another, the model demonstrates a practical means of gradually but effectively altering the path of not only the university community, but also the wider community.

For example, suppose the field-semester took on the McGill Food Dining Services and McGill Food Systems project as a client. Reducing the ecological footprint of McGills food cycle would be a powerful means of engaging all students, as regardless of their ecological awareness, social group, and/or political orientation, everybody needs to eat.

After completing their internship and preliminary coursework on the issue of food, the field-semester students would be prepared to engage in their project. Using their knowledge and community engagement to fuel the process, field study students could put their energies into transforming the story of food on campus to become one of self-sufficiency. The menu could be set by a group of students with a background in Nutrition and Dietetics, who have rigorously researched a healthy, seasonal and delicious combination of foods for one to choose from. Studied and administered by agricultural, environment and urban planning students alike, a significant amount of the fresh produce could be grown at the Macdonald Campus Farm, the campus greenhouse, and at the urban gardens of the Downtown Campus, providing living examples of agricultural systems in harmony with their natural local surroundings. Designed by engineering students, the unused stalks could be used to provide energy to the greenhouse, and the preparation waste could be composted on site for the next growing season. In the end, every step of McGill's food system would become intentional, efficient, and sustainable and the process in which it was accomplished would contribute to the academic development of the students who helped produce it. In the end, such a project would result in a system that students and professors are excited to study, staff and administrators are enthusiastic to run, and all campus members are proud to eat from.

By actively engaging in the ecological footprint model (as opposed to just passively learning about it), and focusing on projects that affect change in real time and immediate reality of the university campus, the students efforts would both reduce the footprint of the university community and produce valuable knowledge and experience for other communities around the country. Thus, through the field study semester, students could creatively reshape a culture of sustainability at McGill, while providing a motivating and effective way to reduce our ecological footprint.

Phase 3: The University - A leading institution

In the first two phases, we outline how, through the concept of living laboratories and ASR, the modern university presents an incredible opportunity for addressing the deep-seated societal issue of our ecological footprint. Instead of merely publishing and teaching sustainable solutions, these lessons can be applied where they are developed. In addition, by establishing an interactive link between academic teaching and research, and the real operational issues of our campuses, these models can also reduce the university's costs, support its academic mission, and improve its infrastructure. As noted by the Canadian Roundtable on the Environment and the Economy, universities are well suited to (a) "convene academic disciplines on large, complex issues, mobilize resources, {and} create incentives and programs" and (b) to "…support practical applications of sustainability." (ibid)

Further, and most importantly for the larger aims of this proposal, many of the problems in the university's own operations mirror those issues faced by society as a whole. **Where better to**

test the critical ideas, approaches and technologies needed to meet these challenges than within the university community itself? The "educational, research and public service roles of universities enable them to be competent, effective contributors to the major attitudinal and policy changes necessary for a sustainable future…and most importantly, to lead by example**."** (ibid)

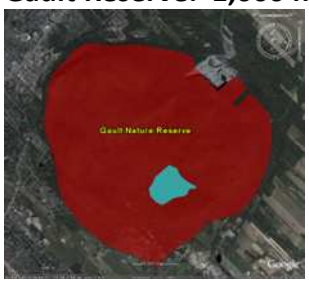
Indeed, McGill University does resemble a small city, making it well-suited for a pilot study for broader issues faced by our regional governments

- 2 main campuses (Downtown, Macdonald)
- 40,000+ occupants
- 263+ buildings, 30,300+ rooms, 780,000+ sq.m.
- Other properties: Morgan Arboretum (245 ha); Nature Reserves including Gault (1,000 ha), Penfield (188 ha), and Molson (51 ha);
- Other: Bellairs Research Institute Estate (Barbados), Sub-Arctic Research Station (Schefferville, QC), McGill Arctic Research Station (Axel Hieberg Island, NU)

Downtown: 36 ha

Macdonald: 650 ha

Gault Reserve: 1,000 ha



Glen: 17 ha

Providing the platform for developing and testing solutions for our own campus, in turn, the university can provide the same services to society at large. By developing practical and effective methods of reducing the collective ecological footprint of the institution, extending our work beyond McGill will be a major measure of success for the project. It will occur in several ways:

First and perhaps most obvious, McGill will set the precedent for other Canadian universities, making publically available the ideas and resources developed in first two phases. Second, students will be required to collaborate with community members in phase 2, pushing the ideals espoused in the project to the immediate community. Third, the project will educate and socialize the leaders of tomorrow, resulting in the broader mentality shifts that will be required to induce widespread change. Additionally, allowing future community leaders the opportunity to be a part of successful change will likely fuel students' future environmental undertakings. Finally, as the field study semester matures over time, the scope of the student projects could be extended to the municipal and regional levels.

Buy-In: Support and viability for this project

Internal Buy-In

Perhaps the most rewarding part of our research has been the overwhelming show of support by key individuals from across the university. The project has been met with enthusiasm, as details in both in the pedagogical and logistical areas of the project have advanced significantly.

Pedagogical support

McGill School of Environment (MSE)
As the overseer of this project proposal, the MSE's academic coordinator of undergraduate research has demonstrated the schools support for the realization of the project. More importantly, the Director of the MSE has committed to further developing the project's vision, and has offered to coordinate the administrative responsibility for the eventual implementation of the field study semester.

In a brief survey given to an MSE introductory course by the administration, 80% of students said they were *definitely* or *likely* be interested in taking the field study semester, with the remaining 20% indicating a possibility of interest; no students said they not interested. The most cited response was a request for more information.

MacDonald Campus (MAC) Academics
Initial discussions with the Dean of MAC have proven to be positive, affirming his support for the field study semester. In a recent meeting of Department Chairs for MAC, the project-proposal has also been received substantial support. Enthusiastic that the academic process of this project would be driving its success, they subsequently asked for an executive summary to be presented to their deans.

School Of Architecture and Urban Planning
A senior professor from the school of architecture saw the first phase of this project as a very exciting and practical learning opportunity for his students, and committed to overseeing student design projects in the winter of 2010, with their design proposals being made available by summer 2010. In addition, a senior professor from the school of urban planning has expressed interest in investigating the place-based notion of sustainable living, with potential plans to incorporate these ideas into community-design plans.

Logistical support

Administration and Staff

After being briefed on the prospects of this proposal, the Director of Campus Space and Planning said that this was "best use for the building he had heard" after almost a 30 year career at McGill.

The Director of Academic and Administrative Services at MAC, the administrator in charge of the proposed building, has also been tremendously supportive since the beginning of this process and has provided the much needed information and access to the building. Very eager to see it put to good use, his enthusiasm and encouragement are representative of a larger constituency of MacDonald campus community members.

Additionally, we have been in regular contact with the Associate Vice-Principal of Operations throughout the process to ensure that the project remains within the scope and direction of the university's mission. An underappreciated necessity for success within McGill, this collaborative and transparent approach will ensure that the values and ideals so essential to the process are also maintained leading up to its development.

External Buy-In

Perhaps the most promising external partnership is with the Quebec Chapter of the Canada Green Buildings Council (CaGBC) who have expressed a keen interest in the project. Sending a representative to tour the building earlier this year, the CaGBC saw many opportunities for various venues for their involvement. Though they are not in a position to finance the project, they see a mutually beneficial relationship being formed based on a collaborative effort to promote the project and green buildings in Quebec. A concrete means of including the entire province, we believe this partnership will be extremely valuable for especially the architecture students, as they will have access to the expertise of committed and experienced LEED-certified architects.

Beyond the CaGBC, a private architect has already volunteered their time as an advisor to the project and the Canadian Centre for Architecture has requested proposals for the roles it could play in its realization.

Beyond building professionals, several community members have expressed their excitement for the possible realization of the project. Professors from John Abbott College and MacDonald High School, both located at MAC, have expressed their intention of exposing their students to the initiative once the first phase is initiated.

Funding

With regard to this project, there are considerable costs, not the least of which would be the renovation of Glenaladale building. Beyond phase 1, professors need to be hired to coordinate the field study semester, and scholarships would be useful to help students cover the increased operating costs of the program, particularly transportation and laboratory assays.

Potential Sources of Funding:

McGill Sustainability Projects Fund

This january, the McGill Sustainability Projects Fund was created with the purpose of facilitating effective and coherent planning, financing and implementation of projects that promote sustainable practices at McGill University. Over the following three years, the fund will raise approximately 2.5 million dollars, accessible to students and faculty. With the purpose of the fund being to fully finance or provide seed capital for dynamic and innovative sustainability projects, it will allow projects to be implemented more quickly and effectively than might have otherwise been possible**.** Expected to both enhance a culture of sustainability at McGill and encourage broader involvement in sustainable practices and initiatives, our project is very well suited to this fund.

Donor Fundraising through MacDonald Development and Alumni Relations (MDAR)

The MDAR team, including its director, have been active in furthering this project from first contact, including the organization of building tours for internal and external stakeholders. Moreover, if the proposal is approved, they have indicated that their team can take on a substantial amount of the fundraising responsibility, citing the many donors they have expressed interest in contributing to a creative project furthering McGill's actions on sustainability.

Government

In 2009, precedents were set at the federal level for university infrastructure and green building projects, including the nation-wide knowledge infrastructure fund. In addition, the federal government set a recent precedent by contributing nearly half of the million-dollar bill for the LEED certified John Molson School of Business building at Concordia University.

Conclusion

Reducing Canada's ecological footprint is one of our nation's most trying tasks. Requiring commitments from all members of our society, it is our firm belief that it is the modern university that wields an underutilized potential to propel profound social change. By moving forward on the project outlined in this essay, McGill University could further its role as an agent of change in our society. In the coming year, we will continue working on this project with hopes of witnessing its realization in the near future.

Letter of Support

McGill

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January 15, 2010

To Whom It May Concern:

Through this letter I would like to indicate my strong support for the proposal for the TD Go Green Challenge proposal being submitted by Jonathan Glencross, Dana Lahey and Anastasia Pokholok.

As Director of the McGill School of Environment, I am extremely excited about the possibility of developing a field study semester based at McGill University where students have non-traditional learning experiences that allow them to actively engage with professors in projects that will make our local environment more sustainable.

I have had regular contact with the students who have prepared this application, and have represented their interests to my colleagues and to the Dean of the Faculty of Agricultural and Environmental Sciences. The concept of renovation of one of our buildings ("Glenaladale") is consistent with goals of the Campus and the MSE, and I am extraordinarily impressed with the progress that the students have already made in terms of lining up other students, professors and outside experts to help in the conceptualization and design phase.

I wholeheartedly support their application, and acknowledge that the McGill School of Environment will do whatever we can to help this project come to fruition.

Yours sincerely,

Marilyn E. Scott

Marilyn E. Scott, Ph.D.
Director, McGill School of Environment

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