

Environmental Auditing Strategy for Sir Wilfred Grenfell College

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Overconsumption has caused environmental degradation, while creating a dependence on convenience commodities. It is the disposal of solid waste which will prove problematic in the future with growing world populations requiring resources and the use of the land. Universities, as institutions of higher learning, have an opportunity to reduce their environmental impact through its daily operations. Adopting an environmental management system and creating an environmental policy is the means by which these institutions become sustainable campuses. Stewardship policies are developed for universities, such as Sir Wilfred Grenfell College by analyzing current consumptive practices of the students, faculty, and staff at the institution, often by way of an environmental audit.

Introduction

Overconsumption is the leading cause of environmental problems in the twenty first Century. Overconsumption being the unnecessary use of resources which could have had an alternative purpose. Developed nations are associated with this convenience lifestyle and excess use of resources. Through the use of a market-based economy, universities across North America are competing with each other enticing individuals to attend larger institutions. These institutions have more resources and choices available to the consumer, that is, the students. These universities are also associated with the generation of considerable amount of solid waste. Solid waste is an environmental problem which can be avoided through the use of effective management systems. Solid waste production uses many resources and when disposed utilizes the land so it can no longer be assessable for another purpose.

Sir Wilfred Grenfell College is a small institution and in total produces less solid

waste, uses less resources and less land for disposal at the College. However, the College is producing and consuming items which are associated with environmental degradation. The College uses products which similarly larger institutions utilize, such as energy, paper, coffee cups and hazardous chemicals in laboratories. Sir Wilfred Grenfell College is a smaller segment of Memorial University of Newfoundland and the institution could become a pilot project of sustainable initiatives for the larger campus.

As institutions of higher learning, there is a responsibility to initiate environmental awareness and education through daily activities. Especially institutions such as Sir Wilfred Grenfell College which offer unique programmes and opportunities for students to study sustainable development through environmental programmes. In order to exemplify the theories outlined in the classroom, effective management systems can guide the teachings through sustainable practices, such as recycling initiatives.

Oftentimes universities are motivated either through legislation or economics to reduce the amount of waste they produce and, subsequently, their motivation revolves around reducing the overall costs which may be burdening such an institution. Sir Wilfred Grenfell College is not presently pressured by either of these factors because no legislation exists in Newfoundland and Labrador with regards to solid waste disposal. There is no apparent necessity to reduce solid waste production because there is no limit or cost associated with disposal. As well, the cost of disposal is not even comparable to larger institutions in North America which are constrained by costs or legislation.

Sir Wilfred Grenfell College has a unique opportunity, not available to other institutions, to implement sustainable initiatives. Thereby, reducing their impact to the environment, noting they are not required to make these changes. Sir Wilfred Grenfell College offers several programmes, among which, Environmental Studies, Environmental Science, and Forestry, exemplify their commitment to preserving the environment for future generations. Education and awareness are essential for preserving the integrity of the environment and management initiatives can exemplify level of commitment.

Environmental management systems are an effective way of organizing and implementing more sustainable practices into the daily operations of any institution, such as a university or college. Examining current practices and setting targets of improvement are the way in which these systems succeed. Also, by reviewing the practices employed by other universities or institutions of higher learning, the College can implement the practices that have had a positive impact on reducing the amount

of waste generated by such institutions. An environmental audit will provide an assessment of the current practices at Sir Wilfred Grenfell College and it will develop standards necessary for improvement.

SECTION I

What is Environmental Auditing?

As we move into the twenty-first century, environmental issues are of a pressing concern for most individuals and consumers. Some corporations have also moved into the 'green' light by adopting more sustainable practices and voluntarily setting environmental regulations within their management systems. Environmental Impact Assessments were once mandatory for organizations taking on large projects which may have unknown consequences towards the environment. After an Environmental Impact Statement was completed and the project was under way, a post audit was suggested so that the possible effects could be identified and mitigative measures taken to ensure the viability of the local environment. Environmental auditing is one of several aspects of Environmental Impact Assessments. In 1969, the Environmental Impact Statement was first introduced in the United States as a requirement of the National Environmental Policy Act (NEPA) (<http://encarta.msn.com>, 2000).

Presently, Environmental Impact Assessments are not mandatory in Canada. However, consumers now require environmental consciousness among the corporations from which they purchase goods and services. Consumers would like to know that these goods have been produced in an environmentally friendly manner and,

subsequently, many companies have adopted an environmental management system. An environmental audit in this sense refers to the voluntary assessment of a company, corporation, organization, or institution's environmental performance and practices in producing the goods and services requested by the public. Environmental management systems are useful in creating competition among similar organizations within the current economic system. It is this current economic system of infinite growth, which is responsible for many of the global environmental issues. One of the environmental issues of pressing concern is related to solid waste disposal. With the increases in world population, there is an increase in consumption in many developed nations such as the Canada and the United States.

The goods we purchase are often of a disposable nature, thereby encouraging us to throw them away. These resources used to produce these disposable commodities may have been used for other products; that is, the opportunity cost theorem. These items are not only a poor use of resources, but they use much landfill space when their use has been fulfilled. Solid waste disposal is an issue, which needs to be seriously addressed. Many organizations have developed environmental management systems to address issues such as solid waste. An environmental audit will be able to identify the uses of commodities and how these items are discarded. An environmental audit in this sense is a voluntary approach of increasing magnitude in the economic sector. The audit will identify areas of concern and mitigative approaches will be suggested to remedy the situation.

What is ISO 14,000?

The International Standards Organization 14,000 series is relatively a new and dynamic approach to environmental management. It has been designed to meet the increased desire by managers and consumers to develop products through a more environmentally conscious manner. The approach is based on the concepts of sustainable development than the previous ISO 9,000 series. The ISO 9,000 series encourages improving the management of a company for more efficient and consistent production of goods and services. The concept of sustainable development involves managing the use of resources to produce the commodities demanded today. The ISO 14,000 series is about meeting the demands of the consumers, but also satisfying the needs of the organization itself.

The purpose of the international standard is so environmental regulations and legislation are met. These standards may vary from country to country, and within regions. The standard has been developed in such a way in that it encourages companies, corporations and institutions to develop their own set of regulations or targets which they would like to satisfy through the use of an Environmental Management System (EMS) and the ISO 14,000 series. The ISO 14,000 series creates a management system, which is modeled after the ISO 9,000 series (www.mgmt14K.com.14slice1.htm, 1999). Not only will organizations set their own objective goals they may wish to obtain, but they must also develop mitigative measures similar to those found within the Environmental Impact Assessments. These measures are no longer created to satisfy the possibility of a 'what if' situation for large projects, but rather the 'what if' situations of everyday operations.

Environmental auditing will ensure that such management techniques are in place and being used effectively. "It is important to remember that ISO 14,000 is not an add on-program. Nor is it about 'environmentalism' or being 'green'. An effective EMS is the consistent and systematic control of procedures or operations, products or services which can have a significant impact on the environment" (www.mgmt14K.com.14slice1.htm, 1999). The organizations or companies are the ones which develop environmental policy and state their objectives. This may prove problematic because the responsibility is on the part of the 'polluter'. There may be those organizations which do not want to improve their environmental track record and 'not pay' for pollution control. The ISO 14,000 series is based on other systems and it is not as complete or demanding that companies meet certain requirements or regulations. The only requirement is that the company strives for a higher standard and meets the goals, which they set in the beginning. ISO 14,000 involves the development of several primary steps.

The first step involves the development of an environmental policy. This is pretty much the stepping-stone for the other steps. A company or organization must establish their purpose and commitment to improving their management with regards to the environment. "The Environmental Policy is the documented statement of commitment from top management. This policy sets the overall EMS intentions of the organization and contains a commitment to prevention of pollution and to continuous improvements" (www.mgmt14K.com.14slice1.htm, 1999).

The second step, planning, is where the organization or company will determine their goals, targets and regulations that the

environmental management system plans to deter. Planning involves several aspects, including: environmental aspects, legal and other requirements, objectives and targets, and environmental management programmes. With regards to these steps an organization or company needs to identify activities within their operations. Environmental aspects would identify those activities a company undertakes and the conflicts which would ensue towards the environment. Legal requirements would be identified by the organization at this time. For instance, are there any restrictions on polluting operations carried out by a particular institution?

Thirdly, a company would need to develop targets and purpose for creating an environmental management system in the first place. Finally, a company will need to assess the appropriate environmental management programme for their needs in order to complete the targets initially set by the organization. The company needs to identify the means for carrying out the programme. (www.mgmt14K.com.14slice2.htm, 1999)

The third phase in the ISO 14,000 series is Implementation and Operation. The steps included in this section are: structure and responsibility; training, awareness, and competence; communication; environment management system documentation, document control, operation control, and emergency preparedness and response.

1. Structure and Responsibility involves identifying those individuals within an organization whose activities may have an impact on the environment and through what possible means these activities exist.
2. Training, Awareness, and Competence involves identifying and developing the training for individuals whose activities may have an impact on the environment.
3. Communication of the information

regarding environmental issues to the individuals performing tasks imposing a threat to the environment.

4. Environmental Management System Document involves obtaining the information with regards to the EMS, the alterations within this system, and the documentation of these activities. The organization also needs to identify how to control the documentation, what operations within the system, not caused by individuals, and the readiness of the organization to ameliorate any environmentally detrimental occurrence.

The ISO 14,000 series fourth aspect involves, Checking and Corrective Action. This section also identifies several steps, which need to be addressed in order to effectively carry out an appropriate Environmental Management System, including: monitoring and measurement, non-conformance and corrective and preventative action, records, and environmental management system audit. Monitoring and measuring is self-explanatory. There is the possibility for non-conformance within the system; such activities need to be identified which may mitigate a potentially destructive situation. Records should be well documented and occasional auditing is encouraged. An audit will identify any areas, of the environmental management system, which may not be operating as efficiently as planned. An environmental audit will determine the targets a company asserts to meet and subsequently what actions will better the situation.

The final aspects of the ISO 14,000 series are Management Review. The review of the environmental management system is used to identify the true efficiency of an organization's management scheme.

The International Organization for

Standardization (ISO) developed the technical committee for environmental management to determine the standards for monitoring the environmental effects. "It has developed more than 350 international standards for the monitoring of such aspects as the quality of air, water, and soil" (www.tc207.org/faqs/faqs_main.htm, 1998). The environmental auditing aspects are specific to the International standards in so much as to include the ISO 14,010; 14,011; and 14,012. These three areas have information pertaining to general principles, audit procedures, and qualification criteria for environmental auditors (www.tc207.org/faqs/faqs_main.html, 1998).

There are many benefits to choosing the ISO 14,000 system including: reduced costs associated with production, less pollution and amelioration of harmful activities, and an improved image to consumers. This system also allows for freedom to meet the varying needs of different companies or organizations, which require different standards. These companies may have to adhere to different regulations or legislation as may seem appropriate for the individual organizations. The environmental management system is used to determine these activities and regulations pertaining to such harmful environmental effects. The management of these activities minimizes these consequences. The benefits of these practices are that it acknowledges the commitment to sustainable development. The EMS reduces costs and encourages human stewardship towards nature and the unnecessary use of resources.

What are EMAS and BS 7750?

Before the introduction of ISO 14,000 there was an environmental management system already in place in the European Union

(EU) known as the Eco-Management and Audit Scheme (EMAS). There are some similarities and differences between the ISO 14,000 series and the EMAS- European system. There are these differences which amount for the new system being developed in the first place. The EMAS system is also used to determine the most appropriate management criteria. Secondly, the EMAS systems seriously consider the environmental policies during an audit. The system is based on constant figures already determined for a particular company or organization (www.isogroup.lserv.net/emas.html,1996).

However, the EMAS system is more critical over the management system, which is to identify those activities harmful to the environment. For EMAS the audit needs to follow a specific time frame, which will truly determine the effectiveness of the environmental management system. "Under EMAS your environmental management system must be audited for completeness and effectiveness at least once every three years" (www.isogroup.lserv.net/emas.html). The purpose of the audit during both systems is to determine if the system is effective and if there is room for improvement. For EMAS, the organization needs to formally report their performance and these activities are acknowledged through an external auditor. The system also has similar characteristics to other environmental management systems, including, BS 7750.

The Eco-Management and Audit Scheme (EMAS) is a regulation, developed to meet the needs and expectations of governments, citizens, and consumers in the EU Member States. Because EMAS has legal status within Member States, it can take a more prescriptive approach to environmental management issues; the ISO 14,000 standards, by contrast, rely on voluntary acceptance by all interested

parties, and therefore must maintain a balance between the needs and expectations of each of these parties (www.iso.ch/,1998).

SECTION II

History of Sir Wilfred Grenfell College

Sir Wilfred Grenfell College is located in Corner Brook, Newfoundland and Labrador and is an associated campus of Memorial University of Newfoundland. The school has several unique programmes not found in St. John's, including: Environmental Studies, Environmental Science, and Forestry. The population of Sir Wilfred Grenfell College is approximately 1,200 students, including; part time, full time, and Nursing students. Sir Wilfred Grenfell College consists of 5 buildings and relies on the infrastructure of the City of Corner Brook. This means that the College uses the existing waste and sewage disposal systems already established in Corner Brook. The College, therefore, does not assume responsibility for the waste it generates and it does not treat its waste prior to disposal. This background information is necessary in order to establish the system in which the College operates.

Current Solid Waste Disposal System and Recycling Programme

Sir Wilfred Grenfell College produces 4,940 cubic yards of garbage per year and the cost associated with disposal is around \$3,000.00 per year. The College collects 832 cubic yards of recyclable material per year and the cost to recycle is \$0. The University collects mostly cardboard and paper to recycle, and it does not collect drink containers to be recycled. This has occurred in the past when students have taken the

initiative to start the collection of containers, usually for a fundraising event. This activity is not, however, occurring at the College at the moment.

Nearly, every classroom, office, staff lounge, and residence common areas have bins for collecting recyclable materials. There are also two areas on campus where the janitorial staff would temporarily store materials to be recycled. These large bins are located in the Fine Arts Building and in the Arts and Science Building. There are 16 janitorial staff presently employed at Sir Wilfred Grenfell College, who are responsible for the collection of residuals. The staff are supposed to collect the recyclable materials from the offices, classrooms and other areas. They are not responsible for removing items already in garbage bins to be recycled, but they do remove refuse from what is supposed to be recycled. The attitude at Grenfell assumes that many times the recycled material is mixed with the refuse and not separated at all.

Sir Wilfred Grenfell College programme is lacking some fundamentals which could make this a more viable and economically competitive programme. There is no signage or advertising in place to encourage recycling at Memorial University. The recycling bins are not clearly distinguished from other refuse bins. The present system encourages consumptive and convenience disposal behaviour. Many individuals are not aware of the types of products, which are recyclable, and the University has not provided educational material to the general population. There is no composting programme and the cafeteria provides disposable dishware at the moment. There is no option of reusable dishes at the moment. The management of "Treats" says that his establishment uses nearly 1,200 disposable Styrofoam coffee

cups every week. There has been no waste audit carried out at Sir Wilfred Grenfell College, no environmental policy exists, and there is no standing committee to address these issues.

Current Purchasing Policies

Universities use an immense amount of paper over the course of a year, and Sir Wilfred Grenfell College is no exception. The College has purchased and used 10,909 kilograms of paper in the last 5 years and the cost was around \$200,000. This amounts to 2,182 kilograms per year at a cost of \$40,000; with each student consuming approximately 1000 sheets of paper per year. This number does not include the paper purchased and used by the students outside of the university. This basically amounts to photocopying and printing assignments. Presently, the University uses is 100% virgin, bleached paper and the photocopiers available for general use are set to only one-sided copying (Personal interview, Feb.4, 2001).

Environmental Attitudes Among Students at Sir Wilfred Grenfell College

Assessing environmental attitudes is essential in determining the necessity of an environmental management system. A survey of these attitudes will determine if the individuals and departments at Sir Wilfred Grenfell College will accept a sustainable policy and alter their actions according to the mandate outlined in such a policy. A test questionnaire (Appendix A) was used in an attempt to evaluate the attitudes of individuals at Sir Wilfred Grenfell College with regards to the environment and recycling. A test survey was completed to identify the types of questions which could be asked in a future

survey. The results of this survey will aid in proposing hypothesis to be statistically tested by such a survey. This test survey cannot be used as a valid survey or have any statistical significance because the sample is too small. Secondly, the test survey was completed using a convenience method rather than random or systematic sampling. Thirdly, the survey did not include those attitudes of faculty or staff which would be essential in a future assessment of environmental attitudes at Sir Wilfred Grenfell College.

The survey asked the respondents to evaluate the College's environmental policies and recycling programme, as well as their personal impact to the environment. Also, it asked the respondents to suggest mitigative measures, which could be put in place to reduce the College's and the respondent's personal impact to the environment.

The survey was used to create awareness among students about their personal actions and how they influence the natural environment. Every day we use products or resources without considering the true impact our actions have on the environment. Overconsumption is a root cause to many environmental problems, especially the production of solid waste. In realizing our personal influence on natural ecosystems there is an assumption that we would consequently act in a more environmentally friendly manner, thereby preserving the integrity of the environment for future generations.

The test sample consisted of forty questionnaires and was completed as a confidence sample of student attitudes. Initially, the sample was going to consist of only graduating students, however, the list containing the graduating students names did not contain a complete listing of local phone numbers, making it impossible to contact those on the list in a systematic or random

fashion. The survey was subsequently altered to include any and all students, regardless of programme or year of study.

The survey comprised of several questions identifying the respondent's attitudes and activities relating to the environment. (Appendix B). Many of the students surveyed have taken a course at Sir Wilfred Grenfell College dealing with environmental issues. These same students are likely to recycle at home and have a knowledge about which products are recyclable in Newfoundland and Labrador. The survey asked the respondents to acknowledge the amount of paper they used each week for class work; assignments, among others. The purpose of this question was to make these individuals aware of their own personal impact, and to place them in the larger scheme of paper usage at the College. The next question asked the respondents to identify where they are likely to have seen a recycling bin on campus; the majority cited the cafeteria as a location of a recycling bin. There is recycling available in the cafeteria, however, the bin is for beverage containers. Presently, this is an area which Sir Wilfred Grenfell College is not responsible for collecting. The College only collects paper and cardboard for recycling at this time, and the collection of beverage containers is primarily an activity left for student fundraising initiatives. The respondents identified paper as a large segment associated with wastage by varying departments at the College and recycling was an initiative which many individuals and departments have relied on to decrease their environmental impact. The respondents also showed their support for several mitigative measures which could reduce the amount of paper they use and the subsequent impact to the environment, including: passing in assignments via email, passing in assignments double sided, and

using paper containing recycled content. When asked what they would suggest Sir Wilfred Grenfell College do to be more environmentally friendly, the majority of respondents said to increase recycling and their own activities would include more recycling. The graphs of the results can be found in Appendix C.

The purpose of the survey was an attempt to develop questions which could assess the attitudes of the individuals at Sir Wilfred Grenfell College about environmental initiatives and recycling efforts. A future survey could exemplify the attitudes of the entire campus. The Administration of Sir Wilfred Grenfell College is supportive in improving their recycling initiatives and, subsequently, improving their environmental track record. The College has made improvements and commitments in areas other than solid waste disposal such as energy efficiency and prohibiting the use of pesticides on campus. However, the College could improve by encouraging recycling efforts on campus through an awareness and education campaign. Also, the College could provide more of an opportunity for individuals to recycle and to choose more environmentally friendly products; both are essential to reducing the overall amount of solid waste the College produces. Furthermore, the College could implement an environmental policy and an environment management system to monitor its efforts.

SECTION III

Sustainable Campuses Initiative

The new environmental movement has created change in the minds of many when it comes to thoughts on environmental issues. The media has been more involved in this new movement

and has created concern in individuals who were not otherwise aware of these issues. The world became more informed of climate change as the developed nations met for the Earth Summit in 1992. The hole in the ozone has become a common place of discussion in many households. For instance, we discovered the extent of deforestation in Brazil as images flooded into our living rooms. The average person began to realize their own personal influence on the environment and their consumption patterns are to blame. The last ten years, universities across North America began offering courses and programmes in environmental theory. With that said, universities have become a unique setting to objective thought and activism and are associated with inventive action to social crises.

Universities are involved members of the community and supporters of the local economy. They attempt to exist competitively within the markets and with other Universities. Universities would like to develop effective management plans, and this may include environmental and sustainable initiatives. These institutions are associated with these positive cultural changes, but often have failed to implement any of these theories into their own daily activities. For instance, Sir Wilfred Grenfell College's Environmental Studies and Science programmes embrace the theory of sustainable development by teaching this to the students but, until now, they fail to implement a sustainable development policy for the use and discard of products.

The Sustainable Campuses Initiative (SCI) is one of the positive changes universities and colleges are becoming a part of all across North America. Universities are realizing their stake in the environment as leaders of change. Several University Presidents signed a declaration stating their inherent concern

over the extent of environmental degradation. In 1990 several University presidents signed the Talloires Declaration, which resulted from a meeting in Tallories, France. This document claims the support of Universities as institutions of change.

We, the presidents, rectors, and vice chancellors of universities from all regions of the world are deeply concerned about the unprecedented scale and speed of environmental pollution and degradation, and the depletion of natural resources...these environmental changes are caused by inequitable and unsustainable production and consumption patterns aggravate poverty in many regions of the world. We believe that urgent actions are needed to address these fundamental problems and reverse the trends (Creighton, 1998, 291).

Examples of Sustainable Campuses in Canada

Since many universities across Canada are offering courses in environmental theory it would be natural that such institutions practice what they preach, by adopting sustainable development activities. The management system in which they operate needs to be refined to include more environmentally friendly initiatives. This can include, but not limited to, solid waste and recycling, water conservation, energy efficiency and purchasing policies. The daily operations of these institutions are impinging on the environment, concurrently, as they teach conservation, preservation and heritage of the environment to future generations of students.

A. Mount Allison University

Mount Allison (Sackville, New Brunswick) conducted their first

environmental audit to determine their current status in 1998. Since that time many changes have occurred, including the development of a campus environmental policy, passed in May of 1999 (Mount Allison- Environmental Trends, 2000, 1). Some of these positive changes have included: "...the use of energy and water efficient fixtures, the decision to use paper-saving digital copier machines, increased environmental course offerings, and the passing of an environmental policy..." (Mount Allison- Environmental Trends, 2000, 1). A second audit was conducted in the year 2000 to determine the extent of the progress. This audit looked at several areas including: buildings, energy, transportation, air, emissions from energy consumption, hazardous waste, solid waste, paper, food, water, finances, and education. The aspects of concern are those related to solid waste consumption and disposal. For instance,

Between September 1998 and September 1999, Mount Allison sent 305.7 tonnes of garbage to landfills, a significant increase from the previous year. The recycling program has not changed since 1998 and participation is still limited. A random sample of a day's worth of garbage showed that approximately 50 percent of garbage consists of materials that can be recycled in the current program (Mount Allison-Environmental Trends, 2000, 7).

The second audit also determined that the paper consumption at the university had increased, and the amount of food consumed also showed an increase in the 2000 fiscal year to 10,205.77 kilograms (Mount Allison-Environmental Trends, 2000, 8). The Board of Regents approved the Mount Allison University Environmental Policy on May 11, 1999 (Appendix D). The policy identifies the administration's commitment to environmental initiatives through the

minimization of harmful and unsustainable activities, but it lacks in any real know how. The policy is a basic outline of intentions, but it lacks the means to create change. The policy states for solid waste issues that, "the University will endeavour, under the supervision of the Department of Facilities Management, to minimize solid waste production"(Mount Allison-Policy, 1999, 2).

Sir Wilfred Grenfell College could use the examples from other schools to develop a more advanced environmental policy relating to solid waste. We must analyze what has worked in their policies and avoid repeating what has failed in the Sir Wilfred Grenfell College policy. Mount Allison's policy does, however, acknowledge the positive changes, which have occurred since the last environmental audit was completed in 1998. Universities should admit their improvements and successes in developing truly sustainable practices.

Solid waste at Mount Allison University comprises several aspects besides the actual refuse, including: paper, hazardous materials, and food. The audit identified how much waste had been produced, and the environmental significance to the creation and disposal that such waste would have on natural resources. The university is interested in reducing the amount of waste which reaches the landfill, or other more appropriate disposal mechanism. This can be done through several ways including, but not limited to, reduction at the site, reuse of materials which would ordinarily be disposed, and recycling those other materials which do not apply to those other systems. All of these options need to be considered in the future before further solid waste reaches the landfill, unnecessarily.

The Universities commitment comes from the assurance that the federal government

declared that solid waste in Canada must be reduced by the year 2000. "In 1988 the Canadian Government cracked down on the amount of garbage produced. A commitment was made to decrease solid waste going to landfill to 50% of 1988 levels by the year 2000 (Mount Allison-Section 4, 1998, 1). The audit of the solid waste stream also identified the areas of the university where the waste was generated. The composition of the refuse is of particular importance because once a source has been identified then a solution can be developed to minimize the impact of that source on the environment. The audit identified the specific items found in the waste. Once these particular items have been identified, then recommendations were issued. For instance, if one of the waste problems involves the overuse of virgin, bleached paper; the university subsequently adopts a policy which says the practices of the university shall move, from the default of virgin paper to one having at least 20% post consumer content. The university identified specific steps which various members of the university community can implement themselves. Those activities can be viewed in more detail in the attached appendix. The reasons for actually reducing paper consumption relating to the amount actually being used and the consequence this plays on the environment.

Four million, nine hundred, and twenty two thousand sheets of bleached, non-recycled paper were bought by Mount Allison University between May 1997 and April 1998. This translates to 1.22 sheets of every second that the school was up and running. Paper bought by the university contains no recycled content and only estimated 35-50% is recycled after being used (Mount Allison-Paper, 1998, 1).

Reducing paper consumption rates could

resolve many natural resource issues. Carbon dioxide has been associated with climate change, and trees are known to essentially clean the air. Changing our use of paper could mean a reduction in unnecessary wastage of trees, and virgin paper. The average individual does not think in this manner of associating their personal activities to environmental degradation. So the solution is through education and promotion of sustainable development programmes with alterations in behaviour.

B. University of Victoria

The University of Victoria in British Columbia greatly exceeds the population and magnitude of the Mount Allison campus. As such, the University of Victoria has a larger ecological footprint and a larger impact on the environment. Student, Roxanne Paul wrote the Solid Waste Audit Report (2000) and, as a result, her master's report is not officially published. The report had several objectives including evaluating management practices, and the identification of the composition of solid waste. The University of Victoria's recycling and waste reduction initiatives is a relatively new programme. "The UVic Waste Reduction and Recycling Program was officially established in 1996 in partnership with the UVic Waste Reduction and Recycling Committee (WWRC) which also oversaw waste management and recycling initiatives" (Paul, 2000, 2). The UVic's policy is more substantial and comprehensive than Mount Allison's University Policy. It includes specific solutions to harmful activities, which are responsible for environmental destruction.

The University of Victoria is committed to positive change so much so that it has included a section based on sustainability aspects. The sustainability

aspects have been adopted eight-fold, and they include: adoption of a waste plan, measuring and evaluating current behaviour on a regular basis, and the assigned penalties associated with these activities. There has also been an agreement to research and develop new and dynamic technologies towards solid waste disposal, minimize waste production, education, and an increased response towards environmentally degrading activities (Paul, 2000).

C. Dalhousie University

Dalhousie University (Halifax, Nova Scotia) is a large institution with many students and faculty consuming and disposing resources throughout the campus. Since the early 1990s Dalhousie has been supportive of environmental incentives and actions on campus. Dalhousie exemplifies environmental leadership through its own sustainable activities, and the University developed and implemented an environmental policy in 1994 (Clarke, 2000, 4). This policy considers issues and operations related to several facets of the University including: academic courses, research activities, working and educational environment, buildings and grounds and corporate operations (Appendix E).

Dalhousie considers those activities which degrade the environment, both internally and externally, to their management system. They are committed to environmental management and sustainable policies and the University has signed the Talloires Declaration (Appendix F) to show their level of commitment.

The School for Resource and Environmental Studies at Dalhousie University had students conduct a study of fine paper usages. Recycling initiatives are one of those activities which considerably

reduce the overall impact on the environment. Dalhousie has gone even further in being more environmentally friendly by assessing the ability to reduce or alter their waste stream. Graduate students Amelia Clarke and Joshua Campbell assessed the fine paper usage at Dalhousie as an aspect of their Masters thesis. They used the life cycle analysis concept to assess the production, consumption and disposal of paper, with an analysis relevant to Dalhousie University. Their research showed that recycled paper is one of the imperative practices which reduce the amount of waste generated by the University. "Purchasing only unbleached recycled paper is another practice that is viewed as a best practice. Numerous studies have shown that it takes less energy and fewer trees (up to 17-19 trees per tonne of paper) in making recycled paper than paper containing only virgin material" (Clarke, 2000, 9).

There are better alternatives to recycled paper and wood-free paper is the most estimable choice. There are hemp and straw-paper alternatives which use even less energy and land in the production phase. For instance, "one acre of hemp produces as much pulp as 4.1 acres of trees and the fibers can be recycled twice as many times as conventional wood fibers" (Clarke, 2000, 9).

The Administration of the University is mainly responsible for the choice over what type of paper the students, faculty, and staff will consume. Often the choice of what type of paper to purchase is based on the cost, and only recently have university managers considered the choice from a sustainable perspective. Recycling is only one initiative which reduces the amount of waste a particular campus produces. Many institutions are now considering their purchasing ability to reduce their impact to the environment, as well, reducing the actual

consumption of paper. The University of British Columbia has been cited for their environmental initiatives, and has an effective reduction strategy in place in hope of diverting unnecessary waste from disposal. The motivation for this University is due to the paper ban which exists in the Vancouver region.

The environmental review of fine paper at Dalhousie revealed "based on less conservative estimates and improved baseline data collected in 2000 it was estimated that 43,106,813 sheets of paper were distributed by Dalhousie's Administrative Services in 1999" (Clarke, 2000, 12). The paper used at this institution had a profound impact on the environment. If Dalhousie changed its practices of consumption to a paper containing some recycled content then there would be less of an impact to the environment and nearly 855 trees would be saved (Clarke, 2000, 12). This review considered the types of paper used at this institution and by what means it is consumed. Dalhousie has a comprehensive recycling programme, and regulations in Nova Scotia stipulate a charge on these sorts of items entering the landfill. There is a market for recycled paper in Nova Scotia, and the University avoided costs associated with shipping this additional waste to the landfills. The recommendations include: reusing paper, reducing paper consumed, and improving the present recycling programme in order to capture those materials still entering the landfill.

Dalhousie University may greatly differ in size from Sir Wilfred Grenfell College, but the environmental impacts are similar. Universities are institutions which consume large amounts of paper, and any effort to reduce the amount generated and disposed is lessening the overall impact on the environment. The College could follow

policies such as Dalhousie's in order to create its own unique sustainable policy. Policies and management frameworks, which reduce the waste generated, also lessen the impact the College has on the environment.

D. University of Waterloo

Environmental initiatives have been associated with the University of Waterloo (Waterloo, Ontario) for several decades, and they are commonly associated with more experience of solid waste issues and environmental activism. The Alternatives Journal is published there and they have a very competitive environmental studies programme. The University of Waterloo has reduced the amount of solid waste they produce by 48% since 1987 (www.adm.uwaterloo.ca/infowast/solidwastemgmt.html, 2000). This institution has been forced to reduce its waste stream and alter its consumption of many products, including paper, because of Ontario legislation. The University has created environmental programmes and progress has been tracked through waste audits. Their motive, summarized,

Recycling and composting has been going on at the University since the 70's, not necessarily as environmental initiatives, but as wise methods of operation. With bans on materials going to landfill, increased costs of tipping fees and garbage disposal, and the passing of legislation requiring 50% reduction in waste by the year 2000, came growing concern for the amount of waste produced on campus. The University has achieved 48% reduction in waste, with increased student numbers (www.adm.uwaterloo.ca/infowast/solidwastemgmt.html, 2000).

The reason for considering the

conservation efforts made by the University of Waterloo was mainly to generate ideas about how waste can be reduced. The University of Waterloo has a requirement through legislation to act in an environmentally friendly manner. Sir Wilfred Grenfell College is not required by legislation to alter their consumption patterns at this moment. However, this should not deter the positive efforts already occurring at the College or future initiatives. Sir Wilfred Grenfell College could implement some of the programmes found at the University of Waterloo, such as composting and more diverse recycling, in order to prepare for the future when legislation is required in Newfoundland and Labrador.

E. Memorial University of Newfoundland

Presently, no environmental policy exists at Memorial University, but the commitment for change is there. Memorial's Facility Management hired a consulting firm to determine what environmental stake the University's daily activities and consumptive patterns have towards the environment. The Jacques Witford Environment Limited Company conducted a Phase 1 environmental audit in January and February of 2000, and published a report citing their findings in September of 2000.

The main aspect of the audit was to look at technical operations and indoor air quality. There was not much detail given to solid waste issues. The University, however, expresses their concern for the environment and would consider implementing an environmental management system.

According to the Administration at Memorial University a study of Sir Wilfred Grenfell College is planned for to occur in about a year (Interview, Feb. 25, 2001). The

Environmental Assessment of Memorial included a brief overview to the types of waste generated at the Institution, but failed to assess the amount of waste. A formal audit would consider these within the confines of the project. In an interview with Facilities Management, it was stated that the time had come for to place emphasis on the environment. The assessment was in actuality a stewardship assessment of the University's activities and they now wish to commit to more long-term initiatives (Interview, Feb. 25, 2001).

Examples of Sustainable Campuses in the United States

The United States is the leading developed nation in the world responsible for massive destruction of natural resources and the environment. However, the United States has developed positive changes exemplified in several of their universities. Canada tends to follow suit to many activities that the United States pursues, so it just seems appropriate to include some of their positive changes as examples to be applied in Canadian Universities. If we can study materials and textbooks from the United States, then we should be able to implement similar environmental initiatives.

A. University of South Carolina and Clemson University

The University of South Carolina, along with Clemson University of South Carolina and the Medical University of South Carolina, has embarked upon developing an environmental management programme which satisfies the sustainable campus project. The project adopts the principles of sustainable development through education and action.

For these institutions, this initiative requires, "environmental protection, economic stability and social equity-often called 'the three E's'-are inextricably inked and provide the basis for sustainable development" (www.sc.edu/sustainableu/project.htm, 2000).

Their goals include: educating the public about their specific activities which are proving harmful to the environment, educating their students with a more astute level of knowledge of environmental issues, the project also contends the importance of leading by example, and this commitment should be done in partnerships and along with other initiatives.

B. Seattle Pacific University

Seattle Pacific University in Washington State, has been involved in positive environmental change since the early 1990s when they first began recycling. This system acknowledges the successes the University has made towards more sustainable practices, and it outlines a plan for the future. Environmental management systems, like any other effective management plan, will outline future considerations because no such system exists that is totally inclusive. The short-term goals they have outlined include: establishing a 30% recycling rate on campus, composting and to consider large scale recycling. The long term goals involve the improving the internal systems of communication, education and adapting existing programmes. The systems external to the University involves input from the public, communication with outside affiliations and, subsequently, increasing the knowledge base on recycling programs.

Seattle Pacific University has greatly improved its environmental program since it was implemented over ten years ago. They

have implemented more recycling facilities, services, and increased the amount and extent of communication about recycling.

C. Princeton University

Princeton University in New Jersey is known for its prestigious education, so it would seem appropriate that they implement environmental standards into their management plan. The reasons they began recycling is not through choice, but rather, because environmental legislation in New Jersey required more efficient disposal of solid waste.

Following the 1987 passage of the New Jersey Statewide Mandatory Recycling and Source Separation Act and subsequent state mandates to recycle 60% of its municipal solid waste (MSW), Princeton University established a comprehensive recycling program that sought to provide adequate recycling facilities for the entire university community (www.princeton.edu/~perc/Percchap1.htm, 1995).

The University is under great pressure to develop an efficient recycling programme because the State is enforcing solid waste disposal issues. New Jersey has a large population and, subsequently, generates a large amount of waste, but it does not have the resources or infrastructure to dispose of the refuse. The New Jersey State is dependent on nearby States to dispose of Princeton's waste, thereby, overburdening these systems. The University has invested into its recycling program, in order to develop an efficient system which would reduce costs in the future. The University acknowledges the success of their recycling programme, but would like to see further improvements.

A benefit-cost analysis has determined the

benefits accrued by implementing a recycling programme in the first place. With increases in tipping fees and waste disposal, the savings for the University have amounted to US \$ 1 3 6 , 0 0 0 in 1 9 9 3 - 1 9 9 4 (www.princeton.edu/~perc/Percchap1.htm, 1995). The costs remaining amounted to \$409,000 for disposal of the non-recycled waste. This data applies to quarters. This number appears to be quite large in comparison to Sir Wilfred Grenfell College's cost of disposal of \$3,000 Canadian per year. The difference amounts to the fact that Newfoundland and Labrador has a different system of solid waste disposal than other Provinces and the United States. Newfoundland and Labrador has nearly 250 landfill sites and citizens are able to dispose of any type and amount of waste, as they want without incurring into a cost. This is also one of the problematic reasons our recycling programme has not been as effective at diverting unnecessary waste from landfills. Princeton University has a unique feature Sir Wilfred Grenfell College could adopt in their own management practices, an environmental committee; which considers many of the pertinent environmental issues separate from the daily activities of management. The Princeton Environmental Reform Committee has attempted several education techniques on campus to try and increase the types and amount of recyclable material being recycled.

In essence, the Sustainable Campus Initiative has been successful in diverting many tonnes of solid waste from the already overburdened landfills. With increases in world population the amount of land used for this purpose is slowly, but surely diminishing. Universities are the leaders in education on environmental thought and theory. It seems natural they be the leaders in stewardship practices. Universities and institutions across

North America have been implementing environmental management systems into their daily activities, and they strive to decrease their impact on the earth's fragile ecosystems.

Furthermore, universities have an opportunity to make choices themselves and become stewards of environmental systems in anticipation of the needs of future generations. Universities can both teach and demonstrate environmental principles and stewardship by taking action to understand and reduce the environmental impacts that result from their own activities (Creighton, 1998, 6).

SECTION IV

Auditing Methodology-Benefits of an Audit

The auditing methodology can vary between institutions, and the scope of the audit may differ as to the type of audit to be completed. *McGill's Guide to Organizing and Carrying out a Waste Audit at an Educational Institution* (1997) proved very useful in identifying the steps and procedures associated with a solid waste audit. Universities, including McGill University and Sir Wilfred Grenfell College, first need to determine why an audit should be completed. Sir Wilfred Grenfell College is obviously much smaller than most university campuses across Canada, and the subsequent effects accrued to the environment are much less than that of larger institutions. However, the reasons for completing an audit and implementing an environmental management system are the same.

We must realize that, as an institution, we are having an impact on our local ecology which could be mitigated through more effective use of resources and disposal methods. As a University we set the standard

for the rest of the community with regards to increased health and viability of our environment. So, why do a waste audit? Audits are used as tools to assess the effectiveness of recycling initiatives, and waste reduction programmes. Secondly, they identify the positive and negative aspects of such programmes in a specific way so that solutions to remedy the problem can be developed.

McGill discovered some very interesting information about their current practices, including: the "University found out that its recycling program was failing to divert at least a ton of paper every day from going to the landfill" (McGill, 1997, 5). Finally, an environmental audit trains and educates those individuals who become involved with the process (McGill, 1997, 5). An environmental audit raises awareness about overconsumption as a major concern, which fails to be addressed adequately, due to the lack of knowledge by individuals about their purchasing behaviour and power. Volunteers and publicity can become two very useful tools when carrying out a successful audit.

How to complete an Environmental Audit

A solid waste audit can be as comprehensive as the institution wants it to be; this, in order to meet their needs at that particular time. Among the several factors, which may hinder the extent of the audit are time and money. Sir Wilfred Grenfell College is a small campus and, presently, no money or time is invested in the success of the recycling programme. Before an audit is carried out the Administration of the College needs to determine their budget for developing an extensive solid waste disposal programme.

Before an institution commits to complete an environmental audit, they need to decide

what they plan to accomplish. They need to determine for what reasons have they decided to complete the audit at this moment in time. Is the audit being completed to reduce costs, to create revenue, or to create a sustainable image of the institution to the public? The institution needs to identify, through a solid waste audit, the extent and type of solid waste commonly generated at the institution. Often, a site assessment is completed in advanced so the auditor has an idea of what will be discovered by the audit. The auditor will complete an assessment of the institution and will develop a strategy, which in essence will prove a hypothesis or theory concerning current waste disposal practices. The audit will provide an opportunity for specific data to be analyzed and the results will be used to develop strategy for a more improved system of solid waste disposal. This plan would include the methods of diversion, which have been in essence forgotten or neglected within the present system of solid waste disposal. With the analysis complete, the institution should determine a time frame and the budget they wish to commit to the project. Also, through both, a site assessment and environmental audit, the administration should be able to determine what department and the associated activities producing with the most waste. The subsequent plan and policy development can include a specific category for these areas of concern.

The purpose of the environmental audit is not only to develop a comprehensive recycling programme. Instead, the environmental management system and environmental policy is about assessing the root causes of degradation and to develop a solution. The solution often considers the human reasoning and behaviour behind consumption. The institution is trying to intervene in this consumption pattern that has probably been

the practice until this point.

Perhaps an example would further clarify this theory. Through a site assessment and subsequent environmental audit, the university administration discovers that the Native Studies department (this is an arbitrary example) consumes the most paper on campus. The department has printed numerous handouts for the students and the students are using a large amount of paper to produce their assignments and term papers. The administration feels that more sustainable practices within this department are necessary and asks the department to make some changes. These changes in behaviour would be outlined within the environmental policy of the university. These changes could include numerous items such as: professors accepting assignments via e-mail, students printing their work on used paper, and faculty can provide handouts on the Internet or through e-mail. These are some suggestions the department could adopt as common practice to reduce the amount of paper entering the disposal stream. It is more desirable to reduce waste than recycling. The cost associated with either waste disposal or recycling will be reduced because this additional waste never had the opportunity to enter the system in the first place. Secondly, the impacts to the environment are also reduced. The amount of space required for this material in our already overburdened landfill system has been avoided. The land has been left available for some other use; opportunity cost theorem.

Before the beginning of every audit the Administration should consider not only what they hope to accomplish, but also by which means. Therefore, the scope of the environmental audit needs to be determined. Secondly, it is often difficult to assess an entire university's waste disposal practices, the size of the institution can be a contributing

factor. Realizing that this is not a problem at Sir Wilfred Grenfell College because the campus contains only five buildings and the population is around 1,200 students. However, in considering other universities across North America it is pertinent to briefly mention the significance of this factor. Larger institutions, such as the University of Victoria have an enormous campus. It can become cumbersome to properly assess the entire campus through an environmental audit, so the Administration only assesses a part of the campus, a sample of the whole population waste disposal practices.

The environmental policies, which are developed from the sample audit can then be applied to the entire University and to all of the department's unsustainable activities. The main reason is because both, time and budget are constraints in the auditing process. The University may become more interested in the final results rather than the process of analysis that is essential to any comprehensive policy plan. This results in a particular area of the campus being developed. This can also prove to be problematic in terms of evaluating the effectiveness of these policies which concern solid waste disposal. For instance, a university may choose to look at those areas, which are consuming more than other departments or areas of the campus. Even though this may be rare or nonexistent, some universities may look at those areas of the campus which have the least environmental impact so their policies will reflect these activities in policy implementation and management. This was not found in any of the research, but it is a possibility.

In areas where solid waste regulations exist and it is mandatory by government, then an institution, such as universities, may find that regardless of choice they must comply. The ISO 14,000 standards are a system of

management which allows the institution to develop, implement, and audit their own system. Environmental economics explains the theory in which the polluters may sit on the back burner in implementing programmes to reduce their environmentally degrading practices, while allowing others to pay the price for their harmful activities.

The scope of the assessment determines why environmental management systems should be developed, and by what means. This may be accomplished through a visual site assessment. Secondly, the administration develops a strategy for policy development and determines that an environmental audit will provide more detail about the present means of waste disposal. A sample size is determined in one of the first steps of the strategy. The physical equipment should be identified and collected. The audit needs to be organized to include others in the sorting process. The actual audit will mean that a group of individuals, usually volunteers, will sort a particular sample of the waste stream. The process involves the separating of materials often found in waste, which may be recycled at the moment. These items are found in the garbage because of several reasons. Either the individual was not aware of the recycling potential of the item, the person may not have had access to a proper recycling facility, or the individual may not have any incentive or concern for environmental issues. Once the items have been sorted, the volunteers will weight the material. The weight applied to the material is very important in determining the extent of recyclable material being found in the disposal system. The data needs to be known in order to develop an effective diversion programme. The university needs to be made aware of the problem in detail before changes can occur.

Acadia University (Wolfville, Nova

Scotia) is a smaller university, which is comparable to the size of Sir Wilfred Grenfell College. The information provided by this institution may help in encouraging the completion of an environmental audit. Acadia followed a relatively simple procedure of sorting and sampling the waste at their university. They recruited a group of volunteers who completed an assessment of 6 buildings. Their method was not complex, and that was positive because it reduced the time commitment and restrictions which may exist at other institutions. This does not mean that their data is any less reputable.

Acadia University places waste in one of two bags; black bags are garbage and blue bags are for recyclables. The auditing process involved the sorting of waste into five streams regardless of the bag it was in: Refundables, Paper, Mixed Recyclables, Compost and Garbage. Each bag (either garbage or recyclable) was sorted, weighed, and recorded as to what stream it was in (i.e. blue bag paper) (Campus Solid Waste Audit Guidebook, 2000, 5).

Acadia University noticed that during the time period, which the audit took place, that the disposal practices at the institution actually improved. The University was trying to improve their image, so they were making the system seem more efficient at the moment than the actual results. If this is the case, then the Administration failed to truly consider the reasons why they were completing the audit in the first place. The audit was to be used to assess their current practices and recommend future programmes to combat the problem by diverting recyclable material from the waste system. The audit is to be used as a tool of assessment, not as an end to a problem. The audit is used to begin the solution.

Strategy for Sir Wilfred Grenfell College

The strategy for Sir Wilfred Grenfell College can be quite similar to the sorting and sampling strategy for Acadia University. The audit could cover the entire campus and the logistical method is very basic and can easily be duplicated here. The academic programmes offered at Sir Wilfred Grenfell College including but not limited to Environmental Studies and Environmental Science, can provide an opportunity for volunteers to develop an audit. The students may be enticed with university credit for their work and analysis; or it may become a requirement for these programs. In any sense, the University has a unique atmosphere, which would make it conducive to more sustainable initiatives.

At the moment, Sir Wilfred Grenfell College has no formal environmental policy, not every university in North America does. So in comparison, the university is not far behind in sustainable development, but we are not the leaders in the discourse either. This is not a criticism of Sir Wilfred Grenfell College's faculty, staff or administration who have missed to consider this method sooner but, rather, an encouragement to take action. In comparison, larger institutions, with a more flexible budgets, are placing a greater strain on environmental systems and their motivation for early implementation of these programmes revolves around these notions. They may feel under pressure to meet regulations concerning solid waste disposal in the area. Smaller institutions, such as Sir Wilfred Grenfell College, often have money constraints, which explains, partly, why they usually have no formal policy on disposal and are continuing with outdated, default practices. Secondly, these institutions have less of an impact on the environment and the

pressure is not felt by Administration directly.

Conclusion and Recommendations

Sir Wilfred Grenfell College is a small segment of Memorial University of Newfoundland, and would make for an ideal pilot project of environmental management systems. These management systems are an effective way of mitigating negative environmental consequences. The implementation of an environmental policy will exemplify the College's level of commitment to sustainable development. Overconsumption results in the unnecessary use of resources and the depletion of the environment. Solid waste production and disposal is adding an additional burden to the environment thereby greatly reducing the carrying capacity of the earth. We have an obligation to preserve the integrity and natural state of our environment for future generations. Lester Russell Brown once said, "We do not inherit the earth from our grandparents, we borrow it from our grandchildren" (Minty, 1993, 17).

It is not the right of individuals to choose more sustainable initiatives, but rather our obligation to future generations. Institutions and universities have larger accountability because they are responsible for teaching these to future generations. Sir Wilfred Grenfell College is no exception and by improving its environmental track record exemplify its commitment to future generations.

Sir Wilfred Grenfell College could implement several recommendations to reduce the amount of solid waste generated at this institution, and to create a sustainable campus policy to improve the stewardship practices of the College.

1. *More efficient recycling programme*

Sir Wilfred Grenfell College presently recycles paper and cardboard. There are recycling bins located in nearly every office and classroom, with several others located in the hallways and cafeteria. The University could improve its recycling capabilities by putting more bins in the hallways, lounges and the cafeteria.

Increasing the signage about recycling, clearly distinguishing recycling bins from refuse bins and the types of products, which can be recycled at this institution, would be ideal.

The College could implement a paper reduction strategy. For instance, assignments could be passed in via email, or double sided. The College could encourage the reuse of paper by students, faculty and staff. Also, the use of paper containing a certain percentage of post consumer content could reduce the amount of trees needed to produce 'virgin' paper.

2. *Environmental Committee*

Sir Wilfred Grenfell College should develop an environmental committee comprising of students, faculty and staff. This committee would develop an environmental policy based on the ideas of this group which would exemplify the College's commitment to sustainable development and preserving the integrity of the environment for future generations. The committee should have representatives from each of the departments so the teachings of these areas can be put into practice through this environmental policy. The policy would outline the specific ways the recommendations can be implemented into the current management system.

3. *'Lug a Mug' Programme*

The 'Lug a Mug' programme has been implemented at other universities and has been a successful practice which has greatly reduced the number of Styrofoam coffee cups entering the landfill. Styrofoam takes a long time to decompose and it uses space in the already overburdened landfills. The 'Lug a Mug' system requires consumers to bring their own mug to be refilled at restaurants in the cafeteria. As an incentive for those who bring their own mug the institution can offer a discount. This encourages individuals to bring their own mug and reduces the amount of waste generated by disposable coffee cups.

4. *Composting in the Cafeteria*

The cafeteria disposes of large amounts of food waste daily. This waste can be diverted from the landfill through an effective composting system. The exact system will vary depending on the amount and types of food waste generated.

The cafeteria could also offer dishes and metallic cutlery rather than the present system involving disposable plates, cups, napkins, and plastic cutlery. The cost of operating such a system should be evaluated to determine if it is economically feasible.

5. *Education*

Sir Wilfred Grenfell College could increase the number of courses with environmental content and practical applications so more students have an opportunity to learn about environmental solutions from both a global and local perspective. For instance, the courses could have the students complete a class audit, group surveys, develop environmental policy.

Presently, there are courses which deal with these topics in theory and the practical aspect could be added.

The College could also review the possibility of having an environmental requirement for their degree programmes, similar to the English, Math and Science requirement which presently exists. The College could require that students take at least one course dealing with environmental issues so the students become more aware of their personal impact on the environment.

6. *Environmental Coordinator*

Sir Wilfred Grenfell College could consider hiring an individual to review their current practices of solid waste disposal, and other areas of environmental concern such as energy usage, water conservation, transportation, building design, ground maintenance and hazardous materials disposal. This individual would develop an environmental management system which would reflect the College's commitment to sustainable development.

7. *Green Building Design*

Before the College considers constructing additional buildings on campus, they should evaluate the current design method and determine if it is environmentally friendly. The College could use the green building design similar to the University of British Columbia's CK Choi Building. This building was constructed using recycled products; it contains grey water recycling, compostable toilets, and solar lighting. Sir Wilfred Grenfell College could implement some of these initiatives in its future building construction depending on the costs and availability of materials.

This project was just the beginning and additional research is suggested in order to develop a truly efficient environmental framework which can have a dramatic impact on future generations.

These recommendations can be used as the beginning of more sustainable practices at Sir Wilfred Grenfell College. The Environmental Auditing Strategy was developed as an assessment of the current practices at the College with suggestions for future programmes. Sir Wilfred Grenfell College has a unique opportunity to develop a sustainable campus; through the support of students, faculty, and staff of the College.

Overconsumption is the main cause of environmental degradation and the time to change our consumptive lifestyle is now. Changes at Sir Wilfred Grenfell College become the beginning and exemplify the institutions level of commitment to the sustainability and quality education.

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Purpose: What are the attitudes of individuals at Sir Wilfred Grenfell College with regards to the environment and recycling?

1. Have you ever taken a university course dealing with environmental issues?

Yes No

2. Do you recycle at home?

Yes No

3. Do you know which products are recyclable in Newfoundland? If so can you list some.

Yes No

4. How much paper do you use per week i.e. sheets of paper for class work, assignments, etc.

- 0-20
- 20-40
- 40-60
- 60+

5. Could you identify where you are likely to have seen a recycling bin on Campus? (Please check as many as needed).

- In a classroom
- In an office
- In the cafeteria
- In the hallways
- In residence

6. What areas of wastage, with regards to the environment, do you see around campus and within your department?

7. What initiatives have you or your department taken to decrease your environmental impact?

8. If you could pass in assignments via email, would you?

Yes No

9. If you could pass in assignments double sided, would you?

Yes No

10. Would you use paper containing recycled (post consumer and tree free) content if it is offered, at an increased cost?

Yes No

11. Do you know what other universities are doing to create a sustainable campus? If yes, provide examples.

Yes No

12. How would you rank SWGC to other universities according to environmental standards?

- Better than other universities
- Worst than other universities
- Unsure

13. What would you suggest SWGC should do to be more environmentally friendly?

14. What do you plan to do to be more environmentally friendly? Please list activities.

15. What is your program of study? _____

16. What is your age? _____

17. Are you male or female?

- Female
- Male

Results

1. Have you ever taken a university course dealing with environmental issues?

Yes 31 No 9

2. Do you recycle at home?

Yes 26 No 14

3. Do you know which products are recyclable in Newfoundland?

Yes 36 No 4

4. How much paper do you use per week i.e. sheets of paper for class work, assignments, etc.

0-20 13

20-40 15

40-60 3

60+ 9

5. Could you identify where you are likely to have seen a recycling bin on campus?

In a classroom 24

In an office 10

In the cafeteria 31

In the hallways 7

In residence 10

6. What areas of wastage, with regards to the environment, do you see around campus and within you department?

- Too much photocopying
- Paper
- Paper just dumped when it could be recycled
- Paper mostly, some plastics
- Paper, chemicals, food waste
- Paper being thrown into the garbage(not recycle bins) and pop bottles
- Paper, chemicals, foodwaste
- Paper
- Waste of paper
- People don't always use the recycle bin and paper, bottles, and cans are thrown into the garbage
- The lawns and roadways are usually covered in garbage

- Paper
 - Everything is wasted... not much recycling going on
 - Newspapers strewn around, flyers, and pamphlets
 - Not all paper is recycled or containers
 - Paper, water
 - Treats cups mostly, lots of paper
 - Paper wastage, cans & bottles wastage, juice containers wastage
 - Library-paper in bins(is it there for recycling) cafeteria. Theatre carpentry shop
 - Mixed garbage where recyclables are thrown out
 - Paper
 - Paper is thrown out, plastic & glass as well in classrooms, offices and the cafeteria
 - The library- library notices- so much wasted paper! The cafeteria- bottles/cans. Paper use in general –check photocopiers garbage bins.
 - People don't recycle paper, cans & bottles like they should. Paper over used by profs
 - Not everyone recycles paper, lots of paper not recycled! A lot of people just throw their cans & recyclable containers in the garbage without thinking about it
 - People don't recycle paper, and they just throw it away in the garbage, unnecessary printing
 - Too many garbage cans
 - Profs not double-copying handouts
 - Paper
 - Not enough recycling bins. Have to pass in assignments in on paper instead of email
 - paper
7. What initiatives have you or your department taken to decrease your environmental impact?
- Recycle don't litter
 - Education
 - Recycling containers available, use small quantities of chemicals, not throwing chemicals down the sink
 - Recycling
 - Recycle
 - Recycle paper, collect recyclables, beverage containers
 - Recycle bins
 - Chemical waste bins
 - Some recycling
 - Nothing
 - Little to none
 - Nothing... I'm ashamed
 - None

- Recycling bin in geography lab
- Use both sides of the paper
- Recycle paper, cans, bottles, reuse backs of paper
- None
- Not much probably just what you see
- Recycling paper
- None
- Recycling plastics and aluminum
- Recycling, energy efficient heating, solar home heating
- Have no idea
- Learn about it
- Recycle
- Recycling
- Not really involved
- We recycle at home
- Use recycle bins whenever possible-try not to waste paper-don't litter
- Recycle cans, bottles and tetra. Reuse what can be, buy recycled products, walk
- Reuse plastic tumblers for rehearsal, recycle where bins are provided

8. If you could pass in assignments via email, would you?

Yes 32
No 8

9. If you could pass in assignments double-sided, would you?

Yes 34
No 6

10. Would you use paper containing recycled (post consumer and tree free) content if it is offered, at an increased cost?

Yes 25
No 14
N/A 1

11. Do you know what other universities are doing to create a sustainable campus?

Yes 3
No 37

12. How would you rank SWGC to other universities according to environmental standards?

| | |
|--------------------------------|----|
| Better than other universities | 2 |
| Worst than other universities | 7 |
| Unsure | 29 |
| N/A | 2 |

13. What would you suggest SWGC do to be more environmentally friendly?

- Create more awareness to the issues, more recycling outlets/bins readily available
- Enforce recycling
- More recycling bins
- Recycle more, especially paper
- Recycle more, put bins next to printers/photocopiers not garbage cans, more recycle bins
- With regards to air quality I think the whole campus should be smoke-free
- Recycle more, don't put garbage cans next to the printers-put recycle bins
- Recycle more
- Allow laptops to be used for note taking
- Photocopying-double sided
- Recycle bins(separate bins for plastics, paper, cardboard, etc)
- More recycling
- More recycling bins put them everywhere!
- Let people know about the recycling program
- Better recycling program
- More recycling
- Better recycling programs
- Put up signage to remind people to recycle(near the garbage bins)
- Keep doing surveys
- I think they do a pretty good job-but less paper wastage
- More recycling bins, put up signs to encourage recycling
- Make recycling mandatory, actually use recycle bins for those purposes.
Encourage and promote recycling, make recycling more assessable for resident students as well as allowing off campus students to bring their recyclables to the campus for drop off
- Enforce recycling in the student union(plastic cups are always thrown out)
- Recycle paper
- More striengent(recyclables, more fuel efficient and water conservation)
- Recycle bins all over the place

14. What do you plan to do to be more environmentally friendly? Please list activities.

- Don't waste things (ex: don't buy the swiffer sweeper!), reuse if possible
- Always recycle
- Walk, recycle
- Recycle, use as much of the paper as I can

- Start recycling, reuse material
- Recycle more often, produce less waste
- Recycle all, not just products you get refund for
- I would like to recycle at home
- Start recycling plastic bottles and containers
- Recycle cans and bottles
- Use more environmentally friendly products around my apartment
- Use less paper, throw recyclables in recycle bins
- Try to recycle more
- Recycle, be more environmentally friendly in the products I use
- To continue to recycle paper, cans, bottles, reuse paper
- Walk more, drive less
- Waste less water
- Walk
- Walk instead of driving, use things to their full capacity
- Educate people and clean up forest
- Recycle more paper
- Recycling, double sided photocopying
- Start picking up flyers to be recycled
- Walk more, recycle more, encourage others to do the same
- Recycle, walk instead of bus/car, buy recycled products, reuse what can be
- Obviously recycle, use environmentally friendly products, reuse paper

15. What is your program of study?

| | |
|-------|----|
| EVST | 6 |
| EVSC | 7 |
| ENGL | 4 |
| HIST | 2 |
| PSYC | 11 |
| THEA | 5 |
| Other | 3 |
| N/A | 1 |

16. What is your age?

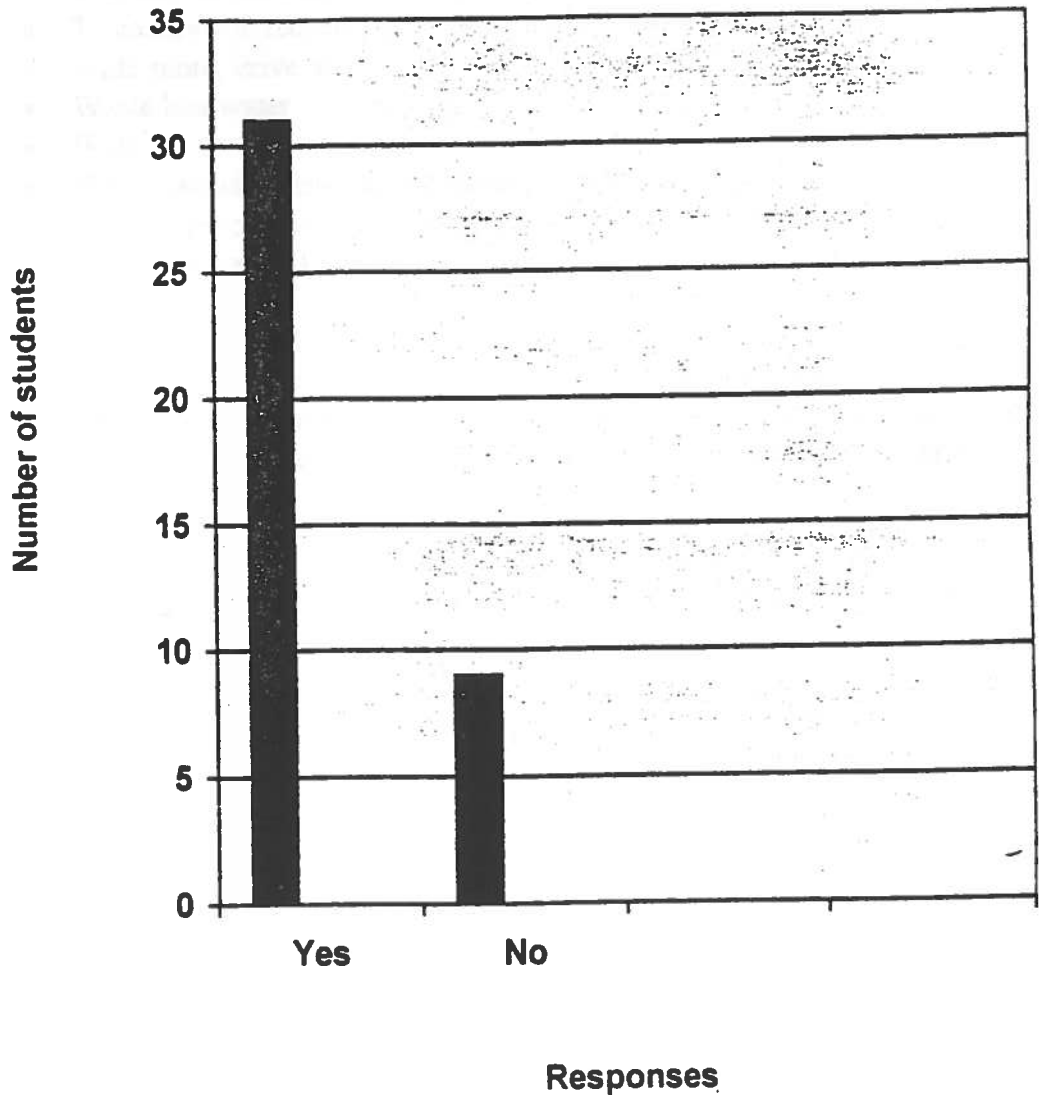
| | |
|----|----|
| 20 | 3 |
| 21 | 13 |
| 22 | 10 |
| 23 | 6 |
| 24 | 1 |
| 25 | 1 |
| 26 | 1 |

27 1
28 0
29 1
30 +1
N/A 2

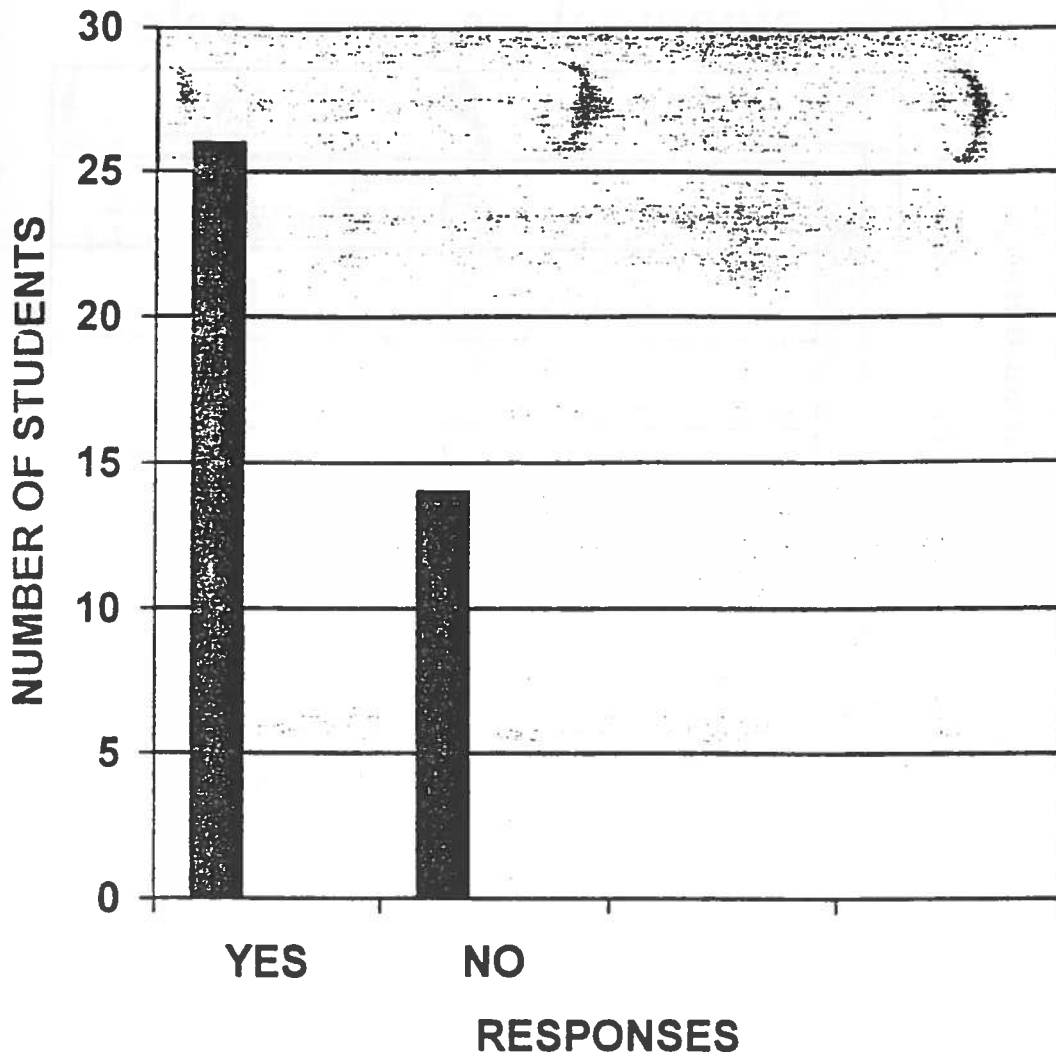
17. Are you male or female?

Male 13
Female 27

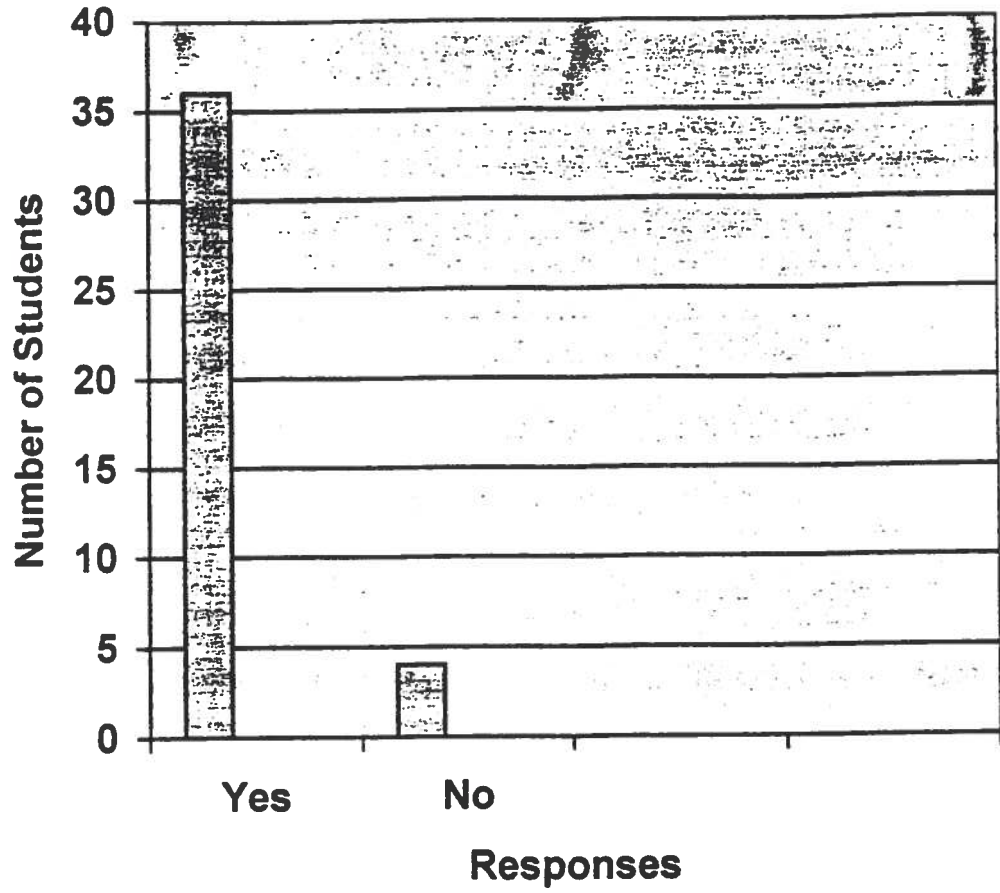
Have you ever taken a university course dealing with environmental content?



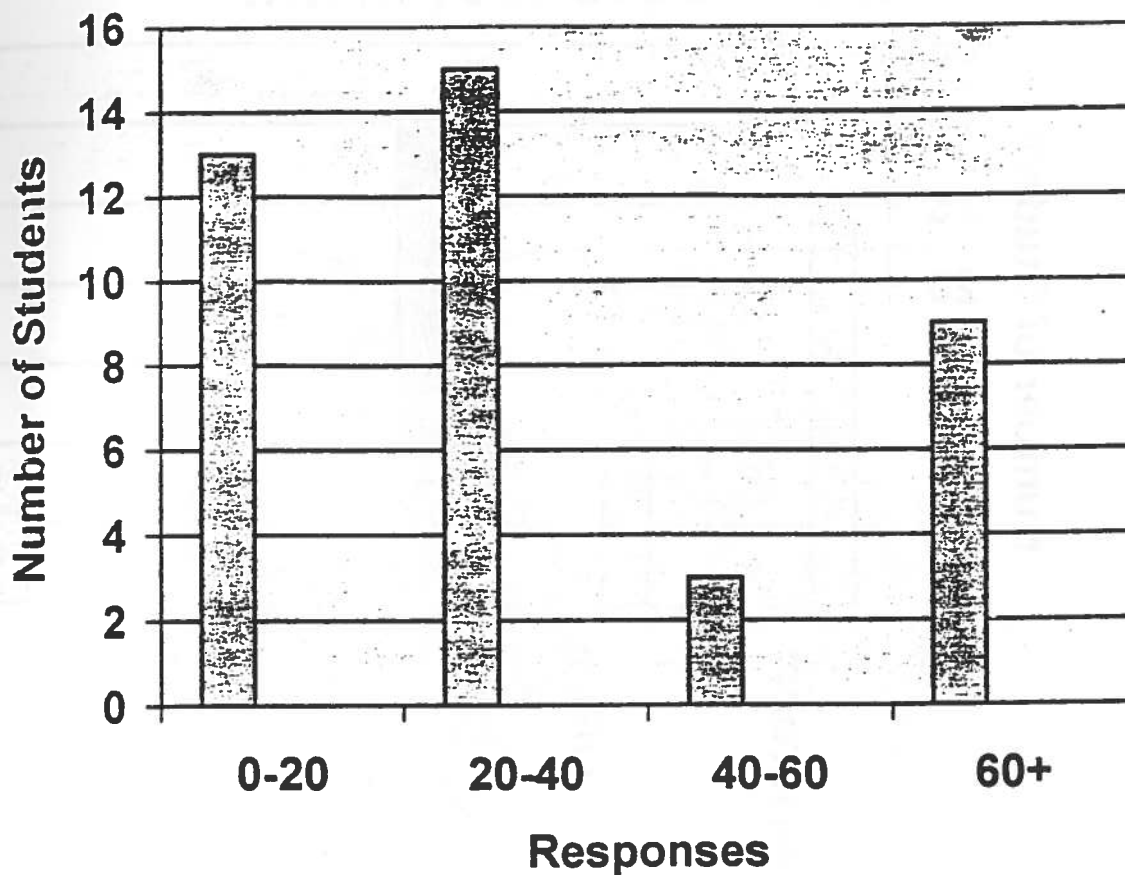
DO YOU RECYCLE AT HOME?



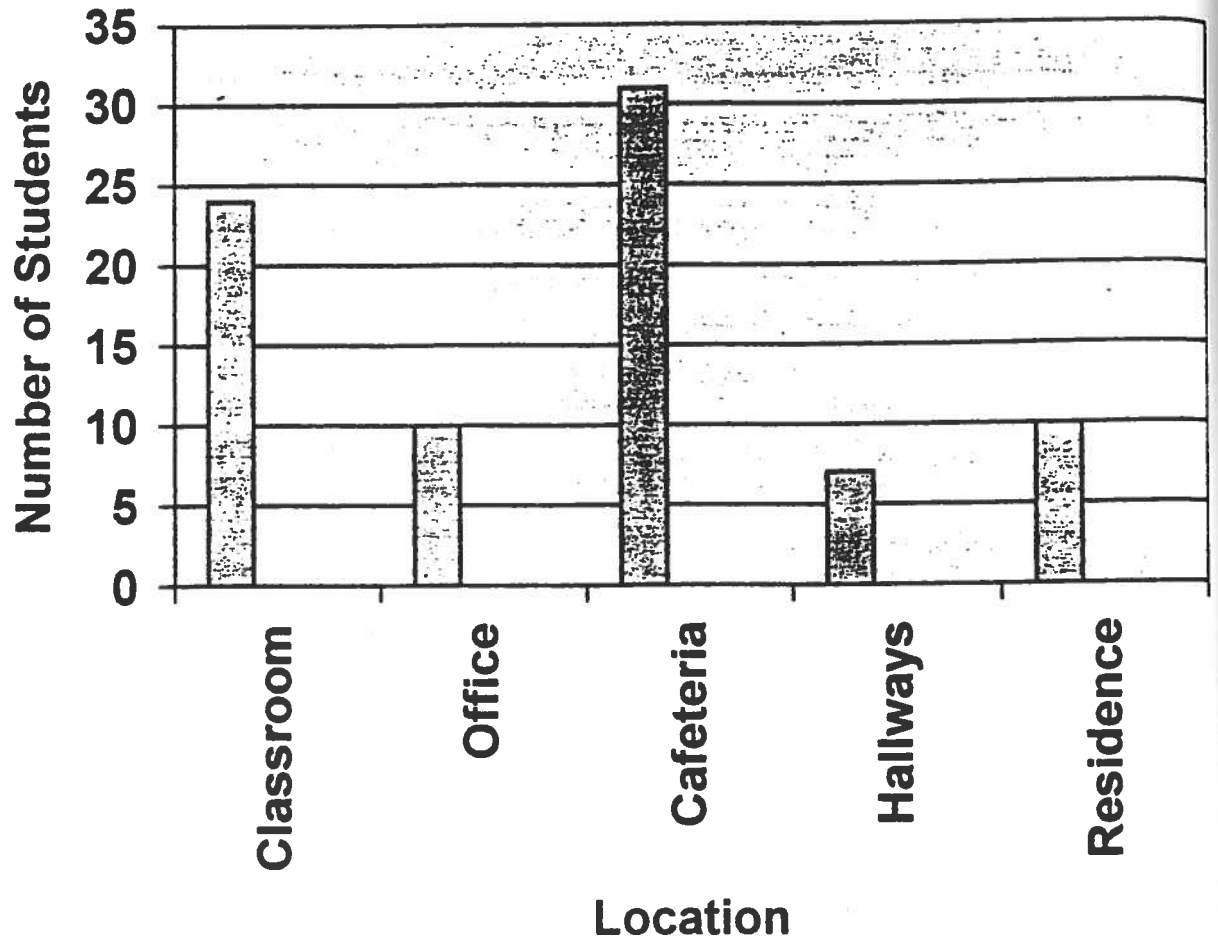
Do you know which products are recyclable in Newfoundland?



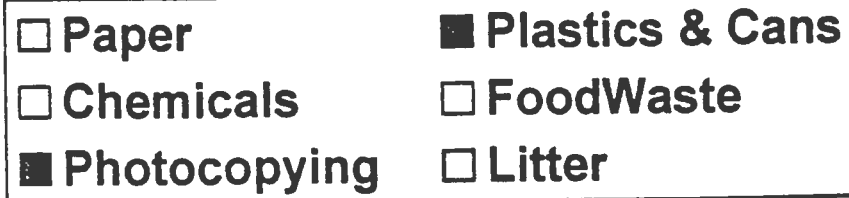
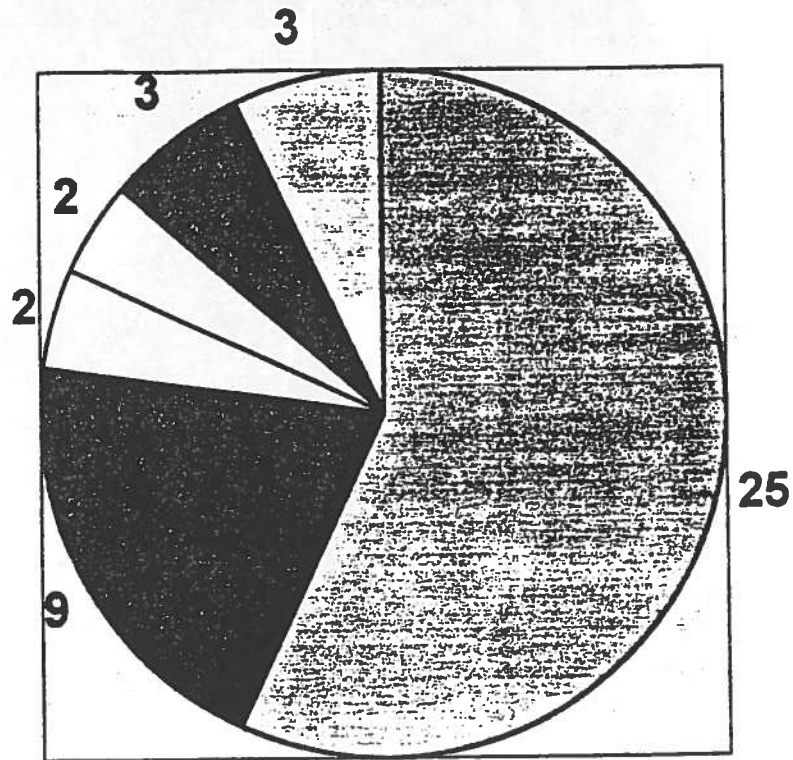
How much paper do you use per week (i.e. sheets of paper for class work, assignments, etc.)?



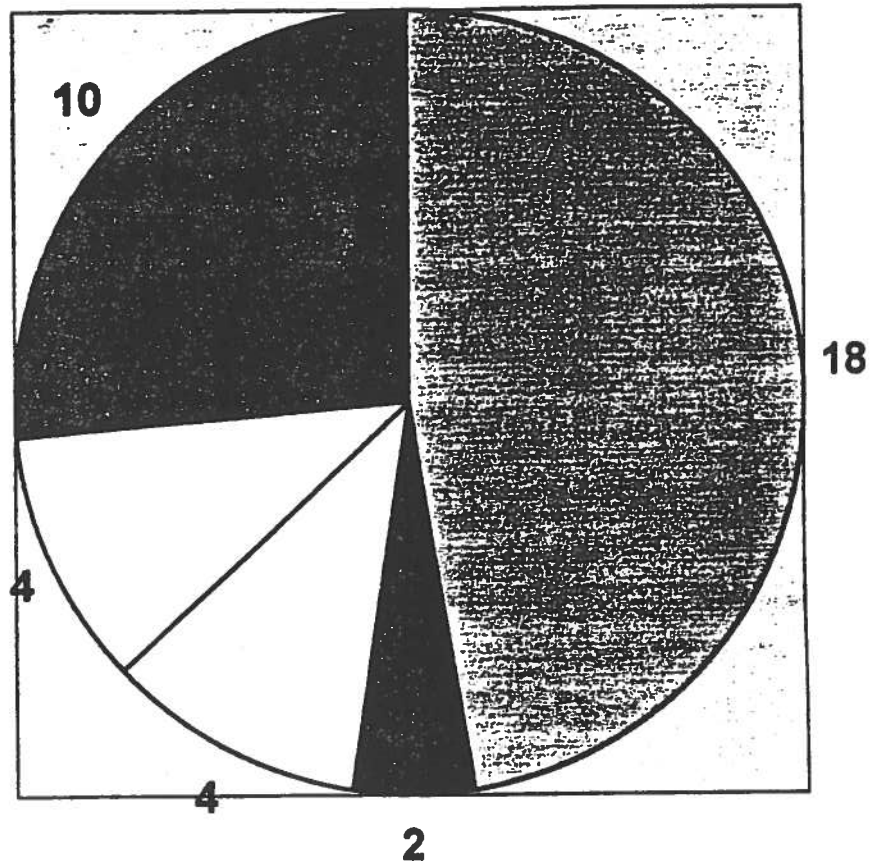
Could you identify where you are likely to have seen a recycling bin on campus?



What areas of wastage, with regards to the environment, do you see around campus and within your department?

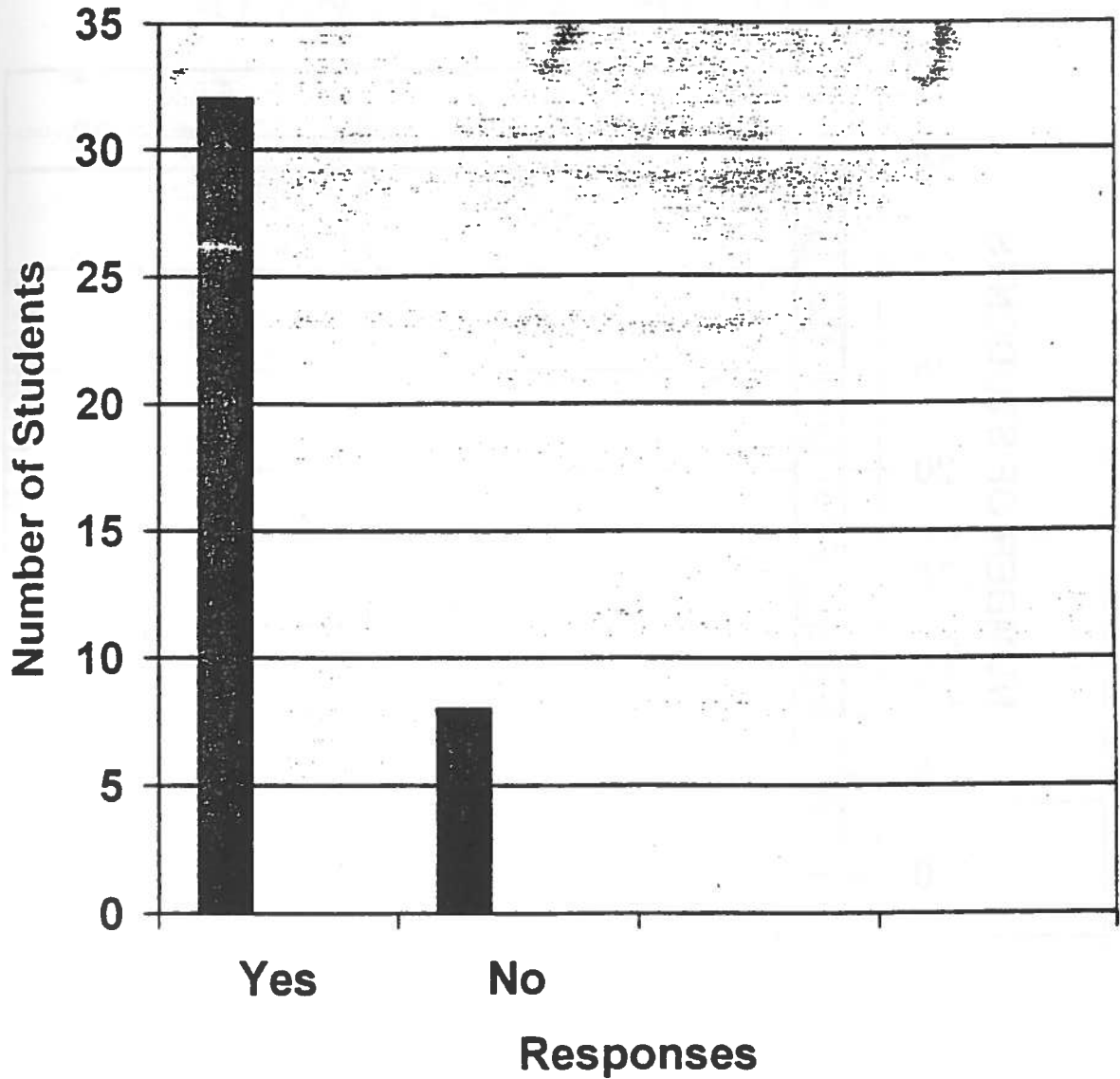


What initiatives have you or your department taken to decrease your environmental impact?

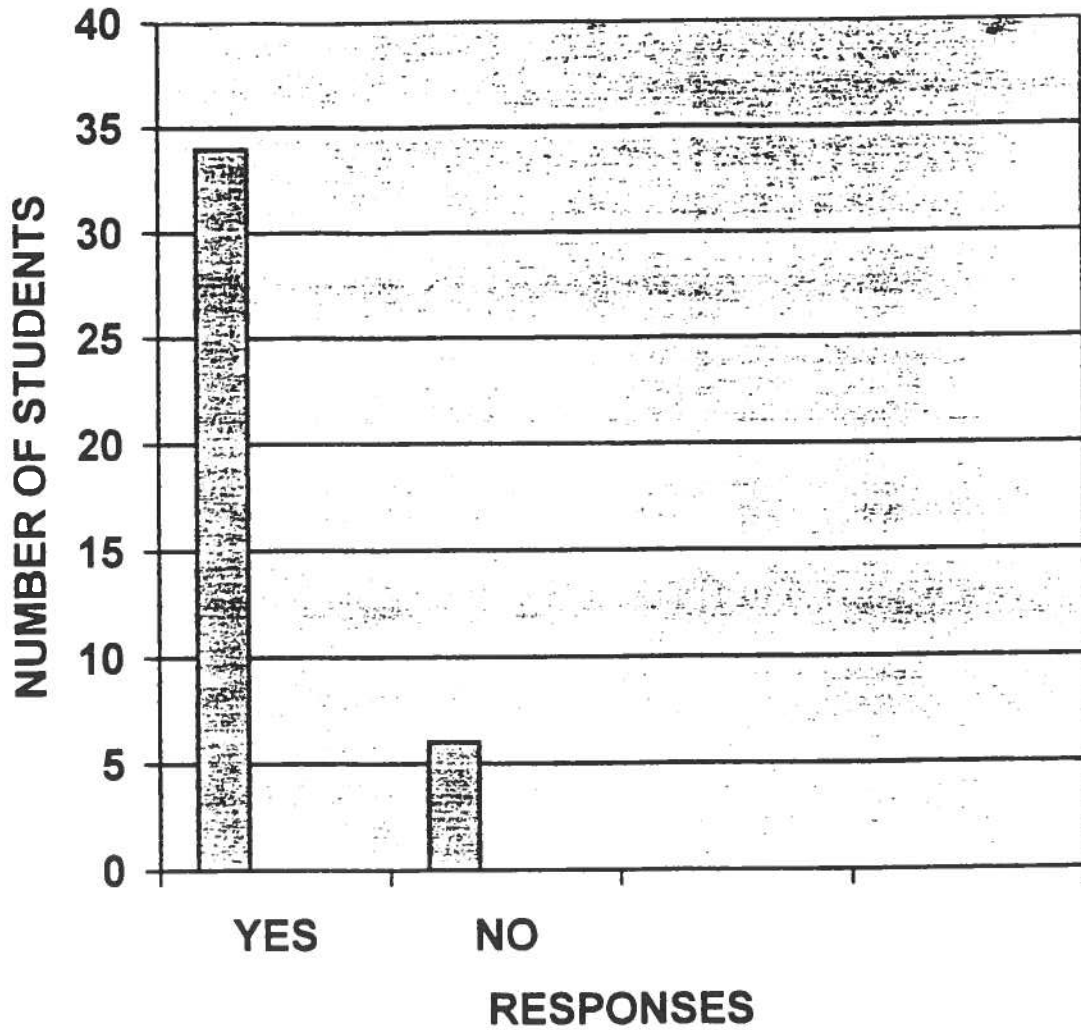


Recycle Education Reduce Reuse Nothing

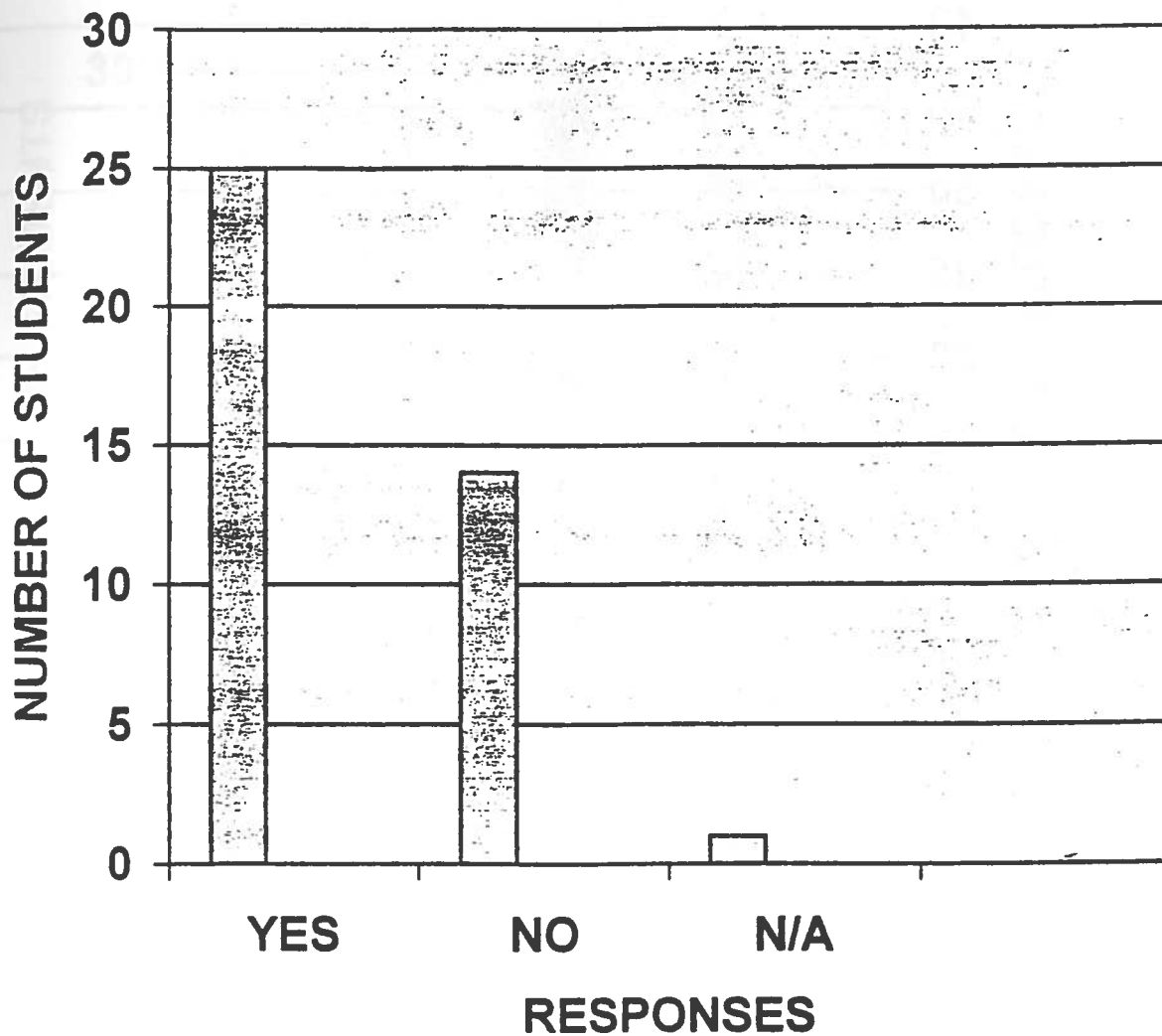
**If you could pass in assignments
via email, would you?**



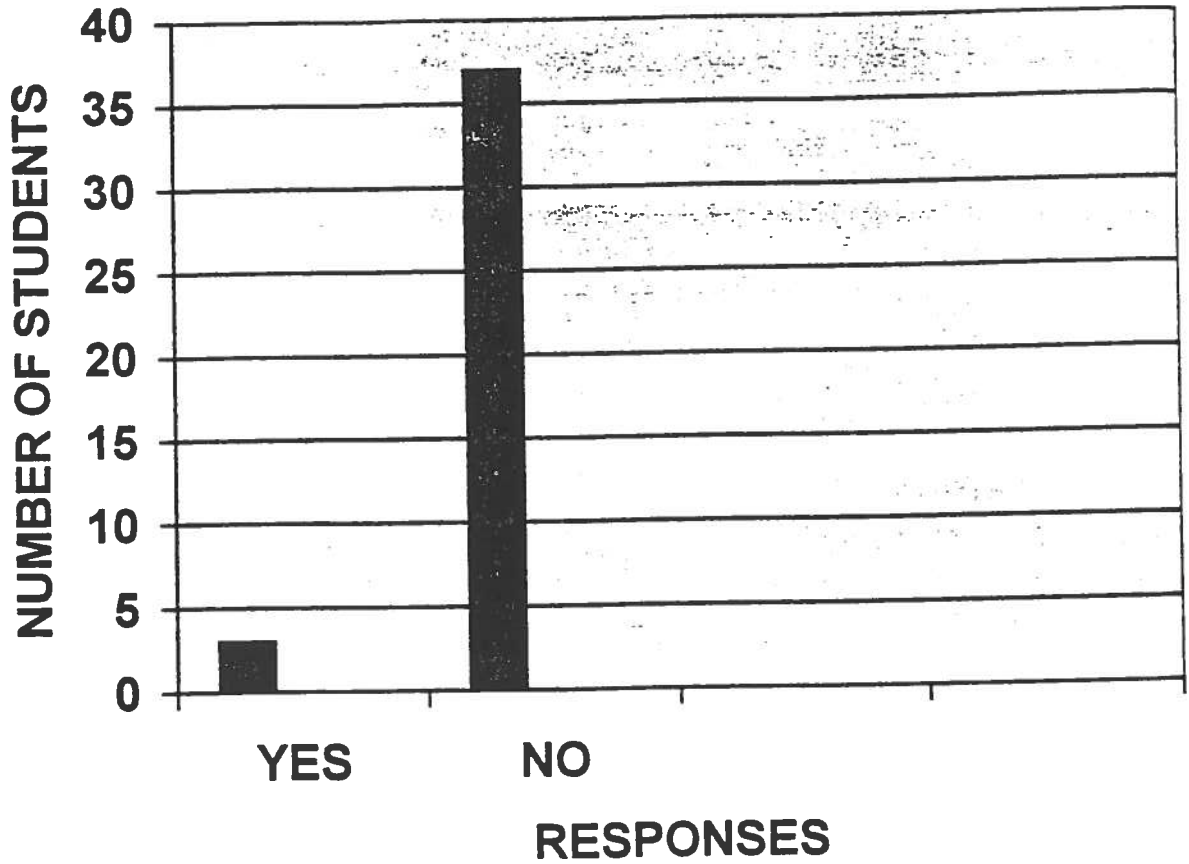
IF YOU COULD PASS IN ASSIGNMENTS DOUBLE-SIDED, WOULD YOU?



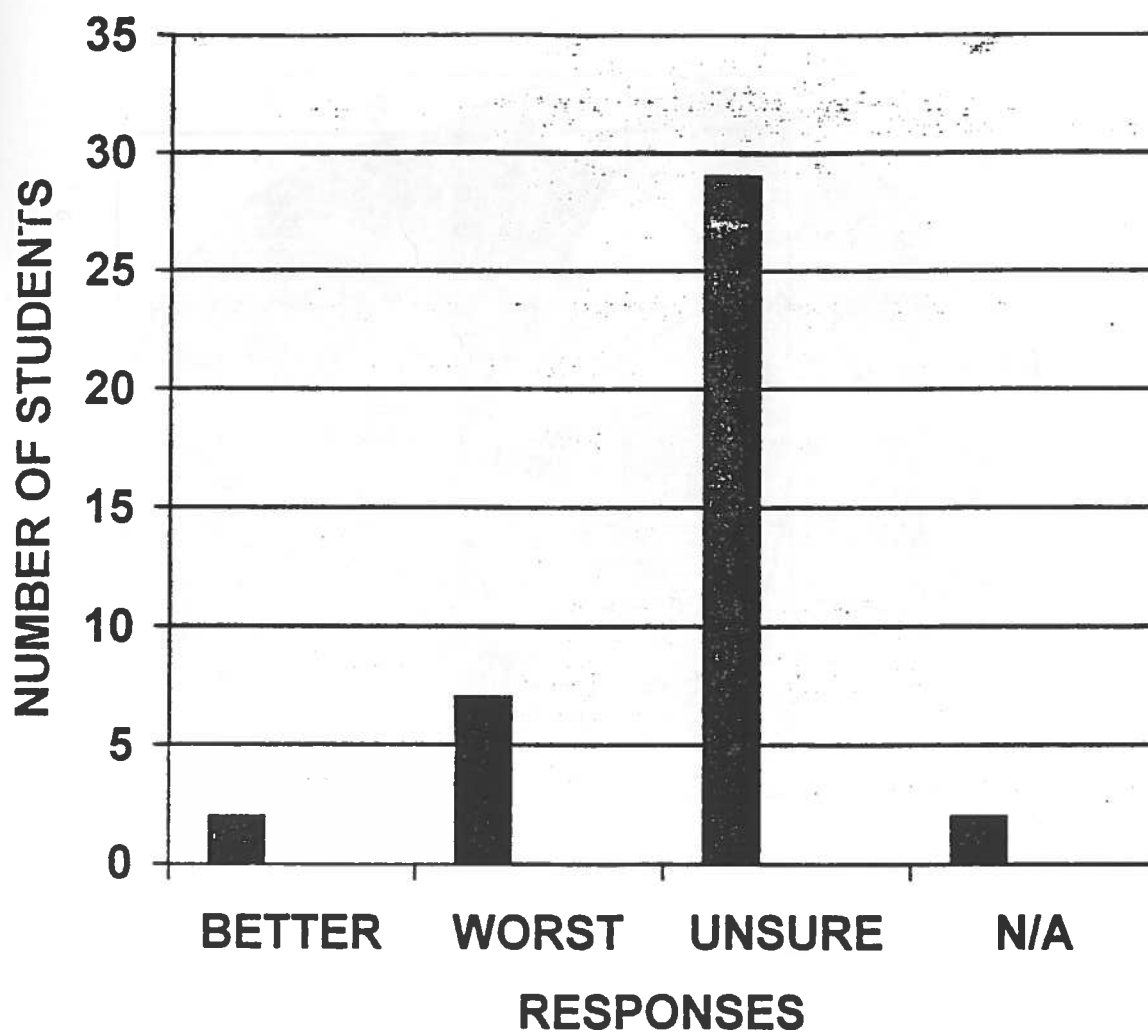
**WOULD YOU USE PAPER
CONTAINING RECYCLED
CONTENT IF IT WAS OFFERED,
AT AN INCREASED COST?**



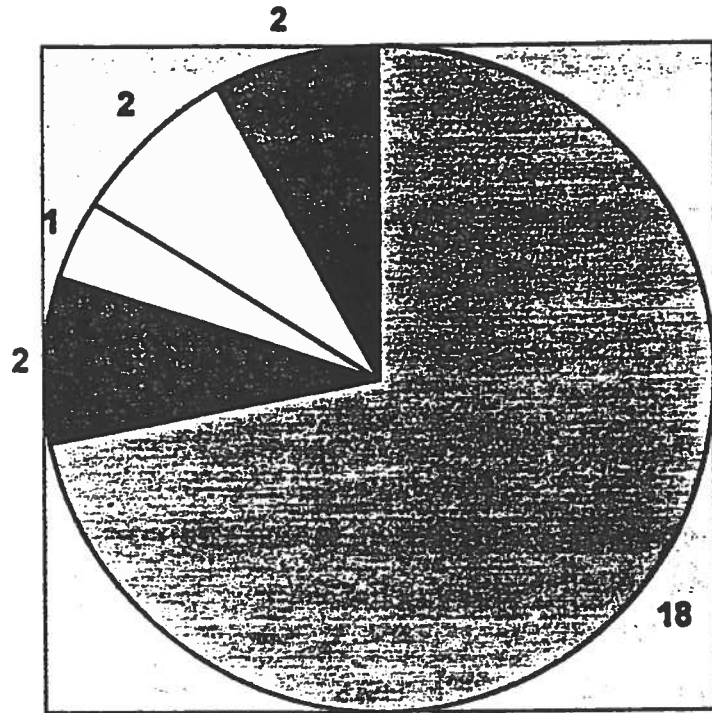
DO YOU KNOW WHAT OTHER UNIVERSITIES ARE DOING TO CREATE A SUSTAINABLE CAMPUS?



HOW WOULD YOU RANK OTHER UNIVERSITIES ACCORDING TO ENVIRONMENTAL STANDARDS?

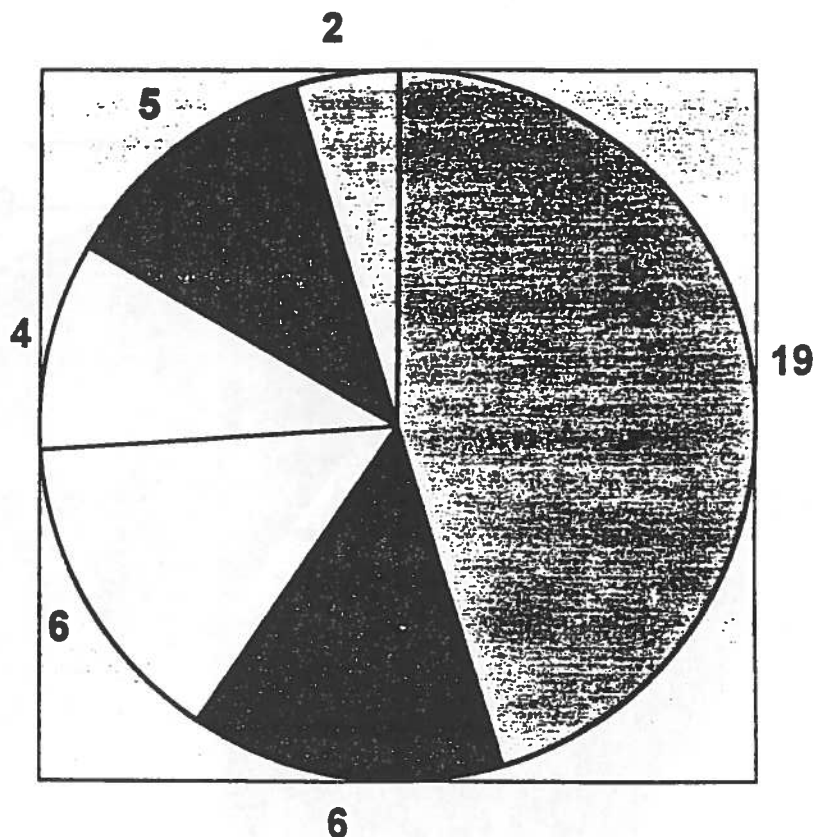


WHAT WOULD YOU SUGGEST SWGCG DO TO BE MORE ENVIRONMENTALLY FRIENDLY?



- Recycle more
- Education
- Smoke free
- Create signage
- Double-sided photocopying

WHAT DO YOU PLAN TO DO TO BE MORE ENVIRONMENTALLY FRIENDLY?



RECYCLE

REUSE

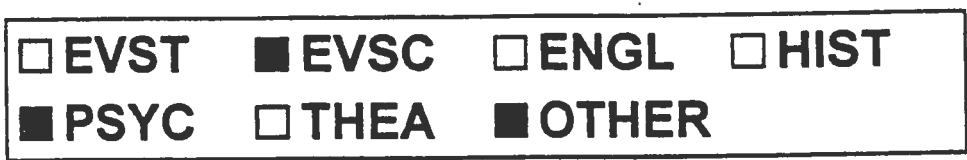
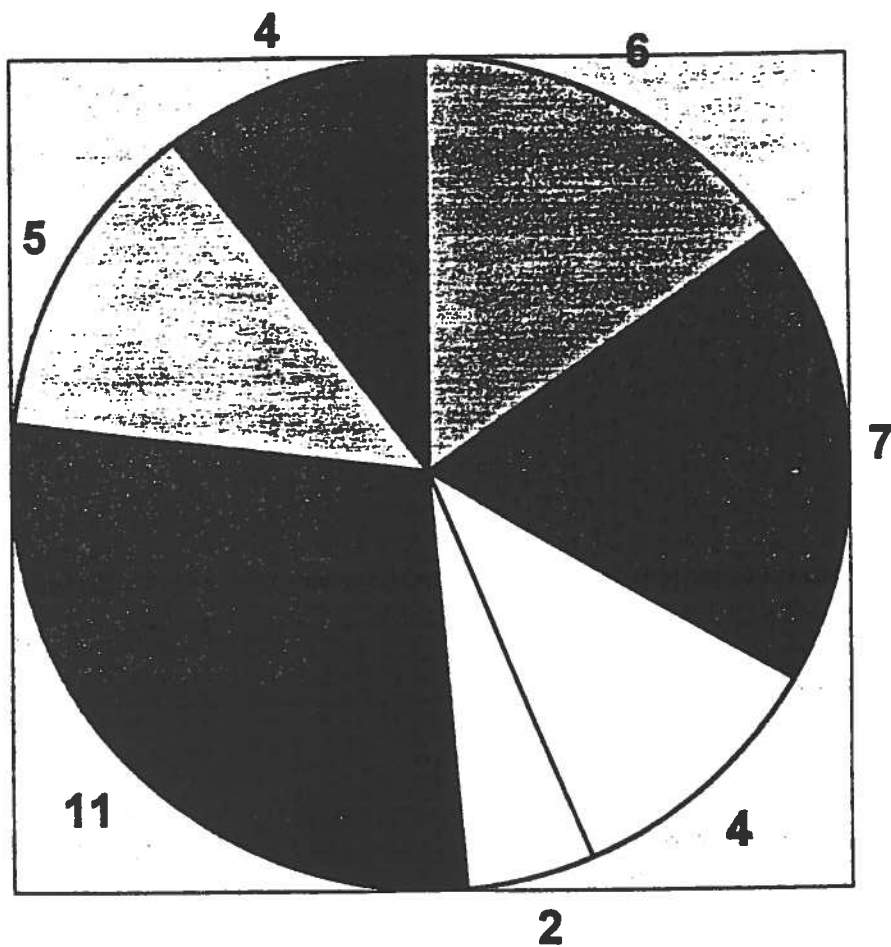
REDUCE

CHOOSE LESS HARMFUL PRODUCTS

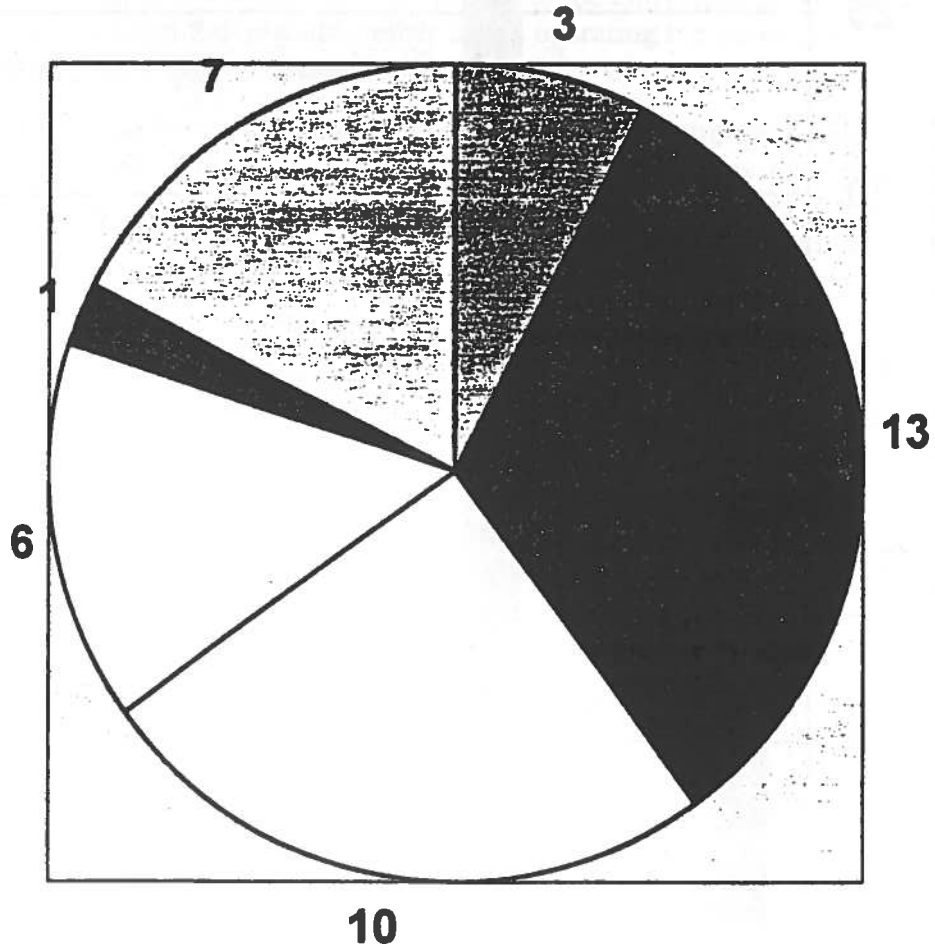
WALK

EDUCATE

WHAT IS YOUR PROGRAM OF STUDY?

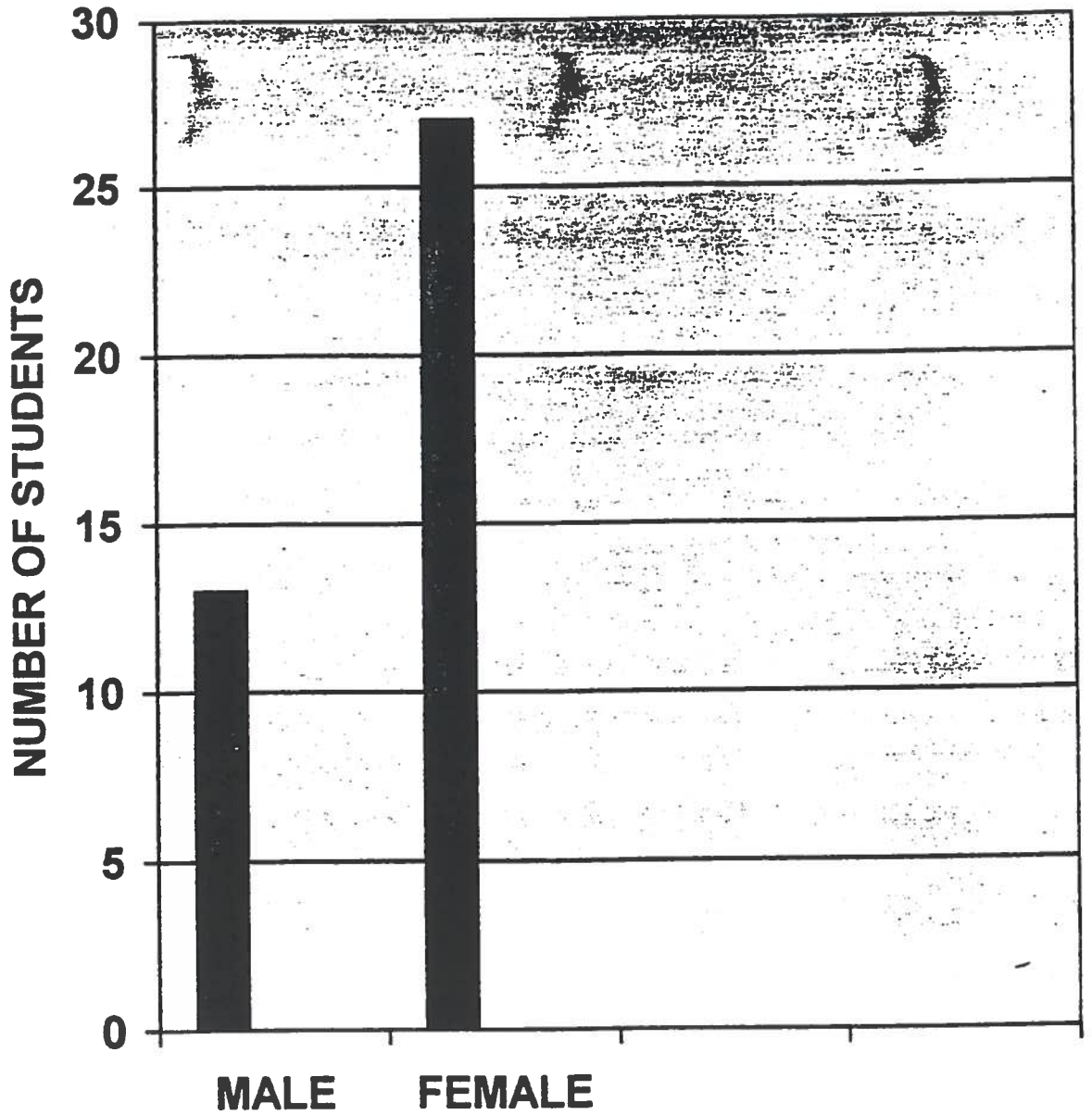


What is your age?



20 21 22 23 24 25+

ARE YOU MALE OR FEMALE?



Approved by the Board of Regents at its meeting of May 11, 1999

**MOUNT ALLISON UNIVERSITY
ENVIRONMENTAL POLICY**

1. Preamble

The Mission of Mount Allison University is to provide a rigorous liberal education of high quality primarily to undergraduate students. The liberal nature of education includes the development of the whole person. The development of the whole person can be enhanced by nurturing an awareness of the effects of the University and of human activity on the environment by among other things operating the university in an environmentally responsible manner.

For these reasons the University strives to be an innovative environmental leader by ensuring all members of the University community are aware of environmental issues and by contributing to the resolution of these issues. Mount Allison seeks to minimise its impact on the environment through a program of continual improvement in environmental performance, achieved by implementing a feasible and comprehensive environmental policy with measurable and achievable targets.

The nature of the policy is such that the implementation of policy guidelines is expected to occur on an ongoing basis as resources become available and technology improves.

2. Policy

The policy is structured into nine areas: Curriculum, Energy, Hazardous Materials, Transportation, Water Consumption, Solid Waste, Food Purchasing and Buildings.

2.1 Curriculum

The University encourages faculty and senate to consider, where appropriate, taking steps to incorporate environmental content throughout existing curriculum, increasing environment related course offerings and programs seeking more resources to dedicate to environmental research.

2.2 Energy

The University will endeavour, under the supervision of the Department of Facilities Management, to minimize energy consumption, reduce emissions and reduce the consumption of fossil fuels and other non-renewable energy sources.

2.3 Hazardous Materials

The University will endeavour, under the supervision of the Department of Facilities Management and other departments, to limit and monitor the use of hazardous materials on campus grounds, in cleaning and in laboratories

2.4 Transportation

The University will endeavour, under the supervision of Facilities Management, to minimise energy consumption and to reduce emissions and the consumption of fossil fuels.

2.5 Water Consumption

The University will endeavour, under the supervision of the Department of Facilities Management, to minimize water consumption.

2.6 Solid Waste

The University will endeavour, under the supervision of the Department of Facilities Management, to minimize solid waste production.

2.7 Food

The University will endeavour, through the Department of Administrative Services, to minimize the ecological impact of food consumption on campus.

2.8 Purchasing

The University will endeavour, under the supervision of the Controller to minimize the ecological impact of the products and services purchased in support of campus operations.

2.9 Buildings

The University will endeavour, under the supervision of Facilities Management, to minimize the ecological impact of the construction, maintenance and operation of the buildings on campus.

3. ENVIRONMENTAL COMMITTEE

An Environmental Policy requires regular monitoring and continuous evaluation if it is to be effective. Therefore, an Environmental Committee shall be established with the following membership:

The Dean of Students, Chair

The Vice President, Administration

The Director of Facilities Management

The Purchasing Manager

The Manager of Custodial Services

The Director of Administrative Services or designate

A community representative appointed by the Committee

2 students appointed by the SAC

The SAC president or designate

3 faculty members appointed by the Committee (Faculty Council?)

The Environmental Committee's mandate will be as follows:

- i) to educate members of the University community on environmental issues;
- ii) to recommend to the President amendments to the Environmental Policy, additions and revisions to the performance indicators, and amendments to other University policies such as the Investment Policy;
- iii) to monitor the financial effectiveness of the operation of the policy, to recommend to the President that any savings generated as a result of the operation of the policy in a year be transferred to the Special Purposes Fund to support future environmental projects and to recommend to the President projects to be supported by any funds so transferred;
- iv) to recommend to the President that the University seek donations to support specific environmental projects;
- v) to conduct a biannual environmental audit, using performance indicators, to assess the progress being made by the University towards achieving the goals outlined in this Policy; and
- vi) to report to the President on the biannual audit and annually on other matters on which the Committee considers it appropriate to report.

4. PERFORMANCE INDICATORS

For the purposes of the environmental policy, performance indicators are measurable targets. The purpose of the performance indicators is twofold. Firstly, they will provide a framework for the implementation of the environmental policy. Secondly, they will serve as a standard upon which the auditing body can measure progress in the implementation of the policy

As a result of the findings and recommendations of the biannual audit and the vision of the Environmental Committee, performance indicators will be added and revised from time to time.

PERFORMANCE INDICATORS

1. Curriculum

- Cases and examples derived from the audit or other on campus environmental work are incorporated into course-work.
- Local- community resources such as Canadian Wildlife Services are utilized, and local regional issues are integrated, into course work.
- An environmental certificate acknowledging that a student is graduating with an understanding of environmental issues, resulting from taking a certain number of

related courses, is awarded upon graduation.

- Speakers, presentations, debates and other such methods are utilized to educate students on environmental topics.

2. Energy

- A baseline has been established as a standard against which improvement in energy consumption can be measured.
- Projects to increase energy efficiency or decrease pollution have been undertaken wherever there were an acceptable payback period of the costs required to undertake the project.
- A holistic approach to utilities management is used. A holistic approach implies that energy costs should be analysed by taking into account all energy types rather than examining individual systems or energy types in isolation
- Buildings not in used during the summer are closed.
- Government initiatives are monitored to ensure participation in relevant programs in the areas of pollution reduction and energy efficiency.
- Buildings are constructed incorporating energy efficiency and renewable energy technologies

3. Hazardous Materials

-
- Pesticides are used on campus only when required
- Micro-scale laboratories are used
- Effective, environmentally friendly cleaning supplies are used.
- The transportation of all hazardous materials is monitored.

4. Transportation

- Bike racks are available at academic and residence buildings.
- Emission levels are taken into consideration in the purchase of vehicles

5. Water Consumption

- Water efficient models are installed when replacing any water fixtures on campus.
- Projects are undertaken to decrease water usage.

- Longevity and water efficiency are primary considerations when purchasing water fixtures
- There is an effective paper waste reduction program.

6. Solid Waste

- Solid waste generated by the university is limited.
- An effective recycling program is maintained across campus.
- Yard waste is used as mulch on campus grounds
- Furniture is offered for sale or donation prior to disposal.

7. Food

- Packaging and waste are minimized.
- Organic(pesticide/herbicide free) and seasonal options(food that does not have to be preserved) are used.
- Food is procured from local sources
- Information regarding ingredients and processing practices are made available to students
- Products which meet or exceed the standards outlined by the National Ecology labelling system are purchased.
- Environmentally friendly cleaning supplies are being used
- China or reusable plastics are used
- Food and cardboard recycling programs are used

8. Purchasing

- Photocopiers and printers minimize the required use of paper,
- Recycled and post-consumer paper is purchased.
- Unbleached recycled paper is available in the Bookstore.
- In the purchase of products, the following factors are taken into consideration: a) reduced packaging; b) environmental performance(i.e. energy saving), c) reduced consumption; d) construction (i.e. recycled materials rather than tropical hardwoods, PVC); and longevity.
- Information is provided to departments comparing the environmental performance of different products. I.e. Fax machines that can use recycled paper, etc.

9. Buildings

- Response time for building maintenance and repairs is monitored and minimized. Neglected maintenance tasks generally increase energy use and potential harm to the environment.
- Prior to new building projects, an environmental impact analysis is completed and such impact is minimized through appropriate selection of materials or design elements.
- Building construction or renovation makes use of environmentally friendly materials and disposal procedures

April 9, 1999

An Environmental Policy For Dalhousie University - 1994

Dalhousie University is an educational and research institution, an employer, a corporate citizen, and a property owner. Dalhousie University recognizes that, in all of these contexts, it has a special responsibility to conduct its activities in an environmentally sound manner.

Dalhousie University realizes that its diverse academic and operational activities have significant impacts on the environment. Some of these impacts are positive, and these are to be encouraged. Some negative impacts may be unavoidable, but others can be eliminated or substantially mitigated. Dalhousie University believes it should take a leadership role in regard to environmental management.

It is the policy of Dalhousie University to strive to conduct its activities in ways that do not cause unacceptable degradation of the environment. The cornerstones of Dalhousie's environmental policy are the following:

- Dalhousie University will offer academic choices that will ensure that its students, employees, and the broader community will have opportunities to become well versed concerning environmental issues and solutions.
- Dalhousie University will strive to conduct its research activities in ways that are environmentally appropriate.
- Dalhousie University will also encourage its faculty and associates to conduct research that investigates the causes and mitigation of environmental degradation, as well as social, economic, and industrial pathways towards sustainable development.
- Dalhousie University will strive to achieve a working and educational environment that is acceptable in terms of health.
- Dalhousie University will strive to manage its buildings and grounds in ways that are environmentally appropriate.
- Dalhousie University will play an exemplary role by ensuring that its corporate operations become as environmentally sound as allowed by technology, economics, and common sense.

It is the expectation that all persons and units affiliated with Dalhousie University will strive towards the attainment of these environmental objectives.

The Talloires Declaration

(signed October 1990 in Talloires, France; Revised 1994)

We, the presidents, rectors, and vice chancellors of universities from all regions of the world are deeply concerned about the unprecedented scale and speed of environmental pollution and degradation, and the depletion of natural resources.

Local, regional, and global air and water pollution; accumulation and distribution of toxic wastes; destruction and depletion of forests, soil, and water; depletion of the ozone layer and emission of "green house" gases threaten the survival of humans and thousands of other living species, the integrity of the earth and its biodiversity, the security of nations, and the heritage of future generations. These environmental changes are caused by inequitable and unsustainable production and consumption patterns that aggravate poverty in many regions of the world.

We believe that urgent actions are needed to address these fundamental problems and reverse the trends. Stabilization of human population, adoption of environmentally sound industrial and agricultural technologies, reforestation, and ecological restoration are crucial elements in creating an equitable and sustainable future for all humankind in harmony with nature.

Universities have a major role in the education, research, policy formation, and information exchange necessary to make these goals possible. Thus, university leaders must initiate and support mobilization of internal and external resources so that their institutions respond to this urgent challenge.

We, therefore, agree to take the following actions:

1. Use every opportunity to raise public, government, industry, foundation, and university awareness by openly addressing the urgent need to move toward an environmentally sustainable future.
2. Encourage all universities to engage in education, research, policy formation, and information exchange on population, environment, and development to move toward global sustainability.
3. Establish programs to produce expertise in environmental management, sustainable economic development, population, and related fields to ensure that all university graduates are environmentally literate, and have the awareness and understanding to be ecologically responsible citizens.
4. Create programs to develop the capability of university faculty to teach environmental literacy to all undergraduate, graduate, and professional students.
5. Set an example of environmental responsibility by establishing institutional ecology policies and practices of resource conservation, recycling, waste reduction, and environmentally sound operations.
6. Encourage involvement of government, foundations, and industry in supporting interdisciplinary research, education, policy formation, and information exchange in environmentally sustainable development. Expand work with community and nongovernmental organizations to assist in finding solutions to environmental problems.

7. Convene university faculty and administrators with environmental practitioners to develop curricula, research initiatives, operations systems, and outreach activities to support an environmentally sustainable future.
8. Establish partnerships with primary and secondary schools to help develop the capacity for interdisciplinary teaching about population, environment, and sustainable development.
9. Work with national and international organizations to promote a worldwide university effort toward a sustainable future.
10. Establish a Secretariat and a steering committee to continue this momentum, and to inform and support each other's efforts in carrying out this declaration.

Charter Signatories: (Titles and Affiliations in 1990)

Jean Mayer, President and Conference Convener: Tufts University, Massachusetts, USA

Pablo Arce, Vice Chancellor: Universidad Autonoma de Centro America, Costa Rica

L. Ayo Banjo, Vice Chancellor: University of Ibadan, Nigeria

Boonrod Binson, Chancellor: Chulalongkorn University, Thailand

Robert W. Charlton, Vice Chancellor: University of Witwatersrand, South Africa

Constantine W. Curris, President: University of Northern Iowa, USA

Michele Gendreau-Massaloux, Rector: l'Académie de Paris, France

Adamu Nayaya Mohammed, Vice Chancellor: Ahmadu Bello University, Nigeria

Augusto Frederico Muller, President, Fundacao Universidad Federal de Mato Grosso, Brazil

Mario Ojeda Gomez, President: El Colegio de Mexico, Mexico

Calvin H. Plimpton, President Emeritus: American University of Beirut, Lebanon

Wesley Posvar, President: University of Pittsburg, Pennsylvania, USA

T. Navaneeth Rao, Vice Chancellor: Osmania University, India

Moonis Raza, Vice Chancellor Emeritus : University of New Delhi, India

Pavel D. Sarkisov, Rector: D.I. Mendeleev University of Chemical Technology, Russia

Stuart Saunders, Vice Chancellor: University of Cape Town, South Africa

Akilagpa Sawyer, Vice Chancellor: University of Ghana, Ghana

Carlos Vogt, President: Universidade Estadual de Campinas, Brazil

David Ward, Vice Chancellor: University of Wisconsin, Madison, USA

Xide Xie, President Emeritus: Fundan University, People's Republic of China

Source: University Leaders for a Sustainable Future, <http://www.ulsf.org/about/tallo.html>

