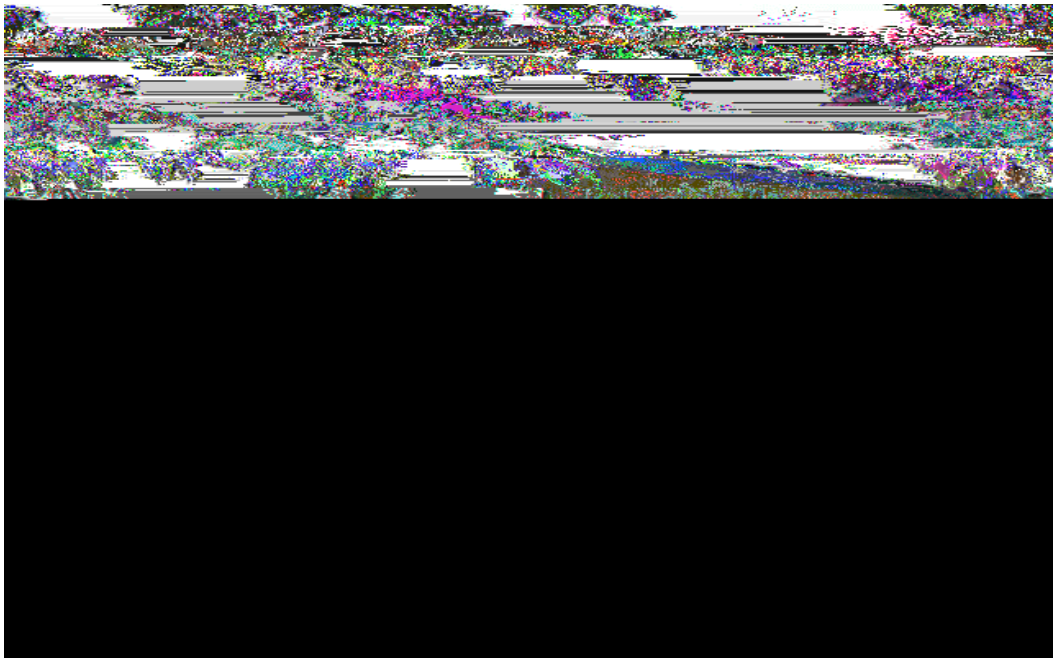


Mount Allison University Environmental Audit 2002:

Completed by Sustainability Solutions Group

Table of Contents	
1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18.	

Preface

Six years have passed since Mount Allison University first began the environmental auditing process. Over this time, a number of significant changes have occurred, both in the state of the world environment and at our university. The world's resources continue to be degraded at an exhausting pace. Environmental issues are one of the most pressing

Energy

There has been a steady increase in electricity consumption at Mount Allison. From June 1, 2001 to May 31, 2002, our total consumption measured 11,420,093 kilowatt hours, an increase of 410,609 kilowatt hours over the previous year. Oil consumption fluctuates from year to year as a result of winter weather conditions. Efforts have been made to make the steam lines leak-free, and to install more efficient fixtures whenever renovations are done. In two years, when natural gas is expected to become available in Sackville, the university will be prepared to switch the main

on campus are not disposed of on a regular basis, but are disposed of only when there is sufficient quantity to warrant disposal. It is recommended that the University create a campus wide database dealing with hazardous wastes on campus, providing information on the purchasing, storage, and disposal of wastes. A system of this nature would allow the tracking of wastes from cradle to grave, and eliminate the purchasing of chemicals which might already be in excess in on campus. It is further recommended that all members of the University community strive to ensure that all hazardous wastes are kept, labeled, used and disposed of in the proper fashion.

Grade Assigned C

Solid Waste

An accurate measurement of the amount of solid waste produced by the university is impossible to obtain, as the amount of waste produced is not weighed. Thus a comparison on the amount of waste produced between this audit and the previous audit is not possible. It is important that if the university wishes to accurately gauge its impact upon the environment that it begin to measure the amount of waste produced. The University is currently billed for 224 tonnes per year, 23 tonnes per month from September to April, and 10 tonnes per month from May to August. The cost of disposal varies depending on what materials the University is disposing of. The University has made some progress in the area of solid waste. A number of new recycling containers were installed in the fall of 2000, and in the spring of 2002, yard waste started being composted on site, to eventually be reused as fertilizer on campus grounds. It is recommended that the University begin to weigh the amount of solid waste and recycling which it produces. Without accurate numbers on the amount of waste produced, gauging the environmental impact, and making reductions, is difficult.

Grade Assigned D

Paper

The 1998 audit reported that 4 498 218 sheets of paper were consumed between 1997 and 1998. In 2000, the audit reported that 6 450 000 sheets of paper had been consumed from May 1998 to April 2000. From May 2000 to April 2002 Mount Allison University consumed 8 275 681 sheets of paper. This marks a 1 825 681 increase in the amount of paper consumed at the University. This increase is partly due to greater consumption, and partly due to more accurate accounting of paper used on campus. It is recommended that the University create a specific section of the environmental policy dealing specifically with paper use on campus. All members of the University community are encouraged to adopt paper saving methods, such as printing double-sided, using both sides of the paper before recycling it, and only printing necessary documents.

Grade Assigned C

Food

Acknowledgments

Mount Allison University's Third Environmental Audit was made possible through the help and advice of numerous people:

The Environmental Issues Committee for overseeing the continuation of the auditing process over the past six years. Sustainability Solutions Group for providing its services in environmental auditing. Jeff Lamb for his advice and good judgement. Perry Eldridge for having to answer oh, so many questions about the technical backbone of the university.

We thank the following people for their help with all the details contained in the report: Audrey Kenny, Deanne Ward, Pamela Lusas, Andrea Ward, Michelle Strain, Mark Payne, Wendell Richards, Mark Henchy, Janet Robinson, Rosemary Polegato, Brad Walters, Paul Bogaard, Margaret Beaton, Jean-Guy Godin, Robert Ireland, John Read, Rog1.6snu63.322 (ermh ap61.6 its s989 (2ap6slledgm*-60..333 (ert ptfle nunvi)65. s9ol72.ich77)-107.3cK help w)-65nn Go providing itDave6Stew0 >(ame (6 (nals(ea*56.Creelns , Georg(ard, P)349 (t. burGo)-6hisO Tcrh(, nsralf(alun2 (o)Cindy(ison 2.66e, Wike.66Rog1.)]TJ uenhau,n-Guard

and no change is proposed.

Letter Grades are explained in the Executive Summary of the report. They are designed to give the briefest possible synopsis of the university's performance in each of the areas studied by the auditors. They appear at the end of each chapter.

N.B. All direct references made in the text are footnoted and a complete bibliography of sources used for the report can be found on page As much as possible, data collected for the audit was integrated into the text of the report. In instances where extensive data was collected, a note of it is made in the text with directions to an appendix. All appendices are located at the end of the report.

Buildings

Introduction

There are currently 47 buildings that comprise the University campus. A small number of changes have occurred since the last audit. In the past two years, one building, Hillcrest house, was demolished, while one building, the Coastal-Wetlands Center was built. Significant renovations have taken place in a number of buildings, including Bennett building, Avard-Dixon, Barclay, Bennett House, Edwards, University center and Hunton house. Where ever possible the university attempts to take full advantage of environmentally-friendly technology, including tripled layered insulation, Wattstopper technology in bathrooms, low flow faucets, and low flow-high pressure toilets.

Environmental Significance

"We think that education occurs mostly in buildings, yet apparently we believe that the design and operation of those same buildings have nothing to do with education."[1]

-David Orr

The way in which we choose to design and construct our buildings impacts

- The removal of the Fine Arts studios from both Hart Hall and Gairdner buildings. Hart Hall will be renovated to create more class room and office space.
- The Library space will be reorganized so as to make more study and book space. The archives will be relocated to either the Gairdner building or to a Library extension.
- Renovation and updating of laboratory space in the Barclay building, which will increase the overall amount of space dedicated to research.
- Renovation or Replacement of Trueman and Palmer
- Accessibility renovations, in Avard-Dixon, Flemington, Crabtree, and Centennial Hall.
- Renovation of Athletic centre.

The special features of option one are as follows:

- Trueman is replaced by a new residence located at the north end of campus
- Trueman/McConnell is renovated to house all current occupiers of the University Center (SAC, Student services, CHMA, Argosy, Allisonian, Pub, Golden A, Mail room, Mail boxes), except Windsor theatre. It is planned for this facility to also house the book store, and repro graphics.
- Renovations to the University Centre so that it could house the entire Fine Arts department, and Windsor theater.

There were a number factors contributing to the decision to pursue option one of the proposed plans. One of these factors was adherence to the university's environmental policy. While option one would see the creation of approximately 6000 sq ft more unsubstantiated space than option two, option one focuses on the renovation of existing buildings rather than the creation of new facilities. This will allow the university to reuse existing building space and materials, cutting down on the need for new materials. While option one maybe be acting against the environmental policy, in terms of creating more unsubstantiated space, it may, in the long run, reduce the schools environmental footprint by reusing existing structures rather than creating new ones. The true test of adherence, and commitment to the environmental policy will be shown in the way in which these facilities are renovated or built. The building plan presents a tremendous opportunity for the university to demonstrate its commitment to reducing its environmental impact. New buildings present to university with the opportunity to use the latest in technology, reducing energy, water and heat consumption, through proper insulation, solar panels, and low flow water fixtures, and alternative building techniques, taking advantage of passive solar heating and wind generated power. Renovations, as well present the university the opportunity to invest in technology which will both reduce the amount of money spent on each building (energy, heat, water) but will also act to reduce the environmental impact of that building. For example, both Trueman House and Palmer House are slated for extensive renovations. Both buildings have extensive southern exposure, which would make them suitable for the use of passive solar heating, and/or the use of solar panels.

In the 1999/2000 academic year, the sustainable residence initiative was begun. This student initiative sought the construction of a multipurpose environmentally friendly facility which would serve as a residence, meeting center, classroom, and demonstration center for sustainable living. Currently the university has adopted the Sustainable Residence Initiative as an official university project, and is currently raising funds so that a architect and engineer can be hired to design building plans. A building of this nature would help the university reduce the environmental impact, and provide a model from which future building can be based upon.

Case Study

In 1996, McGill University carried out an extensive renovation of one of their residences on campus. The residence which was built in the late 1960's was in a state of disarray, and required immediate attention. The structure of the building itself was still functional, so the decision was made to renovate the building, incorporating a number of environmentally friendly technologies. The University strived to recycle as many products as possible from the old residence, incorporating them in various fashions in the new residence. The facility was constructed in a fashion that allowed the university to add on additional, environmentally friendly technology once it became financially possible to obtain and implement. The building currently features, and can house a number of interesting technologies including:

- A greenhouse for each housing unit, designed to capture and store solar heat, which is then used to heat the building (passive solar heating)
- Water heated through the use of solar energy (active solar heating)
- Rainwater collection system, to be used in gardening and laundry facilities
- Avoidance of PVC-based products
- Ecological waste water treatment facility (Living machine)

The residence is being built as a multi-purpose facility, as it will be used as a resource and demonstration center, and is integrated into a number of classes taught at the university.

Recommendations

For Senior Administration

1. Establish a set of standards to direct the energy use, water consumption, quality and design of future building projects on campus with the purpose of minimizing the environmental impact of the university's buildings. Specifics might include those listed in Recommendation 5 for staff.

2. Prior to approval of significant renovations or construction on any existing or future structures on campus require that an environmental impact analysis be presented. This analysis would consider the type and efficiency of materials used, the damage to local flora and fauna, the energy efficiency of the design and its ability to maximize renewable environmental resources.

3. Encourage the reduction of toxic building materials by providing funds for the purchase of non-toxic alternatives.

4. Make a commitment to eliminate purchases of all old growth wood products.

5. Continue to support and provide funding for the design and building of the Sustainable Residence.

For Staff

5. Make a commitment to favour structural designs which have a smaller environmental impact. Favoured designs would include:
   a) Plans sized for optimal use of building materials
   b) Space for recycling containers
   c) Recycled products (eg: carpet, tile, furniture)
   d) Low toxicity floor and wall coverings
   e) Efficient energy and light fixtures
   f) Optimal use of passive energy from shade and sun using windows
   g) Insulation which significantly exceeds existing

building codes

h) High quality ventilation system
i) All contract agreements include a clause outlining the treatment of solid waste by the contracted company. This agreement would demand that a concerted effort be made by the company to:
j) maximize the efficiency of all materials used
k) use recycled and environmentally friendly materials whenever they are less than 5% more expensive than the non-recycled alternatives.
l) sort and recycle all recyclable solid waste.

1. Demand full corporate disclosure of all products and procedures used by companies entering or under contract with the university. The disclosed material and processing information should then be made available to all concerned individuals.

2. Establish a data base to record and address maintenance issues as quickly as possible. This should be accessible to all staff, students and faculty for input. A well maintained building is generally less harmful to the environment, and observations made in existing buildings can help in designing better buildings in the future. Continue to keep accurate and accessible records of building maintenance done.

3. Encourage the reduction of waste in the trades shop by providing funds for the removal of recyclable waste (wood, metal) to recycling centres.

For Adm (ftt t)heaculty, Staff, and Students:

4. Take the initiative to kindly report any facility defects you find to Facilities Management by e-mailing fixit@mta.ca

Figure 1.1 Review of Current Environmental Policy

Current Performance Indicator	Current State of Affairs	Proposed Change to Performance Indicator
Response time for building maintenance and repairs is monitored and minimized. Neglected maintenance tasks generally increase energy use and potential harm to the environment.	This policy is adhered to for most repairs. Some repairs assume priority over others, bumping more unimportant repairs down the priority list.	No change proposed.
Prior to new building projects, an environmental impact analysis is completed and such impact is minimized through appropriate selection of materials or design elements.	Environmental impact analysis is not carried out in all cases.	Require that an environmental impact analysis be conducted prior to all new construction and major renovations.
Building construction or renovation makes use of environmentally friendly materials and disposal procedures.	While not all materials are environmentally friendly, there has been some headway made in this area.	Define what environmentally friendly materials and disposal procedures are.

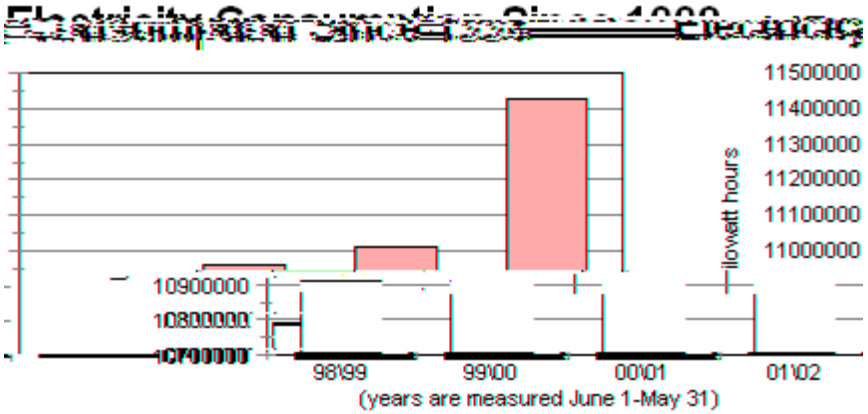
Letter Grade: C

Energy

Introduction
There has been a steady increase in electricity consumption at Mount

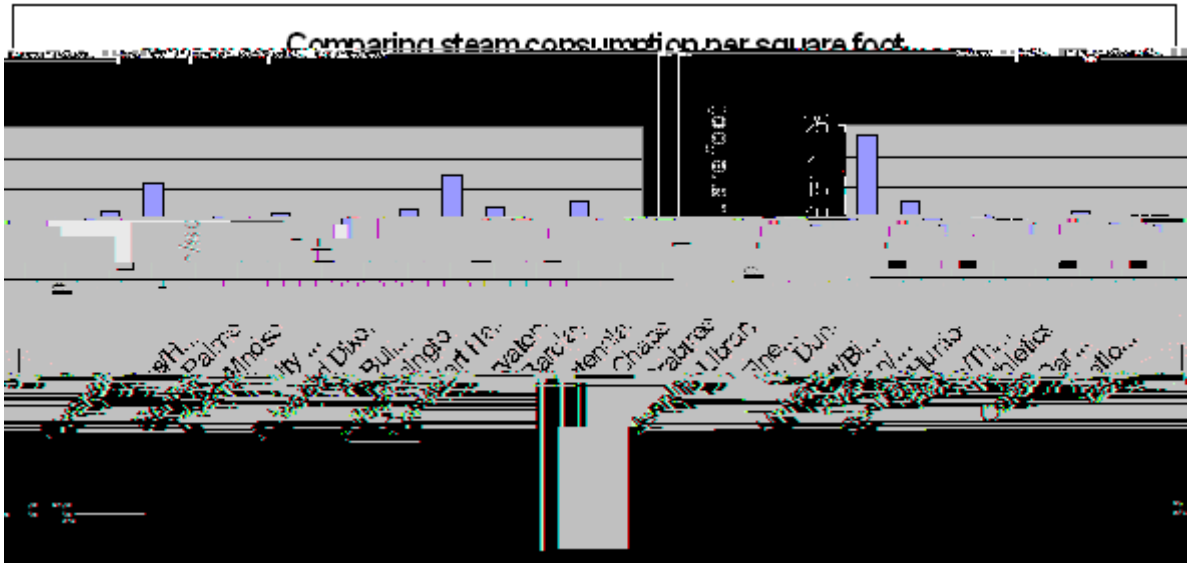
be environmental friendly and sustainable, we have the tendency in Canada to build massive dam projects, such as phase one of the James Bay project, which flooded an area of 15873 square km[4]. Large hydro-electric dams of this nature cause the release of large quantities of methane, a greenhouse gas, from decomposing vegetation. The flooding also causes the release of mercury from vegetation, which eventually bio-accumulates in the food stream, effecting the health of humans, Beluga whales and seals[5].

We must strive to reduce the amount of energy that we consume, while at



use to a warmer winter. The steam produced by burning Bunker A oil is measured in pounds per hour and is metered as it flows into individual buildings. The university now has over one year's worth of data collected from these meters that can be used to establish a baseline from which to make reductions. This data is contained in Appendix F. Figure 2.2 compares, per square foot of total floor area, the heat consumption in each of the buildings heated by steam.

Figure 2.2:



3.

sit down mower which is gas powered. Since the last audit the use of these vehicles has not decreased a significant amount. To decrease the amount of subsidized driving taken by Supervising members of Facilities Management, a bicycle has been purchased which can be used by supervisors to travel to and from work sights on campus. The use of this bicycle will help offset the use of vehicles on campus to travel very short distances. Despite the small size of Sackville and the close proximity of the university to residential and commercial centres, many people still insist on driving their automobile to work. For many people who live close to the

dollars a year from decreased fuel, oil, and maintenance costs.[8]

Recommendations

For Senior Administration

1. Support, through allocation of funds, the purchasing of lower or zero emission vehicles.

For Staff

2. When possible, arrange to use one vehicle for multiple tasks (eg custodial deliveries combined with carpentry deliveries).

3. Plant hedges in areas where people cut corners to prevent the problem of pedestrian damage to the turf and tree roots.

4. Explore alternatives to current use of university vehicles:
   • make small deliveries on foot/bicycle
   • consider the possibility of using cleaner burning fuels (eg biodiesel, propane)
   • consider purchasing lower or zero emission vehicles

9. When on University business, travel more sustainably by taking a train or bus instead of flying or driving alone.

10. Create a ride-sharing page on the Mount Allison website, where rides can be posted and car-pools organized.

[8] Wright State University, 'Costs Saving From Electric Vehicles,' http://www.wright.edu/cgibin/news_item.cgi?43

For Administration, Staff, Faculty, and Students:

5. Unless absolutely necessary, all members of the university community should avoid driving their vehicles onto the campus.

6. The university community should be encouraged to car pool, and to use the drive board in the University Centre.

7. For those staff, faculty and students who live 5 km or less from the university campus, cycling or walking to work or class is a realistic alternative.

8. Because neither the grass nor the root structures of the trees on campus are strong enough to support regular pedestrian traffic, all members of the university community should try to keep to the walkways in order to preserve this vegetation.

Figure 3.1 Review of Current Environmental Policy

Current Performance Indicator	Current State of Affairs	Proposed Change to Performance Indicator
	Current 12or	

Air

Introduction

From May 2000 to April 2002 1 006 528.35 kg of green house gases were emitted by Mount Allison University. A comparison with the previous audit on the amount of greenhouse gases produced is difficult, because a different method for calculating the amount of gas produced was used to calculate this years total. The 2000 audit reported that 5 654 472.9 kg of green house gas were emitted by the University in the two year auditing time frame.

Environmental Significance

Global climate change, caused by excessive amounts of greenhouse gas, threatens to have a devastating impact upon the environment. Although we may produce relatively small amounts of greenhouse gas here in Sackville when compared to other places, because of its trans-boundary nature, global climate change will impact the entire planet. Green houses gases produced here in Sackville will impact upon peoples and environments throughout the world. As example, It has been shown that the majority of smog in the Southern Atlantic Region originates in the Eastern United States and Southern Ontario[1]. From extreme weather patterns, to rising sea levels, global climate change could have a grave impact, not only throughout the world, but also specifically here in Sackville.

Air quality is progressively becoming an issue of greater concern, as science continues to unveil the impacts poor air quality can have on both environmental and human health. We can examine the quality, of the air which surrounds us immediately, in terms of what chemicals and particulate matter is in the air we breath, and what negative effects it has upon the environment and our health. Air quality of this nature is often referred to as ground level ozone, and has received quite a bit of attention from health and environment officials, because direct links can be established between this ground ozone and environmental and human health degradation. Ground level ozone has been linked to causing a number of cardio-respiratory complications, damage to vegetation, and damage to other synthetic and natural materials[2]. Air quality can also be dealt with on the amount of greenhouse gases which the university emits, contributing to global climate change. Climate change threatens to change the way in which the world functions, which will inevitably result in the devastating impacts upon the integrity of the environment and our livelihood within that environment. While separated for the purposes of description, these two aspects of air quality are very much interconnected. It is often the same chemicals that cause ground level ozone which are also responsible for causing global warming.

Current Environmental Policy

The University currently does not have a policy concerning air quality

Responsible Parties

Air quality is effected in a number of ways by the Mount Allison community. From the consumption of fossil fuels for heating, electricity, and transportation, to wastes sent to the landfill, to the use of fertilizers on campus lawns, almost all activities under taken at Mount Allison have a direct impact upon air quality.

The University currently operates thirteen vehicles, and three tractors in their vehicular fleet. Unfortunately, the auditors were unable to get information on either the number of kilometers driven or the amount of gas consumed in the past two years. It is recommended that the University begin to record this information, so that environmental impact can be accurately measured.

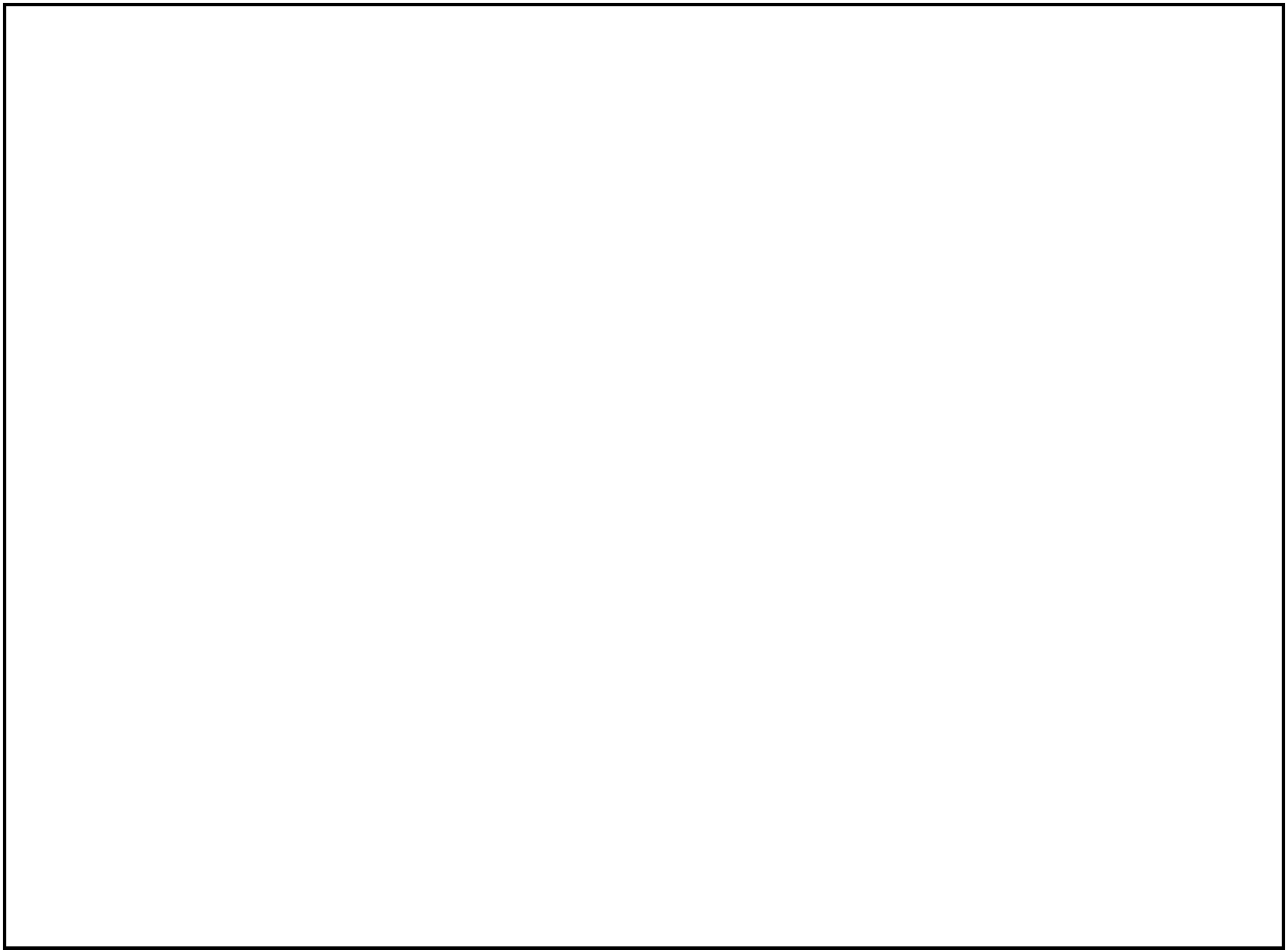
The University currently uses a two sit down mowers, a number of push mowers, and 'weed-whackers.' All of these tools consume gas and emit green house gases at varying levels, depending upon fuel efficiency and use.

Personal transportation, under taken for University related activity's, such as attending various conferences, or meetings, produces large amounts of greenhouse gas. The University currently does not record the number of kilometers traveled or gas consumed when subsidizing travel. Travel expenses are not separated into different categories, they are currently recorded all as a single cost. Gas, cost of airplane ticket, lodging, and food is all recorded as one cost. It is recommended that the University begin to keep separate records on the amount of kilometers traveled, gas consumed, and distance of airplane travel, so that the University will be able to more accurately measure their impact upon the environment.

Although undertaken as an individual choice, the method of transportation that one chooses to travel to and from the University has a great impact on the environment. Although it is not directly related to the environmental impact of the University, as it is not the jurisdiction of the University to control how members of the University community travel to work. Indirectly, the University can have a large impact on aiding members of the University community reduce their dependence on their automobile. By organizing car-pools, making the campus bike and walking friendly, the University can act to reduce the environmental impact of its staff.

Solid Waste

As waste generated by the University decomposes it produces methane gas. The exact amount of gas cannot be determined exactly, as neither the exact amount of waste produced by the University is not measured, and the



older buildings on campus were identified as having very poor air quality. It is important that the University carry out a annual tests on indoor air quality, to ensure that members of the University community are not being exposed to harmful air.

Case Study

The students at Lewis and Clark University recently (Feb 27, 2002) voted to allocated $17 000 dollars of student fees to bring the University into compliance with the Kyoto Protocol, bringing its greenhouse gas emissions 7 percent below 1990 levels. 83% of voting students supported the small increase in fees in order to meet the Kyoto goal. This money was directed towards various projects, including energy reduction retrofits and tree planting.

Recommendations

chapter on Energy)

14. Request that Sodexho purchase more food from local sources. This will reduce emissions resulting from transportation.

Letter Grade: D

Environmental Significance

It is a difficult task to describe hazardous wastes in their most general sense. A vast array of chemicals exist which are considered hazardous, with new ones being discovered every day. Each of these chemicals is a distinct

Hazardous Materials

Introduction

From May 2000 to April 2002 Mount Allison University disposed of approximately 25 251.42 litres and 14 379.2 kg of hazardous waste. For this calculation, 'disposed of' includes all hazardous wastes going through the Science Stores facility for special disposal, and hazardous waste disposed of through the regular waste stream. In comparison with the 2000 audit, there was a 2511 litre increase in the amount of liquid hazardous waste being disposed of, and a 13 277.9 kg increase in the amount of solid hazardous wastes disposed of. This extreme increase is due to the inclusion of solid cleaners used in food services in this years audit. Exact comparisons with the previous audit in hazardous wastes is difficult, as wastes are not disposed of on a regular basis, but are rather disposed of when there is sufficient quantity to warrant disposal. As a result disposal occurs on a irregular schedule.

The sources and volumes of hazardous materials being used in an intricate system such as Mount Allison University are often hard to track, which makes the measuring of the impact of hazardous chemicals disposed of by the University largely unknown and difficult to estimate. Although Mount Allison does not currently have a unified campus wide database, to record the purchasing, storage, and disposal of hazardous materials on campus, there are a number of smaller systems regulating their use on campus, such as the Science Stores facility.

systems, where they proceeded to destroy all aquatic life within the river system[3].

Current Environmental Policy

"Under this policy, the university will endeavour, through the Fine Arts and Safety Committee, to limit the use of Hazardous Materials as follows:

- 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." (Section 2.3, Mount Allison University Environmental Policy, www.mta.ca/environment)

Audit

The generation and use of hazardous waste is concentrated in five major areas on campus: scientific research, fine arts, cleaning materials, facilities management trades shops, pesticides/herbicides use, and other sources. As per the previous two audits, these five sections will be audited separately, with a number of recommendations for each specific chapter.

Scientific Research

Responsible Parties

Chemicals used in the university labs are ordered by professors on an individual basis, however, the chemistry department is generally considered central in possession of chemicals as it houses the Science Stores facility, which is directed by Roger Smith. The Science Stores facility is responsible for the storage and disposal of hazardous wastes on campus.

Audit

As mentioned in the previous two audits, in all possible situations, lab experiments are done using micro scale chemistry. The use of as little chemistry as possible has been implemented in as many classes and research laboratories as possible. Micro scale work reduces cost and toxic waste by using chemicals in as minute quantities as possible.

The Science Stores facility is a centralized service that provides chemicals and coordinates the disposal of hazardous wastes on campus. The facility is located on the ground floor of the Barclay building. Since the last audit in 2000, there have been no major changes to the functioning of the Science Stores facility. Science Stores continues to make use of a database into which all departmental and research purchase orders are compiled and processed. A number of departments acquire their chemicals through Science stores, including all science departments, and the fine arts

Canada. In the past two years, Science Stores disposed of 2350.63 kilograms of solid hazardous wastes and 1305 litres of liquid hazardous wastes. A full break down the wastes disposed of can be seen in Appendix I. An exact comparison with the 2000 audit is not possible, because in the 2000 audit all chemicals were measured in litres, while for this audit, measurements were compiled in both kilogram and litre measurements. It is, as well, difficult to do comparisons from year to year on the disposal of hazardous wastes because lab packs are disposed of only as they reach full capacity. Which means that there is little continuity in the amount or type of chemicals disposed of from year to year. It is hoped that through proper education and awareness, students and staff will choose to dispose of their chemicals in the proper fashion. But it is difficult to ensure that all hazardous wastes are disposed of in the proper manner.

Science Stores and Laidlaw Environmental Services Ltd, are licensed by their respective provincial governments, to both produce and dispose of hazardous wastes, and is audited by the government for compliance with environmental regulations.

For the past two years, radioactive materials on campus have been regulated by Dr. Ralf Bruening of the Physics department. The university is licensed to handle certain radioactive materials through the Atomic Energy Control Board.[4] The use of radioactive materials is designated for use in the Dunn, Flemington, Barclay, and Huntsman marine science centre in St. Andrews New Brunswick. It was noted in the 2000 audit, that the use of radioactive materials on campus has been steadily decreasing. This trend has continued, as radioactive materials have only been used once on campus in the past two years. Because they are quite expensive, many departments have successfully found alternatives to using radioactive materials in teaching and research. As a result, the use of radioactive materials has almost been eliminated on campus. It was however pointed out that Dr. David Fleming, a bio-physicist, who is the recent recipient of a Federal research chair, will most likely require the use of radioactive materials in his research. It is believed that the university will be required to apply for a new license to accommodate the materials that Dr. Fleming will require to carry out his research.

The storage and disposal of radioactive material is all done according to the regulations set out by the Atomic Energy Control Board. Storage occurs in one of two ways, sealed and unsealed, and both are kept in labeled refrigerators. In January of 2001, there was an inspection carried out by the Canadian Nuclear Safety Commission. They found a number of minor infractions on campus, mostly pertaining to improper labeling and lack of contact numbers, all of which have been subsequently rectified. In the past two years the university disposed of a large portion of the radioactive waste stored on campus. The waste was disposed of according to AECB regulations. A large portion was removed by the inspecting officer, while other material were neutralized and disposed of through the regular waste stream. The University is required, and does keep extensive records of purchase, storage, use and disposal of radioactive materials on campus.

Science Research Recommendations

For Faculty

1. Consult Science Stores before purchasing hazardous materials to avoid overlap.

2. Ensure proper labelling of all hazardous chemicals in labs so as to avoid unknowns in the disposal procedure.

3. Continue to meet regulations for purchasing, using, disposing of hazardous materials. Consider exceeding regulations for the sake of environmental safety beyond human health.

4. Educate students on the effects of toxic laboratory chemicals on wildlife and their larger environmental impacts when they are poured down the drain, both in teaching and through signs posted

[4] Mount Allison's license is set to expire on January 31 2003. The auditors were told that under the new license the Atomic Energy Control Board would increase the monitoring of nuclear materials.

Rapid Fix	1710 litres
E-6 Developing Kit	30.4 litres

Printmaking and Lithography

The auditors requested, but did not receive an inventory of the quantity of chemicals used in printmaking and lithography since 2000. They were informed that use of chemicals has not changed significantly in the past two years.

The printmaking studio currently uses a variety of chemicals, most of which are hazardous. Varsol continues to be the main cleaning agent used in the printmaking studio. The Varsol is recycled as much as possible, and is only discarded of when it is no longer useful for cleaning. When a sufficient quantit06 -12 Td (years.) When a12 2 (le,(t8 48 T h 1uan (yeged s.656t(n t8t)73of posele,(t8 4it isthr72.66oughcl)60S(en8agenT)-Tc -0.12 Tw T* [(discarded S3 arThe 6tient78 (scr8 567.656 (hki)74 (n)6ant)72 lithograpTc -0.18 Tw 0.06 -12 Trded y s a7s t8 48 llquantimour.656 le,(t8 4maia0 (rblef)71.etytTc -0.12 Tw 0.06 -1

d4ch as 70 (t)ab(werg)-70 (ut(hki)74 is on4.33opeossibnd)-6rnd d.r two prichemict3 (we5.) Whnaltmnar6uThe prdiquThe prdi n7vari4.8ntm

is projected that the university will spread 16.33 kg of fertilizer on the fields this year. No numbers were given to the auditors as to the amounts of fertilizers used in previous years. In the past year, the University began composting yard wastes. This material is composted and utilized as fertilizer. Compost material has so far only been used on flower beds, but the Grounds Supervisor hopes that soon, through the use of a screening process, the compost material will be made suitable for use as a lawn fertilizer, which will serve to reduce the University's dependence upon chemical fertilizers. The auditors were informed that fertilization does not occur on the grounds surrounding the Swan Pond, as they do not want the fertilizers leaching into and contaminating the Swan Pond water.

Since May 2000 the University has use 500 ml and 90 grams of indoor pesticide to kill of various insects. A complete break down of indoor pesticides used is available in Appendix N

When asked whether or not they support the spraying of the campus with herbicides in order to maintain a weed free campus, 70% of students, 86% of faculty, and 66% of staff claim that they do not support spraying.

Recommendations

For Senior Administration:

21. Make funds available for increased upkeep of grounds to reduce the need for chemical pesticides, herbicides, and fertilizers.

22. Make funds available for the purchase of more environmentallyRo fTw T* [(pe1 (co656tr--62.icid8 (hsl5 M.333 (atte4nA)-6m333 08 559.92 54 Tc -Liftifmn)58 (A padv9n (hat they do not sup 559.92 54 Tc -ilizer)-60.333iof:333 (Adminis)upport sprayio6:Morpot tfortai(chingus,e br)65 (eak down)59.989 (76 r.61.ithinieu up s

Shop Chemicals

Responsible Parties

Wendell Richards, the trades supervisor at the university's Carpentry shop is responsible for the purchasing, storage, and disposal of all hazardous materials used by shop staff. Perry Eldridge is responsible for the Plumbing shop and the hazardous chemicals in this work.

Audit

The auditors were informed this year that little change has occurred in the carpentry shop over the past two years. As reported in the previous audit, there is currently no inventory in place to keep track of the products used in the carpentry department. Supplies are purchased when the need arises. All members of the Carpentry department make use of the same materials, avoiding unnecessary overlap. The main sources of hazardous materials in the shop are paints, varnish, solvents, batteries, and various adhesives. Of all the paints and stains purchased, approximately 75 percent of paint is water based, while 50 percent of all stains are water based. Water based paints are chosen due to financial reasons as they are less expensive than oil based paint. The shop has investigated the use of water based alternatives to traditional adhesives, but found that these products much more expensive and not quite as effective. With the exception of batteries used for drills, batteries used by the shop are not rechargeable. Batteries and flourescent lights (containing acid) are clearly labeled and disposed of in the regular garbage waste stream. Other hazardous materials, including varsol, varnish, adhesives, and contact cement are collected, and disposed of at the end of the fiscal year through the Westmorland-Albert solid waste corporation.

The plumbing shop currently makes use of one chemical. In the past two

amount of hazardous material in products supplied and potentially disposed of.

41. Request full disclosure on hazardous materials used by companies contracted to do work on the campus. Consider including a request for less hazardous alternatives to these materials in work contracts.

42. Establish and maintain a battery recycling program on campus.

Case Study

The University of Washington is one of the most progressive schools in dealing with and minimizing the impact of hazardous wastes on their campus. The school has created a campus wide data-base containing chemical inventories, which has allowed for the creation of "comprehensive and systematic programs for the sharing of surplus chemicals and the recycling and substitution of hazardous materials campus-wide.[5] This program reduced the amount of chemicals disposed of by the University, and also acted to reduce costs, as fewer chemicals required purchasing. The database contains an 'excess chemical' page on which professors can indicate what excess chemicals they posses. Other professors search this page before purchasing new chemicals. Often the excess chemicals were offered for free or reduced price, which makes greater incentive for reuse. The University of Washington also hired a specific staff member to "minimize hazardous waste by helping lab and physical plant staff identify safer substitutes for commonly used chemicals.[6] These two activities in conjunction with one another has served to greatlye at the
University ofashington.

General Recommendations

For Senior Administration:

43. Ensure tolidated system of monitoring the purchase, use, storage, and disposal ofl hazardous materials at Mount Allison University is established.

44. Request full disclosure of procedures from all companies supplying toxic substances to ount Allison community. Divest from those companies with violations of environmental regulations.

For Staff:

45.

Figure 5.2 Review of Current Environmental Policy

Current Performance Indicator	Current State of Affairs	Proposed Change to Performance Indicator
Pesticides are used on campus only when required	Pesticides are currently used only when pests are sited on campus. Spraying is limited to the problem area. The football fields continue to be sprayed with pesticides each year.	Further define the term required, detailing what problem and to what degree of damage. Define what types of pesticides will be used on campus.
Micro-Scale laboratories are used	The micro-scale method is implemented in the majority of chemistry classes at Mount Allison.	No change proposed.
Effective, environmentally friendly cleaning supplies are used	A few Environmentally friendly cleaning supplies are being purchased, but the use of these products is optional. Most products are still purchased with price foremost in mind.	Define where these environmentally friendly cleaning products are to be used. Establish exactly how many environmentally friendly products are to be offered.
The transportation of all hazardous materials is monitored	Hazardous Materials are monitored in a series of smaller database systems. A University-wide monitoring database has not yet been created.	A University-wide monitoring system to track the transportation, storage, and disposal of hazardous materials should be created.

Grade Assigned: C

Solid Waste

Introduction

An accurate measurement of the amount of solid waste produced by the university is not possible to obtain, as the amount of waste produced by the University is not weighed. Thus a comparison on the amount of waste produced between this audit and the previous audit is impossible. It is important that if the university wishes to accurately gauge its impact upon the environment that it begin to measure the amount of waste produced. Recycling procedures are largely similar to those two years ago, there has been an observed increase in the amount of waste being recycled at the university, but is hard to quantify in specific numbers, as the amount of recycling is, as well, not measured.

Environmental Significance

The accumulation of solid waste is increasingly becoming recognized as a problem that is not best solved by simply finding more places to hide it. We are discovering the alarming effects of landfills on water, soil, and air quality, not only in their immediate surroundings, but globally. The ability of contaminants to move through, and damage, ecosystems is shocking. For example, as of last year, 1/4 of the landfills in the state of Maine were discovered to have contributed to ground water contamination[1]. Methane from the decay of organic material in landfill

to limit the amount of food waste generated. To help decrease the amount of food waste produced, food services have introduced a number of 'on-site' (on-demand) cooking, which eliminates the creation of excess amounts of food. The amount of food waste generated can still be further reduced if students were to take only as much food as they need.

A large portion of dry waste at both the Jennings meal hall and Golden A café is generated from food packaging. The director informed the auditors that whenever possible, products are purchased in bulk. While this is primarily a financial consideration, it does help reduce the amount of packaging per volume of food. In addition, many products that were once packaged in boxes are now packaged in bags, which in turn has decreased

or building, after which custodial and/or grounds staff transfer the material to a central location (McConnell Hall). Glass bottles are collected and recycled, by individuals, on a building by building basis.

In the fall of 2000, following recommendations made in the 2000 audit, the university purchased a number of containers designated specifically for can and paper recycling. These containers were placed in all academic, administrative and residential buildings on campus. Educational campaigns were carried out by both the Blue-Green society and Green Ambassadors, informing the university community about how to recycle on campus. There are still however, a number of questions as to exactly which items can and cannot be recycled. It may prove to be worth while for the university to send out a mass e-mail, and post on the Mount Allison web page, exactly which items can and cannot be recycled. Most of the confusion centred around exactly which paper products can be recycled.

When asked whether or not they felt they had an adequate understanding of how to recycle on campus, 71% of students, 66% of faculty, and 66% of staff claimed that they have an adequate understanding. A number of concerns were raised with the auditors, that the recycling program on campus is not clear enough.

In 1999 the town of Sackville switched to the Wet-Dry system introduced by the Westmorland-Albert Solid Waste Corporation. Some confusion associated with the recycling program on campus may have to do with the implementation of a system that is incongruent with the University's. Investigations and experiments are currently taking place to assess the possibility of implementing the Wet-Dry program here on campus. The facilities management department have successfully implemented the Wet-Dry program within their building. It is planned that in the fall of 2002 two buildings, one academic and one residential, will serves as test cases, to assess the viability of implementing the Wet-Dry program on campus. It is currently unknown how much the Wet-Dry program will cost the University.

The amount of solid waste that the university sends to the landfill can be greatly reduced if the University is able to successfully implement the Wet-Dry system on campus. There are however, other methods which the university could undertake to reduce the amount of material sent to the landfill. These measures include, on-site composting, and the further recycling of various materials on campus.

grf (Albsuc)-67J T* [(b TD [(The amoe(re /T1_1 9 Tf7 (s i)56.985oli)62.663easures(S

number of areas, including Solid Waste, Food, and Education.

Recommendations

For Senior Administration:

1. Ensure that the university's solid waste is being weighed

yogurt containers, etc. for arts and crafts.

12. Bring unwanted clothing, books, furniture, etc. to the Salvation Army.

13. Educate those around you if you notice them throwing out something which could be recycled or reused.

14. Before making any purchase, business related or personal, consider the following questions before making a decision:
- Do I really need this product ?
- Can I buy it used ?
- Could I repair or refurbish the old item instead ?
- Can I loan or lease it from someone else ?
- Does it contain recycled/recovered materials ?
- Will this product reduce waste in my office ?
- Is it made from non toxic materials ?
- What kind of packaging is used ?
- Is it reusable or recyclable ?

Figure 6.1 Review of Current Environmental Policy

Current Performance Indicator	Current State of Affairs	Proposed Change to Performance Indicator
There is an effective paper waste reduction program	Paper waste continues to be a major issue at Mount Allison, paper consumption has steadily risen over the past six years.	Establish a specific section of the Environmental Policy dealing with paper consumption on campus. Create effective polices to reduce paper consumption and set target dates for implementation
An effective recycling program is maintained across campus	In order to increase participation, participants require more information, and increased number of bins.	Define what participation levels, and quantity of products recycled, renders a system effective.
Furniture is offered for sale or donation to disposal	Effort is made to make furniture available for sale or donation	No change proposed
Yard Waste is used as mulch on campus grounds	Yard waste is composted and re-used as fertilizer	No change proposed

Letter Grade: C

Paper

Introduction

The 1998 audit reported that 4 498 218 sheets of paper were consumed between 1997 and 1998. The 2000 audit reported that 6 450 000 sheets of paper had been consumed from May 1998 to April 2000. From May 2000 to April 2002 Mount Allison University consumed 8 275 681 sheets of paper. This marks a 1 825 681 increase in the amount of paper consumed at the University. This increase is partly due to greater consumption, and partly due to more accurate accounting of paper used on campus.

Environmental Significance

Global paper consumption continues to increase at an unrelenting pace. In their report,The State of the World 2000

systems)[8]. Specifically in New Brunswick, forests currently occupy approximately 85 percent of the land,[9] with over 70 percent of wood harvested using clear cutting methods.[10] New Brunswick alone currently has 10 paper mills in operation.[11] As current practices in the consumption and production of paper bring high environmental costs, we must seek to reduce unnecessary paper use, reuse whenever possible, and when no longer useful, recycle.

Current Environmental Policy

There is currently no policy regarding paper, except for four performance indicators contained within other sections. Within the Solid Waste section, the performance indicator states:

-"There is an effective paper waste reduction program."

In the Purchasing section, there are three performance indicators specifically regarding paper, they state:

departments. The faculty of Social Science is composed of five different departments, which gives each department an average paper use of 1.48% from May 2000 to April 2001, and 1.32% from May 2001 to April 2002. Appendix ?, represents the changes in consumption over the past two years, illustrating an increase or decrease in the amount of paper consumed by the various departments on campus.

The largest increases, over the two year period, in the amount of paper consumed occurred in the following departments; Bookstore (206568 sheet increase), The President's Office (67589 sheet increase), SAC-CHMA-Pub-Sodexho (62313 sheet increase), SAS (incl Massie) (38806 sheet increase), Psychology (31063 sheet increase), Computing Services (25458 sheet increase), Math/Computer Science (24268 sheet increase), and Chemistry (23064 sheet increase). The largest decreases in the amount of paper consumed over the past two years occurred in the following areas; Library photocopiers (55000 sheet decrease), Financial Services (33524 sheet decrease), Printing Labs (30000 sheet decrease), Library Administration (20572 sheet decrease), and History (17333 sheet decrease). A full break down of the total amount of paper consumed can be viewed in appendix (***insert appendix number here***).

In 2000, Mount Allison purchased all of its paper from Xerox. As noted in the previous audit, Xerox has a policy to only purchase paper from companies that "are committed to sound environmental practice and sustainable forestry management...(these) companies must be in full compliance with environmental regulatory requirements in the countries where they operate." The auditors were unable to find out exactly from who Xerox purchases its paper, and the old growth content of its paper. In 2001, Mount Allison switched contracts for paper supply to Econosource. Paper from Econosource has no recycled content, and is made entirely from virgin fiber. However, coloured paper from Econosource contains 30% post-consumer content, while card stock contains 50% post-consumer content. The auditors were unable to determine where exactly econosource paper comes from, and whether or not they have an environmental policy to which they abide.

The two largest sources of paper consumption on campus are photocopying and printing. Mount Allison, along with all other Maritime Universities, is a part of a collective bargaining group which forms collective contracts for photocopy suppliers. In August 2000, Mount Allison entered into a new contract with Canon.[12] The University currently employs 6 public copiers and 27 departmental copies. All of the new machines from Canon are consolidated digital photocopiers and printers. The consolidation of the two greatly reduces the amount of tonner consumed. The Canon copiers also allow for easier double-siding of documents, which, if used, can drastically reduce the amount of paper consumed. In the coming academic year (2002-2003) all Canon copiers on campus will have their default setting placed on double sided printing. A number of departments on campus still have single function printers. Although these single function printers are not being removed, the trend is towards using the Canon copiers as much as possible, as they decrease both the amount of tonner and paper (through easier double siding printing) consumed.

During the past academic year, a new printing program was begun, which has dramatically reduce the amount of paper consumed by student printing. The new system sends print jobs to a central computer which is linked directly to the printer. After sending a print job to this central computer, the user must click on their work and enter their password in order for it to print. This process eliminates the printing of unwanted copies, ensuring that only the documents that are wished to be printed are. Although there maybe other factors contributing to the decrease in the amount of printing taking place at University Print labs, there was a substantial decrease of 30 000 sheets in the past year, which can partly be attributed to the implementation of this new printing system.

The "Record", is Mount Allison's alumni magazine, which is published by the external relations office. Approximately 15000 copies of each issue are printed and distributed to alumni. The Record is published three times during the year, with two issues being approximately 40 pages, and the other being approximately 56 pages. As was noted in the previous audit, the Record continues to be printed on recycled paper.

[12] Canon's environmental policy can be found on the companies web site: http://www.canon.com/environment/a-01.html

The paper towel used by the University is 100% recycled with 80% post consumer content. The paper towel at the University is supplied by

- 62 895.2 litres of oil burned
- 1556 kg of air pollution released
- 3 211 179.2 litres of water consumed
- 262 371.3 kWh of energy consumed
- 4122.6 kg/yr of CO_2 filtering capacity lost[13]

The results from the environmental survey indicate the both faculty and students are more than willing to undertake a number of paper saving measures. 100% of Faculty respondents to the environmental survey indicated that they would be willing to use unbleached and/or recycled paper if it were available. 33% of faculty support an increase of 10% in spending to purchase environmentally friendly products, while 44% support an increase in 5%. 72% of faculty would accept assignments via email. 94% would accept assignments printed on both sides of the page, while 91% would accept assignments printed on one-sided paper (paper on which one side has already been used). 94% of students responded that they would use unbleached and/or recycled paper if it were available. 25% of students indicated that they would support a 10% increase in cost to support environmentally friendly products, while 33% indicated that they would support an increase of 5%. 89% indicated that they would hand in assignments via email. 81% would print assignments on both sides of the page, while only 63% said that they would hand in assignments printed on one-sided paper. 100% of staff respondents indicated that they would use unbleached and/or recycled paper if it were offered. The high results from faculty and students indicates a willingness on both sides to conserve the amount of paper being consumed.

Case Study

In 1998, the University of British Columbia committed itself to reducing its paper consumption by 20% by 2004. The University is taking a pro-active paper reduction program, singling out the largest paper users on campus

already used on one side.

12. Encourage students to submit shorter assignments via E-mail and allow students to use this method when submitting longer essays as well.
13. Reduce your own paper consumption by using E-mail as much as possible and not printing anything you don't have to.
14. When possible, use overheads instead of handouts.
15. Reuse all paper that has only been used on one side. One-sided paper can also be made into scratch pads free of charge at Central Stores. (One-sided paper should not be recycled since half of it is still useful.)
16. Recycle paper once it has been used on both sides.
17. Consider using part of the department's budget for a paper shredder so that confidential documents can be recycled.

For Staff:

18. Discuss with your department the possibility of order less paper each year and using the savings toward the purchase of recycled content paper.
19. Suggest a departmental policy that all copying be done on both sides of the paper
20. Reuse all paper that has only been used on one side. One sided paper can also be made into scratch pads free of charge at Central Stores. One sided paper should not be recycled, half of it is still perfectly good.
21. Consider using part of the department's budget on a paper shredder so confidential documents can be recycled.
22. Reduce your own paper consumption by using E-mail and not printing anything that you don't have to.
23. Print all exams and exam booklets on both sides of the paper.
24. Recycle paper once it has been used on both sides.

For Students:

25. Ask your professor if you can hand in assignments single spaced, double sided, or via E-mail. If told that you can't, ask why not.
26. Encourage the SAC office to purchase recycled paper products.
27. Read books on course reserve in the library rather than photocopying them.
28. Photocopy double-sided or onto paper that has already been used on one side.
29. Use posters minimally, and if you do make them, use paper that has already been used on one side.
30. Reuse all one sided paper (to print assignments on the other side, for signs, for rough work, for class notes, etc.)
31.

Food

Introduction

Sodexho continues to be the primary food provider on campus. Approximately $42,000 are spent each week of the school year on food served at Jennings and the Golden A Café. A small portion of this is supplied by local sources and some adjustments are made to the menu according to the season. Unfortunately, organic food is not yet served by Sodexho.

Environmental Significance

The interrelationship between the food we produce and the health of the environment is one that is often over looked. Not only how we choose to produce our food, but what we choose to consume, has a profound effect upon the health of our environment. It is a delicate balance, as the foods we choose to produce and consume has a direct impact upon the environment, while environmental conditions largely dictate what foods we are able to produce. Agriculture world wide is in a state of disarray environmentally, from the use and run-off of pesticides, to increased rates of soil erosion, to bacterial contamination, the 'factory' farm constitutes a great threat to the integrity of the environment.

The use of pesticides is one of the greatest environmental concerns today. A wide variety of pesticides in use today are known to cause cancer and birth defects, while others can act as hormone mimickers causing adverse health effects. Health Canada estimates that "food generally accounts for about 80 to 95 percent of our daily intake of most persistent toxic contaminants."[1] The result being, that a large portion of the pesticides sprayed upon our food is absorbed into our bodies. Pesticides as well, besides being disastrous to human health, are devastating to health of the environment. The accumulation of pesticides in an ecosystem have been known to cause, the re-gendering of amphibians, the build up of bacterial matter, and if in high enough concentrated, the destruction of entire ecosystems.

On average, the typical North American diet derives 25% of its calories from animal products. Besides generally being a fattier diet, the grain used to produce one pound of hamburger, through animal feed, could other wise be used to produce 8 loaves of bread or 24 plates of spaghetti. The amount of water used to produce that same amount of hamburger (2,500 gallons) could be used to grow more than 50 pounds of fruits and vegetables. It is estimated that cattle consume 70 percent of all grain in the United States, and that half of all water consumed in the United States is used to grow feed and provide drinking water for cattle and other livestock.[2] In a world of over six billion people, with what little resources we have, the typical North American diet is simply no longer sustainable. By eating lower on the food chain more often, we are able to lessen our impact upon the environment.

Often the transportation involved in shipping the foods we consume is over looked in its impact upon the environment. The purchasing of tropical foods, or foods grown great distances from where they are consumed

[1] Health Canada. "The Health and Environment Handbook for Health Professionals" http://www.hc-sc.gc.ca/ehp/ehd/catalogue/bch_pubs/98ehd211/chapter8.pdf

[2] Earthsave Canada www.earthsave.bc.ca

require large quantities of fossil fuels to be burned in the transportation process, contributing to urban smog problems and climate change. A focus on purchasing local foods when ever possible can greatly decrease the amount of fossil fuels burned in the transportation process.

Mount Allison university, as a representative of a large population, holds a significant amount of purchasing power. The decisions the university makes on what it chooses to consume effects not only the health of the environment, but the health of all members of the university community. The choice to purchase local-organic food, not only promotes sustainable agriculture and environmentally friendly practices, but improves the health of university personal, and spurs development in the regional economy. David Orr writes, "agriculture (not argibusiness) would be given a large economic boost if a number of these institutions purchased locally grown food from farms operated sustainably. In return they would raise the quality of the food they serve, thereby improving the health of their students, lowering expenditures by reducing the costs of transporting food long distances, strengthening the local economy, and improving their ethical posture by reducing their complicity in a food system that is neither just nor sustainable.[3]

Current Environmental Policy

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

The performance indicators for this section are as follows:

- " 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 hooj /T, and itor t.9460.33u(o be r-0.12 Tw564.32ti)60am (s

environmentally friendly as possible."

With the exception of the food served at the President's Cottage and at Cranewood, all food on campus is prepared by Sodexho. This food is served at the Golden A Café and at the Jennings meal hall. Food at the café is sold on an item by item basis. All students living in residence, with the exception of those in the Pavilion Bousquet, are required to purchase a meal plan which entitles them to 14 or 19 all-you-can-eat meals per week. Those W tin tnmehose

distributor of organic coffees.[5]" Bates College has a population of approximately 1650 students.

Recommendations

For the Director of Food Services:

1. Begin offering an organic option in the Golden A and meal hall by providing one meal with organic ingredients every week. With sufficient student demand, increase the amount of organic options available.

2. Purchase produce from local growers whenever possible.

3. Request product information regarding ingredients, processing methods and suppliers for all food items supplied by Sodexho and make it available to students.

4. Consider donating extra food to a charitable cause, such as a soup kitchen or a Meals-on-Wheels program.

For Students:

5. Request product information from Sodexho regarding ingredients, processing methods and suppliers for all food items.

6. Avoid eating those foods which do not meet environmental and socially acceptable standards.

7. Reduce food waste, only put on your plate what you can eat.

8. Limit the meat content in your diet. Eating lower on the food chain requires the input of less energy and fewer resources.

[5] Bates College, 'Environment Initiatives,' http://www.bates.edu/dining-environment.xml

Figure 8.1 Review of Environmental Policy:

Current Performance Indicator	Current State of Affairs	Proposed Changes to Performance Indicator
Packaging and waste are minimized.	Some packaging is avoided by purchasing in bulk. Wastes are not measured.	Separate the components of this indicator to address packaging, dry waste, and food waste specifically.
Organic (pesticide/herbicide free) and seasonal options(food that does not have to be preserved) are used.	No organic options are currently available; some changes in foods offered depending on the season.	No change proposed.
Food is procured from local sources	A small portion of food is procured from local sources.	No change proposed.
Information regarding ingredients and processing practices are made available to students	A binder is available that lists the ingredients of all dishes served in the meal hall. It does not include information on processing.	No change proposed.
Products which meet or exceed the standards outlined by the National Ecology labelling system are purchased.	The National Ecology labelling system does not contain many food products in its listings.	Research a labelling system specific to the food industry and revise this performance indicator accordingly.
Environmentally friendly cleaning supplies are being used		

(ng2.9us (ilaplavai 63.656 iorga)cplieseing 9) 56.667rcesF67 t (

Water

Introduction

In 2001, Mount Allison's water consumption increased by 3,147,000 litres over the previous year to a total of 174,386,000 litres. Retrofits, a decrease in activity in some labs, and the combination of the two meal halls, has reduced consumption in some of the larger buildings, however the overall trend has been an increase. The university continues to install more efficient fixtures whenever renovations are done, and is open to testing water saving technologies. The quality of incoming water from the Town meets health regulations, however the university remains somewhat vague on the impact of its activities on waste water.

Environmental Significance

In Sackville the water supply comes from Tantramar River watershed, a ground source. 91% of the population in the Atlantic region[1] and

•

•

_____)

[4]

,000 ls6

.09

.9 9

[3] in

Fig 9.1:

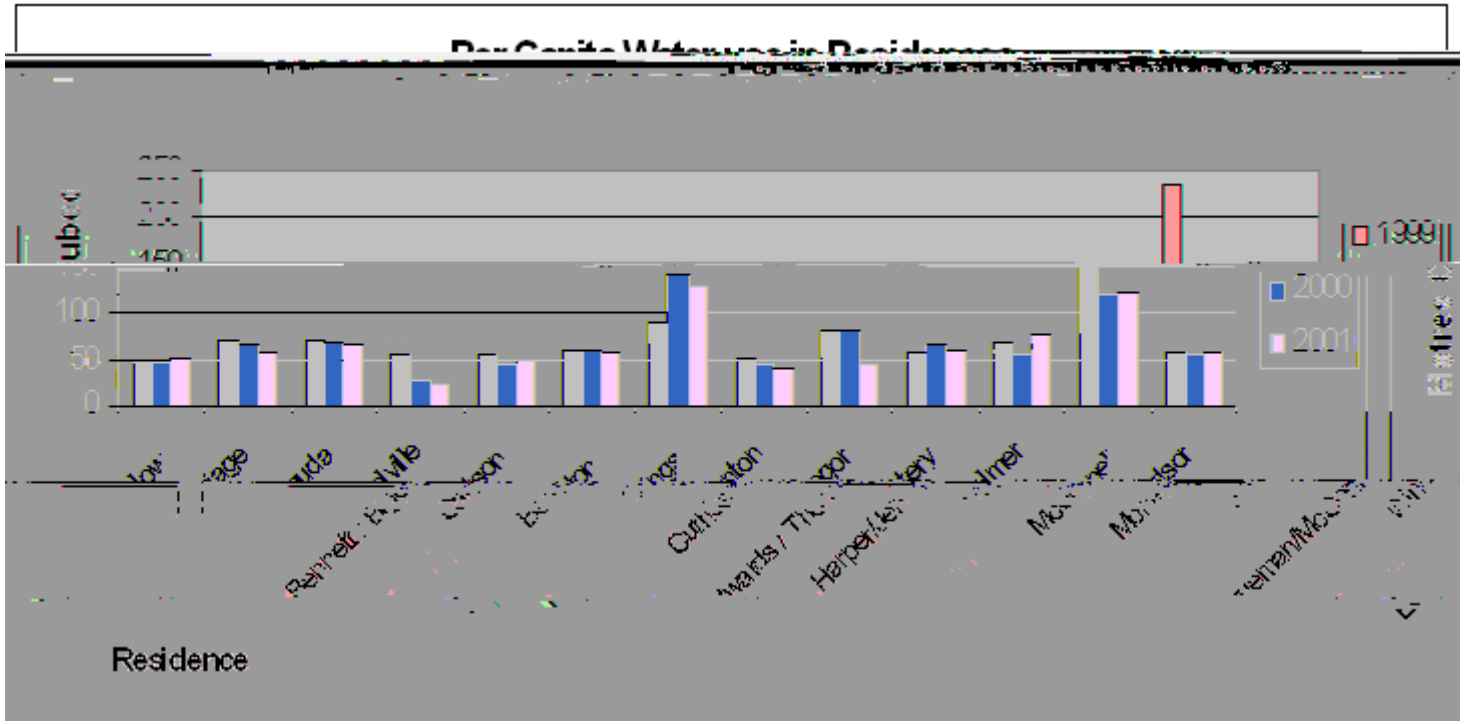
	1999	2000	2001	% 6 in 2001
	40,36 [3]	20,143 3m	20,5	11.79 4
	16	20,44,328	19 ,334	11.09
	15,336	24,05	21,9 8 4	12.6
	12,9 9 3	10,022	10,6	6 25
	12,8 79	12,438	12,733	7.3
	10,38 4	14,425	12,19 2	6
	9 ,229	9 ,228	8 ,478	4.8 6
	8 ,46	8 ,205 8	9 ,330	535
	6	5,248,374	5,134	2.9 4
	5,105	4,6	3,45 70	1.9 8

30m

[4]

2002.

Figure 9.2:



8 .

Figure 9.3 Recycling Facilities

Facility Location	Facility Status	Recycling Facility
Wesleyan Residence Main Floor Laundry Room	Waste Management Facility Recycling Facility	Paper Cardboard Plastic Glass Aluminum
Beaton Residence Main Floor Laundry Room	Beaton Residence Recycling Facility	Paper Cardboard Plastic Glass Aluminum
Lingley Residence Main Floor Laundry Room	Lingley Residence Recycling Facility	Paper Cardboard Plastic Glass Aluminum

Figure 9.4 Composting

F in

I nth

E ind

C nE ind

1.

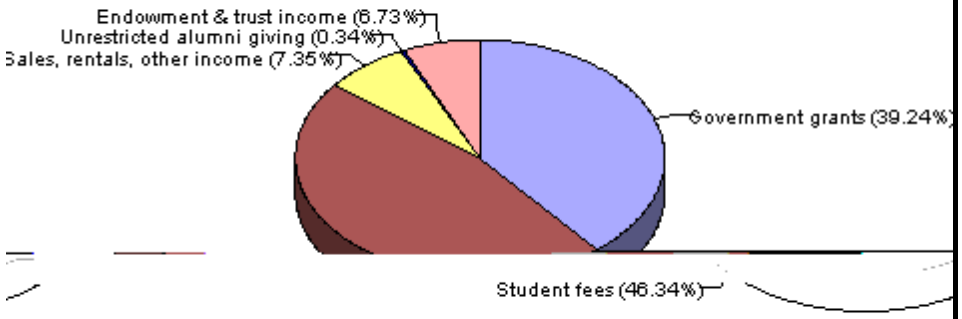
2.

3.

4.

5

Fig 10.1


Endowment & trust income (6.73%)
Unrestricted alumni giving (0.34%)
Sales, rentals, other income (7.35%)
Government grants (39.24%)
Student fees (46.34%)

13% in 2000-2001.

F[illegible]10.4:

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible] [illegible]		[illegible]
[illegible]	[illegible]	[illegible]
[illegible]		[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	D [illegible] [illegible] 003_[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible] [illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible] ([illegible]) [illegible] [illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible] [illegible]

[illegible]

[illegible] $55 [illegible] $15 to $25 [illegible] $11 [illegible]

[illegible]

[illegible] 2000, [illegible]

[illegible]

[illegible] 1970s, [illegible]

[illegible]

[illegible]

1. [illegible]
   - [illegible] 15% [illegible]
   - [illegible]
   - [illegible]
   - [illegible]
   - [illegible]

2. [illegible]

4.

5.

6.

F

7.

Fig 10.5 Eligibility

Criteria	Criteria for Aid	Reason for Change
Eligibility for aid is based on income	To be eligible for aid, income must be below the poverty line	No change
Eligibility for aid is based on income	If income is between 30% and 20% above the poverty line, aid is given at 30%	No change
Eligibility for aid is based on income	100% aid is given to those below the poverty line	No change
Eligibility for aid is based on assets (ie savings, property and other wealth (ie excluding PPR); and	Eligibility for aid is based on assets of less than £6k. Assets of between £6k and £16k are taken into account at £1 per £250	No change
Eligibility for aid is based on the income and assets of the applicant (ie excluding those of parents)	To be eligible for aid, income must be below the poverty line	No change

Guidance Note

At Mount Allison University, a number of programs exist, both academic and extracurricular in nature, which seek to educate the university community about environmental issues. The university continues to offer Environmental Science and Environmental studies programs, which integrate environment-related courses from a variety of departments. A number of faculty have expressed concern over the lack of resources devoted to the Environmental Science program, however. In addition to academic programs, a number of extracurricular environmental initiatives have been undertake in the attempt to raise environmental awareness. These initiatives, in large part, have been undertaken by the Blue Green Society and Green Ambassadors, both of whom have sought to increase environmental awareness within the university community through a number of educational campaigns. Unfortunately, many members of the university community remain unaware of the university's impact on the local and global environment.

The world is currently faced with a significant number of environmental problems. If positive environmental change is to be realized, we, as human beings and citizens, must become more informed of the exact nature of these environmental crises. From global climate change, to deforestation, to the pollution of local water systems, we must learn and become aware of the role we play in both creating and solving these environmental problems. As institutions of higher education, universities are granted the unique opportunity to assume a lead role in educating students about environmental sustainability. Our educational institutions hold the responsibility of training students to become well informed and socially conscious decision making citizens. David Orr writes in , that "the ecological emergency is about the failure to comprehend our citizenship in the biotic community," which can only be resolved, "if enough people come to hold a bigger idea of what it means to be a citizen, and this knowledge will have to be taught carefully at all levels of education."[1] Although an environmental education must account for, and encompass, the global significance of environmental issues, it must simultaneously strive to be rooted within the local environs. This "will require a curriculum shaped in part by the particularities of location, bioregion, and culture."[2]It is through an understanding of our local environment that we are able to understand the ways in which ecosystems function, and the impact we have upon them. Kirkpatrick Sale writes, our crucial task as human beings is to come "to understand the place, the immediate, specific place, where we live."[3] Only through an understanding of place are we able to take global environmental issues, which seem so large and distant from ourselves, and place them within our immediate local environment to see their effects and possible solutions. Given the pervasive nature of environmental problems, a basic understanding of environmental issues will allow students to be capable of lessening their impact upon the

[1]Hannum, Hildegrade ed. People, Land, and Community. New Haven: Yale University Press, 1997 pg 243

[2]"Re-ruralizing Education" by David Orr.Rooted in the Land: Essays on Community and Place eds. William Vitek and Wes Jackson. New Haven and London: Yale University Press, 1996 p.231

[3]Hannum, Hildegrade ed. People, Land, and Community. New Haven: Yale University Press, 1997 p. 220

environment. It is only through education, learning about the causes, consequences, and possible solutions to environmental issues, that we will be capable of bringing about positive change.

C

"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."

The performance indicators for this section are as follows:

-"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." (Section 2.1 Mount Allison University Environmental Policy, www.mta.ca/environment)

I

The University Senate is responsible for making decisions regarding academic affairs.

A

There have not been any additions to environmental course offerings since the 2000-2001 calendar was printed, however there are a handful of courses with environmental content that were not listed in the 2000 Environmental Audit that are starred in the chart above. It should be noted that a number of the courses listed in the academic calendar have not been offered in recent years, including Biology 1211, Sociology 3611 and Chemistry 3011. Economics 3821 Natural Resource Economics, Anthropology 4521, and Anthropology 2501 will not be offered in the coming school year 2002-2003. Figure 11.1 lists the environmental courses and course with environmental content listed in the university calendar.

[illegible]11.1:

[illegible]	[illegible]
Anthropology 2501"Environment and Society” Anthropology 4521"Ecological Anthropology” Anthropology 4531* “Cultural Ecology” Chemistry 3011 “Environmental Chemistry” Environmental Science 4901 “Environmental Issues” Environmental Studies 4000 “Issues in Environmental Studies” Environmental Studies 4951 “Special Topics in Environmental Studies” Geography 2101 “Natural Resources Management” Geography 3101 “Environment and Development” Geography 3201 “Geography and Public Policy” Geography 4101"Seminar in Environmental Issues” Geoscience 2031 “Global Environmental Change” Philosophy 1651 “The Changing Image of Nature” Philosophy 3721 “Environmental Ethics” Sociology 3611 “Environmental Controversies”	Biology 1211, 2101, 3011, 3501, 3551, 3911* Canadian Studies 3400 Chemistry 1501 Commerce 3371 Economics 3551, 3801, 3821 Geography 1201, 2221, 2311 Geoscience 1001, 2101 History 3360 Math 1131* Philosophy 3511 Religious Studies 1651, 3911, 3921

The auditors and faculty from the Environmental Science and Studies programs identified a number of courses and charted their registration levels in the last five school years as a means of determining student interest in environmental topics. The results of this study were not conclusive. Registration levels fluctuated for most courses, some of which have not been offered every year. The totals are listed in Appendix S.

There have not been any developments to the Environmental Studies department since the requirements listed in the 2000-2001 academic calendar. The number of students pursuing declared environmental studies majors in the 2000-2001 academic year was 7, and the number pursuing declared environmental studies minors was 13. In the 2001-2002 year, these numbers increased to 13 and 14, respectively. The number of students who graduated with a major in environmental studies in 2001 was 0. This increased to 5 in 2002.

The Environmental Science program, though it continues to be offered as an interdisciplinary science major, lacks the necessary leadership to develop as a particular field of study. Presently, the requirements make it a fairly rigorous general science degree. The current director of the program is optimistic that the return of a separate capstone course on environmental issues, Environmental Science 4901, which this past year (2001-2002) was shared with the Environmental Studies department, will help to fine tune the major. This coming year (2002-2003), the capstone will be taught by Dr. Duffy of the Chemistry department. It will centre on a major theme that will integrate science-based project work with an issue that is subject to environmental policy and debate. In addition, the course will include material on a range of environmental issues and presentations from experts in these fields.

The faculty interviewed regarding the Environmental Science program shared the opinion that the leadership necessary to shape the program would best come from the creation of a part-time or full-time faculty position that would have as its job description the development of Environmental Science and teaching the capstone course. It was also suggested that at least one other Environmental Science course be added to the elective options for the major, a course that would integrate the sciences as opposed to one taught within any of the four science departments.

The number of students pursuing declared Environmental Science majors in the 2000-2001 academic year was 9. In the 2001-2002 year, the total of declared majors increased to a total of 11 students. The number of students who graduated with a major in Environmental Science in 2001 was 1. This increased to 12 in 2002, demonstrating a clear interest in this program on the part of students. It will be pertinent after the 2002-2003 academic year to evaluate the program, including a survey of students who have completed the program and the professors who have taught courses that contribute to the requirements.

In response to the establishment of the Environmental Studies and Science programs, the library has created a $10,000 account for books, films and other resources on environmental topics to be purchased in the 2002-2003 school year. This account is funded by the Student Donation Fund for library acquisitions. At the time of this report, $7000 worth of materials are already on order.[4]

In December 2000, the university approved the Institutional Strategic Research Plan to direct the allocation of Canada Research Chairs (CRC)[5].

of multi-disciplinary research being conducted, and increased numbers of visiting researchers to the university for collaborative projects in the major research themes identified. The chairs have been and will be selected on the basis of four major research themes: Coastal Wetland Environmental Sciences, Health-Related Research, Canadian Studies, and Critical Cultural Theory. Of these the first is has a predominantly environmental focus. It was intended to provide a common research focus for ten faculty in the Biology and Geography departments and opportunities for collaboration with related agencies and other universities.

The Coastal Wetlands Institute facility was completed in 2000. The building houses the Chignecto Herbarium, sedimentology lab, GIS mapping facility, molecular biology lab, and controlled-environment facilities including the greenhouse visible from the centre of campus. The institute was created with funding from the Canadian Foundation for Innovation, private donation, and maintenance and in-kind support from the university itself. It was designed to draw together researchers from multiple departments on campus, as well as provide an important and long-needed connection between the university, government researchers (Canadian Wildlife Service, Ministry of Environment, Department of Fisheries), and community memyniv 687.72 0 l 6n958.656 dars hae(ina)-65d aned7322 (resrs)656r (chrs)-59.322sed witm thAed7359.333tetltical

nrs d cro haf t ampw he
itica8helis i667 ifatinor670ctre Se

residence.

In the past two years, the Blue Green Society has undertaken a number of initiatives designed to increase environmental awareness on campus. In 2000-2001, these initiatives focussed around campus greening and recycling, MAUSRI, the Free Trade Area of the Americas summit, a double-sided photocopying campaign (carried out in conjunction with Michelle Strain), and an educational campaign for the international Buy Nothing Day in November. As well, during that year, a number of students planned and organized the Climate Change Caravan, a cross country bicycle trip which sought to educate Canadians on the issues surrounding climate change. In the 2001-2002 academic year, environmental initiatives focussed on the sustainable residence initiative, the school group, which conducted environmental education in local schools, and the forestry group, which completed the initial steps to begin a native tree nursery on the university farm. The Blue Green Society was also involved in the initial stages of a project seeking to developing wind turbines in the Tantramar area.(Please consult the Energy chapter of this report for further details on this endeavour).

There have also been a number of environmental initiatives undertaken by groups, which, although not technically affiliated with the university, include many members from the university and Tantramar community, and are a valuable educational resource. The two main local organizations are the Tantramar Environmental Alliance (TEA) and the Council of Canadians. Some of the campaigns carried out include awareness on water grmew70fuy7.33campainfieClim64[(rve ()tieC1 5.ley6avaey, Mpall (SR1 5.l)IenmrW698

higher education and the collegiate experience over time...Bowdoin's built environment is the seminar's most valuable resource."[6] This seminar could be used as a model for a future course at Mount Allison integrating the sustainable residence.

[redacted]

[redacted]

1. Appoint an environmental literacy task force to work towards the implementation of the following recommendations:

2. Include the statement "all students, upon graduating, will possess the knowledge, skills, and values to work towards an environmentally sustainable future" (Blueprint for a Green Campus) as part of the university's mission statement.

3. Consider hiring an environmental science professor specifically to coordinate the Environmental Science program.

4. Make funds available for the creation of more Environmental Studies and Environmental Science courses.

5. Develop a mandatory first year course, which would focus on the problem of environmental degradation and, more importantly, the possible solutions. This course would focus on students' individual responsibility for the environment and provide them with the tools needed to be environmentally responsible citizens. The course could also include a section on the environmental impacts of campus life and methods to reduce that impact.

6. Sign and abide by the Talloires Declaration (see Appendix T).

7. Encourage faculty to incorporate and highlight environmental content in their courses.

8. Organize workshops for faculty in all relevant disciplines to teach professors how to add environmental content to their courses. This could be done with the help of an organization such as Second Nature, which provides training to faculty so that students will be environmentally literate when they graduate.

9. Make funds available for supervisors and management staff to learn more about minimizing the university's environmental impact in their area of responsibility. This might include workshops, conferences, and reading material.

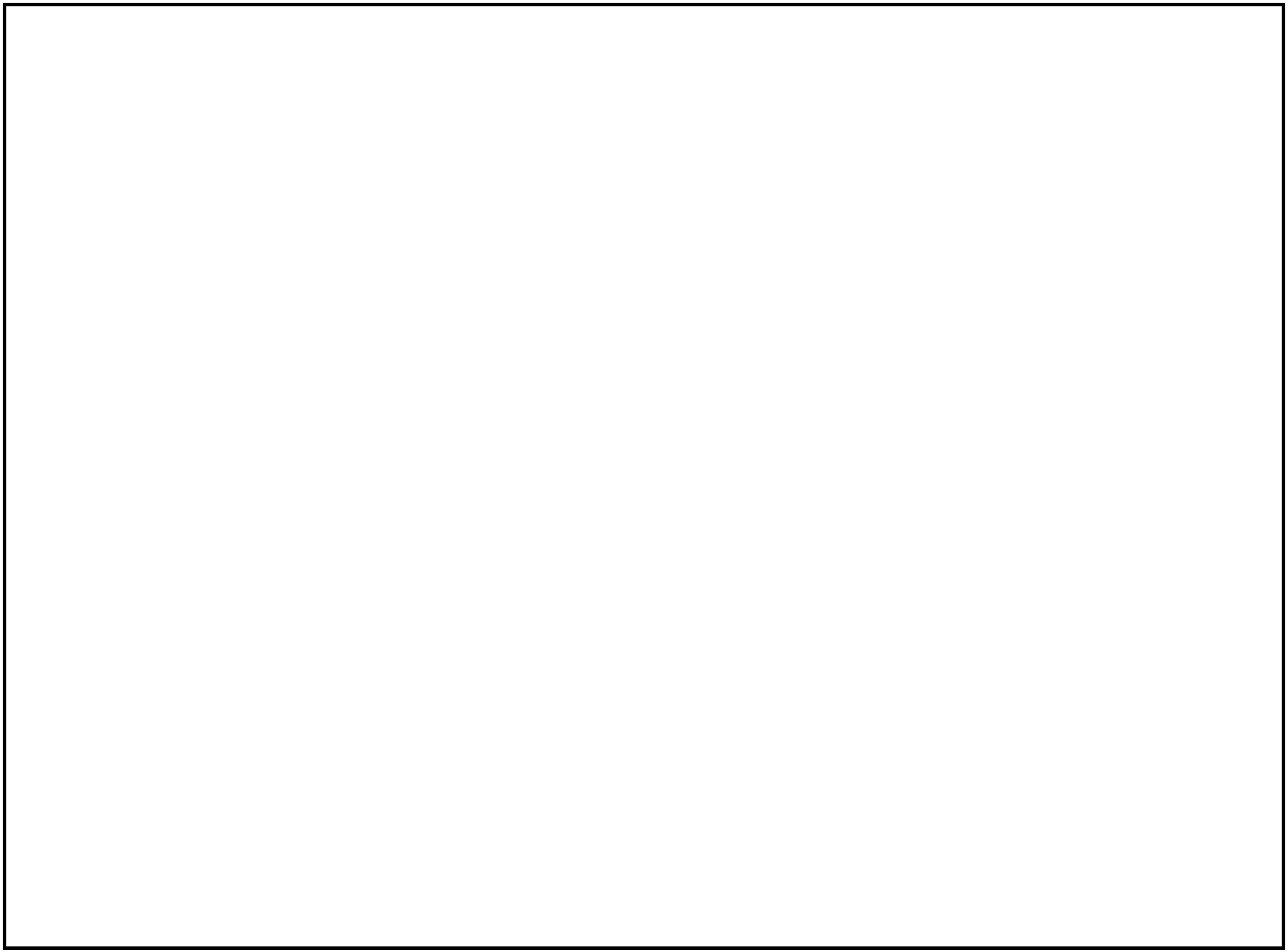
10. Co-ordinate the selection of environmental representatives from each department (both academic and non-academic) on campus. These representatives would be responsible for implementing the environmental policy in their departments. They could hold a training session on environmentally friendly practices in the office and classroom, including how to copy on paper that has already been used on one side, how to copy on both sides, what can be recycled, as well as how to save energy and water in the workplace.

[redacted]

11. Research environmental issues applicable to your field with the ailiscu12 pLsto sy arw T*,0.

class, be sure to mention that turning off lights and computers when not in use and walking or cycling rather than driving can help to reduce the greenhouse effect.

12. Wherever possible, make use of community resources such as the Canadian Wildlife Service and the Tantramar Environmental



ys 134
o 33
dkv 237

11. Do you support the spraying of the campus with herbicides in order to maintain a weed free campus ?

[]Ys []No

38 3 mh
ys 112
o 271

12. Do you feel you are adequately educated on environmental issues ?

[]Ys []No []NA

39 3 mh
ys 120
o 230
NA: 43

13. Do you feel that there is an adequate number of courses offered that focus specifically on environmental issues ? If no, in which area would you like to see more focus on environmental issues (ie biology, political science)

[]Ys []No []NA

39 9 mh
ys 8 5
o 140
NA: 174
Sfoplhdlsm
ihgfgdbv
jhBy Cm Bdg
Bdg Egn Gdy Fdnfo
pvgdhdnh
n

14. Would you consider the ventilation, heating and cooling in the building you live/most often work in on campus to be:

[]Vyp []Bd []Fir []Gd []Exln Nvr
Bdg

38 7 mh
Vyp 44
Bd 116
Fir 127
Gd 8 8
Exln 12
Sdmvdgvdg
nd I tadtmtsl

15.Do you support the introduction of alternative energy sources (wind turbines, solar panels, et cetera) as a means of supplementing the current energy sources used on campus ? Why or why not.

[]Ys []No

39 4 mh
ys 36 8
o 26

Bfqdgdgdh
jn ddqhsmn Bdg
ldnfo, dfy

16. What areas of wastage do you see in your department and around campus ?

Sfmdkp vg Gfn
hy dvdg

this campus ? Please comment further if there are hazardous wastes specific to your area of study.

[]Ye []Po []Fa []Go []Ex []NA

33 re
ye 11
po 6
fa 39
go 6 5
ex 15
NA: 217
Th
la

Food Services (
Ga A Ca

19. Would you eat organic food were it offered ?

[]Ye []No

348 re
ye 29 7
no 5

20. Are you vegetarian ?

[]Ye []No

36 7 re
ye 6 8
no 29 9

21. If so, do you feel there are adequate vegetarian options available ?

[]Ye []No

6 6 re
ye 20
no 46

22. Do you support the use of reusable containers, and/or reduced packaging overall in food services on this campus?

[]Ye []No

36 4 re
ye 344
no 20

23. What ideas do you have to improve the environmental practices of this university ?

24. Do you have any suggestions for this year's auditors, beyond the questions asked in this survey ?

Environmental Audit Survey 2002: Faculty Results

1. Are you familiar with the university's Environmental Policy, approved in May, 1999 ?

[ ] Yes [ ] No

36 Respondents
Yes: 15
No: 21

2. Are you familiar with the university's Environmental Audits, conducted in 1998 and 2000 ?

[ ] Yes [ ] No

36 Respondents
Yes: 15
No: 21

3. What method of transportation do you most commonly use to commute to work/class every day ?

[ ] Car [ ] Bicycle [ ] Fl No[ ] CarWhaycle (n(iversity's En)-72.322 (vironm Td :7 (sTJ /T119iver)57 (sit)84.98 [ ](Yes: 1 0 040 -11.94 TD Do83.33car-6 Td
approved id in 1998 and 2000 ?

Yes: 24
No: 12

13. Do you feel your knowledge of environmental issues is adequate to incorporate environmental concepts into your daily teaching ?

[ ] Yes [ ] No

36 Respondents
Yes: 25

Environmental Audit Survey 2002: Staff Results

1. Are you familiar with the university's Environmental Policy, which was approved in May, 1999 ?
[ ] Yes [ ] No
51 Respondents
Yes: 35
No:16

2. Are you familiar with the university's Environmental Audits, conducted in 1998 and 2000 ?
[ ] Yes [ ] No
51 Respondents
Yes: 34
No: 17

3. What method of transportation do you most commonly use to commute to work/class every day ?
[ ] Car [ ] Bicycle [ ] Foot
56 Respondents
Car: 34
Bicycle: 4
Foot: 18

4. Do you car-pool regularly ?
[ ] Yes [ ] No [ ] N/A
53 Respondents
Yes: 7
No: 28
N/A: 18

5.Would you be interested in car-pooling ?
[ ] Yes [ ] No [ ] N/A
51 Respondents
Yes: 5
No: 24
N/A: 22

7. How far do you live from campus ? (Km)
24 Respondents
5km or less: 16
6km to 15km: 3
16km to 30km: 1
Over 30 km:4

8. Would you use unbleached and/or recycled paper if it was offered ?
[ ] Yes [ ] No
50 Respondents
Yes: 50
No: 0

9. Would you support a university purchasing policy which favoured environmentally friendly products, equal in quality to the unfriendly alternative, at a cost;
[ ] 10% more expensive [ ] 5% more expensive (as per the current policy) [ ] Equal in price [ ] Other
50 Respondents
10%: 11
5%: 25
Equal: 14
Other: 0

10. Would you prefer the university invest in "Ethical Investment" funds over standard investment funds ? Please comment.
[ ] Yes [ ] No [ ] don't know
49 Respondents
Yes: 16
No: 9
Don't Know: 24

11. Do you support the spraying of the campus with herbicides in order to maintain a weed free campus ?
[ ] Yes [ ] No
47 Respondents
Yes: 16
No: 31

12. Do you feel you are adequately educated on environmental issues in your work at Mount Allison?
[ ] Yes [ ] No
49 Respondents
Yes: 20
No: 29

13. Would you consider the ventilation, heating and cooling in the building you work/live in on campus to be:
[ ] Very poor [ ] Poor [ ] Fair [ ] Good [ ] Excellent Name of Building(s):
51 Respondents
Very Poor: 12
Poor: 19
Fair: 9
Good: 9
Excellent: 2

14.Do you support the introduction of alternative energy sources (wind turbines, solar panels, et cetera) as a means of supplementing the current energy sources used on campus ? Why or why not.
[ ] Yes [ ] No
52 Respondents
Yes: 52
No: 0

15. What areas of wastage do you see in your department and around campus?

16. Please identify any ways you know of to reduce water wastage on campus.

17. Do you feel you have an adequate understanding of how to recycle on this campus ? Please comment.
[ ] Yes [ ] No
48 Respondents
Yes: 32
No: 16

18. How would you rate the disposal methods for hazardous wastes on this campus ? Please comment further if there are hazardous wastes that are specific to your department.
[ ] Very poor [ ] Poor [ ] Fair [ ] Good [ ] Excellent
17 Respondents
Very Poor: 0
Poor: 3
Fair: 6
Good: 7
Excellent: 1

19. What ideas do you have to improve the environmental practices of this university ?

20. Do you have any suggestions for this year's auditors, beyond the questions asked in this survey ?

Bibliography

General

Mount Allison University Environmental Audit, 1998, 2000

Mount Allison University Environmental Policy, 1999

of Vermont,'
http://www.nwf.org/campusecology/pdfs/uvm_bus.pdf
Think Technologies, 'Electric Vehicles,'

Solid Waste

Alain David, Environment Canada engineer,

William Vitek and Wes Jackson. New Haven and London: Yale University Press, 1996

Sodexho, 'Environmental Policy,'
http://www.sodexhousa.com/corp_environ.html

Water

Council of Canadians www.canadians.org

Eldridge, Perry, Technical Services Manager, Mount Allison University, Interview by Auditors, July 2002, Sackville NB

Environment Canada's State of the Environment Report:
www.ec.gc.ca/soer-ree/English

Woodburn, George, Town of Sackville Engineer, Town of Sackville, Interview by Auditors, June 2002, Sackville NB

World Watch Institute, State of The World 2001, New York: W.W. Norton & Company, 2001

Finance

Creelman, Dale, Purchasing Manager, Mount Allison University, Interview by Auditors, July 2002, Sackville NB

Stewart, Dave, Vice-President Administration, Mount Allison University, Interview by Auditors, July 2002, Sackville NB

Education

Beaton, Margaret, Co-ordinator Environmental Science, Mount Allison University,
Interview by Auditors, May 2002, Sackville NB

Bowdoin College, 'Campus: Architecture, Planning, and Landscape in the Groves of Academe,'
http://academic.bowdoin.edu/courses/f01/es011/

Duffy, Stephen, Chemistry Professor, Mount Allison University,
Interview by Auditors, June 2002, Sackville NB

Ennals, Peter, Vice President Academic and Research, Mount Allison University,
Interview by Auditors, May 2002, Sackville NB

Godin, Jean-Guy, Dean of Science, Mount Allison University,
Interview by Auditors, May 2002, Sackville NB

Appendix A - Major Repairs and Renovations

Building	Use	Date Built	Floor Area	Basement Floor Area	Date	Job	Date	Job	Date	Job	Date	Job
Flemington	Labs/Class	1933	32010	3261	September 2000	waterproofing foundation						
CLT	Office/Class	1958	10246	2895								
Con Hall	Auditorium	1966	48565	9711	?	roof replacement						
Crabtree	Offices/Classes	1979	43505	10876								
Fawcett	Support Services/B	1960	7950	7950								
Gairdner Fine Arts	Studios	1965	14593	4892	October 2000	gutter/eavestrough repairs						
Harper	Residence	1964	44000	11000	April 2001	roof repair						
Hunton House	Residence	1958	20500	5130								
Jennings	Dining Hall	1965	16685	16685								
MacGregor	Residence	1920	3100	900								
Monastery	Residence	1920	9200	3100	November 2000	microbial remediation						
Owens Art Gallery	Gallery	1900	22546	8245								
Palmer	Residence	1934	24343	6319								
President's Cottage	Offices/Dining	1910	6468	1325								
Allison Gardens	Arena	1946	25000	3200								
Sprague House	Offices	1900	3200	900								
Thornton	Residence	1968	24800	6200								
University Centre	Offices	1928	36446	10716	September 2000	sloped roof replacement	October 2000	masonry repairs				
Windsor Hall	Residence	1962	59650	12050								
Library	Library	1970	76245	34320								
PEG	Offices/Labs	1957	34220	9859								
Trueman/Tweedie/McConn	Residence/Dining H	1946	76000									

Appendix B - Sample of electricity demand and steam flow from meter readings

Electricity Demand at 10:12am on June 26, 2002

Building	kW
Centennial Hall	18.25
Chapel	5015
Crabtree	60.44
Library	222.1
Owens	63.53
Dunn	25
Bennett Building	0
Trueman/McConnell	104
Hunton	1.45
Edwards/Thornton	16.01
Athletic Centre	0
Allison Gardens	1.95
Convocation Hall	37.16
Fine Arts	19.2
Jennings/Harper	90.09
Palmer	2.48
Windsor	16.98
Facilities Management	106.4
Avard Dixon	24
University Centre	54.55
Flemington	56.03
Presidents Cottage	4.45
Conservatory	33.4
Barclay	194.7
Bennett/Bigelow	19.21
Hart Hall	16.41
Campus	1225.04

Steam Flow at 10:39 am on June 26, 2002

Building	pounds per hour
Harper/Jennings	87.18
Palmer	0
Windsor	172.1
University Centre	0
Avard Dixon	93
Conservatory	0
Bennett/CLT	50.83
Hart Hall	18.78
Centennial Hall	0
Flemington	1043
Barclay	48.37
Crabtree	88.84
Chapel	26.91
Dunn	0
Owens/Fine Arts	174.4
Library	861.7
Convocation Hall	0
Bennett/Bigelow	0
Trueman/McConnell	0
Athletic Centre	0
Hunton	0
Allison Gardens	150.4
Edwards/Thornton	401.4
Total campus:	3471.83

(Includes all 23 buildings fed by the main boiler at Physical Plant)

Appendix C - Power Consumption: June 1, 2000-May 31, 200 :

Building	KwH		
	2000	2001	2002

Appendix D - Light Oil Consumption May 1, 2000-April 30, 2002

	2000								2001												2002			
Building	May	June	July	August	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec	Jan	Feb	March	April
Cranewood	985	1499	305	632	186	1478	2048	2633	4458	3240	2586	3467	1152	565	0	0	0	390	1403	1947	2221	2449	1770	1583
Baxter House	0	167	0	86	0	613	752	1122	634	1067	1422	686	358	515	0	0	12	187	821	1139	1089	1081	841	583
Black House	1426	0	531	0	0	581	1552	1554	2620	1797	1157	1218	467	769	0	0	0	997	1048	1448	1643	1854	1451	1071
Canadian Studies	1402	523	406	0	379	638	1793	2434	3308	1860	2237	1658	380	1241	0	0	0	1451	1894	2442	2263	2500	2165	1722
McGregor House	0	0	268	0	0	174	1043	369	960	794	703	0	0	261	0	0	0	81	338	561	444	728	388	288
Monastery	2082	1349	558	28	28	727	2691	2785	2151	2441	2068	1826	1288	495	694	0	435	337	2061	2057	2080	2255	2361	2265
Colville	315	315	180	185	185	175	622	1223	1544	567	990	696	0	321	0	0	0	159	707	1074	1146	1143	954	665
Total:	6210	3853	2248	931	778	4386	10501	12120	15675	11766	11163	9551	3645	4167	694	0	447	3602	8272	10668	10886	12010	9930	8177

May1'00-April 31'01: 89182

May 1'01-April 31'02: 72498

98\99 151481
99\00 84220
00\01 89182
01\02 72498

Appendix E - Bunker A Oil Consumption

	Month	Litres	Dollars (before tax)
2000	May	127684	29504.79
	June	83459	19478.76
	July	42230	10997.53
	August	41960	10309.57
	Sept	85703	34872.68
	Oct	170778	44009.49
	Nov	256332	69898.57
	Dec	331807	81361.99
2001	Jan	341160	79431.85
	Feb	339412	76299.11
	March	297959	66398.16
	April	232798	53867.23
Total 00/01:		2351282	576429.73
	May	166193	36317.26
	June	41056	9348.45
	July	40982	9102.1
	August	42107	8636.15
	Sept	39081	9031.62
	Oct	168263	40653.95
	Nov	252297	56998.64
	Dec	291648	60279.78
2002	Jan	327806	65931.43
	Feb	302733	61017.05
	March	310645	62062.73
	April	227239	53602.71
Total 01/02:		2210050	472981.87

Year	Total Litres
98\99	2131155
99\00	2022800
00\01	2351282
01\02	2210050

Appendix F - Steam Consumption

Building	Flow	Jan	Feb	March	April	May	June	Jul y	Augus t	Sept	Oct	No v	Dec
Jennings/Harper	87.18	1321933	1190666	1422841	769253.1	383233	39373.02	45359	23484.2	195801	489598.2	0	1041527
Palmer	0	338368.7	316192	309381.5	235344	168085.8	9223.24	39000.2	28395.9	44692.3	141824.7	700749	365219
Windsor	172.1	742634	693144	628313	447499	222769	234044	175310	172097	205351	296212	475047	572610
University Centre	0	235293	213028.4	173934.8	119836.1	53423.32	2115.89	0	0	0	40696.29	133523	208509.9
Avard Dixon	93	488206.7	29249.33	200140.3	243585	178744.3	112661.5	121330.4	119278	147342	181437	226128	411606
Bennet Building	50.83	115642.2	110932.3	113253.4	103368.1	50533.02	93.96	0	0	486.68	8080.44	75670.4	108574.8
Flemington	1043	334038	314184	306478	236888	0	37673.2	34209.3	32093.83	29246.27	119847.2	217332	268957
Hart Hall	18.78	257807	0	161981	145002	86334.31	81749.9	10762.93	1552.24	4627.51	77960.58	158561	197165
Conservatory	0	77142	231108.9	187550	154144.8	869.67	0	931.21	0	0	0	10478.1	221686.6
Barclay	48.37	132114	1153533	112781	930510	651244	54699.5	123833.9	116938	118826	488151	867711	1223960
Centennial	0	209699	212169.1	198291	158808	73364	37469.3	18381.13	10975.5	992.19	100291	173065	206808

Appendix G - Comparing energy use in campus buildings per square foot of floor area

Electricity

Building	March, 2002	Floor Area	Building	kwh per squ. foot
Centennial Hall	11933.95	17442	Centennial Hall	0.684
Chapel	4515.47	10428	Chapel	0.433
Crabtree	26664.61	43505	Crabtree	0.613
Library	105571.8	76245	Library	1.385
Owens	18974.04	22546	Owens	0.842

Steam

Building	March, 2002	Floor Area	Building	kwh per squ. foot
Jennings/Harper	1422841	60685	Jennings/Harper	23.44633765
Palmer	309381.5	24343	Palmer	12.70925934
Windsor	628313	59650	Windsor	10.53332775
University Centre	173934.8	36446	University Centre	4.77239752
Avard Dixon				

Appendix H-Emissions Questionnaire
(created by the Canadian Mortgage and Housing Corporation and was published in the Calgary Herald Saturday, May 20, 2000

"Greenhouse Gas Emission Questionnaire"

PERSONAL TRANSPORTATION

Does anyone in your household use a vehicle? If no, enter 0 at the end of this section and go to the next section on Mass Transportation.

Operating Energy

If someone in your household does use a vehicle, you can estimate the yearly operating emissions if you know the fuel efficiency of the vehicle

TOTAL EMISSIONS

Each household has its own emissions “profile” depending on personal choices and circumstances. For instance, your household may have heavy emissions in personal transport if you drive a lot, or in mass transport if you fly frequently. In order to see your household’s profile and total emissions bring forward the sums you arrived at in the questionnaire to fill out the following table. Add them up to get your household’s grand total.

Home	_____ kg/yr.
Personal Transportation	_____ kg/yr.
Mass Transportation	_____ kg/yr.

W

kg/yr.

Appendix I - Hazardous Waste Disposal 2000-2002

Hazardous Chemical	Number of Units Disposed Of	Quantity
Waste Oxidizing Substances Solid	1	80kg
Waste Solid Containing Flamable Liquids	4	400kg
Waste Corrosive LIquids	2	240kg
Waste Flamable Liquids	6	550kg
Waste Phosphrous, amorphus red	1	15kg
Waste Poisonous/Flamable Liquids	2	160kg
Waste Corrosive Liquids	4	245kg
Waste Contaminated Glass	1	100kg
Waste Cynaide	1	6.83kg
Waste Poisonous Solids	7	466kg
Waste Water Reactive Liquid	1	17.8kg
Waste Poisonous Liquids	5	285L
Waste Flamable Liquids	5	840L
Waste Oil	8	160L
Waste Verciculite/Oil	3	40kg
Waste Fermaldehyde	1	20L
Waste Solids Containing Corrosive Liquids	1	30kg
	Total Amounts	2350.63kg
		1305L

Appendix J - Cleaning Product Usage May 1, 2000 - April 30, 2002

Product	Use	May 1, 2000 - Apr 30, 2001	May 1, 2001 - Apr 30, 2002	units each	MSDS	Total Amount 2000-2001	Total Amount 2001-2002	Total
Gum Remover	remove gum from carpet	35	62	spray can	no			

Appendix K - Cleaning Materials From Food Services	Quantities Used	Amount per Unit	Total
Solid Fun Cleaner	35capsuels	8 lbs	280 lbs
Stainless Power Cleaner	35capsuels	8 lbs	280 lbs
Metal Pro Dishwasher Plus	800capsuels	8lbs	6400 lbs
SterBac Sanitizer	18	4 L	72 L
RinseDry	64	2.27 L	145.28 L
Lime Away	36	1 Gallon	36 Gallons
Grease Cutter	150	1 Gallon	150 Gallons
SS Cleaner	16	?	
Simplex Toilet Cleaner	35	32oz	1120 oz
Digiclean Handsoap	65	750ml	48.75 L
Window Cleaner	35	32 oz	1120 oz
Floor Cleaner	45	4 Gallons	180 Gallons
DiningHall Dynamix	100	32 oz	3200 oz

Appendix L - Fertilizer Use 2001 and Projected use 2002

	2001		
Fertilizer	Number Used	Amount	Total Amount Used
12\24\24	10 Bags	25 kg	250 kg
16\30\6	5 Bags	25 kg	125 kg
10\6\4	5 Bags	25 kg	125 kg
12\3\10	30 Bags	25 kg	750 kg
Bonemeal	10 Bags	20 kg	200 kg
		Total Amount	1450 kg

Projected Use 2002			
Solucal S	27 Bags	20 kg	540 kg
20\5\20	61 Bags	25 kg	1525 kg
15\3\12	17 Bags	25 kg	425 kg
Bonemeal	15 Bags	20 kg	300 kg
10\8\20	13 Bags		
10\6\4	3 Bags		

Appendix M - Main and Lower Field Fertilization Program: 2002

Date	Fertilizer	Amount
Late May	15\30\12	5 pds
3rd week June	20\5\20	4 pds
2nd week July	20\5\20	4 pds
1st week August	20\5\20	4 pds
4th week August	Solucal	7 pds
1st week September	20\5\20	4 pds
4th week September	20\5\20	4 pds
Late November	10\8\20	4 pds
		36 pds

Appendix N - Indoor Pesticide Use On Campus May 2000 to April 2002

Chemical	Amount
Dursban 2e	500ml
Ficam W	90 grams

Appendix O - Pool Chemical Use: May 2000 to February 2002

May 2000
40 (20litres) of Atlantic 12
06 (25Kgs) of Sodium Bicarbonate
6 (20 Kgs) of Calcium Chloride
03 (8 Kgs) of Super Sequa Solution
4 (25 Kgs) of Soda Ash

July 2000
1 (8Kg) of GLB Oxbybrite
2 (4 litre) of TLC

Sept 2000
40 (20 litres) of Atlantic 12
4 (x 4 litres) of Muriatic Acid

Nov 2000
40 (20 Litre) of Atlantic 12

Feb 01
40 (20 Litre) of Atlantic 12

May 01
48 (20 Litre) of Atlantic 12

June 01
6 25 kgs of Sodium Carbonate
6 20 Kgs Calcium Chloride
3 8 Kgs of Super Sequa Solution
4 25 kgs of Soda Ash

July 01
1 R0007 22 ml
1 R0008 60 ml
1 R0009 60 ml
1 R0010 60 ml
1 Roo11 60 ml
1 R0012 60 ml
1 (4x4 litres) Ultra Pool Secure
1 (50 kg) of Oxybrite

Oct 01
30 (20 Litre) of Atlantic 12

Dec 01
30 (20 litres) of Atlantic 12
4 (x 4 litres) of TLC

Feb 02
40 (20 litres) of Atlantic 12

Appendix P - Paper Use Totals:

Department	May 2000 to April 2001 Totals	May 2001 to April 2002 Totals	Difference	Two year Total
Biology	201765	198355	-3410	400120
Chemistry	106594	129658	23064	236252
English (incl Windsor Theatre)	72460	64629	-7831	137089
Fine Arts/Owen's	55007	58828	3821	113835
History	80571	63238	-17333	143809
Mathematics/Computer Science	40312	64580	24268	104892
Modern Languages	89408	103750	14342	193158
Music	74829	81432	6603	156261
Philosophy/Rel Studies/Classics	68262	80793	12531	149055
Physics	52224	56274	4050	108498
Psychology	83583	114646	31063	198229
Social Sciences	290853	289040	-1813	579893
	0	0	0	0
Athletics	76765	98355	21590	175120
Computing Services	17519	42977	25458	60496
Dean's Office	46467	60469	14002	106936
DSS	5840	8287	2447	14127
External Relations	121568	139951	18383	261519
Facilities Management	81240	93197	11957	174437
Financial Services	214717	181193	-33524	395910
Human Resources	46689	60961	14272	107650
Library Admin	101511	80939	-20572	182450
President's Office	129072	196661	67589	325733
SAS (incl Massie)	281192	319998	38806	601190
Student Services	165213	161961	-3252	327174
	0	0	0	0
RSTP/Dobson	60222	60612	390	120834
Grants	52587	69838	17251	122425
Meighen Centre	11225	13123	1898	24348
	0	0	0	0
Printing Labs	155000	125000	-30000	280000
Library Photocopiers	480000	425000	-55000	905000
SAC, CHMA, Sodexho, Pub	56944	119257	62313	176201
Exam Booklets	91821	80126	-11695	171947
Book Store	507264	713832	206568	1221096
				8275684

Appendix Q - Water consumption in cubic meters for Jan 1, 2000-June 30, 2002

Building	Jan 1-June 30, 2000	July 1 to Dec 31, 2000	Jan 1-June 30, 2001	July 1-Dec 31, 2001	Jan 1-June 30, 2002
Allison Gardens	1832	3,315	1,588	4399	2051
Athletic Centre	8493	5,932	7,424	4768	4271
Avard-Dixon	591	335	275	319	314
Barclay (Chemistry)	11338	9,095	9,363	9971	8977
Baxter	17	39	61	0	0
Bennett / Bigelow	4016	4,189	5,205	4125	5829
Bennett Carriage Hse	410	309	339	292	350
Bermuda	1117	1,165	1,154	992	1000
Biology (Flemington) + Coastal Wetlands Facility	2160	3,088	1,952	3182	3,306
Black House	90	123	37	35	43
Canadian Studies/Anchorage/External	123	43	69	46	28
Centennial Hall	325	248	405	450	413
Central Stores/Fawcett Building	101	72	92	81	102
CLT/Bennett Building	63	101	272	72	125
Colville	241	30	17	205	202
Conservatory	917	1,041	1,252	750	585
Convocation Hall	384	170	407	194	336
Crabtree	2554	7,468	2,647	7978	1694
Cranewood	220	227	304	114	121
Cuthbertson	288	223	334	258	299
Edwards / Thornton	4726	4,502	4,061	4417	4251
Facilities Mgmt Bldg	134	109	137	140	143
Fine Arts	461	598	456	331	331
Harper / Jennings	11826	12,225	10,815	11169	11288
Hart Hall	2374	2,296	2,430	1025	3,941
Heating Plant	3085	2,155	2,555	1745	2635
Hunton	1935	1,952	1,738	1967	2035
Library	782	1,758	1,657	2012	3703
McGregor	407	324	206	182	252
Monastery	679	474	565	488	463
Owens Art Gallery	546	919	444	291	322
Palmer	2476	2,377	2,721	4224	2244
Dunn Building/PEG	620	655	784	952	1600
Presidents Cottage	207	467	645	688	258
Sprague	24	28	14	20	15
Student Centre/University Centre	2105	2,475	2,419	2928	3078
Trueman/McConnell	13418	1nJ 767020 Used (m3) 0 Td (lding)Tj 77			

Appendix R - Residence Water Use Comparison

Building	Number o	Jan 1-June 30, 2000	July 1 to Dec 31, 2000	Total for 2000	Cubic Meters Per Capita	Jan 1-June 30, 2001	July 1-Dec 31, 2001	Total for 2001	Cubic Meters Per Capita
Bennett / Bigelow	181	4016	4,189	8205	45.331	5,205	4125	9330	51.54696133
Carriage	11	410	309	719	65.364	339	292	631	57.36363636
Bermuda	33	1117	1,165	2282	69.152	1,154	992	2146	65.03030303
Colville	10	241	30	271	27.100	17	205	222	22.2
Cuthbertson	12	288	223	511	42.583	334	258	592	49.33333333
Edwards / Thornton	152	4726	4,502	9228	60.711	4,061	4417	8478	55.77631579
Harper / Jennings	171	11826	12,225	24051	140.649	10,815	11169	21984	128.5614035
Hunton	88	1935	1,952	3887	44.170	1,738	1967	3705	42.10227273
McGregor	9	407	324	731	81.222	206	182	388	43.11111111
Monastery	18	679	474	1153	64.056	565	488	1053	58.5

Appendix S - Registration in environmental courses

	Year				
Course	97\98	98\99	99\00	00\01	01\02
ANTH 2501	0	0	36	46	20
BIOL 4251	0	0	28	0	37
CHEM 3011	15	15	6	5	10
ECON 3801	20	19	16	25	43
GEOG 2101	205	257	319	275	273
GEOG 3101	0	0	0	90	52
GEOG 4101	32	34	25	15	28
PHIL 3721	28	0	42	0	35
SOCI 3611	0	0	28	0	7

Appendix T - The Talloires Declaration

(copied directly from Mount Allison University Environmental Audit-1998)

The Talloires Declaration

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 non-governmental 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.

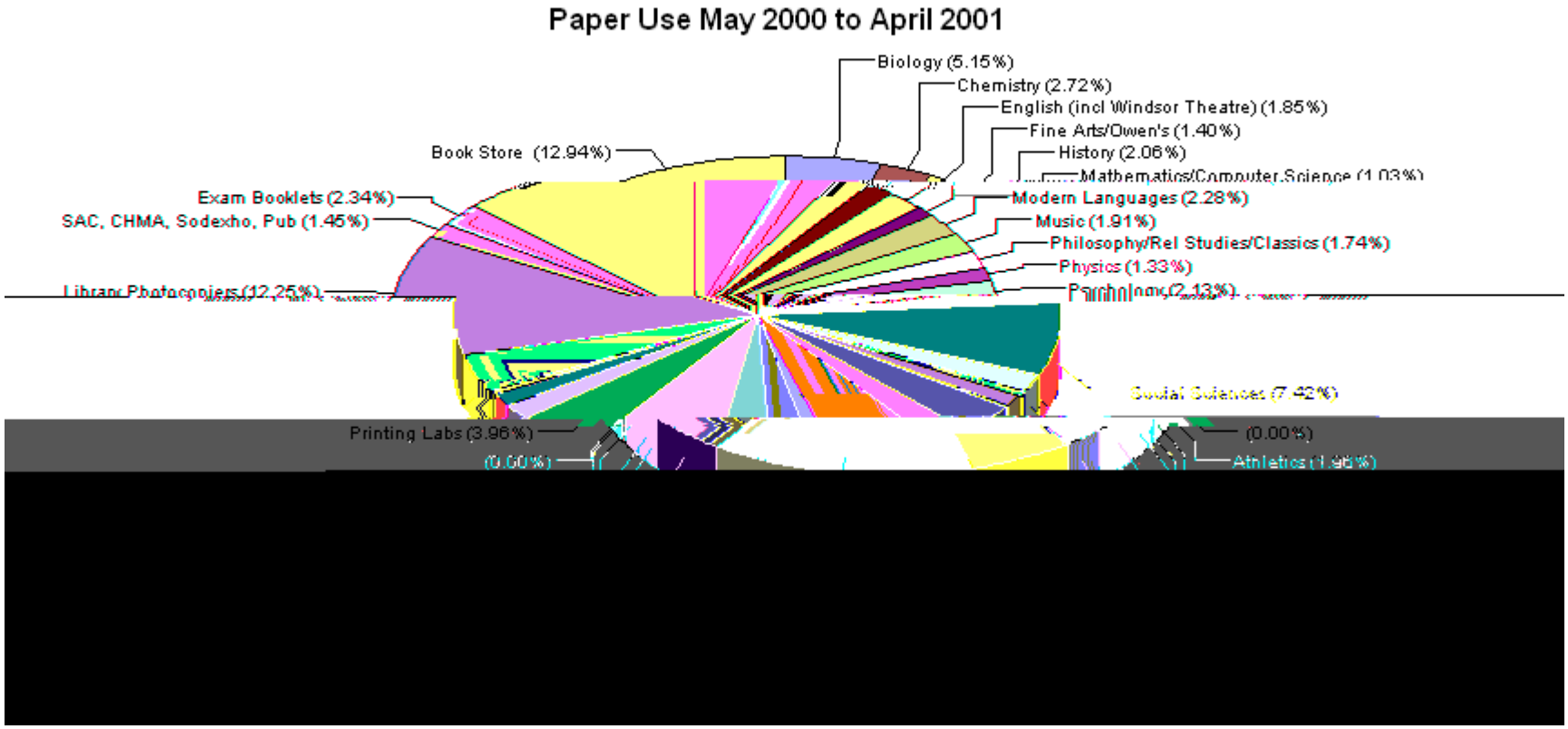
9.Work with national and international organizations to promote a worldwide university effort toward a sustainable future.

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.

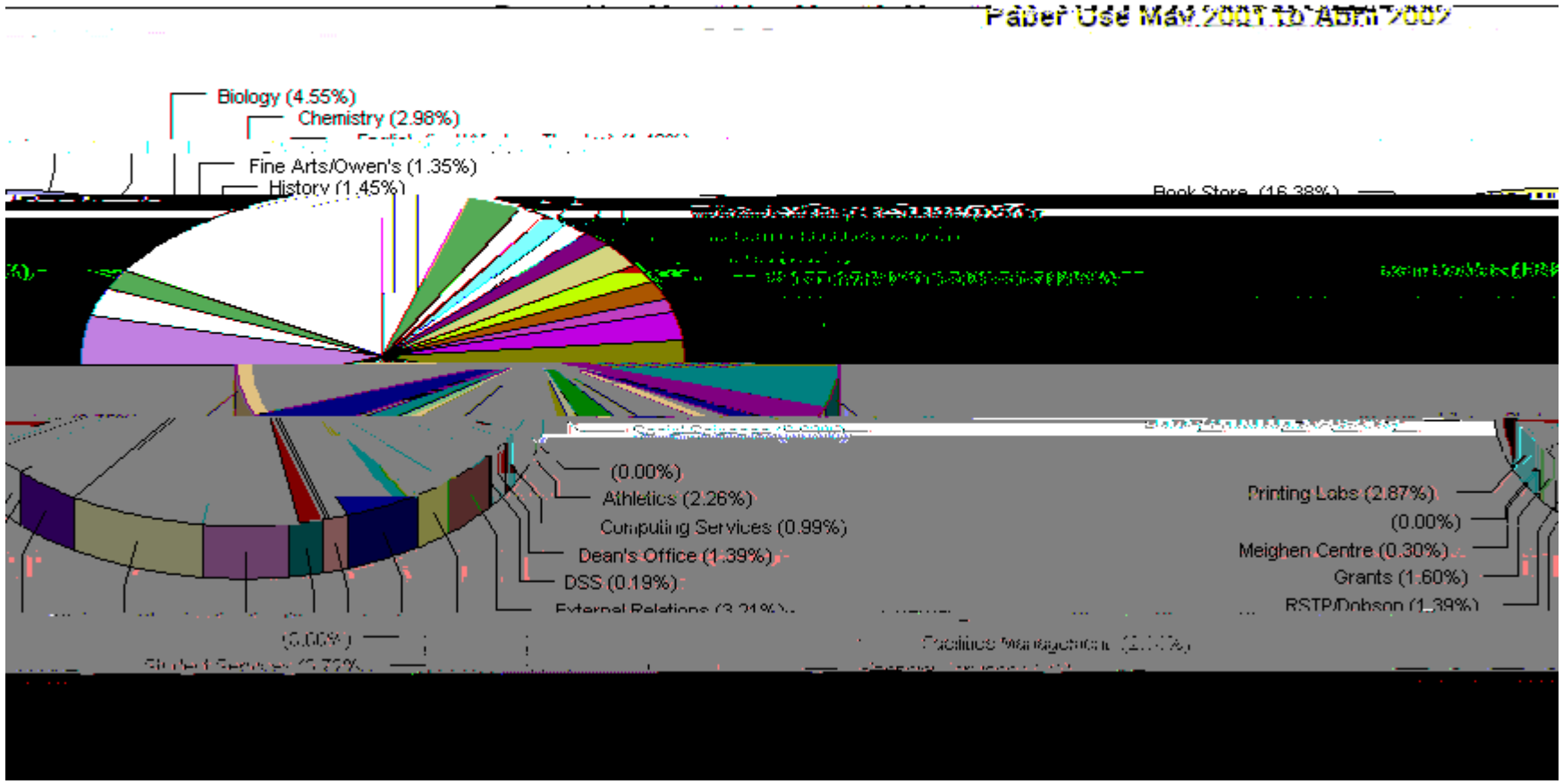
Charter Signatories (Titles and Affiliations in 1990):

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'Academie 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. Mendeleyev University of Ch11.9o Reussv
TSturtn69 (,Sarnd)rsi,65.989 (lVice Chancell)76.333 (or, Univer)63.323 (sit)654989 (l of Chape Town South58.333 (s Af)i)92.667 (a)]TJ T* [(LAkilagp)58 (eSawer

Appendix U Paper Use by Department (percentage of total paper use) May 2000 to April 2002



Appendix V Paper Use by Department (percentage of total) May 2001 to April 2002



Appendix W Total Paper Use May 2000 to April 2002