

Greening the Campus...



*Where Practice and Education
Go Hand in Hand*

This project was funded by a grant from the US Environmental Protection Agency (EPA) Region 1 New England Environmental Assistance Team (NEEATeam). The NEEATeam provides secondary schools, vocational schools, and technical colleges with information and training on how to comply with environmental requirements, prevent pollution by minimizing waste, and implement strategies for achieving safer, healthier learning environments.

The proposal was submitted by the Northeast Partnership for Environmental Technology Education (NEPETE), through the New England Interstate Water Pollution Control Commission and Environmental Training Center (NEIWPC/NEIETC).

NEPETE is one of six regions that make up the national organization, PETE, a community/technical college advocacy group whose role is to augment, facilitate, and broker academic, industrial, and governmental partnerships to ensure that community/technical college graduates meet the job market demands of the region. NEPETE is comprised of approximately 150 community/technical colleges in 14 Northeast states that offer, or wish to offer, full-time or continuing education in environmental training. For a period of six years, NE PETE was operated by NEIWPC under contract to PETE.

NEIWPC was established by an Act of Congress in 1947. Its member states include all of New England and New York. The Commission has three broad functions: 1) coordinating interstate water quality improvement efforts; 2) educating and training environmental professionals; and 3) communicating to the public on water quality issues. NEIETC is the training branch of NEIWPC.



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What Is a Green Campus?

In addition to being learning centers, college and university campuses are self-contained communities that are supported by vast systems of institutional and operational functions.

- **A GREEN CAMPUS** is one that carries out these functions according to a system-wide culture of environmental sustainability, balancing function and design with existing and foreseen resources.
- **A GREEN CAMPUS** is a place where environmentally responsible practice and education go hand in hand and where environmentally responsible tenets are borne out by example.
- **THE GREEN CAMPUS** institution is a laboratory of self scrutiny, experimentation, and application. At its best, it is a model environmental community where operational functions, business practices, academic programs, and people are inter-linked, providing educational and practical value to the institution, the region, and the world.



"An enduring environmental ethic will aim to preserve not only the health and freedom of our species, but access to the world in which the human spirit was born."

"The Diversity of Life"
E.O. Wilson

Why Should Your Campus Be a Green Campus?

As an institution of higher learning, the seeds of change that are sown on your campus will grow and, ultimately, disperse far afield. The Green Campus concept offers your institution the opportunity to take the lead in rethinking its environmental culture and developing new paradigms for solving problems that are local, national, and global in nature.

Greening the campus is about sweeping away wasteful inefficiencies and ushering in positive changes. Many of these changes address the daily, practical aspects of campus life—correct disposal, handling, and storage of cleaning chemicals and materials associated with labs and automotive shops; purchase of environmentally friendly supplies; effective recycling programs. Other changes may require larger, big-picture investments.

Changes don't have to happen all at once. They can be approached through a manageable, step-wise process in which changes are built into the institutional planning and budgeting processes, with an eye toward continually improving the campus and implementing responsible recommendations.

The Paybacks

Greening initiatives are challenging and require determination and a long-term commitment on the part of the entire campus community. These efforts, however, can yield significant paybacks. Such paybacks include:

- **Environmental and economic sustainability.** A system-wide culture of sustainability helps preserve and enhance what you value as an institution today, as well as for the future.
- **Reputation as a leader through example.** Many colleges and universities fall far short of making their mark as environmental leaders, because they fail to practice on the campus what they preach in the classroom. Although colleges and universities offer courses in environmental management, engineering, laws and regulations, and assessment, many have failed to comply with environmental requirements or to take part in pollution prevention activities. As a result, some institutions have been assessed substantial fines by the U.S. Environmental Protection Agency (US EPA). Colleges and universities need to examine their own organizations and implement on their own campuses what they and the public expect industry to do.
- **Economic benefits.** A routine, curriculum-based, environmental audit program that reveals waste and inefficiency associated with campus activities, coupled with the identification of environmentally friendly alternatives, can yield significant cost savings for your institution. Without paying outside contractors, you can discover steps—often simple steps—that your institution can take to correct and improve environmental problems on campus. By acting on the recommendations resulting from these audits, colleges and universities can realize cost savings by reducing energy and water use, minimizing the campus waste stream, improving systems reliability, and increasing the efficiency of heating/air conditioning systems—to name a few. In addition, you will improve your environmental compliance and thereby minimize your potential for liability, fines, and cleanup costs.
- **“Real-life” work experience for your students.** Environmental audits and pollution prevention evaluations can be integrated into the curriculum, providing students with hands-on investigative and problem-solving experience that they can take with them when they enter the workforce. This experience not only makes your students more marketable, it also provides them with the kinds of broad-thinking skills that allow them to succeed and thrive once they are employed.



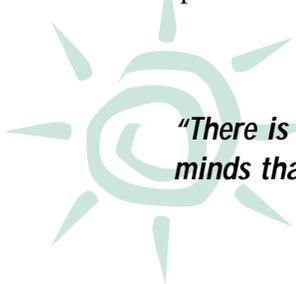
- **Improved quality of life on your campus.** A Green Campus is a cleaner, safer, and healthier place to live and work.

The Student Ingredient

What better place than a college or university to ply the lesson with the practice? Yet, undergraduate and graduate programs are often caught up in theory and removed from the practical aspects of daily life. As a result, students risk losing sight of their connection to the world in which they live.

The Green Campus program is your golden opportunity to develop an exciting new curriculum that encourages students to take the lead in creating positive change and, at the same time, to gain invaluable, marketable skills. Your students, particularly those who hope to work in the environmental field, are the key ingredient for a successful program.

Students can team up with faculty and experienced personnel from government agencies, utilities, and private industry to conduct environmental evaluations of the campus. In the examples of pilot projects that took place at Gateway Community College and Southern Maine Technical College (see pages 8-12), students coordinated meetings, gathered data, performed audits, analyzed the results of the audits, wrote detailed technical reports of their findings, and presented their findings and recommendations to both college administrators and US EPA personnel. They also became involved in developing campus-wide marketing strategies to promote Green Campus initiatives.



"There is a connection between knowledge organized in boxes, minds that stay in boxes, and degraded and global imbalances."

"Earth In Mind"

David Orr

Room for Improvement

Almost any administrative or operational function on campus influences the use of resources and the generation of waste to some degree. There is room for environmental improvement in just about any activity at which the investigative eye dares to aim its sights—regulatory compliance, procurement, transportation, fleet management, physical plant operation, grounds maintenance, food services, waste management, social programs, laboratory practices, materials management, and communication services.

Greening the campus calls for a thorough review of all administrative and operational functions from the standpoints of human health and the environment. The following areas of concern factor into many campus activities:

- **Pollution prevention—solid and hazardous waste management/air emissions reduction/consumption minimization/maintenance regimens for equipment, ventilation, and other infrastructure areas;**
- **Hazardous materials management/purchasing/handling/disposal;**



- Water quality/use/conservation;
- Wastewater/stormwater management;
- Air quality;
- Energy use/conservation; and
- Environmental management systems.

Improvements made in any of these areas serve as important lessons in environmental accountability and responsibility. Some improvements involve solutions that are more obvious and practical, some are required by regulation, others call for out-and-out ingenuity. The challenges are there for the taking.

The Makings of a Successful Green Campus

The impetus for a successful Green Campus must begin at the top and emanate throughout the rest of the campus. Without a strong message of commitment and involvement from both the president and the administration, well-intentioned initiatives may be too fragmented to allow for campus-wide participation and too easily undermined by nay sayers and other obstacles.

Once the decision to become a Green Campus is made, then the real work begins. While no two campuses are alike, and approaches to launching and maintaining a Green Campus will differ from place to place, there are some basic ingredients that will help ensure success:

- **Establish a Green Campus Environmental Ethic Awareness campaign.** Make it known campus-wide that a new environmentally responsible way of doing business is in the offing. Outreach and education from the beginning is important so that all members of the campus community are well versed and supportive of the initiative.
- **Set forth a Green Campus Mission and a Statement of Principles.** Spell out your goals and the basis for your strategic planning. Your goals should address such issues as pollution prevention, waste minimization, regulatory compliance, energy conservation, social/behavioral change, and the role of your institution as an environmental leader.



- **Establish a Green Campus organizational structure and team to facilitate and coordinate your initiative and establish a strategic plan.** Make sure the team is representative of the student body and every campus department. Include all relevant parties from the very beginning. The participation and input of physical plant and maintenance personnel, as well as your chief budget/financial officer is vitally important to securing their cooperation. The backing of your college/university president is essential.

- **Develop a strategic plan.** Be sure it includes policy and curriculum reforms that reflect your stated “green campus” mission.
- **Create student teams to carry out specific tasks of the strategic plan.** The teams should work closely with faculty and administrative staff. If established as course work, these programs should be listed in the course syllabus with an explanation that this is a project-oriented course requiring considerable work outside the classroom. Be sure teams are large enough so that Green Campus work does not overwhelm their other studies and that students and faculty advisors are willing to make the necessary time commitments to support the program. (There are, of course, other options, such as internships or classroom projects, for integrating Green Campus goals into school study programs.)
- **Establish public/private partnerships with personnel from federal, state, and local environmental agencies, utilities, and the business community.** These professionals can be invaluable resources to help advance Green Campus efforts, serve as advisors to student teams, and assist students in accessing information and performing environmental audits. Such partnerships may also lead to internships or future job opportunities for students.
- **Evaluate daily operations in terms of pollution prevention, waste stream management, and energy efficiency—reducing, reusing, recycling, repairing wherever possible.**
- **Implement business practices that are environmentally responsible, efficient, and in harmony with your Green Campus goals.** Address life cycle analyses—buying cheaper may sometimes have serious environmental or financial (e.g., high disposal costs) drawbacks.
- **Adopt and implement an environmental management system that is similar to those being adopted by progressive businesses and industries.**
- **Determine and document short-term and long-term economic benefits.** Don’t forget to include the benefits of environmental compliance and improved health and safety.
- **Secure a commitment up front from the people in charge that well-founded recommendations will be acted upon once audits are completed.**
- **Make the commitment to a long-term program of system-wide environmental reeducation and retooling.**



Pilot Projects Provide the Green Light

A number of colleges and universities around the United States have begun to embrace the Green Campus concept in various ways. George Washington University, for example, embarked on an ambitious Green Campus program in 1995. The National Wildlife Federation's Campus Outreach Division has been assisting college students in educating themselves and their schools on issues of sustainable development since 1990.

In New England, the Northeast Partnership for Environmental Technology Education (NEPETE), the US EPA-Region 1 NEEATeam, and the New England Interstate Water Pollution Control Commission joined forces in sponsoring pilot Green Campus Environmental Ethics projects at two technical colleges in the region—Gateway Community College in Connecticut and Southern Maine Technical College.

Two-year community/technical colleges were chosen because they, in particular, are involved with teaching, assessing, and communicating environmental mandates and technologies. However, they, like other colleges and universities, do not necessarily practice what they preach. Goals for the New England projects included:

- Testing out the Green Campus concept on a small scale,
- Evaluating the effectiveness of having all levels of the learning institutions work together to identify and address environmental issues and improvement opportunities on their campuses,
- Exposing students to real-life work experiences,
- Initiating partnerships with government agencies and private companies through the process of conducting environmental audits on campus,
- Having students prepare recommendations as a result of the audits, and
- Having the institution implement as many of the recommendations as possible.



The pilot projects took place during the 1997/98 academic year, enough time to conclude that such programs could be of enormous value and benefit to colleges and universities. (See the project summaries on pages 8-12.) Many of the suggestions in this paper reflect the lessons learned from these pilot projects. PETE, as a national advocacy group, is using the results of these pilot projects as a template to move the Green Campus concept to a national level.

How Do You Get Started?

- **If you wish to get started** on a Green Campus program, contact the Partnership for Environmental Technology Education (PETE) or the US EPA-Region 1 NEEATeam. Greening the nation's campuses is a priority for both organizations.

Contact:

Kirk Laflin

PETE

2 Fort Road

South Portland, ME 04106

Phone: (207) 767-2539

or

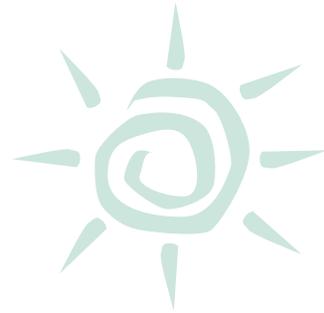
Lee (MacMichael) Fiske

US EPA-Region 1 NEEATeam

1 Congress Street, Suite 1100 (SPN)

Boston, MA 02114-2023

Phone: (617) 918-1847



- **For More Information** about Greening the Campus, go to the EPA-Region 1 Colleges and Universities Web site at www.epa.gov/region01/steward/univ/index.html.

Receive Five-Star Recognition for Your Green Campus

PETE has proposed to EPA headquarters the launching of a Five-Star program to recognize colleges and universities that have made wide-spread progress in greening their campuses. One star will be awarded to institutions that have implemented some reforms. Green Campuses may use this recognition in marketing for prospective students.

Watch for further details. To find out more, contact PETE.

US EPA Region 1 is also considering launching a regional green campus awards/recognition program. Watch for details on the EPA Region 1 Web site.



Gateway Community College (GCC) Campuses North Haven and Long Wharf, Connecticut

"The benefits have been enormous. Not only have we reduced our costs in the college, but students have actually gone on to be employed on the strength of the skills they gained conducting this audit. Their work gave them real experience in dealing with agencies, departments, utilities, and all kinds of data, paperwork, and regulations. In turn, daily life on campus is safer, cleaner, and healthier for all students, staff, and faculty. Everyone gained a greater appreciation for these issues."

Wes Winterbottom
GCC Environmental and Toxicology Programs Coordinator



With a mission to promote heightened awareness of environmentally sound practices in all of its management operations and activities, GCC formed a Green Campus Initiative Team consisting of Environmental Toxicology students, the GCC Environmental and Toxicology Programs Coordinator, and Dean of Administration. Technical advisors to the project were from NEPETE/NEIETC, US EPA-Region 1 NEEATeam, and the Connecticut Department of Environmental Protection (CT DEP).

The GCC team chose the following five areas of concern for which they would perform audits: Pollution Prevention, Water Conservation, Wastewater, Energy, and Indoor Air Quality. They also developed a timetable according to which they would schedule their efforts and evaluate the "big picture." When the work was completed the students presented their findings to the project sponsors and the college's administration, faculty, and staff.

AN AUDIT SAMPLER: POLLUTION PREVENTION

In this category the audit was conducted by three students, a technical advisor from CT DEP, the Maintenance Superintendent, and the Maintenance Supervisor. They audited the automotive department, bio-medical engineering department, chemical supply room, cafeteria/kitchen, maintenance storage area, printing/graphic arts area, recycling set up, underground oil tanks, and the contracted cleaning service.

Recommendations included:

- Ensure that recycled products picked up by the contract cleaning service remain separated and are actually recycled rather than returned to the general waste stream. Spot checks were suggested.
- Set up an easy-to-use system for posting reusable chemicals on the Internet.
- Institute a routine maintenance program for checking the equalization tanks in the lab area.
- Store acids and bases in proper containers on proper shelving, and segregate them appropriately.
- Install a proper grease receptacle.
- Use soy/vegetable-based, water-soluble inks in the printing lab.

- Use an inside/outside collection system for the automotive department's oil and antifreeze removal, and put in place a proper storage system for automotive fluids. Find out about procuring environmentally safe solvents and fluids.
- Develop a program for proper disposal (recycling) of fluorescent light bulbs.
- Properly store oil and paint cans in the boiler room.

GREEN CAMPUS PROMOTIONAL PROJECTS

- **Green Campus Day** - To maximize participation, this effort was combined with the annual college picnic run by the student government.
- **Brochure** - Designed to communicate information about the project and to generate campus interest.
- **Posters and signs** - Contained information about the Green Campus Initiative, the mission statement, and some suggestions for getting involved.
- **Recycling centers** - Containers for plastic, glass, newspaper, and white paper were ordered for the cafeteria areas. They were arranged in a special "Recycle Center" area. White paper recycle containers were placed in every office, classroom, and library.
- **Environmental education in all GCC programs** - In an effort to incorporate environmental awareness training into all courses of study, the team initiated a project to encourage staff and faculty to include at least one assignment per semester that pertains to the environment. They recommended four areas of environmental interest: new technology, pollution prevention, general environmental information, and environmental awareness.

Since completing the project, GCC has made a commitment to continue to investigate ways to implement a Green Campus program through student participation. For more information about the GCC Green Campus program, contact Wes Winterbottom at (203) 234-3398.



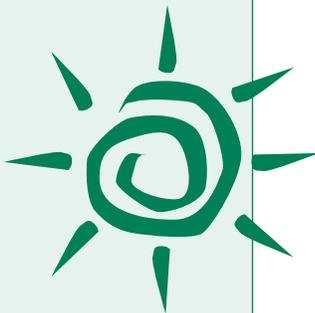
◀ Students at GCC conduct an audit of a classroom laboratory.



GCC laboratory storeroom audit and inspection. ▶

Southern Maine Technical College (SMTC)

South Portland, Maine



The Green Campus project was very worthwhile both from the perspective of the students and of the college. Students gained real-world experience and provided a professional presentation on the results of their investigations. The report prepared by the students summarized areas where the Southern Maine Technical College has made progress and detailed steps that the college can follow to become a "Green Campus." As an added benefit, the students' work highlighted areas where the college can enjoy significant cost savings while improving quality on campus.

Wayne Ross
President, Southern Maine Technical College

The kickoff meeting of the SMTC Green Campus pilot project was attended by the college president, academic dean, the finance director, maintenance staff, and faculty members. The support given to this project by all levels of the administration from the college president on down gave the project higher visibility and credibility.

The core of the program was developed as part of a Pollution Control class taken by 21 students in the Environmental Technology program. The class was divided into six groups, each of which focused on one topic area. The Green Campus team selected the following six areas of concern: Water conservation, Stormwater Management and Wastewater Generation, Air Quality, Energy Conservation, Solid Waste Management Practices, and Hazardous Waste and Special Waste Practices. Students had the benefit of working with professionals from NEIETC/NEPETE, the US EPA-Region 1 NEEATeam, Maine Department of Environmental Protection, and Central Maine Power.

The project resulted in a comprehensive, professional report—prepared almost exclusively by the students—that benchmarked environmental progress the college had made to that point and outlined a series of recommendations for the college to follow to become a truly Green Campus.



◀ SMTC students collect samples from a campus stormwater discharge area.

The students had the opportunity to apply skills they had gained from their courses directly to the project. A case in point is their development of a cost analysis for a recycling program. They had been given an assignment earlier in the semester on developing just such an analysis. They now had the opportunity to apply these skills by evaluating various options for the campus and, in doing so, discovering areas where there could be significant cost savings for the college.

One student researched waste management contracts at other institutions and prepared a draft bid document based on that research. In each of these cases, students were able to move beyond simply fulfilling assignments to actually accomplishing tasks that were of value for the college.

AN AUDIT SAMPLER: ENERGY MANAGEMENT AND CONSERVATION

The students audited two dormitories where electrical meters were separate from others on campus. An energy auditor from Central Maine Power was contacted and joined the students in performing a Level 1 Energy Audit. In one dormitory the thermostat for the entire floor was located in one student's room. The thermostat had been turned up to a high temperature and the windows were wide open, allowing considerable waste of energy. Many of the student rooms had electrical appliances running while no one was present. Numerous other sources of energy waste and inefficiency were noted.

Recommendations included:

- **Make minor modifications to the boiler room.**
- **Replace single-paned windows with double-paned insulated glass or low E windows that allow heat and energy into the building and reflect it back so it will not escape.**
- **Retrofit light fixtures to low energy bulbs, especially where incandescent lights are in use.**
- **Place motion detectors in lounges and hallways to ensure that light is turned off when an area is not in use.**
- **Place thermostats in each dormitory room (if practical), so students can regulate their own heat. This step could also eliminate the use of portable electric heaters, which are a considerable energy drain.**
- **Conduct routine maintenance checks, and clean heater coils and diffusers.**
- **Include information on energy conservation as part of student orientation in the beginning of the school year.**
- **Meter each building to facilitate campus-wide energy use monitoring.**

Students evaluate whether there is non-point source pollution runoff. ▶



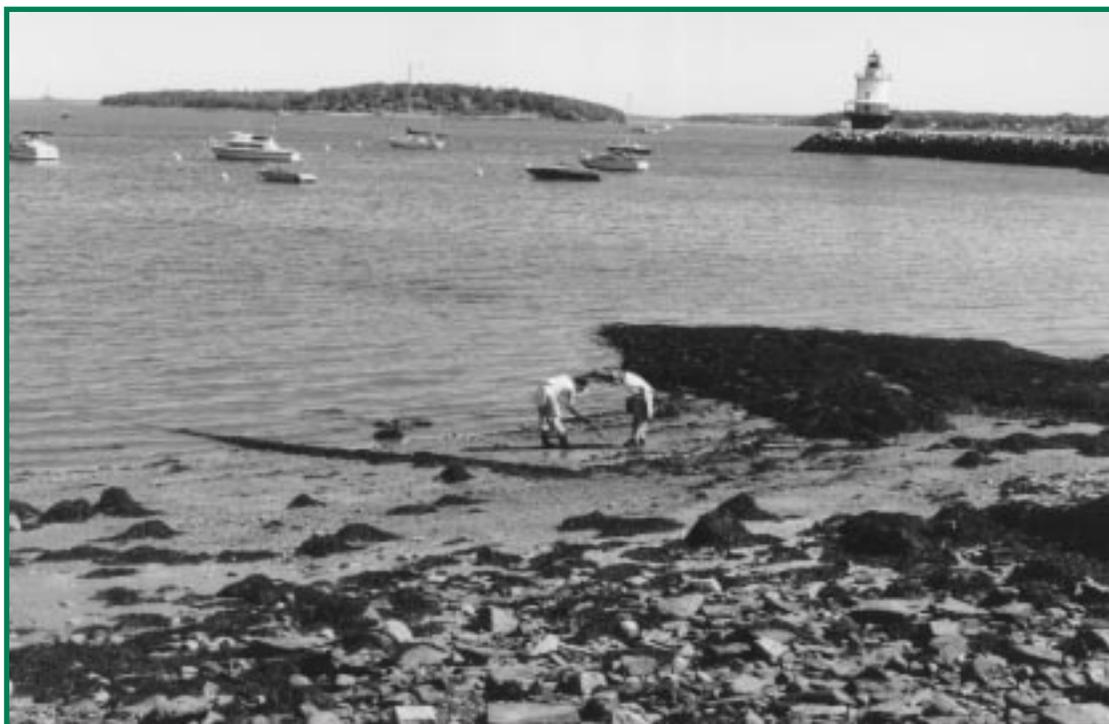
WELCOME TO THE REAL WORLD!

Students who participated in the Green Campus project learned that real life does not always add up to what the textbooks say. They learned that:

- Locating data and coordinating meetings with on-campus personnel and outside agencies was a tougher job than expected;
- The importance of clear, concise communication (verbal and written) was key to gaining support during the initial phase and the reporting and recommendation phases of the project;
- Determining the cost benefits and social impacts of their recommendations was difficult to calculate; and
- Implementing their recommendations was sometimes easier said than done.

When asked what they enjoyed the most about the project, students replied that it seemed like the project was of value and had the support of the college's administration. The fact that the course culminated in a formal presentation by the students to an audience that included the college president, finance director, and representatives from NE PETE and EPA was real-world experience that is difficult to replicate in a classroom setting. Many students hoped that maybe some day, what they did would make a difference in how the campus operated environmentally. They agreed that their Green Campus experiences were a great introduction to the real-world work place.

As a result of this project, SMTC launched a complete compliance audit and is currently working on a fast track to correct deficiencies. For more information about the SMTC Green Campus program or for a copy of the student report, contact Eileen Johnson at (207) 767-9500.



▲ SMTC students conduct samples to determine if the old stormwater discharge pipe is still operating.



A collaborative effort by US Environmental Protection Agency (EPA) Region 1, New England Interstate Water Pollution Control Commission and Environmental Training Center (NEIWPPCC/NEIETC) and the Northeast Partnership for Environmental Technology Education (NEPETE)



EPA Region 1 College and University Web page: <http://www.epa.gov/region01/steward/univ/index.html>