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Sarah Hammond Creighton, 1998

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**Greening the Ivory Tower**

**Improving the Environmental Track Record  
of Universities, Colleges, and Other  
Institutions**

Sarah Hammond Creighton

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## Foreword

In 1988, ten environmental-planning graduate students at the University of California at Los Angeles began meeting to decide on a common topic for a group comprehensive project. The project, a client-based research undertaking, served as a substitute for the students' master's theses and was considered the signature event in their professional training-oriented education. Two topics were considered: an environmental justice theme identifying and evaluating the complex of environmental hazards experienced by residents of East Los Angeles, and an evaluation of the environmental issues associated with the activities of UCLA. The students essentially divided between those who considered community-based justice or "risk discrimination" issues to be of paramount importance and those students who felt a community imperative to take responsibility for what they called their own backyard. The ten students eventually split into two separate groups, both producing high-quality projects.

The award-winning UCLA-related study, *In Our Backyard: Environmental Issues at UCLA, Proposals for Change, and the Institution's Potential as a Model*, was notable for several reasons. First, it demonstrated that the university, partly as a function of its size, did indeed generate significant environmental impacts: water use (eighth largest user in the city of Los Angeles), energy use (third largest user in the city) air emissions (tenth largest emitter of carbon monoxide in the regional air basin), sewage flow (accounting for nearly one-half of 1 percent of the wastes treated at the City's Hyperion Treatment Plant), hazardous materials use and waste generated (more than 100 tons annually), solid waste sent to landfills or incinerators (15,000 tons annually), and so forth. Second, despite

some interest in environmentally oriented programs (a ride-share program, use of alternative fuels for some campus vehicles), there was an absence of environmental efforts in several key areas as well (continuing emphasis on the automobile by investment in parking infrastructure, absence of recycling or reduction strategies, little support for alternative transportation strategies such as bicycles). Most symbolic of this absence of effort had been the failure to establish a recycling program. During the 1970s, after the initial enthusiasm of the first Earth Day, a modest student-led recycling program was begun. This was soon suspended due to the chancellor's decision to remove the recycling bins since he felt that the bins spoiled the aesthetics of the campus. Ultimately, the response of the university administration to the In Our Backyard study was also negative (primarily due to the study's extensive press coverage), and the opportunity to follow through on this evaluation, or environmental audit, was never pursued.

Despite this reluctance at UCLA, the In Our Backyard study in fact became one of the keystone documents that helped inspire what has since become known as the campus environmental audit. These audit activities—some undertaken in conjunction with university administration support, some forced to operate independently or at the margins (often as student activist-oriented investigations)—have quickly extended to more than several hundred campuses in just a few years. But despite widespread interest in the concept, the campus environmental audit has remained largely ad hoc, often disjointed, and has often been lacking in breadth and analytic rigor.

Sarah Hammond Creighton's work in this area is an important and welcome addition to this literature. Derived in part from one of the most ambitious university environmental programs, based at Tufts University, Creighton's study captures the range of issues necessary for any comprehensive evaluation and provides a framework for investigation and analysis that can turn such an effort into a more comprehensive and coherent undertaking.

For the campus environmental audit to identify the issues and help transform a university environment, it needs to become both subject and object of rigorous environmental analysis, emerging in effect as a program for environmental literacy as well as environmental improvement.

The campus environment needs to be seen as an area where the relationships between work and knowledge constitute the basis for environmental change. And the campus environmental audit as an instrument for such change must also firmly establish the principle that environmental literacy—and environmental justice—is a function of responsibility for those places where we work as well as live and play.

Robert Gottlieb



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There are many people who helped to make this book possible and contributed some of the ideas or helped me to learn the lessons that I have tried to share here. Friends and colleagues at Tufts University were important to the successes there and to the increased knowledge of greening a campus. Tony Cortese had the vision to seek support for campus stewardship efforts. Bill Moomaw led the Tufts CLEAN! project in its infancy and still continues to push the envelope of what seems realistic and possible at Tufts. Members of the Tufts community, in dining services, purchasing, physical plant, and elsewhere, took (and continue to take) suggestions and ideas, trying them out and thereby providing me with rich experiences that form the basis of this book. Graduate student researchers and colleagues helped me to gather information for Tufts CLEAN! that I later used for some of the background for this book: Peter Allison, Karen White, Caroline Ganley, Chris Bell, Meg McClennan, Priscilla Ryder, Lucy Edmondson, Jim Greenbaum, Ilze Gottelli, Sheila Machado, Warren Goldstein-Gelb, and Maureen Hart. Special thanks to Patti Lee, Molly Anderson, Eric Friedman, Keith Kidd, and Ann Rappaport for their thoughtful comments on early drafts of chapters and for their dedicated work to green Tufts. Special thanks to H. Emerson Blake for his wisdom, guidance, and editing. Many thanks are also due to my husband and family who put up with this project longer than we wanted, provided moral support through the project, and pushed me to see it to completion.

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## Introduction

In 1990 the U.S. Environmental Protection Agency awarded a research group at Tufts University's environmental center a grant to undertake an effort, known as Tufts CLEAN! (Cooperation, Learning, and Environmental Awareness Now!), to reduce or eliminate the environmental impacts from the university's own operations. Tufts was chosen because of its leadership role in environmental education and research and its commitment to environmental programs. The small group of researchers and students who gathered to work on the project recognized that universities use resources and generate a great deal of waste in conducting their business and therefore offer a multitude of opportunities to prevent pollution, demonstrate clean technologies, and take leadership for environmental protection. Colleges and universities are microcosms of society's systems to house and feed people, conduct research, and administer programs, so their operations have many of the same consequences and opportunities for the environment as homes, offices, restaurants, and hotels.

The Tufts CLEAN! project could have underwritten the installation of a technology that would reduce the university's environmental impacts in a single area, such as an efficient new heating system or a fleet of electric vehicles that would reduce on-campus air emissions. Instead the team chose a more comprehensive approach by serving as a resource and catalyst for action to reduce the environmental impacts of many of Tufts' own activities on and off campus. The team examined specific issues in depth, such as food waste, transportation, energy efficiency, and procurement practices, and members worked with target departments to develop recommendations. Tufts CLEAN! differed from many other university environmental action efforts in that team members worked directly with

the university staff in operations departments such as buildings and grounds (known on some campuses as physical plant or facilities and maintenance), purchasing, dining services, printing services, and computer services, as a catalyst for action and an information resource to include environmental factors in the decision making of department personnel.

The team members—academics, staff researchers, and students—had little background in running a project of this magnitude and initially relied on a descriptive approach to quantify the needs and identify solutions based on empirical evidence. Later, team members spent a great deal of time understanding practical considerations that are essential to keeping the university running smoothly. The team engaged students to help on research related to purchasing, dining, energy, composting, and hazardous materials. In all but the first year, I served as project manager, and the team included several faculty members who participated on a limited basis.

Throughout the first year of Tufts CLEAN! the project team gathered data and made recommendations about the logical and justifiable changes in practices and policy that the university could make in order to reduce or eliminate its burden on the environment. In many cases, the recommendations have been implemented; however, it took a long time to recognize that as a research team, we were nearly powerless to effect the changes in university systems and procedures necessary to implement the far-reaching waste reduction and conservation goals we envisioned—for example, solar hot water systems, natural gas-powered vehicles, recycled paper with 100 percent postconsumer waste, and reusable dishes in all dining halls and cafeterias. For example, members of a research team do not upgrade the lighting; that is done by the buildings and grounds department. Decisions about the cleaning products used at Tufts are made by the head of custodial services and the purchasing department. The grounds department waters the athletic fields, and dining services ultimately decides whether the students eat off paper, polystyrene foam, or china dishes.

Perhaps the biggest lesson from Tufts CLEAN! is that actions to reduce or eliminate a university's adverse impacts on the air, land, water, health, and safety require the personal commitment and direct involvement of

university staff who have the responsibility for operating the institution on a daily basis. This lesson is essential to the success of broad-based university environmental stewardship on any campus and is one important reason for writing this book.

### About This Book

This book is about college and university actions to reduce environmental impacts from campus decisions and activities. It is about the numerous small and humble actions that the members of a university community can undertake to reduce the environmental footprint—the multitude of on- and off-site impacts resulting from university business and decisions—of their institution. The book is also about the process of planning and undertaking these actions at a college or university, in the hope that the process will lead to successful outcomes. Although the Tufts experience forms the basis for much of the thinking behind this book, the actions described go well beyond those that Tufts has undertaken, and, examples from other institutions are used to illustrate successful implementation actions.

This book is written for people who, like me and members of the original Tufts CLEAN! team, are interested and motivated to help green their campuses but have little or no experience with changing institutions or with the technologies that are needed to accomplish the task. Students, faculty, staff, and administrators will find strategies that are relevant to them, as well as ways to support and encourage action throughout the university.

The environmental stewardship actions that are detailed in this book are important steps toward transforming a university to an institution that treads lightly on the earth. The book offers numerous action steps for greening the ivory tower, and each action is simple enough that any university community can expect to be able to accomplish it. The truly green university will need to undertake comprehensive implementation of these actions, and go beyond those I describe. If only a few actions are taken at each of the more than three thousand institutions of higher learning in the United States alone, progress will be made. Undertaking all the actions will be overwhelming if each action is considered individually;

instead, these actions are concrete examples of how to operationalize the concepts of reducing waste, decreasing hazards, maximizing efficiency, handling wastes optimally, and engaging members of the university community in the process. Universities that are committed to a goal of environmental stewardship will find that university commitment supports and reinforces the individual actions that become expectations rather than exceptions. On the other hand, members of many institutions will find that they need to approach these actions individually, because overall commitment or a master plan for environmental action is lacking.

### University Environmental Impacts

Colleges' and universities' use of electricity, oil, natural gas, water, and chemicals is significant and may be the largest uses in the community or region where an institution is located. Tufts' main campus, for example, uses more electricity than any other business in its electric company's district. The impacts of energy use by colleges and universities are probably these institutions' largest single environmental impact. A small town may find that its college is a major contributor to the wastewater treatment plant, as well as the greatest single user of clean freshwater. Even if the university operates its own wastewater treatment systems and supplies its own drinking water, the financial costs of running these systems, complying with laws for wastewater treatment, and providing safe drinking water are large. Universities and colleges generate large quantities of trash, or solid waste, as well as hazardous wastes, such as chemical waste, pesticides, paints, solvents, and radioactive wastes. In Massachusetts, university, medical schools and research labs are among the largest generators of low-level radioactive wastes, stemming largely from the research laboratory. Hazardous chemicals used in laboratories, pesticides, insecticides, and fertilizers are abundant on college campuses and contribute to water pollution and indoor air pollution problems that can endanger workers, students, and community safety and natural systems. In New England alone, thirty-five universities or colleges are listed as contributors to listed Superfund (hazardous waste) sites for their failure or the failure of their contractors to dispose of hazardous waste properly.<sup>1</sup> Chemicals that deplete the ozone layer, causing increased human, animal, and plant

exposure to harmful ultraviolet radiation, are prevalent in cooling and refrigeration systems, fire extinguishers, automobiles, and libraries. Disposing of the university's solid waste also contributes to air and water pollution. Transportation to and from the campus by deliveries and commuters may increase noise, congestion, and air quality problems for local communities.

Significant indirect impacts are created off campus by the use of services or the production of goods outside the institution, such as pesticides on food served on campus or dioxin resulting from bleaching paper used in offices. These environmental problems may seem distant, but they are indeed related to university actions. The purchasing and product use decisions that members of the university community make individually and collectively may influence off-site growing and manufacturing practices, the demand for environmentally friendly products, or the reduction of waste and pollution.

The following statistics provide a glimpse into Tufts' annual activities and environmental impacts on its main campus:

- 3,200 students housed by the university
- 5 million meals served
- 14 million copies made
- 65 tons of paper towels purchased
- A large-quantity generator of hazardous waste<sup>2</sup>
- 110 million gallons of water used
- 2,127 parking permits issued
- 1.1 million gallons of fuel oil burned in four central heating plants, resulting in the emissions of 22 million pounds of carbon dioxide
- 23 million kilowatt-hours of electricity consumed, resulting in the emission of another 34 million pounds of carbon dioxide
- Over 2,000 tons of solid waste generated

### Motivation for Campus Environmental Action

Institutions of higher learning teach young people the professional and intellectual skills they need to cure disease, run businesses, lend money, and legislate policy. Universities also conduct basic research that is instrumental in understanding the natural world and our effect on it. In teach-

ing these skills and investigating new research areas, universities and colleges have a unique opportunity, in the classroom and by the example of their physical plant, to provide students with a basic understanding of the interaction between business decisions and the natural systems on which our health and well-being depend. Furthermore, universities have an opportunity to make choices themselves and become stewards of environmental systems in anticipation of the needs of future generations. Universities can both teach and demonstrate environmental principles and stewardship by taking action to understand and reduce the environmental impacts that result from their own activities.

Many of the actions that reduce the environmental footprint of the university involve the reduction of waste: wasted heat, wasted water, wasted electricity, wasted chemicals, and solid waste. Thus, actions to reduce these wastes represent opportunities to save. Embracing waste reduction projects can save a university money, although implementing some can require up-front capital. But the fact that most institutions of higher learning plan to exist well into the next century makes long-term thinking and investment in long-term waste reduction prudent. Furthermore, the long-term costs of solid and hazardous waste disposal, freshwater, wastewater treatment, and energy will continue to rise, making efficient use of these resources a financially sound decision. Liability from poorly handled wastes or accidents to students, employees, and property can also be costly, and they are avoidable.

Since universities are generally long-lived institutions, they should be concerned with the long-term health and liability of their community and region. A beautifully maintained campus surrounded by traffic, air pollution, litter, and a filthy river will have difficulty attracting students. Furthermore, environmental efforts can be a selling point for the university, both within its community and with prospective students. Nearly 20 percent of the students who enter Tufts list environmental concerns as one of their three top concerns.<sup>3</sup>

### University Environmental Action

Some universities and colleges are already implementing prudent practices that comply with or exceed local, state, and federal regulations, im-

proving energy efficiency, recycling wastes, and improving the storage and handling of hazardous chemicals. Student audits of their campuses have raised awareness of their university's contribution to local pollution problems and have spurred action. Across the country, students have started recycling programs, advocated for divestment from corporations with poor environmental records, and helped administrators and staff to research and implement programs to buy recycled products or begin composting. Faculty members have expanded curriculum to include the study of resources and pollution, as well as the policies, and engineering that contribute to both problems and solutions. Facility managers have discovered the rapid payback of energy-efficient lighting. Dining service staffs routinely separate cans, bottles, and cardboard for collection and recycling. These efforts and the hundreds of others like them represent progress toward a greening of the ivory towers that teaches our future leaders and workforce.

There are many exciting and innovative efforts in nearly all sectors of campus operations and activities.<sup>4</sup> Sometimes a particular effort will flourish in one part of the university, but the other operational units of the same institution will lag far behind. In many places, efforts have started but dwindled; in others, seemingly logical actions remain undone. Few, if any, colleges or universities have undertaken comprehensive, across-the-board environmental stewardship in curriculum, operations, and university policies. A number of institutions, including Brown University, Ball State University, Georgetown University, the University of Vermont, the University of Wisconsin, and Tufts, have taken steps to think comprehensively about the range of stewardship actions and to embrace them throughout the institution. As at other campuses, Tufts' successes are found in targeted areas where individuals are willing to spend the time; seek out the information and support of government agencies, nonprofits, knowledgeable alumni, and other helpful resources; or change the way they do business. Sometimes these efforts are motivated by outside pressure, laws, mandates, or incentives. Other efforts are motivated by student pressure or financial opportunity. Still others stem from personal or institutional commitment to making the world a better place.

Some universities have yet to begin, but on many campuses the easiest

initiatives are already underway—those with opportunities for quick financial payback, positive visibility, research funding, or student participation. In the next phase of the campus environmental stewardship movement, colleges and universities will see the long-term benefits and invest in capital projects with longer-term paybacks, change curriculum to reflect holistic thinking, reduce or eliminate hazardous by-products, and examine each business decision in the light of the quality of life and the quality of the natural world.

As with all other institutions, universities are communities of people: students, faculty, administrators, and staff. To date, no university or college community has completely understood and acted on the opportunities to save money, reduce risk, demonstrate new technologies, and increase student learning that a truly green university might offer. The progress toward that end will require the commitment of many individual people. It will involve rethinking some priorities, taking risks, making mistakes, and persevering.

#### The Green University of Tomorrow

The green university of the future may use resources efficiently, create little or no waste, and take full responsibility for any waste that it does generate. As Bates College has begun to do, the green university may purchase organic foods grown by local farmers. This university will invest its endowment to purchase shares in companies that specialize in efficient technologies rather than polluters that destroy precious lands and waters to provide stockholders with ample returns. As Rutgers University has begun, the green university will rewrite contracts to favor reuse and recycling and to buy products from green businesses that have taken steps to reduce their own environmental impacts. The green university might renovate an existing building rather than build a new one, or reduce mowing and increase wild plant species in target areas, as the University of Buffalo is trying. The University of Waterloo allows students in some classes to submit papers electronically, and perhaps these computers will one day be powered by local and renewable sources such as solar or wind. Further, this green university will include learning and appreciation for the physical environment and our connection to it in courses, labora-

tories, and university culture and throughout the institution's physical plant.

The complexity of our lives and institutions makes this vision nearly impossible unless change is seen in some of our goals, expectations, rewards, educational processes, and perhaps even the tenure and promotion system—long-term and ambitious goals, to be sure. In the near term, universities can make progress toward this vision. Members of university communities can learn how to reduce or even reverse these impacts through their individual and collective actions. The green university recognizes that it has a responsibility to lead rather than follow, try new solutions to old problems, and continuously improve its business of environmental protection.

#### In Summary

Tufts CLEAN! made progress on environmental stewardship projects throughout the university. Perhaps most important, Tufts continues to embrace many initiatives that Tufts CLEAN! helped to begin, such as hiring an energy manager, upgrading the lighting with efficient technologies, regularly purchasing energy-efficient computers, recycling and composting wastes, exploring the use of organic foods, and displaying a dramatically increased awareness about environmental issues and the university's role in addressing them.

The Tufts approach encompassed master planning and a vision but emphasized implementation. Tufts CLEAN! taught several major lessons that are essential to success of environmental initiatives in a decentralized place like a university and are very transferable to other settings. We learned that the business of *greening* a place requires sound research, attention to details, and unfailing commitment. We learned that university operation staff in purchasing, facilities, dining, printing, computer services and other departments hold the key to implementing many projects. We learned that to maximize student energy and faculty expertise requires careful targeting of those resources. We learned that decisions that affect the environment are complex and that the environmental efforts must complement rather than consume the educational mission of the university and its departments.