

Pollution Prevention Strategies for College Campuses: A Case Study at the University of Michigan

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of the requirements for the degree of Master of Science
at the University of Michigan's Rackham School of Graduate Studies by**

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Preface

We began this project thinking that we would dig up lots of numbers about our university's pollution and energy-consumption sources. Next, we thought we would examine those numbers to find specific problems with clear-cut answers ("X is a big generator of the Y waste stream, so here's what X should do"). Our specific analyses and solutions would be pragmatically summed up in an official-looking document.

As with most big ideas, things did not turn out exactly as planned.

We thought we would come in as pollution prevention experts executing "the right" intervention; instead, we acted as consultants and facilitators who worked *with* members of the university community. We spent less time analyzing and more time communicating. Our goals became quite process-oriented. And the document following this preface has much more text than numbers.

Our university is a unique place. We realized that data on its consumption and pollution would not be very useful for students on other campuses—there are too many variables in size, location, and activities to make accurate comparisons. While we gathered *data* in the hopes that it would be useful for future pollution prevention at U-M, we believe it is our *stories* that will help people perform similar work at other institutions.

This approach—using narrative text—may be unfamiliar to academicians who only see "truth" in numbers. However, we believe that stories are inherently fascinating and can be as useful to the general population as tables or quantitative analyses. Therefore, we use chronologies and anecdotes to explain how we did things, how long they took, and what sorts of barriers and enablers we encountered.

We wrote this document for other students who share our dream of making their campuses more environmentally responsible. We hope that all of them—whether Ph.D. students or freshpersons, biologists or musicians, at campuses large or small—can gain vicarious experience from our stories and use our work as a model.

Here at the University of Michigan, we have studied action research, community participation, and environmental psychology along with environmental policy and the natural sciences. As we begin careers in these exciting fields, we are proud to have used their theoretical frameworks in a "real life" situation on our own campus. May you find our work useful, inspirational, and, above all, readable.

Sincerely,

The Members of the 1992-93 U-M Pollution Prevention Master's Project

Executive Summary

The Pollution Prevention Project was undertaken by nine graduate students at the University of Michigan (U-M) to fulfill the requirements for the Master of Science degree in Natural Resources. We had a common desire to develop a pollution prevention program that we could actually implement and that would not remain a promising set of ideas lost on a dusty shelf. We hoped that our project would lay the groundwork for future pollution prevention at U-M and also be a reference for similar initiatives at other colleges. We were advised by Professor Jonathan Bulkley, director of the U.S. EPA's National Pollution Prevention Center for Higher Education, which is sited at U-M's School of Natural Resources and Environment.

Our strategy was to first collect baseline data by conducting an environmental audit of U-M's Ann Arbor campus and then use this data to choose areas for intervention. The Project thus fell into two distinct stages: a period of data-gathering, and a period of active intervention. Throughout, we documented our work and reflected on its directions, barriers, and successes.

In the first stage, we examined audits from other campuses and developed a methodology for our own audit. Our audit covered a dozen areas: solid, hazardous, radioactive, and medical waste; air and water emissions; food, energy, and water usage; pesticides and herbicides; procurement policies; and transportation. In the process of actually conducting the audit, we publicized our masters project and made contact with knowledgeable U-M staff members. This turned out to influence our choice of interventions as much as the audit results did. In publicizing our project, we made contact with an alumnus who had studied the use of hazardous chemicals on campus; also, the dean of the School of Business Administration heard about our work and invited us to conduct a demonstration project at his school.

The second stage of our work involved developing and conducting two complementary demonstration projects. Five of our members formed the Business School group, whose goal was to increase the environmental responsibility of the U-M Business School. While this project was conducted in one location, it encompassed many areas of campus pollution, including solid waste, procurement, energy and water use, food preparation and disposal, transportation, and air and water emissions. The Business School group conducted its own audit and survey; developed a mission statement for the School along with goals, strategies, and project ideas; and formed an environmental advisory committee ("Green Team") of Business School students, staff, and faculty to carry on this work in greater detail.

The other four members formed the Chemical Tracking group to deal with one waste type that is found in many locations on campus: hazardous chemicals. This group worked on one of the basic techniques for reducing hazardous waste: improving inventory control. Most research institutions, including U-M, have no reliable chemical tracking system on which to base waste reduction interventions. Our group focused on researching and implementing a tracking system, which uses bar-code labels and a database to monitor chemicals' procurement, receipt, storage, use, and eventual disposal. Through this group's research and facilitation, the U-M administration has made the implementation of a chemical tracking system a high priority. This document also updates what transpired on the project from May through December, 1993 to allow the reader to follow the resulting changes that occurred after the Master's Project group disbanded.

Because these projects involved work in departments in which we were "outsiders," we relied heavily upon the paradigms of action research, community participation, and behavior change to implement them. A major turning point in each demonstration project came from our realization that we would do the most good by setting up internal organizational structures that could initiate change themselves. At the close of our project, we drew upon our experiences to develop general pollution prevention strategies for universities, from first collecting baseline data to conducting successful intervention projects to maintaining momentum. We also generated a list of pollution prevention projects that may be performed by students at any college or university.

List of Abbreviations

BTUs	British thermal units
CCU	100 cubic feet
CEC	Central Environmental Control
CEPA	California Environmental Protection Agency
CFM	Cubic feet per minute
CPP	Central Power Plant
CRI	Color Rendering Index
CTS	Chemical Tracking System
DOE	United States Department of Energy
ECAP	Energy Cost Avoidance Project
EPA	United States Environmental Protection Agency
FY	Fiscal year
hazmat	Hazardous materials
MPC	Menu Planning Committee
MSDS	Material Safety Data Sheet
NEAC	Nutrition Education Advisory Committee
NPPC	National Pollution Prevention Center for Higher Education and Curriculum Development
NRC	United States Nuclear Regulatory Commission
OSDH	Occupational Safety and Environmental Health
PolPrev	Pollution Prevention Master's Project
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendment and Reauthorization Act
UHS	University Health Service
U-M	University of Michigan