A Proposal for Conducting an Environmental Assessment of Bucknell University

Prepared for the Bucknell University Environmental Center

by

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Why Conduct an Environmental Assessment?

If self-inquiry is a natural and necessary outgrowth of a quality education, it could also be stated that institutional self-inquiry is a natural and necessary outgrowth of a quality educational institution. Since the early 1990’s, members of the Bucknell community, along with countless other colleges and universities worldwide, have voiced a sincere and increasingly urgent concern for the health and well-being of the planet and its future generations of inhabitants. Concern about global environmental degradation and resource depletion is a logical consequence of the scholarly research, teaching, and learning that takes place on campuses everyday. Because universities are by nature inquisitive institutions, it is only natural for the university to examine itself. Indeed, a university that promotes investigation of the world at large, and neglects to investigate itself in the process, misses a tremendous opportunity to teach its students by example. Thus it is imperative that the university evaluate its own contributions toward a sustainable future.

This document presents a proposal for both the process and the content of an environmental assessment of Bucknell University. The process involves the formation and deliberation of assessment teams, each consisting of a group of knowledgeable stakeholders within the campus community. The content is presented primarily in the form of ecological indicators to be investigated and evaluated by these teams. Because this proposal has incorporated the best examples of several university assessments, it may, at the outset, appear daunting. It is of the utmost importance to state that the assessment process is not intended to impose an overwhelming or discouraging task to the university, but rather to provide a point of departure for discussion and investigation. In this spirit, the assessment is designed to be flexible, leaving to the stakeholders themselves the ultimate decision as to its final content. Should the proposal move forward in good faith and with a reasonable amount of time and effort, the resulting body of work would clearly position Bucknell at the forefront of the campus greening movement.

Environmental Assessments and Campus Sustainability

Sustainability is a term first made popular by the 1987 Brundtland Report of the World Commission on Environment and Development entitled “Our Common Future”. It defines sustainable development as development that “meets the needs of the present without compromising the ability of future generations to meet their own needs” (United Nations Development Program, 1987).
Nations 1987, p. 24). Although this definition leaves room for interpretation, the Brundtland Report clearly states that both global ecological integrity and social justice are essential to the concept of sustainability.

The Brundtland Report helped pave the way for the campus greening movement, which began in earnest in 1994 when delegates from 50 states and 22 countries gathered at Yale University for the Campus Earth Summit. The collaborative work of these participants resulted in the publication of “Blueprint for a Green Campus,” (Heinz Family Foundation 1995) which has since served as a compass for campus sustainability initiatives worldwide. The Blueprint explicitly recognizes the importance of environmental assessments in its definition of a green campus, which addresses both the physical elements of university operations, such as waste and energy efficiency, as well as academic elements such as course offerings and career-building (Heinz Family Foundation 1995, p. 1). This suggests that a good assessment will examine multiple aspects of university functioning including both tangible and intangible aspects of university life.

Since the Blueprint was issued, innumerable environmental assessments have been conducted and published by colleges and universities worldwide. Indeed the Campus Sustainability Assessment Project (CSAP), a program at the University of Western Michigan initiated in 1999 to assist colleges and universities in “evaluating their social and environmental performance”, maintains a database of over 1,100 such documents from 13 countries (CSAP 2006, “CSA Database”).

Goals of the Assessment

The overarching goals of Bucknell’s environmental assessment are as follows:

To establish a baseline of existing conditions

Although the Environmental Center’s 2005 campus greening report provided a historical summary of greening efforts at Bucknell, the account in that report was not an exhaustive list, nor was it sufficiently detailed to serve as a reference point for future initiatives (El-Mogazi 2005, pp. 10-20). The environmental assessment should be conducted in such a way that it provides, as specifically as possible, a baseline reference for future sustainability programming.

To provide basis for improved sustainability

Once a baseline is established, the data can serve as a point of departure for further action in campus greening. Existing data will allow the university to compare its programs and operations with those of peer institutions, identify areas in need of improvement, and prioritize the implementation of future projects. This data will also provide a basis for calculating the economic benefits of resource conservation projects, by establishing the current rates of resource use and their associated costs.
To promote environmental awareness through the assessment process

The environmental assessment provides students with valuable hands-on learning opportunities and a real sense of benefiting their local and global communities. Furthermore, the assessment process provides an excellent means for fostering communication among members of the campus and developing greater awareness of the interrelationships among campus departments and operations.

To create an educational document for future use

Once the assessment is completed, the resulting document can serve as an official reference source for any research, course projects, or new initiatives pertaining to the ecological and physical functions of the campus. If made available online, the assessment has the potential to serve as a resource for other college and university campuses.
Assessment Structure and Organization

Overview

The assessment structure presented here incorporates two separate dimensions. The first section “Indicators of Sustainability” contains the framework for the assessment’s content, in other words, the subject matter to be included in the assessment. The second section “Guidelines for Execution” briefly outlines a proposed process for conducting the assessment. These are explained in greater detail below.

Indicators of sustainability

The term “sustainability indicator” was made popular by the Penn State Indicators Report (Green Destiny Council 2000), and simply refers to a variable or category of variables that can be used to measure some aspect of environmental performance on campus. In order to facilitate the assessment process, indicators are organized to align as closely as possible to the functional organization of the university.

The bulk of the assessment’s content is a list of proposed questions (see El-Mogazi 2007 for more details) to be answered by those involved in conducting the assessment. Most of the questions have been derived from model environmental assessments conducted by other institutions, and modified to fit Bucknell’s unique circumstances. Some of the questions require raw data to be derived from university records and documents, and are best answered under supervision of university staff. Others are designed to be answered by students in the form of “in-depth exercises”. This should help reduce the time burden on university staff, while also providing a valuable experience for the students. In the complete document, a full list of benchmarks and resources are also provided to facilitate the investigation.

The sustainability indicators include the following:

University administration and policy

This indicator addresses institutional commitment, governance, and investment policy. University administration is vital to the process of realizing campus sustainability, and university policy is an essential instrument for any substantial change in the campus environment. For instance Nan Jenks Jay, director of Middlebury’s highly acclaimed campus greening program, claims that the philosophical and financial support of the administration has been key to the program’s lasting success (Jay 2003, pp 2-3). An evaluation Bucknell’s administration and policy will provide a sense of the strengths and weaknesses in the university’s commitment to sustainability, and should help to focus future efforts in campus greening programming.
Education

This indicator addresses campus-wide environmental literacy, curriculum, teaching methods, research, and degree programs. Quite ironically, the *State of the Campus Environment Report*, the first large-scale study of higher education environmental performance, found that the area in which institutions of higher education need to improve most is in “ensuring graduates, regardless of major, are environmentally aware and literate” (McIntosh 2001, “Overview”). Because a university’s greatest spheres of influence are education and research, these are clearly areas where sustainability should be prioritized.

Energy

This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliances, and vehicles. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment. However, many may not realize how much influence the higher education sector has in the larger energy market. As discussed in a 2005 report by the Apollo Alliance,

College and university campuses are uniquely placed to affect America’s energy future. The higher education sector is a $317 billion industry that . . . spends billions of dollars on fuel, energy and infrastructure. And the footprint of higher education is widening — enrollment between 2000 and 2013 is expected to increase by 23%” (Rhodes-Conway 2005, p. 5).

The weight of these figures provides additional motivation for setting a sustainable energy course for Bucknell.

Water

This indicator addresses water consumption, water sources, irrigation, stormwater, appliances and fixtures. Although in the temperate region of the northeastern United States water supply appears to be almost endlessly abundant, the global water picture is much less encouraging. Aquifer depletion and water contamination are taking place at unprecedented rates, and invaluable ecosystems such as the Chesapeake Bay are in rapid decline. It is therefore essential that any environmentally responsible institution examine its water use practices.

Solid waste

This indicator addresses waste production and disposal, paper waste, food waste, and recycling. Municipal solid waste has a number of adverse environmental impacts, most of which are well known and not in need of elaboration. Waste sent to the landfill takes up large amounts space that could otherwise serve better uses, such as farmland or wildlife habitat. Buried waste contains harmful contaminants that leach
into soil and water supplies, and also produces greenhouse gases contributing to global climate change. Furthermore, solid waste often includes wasted material resources that could otherwise be channeled into better service through recycling, repair, and reuse. Thus the minimization of solid waste is essential to a sustainable university.

**Hazardous materials**

This indicator addresses hazardous waste, laboratories, medical waste, art supplies, and chemicals used in campus maintenance. Hazardous materials represent significant risks to human health and ecological integrity. They often persist in the environment leaving a legacy of land and water contamination for generations. Many accumulate in the tissues of organisms and become concentrated within food chains, leading to cancer, endocrine disruption, birth defects, and other tragedies. The minimization, safe handling, and ultimate elimination of these materials are essential to the long-term health of the planet.

**Purchasing**

This indicator addresses purchasing policies, durable goods, and paper. The purchasing department is an important hub of material flows within the university and, as Creighton explains in *Greening the Ivory Tower*,

> The purchasing department has an important educational role to play. Even in a decentralized university, it is often a central point of information, policy, and process for all items bought within the university and it can therefore be a university-wide catalyst for action to minimize environmental impacts (Creighton 1998, p. 156).

On that note, it is essential that the environmental assessment process look into the impacts of purchasing practices and investigate the potential for this office to become an instrument of sustainability.

**Dining**

This indicator addresses food sources, nutritional quality, packaging, dishes, and utensils. The impact of food choices on environmental quality is often underestimated. For instance, a study released in 1999 by the Union of Concerned Scientists presents a scientifically-backed rationale for consumers who wish to make effective environmental decisions. The study determined that eating organic food and less meat is second only to reducing gasoline consumption as the most effective environmental choice an individual consumer can make (Brower and Leon 1999, p. 85). Farming practices have a tremendous impact on soil and water quality, and food packaging contributes significantly to solid waste. Furthermore, food quality has lasting effects on the health and well-being of campus community members. For these reasons dining practices are important indicators of ecological sustainability.
Built environment

This indicator addresses buildings, construction, and transportation infrastructure. Buildings are the most resource-intensive components of the campus, using vast quantities of metals, wood, concrete, brick, glass, plastics, and other materials. Campus buildings also require extraordinary amounts of energy for their use and maintenance. Furthermore, these buildings have very long life spans, so any decisions made about their design and function will have lasting impact. It is therefore prudent to examine, as closely as possible, the process of constructing new buildings on campus, in order to maximize the potential for their sustainable design and use.

Transportation is also a highly energy intensive aspect of campus operations. As mentioned previously, a 1999 study by the Union of Concerned Scientists determined that reducing gasoline consumption is the foremost action that a consumer can take to reduce his or her personal impact on environmental quality (Brower and Leon 1999, p. 85). The design and planning of campus transportation infrastructure has the potential to influence automobile use to a great extent, thus setting the stage for fuel conservation by the thousands of campus community members who drive their automobiles to and on campus each day.

Landscape

This final indicator addresses open space and landscape maintenance. While the aesthetic appearance of the campus landscape is often admired and appreciated, its functional significance as part of the larger ecosystem is often ignored or misunderstood. The large amounts of land dedicated to college and university campuses function both as habitat for plants and animals, and as watersheds for local rivers and streams. Furthermore, the maintenance of campus landscapes to suit the traditional highly-groomed “country club” aesthetic is extremely resource-intensive and often leads to larger scale environmental degradation. A closer look at the campus landscape and its associated maintenance costs is essential to an ecologically sustainable campus.

Guidelines for Execution

Opening summit

This section of the proposal outlines a basic process for carrying out the assessment. The assessment process should begin with an opening summit in which interested members of the campus community come together to form assessment teams to address each major sustainability indicator. During this summit, assessment team members should become acquainted with each other and the assessment guidelines. The guidelines should be discussed among team members, and plans should be made as to how the work of answering the questions should proceed. Each team should
come up with a schedule for regular meetings and communication on work in progress.

**Assessment teams**

Ideally, each assessment team should include a mixture of students, faculty, and staff, and should not overlook any campus community member with significant interest, expertise or responsibility in the field represented by that indicator. One member of each team should take on the role of team leader, with the ultimate responsibility of organizing the work of the group. Although assessment teams are charged with directing and organizing the research for that particular indicator, team members do not necessarily have to conduct the research themselves. In many cases it may be preferable to delegate research projects to interns, independent studies, courses, or even outside consultants as needed.

**Review Board**

Ideally the assessment’s results should be examined by a peer-based review board or panel. A peer review would lend objectivity and credibility to the project, and also provide opportunities for interactions with other universities. Suggested members of the review board include representatives from other campus greening programs or representatives from notable campus greening organizations. Members of the review board should be committed to read, evaluate, and comment upon the results of the assessment, but do not necessarily need to participate in the opening and follow-up summits.

**Community resources**

In addition to members within the campus community, many professionals within the local community have the potential to make valuable contributions to the assessment process. These professionals, should they agree to participate, should be considered as “consultants on call”, and should take part in the opening and closing summits if at all possible. A partial list of these professionals is provided in the unabridged assessment guidelines (see El-Mogazi 2007).

**Follow-up Summits**

At a specified time intervals, most likely every one to two years, follow-up summits should be held. At this time assessment teams should share their results with the campus in the form of oral presentations.

**Document preparation**

Once the first follow-up summit has taken place, a written document should be prepared from the results of the work of the different assessment teams. This will involve editing and compiling the research, organizing the document, adding graphics, quotations, and supplementary information, and creating a pleasing,
readable document for future use. This work should be the responsibility of the sustainability coordinator.

A draft of the document should then be distributed to the review board for comments and suggested revisions. Once these have been made, the finalized document should be published online.

Associated Costs

Itemized costs associated with completing the assessment are estimated in Table 1 below. Please note that although the total estimated cost is $81,000, most of this need can be met in the short term through existing sources, leaving an unmet need of only $14,400.

Table 1. Estimated Cost Breakdown for the Proposed Environmental Assessment, Spring 2007 through Fall 2008.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Estimated Cost</th>
<th>Source</th>
<th>Unmet need</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening Summit</td>
<td>Costs associated with space, materials, and catering for the opening summit, approximately 50 people</td>
<td>$800</td>
<td>New</td>
<td>$800</td>
</tr>
<tr>
<td>Research projects</td>
<td>stipends for students who may be hired to complete assessment research in the summer months</td>
<td>$15,000</td>
<td>McKenna, Program for Undergraduate Research, etc.</td>
<td>$0</td>
</tr>
<tr>
<td>Student Interns</td>
<td>2 interns per semester for research assistance</td>
<td>$7,200</td>
<td>New</td>
<td>$7,200</td>
</tr>
<tr>
<td>Consultants</td>
<td>any fees associated with the use of outside professionals for certain portions of the assessment</td>
<td>$3,000</td>
<td>New</td>
<td>$3,000</td>
</tr>
<tr>
<td>Sustainability Coordinator</td>
<td>portion of time required by the Sustainability Coordinator to oversee and facilitate the assessment process</td>
<td>$16,600</td>
<td>Environmental Center</td>
<td>$0</td>
</tr>
<tr>
<td>Facilities time</td>
<td>portion of time and resources required by facilities personnel to compile data and perform calculations</td>
<td>$35,000</td>
<td>Existing operating budget</td>
<td>$0</td>
</tr>
<tr>
<td>Conferences</td>
<td>Funding for BUEC representatives to attend any relevant conferences for networking purposes</td>
<td>$2,600</td>
<td>New</td>
<td>$2,600</td>
</tr>
<tr>
<td>First Follow-up Summit</td>
<td>Costs associated with space, materials, and catering for</td>
<td>$800</td>
<td></td>
<td>$800</td>
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<tr>
<td>the follow-up summit, approximately 50 people</td>
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<tr>
<td>Total</td>
<td>$81,000.00</td>
<td>$14,400.00</td>
<td></td>
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</tbody>
</table>

**Timeline:**

Recommended timeline for the assessment is as follows:

- Summer ’07: summit planning, assessment teams identified
- Early Fall ’07: first sustainability summit
- Fall ’07, Spring ’08, Summer ’08: assessment teams perform investigations
- Early fall ’08: First follow-up summit
- Late fall ’08: First assessment document published.
References


<http://www.are.admin.ch/imperia/md/content/are/nachhaltigeentwicklung/brundtland_bericht.pdf> (accessed July 14, 2006).