

ABSTRACTS FOR AASHE 2006, OCT 4-6, TEMPE, AZ

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ABSTRACTS Thursday, October 5 Session A (10:15-11:45) Papers

A1 LEEDing the Way

10:15 Best Practices for Facilities Management: Using LEED EB to Improve the Bottom Line

Tia Heneghan, President, Sustainable and Green Economics (SAGE). tia.heneghan@earthlink.net

You've heard about green cleaning, energy management, construction waste recycling, environmentally-preferred materials and more! Where should you start? Join us for an overview of best practices to help you get going. This session will show you how to use LEED for Existing Buildings (LEED EB) as a tool to help your organization move toward greener strategies that can save money.

10:35 How to Achieve the Best LEED Results Cost-Effectively: Lessons from the Front Lines

Mark Wilhelm, Principal, Green Ideas, Inc. mark@egreenideas.com

This paper will leverage the wisdom and knowledge gained through experience and share best practices. Attendees will be given practical suggestions to set the stage for sustainable building projects that will deliver the best results at the lowest cost, including the following:

- 14 strategies to ensure the best high-performance building results
- Specific situations where project costs were reduced and results were increased – and vice-versa
- Case studies of successful LEED projects with implications for sustainable building projects in higher education
- Recommended ways to use the LEED-NC Application Guide or Multiple Buildings and On-Campus Building Projects (AGMBC)
- The importance of strategic alliances to higher education sustainable building projects and how to implement them successfully
- Setting the bar high for campuses through core requirements

10:55 UW Merrill Hall Center for Urban Horticulture: Lessons Learned

Matthew Younger, Principal, Stantec Consulting. myounger@stantec.com

Merrill Hall is the University of Washington's Center for Urban Horticulture's research and outreach facility. It is the first LEED Certified (Silver) project at the UW Campus and has received an ASHRAE Regional Overall Technology Award. The Center houses outreach programs, administrative offices, a horticultural library, student classroom and study space, as well as fully outfitted ecological research laboratories. The original structure was extensively damaged in an arson fire, and 70% of the structure required demolition. Integrating the building's function and form with the principles and values of its users was of utmost importance. The design team identified energy consumption, indoor space quality and water use as fundamental pillars of sustainability to be incorporated into the project. Through the incorporation of natural ventilation, air quality throughout the building is dramatically increased. The design team's focus on energy provided for 36% energy savings compared to ASHRAE 90.1. Through construction, commissioning, and occupying the building, many "lessons learned" have informed the owner and design team of how the building and its systems are actually operating. Many of the sustainable features such as water conserving toilets and minimal HVAC demand caused unique complications during operation of the facility.

11:15 Case Study on LEED Prototype Credits

Cynthia Hughes-Doyle, Senior Associate, Davis Langdon. chdoyle@davislangdon.us

The LEED-NC Application Guide for Multiple Buildings and On-Campus Building Projects (AGMBC) provides an opportunity for the higher education campus to reduce the environmental impacts of its buildings and land use by approaching green planning in a broader context. This campus-wide approach to green design allows for economies of scale, enabling more opportunities and flexibility in achieving sustainable goals. Campuses are allowed to submit and gain approval for campus-wide credits, known as "Prototype Credits," to the USGBC prior to submitting individual building certification applications. In one option a campus may gain the prototype credit for the entire campus allowing future buildings that will seek certification greater flexibility in the sustainable design process, knowing that a set amount of credits has already been confirmed. In another option, all projects seeking LEED certification may combine their data to help gain the credit. I will use the recently completed first phase of the University of California, Merced campus as a case study to discuss how a campus can seek Prototype Credits through the AGMBC.

A2 The Road to Greenhouse Gas Reduction

10:15 The Role of Graduate Students in the Next Industrial Revolution

Daniel Worth, Executive Director, National Association of Environmental Law Students (NAELS). dworth_99@yahoo.com

This presentation will explore the role of graduate student research, advocacy, and leadership in creating a low-carbon, clean-energy future. The session will focus on current case studies, lessons from the past, and ideas for the future, based on four years of experience with NAELS.

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10:35 The Winding Road to Greenhouse Gas Reduction at Middlebury College

Jack Byrne, Sustainability Coordinator, Middlebury College. jmbyrne@middlebury.edu

In 2003 Middlebury College adopted the goal of reducing its greenhouse gas emissions by 8% below its 1990 levels by the year 2012. Since then faculty, staff and students have developed a comprehensive portfolio of projects to achieve this goal and the college has been in the process of implementing these projects. This presentation will provide:

- an historical perspective of the process and achievements to date,
- details about implementation projects including the establishment of an institutional monitoring and reporting system for greenhouse gases, and
- what's worked well and why and lessons learned.

It will also include a focus on the role students are playing as catalysts of change within the college and through a network of NGO's and students at other academic institutions.

10:55 New Jersey Higher Education Presidents' Innovative Commitment to GHG Emissions Reductions

John Cusack, Executive Director, New Jersey Higher Education Partnership for Sustainability. johnlcusack@att.net

The New Jersey Higher Education Partnership for Sustainability (NJHEPS) is a unique consortium of 40+ higher education institutions in New Jersey committed to promoting sustainability in campus operations, curricula and communities. Members range from Princeton and Rutgers to public research universities, community colleges, seminaries and small liberal arts colleges/universities. In 2001, NJHEPS persuaded the Presidents of all 56 NJ higher education institutions to voluntarily commit to try to reduce GHG emissions that cause global warming by 3.5% from 1990 levels by 2005. This paper will discuss the results of this commitment, reduction strategies employed by the institutions, the successes and shortcomings of meeting the goals, and the reasons why some institutions exceeded their commitment and some fell short. The paper will also discuss proposed new voluntary commitments by New Jersey's higher education institutions to reduce GHG emissions for the time period 2005-2010, and the potential financial benefits of these emission reductions due to reduced energy costs and sales of carbon/renewable energy credits.

11:15 Measuring Evergreen's Campus Carbon Budget

Robert Cole, Member of the Faculty (Physics), The Evergreen State College. rscole@evergreen.edu

During Fall and Winter Quarters 2006 – 2007, the Introduction to Environmental Studies program at The Evergreen State College is engaged in an analysis of Evergreen's campus carbon budget, and the ongoing work will be described. Specifically, details of measurements of net carbon uptake in the trees on the campus forest will be explained, as well as a description of the carbon generation from campus activities. Students are actively involved in all aspects of field measurements and the subsequent spreadsheet calculations. Some of the issues surrounding campus carbon neutrality and net carbon sequestering will be discussed.

A3 Marketing, Finance and Sustainability

10:15 Integrating Sustainability into the Marketing Curriculum

Claudia Bridges, Assistant Professor of Marketing, California State University Sacramento. bridgesc@csus.edu

Wendy Wilhelm, Professor of Marketing, Western Washington University. Wendy.Wilhelm@wwu.edu

Previously seen as the purview of Birkenstock-wearing social activists, environmental sustainability (ES) has now become part of strategic planning for many Fortune 500 companies. In fact, most of them now have ES reports containing detailed information on the firm's environmental, social and economic performance. This information is woven into the marketing strategy of these firms in areas such as new product development, packaging, disposal, and supply chain integrity. There are also jobs in the marketplace that are relying on the knowledge of this important trend. Corporations have developed ES positions or have incorporated these jobs into their Corporate Environment, Health and Safety positions. So, we ask the question: Where is this being taught in the marketing curriculum? In most cases, the answer is "nowhere." Occasionally there is a brief mention given in the Ethics and Social Responsibility section of the textbook, but not always. We have to close this gap. The purpose of this paper is to (1) communicate the necessity and urgency of adding this to the marketing curriculum, (2) examine current initiatives in the classroom, (3) develop some specific curricular recommendations and resources, and (4) suggest avenues for future pedagogical research in this area.

10:35 Sustainable Endowments: Harnessing University Investment Power

Mark Orłowski, Founder & Executive Director, Sustainable Endowments Institute. Mark@EndowmentInstitute.org

With combined endowments of more than \$300 billion, colleges and universities have extraordinary power as investors. While many campuses have taken significant steps with on-campus sustainability initiatives, only a few schools have created sustainability initiatives that engage their endowments. This paper will discuss best practices and opportunities for transforming university endowment investment policies. Topics to be discussed will include case studies of leading schools as well as the Institute's groundbreaking research on university endowments--as featured in USA Today, Inside Higher Ed and the Chronicle of Higher Education.

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10:55 The Role of Institutional Investment Policies in Creating a Sustainable World

Rex LaMore, State Director, Community and Economic Development, Michigan State University. lamore@msu.edu
Co-Author: Terry Link, Director, Office of Campus Sustainability, Michigan State University. link@msu.edu

Institutions of higher education face a wide range of opportunities associated with achieving smart and sustainable campuses. An important element of an institutions impact are it's financial resources as represented by their endowments and pension funds. According to a study conducted by the NACUBO in 2005 higher education endowments, based on responses from 746 institutions, reported \$298.9 billion in total endowment assets. In addition the pension funds of higher education employees (for example TIAA-CREF manages \$340 billion in investments) could be invested towards sustainability. Our earlier research highlighted the feasibility of investing in socially responsible portfolios that promote sustainability and community development. In April 2006 the authors organized and hosted the first higher education conference on Responsible Investing and highlighted many of the exciting new approaches to moving institutional investments into sustainability. This paper will build from our earlier research on the feasibility of this approach and will examine the practical aspects of developing and implementing a public higher education socially responsible investment initiative that promotes sustainable development locally and globally.

11:15 Teaching Accounting and Financial Management to Support Sustainability

Kate Lancaster, Associate Professor of Accounting, Cal Poly San Luis Obispo and Bainbridge Graduate Institute.
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Co-Authors: Doug Cerf and Arline Savage, Cal Poly San Luis Obispo.

Sustainability provides an important focus for designing business courses. We present a systematic approach to designing an accounting and financial management course that provides students with the tools needed to analyze sustainable business decisions. Our primary purpose is to introduce markets, investments, reporting techniques and analytical methods that entities and individuals could use to increase their support of sustainability. We offer educators the opportunity to add value to the educational experience of graduate and/or undergraduate students. The paper proceeds as follows. First, we discuss the philosophy underlying our approach to design this course. Second, we discuss the accounting and financial management areas addressed in the course. The external reporting modules are directed towards providing information to outsiders, such as shareholders, financial analysts, creditors, prospective investors and employees, and social activists. The internal reporting modules are concerned with providing information to management for decision-making. The finance category relates to resource allocation, management, acquisition, and investment. Finally, we discuss the challenges of identifying course material from the large body of available content; and the perceived benefits for educators and students. We conclude with a discussion of how this course can help achieve objectives outlined in the Beyond Grey Pinstripes 2005 report.

A4 Sustainability In and Out of the Classroom

10:15 The Community Sustainability Partnership- Working Together to Build Sustainable Communities in West Michigan

Norman Christopher, Director of Sustainability, Sustainability Initiative, Grand Valley State University. chrisfn@gvsu.edu

Grand Rapids is the second largest city in Michigan with ~200,000 residents (2000 census). It is a major manufacturing center. Large ethnic communities include Dutch American, Polish American, African American, and Hispanic. The city has been faced with most challenging environmental, economic, and social issues including: continuing job losses; a declining manufacturing base; innumerable school and business closings; increasing poverty and a decline in family per capita income in our region. The City's general fund budget of ~\$100MM has required a major overhaul. After taking office, Mayor Heartwell embraced sustainability "triple bottom line" goals of preserving environmental integrity, increasing economic prosperity, and fostering social justice to address our issues. He set goals to reduce the city's dependency on non-renewable resource power by 20% by 2008 and to reduce the illiteracy rate by 50% in the next decade. Three colleges and universities and the public schools joined with the City to address these persistent sustainability issues. Recent mutual progress includes: the adoption of LEED building standards; signing the U.S. Climate Protection Agreement (168th city); receiving a \$15 million grant for Workforce Innovation in Regional Economic Development; and developing the Community Sustainability Partnership which has the endorsement of over 80 business, service, and education organizations. This paper will discuss innovative approaches higher education can use to help cities and regions in transformation.

10:35 Teaching Skills and Sustainability: Using a Thematic Approach to Addressing Sustainability in Skills-Based Courses

Heather Burns, Doctoral student, Portland State University; Adjunct Professor, University of Portland. hburns@pdx.edu

Are skills-based courses compatible with sustainability? I'll share my experience integrating sustainability into a university writing course for international students. I sought to incorporate an experiential place-based sustainability theme while still meeting academic writing goals. I chose readings, invited speakers, planned off campus visits, found DVDs and rewrote assignments to explore the theme of community food systems and its relationship to bio-cultural sustainability. Students journaled in response to readings about local food movements, researched and wrote about local organizations that are contributing to community food systems, and analyzed differences between global and local food systems. Students also conducted a low-income grocery store scavenger hunt and a neighborhood food assessment to address the issue of food security. Throughout the semester, students not only improved their writing skills, but also improved their conversational English abilities by sharing their personal and cultural connections to food systems. Based on final course evaluations, the implementation of this theme was successful, but it wasn't all smooth sailing. I'll share what worked and what didn't, research on developing sustainability curriculum, and tips for successfully implementing a sustainability theme to meet the goals of an existing skills-based course.

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- 10:55 Do Sustainability Courses Affect Environmental Attitudes and Behavior? Evidence from a Liberal Arts College
Scott Steele, Assistant Professor of Economics, Berea College. Scott_Steele@bera.edu

This paper analyzes the effects of taking sustainability courses on undergraduate students' environmental attitudes and behavior. Drawing on data gathered via a web-based survey over four years at Berea College (approximately 1,500 observations), I evaluate whether students who have taken sustainability courses are (1) more likely to exhibit pro-environmental behaviors and attitudes, and (2) more likely to experience a change in their environmental attitudes. Environmental behavior is measured with a series of responses to contingent valuation questions concerning: (1) renewable energy on campus, (2) local procurement of produce and meat for campus food services, (3) local drinking water quality, and (4) "offset" purchases to make college-sponsored travel "climate neutral." Contingent valuation is a standard economics tool used to place a value on environmental goods that are not exchanged through markets. Additional analysis aims to determine the factors that influence changes in environmental attitudes for Berea College students. For such analysis, a change variable is constructed and I attempt to determine the primary factors (sex, year in college, ethnicity, major, etc.) affecting the likelihood that there is an observable change in environmental attitudes.

- 11:15 A University-Wide Model for Teaching Sustainable Cities

David Pijawka, Professor, Arizona State University. david.pijawka@asu.edu

Greg Peterson, Graduate Student, Environmental Planning, Arizona State University. Greg@UrbanFarm.org

A new model for teaching Urban Sustainability at the freshman level was launched at ASU two years back. Based on all outcome measures – student growth, evaluations, interdisciplinary learning, team-based research, learner centered philosophy, and cross-campus engagement, it was considered a major success. The course has grown from 80 students to well over 400 from a wide array of disciplines. The success of the course is based upon assuring that sustainability applied to cities requires attention to ecology and environmental protection/stewardship, social justice and community well being and economics -- in balance. This balance is also seen in the two course instructors who are from engineering and planning. An interdisciplinary team of faculty from the university and practitioners from the community serve as advisors and lecturers. Students were able to have the course serve as one of three General Studies requirements -- Humanities, Social and Behavioral Studies, and Global Awareness. How one course in sustainability can meet three standards is an important dimension of teaching sustainability. Team based research projects in transforming the ASU campus into a green campus as part of this course is instructional as a model.

Field Reports

A5 Leveraging Change

- 10:15 Broadening Participation in Sustainability Part I: Faculty

Susan Swensen, Associate Professor of Biology, Ithaca College. sswensen@ithaca.edu

Integrating sustainability into the college curriculum requires the participation of a broad range of faculty representing different professional disciplines. Often, faculty participation in sustainability education is nucleated in only one or a few academic areas and fails to spread more broadly. Ithaca College has implemented several programs aimed at attracting new faculty into our sustainability initiative. These programs include a building-based sustainability group, a campus-wide seminar series, a mini-grant program, a partnership with EcoVillage at Ithaca, and sustainability-focused courses that emphasize experiential learning. This presentation will describe how and where these different programs evolved, how they changed over time, and where they are headed in the future.

- 10:25 Broadening Participation in Sustainability Part II: Students

Jason Hamilton, Assistant Professor of Biology, Ithaca College. Jhamilton@ithaca.edu

Cultivating student buy-in and participation in sustainability requires the development of a range of meaningful projects for student involvement. Without these opportunities, the call for sustainability rings hollow and can quickly be viewed as a publicity stunt. Since Ithaca College launched its sustainability initiative, there has been an ever increasing call for substantive ways in which students can participate and produce tangible results. In the Biology Department and the Environmental Studies program, we were able to adapt an existing course infrastructure to provide many opportunities for student participation and impact. These involve projects as diverse as teaching student-developed courses, affecting policy decisions for land management, building solar demonstration installations, partnering with local businesses, and altering energy use behavior of faculty and students. In this part we will discuss the successes, failures and lessons learned for integrating sustainability fully into the students' educational experience.

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10:35 Rewire: Community Based Social Marketing at the University of Toronto

Chris Caners, Coordinator, Office of Sustainability, University of Toronto. sustainability@utoronto.ca

While there have been mixed results from government information campaigns aimed at reducing personal energy consumption in Canada, there have been recent successes using social marketing techniques for the same purpose. This paper outlines a recent initiative implementing and evaluating such techniques in a University setting.

Rewire is a student-run community based social marketing campaign, effectively combining academic research and project delivery for energy conservation purposes on the University campuses. Under the guidance of the Sustainability Office, these students have developed surveys and social marketing materials, performed complex analyses, implemented pilot testing and have planned for the expansion of the project to an increased number of residences and offices in the fall of 2006.

This paper serves as an overview for the Rewire project, including the organizational structure of the project team, student involvement, development of the project materials, evaluation methodologies as well as ongoing project planning and expansion. Results from pre and post intervention surveys will be presented, in conjunction with electrical data for the pilot project. The resulting refinements to the Rewire project will also be discussed.

10:45 University of Toronto Sustainability Office: Academic and Operational

Chris Caners, Coordinator, Office of Sustainability, University of Toronto. sustainability@utoronto.ca

The University of Toronto Sustainability Office was established in late 2004 with seed funding from a municipal granting agency. Since then, the Office has undertaken many projects while reporting to both the academic and operational divisions of the University of Toronto.

The administration of the University has been particularly interested in the student engagement activities of the Office, which employs those students as a valuable resource to deliver efficiencies and environmentally beneficial projects. The result is that Office staff work closely with Facilities and Services, which is responsible for the day to day operation of the University facilities, as well as faculty members within academic divisions.

More specifically, the Office utilizes four methods with which to engage students: a governmental work study program, course credit, payment using grant monies, and finally, volunteerism. Furthermore, other grants allow the Office to hire recently graduated students for internships of a year in length to coordinate and oversee the projects.

This paper will discuss the benefits and challenges of this reporting arrangement, using examples of projects currently underway at the University of Toronto, with topics encompassing energy efficiency and generation, resource conservation, transportation and communications activities.

10:55 Two Bucks Each: How Student Fees Can Add Up to Big Changes for the Campus Sustainability Movement

Steve Mital, Sustainability Coordinator, University of Oregon. smital@darkwing.uoregon.edu

The University of Oregon's ECAFF project (Energy Conservation and Alternative Futures Fund) offers a direct and easily replicated model for students to self-fund sustainability projects on their campuses. In Spring 2005 UO students voted for a modest \$2.00 per student per year fee increase and created a special committee in the student government to oversee these funds. The ECAFF committee comprised of students and faculty now has an annual budget of \$40,000.00, reviews proposals bi-annually, and funds projects that improve energy efficiency, increase reliance on green energy, and/or educate the campus community about energy issues. ECAFF is driving interest in student-led, extracurricular sustainability initiatives that in turn provide students with real-world experience in grant-writing, project implementation, and management. This presentation will discuss the challenges of establishing and maintaining ECAFF as well as lessons learned from ECAFF's first year of operation. It should be of interest to those considering similar programs on their campuses.

11:05 Student Leadership for Regional Sustainable Transportation

Daniel Roth, Cornell University Graduate Student, Cornell University dnr6@cornell.edu

Car Sharing is a sustainable mobility option that is taking off on campuses across North America. This field report will share the experiences of student leadership in the development of a regional 'car share' effort that brought together local government, transportation planners, higher education, sustainability advocates, and local residents. Through a partnership of Ecovillage at Ithaca (EVI) and Ithaca College, a \$1000 NSF supported mini-grant was awarded to a Cornell University graduate student to initiate a student-led 'car share' business development project. During the 2005 fall semester a team of students engaged local stakeholders and developed a viable pilot-scale business plan.

The engagement process resulted in key stakeholders in the community becoming interested in car sharing for the wider region. The student leader initiated a planning committee to host an Ithaca-wide car share summit. Successful fundraising and effective group learning led to a well-attended summit in January 2006 that included speakers from successful car share operations and an introductory support speech by the Mayor of Ithaca. Since the summit, community support has been steady and currently Ithaca Car Share is forming a board of directors that represents local universities, local government, Eco-village, and other community stakeholders.

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11:15 Student Centered Sustainability

Courtney Voss, Associated Students President, California State University, Chico. aspresident@csuchico.edu

In April of 2006, students at California State University, Chico passed a fee increase to create a sustainability program, and fund the position of sustainability coordinator for the Associated Students. A strong student community was key to the effort. Courtney Voss, the author of the initiative, and current Student Body President, will describe the effort. The presentation will include detailed descriptions of the documents and ballot language that created the fee and the position, in the hope of seeing the effort repeated elsewhere.

Panels, Roundtables, Workshops

A6 Panel: Changing the Way We Think in Universities

Changing the Way We Think in Universities

James Biggar, Graduate Student, University of Victoria. jamesbiggar@gmail.com

This panel will focus on the transformative capacity of different reforms in the ways that we think in universities. Building on an analysis of the role that universities are playing in shaping society toward undesirable ends the participants will present different visions for reforms that could change the trajectory of university impacts on society. They range from changes to curriculum to changes in the way that universities understand and govern themselves.

Making the Cultural and Environmental Commons the Focus of Reforming Universities

Chet Bowers, Adjunct Professor of Environmental Education University of Oregon. chetbowers@earthlink.net

Today, few university graduates are able to recognize what remains of the non-monetized cultural commons of their communities, why these commons represent alternatives to a consumer-dependent lifestyle that is further degrading the environment, and why the world's diverse cultural commons represent alternatives to the further decline into poverty-- thus why the market forces that are enclosing (monetizing and privatizing them) need to be resisted.

This presentation will focus on how universities can contribute to the renewal of the world's diverse cultural and environmental commons by reframing how courses in philosophy, political theory, economics, history, the fine arts and sciences, etc., are taught. Instead of reinforcing both ethnocentrism and the assumption that bringing more aspects of the cultural and environmental commons under the control of market forces is the expression of progress and modernization, this presentation will suggest that universities need to make the renewing of the cultural commons a central focus of curriculum reform. This will require helping students to recognize the history of ideas and assumptions that contributed to undermining the world's diverse commons—including the commons of the students' own communities. Curricular reforms also need to provide both a historical perspective as well as current examples of practices and values that strengthen the cultural and environmental commons.

The Importance of Big Ideas or, How to Encourage Active Wisdom

Marcus Ford Professor of Humanities, Northern Arizona University, marcus.ford@nau.edu.

This talk will draw on the philosophy of Alfred North Whitehead and propose a whole new curriculum for higher education.

Whitehead famously proposed that there is a three part rhythm to learning: romance, precision, and generalization. The proposal being developed here is that university education should be based on a careful examination of certain very broad generalizations such as all education is moral education and the current form of civilization is both unjust and ecologically unsustainable.

Towards the "Planetary University"

Michael M'Gonigle, Eco-Research Chair of Environmental Law and Policy, University of Victoria, mgonigle@uvic.ca

Universities possess massive potential to help resolve the world's escalating sustainability challenge. Arguably, the "higher education industry" is the world's most important industry, with huge size and scope, and unparalleled influence. It is a major producer of knowledges for other industries, shaping the leaders of all sectors. But unlike other industries, the university is being "let off the hook," and so continues in the historic patterns that produce unsustainability.

To demonstrate the potential of universities, the authors review many "best practices in everything from building design to resource efficiencies. As nearly every substantial city has a university or college, it could above all become a driver to reshape its regional economies. But what is technically possible is the easy part.

The hard parts are the decision-making processes needed to liberate this potential. Sustainability in governance requires a willingness to discuss, and change, how powerful structures work. The possibilities for innovation are there (as many corporations have shown), and are not really that difficult for those who are willing to open up historic patterns. To help this happen, individual campus sustainability movements must ensure that their institutions each become a "planetary university", that is, a university consciously working to become a model of "comprehensive local innovation." This is the key strategic advantage of these local/global institutions.

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A7 Panel: Campus Environmental Master Plans: Balancing Growth and the Environment

Moderator: R Umashankar, Campus Planner, Project Manager, Hughes Good O'Leary & Ryan, Inc (HGOR, Inc.). uma@hgor.com
Cindy Pollock Shea, Director, Sustainability Office, University of North Carolina at Chapel Hill. cpshea@fac.unc.edu
James R Johnson, Project Manager, Emory University. james.johnson@emory.edu
Martha Droge, Associate, Ayers/Saint/Gross (Baltimore). mdroge@asg-architects.com

A Campus Master Plan is an essential tool to guide future growth and development and to articulate the fundamental values and desired physical character of a campus. Many master plans identify the environmental features on a campus. Far fewer explicitly address how growth and the environment will be balanced and mutually enhanced. As universities and colleges expand at a record pace, and are increasingly looked upon as models of sustainable development, the need for environmental master plans becomes ever greater.

An environmental master plan recognizes the ecological, natural and cultural resource value contributed by the lands owned or managed by the institution. It re-affirms the institution's commitment to protecting and restoring the healthy functioning of these resources. It provides guidance for long-term future land uses and the mechanism to evaluate and balance divergent priorities. Environmental master plans also draw attention to resource constraints and enable the development of shared principles to address complex issues such as stormwater management.

The panelists will discuss the process, technologies, and end-results from their own respective experiences with environmental master plans.

A8a Panel: Collaborative Water Harvesting at the University of Arizona (45 mins)

10:15 Moderator: Emilie Brill Duisberg, Student/ Project Organizer, University of Arizona. emilie@email.arizona.edu
Grant McCormick, UA Campus Planner, University of Arizona. grantmc@u.arizona.edu
Jim Riley, Associate Professor, University of Arizona. jiriley@ag.arizona.edu
Prabjit Virdee, Student, University of Arizona. pra8jit@gmail.com
Co-Author: Chester Phillips. cfp@email.arizona.edu

For the first time, a course in water harvesting was offered at the University of Arizona in the Spring 2006 semester. This course came about through the initiative of a student club promoting sustainable resource use at the university and collaboration with faculty and facilities management staff. University Facilities Management and a grant from the USGS Water Resources Research Center provided funding. The primary objective was to transform a high profile flooding problem at the McKale Center athletic facility into a showcase for the use of rainwater to meet desert landscaping needs, with educational signage describing the intervention for the general public. A secondary objective was to teach water harvesting practices to students for use in their own lives. This pilot course was a success and will now be offered each spring semester. Furthermore, it will be integral to Tucson's ADEQ stormwater compliance program which requires university participation in stormwater runoff mitigation. The yearly class project will fulfill the university's obligation and institutionalize water harvesting within the curriculum.

The panel will present the project and discuss the challenges and successes involved in water harvesting at a state university.

A8b Panel: Green Computing on Campus (45 mins)

11:00 Moderator: Maureen Cane, Silicon Valley Toxics Coalition, mcane@svtc.org
John Katz, Pollution Prevention Coordinator, U.S. Environmental Protection Agency. katz.john@epa.gov

Sustainability on college campuses no longer just means dorm recycling programs or energy efficiency in classrooms. It also means looking at the full life cycle of the cutting edge technology used in computer labs, dorm rooms, and libraries across campus. Computer equipment consumes a lot of energy, contains a host of toxic materials, and poses significant risks to the environment and human health in production and if dumped as "toxic trash."

This session will provide an overview of the environmental and human health challenges posed by electronics and "e-waste", and will highlight ways campuses can reduce these risks. Speakers will describe opportunities to: buy environmentally and socially responsible computer equipment using the EPEAT web database (www.epeat.net) and other purchasing criteria; ensure proper management of e-waste; and mobilize students, faculty and staff to implement green technology initiatives

By tackling the full life cycle of electronic equipment, colleges and universities can drive innovation in technologies that promote environmental progress and sustainability.

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A9 Roundtable: A Cohort-Based Model for a PhD Program in Sustainability Education

Organizer: Rick Medrick, Core Faculty, Prescott College. rmedrick@olts-bt.com
Janice Crede, Prescott College. jcrede@uwsuper.edu
Henry Ebarb, Prescott College. tonyebarb@cableone.net
Linda Edwards, Prescott College. linda@aroundtheworldhandbags.com
Jane Nichols, Prescott College. jnichols@email.wcu.edu
Gregory Roberts, Prescott College. groberts@npc.edu
Terril Shorb, Prescott College. tshorb@prescott.edu
Paul Sneed, Prescott College. psneed@prescott.edu
Chad Thatcher, Prescott College. thatcherchad@yahoo.com

This roundtable discussion will present Prescott's new PhD Program in Sustainability Education and reflect on the viability of the cohort learning model for advanced interdisciplinary study. This program is a combination of Education for Sustainability, or the act and practice of learning how to achieve global and local sustainable communities, and Education as Sustainability, or the process of transforming education to create a more informed and committed populace to support a more sustainable, secure society. The program examines issues that involve the four "Es" of contemporary sustainability: Ecology, Economy, and Equity with an emphasis on Education to develop scholar/practitioners who will impact our future in tangible and significant ways.

Faculty will present an overview of the program; individual students will speak briefly about strengths and weaknesses of the cohort learning model. Questions raised will include: How can these very different but interdependent dimensions of sustainability be addressed and interwoven? How can interdisciplinary study enhance our understanding of the influences that guide such exploration? How are adult learners engaged more deeply through the cohort process? How does a dialogic, collaborative learning model empower individuals to take initiative for their own learning and employ that learning in their respective communities?

A10a Panel: Campus as Community: Using Saul Alinsky's Organizing Principles for Sustainability (45 mins)

10:15 Moderator: Riley Neugebauer, Environmental Coordinator, American University. neugebau@american.edu
Jared Duval, National Director, Sierra Student Coalition, jared.duval@sierraclub.org
Taylor Jackson, Arizona State University, taylor.jackson@asu.edu

Often a large concern within higher education is town-gown relations, and how schools can better communicate and work with their community neighbors when it comes to parking, traffic, noise, lights, community service, and sustainability, among other things. We feel that these issues are extremely important, but we also feel that the community which exists on campus should not be ignored. A campus is itself a community with its own residences, dining establishments, diversity, and problems! By looking at this community, and applying the organizing principles that come from the renowned organizer Saul Alinsky, it can be very effective to use the principles to advance our sustainability causes. When you first focus on your campus community and effectively engage them in the interdisciplinary issues that arise when working in sustainability, you can change your own small community which will then allow you to more effectively organize in the broader community. It will also inherently lead you to community groups and leaders outside of campus as you find solutions and approaches to sustainability issues through local resources. Learn more about the theories and principles of community organizing put simply by Saul Alinsky in his books and demonstrated through a sustainability lens.

A10b Roundtable: "Red State Sustainability": Making Effective Arguments for Sustainability within Conservative Communities (45 mins)

11:00 Moderator: K.D. Hatheway-Dial, Faculty, Dept of Accounting College of Bus & Econ, Univ. of Idaho. kddial@uidaho.edu
Claudia Hemphill Pine, PhD Candidate, Environmental Science Program, Univ. of Idaho. claudiah@uidaho.edu

Sustainability, by definition, must include everyone. This roundtable continues a conversation that began at the Oct. 2004 EFS-West conference in Portland, Oregon. Faculty, staff and students in many states that do not readily affiliate with sustainability raised two needs, which are not well addressed in the literature. First is the need to reframe sustainability away from perception as a set of expensive urban technologies embedded in social politics, to refocus on its demonstrable effectiveness for building the economically viable, clean, socially vibrant local communities that every region wants. A complementary concern is to recognize these positive themes in existing conservative discourse, and foreground them in a common language of sustainability. Participants with disciplinary experience in business, religion, education, ethics, agriculture, community development, natural resource management, etc., will help address these needs by identifying:

- arguments for sustainability that already exist within conservative communities;
- effective approaches that have worked in such communities;
- elements and language that unify 'red-state' and 'blue-state' sustainability practitioners and concerns.

The roundtable will summarize these strategies in a document to guide more effective action and inspire further convergence of diverse political and social groups in a common engagement in sustainability.

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A11 Workshop: Engaging Imagination: Encouraging a Culture of Sustainability on Campus

Liz Forsberg, Grad Student York, University, Toronto, Canada. lizforsberg@sympatico.ca
Laura Reinsborough, Grad Student, York University, Toronto, Canada. lcreinsb@yorku.ca,
Andrew Wilson, Campus Planner, York University, Toronto, Canada. awilson@yorku.ca

This workshop will consider how creative expression can encourage a culture of sustainability on university campuses. Two initiatives proposed for York University will be showcased: HUB, a virtual network of arts-based projects that use the campus as a site for inspiration, study and expression; and a community-based audio archival project, like [murmur], of site specific stories shared digitally. These initiatives are arising out of student, staff and faculty collaboration relating to course work, research and university management. Projects will uphold a “digging-where-you-stand” philosophy that advocates an interdisciplinary exploration of ideas to be shared in imaginative ways. It is assumed that by connecting with the campus community this way, a heightened awareness and understanding of our diverse relationships to the built, natural, social, and organizational environments where we study, work and play will follow. The aim is to cultivate a sense of place, to connect the campus community more meaningfully within and to their environment in the belief that an ethic of care and, related to that, a culture of sustainability will emerge. A series of participatory activities will be facilitated by the presenters to encourage the sharing of ideas and brainstorming about potential initiatives among and within participating campuses.

Thursday, October 5
Session B (1:00-2:30)
Papers

B1 Service Learning for Sustainability

1:00 Jumping from the Ivory Tower: Connecting Colleges and Communities to Promote Environmental Leadership

Rosemarie Russo, Dean, Front Range Community College. rosemarie.russo@frontrange.edu

This presentation's main objective is to explore how service learning can enhance environmental education in the classroom and across campus. Traditional college-level environmental curricula do not always provide the basic skills needed to address enormous environmental issues today such as mass extinction, climate change, loss of biodiversity, habitat destruction, and others. Combined with traditional environmental curricula, service learning may enhance a student's ability to meet these challenges and help them assist their college and community in setting green standards. Despite the increasing studies on service learning, little is known about environmentally oriented college-level service learning. There seems to be a prejudice in the sciences about the academic rigor of service learning. My doctoral research evaluates the potential of environmental service learning. During the presentation, I will discuss my findings as well as my work at several colleges to start service learning programs. The information will provide knowledge to colleges interested in strengthening and/or implementing environmental service learning programs. The data can inform administrators and faculty about the integrative potential of service learning. Gender comparisons were made to determine if there are preferences toward a more collaborative approach to solving environmental challenges. The data illustrates the potential service learning has to improve environmental education in terms of civic responsibility, problem-solving, critical thinking, communication skills and an increase in their local ecological knowledge.

1:20 Walking our talk: On-campus Environmental Service Learning

Lisa Barlow, PhD, Senior Instructor, ENVS, Geological Sciences, and Baker RAP, University of Colorado at Boulder.
Lisa.Barlow@colorado.edu

Initiatives for Sustainability and for Service Learning have been embraced by many campuses across the country. Environmental service learning courses can provide a rich learning experience for students, as well as concrete results to advance sustainability goals. The issues of environmental sustainability on a residential university campus are the same faced by municipalities throughout the United States and abroad, and so this course takes a “University, sustain thyself physician, heal thyself” approach to service learning projects. The course has produced a “win-win” combination of applied learning for students as well as advancement of sustainability goals for facilities, dining and housing operations on campus. Oftentimes, a student progresses through the undergraduate experience without the type of challenge that comes from environmental problem-solving for multiple stakeholders with multiple environmental priorities. Student's environmental ideals and values are challenged as they come to terms with economic, regulatory, logistical, and cultural realities. Ensuring an outcome that provides a challenging and empowering student learning experience with results that will be used by real world stakeholders requires diligent planning by the instructor. This presentation provides a model of best practices in development of an environmental service learning course.

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1:40 Enabling Sustainability: Key Features of the Learning City Classroom

Janet Moore, Assistant Professor, Simon Fraser University. jlmoore@sfu.ca

This paper describes the conceptualization and implementation of a higher education classroom focused on enacting and enabling urban sustainability in Vancouver, British Columbia. The Learning City project (www.learningcity.gnwc.ca) aims to bring together community members, researchers, students and instructors from four higher education institutions (Simon Fraser University, University of British Columbia, Emily Carr Institute and British Columbia Institute of Technology) to create sustainability programming at a new collaborative initiative called the Great Northern Way Campus (www.gnwc.ca). We have chosen 3 overarching concepts to describe the Learning City Classroom; collaboration, transdisciplinarity and community service learning. The presentation will focus on the first pilot course of the project where action research allowed the participants to reflect, act and create change towards a classroom that embodied sustainability. The course focused on a real world project – an urban greenway – and community members were involved in framing and developing student projects. Participants were asked to complete pre and post surveys, course evaluations and ongoing reflections were recorded throughout the course. The presentation will outline ways in which we used a real world event, reflection and community dialogue to enact sustainability education.

2:00 Lessons Learned: Instigating Positive Change through a Community Service-Learning Project

Gerald Taylor, Assistant Professor, California State Polytechnic University, Pomona. jotaylor@csupomona.edu

Through a community service-learning project in their capstone class, seniors majoring in landscape architecture were challenged to remedy complex environmental and social conditions in an urban environment. Students focused on Wilmington, a district within the City of Los Angeles. Heavily impacted by the adjacent Port of Los Angeles, the nation's busiest port, residents have had to bear the brunt of port activities. Pollution, truck and rail traffic, noise, unsafe streets and bicycle routes, limited access to the waterfront, and the lack of recreation and open space are some of the problems affecting the residents' quality of life. Student groups selected an issue of concern, the community group they would champion, and a physical site to design. The students interacted with the community through meetings, workshops, and community presentations. This paper describes the project's goals and objectives, process, student projects, interaction with the community, and the students' sense of empowerment and achievement. A particular focus of this paper is on one group's efforts to save the last remaining saltwater marsh within the Port of Los Angeles.

B2 Energy Management & Green Power

1:00 Developing and Implementing Energy Management Tools at Rice University

Richard Johnson, Sustainability Planner, Rice University. rj@rice.edu

Rice University's energy management team has developed a series of web-based tools to improve the management of energy on campus. One such tool is a model that predicts energy consumption for individual campus buildings based on outdoor temperature, humidity, and historic use of the building. These tools can be used to provide real-time feedback for energy conservation measures and to identify potential energy-related waste. This paper introduces several of the tools, and discusses successes, implementation barriers, and lessons learned in applying these tools to campus energy management objectives.

1:20 Designing Real-time Displays of Energy and Material Flows to Create Smart People in Environmentally Dumb Buildings: Architecture, Pedagogy and the Ecology of Buildings

John Petersen, Associate Professor of Environmental Studies and Biology, Oberlin College. John.Petersen@oberlin.edu

Co-Authors: Michael Murray, Vladislav Shunturov, and Gavin Platt, all with Lucid Design Group.

The steady expansion in human resource use and its ecological consequences can be partially attributed to activities that take place within the built environment. Residential and commercial buildings account for two-thirds of the electricity used in the U.S., 36% of U.S. greenhouse gasses, 9% of world greenhouse emissions, and 12% of U.S. fresh water consumption. Buildings dominate the ecological footprints of institutions of higher education. For example, greater than 90% of Oberlin College's greenhouse gas emissions are attributable to activities that take place in campus buildings. Yet few students are fully aware of the continuous flows of energy and material necessary to support their campus activities.

Personal as well as technological choices have the potential to substantially reduce resource use in college buildings. Rendering the invisible flows of energy and matter through buildings visible and easily accessible to a non-technical audience in real-time provides one possible mechanism for educating, motivating and empowering desired behavioral change. Development of the "Campus Resource Monitoring System" at Oberlin College and work we are undertaking at other educational institutions provide examples of how real-time data displays can be designed to serve as core components of curricula emphasizing environmental stewardship.

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1:40 Making the Grade with Green Power

Anthony Amato, Environmental Analyst ERG on behalf of EPA. anthony.amato@erg.com

EPA's Green Power Partnership has over 60 college and university partners purchasing a combined 600,000 megawatt-hours of green power – enough to power 55,000 homes. This presentation focuses on the higher education sector's leadership in the procurement of clean, renewable energy. Using case studies of partnering institutions, the presentation examines:

- Procurement options (utility products, renewable energy certificates, onsite generation)
- Reducing campus greenhouse gas emissions via a green power purchase
- Onsite renewable power generation as a teaching tool
- Innovative financing methods, including student campaigns for renewable energy fees

In addition, the presentation highlights how schools have leveraged their purchases to attract prospective students and position themselves as community leaders

2:00 Are We Being Aggressive Enough? Rethinking RECs

Davis Bookhart, Manager of Energy and Environmental Stewardship, Johns Hopkins University. dbookhart@jhu.edu

A number of universities are opting to offset their greenhouse gas emissions by purchasing RECs. RECs provide an easy and convenient accounting system for drawing down emissions. However, while RECs will have an important role to play when carbon becomes a regulated pollutant, today they are simply a financial reward for green power producers. Buying RECs gives universities bragging rights, but the purchase does not change the composition of the regional electricity power pool, does not improve the local air quality, and does not guarantee that the money will be used for new green power facilities. Most distressing, RECs provide an excuse for universities to avoid making the hard decisions necessary to become more sustainable.

Ultimately the purchase of RECs reduces the amount of funds available for real on-site reductions. This paper will argue that universities should be creating RECs, not buying them. By focusing on aggressive improvements in energy intensity, increased use of renewable liquid and gas synthesis fuels, and transition into greater use of distributed energy resources, universities can reduce their emissions while generating income for future sustainability initiatives.

B3 Ecological Literacy

1:00 Evaluation of the University of Georgia's Environmental Literacy Requirement

Gwyneth Moody, Student, Institute of Ecology- Environmental Ethics Certificate Program University of Georgia. gglove@uga.edu
Co-author: Peter Hartel, Professor, Crop & Soil Sciences

The University of Georgia is one of the few state universities in the United States that requires that every undergraduate student complete an environmental literacy requirement (ELR). In Fall 2005 and Spring 2006 semesters, we assessed a total of 7,268 students currently taking an ELR course and 86 faculty teaching these courses on their awareness, support, and satisfaction for the requirement. Although a majority of faculty (87 percent) was aware of the ELR, a majority of students (68 percent) were not. Most faculty (81 percent) did not know the specifics of the two ELR criteria. Both a majority of faculty (89 percent) and students (84 percent) supported the idea of an ELR. The ELR increased student knowledge (76 percent) and concern (65 percent) about environmental issues and changed some students' behavior (26 percent). Most students (74 percent) thought that they were environmentally literate before taking an ELR course, while almost a majority of faculty (48 percent) thought students were not. Although there was widespread support and satisfaction with the requirement, creating an ELR coordinator position, publicizing the ELR, and evaluating the ELR periodically should improve the requirement. Such an ELR could serve as a successful role model for other institutions.

1:20 Eco-Literacy for the Whole Campus

Stephanie Kaza, Professor, Environmental Program, University of Vermont. Stephanie.Kaza@uvm.edu

A number of campus eco-literacy requirements have been proposed, most of which are built around taking environmental courses. Environmental knowledge and values are presumed to be best transferred through an academic delivery format. In our proposed model, we aim for institutional transformation across all sectors by developing eco-literacy certification for staff, faculty, and administration as well as students. The model recognizes the need for a range of learning modes and the importance of motivation in galvanizing environmental commitment. It also recognizes the need for mutual peer pressure to take a campus across the "tipping point" of commitment to sustainability. Each sector has a list of 8-10 learning areas, with opportunities for becoming eco-literate through residential practice, outdoor experience, service learning, course work, technical training, advocacy, etc. An eco-literacy certificate can be earned in many ways and would be expected to take 1-2 years to complete. Staff procedures already exist for earning similar certificates; students will be checked by academic coordinators supported by faculty advisors in each college. Administrative options are similar to staff; faculty checklists would highlight teaching and working with students and colleagues on eco-literacy related projects. An initial pilot program with students and staff will be field tested in spring '07.

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- 1:40 Technical Issues in and Ethical Matrix - Implications for Teaching Sustainability in Early Undergraduate Education
Christine Mondor, Special Appointment Faculty, Carnegie Mellon University. cmondor@cmu.edu

The Greening of Early Undergraduate Education at Carnegie Mellon University was initiated to create a dialogue across departmental units to address ecological literacy and issues of sustainability in a student's first years of university. Throughout a multiyear process professors were asked to examine how three fundamental concepts of sustainability applied to their field and their coursework. This paper will describe the School of Architecture's leadership in the program through two courses, Design Studio: Materials and Assembly and the History of Sustainable Architecture (HSA).

The predominant model of sustainable design pedagogy in architecture has been as an applied approach that develops technical expertise in fields such as energy modeling, site design, impact assessment, etc. Through the Design Studio and HSA courses, we have outlined a pedagogical model that encourages the development of a historical, theoretical and ethical matrix into which the technical issues are cast. Findings include:

- It is important to attach environmental knowledge to environmental values to ensure future action.
- Early environmental literacy education must focus on making students "sticky" for future technical material.
- The Socratic nature of the studio environment is an ideal setting for integrating technical knowledge with environmental values.

- 2:00 Placing Sustainability at the Center of General Education

William Throop, Provost Green Mountain College. throopw@greenmtn.edu

For over a decade, Green Mountain College has focused its 37-credit general education program on the environment, providing all 700 students with the major elements of ecological literacy. This Environmental Liberal Arts Program requires that students identify and analyze complex physical and social problems accurately, that they understand the cultural and historical contexts that shape these problems, and that they can develop creative and effective solutions. Recent curricular revisions have added social and economic sustainability to the environmental theme, and the program now has a required project-based capstone devoted to sustainability. Both portfolio and test-based assessment tools have been piloted to determine the success of the program in teaching the skills, knowledge and character traits that the faculty believe to be critical for creating a sustainable society. This presentation summarizes the program and assessment results to date. It identifies the aspects of sustainability studies that seem most difficult to teach to a mixed audience of pre-professional and liberal arts majors, and it explores the tensions implicit in delivering a required, value-laden curriculum to a diverse student body.

B4 Working in Partnerships with Communities

- 1:00 The Role of the Cooperative Extension System in Social, Environmental and Economic Sustainability: A Case Study
Carolyn Gregov, County Extension Director, University of Florida/IFAS Sarasota County Extension. cgregov@scgov.net

This presentation will discuss opportunities for Cooperative Extension faculty and staff in all disciplines to engage in their county's sustainability dialogue and efforts, based on the experience of one coastal community faced with development pressures, reduction in agriculture land and food production capability, water quality concerns, affordable housing, high energy costs and the need for economic development opportunities. The presentation will include a discussion about partnership challenges faced by educational institutions as they struggle to keep their activities within educational limits and avoid spilling over into advocacy or policy setting activities. It will also include lessons learned and impact data collected over twelve years of operating a sustainability demonstration facility.

- 1:20 Imagining a Sustainable Meadville: Center for Economic and Environmental Development (CEED)'s Community Engaged Research

Erin Kirk, Program Coordinator, Allegheny College. Erin.Kirk@allegheny.edu

We will present a summary of the Center for Economic and Environmental Development (CEED) at Allegheny College. CEED works to catalyze action on issues related to sustainable economic and environmental development in Northwest Pennsylvania. CEED engages students in active, community centered learning that addresses issues in watershed stewardship, educational outreach, strategic environmental management, entrepreneurship for sustainability, art and environment, energy, forestry, environmental writing, community visioning, and environmental justice. Working with community partners, CEED faculty and students identify economic and environmental problems and implement sustainable, regenerative solutions. CEED's most recent initiative has involved the creation of a community wide coalition of government and not-for-profit agencies, area businesses and local residents aimed at transforming Meadville, PA into a model of economic, ecological and social sustainability. This initiative, entitled Meadville, PA: Not Your Run of the Mill Community, focuses on placing our natural assets, primarily Mill Run, an historically significant stream that winds its way through Meadville, at the heart of community and economic development efforts. This college-community collaboration promotes the development of walking trails, green businesses focused on zero waste and clean technology, ecotourism, community based art, and connects businesses, not for profits, and government agencies in community planning and development.

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1:40 Sustainability in Berea, Kentucky: College and Community Perspectives

Tammy Clemons, Sustainability Coordinator, Berea College. clemonst@berea.edu

Like most college towns, Berea College and the city of Berea have a long and intertwined history. In recent years, both the College and the community have built upon their progressive heritage to focus on socially and ecologically sustainable approaches for community development. This paper, which is a chapter-in-progress for an upcoming anthology entitled, "Academics and Activists: Confronting Ecological and Community Crisis in Appalachia," will describe steps that Berea College is taking to become a sustainable campus, some sustainability initiatives in the broader community, and the holistic approaches of both that blur the line between academics and activists. Berea College sustainability activities include academic programs, ecological renovations, service-learning projects, and student initiatives. Community efforts include the networking and activism of sustainability-related non-profit organizations and homesteaders. There are also important College/community partnerships such as service/outreach projects and experiential learning opportunities. The distinct but collaborative Berea town-and-gown programs, projects, and people committed to the realization of a sustainable future represent innovative models for achieving sustainable campuses and communities elsewhere in Appalachia and beyond.

2:00 Achieving Sustainability through Community Partnerships

Gary Deason, Deputy Director, Center for Sustainable Environments, Northern Arizona University. Gary.Deason@nau.edu

University partnerships with local governments advance sustainability by improving efficiency, accruing savings and building social capital. This presentation highlights three partnerships between Northern Arizona University (NAU), the City of Flagstaff and Coconino County.

Waste Management. A new agreement between the City of Flagstaff and NAU has diverted about 20 tons per week from the landfill, saved the University approximately \$100,000 per year, and improved the City's profit on recyclables.

Reclaimed Water. The City of Flagstaff operates a reclaimed water facility which processes sewage to a level of purity appropriate for non-potable uses. NAU has tied into the City reclaimed water system and now irrigates 45% of campus lands and flushes all toilets in new buildings with reclaimed municipal water at considerable savings.

Regional Planning. The Coconino County Sustainable Economic Development Initiative identifies areas for economic growth in northern Arizona that simultaneously protect natural resources and promote social equity. This effort involves about 150 stakeholders seeking to identify specific goals and action steps to guide sustainable development.

Field Reports

B5 Lessons from the Field 1

1:00 SEE Your World

Pushpa Ramakrishna, Chandler Gilbert Community College. pushpa.ramakrishna@cgcmail.maricopa.edu

Chris Schnick, Chandler Gilbert Community College. chris.schnick@cgcmail.maricopa.edu

Chandler Gilbert Community College has chosen 'Sustainability' as a theme for faculty staff development. Faculties from different disciplines are incorporating "SEE your world" theme into their curricula where the S stands for social, E for environment and E for economics. We have had a wide range of talks by guest speakers on our campus giving presentations on world hunger, child labor, water, Nicaragua, AIDS and humanity and biomedical research. Many classes gathered together to discuss various aspects of the effect of Hurricane Katrina. Our service learning program linked the SEE your world theme to the community around us. Students built activities and presented at the feathered friends festival which was attended by more than 5000 people.

Maricopa Community Colleges, faculty staff and administrators had a series of conversations on global sustainability. Nationally acclaimed speaker Dr. Rowe visited and gave a talk. Faculty from the Maricopa colleges got together to discuss how they can use Global sustainability in the classroom, in the campus, how the Maricopa colleges and the outside community could get together to form linkages and connections. A listserv has been created for people to share ideas on global sustainability.

1:10 Challenging the Change: Higher Education and the Sustainability Transition

Bob Manteaw, Doctoral Student, Washington State University. bob_manteaw@wsu.edu

The discourse on sustainability in higher education has often times focused on institutional initiatives and actions as the sole driver of change. In most institutions, however, such whole-school initiatives backed by institutional policies and support are lacking and so have left the sustainability movements in the hands of a few committed individuals. This paper examines the work and experiences of some of these individuals and on how they are challenging the change process almost single-handedly out of personal commitment and passion. It is an appreciative inquiry that focuses on the positive present; it treats the commitment to sustainability and other issues of social justice as a phenomenon which plays out almost naturally in the works and experiences of these people. The paper therefore explores what lessons could be learned from these individuals especially when universities have been slow or reluctant in responding to the issue sustainability education and practice, and to find out what could be done to change the situation as it is now.

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- 1:20 **Building Critical Mass Towards a Center of Excellence for Sustainability at the University of Hawaii at Manoa**
John Cusick, Assistant Specialist, University of Hawai'i at Manoa. jcusick@hawaii.edu
This presentation reviews the process toward and organization of an undergraduate Sustainability Studies program at the University of Hawai'i at Manoa (UHM). The University strategic planning process initiated discussion of how sustainability themes can be infused in education, research, service, and the built campus. The complexity of concerns about long-term environmental, economic, and cultural health and well-being in the State of Hawai'i demands the attention of individuals educated and trained to think critically and to resolve problems across disciplinary boundaries. As the dominant institution of higher education in the State, UHM has a responsibility to address issues related to energy, food security, water quality, waste disposal, and invasive species. Selected courses for the program address the academic, research, and professional needs related to the environment and sustainability, in general, and specifically to the Asia-Pacific region. The projected program reflects a broad range of available expertise, and takes advantage of our environmental diversity for education, research, and career internship opportunities. A Sustainability Studies track provides experiential learning and research skills increasingly in demand of academics and professionals. Our unique location requires that decision makers and communities sustainably balance economic health and environmental integrity to maintain a reasonable quality of life.
- 1:30 **Engaging Sustainability: A Critique of Integrated Sustainability in Higher Education**
Kevin Emerson, Masters graduate Environmental Sustainability, 2005 University of Edinburgh. kevin@wasatchsustainability.com
Higher education institutions play a crucial role in creating a sustainable society, from using renewable energy to adopting sustainability policies. The University of Edinburgh has recognized 'sustainability' as a priority since 2000. This pilot study focused on clarifying the successes and challenges faced by the University of Edinburgh in 'engaging sustainability' through sustainable management, communication and education. Success was measured against examples from best practice in higher education, key internal documents from the University of Edinburgh, as well as social research carried out with key stakeholders at the University. Through a literature review and qualitative interviews with key respondents, it was found that the University of Edinburgh has primarily seen successes in management activities, (the 'low-hanging fruit'), while also making strides in its academic offerings. The University's primary challenge involved communication and coordination for sustainability, mirroring challenges within the very tradition of higher education itself.
- 1:40 **Providing Common Ground**
Sarah Mallory, Assoc. Prof., Biology, LaGrange College. smallory@lagrange.edu
LaGrange College is a co-host and site of "Leveraging Landfills with Public-Private Partnerships," a June, 2006 conference to share best practices with representatives of cities and counties across the U.S. This conference will provide information needed by those local governments to be able to capture the methane produced in their landfills and to provide it for industrial energy needs. Such a relationship already exists between the City of LaGrange, Georgia and Interface Flooring Systems and Milliken and Company. This field report, conducted and presented by the Sustainability Task Force of LaGrange College as part of its campaign "On Holy Ground: Cultivating Sustainability at LaGrange College," will feature the college's role in the planning, development, and hosting of this conference. Information will also be provided for colleges interested in beginning the discussions necessary to assist local governments and industry in similar public-private partnerships.
- 1:50 **The Greening of ISU: Promoting the Culture of Sustainability at an Institution of Higher Learning**
Jeri Neal, Chair, ISU Council on Sustainability Iowa State University. wink@iastate.edu
Bill Diesslin, Assistant Director, Envir Health & Safety, Iowa State University. wmdiess@iastate.edu
Acknowledging their leadership role in the state of Iowa, Iowa State University has recently chartered a Council on Sustainability. Formation of the Council, along with administrative commitment to the concept of sustainability, leads a new strategic effort at Iowa State University to promote a convergence of random and independent "green practices" with measures to document and institutionalize sustainability as a core value of graduates and faculty. It is too early to determine the impact of this effort, however, establishment of this cross-discipline, multi-department, and broadly-based stakeholder support is a critical first step towards the institutionalization of sustainability. It provides a means to focus on systemic learning and cooperative solutions in an environment generally organized into specialized, competing and hierarchical disciplines. The report will explore four main points: sustainability as addressed in the ISU 2005-2010 Strategic Plan; formation of the ISU Council on Sustainability (COS); COS short term and long-term goals; and barriers, pitfalls and setbacks encountered in this process.
- 2:00 **Toward a More Sustainable Campus**
Robert Van Der Like, President, Energy & Environmental Education, Inc.. r.vanderlike@earthlink.net
How can a sustainable campus program be initiated at your university or college? There are no doubt any number of ways, however, this report presents a case study of how a program was initiated at Florida State University from informal beginnings through their service-learning program. Pockets of interest and potential champions existed throughout the campus in various academic and administrative departments. Through initiatives developed in service and service-learning projects and activities we were able to establish a network of information, enlist sustainable campus enthusiasts, involve students and faculty, as well as administrative and operational staff. This eventually led to the development and recommendation of policy statements for the

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administration to consider in order to establish more formal administration support for all departments at the university - encouraging them to include sustainability in their on-going institutional planning processes.

2:10 Steering Technical Curricula Toward Sustainability at 2-year Colleges

Noelle Studer, Sustainability Coordinator, Portland Community College. noelle.studer@pcc.edu

The Pacific Northwest is gearing up for a new economy through workforce training. Portland Community College, Lane Community College, Portland Public Schools, and Portland State University have been awarded a grant from the National Science Foundation's Advanced Technological Education program to meet regional needs for technicians with strong math and science skills rooted in an ethic of energy and habitat conservation. Early progress in building education partnerships with business & industry and aligning with public policy goals will be discussed.

Panels, Roundtables and Workshop

B6 Panel: Designing a Coherent Sustainability Curriculum: From Policy to Implementation

Moderator: Edward Quevedo, Director, WSP Environmental. edward.quevedo@wspgroup.com

David Johnson, William McDonough + Partners. djohnson@mcdonough.com

Jane Lorand, Dominican University of California, GreenMBA. jane@greenmba.com

Heather Scholefield, University of British Columbia. heather.scholefield@ubc.ca

The panel will discuss their work on sustainable curriculum design and implementation experience at UBC and other Universities across the globe. While many of today's top universities have begun to develop and implement comprehensive environmental and sustainability programs, the focus has been to address the campus environmental footprint; reducing greenhouse gas emissions, waste reduction and recycling programs, promoting sustainable transportation, purchasing renewable energy and so on. However, as institutions of higher learning, the primary responsibility is to educate and prepare today's students to become tomorrow's best citizens. In this light, incorporating the core elements of sustainability into the curriculum is an essential ingredient. More over, we will discuss the opportunities and challenges of integrating the principles of sustainability into coursework across the institution, from business management to communications to law and humanities.

B7 Panel: Using LEED for Portfolios – Translating Individual Building Lessons Learned into Overall Portfolio Performance

Moderator: Marc Heisterkamp, Program Coordinator US Green Building Council. mheisterkamp@usgbc.org

Riley Neugeberger, American University. neugebau@american.edu

Ryan Schauland, University of California, Santa Barbara. rschauland@umail.ucsb.edu

USGBC's portfolio program is being developed to help market leaders expand their use of green building practices and minimize the total environmental impact of their real estate portfolios. While market leaders have had great success with innovative environmental guidance and recognition programs such as LEED, many are seeking to take the next step by taking their lessons learned and implementing them as standard procedures throughout their portfolio of buildings.

USGBC is addressing this need with an innovative program (currently under development) that provides portfolio solutions to improve environmental performance. The program's goal is to dramatically and quickly improve the environmental footprint of companies and organizations by providing guidance, education, and standard procedures based on the LEED green building models. Although this program is broad and will have participation from a variety of industry sectors, universities have unique opportunities due to their geographically centralized nature.

This panel will provide an overview of USGBC's intentions for the program and how colleges and universities will be able to use it as a valuable resource towards meeting sustainability goals. Representatives from universities that were active in the program development process will provide detail on their portfolio-wide green building efforts and overall portfolio sustainability goals.

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B8 Roundtable: Moving from Theory to Practice on a Sustainable Campus: Service Learning Projects to Build Campus Community

Moderator: Kurt Teichert, Resource Efficiency Manager and Adjunct Lecturer, Brown University. Kurt_Teichert@brown.edu
Julie Newman, Yale University, Sustainability Director, julie.newman@yale.edu

The development of a sustainable campus requires student engagement at all the levels of the university system. Through coursework, independent research and thesis projects, students can be challenged to apply critical inquiry and systems thinking approaches to assess and make recommendations for the applications of sustainability principles to institutional systems. Questions which drive this larger discussion include:

- How can institutions advance the objectives of sustainable development?
- How can the integration of sustainability principles advance the objectives of the institution?
- How can applied projects incorporate the broadest range of sustainability principles and achieve concrete results for the students and institution?

This roundtable session will be led by mentors experienced in applied theory manifest in service-learning academic projects and institutional change on campuses. Discussion will include specific undergraduate/graduate student projects from Brown's Course: Environmental Stewardship and Sustainable Design and Yale's Seminar: Sustainable Development and Institutional change. The goal is to engage participants in a discussion of successful (and ineffective) strategies to engage students in course projects, research and internships. The mix of workshop participants ideally will include faculty, campus sustainability practitioners, and students with experience or interest in service-learning.

B9 Roundtable: Developing a Campus Sustainability Rating System

Moderator: Dave Newport, Director, University of Colorado at Boulder. dave.newport@colorado.edu
Julian Dautremont-Smith, AASHE. julian@ashe.org
Judy Walton, AASHE. judy@ashe.org

This roundtable will address the call by higher education associations to develop a standard, voluntary, rating system for assessing progress in campus sustainability. Sustainability practitioners and all interested stakeholders are invited to participate in a dynamic discussion of whether and how higher education institutions can be objectively evaluated and compared on sustainability criteria. Roundtable organizers Dave Newport, Julian Dautremont-Smith, and Judy Walton will provide an overview of the initiative, followed by a facilitated discussion among session participants that will cover:

- Discussion of the need for a national (or US & Canada) campus sustainability voluntary rating system, vs. a ranking system or simply a standardized assessment tool with no point values.
- A "straw" proposal for a rating system, and/or a proposal for a standardized assessment tool.
- Next steps

This session seeks to set higher education on a course towards a precedent-setting campus sustainability reporting system with potentially enormous impact for sustainability practitioners, administrators, students, faculty, community, and related stakeholders. Broad discussion of this idea has begun on AASHE-sponsored electronic discussion boards.

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B10 Roundtable: Regional Consortia: Strength in Numbers to Promote Environmental Collaboration

Moderator: Jean MacGregor, Director, Curriculum for the Bioregion Initiative Washington Center for Undergraduate Education at The Evergreen State College. macgjean@evergreen.edu
Virginia Brown, Program Administrator, Alabama Environmental Education Consortium (ALEEC), and Associate Director, Environmental Management Graduate program, Vulcan Materials Center for Environmental Stewardship and Education, Samford University, Birmingham, AL. vnbrown@samford.edu
Alabama Environmental Education Consortium.

Michelle Land, Director, Environmental Consortium of Hudson Valley Colleges and Universities. mland@pace.edu

Networks of campuses throughout the continent are finding strength in numbers by forming consortia to advance sustainability and other environmentally related goals among their institutions and within surrounding communities. In order to achieve and maintain sustainability, we must cross all academic disciplines, engage policy makers, and educate the public. Consortia have the potential to bring together scientists, engineers, policy-makers, educators, business leaders, media, and the public in order to collaborate on sustainable strategies that may improve society - economically, socially, environmentally, and politically. Several of these networks are using a regional or ecosystem-based approach as an organizing focus for their work. By sharing resources and expertise, collaborative consortia can accomplish collectively what no one institution could do on its own. At this roundtable discussion, we will describe our beginnings, our goals, our strands of work, and the organizational and institutional challenges addressed along the way. We are eager to meet other network leaders to share ideas and strategies!

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B11 Roundtable: Translating Sustainability to the Media

Moderator: Shana Weber, Sustainability Manager, Princeton University. shanaw@princeton.edu
Greg Peterson, producer of Smart Spaces TV, Arizona State University. Greg@UrbanFarm.org
Betsy Rosenberg, Host/Creator, EcoTalk Radio. betsyrosenberg@cs.com

There is a hornet's nest of activity around the premise that higher education can and must influence the media and the larger culture. Higher education is a vibrant source of research, innovation and application in the field of sustainability and many feel it is critical that they take a prominent role in inspiring a cultural shift through strong media presence. The challenge is how to effectively organize such an effort and connect the various people working toward that goal. This is bigger than tapping into just the environmental media market. This effort has to successfully translate sustainability-related opportunities and challenges in ways that resonate with a far broader audience. The stories are relevant to all sectors of society and all lifestyles, from business and government to community planning and faith. The goal of this roundtable session will be to discuss strategies for effectively making literacy about sustainability challenges and engagement in solutions a societal norm.

B12a Roundtable: Working Together to Build A Greener Campus (45 mins)

1:00 Moderator: Jim Newman, Director of Online Services, BuildingGreen, Inc.. jim@buildinggreen.com
Anna Stefanidou, Director of Online Education, Boston Architectural College. Anna.Stefanidou@the-bac.edu

An integrated design methodology is one of the pillars of green design of the built environment. BuildingGreen has been working with several colleges and universities in North America to create an integrated view of design education and institutional responsibility.

Working with architecture/design programs, environmental science programs, and facilities groups, the goal has been to integrate institutions' facilities goals with their educational mission and with teaching and research in related, but separate fields. This roundtable will bring together participants in this process from two institutions to discuss how their programs to create integrated views of design education and institutional responsibility have worked, and what might be the next steps.

Topics presented in the roundtable discussion will include broad institutional goals, learning opportunities at the institutional level for students, academic research that supports institutional sustainability goals, specific shared tools, and other areas where shared goals have been used to drive teaching, research, and institutional change.

B12b Workshop: Designing Green in a Grey World: Exploring Methods for Realizing Green Design in an Unenlightened Context (45 mins)

1:45 Organizer: Ron van der Veen, Mithun. Ronv@mithun.com

In trying to help universities and colleges create environmentally intelligent buildings, we often find ourselves at odds with the political climate of the institution. The administration may be interested in pushing for green design, but will also need to counter voices of dissent. It seems there's a general lack of understanding about the overall benefits of green design to campus expansion. Seeing the "big picture" is essential for recognizing that smart buildings provide immediate payoff in student and faculty morale, as well as in long term energy cost savings. The first step is to make the language of green design more accessible to decision makers – exploring paybacks and developing strategies that resonate with funding sources. Key concepts include a basic explanation of how designs that protect the environment also protect the institution's resources. Sustainable development goes beyond environmental issues to encompass a project's social and economic aspects. Measures range from minimizing the impact of construction and its related use of materials to promoting staff retention and energy efficiency – increasingly significant as energy costs rise. In this workshop, we will explore terminology, strategies, and dialogues to move higher-education capital improvement projects forward effectively with sustainable outcomes.

Thursday, October 5

Session C (3:30-5:00)

Papers

C1 Sustainability and Equity

3:30 Including Social Equity in your Building Product Decisions

Antoinette Bunkley, Senior Project Manager, HDR Architecture, Inc. Antoinette.Bunkley@hdrinc.com
Katrina Rosa, Sustainable Design Project Manager, HDR Architecture, Inc. Katrina.Rosa@hdrinc.com

Within the universities and green building professions, there is tremendous dialogue about the life cycle of buildings and of the products used to create them. We have a better understanding of the environmental ramifications of wasteful manufacturing, toxic chemical releases or excessive dumping. Missing from these discussions are the inherent social ramifications; as important to address in striving for sustainability as the environmental, and in fact cannot be separated. What role does the life-cycle of a single product play in our daily lives of work, family, sense of self, and "pursuit of happiness"? What role does it play in the daily lives of the global peoples? How do we make better product choices?

Our universities and colleges are leading the way to the sustainable future for their communities, making decisions that ripple to the entire world. Discussions of the relationship between our building product choices and social equity are timely and imperative. This session is meant to enhance the discussion by examining the three life-cycle stages of our most specified building products, and highlighting the rippling effects those product choices have on people, individually and collectively, locally and globally.

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3:50 Strategic Sustainability

Jocelyn Bates, AIA, Senior Associate, SRG Partnership. jbates@srgpartnership.com

Michel George, Assoc. Vice President for Facilities, Seattle University. georgem@seattleu.edu

How does an institution with a long history of sustainability move to the next level? The challenge to SU Facilities was to take their programs to the next levels. As SU updated its Facilities Master Plan we questioned how we could make our campus more consistent with the needs of the 21st Century "green" learner. Sustainability emerged as one of the key drivers in the plan. The RFP required experience with sustainability, along with open communication (transparent process) and out of the box thinking. The challenge of how to practice cost effective sustainability in a urban environment was one the team met early on. Goals of the plan were to: institutionalize sustainability into the facilities capital and operational planning process; improve the built and landscaped campus in relation to the natural environment; develop strategies to partner with the city and the surrounding community re: sustainability, identification, outreach, and traffic control; create a program that uses the campus as a sustainability learning environment; and the application of appropriate technology and design standards to minimize environmental impact while enhancing community experience.

Process, issues and findings will be outlined by Michel George of Seattle University and the SRG/Walker Macy planning team in a short 15-20 minute presentation followed by a 10-15 minute discussion/question period.

4:10 Sustainable Building Project / Environmental Design Advice

Edward Quevedo, Director, WSP Environmental. edward.quevedo@wspgroup.com

David Johnson, William McDonough + Partners. djohnson@mcdonough.com

The Panelists will discuss their work and sustainable design experience with Ithaca College, in Ithaca, NY, where they facilitated the building design process and developed 12 integrated sustainability principles and design criteria unique to the University environment.

We advised that the new Business School building design needed to incorporate social, academic, and financial responsibility idioms to further enhance the ecological design features, leaving the "best practices" embodied in LEED[®] far behind. The excitement generated by this innovative merger of academic facilities design and sustainability curricula attracted internationally-renowned firms to submit spectacular project concepts to the architectural competition. Our session will reveal the 12 points we developed, the interdisciplinary approach, and the building design and curricula that evolved. Opportunity will be given to explore further design considerations that would exemplify the three dimensions of sustainable development (environmental, economic, and equity) within the context of higher education.

4:30 Creating Competitive Advantage through Sustainable Design

Susan Engelkemeyer, Dean, School of Business, Ithaca College. sengelkemeyer@ithaca.edu

Peter Bardaglio, Provost and Vice President for Academic Affairs, Ithaca College. pbardaglio@ithaca.edu

Envisioning a new LEED platinum certified home for the School of Business at Ithaca College has involved a collaborative process involving planning, design, and construction. We have approached this project with a stakeholder process involving representatives from the campus and community to conceptualize key elements of the building: the architectural design competition; the processes of design development and energy modeling that sought to effectively balance the triple bottom line; and the challenges involved with bringing the project within budget while simultaneously delivering on environmental and human factors. Our goal is for this new space to serve as a model for higher education, particularly business education. This building will translate into a competitive advantage by incorporating the elements of sustainability into the design, operations, and curriculum of the School of Business, through: (1) a space that facilitates interaction and collaboration, (2) a vegetated roof, gray water reuse, and other elements that reduce the environmental impact of this structure, and (3) visible displays on operating cost savings and efficiency.

C2 Institutional Transformation: Campus Case Studies

3:30 Sustainability's Challenge to Higher Education: Transforming the Institution into a Community of Practice

Claudia Hemphill Pine, PhD Candidate, Environmental Science Program, University of Idaho. claudiah@uidaho.edu

Benjamin C. Austin, Environmental Science, University of Idaho. aust4812@uidaho.edu

Justin Saydell, Student, Environmental Science, Natural Resource Ecology and Conservation Biology, University of Idaho. sayd5721@uidaho.edu

Taking the ongoing transformative experience of the University of Idaho as a case study, this paper explores how a campus shift toward sustainability entails much broader systemic transformations. Research from two senior projects and graduate study are used to show how patterns of participation and program change at U-Idaho mark this shift. The change is theorized as a Community of Practice (CoP). The CoP concept provides a single lens through which sustainability in higher education is revealed as an information-rich, participatory social praxis. CoP fruitfully combines relevant scholarly literature on multiple key aspects of sustainability -- collaborative learning, organizational development, science issues, and the public policy context in which these operate. For higher education, sustainability as a CoP emphasizes learning as a social practice that extends beyond classroom curricula and campus operations to become the transformative and empowering experience students seek. At the same time, a sustainability CoP challenges the institution to transform from a traditional hierarchical, centralized structure into a fully

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participatory learning community. Knowledge must become social, shared, public, and practiced. U-Idaho's experience exemplifies how sustainability challenges social institutions with new requirements, multiple rewards, and a path toward achieving them.

3:50 Inspirations & Aspirations: Developing and Implementing a Sustainability Strategy at UBC

Heather Scholefield, Strategy Manager, University of British Columbia. heather.scholefield@ubc.ca

Inspirations & Aspirations is a comprehensive sustainability strategy that outlines nine goals and 68 targets demonstrating how UBC will improve its social, economic and ecological performance from 2006-2010. Unique from previous sustainability documents that report accomplishments, UBC's sustainability strategy charts our course forward on sustainability, mapping out specific, measurable targets and identifying responsible groups, action plans, and timeframes. To succeed, the plan relies on the participation of the entire campus community and their understanding that the social, economic and ecological objectives are all interdependent. For this, a companion document *Inspirations & Aspirations: the Sustainability Strategy and YOU* outlines the various targets that all individuals can strive for. The journey in creating the strategy was as significant as the document itself—a 3 year appreciative inquiry involving all 12 faculties, over 20 departments and all major student organizations helped raise awareness and for people to understand their contribution to sustainability on campus. We appreciate the opportunity to show off our strategy and to listen and learn from others.

4:10 Institutional Transformation at the University of Michigan: Development of the Graham Environmental Sustainability Institute to Promote Interdisciplinary Research and Education

Jeremy Semrau, Associate Professor, University of Michigan. jsemrau@umich.edu

The University of Michigan (UM) has partnered with the Graham Foundation to create a new, entrepreneurial initiative focused on sustainability—the Graham Environmental Sustainability Institute (GESI). GESI has as its mission the promotion of interdisciplinary research and education in environmental sustainability related fields.

Specifically, through innovative programs, GESI will: encourage environmental sustainability collaborative research through incentives and administrative support; leverage present UM research and academic efforts through improved coordination, strengthening programs with leadership potential, and publicizing the academic and research opportunities already available at the UM; encourage innovative academic programs that teach and explore the complexities of environmental sustainability and emphasize the inter-relationships between ecological systems; and develop an environmental outreach program that educates communities and policy makers.

GESI will focus on six sustainability areas where UM has significant expertise: energy; freshwater and marine systems; human health and its link to the environment; global change and biodiversity; infrastructure, built environment, and manufacturing systems, and; environmental policymaking and human behavior.

Sustainability related research accounts for approximately \$30M per year and approximately 300 faculty members in seven schools are involved in environmental sustainability related research and education, including studies in the natural and social sciences; engineering, business, public health, and policy.

4:30 The Elephant in the Room – Social Sustainability in a Bottom Line World: Teaching and Research at UBC Okanagan on Sustainability to Protect Ourselves and Future Generations.

Gord Lovegrove, Assistant Professor, University of British Columbia, Okanagan. gordon.lovegrove@ubc.ca

UBC Okanagan, UBC's newest campus in Kelowna BC Canada, has been touted as being primarily a Sustainability-oriented institution. UBCO places a heavy emphasis on increasing interdisciplinary links between undergraduate education and research on sustainable development. A strategic analysis of strengths, weaknesses, opportunities, and threats facing university engineering programs reveals that if we are to get serious and equip our students with the skills necessary to lead and build a more sustainable society, then a more holistic approach is needed. In order to be effective, motivate learning, and increase retention to practical limits will require a grossly different approach than the narrowly focused models traditionally used. Some proven tools that have been put in place at UBC to promote sustainable development, research, and education will be presented, including: academic and research programs, institutional operations and facilities, community services and outreach. Future research needs will also be discussed.

C3 Students Leading the Way

3:30 Student-Led Sustainability Initiatives at Ithaca College

Daniel Carrion, Student, Ithaca College. dcarrion1@ithaca.edu

Jack Haurin, Student, Ithaca College. jhaurin1@ithaca.edu

Ithaca College's Students for Sustainability (SFS) and the Ithaca College Environmental Society (ICES) are two student-oriented groups that focus on educating peers about sustainability in an effort to promote environmental and social consciousness. Both groups also attempt to influence institutional policies through student led action and education campaigns. For example, Ithaca College recently signed the Talloires Declaration, the result of a year-long campaign led by SFS that included petitions, classroom presentations and coalition building between students and faculty. A similar year-long effort by ICES resulted in a switch from disposable to reusable dishware in dining halls. We will discuss tactics, events, and benchmarks that led to these successes. We will also discuss current objectives for both groups, which include efforts aimed at purchasing wind energy instead of coal power, and replacing diesel fuel with biodiesel in campus maintenance vehicles.

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- 3:50 How Student Participation has Jump-Started Recycling and Composting at the University at Buffalo
Erin Cala, Environmental Educator, University at Buffalo. ecala@facilities.buffalo.edu

Campus recycling and composting programs tend to be most effective when institutionalized and fully staffed by facilities departments. However, these programs invite and can only benefit from student participation. This presentation will describe how the University at Buffalo's recycling program has benefited from its partnership with a Media Studies professor and her students, and will showcase an innovative advertising campaign which brought together the university's campus environmental stewardship office and its highly visible athletics program. We will also examine the role of student involvement in the development of UB's composting program and detail how students have been responsible for the expansion of composting on campus.

- 4:10 Developing Student Partnerships for Sustainability

Corinna Kester, Sustainability Coordinator, Env. Health & Safety, University of Texas at Austin. ckester@austin.utexas.edu

This presentation, for both student and faculty/staff, provides a guide for how to develop sustainability partnerships with students. It helps faculty/staff learn about what's important to students, how to find and recruit them, and how to address concerns about reliability. The presentation will also help students identify the needs of faculty/staff, learn how to successfully approach potential partners, and how to ensure the partnerships succeed long-term. Case studies will be used from the Campus Environmental Center at the University of Texas at Austin. The CEC has developed many successful partnerships, including aluminum & plastic recycling, litter cleanups, gardening, energy conservation, dorm education, buying local food, ink cartridge recycling, and a staff sustainability network.

- 4:30 Creating a Sustainable Student Community

Mark Stemen, Coordinator, Env Studies, California State University, Chico. mstemen@csuchico.edu

Sustainability is at heart, a crisis of spirit, and my presentation will address this social dimension of sustainability. Chico State has quickly become a center of sustainable activity and innovation. Part of the success is attributable to a supportive administration, but another factor is the conscious efforts of students, faculty and staff to create a community that embraces and empowers its students. My paper will focus on the efforts at CSU, Chico to create a sustainable community of student activists that continues to grow over time. Emphasis will be placed on describing those types of activities that change the student's hearts as much as their minds.

C4 International Perspectives & Partnerships.

- 3:30 A Service Learning Course on Sustainability in Ecuador

David Saiia, Assistant Professor Ithaca College. dsaiia@ithaca.edu

This proposal describes the creation of a service/learning course designed at Ithaca College (I.C.) called "Sustainable Micro-enterprise in Ecuador" from its inception to implementation. In May 2006, an interdisciplinary group of students traveled to Ecuador for an experiential, service-learning program examining sustainable micro-enterprises established through Fundación Maquipucuna (FM). As FM has implemented the Choco Andes Ecological Corridor project from 2000 to the present, a number of businesses have been created including: organic coffee, marmalades, and eco-tourism. An important example of a micro-enterprise is eco-tourism; indeed, our students experienced eco-tourism during their field study (<http://www.arches.uga.edu/~maqui/index.htm>).

I.C. students studied the Ecuadorian context and the current micro-enterprise activities. We spent several weeks creating the research questions as the basis for three research projects focusing on:

- 1) Existing services for sustainable enterprises around the Maquipucuna Ecological Reserve;
- 2) Augmenting the "master-branding" concept to promote regional products;
- 3) Examining the "eco-tourism" operation for sustainability.

In Ecuador, students operated in three teams and spent their time visiting the sites of the budding micro-enterprises and gathered data. Our paper will describe the course development, its implementation, and how the learning derived from this service learning experience will contribute to sustainability both at FM and at I.C.

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3:50 Building Bi-National University Partnerships in Sustainability

Linda Oviedo, Director Global Initiatives ITSON, Mexico. lindaoviedo@yahoo.com
David Pijawka, Arizona State University. david.pijawka@asu.edu

In an era of global engagement and sustainable development there is already a growing need for understanding how to build bi-national institutional partnerships in sustainability and sustainable development. Despite this growing and articulated need, there are few experiences and models from which to learn about the dimensions for successful and long-lasting global partnerships in institutions of higher education. The task is challenging because of long-standing differences in institutional cultures including educational goals, the role of universities in research, faculty reward structures, language and administrative support philosophies. Building these partnerships becomes even more challenging when they are based on sustainability education, research and community development.

This paper addresses these challenges, and using a U.S. - Mexico case study, provides a model of bi-national university partnerships in sustainability. The model covers graduate studies for Mexican students in the US, collaborative research in sustainable development, and outcome measures. The paper specifically addresses sustainability education issues across a border, but also examines the dimensions of program success through the development of a "ladder of partnership building in sustainability". The U.S. Agency for International Development initiated a bi-national program for enhancing Mexico's education needs through a grant program that supported university- to- university partnerships between the U.S. and Mexico. This paper describes one of the program's success stories and demonstrates how this is transferable.

4:10 Creating Agents for Change: K- 16 Sustainability Education Program

Donald Boonstra, Sustainability Education, Arizona State University. DonBoonstra@comcast.net
Sheri Klug, Arizona State University, sklug@asu.edu

To create a Sustainable World, we need students who are informed, engaged and empowered as agents of change for sustainability. To achieve this we must re-imagine schools as learning environments that promote and model sustainability. This presentation will describe a proposed international sustainability education program to be embedded within the large-scale sustainability efforts that are being spearheaded by Arizona State University. The Sustainability Education Program will promote and support K-16 formal education. Critical elements of this program include:

An international network of Sustainability Schools and Centers promoting sustainability curriculum, professional development for sustainability education, and development of "green" facilities;

- Sustainability Education Website as primary source for all sustainability education programs, curricula, projects, and activities;
- Coordination of sustainability education efforts across disciplines;
- Local, national, and international networking; and
- Partnerships with industry, research, academia, and professional organizations.

By focusing on transformations in formal education – learning sustainability in an environment that promotes thematic, inquiry-based, immersive experiences – change can be instituted and embraced beyond the school, spreading through the family and surrounding communities.

4:30 International Institutional Collaborations for Sustainable Development

Leti McNeil, Director of External Affairs, Engineers for a Sustainable World. lmcneill@esustainableworld.org

Though the challenges in developing and developed communities may require different approaches and solutions, the overarching challenge of creating a more sustainable world is one that individuals and institutions everywhere must share responsibility for. One cannot isolate the social, economic, and environmental impacts of one nation or one community's development, and thus, collaboration and cooperation are necessary to ensure that the human race can continue to survive in harmony with our planet.

This paper will focus on Engineers for a Sustainable World (ESW) efforts to develop meaningful collaborations between institutions in the United States, and those in developing countries. Partnering with these international universities and non-governmental organizations (NGOs), ESW and its affiliated universities have collaborated on initiatives to address critical local problems. In addition to facilitating knowledge transfer, these collaborations encourage capacity building efforts by engaging local partners who are co-owners in identifying problems and designing appropriate, sustainable solutions.

C5 Teaching Sustainability

3:30 Teaching Sustainability Through Story: The Role of Writing Local Natural History

Rochelle Johnson, Chair, Env. Studies, Associate Prof., English & Env. Studies, Albertson Coll. of Idaho. Rjohnson@albertson.edu

In this presentation, I share my experience using natural history writing in my composition courses in order to produce a book that provides a natural history of our region, with a focus on the necessity of sustainability. The courses focused on our town's downtown revitalization project, which centers on uncovering--or "day-lighting"--a creek that had been paved over in the 1950s. The result was Rediscovering Indian Creek, which shares the story of the geology, early natural history, Native American presence, and settlement of the region, while centering on Indian Creek: its formation, its use, and its environmental challenges. Through the generosity of donors, 2000 copies of the 70-page book have been distributed throughout the community. These courses--and the book that they produced--helped foster community and teach the basic concepts of sustainability in my rural town.

In my paper, I will discuss the impacts that this project had on both my students and the local community. Through collaborative work with each other, civic leaders, business people, engineers, and other residents of this place, my students and I realized the important role that our college plays in educating our community about the importance of sustainability in our area.

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3:50 Teaching Sustainability Planning

Stephen Wheeler, Assistant Professor, University of New Mexico. wheelers@unm.edu

Designing courses to help undergraduates or graduate students understand the wide range of issues connected with sustainability is not easy. This paper reflects on some useful strategies by drawing on the author's experience in teaching "planning for sustainability" courses and studios at UC Berkeley and the University of New Mexico between 1997 and the present, and in authoring two textbooks on this subject (Planning for Sustainability, Routledge 2004; The Sustainable Urban Development Reader, Routledge 2004, co-edited with Tim Beatley). Main themes include 1) helping students understand different perspectives and historical debates around sustainability, 2) helping them understand interactions between the different topic areas and scales of planning, and 3) devising "active learning" methods for them to integrate theory and action. The author particularly emphasizes experiential learning approaches including in-class exercises and role plays, walking tours and field trips, and community-based work.

4:10 Project-based Learning for Sustainable Development

Marcia Nation, Project Manager, Arizona State University. marcia.nation@asu.edu

Project-based learning is an excellent pedagogical approach for involving students in the application of classroom concepts to real situations, such as issues of sustainable development. This paper focuses on the opportunities and challenges realized when project-based learning was used in a graduate-level course at Ohio University, "Sustainable Development in Appalachian Ohio," which was part of a larger teaching initiative in the Appalachian region forwarded by the Appalachian Regional Commission (ARC). Students in this course, which spanned one quarter (10 weeks), conducted a pre-feasibility study for a greenway/trail, and while doing so, engaged local stakeholders in the planning process. Their work sparked debates in the classroom about the role of students in community-level planning processes, who can speak for and represent the "community," and how "community" is defined. The ARC dimension of the course meant that students also had an opportunity to learn what other universities were doing and to present their research at a forum in Washington, D.C. that all universities participating in the ARC teaching initiative attended. This paper discusses the challenge of initiating long-term work in relation to the relatively brief duration of university and college courses and suggests some ways of addressing this challenge.

4:30 Choices and Change in the Arctic National Wildlife Refuge: Wild Adventures in Transdisciplinary Education on Complexity, Controversy, and Sustainability

David Secord, Director, Program on the Environment, University of Washington, Seattle. dave@u.washington.edu

Among the most contentious and public environmental controversies in recent memory is the question of oil drilling in Alaska's Arctic National Wildlife Refuge. This controversy is not merely a contemporary political and media debate about "oil versus caribou." The Refuge has stood as an iconic wilderness for sixty years. We address the problem of how traditional disciplinary universities can help students address sustainability issues in their full complexity. These issues embody the apparent intractability typical of sustainability problems, including scale, wilderness science and policy, values, indigenous human rights, economics, politics, natural resource geology, climate change, and the arts. We used the Refuge as the focus of a profoundly interdisciplinary field course offered by the University of Washington Program on the Environment. Essential features included a wide variety of student levels (from sophomores to doctoral students) and backgrounds (eight departments), meetings with diverse experts and practitioners, and an intense arctic wilderness experience. We outline reasons for the success of this course, including learning goals, the student experience, transdisciplinarity, field and classroom logistics, and budgets. This course models how highly complex, multifaceted sustainability issues can be addressed as a transformative part of undergraduate or graduate education, key to preparing future sustainability leaders.

Field Reports

C6 Lessons from the Field 2

3:30 Community Service Learning Health Education Project: Reducing Exposure to Endocrine Disrupting Chemicals

Allison Butler, Biology Faculty University of Alaska Anchorage. afadb@uaa.alaska.edu

Overwhelming scientific evidence is beginning to reveal an ominous global threat to humans and other animals from disruption of our endocrine (hormone) systems by ubiquitous chemicals in our environment; yet the public is largely unaware of the magnitude of this issue. The primary outreach goals of this service learning project were to (1) raise community awareness about significant health risks from common, every-day products containing endocrine disrupting chemicals (EDCs), and (2) provide practical recommendations for reducing exposure, particularly for those most vulnerable: developing fetuses, infants, and children. A total of 16 students from two human anatomy and physiology courses (most of whom are pursuing careers in human health care) participated in this pilot project during spring 2006. They studied the endocrine system and its broad, lifelong influences on development and function of all other body systems. They learned about sources, exposure routes, basic physiological mechanisms, and possible effects of EDCs. Working individually or in small groups, they developed educational materials and presented their information and recommendations to groups of people in businesses, schools, and health care settings, collectively reaching more than 200 individuals. This project will become an integral part of future human anatomy and physiology courses at UAA.

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3:40 Getting Every Inch Out of the Landscape

Craig Chatburn, Grounds Manager, Seattle University. chatburn@seattleu.edu

Our long commitment to an organic campus has inspired a new look at the landscape. In April of 2006 Seattle University dedicated the Vi Hilbert Taqwsheblu Ethnobotanical Garden which showcases the intimate and sophisticated relationship between Puget Sound-area Native peoples and our region's native plants. Facility Operations collaborated with Professor Rob Eford to create an 11,000 square foot garden that will serve as a sustainable interdisciplinary teaching tool for SU students and faculty as well as a means of outreach to local elementary schools, community groups, and the general public. We transformed turf covered hillside into a sustainable native garden that uses; stormwater to feed our wetland water feature, sheet mulching to control weeds and eliminate turf, salvaged logs and recycled shells to create a midden seating area, and low impact development pathways.

3:50 Waste Management: A Solid Foundation for Campus Sustainability

Mark Darling, Program Coordinator-Resource Management Program, Ithaca College. mdarling@ithaca.edu

Ithaca College has had a strong recycling program in place since the early Nineties; all campus paper and container recycling, desk side collection, separation bins in each residence hall room, reuse programs, full scale food scrap composting and a recycling rate near 50%. The recycling program, and the vision of the students who started it, has provided the foundation and campus model for other sustainability efforts on campus. A comprehensive solid waste management plan is essential to the sustainable operations of a campus and is an excellent starting point for building a sustainable campus. This eight minute session will track the evolution of the Ithaca College program and present our plan for comprehensive sustainable solid waste management. It is hoped that our vision will help other colleges and universities be agents for change in how solid waste is managed in the US.

4:00 Reducing Our Waste: A Campus-Community Sustainability Partnership

John Hickey, VP Finance, University of Puget Sound. hickey@ups.edu

Sometimes in our enthusiasm to improve the sustainability of our campus operations and infuse sustainability principles into our curriculum we look past one of our greatest resources and opportunities to make an impact—our surrounding community. Each college and university campus has home town and neighborhood. The sixth action point of the Talloires Declaration challenges institutions of higher education to “involve all stakeholders” and to “expand work with community and nongovernmental organizations to assist in finding solutions to environmental problems.” At the University of Puget Sound we have taken this point to heart as we have formed a campus-community waste reduction task force. This task force of students, faculty, staff, local business leaders, city officials and residents of the surrounding community has analyzed the waste streams both on and off campus, prioritized aspects of the waste stream for improvement, developed indicators to track progress, and adopted social marketing strategies to foster sustainable behavior both on and off campus. We would like to share our experiences in this field report and learn from other institutions taking on the challenges of working with their surrounding community to promote environmentally sustainable behavior.

4:10 Pursuing Environmentally and Socially Sustainable Custodial Practices at Rice University

Richard Johnson, Sustainability Planner, Rice University. rrj@rice.edu

The custodial group within Rice University's Facilities Engineering and Planning Department has implemented a number of programs and practices that fall under the headings of environmental and social sustainability. Experiences with green cleaning practices, custodial training programs, and family-friendly work schedules are discussed. Benefits and key learnings from these programs and practices are distilled.

4:20 Universities Leading the Way for California's Clean Energy Future

Stephen Miller, Program Director, Strategic Energy Innovations. stephen@seiinc.org

On the surface, solar and other clean energy technologies are the obvious solution to California's growing appetite for energy consumption. This presentation will focus on opportunities and ongoing efforts for California universities to take the lead in directing our alternative energy future. Specific efforts to highlight in this session include:

- California's Solar Initiative (CSI) – The State's first long-term (10 year) solar energy incentive program is paving the way for California colleges and universities to meet their clean energy standards while substantially increasing the State's installed solar energy capacity.
- Bioenergy in the Central Valley – Farmers in California's fertile Central Valley are partnering with academia to advance research, development and commercialization of vital sustainable agriculture technologies and practices.
- Community-based Clean Energy in the Northern Sacramento Valley – North State Renewable Energy (NSRE) is organized out of Cal State Chico, connecting area universities/colleges, along with municipal, commercial and community members around renewable energy through targeted outreach and vocational training & support.
- California Partnership for the San Joaquin Valley – Established in June 2005 by Governor Schwarzenegger's executive order, the California Partnership is working with area institutions of higher education to identify strategies to leverage clean energy to encourage economic revitalization of the region.

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4:30 Move-out Green! Fostering Reuse and Recycling During Move-out Week

James Vance, Supervisor of Custodial Services, University of Puget Sound. jvance@ups.edu

Residential students present a unique waste stream challenge in that they establish and then vacate living quarters each year. The challenge becomes most visible during “move-out” time, when most students have large volumes of goods to “unload” before heading home. In the past move-out week demands were simply met with increased access to dumpsters bound for landfills, without adequate systems set up for reuse and recycling. In the spring of 2005 the University of Puget Sound facilitated reuse and recycling during move-out week with impressive results. We halved the amount of solid waste we produced during this time compared to the previous year, producing 32 tons less waste. Approximately 20 tons of this reduction was diverted into recycling, while 12 tons were reused. We are still reviewing the results from the spring 2006 sustainable move-out effort. Despite our success, we still face several significant challenges including: ensuring volunteer and staff support during the busiest week of the year, ensuring safety during waste sorting, providing aesthetically pleasing facilities, partnering with local groups and government agencies, and reducing consumption during the “move-in” periods. We would like to share our innovations and gain feedback on our challenges by providing a field report on our sustainable move-out efforts.

4:40 Relating Environmental Attitudes to Behaviors for San Jose State University Students

Katherine Cushing, Assistant Professor, San Jose State University. kcushing@email.sjsu.edu

The purposes of our research project were to 1) assess key environmental attitudes and behaviors of the current student body and 2) determine if any statistically significant relationships exist between attitudinal, behavioral, and demographic variables. To accomplish these goals we designed and administered an original survey during the spring of 2006 and administered it to over 300 currently enrolled students.

Our findings indicate that the large majority of students are strongly supportive of a wide range of environmental issues, ranging from increasing student fees to fund campus environmental improvements to increasing the use of alternative energy. However, many are misinformed on major environmental topics (e.g., climate change, drinking water quality). The attitudes and behaviors of our students are quite similar to those of the general U.S. adult population. Finally, using two-way contingency analyses, we found a strong statistical relationship between attitudes and behaviors and between student status (i.e., undergraduate versus graduate) and environmental behaviors.

Panels, Roundtables and Workshops

C7 Panel: Integrating Sustainability Throughout a University’s Core: A Case Study of the University of New Hampshire’s Energy and Climate Initiatives

UNH Energy Task Force: One Innovative Means by which the University of New Hampshire is Meeting its Climate Protection Commitment

Tom Kelly, University of New Hampshire. tom.kelly@unh.edu

As a Climate Protection Campus, the University of New Hampshire (UNH) is committed to reducing its emissions of greenhouse gases, improving energy efficiency, and educating students, faculty, and staff about the relationships among energy choices, climate change, and economic and social well-being. From its integrative, cross-departmental structure to its fostering of links among curriculum, research, and operations on campus, to its empowerment of its members to think outside the box, the UNH Energy Task Force (ETF) is a case study from which other institutions can learn. Chaired by a UNH vice president, the ETF has faculty, staff, and student members from across campus. From its establishment, the ETF used creative problem-solving to develop initiatives that have already reduced energy use, emissions, and costs. Faculty members on the ETF teach a wide variety of courses that help students understand the climate system and its relationship to ecological and human health. Many also conduct research that informs UNH’s involvement in outside scientific studies and policy development. The ETF also supports the involvement of faculty, staff, and students in collaborative research around campus operations. Synergistic efforts like the ETF are what’s needed on more campuses to help lead the way in addressing climate change.

Investment in Energy Efficient Operations and Management: An Investment in the University of New Hampshire’s Future

Sara Cleaves, University of New Hampshire. sara.cleaves@unh.edu

For over 25 years, the University of New Hampshire (UNH) has conducted an on-going energy efficiency program. As a result, UNH has saved several million dollars. In its peer group, UNH is in the top five percent for energy efficiency. But UNH views operations and management as more than just how the University is “run” and powered. Through the UNH Energy Task Force, the UNH Energy Office works with others on campus to conduct energy awareness programs that encourage conservation. As a result of UNH’s continued investment in not only more efficient operations but also in conservation education, UNH’s overall energy efficiency will only improve in the coming years. For example, this year starts the first full year of operations of UNH’s new 7.9MW Combined Heat and Power plant, forecast to save the university over \$20 million in energy costs, reduce campus greenhouse gas emissions by approximately 40%, and dramatically improve energy security and flexibility through its dual fuel capabilities. What’s more, within two years UNH hopes to be operating the plant on landfill gas from a local landfill facility, further improving efficiency and lowering emissions by supplying energy to the campus from a renewable resource.

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Branding Clean Fuel Vehicle Fleets: The University of New Hampshire's Eco-Cat Program

Steve Pesci, University of New Hampshire. steve.pesci@unh.edu

The University of New Hampshire (UNH) is a Climate Protection Campus committed to conserving energy and reducing greenhouse gas and toxic emissions. Key to this commitment is the university's investment in clean and alternative fuel fleet and infrastructure. By August 2006, approximately half of the University's extensive transit fleet became part of a "clean fleet" program with one-third run on alternative fuels. UNH's Clean Fleet vehicles include low emission biodiesel and CNG buses as well as electric, hybrid, B20 and CNG general fleet vehicles. Viewing its entire suite of Clean Fleet vehicles as moving educational opportunities, UNH has developed a unique 'Energy-Star' equivalent branding campaign targeted at the larger community, grantors, and elected officials. The campaign highlights the importance of clean-fueled, accessible transportation in a comprehensive energy and climate action policy. The presentation will focus on UNH fleet and infrastructure efforts to date; the educational campaign and new programs relating to rental car vendors, anti-idling initiatives and procurement standards.

Towns, Gowns and Climate Changes: Connecting UNH to Political Debates about Climate Policy

Stacy VanDeVeer, University of New Hampshire. stacy.vandever@unh.edu

This presentation describes and assesses efforts by UNH faculty, staff, administrators, and students to enhance the connections between individuals and institutions within the University community and political debates and policymakers beyond the campus. Particular attention will be given to the activities of students, faculty and staff associated with several environmental and sustainability oriented courses, as well as those involved in the University's Office of Sustainability (OS), Climate Education Initiative (CEI), and Energy Task Force (ETF). For example, several faculty and student collaborative research projects have analyzed university, municipal, state, and national climate change and energy policy options. This presentation will also explore and explain how OS, CEI and ETF can be used to gauge, bring together, and integrate faculty and student research, such as through the hosting of conferences and workshops on campus. Curricular and research efforts at UNH around climate change demonstrate how the University can pursue its land grant mission of public engagement even as it enhances its 'branding' as a university working at the forefront of contemporary political, social, and technological issues.

C8 Panel: Campus Environmental Management Systems: Where are We/Where are We Heading?

Moderator: Thomas Balf, Director, Campus Consortium for Environmental Excellence. tbalf@c2e2.org

Gioia Thompson, University of Vermont. Gioia.thompson@uvm.edu

Harvest Collier, University of Missouri-Rolla. hcollier@umr.edu

The panel discussion will include three presentations, together with active discussion and dialogue. Tom Balf will unveil the survey findings from the C2E2's Campus EMS Benchmark Survey and explore the relationship between campus sustainability projects and EMS program implementation. Gioia Thompson, Sustainability Coordinator at the University of Vermont will discuss her experience co-teaching an EMS class and subsequent student projects designed to adapt the United Kingdom's EcoCampus framework on the UVM Campus. Harvest Collier, Vice Provost for Undergraduate Studies, University of Missouri Rolla, will discuss his university's experiences in implementing a comprehensive EMS and provide insights into campus EMS opportunities and challenges as chair of the EMS Working Group which is collaborating with the U.S. Environmental Protection Agency as part of the college/university sector strategies initiative.

C9 Panel: Mountain Air Makes You Smarter: Seeking Sustainability at 7000 Feet

Challenges of Platinum Certification at High Altitude

Paul Dufek, Project Manager, Applied Research and Development Building, Northern Arizona University. paul.dufek@nau.edu

A Coordinated Approach to LEED Certification at NAU

Mark Wilhelm, Green Ideas, Inc. , and Chair, U.S. Green Building Council-Arizona. mark@Egreenideas.com

Paul Davila, Director of Operations, Northern Arizona University. paul.davila@nau.edu

Using LEED Buildings as Educational Tools

Tom Weinert, Environmental Engineering, Northern Arizona University. tom.weinert@nau.edu

Converting to Renewable Energy: A Major New PV Installation and Two Biomass Generators

Mark Flynn, Executive Director, Capital Assets, NAU. mark.flynn@nau.edu

This panel describes unique projects and unexpected challenges for sustainable construction and building operations in the rarefied atmosphere, intense solar radiation and arid forest conditions of Northern Arizona University in Flagstaff, Arizona. Find out how NAU has faced up to these challenges with new innovations by working with the Arizona Chapter of the U.S. Green Building Council, with Arizona Public Service (APS) and with the Flagstaff Forest Partnership.

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C10 Roundtable: Aligning for Sustainability in Academia

Moderator: Lorinda Rowledge, Provost, Bainbridge Graduate Institute. lorinda.rowledge@bgiedu.org

Kate Lancaster, Associate Professor of Accounting, Bainbridge Graduate Institute and Cal Poly San Luis Obispo. klancast@calpoly.edu

Why should I be interested in sustainability? How can we engage students' interest in sustainability? Is there a way to break through the barriers faculty see to incorporating social justice and environmental sustainability issues into their courses? By what means can we convince academic administrators to incorporate sustainability concepts and competencies into higher education programs? What critical knowledge/competencies are needed for the sustainability-related challenges of today's and tomorrow's world (e.g., cross-cultural competence, understanding of globalization and social justice, adaptation to global warming, transformational leadership, systems thinking, etc.)? What are the barriers to institutionalizing sustainability in all sectors of higher education? These are but a few of the questions and responses you may hear from students, faculty, and administrators when the topic of sustainability is brought up in the class or in the hallway. How does one address these questions and facilitate change in a traditional program?

This roundtable session will use a highly interactive group "creativity session" process to more deeply understand the challenges and develop effective response strategies. Dialogue will result in actionable solutions that open the way for change.

C11 Workshop: Campus Climate Challenge

Kristin Kranendonk, National Coordinator, Campus Climate Education & Action, National Wildlife Federation

Campus Climate Challenge. kranendonkK@nwf.org

Melissa Fries, Fellow, Campus Ecology, National Wildlife Federation. fries.33@osu.edu

Kristy Jones, Manager, Campus Ecology, National Wildlife Federation. jonesk@nwf.org

Slowing global warming is the defining challenge of the youth generation. Despite a 15-year scientific consensus on the gravity of the threat, our parents' generation has not been able to slow the rate of carbon pollution into the atmosphere. We need new solutions. This workshop will encourage participants take the Campus Climate Challenge, leading and identifying steps to slow global warming on their campuses. For example, secure funding from the campus or through fundraising efforts to purchase substantial amounts of clean energy, conduct a greenhouse gas inventory on campus and distribute the results to the campus and administration with steps for emissions reduction, draft policies for new campus buildings to have energy efficient design, lobby the procurement office to purchase green materials and more. Case studies of best practices and available resources will be presented through a presentation and small group breakouts. The Campus Climate Challenge is an initiative of Energy Action, a collaboration of over half a dozen major youth and campus organizations in the U.S. and Canada.

C12a Panel: Environmental Sustainability across Carnegie Mellon (45 mins)

3:30 Melissa Cicozi, Assistant Head of Design, Carnegie Mellon University. cicozi@cmu.edu

Barbara Kviz, Environmental Coordinator, Carnegie Mellon University. bk11@andrew.cmu.edu

M. Shernell Smith, Carnegie Mellon University. mssmith@andrew.cmu.edu

Carnegie Mellon has been a leader in many aspects of environmental research –ranging from water and air quality to green design and chemistry to environmental history and eco art. Adopting environmental sustainability as a strategic priority, we have now intentionally infused it into our education and practices. This panel discusses three facets.

- The overarching themes and assessment of environmental literacy for our Luce Foundation-funded project on “greening” our education.
- The work of the Green Practices Committee to “develop university practices that improve environmental quality, decrease waste, and conserve natural resources and energy, thereby establishing Carnegie Mellon as a practical model for other universities and companies.”
- Student leadership, service-learning experiences, action-oriented cross-campus collaborations in sustainability practices centered in our New House Residence Hall, the first LEED silver certified residence hall at a university.

We will describe our methods and lessons learned so far in education through:

- Ecological knowledge and processes of learning, doing and understanding the environment through the lenses of diverse subject areas; and building a community of faculty across disciplines
- Sustainability practices and ethos across the campus
- Organizations and practices in which students and university staff collaborate closely in fostering an environmentally conscious community.

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C12b Workshop: But Does It Work? Operational Lessons from Building Green (45 mins)

4:15 Organizer: Bruce Alperin, Director of Strategic Initiatives, Aramark Higher Education. alperin-bruce@aramark.com
Steve Guenther, Vice President for Operations, Aramark Higher Education. Guenther-Steve@aramark.com

The push to build green is sweeping the nation. Yet, often it seems the tiered certification system inadvertently places greater emphasis on developing a building that achieves the correct color (silver, gold, platinum) than on a building that actually operates correctly. Vanguard projects are commended for pushing innovation in green design. Yet, in the euphoria to be in the forefront of sustainable design, owners may receive buildings that are unsustainable operationally. The lost voice in the green building process is often that of the operations and maintenance staff. What happens after a project has been turned over to a campus' operations and maintenance department?

This session will offer green buildings from the perspective of the owner, those whose must live with and operate the facility every day. How can institutions assure that a green building's long-term environmental, economic, and social benefits truly outweigh its short term publicity value? Which systems best lend themselves to sustainable success and which should be approached with caution. Drawing from the commissioning and operating experience of traditional and alternative technologies, this session will present cautionary tales, lessons learned, and recommendations for long-term green building success.

Friday, October 6 Session D (8:30-10:00) Papers

D1 Whole Campus Approaches to Sustainability

8:30 Creating a Culture of Sustainability

Gary Deason, Northern Arizona University. Gary.Deason@nau.edu
Heather Farley, Northern Arizona University. Heather.Farley@nau.edu
Mike Madigan, Northern Arizona University. mdm92@nau.edu

In February, 2004, Northern Arizona University approved a ten-point plan for advancing sustainability campus wide. A steering committee has been working to implement the plan at all levels of the University including facilities, operations, food service, student activities, teaching and curriculum. This effort has resulted in the founding of a network of representatives from different offices interested in learning more about day-to-day sustainable practices, touring sustainable sites in the area, and sharing what they learn with their colleagues. The network produces the monthly "Greenwise Bulletin" circulated on campus and a green practices manual distributed widely across campus. Come and hear about this grassroots effort to "create a culture of sustainability" and find out how to access your own copy of the "Green Practices Guide."

8:50 Whole-College Approaches to Sustainability in Teacher Education in Jamaica

Marceline Collins-Figueroa, Lecturer, Institute of Education, University of the West Indies, Mona, Kingston, Jamaica
Mona. mcolfig@yahoo.com

Two teachers' colleges in Jamaica have piloted whole-college approaches to environmental education for sustainable development. Recently, these colleges are demonstrating how to reorient teacher education towards sustainability through a variety of strategies including:

Curriculum revision that infuse ecological, social and economic concerns and develop new courses on sustainable development;
Institutional transformation that involves shared visions, decision-making and commitment of all sectors of the colleges around stewardship of resources, college greening, and socio-cultural institutional practices and policies;

Professional development that aims to build knowledge, skills, and competencies for improved teaching and learning approaches, and capacity for developing change agents with an ethic of sustainability;

Development of strategies for research, monitoring and evaluation of whole-school programs;

Forming partnerships with external organizations that facilitate financial and technical support for planning and implementation of activities aimed at moving the institutions towards sustainable futures.

The paper will analyze the changing practices and tensions within the college communities, and discuss how some of the tensions are being resolved. It ends by identifying success factors that facilitate the reorientation of teacher education towards sustainability.

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9:10 An Integrated Approach to Sustainability at the University of Rochester

Rebecca Neville, Campus Sustainability Intern Coordinator University of Rochester. rebecca.neville@rochester.edu

This paper will present a concept for an integrated approach to sustainability and will discuss the proposal for the creation of a holistic sustainability institute at the University of Rochester. These conclusions and this proposal are the culmination of research completed over a year and a half by three sets of student interns and independent study researchers (including five student interns during Summer 2006). The presentation will highlight the process through which students individually and jointly researched sustainability and its implementation in the areas of curriculum, research, community outreach, and residential life. The collaborative process through which the students worked to build both a grassroots-level and administrative-supported sustainability movement will be emphasized. Our conclusions are based on in-depth synthesis of work done by other peer institutions and our process of identifying and working to overcome challenges that arise when working in a very decentralized, major research institute. Many colleges and universities have undertaken sustainability initiatives that have either focused on greening the campus or on developing sustainability curriculum. Whereas these initiatives have been important in raising the profile of sustainability in higher education across the nation, our research has identified the urgency of pursuing an integrated, University-wide approach.

9:30 Productive Collaboration: a Whole Systems Approach to Sustainability

Robert Koester, Professor and Director, Ball State University. rkoester@bsu.edu

Presents a case study of a large publicly supported Midwestern University actively engaged in the Greening of the Campus movement for the past 15 years. The session presents a whole systems approach to institutional transformation, which enables the productive collaboration of students, faculty, staff and local community members. The approach broadens awareness, enriches understanding and conveys the implementation ability needed for all participants to take initiative, track achievement and stimulate continuing transformation through informal and formal collaborative structure.

The approach can transform curricular offerings, operational practices, facilities design, and community cooperation. One of the products of this approach is a tracking of the throughput of resources used to manage the upstream and downstream ecological footprint of the institution.

Relevance of the proposal to the conference themes: Colleges and universities cannot address the challenges of sustainability in a fragmented fashion; rather they must empower the many fragmented members of the academic community to affect institutional transformation.

A whole system approach must be used for the strategic thinking, tactical planning and use of multiple metrics for implementing the processes of transformation and evaluating the resulting achievement.

D2 Walls and Windows: The Case for Green Building

8:30 Building a Case for Sustainability in Higher Education Facilities

Jordan Lerner, Abacus Engineered Systems. Jordan.Lerner@abacus-engr.com

Growing concerns about the long-term impact of buildings on the environment, and the health, comfort, and more recently productivity of building occupants, have spawned a rapidly growing trend in facilities – the high performance building. We will show how their key decisions around the facility's return on investment, occupant productivity, process efficiency, asset lifespan, energy volatility, and marketplace drivers impact the value returned from the high performance facility. We will provide clarity on how market drivers will forever change the way building assets are viewed for years to come. This paper will highlight high profile facilities, such as Central Washington University. Through these case studies, we will show how regional performance initiatives sponsored by private and public partnerships can stimulate institutional and commercial improvement.

8:50 Environmental Metric Development and Reporting at the University of Michigan

Andrew Berki, Environmental Stewardship Coordinator, University of Michigan. aberki@umich.edu

The University of Michigan (U-M) is one of only two public institutions consistently ranked in the nation's top ten universities and now contains over 29 million square feet of infrastructure in 19 schools/colleges, serving 39,000 students and 33,000 full-time employees on the Ann Arbor campus.

In 2003, University President Mary Sue Coleman established an Environmental Task Force to “develop a plan for the University of Michigan to create a more sustainable future.” The Task Force was charged with identifying indicators which best measure the progress of the University with respect to environmental performance, and to investigate how these indicators might be measured and reported.

The following metric categories were selected as a set of measurable and reportable environmental performance indicators that best captured the environmental footprint of the U-M Ann Arbor campus. These indicators were chosen for their significance of impact, campus-wide applicability, and availability of data. The indicator categories are:

- Energy: Buildings and Transportation
- Water Use
- Land Use
- Emissions
- Solid Waste and Recycling
- Cross-Cutting and Emerging Issues

This presentation will discuss the reporting process, present environmental metrics and data, and highlight several successful programs implemented in the operational functions of the university.

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9:10 As Easy as Opening a Window?

Jim Kalvelage, Principal, Opsis Architecture/Western Washington University. jim@opsisarch.com
Matthew Younger, Stantec Consulting. myounger@stantec.com

Natural ventilation systems for higher education buildings on the West Coast hold tremendous potential for reducing operational and maintenance costs for the life cycle of the facility, in addition to providing increased user control and healthier environments for faculty, staff, and students.

Planning for these systems requires an integrated approach, both on the part of the design and engineering team, and on the institution's side. Understanding the implications for mechanical systems, controls, acoustics, and structural engineering can ensure the building will perform as expected. Working closely with building users, facilities staff and university administration to verify what building areas are appropriate for natural ventilation and how sustainable systems effect daily life in a building is also key to successful implementation.

This presentation will provide an overview of the natural ventilation strategies planned for the Western Washington University Academic Instructional Center, a 107,000sf building slated to begin construction in July. With classrooms, lecture halls, offices, labs and clinics, the building includes a diversity of building systems strategies and a variety of users. Learn how the plan for sustainable design success in this facility started with the early planning, and will be monitored after completion with post-occupancy surveys.

9:30 If These Walls Could Talk - Connecting Buildings and People

Philip Ling, VP Technology, Powersmiths International Corp.. pling@powersmiths.com

Many building elements, including the systems that distribute our energy, fresh air, and water are invisible to all but the handful of specialists directly involved with metering and managing them. In the case of a "green" building, many positive decisions have been made, yet they remain to a large part invisible to the daily building hustle and bustle. Imagine how these benefits could be multiplied if only their story was told outside the curriculum, for all to see and hear. By using our buildings as teaching tools, we can access thousands of open minds outside the curriculum, helping educate today's and tomorrow's generations about how to play a role in moving towards a sustainable world. In an attempt to humanize the connection between our building systems and occupants, this paper will explore going beyond describing how a product is performing in the building - to show how our product and design choices affect not just OUR environment, community and economy, but also those associated with the product's resource extraction, manufacture, and ultimately, disposal. It will show how the information not only educates, but provides positive reinforcement to the evolving campus purchasing process.

D3 Multidisciplinary Programs

8:30 The Greening of a Professor: Committing to a Sustainability-Themed Honors Program

Heather Burns, doctoral student/adjunct professor, Portland State University and University of Portland. hburns@pdx.edu
Laura Steffen, Coordinator for Sustainable Entrepreneurship University of Portland. steffen@up.edu
Co-Author: Ed Bowen, Ph. D., Associate Dean, College of Arts & Sciences, University of Portland. bowen@up.edu

Ed Bowen, Director of the University of Portland's Honors Program, has developed a sustainability-themed honors program that begins with a week-long colloquium for high-achieving freshman from all majors. The week will focus on food issues, starting with lessons on local food and moving to regional and global issues. The roundtable will discuss the evolution of the colloquium curriculum and the challenges of choosing a theme that allows students to learn about sustainability in an engaging and empowering way without being completely overwhelmed and depressed.

UP's Honors Program is built around the University's fundamental questions, which inform the entire core curriculum, including "Who am I becoming?", "How does the world work?", "How could the world work better?", and "How do relationships and communities function?" By weaving the topics of food, food security and sustainability into discussions around the fundamental questions, Ed hopes to create an intense week-long experience that springboards the students into becoming catalysts for change on campus and in the world. By October, the weeklong colloquium will be completed, and we hope to share best practices and gather suggestions from the audience for continuing the honors students' sustainability education throughout their four years on campus and beyond.

8:50 Inventing a Multidisciplinary Graduate Certificate in Sustainability

David Ervin, Professor, Portland State University. ervin@pdx.edu

Portland State University began building a novel graduate certificate in sustainability in 2002 that is now flourishing. The certificate offers an integrated set of courses that comprise a multidisciplinary study of the environmental, social and economic dimensions of sustainability. Students receiving the certificate complete 6 linked classes (1) environmental sustainability; (2) social sustainability; (3) economics of sustainability; (4) integrating sustainability using case analysis, and two focus electives.

It is based on the philosophy that sustainability is a scientific approach that is relevant to all disciplines across campus. The students gain an understanding of the major theories and concepts related to all dimensions of sustainability, as well as case analysis experience with applications to real world projects. The program resides in Interdisciplinary Studies and is administered through the Office of Graduate Studies.

This paper describes the multidisciplinary process used to create the certificate, the patterns of enrollment, the evolving content of the core classes, the challenges of teaching to multidisciplinary graduate audiences, and the administrative challenges in implementing a campus-wide program. The co-learning by core course instructor teams is also assessed. Recommendations are offered for other universities that may be interested in creating such a program.

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9:10 Transdisciplinary Foundations and the Education of Tomorrow's Leaders

Lewis Gilbert, Associate Director, The Nelson Institute for Environmental Studies at the University of Wisconsin, Madison.
gilbert2@wisc.edu

There is broad agreement that sustainability, however it is operationalized, will require a strong cadre of people with great facility in working across traditional disciplinary boundaries. Traditional solutions to this challenge have focused on delivering the right set of concepts through broad curricula. Among other critiques, this approach cannot possibly anticipate all of the challenges a cohort of students will encounter throughout their careers. In the Nelson Institute, we are addressing this problem through the development of a pedagogical framework that delivers disciplinary depth and a set of competencies that facilitates breadth through participation in and management of transdisciplinary teams. Talented students from different disciplinary backgrounds will join thematic communities associated with our research centers and develop disciplinary strength through completion of traditional degree requirements. Inter/Transdisciplinary needs will be addressed through completion of a common core curriculum focused on issues of variance in epistemology and rules of evidence, team building and management, and stakeholder engagement and management. This framework will be applied in both our professional and Ph.D. programs with appropriate adjustments between practical and theoretical topics.

9:30 The Emergence of Interdisciplinary Graduate Education for Sustainability

Dhara L. Kothavala, Researcher & Projects Manager, MBA, Admitted Ph.D. candidate, Arizona State University and Prescott College.
dharavala@usa.net

This paper explores transforming higher education from the perspective of graduate students pursuing advanced degrees in multi-disciplinary fields related to sustainability; and administrators and faculty delivering sustainability education at the graduate level. Even at leading universities engaged in sustainability education, there are few, if any, faculty trained and degreed to teach 'Sustainability.' By its nature, sustainability encompasses all traditional campus departments – law, literature, business, science, arts, psychology, policy, engineering, communication, architecture, anthropology, etc. How then do we make accredited graduate programs in Sustainability available to well-qualified applicants – many of whom already have education, experience and specialized interests in the field? As university administrators, faculty and students transform graduate education, they contend with accreditation, school and department reporting structures, hiring, attendance, funding, program requirements and careers. Students, meanwhile, may require mastery of equal portions of multiple disciplines, such as geography/energy/policy for climate change; or conservation biology/economics/forestry for wildlife conservation, or communication/ psychology/business for social behavior modification, etc.; and need multiple areas of depth to establish academic competence in the field.

This paper highlights trends, successful approaches, Ph.D. candidate recommendations, and leadership examples as colleges and universities transform higher education to prepare tomorrow's leaders in sustainability scholarship and practice.

D4 Approaches to Sustainability Education

8:30 The Universe Story, Sustainability, and Higher Education

Paul Morgan, Associate Professor, West Chester University of Pennsylvania. pmorgan@wcupa.edu

This workshop challenges participants to go beyond the low-hanging fruit of sustainability by promoting a new integrating narrative for higher education: the universe story. I argue that while much can be accomplished within higher education's utilitarian industrial philosophy, more fundamental changes are required. Hyper-specialism and a discipline-centered structure contradict basic lessons of inter-connectedness. Likewise, sustainability course requirements are welcomed, but left mostly untouched is the cafeteria-style curriculum that provides no overall coherence or meaning. If there has been no demand for an integrating narrative it is because the de facto aim of higher education is still training professionals (albeit green) for the economy. If the challenge of sustainability is ultimately how to be more instead of consume more, then we need a new understanding of ourselves. This process begins with world-view creating questions, including 'How did we come to be?' Some good answers are provided by the disciplines, but the dots have not been connected – the story has not been put together as the backbone of the curriculum. The centerpiece of the workshop is a multi-media presentation of this cosmology, followed by small-group discussion of the implications of this narrative for a coherent new liberal arts education.

8:50 The Naïve Dream of the Return to Nature: A Depth Psychological Perspective on Environmentalism

Lori Pye, Professor, Santa Barbara City College. lori@mythology.org

Ecologists use the word 'ecosuicidal' for populations of humans who are behaving in such disconnected ways as to destroy the resources they depend on for their survival. Disconnection is not the main problem, as the challenge posed by a suicidal personality is that the person lacks even the awareness of the disconnection. The disconnection has become the natural state. The fact that the field of environmentalism is dominated almost exclusively by scientists, is responsible for a poverty of insights about the unconscious aspects of such ecosuicidal behaviors. For information to become education, and for education to become activism, something of a psychological nature needs to happen, a feeling that ignites passion for an ideal.

Environmental education is asking anew the basic question at the core of all mythologies: What are the stories of our disconnection with Nature? What value are we to give to Nature and to Life itself? How are we to feel our interdependence with Nature? The knowledge accumulated by the science of ecology needs to include the psychology of ecology, in order to move from logos to mythos, to move from dialogue to action. Only then can it generate the kind of power that brings about revolution.

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9:10 How Can We Clone the "Green Gene"?

Betsy Rosenberg, Host/Executive Director, EcoTalk Radio. betsyrosenberg@cs.com

Betsy Rosenberg, creator and host of the nationally syndicated radio program EcoTalk, shares views on 'environmentalism' to foster new ways of thinking about nature, and acting accordingly - to facilitate more internalization of the challenges we face. How can we frame the national discussion (through media, education, etc.) so that others perceive the real benefit in changing our approach to living (instead of the perceived sacrifices)? Betsy will explore the sociological aspects of environmental consciousness and stewardship from her perspective within the media and share her views on how to clone the "green gene" in American culture, and how essential it is to do so.

9:30 Toward a Beauty-centric Education

Sandra Lubarsky, Director, Master of Liberal Studies Program on Sustainable Communities Northern Arizona University.
sandra.lubarsky@nau.edu

Sustainable education should teach strategies for life affirmation. Yet, many people involved in educating for sustainability maintain "critical thinking" as an essential educational goal. But critical thinking has its philosophical home in a mechanistic world view in which knowledge is the detached examination of parts. The very assumptions that undercut sustainability slip back in when we focus on critical thinking. What is required is a new center, one that includes but is not limited to logic-based assumptions. A beauty-centric education would involve refining and enlarging sensitivities through increased knowledge, direct experience and expanded relationships. The pull of beauty is toward wholeness, contribution, compassion, and enjoyment. These are the values on which sustainable education must begin to ground itself. Drawing on the thought of philosopher, Alfred North Whitehead and architect, Christopher Alexander, this paper will lay out an argument for beauty-centric education as sustainable education.

D5 Engaged Students and Staff

8:30 Tangible Evidence for Smart Design in a Green World

David Damon, Senior Associate, Sasaki and Associates. ddamon@sasaki.com

The primary audience of higher education – students – may have the greatest future influence on environmental stewardship. Sustainable issues among students go from global reach to policy to building design. Too often only university administration is engaged in key decisions, yet the true audience for collegiate architecture is the undergraduate. A survey of sustainable issues, solicited to students throughout the United States, found a cross section of views and opinions. This session will outline what sustainability means to students and how this should influence design on campuses.

The design for student life on campuses offers untapped potential to align student values with physical academic settings and to align institutional vision with smart buildings. All buildings impact people and place, but the audience of collegiate buildings may have the opportunity for the greatest future influence on environmental stewardship.

Institutional policies and operations are often obstacles to change – perceived or absolute – as a result of environmental initiatives. Projects must cooperate with institutional standards for building systems, fixtures, and products, to ease campus-wide facility management. However, if the standards do not align with the vision, we must sometimes challenge and change our paradigm to improve our built world.

8:50 Engaging College Students in Energy Efficient Strategies in Their Community

Mildred C. Dandridge, Senior Program Director, Strategic Energy Innovations. mildred@seiinc.org

Strategic Energy Innovation's award winning Awareness for Communities about Energy (ACE) program engages college students, their campus and the community in energy efficiency strategies and the issues related to energy consumption. The ACE program trains college students to perform energy audits. The students use this training in some or all of the following:

1. To perform an energy audit of their campus, to analyze the data and write a report that includes recommendations for savings, amount of yearly energy and dollar savings for each recommendation, and strategies students can undertake to influence no cost behavioral changes.
2. To perform audits of small businesses, affordable housing facilities and residences to decrease electricity expenses and greenhouse gases through energy conservation and efficiency techniques.
3. To mentor high school students as they perform school, small business and/or residential audits.
4. To mentor elementary school students as they help elders living in affordable housing facilities save money on utilities bills and reduce greenhouse gases through energy conservation techniques. This session will provide a description of the ACE program.

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9:10 Beyond Compliance: Using Compliance Programs to Launch and Leverage Sustainability Initiatives

Joy Grillon, Senior Project Engineer Woodard & Curran. jgrillon@woodardcurran.com

In recent years, colleges and universities have enhanced their compliance programs and in many cases moved beyond compliance to improve sustainable practices across the campus. This session will describe examples in which colleges and universities can leverage specific compliance programs toward more sustainable practices, thereby ensuring compliance with regulations, improving the sustainable development of the campus environment, and saving money.

Using specific examples, we will demonstrate how colleges and universities can improve compliance programs in areas such as waste management, air emissions, wastewater, and stormwater management by implementing sustainable practices. Examples will include practices such as material replacement or substitution, conservation measures, environmentally preferable purchasing, and engineering modifications. We will also discuss a road map for institutions shifting from a compliance focus to a sustainable program and reducing their compliance burden in the process.

This session will be of particular interest to those campus professionals interested in ensuring that sustainability programs are well-integrated with compliance programs and who are seeking opportunities to reduce complexity and cost across the campus value-chain.

9:30 Re-inhabiting the Lost Landscapes of Sustainability in the Community

Terril Shorb, Core Faculty Prescott College. tshorb@prescott.edu

The emerging sphere of sustainability generally includes ecological and social elements in its focus. In higher education, however, the approach often fails to engage neighbors and decision-makers in communities in ways that advance genuine sustainability, defined by the author as right relationship with the natural world. This paper offers a developmental narrative of the Sustainable Community Development program at Prescott College, one of the first established in the U.S.(1998), to offer a dedicated undergraduate degree emphasis on what might be called the two lost landscapes of true sustainability: restoring intimate, direct human relationship with local nature, and, reweaving relationships among humans working toward a more sustainable future in their community-of-all-life. The paper offers glimpses into this unique program through experiences of its students who grow their studies from actual needs of their respective communities, nourished by local human mentors and tutors of the natural world. This program takes the "loom" out of gloom, the "do" out of doom, and invites students to weave a more sustainable world one natural neighborhood at a time.

Panels, Roundtables and Workshops

D6 Panel: Making Sustainability Social

Moderator: Dave Newport, Director, Environmental Center, University of Colorado at Boulder. dave.newport@colorado.edu

Hunter Lovins, Natural Capitalism Solutions, Inc.

Beatrice Barr, MBA candidate, Presidio School of Management

Discussions by panelists of higher education sustainability projects designed primarily to deliver social benefits, lessons learned, and what additional observations and suggestions audience members have to enhance the integration of social benefit planning.

Discussion of criteria by which to plan and measure the effectiveness of social-sustainability projects includes:

- 1) Extent to which social equity outcomes were planned for and designed in to the project/program/course/whatever form the beginning
- 2) Identify origin of resources utilized to accrue social benefits of project.
- 3) How was the extent of social benefits tracked and/or measured?
- 4) What new tools and/or methodologies to enhance social benefits were developed, identified, or recommended for future projects?
- 5) What new partners and/or social/cultural (non-environmental) constituencies were involved in the project? What was their reaction/recommendation?
- 6) What was the reaction of campus/community leadership to the increased social benefits of the project? How has that helped/hindered future planning?
- 7) How was a return on investment calculated/quantified--and did the project measure up?

Following the panelists brief presentations, the panelists will query audience members asking for their comments and suggestions in order to stimulate a robust dialogue.

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D7 Roundtable: Thinking Beyond the Campus Boundaries

Moderator: Kristine Kenney, Senior Associate Mithun. kristinek@mithun.com
JP Kemmick, Student, President of GREAN, Pacific Lutheran University. kemmijp@plu.edu
Dave Kohler, Director of Facilities, Pacific Lutheran University. kohlerdl@plu.edu
Sheri Tonn, Vice President for Finance and Operations, Pacific Lutheran University. Sheri Tonn tonnsj@plu.edu

This session will provide a forum for exchange of information and strategies on the social dimensions of sustainability. Using PLU as a case study, the presentation will illustrate the importance of holistic planning through a discussion of PLU's integration of the master planning process with facilities operations, administrative policy change, student life activities and curriculum. Each presenter will discuss how these aspects support the University mission of educating students for lives of thoughtful inquiry, service, leadership and care - for other people, for their communities and for the earth. Following the presentation, interactive discussion with the audience will elicit out-of-the box strategizing of implementation strategies and next steps that could apply to other colleges and universities. The attendee will gain valuable knowledge and an increased awareness of the benefits to an integrated master plan process that includes sustainability as one of the major drivers.

D8a Workshop: From Sustenance to Sustainability: Involving Internal Constituents and External Stakeholders in Common Conversations (45 mins)

8:30 Organizer: B. David Rowe, Vice President for Advancement LaGrange College. drowe@lagrange.edu
Mark Y. Alex Davies, Ph.D. Dean, Wimberley School of Religion, Oklahoma City University. mdavies@okcu.edu

In March, 2006, a LaGrange College advisory body, consisting of alumni, local business leaders and friends from around the country, hosted a one-day workshop, From Sustenance to Sustainability: A Symposium on Organizational Transformation. Audience participants included trustees, friends, faculty, staff and students. The symposium aimed to cease conceptualizing sustainability efforts as budgetary trade-offs with other programs and to begin to understand the work of "doing college" from a thorough sense of institutional sustainability. Presenters included professionals from other educational institutions and a multinational corporation with a successful track record of creating a corporate culture of sustainability as well as experts in the field of conservation and in LEED construction and design.

Recapitulating the development of this workshop from concept through execution and sharing the discernable effects of the event with AASHE participants will offer a model for catalyzing intra-institutional conversations across multiple constituencies. Results from the workshop include increased internal cooperation and shared commitment to sustainable practices, the creation of at least three inter-institutional partnerships, the re-conceiving of at least two building projects as potentially LEED certified programs and the cultivation of donors with a passion for ecological sensitivity and institutional success.

D8b Workshop: The Bequest: A Film about Sustainability (45 mins)

9:15 Organizer: Monty Hempel, Professor/Director, University of Redlands. hempel@redlands.edu

This special presentation -- a video presentation (world premier) - doesn't fit the normal conference format but could be offered as a workshop. It involves the screening of a short documentary film about sustainability. The film, produced by Monty Hempel, examines the concept of sustainability and is intended for use in college classrooms (this is a non-profit venture). The film compares sustainability to a bequest for future generations. Emphasis is placed on preserving wilderness and biodiversity as fundamental indicators of sustainability. The film could be used in a workshop setting as a catalyst for discussion about environmental interpretations of sustainability, and their limitations.

D9a Workshop: Stop Messing With Creation! Christianity as Part of the Environmental Movement: Why Global Climate Change (Not Evolution) is the Real Concern of God the Creator (45 mins)

8:30 Organizer: Audrey deCoursey, MDiv candidate Pacific School of Religion, Berkeley. adecoursey@psr.gtulink.edu

I propose to present resources from my seminary's environmentalist group (TREES) about the role of religion (specifically Christianity) in aiding the movement for environmental sustainability and justice, the movement for fostering right relation with all of God's Creation. Christianity in particular can contribute much to the environmental movement by instilling in us the value of hope and of deep mourning, all through community. Our group's principles range from ecofeminist and Cosmic Spirituality theo/alogies to evangelical stewardship philosophies, and we seek to connect institutional values at our seminary to the lived experiences of congregations. [For more information on TREES, please see our website at <http://www.gtu.edu/studentgroups/trees/Home.htm>]

I am particularly interested in exploring the ways that rhetoric about creationism has been wrongly channeled into attacks against evolution theories, instead of the greater threat to respect for God the Creator: global climate change. I hope to invite insights from the audience, to offer a space for constructive brainstorming about how Christianity and other religions can positively impact the movement for creating a sustainable world. The workshop would close with a participatory activity: creating a personal ritual of mourning for the losses from environmental desecration, to express through art small facets of the planetary pain for human injustices.

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D9b Workshop: Creating Patterns that Connect: Sustainability Education as Lived Experience (45 mins)

9:15 Organizer: Barbara Widhalm, Education Specialist University of New Mexico and California Institute of Integral Studies. truffula@swcp.com

How can we design learning experiences in sustainability that feel alive, vibrant, and palpably contagious? In this workshop we will explore how to facilitate courses, workshops, or events ecologically, sustainably, and creatively, such that learning experiences mirror and embody the very principles, patterns, and life processes that are at the core of sustainability. We will draw from non-rational and relational ways of knowing, including storytelling, metaphors, ritual, and movement, as well as principles of living systems (Capra) and patterns that connect (Bateson) to develop an increased sensitivity and creative repertoire for sustainability education as a holistic, dynamic, life-inducing process. Please bring your stories and experiences.

Barbara Widhalm has worked in sustainability for fourteen years and has been in sustainability education for eight years as an instructor and consultant. She is adjunct faculty at St. Mary's College of California and at the University of New Mexico. Barbara is pursuing doctoral studies in Transformative Learning and Change at the California Institute of Integral Studies with a research focus on learning communities as living systems.

D10 Workshop: The Business of Sustainability- Integrating Sustainability into Undergraduate Business Courses

Organizer: Paul Hudnut, Director, Global Sustainable Enterprise Program. College of Business Colorado State University. paul.hudnut@business.colostate.edu

Emily Bonner, Colorado State University. Emily.Bonner@business.colostate.edu

Ken Peterson, Colorado State University. kjp@kjpetersen.com

This workshop will focus on integrating sustainability into undergraduate business courses at Colorado State University. The workshop leaders will each cover previous approaches, and how the courses were redefined to emphasize sustainability. The leaders will also discuss cases and projects used in their courses. It is hoped that the audience will also have ideas and examples to contribute.

Dr. Emily Bonner will discuss how the inclusion of microfinance cases in international finance classes is being used to broaden the discussion of financial instruments and the nature of capital. Banking for poor is beginning to dispel the notion that poverty and ability to carry debt are inversely related.

Paul Hudnut will discuss the use of a triple bottom line "opportunity screen" in his entrepreneurship classes and provide examples of student business plans which focus on various mission based business models, including several businesses focused on "base of the pyramid" markets.

Dr. Ken Peterson will discuss how his operations management/supply management and logistics courses have moved from a departmental/functional focus to company-wide focus to cross-company (supply chain) focus and now are moving towards a sustainable supply chain management (financial, social and environmentally) focus.

D11 Workshop: EMS as a Tool for Achieving Sustainability

Organizer: Susan Sakaki, Co-Founder Sustainable Earth Initiative. sue@sustainableearthinitiative.org
Dorothy Atwood, Zero Waste Alliance. datwood99@comcast.net

An Environmental Management System (EMS) focuses on environmental improvement areas, but it is first and foremost a management system that applies a discipline and rigor to goals and initiatives like the broad and far reaching goal of sustainability. The EMS can be useful in bringing together different department, programs and initiatives in a cohesive program that is grounded in the principal of continuous improvement. Unlike many initiatives that disappear when the individual champions and proponents move on, the EMS institutionalizes those programs that are identified as having value to the organization. In an academic setting, the EMS can serve as a management tool for campus operations as well as a laboratory for the environmental studies or business management academic programs. This workshop will be lead by Dorothy Atwood of Zero Waste Alliance (www.zwa.org) and Susan Sakaki of Sustainable Earth Initiative (www.sustainableearthinitiative.org), representing Local Resource Centers designated by the Environmental Protection Agency to assist public entities in EMS implementation (www.peercenter.net). Ms. Atwood and Ms. Sakaki are experienced trainers, and will fill the 90 minute session with an overview of the EMS process, classroom exercise, discussion of campus specific issues, and other interactive techniques.

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Friday, October 6
10:15-11:45
Plenary -- Global Warming

Global Warming and Higher Education

Moderator: Julian Keniry, National Wildlife Federation. keniry@nwf.org

Eban Goodstein, Lewis & Clark College. eban@lclark.edu

Billy Parish, Energy Action Coalition. billy@energyaction.net

Moderated by Julian Keniry of the National Wildlife Federation, this session will share insights into new constituencies and means to solve global warming with campuses all across the country and beyond in the lead. Billy Parish from Energy Action will discuss the Campus Climate Challenge, a generation-wide movement to stop global warming. Combining grassroots organizing, coalition-building and a 21st century communication strategy, "The Challenge" is a 3-year campaign that will engage one million students at 700 U.S. and Canadian high schools, colleges and universities in efforts to promote local, national and international climate solutions. Eban Goodstein will discuss Focus the Nation, a major educational initiative that is coordinating teams of faculty, students and staff at over a thousand colleges, universities and high schools in the United States, to collaboratively engage in a nationwide, interdisciplinary discussion centered around the theme of "Stabilizing the Climate in the 21st Century".

Friday, October 6
Session E (12:45-2:15)
Papers

E1 Planning Sustainable Campuses and Communities

12:45 Implementing Smart Growth On and Off Campus

Kevin Nelson, Policy Analyst, US Environmental Protection Agency. nelson.kevin@epa.gov

Many colleges and universities are recognizing the benefits of adopting smart growth development strategies for the following four reasons: 1. Creating enduring, vibrant places that improve campus and community quality of life, facilitate the campus' growth needs, and boost student, faculty, and staff recruitment and retention. 2. Realizing fiscal benefits. Maximizing dollars spent by building efficiently, creating multi-use live-work-play developments on or near campus, and, where appropriate, partnering with private and public sector entities to make the most effective use of investment dollars and infrastructure requirements. 3. Being a good neighbor. Collaborating with the local community to create economic development opportunities and additions to the community fabric that benefit all stakeholders. 4. Contributing to a healthy environment. Protect limited natural resources by building efficiently and with sensitivity to the environment. In conjunction with private sector design professionals and trade associations representing colleges and universities, the EPA is developing a primer on smart growth development practices for colleges and universities. This primer is aimed at institutional leadership on campus and in the community that has decision-making authority on campus expansion, land acquisition, and facility development. In this roundtable, we'll discuss the environmental, fiscal, and community based benefits associated with smart growth development practices on and off campus.

1:05 Planning for Sustainable Campus Development

Pat Sonnino, Senior Associate Sasaki and Associates, Inc. sonnino@sasaki.com

N. Scott Smith, Sasaki Associates, Inc. ssmith@sasaki.com

Universities are at the forefront of the sustainable design movement in this country. Green initiatives led by passionate students, faculty, and staff are flourishing on campuses. Administrators are embracing sustainability as a strategic objective. Institutional leaders are increasingly aware that stewardship of resources reinforces community, enhances a campus' sense of place, and improves the institution's bottom line and market competitiveness.

However most of the activity is incremental, project by project. Few campuses are conceptualizing integrated, campus-wide planning strategies that establish sustainable practices that will enhance community and achieve measurable results.

It is at a planning level that integrated design and management of site, building, and infrastructure can best be holistically integrated and an institutional framework, supportive of sustainable practices, can be developed and leveraged on a campus and community wide basis. In this presentation, a team of Sasaki planners and designers, together with one of their clients, will speak to the sustainable planning process and to the strategies being employed at university campuses around the country. The team will discuss the integration of framework, design, and sustainability strategies that include the campus' overall density and form, transportation, utilities, development and open space sites, resource management, community building, and performance standards.

1:25 University of California Merced: A Model for a Sustainable Campus

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Carrie Byles, Managing Partner, Skidmore, Owings & Merrill LLP. carrie.byles@som.com

Aidan Hughes, principal, ARUP. aidan.hughes@arup.com

Ellen Lou, Director of Urban Design and Planning, Skidmore Owings & Merrill LLP. ellen.lou@som.com

The University of California Merced is the first major American research university built in the 21st century. Skidmore, Owings & Merrill LLP designed the master plan as well as two of the first-phase buildings: the Library and Information Technology Center and the Central Plant. The master plan (and accompanying architectural guidelines) will help the campus become a model for sustainable growth, establishing energy-use thresholds for the grounds and buildings that exceed current codes by 20-to-50 percent. The plan shows how campus population increases can be accommodated while preserving the agricultural and environmental basis of the region's economy and ecosystem. The Central Plant is the heart of the campus's sustainability strategy. In addition to providing electricity and water for the Phase I buildings, it also functions as a dynamic living laboratory for students studying environmental resources, while creating a luminous symbol for the new university's focus on energy research. The library's design incorporates the sustainable architectural guidelines with its abundance of light-colored materials, deep daylight penetration, and sunshading devices. Both the library and central plant are applying for (and expected to achieve) Silver LEED™ certification. In addition, SOM may receive rebates from the utility company for the buildings' energy-efficient designs. This presentation will explore how the master plan and two buildings work in tandem to create a model for a sustainable campus.

1:45 The Sense of Site: Rediscovering a Sustainable Campus Environment

Mike Abbate, ASLA, LEED™, Principal, GreenWorks Landscape Architects. abbate@greenworkspc.com

A university campus represents not just a series of buildings, but rather a complex site in which buildings, infrastructure and other facilities are organized. Campuses must be evaluated in ways that maximize sustainable planning, design, construction, and maintenance practices.

In this presentation, Mr. Abbate will discuss the 10 most important physical and cultural site considerations to be addressed during the design of new projects or evaluation of existing facilities. Each principle will be illustrated using project examples. He will address both large scale campus projects (UC Davis West Village, 200 acres) and individual building projects (Kelley Engineering Building, Oregon State University: <1 acre).

E2 Beyond Low Hanging Fruit

12:45 Changing Campus Food Service through Student Initiatives

Gary Deason, Deputy Director, Center for Sustainable Environments, Northern Arizona University. Gary.Deason@nau.edu

Ben Williams, Senior Undergraduate, Environmental Science Northern Arizona University. bnw7@nau.edu

Bret Wojciak, Senior Undergraduate, Environmental Science Northern Arizona, University. bbw4@nau.edu

Food service is rapidly becoming recognized as an area of campus operations in which significant improvements in sustainability can be made. Some of these changes not only benefit the environment but also help the local community.

A student-initiated food surplus program has been established working with NAU-Sodexo and the Flagstaff Family Food Center. Untouched surplus food is packaged by Sodexo staff, frozen, picked up on campus by food center staff and distributed to community kitchens, shelters, and children's centers. Hundreds of people are being fed each week with food that was formerly thrown away.

Students are working to implement more sustainable food service policies and practices by helping to write the next Request-for-Proposals (RFP) for the University's food service contract. Using a model RFP developed by Portland State University which includes sustainability criteria, a senior undergraduate has rewritten the criteria for NAU's location and climate. These criteria aim to benefit the environment while remaining practical and economical for vendors.

1:05 Making Food Service Sustainable: Portland State University's Experience

Jennifer Allen, Associate Director, Center for Sustainable Processes and Practices, Portland State University. jhallen@pdx.edu

Co-authors: Charlie Benson, Sodexo, Manager of Portland State University, Food Services, Madeleine Pullman, PSU School of Business Administration, Marci Shuman, Portland Energy Conservation Inc., Dresden Skees-Gregory, Portland State University, Sustainability Coordinator.

When Portland State University issued a Request for Proposals for food services in January 2005, the RFP included a bold set of requirements related to sustainable practices, noting that "sustainability is part of the University mission." PSU was looking for vendors willing to source from farms producing food in environmentally friendly and socially responsible ways and willing to educate their consumers about the benefits of sustainable agriculture.

PSU received three responses to the RFP, which was eventually awarded to Sodexo in May 2005. Since the RFP was issued, PSU has been contacted by numerous organizations across the country and in Canada seeking to build similar requirements into their purchasing policies.

This paper will describe the process through which the RFP was developed, the sustainability specifications that were included, and how contract implementation is proceeding. The paper will highlight lessons learned as well as factors that contributed to the successful bidding and implementation of this contract.

1:25 Northern Arizona University's "Sustainable is Attainable" Pledge Campaign: A Case Study

Lea Parker, Professor, Northern Arizona University. Lea.Parker@nau.edu

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During the month of October, 2005, Northern Arizona University's Sustainability Steering Committee conducted a campus-wide environmental education campaign. The "Sustainable is Attainable" campaign goals were to raise environmental awareness and to solicit pledges to reduce energy, water, and waste by 10 percent. The target audience included the entire campus population of students, faculty, staff, and administrators. The campaign planning team involved an interdisciplinary mix of faculty, staff and students. This case study examines the "Sustainable is Attainable" Pledge Campaign for the effectiveness of its strategies and results as related to the theory and practice of Community-Based Social Marketing.

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1:45 Educating the next generation through EPA's P3 Award Program

Julie Zimmerman, Engineer, US Environmental Protection Agency. zimmerman.julie@epa.gov

Among the critical components to promote a systematic shift towards more environmentally benign and sustainable products, processes and systems, is increased awareness and training. It is imperative to recognize that scientific, engineering, and policy innovation play a key role in addressing the persistent challenges of sustainability and under-development in the world. To this end, EPA launched the P3 (People, Prosperity, and the Planet) Award program to provide grants to teams of college students to research, develop, and design solutions to challenges to sustainability. The P3 Awards challenge students to respond to the scientific and technical needs of the developed and developing world in moving toward sustainability through research and development. Challenges to sustainability in a wide range of categories are considered, including water, energy, agriculture, ecosystems, the built environment, materials and chemicals, and information technology. This talk will discuss the goals and strategies of the P3 Award program as well as highlight the significant successes of the program to date including curriculum changes, start up businesses, and tangible environmental benefits.

E3 Leading Change Toward Sustainability

12:45 What Is a Provost to Do? or The Role of the Chief Academic Officer in Advancing Campus Sustainability

Peter Bardaglio, Provost and Vice President for Academic Affairs Ithaca College. pbardaglio@ithaca.edu

On the Starship Enterprise, Captain Jean-Luc Picard listens thoughtfully to the recommendations of his crew, makes a decision, and then issues the simple directive, "Make it so." If only it was as easy for the chief academic officer to lead those under his or her command to "go [sustainably] where no one has gone before."

For many campuses, sustainability not only gathers under its umbrella many existing functions, but numerous new activities as well. Sustainability should be more than a buzzword or "one more thing we have to do"; it should be an integral part of an institution's academic mission and vision. Sustainability is not just about doing the right thing; it is about doing the smart thing. Strengthening a college or university's ability to employ its limited resources more effectively and preparing the next generation of leaders to address the critical long-term problems can both be accomplished as part of a strategy that places sustainability at its heart.

In facilitating the success of a campus sustainability initiative, the provost takes on many functions: visionary, educator, advocate, diplomat, arbiter, change agent, risk-taker, cheerleader, and underwriter. This presentation will explore these various roles, using Ithaca College as a case study.

1:05 Sustainable Idaho: Making Sustainability Sustainable in Higher Education

Max Dakins, Interim Director of Environmental Science, University of Idaho. medakins@if.uidaho.edu

University of Idaho President Tim White signed the Talloires Declaration in March 2005. It is a ten-point action plan for incorporating sustainability in teaching, research, operations and outreach at colleges and universities. In April 2005, the Idaho Legislature passed a joint resolution that "an educational focus on sustainability will lead the state of Idaho to the realization of its economic aspirations, environmental goals, and beyond our greatest expectations for the future."

Most exciting of all, in early 2006, an internal UI competition for \$1 million per year resulted in the funding of three initiatives related to sustainability including a Sustainable Idaho: Learning Together, Leading the Way Strategic Initiative. The Initiative has four goals: transform the academic environment to integrate sustainability and experiential learning, stimulate research to create knowledge regarding sustainability, strengthen outreach to build strong University-community relationships, and model sustainability in operations to move toward a sustainable institution.

Together, these indicators point to a convergence of interests between the State of Idaho and the University Administration, faculty, staff, students, and community members. These events represent a new era for the University of Idaho, an era where sustainability will play a central and key role in curriculum, research, outreach and operations.

1:25 Champions of Organizational Change toward Sustainability and Pivotal Experiences that Influenced their Work

Brian Dunbar, Director, CSU Institute for the Built Environment Colorado State University. dunbar@cahs.colostate.edu

Change toward sustainability requires fundamental shifts in thinking. Organizational change and diffusion of innovations are well research topics. Practitioners and scholars agree that the commitment of key individuals in positions of authority are crucial to the successful integration of any organizational change effort. This paper explores how and why key individuals become deeply committed to sustainability.

Ray Anderson of Interface, Inc. and David Gottfried, founder of the U.S. Green Building Council, developed a commitment to sustainability as a result of a transformational or pivotal-type experience. Other selected leaders in sustainability and green building were interviewed to determine whether a pivotal experience influenced their focus and their career work. This paper will present research findings, explore the role of pivotal experiences in the adoption of sustainability and offer a model for graphing individual shifts in mindset. Finally, a discussion will explore the possibility of creating settings that encourage transformational experiences as a means to facilitate the adoption of sustainability and green building. Creating fundamental shifts in thinking for key individuals may be one of the most effective ways to generate change toward sustainability.

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1:45 Searching for Sustainability in Southern California

Monty Hempel, Professor/Director University of Redlands. hempel@redlands.edu

For many people, Southern California is the epitome of unsustainable development. But others see bold flashes of sustainability in the actions of local people and organizations dedicated to improving the quality of life for both present and future generations. The objective of this presentation is to explore how these kinds of perceptions can be used in classroom teaching.

"Searching for Sustainability in Southern California" will assess regional development trends and forecasts, their interaction with global environmental change, and their implications for achieving sustainability in a particular region that is home to the University of Redlands. Examples will be provided to demonstrate how lifestyle choices and local and regional trends in development can be used to draw strategic lessons about sustainability.

E4 Mapping the Way Forward

12:45 Developing Research Priorities with a Cohort of Higher Education for Sustainability Experts

Tarah Wright, Director of Environmental Programmes, Dalhousie University. tarah.wright@dal.ca

This paper examines the results of a Delphi exercise used at the Halifax Consultation in which 35 experts representing 17 countries gathered to develop research priorities for the emerging field of higher education for sustainability. The Delphi Technique was used to elicit the opinions of the group in order to achieve a consensus position on a research priority list through a series of questionnaires interspersed with controlled feedback. The final stages of the Delphi exercise revealed 19 research theme areas that were ranked by the group to develop a final priority list. The results from each round of the Delphi give an interesting perspective on expert's conceptualizations of what constitutes important research in the field. Further, the final results can be used to develop research programs and projects in the future. Further, the results have been used as the foundation for further consultations with researchers and practitioners in this field in creating action plans for the United Nations Decade of Education for Sustainable Development. It is hoped that the results will contribute to the tremendous work efforts to come and prove to be an important component in the process of furthering the field of higher education for sustainability in the future.

1:05 A Definition of Sustainability for Higher Education

John McGovern, Graduate Student, Cleveland State University. c2381056@urban.csuohio.edu

Sustainability is a vaguely defined concept though an accepted definition is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." A critical element of this definition places humans within the bounds of earth's ecosystem rather than outside of it. Therefore sustainable development places humans as a part of a functioning ecology where humans are but one organism, albeit a dominant and thinking one, of many.

A definition for higher education is similarly murky ranging from the selfless pursuit of knowledge to economic development. A definition grounded in history defines higher-ed as an incubator for the creation and storage of knowledge. Knowledge creation is akin to the early stages of an ecosystem for as the diversity of ideas (organisms) increases, the rate of new knowledge development (evolutionary adaptations) also increases. The creation of knowledge is an adaptive function unique to our species.

Thus sustainability for higher education is defined hereto as the perpetuation of the cultivation of a diversity of ideas in order to ensure the future existence of humans within the earth's ecosystem. So long as humans can exist within the earth's ecosystem, knowledge can also flourish and vice versa.

1:25 Psychological Obstacles to Sustainable Environments

Edward Sadalla, Professor, Department of Psychology & Ledlow, S. E. (Center for Learning and Teaching Excellence), Arizona State University. edward.sadalla@asu.edu

There are components of human nature that make it difficult for humans to construct sustainable environments, and components that encourage thinking about sustainability. Evolved psychological tendencies that constitute obstacles to sustainability include (1) short-term time perspective: a tendency to react behaviorally and emotionally only to events in the immediate future; (2) status seeking: a basic desire for increased status in hierarchical social systems, resulting in increased consumption rates and a tendency toward "conspicuous consumption;" (3) territoriality: defense, maintenance, and identification with a specific spatial region, leading to a lack of concern about other regions; and (4) innumeracy: an inability to comprehend large numbers and an inability to understand probability, leading to an inability to appreciate large scale trends and accurately estimate risk. Social institutions and traditions, such as religion, may also promote behaviors that are not sustainable. This paper reviews the evolutionary origins of the psychological obstacles to sustainability, explores their relationship to the problem of constructing sustainable environments, and offers suggestions as to how these obstacles might be minimized. We also argue that psychological and behavioral predispositions are a seldom-considered yet essential part of any program that seeks to promote sustainable environments.

1:45 Understanding Sustainability

Walter Simpson, Energy Officer University at Buffalo, SUNY. wsimpson@facilities.buffalo.edu

Environmental sustainability is a huge challenge and college and university campuses should lead the way in achieving sustainability and teaching about it. But the environmental sustainability is not well understood and the term is typically misused. The bar is a lot higher than we think. This presentation will explore the meaning of sustainability and try to envision a genuinely sustainable campus while contrasting it with green campus activities.

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Field Reports

E5 Lessons from the Field 3

12:45 Steering in the Right Direction for Sustainability

Ron Hubert, Project Director Northern Arizona University. rhubertaz@earthlink.net

The way we plan, build and live in our cities is a major source of our unsustainability, yet the 1,500 US cities trying to become more sustainable are following policies and practices that are either sub-optimal or counter-productive. Sustainable community managers often confuse sustainability with what is to be sustained, choose indicators based on what data is available rather than the information needed, seek to optimize outcomes rather than system functionality, and ignore the evolutionarily proven operating principles of natural systems for the dysfunctional, hierarchical control philosophy of most social systems.

The problem lies in our conceptual framework of sustainability, rather than in our willingness to work hard to be more sustainable. Research is underway to demonstrate the design principles that work to improve the sustainability of interdependent social, economic and ecological systems in our communities based on their results. These findings can increase the effectiveness and efficiency of sustainability initiatives only if we also expand our understanding of this new framework, develop ways to integrate it into our education system, and make corrections to the model of how to manage for sustainability prevalent in the rest of society.

12:55 A New Campus Sustainability Assessment Framework: a Comparative Tool for Students, Faculty, and Staff to Evaluate Their Campus

Lia Wetzstein, Lab Coordinator/Lecturer, University of Washington, Tacoma. lwetz@u.washington.edu

A tool was created by faculty, staff, and students from seven Pacific Northwest college and universities to assess several aspects of campus sustainability. The Association for the Advancement of Sustainability in Higher Education (AASHE) led effort has created an assessment framework to review 15 features of sustainability on a campus. The intent was to create a series of questions students could work on answering in a semester class or as individual projects. Another objective was to facilitate a way for campuses to compare their sustainability efforts with one another and track changes over time. This talk will look at which colleges and universities are using the framework, and how it is working from the perspective of students, faculty, and staff.

1:05 Identifying the Perceived Challenges to Implementing Sustainability Initiatives on Campus by a Cohort of Talloires Signatory University Administrators

Tarah Wright, Director of Environmental Programmes, Dalhousie University. tarah.wright@dal.ca

A series of interviews and questionnaires will be conducted in the summer and fall of 2006 with the presidents and vice presidents of Canadian universities that have signed the Talloires Declaration. The objectives of this study are, to investigate how university presidents conceptualize sustainable development, sustainable universities, the role universities play in achieving a sustainable future, and the barriers to implementing sustainability initiatives on campus. This "field report" will discuss the results to date and ask colleagues to engage in discussion regarding the direction of the research.

1:15 Bridging Sustainable Development with Water

Daniel Baker, Lecturer University of Vermont. daniel.baker@uvm.edu

The common need for water provides an avenue to link universities and developing communities. Over 4 years the University of Vermont followed a rural Honduran community's need for clean water as a guide for designing an integrated community development program that builds social, natural and human capital. Through this development process a high school science curriculum has been strengthened, community leaders identified common goals, a community water system was built and expansion begun towards a regional program. The program is based on the adaptation and transfer of a water quality monitoring model that provides critical environmental data to communities. Through a service-learning methodology university students worked with a low-income community to address poor water quality through the design and construction of a sand filter. Water monitoring and the filter work together to strengthen environmental education and community project-ownership.

The lessons learned from this experience provide a useful and transferable model for higher education institutions that facilitates engagement in interdisciplinary, community-based research with low-income, international communities. The conclusion of this study is that working with communities to understand and address the widespread experience of contaminated drinking water can build local capacity, improve health, and involve university students in meaningful, interdisciplinary research.

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1:25 Carbon Offset Initiatives on Study Abroad Programs

Daniel Greenberg, Executive Director, Living Routes - Ecovillage Education. daniel@LivingRoutes.org

An inherent challenge with study abroad programs is the environmental impact of international travel. For example, a round-trip flight from Boston to London produces over a ton of carbon dioxide - per person! Carbon dioxide is a major contributor to the Greenhouse Effect, which is warming the Earth's climate and is quite possibly the greatest environmental threat of the 21st century. Living Routes, which partners with UMass-Amherst to offer college programs based in "ecovillages" around the world, has recently instituted a Carbon Offset Program in order to address this challenge. We calculate international and ground travel on each of our semester, summer, and January-term programs (as well as for U.S.-based staff) and commit to planting trees to offset the carbon emitted by all this travel. Wherever possible, students plant the trees themselves within the host ecovillages and/or affiliated regional sites. This Field Report will describe this new initiative and how it:

- Supports our host ecovillages and their regional ecosystems,
- Further educates students around the ecological impact of travel,
- Offers students an opportunity to mitigate this impact, and
- Allows Living Routes to further be in integrity with our mission and "walk our talk".

1:35 Sustainability at the Human Scale

Taylor Jackson, Master's student, Biology and Society, Arizona State University. tsjackson@gmail.com

Sustainable living. Sustainability studies. Sustainability science. These concepts are common in campus and community discussions. We propose a novel approach to integrating the concepts – a reflexive community of students that studies itself and others at the scale of human experience, then applies the lessons it learns to recreate itself and its environment.

Within the soon-to-be new campus of Barrett Honors College, ASU has planned a sustainable living community, a block of residential space designed for and committed to sustainable lifestyles. At the same time, within the proposed School of Sustainability, ASU has planned for a "clustered learning network," linked to this residential feature, that focuses on community and individual-level experiences of sustainable living.

Each fall, a group of students will spend the year together studying sustainability in an interdisciplinary grouping of courses. As part of the program, students will apply the tools of sustainability science and social sciences to conduct use-inspired research in their own residential community and beyond. Materials and energy assessments will go hand-in-hand with values assessments. This proposed Sustainable Living Community will encourage breaking down boundaries between learning and doing and between traditional natural science and social science perspectives on sustainability.

1:45 Creating a Just Community: A Model for Collaborative Action

Geoffrey Milz, Master's Student/Mr., University of Cincinnati. milzgg@email.uc.edu

In the Spring of 2003, a student environmental advocacy group at the University of Cincinnati, a national environmental advocacy organization, a camera crew, and a state politician consciously and collectively ventured into places one would hardly expect to find any: two communities riddled with superfund sites, chemical plants, sewage treatment facilities, toxic drums... and families. When the dust settled, a professional video was produced and distributed to local decision makers, the efforts of the student group were featured in Sierra Magazine, the student participants' eyes were opened and, most importantly, the plight of two communities struggling to voice their hardship was heard by state and local lawmakers. This field report presents a case study in collaborative action. Fighting for environmental justice has taken many forms, and this case study presents a respectful, fruitful and replicable example of a university community stakeholder partnership for change in the economically marginalized, politically disenfranchised and environmentally overburdened communities of Winton Hills and Lower Price Hill in Cincinnati, Ohio.

Panels, Roundtables and Workshops

E6 Panel: A Journey to Sustainability: How Furman University has Traded the SUV for a Hybrid

Moderator: Frank Powell, Professor, Furman University. frank.powell@furman.edu

Anchored by a strong strategic commitment to environmental sustainability, Furman University in Greenville, SC is unique in its accomplishments. Now 180 years old, the school relocated in the 1950's to 750 acres of non-descript farmland, now fairyland with tremendous unanticipated environmental constraints. Or, as recently described by a visitor from Warren Wilson College just up the road, Furman is "the most country club-like university I have ever seen". For example, there is ~700 ft² of heated space/student, 94% of whom have a motor vehicle on campus. This religiously conservative and politically moderate, undergraduate, liberal arts school has, predominantly over the last decade, begun to focus its human and financial resources on doing the right thing with regard to environmental sustainability. And, traditional pressures and external motivators from high energy costs, strong environmental laws, environmentally designated gifts, and a preponderance of environmentally liberal constituents, are notably absent. Our story is both instructive and inspirational as we celebrate our Year of the Environment in 2006-07. The transformation toward becoming the national leader among liberal arts colleges committed to sustainability is presented in the context of the five C's: our Constituents, our Consumption, the Curriculum, our Curiosity, and the surrounding Community of one million.

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How We Arrived at Where We Are: The Role of Strategic Planning

Bill Ranson, Furman University. bill.ranson@furman.edu

Furman University's President, David Shi, a noted Historian, has had the environment high on his agenda since arriving at Furman in 1992. This grows from his scholarly activity on the history of the American environmental movement, his best known book *The Simple Life*, and the fact that he is forced to live in the largest mansion in town. His 2006 President's Report notes that Furman was the first member of the Associated Colleges of the South to include sustainability in its strategic plan. Furman's latest Strategic Plan (May 2004) created by a broad-based constituency, calls the University "To strengthen our commitment to the environment by promoting sustainability through educational programs, campus operations/construction practices, and public awareness initiatives." This top-down approach, backed by budgetary support, has promoted change based on the premise that we must now do what we say we are going to do (walk the talk). Our 2005 curriculum upheaval requires all students to take a "humans and the natural world" course. It strengthens our environmental studies curriculum and stimulated giving a \$1000.00 stipend to 20 freshman enrolled in an Earth and Environmental Sciences living and learning class. We are calling this group the Environmental Community of Students (ECOS).

Help from Our Neighbors: Furman University and the Associated Colleges of the South

Scott Salzman, Furman University. scott.salzman@furman.edu

Boyd Yarbrough, Furman University. boyd.yarbrough@furman.edu

Integral to Furman University's sustainability awakening is the Associated Colleges of the South (ACS) a consortium of 16 selective, undergraduate schools. ACS supports a number of cooperative alliances including an eight year Environmental Initiative that promotes and fosters programs that help member schools develop and share both academic programs and institutional practices which emphasize environmental sustainability. ACS, with much support from Second Nature, provides stipends for Faculty Fellows and Student Interns who serve as liaisons between the consortia initiative and their home institutions. In 2003 this program facilitated the development of Furman's first Ecological Footprint document. Membership in the ACS provides Furman with resources and a forum in which it can readily collaborate with other institutions within a broad geographic region. Annual environmental conferences provide students, faculty and staff with opportunities to network, share ideas and motivate each other. Small grants from ACS have provided the means to implement new programs including Furman's seven year old, photovoltaic powered, Eco-Cottage, environmentally oriented study away experiences, and a Student Leadership Conference.

Consumption and the Triple Bottom Line

Phil Lewis, Furman University. phil.lewis@furman.edu

Jeff Redderson, Furman University. Jeff.Redderson@furman.edu

Consumption: What is Necessary rather than Superfluous, and Useful but not Wasteful. The cost of a college education varies tremendously and the costs of water, solid waste and energy, the consumptive costs, are considered overhead. Furman University has been forward thinking in its efforts to contain the consumptive costs even though they represent a smaller share our total budget compared to our competitors. Our electrical, solid waste and water costs per unit are amongst the lowest in the nation, largely due to our geographic location, and yet our innovativeness and commitment aimed at further reducing these costs is quite high. Significantly, decisions to upgrade our infrastructure, invest in greater building efficiency, and reduce, reuse, and recycle arise from our sustainability initiatives. Economic payback is important but the triple bottom line that includes environmental and social capital is being applied to the major economic decisions here. Energy costs per ft² are down over 10%, potable water use, corrected for weather conditions is declining, nearly half of our waste stream is being diverted from the landfill, and we have significantly reduced fossil fueled vehicular traffic on campus. The final major building project, a 113,000 ft² new construction/renovation science complex will represent our sixth LEED certified structure.

Recruiting Sustainably-Minded Students and Growing Our Own at Furman University

Trevor Cutsinger, Furman University. Trevor.cutsinger@furman.edu

Colin Hagan, Furman University. colin.hagan@furman.edu

James Wilkins, Furman University. james.wilkins1203@furman.edu

Despite the inherent difficulties in changing human behavior by the time students reach college age, Furman University is increasingly successful in both recruiting environmentally oriented students and growing our own. Our student demographic is dominated by those who believe in the traditional free market ideals of unlimited growth and consumption that lead to a strong economy and improved standard of living for all. And, the average family income of students at Furman is >\$165,000. Too few arrive at Furman with a realistic understanding of the negative human impacts on the Earth and the social and environmental inequities that accompany massive globalization, described by one student as "wealth-induced stupor". Listen to Furman students talk about the growing number of environmentally related programs that are gradually reaching the level of consciousness of the "general" student body. The vision and hard work of our Environmental Action Group has both pressed for change and provided leadership models for many more students to follow.

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E7 Panel: Arizona Water Institute - Bridging Institutions

Moderator: Kathy Jacobs, Executive Director Arizona Water Institute, University of Arizona. kjacobs@cals.arizona.edu
Len Drago, Intel Corp. Leonard.C.Drago@intel.com
Charlie Ester, Salt River Project. ceester@srpnet.com
Chuck, Graf, Arizona Water Institute, cgg@azdeq.gov
Jim Holway, Arizona State University. jim.holway@asu.edu
Karen Smith, Arizona Department of Water Resources. ksmith@azwater.gov

Arizona's three universities have one of the largest concentrations of water related researchers in the United States, more than 400 faculty and staff who work on this topic. The Arizona Water Institute (AWI) is unique because it is a collaboration that is designed to connect academic institutions, state agencies and private sector interests to focus on real-world applications of cutting-edge water-related science. This organization will form a "bridge" between water-related stakeholders who understand the specific applications of science and policy, and those in academia who are researching new technologies and water management options supporting sustainability.

This panel will discuss the goals, objectives and structure of the AWI as well as the findings of recent needs assessment activities that have engaged all water use sectors, local, state and regional governments, Indian tribes, NGOs and watershed groups. The collaborative, interdisciplinary and boundary-spanning innovations of the AWI, potential partnerships with the private sector, plans for project development and prioritization, fundraising activities, initial projects, and criteria for defining success will be discussed in an interview format.

E8 Roundtable: Sustainability and Planning: An Integrated Approach to Academics, Resource Planning and Facilities

Moderator: John Ruffo, WRNS Studio. jruffo@wrnsstudio.com
Katie Maynard, University of California Santa Barbara. kmaynard@geog.ucsb.edu

Sustainability is a global issue. Higher education is embracing it in a very big way. It touches all aspects of the campus from mission to student life, from curriculum to community outreach and partnerships, to budgeting and resource planning, to infrastructure and facilities. It is not just about recycling programs. SCUP's role is to provide knowledge, connections and resources to help you identify, introduce, influence and integrate these efforts at your institution through effective planning. Over the past few years, SCUP has initiated a number of programs focused on Sustainability. This workshop builds upon the strengths of these individual efforts in an integrated way. In broadest terms, we believe that it is critical that all levels of higher education recognize and understand the full breadth of the topic; that we communicate with our educators and students the importance of the topic; that we integrate sustainable practices across all levels of the institutional mission; that we understand where and how this has been done; and that we be able to evaluate and measure the benefits of our efforts. Participants will work with faculty to gain an appreciation of the spectrum of sustainability on campuses, to recognize the importance of an integrated planning process, and to study in depth best practices in integrated planning that can be taken home and put into action on their campuses.

E9 Panel: Challenges of Implementing a University-Wide Sustainability Initiative: Lessons Being Learning from Arizona State.

Moderator: Charles Redman, Arizona State University. charles.redman.asu.edu
Bonny Bentzin, Arizona State University. bonny.bentzin@asu.edu
Jim Buizer, Arizona State University. james.buizer@asu.edu
Brett Perozzi, Arizona State University.
Austin Shangraw, Arizona State University. ajshangraw@yahoo.com

In Fall of 2006 Arizona State University is embarking on a new adventure, establishing a school devoted to sustainability, encompassing the widest range of disciplinary perspectives, and offering degrees at all levels. The degree programs are flexible, interdisciplinary, problem-oriented journeys where students explore the sustainability of human societies and the natural environment on which they depend. The principles that drive this endeavor include: 1. considering the interconnectedness of environmental, economic, and social systems; 2. reconciling development goals with the planet's environmental needs over the long term; 3. avoiding irreversible commitments that constrain future generations

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E10 Workshop: Focus the Nation: Climate Stabilization in the 21st Century

Organizer: Eban Goodstein, Professor, Lewis & Clark College. eban@lclark.edu

Focus the Nation is an ambitious educational initiative that will coordinate teams of faculty and students at over a thousand colleges, universities and high schools in the United States, to collaboratively engage in a nationwide, interdisciplinary discussion centered around the theme of "Stabilizing the Climate in the 21st Century". The project will culminate January 31, 2008, in the form of one-day, national symposia held simultaneously on campuses across the country. Occurring early in the political primary season, the event will provide an opportunity to engage political candidates from across the country and at all levels of government in campus-based, non-partisan discussions of climate solutions, creating a national educational dialogue on policy options for the next decade. Working from a firm base in educational institutions, Focus the Nation will incorporate participation by religious, civic, and business organizations. Focus the Nation has the potential to organize thousands of institutions and millions of participants across the country to focus national attention for a day around a serious discussion of climate stabilization.

Workshop participants will share ideas about how to develop curricula and maximize participation, making Focus the Nation a success on their campus and in their community.

E11a Workshop: Federal Funding Opportunities (45 mins)

12:45 Organizer: James Elder, Director, Campaign for Environmental Literacy. jelderjr@aol.com

In our day-to-day labors to maintain and hopefully expand our individual campus sustainability initiatives, some of the barriers against which we struggle are systemic (e.g., the lack of available funding opportunities). Together, we will take a look at some of these constraints, and explore how we might use our collective leverage to change the system.

Specifically, the federal government presents an overlooked target of opportunity for the higher education sustainability movement. The federal government has an important role to play in providing national educational leadership and funding, yet the federal government currently offers no grant programs specifically identified for funding campus sustainability efforts.

This presentation will first review the few existing federal grant programs that have funded campus sustainability initiatives (within a broader funding framework). Then, we will get updates on current advocacy efforts such as the Higher Education Sustainability Act, and discuss possible next steps. Finally, ideas and opportunities for new federal legislation and funding will be solicited from the audience.

While the political and fiscal climate in Washington is currently bleak, gains can still be made with sufficient creativity and engagement from the higher education sustainability community. If we don't stand up for ourselves in Washington, who will?

E11b Workshop: Why Green Purchasing? (45 mins)

1:15 Organizer: Brian Yeoman, NAEP/ Houston Advanced Research Center. byeoman@harc.edu

Why green purchasing indeed? The higher education sector is responsible for the transformation of a myriad of natural resources into millions of pounds of products, billions of pounds of packaging material, the expenditure of billions of gallons of fossil fuel and the expenditure of untold hours of labor. The consequences include a decline in all living systems, as well as the tremendous challenge of global climate change.

As higher education struggles to define and chart a path away from this destruction, Purchasing departments represent the single most logical place to respond. Why? 15-18% of the institutional budget passes through this process typically. The process can be shaped to define the sustainability objectives through the use of specifications and term contracts. The process contains most if not all of the low hanging fruit for demonstrating that the institution is in fact "walking the walk" instead of "talking the talk" can be found in purchasing.

Many goods higher education purchases serve a very limited function for a very short time period and then are turned into waste. Procurement officials can play the critical role of turning around and shrinking the environmental footprint of the campus and greatly affect the personnel in the organization. Come and learn about some of the opportunities and some of the tactics to address the operational side of the sustainability on campus topic.

AASHE 2006 Abstracts

E12 Workshop: Engaging Students in Issues of Health and Justice

Jean MacGregor, Senior Scholar, Wa Center for Undergrad Education, The Evergreen State College. macgjean@evergreen.edu
Katherine Davies, Antioch University, Seattle. kdavies@antiochsea.edu
Lin Nelson, The Evergreen State College. nelson@evergreen.edu
Cynthia Updegrave, University of Washington. cupdegra@u.washington.edu

The imperative of sustainability can be powerful for students when it is framed in terms of health and justice issues close to home. The presenters are engaging students in community-based learning in Washington State –learning that focuses on how individuals and organizations struggle to understand, protect, and restore their communities. This workshop will begin with our stories of constructing relationships with community groups and constructing meaningful learning experiences for students; it will then move to a discussion of tools for community-based research and the pedagogical practices that both empower and deepen student learning. Lin Nelson will explore two regional community-based challenges, one to do with food systems and poverty, the other dealing with industrial pollution and changing urban landscapes associated with a major Superfund site in Tacoma. Cynthia Updegrave will recount her course (designed with student input) in Community, Environment and Planning at the University of Washington based on the environmental history of the Duwamish River, another Superfund site. Kate Davies will discuss how pedagogical concepts of community engagement, collaborative learning, and reflective practice are being applied in an interdisciplinary graduate program to help students explore the connections among environmental health, justice, and sustainability in their own communities.

Friday, October 6

2:30-4:00

Plenary -- Curriculum

Rebuilding as We Sail: Creating New Norms for Education for Sustainability

Jean MacGregor, The Evergreen State College. macgjean@evergreen.edu
Jim Farrell, St. Olaf College. farrellj@stolaf.edu
Yolanda Moses, University of California, Riverside. yolanda.moses@ucr.edu
Debra Rowe, US Partnership for Education for Sustainable Development. dgrowe@oaklandcc.edu

The imperative of a sustainable future is asking us to rebuild the ships (that are our campuses) while we are sailing them. That's a tall order. How can we create the vehicles for the transformative collaborative work that is needed? How can we bridge the divides of disciplines, roles, and status on our campuses? How can we attract more allies and "boat-builders?" The panelists, all senior leaders in educational reform, will offer their insights as change makers within and across institutions, and will invite us all to imagine and discuss real-life barriers and additional strategies for institutional transformation.

Plenary -- Food

Feeding Institutional Transformation through Local Food Systems

Moderator: Ginny Peckinpugh, Executive Director, Oregon Campus Compact. ginnyp@pdx.edu
Celine Fitzmaurice, Assoc. Director for Community Programs in the Center for Science Ed, Portland State University. celine@pdx.edu
Tim Galarneau, UC Santa Cruz Food Systems Working Group Coordinator, CSSC's UC Sustainable Foods Project Advisor, University of California, Santa Cruz. tgalarne@ucsc.edu
Tom Kelly, Director, University of New Hampshire Office of Sustainability University of New Hampshire. tom.kelly@unh.edu

College campuses are becoming powerful sources of transformation as they link teaching, research, and campus engagement to focus on community food systems. After outlining structural problems with our current food system, this plenary will present initiatives from across the country that are addressing various aspects of the issue.

The Office of Sustainability at the University of New Hampshire is an endowed program that integrates sustainability into the university's land grant mission. The Food and Society initiative has facilitated critical investments in faculty positions, research priorities and infrastructure that support teaching, research and extension in organic agriculture, sustainable food enterprises, nutrition, and local/regional food procurement.

The University of California is implementing sustainable food system initiatives across the state, bridging academic research, undergraduate experiential learning, and community partnerships. Strategies have led to the successful integration of sustainability in food services and include procurement and distribution, waste reduction and energy saving initiatives, and innovative curriculum. Oregon's 3-year initiative – "Oregon Civic Solutions: Statewide Partnerships for Public Service" – has catalyzed innovative campus initiatives around food systems. A wide variety of projects are transforming both students' education and the ways in which they and the community are thinking about local food systems. Projects address food security, environmental education, community economic development, and childhood obesity, all within the context of sustainability.

AASHE 2006 Abstracts

Friday, October 6
Session F (4:00-5:30)
Papers

F1 Assessing Sustainability on Campus

4:00 Crucial Curricula for Sustainable Development

Philip White, Assistant Professor, School of Sustainability, Arizona State University. p.white@asu.edu

This paper focuses on sustainable development in design education with content applicable to environmental science, engineering and business.

1 Evolving environmental impact assessment methods

The paper outlines state-of-the-art environmental impact assessment methods. End-point and midpoint assessment methods, and the LCA standard developments by the International Standards Organization, the European Union and the United Nations are described. Methods to compare environmental impact categories and improve the comparability of process inventory data are reviewed.

2 Approaches to integrating social equity

A range of approaches will be discussed including rich verses poor (UNEP Human Development Index), today's generation verses future generations, corporate social responsibility reporting, product services as they correlate to Maslow's Hierarchy of Needs, product labeling and Environmental Product Declarations, as well as new ISO 26000 standards.

3 Teaching the Okala Ecological Design curriculum

Okala Ecological Design is a publicly available curriculum sponsored by the US EPA and the Industrial Designers Society of America. It covers the significance of the ecological crisis and the role of design in its resolution, strategies for creating new product and services, methods to analyze lifecycle impacts, and challenges in professional practice. Observations on how best to teach topics in both small and large classrooms are reviewed.

4:20 Peeking in Closets: An Environmental Sustainability Assessment at Portland State University

Amy Dvorak, Sustainability Graduate Research Assistant, Portland State University. dvorakaj@pdx.edu

A qualitative sustainability assessment was implemented between June 2005 and July 2006 at Portland State University to determine the highest environmental impact areas associated with campus activities for the purpose of efficient allocation of resources and program development. The framework for the assessment, including the indicator categories and aspects, were formed by a review of previous academic assessments, private corporations reports and audits, ISO 14000 documents, Oregon Natural Step workshops, as well as public meetings. The assessment was implemented through a series of interviews and tours with over 150 departments and facilities campus-wide. Thirty-six aspects were used to represent six indicator categories; environment, resource consumption, regulations, workplace health, community and green features. Each aspect was ranked by impact and significance using a numeric scale. Impact scores were then weighted for their frequency, severity, and health effects. Results of the assessment have shown that resource consumption and environmental indicators have priority impacts due primarily to high paper and electricity use. However, strong connections have been observed between these indicators and social and economic issues at the university.

4:40 Sustainability in Higher Education in Atlantic Canada

Almut Beringer, Director, Environmental Studies and Sustainability, University of Prince Edward Island. aberinger@upe.ca

During the academic year 2005/'06, all Association of Universities and Colleges of Canada (AUCC) member institutions in Atlantic Canada participated in a study ascertaining the status of sustainability in higher education in this region. The Sustainability Assessment Questionnaire (SAQ), developed by University Leaders for a Sustainable Future (ULSF), was used to collect data in the areas of curriculum; research and scholarship; physical operations; faculty and staff development; outreach and service; student opportunities; and institutional mission, structure, and planning. This presentation will share the findings of this study. Study co-authors: Dr. Tarah Wright, Dalhousie University; Leslie Malone, Imperial College/University of London, UK

F2 Models and Demonstrations: Towards a Green Future

4:00 Using Sustainability to Connect Academia with Government

William Leahy, Director, Institute for Sustainable Energy, Eastern Connecticut State University. leahyw@easternct.edu

In 2001, the Board of Trustees of the Connecticut University System created the Institute for Sustainable Energy (ISE) at ECSU to challenge academia to support state and local government in developing solutions that create a more sustainable future. Today, ISE is responsible for; facilitating the annual CT Energy Plan for the CT Energy Advisory Board and the State Legislature, developing and implementing the state's high school curriculum on energy and the environment, promoting "Green" building standards by providing annual training to local building inspectors and facilitating a statewide stakeholder process to identify the benefits and barriers to local communities adopting High Performance Building Standards, serving as lead support agency for the Green Campus Initiative in the CT Climate Change Action Plan, conducting demonstration projects for bringing landlords and tenants together in order to make multifamily housing more affordable, testing and evaluating biodiesel fuel in stationary boilers at the local university, and benchmarking municipal buildings, including local public schools, in order to assist communities target limited capital funds. This is all accomplished with three full-time employees, three part-time university assistants, ten student interns and a network of academic experts in a variety of fields. Last year ISE was awarded EPA & DOE's EnergyStar Partner of the Year in Energy and Environmental Education.

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4:20 *The University of Michigan Energy Management Program: Using Engineering, Research, Education, and Outreach towards a Sustainable Energy Conservation Effort*

Stephen Kunselman, Energy Management Liaison, University of Michigan. skunsel@umich.edu

Yoshiko Hill, Manager, Electrical Engineering & Energy Management Section Plant Operations, Utilities & Plant Engineering, University of Michigan. yhill@umich.edu

The University of Michigan's Energy Management Program has a rich history of minimizing campus building energy consumption and reducing facility operational impacts on the environment. By using engineering, research, education, and outreach, the U-M Energy Management Program has developed a sustainable energy conservation effort that is comprehensive and cost effective. This abstract discusses the components of the successful U-M Energy Management Program.

Engineering: Energy management engineers annually develop and implement energy conservation measures that reduce energy consumption of campus buildings. They communicate and partner with U-M personnel to ensure the efficient operation of building mechanical systems. These interdepartmental cooperative efforts are increasingly necessary to find additional energy cost savings from building operations.

Research: The Energy Management Program develops, implements, and evaluates pilot projects to accurately assess installation feasibility and projected energy cost savings of new equipment technologies and renewable energy opportunities.

Education: The implementation of new energy efficient technologies in campus buildings often necessitate educating U-M personnel of the operational procedures of the technologies to ensure proper utilization. Energy Management Program staff provide educational assistance of these operational procedures.

Outreach: Visibility and recognition of the Energy Management Program is an important strategic element of campus energy conservation efforts. Raising energy awareness across campus is accomplished with outreach activities; distribution of energy conservation oriented posters and brochures; and presentations at seminars and conferences.

4:40 *The Future of Higher Education Infrastructure*

Roger Ebbage, Director, Energy Programs, Lane Community College. ebbager@lanecc.edu

The Energy Management Program (EMP) at Lane Community College is planning to build the Northwest Energy Education Institute Energy Demonstration Building and Training Center. This will be an internationally ground-breaking facility designed to demonstrate how technology can eliminate a building's use of energy and other resources, lower greenhouse gas emissions, and improve campus employee productivity.

Founded in 1980, the EMP has served as the regional training ground and national leader for energy efficiency practitioners through the program's Northwest Energy Education Institute (NEEI). Now, working with SOLARC Architecture and Engineering, the Energy Management Program has designed and will build a demonstration and teaching facility on the Lane Community College campus. By using the latest in energy efficiency and renewable energy technologies, this innovative building will export energy to it neighboring campus buildings throughout the year.

This paper will describe the unique collaboration between a public education program and private consulting firm to develop a building with the capacity to "plug and play" and "mix and match" systems and products allowing the building to demonstrate how rapidly changing technology can bring more and more efficient use of natural resources.

5:00 *Green Residence Hall Demonstrations: A First Step Towards Sustainability*

Stephen Miller, Project Director, Strategic Energy Innovations. stephen@seiinc.org

Select higher education institutions are successfully employing demonstration spaces as non-threatening, interactive, educational vehicles for promoting sustainability to their students and broader campus community. Within the residence hall setting, students, staff and faculty are coming together to form interdepartmental working groups with the aim of designing, installing and promoting energy and environmentally sustainable living showcases on their respective campuses.

This paper explores the motivation and successes behind these sustainable (or "green") residence hall demonstrations, including three recently installed showcases (at UC Berkeley, Cal State Chico and the University of Hawaii,) that have garnered notable campus and community press for advancing energy-efficient and related green lifestyle practices & technology adoption within college residence halls. This review will focus on an assessment of the key steps required to host a green demonstration at any school, with particular emphasis placed on student-staff collaboration, forging industry partnerships, positively influencing institutional design policy & standards, shifting student consideration & consumption behaviors, and the broader potential for leveraging these demonstration spaces.

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F3 Connecting with Communities

4:00 Community-based Planning for a Sustainable Future

Nancy A. Parkes, Sustainability Task Force Co-chair, Member of the Faculty, The Evergreen State College. parkesn@evergreen.edu
John Pumilio, Sustainability Task Force Coordinator, MES Graduate Student, The Evergreen State Coll. pumjoh31@evergreen.edu

Each college or university has the unique opportunity to establish a vibrant, community-based sustainability plan of action through engagement and participation with all community stakeholders, including administrators, staff, faculty and students. The Sustainability Task Force at The Evergreen State College initiated an extensive campus-wide outreach program that proved to be an effective strategy for developing such a plan. The Task Force developed various methods to engage the community, including staff meetings and a mini-institute; academic program workshops for students; individual meetings with faculty members, college administrators, and student groups, and an accessible online survey. By developing a grass roots approach, the Task Force gained essential insight into the ideas, perspectives, and concerns of Evergreen's diverse community members. Moreover, this collaborative approach gained wider acceptance from the community. Our community is also now vested in its outcome. The recommendations of the Sustainability Task Force subsequently became part of Evergreen's five-year strategic plan. Our community-based planning has resulted in a commitment to such critical sustainability initiatives as carbon neutrality, zero waste, a push for improved campus health and well-being, and a curricular track in sustainability. In sum, an extensive community-based outreach program can be a valuable tool for any academic institution hoping to develop a sound sustainability plan.

4:20 Collaborative Graduate Research for Sustainability: Spatial Analysis of Campus Storm-water Runoff using GIS

William Lotz, Graduate Student (Geography), Institute for Environmental Studies, Western Illinois University. wh-lotz@wiu.edu
William Brewer, Western Illinois University. WE-Brewer@wiu.edu
Co-Author: William Doe, Western Illinois University.

The sustainable management of stormwater and non-point source runoff from rainfall events is a critical component of campus operations. Campus drainage networks are often linked to adjoining rivers and streams, delivering sediment and pollutants that impair water quality. The historical design of campus buildings, parking lots and other impervious surfaces ignores best management practices (BMPs), such as on-site retention, gully stabilization and low-impact design that will reduce stream impacts. At Western Illinois University, a graduate student research project in stormwater management provided a framework for inter-campus collaboration between academic and operational units. The East La Moine River flows through the campus and is classified as an impaired stream segment by the State of Illinois. The effects of campus runoff on this stream have not been previously studied. The student performed a spatial analysis of stormwater runoff on the campus using field reconnaissance, digital topographic data, facilities plans and GIS. This research supports ongoing master planning initiatives and provided a stimulus for collaboration between the operational, planning and academic components of the campus. The study is expected to identify areas for further design evaluation that can enhance campus storm water management and attain specific sustainability goals at Western Illinois University.

4:40 Reducing Water and Energy Use on Arizona Farms and Ranches

Tom Acker, Director, Sustainable Energy Solutions and Faculty, Mechanical Engineering Department
Northern Arizona University. tom.acker@nau.edu
Mark Glauth, Research Associate, Northern Arizona University. mglauth@aol.com
Gary Deason, Deputy Director, Center for Sustainable Environments, Northern Arizona University. Gary.Deason@nau.edu

This long-term project seeks to assist Arizona farmers and ranchers in reducing their use of water for crop irrigation by introducing water conservation technologies and state-of-the-art irrigation methods. By reducing water use, farmers and ranchers can decrease their need for pumping, the single highest use of electricity on most farms and many ranches. Reduced pumping, in turn, increases the ability of renewable energy systems to meet all or most electricity requirements.

This presentation will address interrelations of water and electricity on three farms and ranches in diverse parts of the state. Building on these actual case studies, project leaders will develop methods to assist landowners in analyzing their water and energy needs and determine the economic feasibility of introducing water conservation measures and switching to renewable energy systems. The project will produce analytical software, technical information and financing opportunities available to farmers and ranchers in different parts of the state.

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5:00 How the Trees Brought Us Together

Peggy Green, Associate Professor of Biology, Broward Community College. pgreen@broward.edu

Broward Community College (BCC) adopted a native landscaping policy last year that is transforming our campus environment to reflect the unique natural communities and local flora of South Florida. All of the benefits of landscaping with natives – elimination of pesticides and inorganic fertilizers, water conservation, and creation of habitats for native wildlife – are being modeled through this practice. The most recent North Campus landscaping project involves the creation of a tropical hardwood hammock. Planting this native South Florida habitat on campus was the result of a cooperative venture between the Kids Ecology Corps (KEC) and BCC along with city, county, and state support.

This paper and PowerPoint presentation will focus on 1) an overview of the BCC landscape policy, 2) the collaboration that provided help in funding the hammock project as well as planting the trees with fourth graders from nearby Coconut Creek Elementary joined by over 60 college student volunteers and 3) the bonding that occurred between individuals and agencies working on the project as well as between participants and the trees they nurtured. Concluding the paper will be a discussion of the future use of the hammock as an outdoor learning laboratory and a site for service learning projects.

F4 Curriculum and Pedagogy

4:00 Principles of the Sustainable Classroom

Carole Huber, Instructor, University of Colorado at Colorado Springs. chuber@uccs.edu

Co-Author: Michael Larkin, mlarkin@uccs.edu

Using the concept of fundamental principles developed in The Sustainability Revolution as a model, we explore the principles of a sustainable classroom as we initially conceived them, as our students conceived them and as they evolved and coalesced throughout our course, Saving Place. Components we consider include the following: course subject matter; course format; the physical environment; material used and consumed; the cultural environment; teacher/student relationship; projects created; and extension of the learning environment and outcomes beyond the classroom and beyond the term. Much as Sim Van der Ryn and Stuart Cowan's first of their Five Principles of Ecological Design, "Solutions Grow from Place," reflects the essential role place plays in sustainable design, a focus on place, a focus on the local, emerged as a central core of our understanding of what constitutes a sustainable classroom. We examine place more closely as the nexus of our course, concentrating on three components: classroom location; experiential activities; and, final projects. The unconventional location of our classroom shaped the course and ultimately provided its spiritual foundation. Local fieldtrips served as catalyst for self-examination and life-altering experiences for students and faculty alike. Students' final group projects both reflected and shaped their experiences with place.

4:20 Combining Science with the Arts: An Effective Way to Enhance Student Understanding of Sustainable Development.

Brett Robbs, Associate Professor, University of Colorado at Boulder. Edward.Robbs@colorado.edu

Co-authors: Jason Neff, Michelle Ellsworth, and Maura Troester

Can one course combine science and art to enhance students' understanding of the science surrounding sustainable development and encourage them to follow sustainable practices upon graduation? Research and student performance in a new course, The Art and Science of Climate Change, suggest the preliminary answer is yes.

Such a combination of art and science is unique. The paper describes how the interdisciplinary course was designed and funded, how the science (earth climate and human-caused climate change) was presented and how the creative lab helped students explore idea generation and creative thinking and learn to use video and audio software. Students were tested and required to embody scientific principles in a soundscape, video, choreography and storytelling. Excerpts will be presented.

Finally, the paper describes course outcomes. Tests and class discussions suggest the students, who were liberal arts majors, mastered the scientific material more thoroughly than most students in traditional science classes. Long form interviews indicate that embodying scientific principles in art enabled students to engage the material more deeply. That engagement opens the possibility for long-term change as students told the interviewer of plans to pursue more sustainable forms of living. Follow-up research will determine if such change occurs.

4:40 Sustainability in Unexpected Places: Integrating the Ideas into "Regular" College Courses

Linda Vanasupa, Professor, Cal Poly, San Luis Obispo. lvanasup@calpoly.edu

Universities have taken several approaches to address education for sustainability: some approaches include programs in environmental studies, courses, and applied research initiatives. Ideally, the underlying principles of sustainability would be integrated throughout all courses of study as a natural part of any disciplinary education. In this paper, we present ways in which one can integrate the issues underlying sustainability into a "regular" college course. Our examples are taken primarily from freshmen- through senior-level engineering courses, but can easily be adapted to other programs of study. They include fostering systems thinking, moral development, and sound understanding of sustainability issues through: structured reading and discussion sessions; case studies coupled with a group exercise on professional ethics; a formal debate; and design projects. In this talk, we will present several examples and the component that ensure their success.

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5:00 Teaching and Assessing "Ecological Thinking" as a Liberal Art

Steve Woolpert, Dean of Liberal Arts, Saint Mary's College. woolpert@stmarys-ca.edu

This paper describes a particular liberal art, "ecological thinking", that helps prepare students to contribute to the common good. This habit of mind seeks to know about how things fit together, about patterns and interrelationships, and about our solidarity with the living world. The paper describes a rubric for teaching ecological thinking which operationalizes two primary dimensions of the concept, identifies evidence to be used in evaluating students' proficiency in using it, and establishes criteria for assessing that evidence.

One way to develop ecological thinking is a technique called the "concept map". In this activity, students are given a list of terms, names, or events, in alphabetical order. They are instructed to position these items on a page and then show by means of specific links how they are related to each other. Another approach involves "pedagogies of place." In these activities students treat their locale and daily patterns of living as subjects of inquiry. The landscape of their campus provides countless "teachable moments." At Saint Mary's College, student in service learning courses are conducting environmental audits, the results of which are helping to make it a more sustainable campus. Several examples will be presented.

Field Reports

F5 Sustainable Campuses: Reports from the Field 4

4:00 The Process of Learning Sustainable Design in Interior Architecture

José Bernardi, Associate Prof Arizona State University. jose.bernardi@asu.edu

This paper will critically discuss the learning experience in two related classes structured around issues of sustainability for architectural interiors. A construction class taught in the fall semester begins the sequence, here the students explore aspects that locate sustainability within larger and complex societal frameworks, and specifically study how these issues are connected to both materials and construction methods, in conjunction with the life cycle assessment and performance of building in the desert. The course ends with a project constructed with sustainable and recycled materials for children with cancer at the Phoenix Children's Hospital. The project explores the issue of serving by sustaining the value of life in all its dimensions. The sequence continues with a Senior Design studio in the spring semester. The spring studio addresses four larger questions: Is the design EXPERIENTIAL, does it add value to the PLACE that was created, and enhance the user's experience? Is the design THOUGHTFUL, collaborative, and indigenous? Does the design meet criteria for TECHNICAL EXCELLENCE? Is the design ETHICAL, sustainable, and socially responsible? The projects were recognized with international as well as national awards and continue to learn from the comments and critiques received during these years.

4:10 Incorporating Green and Sustainable Chemistry into the Undergraduate Curriculum: Pedagogy, Research and Outreach Activities

Edward Brush, Associate Professor, Bridgewater State College. ebrush@bridgew.edu

Sustainability issues are becoming a focal point in a liberal arts education. It is important to educate all science students on practical and sustainable approaches to reducing or eliminating the use and generation of hazardous chemicals. This presentation will focus on examples of green chemistry research, curriculum and outreach activities at Bridgewater State College. Pedagogical initiatives teach traditional chemistry concepts and lab experiments, while emphasizing how creative research and industrial approaches have led to the design of less hazardous processes and materials. Undergraduate students play a critical role in these initiatives. Honors students develop and test greener lab experiments and serve as green chemistry liaisons. Research students are investigating greener approaches towards the synthesis of novel materials made from naturally occurring feedstock. Finally, the Chemistry Club participates in hands-on outreach activities to communicate the important message behind green chemistry and sustainability to the local community.

4:20 Cal Poly Land: The Place of the University

Steven Marx, Professor of English Cal Poly, San Luis Obispo. smarx@calpoly.edu

The Cal Poly Land Project is an interdisciplinary program of instruction, research, and institutional self-study founded in 2000. Its subject is "place study"—the place being the 10,000 acres of California Polytechnic University itself.

The project has three independent components, each nourishing the others. One is an award-winning book, *Cal Poly Land: A Field Guide*, enthusiastically reviewed in *Orion Magazine* and *ISLE (Interdisciplinary Studies in Literature and the Environment)*. It serves as a textbook for the second component of the project, a course entitled "Cal Poly Land: Nature, Technology and Society." Formerly cross-listed as Agriculture and Humanities, the class has recently found its interdepartmental home funded by the Office of Academic Programs along with a "UNIV" prefix that offers General Education credit. It's now offered to sixty students at a time by two instructors and dozens of guest lecturers and guides. The third component of the project is the Cal Poly Land website—<http://polyland.calpoly.edu>—which archives local information about places and topics including Geology, Climate, Flora, Fauna, Archaeology, History, Agriculture, Infrastructure, Recreational opportunities and Stewardship in an attractive and easily navigable format. Students in the class use the website as a resource and contribute new sections to it every year.

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4:30 Experiential Learning: Standard Sustainable Interior Materials Binders

Janice Jennings, Interior Design Faculty, Mesa Community College. jennings@mail.mc.maricopa.edu

Through the Interior Design program at Mesa Community College, (MCC), students have engaged in experiential learning to develop standard sustainable materials binders for the MCC Maintenance and Operations department. A collaborative process engaging students, faculty, staff, and administrators focuses on the goal of environmental sustainability. Approved vendor contact information, a materials list, and the number of schemes to develop are provided to the apprentices. Through a formal presentation, administrators approve of the end product for implementation. This method enables design students to learn about facilities planning and management strategies; sustainable materials, specifications, and how to work within a hierarchical corporate culture. They are given internship credit for their efforts. The Interior Design program also gains student work necessary to meet the Council for Interior Design Accreditation, CIDA, indicators on sustainability. The campus remodel projects are completed using these environmentally friendly materials. Presumably these efforts could facilitate future certification goals within the Leadership in Energy and Environmental Design for Existing Buildings, (LEED-EB).

4:40 One Classroom at a Time: Sustainable Renovation at the Classroom Scale

Michael Rogers, Assistant Professor, Ithaca College. mrogers@ithaca.edu

The Ithaca College physics department is implementing the Studio Physics / SCALE-UP (Student-Centered Activities for Large Enrollment University Programs) programs in all of our introductory physics classes. These instructional approaches move students out of the lecture hall and into a technology-rich, active-learning studio room. Our classroom uses 7-foot-diameter tables to create learning communities for 9 students at each table with a total of 99 students in the classroom. Construction of this classroom requires the renovation of two existing classrooms plus two adjacent storage rooms. This renovation is small in that it does not involve redesigning HVAC and other building systems, but large enough to benefit from sustainable design. Classroom-sized renovations are often considered not worthy of the "effort" of sustainable design due to the minimal impact resulting from such "small" projects. Our successes and challenges at using sustainable design to build our classroom in the best way possible while establishing methods that can be used by others will be discussed.

4:50 Teaching for a Positive Future: Education for Sustainability in a Teacher Preparation Program

Victor Nolet, Associate Professor, Western Washington University. vnolet@wwu.edu

This session will present an overview of the Teaching for a Positive Future (TPF) project at Western Washington University. This is a pilot project that seeks to infuse sustainability education into the preservice preparation of teachers. The project includes faculty in Elementary, Secondary, and Special Education in the College of Education, as well as faculty from discipline areas in other colleges who are involved teacher education. Participating faculty agree to make at least one curricular innovation in a teacher education course to introduce topics, assignments, or activities related to sustainability. The TPF project then provides curriculum materials, technical support, and assessment tools to assist these faculty members as they implement curriculum changes. The TPF project also sponsors periodic Learning into Action events such as inquiry symposia, interactive panels, and teaching demonstrations that address specific topics, such as food security, consumerism, environmental justice, and local economies. A series of case studies are being developed to document the project and to provide examples that can be implemented in other teacher education programs. This Field Report session will present a conceptual framework for the project, an update of activities underway, and a brief overview of project development, staffing, partnerships, and funding.

F6 Panel: From Public Policy to Sustainable Campuses: : the case of the Los Angeles Community College District (LACCD)

Moderator: Woodrow Clark, Energy Director, Los Angeles Community College District. wclark13@aol.com

Larry Eisenberg, Los Angeles Community College District. eisenblh@laccd.edu

Mona Field, Los Angeles Community College District. fieldm@laccd.edu

Ms. Mona Field, LACCD Board Member -- Board proposals for Sustainable Campuses Program/Policy made and passed in 2001 that created LEED Silver level building goals and also 10% renewable energy across the nine campuses, plus two satellite ones. Then in 2002, voters approved two separate bond measures for over \$3.2 billion to finance the programs.

Dr. Woodrow Clark, LACCD Energy Director will speak about the transition from policy to practice for a four stage energy program: 1) renewable energy central plant, 2) energy efficiency and conservation, 3) 1 MW Solar/PV for each campus and 4) Sustainable Development Curriculum across all campuses.

Mr. Larry Eisenberg, VP and Facilities Manager for LACCD -- the specifics of sustainable and smart campus implementation requires not only energy but also concern for land, water, waste and recycling on all campuses. These and other infrastructures (such as transportation and telecom) are critical for planning sustainable campuses. The use and reuse of materials for construction as well as new environmentally friendly products and technologies must be identified, implemented and institutionalized through set standards, goals and bulk purchase programs to reduce costs and be competitive in the market place.

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F7 Panel: Tips for Teaching Sustainability

Moderator: William Timpson, Professor, Colorado State University. wtimpson@lamar.colostate.edu
Brian Dunbar, Director, CSU Institute for the Built Environment, Colorado State University. dunbar@cahs.colostate.edu
Tony Cortese, Second Nature. adcortese@verizon.net

At its core, our newly released book on sustainability is about empowerment, facing real world challenges, and learning to act with greater reverence for Earth, her limits and her intelligence, and then teaching others to do the same. Sustainability is a big, complex concept that defies easy definition yet demands attention for our collective well-being. It affects all of us, regardless of our background, age, political affiliation, geography or other characteristics. It requires cooperation and collaboration from ecologists, sociologists, economists, community leaders, business leaders and many, many others who have not historically worked together. Our book, truly a community effort, reflects this. Our writing team included scholars, teachers, students, local business people, and representatives from non-profit organizations.

Teaching about sustainability can be truly transformative as it empowers us to think critically and act creatively in very new ways. Our book—*147 Tips for Teaching Sustainability: Connecting the Environment, the Economy and Society*—presents ideas and strategies for addressing compelling issues in practical and effective ways. Our panel will discuss the basis and format of the book and engage the audience in discussing additional ways to develop and disseminate curriculum that focuses on understanding and applying this comprehensive concept of sustainability.

F8 Panel: Accelerating Change in Renewable Energy and Climate Change Markets

Greg Chambers, Sterling Planet Inc. gchambers@sterlingplanet.com
Blaine Collison, US Environmental Protection Agency. collison.blaine@epa.gov
Chris Fanning, Conservation Fund cfanning@conservationfund.org
Bjorn Fischer, The Climate Trust. bfischer@climatetrust.org
Marcus Krembs, Sterling Planet, Inc.. mkrems@sterlingplanet.com

Global warming is one of the most challenging environmental challenges in human history. Anthropogenic actions primarily as a result of burning fossil fuels are made responsible for a changing climate that impacts life on earth. As a knowledge based economy, academia plays an important role in shaping policies and programs that help reducing climate change impacts by transitioning our fossil fuel based economy towards a sustainable future. Higher education administrators, energy directors, faculty and students are faced with an array of choices as they chart a course in renewable energy and climate change markets. This panel is comprised of a group of speakers who will identify sources of guidance and review strategies that can be implemented to lessen the energy and climate change impacts associated with campus sustainability programs. Attendees will learn about climate change programs, GHG inventories, going carbon neutral, buying renewable energy certificates and offsets, onsite generation, and other topics as they evaluate their role in renewable energy and climate change markets.

F9 Panel: Sustainable Campuses as Learning Tools: Green Buildings and Grounds and the Educational Mission of the University

Moderator: Joe Bowersox, Professor, Government and Politics Willamette University. jbowerso@willamette.edu
Michael Sestric, Lewis and Clark College. sestric@lclark.edu
Sheri Tonn, Vice President for Administration and Finance Pacific Lutheran University. tonnsj@plu.edu
Bob Snyder, Zimmer Gunsel Frasca Partnership. rsnyder@zgf.com

In the midst of soaring energy prices, concerns about water conservation, worries over occupant/employee exposure as well as pressure from well-meaning students and alumni, colleges and universities across the country are adopting sustainable building and landscaping practices. But to what extent are colleges and universities utilizing sustainable construction and landscaping as teaching moments in sustainability for students and the community? By examining the incorporation of LEED Gold and Silver projects into the curriculum and co-curriculum of four Pacific Northwest universities and colleges, this panel will lead a roundtable discussion on opportunities for maximizing the educational impact of adopting sustainable operating practices. Examples will cover everything from involving student research in design, to class use of systems monitoring, to assigning faculty to a facility specifically to foster teaching and outreach opportunities.

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F10 Panel: Improving Campus Energy Performance: Best Practices in Student-Driven Energy Efficiency and Conservation Programs

Moderator: Andy Coghlan, Program Associate, Alliance to Save Energy. acoghlan@ase.org

Jocelyn Orr, Humboldt State University. jmo32@humboldt.edu

Joanne Panchana, California State University, Chico. jpanchana@mail.csuchico.edu

Shyla Raghav, University of California, Irvine. sraghav@uci.edu

Ryan Schauland, University of California, Santa Barbara. rschauland@umail.ucsb.edu

Because students can effectively influence their peers and high-level campus decision makers, they are ideally positioned to catalyze sustainability initiatives on both an individual and an institutional level. Through the Alliance to Save Energy's Green Campus Program, student interns on a dozen California university campuses have partnered with faculty, staff, and other student groups to implement programs designed to reduce campus energy use and further campus sustainability goals.

In the past two academic years, Green Campus interns have successfully spearheaded projects that:

- raise overall awareness about the environmental and financial costs of campus energy consumption;
- examine current campus operating procedures to identify wasteful practices and recommend potential alternatives;
- address energy consumption in student housing;
- integrate energy efficiency and conservation into for-credit service learning projects;
- incorporate new data collection and energy-efficient technologies in campus buildings.

This panel will feature student presenters from Chico State University, Humboldt State University, UC Santa Barbara, and UC Berkeley. Students from each school will highlight replicable best practices that draw on their experiences in building effective student-staff partnerships, measuring projects' effectiveness, and ensuring program longevity by institutionalizing environmental stewardship within campus departments.

F11a Workshop: Green Demonstration Areas: Practical Demonstration of Sustainable Living (45 mins)

4:00 Laura Moreno, Student Sustainability Education Coordinator, University of California, Berkeley. lmoreno@berkeley.edu

Opened in October 2005, the EPA Award-winning Green Room is a demonstration area designed to teach the campus community about living sustainably and using sustainable technologies. It is a "typical" UC Berkeley residence hall room with live-in hosts who demonstrate how typical college students can live more sustainably without drastically changing their lifestyles or spending copious amounts of money. The room showcases personal care products, Energy Star appliances, and signs on behavior changes that enable students to be more environmentally friendly. Central to this program is the concept that the Green Room provides a practical display of sustainability, not just an abstract description. This display allows visitors to comprehend the concept of "sustainability" and how they can easily integrate it into their own lives.

In October 2006, the Green Room is expanding to encompass a Green Apartment and a Green Suite. The Green Apartment will focus on "green transitions" from residence hall life to apartment life. The focal points of this area are behavioral choices and common apartment appliances. The Green Suite will focus on "green technologies" such as pressure-assist toilets. This area is intended to introduce sustainable building technologies of the future and is designed to accommodate class tours.

F11b Workshop: Incorporating Sustainability into the Residence Halls (45 mins)

4:45 Laura Moreno, Student Sustainability Education Coordinator, University of California, Berkeley. Laura Moreno

The award-winning Residential Sustainability Education Coordinator (RSEC) Program is a primarily student-run, peer-to-peer education program designed to interactively teach students in the residence halls about sustainability. Integration of sustainable living into student life is a key method of reaching students early in their adult lives and positively influencing their behaviors and attitudes towards the environment, conservation, and recycling. This program enlists both paid workers and volunteers who live in the residence halls and are point sources of information about sustainability for their peers. Two Student Sustainability Education Coordinators (SSECs) are also employed and recruit and manage the RSECs and serve as liaisons between the staff and the volunteers. Sustainability is incorporated into student life through different programs, activities, and signage that inform students about the different aspects of sustainability in interactive and innovative ways. The RSEC program collaborates with housing, dining, and other student groups to create and facilitate various programs. Examples of programs facilitated by the RSEC program are Sustainability Week, battery recycling, water awareness month, and the trash art contest. The RSEC program seeks to create a paradigm shift in the way that students think about resources and the environment, and how, in turn, they choose to live.

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Thursday, October 5
2:30-3:30
Poster Session

P1 Sustainability Partnership: Bringing Science to Practice, and the Practical to Science

Anne Ellis, Program Manager, GIOS, Arizona State University. anne.ellis@asu.edu

This poster presents an overview of the Sustainability Partnership, a boundary-spanning unit within the Global Institute of Sustainability at ASU. The Sustainability Partnership works to “bring science to practice, and the practical to science.” Its mission is to facilitate ongoing dialogue and partnerships between ASU faculty and community leaders, with the expected outcome of advancing sustainable development. Initial Sustainability Partnership efforts are focusing on the urbanizing edge of Phoenix and the Valley of the Sun. The poster highlights recent, current and potential future projects and partners.

P2 Student Contributions to Campus Sustainability

Stephanie Kaza, Professor, University of Vermont. Stephanie.Kaza@uvm.edu

Gioia Thompson, Environmental Coordinator, University of Vermont. Gioia.Thompson@uvm.edu

Students at University of Vermont are a significant critical mass for social change regarding sustainability values and practices. Seven forms of advocacy and research have generated helpful research, innovative projects, and supportive policies for UVM's goals as an environmental university. Through a competitive small grants budget, the Environmental Council has helped students design a biodome, launch a yellow bike program, promote off-campus bus use, and analyze local food use in campus dining. Students have also done internships with the Council, working on use of recycled paper, carbon emissions analysis, and demonstration energy projects. Through class projects and senior theses, students have advocated for biodiesel shuttle buses and energy star mini-fridges; one students-teaching-students (STS) class focused on campus sustainability. A new Eco-Reps Program is growing the culture of sustainability and environmental responsibility through residence hall representatives. Our small “green” dorm (Slade Hall) practices sustainable food buying and preparation; the new and larger “GreenHouse” will be a center for activism and education for incoming students. Across this range of engagement, students learn knowledge, skills, and values through practical hands-on research, catalyzing campus and administration motivation for investment in sustainability.

P3 Ecovillages as Campuses for Sustainability Education

Daniel Greenberg, Executive Director, Living Routes - Ecovillage Education. daniel@LivingRoutes.org

There exists today a growing international network of “ecovillages” – communities that are striving to create cooperative lifestyles in harmony with their local environments. In addition to pioneering social and ecological tools such as consensus decision making, ecological design, organic agriculture, and renewable energy systems, ecovillages are bringing these tools together into wholes that are greater than the sum of their parts. Ecovillages are not utopias. They are living laboratories developing integrated, community-scale solutions to our global social and ecological crises. In the process, they are developing real-world models of sustainable development that make ideal “campuses” where students can learn about sustainability while striving to live it. This paper will provide an introduction to: the growing ecovillage movement worldwide (e.g., Findhorn, Scotland; Auroville, India; Sirius, MA), the work of Living Routes, which partners with UMass-Amherst to offer study abroad programs based in ecovillages worldwide, and the possibilities and challenges of using these communities as contexts for education and social change, especially in comparison to traditional university-based education.

P4 Implementing Smart Growth On and Off Campus

Kevin Nelson, Policy Analyst, US Environmental Protection Agency. nelson.kevin@epa.gov

Many colleges and universities are recognizing the benefits of adopting smart growth development strategies for the following four reasons: 1. Creating enduring, vibrant places that improve campus and community quality of life, facilitate the campus' growth needs, and boost student, faculty, and staff recruitment and retention. 2. Realizing fiscal benefits. Maximizing dollars spent by building efficiently, creating multi-use live-work-play developments on or near campus, and, where appropriate, partnering with private and public sector entities to make the most effective use of investment dollars and infrastructure requirements. 3. Being a good neighbor. Collaborating with the local community to create economic development opportunities and additions to the community fabric that benefit all stakeholders. 4. Contributing to a healthy environment. Protect limited natural resources by building efficiently and with sensitivity to the environment. In conjunction with private sector design professionals and trade associations representing colleges and universities, the EPA is developing a primer on smart growth development practices for colleges and universities. This primer is aimed at institutional leadership on campus and in the community that has decision-making authority on campus expansion, land acquisition, and facility development. In this roundtable, we'll discuss the environmental, fiscal, and community based benefits associated with smart growth development practices on and off campus.

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P5 Go With the Flo: Designing Social Benefits Into A Product

John Takamura, Faculty Associate, College of Design, Arizona State University. John.Takamura@asu.edu
Co-Authors: Tamara Christensen, Dosun Shin, Dean Bacalzo

Noting that proponents of universal design often cite the need to accommodate elderly populations, and further noting that universal design should strive for a more cradle to grave approach in terms of the user; the goal was to design a transgenerational toilet that is usable by toddlers and their grandparents alike. This is a case study of a transdisciplinary team of four, their approach to this problem, and how the resulting design shifts paradigms of toilet use, universal design, and toilet sustainability with regards to water consumption.

The Flo toilet is a product of a transdisciplinary design process that brought together graduate students and faculty of the Industrial Design department at Arizona State University. This project was undertaken to address the challenge of designing a transgenerational toilet that is both sustainable and socially conscious. The final product illustrates the benefits of collaboration and rigorous research. The project is a case study about bridging the gap between research and practice in the academic arena and the designing of social benefits into a product.

P6 Tracking the Literature: A Bibliometric Study of Higher Education for Sustainability Journal Articles

Tarah Wright, Director of Environmental Programmes, Dalhousie University. tarah.wright@dal.ca

Using the tool of bibliometry, this study examines publications related to higher education for sustainability (HES) in academic journals from 1990 to 2004. It offers a statistical description of the literature, and analyzes the development of HES publications within the journal literature to date. The results show that the number of HES research articles has increasing in the journal literature. The number of academic journals publishing HES articles has also increased but not at the same rate as the total amount of articles. The sheer increase in publications seems to be primarily due to the creation of a new HES journal rather than the more traditional and established journals increasing their publication of HES articles. The results reveal that the number of authors publishing in the area of HES has increased significantly. Further, the study illustrates the global nature of HES publications in the English-language.

P7 A Campus-Community Partnership for Biodiesel Production

Karin Warren, Chair of Environmental Studies, Randolph-Macon Woman's College. kwarren@rmwc.edu
Co-Authors: Jessica Shahan, Department of Environmental Studies and Biology, Randolph-Macon Woman's College,
William Bare (Department of Chemistry) wbare@rmwc.edu

The use of biodiesel as an alternative fuel is becoming more common on college campuses, as is on-campus production of biofuels, and offers a means of addressing on-campus energy needs with reduced environmental impact. Establishing a campus-community biodiesel project can stimulate local interest in alternative energy, provide research and curricular opportunities for students, and reduce overall costs of production. The Environmental Studies program at R-MWC has developed a joint biodiesel production venture with Lynchburg Grows, a non-profit, urban organic farm and community development organization located in downtown Lynchburg, Virginia. This project was accomplished with undergraduate students, and has occurred in tandem with other sustainability projects between our college and Lynchburg Grows, including community composting and vermiculture. We established partners (including colleges, restaurants, and food service organizations) throughout the city to obtain feedstock vegetable oil, and designed the biodiesel apparatus after a thorough survey of other colleges' biodiesel production efforts. The biodiesel generation facility was constructed on-site at Lynchburg Grows, and was designed to be portable to encourage educational use throughout the community. We have also planned an on-campus biodiesel storage facility in pursuit of LEED certification for a campus building renovation.

P8 Collaborative Water Harvesting at the University of Arizona

Emilie Brill Duisberg, Student/Project Organizer, University of Arizona. emilie@email.arizona.edu
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For the first time, a course in water harvesting was offered at the University of Arizona in the Spring 2006 semester. This course came about through the initiative of a student club promoting sustainable resource use at the university and collaboration with faculty and facilities management staff. University Facilities Management and a grant from the USGS Water Resources Research Center provided funding. The primary objective was to transform a high profile flooding problem at the McKale Center athletic facility into a showcase for the use of rainwater to meet desert landscaping needs, with educational signage describing the intervention for the general public. A secondary objective was to teach water harvesting practices to students for use in their own lives. This pilot course was a success and will now be offered each spring semester. Furthermore, it will be integral to Tucson's ADEQ stormwater compliance program which requires university participation in stormwater runoff mitigation. The yearly class project will fulfill the university's obligation and institutionalize water harvesting within the curriculum.

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P9 Involving Students in LEED Certification of a Sports and Activities Center

Karin Warren, Chair of Environmental Studies, Randolph-Macon Woman's College. kwarren@rmwc.edu
Co-Author: Richard D. Barnes, Professor of Psychology and Environmental Studies, Randolph-Macon Woman's College.
rbarnes@rmwc.edu

Randolph-Macon Woman's College recently received a grant from the Kresge Foundation to support sustainable design and planning for major renovations to our sports and activity center. The College has registered the project for LEED Certification and is working with Sasaki and associates architects to incorporate green building technologies into the building. The project is in the design development phase with anticipated completion in Fall of 2008. A unique feature of this project is involvement of students in the LEED documentation process. This presents an opportunity for students to gain hands-on experience with the process of creating a green building. Students are doing background research and documentation as part of the LEED certification team for the project. The field report will provide a brief summary of the project and the planned green features of the building. An update on the student involvement will be given, along with a summary of advantages and challenges of student involvement in LEED certification.

P10 Keeping (the) House

B. David Rowe, Co-founder, Oikos, LaGrange College. drowe@lagrange.edu
Mark Y. Alex Davies, Ph.D. Dean, Wimberley School of Religion Oklahoma City University, Co-founder, Oikos. mdavies@okcu.edu

Founders of a new non-profit inter-institutional metacollaborative network seek input and involvement in the intentionally opened development of a new cooperative pattern of relationships and action. Oikos, named for the Greek word for house and the root for English words economy, ecology and ecumenism, seeks to involve actors from around the world in institutional sectors broadly categorized as Government, Faith, Economy, Service (includes NGOs, healthcare and media), and Education to address issues of peace and non-violence, human need and social justice, and ecological sustainability. By convening leaders from multiple institutional settings, Oikos intends to create a collaborative community of actors, to develop content knowledge about and around the issues areas and to deepen personal and organizational capacity for confronting complex challenges through an international process of developing leadership competence and philanthropic support. AASHE member input and involvement at the earliest stages of development of the first Oikos initiative, to create Oikos Scholars programs at multiple educational institutions around the world, would enhance the program's prospects for effectiveness and adaptability to multiple curricular contexts and provide insights for the overall development of the network.

P11 Pacific University & Mahlum Architects: A Model of Holistic Development

Kurt Haapala, Architect, Mahlum Architects. khaapala@mahlum.com
Deke Gundersen, Pacific University. deke@pacificu.edu

At Pacific University the social, economic, and environmental facets of sustainability are being approached holistically. Working together with students and the community on a variety of programs and initiatives, Pacific University models how higher education campuses can push the envelope with regard to sustainability. Constructing green buildings, setting up a demonstration farm utilizing environmentally sensitive farming techniques, educating local minority groups on how to market organic produce, working on local restoration projects, and protecting on-campus habitat are a few examples of Pacific University's efforts to engage students in protecting and respecting the community and environment, now and into the future. Deke Gundersen, Professor of Environmental Science, who has helped coordinate many of these campus sustainability initiatives, and Kurt Haapala of Mahlum Architects, who designed Pacific University's new student housing facility, which is expecting a LEED Gold rating will present an overview of sustainable practices at Pacific University. Mahlum and Pacific University worked together on this project to design a building that fully supported the campus goals of social and environmental responsibility. Bringing together two key participants of the holistic development process—educator and designer—our presentation will demonstrate how higher education campuses can advance sustainability by linking facility planning and construction to the broader spectrum of sustainability efforts on campus and in the community.

P12 Auburn Sustainability Action Project (ASAP): Interdisciplinary Cooperation with Quick Visible Results.

Lindy Biggs, Professor, History, Auburn University. biggsb@auburn.edu
Co-Author: Matthew Williams, Assistant Director, Sustainability Initiative. Auburn University. miwilliams@auburn.edu

In spring 2006 we created an upper-division course that brought together a wide range of students, and challenged them to actively address campus-wide sustainability issues. Over the course of one semester students were challenged to design projects that would produce visible results. Students received credit for the course, resulting in more in-depth participation than generally seen in volunteer campus organizations.

The first class included 13 students from eleven different majors in five separate colleges. Students in the first course proposed a variety of topics they generated themselves and then collectively selected the two final projects: a plan for a green roof on part of the largest teaching building on campus, and a footprint analysis for a building that houses the majority of a single college. Both projects presented the students with exposure to current campus related sustainability topics, gave them experience working in a group with diverse backgrounds and talents, exposed them to administrative activities in a university setting, and encouraged them to efficiently identify projects that simultaneously addressed current needs and expanded sustainability awareness on campus.

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P13 Positive Approach to Sustainability

Syed Hashim, Environmental Specialist, Facility Services Idaho State University/Idaho GemStars. engrusa@yahoo.com

Many worthwhile and necessary programs that would be beneficial to the sustainability of our campus, city, nation, and planet are being started at considerable expense in time and money but are being ignored by many organizations that should be participating. There are a multitude of ways to implement action programs. The most successful ones provide purpose, direction, recognition and measured goal attainment for potential participants. Emphasis should always be placed on the positive aspects of the program so participants want to be part of the efforts. Recognizing the needs and wants of the institutional leadership, both formal and informal, and tailoring the sustainability message and program to meet these needs is not always an intuitive effort. The Idaho GEMStars program is a successful sustainability program that is centered on the positive. The program provides collaborative opportunities for private and governmental organizations to share information and ideas and to reward and recognize those who are actively supporting pollution prevention programs. This paper outlines the positive methods of gaining and maintaining willing support of sustainability programs from students, faculty, administration and the community.

P14 Creating a Student-Directed Farm at Colorado College

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We aim to create a student-directed, sustainable, organic 3 acre farm at Colorado College. This farm will contribute to the regional development of an ecologically, economically, and socially responsible society – providing the community with the benefits of fresh food, farm experiences, and resources for agricultural education and research.

We present the result from our feasibility study which included farming a 2.5 acre market garden, researching farms at other liberal arts colleges, and networking within Colorado College. The feasibility study focused on five major aspects: 1) Integration into academic curricula through on-site courses and research. 2) Integration into student-life through active student leadership, farm festivals and a speaker's series. 3) Development of community relations through education, outreach to school children, and collaboration with local soup kitchens. 4) On-the ground sustainability through ecological management of soil fertility and non-crop organisms. 5) Financial feasibility through grant writing and farmer's market participation.

Based on the results of this study we are moving to create the CC Farm. Our farming techniques will promote environmental sustainability. Our educational opportunities and produce will be accessible to people of all backgrounds, especially to marginalized communities. Participation in local markets and local production will promote economic sustainability.

P15 Using Ecological Footprinting as a Quantitative Case Study for Assessing Personal and Institutional Sustainability

Phil Camill, Associate Professor, Carleton College. pcamill@carleton.edu

The ecological footprinting approach developed by Wackernagel and Rees is a useful tool for helping students visualize notions of sustainability that are often vague and difficult to conceptualize. I present a footprinting case study that I developed for an introductory environmental studies course. Over a period of 2-4 weeks, students account for their consumption in six general categories: food, transportation, housing, goods, services, and waste. The calculator used is a personal consumption spreadsheet developed by Redefining Progress, which includes almost 90 consumption categories, making it one of the most thorough sustainability assessment tools available. This exercise produces several outcomes. Perhaps for the first time in their lives, students arrive at a quantitative estimate of land consumption based on their lifestyle decisions, and they are able to rank order the consumption categories that require the most land area. Students can conduct sensitivity analyses for each category by changing data values to determine how data uncertainty or alternative, hypothetical scenarios of diet, travel, goods, and housing consumption affect land use. Another benefit of this approach is that it can be used as an index of sustainability across scales, from individuals to households to an entire campus. Examples of past student projects are shown.

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P16 Sustainable Science and Engineering Education in the U.S.

John Crittenden, Presidential Professor, Arizona State University. J.Crittenden@asu.edu
Co-Authors: Braden Allenby, Yongschen Chen, Junbeum Kim, and Ramzy Kahhat

Sustainable Engineering is in large part simply good engineering, therefore two parallel efforts are required to build community. First, in a short term, specific activities intended to modernize engineering education and practice are necessary. Second, in the longer term, sustainable engineering must be built into all engineering disciplines. Sustainable Engineering includes the following design decision levels: design for environment, life cycle assessment, industry ecology and cultural and social dimensions, etc.

Based on current knowledge of barriers limiting the use of sustainable engineering materials, we have to develop new activities for dissemination and use of these materials that overcome the barriers. Therefore, Arizona State University (Braden Allenby and John Crittenden) had established the Center for Sustainable Engineering with Carnegie Mellon University and University of Texas at Austin. The goal of the Center is to develop and implement activities to enhance education in Sustainable Engineering at colleges and universities around the US and around the world. Some activities that are included in this project are workshops to assist faculty who wish to add Sustainable Engineering to their courses, disseminate materials in modular form using an online portal, and build a community of Sustainable Science and Engineering educators.

P17 Sustainable Schools, Sustainable Cities: A Service Learning Project

Nancy Crocker, Director, Academic Community Engagement Services, University College, Arizona State University.
Nancy.Crocker@asu.edu
Co-Authors: Monica Elser and Heather Bush

During academic year 2005 – 2006, a sustainability service learning project was piloted in Phoenix, Arizona. Project participants developed and implemented a curriculum aligned with the local 7th grade science learning outcomes within the context of sustainability concerns in the southwest. In this project, Arizona State University (ASU) students led eighty-one 7th grade students in hands-on learning activities focused on water and energy conservation, recycling and environmentally conscious building practices. The University students functioned both as small group leaders and as liaisons to the University and local community sustainability resources. Two of the 7th graders presented about their activities at a national education conference. In the poster we present examples of learning activities and projects completed by the 7th grade students and their ASU undergraduate student mentors. The project is continuing during 2006 - 2007.

P18 Creating a Culture of Sustainability: The Sustainable Foods Movement at Pacific Lutheran University

Rachel Esbjornson, Sustainability Fellow, Pacific Lutheran University. esbjorrd@plu.edu
JP Kemmick, Student, Pacific Lutheran University. kemmicjp@plu.edu
Co-Author: Kate Fontana

Pacific Lutheran University has recently shown a commitment to sustainability, as demonstrated by its formation of a sustainability committee, the signing of the Tallories Declaration, and the construction of a LEED gold-certified building. These and other actions demonstrate PLU's movement towards creating a culture of sustainability: where all members live with daily awareness of our relationship to each other and the earth. In order to move PLU closer to having developed this culture of sustainability, over the summer we organized and established PLU's Sustainable Foods Movement. This movement aims to continue educating students both inside and outside of the classroom on the importance of sustainability, as well as provide people with ways in which they can put their knowledge into action. We want to show experientially what food sustainability means and provide people with opportunities to practice food sustainability. Consequently, the movement has a three-pronged structure: operations, education, and co-curricular activities. We've started an organic community garden, held a sustainable foods fair, arranged for speakers on issues of food sustainability to come to campus, increased signage on sustainable foods in our dining hall, and integrated a number of courses into PLU's Community Garden and Dining Services. We are also working to reduce food waste, arrange tours of local organic farms, and host a series of films highlighting topics of food sustainability. We are addressing the challenge of approaching people at different levels of awareness, planning to not only create change at the institutional level, but also at the personal level so that graduates leave with the knowledge and skills to lead sustainable lifestyles.

P19 The Greening of Eastern

William Leahy, Director Institute for Sustainable Energy, Eastern Connecticut State University. LeahyW@easternct.edu

Over the past five years, Eastern Connecticut State University was transformed from a typical predominately commuter attended state college, to Connecticut's Public Liberal Arts Residential University. During that time, the curriculum expanded in many dimensions, as did student population (+20%) and square footage (40%). Through twelve step process and an interdisciplinary team effort by students, faculty and administration, the university community dedicated itself to becoming a model "Green" campus for the state. All older buildings were retrofit with energy efficiency lighting, the all-electric 9 story high rise residence hall was converted to geothermal heating and cooling, three new residence halls were built to LEED standards and a new science center is being built to LEED Silver standards, solar PV with LED lighting was added to all bus stops, recycle centers and to two dorms, a 19 acre Arboretum was created, the Board of Trustees approved an Endowed Chair for a new minor - Sustainable Energy Studies, and also formed the Institute for Sustainable Energy for community outreach on sustainability, the President signed the Talloires

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Declaration and now he and the University recruiter drive Hybrid vehicles, and the students formed an active chapter of Jane Goodall's Roots and Shoots.

P20 School of Sustainability: A New Approach to Education

Lisa Murphy, Program Development Specialist, Global Institute of Sustainability/School of Sustainability, Arizona State.
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Co Authors: Charles Redman, Charles Perrings, Brenda Shears, Lauren Kuby

In 2007, a group of Arizona State University undergraduate and graduate students will embark upon a unique educational odyssey. These students are our future leaders in the struggle to achieve sustainability in the face of challenging environmental, economic, and societal needs. Arizona State University's new School of Sustainability, together with the Global Institute of Sustainability, will engage students in new academic and research programs that embody collaborative learning, interdisciplinary approaches, and problem-oriented training. Graduate programs in sustainability include a Master of Arts, Master of Science, and Doctor of Philosophy. Undergraduate programs in sustainability include a minor, Bachelor of Arts, and Bachelor of Science. The School will collaborate with a number of other units and disciplines on campus to offer these programs. Areas of focus will include urbanization, energy and materials, water, economic development and social transformation, biodiversity, and socioecological resilience. Graduates of these new cutting-edge programs will be able to think in a holistic way about sustainability problems and will be able to provide adaptive solutions to some of the most challenging issues of our time.

P21 Engaging Students in Ecological Research: The Central Arizona-Phoenix Long-term Ecological Research (CAP LTER) Project

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The Central Arizona-Phoenix Long-term Ecological Research (CAP LTER) project is one of 26 long-term ecological research projects funded by the National Science Foundation. CAP LTER focuses on how patterns and processes of urbanization alter the ecological conditions of the city and its surrounding environment and how the ecological consequences of these developments feed back to the social system to generate future changes. This poster will outline how CAP LTER involves higher education students as a means of reaching research goals and of training the next generation of scientists and environmentally-aware citizens. Student engagement includes initiatives that place service learning students in middle school classrooms to initiate ecology projects, undergraduate summer research internships in faculty laboratories, and graduate student research. In addition, CAP LTER provides opportunities for students to share their research with the wider scientific community on campus and across the United States.

P22 Arizona Water Institute: Building Innovative Collaborations

Peter Newell, Research Specialist, Global Institute of Sustainability, Arizona State University. peter.newell@asu.edu

This poster presents an overview of the Arizona Water Institute, a "first of its kind", tri-university, boundary spanning organization established through a governor's initiative in 2005 to bring together water experts throughout the state to work collaboratively to address pressing water issues. The AWI represents a consortium of Arizona's three universities focused on water sustainability through research, technical assistance, education and technology development. The poster describes the mission, research themes and current projects for the institute.

P23 Sea Kayaking among the Mangroves, Fishing with the Community: Lessons Learned in Cross Cultural Place Based Education

Mark Ritchie, Executive Director, International Sustainable Development Studies Institute. mritchie@isdsi.org

The International Sustainable Development Studies Institute (ISDSI) runs study-abroad learning expeditions which immerse students in cross-cultural experiential learning about sustainable development in Thailand.

Program courses examine the links between culture and ecology, and are intensely experiential. Courses include backpacking in Northern Thailand with Bak'er'ya hill tribes while studying forest ecology, skin diving the reefs of the Adang archipelago with Urwak'lawoi sea gypsies, and canoeing the Yom river with Khon Müang village elders fighting against damming the river on which their lives depend.

This paper discusses the lessons learned in doing place-based expedition learning through a case study of an ISDSI course on coastal resource management and mangrove ecology in Southern Thailand. The course focuses on social and environmental justice, the struggles of marginalized people to conserve and gain control over their local resources, and the political ecology of place—how local ecologies shape culture, and how those cultures shape the ecosystems within which they are embedded.

Key issues and best practices in developing place-based courses are examined, including community involvement in the design and teaching of the course, how to address the practical challenges of expedition-based education while maintaining high academic standards, risk management issues for off-campus courses, and related topics.

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P24 Sustainability through Active Listening

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Perhaps one of the most important skills in making a campus or community more sustainable is active listening. This basic, but nevertheless difficult and essential ability, results in mutual understanding, trust, and a greater sense of belonging within communities. Active listening can provide connection between disciplines, organizations, and operation sectors of a college. This tool becomes especially important in helping diverse cultural groups discover common values and can therefore help link social and environmental justice movements. More than a social tool, active listening can create a philosophy of awareness towards our ecological community as well. This poster will provide a visual model of Sustainability through Active Listening, including definitions and explanations. It is recommended that colleges and universities teach and practice active listening in and outside of curriculum through role playing and other exercises, encouraging individuals to break out of usual comfort zones. Whether we are listening to an individual from a local cultural organization or our own body signals, active listening is crucial to making our lives and communities more sustainable.

P25 Making it Official: Factors Associated with the Adoption of the Talloires Declaration

Daniel Sherman, Professor Environmental Studies, University of Puget Sound. dsherman@ups.edu

In 1990 a group of higher education administrators met in Talloires, France to formally declare their commitment to environmental sustainability. The resulting Talloires Declaration is a ten-point plan to integrate the principles of environmental sustainability into campus operations, education, outreach, and research. Since 1990 more than 320 institutions of higher education in 48 different countries have signed the Talloires Declaration. Additional institutions are signing this important statement of commitment to environmental sustainability each year. Why? What factors have facilitated the diffusion of the Talloires Declaration across so many institutions of higher education? What internal processes have institutions taken to signing the declaration? What characteristics are associated with the signatory institutions? What distinguishes signatory institutions from non-signatory institutions? We attempt to answer these questions by employing the sociological tools used to reveal the diffusion of innovations within and across organizations. By gathering both quantitative and qualitative data on signatory and non-signatory institutions in the U.S., Canada and Australia we are able to provide insight into the organizational factors and processes that have facilitated adoption of the Talloires Declaration. This effort is the first step in a larger project to determine not only adoption, but also to track the progress of implementation efforts related to the Talloires Declaration.

P26 Focusing Student Energy through Service Learning

Noelle Studer, Sustainability Coordinator, Portland Community College. noelle.studer@pcc.edu

Service Learning is an excellent way to encourage students to explore new experiences and develop leadership skills at commuter campuses. Portland Community College faculty encourage students to participate in a variety of activities, from ecosystem restoration and gardening, to developing information campaigns for children and building awareness on campus.

P27 SustainableCampus.Org

Robert Van Der Like, President, Energy & Environmental Education Resources, Inc.. r.vanderlike@earthlink.net

"The Sustainable Campus" is a free website information resource available to anyone interested in learning about sustainability, the issues & concepts, what can be done, and who is doing it. Any content that is provided for the website is for the purpose of educating newcomers to the world of sustainability (and there are still plenty of those out there). The other goal of the website is to provide as many links as possible to other site that show work being done relating to the development of a more sustainable campus. Visitors are encouraged to send comments, questions, and propose content that is applicable to the subject of campus sustainability.

P28 Is PV Worth It? Only if you use it to Educate!

Walter Simpson, Energy Officer, University at Buffalo, SUNY. wsimpson@facilities.buffalo.edu

The University at Buffalo is installing a 73.5 kilowatt photovoltaic system. Despite its hefty \$570,000 pricetag, this array will generate only a modest amount of electricity. The payback, even with state incentives reducing the cost to UB, is very long -- much longer than energy conservation measures, for example. If PV is not yet cost-effective, why do PV? This poster argues that a campus investment in PV makes sense if it is coupled to an extensive and multi-faceted program to teach about our current energy problems and the energy solutions of the future. UB is creating such a program and it is depicted and described on this poster.

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P29 Campus Planning and Water Resource Management

Peter Doo, Principal, Hord Coplan Macht Architects. pdoo@hcm2.com

Campus planning has taken on a new complexion. Watershed, regenerative design, bio-retention, ecosystems and habitat are now as much a part of the planning challenge as student housing, enrollment growth, parking lots and facility management.

Management of watersheds defines environmental issues on campuses today. Stormwater management, groundwater recharge, graywater recycling, water collection and re-use, green roofs, and preservation of existing vegetation all factor into the requirements for both new projects and management of campus land.

Hord Coplan Macht's approach to regenerative design moves beyond green to integrate all aspects of the campus environment – both physical and social. Extensive analysis of natural systems results in meaningful places for students, faculty and visitors to interact. The ecosystem becomes a source of both education and celebration.

Hord Coplan Macht uses many innovative techniques to enhance protection and enhancement of the natural resources on a site:

An integrated design process

Assessment of site evolution

Watershed analysis

Preserving existing vegetation wherever appropriate

Use natural systems to treat stormwater

Make the design visible so that it can be part of the educational process

We will discuss these concepts and their benefits, through examples from our projects for education clients.