Leaf Litter
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Thoughts on Sustainability in Higher Education

For many people, fall marks the return to the lecture halls, dorms and classrooms of a college campus. What better time for Leaf Litter to explore the topic of Sustainability in Higher Education.

Photo courtesy of AASHE

Sustainability is working its way into the missions of many colleges and universities. In the past three years, presidents from more than 650 colleges and universities have signed on to the American College and University Presidents' Climate Commitment. An increasing number of colleges and universities have designated sustainability coordinators and offices. According to a survey by the The Princeton Review, more than a quarter of university applicants now say that a school's commitment to environmental issues would "very much" or "strongly" influence their decision to apply.

It is clear that a movement is underway. But who is leading this movement and where is it going? Join us as we school ourselves on the subject of sustainability in higher education.

We begin by interviewing the man many say launched this movement, David Orr. The tireless writer, speaker, entrepreneur and environmental educator talks to us about how far the movement has come and the many challenges that remain.

We also profile the Association for the Advancement of Sustainability in Higher Education (AASHE), and chat with the organization's new president, Paul Rowland.

Photo courtesy of Glenn Asakawa

Any discussion of campus sustainability would be incomplete without the voice of an actual student. Meet Dan Omasta, a student at the University of Colorado at Boulder who is helping to further his campus' sustainability movement in his role as Director of Sustainability for the Student Union.

Architect Luanne Greene, Principal and Director of the Campus Planning Studio for architectural and planning firm Ayers/Saint/Gross, offers us a glimpse into the world of campus master planning.

Internationally renowned proponent and practitioner of sustainable and regenerative design Bill Reed stresses that

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Moving towards Integrated Design in a Disintegrated World requires a true change in our thinking practice.

Biohabitats' landscape architects Allegra Bukojemsky and Jennifer Dowdell tell us how campuses can embrace sustainability holistically by integrating landscape sustainability and green infrastructure into campus planning and design.

We share loads of resources on the topic of sustainability in higher education. Be sure to check them out.

We'll also tell you about some of our recent campus-related work and other Biohappenings.

As always, we want to know what you think. Visit our blog, Rhizome, and share your thoughts. If you want to reference a specific article, be sure to include it in your post.

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Leaf Litter Talks with David Orr

Paul Sears Distinguished Professor of Environmental Studies and Politics
Oberlin College

David W. Orr's career as a scholar, teacher, writer, speaker, and entrepreneur spans fields as diverse as environment and politics, environmental education, campus greening, green building, ecological design, and climate change. He is the author of six books and co-editor of three others. Ecological Literacy (SUNY, 1992), described as a "true classic" by Garrett Hardin, is widely read and used in hundreds of colleges and universities. A second book, Earth in Mind (1994/2004) is praised by people as diverse as biologist E. O. Wilson and writer, poet, and farmer, Wendell Berry.

Orr is the Paul Sears Distinguished Professor of Environmental Studies and Politics and Special Assistant to the President of Oberlin College and a James Marsh Professor at the University of Vermont. He is the recipient of five honorary degrees and other awards including The Millennium Leadership Award from Global Green, the Bioneers Award, the National Wildlife Federation Leadership Award, a Lyndhurst Prize acknowledging "persons of exceptional moral character, vision, and energy." He has lectured at hundreds of colleges and universities throughout the U.S. and Europe.

Orr helped to launch the green campus movement in 1987, when he organized studies of energy, water, and materials use on several college campuses. In 1996 he organized the effort to design the first substantially green building on a U.S. college campus. Oberlin's Adam Joseph Lewis Center for Environmental Studies was later named by the U.S. Department of Energy as "One of Thirty Milestone Buildings in the 20th Century," and by The New York Times as the most interesting of a new generation of college and university buildings. The Lewis Center purifies all of its wastewater and is the first college building in the U.S. powered entirely by sunlight. But most important, it became a laboratory in sustainability that is training some of the nation's brightest and most dedicated students for careers in solving environmental problems. The story of that building is told in two books, The Nature of Design (Oxford, 2002) and Design on the Edge (MIT, 2006).

In an influential article in the *Chronicle of Higher Education* Orr proposed the goal of carbon neutrality for colleges and universities and subsequently organized and funded an effort to define a carbon neutral plan for his own campus at Oberlin. Nine years later hundreds of colleges and universities, including Oberlin, have made that pledge.

He is the author of the newly released book, Down to the Wire: Confronting Climate Collapse (Oxford University Press, 2009).

Do you use the term sustainability? If so, how do you define it?

Sustainability is a contested word, and I don't think anyone really knows exactly what it means or what, as a goal, it will require us to do. It implies, however, two big things. One is longevity and durability. The second is a systems concept, by which I mean seeing the relationship between lots of different parts.

So a sustainable world or culture is one in which we've integrated food systems, energy systems and the means by which we provision ourselves with materials and water and waste cycling into coherent patterns that work the way natural systems work.

The big question, it seems to me, is whether we can build sustainability within the same culture that became radically unsustainable, or whether we will have to go through a much more profound cultural shift to become sustainable. Somebody once put it that our choice is between "a long, but dull career or a brief, but exciting career" as a species. I think that captures some of the uncertainty about the word "sustainable."

Is there an ideal, sustainable university? If so, what does it look like - physically, socially and programmatically?

It depends how large the accounting boundary is. There is no sustainable campus, nor any even close, if you look at all the environmental impacts associated with the campus, its activities, and transportation to and from the campus.

There are many colleges and universities moving toward things like energy efficiency, building greener buildings, things like recycling and local food purchases - all of which are good, but none of which adds up to sustainability in the purest sense of the word. But I don't think they have to. We're in the business of developing and honing capacity to think and analyze and act in the world, so I don't believe it's necessary to become sustainable in the purest sense of the word. There has been a great deal of progress in analyzing campus resource flows, the way materials are sourced, energy systems, building better buildings, etc. The larger impact has been the effect those activities have had on the students who have often driven them and those who have been party to this transformation of campus operations.

Your book Earth in Mind was originally published in 1994 and reissued 2004. I recently read an excerpt - the essay "The Dangers of Education" which appeared in a 2005 issue of Independent School. In that essay you express your concern / frustration about efforts at that time to reform education. You write:

The great fear is that we will not be able to produce as many automobiles, DVD players, digital TVs, or supercomputers as the Japanese or Europeans. In contrast, I worry that we will compete all too effectively on an earth already seriously overstressed by the production of things economists count and too little production of things that are not easily countable, such as well-loved children, good cities, healthy forests, stable climate, healthy rural communities, sustainable family farms, and a diversity of all sorts.

We are now, obviously, in very different economic times. How do you view the collapse of the economy in terms of its effect on the sustainability movement?

I think the fact of the matter revealed in the downturn is that we were never as wealthy as we thought ourselves to be. There was a great deal of dishonest bookkeeping and fraudulent numbers. But there is another, deeper accounting issue that concerns the drawdown of natural capital - soils, forests, wildlife, ecological resilience, climate stability - that was never priced and still isn't.

The trick now is to recover from this recession, but do it in a way that doesn't compound this larger debt that we owe to the natural world. So money spent, for example, to build more highways for more gasoline powered cars, instead of money spent to, say, increase the number of bike trails or high-speed rail systems, only compounds that second deficit.

Right now, we're running two deficits. One is simply a fiscal deficit. The other is an ecological deficit.

So I don't think anything has necessarily changed, except we should be able to see more clearly than we've ever seen how important it is to keep honest books - both in the fiscal sense and in that zone where economics meets ecology.

Do you think we are still in an age that "regards economic growth as the highest goal?"

I don't think anything has changed. I only know of one government, the government of Bhutan, that has shifted its standards for accounting from monetary accounting to, in their case, national happiness. But I don't think any politician in this country would run for higher office based on, let's say, principals of natural capitalism. I don't think the paradigm has quite shifted, but more people than ever before are now questioning what wealth really means.

Are you seeing that questioning in the world of higher education? Are schools equipped to teach a new way to rebuild and sustain the economy in a just and fair way?

Yes. I think the sustainability movement has had a progressively stronger impact, year by year, on the thinking of faculty and certainly students.

A profile of you in a 1998 issue of *Oberlin On-line*, reads:

...he views education as the door out of the maze. But he wants to take the door off its hinges and re-frame it. Institutional reform is perhaps his greatest cause--he advocates nothing less

than a new paradigm for higher education--if, that is, we are brave enough to take the "long-term human future seriously."

How far have we come in terms of institutional reform in the last 10 plus years? Have we made strides since that profile appeared?

I think so. The list of colleges and universities that have created environmental studies programs or have active sustainability coordinators or have committed to reduce carbon emissions is really quite long. Relative to the size of the challenge, we haven't gotten there yet, though. We haven't really reformed curriculum. There was a study done last year by the National Wildlife Federation that looked at campus sustainability efforts relative to operations and curriculum. They determined that, in terms of curriculum, we've actually gone backwards. Fewer people were graduating with awareness of environmental issues than perhaps ten years before. I think it's a bit of a mixed bag.

It's easier to reform campus operations, I think, than it is to reform curriculum. In curriculum, you've got to confront professional associations and lots of other factors and forces.

Your book *Design on the Edge: The Making of a High-Performance Building* tells the story of the Adam Joseph Lewis Center for Environmental Studies, which is heralded as the first substantially green building to be built on a college campus. How has it performed since it opened?

The Adam Joseph Lewis Center, photograph © Barney Taxel

You have to define what you mean by "performed." The building is coming up on its tenth anniversary next year. The energy use in the building, the wastewater system and all of the building's systems perform remarkably well.

If you ask, in an academic sense, if it is living up to its potential to change the way young people think about design, I think it's off the charts. I think it's the best laboratory for sustainability on any college campus in the country. The building itself became a driver in the curriculum. This is an ideal place for students wanting to learn ecological engineering. For students wanting to learn building monitoring, horticulture, ecological design, solar systems, this has been a laboratory without peer.

If you ask what else is happening in the world because of the Lewis Center, I think it is now moving off the charts. We're taking this building, which is essentially a 1.25-acre site, and using this as the template for what we're doing in downtown Oberlin with a project that is 25 times the scale of this building. Beyond Oberlin, by the last count I took five years ago, several hundred campuses were using this building as a model for their own projects. That goes from schools in California all the way to the East Coast.

So the building, as a pedagogical device, a driver for larger change in the academy and as a local template for sustainable development, exceeded any expectations we could have legitimately had in the late 1990s.

The Lewis Center was planned and designed before the US Green Building Council had established the LEED rating system, right?

Yes. Effectively, it was a Platinum building before there was a LEED rating system.

The College, the City and the School District are planning a College and Community Green Arts District, which will be a mixed used community spanning an entire city block and built to the highest environmental standards. Are there lessons learned from the planning, design, construction, maintenance and operation of the AJLC that will be incorporated into this new project? If so, what are they?

The biggest challenge for design isn't the specific components. It's the integration across components - engineering, landscape design, architecture, specializations in water, energy, materials and lighting. It's the integration across different professions, disciplines and professional jargons. I think the design professions are getting very good at that.

What we're doing in the Green Arts block is to raise the ante. We've answered the question, can you design great buildings powered by sunlight with zero discharge? The answer is yes. Now we ask, can we raise that to a whole city block and do a city block as a Platinum-rated endeavor?

Then, we've added one more challenge to that: can you do not just a Platinum-rated block, but can you also make that a driver for a green economy?

So, we've raised the ante to the community scale, to the block scale, and now we're asking that that process be configured so as to be an economic driver in the emergence of a green and presumably sustainable economy.

I imagine a lot of eyes will be on that project. When do you think it will all be realized?

We are in the second of three phases of planning. We would hope to break ground progressively starting on parts of the block in 2010 and really in earnest in 2011. The buildout will be hopefully not more than five years. But there are a lot of moving parts in this. The whole plan includes a 20,000-acre green belt, lots of work on renewable energy systems, as well as the Green Arts block and the economy and educational programs. With this project, we have essentially taken all the strands of sustainability and brought them together into one single project in a circle with a radius of about seven miles.

This is something whose time has come. We've been collecting intellectual and operational capital in the sustainability movement for a long, long time. I think we're ready to Main Street.

Are there examples of projects like the Green Arts District that you've looked to as models?

There are lots of projects that we'll draw inspiration and instruction from. For example the Transition Towns movement that originated in Britain. We're going to be beggars, borrowers and stealers of ideas from lots of people. I think the uniqueness of this is the intent to bring all of these things - green development, green economy, green education, green building, sustainable agriculture, sustainable forestry and carbon neutrality - together and make this the most exciting educational project in the country.

We want students involved from vocational schools, public schools, the college, and two-year colleges.

How have students been involved in that project to date?

Not a whole lot. I've had one class. We're just at the very inception of this. It wasn't really until this summer that we finished conceptualizing a good many of its components. As with [the Lewis Center], where we had hundreds of students involved over the years in the design of the building and eventually its operation and maintenance, in this project, over the next ten years, there will be hundreds of hundreds of students involved. That way they understand the issues of sustainability, but they also get to roll up their sleeves and make it work.

Paul Rowland, the Executive Director of AASHE, believes that the short-term nature of most institutions' funding mechanisms is one of the greatest challenges to that institution's movement toward sustainability. LuAnne Greene, an architect involved in campus master planning, cited the compartmentalization of funding as a challenge. What do you see as the greatest challenge institutions of higher education face in moving toward sustainability?

Imagination.

This goes back to your earlier question about economics. The scale of an institution or corporation will have to be much more creative and imaginative in a more constrained world that demands complete honesty and transparency about true cost and long-term cost.

One of the keys to sustainability at the campus level, the corporate level, and at the level of human communities and cities, is to understand that as we become more efficient and make the transition to renewable energy, we're creating long-term value that we can discount back to net present value and borrow against. So as we make the

transition to sustainability, we're eliminating a whole lot of costs that typically are dispersed widely through an institution or through a society or offloaded on future generations. These costs have to do with health, security, long-term employment. As we improve sustainability, we're eliminating costs and also creating future value.

Let me give you an illustration. We are getting ready to put together, in a very financially constrained time, a package of solar development for the city. In doing that, we are putting together numbers that explain why this particular investment is a good investment. It buys electricity made from sunlight at a cost that will be stable. So we've eliminated the uncertainty cost and also the short-term supply interruptions. We've created local employment and local business. We've also eliminated the need to have to go into capital markets and rent money very expensively to participate in, say, coal fired power plant projects or nuclear projects, where the money simply leaves the town. We've created a local pool of wealth that stays in the community. We've avoided situations where wealth has to leave the community in order to keep the lights on.

What's the impact of all of this on university budgets? The thing most in shortage is the imagination to see clever, smart, honest ways to finance what we have to do anyway for lots of other reasons.

Let's talk for a minute about K-12. Do you believe students are coming into college fully prepared to tackle the challenge of sustainability?

It varies widely. I met a 15 year old young man from California named Alec Loorz. At the age of 12, he began to organize his peers to stop climate change. Alec is now 15. He's prepared to be an amazing leader on this issue. But I think for every Alec Loorz, you will find lots of kids who aren't prepared and who have come out of school experiences that have not equipped them to think very deeply about these kinds of issues. So it is a mixed bag. But I think overall, the generation coming behind us is one that understands more clearly than any before, that it's all on the line and we're going right down to the wire on this.

Who do you view as innovators in the area of campus sustainability? Who inspires you?

You don't have time for that list! The best part of that is that it's a list that keeps growing. There are more and more people that are stepping up to do amazing and creative things on their campuses. Let me mention just a few of the pioneers in this field.

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Bob Koester at Ball State University has been the driver in their ecology and campus sustainability conferences for a decade. Ball State has made tremendous strides to become one of the great leaders.

Bruce Hannon at the University of Illinois is one of the great lights in computer science, but has been an amazingly creative pioneer at the Champaign-Urbana campus for sustainability and, in particular, landscapes that are natural and unmanaged.

Nan Jenks-Jay at Middlebury College has been a real beacon of campus planning and sustainability coordination on their campus.

Walter Simpson at State University of New York at Buffalo is the exemplar of great energy planning. Walter has saved them millions of dollars over the years because of some very adroit energy planning.

Rocky Rohwedder at Sonoma State in California has led that campus' sustainability efforts, culminating in a campus building much like the Lewis Center.

There are lots of heroes.

We see a lot of attention being paid to energy, but vey little attention paid to biodiversity and sustainability of the landscape. What are your thoughts on that?

Energy is kind of the lynchpin that connects lots of issues, including landscape and biodiversity. Too much energy in a region tends to degrade biodiversity very quickly. It's a matter of the speed with which we move through landscapes.

That's really unfortunate. Not only are buildings instructive devices, but landscapes are as well. To engage students imaginatively with their surroundings where they learn about the interactions between native plant and animal species and human settlement patterns is crucially important. That is disappointing to me. I believe that you're right and that is mostly characteristic of these efforts.

Do you see that changing?

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Not quickly. Part of the difficulty has been what Richard Louv defined in his book, Last Child in the Woods as "nature deficit disorder." I think we have a generation of kids coming in who are electronically adept and, to an increasing degree, ecologically incompetent.

This is not a generation that grew up on farms and has a routine understanding of plants, animals and soils. They spent way too much time indoors, and I think we're paying a significant price for that. So I don't see it changing quickly. I see some intriguing efforts by Richard Louv and others to organize cities and states and developers around open space and creating more incentive for young people to get outdoors and engage in the natural world. I think it's one of the prices we've paid for being so electronically adept at television, computer building, iPods and cell phones. We've now created a world that is very distracting, alluring and tempting for young people.

Are your graduates furthering the movement toward sustainability?

Yes. There are many examples. I'll give you two. Three blocks from my office, three students who graduated around 2002 have launched a $15 billion dollar project building a three-story building that will be LEED rated as part of the economic renewal of the Oberlin downtown. They stayed in town and began a development company, Sustainable Community Associates, and it's a remarkable achievement.

Several of the students who had worked on the development of a high-performance building monitoring system for the Lewis Center took what they learned and formed a company called Lucid Design Group. The company has been very successful. They've done a number of projects all over the country developing high-performance building monitoring systems.

There are many more examples. That's one of the most powerful things that we in teaching can experience - to see students take ideas, make them work in the world, and cross the chasm between theory and reality.

What are you working on now?

I'm working on a reader that should come out next year, which is a collection of essays written over the last 25 years. But my day job is the Oberlin renaissance project. (The Green Arts Block, green belt around town, carbon neutrality effort, etc.)

Any final words of advice to *Leaf Litter* readers on how to help further the sustainability movement on college and university campuses?

The beauty of this is to begin to see campuses and their landscapes as instructional devices and models of sustainability. What we'd like to see outside the world ought to be mirrored inside that campus. I'd love to see campuses become celebrations of sustainability. What does it mean to live in harmony with earth and earth systems? So in the work of landscape architects, architects and campus planners, there's a harmony of systems of ideas and life forms that is the goal. We have made huge strides. We ought not to despair. What we're talking about in this interview is now part of the background conversation on virtually every campus.

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Leaf Litter Talks with Dan Omasta

Sustainability Director
University of Colorado Student Union

Dan Omasta, 21 years old, is currently a senior undergraduate student at the University of Colorado at Boulder, double-majoring in Political Science and Environmental Studies. In the past few years, Dan has worked as the chapter president for CoPIRG Student Chapters and the Vice-President of the Legislative Council for the University of Colorado Student Union (UCSU). His passion for the environment and sustainability has led him to co-found Beyond Organic Farm (a student-run 40-acre farm in Boulder County) in the Summer of 2009. Dan is currently the Sustainability Director for UCSU, where he works with the Environmental Center, students, and administration on a daily basis to implement progressive sustainability programs that significantly reduce the University's ecological footprint. His latest work has been with the CU Board of Regents to craft system-wide sustainability policies that further climate neutrality throughout the State of Colorado.

How did you become interested in sustainability, and how did that interest ultimately lead you to CU and to your current position as Sustainability Director?

I was born and raised in Colorado. I've been hiking, backpacking and fishing in across the state since I was three years old, so the environment and outdoors are very special to me.

Coming into college, I started to do work with CoPIRG (Colorado Public Interest Research Group) on their climate change campaign. This enabled me to go to Washington, DC and learn about a lot of the climate bills and work with a lot of our policy makers in Washington to craft the best policies possible. I don't know if I had much weight as a student, but the expirience really influenced me to continue my work in government and campus policy. From there, I ran for office and became the vice president of the legislative council on campus. I passed a few environmental policies and now I'm the Sustainability Director for the student government.

I have a long history of working with the environment.

What are your main responsibilities as Sustainability Director?

My main responsibility is helping others make a difference. In terms of sustainability, it's my job to get people the resources - whether it's information or financial incentives - to do the positive work they want to do.

On a typical day, I'm working with the Board of Regents to craft system-wide sustainability policies. At the same time, I could be helping a student group to create posters or flyers to promote a speaker on campus.

Is this a paid position?

Yes. It is paid through the student government, which is funded by student fees.

In describing your typical day, you neglected to mention your coursework. Your last hour is probably a great example of the balancing act you must have to perform. You just came from a press conference related to green audits for rental properties off campus, you have to do this interview with me, and then you have to get to a class by Noon. How do you balance the demands of that position with your coursework?

I'm lucky enough to be able to study two majors that follow in line with my job. Faculty is generally supportive if I have to miss class for an event. If I need help on a policy, I might use what I've worked on in a class to mold my actions as the Sustainability Director. In terms of time management, it's hour-by-hour, probably from 9 a.m. - 6 p.m. But it's well worth it.

Can you tell me a little bit about the culture at CU and how it has impacted campus sustainability?

The guiding sustainability principles have evolved out of the culture here at CU. We founded the Environmental Center as students in 1970, before the Environmental Protection Agency was even created. We launched one of the first recycling centers in the country in 1976. There's a long history of environmental stewardship here at CU. That continues today. We are about to release our plan to be carbon neutral by 2050.

Right now is an amazing time to be on this campus. So much is being done around sustainability, whether it's building renovations, transportation upgrades, the CU Bike programs, etc. The culture of sustainability is widespread here on campus.

What role does the Environmental Center play in furthering the University's movement toward sustainability?

The Environmental Center plays a crucial role. They run our recycling programs, and Live Green programs. They do most of the campus education around sustainability. They handle transportation and energy policies. They've become the center for sustainability on campus. That's not to detract from all of the other agencies - facilities management, transportation, housing, etc. - who have made a big impact on campus, but the Environmental Center seems to be the key leader in all of these activities.

It seems like there is so much going on at CU with regards to sustainability. You mentioned plans to go carbon neutral by 2050. I read that the campus is striving towards zero waste by 2012. Is the management of all of these sustainability-related activities handled by one central body/place, or is it dispersed throughout the campus?

Typically, the responsibility has been dispersed throughout the campus. Over the past few years, since CU signed on to the American College and University Presidents' Climate Commitment, everyone has had to come together and work on this big plan. A Chancellor's Committee has evolved out of that comittment, which is a combination of students, faculty, staff and administration officials, as well as experts from research centers around the state. A lot of the big scale sustainability initiatives, like building renovations, will be handled through that committee. But the Environmental Center will still remain the center for recycling operations, zero waste and student outreach.

Are you a member of that Chancellor's Committee?

Yes, as the Sustainability Director, I have a seat on that committee.

What are your thoughts about the power and role of students in the sustainability movement on college campuses?

The sustainability movement is centered on cultural awareness and knowledge of the important issues that our planet faces today. The college setting is the perfect opportunity for students to gain these important perspectives.

Going back to the creation of the Environmental Center and our recycling program, it was students who came together in coordination with faculty and staff to address some of the pressing issues they saw in the 1970s. When they first started their recycling program, they made their own crates, and they'd pick up all of those in the classrooms and take them to the recycling center themselves. Since then, recycling centers have become almost mainstream on college campuses.

Students have the opportunity to craft programs and policies on a campus level, where they can then be expanded to cities and governments around the country and perhaps around the world.

A CU law professor, Charles Wilkinson, describes the three generations in America as: settling, resource extraction and learning to live sustainably. It's our generation that's going to have to come to bat in terms of dealing with climate change and energy shortages. It's crucial that we learn today how to shape our behaviors and perspectives to deal with these challenges.

Do you think most freshmen come to school prepared to tackle the challenge of sustainability?

I think that the number of freshmen who are aware of the issues and prepared to tackle those big problems is increasing. We definitely still see a lot of misinformation or apathy towards climate and sustainability from students coming in from all over the country. This gives us an opportunity to engage the country as a whole as we start changing behaviors.

An example is our EcoStar Challenge, where dorms compete against one another to see who can reduce the most amount of energy and water use. We also have Eco-Leaders, students in the dorms who work to educate their peers on the importance, and simplicity, changing light bulbs, turning off lights, reducing waste and recycling.

CU is really focusing on freshmen and putting a message out to incoming freshmen that on this campus, sustainability is a key objective and we want to work with everyone as a community to further our goals.

Do the Eco-Star Challenge and the designation of dorm Eco-Leaders parallel the University's Green Office Certification and designation of Eco-leaders within departments?

Yes, it is mirrored by the Green Office Certification and Eco-Leaders in departments. We don't ask anything of students that we don't ask of ourselves as staff members.

What percentage of CU students participate in efforts to make the campus more sustainable?

In a way, every student on campus participates because as a whole, we purchase wind credits, and we purchase bus passes.

Tell me more about the wind credits and bus pass?

In 1991, students voted to purchase a bus pass. This was a partnership with RTD and the City of Boulder, along with CU. Students get discounted rates on the pass because we can purchase as a whole. That bus pass was reaffirmed last spring. Students voted to keep it as a student fee. Through the pass, students are obviously driving less.

Photo courtesy of Peter Roper

In 2002, students voted to offset all of the energy use in the three buildings paid for buy student fees with wind credits.

When you were talking about the role of students in the sustainability movement, you said that students on campus have an opportunity to craft programs and policies that can be expanded beyond the campus. Have there

been any programs or policies that you've been instrumental in crafting that have been implemented and then expanded beyond the campus?

There are two examples of far-reaching impact. I was a part of one of them.

The one I'm working on right now is system-wide sustainability policies through our Board of Regents. We're asking our Regents to craft a set of sustainability goals to meet our Governor's Executive Order to institute LEED building standards for all new buildings and renovations, and to provide resources and support to all of our campuses who are pushing for carbon neutrality. The goal is to have this policy modeled by other universities and by towns and city governments who will then be provided a model that shows the economic, social and environmental benefits of broad sustainability policies.

Photo courtesy of Dan Baril

The second example is Folsom Field, our zero waste football stadium - the first one in the country. Already, we're working with the City of Denver and Coors Field and Invesco Field to implement the same type of system in those professional stadiums. In addition to that, Frito Lay is changing their [packaging] from the type of material you can only throw away to compostable material so they can continue to sell their product in our stadium. This is an example of how we're changing the entire consumption system in the U.S. just by changing our own behaviors here at home. We started the program last year. It was really a partnership between the athletic department, the recycling crews and the Environmental Center, so I can't take credit for the program. There have been so many people who have played such a big role. I volunteer every game. I sort trash until 12:30 at night, but that's really my biggest role in that program.

The zero waste stadium is certainly one indication of why your campus scored so highly (10 out of 10) in the category of waste management in the Sierra Club's recent "Cool Schools" listing of "eco-enlightened" U.S. universities. You also scored highly in transportation. Can you tell me more about what is being done in those two areas?

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Like I said, Folsom Field is the first zero waste sports stadium in the world. We have taken out all of the trash cans. We have now expanded that to our entire athletic department, so every sporting event on this campus is zero waste. In addition to that, the student government and the Environmental Center are teaming up to create a zero waste office program that will then expand to our cost centers and other departments on campus. The student government has also taken it upon themselves to pass legislation that mandates that all student fee funded events on campus are zero waste.

Photo courtesy of Dan Baril

As a campus as a whole, we're still working to the Governor's Executive Order of 20% reduction in waste by 2012. We're pushing for zero waste by that date so hopefully we will exceed that dramatically. The Chancellor has implemented a sustainable action team just focused on paper reduction and waste management. Everyone is coming together to find out ways to reduce waste across the campus.

What about transportation?

Photo courtesy of Peter Roper

In addition to the bus pass, we have an excellent bike program where students can check out bikes free of charge just by using their buff cards. That program is now being expanded to a few other campuses in the CU system.

We have a Ski Bus on campus that brings students up to the mountains so we reduce a lot of the traffic on I-70 and we allow our students to "sleep to the slopes." This helps them have a positive impact and still do the things they love.

We're also instituting a new policy over the next few years [whereby] freshmen cannot bring their cars the first year. So we're reducing parking spaces and providing a lot of disincentives to drive here in Boulder. But it's important to recognize that we're able to do that because the City of Boulder, where the campus is located, already has such a good public transportation system.

One area in the Sierra Club's "Cool Schools" listing in which your school did not rank so highly was in energy. You scored a three out of 10. How is the school addressing energy?

For a long time, our facilities management people have been replacing windows and insulating buildings. Our administration just approved installation of solar panels on three more buildings. We're definitely making efforts to reduce energy use and increase our use of alternative energy sources.

But the fact of the matter is that we have a $27 million light bill on this campus. We need to bring that down significantly. A problem that's going to contribute to that is that part of our campus master plan is to double the size of our campus footprint in 20 years. With all of these new buildings, we're going to see a significant rise in energy use.

That three score is important because we're already behind in that category, and now that we're going to be expanding our campus significantly, we need to take serious action around alternative energy use and conservation.

CU is in an area where we get a significant amount of wind and sun. We need to make sure we invest heavily in those areas instead of having to continually exploit fossil fuels as the way to power this campus.

One of the areas of great interest to our readers is landscape ecology and green infrastructure. I would imagine, given the campus location, that you are in an ecologically rich area. What is the school doing to preserve and enhance its natural resources on campus?

The University does try very hard to minimize resource use on the campus and maximize every opportunity we have to conserve resources. For example, we reduced water significantly by switching from sprinklers to ditch irrigation. That came out of facilities management working with our grounds crew.

We find every way to use and reuse resources on this campus, especially water. We have a co-generation plant, so when we're producing electricity, we're also producing steam. It's important that we capture that steam to heat our buildings and not just release it into the atmosphere and waste it.

The administration has passed policies that mandate that architects and consultants present strategies for effective resource conservation in the building planning process.

What about enhancing biodiversity on campus?

We're continually using more xeriscaping practices and we're starting to focus more on native trees and plants that don't require as much water use. We stopped using herbicides and pesticides a long time ago. It's important that we bring a lot of native species that have already evolved to combat many of the typical infestations of diseases that may come to plants in the area.

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We also just started a one-acre campus garden. Hopefully that garden will be to provide the dorms and our dining services with a diverse amount of food. The Environmental Center is going to be working closely with the Environmental Studies department to educate students on the importance of biodiversity in agriculture and give them the opportunity to practice that first-hand.

Photo courtesy of the CU Environmental Center

Do you foresee the campus ultimately being able to supply its own food?

Long-term, I think the University will be working with local farmers around the state of Colorado to form co-ops. We really don't have the space available in our plans to be able to grow all of our own food on campus.

Food is a big deal. The university is already working with local farms. This summer, students co-founded Beyond Organic Farm, a 22-acre student-run farm located 10 minutes from campus. Students are recruiting their peers from all over the campus to work on providing local, organic food to the University and to businesses around the Boulder area.

Working towards sustainability undoubtedly requires a great deal of communication/outreach/education to all members of the campus community. Is there a particular sector that you've found to be the most challenging to reach?

I am fortunate to be able to work on a campus where a good number of the communities easily come together around sustainability for whatever reason - whether it's economics, social justice, or environmental benefits.

Probably the community most difficult to reach out to has been the Greek community, which is an important group because they have large buildings for communal living.

Just overcoming the stigma that people focused on sustainability are just hippies or environmentalists trying to save the trees and the polar bears is something we're really working on. I touch on the benefits of social justice and cost savings as other incentives. We're working with members of the Greek community to reach out to everyone in the houses and get them involved in the zero waste football games.

Our current student body president, who is also a member of Kappa Sigma, just led an initiative in that fraternity to install solar panels on their house. This will save them tens of thousands of dollars over the coming years in energy bills alone. So there is a shift in terms of getting the Greek community involved.

Photo courtesy of the CU Environmental Center

What do you think have been the most effective tools in creating that shift?

Peer-to-peer contact has been extremely important. We've reached out to leaders in each house, just as we've reached out to freshmen in the dorm. We have provided these leaders with the resources and information for them to encourage their members to shift their behaviors, even on simple behaviors like turning off the light and recycling. That awareness campaign has really been effective in starting the conversation. From there, we have expanded recycling programs, in coordination with the City of Boulder, to all of the fraternities and sororities. We just did a big ask from the director of the athletic department and our student government for the Greek system to provide volunteers to the zero waste football events. So we're really trying to build this community and incorporate them in awareness campaigns and more sustainable actions.

In your role as Sustainability Director, or simply in your role as Dan, have you had any opportunities to travel to, share information with, and/or learn from campuses that you see as models for sustainability?

Absolutely. I've been fortunate enough to attend the Power Shift Conference in 2007 and 2009. Power Shift 2007 was the largest student conference on climate change, with over 5,000 students from every district in the U.S. then, in 2009, there were roughly 11,000 students who attended. At these conferences, we're attending panels and workshops and discussing new ideas and working together to overcome common problems we see on our campuses. The creation of our campus farm actually evolved out of conversations from the Power Shift 2009 conversations.

I have a good number of friends at other universities like U.C. Berkeley, with whom I compete on a day to day level to see who can get the most accomplished.

Who do you see as innovators in the campus sustainability movement?

There are a number of schools I've been impressed with. There are a number of Ivy League schools. The California system always comes to mind. Smaller colleges like Middlebury are always pushing barriers.

In the issue of Sierra Magazine in which the Cool Schools rankings were published, it was really interesting to see all of the different projects that students are working on. From the graduates installing solar panels and leading agricultural revolutions to

information campaigns and campus bike programs, students are doing a lot! There are a good number of universities that really inspire me to do the work that I do. I know that what I do at CU is part of a larger movement. Really, it's the combination of what all campuses in this country are doing that is going to prepare our generation of students to go out into the world and make a difference.

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Leaf Litter Talks with Luanne Greene

Principal, Ayers/Saint/Gross
Director, Campus Planning Studio

Photo courtesy of Ayers/Saint/Gross

Luanne Greene, AIA, LEED AP, is the Director of the Campus Planning Studio at Ayers/Saint/Gross (ASG), an architecture and planning firm specializing in campus planning for colleges and universities. With 25 years of design and planning experience, she has been a strong advocate for smart and sustainable campus planning strategies which address both the campus and local community's needs.

Luanne has worked with numerous colleges and universities throughout the Baltimore area and across the nation, including: Johns Hopkins University; the University of Maryland, Baltimore; the University of Delaware; the University of North Carolina at Chapel Hill; Wake Forest University; the University of Georgia; Washington University in St. Louis; and the University of Wisconsin, Madison.

Luanne is a member of the American Institute of Architects, the Society for College & University Planning, and the Greater Baltimore Committee's Leadership Program, and the board of directors of Live Baltimore, a non-profit organization focused on education and marketing outreach to promote city living.

Luanne is a registered architect in Virginia and a LEED Accredited Professional. She received both her Bachelor of Science in Architecture and Master of Architecture degrees from the University of Virginia.

Ayers Saint Gross's history dates back more than 90 years, but in the 1980s, the firm's leaders decided to focus on non-profit institutions, specifically in higher education. What led to this decision?

In those almost 100 years, public work was always part of the strength of the firm. In the 1980s, the firm's leadership reflected on the success of our projects in higher education, our satisfaction with that work, and the overall quality of those projects.

Can you describe your client base?

The most striking characteristic of our clients is how diverse they are. We work for large public institutions like the University of Wisconsin-Madison with over 40,000 students, as well as small liberal arts colleges, community colleges, and everything in between. That's one of the things we love about it - the diversity of the project type, client type and physical characteristics.

In general, how far into the future do most colleges/universities look when master planning (5 yrs, 10 yrs? Is there an average?)

Our ethos, which I think works well with a lot of colleges and universities as well as cultural institutions, is that they are there to stay. They are not going to pick up and move to another city. They are going to stay in place.

We typically will establish a vision for the next, say 50 years, but then implementation strategies within five years - those are projects you're actively planning to build - and ten years - the next group of projects. So it's near term (five and 10), mid-term (10-20) and then beyond. We usually provide two or three snapshots of how the vision would come into place.

For a firm like ASG, what is the greatest challenge to balancing sustainability with the hard and fast realities of a campus, such as the need for parking, classrooms, labs, etc.?

We are definitely believers in integrated planning. All of the issues have to be blended together. One of the characteristics of higher education institutions is that they are mission-driven. The generic mission of a university is: teaching, research, and outreach/service. We're helping them find the balance to make it all work together.

Is this demand for sustainability new in campus master planning?

I would say that over last five years, it has become a key issue. Before that, you'd be more likely need to explain why an institution would care about sustainability. Now they come knowing it's important and needs to be incorporated as a core planning value.

What do you think is the primary factor motivating colleges and universities to strive towards sustainability? (The American University College and Presidents' Climate Commitment? Pressure from students? Alumni? Budget? Regulatory requirements?)

It's absolutely all of those things. It's also that it makes sense. It is an important issue for recruitment and retention and it is a common sense way to save money and resources.

Sustainability is defined so loosely, in so many different ways, with so many components. When it comes to campus planning, what components of sustainability seem to be no-brainers to your clients and what components are hard sells?

One of the key aspects of sustainability we think about is compaction and density - that you should disturb as little of the land as possible and create a lively, intellectual community at the same time. A compact footprint that works with the land and the surrounding context is key to the form of the campus. So, utilization of resources - how many classrooms we have and if they are being used wisely and intensively - is, in fact, an issue of sustainability. It relates to energy use in terms of cost as well as climate impact.

Probably ten years ago, concern for integrated stormwater strategies was an area that was a harder sell. That's much less so now, and I think changes in regulations have done a lot to make that happen. Today, institutions are seeking out new strategies for managing their important resources.

Another thing that is not so much a hard sell, because it's very logical, but is challenging because it requires individual changes in behavior, is transportation. Getting people beyond the mindset of one person=one car is a very personal shift for people and usually requires a lot of leadership. Usually a suite of options rather than one single solution works best with that challenge.

Are there common threads of sustainability that can be woven into any campus' master plan, regardless of regional differences such as climate, land use patterns, political relationships, etc.?

I think respect for the land is the starting point. One of the first drawings we do on any plan is an analysis of the topography. What is the shape of the land? Where is the vegetation? Where does the rainwater go? What is the solar orientation? What is the context of the community around it? That's really where we start.

We often talk about the responsible capacity of the land, which we consider to be the carrying capacity within the culture of the institution and the community.

We find that people in an intellectual setting want to be close to each other. A professor in one science discipline wants to be close to another researcher in another science discipline. They want to be close to each other for academic reasons. The head of security wants them to be close together because it makes it easier and safer for campus police because patrols are shorter and faster. The transportation person likes it because the same shuttle bus service might work for both people.

So wise use of land and resources is probably the most common theme that runs through everything.

Who among the many members of a campus community (students, faculty, administration, staff, surrounding community) seems to be talking the most about sustainability?

I don't think there is a single answer to that question. Higher education institutions do have very distinct personalities. We have some campuses where the students - hands down - are the most excited about it. We have other areas where it comes from faculty and others where the administration is pushing it. There is really no single answer, which is exciting.

Sustainability is often talked about as having three pillars - economy, ecology and society. In general, based on your experience, do institutions of higher education tend to prioritize these pillars? If so, how?

As I mentioned earlier the three pillars of higher education are teaching, research, and outreach. That's the first lens through which higher education looks - through their own mission and strengths and priorities from an academic point of view. I don't think they are incompatible with the three pillars of sustainability. I think higher education has always had to balance these lofty, mission driven ideals against very straightforward, common sense [realities such as] implementation, budget, enrollment numbers - the hard facts and figures sustaining their operations. It seems compatible with their approach to problem prioritizing and solving.

When your clients initially discuss sustainability, where does the topic of the landscape and its natural resources fall in the conversation?

That varies by the campus. I think it comes up faster and with great intensity in campuses where they have a unique, beautiful or distinctive land resource. A lot of our campuses do, particularly the land grant institutions. What we try to do, even when working with a more urbanized campus, is really promote that as a distinguishing characteristic. We try to encourage [our clients] to never lose sight of the landscape features. They give a place its identity and character. The larger ecological context needs to be part of the character of a campus, even if it's urbanized.

Do you find that people listen to that?

They are receptive, even if it's not always completely intuitive to make those connections. But I think leadership is, in spite of the complexity of the issue, part of what being a college or university is.

What trends do you see in the way colleges/universities involve all stakeholders in discussions of sustainability?

People want to be involved in this discussion. Sustainability is such a broad topic. You'll find people who are primarily motivated by energy, finances, social justice issues or the ecology of the setting, etc. There is really something for everyone. We rely on a consensus-based planning process so we typically involve all of those stakeholders anyway.

Web sites have definitely been a great tool for planning in general. Having a web site for the planning process, and having a way for people to get information and ask questions and connect has been a big plus.

But we still do traditional public meetings and face-to-face conversation. The interesting thing about having an open, town-hall style meeting is that you might come with a particular question about energy, and you're going to get an answer to that question. But the person two seats down from you might have a question about ecology. In listening to that question and answer, you may become aware of an issue you were never tuned into before. You just can't beat the face-to-face public meetings for bringing people together and helping to balance the sets of issues.

Paul Rowland, the Executive Director of the Association for the Advancement of Sustainability in Higher Education, believes that the short-term nature of most institutions' funding mechanisms is actually the greatest challenge to the movement toward sustainability. As someone who works in master planning, a long-term initiative that is funded, I'm curious to know if you agree. If not, what do you see as the greatest challenge your clients face in moving toward sustainability?

I agree that funding is a real challenge. In my experience, it has been more about the compartmentalization of budgets. Where does the money come from and where do the savings go? I do think the complexity and nature of funding for higher education is a key element to truly integrating sustainability.

For instance, let's say we have a facilities need that will be predominantly addressed through fundraising for a new building. A dean will be in charge of raising, say 50 million dollars for this project. They're going out and working to develop a pool of money that the school is going to use to pay for the new building. Let's say that the building need is going to be three stories tall, but the capacity of the site can handle five stories. How is that going to work? Do you under-build the site? Is there another pool of resources and users that can be tapped so that full capacity is achieved?

One of the interesting things we've been dealing with lately has been height and density. Most mature campuses have been there for 100 years or so, and the easy development sites were probably developed first and early on. Now they're getting to more and more complex development sites and the preciousness of their real estate resources is a heightened concern. This is causing a very interesting and good debate about height and density, and not wasting sites.

So what happens if you have a chunk of money from Pot A and a chunk of money from Pot B and we want to pull those resources together and really see the true capacity of the site come to fruition? How does that work? We are dealing with a need for creative problem solving on the funding side, absolutely.

Universities don't usually have a pot of money just lying around to top off that dean's fundraising efforts to put in swing space that's going to be university "owned." So how can they develop those resources? Of course now is an extremely challenging time for all funding issues in higher education.

How can firms that focus on ecological planning better understand the challenges faced by higher education institutions?

I certainly found that the ecological context of the physical setting can be one of the most powerful and compelling components of any plan, but it's complex and not simple to explain. It's not the same as doing an analysis of how many people work here and how many theoretical parking spaces we need. It's interrelated to a wide variety of issues. Most Americans know how to drive a car and understand how to park it. Not that many people have a working knowledge of the components of ecological planning. So first there's an education component, then the problem solving.

I would recommend you do anything you can to break those complex and often nuanced relationships down so they can be understood. Understanding how those components work together and why they are important in the first place is the first piece in making sure those components are valued, protected and enhanced.

Can you give a few interesting examples of how some of your clients have incorporated sustainability into their master planning efforts?

Carolina North. Photo courtesy of The University of North Carolina at Chapel Hill.

The story of the [University of North Carolina's] Carolina North campus has been one of the real success stories of how the ecological planning really created consensus about where development should be on a parcel.

A series of parcels were assembled by a professor named Horace Williams. In 1940, he gave this property to the University of North Carolina at Chapel Hill. It's about a thousand acres - an incredible site, located about a mile and a half from the University's main campus. Up until now, it had many uses. It served as a regional airport and an interesting collection of unrelated University and municipal support functions.

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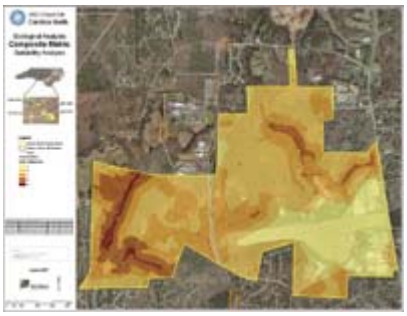
For a long time, through the 1960s and 1970s, the main campus had enormous capacity, and could accommodate the surges of growth related to enrollment, research and patient care. In the 1980s, there was a heightened awareness of Carolina North, and the University started planning work on it. There was a plan done at that time, which conceptualized development at Carolina North around transportation nodes. By the 1990s, the main campus capacity was getting tight and people started talking about Carolina North from a programmatic point of view - what programs will go out there and how will it work?

In 2006, Chancellor James Moeser identified that the challenge for Carolina North was to create a model of sustainable community. He was talking about how Carolina North will be built and framed the challenge in a very distinctive way.

Consequently, one of the first things we did, in early 2007 (with Biohabitats' assistance) was an ecological assessment of the parcel. That analysis resulted in every acre of the land classified on a spectrum from "most appropriate for conservation" to "most appropriate for development."



Not surprisingly the areas that had already been disturbed (such as the airport) were the areas that were appropriate for development. They also happened to be the areas that were adjacent to existing streets so they were accessible. So it made a lot of sense and became the underpinning that led us to the creation of different concepts of how the plan would fit together, programmatically and physically. That process of refinement kept building until we ended up with the plan we have today, but the University and the Town of Chapel Hill have used that plan as the basis for their work together to create new zoning and a development agreement for the next 20 years that was adopted in June 2009.

Working Landscape will connect the existing natural areas of Carolina North to the developed areas of the campus; color and texture will vary with the seasons. Image courtesy of Ayers/Saint/Gross.

The foundation of the campus plan for Carolina North is rooted in the ecological aspects of the land. Because the site is so beautiful in some areas, there's a real love of the place and a desire to not lose that

This project was really successful. One of the really satisfying moments of the project came during a public meeting. The ecological assessment had been done and we were developing land use concepts, which involved a lot of public meetings. We'd hand out comment cards at the beginning of the meetings and then collect them at the end. I can remember reading one from someone who said, "I still don't want Carolina North to be developed, but this is a good plan." In other words, this person was still politically against the development, but was appreciative of the effort, thought and logic that had

gone into the creation of the plan. I think that appreciation began with the ecological assessment. People could understand the starting point.

Do you believe that colleges/universities are truly integrating sustainability into their whole institutional framework, or is there still work to be done?

There's still work to be done. For some institutions it has been a big shift. For others, it hasn't been as big. But I think we're still in transition.

Anything else you'd like to say to Leaf Litter readers about sustainability in the campus master planning process?

We often talk about our plans striking a balance between the visionary and the realistic. In other words, a plan that doesn't have a clear and exciting vision is not likely to be implemented because it can't rally enthusiasm. Yet if it isn't realistic, it won't be implemented for different reasons. Really, what you're trying to do is find a balance between those two ends of the spectrum. Integrating all these issues of sustainability with the mission-driven aspects of the institutions is really what we're trying to do.

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Leaf Litter Talks with Paul Rowland

Executive Director
Association for the Advancement of Sustainability in Higher Education (AASHE)

From his first job as a high school science teacher to his current role as Executive Director of the Association for the Advancement of Sustainability in Higher Education (AASHE), Paul Rowland has devoted his nearly 36-year career to the melding of education and sustainability.

Before taking on his current role at AASHE, Paul served as Dean of the College of Education at the University of Idaho. He also served as Dean of the School of Education at The University of Montana and as the Director of the Center for Environmental Sciences and Education and Coordinator of Environmental Education and Director of Academic Assessment at Northern Arizona University.

While at Northern Arizona University, Paul was one of the founders of the Ponderosa Project, a faculty development project focused on integrating sustainability throughout the curriculum. He has written numerous articles and book chapters on science and environmental education particularly as they related to diverse populations. Paul has served on the boards of the Arizona Natural History Association, Education for Sustainability - West, The Arboretum at Flagstaff, and the Global Network of Environmental Education Centers. He holds a bachelor's degree in biological sciences, a master's degree in ecology from Rutgers University and a doctorate in curriculum and instruction from New Mexico State University.

For a quick profile of AASHE, see Leaf Litter's Non-Profit Spotlight.

Tell me about your early experience as an environmental educator and how you ultimately became to be the Executive Director of AASHE.

I grew up on a dairy farm in upstate New York, so obviously I had a lot of connection to the land - as a person who had lived off the land and a person who spent a lot of time outdoors. As a result, I majored in Biology in college. I was interested in becoming a biology teacher. My favorite courses were those centered on the field of ecology. That's when I really honed in on the ecological sciences.

Years later, when I was a high school science teacher, I started an environmental sciences course. After spending years developing that course, I earned my Masters in ecology from Rutgers. I then headed off to New Mexico and spent some time at New Mexico University where, for several years, I worked with the Mexico Solar Energy Institute as their school and public educator. In that job, I developed a set of workshops called "The Self-Sufficient Solar Home," which I distributed throughout the state of New

Mexico. Through that experience, I developed a strong background in working with schools on a number of areas related to sustainability.

I then went on to earn my doctorate degree, which was in curriculum instruction with a focus on energy education. When I got to Northern Arizona University, I was named Coordinator of Environmental Education as the Center for Environmental Science and Education was being formed. I did a lot of environmental education work in that role - both with undergraduate students as well as with some of the organizations on the area - and developed quite a bit of background in environmental education. While I was at Northern Arizona University (NAU), I worked with Geoffrey Chase and others on the faculty to develop what became the Ponderosa Project - workshops to help faculty fuse sustainability into their curriculum. That process went on for a number of years. We provided workshops for well over 100 faculty members, conducted forums for discussion about sustainability in the curriculum and across the university and continued to stay connected to the sustainability work that I moved into other forms of administration.

From NAU, I went to Montana, where I was Dean of the School of Education but also served on the university sustainability committee. I also served on the board of Education for Sustainability (EFS) West. It turns out that EFS West was a precursor to AASHE's formation. EFS West morphed into AASHE just about the same time that I moved from Montana to Idaho to become the Dean of the College of Education at the University of Idaho. At Idaho, I had the opportunity to work with other faculty members on the Palouse Project, which was modeled on the Ponderosa Project. The Palouse Project did the same kind of thing. I supported faculty in going through the same kind of workshops. When I left my position there this summer, we had two teams named to develop curriculum on sustainability. That was a real plus for the college.

After making a presentation at last fall's AASHE conference, I was asked to put my name into the hat for the Executive Director position, and here I am today.

Tell me about the ways AASHE helps universities and those working with universities.

The most important thing that AASHE does is provide forums for sharing of information so people can find the best practices for a wide variety of sustainability initiatives and ideas about curriculum. Through our bulletin that is sent out weekly to several thousand people, our digest, which is available for free on line and our conference, we try to get information from one institution to another so they can find examples of best practices and network to move forward in sustainability. We also offer workshops to help faculty develop sustainability curriculum. We will soon be rolling out the new version of STARS (Sustainability Tracking, Assessment & Ranking System), which will help institutions track how well they're doing but also connect institutions.

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Photo courtesy of AASHE

I would probably characterize it all as an opportunity to help connect people with good ideas and with each other

I read that AASHE's membership doubled in the last year. Can you describe that membership?

As of the end of July, we had 891 members. Members are institutions, not individuals, so all of the members of an institution are members of AASHE. That includes administration, faculty, students and staff.

Of those 891 members, 499 are four-year plus institutions. There are 180 two-year institutions, which includes a growing number of community colleges. There are 14 systems office members. (e.g., the California State University system). We have 139 business partners, 47 NGOs, two government agencies and ten K-12 schools.

Among the U.S. higher education institution members, 61.5% are public; 37.8% are private non-profit and .6% are private for-profit.

What motivates institutions to join AASHE?

A couple of things motivate them. One is the opportunity to learn from each other. [Joining AASHE also provides] the opportunity for an institution to show that it has a commitment to sustainability.

What does showing a commitment to sustainability do for an institution?

Sometimes it's students who are pushing the administrations, or even faculty, to become more involved in sustainability. So part of what it does is allow the leadership of an institution to say to its students, "We are indeed interested in sustainability and this membership is one of the ways we show that we're paying attention to it. We are getting more resources available to you through our membership in AASHE." It shows a commitment to the students who are on the campus and gives those students the sense that the institution is paying attention to what they're looking for.

One of the other areas where it has significant impact is in recruitment. There have been some recent surveys that have confirmed that students are looking for sustainability in the institutions they attend. One of the questions [students] will ask is, "What kind of programs and practices do you have that show a commitment to sustainability?"

How does AASHE define sustainability?

I'll give you our official, web site definition: AASHE defines sustainability in an inclusive way encompassing human and ecological health, social justice, secure livelihoods and a better world for all generations.

This is one of those definitions that everyone asks us about. We probably are, like most organizations that use the word "sustainability," still trying to figure out what we're talking about. We have a pretty good feel for it. We know what it is when we see it. But defining the term sometimes gives us a cumbersome set of definitions.

In a recent presentation I made at Georgia Southern's convocation, I talked about sustainability in terms of opportunity. Really, sustainability is about ensuring opportunity - opportunities to live in a healthy environment; opportunities to have a good job; opportunities to have strong social systems; opportunities to participate in a solid economic system - for current and future generations.

Do you find that AASHE members adhere to this definition of sustainability as they go back to work on their campuses?

I'll say there is a growing understanding of the breadth of sustainability. Going back to the early to mid-nineties, when I was first really getting going in this, the word "sustainability" had more to do with environmental sustainability.

One of the things we've seen over time is that it has come to be more about people. What we do socially and economically has impacts on the environment. What we do to the environment has impacts on our health. What has emerged over the last decade and a half is a greater understanding of how all of these discussions about sustainability are really about interconnectedness and wishes for outstanding opportunities for everybody, now and into the future.

There seem to be several different sustainability rating and raking programs and reports. How does AASHE's STARS program compare to some of these other methods of assessing sustainability on college campuses?

The STARS program was developed by AASHE in response to a call by the Higher Education Associations Sustainability Consortium (HEASC) to develop a campus sustainability rating system. As a member of the consortium, AASHE agreed to move forward on that. For more than a year, we've been working on developing this system that would provide institutions with ways to rate their sustainability. The model we looked to was the U.S. Green Building Council's LEED program. We thought that what U.S. GBC did for buildings could be a good model for what could be done on campuses. Rather than getting into rankings, we were more interested in ratings. How could people rate themselves? How could people earn credits that would move them forward on a rating scale so they could make claims of being a bronze or platinum level campus?

STARS is really about helping institutions understand where their strengths and weaknesses are. What is unique about STARS is that it really is a comprehensive,

transparent rating system. It covers much of the breadth of our definition of sustainability. It is very transparent in that the vast majority of the information that an institution will submit to us will be made available for others to see. STARS will also be the kind of system that enable institutions to track their progress over time.

Many of our readers are involved in conservation planning and ecological restoration. They are going to be very interested in aspects of the STARS system that pertain to the kind of work we do, such as landscape and natural resources master planning and innovative stormwater management. Does STARS address these components of sustainability?

I'll give you a brief overview of the components of STARS. In the STARS program, there are general areas. The first of those is education and research, which looks at co-curricular education, the curricula, faculty and staff development and training, and research that is being conducted at the institution.

Photo courtesy of AASHE

The second big category is operations, which is broken down to buildings, dining services, energy and climate, grounds (which I think addresses some of the issues you raise), materials recycling and waste minimization, purchasing and transportation. Electric campus vehicles.

The third area is administration and finance. That looks at investment, planning, sustainability infrastructure (Is there a recognized part of the university charged with addressing sustainability?), community relations and partnerships, diversity access and affordability, human resources and trademark licensing.

There are pieces of pretty much everything in there. When you look at grounds, we've been looking this week at credits for the organic campus and what they'd look like.

Did the American College and University Presidents' Climate Commitment (ACUPCC) impact the development of STARS?

The Commitment and STARS developed in concert with each other. Some of the people who were working on STARS were also working on ACUPCC reporting tools. That's actually the strongest connection. A lot of the ACUPCC signatories were also pilot campuses for STARS last year. We have people who work on both projects, so the two initiatives have cross fertilized in a lot of ways.

When will STARS be officially released?

Let me give you a time line. What we've been doing up to now is going through a pilot program. We piloted what we call STARS Version 0.5 with about 70 institutions. We've received information back on that. The results of the pilot are posted on our web site.

We are now putting on the final touches of Version 1.0, which is the version that will go out for real world consumption. We will announce its availability and begin a pre-registration process at the Greening of the Campus VIII conference we're co-sponsoring with Ball State.

Through the fall, we'll be doing the pre-registration and making the credits documents available to campuses so they can start working on putting together what they need for the reporting. In January, we intend to do the formal roll out, and at that time we'll have our on-line reporting tool ready for campuses to start using.

Since beginning the STARS pilot in 2007, what are some of the things you have learned - both about the system itself and about sustainability in higher education?

One of the biggest issues has been trying to find that balance between complexity and simplicity that allows campuses to really get a handle on what they're doing and not doing, but at the same time not overwhelm them with collecting incredible amounts of information and causing them to become paralyzed in that process. That has been a big lesson.

How about things you've learned about the schools themselves and their efforts to move toward sustainability?

One of the things we've learned is the importance of paying attention to the regional differences so that a campus that is located in the Coastal Plain isn't trying to meet a credit the same way as someone who is located in a high desert area; or a campus that is in an area with lots of wind resources has a different way to meet energy requirements than a campus that is in a place that has high solar availability. That has been part of it - just learning about the regional differences that exist within this country and trying to translate that into something that is understandable broadly.

I know that AASHE's intention with STARS is to provide your members with an assessment tool, but I'm curious to know if the pilot phase revealed any interesting findings about the way pilot participants have or haven't integrated sustainability into their curricula and research programs.

What we've learned in that area is that there is a huge amount of variability. It's impossible to make any strong conclusions in that area. We're finding that it's really quite a mix and depending on who is collecting the information, it's really not that easy to collect. Answering the question, "How much of the curriculum is focused on sustainability?" is not an easy process. Some institutions are having trouble figuring out how many sustainability-focused and related courses they have. What has been most surprising to us is how many of the institutions

had trouble figuring out how to even respond to those types of credits and come up with their own internal ratings of how they're doing.

I can say that based on our early data from the pilot programs, it's probably at a lower level than we had hoped for, but on the other hand, I think it's very difficult at this point for, say, a sustainability officer to collect that information. We are now spending a lot of time looking at how we can make that section easier to work on.

What about in the area of investments? Did STARS reveal anything about the degree to which institutions are managing endowments to support sustainable industries?

Where information came in, we were finding reasonably high levels of investment transparency, but there also seemed to be institutions that were not doing much screening at all. They were leaving it to investment offices. With respect to the major credit of positive sustainability investment, we're not finding a lot of institutions that are able to provide us with evidence that they are making specific investments in sustainability.

Has the work on STARS shifted AASHE's mission, focus and/or priorities?

One of the things that AASHE is quite proud of is that we integrate all of our programs. As we work with STARS, we're also looking at how the information gathered from STARS can feed into our resources center and how it can become part of our conference work. The connections between STARS and the ACUPCC work is pretty straightforward. It's a key part of serving our membership.

Although I'd agree that we put a lot of effort and resources into the development of STARS over the past year or so, we are seeing that it is more than just an instrument for assessment. It is also triggering institutions to do different things and it's providing us with information that we can share with other institutions, which gets back to our core mission of serving as a site for networking among the institutions.

How does AASHE work with other, like-minded organizations, such as Second Nature, the Higher Education Associations Sustainability Consortium and the U.S. Partnership for Education in Sustainable Development and how is AASHE different?

Part of it is sorting out where we can support each other. As a member of HEASC, we participate and share information about what we're doing. We do build a number of partnerships with all types of organizations. Some focus specifically on higher education sustainability like Second Nature, with whom we have a good working relationship. Second Nature tends to focus primarily on high level administrators, while AASHE tends to have a broader set of constituents within our member institutions. We're a member institution and they're not. But we often have healthy, candid conversations to ask, "So, what is it you do, and what is it we do?" so that we're not tripping over each other.

There is so much work to be done, and so much urgency to getting that work done, that I don't think we ever feel we're competing with each other. It's more making sure we're not duplicating our efforts.

How many of the STARS pilot participants have designated sustainability staff?

Of the 60 institutions that responded. Seven did not earn any credit; 19 earned one credit, which means any percentage of a paid staff member's time is dedicated toward sustainability initiatives; 13 institutions (21%) earned two credits, meaning they have a full-time, paid sustainability person. 35% earned all three credits, which means they have a sustainability officer with both academic and operational purview who report to a president or vice president.

So 56% [of pilot participants who responded] reported a full-time person, and 31% reported at least a part time person.

AASHE's web site includes profiles of members who have entered your Campus Sustainability Leadership Awards. Is there one standout in your mind? One institution you see as leading the way in terms of all-around sustainability?

AASHE award winners. Photo courtesy of AASHE

There really are so many outstanding examples. A year from now, after we get the STARS ratings in, I'd be interested to see if I can better answer that question.

What about outside of North America? Are there any great models out there?

There are some interesting, AASHE-like networks that have been established in Scotland. But I cannot think of a particular institution that I'd point to. I think it's like here in the U.S.; there are some institutions that have done phenomenal things with energy, some that have done great things with their curriculum and others that have paid more attention to their waste streams.

In working on a university stormwater and landscape management master plan, one of my colleagues recently made the following observation:

Over the last five years, many colleges and universities have placed an emphasis on establishing sustainability programs and signing on to the American College and University Presidents Climate Commitment. Most of these programs focus on energy conservation and efficiency, transportation, waste management, and water conservation. Fewer institutions are doing great work in innovative stormwater management and integrated regenerative landscape design and planning. As a general observation, higher education campuses have yet to exhibit a broader systems thinking on landscape planning, incorporating green infrastructure connections in the campus and environmental connectivity potential across the campus landscape. Furthermore,

there is little or no integration of sustainability program elements and sustainable stormwater and landscape management.

What is your reaction to this observation? Do you agree? Disagree?

I think it's true on a lot of campuses, but there are some campuses where there is certainly some activity going on with respect to groundwater control and landscaping. I'm not sure it has gotten the level of attention as, say, greenhouse gas emissions. That is probably because the issue of greenhouse gas emissions has gotten a lot of attention in the national media. There are some areas of sustainability that get emphasized at different times and this is probably the time where energy and greenhouse gas emissions are getting a lot of the emphasis.

One of the things we hope STARS will help institutions do is recognize that there are areas that they're not moving forward on. They'll be able to see that they're not getting credits in a certain area and realize that they should integrate into their sustainability programs.

I don't think it's an unfair observation. I just think there are campuses where that is not true.

What advice would you offer ecological restoration, conservation planning and regenerative design professionals who are involved in university campus design and planning projects and want to get institutions thinking about the landscape, natural resources and innovative stormwater management early on, rather than as an afterthought.

What we're really talking about is getting people connected. That's really the key - getting in on the early levels of planning.

Have a presence with planning organizations. Planning organizations really do begin drawing the lines as to what might or might not be done. If you're interested in innovative stormwater management, for example, you really have to work with the planners to get involved. You have to get that issue in front of the planners and the university early on. These are not easy issues, because this usually involves a fair amount of training that has to be provided to the decision makers. That's the complexity. You first have to determine, in a given setting, who the decision maker is and how you're going to be able to provide them with background and information that will help them understand that certain decisions could lead to a more sustainable campus infrastructure.

You mentioned that many institutions join AASHE because they want to show that they are responsive to students and they know it matters with regard to recruitment, so I guess it always has to come back to that.

Yes. I'd throw in another piece. If you're really interested in emphasizing [natural resources management, innovative stormwater management] you have to figure out how to get students involved. There is an incredible resource in students. On every campus, they make up the bulk of the population. They have quite a bit of influence as to what does or doesn't get done.

I'm thinking of a project that was initiated at the University of Idaho, just before I left there. There is a stream that runs through the campus. The president, along with one of the local environmental organizations launched a stream restoration project which, in addition to being an on-the-ground restoration project, is also an academic/research project studying the effects on water quality and aquatic habitat.

I think there are a lot of ways to try to pull these kinds of efforts into the educational system so it's not just a facilities decision but it has some educational value that can tap into the academic side of the institution.

Generally speaking, what role do students seem to play in the sustainability movement on college campuses?

Photo courtesy of AASHE

Their role has been, and will continue to be huge.

I think their role is high in motivating some of us from an older generation to really make decisions that take into account sustainability. They have been quite impressive in moving the curriculum forward and asking for more coursework on sustainability. On a number of campuses, they have taxed themselves, increasing student fees designated for sustainability, and then used those fees to develop sustainability offices from which they carry out projects, provide internships, etc. Students are heavily involved.

If it weren't for students, we probably wouldn't be doing the sustainability work we are doing today.

How does AASHE interact with the business community?

AASHE has business affiliates. We provide them the opportunity to become a member. A lot of our members participate in the conferences. We have some sponsorship of our bulletin and digest by some of our business partners. That's our main interaction. We don't do endorsements or push products, but we do try to provide opportunities for our membership to interact with business members at our conferences.

What are some of the common challenges faced by colleges striving toward sustainability?

The most important challenge they face is probably their funding mechanisms. Most colleges and universities are funded - and budget - on an annual or biennial basis. When you're working in the realm of sustainability, it's really important to be able to look out over multiple years. Sometimes a particular activity may not have an economic payback time of less than a year or two, so that sometimes discourages people from engaging in that activity. The financing of institutions works against sustainability because it's done on such a short term basis. It doesn't look out into multiple years or generations.

Another barrier is that, in some ways, higher education is probably one of the institutions that is slowest to change. It has a very conservative nature to it and at times that has probably been good. But when you face the kinds of issues we're facing in sustainability, that conservative nature tends to make people like me kind of impatient.

Going back to the challenge of financing, and thinking about long-term return on investment...do colleges and universities consider natural capital valuation as part of the sustainability portfolio?

I think that is just starting to be used. I do not think that's been a part of how they have looked at their budgets, particularly when you're thinking of public institutions. I don't think they've had any incentive from their funders to think that way.

Do you see any major differences in the way different types (e.g., 4-year vs. community college; public vs. private) of schools approach sustainability?

There have been differences, but I think it has had more to do with the individuals who have been involved at the institutions than anything else.

Some institutions have put a lot of energy into looking at sustainability in the curriculum while others have put a lot of their energy into looking at sustainability in operations. There have been some almost dichotomous approaches. Some institutions came into sustainability looking for the low-hanging fruit such as energy management systems that could provide rapid paybacks; whereas other institutions realized that they were going to have to get involved in long-term changes.

Photo courtesy of AASHE

I would say, though, that there are some small, private institutions that have been able to make huge strides forward, simply because they were able to make a full commitment to sustainability. Examples include College of the Atlantic and Unity College. Some of these schools have been able to embrace sustainability at a level that is really difficult for some of the national research universities with tens of thousands of students to achieve.

So there is that difference in terms of type. Smaller institutions can sometimes move things a lot faster than larger institutions.

Is there anything else you'd like to say to our readers?

The most important thing I'd like to leave you with is the idea that AASHE is here trying to support higher education in moving forward in sustainability. As a supporter of the institutions moving forward, we want to do what the institutions need. What we do at AASHE is a function of what the institutions need at a given time, and that will probably change over time. We look forward to being nimble enough to make those kinds of changes.

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Non-Profit Spotlight

Association for the Advancement of Sustainability in Higher Education
www.aashe.org

The Association for the Advancement of Sustainability in Higher Education (AASHE - pronounced "AY-shee") is an association of colleges and universities that are working to create a sustainable future. A member-driven, independent 501(c)(3), AASHE works with all sectors of the campus community in its mission to "empower higher education to lead the sustainability transformation."

AASHE provides resources, professional development, and a network of support to enable institutions of higher education to model and advance sustainability in everything they do, from governance and operations to education and research.

Officially established in 2006, AASHE grew out of the Education for Sustainability Western Network (EFS West), which was formed in 2001.

"One of the things that has happened over the years of the short life of AASHE is that it has gone from being a small program with some high hopes to being a national organization that serves a large number of institutions and provides them with help in moving forward on issues of sustainability," said the organization's Executive Director, Paul Rowland. "My charge in coming into this position is to help AASHE assume leadership at the national level and help higher education move forward in sustainability."

AASHE offers its members a variety of professional development opportunities, including the organization's biennial conference which is taking place this week.

AASHE's Biennial North American Conference. Photo courtesy of AASHE.

AASHE's on-line resource center is an ever-expanding storehouse full of publications, links, discussions, tools and statistics related to campus sustainability. AASHE also hosts the reporting system for the American College and University Presidents' Climate Commitment. Perhaps one of AASHE's most exciting programs is its new STARS (Sustainability Tracking, Assessment and Rating) System, a comprehensive and transparent tool colleges and universities can use to measure their progress toward sustainability.

AASHE offers institutional (for U.S., Mexican and Canadian colleges and universities), international and business memberships. Check out AASHE's web site for more information on how you can get involved.

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Sustainable Design
Moving towards Integrated Design in a Disintegrated World

Bill Reed, AIA, LEED

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Incorporating "sustainability" into school building projects, curriculum, and governing principles is now seen by many to be of increasing relevance and even more, a basic framework for understanding our relationship with life on this planet. If sustainability has yet to be identified as a specific objective in your education agenda it will, at the least, soon be seen as an issue worth investigating. In the process of thinking about and practicing sustainability - from a building perspective in this article - these two questions will need to be addressed:

How far do we take it?
How do we realize it?

How far do we take it?

Sustainability is a term used in almost any context these days. A corporation states they need to grow in order to sustain their business. A dam project in India is justified because it will create a more sustainable economy. These organizations are using the term correctly within a limited perspective. However, it is in the larger systems perspective that the term takes on its intended focus. Here's a straightforward way to understand its intended usage within the larger environmental perspective, "If something is sustainable, it means we can go on doing it indefinitely. If it isn't, we can't." Jonathon Porritt (former director of Friend's of the Earth).

How do we get our hands around that? It's actually pretty simple. To get a general impression of some practice or product - whether its use is more or less sustainable than some alternative - we need to lift our heads out of our immediate sphere of action. This requires that we follow the implications of the practice or product logically - What was needed to produce this product? What happens to it after you're done using it? Take water for example: Where does it come from? Rain. Can you drink the rain? If, yes, why aren't you drinking it from your roof? If, no, from where do you get it? A well. Where does the well get its water? The rain. If you can't drink the rain, what makes it clean in the well? The earth. What kind of earth is required to clean the water? Healthy earth. What makes the earth healthy? Habitat - microbes, animals, plants in healthy diversity. So it seems we need habitat to create fresh water. Not many of us think of this when we

have readily available tap water but this is a critical relationship that we ignore at the expense of fresh water for our future.

Even Massachusetts, with 40 inches of rain per year has two towns that are building desalination plants - very expensive, and energy intensive - in an effort to compensate for failing groundwater supply. These towns have ignored the basic source of fresh water - not to mention, a free source - by paving over the local habitat and sending water sideways into the ocean instead of into the ground. "Systems thinking" is not a difficult process but does require asking some linked questions. It is hard for us as a people to question basic assumptions and relationships. We assume others are doing this thinking and we trust them to make good decisions. Respectively, they are not and they do not. Refer to the two towns in Massachusetts. They believe that technology is the answer, not a rethinking the basic assumptions of their water supply system. They are no different than you and me. We've been educated with the same limited and disconnected constructs and thinking process.

Even though thinking in systems seems like common sense - once you learn the knack and know what kind of questions to ask - it, in fact, does require a change in what we think important and value. Change in our thinking practice can happen by slow evolution or in spurts; with bursts of understanding supported by training or asking questions of experts. In general, as a society, we seem to be on the slow evolution track. In 2000 the U.S. Green Building Council officially launched the LEED® Green Building Rating System. It is a grading system that assigns points and assigns levels of performance to various criteria relating to our health and the health of the ecosystem. These points are grouped in general categories of energy and atmospheric pollutants; community issues; habitat; water quality and conservation; material resources; and the quality of our indoor environment including the issues of persistent toxics and pollutants. The purpose of this rating system is to put these issues in front of us as a grouped system. The LEED system grades a client and design team's willingness to reduce impact in these broad areas. It has been very successful in its impact on the marketplace. The danger is that users think that LEED helps create sustainable buildings. It does not. It helps people create buildings that have some features that lead toward a sustainable future. LEED is like a set of training wheels to help people move to higher levels of systems thinking. It is score card to gauge performance of those at an entry level of green design and those who are ready to ask questions such as, OK, I understand what LEED is about, what's the next level? Indeed, that's the question LEED is meant to inspire. This is the evolutionary beginning to deeper systems thinking. In fact, one can't really do a LEED building cost effectively without a reasonable level of

integrated systems thinking. The last section of this article addresses a summary of this process.

So where to after LEED? One might think that we simply need to do better and set higher performance benchmarks. Instead of saving 30% of our energy use compared to an energy code, the next step may be achieving a 70% improvement. This is certainly an important improvement but is it sufficient to reach a sustainable condition? If we achieve 100% less bad as Bill McDonough says, have we achieved sustainability? The answer is; any approach that limits the damage is important but insufficient. It is essential that we begin to look at the earth and its life support systems not as mechanical constructs that we can manage by creating uniform conditions but as living and evolving systems of which we are in integral part. We need to participate with these systems on their own terms - meaning: it is essential for us to understand that we are a part of evolutionary patterns - birth, life, death, rebirth cycles. We are not above these patterns, nor below them, simply part of them. Until we learn how to swim in these conceptual waters we will continually find ourselves exhausted by kicking against the flow of life that - while damaged for our purposes - overall really isn't concerned whether we exist or not. It will fill in behind us just as water fills in behind our movement through it.

The next level beyond a simple mechanical view of sustainability is the concept of Restoration and Regeneration. This article is not meant to explore these. For now we'll let the following definitions suffice. When an organization is ready to think in terms of deeper systems approaches these concepts will be useful.

- **Restorative Design** - Approaching design in terms of using the activities of design and building to restore the capability of local natural systems to an entry state of self-organization and continual evolution.
- **Regenerative Design** - This design process acknowledges that humans are an integral part of nature. Human and natural systems - currently disparate systems in Western culture - need to be in alignment in order to achieve a state of continual and healthy evolution. The design process can and should catalyze this alignment.

How do we realize this?

To realize any movement towards a sustainable condition requires change - change from the conventional way of thinking and doing things. As Albert Einstein said, "Problems cannot be solved at the same level of awareness that created them."

Moving towards sustainability means that we need to move towards more complex system awareness. This way of approaching problems helps us address and make use of many more issues and systems than we typically address when working within a conventional framework.

For example, a conventional design process will have the architect design a building to meet typical functional and aesthetic requirements. The architect then sends the design to the mechanical and electrical engineer to make it comfortable and provide adequate light. In a systems design process - an integrative design process - the engineers, architect, and client are designing the building in a joint manner from the very beginning. Instead of simply adding more efficient equipment to the building - which alone can be costly - the engineer may alert the architect that the orientation and fenestration design of the building can alone save more energy than any level of equipment efficiency. Using daylight will further decrease energy costs and add greater quality of life to the building. Integrated decisions usually decrease the cost of the building while increasing its environmental performance.

While most architects and engineers feel they are "systems designers" by the nature of their work in delivering complex buildings - they usually are not. Sustainable design requires a different mindset or mental model. This model is able to look at systems in a more complex way. Instead of looking at just the physical elements of the building, the invisible connections between the elements need to be understood. These invisible connections and patterns, for example, may be manifest in the downstream impact of toxins in building materials, the multiple efficiency and cost relationships between the many variables in an HVAC system and the building envelope, or the impact on social systems due to logging practices or any raw material extraction. This level of analysis requires a rigorous level of enthusiastic and early engagement from the participants and an understanding of tools used to make these evaluations. Since no one has all of this knowledge themselves, the role of the team takes on great importance; the role of questioning takes on an equal importance in order to elicit answers beyond the conventional.

For teams to embrace this process a different mindset or mental model is required; a mindset that has the desire to change the way things are done. A mental model that is open and willing drives the successful integration of green design.

A systems approach requires a collaborative approach. The very strength of the integrative approach has in it a potential weakness - it depends on collaboration from the key players - the client, architect, engineers, interior designers, landscape architects. Fostering and working within a collaborative framework is hard because we have been trained to be "experts". The client expects it and the design team members feel they need to exhibit it.

It is necessary to move from being 'experts' to being 'co-learners'. The basis of a systems approach is the establishment of a network of mutual learning. No one person can know all the issues that need to be addressed; collective knowledge is far greater than individual knowledge. As Carol Franklin of the ecological landscape design firm Andropogon says, "To design ecosystems we need to deal with ego-systems." (Please see Environmental Building News for an excellent article on Integrated Design, November 2004 issue.)

By far, most successful green projects (i.e., projects that achieved the high environmental goals they originally set out to achieve, within budget) have done so, not because of adding technology and products to the building, but because they had the willingness to focus on the environmental issues - the invisible and critical connections - as essential to the success of the design. They had the willingness to ask many questions about the potential beneficial relationships between ALL the systems in the building, site and region and explore the many different ways to reach toward better ecological integration. The environmental concerns were not secondary, nor were they dominant, just an integral part of the design. The usual "right" answers were never assumed and they were always questioned.

It is the role of the client, should they wish to reach towards cost effective sustainable building solutions, to select design teams (or green building experts) with expertise in integrated design and the design process to optimize systems in a cost effective manner. Even more important than green expertise however is the willingness or attitude of the design team to learn new ways of looking at systems and the willingness to change their design process.

The following is a list of the essential aspects of an effective integrative design process

The Basic Elements of Integrated Design

1. Client (main decision maker) involvement in the design decision process
2. Select the right design team (ATTITUDE is critical - i.e., teachable)
3. Alignment of Expectations and Purposes between the stakeholders and design team
4. Goal Setting of environmental targets (if you can't measure it, you can't manage it)
5. Identify Champions or a Core Team (to hold these goals through the project)
6. Optimization of the design of systems (using evaluation tools and an iterative process in predesign and schematic design - after this it can get expensive to "add green technologies to a project that wasn't designed with these in mind from the beginning)
7. Follow through in Construction Process
8. Commission the project (make sure it performs the way it was designed to perform - just because it's built doesn't mean it works)
9. Maintenance and Monitoring (entropy happens - feedback is essential to maintain performance)

The process to incorporate sustainable thinking in any project is really not that difficult. The difficulty is accepting that the older conventional practices need to be reconsidered. Change is hard for humans. It is the process of changing that is actually the most exciting aspect of reaching towards sustainability. The technologies will always be improving in sometimes subtle and sometimes significant leaps. When we build in a sustainable manner it is the change of perspective, the change of heart, and a fundamental reawakening of an awareness of our relationships to the systems of life that makes all this worthwhile.

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Greening the Campus Green, sustainability in the campus landscape

Allegra Bukojemsky, ASLA, LEED AP
Biohabitats San Francisco Bay Bioregion Leader & Landscape Architect

With sustainability becoming mainstream and being embraced by our younger generations, it is not surprising that Colleges and Universities are taking steps in improving their campus sustainability. Some programs are created and run by students, others by university staff, and sometimes staff positions and departments are specifically created for the cause.

With the growth of sustainability on campus, the ranking of schools based on their sustainability has also increased with reports from the Sierra Club, National Wildlife Federation, and the Association for the Advancement of Sustainability in Higher Education (AASHE) Sustainability Tracking, Assessment & Rating System (STARS). These programs and reviews rate everything from energy and water use, local food production, recycling practices, and incorporation of sustainability topics into the curriculum. However, one element seems to be consistently lacking or, if touched on, limited in scope and depth in both practice and curriculum: the sustainable landscape.

Granted buildings are the big energy hogs and their consumption of resources during construction and operation can easily be measured. The root of sustainability is limiting our impact on natural resources, ecology and human health and well being. So why do sustainability programs focus almost exclusively on limiting off-site impact, when we can also be improving on-site cultural and natural resources?

Campuses have the potential of providing a great deal of ecosystem services when designed and managed properly. Well structured landscapes can result in functioning ecosystems, while key landscape elements can have a variety of positive benefits. Native plants in natural areas as well as the manicured landscape can provide key habitat for pollinator species such as native and honey bees, and birds. The use of native grass for turf areas can improve soil structure and stormwater management, while reducing chemical inputs and water needs. In appropriate bioregions, continuous native tree canopies and remnant forest canopies can have large positive effects on local microclimates, building heating and cooling loads, providing habitat and travel corridors for many bird, insect and small mammal species. Preserved and restored streams and drainages and LID practices can not only improve stomwater management, but also provide habitat and an aesthetic amenity to campus users. Green roofs can provide habitat and resting spaces for migrating bird and insect species, while also reducing stromwater runoff and building energy needs.

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All-in-all the landscape can manage stormwater, provide recreation and restorative spaces, provide habitat and travel corridors for many animal species, reduce urban heat island effects, reduce building heating and cooling loads, filtering air pollution, sequester carbon, and much more. All of these elements when overlapped can have large local and regional benefits, truly strengthening any sustainability program.

Sustainability programs, to truly be sustainable, must be holistic in their approach. While the specific pieces and targets of water and energy reduction are important, the balance and interaction of all the sustainable choices and practices are what need to be considered. Sustainability measurements and efforts need to go beyond the easily measured elements to provide a more holistic process that include on-site and off-site ecology, human health, as well as providing inspiration and exemplary education. Conservation planning, sustainable landscape design and maintenance, and ecological health are becoming easier to consider, and the tools for measuring these elements are developing constantly. The development of Whole Measures, the Living Site and Infrastructure Challenge, the Sustainable Sites Initiative, and the Star Community Index will all help forward the holistic sustainability practices that include buildings, landscape, infrastructure, and community.

The campus landscape is a key element in the schools identity. Many are designed by respected designers as these campuses are often a place of local identity and pride. So now is the time to embrace sustainability holistically on campus and think about greening the campus green. Universities and colleges can teach a great deal through curricula, but potentially even more by example.

Landscape Lens: Green infrastructure and landscape ecology at the campus scale

Jennifer Dowdell, LEED AP
Biohabitats Landscape Architect

When it comes to sustainability, the university/college campus provides an interesting challenge. Often consisting of housing, medical facilities, classrooms, labs, recreation space, parking, stores and various other facilities and services, the campus is, in a sense, a functioning town for the student body. The legacy of an institution's development over time often determines the amount of open space and natural resource amenities that may still exist.

Yet even in the most urban conditions, there are many opportunities to enhance the ecological value and function on a university campus. But where does one begin?

At the planning table.

Integrating landscape ecology and conservation planning into campus master planning efforts is a critical first step in providing colleges and universities with a sustainable framework for growth.

One must begin this process by understanding the campus as part of broader functioning natural and hydrological systems. Those same systems, at the campus scale, can be enhanced and preserved in a way that strengthens the ecological health of the campus, as well as the overall campus experience.

Many of the observations, analyses, and recommendations made by those of us involved in the ecological aspect of campus planning are related to preserving, restoring, or creating **"green infrastructure"** on the property. Green infrastructure, at the campus scale, is a combination of natural and designed features that are connected and integrated across landscapes on campus and provide a variety of ecological, engineering, and educational benefits. These benefits include improved habitat, increased plant diversity, heat island reduction, aesthetic enhancement, accessible and attractive teaching or learning spaces, water conservation, and stormwater management.

This green infrastructure should also be considered beyond the campus boundaries, within the broader, regional ecological context. Observations and suggestions for future planning might explore how woodland or riparian corridors on campus might provide forage and nesting habitat, or stop-over points for migratory birds; or how the stormwater runoff being generated on campus could be treated with practices that may help stream stability within and beyond the borders of the campus.

Working alongside other members of a planning team, the ecological planner/designer can provide a vision of the campus as a living system with the potential for broader ecological health implications - a green spine off of which everything is connected and, to a certain degree, defined. The ecological planner/designer must try to answer the question: how can the buildings, open space, even the hardened infrastructure respond to the natural functioning system in a way that is sustaining and regenerative?

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By restoring and highlighting natural resource amenities as they plan for future development, institutions of higher education can construct a sustainable framework that can simultaneously support its mission, future growth, the regeneration of natural systems, and an enhanced campus experience for its entire community.

Resources

In addition to the many links that appear throughout this issue we have gathered the following recommended resources on sustainability in higher education.

Association for the Advancement of Sustainability in Higher Education's Campus Sustainability Resource Center

Association of University Leaders for a Sustainable Future

Brown (University) is Green

The Campaign for Environmental Literacy seeks to secure and significantly increase the amount of federal funding dedicated to environmental literacy, including restoring federal funding for environmental education in NOAA and EPA.

Campus Climate Challenge

Campus Sustainability Day - This annual fall event is sponsored by the Society for College and University Planning (SCUP).

Campus Sustainability Planning Network

College Environmental Leadership Conference

College Sustainability Report Card

The Cloud Institute for Sustainability Education works to ensure the viability of sustainable communities by leveraging changes in K-12 school systems to prepare young people for the shift toward a sustainable future.

Disciplinary Associations Network for Sustainability (DANS)

Duke University's Smart Home Program is a research-based approach to smart living.

Earth, Wind, and Fire. Every day is Earth Day for many colleges and universities. This article, which appeared in the July 2009 issue of College Planning & Management, showcases some of today's leaders in the sustainability movement in higher education, such as Maine's College of the Atlantic, Iowa State University and Ohlone College in Newark, CA.

Environmental Studies at Oberlin College

For the author of Go Green, Think Blue, which appeared in the July 2009 issue of College Planning & Management, sustainability starts with the question, "will the choices I make have a positive or negative effect on rain and its aftermath?"

Green Schools Alliance

Higher Education Associations Consortium

International Association of Universities: Sustainable Development

International Institute for Sustainable Development's "Sustainable Development on Campus: Tools for Campus Decision Makers"

Middlebury's Sustainability Integration Office

National Wildlife Federation Campus Ecology

Net Impact's Campus Greening Resources

A New Course for Higher Education provides a snapshot of the sustainability programs and activities at a range of public and private institutions across the U.S.

North American Association for Environmental Education

Oberlin College's Adam Joseph Lewis Center for Environmental Studies

Power Shift is one of the largest youth-centered movements related to climate change and energy policy..

Princeton Environmental Reform Committee

Second Nature strives to accelerate movement toward a sustainable future by serving and supporting senior college and university leaders in making healthy, just, and sustainable living the foundation of all learning and practice in higher education.

Sierra Magazine's Listing of Cool Schools

Sierra Student Coalition

Student Environmental Action Coalition

Sustainable Endowments Institute

Sustain US is a nonprofit, nonpartisan organization of young people advancing sustainable development and youth empowerment in the United States.

Talloires Declaration - Composed in 1990 at an international conference in Talloires, France, this is the first official statement made by university administrators of a commitment to environmental sustainability in higher education.

Tree Campus USA

UB Green

U.C. Berkeley Sustainability

The University of British Columbia's Sustainability Street is a pedestrian-oriented promenade that serves as a demonstration of new approaches to managing waste, energy and water in an urban environment.

Photo courtesy of AASHE.

University of Colorado Environmental Center

The U.S. Partnership for Education for Sustainable Development is a voluntary partnership of individuals, organizations, and institutions dedicated to fulfilling the goals of the United Nations Decade of Education.

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Biohabitats' Projects, Places and People

Biohabitats' Projects

Local Community College Incorporates Ecology In Facilities Master Plan

According to a report by the National Center for Education Statistics, 35 percent of all postsecondary students were enrolled in community colleges. By many accounts, community colleges are in the midst of an enrollment boom. We are delighted to be working with Howard Community College in Columbia, Maryland as it plans for future growth. Located halfway between Washington, DC and Baltimore, the College is situated in the headwaters of the Symphony Stream. The stream flows through Symphony Woods, the site of Merriweather Post Pavilion, a prominent cultural and social space in Columbia. Working alongside architectural and planning firm Ayers/Saint/Gross on the College's facilities master plan, we are examining ecological conditions on the campus and identifying opportunities to enhance and incorporate green infrastructure into its future growth. We applaud Howard Community College's commitment to protect and enhance its natural resources and meet sustainability objectives.

Stormwater Solutions For A New Campus Building

The University of Delaware's planned Interdisciplinary Engineering & Science Building will be a 150,000-square-foot facility that will house science and engineering laboratories and the Delaware Environmental Institute. Located within the drainage area of White Clay Creek, one of the nation's designated Wild and Scenic Rivers, the site presents an excellent opportunity to demonstrate innovative stormwater management solutions to the campus community and beyond. Working with architectural and planning firm Ayers/Saint/Gross, we are currently developing schematic designs for techniques to capture, treat and manage stormwater. Concepts include green roofs, rainwater harvesting and constructed wetlands.

Greenway Has Green Light For Design

The Floyds Fork Greenway, a planned system of interconnected parks and trails along a 27-mile stretch of Floyds Fork, will provide for the recreation and open space needs of the City of Louisville's expanding population. As a member of the multi-firm consultant team that worked on the Master Plan for the Greenway, we're particularly thrilled to be involved with the first phase of design for the project. Working with the lead firm Wallace Roberts & Todd, we

are developing a Landscape Conservation and Restoration Management Plan, which will serve as a blueprint for prescriptive measures for the Greenway's unique ecosystems. We are also developing ecological restoration and mitigation designs, assisting with permitting, and providing details and consulting on the design of the various environmental, bioengineered and ecological features of the park. The Floyds Fork Greenway is the result of Louisville's visionary thinkers and city leaders, particularly the non-profit organization 21st Century Parks. We're honored to further their efforts by beginning to bring this project to life.

Analyzing Landscape & Development Capability In Alaska

Recognizing the inherent value of green infrastructure, the Fairbanks Northstar Borough in Alaska recently initiated a thorough review of its existing land resources. The review represents a critical step toward the development of a new comprehensive plan land use map to help proactively steer growth within the fairly undeveloped, 7,444-square-mile Borough.

Biohabitats was chosen to collect and review the rich geospatial data available and create base maps depicting soil suitability, wildlife habitat and migration corridors, wetland, riparian and river health, mining and forestry potential, and alternative energy potential. The base maps along with some alternative futures analysis will be used by the Borough to inform the municipality's growth and greenspace planning.

Places

Earlier this month, Biohabitats Great Lakes Bioregion leader Ivette Bolender took participants in this year's Great Lakes Restoration Conference on a tour of Hog Island near Superior, Wisconsin. If you weren't able to attend this field trip, take a virtual tour.

Biohabitats San Francisco Bay Bioregion leader Allegra Bukojemsky is in Cleveland September 22 to present a lunch n' learn session on "The Sustainable Sites Initiative, Guidelines for Landscape Sustainability." Co-sponsored by the GreenCityBlueLakes Institute and the Cleveland Museum of Natural History, the lunchtime presentation will provide an overview of this effort to provide a basis for measuring and recognizing sustainability in landscape design, construction, and maintenance.

On September 29, Biohabitats environmental scientist Paul Kovalcik will tell participants at the State of Lake Michigan Conference about his experience developing a master plan to restore resiliency and diversity to a US EPA-designated "Area of Concern" around Muskegon Lake in Michigan.

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People

As a nature-loving kid growing up in Austin, Minnesota, a meat-packing town heralded as the birthplace of SPAM, Adam Ganser's earliest ambitions were to a) leave Austin and b) become a rock star. Though his second aspiration remains unrealized, Adam made his way to Minneapolis, working as a landscape construction foreman, and ultimately landed in San Francisco, where he earned his B.A. in environmental planning. After working for a couple years as a GIS technician, Adam went on to earn his M.L.A. from Cornell University.

We are pleased to welcome Adam, now a Landscape Architect/GIS Technician, to the Biohabitats team. Drawn to Biohabitats by our interdisciplinary collaborative environment, where design is driven by science (he really said that!), Adam looks forward to applying his passion for ecological design and his background in innovative stormwater management to our projects. An adroit problem solver, Adam possesses an impressive array of skills that extends from and 3D modeling to construction documentation and implementation.

We're pleased Adam decided not to pursue his childhood dream and instead chose a career in ecological design. We still think he rocks.

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Glossary

Green Infrastructure - An adaptable term used to describe an array of products, technologies, and practices that use natural systems - or engineered systems that mimic natural processes - to enhance overall environmental quality and provide utility services. As a general principal, Green Infrastructure techniques use soils and vegetation to infiltrate, evapotranspirate, and/or recycle stormwater runoff. (Source: U.S. EPA)

LID - A sustainable landscaping approach that can be used to replicate or restore natural watershed functions and/or address targeted watershed goals and objectives. . (Source: U.S. EPA)

Restorative Design - Approaching design in terms of using the activities of design and building to restore the capability of local natural systems to an entry state of self-organization and continual evolution. (source: Bill Reed)

Regenerative Design - This design process acknowledges that humans are an integral part of nature. Human and natural systems - currently disparate systems in Western culture - need to be in alignment in order to achieve a state of continual and healthy evolution. The design process can and should catalyze this alignment. (source: Bill Reed)

Sustainability - *Leaf Litter* derives its definition from the definition of sustainable development in *Our Common Future*, also known as the *Brundtland Report*, published in 1987 by the United Nations World Commission on Environment and Development (WCED):

> *"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."*

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About Leaf Litter

Leaf Litter is a publication of Biohabitats, Inc. Coinciding with the earth's biorhythms, it is published at the Fall Equinox, Winter Solstice, Spring Equinox and Summer Solstice to probe issues relating to conservation planning, ecological restoration, and regenerative design. Biohabitats has attempted to ensure the accuracy and veracity of the information provided in *Leaf Litter*, however, information contained in *Leaf Litter* should not be construed as a recommendation or endorsement by Biohabitats. Please click here to contact Leaf Litter editors with questions, comments or content ideas.

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