

A Report to the President and Faculty Senate by the Committee on Sustainability

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A Report to the President and Faculty Senate by the Committee on Sustainability

This is a report of the University of Florida Committee on Sustainability, an ad hoc joint committee of the President and Faculty Senate first convened in September 2004. This committee is composed of 16 members, including faculty, staff, administrators, and students. Its responsibility, among others, is to implement, where appropriate, the recommendations of the July 2002 Final Report of the University of Florida Sustainability Task Force. A resolution in support of the Final Report was adopted by the Faculty Senate in October 2002. In April of this year, the Student Senate adopted a similar resolution.

What is sustainability and why does it matter?

Climate change, acid rain, deforestation, species extinction, fisheries depletion, soil erosion, water, land and air pollution, ozone depletion, and growing human populations outstripping their resources bases are some of environmental problems we face today. Most of us are familiar with this litany of problems. Environmental degradation and resource consumption, in many cases, are progressing geometrically. Our students sense the danger. A Gallup poll revealed that over two-thirds of college-age youth believe the world was a better place when their parents were their age, and over half believe things are getting worse.¹ The challenge of living sustainably faces us squarely.

Sustainability can be defined simply as meeting contemporary needs without compromising the ability of future stakeholders to satisfy their needs. It has both individual and institutional applicability. Individual and institutional practices that are sustainable are generally understood to attend to three interdependent areas of concern: ecological preservation, economic viability, and social justice. Though there are exceptions, environmental degradation disproportionately impacts the most economically challenged and underprivileged populations. Concern for the environment and social justice go hand in hand. To be sustainable, therefore, a practice must preserve rather than destroy its ecological base, ensure rather than undermine long-term economic benefits, and advance rather than retard matters of fairness, equity and diversity.

Beginning in the late 1980s, with a global awakening to the environmental and socio-economic crises that were occurring in contemporary nations, the systematic thinking and practices of sustainable stewardship were developed. While its emergence as a global issue has occurred relatively recently, sustainability in its most basic form is simply the retrieval of ancient wisdom dictating that you do not eat your seed corn. In academia, this mixture of conservation and innovation go hand in hand, as we practice conserving our resources to the greatest extent feasible while maximizing the production and refinement of the knowledge, skills, and technology that will allow us to live better without causing future generations to live worse.

Sustainability at UF

The University of Florida has a special obligation to meet the challenges of sustainability for three interrelated reasons. First, as educators we play a leading role in training the scientific, social, political and cultural leaders, professionals and policy-makers who will make a difference in the world. Second, we consume significant resources here on campus. Third, the students we educate and socialize at UF will have major environmental impacts as consumers and conservers when they leave campus with the knowledge and skills we impart. Whether the world is a better or worse place when our students become its citizens, parents, and leaders will be, in no small part, a function of the values, knowledge and skills they receive here.

The challenge before us is to make the University of Florida, in its operations, pedagogy, research, and service, serve as a model laboratory for sustainability. There is an adage that the “hand teaches the heart.” It also teaches the mind. Here at UF we have the opportunity to foster experiential, inquiry-based learning that actively engages students to develop the knowledge-base, technological know-how, and socio-economic skills and practices that further sustainability. This is also a grand opportunity to form partnerships with local and regional stakeholders, as well as provide international leadership.

Embracing sustainability is a matter of ensuring that UF stands at the cutting edge in generating the knowledge and technology that will be in the greatest demand for the foreseeable future. Embracing sustainability is not simply a matter of practicing what we preach, though it is that. The University of Florida has the responsibility, and vested interest, to impart the values, generate the knowledge, and develop the skills that will prepare students to contribute to a high quality of life in this country, and around the globe. We are responsible to prepare our students for the future. By addressing the

environmental and socio-economic impact of our operations as well developing our teaching and research mandates, we can enhance rather than undermine that future while ensuring the best education for our students.

With great foresight, President Young and the Faculty Senate convened the University of Florida Sustainability Task Force in December 2000 with a mandate to determine what was needed for UF to become a “global leader in sustainability.”

That task force built on the work of a UF ad hoc group of faculty, staff and students, Greening UF, which organized in 1997 to advance campus greening. These efforts led to the creation of an Office of Sustainability in the College of Design Construction and Planning (DCP). That office was charged with staffing the Sustainability Task Force and publishing its report. The report offered over 45 recommendations designed to map a course towards global leadership in sustainability.

Concurrently, the DCP Office of Sustainability assisted Greening UF with the compilation of the first set of university sustainability metrics published in accord with international business reporting guidelines, the “University of Florida Sustainability Indicators, August 2001.” UF has since continued to lead international efforts aimed at uniform sustainability reporting among institutes of higher education. Following this path, universities can become transparent and credible in their operational practices and educational modeling.

UF has made significant strides towards the goal of leadership in sustainability. It has a great many physical and administrative operations, academic programs, research projects, and other efforts that address various features of sustainability beyond those carried out by Greening UF and the DCP Office of Sustainability.

Many activities focus on the environmental leg of sustainability. UF, for example, has adopted the LEED (Leadership in Energy and Environmental Design) system for design and construction of campus buildings. The University is leading the state in building more sustainable buildings since 2001, and we have the first GOLD-certified LEED building in Florida. The University is also currently developing a campus-wide program to preserve and enhance the natural environment including participation in the Audubon International Certification process. As a model program for university campuses, the Audubon International project encapsulates our 2000-acre campus in an ecological preserve and makes us the first university in the nation to take this important step toward ecological sustainability. Similarly, our university is one of few with a large, nationally registered historic district, reflecting a commitment to the reuse of building materials and the development of historical and community connections. In turn, bus ridership has grown exponentially and new bicycle trails have also been developed.

Other units on campus contribute to sustainability through their efforts to address aspects of social equity. Certainly this figures in much of our teaching and research. Moreover, Florida Museum of Natural History, the Harn Museum, the Phillips Center for Performing, the Division of Student Affairs and the Office of Community Service affirm the benefits of diversity through varied programming. All of these extracurricular factors contribute to our efforts to promote social equity.

Saving green by going green

Sustainability appeals to our moral and professional responsibilities and duties as educators. It is also fiscally responsible. We need only look at the economic facts, as they have been generated by the leaders in campus sustainability.

At Harvard University, the Green Campus Initiative, which has a Director and 5 staff members, goes by the motto of “Saving Harvard Green \$ by Going Green.” Through its innovative efforts in sustainability, the initiative has reaped over a \$1 million in annual savings since 2000. A Green Campus Loan Fund, which gives interest free loans to conservation-oriented projects, has provided \$2.8 million to 32 projects that now save the University \$750,000 per year, while reducing its annual output of carbon dioxide by over 11 million pounds, its annual use of water by over 5 million gallons, and its production of solid waste by 200,000 pounds per year. On average, these projects have generated enough financial savings to pay back their loans in three years.

At the University of British Columbia in Canada, a Sustainability Office created in 1998 has achieved comparable savings, while reducing paper use by 15%, water use by 30%, energy use by 8%, and greenhouse gases by 7%, notwithstanding a 19% increase in the number of students that attend the university.

Some of the efforts sustainability-oriented universities engage in are very simple. Tufts replaced incandescent with compact fluorescent bulbs on campus and cut lighting energy costs in half. Penn State conducted a study that demonstrated that over \$100,000 per year could be saved in purchase and disposal costs of paper if the default margins on university computers were simply reduced to 3/4 of an inch. The Committee on Sustainability is not advocating these specific changes. They simply serve as examples. In any case, not every opportunity to get more green bang from our resource bucks needs to be exploited. Certainly, it is not a question of stoic self-denial at an institutional level. But there are so many opportunities currently available that make sense, dollars and cents, and plain good sense. The economic benefits are there for the reaping, not only from savings in operational costs, but in securing the research funding and philanthropic support that will accrue to UF when it assumes a position of national and international leadership in sustainability efforts. We note in this regard the recent donation of \$15 million to Arizona State University for the creation of an international institute of sustainability.

With this in mind, the Committee on Sustainability will work with the appropriate offices to facilitate the creation of an endowment fund for sustainability. The creation of this fund will allow alumni and other supporters to contribute directly to the sustainability of the University and the promotion of its sustainability efforts. This endowment fund is expected to be focused not only or even primarily on operations, but also on curricular development, research, outreach opportunities, and efforts to make UF a model laboratory in sustainability.

The task ahead

Incorporating sustainability into the fabric of this university serves the interests of UF's faculty, students, staff and other stakeholders. The Committee on Sustainability firmly believes that taking on this forward-looking challenge will aid UF's efforts to rise into the ranks of the top 10 public universities in the country. Unfortunately, UF's varied and numerous projects and achievements in the environmental, economic, and social aspects of sustainability are currently operating without the benefit of a clearinghouse for ideas, opportunities for coordination, a forum for the sharing of best practices, or the stimulation of interdisciplinarity in teaching, research and service.

President Machen and the current Faculty Senate have asked the Committee on Sustainability to set forward the concrete steps required to make the goal of global leadership in sustainability a reality. The time has come to secure a commitment in principle that can be translated into practice, putting UF on a path of leadership in the eyes of our peer institutes, as well as other public and private institutions and communities, both here and abroad.

The creation of a campus-wide Office of Sustainability, working in conjunction with the Committee on Sustainability and a larger network of UF and community stakeholders, will allow us to make the most of our diverse efforts, to develop innovative new approaches to sustainability, and to gain a position of global leadership. As this office works to coordinate sustainability efforts across disciplines and units, UF will be able to enhance its operations and outreach, advance its teaching and scholarship, while gaining the competitive edge for research funding and curricular development within the growing field of sustainability studies. While the DCP office has served well in developing a foundation for the university's role in sustainability, we concur with a key recommendation of the Sustainability Task Force that a campus-wide Office of Sustainability is required to take us to the next level and facilitate our leadership efforts.

For the Office of Sustainability to succeed, it is crucial that the Committee serve as a key resource in its efforts to reach the broader UF community. In turn, its success will depend on the endorsement of the Faculty Senate and administrative support at the Presidential and Vice-Presidential levels. Only in this way, can sustainability concerns be integrated into the fabric of the university's mission.

As can be seen from Appendices C, D, and E, UF is well poised for this initiative. Of 17 peer institutions examined, 6 have funded offices of sustainability. All 6 of these institutions include sustainability in their curriculum, research, and operational policies pertaining to the use of natural resources. Of the other 11 institutions, 7 have ongoing efforts to establish an office of sustainability, 6 have a university-wide committee on sustainability, 6 integrate sustainability concerns into their curricula, 4 into their research missions, and 8 into operational policies.

Compared to our peer institutes, the University of Florida has some of the greatest resources in terms of curricular development, research efforts, and operational achievements and initiatives in sustainability. In this sense, are already near the front of the pack. Were an Office of Sustainability established at UF, it could immediately build upon the very

extensive but largely uncoordinated academic and administrative interests, achievements, and resources in sustainability, and in so doing, place the University of Florida into a position of leadership.

While the Committee on Sustainability will periodically make reports to the Faculty Senate, we submit today a particular resolution for your consideration. This resolution comes in two parts.

First, and in keeping with the recommendations of the Task Force Report, we ask that the Senate approve the creation of an Office of Sustainability to serve the entire campus. Nationally, the institutional leaders in sustainability already have such an office place. The mandate of the UF Office of Sustainability will be to initiate new, as well as translate existing sustainability-related practices in campus operations, teaching, research, and service into a coordinated effort to launch the university into a position of global leadership in sustainability.

In this respect, the Office will serve as a facilitator and clearinghouse for sustainability-related programs and projects. Of equal importance, the Office will foster innovation and collaboration in sustainability-related teaching, research and service while working to implement cost-effective resource conservation in operations. In turn, it will serve as the public face to the broader community, and the contact point for outreach regarding UF's sustainability efforts.

The Office of Sustainability will initially have a Director, hired after a national search, a Chief Academic Officer, who will be selected from internal applicants, an office assistant, and a graduate research assistant. Staffing will grow with the Office's success in securing student interns and external funding for specific projects. The Director will report to the Vice-President of Finance and Administration. The Chief Academic Office will report to the Provost. The Committee on Sustainability will serve as an Advisory Board to the Office of Sustainability, and its link to the broader community of interest at UF. The suggested objectives and responsibilities of the Office of Sustainability, its staffing and reporting structure, are outlined in Appendix A.

Second, we recommend that the Committee on Sustainability be made a Joint Standing Committee, with appropriate amendments to its mission and constitution. The Committee will provide policy advice to the Office of Sustainability as well as serving as its point of contact to stakeholders within and beyond the UF community. The proposed mission and constitution of the Committee on Sustainability are outlined in Appendix B.

A formal resolution, appearing below, is submitted for your consideration.

The Ad Hoc Committee on Sustainability

Matt Armstrong, Student Government
Mark Brown, Environmental Engineering
Eva Czarnecka-Verner, Microbiology
Linda Dixon, Facilities Planning & Construction Division
Paula Fussel, Finance and Administration
Lisa Hall, Environmental Horticulture
Mark Hostetler, Wildlife, Ecology and Conservation
Marc Hoit, Academic Affairs
Donna Isaacs, Student Government
Charles Kibert, Design, Construction and Planning
Chris Machen
Ramachandran Nair, Forest Resources and Conservation
Rich Segal, Pharmacy
Kim Tanzer, Architecture (ex officio)
Colette Taylor, Division of Student Affairs
Les Thiele, Political Science, (chair)

**Submission from the Sustainability Committee to the Faculty Senate
For Consideration as a Senate Resolution
December 2004**

Whereas, Sustainability is an emerging field of study involving multi-disciplinary and interdisciplinary research and teaching;

Whereas, Sustainability is a proven forward-thinking approach to operations that advance environmental stewardship and the responsible use of human and natural resources;

Whereas, efforts aimed at making the University of Florida a global leader in sustainability are under way; and

Whereas, the University of Florida has a ten-year history of pursuing sustainability initiatives as demonstrated in the following milestones:

- 1994: UF joined 310 universities world-wide in signing the Talloires Declaration, pledging support to reduce environmental degradation and natural resource depletion.
- October 1997: The Greening UF program was initiated as a grassroots movement of students, faculty and staff from across the campus for environmental stewardship.
- September 2000: An Office of Sustainability was established within the College of Design, Construction and Planning to facilitate, among other things, sustainability initiatives on campus and in the community.
- March 2001: A Sustainability Task Force was created jointly by the President and Faculty Senate, following a Faculty Senate proposal of December 2000.
- July 2002: The Task Force released the Final Report.
- October 2002: The Faculty Senate endorsed the Task Force Final Report, but asked for continuation of its term until Fall 2004 for developing an implementation plan.
- March 2003: In response to a request from President Young, the Task Force identified high priority recommendations from the Final Report.
- April 2004: A Student Senate resolution (#1041) urged the creation of a university office of sustainability with “full administrative support.”
- September 2004: An ad-hoc Sustainability Committee was established through appointments from the Faculty Senate and President Machen.

NOW THEREFORE:

The Faculty Senate accepts the following recommendations of Sustainability Committee aimed at enhancing initiatives for making the University of Florida a global leader in sustainability.

- I. The University of Florida shall establish a university-level Office of Sustainability, effective before or during the 2005-2006 academic year, for facilitating teaching, research, service, administrative, and fundraising initiatives in sustainability.
- II. The Ad-Hoc Sustainability Committee shall remain empanelled until Fall semester 2005, at which time a permanent joint-committee on sustainability shall be empanelled through amendment to the University Constitution.

Appendix A: Suggested Responsibilities and Reporting Structure of the Office of Sustainability

A crucial component of raising the University of Florida to a position of global leadership in sustainability is the creation of a university-wide Office of Sustainability. Its staffing, reporting structure, objectives and responsibilities are outlined below.

Staffing

The office will be staffed by a full-time Director, a Chief Academic Officer, a secretarial staff assistant, and one GRA (.33 FTE). Staff may also include grant-writing assistants, interns, student-workers, and GRAs funded through external and project related grants.

Reporting Structure

The Director of the Office of Sustainability will report directly to the Vice-President of Finance and Administration. The staff assistant and GRA will report to the Director.

The Chief Academic Officer will report to the Provost.

Objectives and Responsibilities

Director of the Office of Sustainability

1. Initiate, facilitate and coordinate opportunities to improve the sustainability of the University's physical operations, including energy and natural resource conservation, waste management, procurement, planning, design and construction. This task includes:
 - a) providing feasibility studies for new sustainability projects and practices and outlining best management practices
 - b) disseminating information to and working with all units on campus, including the UF Foundation and the UAA, to improve the sustainability of their current practices and implement changes
 - c) monitoring, evaluating and reporting on sustainability projects and practices in place and making recommendations for further improvement
2. Publish a biannual Sustainability Indicators Report based on Global Reporting Initiative Guidelines.
3. Foster involvement, support and leadership for sustainability practices and projects among faculty, staff and students to create and maintain an institutional culture of sustainability. This responsibility includes
 - a) developing a sustainability awareness program on campus and the creation of on-campus learning sites that capture the imagination and interests of all stakeholders
 - b) facilitating the integration of sustainability concerns into job descriptions of administrative, USPS, and TEAM positions where appropriate
4. Develop and implement an incentives, recognition, and awards program for University units engaged in sustainability efforts Initiate, facilitate and coordinate opportunities to extend UF's community outreach and services in sustainability-related areas.
5. Initiate, facilitate and coordinate opportunities to extend UF's community outreach and services in areas related to operations sustainability.
6. Work with the Chief Academic Officer to communicate, publicize, and promote UF's sustainability related efforts within and beyond the UF community. This duty includes
 - a) managing a university sustainability webpage
 - b) publishing an e-newsletter
 - c) regular press releases
 - d) actively participating in local, state, national, and international committees, organizations and conferences to promote sustainability and engage in partnerships with other institutions to further sustainability efforts
7. Identify and aggressively pursue external funding, including grants and gifts, for sustainability practices and projects relating to outreach and operations, including but not limited to those directly administered by the Office of Sustainability. Assist faculty and staff in the pursuit of grants and external funding.

8. Work with the Chief Academic Officer to develop opportunities for UF faculty and students to engage in interdisciplinary research and teaching that exploits UF operations as a model laboratory
9. Serve as an ex-officio member of the Committee on Sustainability and work with the Committee to jointly develop policy
10. Submit an annual report to the Vice-President of Finance and Administration and the Committee on Sustainability that outlines the objectives and accomplishments of the Office of Sustainability. This report will address and evaluate collective efforts with the Chief Academic Officer.

Chief Academic Officer of the Office of Sustainability

1. Stimulate the development of sustainability-related undergraduate and graduate courses and seminars. This task includes
 - a. pursuing opportunities for the development of new courses and/or the integration of sustainability-related topics in current courses. Oversee seed grant program in this area.
 - b. fostering the development of interdisciplinary, general education courses related to sustainability and environmental literacy
2. Heighten research collaboration and productivity in sustainability-related areas across campus. This responsibility includes
 - a. Overseeing a program that funds graduate research assistants whose efforts are directly linked to sustainability-related research pursued by UF faculty.
 - b. Working under the auspices of the University Scholars Program and/or developing other programs to facilitate sustainability-related research among undergraduates and collaborative faculty-undergraduate research efforts.
 - c. Collaborating with the UF Office of Community Service to stimulate and coordinate undergraduate internships and service learning opportunities in sustainability-related areas
3. Work with the Director to develop opportunities for UF faculty and students to engage in interdisciplinary research and teaching that may exploit UF operations as a model laboratory. Oversee matching grant program in this area.
4. Identify and aggressively pursue external funding, including grants and gifts, for sustainability practices and projects relating to teaching, research, outreach, including but not limited to those directly administered by the Office of Sustainability. Assist faculty in the pursuit of grants and external funding.
5. Initiate, facilitate and coordinate opportunities to extend UF's community outreach and services in areas related to sustainability oriented teaching and research.
6. Work with the Director of the Office of Sustainability to communicate, publicize, and promote UF's sustainability related efforts within and beyond the UF community. This duty includes actively participating in local, state, national, and international committees, organizations and conferences to promote sustainability and engage in partnerships with other institutions to further sustainability efforts.
7. Serve as an ex-officio member of the Committee on Sustainability and work with the Committee to jointly develop policy
8. Submit an annual report to the Provost and the Committee on Sustainability that outlines academic objectives and accomplishments related to sustainability. This report will address and evaluate collective efforts with the Director.

Appendix B: Proposed Mission and Membership of the Committee on Sustainability

Mission:

The Committee on Sustainability will serve as the University's coordinating and representative body regarding all aspects of sustainability. It will report jointly to the Faculty Senate and to the President of the University or his designee. The committee will be active in all areas of campus sustainability, including Research, Education, Campus Operations, Community Outreach and Integration, Campus Community, and Organizational Policies and Practices.

Its specific responsibilities are to:

- Promote sustainability practices within the University as a whole and in its relations with the larger community, the state, the nation and global partners.
- Assess the progress of the University of Florida's sustainability efforts as compared to national and international best practices and pursue their implementation when appropriate. This task includes but goes beyond the recommendations outlined in the July 2002 University of Florida Sustainability Task Force Report.
- Promote the University's sustainability efforts on campus, in the larger community and in national and international arenas to enhance the University standing as a global leader in sustainability
- Jointly develop policy with the Office of Sustainability and participate in the annual evaluations of the Office, its Director and Chief Academic Officer.

Membership:

The Committee on Sustainability will be a Joint Standing Committee. Eight voting members will be appointed by the Faculty Senate; seven voting members will be appointed by the President or his designee; and two student members will be appointed by the Student Body President. To the extent possible, its membership will gain representation from a broad spectrum of faculty representing multiple colleges and administrative staff from among the following units: the Office of the Vice President for Finance & Administration, Office of the Provost, Office of the Vice President for Student Affairs, Office of the Vice President for Public Relations, Facilities Planning & Construction Division, Physical Plant Division, Shands HealthCare, University Athletic Association, University of Florida Foundation. The Director and the Chief Academic Officer of the Office of Sustainability will serve as ex officio members.

Staff:

Staff assistance will be provided by the Office of Sustainability.

Procedure:

The committee will elect its own chair each year.

Reporting:

The Committee will provide an annual report outlining the University's sustainability objectives to the Faculty Senate and to the President or his designee. Minutes of all meetings will be made available to both parties.

Appendix C: Su+-stainability at Peer Institutions

By way of web site searches and personal contact, the UF Committee on Sustainability examined the following peer institutions as to their respective levels of commitment to sustainability:

University of California-Berkeley
University of California-Irvine
University of California-LA
University of California-San Diego
University of California-Davis
University of California-Santa Barbara
University of Southern California
University of Washington (Seattle)
University of Texas-Austin
University of Indiana
University of Michigan-Ann Arbor
University of Virginia
University of North Carolina-Chapel Hill
University of Wisconsin-Madison
University of Illinois-Champagne-Urbana
Penn State University
Georgia Institute of Technology

Of the 17 peer institutions examined, 6 have a funded office of sustainability. These offices are funded in multiple ways: through the administration, grants, gifts and endowments. All 6 of these institutions include sustainability in their curriculum, research, and operational policies pertaining to the use of natural resources. Of the other 11 institutions, 7 have ongoing efforts to establish an office of sustainability, 6 have a university-wide committee on sustainability, 6 integrate sustainability concerns into their curricula, 4 into their research missions, and 8 into operational policies.

The data gathered appear below.

Peer Institutions with:

A funded office of sustainability or another office with comparable duties:

1. University of Illinois (two paid coordinators in the college of Agriculture) – funded through hatch, extension and SARE.
2. University of Wisconsin – funded through research grants, corporate gifts and private funds
3. Georgia Institute of Technology – funding from the vice provost for research and the dean of graduate studies
4. Pennsylvania State University – campus departments, Heinz Endowment
5. University of North Carolina – funded through the Associate Vice Chancellor for Facilities Services
6. University of California, Santa Barbara –paid sustainability coordinator

A university-wide committee focused on sustainability:

1. University of California, Berkeley – Chancellor’s Advisory Committee on Sustainability
2. University of Washington – Environmental Stewardship Advisory committee
3. University of North Carolina – Sustainability Coalition
4. University of Indiana – Council for Environmental Stewardship
5. University of California, Santa Barbara
6. University of California, Davis – Sustainability Administrative Advisory Committee

Sustainability represented in the curriculum:

1. University of Illinois – Master’s degree in sustainability
2. University of Virginia – Integrated into architecture curriculum
3. University of California, Berkeley – Freshman seminar on sustainability

4. University of Wisconsin – office of sustainability works with several departments on their curriculum and offers some graduate student funding
5. University of Washington – Four courses related to sustainability
6. University of California, Irvine – Offers an interdisciplinary minor in sustainability
7. Georgia Institute of Technology – Integrates sustainability into many courses covering a broad range of disciplines.
8. Pennsylvania State University – Offers both courses for credit and for the community
9. University of North Carolina
10. Indiana University
11. University of California, Santa Barbara – One course
12. University of California, Davis – offers several courses that address sustainability

Sustainability policies enacted through their operations and physical development:

1. University of Virginia
2. University of California, Berkeley
3. University of Michigan
4. University of Washington
5. University of Texas
6. University of California, Los Angeles
7. Georgia Institute of Technology
8. Pennsylvania State University
9. University of North Carolina
10. Indiana University
11. University of California, Santa Barbara
12. University of California, Davis

Research pursuits addressing sustainability or have a policy to do so:

1. University of Illinois
2. University of California, Berkeley
3. University of Wisconsin
4. University of Southern California
5. University of Washington
6. University of California, Irvine
7. Georgia Institute of Technology
8. Pennsylvania State University
9. University of North Carolina
10. University of California, Santa Barbara

Some course of action to establish a sustainability office or committee:

1. University of Illinois – seeking a third coordinator
2. University of California, Berkeley – advertising for a Unit Sustainability Education Coordinator
3. University of Michigan – requested the appointment of a sustainability coordinator
4. University of Texas – requested funding for both an office and committee
5. University of California, Los Angeles – Institute of the Environment is trying to organize an effort.
6. University of California, Davis – their committee is charged with forming an office of sustainability
7. University of California, San Diego – they are trying to form a committee

Programs to preserve natural resources and protect the environment of their campuses:

1. University of Michigan
2. University of Washington

University of California - Berkeley

Sustainability was first formally introduced to UC Berkeley administration at the UC Berkeley Recycling Summit in February 2002. The following year an undergraduate student introduced a proposal at the 2003 summit to create the Chancellor's Advisory Committee on Sustainability (CACS). Chancellor Berdahl gave his approval verbally at this summit and the manager of the Campus Recycling and Refuse Services was asked to convene the CACS.

Meanwhile, Greenpeace launched the UC Solar campaign in June 2002 after winning a tremendous victory for solar energy in the Los Angeles Community College District. After a year of successful organizing on nearly every UC campus, the UC Regents passed unanimously on July 16, 2003 a policy to promulgate green building design and clean energy use. The document calls for all campuses to achieve a standard equivalent to LEED(tm) (Leadership in Energy and Environmental Design) "Silver" rating and 20% (10 MW) of all energy purchases from renewable sources by 2017. It is the most comprehensive green building and renewable energy policy in the nation.

After the UC Regents accepted the recommendations of the student-led movement, Greenpeace turned its focus nationally and the students formed the California Student Sustainability Coalition (CSSC), composed of active representatives from nearly every UC campus. The group is currently developing a transportation demand management policy. In August 2003, the University of California Student Association chose unanimously to promote UC-wide sustainability programs as one of its three action items for the 2003-2004 school year. A major component of the sustainability program will be for each campus to form a committee similar to the CACS at UC Berkeley.

This year at UC Berkeley the third class of Residential Recycling Education Coordinators is active and organized by Student Recycling Education Coordinators under the supervision of Campus Recycling and Refuse Services. For the second consecutive year, a professor is teaching an over-subscribed freshman seminar on sustainability. Last year the same professor taught EPS 80, a 470-student lecture also about sustainability....”

In addition to the class mentioned above, there are many apparently uncoordinated teaching and research efforts by individual faculty members and units. Institutionally, the CACS has 16 members, including two appointed by the Faculty Senate, seven students including both graduate and undergraduate students representing a variety of perspectives, and seven staff. The Committee’s mission is “1) To engage the campus in an ongoing dialogue about reaching environmental sustainability; 2) to integrate environmental sustainability with existing campus programs in education, research, operations, and public service; and 3) to instill a culture of sustainable long-range planning and forward-thinking design.” Berkeley is currently advertising for a Unit Sustainability Education Coordinator who will work primarily on recycling. Berkeley also profits from its membership in the UC System, which has campus-wide Green Building Policy and Clean Energy Standards, a website that provides information to Case Studies and other resources, and links from one campus to another.

University of California – Irvine

The University of California, Irvine does not have a centralized Office of Sustainability. However, it has numerous faculty engaged in sustainability-related teaching and research covering a wide range of disciplines. Academic programs with sustainability projects, reports, coursework or publications on the website include computer sciences, transportation, aquaculture, e-commerce, economics, mathematics, manufacturing, mechanical engineering, oceanography, forestry, eco-tourism, and energy. A student webpage hosted through the Associated Graduate Students website presents a wealth of information about sustainable schools. Based on the webpage research, three programs seem to be at the forefront of UCI’s interdisciplinary projects in sustainability. These programs are the Global Environmental Change and Human Security Project, the Citizen Peacebuilding Program and the Interdisciplinary Minor in Global Sustainability.

<http://mamba.bio.uci.edu/~pjbryant/global/>

Special Notes: UCI offers three online undergraduate courses that focus on sustainability.

University of California – LA

There is a UC Regents' policy on sustainability and an office, with web site, has been set up within the Office of the President. Several campuses—notably UC Santa Barbara and UC Santa Cruz—have created committees and some funding.

At UCLA, Vice Chancellor, Pete Blackman, is very progressive on substantive matters such as hazardous waste reduction, green purchasing, and use of alternate fueled vehicles on campus. Mary D. Nichols, Director, UCLA Institute of the Environment is trying to create an organized sustainability policy and has had very modest success in networking with the people in charge of constructing new campus buildings, helping them to network with colleagues on other campuses, etc. At this point, however, UCLA has no formal sustainability program, office or coordinator.

<http://www.ioe.ucla.edu/sustainabilityCTR.htm>

University of California – San Diego

The University of California system hopes to establish a sustainability committee with student representation on every campus. These committees will work locally with their Chancellor's office and system wide with the UCOP. They will also provide a permanent framework for students and the community to be involved with future sustainability efforts.

University of California- Davis

The University of California – Davis has a Sustainability Administrative Advisory Committee that has been charged to formulate an Office of Sustainability. The purpose of this advisory group is to assess the degree of sustainable development and operating practices being conducted on campus and to investigate methods to increase such practices. Through this committee UC Davis can streamline the implementation of sustainable efforts being made within all constituencies including administration, faculty, staff, and students in order to meet and surpass the guidelines set out by Regents Action 102 and the Office of the President.

Sustainability achievements on campus include:

- Classes in many UC Davis programs, such as the Education for Sustainable Living Program, and departments such as, Landscape Architecture, Community and Regional Development, Wildlife Fisheries Conservations Biology, Environmental Science and Policy, Ecology, are just some examples on campus that have addressed the issue of a sustainable future.
- Administration begun to address a sustainable campus in their Long Range Development Plan and the Strategic Plan.
- The University of California Regents also acknowledges the importance of sustainability in Regents Action 102. The UC Office of the President is preparing to pass its Green Buildings and Clean Energy policy July 1st, 2004.

University of California – Santa Barbara

At UC-Santa Barbara, Bren Hall has been given the U.S. Green Building Council's LEEDTM Platinum Award--one of only two awarded nationally--for being the greenest laboratory building in America. It is a physically realized manifestation of the School's environmental programs, and is a frequent selection for architectural and landscaping tours and awards for sustainability. The School is compiling complete information and statistics about sustainable building practices as a resource for other builders, and Bren Hall is being used as both example and model in the UC Regents' newly adopted Green Building Policy, which applies to all 10 UC campuses statewide.

A mandate from Chancellor Henry Yang stipulates that all new construction at UCSB must be LEED Certified to the Silver level. UCSB has hired a new campus sustainability coordinator for physical facilities.

Apart from the paid Sustainability coordinator, there is no other funding for the office of sustainability – it is all volunteer run. There is a class on sustainability that is in the curriculum, but otherwise the sustainability coordinator is concerned with operations.

Website: <http://facilities.ucsb.edu/>

University of Southern California

While there is no office of sustainability or sustainability committee, at the University of Southern California, there is a research center titled Sustainable Cities Center. Its activities are not directed inward (toward the campus), but outward. Its mission: "The Center for Sustainable Cities engages in research and education on environmental, social and economic sustainability challenges facing metropolitan regions, and contributes to policy that improves urban natural and human environments."

<http://www.usc.edu/dept/geography/ESPE/index.html>

University of Washington

Effective, July 29, 2004 The University of Washington embraced its important leadership role regionally and nationally to be an environmentally, economically, and socially responsible institution. The University is committed to practicing and promoting environmental stewardship while conducting its teaching, research, and service missions as well as its facility operations in all of its locations. The institution and all members of the University community support actions, decisions, and leadership that will:

- Provide educational opportunities to the campus communities on sound environmental practices.
- Create intellectual resources which can be used to achieve goals for sustainability for this and future generations.
- Create partnerships at all levels within and outside the University that further the practice of environmental stewardship and sustainability.

Through its landholdings and operations on three campuses and several other locations, the scale and scope of the University's activities have the potential to significantly affect the environment, ranging from working on a reclaimed landfill site, to long-term monitoring of intertidal wetlands, upland temperate forests and fully built office high-rises in downtown Seattle. By exercising effective management over its activities, the University will promote the sustainable use of its resources, seek to minimize risks to and negative impacts on the environment, and underscore our commitment to protect human health and the environment.

<http://depts.washington.edu/poeweb/resources/susuw.html>

Special Notes: Offers four specific courses addressing sustainability issues in various disciplines.

University of Texas – Austin

Their Director of Environmental Health and Safety (Erle Janssen) provided a PowerPoint presentation about Austin's on-going sustainability efforts and an executive summary they have prepared that will be used to request funding for an Office of Sustainability and the establishment of a Campus Sustainability Committee. The EH&S office hired a graduate student to collect information about existing efforts and

projects on their campus and to help prepare these documents. In addition, the University participates in Central Texas Sustainability Indicators project. The web site for that project is:

<http://www.centex-indicators.org/index.html>

The main University web address is: <http://www.utexas.edu/>

It appears that their School of Architecture is working with the facilities folks regarding sustainable buildings. Per their VP for Employee and Campus Services, the last few building projects were LEED certified. They may set a goal of buildings with LEED certification but have not yet made that decision.

University of Indiana

The Council for Environmental Stewardship's mission is to engage students, faculty and staff in academic programs and administrative efforts that enhance the University of Indiana's campus environment and contribute to a healthy and sustainable world.

Formed in early 1998 as part of a campus-wide initiative, the Council has approximately 35 members. It meets monthly to plan programs and activities for the campus. Working groups within the Council research issues, develop recommendations and then work with key decision makers and organizations to implement actions. Working groups look into such areas as energy use, environmental education, green space, hazardous materials, transportation, and materials management, waste reduction, and safety. The Council builds on existing campus policy and practice, working collaboratively with staff, faculty and students to enhance IUB operations and academic programs.

Current efforts include:

- **Green Landscaping** - By modeling a strong land ethic, IUB can contribute to the health of its own campus ecosystem, reduce negative impacts on adjacent ecosystems and instill a parallel land ethic in its student body.
- **Waste Reduction** - Reducing waste at Indiana University benefits the environment as well as the campus community. Focus is on the current state campus dining-related waste and how to improve efficiency.
- **Campus Climate Neutral** - Reducing greenhouse gas emissions on campus while educating students, faculty, and staff on issues of global climate change. This project is part of a larger national effort.

<http://environment.indiana.edu/index.html>

University of Michigan – Ann Arbor

Over the past several years, the University of Michigan has empanelled an Environmental Task Force, a Steering committee for Environmental Issues and Research on Campus, and a Dean's Council on the Environment. A request has been sent by the ETF to the President's office for monitoring campus progress on environmental issues. It also requested the appointment of a sustainability coordinator, at a salary range of \$50,000, but the position has not been funded due to university-wide budgetary concerns. The Taubman College of Architecture and Urban Planning and the School of Natural Resources and Environment have been searching for a faculty member who will be jointly appointed to both colleges, with the goal of stimulating synergy between their academic units.

Among Michigan's initiatives are the following: The President's Office Master Plan development was charged with considering "issues of sustainability" and suggesting the development of and management of UM properties to "support the ongoing processes that sustain life and...promote their continuing function." They have developed several pilot programs on native vegetation and a general policy to avoid irrigation whenever possible and rainwater retention ponds for all new parking lots. They have an EPA Energy Star Buildings Program and do lighting retrofits. They have an Energy Conservation Measures fund. The Transportation Services area has several programs in place to help the environment. They have a Pollution Prevention Program for chemicals, pests, mercury, transportation, and waste. The Department of

Occupational Safety & Environmental Health is engaged in storm water management, soil erosion control, air pollution control, clean up of contaminated properties, and similar programs.

Students are engaged in a number of clubs and organizations devoted to environmental issues. Taubman College students are entering the 2nd National Solar Decathlon, in schools of architecture build full-scale solar houses on the Mall in Washington, D.C.

<http://www.umich.edu/~usustain/sustain.html>
<http://www.housing.umich.edu/services/environ/>

University of Virginia

Efforts towards sustainability at the University of Virginia are being driven by several forces, most based in architecture: First, the original campus, designed by Thomas Jefferson, is a vital part of daily life, a reminder of the value of preservation and of an integrated vision of campus life. Second, the historic center and the rest of the sprawling campus is currently being managed by Campus Architect David Neuman, who is credited with initiating a campus-wide sustainability policy. The Office of the Campus Architect is developing storm water management methods and landscape standards that seem aimed at achieving the goal of sustainability. Third, internationally prominent sustainability advocate and architect William McDonough was Dean of the School of Architecture for a period of years in the late 1990s. His emphasis on sustainability has permeated coursework throughout the School's curriculum and, one might speculate, has led to the hiring of a number of nationally prominent professors of architecture and landscape architecture with this focus. One administrator stated that the University of Virginia does not use the term "sustainability" but engages in sustainable practices. This statement might explain the fact that the term does not appear in simple searches of the University of Virginia website.

In addition, the Facilities Management Department organizes operational issues related to Energy, Recycling, Systems Control, Heating, Cooling, Electricity and Piping, many of which reflect a sustainable ethos. Among their efforts they: Install motion sensors; retrofit building lighting; replace inefficient motors; procure and act on engineering studies of buildings, central heating and cooling plants, electrical demand limiting; automate equipment operation schedules; develop energy policies such as design guidelines for new construction and a motor efficiency policy. The University won the 2001 Energy Star Partner of the Year Award in 2001 for its "outstanding commitment to pollution prevention through continuous improvement of the University's energy management practices." The Facilities Management website states that in one year the University's energy program has saved almost \$100,000.

There is no evidence of institutional presence beyond these areas. The Senate does not have a committee that addresses sustainability across campus. There is not a campus-wide sustainability coordinator, though there are elected student recycling coordinators.

University of North Carolina – Chapel Hill

At the University of North Carolina, there is a funded office of sustainability that came out of a coalition started in April, 1999. A Director was hired in 2001. There are now two additional staff people: a research associate and a person from energy services. The office is under facility services and is a peer of the energy coordinator. It is a mix of operations, teaching and/or research. The Director taught classes at first but then became too busy to continue. The university is trying to create a minor in sustainability. There is also a sustainability advisory board made up of coalition members, faculty and others who report to the Chancellor. UNC is now undertaking an environmental audit of all electricity, steam and chilled water on campus. All construction on campus must go through the committee and adhere to a silver level of construction. The director is Cynthia Pollock Shea.

<http://sustainability.unc.edu/>

<http://www.fac.unc.edu/sustainable/>

University of Wisconsin – Madison

The University of Wisconsin-Madison in 1970 established the Institute for Environmental Studies, a special intercollege unit where professors, students, and other professionals with wide-ranging backgrounds could

converge to better understand and resolve environmental problems. In 2002, the institute was renamed in honor of U.S. Senator Gaylord Nelson, the founder of Earth Day and a lifelong champion of environmental stewardship.

UW-Madison's schools and colleges, offer more than 100 courses. Topics range from environmental health to environmental ethics, from natural resources to natural hazards, and from climates of the past to energy sources of the future. The emphasis is interdisciplinary. The object is to blend the wisdom of many academic fields. Students, may design a campus recycling program, create a watershed management plan for a lakeside community, testing the latest technology for monitoring natural resources by satellite, or create web sites on environmental topics.

Structure and Governance

The Nelson Institute is designed to encourage broad, interdisciplinary collaboration among faculty members at UW-Madison. Ideally, this creates a synergy that benefits the individual participants and strengthens the ties between their colleges, schools, and departments.

To meet its campus wide mission, the Nelson Institute is administered by a **director** who is appointed by the chancellor of the university and reports to the provost. An elected faculty **chair** oversees all operations of the Nelson Institute's **academic programs**. Each of these programs, in turn, has its own faculty chair and committee. Each of the institute's research centers has its own faculty director, appointed by the director of the institute.

The institute's Governance Faculty is its main decision-making body. This group is composed of all "budgeted" (core) Nelson Institute faculty members, the director and academic programs chair of the institute, the chairs of each Nelson Institute degree and certificate program and of the institute's research and outreach committees, the directors of the institute's research centers, and six at-large members of the institute's general faculty. Tenured members of the Governance Faculty constitute the Executive

Research - current and recent topics of research:

- global environmental change and its impacts
- local and regional water management
- restoration of disturbed ecosystems
- new technologies for environmental monitoring and management
- international ecological sustainability and economic development

Outreach

- an award-winning radio program
- distribution of environmental research data via the Web
- community-based water management workshops
- traveling environmental science demonstrations
- public lectures and other campus events

Committee.

A variety of standing committees of faculty and staff members and students deal with matters ranging from curriculum review to long-range planning.

University of Illinois

The University of Illinois has no Office of Sustainability at the campus-wide level. There is however, an Environmental Council which addresses issues of sustainability as well as runs a lecture series on the subject. The council seems to be very active, expending much of its efforts on sustainability.

There are two full-time positions in the College of Agriculture that promotes Sustainable Agriculture. Both of these positions have a budget of approximately \$150,000 plus travel, which consists of some hatch funding, some extension funding and funds from the North Central Region SARE. They are also both academic in nature, with their titles being Co-coordinators of the Agro-Ecology Sustainability Program. They report to the Department Head for Natural Resources and Environmental Sciences. Currently both co-coordinators focus on teaching and outreach. They also plan conferences and meetings, generate publications, and assist researchers connect with farmers.

An open meeting was called in January to gather information on major sustainability achievements on campus and over 60 people showed up. They realized that efforts were fragmented so they are seeking funding for a third full-time employee to maintain a virtual website.

<http://www.nres.uiuc.edu/outreach/programs/index.html>

Penn State University

The Center for Sustainability (CfS) at Penn State is working with faculty, students and the local community to test and exhibit more sustainable technologies and practices. At their 8.5 acre research site they are developing a sustainability showcase with the innovative technologies and techniques that are defining the sustainable revolution.

Housed in the Science, Technology, and Society department of the College of Engineering, the Center offers courses for credit including STS 497D—Projects in Sustainable Living. They also offer non-credit courses, as well as community volunteer workdays and special interest workshops.

Their weekend workdays offer the public an opportunity to learn through hands-on experience with alternative energy, green design, biointensive gardening and more. They periodically offer special interest workshops highlighting the expertise of local community members.

Special Notes: Several achievements are listed on their website, mostly solar power research and gardening innovations.

Georgia Institute of Technology

Georgia Tech has embarked on a multi-year agenda to incorporate the concepts of sustainable technology and development into the core curriculum, required, and elective courses so that their students' understanding of sustainability evolves with their understanding of their discipline and profession. As a major research institution, Georgia Tech's research programs serve a crucial role in undergraduate and graduate education, not to mention the on-going intellectual development of faculty and research sponsors.

Georgia Tech has an Institute for Sustainable Technology and Development which supports the incorporation of sustainability into existing and emerging research programs. They also coordinate the activities of larger scale, multi-organizational research programs in urban and regional ecology and environmentally conscious design and manufacturing. Because Georgia Tech's commitment to creating a more prosperous and sustainable society extends to their own corner of the community, ISTD works to develop campus projects (through senior-level courses and relevant research programs) and provides assistance in implementing changes to existing programs in a sustainable direction.

<http://www.sustainable.gatech.edu/about/vision.php>

Special Notes: Georgia Tech is focusing on creating courses that contain sustainability content. Their Spring 2002 list of these courses was five pages long and included many different areas of discipline.

Appendix D: Academic Resources in Sustainability at UF

In response to a UF Faculty Senator's call for identification of sustainability efforts on campus, a large number of the UF Faculty members responded with an abundance of information. This was an informal survey, in no way a comprehensive analysis of sustainability efforts on campus. The Faculty members that responded reside in various departments and colleges (short list enclosed below). There were approximately 70 responses from Faculty in total of 33 departments, colleges and IFAS extension. There are already two Programs in place at the UF that largely deal with sustainable resources (#14 and #35) and these include numerous scientists that were not counted individually. Numerous Faculty members in IFAS Extension involved in sustainability were not individually accounted for in this informal survey. Overall reported sustainability efforts involve several diverse areas such as research, teaching, administration, service, community outreach and operations.

1. Agricultural and Biological Engineering Dept.; 1
2. Department of Agronomy; 1
3. Department of Animal Sciences; 2
4. School of Architecture; 1
5. Department of Botany; 3
6. Commercial Horticulture - Woody Ornamentals
UF/IFAS Lake County Extension Service; 1
7. Powell Center for Construction and Environment
M.E. Rinker Sr. School of Building Construction; 1
8. College of Engineering, SFRC; 1
9. Department of Entomology & Nematology; 3
10. Department of Environmental Engineering Sciences; 1
11. Department of Environmental Horticulture; 8
12. Department of Fisheries and Aquatic Sciences; 1
13. Florida Energy Extension Service
Pinellas County Extension; 1
14. Florida Sea Grant College Program; numerous
15. Food and Resource Economics Department; 2
16. School of Forest Resources and Conservation; 11
17. Department of Geological Sciences; 1
18. Grassland Science; 1
19. Horticultural Sciences Department; 3
20. IFAS Extension; numerous
21. Indian River Research & Education Center; 1
22. Department of Landscape Architecture; 1
23. Department of Microbiology and Cell Science; 2
24. Materials Science and Engineering; 1
25. UF School of Natural Resources and Environment; 1
26. Department of Political Science; 1
27. Department of Religion; 3
28. Soil and Water Science Department; 1
29. Department of Tourism, Recreation and Sport Management; 1
30. Working Forests in Tropics Program; 1
31. Turfgrass Management and Water, FLREC; 1
32. Urban and Regional Planning Department
College of Design, Construction and Planning; 2
33. Veterinary Medicine; numerous
34. Department of Wildlife Ecology and Conservation; 5
35. University of Florida Program for Resource Efficient Communities; numerous

1. AGRICULTURAL AND BIOLOGICAL ENGINEERING

JONATHAN JORDAN, PhD

Asst. Scientist
IFAS Center for Remote Sensing
Agricultural and Biological Engineering Dept.
Frazier-Rogers Hall
University of Florida
Box 110570
Gainesville, FL 32611-0570
(352) 392-1864 x 279
jdjordan@ifas.ufl.edu

RESEARCH

Sustainability- in form of **remote sensing and geographic information systems projects** in areas of Precision Agriculture, Surface Hydrology, and Invasive Exotic Vegetation mapping. Study areas have included Florida, Taiwan, and Ecuador.

1) Externally Funded Research Projects

a) Precision Agriculture

"Maintaining the Competitiveness of Tree Fruit Production through Precision Agriculture", United States Dept. of Agriculture (USDA), 2002-05, PI W. S. Lee.

"Implementation of Precision Agriculture Technology to Improve Profitability of Florida Citrus", Florida Citrus Production Research Advisory Council, 2003, PI A. W. Schumann.

b) Surface Hydrology

"Development of a Reflectance Spectroscopic P-Sensor for Terrestrial and Aquatic Ecosystems in the Lake Okeechobee Drainage Basin", Florida Dept. of Agriculture and Consumer Services (FL-DoACS), 2002-05, PI W. S. Lee.

"Remote Sensing and Geographic Information System in Runoff Coefficient Estimation for Irrigated Regions, Intl. Commission on Irrigation and Drainage, 1999-2001, PI S. F. Shih.

"Using Remote Sensing Techniques to Assess Stress Conditions in Wetland and Upland Vegetation in the Southeastern Coastal Region, 1997-2001, PI S. F. Shih.

c) Invasive Exotic Vegetation Mapping

"Baseline Mapping via Remote Sensing for Monitoring the Biocontrol of *Schinus terebinthifolius* Raddi in Florida", Florida Dept. of Environmental Protection (FL-DEP), 2004-05, PI J. D. Jordan.

2) In-House Funded Research Projects

b) Surface Hydrology

"Development of an Innovative GIS Database System for Flood Analysis, Crop Planning, and Agricultural Loss Mitigation in Miami-Dade County", Extension Enhancement funds, 2001, PI D. Pybas.

c) Invasive Exotic Vegetation Mapping

"Remote Sensing to Monitor Management of *Schinus terebinthifolius* Raddi in Central Florida", UF School of Natural Resources and Environment (SNRE), 2003-04, PI J. D. Jordan.

"Use of Aerial Photography to Monitor the Spatial and Temporal Distribution of *Ischnodemus variegatus* Signoret, a Natural Enemy of the Invasive Grass, *Hymenachne amplexicaulis* (Rudge) Nees", UF School of Natural Resources and Environment (SNRE), 2003-04, PI W. A. Overholt.

"Remote Sensing of Invasive Vegetation in Florida Wetlands by Multi-Temporal Analysis of Satellite Imagery", UF Invasive Plants Working Group, 2002-03, PI J. D. Jordan.

2. AGRONOMY

JOHANNES SCHOLBERG

Assistant Professor
Environmental Quality/Agroecology
Agronomy Department
Institute of Food and Agricultural Sciences
University of Florida
PO Box 110500, 402 Newell Hall
Gainesville, FL 32611-0500
Tel: 352 392 1811 ext 230
Fax: 352 392 1840
<http://scholberg.ifas.ufl.edu/>

TEACHING

AGR4268C Sustainable Agricultural System Analysis

Learn more about regional and global food security, sustainable/alternative agriculture, and use of computer applications to improve your understanding of agro-ecosystems & environmental quality in an interactive & informal course setting.

AGR6932 Agriculture Environment and Food Security

I work on covercrops, environmental quality, nutrient cycling, organic and integrated cropping systems.

My web site has more info on my program: <http://scholberg.ifas.ufl.edu/>

Overall Program Objectives:

- Develop information on the effects of environmental conditions on nutrient uptake dynamics and to integrate this information in conceptual models.
- Design and evaluate improved irrigation systems and irrigation scheduling techniques for Florida crops.
- Develop integrated cropping systems, featuring improved use of crop residues that will improve nutrient retention, profitability, and sustainability of regional agricultural production systems.
- Design and test improved irrigation, crop nutrition, and weed control guidelines for alternative (organic) production systems.
- Implement user-friendly information systems and decision support tools for Florida growers that will allow successful implementation of site-specific BMPs for efficient use of water and nutrients and to minimize the risk of environmental degradation.

3. ANIMAL SCIENCES

A) SAUNDRA TENBROECK

Associate Professor
Extension Horse Specialist
Department of Animal Sciences
P.O. Box 110910
University of Florida
Gainesville, FL 32611-0910
Phone: (352)392-2789
FAX: (352)392-9059

Most of what I do would fall under the broad description of **sustainability**.

EXTENSION

My assignment in IFAS is 60% Extension - **Horse Specialist** and 40% **Teaching - Equine Health Management, Introduction to Equine Science, Reproductive Techniques, Form to Function**.

I work with adult and youth audiences to provide up to date information regarding **horse care, selection and utilization**.

We are currently working on a BMP manual for horse owners that will focus on **Waste Management**.

RESEARCH

I am involved in research relative to **control of biting flies and mosquitoes on horse farms**.

B) JOEL H. BRENDEMUEHL, Ph.D.

Professor and Assistant Chair
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University of Florida
Gainesville, FL 32611-0910
Phone: 352-392-2186
Fax: 352-392-1913
E-mail: Brendemuhl@animal.ufl.edu

What we are doing falls under the category of sustainability.

Currently at the UF Swine Teaching and Research Unit we have an extension demonstration underway in evaluating the potential for naturally-raised swine. We are working with Frankie Hall from Florida Farm Bureau, the Florida Pig Improvement Group and a company called Niman Pork. We also have several producers that are participating as well as Florida A&M University. If this project exhibits positive potential it could pave the way for small land-owners to use their land to raise swine outdoors and to market those animals into a niche market that pays a premium (Niman Pork). Very little capital investment is required for this type of production system if the individual already owns the land. It may also provide an opportunity for those individuals that have lost broiler contracts due to the departure of Tyson from Florida and the reduction in broiler contracts by Perdue. It may be possible to renovate their existing chicken structures into facilities that would fit under the Niman Pork standards for their animals.

4. ARCHITECTURE

GARY W. SIEBEIN

Professor
School of Architecture
Email: gsiebein@siebeinacoustic.com

TEACHING

I teach courses in **Environmental Technology** at the undergraduate, Masters and Doctoral levels that address the fundamentals of sustainable design principles.

Environmental Technology 1 ARC 3620

Environmental Technology 2 ARC 4620
Architectural Acoustics ARC 6642
Thermal Systems in Architecture ARC 6632

RESEARCH

I also conduct **research acoustical issues in sustainable buildings** and execute **remedial work on sustainable buildings** with acoustical problems such as the UF BCN Building. There are actually many acoustical difficulties encountered in sustainable buildings that research and training are needed to resolve.

5. BOTANY

A) JOSEPH S. DAVIS

Professor
Botany Department
University of Florida
3177A McCarty
Email: jsd@botany.ufl.edu

RESEARCH

My research involves **use of ecological methods to aid salt production from seawater**.

About one third of the world's salt is produced from seawater. I aid almost 30 installations worldwide in this endeavor. Nearly all the energy needed for salt production by this method --evaporation of seawater-- comes from sun and wind, and is free.

At present I have no students nor do I teach a course on the subject. However, **for this year, I have aided large saltworks in Namibia and Mexico. My methods are widely used by the salt industry.**

B) STEPHEN MULKEY, PhD

Botany Department
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PO 118526
University of Florida,
Gainesville, FL, USA 34002-8526
Phone (352) 392-2775
Fax (352) 392-3993
E-Mail: mulkey@botany.ufl.edu

TEACHING

1) I am developing a course on **Global Change** which will be offered beginning Spring 2005 as **BSC 2008**. In the next iteration it will be offered under its own course number. The course covers climate, extinction, tradition concepts of conservation, and ecosystem services. About 50% of the course will be devoted to ecosystem and human health issues.

Sustainability will be a theme reiterated throughout.

RESEARCH

2) My research concerns the **ecophysiology of trees in regenerating forest** in Eastern Amazonia.

C) FRANCIS E. "JACK" PUTZ

Professor
Department of Botany
P.O. Box 118526
3165 McCarty A (note new office location)
University of Florida
Gainesville, FL 32611
fep@botany.ufl.edu
tel: (352) 392-1486
fax: (352) 392-3993

Virtually all of my teaching and research is related to the topic of sustainability.

TEACHING

1. **"Ecosystems of Florida"** considers the ecological basis of sustainable natural resource management with a focus on issues such as fire ecology, invasive exotic species, habitat fragmentation, and forestry practices.
2. **"Plant Ecology"** focuses on reading the landscapes of Florida for insights into historical and future land-use practices that have and will sustain our supplies of water, timber, and other resources.

RESEARCH

My research concerns the **ecological basis for sustainable forest management** for timber, non-timber forest products, and environmental services (e.g., carbon sequestration) in the tropics and in Florida.

6. COMMERCIAL HORTICULTURE - WOODY ORNAMENTALS

JUANITA POPENOE, Ph.D.

Regional Specialized Extension Agent II
Commercial Horticulture - Woody Ornamentals
UF/IFAS Lake County Extension Service
phone: 352.343.4101
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E-mail: JPopenoe@IFAS.ufl.edu

TEACHING

I teach an annual **IPM Scout Training Class** for four days to growers to teach them how to **scout for diseases and pests** and **how to use IPM to reduce their use of harmful pesticides in the greenhouse and nursery industry.**

We are also planning a water use field day to help growers make wise decisions about **irrigation to protect our water supply.**

I help teach the **pesticide safety courses** for pesticide applicator licenses for my three county area as well, and we always emphasize IPM and environmental stewardship.

7. CONSTRUCTION AND ENVIRONMENT, POWELL CENTER

CHARLES J. KIBERT, Ph.D., P.E.

Holland Professor and Director
Powell Center for Construction and Environment
M.E. Rinker Sr. School of Building Construction
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Tel: 352-273-1189 Rinker School: <http://www.bcn.ufl.edu>
Fax: 352-392-9606 Powell Center: <http://www.cce.ufl.edu>
ckibert@ufl.edu Personal/Classes: <http://web.dcp.ufl.edu/ckibert>

TEACHING

a. Organized and teach **BCN 1582, International Sustainable Development**, to 110 students every fall. It carries International and Social (I,S) credits for general education.

b. Developed and teach **three Masters course** on sustainable construction:
BCN 6585 – Principles of Sustainable Construction

BCN 6586 – Construction Ecology & Metabolism
BCN 6905 – Green Building Delivery Systems

These three courses are also delivered via the internet as part of our Masters in **International Sustainable Development**:

ICM 6680 – Principles of Sustainable Construction
ICM 6682 – Construction Ecology & Metabolism
ICM 6905 – Green Building Delivery Systems

- c. Developing a Certificate in Sustainable Construction for both Masters programs.
- d. Co-developed a course on Sustainable Development for Honors Students, DCP 4905

RESEARCH

- a. Generated over \$1.5 million in research on sustainable development topics
- b. Wrote or edited three books on the general subject of sustainable development and construction:

Reshaping the Built Environment: Ethics, Economics and Environment, Washington, DC: Island Press, 1999

Construction Ecology: Nature as the Basis for Green Buildings, London: Spon Press Ltd, 2002

Sustainable Construction: Green Building Design and Delivery, New York: John Wiley & Sons, 2005

- c. Founded the Center for Construction and Environment in 1991 to conduct research into the relationship of sustainable development to the built environment. Was successful in obtaining a \$3million endowment for the Center which is now called the Powell Center for Construction and Environment.

SERVICE

- a. Founded Greening UF in 1997
- b. Member of the UF Sustainability Task Force, 2002-2004
- c. Organized or organizing three major international conferences on sustainable construction:

First International Conference on Sustainable Construction, Tampa, Florida, November 1994

Green Building Materials '96, Gainesville, Florida 1996

Rethinking Sustainable Construction, Sarasota, Florida 2006

- d. Member of the US Green Building Council Curriculum and Accreditation Committee
- e. President of the Cross Creek Initiative, Inc., a non-profit fostering the implementation of sustainable development in the built environment
- f. Organized, supervised, and did fund raising for the first green building at UF, Rinker Hall. The University now has 7 more green buildings being renovated or under construction.
- g. Organized the first student chapter of the US Green Building Council

8. ENGINEERING

A) ALEX E. S. GREEN
Chair CBAF-IGTI

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In my November 1 Energy Colloquium presentation I speak on behalf of a group of concerned UFers rather than an individual with specific energy related research interests. Today natural gas futures rose above \$8/MMBtu and undoubtedly making substitute natural gas or syngas will soon become a very hot topic. We need quickly to groom a leader to develop a MADBANG proposal that resonates with baby boomer or generation X funding agents or rich UF alumni. Our paper might be a reasonable starting point for the proposal. Apart from the Gas Technology Institute in Chicago that has pursued a similar concept for a pulp and paper industry application I am unaware of any other US organization that has put forth the Bioamss Alliance with Natural Gas (BANG) strategy. Thus we shouldn't wait to capture the BANG.thrust. Please put your thinking caps on as to how UF might best capture the leadership role.

9. ENTOMOLOGY AND NEMATOLOGY

A) JAMES P. CUDA, Ph.D.

Associate Professor
Biological Weed Control
UF/IFAS
Entomology & Nematology Dept.
Bldg. 970
Natural Area Drive
PO Box 110620
University of Florida
Gainesville, FL 32611-0620
Tel. (352) 392-1901
SUN 622-1901
FAX (352) 392-0190
E-mail jcuda@ifas.ufl.edu

TEACHING

Teaching (5%)- Advise and mentor graduate students; guest lecturer on biological control and insect community ecology in graduate/undergraduate courses.

RESEARCH

Research (65%)- Focus on classical biological control of nonnative plants that have become invasive weeds in Florida

EXTENSION

Extension (30%)- Develop and implement arthropod pest and weed management programs emphasizing biological control

B) J. HOWARD FRANK, PH. D.

Entomology-Nematology Bldg.
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FAX 352-392-0190
jhf@mail.ifas.ufl.edu

TEACHING

My course on **Biological Control ENY 5241** is explained at:

<http://entnemdept.ifas.ufl.edu/eny5241.htm>

Course Description: Introduction to the principles involved in the natural and biological control of insects.

Objectives and Goals: To demonstrate the ecological principles of biological control; to demonstrate methods used in biological control of insects and other arthropods, by insects, and other arthropods, pathogens, and entomogenous nematodes, as well as biological control of weeds by insects and other arthropods; to show sources of information about biological control and those who practice it; to teach the relevant aspects of the laws that govern the practice of biological control.

Topics

- Natural limitation of populations (abiotic and biotic); Classical biological control; LAB: Division of Plant Industry, FDACS
- Insect predators and parasites (excluding Hymenoptera); On parasitoidism and predation; LAB: quarantine facilities in Gainesville
- Biological control of forest pests; Biological control of mosquitoes; LAB: International Institute of Biological Control
- Laws affecting biological control; The predatory and parasitic Hymenoptera; LAB: The American Entomological Institute
- Biological control of winter moth; Biological control of aquatic weeds; Field trip to Apopka (all day Saturday); Biological control of terrestrial weeds; Biological control of mole crickets; LAB: Drs. Chris Geden and Sanford Porter, USDA
- Who's who among biological control agencies; Assessing effects of biological control agents; Partitioning mortality of pests (life tables); Single-species models; LAB: videotape "Chaos"
- Host-parasitoid models; Predator-prey models; LAB: review of models
- Augmentative biological control; Manipulative biological control; Commercial biological control; Biological control as a component of IPM; LAB: videotapes "Dung Down Under" and "Biocontrol of Cassava Mealybug"
- Biological control of pests of citrus; Controversies in biological control; LAB: field trip to Lake Alfred (all day Saturday)
- Conflicts of interest in biological control; Economics of biological control; Field trip to EPCOT's The Land (all day Saturday); LAB: videotapes of (a) sugar cane borers (b) wine, women and vineyard mite control, (c) cane toads, and (d) control of mites on strawberry
- Insect pathogens as biological control agents; Biological control of mite pests of citrus; Entomopathogenic nematodes

The web page listed is about to be updated to reflect a title change
To Biological Control (WAS Biological Control of Insects)

Permanent suppression of pest mole crickets by classical biological control. The traditional method of dealing with pest mole crickets has been by non-sustainable use of chemical pesticides. Introduction of three beneficial species (two insects and one nematode) has suppressed pest mole cricket populations in the

Gainesville area by more than 95%. These three biological control agents are spreading in Florida naturally and with assistance, and benefiting ranchers, farmers, and turfgrass managers.

RESEARCH

Research into the **management of the two insects** (a fly and a wasp) and **modeling of effects of all three bio-control agents** are ongoing.

C) NORMAN C. LEPPLA, Ph. D.

Professor & Director, IPM
University of Florida
Institute of Food and Agricultural Sciences
Department of Entomology and Nematology
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E-mail: ncleppla@ifas.ufl.edu

Sustainability is a cornerstone of our UF, IFAS **integrated pest management program** at <http://ipm.ifas.ufl.edu/>

10. ENVIRONMENTAL ENGINEERING SCIENCES

MARK T. BROWN, PhD

Associate Professor
Department of Environmental Engineering Sciences &
Associate Director Center for Wetlands,
Acting Director Center for Environmental Policy
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<http://www.ees.ufl.edu/homepp/brown/syseco/>

<http://www.ees.ufl.edu/homepp/brown/>

RESEARCH

I have conducted more than 25 years of research in the fields of systems ecology, ecological engineering, ecological economics, environmental planning, and wetlands ecology. I have had more than 50 funded research projects in these research areas that deal directly with issues of sustainability at local, national, and global scales. Currently my funded research program is as follows:

- 1998 –05 **Development of biological indicators of wetland ecosystem health.** Agency: Florida Department of Environmental Protection/ USEPA. \$1,200,000
- 2004 – 07 **Hydrology and ecological structure and processes of wetlands constructed on phosphate clay settling areas.** Agency: Florida Institute of Phosphate Research. \$590,000
- 2004 - 06 **Evaluation of ecological success, compliance with permit criteria, and effectiveness of wetland mitigation banking in Florida.** Agency: Florida Department of Environment Protection / USEPA. \$200,000
- 2004 - 05 **Environmental accounting and systems synthesis of land management practices and interventions at multiple scales in the Sahel Region of west Africa.** Agency: United Nations Environmental Program. \$225,000

I have an active teaching and mentoring program that deals with issues of sustainability. I have mentored over 30 graduate students will a member of the graduate faculty at U of F and each student has conducted

research and written a thesis or dissertation directly related to sustainability. Below is a list of dissertations I have directed:

Dissertations Directed

| | | |
|---------------|---|----------------|
| Buenfil, A. | Emergy evaluation of water supply alternatives | 08/01 |
| Buranakarn, V | Evaluation of recycling and reuse of building materials using the emergy analysis method / | 12/98 |
| Carstenn, B. | Self-organization and successional trajectories of constructed forested wetlands | 08/00 |
| Cohen, M. | Systems evaluation of erosion and erosion control in a tropical watershed | 2003. |
| Guillen, H. | Emergy evaluation of ecotourism and traditional economies in southern Mexico | 12/98 |
| Howington, T. | A spatial analysis of an internationally shared drainage basin and the implications for policy decisions | 05/99 |
| Lane, C. | Biological indicators of wetland condition for isolated depressional herbaceous wetlands in Florida | 12/03 |
| Nelson, M. | Limestone wetland mesocosm for recycling saline wastewater in Coastal Yucatan, Mexico / | 12/98 |
| Reiss, K. | Developing biological indicators for isolated forested wetlands in Florida | 5/04 |
| Saunders, L | The Role of Hyporheic Zones for Managing Water Quality in Tropical, Rural River Basins | In progress |
| Surdick, J | The influence of landscape setting on the avian, amphibian and arthropod biota of isolated wetlands in Florida | In progress |
| Sweeney, S. | Systems analysis of the dynamic interactions of ecology, economy, and landscape across multiple scales in Thailand | In Progress |
| Tilley, D. | Emergy basis of forest systems | 08/99 |

TEACHING

All of the courses I teach are related to sustainability and balancing humanity and nature.

- 1) **EES3000 – Environmental Science and Humanity:** An introduction to principles of environmental science: patterns and processes of atmosphere, oceans, earth, material cycles, resources, energy, ecosystems, economics, populations, and how they relate to global futures. The course addresses the need for developing a mutually beneficial system of humanity and nature as a means of solving present day environmental problems and preventing future environmental deterioration.
- 2) **EES3008 - Energy & Environment:** Energy basis for systems of humanity and nature, including principles of systems ecology, ecological economics and public policy
- 3) **EES4050 – Environmental Planning & Design:** An introduction to the principles and practices of environmental planning.
- 4) **EES5305 – Ecological & General Systems:** General systems and systems ecology, including examples, languages, theoretical formulations and models for design, synthesis, understanding, simulation, and prediction of systems of humanity and nature.
- 5) **EES5306 - Energy Analysis:** Energy analysis methods for evaluating the combined system of humanity and nature are studied as a means for recommending public policy. Other approaches and references on energy analysis are studied and compared
- 6) **EES5307 - Ecological Engineering:** Principles and practices in design and management of environment and society. Systems concepts for organization of humanity, technology, and nature
- 7) **EES6007 – Advanced Energy & Environment:** A unified view of the system of nature and humans using a “systems perspective” that integrates, rather than fragments science into disciplines to gain understanding of the interdependence of the economy with resources and

environment and the way economic vitality and quality of life depend on a symbiotic system of humanity and nature.

- 8) **EES6009 - Ecological Economics:** Models and mathematical theories common to ecology and economics, interfaces between ecology and economics, measures of environmental value, relationships of energy and money, microcomputer simulations of micro, macro, global scale.
- 9) **EES6051 – Advanced Environmental Planning & Design:** Principles and practices of environmental planning. Planning for, and designing sustainable communities and regions. Exploration of quantitative methods for the evaluation of environmental impacts and analysis of carrying capacity of economic development. Exploration of theories of spatial and temporal organization of systems of humanity and nature
- 10) **EES6932 - Ecological and Biological Systems:** a unified systems course in fundamental principles of ecological and microbiological systems that enables students to use their engineering training to quantitatively evaluate relationships between humans and the environment.

11. ENVIRONMENTAL HORTICULTURE

A) ED GILMAN

Professor
Environmental Horticulture Department
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FAX 352-391-1413

<http://hort.ufl.edu/woody/index.htm>

<http://hort.ifas.ufl.edu/>

RESEARCH/EXTENSION

Research and extension teaching efforts focus on building and managing sustainable urban spaces that support shade trees.

B) MICHAEL KANE

Professor
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<http://hort.ifas.ufl.edu/plantrestoration/KaneLab/html/index.htm>

<http://hort.ifas.ufl.edu/>

Genotypic selection and production of aquatic/wetland plants and native plants, including orchids. Ecotypic effects on field growth performance of micropropagated native wetland and coastal plants in restored habitats and/or retention ponds. Delineation of genetic diversity within and between wetland and native plant populations using DNA fingerprinting technology. Selection and propagation of ornamental water garden plants.

C) D. J. MORSE

Environmental Horticulture Extension
Email: JVMorse@mail.ifas.ufl.edu

TEACHING

As an Environmental Horticulture Extension Agent, teaching sustainability is the largest part of my work. I teach the public ways they can have a healthy lawn and landscape through **proper selection, installment**

and maintenance of plants. Using the Florida Yards and Neighborhoods principles these lawns and landscapes also help **protect our water quality, water quantity, provide for wildlife**, keep yard assets on site by composting, and also save money and time by using less pesticides, herbicides, water, fertilizer, mowing, etc. and still provide a beautiful Florida-friendly landscape.

D) GRADY L. MILLER

Associate Professor
Undergraduate & Graduate Coordinator
Turfgrass - Environmental Horticulture Dept.
POB 110670
2541 Fifield Hall
University of Florida
Gainesville, FL 32611-0670
E-mail: Gmiller@mail.ifas.ufl.edu

RESEARCH

My Research work relates to managing turfgrass, the number one ornamental plant in the landscape. I also work with various ways of managing water resources.

E) JEFF NORCINI

Assoc. Prof. Environ. Hort.
North Florida Research & Education Center
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FAX 850-875-7188; SC FAX 294-7188

<http://nfrec.ifas.ufl.edu/norcini>

<http://hort.ifas.ufl.edu/>

RESEARCH

Since 1996, my focus has been on implementing research and extension programming related to production of **native herbaceous plant materials** that are appropriate for Florida. My programming is designed to support those involved with **native wildflower seed production, container production, and establishment of sustainable populations.**

F) DAVID SANDROCK

Assistant Professor
Environmental Horticulture Department
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dsandrock@ifas.ufl.edu

<http://hort.ifas.ufl.edu/>

RESEARCH

Our lab is working to establish minimum input standards (fertilizer and water) for native and non-native landscape shrubs.

TEACHING

1) **ORH4848C (Landscape Plant Establishment)**, where we discuss best management practices for establishing landscape plants as well as topics like the effectiveness of wetlands mitigation and mitigation banking.

G) TOM WICHMAN

Florida Master Gardener Coordinator
Environmental Horticulture Department
107 Mehrof Hall
PO Box 110675
Gainesville, FL 32611-0675
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FAX 352-391-1413
E-mail: twichman@ufl.edu

<http://hort.ifas.ufl.edu/mg>

The Florida Master Gardener Program began in 1979 and trains interested citizens to assist County Extension Agents in educating residents on how to properly design, install and maintain landscapes in an environmentally friendly way. As a result of this program people plant the right plant in the right place, use fertilizers appropriately, use fewer and safer pesticides, and greatly reduce the amount of water applied as irrigation. These more than 4000 active volunteers donated more than 350,000 hours of volunteer time to the citizen of Florida in 2003.

H) TOM YEAGER

Professor
Environmental Horticulture Department
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E-mail: tyeager@mail.ifas.ufl.edu

<http://hort.ifas.ufl.edu/>

RESEARCH/EXTENSION

The long-term objectives of my research and extension program are to develop fertilization and irrigation regimes for the commercial nursery industry that will minimize nutrient loss to the production environment. This may be achieved by implementing management strategies or Best Management Practices based on model systems in which plant growth and nutrient loss (efficiency) can be predicted from environmental and physical inputs.

12. FISHERIES AND AQUATIC SCIENCES

SHIRLEY BAKER

Assistant Professor (and mother of identical triplets)
University of Florida
Department of Fisheries and Aquatic Sciences
7922 NW 71st St
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Email: smbaker@mail.ifas.ufl.edu

RESEARCH

I do research that supports ecological and economic sustainability. My main project right now is: **CLAMMRS; Clam Lease Assessment Management and Modeling using Remote Sensing.**

Adoption of remote sensing technologies in management practices of the Florida hard clam industry is enhancing the sustainable development of open-water clam farming by increasing production, farm efficiency, and profitability, while minimizing impact on the environment.

13. FLORIDA ENERGY EXTENSION SERVICE

BERT HENDERSON, M.Ed.

Energy Extension Faculty II
University of Florida/IFAS
Florida Energy Extension Service
Pinellas County Extension
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bhenderson@mail.ifas.ufl.edu
<http://coop.co.pinellas.fl.us>

TEACHING

Through FEES, I teach UF's **programs in adult education in the building construction and allied building construction fields.**

I would be interested in knowing issues and information that are directly related to my area of Energy Efficiency and building construction.

14. FLORIDA SEA GRANT COLLEGE PROGRAM

You should touch base with **Dr. MIKE SPRANGER**, Florida Sea Grant. A number of our extension and research efforts are focused on sustainable resources.

JOHN M. STEVELY

Florida Sea Grant College Program
1303 17th St. W.
Palmetto, FL 34221
941-722-4524
jmstevely@ifas.ufl.edu

15. FOOD AND RESOURCE ECONOMICS

A) JEFF BURKHARDT

Professor
Food and Resource Economics Department
E-mail: Rburkhardt@mail.ifas.ufl.edu

TEACHING

I teach an undergraduate course, **AEB 4126, Agricultural and Natural Resource Ethics**, which explores issues of socio-economic justice, environmental responsibility, and globalization, in the context of concerns about ecological, agricultural and institutional sustainability. In addition, my research has focused on the human and environmental impacts of agricultural biotechnology, which some regard as a "technological fix" for issues associated with "The Malthusian Problem."

B) SHERRY LARKIN

Assistant Professor
Food and Resource Economics
IFAS
PO Box 110240
University of Florida
Gainesville, FL 32611-0240
(352)392-1845 x431

fax:(352) 392-3646
slarkin@ufl.edu

TEACHING

- 1) **Environmental and Natural Resource Economics AEB4931** (undergrad)
- 2) **Natural Resource Economics AEB6453** (graduate)

Both courses address sustainability issues.

RESEARCH

1) CRIS Project, Multistate: "MARKETING, TRADE, AND MANAGEMENT OF FISHERIES AND AQUACULTURE RESOURCES" (W-1004; FLA-FRE-04192)

2) CRIS Project, CREES-FLA: "THE EFFICIENCY OF ALTERNATIVE NATURAL RESOURCE AND ENVIRONMENTAL POLICIES AND PRACTICES" (FLA-FRE-03863)

Both umbrella projects include studies that are predicated upon achieving and/or maintaining a sustainable resource stock.

16. FOREST RESOURCES AND CONSERVATION

A) JANA K I ALAVALAPATI

Associate Professor
Forest Policy and Economics
School of Forest Resources and Conservation
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<http://www.sfrc.ufl.edu/alvalapati.html>

TEACHING

1) **Natural Resource Policy and Administration** (undergraduate level): We explore the dynamics of policy development, administration, and assessment by keeping sustainability as a guiding principle. After going through the course, students will have multidisciplinary understanding natural resource conservation.

2) **Forest Conservation and Management Policies and Issues** (graduate): This is a multidisciplinary course focusing on the mechanics of sustainable forest and other natural resource conservation and management. Theories of political economy relating to resource conservation and management are discussed.

RESEARCH

1) **Identifying conservation compatible forest practices** - Which forest practices further biodiversity and what are the socioeconomic implications of adopting these practices?

2) **Exploring strategies to manage protected areas in a sustainable manner.**

Service: Served as a member of UF Sustainable Task Force Committee (2002-2003).

B) JOHN DAVIS & MATIAS KIRST

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TEACHING

1) **Forest Genetics and Tree Improvement FOR6310**

RESEARCH

Use of genomics to improve efficiency of tree breeding, leading to reduced pressure to harvest old-growth forests and enhanced utilization of wood - a renewable, recyclable and biodegradable raw material.

Three graduate student projects (Gogce Kayihan, Philip Bocock, Gustavo Ramirez) are designed to identify genes that underlie domestication traits and thus increase productivity with fewer chemical inputs.

C) SHIBU JOSE, Ph.D.

Associate Professor
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<http://www.sfrc.ufl.edu/allfaculty.html>

<http://wfrec.ufl.edu/center/bios/sjose.htm>

TEACHING

1) Course **FOR 3163C Forest Ecology** in which sustainability of forest ecosystems is discussed in detail.

2) I am developing a distance education course called "**restoration ecology of longleaf pine ecosystems**" which also addresses sustainability.

RESEARCH

I conduct research in which the major focus is "**sustainable wood and food production**". My CRIS projects have substantiality as their cornerstone. They are FLA-Jay-04078 Silvicultural basis for forest production and conservation FLA-JAY-03900 Establishing a Center for Subtropical Agroforestry

D) TIM MARTIN

Assistant Professor
Tree Physiology
School of Forest Resources and Conservation
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352-846-1277 (fax)
tamartin@ufl.edu

TEACHING

1) **Tree Biology FOR 3342C and Physiology of Forest Trees FOR 6340**. Both courses focus on understanding the biological mechanisms underlying ecological cycles of carbon, water, nutrients and energy.

RESEARCH

Research program broadly focused on understanding the controls over carbon, water and nutrient cycles in managed forests.

E) MARTHA C. MONROE

Associate Professor and Extension Specialist
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352-846-1277 (fax)
mcmmonroe@ufl.edu

TEACHING

- 1) **Conservation Behavior**- we explore theories of human behavior and apply them to education and communication strategies that will move societies toward sustainability (graduate course).
- 2) **Environmental Education Program Development** - we explore program and evaluation theories that non-formal educators can use to develop good EE programs- good programs that address environment, economy, and equity in support of the UN Decade for Education for Sustainable Development (graduate course).

RESEARCH/EXTENSION

- 1) **Wood to Energy** - encouraging southern communities to use waste wood for energy supplies; our educational materials will address all three elements of sustainability.
- 2) **Wildland Urban Interface Training**- helping natural resource managers address environment and development issues in the southern interface.

I just returned from a study tour in Australia where I asked colleagues how they were approaching education for sustainable development and the decade. We plan to write several articles. I just spoke to the editor of the journal Applied Environmental Education and Communication about coordinating a special issue on the topic.

In terms of service, I am President Elect of the North American Association for Environmental Education- our next conference will focus on sustainability and much of my term will be spent linking us to the U.N. Decade as appropriate.

F) GARY PETER, ERIC JOKELA, ROBERT SCHMIDT

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E-mail: gfpeter@ufl.edu

TEACHING

- 1) course: **Forest Productivity and Health FOR5161**
Integrated overview of tree breeding, silviculture and forest pathology related to creating sustainable forest tree plantations, leading to reduced pressure to harvest old-growth forests and enhanced utilization of wood- a renewable, recyclable and biodegradable raw material.

One graduate student projects (Xiaobo Li) is designed to identify the mechanisms that control productivity of southern pine trees with increased productivity and improved wood quality for bio-based products.

G) DONALD L. ROCKWOOD

Professor

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352 846-1277 (fax)
dlr@ifas.ufl.edu

TEACHING

1) **NON-TIMBER FOREST PRODUCTS** - For advanced undergraduates and graduate students, the course will intensively review products, with emphasis on non-timber forest products that may be obtained from forestland worldwide and how forestland is managed to produce these products. In consultation with one of the instructors, each student will focus on one NTFP in one region of the world. The project will describe the chosen NTFP, evaluate its marketing, review management options for the NTFP resource, identify significant concerns related to its use, and assess the long-term feasibility of the NTFP.

As trial offering the course was **FOR4934/6934**; in the Fall 2005 it will likely be **FOR5754**.

RESEARCH

Fast Growing Forest Tree Management Systems for Florida and Similar Areas -

To increase productivity of various forestry applications in Florida and similar areas, forest research needs to develop and evaluate new management systems. Management options for appropriate fast-growing tree species grown as short rotation woody crops (SRWC) for applications such as energywood and dendroremediation (i.e., phytoremediation using trees) include genetic improvement, intensive culture, and short rotations on agricultural, forest, and non-traditional sites such as reclaimed mined and contaminated lands. In the near term, the opportunities for SRWCs in Florida and similar climatic and edaphic areas include Eucalyptus species grown under diverse conditions in the Gulf Coast region, eastern cottonwood (*Populus deltoides*) on agricultural quality sites or in intensive culture in the Southeast, cypress (*Taxodium distichum*) on upland sites throughout Florida and adjacent states, and slash pine (*Pinus elliottii*) on reclaimed titanium and phosphate mined lands. The productivity and environmental benefits accruing from such intensively-managed forests permit less intensive and multiple use management of other forest lands.

H) TAYLOR V. STEIN

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TEACHING

1) course **FOR 4664: Sustainable Ecotourism Development**

The course is designed to discuss how nature-based recreation and tourism can be used as a tool to sustain social and environmental benefits to local communities, ecosystems, and visitors. It is a management-based course, that focuses on the natural resource manager's role in identifying sustainable benefits from nature-based tourism and designing management actions to help environments and people attain those benefits.

2) course **FOR 6665: Landscape Planning for Ecotourism**

The course takes a planning approach to providing the benefits of nature-based tourism. It is designed for graduate students who will likely move into decision-making roles for private land operations or public land management agencies. It focuses on landscape planning and collaboration.

3) course **FOR 2662: Forests for the Future**

This is a team taught course that introduces issues associated with the world's forests (timber production, global warming, tropical forests, etc.). It educates freshman and sophomores majoring in diverse subjects how the profession of forestry can be used to sustain the multitude of benefits associated with the world's forests.

RESEARCH

My research program is strongly based on sustainability. Most of my work focuses on working with public land management agencies and how to define the benefits their lands help provide to ecosystems and society. I think conduct social assessment research to identify how visitors to those lands or how neighboring communities can help in the identification of those sustainable benefits or help ensure their sustainability.

17. GEOLOGICAL SCIENCES

JONATHAN B. MARTIN

Associate Professor
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(352) 392-6219 (office)
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(352) 392-9294 (FAX)
E-mail: jmartin@geology.ufl.edu

TEACHING

GLY 5245 Chemistry of Water at the Earth Surface and Near Subsurface; sustainability is a common theme throughout the course.

RESEARCH

Research and teaching focus on water chemistry, particularly in coastal zones and in karst aquifers such as the Floridan Aquifer here in Florida.

18. GRASSLAND SCIENCE

LYNN E. SOLLENBERGER

Research Foundation Professor of Grassland Science
2185 McCarty Hall
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Gainesville, FL 32611-0500
Phone: (352) 392-1823 x 207
Email: les@ifas.ufl.edu

TEACHING

1) course **AGR 5230: Grassland Agroecosystems**

RESEARCH

Grasslands provide wildlife habitat, wetlands, ground water recharge areas, soil erosion control, and a source of nutrients for animals. The focus of my research is to develop and test strategies for managing and preserving grasslands, so they can continue to carry out these vital functions for society in the future.

19. HORTICULTURAL SCIENCES

A) CARLENE A. CHASE

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TEACHING

1) HOS 6905: Problems in Horticultural Sciences

This semester I am teaching a **new graduate level course: Sustainable Weed Management**. It does not yet have a course number so it's being taught under the course number HOS 6905 - Problems in Horticultural Sciences.

RESEARCH

My research is focused on weed ecology and weed management for sustainable and organic horticultural crops.

B) PAUL LYRENE

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E-mail: pml@mail.ifas.ufl.edu

RESEARCH

My principal official research project (my appointment is 80% research, 20% teaching) is entitled "**The genetics, ecology, and breeding of Florida blueberries.**" Eight species of blueberries are native in Florida. I use these in breeding new cultivars for commercial berry production. Some of these species and their races are endangered in Florida due to development. I am monitoring their decline in the wild and am collecting seed stocks for depositing in the national seed storage laboratory in Ft. Collins, CO. Invasive exotic plants, especially bahia grass and Chinese privet, are displacing wild blueberries in many parts of Florida, and I am working informally on this problem in conjunction with the Florida Native Plant Society. I am also breeding commercial blueberry varieties whose cultivation will be less disruptive to the environment: mainly more disease and insect resistant and better adapted to upland soils instead of to lands that border on wetlands. I am very interested in native plants in the southeastern U.S. and in their maintenance and preservation.

TEACHING

I occasionally give **presentations** on native plants to community groups such as the Sierra Club, the Florida Native Plant Society, churches, etc.

C) BALA RATHINASABAPATHI, Ph.D.

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<http://www.hos.ufl.edu/sabaweb/>

RESEARCH

One aspect of the faculty member's research program aims to develop value-added products from by-products of horticulture.

- (1) Allelopathic wood chip mulches with weed suppressive qualities have been identified and evaluated for their effectiveness. This project is done in **collaboration with Dr. James Ferguson, Horticultural Sciences Department** and
- (2) Antioxidant phytochemicals (lycopene and flavonoids) have been identified in culled tomatoes and in Citrus leaves. The **collaborators in these projects include Dr. Steve Sargent, Dr. Jeff Brecht and Dr. Gloria Moore, Horticultural Sciences Department and Dr. Steve Talcott, Human Nutrition Department.**

TEACHING

1) The faculty member teaches two undergraduate courses **HOS3020 General Horticulture** and **VEC2100 World Herbs and Vegetables.**

Sustainable horticultural production is emphasized in both of these courses. Specific environmental problems created due to intensive cultivation of horticultural commodities are discussed.

20. IFAS EXTENSION

CHARLES S. VAVRINA

E-mail: csv@ifas.ufl.edu

Our Extension District is committed to sustainability at all levels and is developing a platform upon which we can report. All programmatic efforts (Ag. Sea Grant, Families, Youth) are working at defining/delineating this new direction as it applies to them. Issues of note include:

1. Urban Environmental Sustainability endowed professorship in Pinellas county
2. A Sustainable Community Multi-County Extension Agent for the west coast below St. Pete
3. Establishment of a Center for Sustainable Living in Sarasota
4. Office of Sustainability in Sarasota
5. Various partnerships with USDA, DEP, DOE, local and regional agencies in water, energy and the environment.
6. Relationship with Department of Urban & Regional Planning for training in Smart Growth

21. INDIAN RIVER RESEARCH & EDUCATION CENTER

RONALD D. CAVE

Assistant Professor
Indian River Research & Education Center
2199 S. Rock Road
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TEACHING

I teach a distance ed course **Fundamentals of Pest Management PMA3010** that deals with sustainable methods for controlling pest populations.

RESEARCH

My research focuses on biological control of invasive arthropods. The objective is to discover new natural enemies of adventive pests in Florida, study these natural enemies and release them in the environment so that they provide long-term, environmentally safe control of a pest insect.

22. LANDSCAPE ARCHITECTURE

GLENN ACOMB, ASLA

Associate Professor
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TEACHING/ADMINISTRATIVE

1. Served on the College of Design, Construction and Planning's Sustainability and Smart Growth Committee for 2002 and 2003. The Committee has not met in 2004.
2. Assisted in the creation and coordination of "Conversations in Sustainability," the bi-weekly forum on sustainability in 2003-04.
3. Served as participating faculty for BCN 4905 "Issues in Sustainability" (Spring 2004), lecturing on sustainable development practices.
4. Incorporates sustainability in his landscape architecture construction courses.

SERVICE/PRACTICE

5. Consultant (since 1999) to the St. Johns River Water Management District and private developers to design water conservation demonstration landscapes as a part of the models in residential communities. The designs utilize native plants, a low-volume irrigation system, limited turf and other sustainable design techniques.
6. Served on the national committee of the National Association of Home Builders to write their new green design guidelines for residential construction and land development (due to be published approximately January 2005).

RESEARCH

7. Co-founded (in 2002) the Program for Resource Efficient Communities, a multidisciplinary group of faculty that is focused in areas of sustainability in land development projects. Current activities include the Evaluation of Sustainable Practices of Baldwin Park (a new infill community in Orlando) with a focus on measures that will protect the water quality of Lake Baldwin.
8. Designed the site and landscape for the model home at Madera (in Gainesville), the demonstration subdivision to illustrate sustainable materials and designs of the home and development. The project is a joint venture of the University of Florida's Energy Extension Service and GreenTrust, a Maryland developer. He continues to assist in the landscape management practices and design of common areas and the main entrance of the project.
9. Current research involves the evaluation of Madera's sustainable practices and costs in comparison to conventional site design and land development. Practices being monitored include land clearing, construction vehicle compaction, stormwater design, landscape design and irrigation design. Capital costs and annual maintenance costs are being collected for the Model site and the development.
10. Other current research involves several grants to create the inaugural "Case Studies in Sustainable Florida Land Design" to document in a case study form the sustainable land development practices in Florida and to create a website that provides information about this on-going program. Funding for this project was obtained through the St. Johns River Water Management District and the American Society of Landscape Architects.

RECENT PAPERS AND PRESENTATIONS

11. Presented at the “Sustainable Community and Site Design Techniques” Building for *Greener Communities National Conference* by the Arbor Day Foundation, held on October 5, 2004 in Nebraska City, Nebraska.
12. Presented “Sustainable Site Design” at the *National Land Development Conference* in Baltimore, Maryland.
13. Presented “Sustainable Guidelines for Communities and Residential Lots” at *GreenTrends*, the annual conference of the Florida Green Building Coalition, May 3, 2004.
14. Presenting “Madera: A Model of Sustainable Site Design” at the national *GreenBuild Conference* in Portland, Oregon, November 3, 2004.

23. MICROBIOLOGY & CELL SCIENCE

A) lonnie o. ingram

Professor
Director, Florida Center for Renewable Chemicals and Fuels
Dept. of Microbiology and Cell Science
PO Box 110700, Bldg. 981 Museum Road
University of Florida
Gainesville, FL 32611
Phone 352/392-8176
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E-mail: ingram @ufl.edu

Dr. Lonnie O. Ingram directs the Florida Center for Renewable Chemicals and Fuels (FCRC), located in the Microbiology and Cell Science Department. This new center was formed in response to increasing demands for renewable fuels and chemicals that can reduce our dependence on foreign oil imports. Processes and microorganisms are being developed to use biomass (agricultural residues, yard waste, and materials from municipal waste) as a renewable feedstock, concurrently improving our Florida environment, producing useful products, and stimulating the Florida economy.

B) eva czarnecka-Verner, PH.D.

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Modern science offers humankind a powerful instrument to **genetically engineer biological organisms for many potential advantages such as assurance of food for all**, improved health through medical advances, **and protection of the masses from biological terrorism**. Through enhanced knowledge and new technologies, science already contributes to astonishing advances in feeding the people of the world. However, if we are to produce enough food to sustain the requirements of the next 25 years, we must put all the tools of modern science to work. The human population is growing by 80 million people each year and it is estimated that within this century the population will reach 9 billion from a little over 4 billion at this time.

Environmental Stress:

Environmental stresses, including heat, low temperature, drought, salinity, cold, and heavy metals, represent the most limiting factors to worldwide agricultural productivity. These stresses impact crop production in areas currently cultivated and also constitute significant barriers to the introduction of crop plants into areas as yet not adapted for agriculture. Stresses associated with temperature, salinity and drought, individually or in combination, are likely to progress in severity in the oncoming decades thus

further encumbering crop productivity. Already, intensive irrigation in agriculture production has caused severe salinity problems in the USA, Israel and other countries. Furthermore, in the USA and several developing countries, problems relating to drought, excessive heat or cold and heavy metal pollution are already considered the major factors impairing agricultural productivity. Therefore, it is absolutely crucial to apply all currently available biotechnology resources in dealing with problems concerning environmental stresses.

Bioterrorism:

The US Department of Defense BIOS program is focusing on the development of biological sentinels as detection agents of terrorism. These could be genetically engineered bacterial sentinels that can detect explosives such as TNT and DNT, and upon detection communicate this to the observer by an obvious change in a molecular reporter system. The next level of sophistication is to develop plant sentinels that are found naturally in the environment and are more robust than bacteria. Plant sentinels could detect agents of terrorism, explosives, *etceteras*, present in ground water. The signal would be detected by plant roots, transmitted to the aerial parts of the plant where the change in the reporter system would communicate the presence of the agents of terrorism.

RESEARCH

My research in the area of plant molecular biology addresses both issues.

- 1) I investigate the mechanisms of environmental stress response in plants and labor to unravel the signal transduction pathway of plants' response to heat stress. The ultimate goal is to engineer superior transgenic plants that have increased tolerance to heat stress and could potentially grow in areas currently not used for crop production, like deserts. This would contribute to advances in feeding the people of the world as well as increasing available land for habitation. If we can grow plants where we can't live, than we can live where we used to grow plants. Although overlooked, men and plants have a semi-symbiotic relationship, meaning we require plants for oxygen and food and they require us for carbon dioxide. It is imperative that we consider for long-term sustainability the preservation of plants by increasing their tolerance to an ever-changing environment and also maximizing their productivity. Taking into accounts that eventually humans will have to expand to other realms in order to sustain life, including space and underwater habitats, we also have to expand our ability to create new sustainable environments for ourselves by utilization of genetically modified, improved plants.
- 2) I aim to engineer sentinel plants that can detect the agents of terrorism and thus contribute to homeland security.

24. MATERIALS SCIENCE & ENGINEERING

ERIC D. WACHSMAN

Professor

Materials Science and Engineering

University of Florida

E-mail: ewach@mse.ufl.edu

RESEARCH

I have a major (24 students and post-docs) DOE and NASA supported research program on Fuel Cells, Hydrogen Production, and Sensors for Emissions Control. You can find some of the details on my web site:

www.mse.ufl.edu/~ewach

TEACHING

- 1) Course **EMA 6446**

25. NATURAL RESOURCES & ENVIRONMENT

A) IGNACIO PORZECANSKI, Ph.D.

Lecturer
School of Natural Resources and Environment
Black Hall 103
University of Florida.
392-0836 and igna@ufl.edu

B.Sc. Agriculture (1967), Hebrew University, Jerusalem, Israel
Ph. D. Plant Genetics (1972), Cambridge University, UK.

RESEARCH

Present research centers around a Project in the Eastern Wetlands of the South American Atlantic Coast – Remote Sensing for Ecosystem Management. It is a joint Project, led by the CIESIN of Columbia University (New York), with the Brazilian Institute of Environment (IBAMA) and a Biodiversity conservation and sustainable development Program in Uruguay (PROBIDES). My main interests lie in the area of natural resource identification, evaluation, and management from a biodiversity conservation and human development standpoints.

TEACHING

- 1) **EVS4000 Critical Thinking in the Environmental Sciences.**
- 2) **ALS5932 Environment and Reason.**

B) RANDALL K. STOCKER

Director, Research and Outreach/Extension
UF School of Natural Resources and Environment
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The UF School of Natural Resources and Environment was created, in large part, to address the sustainability of human activity related to natural resources and environment. Thus, all aspects of SNRE would appear to relate appropriately to this issue. There are **three faculty members (Jim Cato, Steve Humphrey, and Randall Stocker)** with designated administrative appointments in SNRE. Collectively these individuals develop curricula, provide workshops and seminar series, encourage collaborative interdisciplinary research in critically important sustainability areas, and provide an administrative home for several Centers and Programs, such as the Natural Areas Training Academy, the Natural Resources Leadership Institute, and the Program for Resource Efficient Communities.

We are very willing to assist in the development of UF sustainability programs.

26. POLITICAL SCIENCE

LESLIE PAUL THIELE

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E-mail: thiele@polisci.ufl.edu

TEACHING

Environmental Ethics and Politics.

RESEARCH

Conducts research on **environmental education, environmental movements, and sustainable communities.**

27. RELIGION

RICHARD C. FOLTZ, Ph. D.

Associate Professor of Religion, History, Natural Resources and Asian Studies
Undergraduate Coordinator, Dept. of Religion
Faculty Senator
University of Florida
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<http://plaza.ufl.edu/rfoltz>

TEACHING

- 1) In rotation with two other colleagues, a course **REL 3942 Religion, Ethics and Nature**, which deals with environmental values in the world's many religious traditions. Uses edited anthology, *Worldviews, Religion and the Environment* (Wadsworth, 2002), which is now the standard teaching text in the field.
- 2) A seminar on **Islam and Nature: REL 4936/REL5396**, which is unique in academia
- 3) A course on **Religion and Animals**
- 4) Completing the first scholarly book ever on **animals in the Islamic tradition**

RESEARCH

In my research, I have worked with ENGOs throughout the Muslim world, and described their work in my forthcoming edited volume **Environmentalism in the Muslim World** (Nova Science, 2005). Our department offers the only **Ph. D. track anywhere** focusing on Religion and Nature. My colleague **Dr. Bron Taylor** is editor of the forthcoming 2-volume *Encyclopedia of Religion and Nature* (Continuum, 2005), which is likely to define the field for some time to come. You should contact Dr. Taylor and my other colleague, **Anna Peterson**, for more information about their activities.

28. SOIL & WATER SCIENCE

ANN C. WILKIE, Ph. D.

Associate Professor
Soil and Water Science Department
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RESEARCH: ENVIRONMENTAL BIOTECHNOLOGY

Dr. Wilkie specializes in environmental biotechnology, with particular emphasis on anaerobic processes, the microbial and environmental factors influencing biodegradation, and the practical application of anaerobic digestion technology for waste treatment, odor control and energy production from biomass and wastes. Her current research focuses on sustainable livestock waste management technology for odor control, energy production, nutrient recovery and water quality improvement. Dr. Wilkie has worked extensively with the Florida dairy industry to develop sustainable solutions to the problems of dairy manure management and handling. She is the inventor of the fixed-film anaerobic digester for treating large volumes of dilute, low-strength wastewaters such as flushed dairy manure.

29. TOURISM, RECREATION & SPORT MANAGEMENT

LORI PENNINGTON-GRAY, Ph. D.

Assistant Professor
Director of Center for Tourism Research and Development
Department of Tourism, Recreation and Sport Management
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pennggray@hhp.ufl.edu

Tourism has been touted as the largest industry in the world. One of the most critical issues related to tourism is the sustainability of the destination. My research uses a “systems approach” to understand both demand-side and supply-side issues related to tourism. On the demand side, my primary research agenda has concentrated on the consumer travel behavior. On the supply-side, my research has focused on the decision-making process of destination marketing organizations (DMOs).

RESEARCH

I conduct research in sustainable tourism. Particularly sustainable tourism planning focusing on cultural integrity and culturally responsible behaviors of tourists.

Refereed Journal Articles

Pennington-Gray, L.; Reisinger, Y.; Kim, J.E. & B. Thapa (in press). U.S. Tour Operators to Kenya: Do They Educate the Tourist on Culturally Responsible Behavior? *Journal of Vacation Marketing*.

Floyd, M. & L. Pennington-Gray (in press). Profiling Travelers by Risk Perceptions: Segment Characteristics. *Annals of Tourism Research*.

Pennington-Gray, L. & B. Thapa. (2004). Culturally Responsible Tourism: Are DMOs doing a Good Job of Educating the Tourist? *Tourism- An Interdisciplinary International Journal*. 52 (2), 183-194.

Floyd, M, Gibson, H. Pennington-Gray, L. & B. Thapa (2003). The Effect of Risk Perceptions on Intentions to Travel in the Aftermath of September 11. *Journal of Travel and Tourism Marketing*. 15(2/3), 19-38.

Pennington-Gray, L.; D. Stynes & J. Fridgen. (2003). Cohort Segmentation: An Application to Tourism. *Leisure Sciences*. 25, 1-20.

Pennington-Gray, L. (2003). Understanding the Domestic VFR Drive Market in Florida. *Journal of Vacation Marketing*. 3(3), 1-14.

Pennington-Gray, L; Beland, R. & S. Sklar (2003). Examining the Influences of Senior Discount Usage in the Hospitality Industry. *International Journal of Hospitality and Tourism Administration*. 3(4), 77-93

Pennington-Gray, L.; Holland, S. & B. Thapa (2003). Florida Residents' Constraints to Parks and Public Lands Visitation: An Assessment of the Validity of an Interpersonal, Interpersonal and Structural Model. *World Leisure*. 44(4), 51-60.

Pennington-Gray, L & C. Vogt (2003). Examining Welcome Center Visitors' Travel and Information Behaviors: Does Location of Centers or Residency Matter? *Journal of Travel Research*, 41(3), 272-280.

Pennington-Gray, L.; Kerstetter, D. L. & R. Warnick (2002). Forecasting Travel Patterns Using Palmore's Cohort Analysis. *Journal of Travel and Tourism Marketing*. 13 (1/2), 127-145

Pennington-Gray, L. & D. L. Kerstetter. (2002). Testing A Constraints Model within the Context of Nature-Based Tourism. *Journal of Travel Research*. 40(4), 416-423.

30. THE TROPICS PROGRAM; WORKING FORESTS

ROBERT BUSCHBACHER, Ph. D.

Associate Program Director
Working Forests in the Tropics Program
University of Florida
Tel: (352) 846-2831
rbusch@ufl.edu
www.tropicalforests.ufl.edu/wft

TEACHING

1) **The Working Forests in the Tropics program** is an interdisciplinary **PhD program** that focuses on sustainable management of tropical forests.

One of the courses taught is **LAS 6291, Conservation Entrepreneurship**, that introduces business and management practices to sustainable development and conservation practitioners.

Other courses and program activities are listed on the web site: <http://www.tropicalforests.ufl.edu/wft>

31. TURFGRASS MANAGEMENT & WATER

JOHN CISAR

Professor Turfgrass Management and Water
FLREC
E-mail:JLCI @ufl.edu

Sustainable turfgrass systems

32. URBAN & REGIONAL PLANNING

A) LINDA B. CRIDER

Urban and Regional Planning Department
College of Design, Construction and Planning
University of Florida
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TEACHING

I teach a course in the Department of Urban and Regional Planning for graduate and undergraduate students from many varied disciplines (Architecture, Landscape, Geography, Urban Planning, Public Administration, Recreation, Civil Engineering, etc.) in Planning and Design for Bicyclists and pedestrians. It is focused on creating a more balanced and sustainable transportation system for our cities and promoting very walkable/bikable (human powered transportation) options for mobility.

Last year I taught it both fall and spring semesters as an on-line course.

This year I am going back to my original design of a regular spring semester on campus course with web option for off-campus professionals in the field.

1) Courses **Bikeways Planning and Design; URP 6718, URP 4715**

B) RHONDA PHILLIPS, AICP, CED

Director, Center for Building Better Communities
Urban and Regional Planning Department
College of Design, Construction and Planning
University of Florida
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Fax: 352-392-3308

TEACHING

1) A course *Community Conservation and Revitalization*; URP 6884

Focuses on balanced approaches to community redevelopment, including the use of indicators and other measures of sustainable approaches such as asset-based development.

33. VETERINARY MEDICINE

PAT COLAHAN & COLLEAGUES

To my knowledge there are no classes or courses in the College of Veterinary Medicine that address the global questions of ecology, social equity or economy, but almost every course taught in the College of Veterinary Medicine will address the issues of ecology and economy in a very focused, specific way. Animal agriculture, the human animal bond and the preservation of wildlife are what veterinary medicine is about. Some describe it as ecohealth and it directly addresses meeting contemporary needs and the preservation of future potential.

34. WILDLIFE ECOLOGY & CONSERVATION

A) GRAEME S. CUMMING

Assistant Professor
Department of Wildlife Ecology and Conservation
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Tel. (352) 846-0558
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cummingg@wec.ufl.edu

TEACHING and RESEARCH:

1. Theoretical and applied research on resilience and complex systems theory.
2. Approaches to conservation, natural resource management, and what Steve Carpenter calls 'the ecology of the long now'.
3. I've been involved in the Millennium Assessment as part of the scenarios working group (see <http://www.millenniumassessment.org>)
4. Last spring I taught a **graduate course titled 'Resilience and Sustainability'**.
5. I have a grant from the USDA to look at 'Land Use and Sustainability in the Caribbean Region'.
6. I'm part of an interdisciplinary group of faculty on campus, calling ourselves 'the roadies' (because we have an emphasis on understanding the impacts of road developments), who are all interested in sustainability.

If you need it, there is more information on my web page,
<http://www.wec.ufl.edu/faculty/cummingg/index.htm>

B) NAT B. FRAZER

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UF/ IFAS
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Cell: (352) 281-1036

<http://www.wec.ufl.edu/>

TEACHING

1. WIS 2552; Biodiversity Conservation: Global Perspectives

C) MARK HOSTETLER

Asst. Professor, Extension Wildlife Specialist
Department of Wildlife Ecology & Conservation
IFAS, University of Florida
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(for wildlife information: see <http://www.wec.ufl.edu/extension/>)

35. UNIVERSITY OF FLORIDA PROGRAM FOR RESOURCE EFFICIENT COMMUNITIES

Pierce Jones¹, Mark Hostetler, Michael D. G. Acomb, Marc Smith & Marty Main
School of Natural Resources, University of Florida
<http://snre.ufl.edu/programs/prec.htm>

BACKGROUND:

Over the last decade approximately 100,000 new single-family, detached homes have been built annually in Florida, making it one of the most active areas of new residential community development in the United States. In the face of this rapid growth, many Florida communities are looking for support in how to preserve (and even enhance) their local quality of life. More particularly, land planners, developers and others in these communities need tools to manage natural resources in a sustainable fashion while maintaining the economic benefits associated with growth. As one indicator, various organizations such as Audubon International, the US Green Building Council and the Florida Green Building Coalition are attempting to fulfill this need and have begun to offer guidance and support in the form of voluntary certification programs. In several areas of Florida these programs are being well received by many communities and developers.

The University of Florida, as a land grant university, is uniquely qualified to support the development, evaluation and implementation of community level resource management tools. Its faculty has expertise specific to Florida (and even within specific counties) covering a wide range of disciplines related to the environment and land use. Many of its faculty members have direct outreach responsibilities as specialists within the Cooperative Extension Service (CES).

Through CES, the University of Florida offers a range of educational programs directly related to specific natural resource management issues. Although many of these are excellent programs individually, they are generally not well integrated for comprehensive application to sustainable residential community land development or community building.

A University of Florida Program for Resource Efficient Communities (PREC) is one option for an organizational structure capable of partnering with communities to provide sustainable residential community land development. PREC offers an opportunity to precisely integrate and apply educational and analytical resources available at the University of Florida to the major industry affecting the state's environment. This shouldn't be undertaken lightly because land development for residential housing is an involved process that usually occurs over multi-year timeframes. The spatial impact of residential communities is not only on site, but extends far beyond the boundaries of a development, affecting adjoining agricultural and forest lands and various water bodies and wetlands. Any serious effort by the University of Florida to participate comprehensively and substantially in the application of sustainable development principles to the conceptualization, design, implementation and maintenance of real developments will require the on-going commitment of multidisciplinary specialists' services over relatively long periods of time. Furthermore, services provided in the development process must be made available on a timely basis.

MISSION STATEMENT AND GOALS:

The goal of the Program for Resource Efficient Communities is to promote the adoption of best design and operation practices in new residential community development that measurably reduce energy and water consumption and environmental degradation. Focus will extend from lot level through site development to surrounding lands and ecological systems. The Program's primary mission will be to coordinate the delivery and implementation of resource efficient community development practices through direct outreach activities. In addition the Program will directly support integration of resource efficient community best practices and case studies into academic courses and degree programs. Finally, the Program will seek and coordinate applied research grants targeted to improve best design and management recommendations.

PROPOSED ACTIVITIES:

Certification: A responsibility of the PREC will be the review of product, building and community certification systems that apply to resource efficiency. Certification programs will be evaluated from the perspective of best design and management practices as endorsed by University of Florida specialists. This is a necessary core function for the Program. First, the proliferation of standards and their multiple levels of potential application creates confusion that can obscure the relative merits of various programs. Second, it is important to insure that recommendations in the various programs are appropriate for application in Florida's unique environment. Third, the on-going review of certification programs will identify collaboration and partnership opportunities to support the Program's outreach, research and teaching activities. Finally, the Program will establish agreements with exemplary certification programs to allow faculty to directly participate in field certifications both to gain experience and to develop materials for case studies.

Outreach: The primary outreach tool of the Program for Resource Efficient Communities (PREC) will be continuing education and associated professional certificate programs tailored to target specific groups of professionals involved in the various phases of residential community development design, construction and operation. Wherever possible continuing education will be designed to satisfy State of Florida licensure and Professional Association requirements. Beyond those requirements, exams leading to supplemental certificates will be offered on a voluntary basis. These programs and associated optional certificates will be explicitly linked to affiliated resource efficient community related certification programs wherever possible.

Research: A core activity of the Program for Resource Efficient Communities (PREC) will be to identify and prioritize applied research topics related to the resource efficient design, construction and operation of residential communities. A corollary activity will be the regular screening of on-going University of Florida research to identify potential synergies. The Program will actively seek applied research grants covering high priority issues related to certification programs and supporting case studies.

Teaching: The Program for Resource Efficient Communities (PREC) will support graduate programs that address critical applied research issues; provide case studies related to impacts of specific practices; and develop training materials for use in professional continuing education programs. The Program will also promote internship programs with developers, certification groups, government agencies and others that can offer real-world, interdisciplinary experience related to development and/or operation of residential communities.

PROGRAM MEMBERSHIP:

| | | |
|--------------------------|-------------------------------|-----------------------------------|
| 1. Mark Hostetler, PhD; | Assistant Professor | Wildlife Ecology and Conservation |
| 2. Michael Dukes. PhD, | Assistant Professor | Agricultural and Biological |
| Engineering | | |
| 3. Glenn Acomb, | Associate Professor | Landscape Architecture |
| 4. Marc Smith, PhD | Associate Professor | Rinker School of Building |
| Construction | | |
| 5. Marty Main, PhD | Associate Professor | Wildlife Ecology and Conservation |
| 6. Pierce Jones, PhD | Professor | Florida Energy Extension Service |
| 7. Kathleen Ruppert, PhD | Assistant Extension Scientist | Florida Energy Extension Service |
| 8. Craig Miller | Assistant In | Florida Energy Extension Service |

D) MARTIN B. MAIN, Ph. D.

Associate Professor and Wildlife Ecologist
 Program Leader, Florida Master Naturalist Program
 (www.MasterNaturalist.ifas.ufl.edu)
 Southwest Florida Research & Education Center
 University of Florida IFAS
 2686 SR 29 North, Immokalee, FL 34142
 ph: 239.658.3400 fax: 239.658.3469
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TEACHING and RESEARCH:

I am Program Leader for the **Florida Master Naturalist Program (www.MasterNaturalist.org)**, an adult environmental education program that both educates and prepares individuals to educate others about the Florida environment and conservation issues. The FMNP includes 3 ecosystem modules (coastal, wetlands, uplands), each of which is 40 contact hours and includes classroom, field, and practical learning experiences. The FMNP is provided by a network of more than 150 certified Instructors representing ~90 organizations in 45 counties throughout Florida. Since the first course was offered in September 2001, more than 1,500 graduate certificates have been issued. Graduates of the FMNP include interested citizens, teachers, ecotour guides, park rangers and biologists, and others. Graduates of the FMNP are contributing to the education of Florida's citizens and visitors in formal and informal ways that, ultimately, will contribute in positive ways to sustainability in Florida.

E) KATHRYN E. SIEVING

Associate Professor
 Wildlife Ecology and Conservation
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B.Sc. in Wildlife Biology, University of California Davis ('82)

Ph.D. in Ecology, University of Illinois ('91)

RESEARCH:

My core research program seeks to understand forest bird ecology and distribution in disturbed, especially agricultural, landscapes. My work examines bird responses to anthropogenic changes to habitat configurations (e.g., corridors and boundaries) at local and landscape scales, and also addresses positive roles that birds may play in human-dominated ecosystems (e.g., role of avian insectivory in crops as pest control). I lead and support various collaborative research projects in both forested and agricultural ecosystems of north Florida and southern Chile.

TEACHING:

The following courses that I developed and teach (or have taught in the past) deal either wholly or partially with conservation science as a tool for achieving sustainability.

- 1) **WIS 4547C - Avian Field Research**
- 2) **WIS 3403C - Perspectives in Wildlife Ecology and Conservation**
- 3) **WIS 5496 - Research Design in Wildlife Ecology & Conservation**
- 4) **ALS 4921 - Honors Colloquium (topic = Diversity and Resilience in Living Systems)**
- 5) **WIS 2552 - Honors Biodiversity Conservation: Global Perspectives (UF Honors Program)**
- 6) **WIS 6934 - Behavioral Landscape Ecology**

Appendix E: Campus Operations, Organizational Polices, and Initiatives in Sustainability at UF

CAMPUS OPERATIONS

Office of Sustainability, College of Design, Construction and Planning, 1999-2004

Proposed and won unanimous Faculty Senate approval of a plan to empanel the UF Sustainability Task Force, crafted their charge, lobbied the administration, and won Presidential support and budget.

At the direction of the President, staffed the UF Sustainability Task Force, 2001-2004, organized 50+ meetings on and off campus, kept all records, interfaced with press and other universities, published their Final Report.

Crafted two Resolutions that won unanimous Faculty Senate support for the outcomes of the UF Sustainability task Force.

Published the first set of university sustainability metrics compiled in accord with international business reporting guidelines, the “University of Florida Sustainability Indicators, August 2001.”

Organized and chaired an international panel of higher education personnel aimed at adopting a standard approach to sustainability reporting for all colleges and universities.

Sat on an EPA Task Force designed to evaluate and adopt standard metrics for environmental performance reporting among the nation’s colleges and universities.

Organized and produced the 2001 UF Conference on Sustainability, keynoted by Michigan President Lee Bollinger and Dow Jones Sustainability Index designed Alexander Zhender. Over 200 people attended the conference that resulted in 10 newspaper stories, several radio and TV reports, and published proceedings.

Organized the UF Zero-Waste initiative. Developed plans for a partnership with Publix Supermarkets, the Athletic Association, and Aramark to compost food wastes from campus and community. Performed Homecoming zero-waste program in the O’Connell Center and football skyboxes in 2003 and 2004 in cooperation with UAA, Florida Blue Key, Student Activities, the Alumni Association, the City of Gainesville, Alachua County, IFAS, and Sumter County.

Organized and staffed university-wide ad hoc staff committees related to purchasing, energy, and waste reduction. Identified projects for energy conservation, developed new environmental purchasing policy that was adopted, advanced public-private partnership towards zero-waste food composting at County facility.

Organized and managed Carbon-neutrality research, planning and reporting. Developed web-based, queryable data base of all UF facilities ten-year energy use history that allows users to model energy conservation practices for a discrete facility or unit and predict carbon reduction, cost savings, etc. These efforts were reported on in the Wall Street Journal and in a Weather Channel documentary.

Worked to convene a global sustainability conference of university presidents in Tailliores France in cooperation with UNESCO, the IAU, and other notable universities in an effort to advance a vision for the UN Decade of Sustainability in Higher Education (2005-2014).

Organized and hosted dozens of “Conversations in Sustainability” workshops which hundreds of interested faculty, staff students, and community members have attended, press reports have been generated, and visiting speakers have participated.

Assisted organizing and marketing a “Certificate in Sustainable Construction,” distance education program through the School of Building Construction.

Organized and managed a highly successful Honors Course in Sustainability (BCN 4905) in 2004 that filled with students 20 minutes after opening.

Raised >\$300,000 in research grant, matching campus and community money, sufficient to fund director and 3 GRAs, programming, and related activities during the period.

Conducted an annual “Carbon Diet” award survey among dozens of UF and community offices in an effort at spotlighting dedicated and innovative office activities that reduce energy consumption and climate change.

Conducted an annual Earth Week series of programs for students and community members and the press.

Gave dozens of guest lectures, presentations, and so forth for various UF classes, clubs, professional associations, academic conferences, Student Government, and individual students etc—and acted as a discrete point of contact for UF students, community members, and press inquiries relating to sustainability at UF.

Mentored students in the Reitz Scholars program.

Delivered papers and/or made presentations at many national and international meetings in an effort to raise UF’s visibility on sustainability issues including:

- National Academy of Engineering: UF’s Sustainability Initiative, 2004
- Association of Institutional Research: GRI, 2004
- Dartmouth College: GRI feasibility project, 2003
- American Association of College and Universities, 2004

- Yale University: Strategic Greening Symposium, 2004
- Ball State University Campus greening Conferences (2001, 2003)
- ICLEI Climate Change Consortium, Univ. Michigan, 2000, Seattle, 2001
- University of Tennessee sustainability conference 2001
- Florida Pollution Prevention Roundtable conference, 2002
- World Resource Institute BELL conference, 2003
- UF Campus sustainability conference 2001

Audubon Cooperative Sanctuary Certification

In 2001 the university initiated the process to achieve campus-wide designation as an Audubon International Cooperative Sanctuary, thereby becoming a pilot as the first university nationally to participate in the program that was originally developed for golf courses and corporate offices. Audubon Cooperative Sanctuary Programs promote ecologically sound land management and the conservation of natural resources through education and certification programs that are tailored to a diversity of land uses within communities. Participation helps organizations plan, organize, implement, and document a comprehensive environmental management program and receive recognition for their efforts. In March 2003 the University of Florida submitted its resource packet for Phase I of the Audubon Cooperative Sanctuary Program. In July 2003, the ACSP responded with a Certification Status Report conferring approval of Phase I - Environmental Planning. Implementation and monitoring phases are ongoing. The Audubon certification was shepherded by a committee now known as the Ecology, Conservation and Stewardship Committee, or ECOS for short. <http://www.facilities.ufl.edu/cp/ecos.htm>

Biomass Gasification

The University has teamed with Progress Energy and with other universities to pursue the use of waste material, such as the sludge from the wastewater treatment facility and lawn clippings, to generate gas. This

gas will be used as fuel in gas turbine generators or to fire boilers which provide steam to turbine generators; both set-ups are on campus now. Until recently, this was thought to be feasible, but economically unjustified. The University has honed the technology associated with biomass gasification, and the world market cost of gas has done the rest.

Campus Planning: Comprehensive Master Plan 2005-2015

The Facilities Planning and Construction Division is updating the campus Comprehensive Master Plan for the years 2005-2015, which will incorporate ongoing sustainability efforts. Already, the master planning process has focused on analyzing natural constraints on campus such as wetlands and habitats that should be protected from development. A series of visioning workshops in 2003 confirmed the importance of sustainability and environmental issues within the campus community. The campus master planning process will incorporate this feedback, and utilize faculty expertise and student resources to the fullest extent possible. Some of the data collection tasks are being accomplished with faculty and student assistance. Committees were formed in Fall 2004 to include faculty, student, staff and community representatives to help shape the master plan within a sustainable and environmentally responsible framework. <http://www.masterplan.ufl.edu/>

Clean Water Campaign

The UF Clean Water Campaign is a cooperative public education initiative spearheaded by UF/IFAS Extension and the UF Physical Plant Division. Its mission is to build awareness of water quality issues and solutions on the UF campus. The University's Clean Water Campaign has designed and installed stickers to identify storm drains discharging to Lake Alice so that people will know not to dump hazardous materials such as litter, paint or motor oil into the drains. This program began in 2003. The City of Gainesville employs a similar program for creeks in the community. <http://campuswaterquality.ifas.ufl.edu/>

Cogeneration Plant

The Progress Energy cogeneration plant at the University of Florida began operation 1994. The plant supplies the steam requirements of the University and provides a local source of power for Progress Energy's system. Most of the steam is produced in the heat recovery steam generator from the hot exhaust leaving the gas turbine that drives the electric generator. The heat recovery improves the efficiency of the generating plant and reduces the need to direct fire boilers to produce steam. The cogeneration plant was the first such plant to use reclaimed water as the primary water source. The plant normally operates as a closed system in conjunction with the UF wastewater plant, receiving reclaimed water at the discharge and returning effluent to the wastewater plant's intake.

Community Gardens

In operation for several decades, the Community Gardens are utilized by faculty staff and students. They are particularly popular among students living in the adjacent married student housing complex, lending the gardens a distinct international quality. They are located on Museum Road, adjacent to the Bat House at Lake Alice.

Conservation Area Land Management Plan (CALM)

A Conservation Land Management Plan is being prepared by the Facilities Planning and Construction Division in collaboration with students, faculty and staff including the Physical Plant Division, Environmental Health & Safety Division, University Police Department and IFAS Facilities Planning Division. The Plan will detail the steps necessary to maintain over 300 acres of designated Conservation Areas on the university campus. Plant and wildlife inventories, as well as wetland delineations, are part of the data collection that will support the next Master Plan and prescribe certain management strategies. Management plan strategies for individual conservation areas include removal of non-native invasive plant species, provision of educational signage, fencing, trails/boardwalks and habitat enhancement. <http://www.facilities.ufl.edu/cp/clmp.htm>

Eastside Campus

In 2003, the University accepted an additional 14 acres of state land for university use. The site, located in the economically depressed east Gainesville area, was formerly used as a complex of offices, warehouses,

testing laboratories and equipment maintenance facilities of the Florida Department of Transportation, State Materials Office. Prior to the FDOT use, the site had been a prison camp in the late 1800's until around 1920. After more than a century of industrial-type institutional use, the site is an urban brownfield in dire need of rehabilitation, hazardous material abatement, and resurrection as a vibrant economic and employment center. The UF intends to use this site for administrative offices and academic research facilities (offices, laboratories and training rooms). Several buildings will be demolished and others will be renovated. A concept site plan has been prepared and the site has been amended into the Campus Master Plan. Long-term site improvements include on-site stormwater treatment, landscaping and environmental clean-up. Ultimately, this new Eastside Campus will be an employment center for 400-500 university faculty and staff. Although the task is challenging, the University is proud that its Eastside Campus will revitalize an existing urban area, rather than create new impacts on pristine undeveloped land.
<http://www.masterplan.ufl.edu/>

Energy & Water Conservation

The primary functions for the Office of Energy Conservation, within the Physical Plant Division, include monitoring the campus energy consumption, lowering energy consumption and incorporating new, efficient technologies for use at the University of Florida. Currently, the university is engaged in building evaluations and scheduling in order to curb current consumption trends. Between 1995 and 2000, steam, potable water, and electric usage declined although building construction and enrollment grew dramatically. During this same period, chilled water consumption grew, but at a declining annual rate. Consumption of natural gas increased, although this is a relatively cleaner fuel source. The period between 1998 and 2001, saw dramatic decreases in overall energy consumption due to retrofitting of light fixtures, HVAC operating schedules and installation of energy efficient motors and chillers. Future plans include an automated meter reading system, improved building control systems and research into various building systems that lower energy consumption. The Office of Energy Conservation has established energy contacts throughout campus to assist in the lowering of campus energy consumption. This practice has helped to foster an awareness of energy conservation issues on campus. Currently, the University of Florida spends an average of \$2.1 million per month for electricity alone. Locating waste usage of electricity can reduce this figure. Online 'Energy Conservation Tips' are available to help educate the university community on saving energy. <http://www.ppd.ufl.edu/operations-energy.html>

Green Buildings

In 2001, the university adopted Leadership in Energy and Environmental Design (LEED) criteria for design and construction for all major new construction and renovation projects to deliver high performance and sustainable building design to the University of Florida. Eight of the thirty LEED-registered buildings in the State of Florida exist on the UF campus. The M. E. Rinker Hall-School of Building Construction, is certified Gold – the highest certification level. The Orthopaedic Surgery and Sports Medicine Institute will apply for Silver certification. The UF Facilities Planning and Construction Division is the first in Florida to require a LEED-accredited professional on staff to oversee implementation of LEED strategies and certification. <http://www.facilities.ufl.edu/sustain/index.htm>

Green Fleet

In July 2003, the Facilities Planning and Construction Division purchased one of the first green vehicles on campus. The GEM electric vehicle reduces harmful pollution, as the environmental friendly machine releases no tail pipe or evaporative emissions. Zero emission is a win-win solution for the campus. Several administrative divisions on the UF campus are testing green fleet alternatives. The Transportation and Parking Division also purchased a GEM car and a Segway personal human transport vehicle, both operating on electricity. <http://www.facilities.ufl.edu/>

Historic Preservation Plan

Tracing its roots to a parent institution founded in 1853, the University of Florida celebrated its sesquicentennial in 2003. The Campus Historic District of 22 buildings listed in 1989 on the National Register of Historic Places, and the Memorandum of Agreement with the State Historic Preservation Office demonstrate the commitment of the University to preservation of the campus. Information on campus history and past planning efforts has been archived at the George A. Smathers Libraries. In July 2003, the

University received two grants for the purpose of developing preservation standards and expanding the current preservation efforts. A \$150,000 three-year grant has been awarded by the Getty Grant Program for the development of a Preservation Plan and Guidelines, which will supply the university with the information and tools to accomplish its long-range goals. In addition, the university received a \$25,830 grant from the State of Florida, Historical Grants-In-Aid. This grant identified and proposed additional buildings that are eligible for National Register of Historic Places listing. It also produced an updated historic campus walking tour map and other materials in support of the overall Preservation Plan and Guidelines. This planning effort is a comprehensive collaboration of an academic department in the College of Design, Construction and Planning with the UF Facilities Planning and Construction, and Physical Plant Divisions. <http://www.facilities.ufl.edu/cp/hpp.htm>

Irrigation with Reclaimed Water

The three million gallon a day Water Reclamation Facility was built in 1994. The shift from well and potable water to reclaimed water for irrigation was started at that time. In 1999, a dedicated plan was initiated to bring as much of the campus onto the reclaimed system as possible. With the exception of some distal areas, most of the University's campus is served by the reclaimed water system.

Organic Gardens

Since the early 1970's, the Organic Garden Cooperative has administered organic garden plots on the University campus. These plots are open to faculty, staff and students who cultivate plots year round. A limited number of community gardeners are also active on the site. The original site was on Radio Road, but has since moved to an area near SW 23rd Terrace. The gardens include 75 plots cultivated by nearly 100 individuals.

President's Home Garden Restoration

With the arrival of President and Mrs. Machen in 2004, the wooded area adjoining the President's residence has been reworked to incorporate numerous butterfly-attracting plants. This project, a companion to the new McGuire Center for Lepidoptera Research and Butterfly Rainforest will serve to informally educate community members about the important role butterflies play as indicators of healthy environments.

Recycling

The University Solid Waste Management Office manages the collection and disposal of all solid waste generated through University operations, including medical waste. It also manages the University's Recycling Program and provides collection and recycling services for paper, corrugated containers, beverage containers, scrap metal, pallets, masonry, yard waste and other widely used materials. Although a few items were sporadically recycled during the mid-1980s, a formal campus-wide recycling program was initiated in August 1989. In FY 00-01, about 36% (6,530 tons) of the university waste stream was recovered and recycled. With the re-opening of a local concrete recycling facility in February 2001 (and other actions), the University's recycling rate increased dramatically, averaging 45% for the first two months of FY 01-02. During FY 00-01, the University of Florida recycled 6,530 tons of material recovered from our waste stream. This amounts to an average of about 125.6 tons/week or over 25 tons per workday. <http://www.ppd.ufl.edu/grounds-refuse.html>

Transportation: Transit, Bicycling, Walking and Parking

Since 1997, UF has contributed increasing funds to the Regional Transit System (RTS). These funds come from the Concurrency Trust Fund, student fees and direct payment for operation of campus circulator and "Later Gator" routes. Funding increases have created growth in service and ridership for students and the general public. In 1999, UF students accounted for 66 percent of all RTS riders. During the first three years of UF contributions, non-student ridership on Gainesville's City bus routes also increased by 36 percent due to improved service. Between 1995 and 2003, the university's combined financial contributions toward RTS grew from \$604,018 to \$5,805,716. During that same period, total RTS ridership grew from 2,047,500 to 8,103,120 making it the fourth largest urban transit system in the State of Florida in terms of ridership.

UF's partnership with RTS has enabled the University to implement a parking management program to reduce the number of private vehicle trips made to and around the campus. The 1995 Master Plan and Campus Development Agreement allowed a maximum of 2,700 new parking spaces to be constructed by 2005. By the year 2000, 1,300 spaces were constructed leaving a balance of 1,400 spaces permitted. While the 2000-2010 Master Plan update extended the planning horizon for five more years, no additional increase in parking spaces were recommended.

As an urban campus near the center of the City of Gainesville, the university has always supported walking and bicycling as a way to get to campus and for travel within campus. Surveys in 2004 suggest that these non-auto modes are still quite popular with about 14% of employees, and 23% of students accessing campus by walking or bicycling. Thirty-five percent of students reported using buses as the primary mode to access campus. Comparatively, most communities report non-auto modes (including transit) to make up around 4-7% of trips to work (slightly higher for trips to school).

University Arboretum Renewal

At the University Arboretum conservation area on West University Avenue, neighborhood volunteers have joined students and staff for two clean-up workdays, and are organizing for a third. Several neighbors also donated funds to help fund a fence that is now in place to protect against parking impacts. Beginning in 2003, the NW 23rd Street Neighborhood Association spearheaded a fundraising campaign to help pay for the fence with donations being matched by university administration. The Neighborhood Association worked with the University to plant a native tree commemorating their Association President's leadership in these efforts. http://www.facilities.ufl.edu/cp/clmp_plans.htm

University of Florida Bat House

The University of Florida bat house was constructed on the Gainesville campus in 1991, and now houses over 20,000 free-tailed bats. Each night the free-tailed bats in this one colony eat about 10-20 million insects, assuming that each bat consumes 500-1000 of the small insects this species prefers. This translates to roughly 220 pounds of leafhoppers, moths, midges, winged ants, beetles, and other night-flying insects removed from our yards, gardens, and farms every night based on the conservative assumption that each bat eats half its body weight in insects a night. Nursing mothers are known to eat up to 125% of their body weight in insects each night. These bats are living in a structure created specifically for them by the University of Florida and the University Athletic Association and now provide free pest control for the university and Gainesville. This is the largest occupied "bat house" in North America and perhaps the world. http://www.wec.ufl.edu/extension/bat_house.htm

Urban Forestry

An Urban Forester is employed at UF to be responsible for the health and safety of all trees on campus. A diverse and healthy tree canopy is the goal of our Urban Forestry Program. Trees are a significant feature of the University of Florida campus, they define the exterior of our buildings, they reduce our energy consumption through cooling, they provide food and shelter for wildlife, and the list goes on. When a tree is removed because of new construction, injury, or disease, it is unfortunate, but the university also sees an opportunity. Young trees are planted throughout the year to renew and refresh our dynamic tree canopy. Trees removed due to construction are replaced at a two-for-one rate, and sometimes more if the removed trees are substantially large or significant species. <http://www.ppd.ufl.edu/operations-urban.html>

ORGANIZATIONAL POLICIES AND PRACTICES

Ad Hoc Joint Presidential/Senate Committee on Sustainability

Established as an ad hoc Task Force in 2000, the Sustainability Committee continues work that began with a grassroots movement known as Greening UF in 1997. The Task Force submitted its recommendations to the Faculty Senate and the Office of the President in 2002. To ensure the implementation of these recommendations, the current Sustainability Committee was formed in 2004.

The Committee on Sustainability will serve as the university's coordinating and representative body regarding all aspects of sustainability. It will report jointly to the Faculty Senate and to the President of the University or his designee. The committee will be active in all areas of campus sustainability including Research, Education, Campus Operations, Community Outreach and Integration, Campus Community and Organizational Policies and Practices. It is a Joint Committee of the University, appointed by and reporting jointly to the President and the Faculty Senate.

Carbon Neutrality

The Office of Sustainability developed an inventory of UF carbon emissions and a conceptual plan analyzing pathways by which UF can become carbon-neutral.

Ecology, Conservation and Stewardship Committee (ECOS)

The ECOS Committee was established to develop the application for Audubon certification and to oversee other campus wide conservation efforts, the VP for Finance and Administration empanelled this faculty-staff committee in 2001. <http://www.facilities.ufl.edu/cp/ecos.htm>

Global Reporting Initiative

The University of Florida in 2001 became the first higher education institution to use the established Global Reporting Initiative guidelines to publish its sustainability metrics.

Office of Disabilities

The University of Florida, under the guidelines of ADA and 504 federal legislation, is required to make reasonable accommodations to the known physical and mental limitations of otherwise qualified individuals with disabilities. To help provide the best possible service to students, staff, faculty and visitors, the University of Florida has an ADA Compliance Office with a coordinator responsible for access for persons with disabilities. The ADA coordinator assists anyone with questions about access. <http://www.ada.ufl.edu/office/ada.htm>

Talloires Declaration Signatory

In 1994, the University of Florida was one of 310 universities worldwide to sign the international Talloires Declaration pledging support to reduce environmental degradation and natural resource depletion.

Zero Waste

Beginning in 2003, the University Athletic Association partnered with the Powell Center's Office of Sustainability to reduce waste at football games. UAA is now planning to "zero-waste" activities within the skyboxes at all UF football games beginning in 2005.