

UNIVERSITY OF  
**Miami**  
FACULTY SENATE  
MEMORANDUM

**To:** Donna E. Shalala, President

**From:** Stephen Sapp  
Chair, Faculty Senate



**Date:** April 23, 2009

**Subject:** Faculty Senate Legislation #2008-25(B) –Establishment of a degree of Doctor of Philosophy (Ph.D.) in Environmental Science and Policy in the Graduate School

\*\*\*\*\*

On April 22, 2009, the Senate voted to approve the establishment of a degree of Doctor of Philosophy (Ph.D.) in Environmental Science and Policy in the Graduate School as presented by Professors Richard Williamson and Kenneth Broad.

The proposal is enclosed for your information.

The legislation is now forwarded to you for your action.<sup>1</sup>

SS/rh

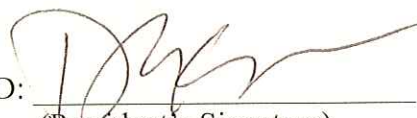
Enclosure (proposal)

cc: Thomas LeBlanc, Executive Vice President and Provost  
Teresa Scandura, Dean, Graduate School  
Kenneth Broad, Associate Professor, Rosenstiel School of Marine and Atmospheric Sciences, and Leonard and Jayne Abess Center for Ecosystem Science and Policy  
Richard Williamson, Professor, School of Law, and Chair, Faculty Advisory Committee, Leonard and Jayne Abess Center for Ecosystem Science and Policy  
Aileen Ugalde, Secretary, Board of Trustees

<sup>1</sup> Following approval by the President, additional approval is required from the Academic Affairs Committee and the Executive Committee of the Board of Trustees (for doctoral programs and new degrees only).

Faculty Senate Legislation #2008-25(B) –Establishment of a degree of Doctor of Philosophy (Ph.D.) in Environmental Science and Policy in the Graduate School

**PRESIDENT’S RESPONSE**

APPROVED:   
(President’s Signature)

DATE: 4/29/09

OFFICE OR INDIVIDUAL TO IMPLEMENT: DEAN SCANDURA

EFFECTIVE DATE OF LEGISLATION: IMMEDIATELY  
(if other than June 1 next following)

NOT APPROVED AND REFERRED TO: \_\_\_\_\_

REMARKS (IF NOT APPROVED): \_\_\_\_\_

**Note:** Additional approval is required from the Academic Affairs Committee and the Executive Committee of the Board of Trustees (for doctoral programs and new degrees only).



Terri A. Scandura, Ph.D.  
Dean of the Graduate School

## MEMORANDUM

To: Chair, Faculty Senate

FROM: Dean Terri Scandura  
Graduate School *Terri Scandura*

DATE: 13 April 2009

SUBJECT: New Program – Ph.D. in Environmental Science and Policy

---

The Graduate Council has reviewed and approved the Ph.D. in Environmental Science and Policy on October 25, 2007. The Graduate School will be the degree-granting institution for this program.

Graduate School  
P.O. Box 248125  
Coral Gables, Florida 33124-3220  
305-284-4154  
Fax: 305-284-5441  
E-mail: [graduateschool@miami.edu](mailto:graduateschool@miami.edu)

Leonard and Jayne Abess Center for Ecosystem Science and Policy  
Proposal to Offer the Degree:  
Doctor of Philosophy

1. *RATIONALE – Give a summary of intellectual and academic need for each degree being reviewed.*

*Overview*

Human and natural transformations of the environmental systems that societies rely on are taking place on local and global scales at unprecedented rates. Responding to these changes while balancing the space, food, water, energy and health needs of current and future generations constitutes one of the central challenges of our time. The feedback between human activities and environmental change, including new forms of and transport mechanisms of pollution, emerging diseases, global climate change, and continued loss of species, are increasingly complex and highly variable across space and through time. Understanding how social and ecological systems are linked and where, how, and why they are changing is critical to anticipating future changes, as well as developing proactive (mitigation) and reactive (adaptation) responses that increase societal and ecological resilience. New challenges call for new approaches to training future scholars and practitioners who can deal with both the scientific/technical and the legal/policy aspects of the issues facing us and articulate their conclusions to legislative and executive decision-makers and the general public.

The University of Miami's Abess Center for Ecosystem Science and Policy (Abess Center) proposes the creation of an elite PhD program in Environmental Science and Policy, offered through the Graduate School. The proposed PhD program will leverage strengths from all the UM schools by building upon the existing interdisciplinary collaborations that have been created by the undergraduate academic and research programs associated with the Abess Center. Comparable programs at other universities usually involve integration between just two fields. The graduate program proposal has been motivated and designed with the input from faculty and researchers from across UM. The program is poised to tap into synergistic networks across the diversity of schools and colleges, including Arts and Sciences, Architecture, Business, Law, the Rosenstiel School for Marine and Atmospheric Science (RSMAS), Communication, Engineering, and the Miller School of Medicine. The original plan included a Masters degree program. However, given the current fiscal situation that impacts hiring and space availability, there is consensus among the Abess-affiliated faculty and the upper level administration that it is prudent to focus energy and resources on recruiting and graduating the highest quality PhD students. As the hiring situation improves with time, the idea of a masters program will be revisited. While no students will be admitted into a terminal masters program, in the event that a student is unable to continue past the comprehensive exams and proposal defense stage, yet has successfully completed all other requirements, the Abess Center, via the Graduate School, will have the authority to grant the student a Master of Arts.

The Abess Center graduate program will target top-caliber students whose demonstrated skills and interests bridge science and societal needs and provide these students with the theoretical and analytical skills to address complex, human-environment problems from academic and applied perspectives. During their first two years, PhD students will receive training in the fundamentals of the methods and theories of environmental and physical sciences, with an emphasis on the possibilities and constraints for integrating science and policy into problem-based research. Students will then narrow their focus on the core areas that best address his/her interdisciplinary research problem, with guidance from relevant faculty from across the UM community. This program will be mutually beneficial to graduate and undergraduate students by providing undergraduates access to innovative capstone courses, providing both groups with research and fieldwork opportunities, and graduate students with teaching assistantships in the Abess Center's undergraduate program.

*a. Exact Degree Title*

The Graduate School seeks to offer an advanced graduate degree, the Doctor of Philosophy (PhD), in Environmental Science and Policy.

*b. Motivation and Demand*

This program is proposed in response to (1) increasing societal demand for academicians and practitioners at the masters and PhD levels with interdisciplinary training aimed at addressing complex problems concerning the impact of human activity on the environment, (2) the current inability within the University of Miami to provide doctoral-level training in this rapidly growing field, (3) the opportunity to take advantage of existing expertise at UM, as well as the unique advantages of South Florida's dynamic social-ecological systems, and its position relative to Latin America, (4) an increasing number of inquiries about an Abess Center graduate program from undergraduate and masters degree recipients from top-tier universities, and (5) the stable research funding base of Abess Center-affiliated faculty that is now being used to support PhD students at other universities because UM lacks an interdisciplinary environmental PhD program.

UM's interdisciplinary strengths are distributed in disparate schools and departments, and interaction is increasing through specific research initiatives. However, there is no graduate program tied to one unit that can provide formal training in both disciplinary and interdisciplinary<sup>1</sup> theory and methods. The only option currently for doctoral students with cross-disciplinary

---

<sup>1</sup> We adopt the definition of interdisciplinary put forth in the AAU Report of the Interdisciplinary Task Force (October 2005): "activities that engage more than one discipline to accomplish research or educational objectives that cannot be accomplished through those same disciplines operating separately." However, to fall under the Abess Center purview, interdisciplinary activities must deal with the human or natural environment, and touch on both science/technical and legal/policy issues.

research interests is the Interdepartmental PhD Program. This program exists to fill an acknowledged gap in the University's ability to accommodate exceptional students with unique research interests. The shortcomings of this program for graduate students interested in environmental matters include the lack of a core curriculum, a physical home, and an identifiable cohort of students. There is no core faculty and no funding base, thus inhibiting a culture of intellectual and social interaction critical for nurturing young scholars and fostering faculty communication. Moreover, to train students adequately in the study of complex systems, one needs to have a clear focus on a set of environmental issues and types of problems for which the University has competitive expertise and geographic advantages.

On a national level, the PhD program will fill a recognized need for interdisciplinary training programs that address salient and critical problems at the human-environmental interface (AAU Report of the Interdisciplinary Task Force, October 2005). Governmental and non-governmental agencies have made funding of environmental research a top priority, and the private sector is rapidly engaging in environmentally-oriented activity; thus the demand is increasing for masters- and PhD-level scholars and practitioners trained with an interdisciplinary perspective. UM possesses the right mix of expertise and geographic characteristics for problem study and research/training opportunities. In addition, given the Abess Center's success in facilitating university-wide collaborations and linkages, it is uniquely situated to develop a program that creates synergies between schools and departments while building on existing strengths in academic units and professional schools.

In a short time, the Abess Center has created a unique undergraduate curriculum, achieved substantial enrollment numbers, and developed a successful research portfolio by drawing together faculty from the College of Arts and Sciences, RSMAS, the Miller School of Medicine, the School of Law, School of Communication, School of Architecture, and the College of Engineering. Progress is impeded by an inability to accommodate the increasing requests from high-quality students for enrollment in a graduate program. Undergraduates in the Abess Center's Ecosystem Science and Policy program lack the ability to interact with graduate students in many of the exciting and well-funded interdisciplinary research projects of Abess Center faculty (see [www.cesp.miami.edu](http://www.cesp.miami.edu)). Furthermore, it is increasingly difficult to remain competitive in recruiting top faculty for the Abess Center (and other departments) without an environmentally focused PhD program at UM. The design and implementation of such program would further bridge departmental, disciplinary, and college/school-level expertise, resources and facilities, and consolidate UM's role in interdisciplinary research and training in environmental science and policy.

*c. Integrative Approaches and Themes*

UM's location in southern Florida and in the city of Miami affords it a natural field laboratory in which to analyze thematic, methodological and policy questions at the intersection of a number of forces: the terrestrial-coastal ecosystems spanned by the Everglades; the urban-ecological system embodied in urban, peri-urban and suburbanizing Miami; local-global connections in

migration patterns, political-economic and climatic-hydrological regimes; and science-policy linkages evidenced in the city's climate, water and health management policies, land use and zoning patterns, and ecosystem conservation/restoration initiatives. Existing faculty research on these thematic and regional concerns will be energized by high-quality graduate research and training. Clearly, the program would also draw from other national and international research, including academic and public policy partners in Latin America and elsewhere.

Drawing on the unique strengths of UM's faculty and the noted geographic advantages, the Abess Center graduate program will enable the student to develop his/her own concentration or tap directly into more established existing interdisciplinary projects at UM. Examples of some of the current, well-funded interdisciplinary research foci at UM include: (i) Urban Ecology, particularly the ecology of coastal cities; (ii) Global Public Health, particularly the challenges posed by changing migration flows and pathogen vectors; (iii) Climate and Society, including the implications of sea level rise for coastal cities, extreme events, and the complexities of energy policy and socioeconomic development considerations; (iv) Environment and the Media, particularly finding effective ways to inform the public about the results of research and their policy implications, (v) Integrated Marine and Terrestrial Management, developing strategies that include architectural considerations, energy-use systems, transportation, and dimensions of health, environment, and migration, and (vi) Global Regulatory Regimes, addressing the new types of and transport of polluting substances and developing approaches that integrate cutting-edge scientific methods with the creation of forward-looking laws, negotiation and dispute-resolution techniques, and institutional arrangements in the U.S. and internationally.

These themes encompass numerous cross-cutting issues that will be addressed in the program's core curriculum and will be active research topics. Some specific examples include: the role of formal (legal) and informal (traditional) institutions in structuring social-ecological interactions across multiple scales; transboundary resources/systems and challenges to adaptive management; feedbacks of changing social-ecological systems through invasive species, ecosystem resilience, human health and well-being; system degradation and restoration; the role of the media and information in influencing cultural attitudes and practices vis-à-vis adaptation/mitigation strategies; biodiversity impacts of landscape management and conservation regimes; and the role of infrastructure and markets in transforming connectivity and resilience of social-ecological systems. Below, we present more detail on some of these themes as examples of the type of integration that UM currently excels in and that fit squarely within the Abess Center graduate program goals. As new faculty and funding opportunities arise, of course, so will new themes.

*Urban Ecology:* The world is rapidly urbanizing; urban growth has been particularly strong in coastal regions that are especially vulnerable to climate change, disease vectors, and other difficulties. Urban ecology is a fundamentally interdisciplinary arena that bridges basic and applied research, with strong science-policy linkages. The University of Miami's schools and departments of Architecture, Anthropology, Biology, Chemistry, Geography,

Geological Sciences, International Studies, Law, and RSMAS have core faculty expertise that bridges the natural and social sciences for training in urban ecology. A fundamental goal of the Abess Center's Urban Ecology focus is to understand how public policy, including globalization, migration, local zoning and planning, and city structure, influence historical and current patterns of growth and consumption. The spatial structure of physical, ecological and socio-economic processes in cities influence material and energy flows in their regions, with implications for climate, ecosystem services, economic flows and human health. Miami serves as a natural laboratory for testing research designs and developing comparative studies with other coastal urban cities. Methodologies and insights from the aforementioned natural and social science departments/disciplines are joined to aid understanding of process-pattern linkages, predict future trends and chart alternatives to improve urban environments and promote a higher quality of life for residents. Students will analyze the complex relationships among human and natural processes in urbanizing environments — of coastal cities like Miami at the interface of terrestrial ecology and marine systems, sensitive to climate change, labor and migration flows, impacted first by pathogens and other vectors, and culturally heterogeneous.

*Global Public Health:* One of the greatest challenges of epidemiology and public health is to monitor and control infectious disease outbreaks throughout the world. Diseases such as Malaria, Dengue Fever, West Nile Virus, Lyme, Ebola, HIV/AIDS, Tuberculosis, Hepatitis B, Plague, Leishmaniasis, and scores of other known and emerging infectious agents have caused recent concern in the public health community, particularly as the number of professionals in the area of infectious disease epidemiology and control has dwindled in the past two decades. The US and other developed nations do not live in isolation. The threat of emerging and re-emerging disease is a major national and international concern. Although the biology of most pathogens is understood, there is a lack of coordinated mechanisms to implement the science and practice of disease ecology and control for solving real-world infectious disease problems. The National Research Council considered this to be one of the eight major priorities for research funding and one of the major challenges to the environmental sciences<sup>2</sup> in the decade ahead. The area of global public health serves as a vital link among basic science, medicine, information sciences, public health practice and policy. It provides an interdisciplinary approach for understanding risk and predicting the dynamics of pathogen transmission. In a practical sense, the science of global public health brings together disciplines and experts that help operationalize public health strategies for controlling disease outbreaks. This challenge is particularly acute in coastal cities, entry points for people and pathogens, wherein patterns of migration and settlement may lead to spatial clustering of health/disease outcomes. Coastal cities are a major point of defense in this struggle to contain the spread of virulent diseases. This theme benefits from existing research synergies among the Abess Center, the Department of Epidemiology and Public Health, and the departments of Geography, Biology, Mathematics, and the Institute for Theoretical and Mathematical Ecology.

---

<sup>2</sup> National Academy Press. 2001. Grand Challenges in Environmental Sciences. National Academy Press.



*Climate and Society:* Another focus of the proposed graduate program centers on the relation between climate and human behavior. Climate impacts resulting from a warming earth, natural variability associated with the El Niño/La Niña phenomena, and extreme weather events all pose scientific and societal challenges in terms of anticipating, preparing and responding to these multi-timescale events. Climate hazards and the human response to them are as much affected by our scientific understanding and perception of these complex air-sea-land interactions as the climate dynamics themselves. Thus, social vulnerability and mitigative and adaptive capacity in the face of climate change are strongly mediated by legal, socioeconomic, policy, psychological, epidemiological and cultural factors, including housing and construction codes, environmental risk perception and health management/delivery. This theme draws on UM's breadth and depth in interdisciplinary climatological and meteorological research addressing risk management in the human health, fisheries, agriculture, water management, natural hazards and coastal zone sectors. Faculty from RSMAS, the Miller School of Medicine and Geography contribute to the climate and society theme with their analysis of both climate trends and hazards, while faculty at the schools of Law, Architecture and the College of Engineering focus on the legal, material and aesthetic aspects of the built environment that influence the mitigation of vulnerability and development of more resilient urban systems.

*Environment and the Media:* The media play a major role in influencing public perception of environmental problems and solutions. Effective understanding of the global and local drivers of consumption and risk perception require cross-cultural understanding of the interpretation of print and visual media. Complementing an understanding of the media's influence in environmental issues is a pressing need to create effective communication strategies and products for education, entertainment and warning. Successfully communicating probabilistic scientific information is a particularly critical and challenging endeavor. Drawing on UM's School of Communication, whose expertise spans the theoretical and technical dimensions of information sharing, this concentration will prepare a new generation of students for the hybrid role of scientist-communicator, a position for which the current generation of academics is under-equipped. Core contributions provided by the School of Communication will be augmented by offerings of the departments of Anthropology, Sociology and Psychology, whose collective expertise provide insights into individual and group processing of environmental information.

*Integrated Marine and Terrestrial Management:* Humans depend on marine and terrestrial ecosystems for a multitude of goods and services. These systems are at risk due to overexploitation and reduction in habitat. Abess Center research in this area is focused on developing ecosystem management strategies that ensure long-term environmental sustainability, guided by the following principles: ecological processes, economic activities, and social interactions are inherently spatial; tradeoffs are intrinsic to systems with multiple management objectives; stakeholder experience and beliefs influence the formulation of management objectives and the design of management plans; and management plans must be adaptive to changing environmental and

social conditions. Training will address the general and sector-specific issues in harvesting approaches (e.g., fisheries, agriculture, forestry), non-living resources (e.g., mining, energy extraction, water management) and waste management (e.g., pollution control, zoning and infrastructure). Thematic and methodological courses in Biology, RSMAS, Geography, Law and Mathematics enrich the marine and terrestrial management core focus, and students benefit from local, national and international research opportunities with faculty from these departments and schools.

*Regulatory Regimes:* International and national legal systems have lagged significantly behind our technological advances in detecting, monitoring and modeling environmental threats. Existing efforts to protect the environment are hampered by concerns over economic consequences and by a long history of failure to anticipate side effects. Policy-oriented students will be trained by legal scholars who work on global scale issues (e.g., nuclear proliferation, toxic waste, the Law of the Sea) in the context of cutting-edge scientific potential (e.g., likely future environmental threats such as the widespread release of endocrine-disrupting chemicals; emerging common property activities such as deep ocean drifting aquaculture) and policy responses (e.g., large scale ecosystem restoration efforts). Natural science-oriented students will be educated about legal constraints and possibilities, allowing them to design more explicit and realistic policy relevant research agendas. The global focus that is inherent in transboundary pollution and resource management cases will be complemented by training in decision-making, negotiation and arbitration approaches that are applicable at multiple sociopolitical scales and to diverse sectors. This training will include recognition of the *de jure* and *de facto* institutions that are often ignored, exacerbating inequity and inefficiency in resource management.

#### *d. Opportunities and Challenges*

The intellectual and motivational pieces are in place at UM for creating a top-tier, nationally recognized graduate program that combines environmental science and policy. Critical components for the success of the proposed program include: targeted student recruitment; post-degree job placement; a solid business model; and estimating faculty, administrative and space needs. Below is a brief sketch of the plan to create the graduate program (details are addressed in the remaining sections of the proposal).

Recruiting of students will take place (i) through the extensive networks of Abess Center-affiliated faculty, many of whom are involved in large, multi-institutional, interdisciplinary projects that involve undergraduates and masters students (e.g., NSF Biocomplexity Projects, NSF - IGERTS, NIH Oceans and Human Health), (ii) through targeted promotion of the program at top-ranked undergraduate departments worldwide, and (iii) from within the pool of the finest UM undergraduate and masters students with environmental interests. The Abess Center will put serious effort into working with UM's advancement team to target donors for scholarships to support outstanding minority PhD candidates from underserved populations. In addition, the Abess Center will vigorously pursue McKnight, Sloane, and NOAA MSI funding for underserved populations.

Completion of the PhD will take approximately five years. Opportunities for graduates are available in a range of prestigious institutional settings; an increasing number of leading universities are developing academic programs and centers that span disciplines (e.g., Columbia University's Earth Institute), as are independent think-tanks (e.g., Resources for the Future) and well-funded research centers (e.g., National Center for Atmospheric Research). Foundations (e.g., The Heinz Center) are now hiring environmental interdisciplinarians as policy analysts and program managers, and government agencies (e.g., NOAA, EPA, NIH) are explicitly addressing socioeconomic policy issues in their mission and adding PhDs to their staffs. Given the lessening of the ideological resistance to acknowledging the critical role of environment in human health, socioeconomic development and cultural survival, environment-related positions within and outside of academia will continue to increase, and Abess Center PhD graduates will be attractive candidates for both academic, government and private sector positions. In order to assure high quality of the program, a formal evaluation process will be put in place from the start.

To maintain the highest pedagogical standards, qualitative and quantitative feedback regarding the student's progress toward the PhD, and the student's opinions about the program, will be gathered annually. During the first year, PhD students will take core courses as well as electives selected based on their specific interests and gaps in skills. Each student will have a primary advisor based on her/his field of interest. An Abess Center faculty member will oversee the coordination of all advising and evaluation activities.

This program's stature will depend on enrolling and retaining the best candidates and thus must be competitive in its ability to offer fellowships. During the first five years of the program's existence, it is envisioned that enrollment will be approximately three to four PhD students per year.

Faculty development, administrative support and space are critical needs. To date, the Abess Center has proceeded cautiously in building up its faculty to the minimum level required to develop the undergraduate major. A great deal of effort has been expended in developing teaching and research collaborations with existing faculty from other departments and schools at UM. As the PhD program evolves and the undergraduate program continues to grow, and UM's financial situation improves, the Abess Center will seek to add tenure track faculty up to the ceiling previously authorized. During the current hiring hiatus, selection of students will be largely based on fit with existing sets of expertise currently at UM (this is logical as PhD students will be primarily supported by research funds held by Abess-affiliated faculty). The undergraduate Abess Center program is already stretched in terms of space, administrative and advising capacity of the affiliated faculty, and there is a need to expand these aspects of the program. The Abess Center has no assigned space on campus. While facilities to meet all the Center's needs can await new construction, minimal space needs must be met before the PhD program can be launched.

e. *Summary*

A first-rate university must address the intellectual challenges of the coming decades. Environmental issues will continue to gain prominence on the international research agenda, and the University of Miami is poised to be a leader in training the next generation of scholars and policy makers. The proposed graduate program in Environmental Science and Policy will educate these top students and broaden and strengthen dynamic linkages throughout the University.

2. *PHYSICAL RESOURCES – List and evaluate all of the physical resources available and needed. Include:*
  - a. *A survey of library holdings, which assess books, all pertinent periodicals and serials; collections of sources and documents, major sets, etc.*
    1. *List any special or unique collections, which we hold.*
    2. *List additional library acquisitions needed and their estimated cost.*
    3. *Estimate the incremental library needs per year over and above #a2.*
    4. *Demonstrate that library resources are adequate not only for instruction, but for the research of faculty recruited as part of the program.*

The proposed PhD program will not require any new additions to the library holdings at any of the involved schools. We have included in Appendix A the collection development statement for Ecosystem Science and Policy prepared with the purpose of supporting "undergraduate instruction and research as well as *faculty research*." It demonstrates that existing resources are sufficient to start a graduate program.

In addition, the Abess Center Faculty Advisory Committee was canvassed regarding the needs they anticipate for research and teaching in support of the PhD program. As additional faculty hires are made, however, this may change. We will raise the issue of library service and holding needs with candidates and be in close contact with the library staff if new demands arise.

- b. *Discuss laboratory equipment and laboratory facilities of all types, which will be needed. Where pertinent, list field station(s) and their equipment.*
  1. *Give estimated costs of equipment on hand.*
  2. *Estimate incremental laboratory needs for succeeding years.*

The proposed graduate program in Environmental Science and Policy requires only modest laboratory equipment and/or facilities beyond the existing facilities available to Abess Center faculty. The vast majority of faculty members have office space and space for students. Additionally, most of the faculty members have laboratory and computer space to meet the needs of their respective research programs. Equipment commensurate with their research programs is also available and is upgraded primarily through continued external grant support.

Computer support will be required. The budget includes money for the set up of a small computing laboratory. Affiliated faculty members will provide the facilities for specialized computing needs. Below is a list of the specialized facilities available to students:

*Anthropology:* The Department of Anthropology maintains a wet and dry research laboratory with comparative reference collections for the study of paleoenvironmental change and adaptation. Human and artifactual materials from Little Salt Spring, a Paleolithic occupational site in south Florida owned by the University of Miami, are curated and available for research purposes along with work and storage space for graduate students.

*Biology:* The Biology department has a number of core facilities. The computing core facility consists of an Apple Computational Cluster. The cluster consists of eight Xserve nodes, each with two dual-core 2.66GHz Intel Woodcrest CPUs, 2 GB memory and 2x80GB SATA drives. The whole cluster consists of 32 computing cores. The nodes are connected to each other through Foundry Edgelron 25G 24-port gigabit switch. In addition, the head node has a fibre channel connection to a 2TB Xserve RAID array.

*Geography:* The Department of Geography and Regional Studies' Geographic Information Sciences (GIS) Laboratory houses over a dozen high performance workstations equipped with ArcGIS, Idrisi, SPSS, Erdas IMAGINE and other advanced remote sensing and GIS software, and serve faculty and student projects in geospatial and environmental analysis. Several Garmin GPSMAP 76S units are available for field data gathering and download. Output devices include the Hewlett Packard (HP) DesignJet 5500, a 42-inch large-format roll-feed color printer, as well as other standard printing devices, and scanning is available via an AGFA T1200 for both reflective and transparency scans at 600 dpi, upwards to 2400 dpi interpolated.

- c. *Evaluate the adequacy of existing laboratory space and estimate the incremental need for space for any proposed work.*

As noted in Section 1, the Abess Center has no assigned space on campus. This need for space must be met before the graduate program can be launched. The program at a minimum needs the following: classroom/seminar room for 50 people; common area with kitchen facilities and space for computers; two offices for faculty/visitors; and one office for graduate program administration. Abess Center faculty has sufficient space to house students working with them. The Environmental Seminar Series that is part of the core curriculum anticipates regularly bringing in leaders in the field of environmental science and policy, whose lectures should be of wide interest to the entire University community necessitating the need for a large seminar room.

- d. *List any other physical resources, such as office equipment, necessary to the proposal. Where these are deficient, estimate the cost of their addition.*

\$10,000 is budgeted in the first year to buy the office furniture and computers. \$5,000 is budgeted in subsequent years to maintain and upgrade the physical resources.

### 3. CURRICULUM

*a. List the major division or divisions of the discipline in which graduate degree work will be offered.*

The Abess Center and the proposed graduate program in Environmental Science and Policy are implicitly integrative and interdisciplinary. The proposed coursework will provide a comprehensive introduction to qualitative and quantitative approaches to study of problems in environmental science and policy.

*b. Evaluate the adequacy of your present undergraduate and graduate curricular structure for the proposed degree.*

The current undergraduate curriculum provides a base set of themes and readings, and teaching and research assistant opportunities for graduate students. Additional graduate classes for advanced undergraduates and the opportunity to observe and interact with high-quality graduate students will benefit the existing undergraduate program.

*c. List any anticipated additions, deletions and changes in your current curricular structure results from this new proposal. For each item, list the faculty involved.*

At present, the Abess Center offers no graduate courses. To support the graduate program a comprehensive curriculum will be developed. It will consist of seven new core courses taught by Abess Center faculty, a seminar, and electives drawn from numerous departments and schools.

*d. List any current, anticipated, or agreed upon cooperative interdisciplinary work with other components of the University or with an extramural agency as pertinent to the program.*

The proposed program will not require any formal cooperative agreements with other components within the University. However, as noted above, students in the proposed program will take advantage of the offerings of other academic units as elective courses, and certain joint degree programs might prove beneficial at some future time.

*e. Provide a detailed description of the proposed program including:*

#### **Degree Requirements for the PhD**

##### *Prerequisite*

Students will not be admitted to the program until they have earned a bachelors or masters degree in an appropriate field.

### *Courses*

Students must complete 21 credits worth of coursework in the following core courses (descriptions provided in Appendix B) and participate in a 2-credit seminar series:

ECS 601 – Interdisciplinary Environmental Theory I  
ECS 602 – Interdisciplinary Environmental Theory II  
ECS 603 – Interdisciplinary Environmental Methods I  
ECS 604 – Interdisciplinary Environmental Methods II  
ECS 605 – Interdisciplinary Environmental Policy Analysis I  
ECS 606 – Interdisciplinary Environmental Policy Analysis II  
ECS 607 – Interdisciplinary Environmental Decision Analysis  
ECS 608 – Interdisciplinary seminar series.

### *Examinations*

All PhD students will be given written and oral comprehensive examinations following the conclusion of the core series of courses. A majority of the examination committee must be members of the Graduate Faculty of the University. A failure to pass the examination will require the student to retake and pass the examination within one calendar year. Any student who fails to be admitted to candidacy for the degree within this one-year period will be dismissed from the program. If the students have successfully completed the following, they will be granted a Master of Arts:

*ECS Core (12 credits) – see above and Appendix B.*

*Graduate Level Electives (12 credits) – see Appendix C.*

*ECS Seminar (2 credits) – see Appendix B*

*Thesis Research (6 credits) or Internship (6 credits)*

### *Additional Coursework*

Students must complete an additional 36 credits of course work. Twenty-four credits must be in courses at the graduate level. For students with a masters degree, transfer credit may count for some of these 24 credits. At a minimum, 13 credits must be dissertation research credits.

### *Dissertation*

Students must complete a minimum of 13 credits of dissertation research. Students may proceed with the dissertation after the

dissertation committee has been appointed and the Director of Graduate Studies and the Graduate School have accepted the dissertation proposal. The dissertation must be an investigation of a substantial scholarly topic and bridge both scientific and policy aspects of the topic area. A final oral defense of the dissertation is required.

**Specific Track for PhD Degree:**

PhD in Environmental Science and Policy (60 credits)

*ECS Core (21 credits) – see above*

*Graduate Level Electives (24 credits) – see Appendix C*

By the end of the student's second semester of full-time course work, the student must submit a proposed group of courses that encompass a coherent scholarly area related to the student's research interest and intended dissertation research area. This group of courses requires approval of the Center's Graduate Studies Committee and the Director of Graduate Studies.

*ECS Seminar (2 credits) – see Appendix B*

*Dissertation (13 credits)*



**Sample Schedule for a full-time PhD student**

| Semester              | Credit | Course Description     | Department and # |
|-----------------------|--------|------------------------|------------------|
| <i>Year 1, Fall</i>   | 3      | ECS Theory I           | ECS 601          |
|                       | 3      | ECS Methods I          | ECS 603          |
|                       | 3      | ECS Policy Analysis I  | ECS 605          |
|                       | 3      | Elective               |                  |
|                       | 1      | Seminar                | ECS 608          |
| Total                 | 13     |                        |                  |
| <i>Year 1, Spring</i> | 3      | ECS Theory II          | ECS 602          |
|                       | 3      | ECS Methods II         | ECS 604          |
|                       | 3      | ECS Policy Analysis II | ECS 606          |
|                       | 3      | ECS Decision Analysis  | ECS 607          |
|                       | 1      | Seminar                | ECS 608          |
| Total                 | 13     |                        |                  |
| <i>Year 2, Fall</i>   | 3      | Elective               |                  |
|                       | 3      | Elective               |                  |
|                       | 3      | Elective               |                  |
|                       | 3      | Elective               |                  |
| Total                 | 12     |                        |                  |
| <i>Year 2, Spring</i> | 3      | Elective               |                  |
|                       | 3      | Elective               |                  |
|                       | 3      | Elective               |                  |
|                       | 3      | Dissertation Research  | ECS 730          |
| Total                 | 12     |                        |                  |

Student should form a four-member dissertation committee by March and write and defend proposal by June of their second year in the program.

Other Semesters    10            Dissertation Research            ECS 730

Below is a proposed teaching schedule of these courses for the first three years of the program. No faculty member will serve as primary advisor for more than five students.

**Core Faculty Teaching Assignments 2009/10 (Sample)**

| Fall Semester – Year 1 (2009)           | Spring Semester – Year 1 (2010)          |
|---|--|
| ECS 601 – K. Broad & affiliated faculty | ECS 602 – K. Broad & affiliated faculty  |
| ECS 603 – R. Meyer & affiliated faculty | ECS 604 – D. Letson & affiliated faculty |
| ECS 605 – M. Doyle                      | ECS 606 – R. Williamson                  |
| ECS 607 – R. Meyer                      |  |

f. *Teaching*

*What kinds of teaching will prevail (i.e. clinical, classroom, independent research, seminar, etc.) and in what proportion?*

The core course, ECS 601-607, will be taught largely in the lecture/discussion format, with the seminar format and/or simulations used for proportions of specific courses where appropriate. Independent study or directed research courses will involve a student working one-on-one with a faculty advisor in directed readings and research.

g. *Indicate the potential distribution of PhD students among advisors.*

The proposed doctoral program intends to enroll three to four students per year and to have about twelve enrolled in the program at any one time. This program will be modeled on an advisor-student relationship, with each student working closely with the advisor in teaching and research. No faculty member will advise more than a handful of students at any one time.

h. *Describe any colloquia series, special seminar, or conferences, which will be held.*

Students will be involved in the planning and public meetings for several existing projects led by Abess Center faculty related to NSF Biocomplexity in the Environment grants, NIH funded Oceans and Human Health Center, EPA Science to Achieve Results program, and NSF Decision Making Under Uncertainty Program. In addition, the Abess Center regularly hosts conferences bringing together national and international experts in various environmental fields. Students will participate in the planning and hosting of these meetings, will help organize and lead discussions, and will work in conference follow-up projects, such as publishing proceedings.

4. *FACULTY*

a. *Include a complete vita for each member of the department who will participate in each program.*

Faculty directly involved in the Abess Center's graduate program will have earned an advanced graduate degree and continue to be active scholars. The Center's Graduate Studies Committee will consist of two students and five faculty members appointed by the Center's Faculty Advisory Committee, a majority of whom are also members of the University's Graduate Faculty. Criteria for admission to Graduate Faculty status will conform to policies established by the Graduate School of the University.

Below is a table of Abess Center faculty who are eligible to participate in the proposed doctoral program as teaching faculty, doctoral committee members, doctoral advisors, and student examination committees members (see Appendix D for faculty vitae).

**Abess Center Eligible Faculty Members**

| <i>Faculty Member</i> | <i>Field</i>            | <i>Terminal Degree</i> | <i>Rank</i>         |
|-----------------------|-------------------------|------------------------|---------------------|
| Traci Ardren          | Anthropology            | PhD                    | Associate Professor |
| John Beier            | Epidemiology            | ScD                    | Professor           |
| Kenneth Broad         | Anthropology            | PhD                    | Associate Professor |
| Otis Brown            | Physical Oceanography   | PhD                    | Professor           |
| Sanjeev Chatterjee    | Communication           | MFA                    | Professor           |
| George C. Cosner      | Math                    | PhD                    | Professor           |
| Jacqueline Dixon      | Geology                 | PhD                    | Professor           |
| Timothy Dixon         | Geology & Geophysics    | PhD                    | Professor           |
| Mary Doyle            | Law                     | LLB                    | Professor           |
| William Drennan       | Marine Physics          | PhD                    | Associate Professor |
| James Englehardt      | Engineering             | PhD                    | Professor           |
| Lora Fleming          | Epidemiology            | PhD                    | Professor           |
| Doug Fuller           | Geography               | PhD                    | Associate Professor |
| Denis Hector          | Architecture            | MS                     | Associate Professor |
| Gary Hitchcock        | Marine Biology          | PhD                    | Associate Professor |
| Theresa Hood          | Geology                 | PhD                    | Senior Lecturer     |
| David Letson          | Marine Affairs & Policy | PhD                    | Professor           |
| Joanna Lombard        | Architecture            | MA                     | Professor           |
| Gina Maranto          | English                 | MA                     | Senior Lecturer     |
| Robert Meyer          | Marketing               | PhD                    | Professor           |
| Donald Olson          | Physical Oceanography   | PhD                    | Professor           |
| Peter Swart           | Geology & Geophysics    | PhD                    | Professor           |
| John Van Leer         | Physical Oceanography   | PhD                    | Associate Professor |
| Richard Weisskoff     | Economics               | PhD                    | Professor           |
| Richard Williamson    | Law                     | JD                     | Professor           |

*b. Estimate the need for additional faculty.*

Because of the interdisciplinary nature of the Abess Center that is based on existing UM strengths, there already exists sufficient depth and breadth to begin the program. That said, there are gaps that need to be filled in hydrology/water resource management, decision sciences, environmental engineering, and several aspects of policy analysis. Hires for these positions are a priority for the Abess Center. In the interim, the program will rely on visiting faculty.

*c. Describe interaction with other graduate programs, i.e. extradepartmental thesis and dissertation committee.*

Interactions with faculty and graduate students in other departments, schools, and centers will broaden doctoral students' perspectives of their application of environmental science theory and research.

Graduate students in the Abess Center program will in many cases have linkages to one or more departments and centers at UM. This is a distinct advantage because they will benefit from interactions with diverse faculty and student colleagues. They will participate in seminar series and special events hosted by these departments and centers. In some instances they will be jointly supervised and have committee members from these departments and centers. This will have a direct bearing on the scope and quality of their dissertation research.

For example, specific linkages will be made with the following well-established centers at UM:

Institute for Theoretical and Mathematical Ecology (ITME). This Institute and associated graduate program integrate faculty and activities of the Departments of Mathematics, Biology, and Computer Science within the College of Arts and Sciences, and from the Rosenstiel School of Marine and Atmospheric Sciences. A major focus of ITME is bridging the intellectual divide between an empirical/field study approach to ecological issues and a more mathematical modeling oriented approach. While this focuses on science, there is a strong parallel to the Abess Center's blending of science and policy. So there is substantial resonance in basic aims, albeit at different scales. ITME also serves as a strong resource for the Abess Center on ecological issues (e.g., the ecology of infectious diseases), for while there is some overlap between the groups, it is far from total. Currently ITME faculty is teaching a graduate course on mathematical modeling in ecology. The course is cross-listed in both mathematics and biology and it is a major component of training students in theoretical and mathematical ecology. However, it is open to students more broadly. Currently there is at least one student from the College of Engineering enrolled in the course, and the course should be highly beneficial to many students who would enroll in the Abess Center graduate program.

The Sue and Leonard Miller Center for Contemporary Judaic Studies. This Center is engaged in outreach activities to explore issues and trends that have affected Jewish people over the last 100 years. The Center has programs in the Middle East that include several projects dealing with water, health and the environment. The director of the Center is seeking strong linkages with the Abess Center to further develop science to policy activities for the Jordan Valley.

Center for Latin American Studies. The Center for Latin American Studies and the masters degree program in Latin American Studies are both natural areas of linkage at the University. The Center has sponsored research on tourism and the environment in Latin America and coordinates the research of over 50 faculty members from multiple schools across the University. Abess Center advisory members Traci Ardren and Kenny Broad are also members of the Center for Latin American Studies advisory board and can help identify faculty affiliated with CLAS that could strengthen the Abess Center program. The degree program in Latin American Studies is developing a joint undergraduate degree in Environment and Society in Latin America with the faculty of the Abess Center.

Knight Center for International Media. The Knight Center for International Media is interested in bringing diverse perspectives to bear on "underreported issues of global significance." From its very inception, the Center has engaged in global issues relating to the environment. The Center, through its chairs in Cross-Cultural Communication and in Visual Journalism, could be involved in examining the role of media in shaping public perception and policy as also the communication processes in play in the course of cross-disciplinary projects undertaken by the Abess Center. There is already collaboration on research projects involving members of the Abess Center's advisory committee (on which the Communication's Vice Dean sits) and faculty in the School of Communication. A PhD program would enhance this interaction considerably.

From the start of the graduate program, our students will have the opportunity to become involved with these and other centers at UM. The impact will be three-fold. These centers will provide our students with unique opportunities and resources that will strengthen their overall experience at UM. Secondly, the involvement of our students in such programs will engage interested faculty in our Abess Center core activities and have an overall net effect of broadening and strengthening our program. Thirdly, the involvement of the centers will help our program identify and leverage further external support for our Abess Center training programs.

## 5. STUDENTS

- a. *Estimate the number of students in the program and the pool for which they will come.*

Potential students for the proposed graduate program are expected to come from a fairly large pool of national and international students who seek to enter environmental science doctoral programs each year. Competitive applicants will have experience in one of our six core theme areas, and an interest in interdisciplinary research training. Because this will be a highly competitive graduate program, our intention is to recruit and select top students from a broad pool of talented undergraduate and masters-trained students both from the U.S. and those trained at top foreign institutions. In many cases, these select students will have prior research and academic experience dealing with key environmental issues. The diversity of their experience will contribute significantly to our longer-term goals of achieving a high standard of academic excellence.

In the case of applications from foreign students, one of our selection criteria will be that the students are affiliated with an academic institution or international organization, so they will have reasonable prospects for employment once they finish the PhD program at UM and return to their home country. In some cases, their affiliated institutions will potentially be able to co-support their PhD programs.

b. *Describe requirement for admission to and retention in each degree.*

*Admission Requirements for PhD:*

- A completed bachelors or masters degree in an appropriate field from an accredited institution.
- A minimum overall undergraduate grade point average of 3.0 (on a scale of 4.0).
- A combined (verbal and quantitative) score of at least 1200 on the Graduate Record Exam.
- A score of at least 550 on the TOEFL for international students.
- Three current letters of recommendations.
- A 1000-word statement of academic and professional goals.

The Graduate Studies Committee and Director of Graduate Studies will decide on admission to the program.

*Retention in the program:*

Students who have been admitted to the program must maintain a minimum grade point average of 3.0 (on a 4.0 scale) in all graduate work. Any student who fails to maintain an overall quality average of 3.0 will be placed on academic probation and will be given one semester to bring the average to a minimum 3.0. A student on probation who fails to achieve a minimum overall 3.0 by the end of the probationary semester will be dismissed from the program.

PhD students must complete a minimum of 13 dissertation credits. Students may advance to candidacy after the dissertation committee has been appointed and the dissertation proposals accepted by the Center.

c. *Describe the need for and specific use of teaching assistants and research assistants. Include the number of each and stipend.*

At the present time, the Abess Center does not award assistantships. With the creation of the doctoral program, the Center anticipates creating assistantships for PhD students in the following categories:

*Research assistants (RAs):* Primary responsibilities are conducting research and/or assisting with research projects.

*Teaching assistants (TAs):* Primary responsibilities are teaching and/or assisting in an area of teaching.

*Fellow (FE)*: Primary responsibilities do not require any direct service to the University and are supported by internal/external fellowship support.

*Trainee (TR)*: Designated as such by specific federal guidelines that indicate a complex process wherein the trainee takes on increasingly independent role in the selection, conceptualization, and execution of research projects under the supervision of an experienced mentor.

The goal of the assistantships is to facilitate the development of students into teacher-scholars. Doctoral students beyond the first year will engage in a research program under their advisors that will lead to the presentation and publication of original research.

Each full-time assistantship will carry a tuition remission scholarship and an annual stipend of approximately \$25,000, subject to revision in future years.

## 6. ADMINISTRATION

- a. *Estimate the administrative increments imposed by this program, i.e.,*
1. *Need for administrative help*
  2. *Need for additional office equipment and supplies.*
  3. *Need for additional travel, publication, costs and other funds.*

The Abess Center needs additional administrative support, office equipment and supplies, travel funds and publication costs for the proposed program. The Center needs to hire a program administrator. The budget includes partial support for doctoral student travel of one trip per year to a national or international conference for the purpose of presenting original research.

- b. *Describe the arrangements for administration and for academic direction of the program as it pertains to the following:*
1. *The day-to-day administration of the program.*
  2. *The academic policy-making mechanisms used to implement the program, including criteria for membership in the faculty of the program.*

The Abess Center Faculty Advisory Committee will appoint a Director of Graduate Studies from current active Abess Center faculty members. The Director of Graduate Studies and one full-time staff member will handle day-to-day administration of the graduate program.

The Center will also form a Graduate Studies Committee from members of the Abess Center Faculty Advisory Committee and students, consisting of five members from the Advisory Committee and two students. The committee will meet on a regular basis and discuss all matters relevant to the Center's graduate programs. The Graduate Studies Committee will select students for the PhD program, subject to the approval of the Director of Graduate Studies. Subject to oversight by the Center's co-directors and its advisory committee, the Graduate Studies Committee will be responsible for setting academic policies for the programs. The selection of course work, the appointment of faculty mentors, and the assignment of faculty to examination and dissertation

committees will require approval of the Graduate Studies Committee and the Director of Graduate Studies.

*c. Governance & Evaluation*

In order to assure high quality of the program, a formal evaluation process for both student progress and overall program quality will be put in place from the start. Each student will have a primary advisor and thesis committee and will present progress to the Advisory Committee annually. Qualitative and quantitative measures that track both the progress and quality of the masters and PhD program will be developed. Appendix E provides greater detail on the methods to be used.



7. *BUDGET – Provide a 3-year projected budget commencing with the year the program gets under way. Each year’s budget should include all anticipated income (use current year tuition credit costs and projected overhead) and all anticipated incremental costs (new faculty with fringe, library additions, teaching assistantships, laboratory equipment, staff, travel funds, etc.)*

| <b>ABESS CENTER PhD PROGRAM COST</b>     | <b>FY 2010</b>   | <b>FY 2011</b>   | <b>FY 2012</b>   | <b>FY 2013</b>   | <b>FY2014</b>    |
|--|------------------|------------------|------------------|------------------|------------------|
|  |                  |                  |                  |                  |                  |
| <b>Ph.D. Student Stipends</b>            | (2 stdts.)       | (4 stdts.)       | (6 stdts.)       | (8 stdts.)       | (10 stdts.)      |
| University coverage (20%)                | \$10,000         | \$20,000         | \$30,000         | \$40,000         | \$50,000         |
| Abess coverage from Grants (80%)         | \$40,000         | \$80,000         | \$120,000        | \$160,000        | \$200,000        |
| <i>Total PhD Student Stipends</i>        | <b>\$50,000</b>  | <b>\$100,000</b> | <b>\$150,000</b> | <b>\$200,000</b> | <b>\$250,000</b> |
|  |                  |                  |                  |                  |                  |
| <b>Administrative Expenses</b>           |                  |                  |                  |                  |                  |
| Student Travel Funds                     | \$2,000          | \$4,000          | \$6,000          | \$8,000          | \$10,000         |
| Office Furniture, Supplies, Computers    | \$10,000         | \$5,000          | \$5,000          | \$5,000          | \$5,000          |
| Recruiting, Publications, Speakers, etc. | \$15,000         | \$10,000         | \$10,000         | \$10,000         | \$10,000         |
| Additional course costs                  | \$50,000         | \$50,000         | \$50,000         | \$50,000         | \$50,000         |
| <i>Total Administrative Expenses</i>     | <b>\$77,000</b>  | <b>\$69,000</b>  | <b>\$71,000</b>  | <b>\$73,000</b>  | <b>\$75,000</b>  |
|  |                  |                  |                  |                  |                  |
| <b>Total Program Cost</b>                | <b>\$127,000</b> | <b>\$169,000</b> | <b>\$221,000</b> | <b>\$273,000</b> | <b>\$325,000</b> |

*COMPARISONS – Compare the proposed program at the University of Miami with five high-quality established programs at comparable universities.*

The proposed interdisciplinary doctoral program compares favorably with other environmental doctoral programs, and, in addition, develops strong inter-departmental, inter-collegiate collaboration in the six identified thematic fields. It is comparable to other interdisciplinary PhD programs in terms of disciplinary integration, curricular structure and requirements, anticipated time to graduation, and integration of student financial aid in the form of research and teaching assistantships. Six established PhD programs at other universities are compared in detail to the proposed Abess Center PhD. The University of Florida and the University of South Florida are included here because they have recently initiated two strong, interdisciplinary PhD programs within our shared geographic region in central/southern Florida, and also feature locally/regionally relevant environmental themes. Indiana University, another state institution, offers a premier and long-established interdisciplinary PhD through its School for Public and Environmental Affairs. Finally, Stanford University, Yale University and Duke University (with three programs) are included as three private universities with highly rated doctorates in Environment and Resources, Forestry and Environmental Studies, and the Environment, respectively.

These eight programs at six universities span a range of approaches to the environmentally focused PhD, with respect to the diversity of their focal areas, programmatic flexibility, departmental/disciplinary integration, and locally/regionally relevant research-education. The proposed Abess Center PhD program builds both science and policy integration in a systematic manner, building on nationally and internationally recognized strengths at UM through its six diverse but well-defined focal themes. Furthermore, the program strongly develops research and training in locally relevant environmental topics, building strong opportunities for field-based analysis and training in curricular development as well as faculty and student research. In doing so, the proposed program aims for both flexibility and rigor through interdisciplinary theory and methods training in core and elective courses. The proposed program addresses an integrated natural-social science and science-policy approach to interdisciplinary environmental education that the other Florida-based PhD programs presented here do not address, and it also addresses regionally germane scientific and policy gaps not reflected in the non-Florida programs listed.

UNIVERSITY OF SOUTH FLORIDA (Departments of Geography and Environmental Science and Policy)  
 Focal themes: Economic, social, and planning issues in the urban environment;  
 Karst science and climate change; Natural/Technological hazards and health;  
 Ecology; Water resources and policy  
[http://www.cas.usf.edu/geography/geography\\_phd\\_info.pdf](http://www.cas.usf.edu/geography/geography_phd_info.pdf)

| Major(s)                                       | Coursework Requirements  | Coursework Time Frame | Qualifying Exam | Dissertation |
|--|--|-----------------------|-----------------|--------------|
| Geography and Environmental Science and Policy | <p><b>Overall:</b><br/>                     90 credit hours past the Bachelors degree or 60 past the Masters.</p> <p><b>Core:</b><br/>                     Seminar in natural environments<br/>                     Seminar in urban environments<br/>                     Doctoral dissertation preparation</p> <p><b>Area of emphasis:</b><br/>                     9 credit hours in one of program's 5 focal themes/areas noted above, selected by student and approved by committee</p> <p><b>Other:</b><br/>                     Additional 42 credit hours in electives, directed reading, independent study and dissertation</p> | Full-time: 2 years    | Written, oral   | Yes          |

UNIVERSITY OF FLORIDA (IGERT in Adaptive Management: Wise Use of Water, Wetlands and Watersheds)

<http://amw3igert.ufl.edu/index.shtml>

Focal themes: Strong integration of research and education as per NSF IGERT mandate, international research partners, and initiatives in (1) Comparative studies of fluxes of biotic and abiotic components of watersheds and wetlands, (2) Measuring and modeling of socioeconomic, political, legal, cultural and ecological variables that affect the sustainability of watersheds and wetlands, and (3) Developing engineering, natural resource management, and policy solutions for water resources protection, management and rehabilitation.

| Major(s)  | Coursework Requirements  | Coursework Time Frame | Qualifying Exam | Dissertation |
|---|--|-----------------------|-----------------|--------------|
| Adaptive Management: Wise Use of Water, Wetlands and Watersheds | <p><b><u>Overall:</u></b><br/>114 credit hours</p> <p><b><u>Core:</u></b><br/>Ecosystems of Florida (3 credits)<br/>Adaptive Management field and research methods (6 credits)<br/>Ecological and General Systems (3 credits)<br/>Adaptive Management: Watersheds (3 credits)<br/>People &amp; Politics: Water, wetlands and watersheds (3 credits)</p> <p><b><u>Ethics:</u></b><br/>Ethics and Adaptive Management seminar in the Fall and Spring semesters each year (8 credits total)</p> <p><b><u>Disciplinary Courses:</u></b><br/>Disciplinary training over 2 years (24 credits total)</p> <p><b><u>Research:</u></b><br/>Course-related, field and dissertation research (38 credit hours total)</p> <p><b><u>Teaching Experience:</u></b><br/>Supervised teaching in home discipline department in years 3-4 (14 credits total)</p> <p><b><u>Other:</u></b><br/>Summer program in adaptive management in year 2 (9 credits)</p> | Full-time: 2 years    | Written, oral   | Yes          |

INDIANA UNIVERSITY (School for Public and Environmental Affairs –  
 SPEA)

[http://www.iu.edu/~speaweb/academics/phd\\_degrees.php](http://www.iu.edu/~speaweb/academics/phd_degrees.php)

Focal themes: Global warming; Developing democracies; Harmful toxins;  
 Conservation; Nonprofits; Public affairs; Health

| Major(s)                     | Coursework Requirements   | Coursework Time Frame | Qualifying Exam  | Dissertation                           |
|------------------------------|---|-----------------------|------------------|--|
| PhD in Environmental Science | <p><b><u>Overall:</u></b><br/>                     90 credit hours in advanced study and research beyond the baccalaureate</p> <p><b><u>Principal field of study:</u></b><br/>                     Selected by student, approved by committee</p> <p><b><u>Breadth in environmental science:</u></b><br/>                     Minimum of 15 credit hours<br/>                     Selected by student, approved by committee</p> <p><b><u>Research methods:</u></b><br/>                     Selected by student, approved by committee</p> | Full-time: 2 years    | Written and oral | Yes, at least 30 research credit hours |

STANFORD UNIVERSITY (School of Earth Sciences)

<http://iper.stanford.edu/>

Focal themes: Interplay between physical and biological systems; Interplay between human and earth systems; Science-policy interface

| Major(s)                  | Coursework Requirements   | Coursework Time Frame | Qualifying Exam  | Dissertation |
|---------------------------|---|-----------------------|------------------|--------------|
| Environment and Resources | <p><b>Required:</b><br/>                     Environmental Forum Seminar, Research Design and Techniques for Data Collection and Analysis, Research Approaches for Environmental Problem Solving</p> <p><b>Tools and approaches:</b><br/>                     Selected by student, approved by committee</p> <p><b>Breadth requirement:</b><br/>                     In each of the following four areas: culture and institutions; economics and policy analysis; engineering and technology; and natural sciences</p> <p><b>Depth requirement:</b><br/>                     In at least two distinct fields of inquiry: Selected by student, approved by committee</p> <p><b>Other:</b><br/>                     Teaching requirement for minimum 1 quarter (TA or guest lecture)</p> | Full time: 8 quarters | Written and oral | Yes          |

YALE UNIVERSITY (School of Forestry & Environmental Studies)

<http://www.yale.edu/sisu/programs.html>

Focal themes: Ecology, ecosystems and biodiversity; Social ecology of conservation and development; Urban ecology and environmental design; Water science, policy and management; Forestry, forest science and the management of forests for conservation and development; Global change science and policy; Environmental health; Industrial environmental management; Policy, economics and law

| Major(s)                           | Coursework Requirements   | Coursework Time Frame | Qualifying Exam  | Dissertation |
|------------------------------------|---|-----------------------|------------------|--------------|
| Forestry and Environmental Studies | <p><b>Required:</b><br/>                     Doctoral student seminar</p> <p><b>Elective:</b><br/>                     Selected by student, approved by committee</p> <p><b>Other:</b><br/>                     Teacher training courses and workshops encouraged</p> | Full time: 2 years    | Written and oral | Yes          |

DUKE UNIVERSITY (Nicholas School of the Environment and Earth Sciences)

<http://www.nicholas.duke.edu/programs/doctoral/>

Focal themes: Physical and biological processes; Coupling of biophysical processes and human ecology; Governance

| Major(s)                          | Coursework Requirements  | Coursework Time Frame | Qualifying Exam | Dissertation |
|-----------------------------------|--|-----------------------|-----------------|--------------|
| Earth and Ocean Sciences          | <b>Required:</b><br>Fluid dynamics<br>Numeric modeling<br><b>Elective:</b><br>Selected by student, approved by committee | Full time: 2 years    | Oral            | Yes          |
| Marine Science and Conservation   | Selected by student, approved by committee   | Full time: 2 years    | Oral            | Yes          |
| Environmental Sciences and Policy | Selected by student, approved by committee   | Full time: 2 years    | Oral            | Yes          |



UNIVERSITY OF MIAMI (Abess Center for Ecosystem Science and Policy)  
 Focal themes: Urban Ecology; Global Public Health; Climate and Society;  
 Environment and the Media; Integrated Marine and Terrestrial Management;  
 Global Regulatory Regimes

| Major(s)   | Coursework Requirements  | Coursework Time Frame | Qualifying Exam  | Dissertation |
|--|--|-----------------------|------------------|--------------|
| Interdisciplinary Environmental Science and Policy | <p><b>Overall:</b><br/>                     90 credit hours in advanced study and research beyond the baccalaureate</p> <p><b>Core:</b><br/>                     ECS 601/602: Interdisciplinary Environmental Theory I &amp; II</p> <p><b>Research Methods:</b><br/>                     ECS 603/604: Interdisciplinary Research Methods I &amp; II</p> <p><b>Other Required Courses:</b><br/>                     ECS 605/606: Interdisciplinary Environmental Law and Policy Analysis I &amp; II<br/>                     ECS 607: Interdisciplinary Environmental Decision Making<br/>                     ECS 608: Environmental seminar series</p> <p><b>Electives:</b><br/>                     24 credits, selected by student, approved by committee</p> <p><b>Other:</b><br/>                     2 credit seminar, 13 credits for the dissertation</p> | Full-time: 2 years    | Written and oral | Yes          |

## Collection Development Statement Ecosystem Science & Policy

Suzanne K. Stemler  
[sstemler@miami.edu](mailto:sstemler@miami.edu)  
305-284-4053

### Purpose

The purpose of the collection is to support undergraduate instruction and research as well as faculty research.

### University of Miami Program

The mission of the Leonard and Jayne Abess Center for Ecosystem Science and Policy (CESP) is to create innovative, interdisciplinary initiatives that bridge the gap between science and environmental policy. The Center is the nexus for a new and flexible undergraduate program that gives students the opportunity to learn in a problem-solving context and gain substantial field experience.

The goal of the undergraduate program in Ecosystem Science and Policy (ECS) is to demonstrate the complex interconnectedness of all the elements of natural systems, to emphasize that environmental decisions must take into account potential ecosystem-wide effects to be truly effective, and to educate the next generation of environmental leaders. The ECS program provides students with a broad background in environmental issues from a variety of perspectives, along with in-depth education in an area of specialization. This preparation will give students both the theoretical background and technical skills to pursue an environmental career, including teaching and research as well as for careers in government and private industries concerned with the environment.

### Collection Guidelines

The primary holdings for environmental sciences are in the Library of Congress GE class however ecosystem science and policy is highly interdisciplinary in nature and may include LC classes of QA, QC, QD, QE, QH, QK, QR, SD, SF, SH, and SK as well as K – public health and environmental law.

## Languages

English is the primary language collected.

## Chronological Coverage

Emphasis is on current research, teaching, and developments.

## Geographical Coverage

Geographical coverage is concentrated on the United States, especially Florida and Southeastern United States, Central and South America and the Caribbean region.

## Types of Materials Collected

Monographs, serials, periodicals, electronic databases, electronic journals, and reference materials are collected. Festschriften, textbooks, dissertations, and conference materials are acquired on a selective basis; freshman-level textbooks are rarely purchased.

## Date of Publication

Emphasis is on current publications although retrospective purchasing may be needed to fill in collection gaps.

## Special Collections and Manuscripts

University of Miami special collections and manuscripts related to ecosystem science and policy include the papers of author and environmentalist Marjory Stoneman Douglas and botanist Walter Swingle as well as additional materials documenting the Everglades and Florida's natural environment.

## Other Resources Available

Interlibrary loan and document delivery services are available at no cost.

**Revision History:** Recorded 4/11/07

## Appendix B – ECS Core Course Descriptions

**Course Number(s):** ECS 601/602

**Title:** Interdisciplinary Environmental Theory (Parts I & II)

**Credits:** 6 (3 per semester)

This two-semester core course will be team taught by two faculty members and will include guest lectures by faculty from within and outside of UM who are actively involved with interdisciplinary environmental research. During the first semester, seminal works from relevant environmental and social science fields, including conservation biology, ecology, geography, economics, sociology, anthropology, philosophy, and more recent interdisciplinary approaches will be read, covered in lectures and critically discussed. Themes will include human ecology, historical ecology, landscape ecology, environmental law and ethics, perception of risk and uncertainty, vulnerability and adaptation, and environmental valuation. The second semester will focus on drawing on these concepts in the analysis of a variety of case studies that address the core CESP themes of Urban Ecology, Global Public Health, Climate and Society, Environment and the Media, Integrated Marine and Terrestrial Management, and Regulatory Regimes. Guest lectures by case study experts will be coordinated with the regular *Abess Center Interdisciplinary Environmental Seminar Series*. Student assignments will combine examinations, individual and group-based projects and presentations, and writing assignments.

**Course Number(s):** ECS 603/604

**Title:** Interdisciplinary Environmental Methods (Parts I & II)

**Credits:** 6 (3 per semester)

Part I: This course will explore how different methods of quantitative analysis in the natural and social science can contribute to environmental research, drawing from relevant fields in ecology, economics, geography, oceanography, physics, and mathematics. The course will provide students with the basic statistical (such as exploratory and graphical data analysis; regression, nonlinear modeling, and Bayesian statistics) and analytic and computation skills needed to address complex environmental problems. Using a case studies approach, the course will focus on improving students' ability to ask answerable questions and choose appropriate quantitative methods.

Part II: This course will explore how different methods of qualitative analysis in the social sciences can contribute to environmental research, drawing from relevant fields in geography, natural resources, anthropology, history, sociology and feminist political ecology. The course will introduce students to qualitative research design, methods for qualitative data collection (such as open-ended interviews, oral histories, focus groups, participant observation, archival research), and qualitative data analysis (including textual, visual/landscape and narrative analysis). A key focus will be on how qualitative and case study research can be used to analyze environmental concepts and perception, and improve our understanding of environmental processes. Additionally, survey research and fieldwork will be a central theme, as students enhance their research skills by conducting original qualitative research and presenting research reports. Finally, the course will also deal with questions of validity and authenticity of qualitative research, particularly in the context of collaborative, interdisciplinary environmental study.

**Course Number(s): ECS 605/606**

**Title: Interdisciplinary Environmental Law and Policy Analysis**

**Credits: 6 (3 per semester)**

How Governmental Institutions Make and Carry Out Environmental Law and Policy in the United State and around the World

This six-credit, two-semester course will analyze science-based environmental decision-making and policy implementation at the federal and state levels in the United States, offer comparative perspectives with other nations, and provide an introduction to international institutions that fashion and carry out environmental policy. Taught by an instructor with experience in environmental policy and politics, in the first semester the course will explore the American Constitutional foundations for legislative and executive action on the environment. Using case studies based on real-world situations, students will be exposed to the authorization, appropriations and over-sight functions of Congress and state legislatures; the role of the executive, federal and state, in initiating and implementing statutes by regulation and other means; and the role of negotiation, litigation, mediation and consensus-building in resolving disputes and advancing or thwarting environmental policy. Students will be asked to play the roles of key legislators, executive branch officials, judges and expert witnesses in working with the case studies and to write papers advocating their positions on controversial policy issues. The course will provide background in public choice and public opinion research. In the second semester, with an instructor versed in international law and politics, students will undertake comparative studies of environmental law and policy-making in civil, socialist, Islamist and other legal systems, focusing on differences and similarities in how specific challenges concerning pollution control and natural resource protection are treated in the various systems. The students will also study the major international entities and treaties with jurisdiction over multi-lateral environmental issues and, using case studies of conflicts between sovereign nations over common resource allocation, will play the roles of diplomat, advocate, arbitrator and judge in working through these real-world scenarios.

**Course Number(s): ECS 607**

**Title: Interdisciplinary Environmental Decision Making**

**Credits: 3**

This course will address different approaches to studying and interpreting human behavior related to a range of individual, group and firm level decision making. Students will be exposed to multidisciplinary theories and methods that are informing work in the decision sciences, including from the fields of psychology, business, economics, political science and anthropology. Topics will include Expected Utility, Prospect Theory, and Rank-Dependent Utility Theory, Constructive Preference, Utility Elicitation and Contingent Valuation, Confidence and Overconfidence in Judgments and Decisions, Motivation and Goals in Decision Making, Reason-based and Explanation-based Decision Making, Emotions in Decision Making, Individual and Cultural Differences in Decision Making, Intertemporal Resource Allocation, Benefit-Cost Analysis, Valuation of Environmental Good and Services, Adaptive Renewable and Non-Renewable Resource Management, and Risk Analysis.

**Course Number(s): ECS 608**

**Title: Environmental Seminar Series**

**Credits: 2 (1 per semester)**

This course will center on the research presented during the *Abess Center Interdisciplinary Environmental Seminar Series*. The lectures will focus on case studies that illustrate cutting edge human-environment research, and include both qualitative and quantitative methods. Students will read papers by these distinguished scholars and other relevant materials prior to their arrival and then meet with the speaker either before or after their public lecture to discuss the work in detail. Students will write a critical piece linked to each lecture.

### Appendix C – List of Elective Courses

| Department                               | Course Number | Title                                  | Credits |
|--|---------------|--|---------|
| Architecture                             | ARC501        | Architecture Design and Theory I       | 6       |
| Biology                                  | BIL520        | Evolution                              | 3       |
|  | BIL521        | Systematics                            | 3       |
|  | BIL523        | Adv. Biology of Marine Invertebrates   | 3       |
|  | BIL527        | Biology of Fungi                       | 3       |
|  | BIL531        | Advanced Field Ecology                 | 3       |
|  | BIL535        | Molecular Ecology with lab             | 3       |
|  | BIL533        | Adv. Conservation Biology              | 3       |
|  | BIL537        | Ecosystem Ecology                      | 3       |
|  | BIL541        | Laboratory and Field Ethology          | 3       |
|  | BIL590        | Bioinformatics                         | 3       |
|  | BIL630        | Population and Community Theory        | 3       |
| Communications                           | COM601        | Theories of Communication              | 3       |
| Civil, Architectural, Environmental Eng. | CAE531        | Surface-Water Hydrology                | 3       |
|  | CAE540        | Environmental Chemistry                | 3       |
|  | CAE581        | Energy-Efficient Building Design       | 3       |
|  | CAE632        | Water Treatment and System Design      | 3       |
|  | CAE530        | Water-Quality Control                  | 3       |
|  | CAE541        | Environmental Microbiology             | 3       |
|  | CAE542        | Solid and Hazardous Waste              | 3       |
| Economics                                | ECO510        | Mathematical Economics                 | 3       |
|  | ECO625        | Applied Econometrics                   | 3       |
|  | ECO680        | Essentials of Economics                | 2       |
| Epidemiology and Public Health           | EPH643        | Qualitative Research Methods           | 3       |
|  | EPH501        | Medical Biostatistics I                | 3       |
|  | EPH512        | Global Health                          | 3       |
|  | EPH521        | Fundamentals of Epidemiology           | 3       |
|  | EPH541        | Environmental Health                   | 3       |
|  | EPH603        | Statistical Methods in Epi I           | 3       |
|  | EPH622        | Epi and Control of Infectious Diseases | 3       |
|  | EPH502        | Medical Biostatistics II               | 3       |
|  | EPH605        | Statistical Methods in Epi II          | 3       |
|  | EPH642        | Survey Methods                         | 3       |
| Geography and Regional Studies           | GEG545        | Remote Sensing of the Env.             | 3       |
|  | GEG515        | Human Dimensions of Global Env Change  | 3       |
|  | GEG591        | Intermediate GIS                       | 3       |
|  | GEG545        | GIS and Env. Modeling                  | 3       |

|                                 |        |   |        |
|---------------------------------|--------|---|--------|
|                                 | GEG523 | Seminar in Urban Management                 | 3      |
|                                 | GEG552 | Seminar on the Geography of South Florida   | 3      |
|                                 | GEG672 | Environmental Monitoring and Assessment     | 3      |
|                                 | GEG681 | Advanced Spatial Statistics                 | 3      |
| Geology                         | GSC515 | Applied Env. Geology                        | 3      |
|                                 | GSC520 | Geology of Florida and the Caribbean        | 3      |
|                                 | GSC550 | Hydrology                                   | 3      |
|                                 | GSC556 | Complexity in Coastal Systems               | 3      |
|                                 | GSC570 | Cont. Structure and Tectonics               | 3      |
|                                 | GSC583 | Scanning Electron Microscopy                | 3      |
|                                 | GSC584 | Environmental Remote Sensing                | 3      |
|                                 | GSC580 | Field Geology                               | 3      |
| Law(all 600-level equivalent)   | LAW213 | Environmental Law                           | 3      |
|                                 | LAW344 | International Env. Law                      | 3      |
|                                 | LAW684 | Everglades/Ecosystem Restoration            | 3      |
|                                 | LAW303 | Coastal Law                                 | 3      |
|                                 | LAW253 | Natural Resources and Energy Law            | 3      |
|                                 | LAW568 | Marine Ecology and Law                      | 3      |
|                                 | LAW661 | Marine Pollution Seminar                    | 2      |
|                                 | LAW267 | Toxic Torts and Toxic Substance Regulation  | 3      |
|                                 | LAW200 | Administrative Law                          | 3 or 4 |
|                                 | LAW312 | International Law                           | 3      |
| Mathematics                     | MTH524 | Intro to Probability Theory                 | 3      |
|                                 | MTH525 | Intro to Mathematical Statistics            | 3      |
|                                 | MTH542 | Statistical Analysis                        | 3      |
|                                 | MTH625 | Multivariate Analysis                       | 3      |
| Political Science               | POL531 | Global Environmental Politics               | 3      |
|                                 | POL548 | Civic Participation and Democracy           | 3      |
|                                 | POL592 | International Political Economy             | 3      |
| Psychology                      | PSY600 | Issues in Prof. Development                 | 3      |
|                                 | PSY625 | Social Psychology                           | 3      |
|                                 | POL671 | Political Environment of Business           | 3      |
| RSMAS Marine Affairs and Policy | 501    | Political Ecology of Resource Mgt           | 3      |
|                                 | 502    | Economics of Natural Resources              | 3      |
|                                 | 505    | Fieldwork in Coastal Cultures               | 3      |
|                                 | 506    | Advanced Fieldwork in Coastal Cultures      | 3      |
|                                 | 510    | Env. Planning and the Env. Impact Statement | 3      |



|           |        |  |   |
|-----------|--------|--|---|
|           | 512    | Aquaculture Management I                         | 3 |
|           | 513    | Aquaculture Management II                        | 3 |
|           | 516    | Ocean Policy and Development                     | 3 |
|           | 517    | Aquaculture and Law                              | 3 |
|           | 518    | Coatal Zone Management                           | 3 |
|           | 519    | Aquaculture Management III                       | 3 |
|           | 520    | Environmental Law                                | 3 |
|           | 525    | Fisheries Socioeconomic and Mgt                  | 3 |
|           | 526    | Marine Cultural Resource Mgt                     | 3 |
|           | 530    | Port Operations and Policy                       | 3 |
|           | 570    | Conservation and Mgt of Large Marine Vertebrates | 3 |
|           | 610    | International Ocean Law                          | 3 |
|           | 620    | Coastal Law and Policy                           | 3 |
|           | RSM520 | Climate and Society                              | 3 |
|           | MPO503 | Intro to Physical Oceanography                   | 3 |
|           | MPO650 | Coastal Ocean Circulation                        | 3 |
|           | MPO551 | Intro to Atmospheric Science                     | 3 |
|           | MPO651 | Weather and Climate Systems                      | 3 |
|           | MPO610 | Physical Env and Marine Organisms                | 3 |
|           | MBF613 | Marine Population Dynamics                       | 3 |
|           | MBF518 | Ecology of Coral Reef Systems                    | 3 |
|           | MBF604 | Biological Oceanography                          | 3 |
|           | MGG513 | Introduction to Geochemistry                     | 3 |
|           | MGG525 | Applied Environmental Geophysics                 | 3 |
|           | MGG676 | Paleoclimatology                                 | 3 |
|           | RSM610 | Climate and Society                              | 3 |
| Sociology | SOC502 | Sociology of Science                             | 3 |
|           | SOC610 | Research Methods                                 | 3 |
|           | SOC613 | Qualitative Research Methods                     | 3 |



**Program Summary**

Program:

Program Web Link:

NRC Ranking /Year (if applicable)

Purpose:

Please rate the purpose of the program with respect to the following three:

|                            | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|----------------------------|-------------------|----------|---------|-------|----------------|
| ■ Revenue-enhancing        | 1                 | 2        | 3       | 4     | 5              |
| ■ Reputation-enhancing     | 1                 | 2        | 3       | 4     | 5              |
| ■ Faculty research support | 1                 | 2        | 3       | 4     | 5              |

Please rank the importance of the above three (1 to 3)

|  | Revenue-enhancing |      | Reputation-enhancing |      | Faculty research support |
|--|-------------------|------|----------------------|------|--------------------------|
|  | 2003              | 2004 | 2005                 | 2006 | 2007                     |
| No. of Degrees Granted                                     |                   |      |                      |      |                          |
| No. of Students Enrolled                                   |                   |      |                      |      |                          |
| No. of Applications  |                   |      |                      |      |                          |
| Avg. Time to Completion (in years)                         |                   |      |                      |      |                          |
| No. of Students Passing License or Certification Exams     |                   |      |                      |      |                          |
| Average Test Scores Entering the Program (GRE, GMAT, etc.) |                   |      |                      |      |                          |
| Average GPA Entering the Program                           |                   |      |                      |      |                          |
| No. of UM Fellowships                                      |                   |      |                      |      |                          |
| No. of RAs   |                   |      |                      |      |                          |
| No. of TRs   |                   |      |                      |      |                          |
| No. of GAs   |                   |      |                      |      |                          |
| No. of TAs   |                   |      |                      |      |                          |
| No. of Stipends/Waivers                                    |                   |      |                      |      |                          |
| Amount of Stipend  |                   |      |                      |      |                          |
| No. of Students Funded on Grants                           |                   |      |                      |      |                          |
| Placement for the past 5 years (Please attach report.)     |                   |      |                      |      |                          |



Thomas J. LeBlanc, Ph.D.  
Executive Vice President and Provost

MEMORANDUM

April 2, 2009

To: Steve Sapp  
Chair, Faculty Senate

From: Thomas J. LeBlanc, Ph.D. *TJL*  
Executive Vice President and Provost

Subject: Ph.D. in Environmental Science and Policy

I write to confirm that the Deans approved the Ph.D. in Environmental Science and Policy at the April 2nd meeting of the Academic Deans' Policy Council.

TL/em