

FLORIDA BOARD OF GOVERNORS

October 21, 2004

SUBJECT: Implementation Authorization for a Ph.D. in Geography and Environmental Science and Policy at the University of South Florida

PROPOSED BOARD ACTION

Consider implementation authorization for a Ph.D. in Geography and Environmental Science and Policy (CIP 45.0799) at the University of South Florida.

AUTHORITY FOR BOARD OF GOVERNORS ACTION

Article IX, Section 7 (d), Constitution of the State of Florida

BACKGROUND INFORMATION

The University of South Florida requests authorization to implement a Ph.D. in Geography and Environmental Science and Policy that will prepare scholars expected to generate new knowledge, pursue academic and research careers, and provide leadership committed to developing solutions in authentic geographical and environmental settings. The program is designed to integrate the strengths of the Departments of Geography and Environmental Science and Policy and is expected to be the first interdisciplinary program with a combined emphasis on both geography and environmental policy offered within the State University System. Specifically, it is intended for students who want to cross disciplinary boundaries and focus their research on pure and applied topics in geographical and environmental approaches to science and policy. There are other programs in the SUS with stand-alone geography and environmental science programs; however, none has integrated both disciplines into a single doctorate.

USF has provided data that demonstrate the need for more doctoral level graduates in Geography and Environmental Science & Policy, evidence of the anticipated demand, and a demonstration of program alignment with the University's Strategic Plan and Mission. Over the last few years, there has been a growing interest in the field of geography and its need to address complex problems and issues. USF believes this program will contribute to developing solutions towards improving societal and environmental dynamics both nationally and regionally, particularly in the South Florida region, as it has various opportunities for students to explore policy implications. Support for this program has been expressed by community partners and agencies, advisory boards, and an external consultant. Dr. Kavita Pandit, of the University of Georgia, was retained as a consultant to review the PhD proposal, and endorses the program's approval.

The USF Board of Trustees approved the proposal for the Ph.D. in Geography and Environmental Science & Policy at its January 23, 2004 meeting. If the Board of Governors approves the proposal, the University plans to implement the program in the spring of 2005.

Supporting Documentation Included:
Facilitators / Presenters:

Staff Analysis
Chancellor Austin / R. E. LeMon
USF Representatives

STAFF ANALYSIS
Proposed Ph.D. in Geography and Environmental Science and Policy
University of South Florida

Estimated Costs:

	Total	% & \$ Current	% & \$ New	% & \$ C&G	Cost per FTE	SUS 02-03 Average Costs
Year 1	\$177,372	100% \$177,372	0	0	\$25,339	\$25,844 for CIP 45
Year 5	\$428,903	78% \$334,365	0	22% 94,538	\$13,375	\$16,961 for CIP 03

NOTE: SUS Average Costs are calculated using the 2002-03 Expenditure Analysis.

Projected FTE and headcount are:

	Projected Headcount	Student FTE
First Year	10	7
Second Year	16	11
Third Year	21	15
Fourth Year	28	20
Fifth Year	34	25

On April 30, 2003, the Florida Board of Governors approved eight criteria, divided into the two categories of Readiness and Accountability, by which implementation authorization of new doctorates were to be assessed. The following is an analysis of the University's proposal based on further delineations of those eight criteria.

Evidence that the proposed program is listed in the current State University System Master Plan and/or that the goals of the proposed program relate to the institutional mission statement as contained in the Master Plan

The program is listed in the University's Master Plan as well as the 1998-2003 Strategic Plan. The proposed program is consistent with the University's mission to excel in research that advances knowledge and promotes social, cultural, economic, educational, and technological development. *Shaping Our Future*, a strategic planning document produced by USF faculty in 1992, identified environmental studies as one of ten areas for future academic growth. The proposed PhD in Geography and Environmental Science and Policy promises to move towards this goal by training graduate students to address environmental and geographical concerns that would improve the overall health of the local community. It will also allow faculty to engage in

research in areas of wetlands disruption, environmental pollutants, endangered species, changing marine ecology, and natural hazards.

The proposed program is also consistent with the mission to build university-community partnerships and collaborations as evidenced by partnerships with the Center for Urban Transportation and the Botanical Gardens.

Evidence of a relationship to specific institutional strengths

The program is designed to integrate the strengths of the Departments of Geography and Environmental Science and Policy. Each department currently offers undergraduate and master's degrees in Geography and Environmental Science and Policy respectively. Graduate certificates are also awarded in GIS and Environmental Management.

Evidence that planning for the proposed program has been a collaborative process involving academic units and offices of planning and budgeting at the institutional level, as well as external consultants, representatives of the community, etc.

Each department held a series of discussions to develop a curriculum that would fit the needs of the integrated program. Effort was made to become familiar with other programs offered in the SUS as well as a market analysis of jobs available in this field. Resources from USF and the Center for Urban Transportation will be utilized for the program as well as resources available from the Botanical Gardens that reside on campus.

Dr. Kavita Pandit of the University of Georgia has recently reviewed the proposal as an external reviewer and endorses its approval. Dr. Pandit provided a favorable report for implementation of the program and believes that this particular program will contribute greatly to the field. She noted in her report that this particular program has a focus on one of the most rapidly growing and exciting subfields in Geography. She says that there is also a growing interest in human-environment issues amongst incoming graduate students. Given this, she believes that the scope of this program is situated in a high demand area. Dr. Pandit further noted that this program will be particularly attractive and likely to draw students because of its partnership between faculty in Geography and Environmental Science. The explicit emphasis on policy further enhances the program, as policy issues are not always included in the forefront of a program and that a doctorate emphasizing the importance of policy is welcome in this discipline.

Evidence of an appropriate timetable of events leading to the implementation of the proposed program

The timetable of events provides sufficient detail to determine that major requirements for implementation will be addressed in a logical sequence. The request to add the program to the SUS Strategic Plan was done summer 2000; however it was delayed until summer 2002. The university received authorization from its Board of Trustees to submit the proposal to the Board of Governors in the spring of 2004. If approved by the BOG, the program will be implemented in the spring of 2005.

Evidence that progress has been made in implementing the recommendations from program reviews or accreditation activities in the discipline pertinent to the proposed program

Both departments underwent program reviews in the last two years. Some of the recommendations from the reviews have been met. However, the recommendations that may have an impact on the program that have not been met include increasing graduate stipends, computer support, and the additional hire of an instructor for the program. Increasing graduate stipends could make the program more competitive. Lack of sufficient faculty or institutions could affect course offerings. The department has received a verbal commitment from the College of Arts and Sciences that stipends will increase if the Board of Governors approves the program.

Dr. Pandit noted in her review that it would be more beneficial if the program could engage students at a more broad and philosophical level through the required coursework. USF has addressed this issue and agrees that such courses are an essential component in the training of PhD students. However, this training is already provided to students who complete the M.A. or M.S. curricula in Geography and Environmental Science and Policy respectively. The completion of these courses is an implicit requirement for the proposed PhD. For students entering the doctoral program with an M.S. degree from another institution, it is expected that they will have completed comparable coursework in their previous degree.

Dr. Pandit also noted that a doctoral program of this nature should require preliminary or comprehensive exams at certain points during the program. Such exams have been incorporated into the degree program and students will be admitted to candidacy only after successful completion of written comprehensive exams and the successful defense of a dissertation proposal. Completion of the degree will also require full completion and oral defense of a comprehensive dissertation.

The last recommendation from Dr. Pandit was to hire at least one or two senior faculty who are highly publicized and who may have also gained national or international reputations. The consultant felt that the current faculty are quite capable and bode well for the future of the program; however, the department has only two full professors on staff and a senior hire would bring expertise and recognition to the program. USF is in full agreement with this recommendation, and additional hires will be incorporated into the faculty recruitment plan for the new program if approved.

Evidence of an appropriate, sequenced, and fully described course of study; evidence of specific learning outcomes and industry driven competencies for any science and technology programs

The sequence of courses and learning outcomes are provided, along with a description for each course. The curriculum consists of 60 semester hours past the master's degree, or 90 hours past the bachelor's degree, and allows distinct concentration in Geography or Environmental Science and Policy. More specifically, the curriculum requires that students complete nine hours of core courses; nine hours in the area of emphasis (Economic, Social, and Planning Issues in the Urban Environment; Karst Science and Climate Change; Natural/Technological Hazards and Health; Landscape Ecology or Water Resources and Policy); 30 hours of electives; and 12 hours of dissertation research.

Within the core requirements, students are required to complete a three credit seminar in each area of natural and urban environments. The remaining three credit hours must be selected from an environmental doctoral dissertation preparation course or a dissertation preparation course with an emphasis on geography.

For the area of emphasis, students are expected to select an area from the following categories upon entry into the program: Economic, Social, and Planning Issues in the Urban Environment; Karst Science and Climate Change; Natural/Technological Hazards and Health; Landscape Ecology or Water Resources and Policy. They must then take nine credit hours in their chosen area of emphasis as designated by the graduate director or the student's major professor and committee. There are a wide variety of graduate courses in the five areas of emphasis available across several departments.

The remaining 42 hours consist of elective and dissertation credit. Students must complete 42 other hours in the form of elective, directed reading, independent study, or dissertation hours. The student's Advisory Committee will advise students on their selection of elective courses and thesis/project. It is likely that students will take graduate hours outside of the Department to support the elective requirements for the degree.

Upon completion of the program, graduates will be able to: engage in scholarly and policy-related research to advance geo-environmental science and policy frontiers as well as to enhance practical policy outcomes; assume positions of leadership in academia and/or policy environments to help resolve complex social and environmental problems; become skilled teacher/researchers and then become faculty members in graduate or undergraduate Geography and Environmental Science and Policy programs.

Evidence that, if appropriate, the bachelor's and master's degree programs associated with the program are accredited and that the institution anticipates seeking accreditation for the proposed program if available

Geography as a discipline does not go through an accreditation process.

Evidence that the proposed institution has analyzed the feasibility of providing all or a portion of the proposed program through distance learning technologies via its own technological capabilities as well as through collaboration with other universities

It is expected that the program will be delivered using traditional instruction primarily on the Tampa campus. It is anticipated that within two years of implementation, some of the instruction may be available via interactive television communications on other campuses.

Evidence that there is a critical mass of faculty available to initiate the program based on estimated enrollments

The program currently has fifteen faculty available and plans to hire four new faculty at the rate of one each year. Comparable faculty numbers were found at peer programs at Arizona State University, George Mason University, and the University of Wisconsin Milwaukee.

Evidence that the faculty in aggregate have the necessary experience and research activity to sustain the program

It is evident from the faculty vitae that experiences in research and directing both master's and doctoral level committees are varied among each department. A total of fifteen faculty members are currently available for instruction and the institution has plans to hire four new faculty as the program grows. Of the current faculty, each one has published articles in refereed and nonrefereed journals as well as authored books and chapters in their particular field of study. Furthermore, over half of the faculty have directed and chaired both master's and doctoral level theses. They have also conducted presentations at professional conferences and meetings related to their field of expertise.

Some examples of journals published in include *Journal of Environmental Science and Health, Cave and Karst Science, Professional Geographer, Energy, Waste Management, and Journal of the American Water Resources Association.*

Evidence that, if appropriate, there is a commitment to hire additional faculty in later years, based on estimated enrollments

The College of Arts and Sciences has agreed to hire at least four new faculty over the next five years. Comparisons were made with three peer programs outside of Florida (Arizona State University – Geography, George Mason – Environmental Science, and University of Wisconsin Milwaukee – Geography)

Evidence that library volumes and serials are sufficient to initiate the program

USF currently has an extensive list of serials and volumes related to Geography and Environmental Science and Policy. The University of South Florida library currently subscribes to more than 4000 subscription titles in the area of geography and environmental science and policy. Representative titles of these subscriptions include: *African Journal of Ecology; Energy; Environmental Management; Environmental Professional; Biodiversity Letters; Environmental Values; Physical Geography and Policy Studies Journal* to name a few.

Evidence that classroom, teaching laboratory, research laboratory, office, and any other type of space that is necessary for the proposed program is sufficient to initiate the program [Revision Made – SK 9/1/04]

The new Natural and Environmental Sciences building is currently under construction on the USF campus. The building will house both Geography and Environmental Science and Policy. New classrooms and teaching facilities will be housed in the new building. According to Ron Hanke, the construction of the new building will be completed December 2004 and ready for “useful” occupancy (teaching classes) in January 2005.

The Department of Geography currently controls 12 offices, a seminar room, a conference room, and two laboratories on the third and fourth floors of the social science building in addition to the Geographical Information Systems Laboratories. In addition, there is an Urban Soils and Sediments Laboratory in the newly renovated science building. All faculty members and staff situated on the Tampa campus have their own office while graduate student assistants are often required to share three to a room. Additionally, adjuncts and academic visitors must accommodate two.

The Geographical Information Systems (GIS) Laboratory was established in 1997 and occupies three rooms on the third floor of the Social Sciences building, with a cumulative

floor space of approximately 1500 square feet. This facility is used for research, especially funded projects in conjunction with the Florida Center for Research and Community Design in the USF School of Architecture. A number of graduate and undergraduate geographers are employed on the grants and this has been a productive relationship between the two units.

The weather station and meteorology laboratory is located on the fourth floor of the Social Sciences building. It consists of a full weather station along with ten computer links for data analysis and interpretation when operational. The demand from students for hands-on experience is high and the facility is utilized in a variety of courses. Furthermore, there are many requests for weather data from around campus, especially from faculty undertaking research in the Tampa Bay area.

An urban soils and sediments laboratory utilized for teaching and research is located on the fourth floor of the chemistry building. The laboratory is used for analysis of soils and sediments collected from polluted locations.

The Department of Environmental Science and Policy currently controls ten offices and a conference room. It also consistently uses one laboratory room in the old Chemistry building for teaching. All full time faculty members and staff situated on the Tampa campus have their own office. The Department also houses a program assistant and an office manager in their own offices. One room is used for supplies and another is used for student assistants. Graduate student assistants are required to share one room, while adjuncts and joint faculty share one office.

One other important aspect of the Department is the Botanical Gardens which is housed on campus. The garden maintains a living collection of over 3,000 taxa of plants and natural habitats that emphasize the rich botanical diversity of the area. With over 30,000 visitors annually, the USF Botanical Gardens serves as a portal for the public to the University of South Florida. It consists of approximately seven acres of developed gardens connected to an additional 6-9 acres of greenbelt area to the north on the southwest corner of the Tampa campus. The Botanical Gardens are an integral part of the ESP Department.

Evidence that necessary and sufficient equipment to initiate the program is available

Adequate resources for start up of the program have been provided and are sufficient for initial implementation. The GIS lab consists of 15 computers with 17 inch monitors. Each computer is equipped with a 12 inch tablet digitizer. This facility is used primarily for teaching GIS-based courses, although a few faculty members and graduate students occasionally undertake research in the laboratory. The research/project laboratory consists of 5 Pentium III computers with 20-inch monitors and 256 MB of RAM.

Each computer in the laboratory is also equipped with a large format (42"x60") digitizing table. The server room houses the main server for the facility, as well as output peripherals - a HP 2500 Color Thermal Inkjet printer, a HP 755CM large-format color plotter, and a HP Laserjet III printer. The server room also houses another computer which acts as a data server and as a server for the collaborative learning software used in techniques courses - FirstClass.

The whole GIS facility is network-wired with fast Ethernet and WindowsNT acts as the server operating system. The main application software used in the facility is the ESRI suite of GIS products - ARC/INFO 8 (all modules), ArcView (most extensions), AtlasGIS, PC ARC/Info, ArcCAD, as well as the statistical application software S-Plus. The facility also has standard office software and web browser capabilities on every computer.

Evidence that, if appropriate, fellowships, scholarships, and graduate assistantships are sufficient to initiate the program

A reasonable number of fellowships, scholarships and assistantships are available from each department. Geography has ten teaching assistants that assist with a variety of instructional efforts in the Department. Geography also receives access to University Graduate Fellowship funds every other year. ESP has five teaching assistants that teach the Environmental Science lab course. ESP also receives access to University Graduate Fellowship funds every other year. Average total annual allocation for assistantships is approximately \$120,000.

Evidence that, if appropriate, clinical and internship sites have been arranged

An internship is not required. However, the Florida Center for Research and Community Design and the Botanical Gardens on USF's campus both accept graduate interns.

Evidence that there is a need for more people to be educated in this program at this level

The proposal provides a convincing argument for the need for more people educated in geography and the environmental sciences by citing national, state and local data. There is only one university in Florida that offers a Ph.D. in Environmental Science. According to the *Environmental Business Journal*, employment opportunities in air and water quality management, solid and hazardous waste management, and related careers has grown at a rate of 16% between 1992 and 1996. According to the Bureau of Labor Statistics, this trend is expected to continue in the future with a growth rate of at least 10 – 20% through 2012 (Occupational Outlook Handbook, 2004-2005). There is also a local need for training students in this area. A survey administered by the university to the local community indicated that at least 90% of employers would give their employees flexible schedules to attend classes and 79% would provide the employees with some type of financial support.

Dr. Pandit also noted that the field of Geography has enjoyed a healthy growth over the past half century. This is evidenced by the number of job listings, degrees awarded, and memberships in the Association of American Geographers.

Evidence that the proposed program does not duplicate other SUS or independent college offerings or, otherwise, provides an adequate rationale for doing so

The proposed program will be unique because it includes an Environmental Science and Policy component and because it is the only program that will focus on urban geography, hazards, and technical aspects of the field including GIS and remote sensing. Since this program is a cross between disciplines, it does not precisely duplicate other programs. However, some aspects in the emphasis areas are similar to other programs offered in the SUS. Florida A&M University currently offers a doctoral degree in Environmental Science; and both the University of Florida and Florida State University have doctoral programs in Geography.

Evidence of reasonable estimates of student headcount and FTE who will major in the proposed program, and commitment to achieve a diverse student body

The proposal provides a budget that identifies the costs for the first and fifth years. Conservative FTE projections in the first year serve to drive up the cost per FTE. The first year cost per FTE is a bit high at \$25,339 which may be due to a projected initial enrollment of only ten students at seven FTE. Enrollment is expected to be 34 students and 25 FTE by year five, driving the costs down to \$13,375 in the fifth year. The average SUS cost per FTE for 2002-2003 for Renewable Natural Resources was approximately \$16,961 and \$25,844 for the Social Sciences, as calculated from the annual expenditure analysis.

The proposal includes a statement on how the university plans to ensure demographic diversity in its enrollments which was signed by the Equal Opportunity Officer.

Evidence of a budget for the program that is complete, reasonable, comparable to the budgets of similar programs at other SUS institutions, and reflective of the proposal's text

The proposed budget is complete, including information concerning the first five years of the program. During the first year, all of the monies for the program will come from the general revenue. By year five, the university anticipates receiving \$94,538 in contracts and grants to offset the costs of the program.

Evidence that, in the event that resources within the institution are redirected to support the new program, such a redirection will not have a negative impact on undergraduate education

The proposed program can be accommodated by existing faculty. Recent hires and requests for new hires have also been made. Therefore, redirection of resources should not have a negative impact on undergraduate education.

Evidence that the academic unit(s) associated with this new degree have been productive in teaching, research, and service

The proposal provides evidence that the academic units and faculty associated with the proposed program have been productive in teaching, research and service. Evidence is provided from the faculty vitae that they have done various scholarly publications, conducted extensive research, and taught classes specifically related to their discipline as well as served on campus and community-based committees.

Examples of book publications include: Urban sediment removal: *The science, policy, and management of street sweeping* by Brinkman and Tobin; *The ecology of plants* by Gurevitch, Scheiner, & Fox; *The philosophy of the young Kant: The precritical project* by Schonfeld; and *Natural hazards: Explanation and Integration* by Tobin.

Examples of funding agencies from which research grants have been obtained include: Hillsborough County Traffic Management Division; National Science Foundation; Florida Marine Research Institute; Southwest Florida Water Management District; U.S. Environmental Protection Agency; University of South Florida Research and Creative Scholarship Grants; and U.S. Geological Survey.

Examples of journals in which faculty have published refereed articles include: *Journal of Environmental Science and Health*; *Physical Geography*; *Conservation Biology*; *American Journal of Botany*; *Evolutionary Ecology*; *The African Journal of Ecology*; and *Earth Science Reviews*.

