FLORIDA BOARD OF GOVERNORS
November 18, 2004

SUBJECT: Implementation Authorization for a Ph.D. in Economics – Environmental and Natural Resource Economics at the University of Central Florida

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PROPOSED BOARD ACTION

Consider implementation authorization for a Ph.D. in Economics – Environmental and Natural Resource Economics (CIP 45.0601) at the University of Central Florida.

AUTHORITY FOR BOARD OF GOVERNORS ACTION

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

BACKGROUND INFORMATION

The proposed program will prepare graduates to successfully address Environmental and Natural Resource (ENR) issues vital to Florida as well as at the national and global levels. The program is consistent with the most recent UCF Economics five-year review that indicated the need and demand for a Ph.D. program that emphasized ENR economics. This program emphasis is not offered as a doctoral field of study elsewhere in the State.

The proposed program consists of 72 credit hours. The required core courses provide the conceptual foundation needed by all professional economists and will be heavily infused with problems, examples, and current issues drawn from ENR economics. All elective courses will emphasize topics that intersect with ENR economics. Students are expected to be mainly undergraduates with bachelor's degrees in economics, but the program will also draw from graduating seniors in other majors such as business, natural sciences, mathematics, and statistics. An average of eight of the best qualified students is expected to be enrolled each year and enrollment will stabilize at 24 students by the fourth year.

The University provides a convincing argument for the need for more doctoral graduates in Environmental and Natural Resource Economics, and evidence is presented in support of the anticipated demand. UCF expects that 80% of the doctoral graduates would be placed in research-oriented academic institutions as well as in research positions in the private sector and in federal and state ENR agencies. Strong support for this program has been expressed by community businesses, the National Marine Fisheries Service, and the Florida High Tech Corridor Council. Dr. Ronald Cummings, recently retired Professor of Economics specializing in Natural Resources and Environmental Policy Analysis and Director of the Environmental Policy Program at Georgia State University, was retained as a consultant to review the proposal, and strongly endorses its approval.

The UCF Board of Trustees approved the proposal for the Ph.D. in Economics – Environmental and Natural Resource Economics at its March 25, 2004 meeting. If the Board of Governors approves the proposal, the University plans to implement the program in the Fall of 2005.

Supporting Documentation Included: Staff Analysis

Facilitators / Presenters: Chancellor Austin / R. E. LeMon

UCF Representatives

STAFF ANALYSIS
Economics – Environmental and Natural Resource Economics
University of Central Florida

Estimated Costs:

	Total	% & $ Current	% & $ New	% & $ C&G	Cost per FTE	SUS 02-03 Average Costs
Year 1	$240,040	33% $79,040	67% $161,000	0%	$53,342.22	$28,845 for CIP 45
Year 5	$535,864	55% $291,912	23% $123,952	22% $120,000	$30,781.93	

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

Projected FTE and headcount are:

	Projected Headcount	Student FTE
First Year	8	4.50
Second Year	15	8.44
Third Year	20	11.26
Fourth Year	24	13.53
Fifth Year	24	13.51

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 was not included on the 1998-2003 SUS strategic plan list of programs for exploration. However, there is an emphasis inherent to the current Board of Governors strategic planning documents to increase economic growth in Florida, and one of the sectors targeted is includes environmental science. This emphasis was a key consideration in the planning and initiation of a Ph.D. in Environmental Natural Resource Economics. It will serve to focus attention on graduate education and research that will address the economic aspects of environmental issues in the state.

Evidence of a relationship to specific institutional strengths

The Economics Department recently hired faculty with strong research and publication records in ENR economics. The faculty has initiated linkages with other programs on the campus. The collaboration with the Institute for Simulation and Training (IST) is just one example of this collaboration. Two of the faculty hired specialize in experimental economics and modeling and

have joint appointments with IST, thus enhancing the collaboration in advanced computer simulation and visualization techniques. IST provides an opportunity to undertake controlled experimental research in the design of better decision-making tools for complex choice situation under risk and uncertainty. The collaboration between Economics and IST will provide the ENR doctoral students with experts in simulation and modeling as they develop their dissertation research. Another collaborative effort is with the Geospatial Analysis and Modeling of Environmental Systems (GAMES) Laboratory in the UCF Biology Department. The proposed program would facilitate graduate student and faculty research in GIS modeling and would complement the new Ph.D. program in Conservation Biology.

Two new initiatives undertaken by the Department of Economics – (1) the Institute for Economic Competitiveness and (2) the proposed Center for Environmental Research and Policy will help in research opportunities. Both initiatives have funding exceeding $1.3 million from extramural research contracts, endowments, and internal resources. The Institute for Economic Competitiveness focuses on local economic development issues and conducts research that focuses on the dynamics of metropolitan economies and especially Central Florida. The proposed Center for Environmental Research and Policy focuses on environmental and natural resource issues and will conduct research on environmental issues of local, state, and national interest. Department faculty already has research funding from other entities: National Science Foundation, U.S. Environmental Protection Agency, U.S. Department of Agriculture, NASA, etc.

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.

The Department selected Natural Resource Economics as its area of specialization in 1999. Since that time the Department has involved other departments in the planning process, submitted a White Paper for the Ph.D. in Economics, hired faculty with linkages to other departments, and engaged in consultations with the community. The draft proposal was sent to the College of Business Administration's Doctoral Program Review Committee and the University Graduate Council for approval. The University Board of Trustees approved the program in March 2004 and sent forward to the Board of Governors to be placed on the November 2004 agenda.

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

The timetable for approval and implementation addresses the key steps in the process up to enrollment of the first class of students. Sufficient time was built into the timetable to allow for the proposal's development and securing all approvals from the various governing entities.

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

Two reviews that included the economics program have been done over the past ten years. The first was the American Assembly of Collegiate Schools of Business accreditation review of the College of Business Administration that recommended (1) hiring additional faculty in business disciplines, (2) enhancing research productivity of the faculty, and (3) encouraging faculty involvement in extramurally funded research. The Economics Department benefited from the

hiring recommendation as the Department hired nine new economics faculty with interests in ENR economics. The second review was conducted on the Economics Department programs. Among the recommendations of the consultant were the following that pertain to the newly developed proposal on Environmental & Natural Resource Economics: (1) introduce a new Ph.D. program in economics that emphasizes environmental and natural resource economics; (2) Develop a functional center (to meet the needs of Orange County) in order to enhance economic research for the Central Florida region and beyond; (3) enhance the Applied Economics – M.A.A.E. program (revisions necessary for the Ph.D. program curriculum, since the first year of the program shares the existing M.A.A.E. core courses).

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 proposed program consists of 72 credit hours; 54 semester hours in coursework and 18 hours in dissertation credit. The required core courses provide the conceptual foundation needed by all professional economists and will be heavily infused with problems, examples, and current issues drawn from ENR economics. All elective courses will emphasize topics that intersect with ENR economics. Thus, training in ENR will be emphasized throughout the program.

The goal of the proposed doctoral program is to provide graduate education in economics with emphasis in ENR Economics, and to prepare students for research-oriented environmental careers in academe, business, and government. The program offers courses that provide a foundation in economic theory and econometrics and training in ENR economics and closely related areas as well as a strong research experience and opportunity for interdisciplinary work. Quality improvement guidelines will be in place to evaluate the success of the program by tracking students' achievements in the qualifying examinations, research work, and professional publications. UCF expects that 80% of the doctoral graduates would be placed in research-oriented academic institutions as well as in research positions in the private sector and in federal and state ENR agencies.

Dr. Ronald Cummings was retained as a consultant to review the proposal and noted that the proposed curriculum was designed to provide a balanced set of courses that prepared students in the basic intellectual "tools of the trade" - core coursework in economic theory and econometrics, and in the practical tools that focus on the applications of economic theory to policy issues related to the management of environmental and natural resources systems. He stated that the proposed curriculum was first-class as it is set out in the proposal.

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

There are no organizations that work with economics departments to accredit undergraduate or graduate programs. However, as part of the overall AACSB accreditation of the College of Business Administration the UCF B.S.B.A. and M.A.A.E. economics programs are accredited. The last AACSB accreditation review was 1997 and the next one will be 2007.

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

This program will be delivered by traditional classroom teaching methods on the main campus of the University of Central Florida. Students are expected to be full-time students in residence at the university. It is important for students to be on campus in order to take part in funded research projects and to take advantage of the interdisciplinary benefits of the program in terms of complementary courses and faculty expertise. There is an indication in the proposal that the university has taken into consideration that nontraditional delivery systems may be appropriate in the future once the doctoral program becomes established. This type of delivery is attractive to students who may be away from campus during some semesters.

Evidence that there is a critical mass of faculty available to initiate the program based on estimated enrollments
There are nine current faculty members that form the core responsible for teaching the new courses and supervising dissertations in the proposed Ph.D. program, augmented with 6 support faculty. Two new faculty members with expertise in econometrics, international trade/development, macroeconomics, and/or industrial organization will be hired in the fourth and fifth year of the program's implementation. The new faculty will add breadth and depth in both research and course offerings for students, as well as assisting with supervision of dissertations. All of the core and support faculty hold doctoral degrees in economics. The present specialty of four of the core faculty and three of the supporting faculty is Environmental and Natural Resource Economics.

Consultant Ronald Cummings stated that having the core and supporting faculty for the ENR program as outlined in the proposal would put UCF in a class of its own.

Evidence that the faculty in aggregate have the necessary experience and research activity to sustain the program
The core faculty research interests span the range of major issues in ENR economics. They publish regularly in leading journals and have mentored Ph.D. students at other universities (i.e. University of South Carolina, University of California, Davis, University of Florida). Participating faculty have also developed research ties with the National Science Foundation, the U.S. Environmental Protection Agency, the U.S. Department of Agriculture, the Sea Grant Program, the U.S. National Aeronautics and Space Administration (Kennedy Space Center), the U.S. National Marine Fisheries Service, the Florida Department of Environmental Protection, and the St. Johns River Management District. This has led to more than $1.3 million in current research funding to support students and to provide opportunities for department faculty to make an impact on the development of environmental policy at the national, state, and local levels.

Consultant Ronald Cummings stated that "the faculty involved with this proposed program are on a par with the outstanding programs of the past. The UCF faculty include several individuals whose work is well known to me, and who have well-established international reputations for excellence in ENR teaching and research."

Evidence that, if appropriate, there is a commitment to hire additional faculty in later years, based on estimated enrollments
Two new faculty will be added to the program, one in the fourth year and one in the fifth year.

Evidence that library volumes and serials are sufficient to initiate the program
There are approximately 5,000 monographs in the library's economics collection. Over three-

fifths of the volumes are in four subject headings: economics (27%), economic development (26%), international economic relations (13%), and environmental and natural resource economics (10%). The annual dollars allocated to Economics has fluctuated from year to year. The proposal states that a concerted effort will be made to enhance the collection in the ENR economics area using additional budgeted library resources. The Library has been responsive to faculty requests for increasing holdings. Both faculty and students have access to materials that support their research needs through the State University System Libraries on-line catalog and the inter-library loan program. The UCF Library subscribes to all of the major journals in ENR economics and closely allied areas.

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

The proposal states that adequate space is available for faculty, graduate student offices, classroom facilities, and laboratory experiments for the new programs. The classrooms needed for the program are currently available in the College of Business Administration buildings I and II. Economics faculty and graduate assistants recently moved into the College of Business Administration II building that opened in Fall 2003. A new research laboratory has been provided in the new building where experimental economics courses and research projects will be conducted. The proposed program does not require any new teaching laboratory.

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

No special equipment is needed for the program. Department funds will pay for new computers for the two new faculty hires. Doctoral students will have access to computers in their offices.

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

In 2002-03 academic year, the amount allocated to graduate assistants was $99,343. Fifteen graduate assistants were hired for each semester. The salary for a half-time graduate teaching assistant or graduate research assistant was $3,200 per semester. In addition, the graduate assistants received a partial tuition waiver granted by the University. Support for most of the graduate assistants came from E&G funds, and other graduate assistants were covered by contracts and grants. The proposal states that it is anticipated that the funds will increase as additional external contracts and grants are obtained through the Center for Environmental Policy and Research and the Institute for Economic Competitiveness. The Department of Economics is working closely with the new College Gifts Officer to seek additional sources of student scholarships. Special emphasis will be placed on using available resources to attract women, minorities, and persons with disabilities. Also under the heading "Graduate Student Support" the proposal indicated that support for graduate students would come from three sources: (1) Academic Affairs for the first three years, (2) E&G funds in College of Business Administration and the Department of Economics, and (3) contracts and grants.

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

An internship is not required.

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

Letters of support indicate that this degree program would be of significant benefit to the

planning and environmental industry, as well as providing advanced study in a field that addresses environmental and natural resource issues that affect Central Florida, the State of Florida and the Nation. The proposal provides evidence that there is a national shortage of Ph.D. ENR economists. In Florida, demand for Ph.D. economists and for Ph.D. ENR economists is projected to expand by about 20% over the period 2000-2010, according to data published by the Florida Agency for Workforce Innovation. The projections indicate that 19 Ph.D. economists will be need annually just to take postsecondary teaching positions that are expected to open in Florida community colleges, four-year colleges, and universities. Dr. Stephen G. Holiman, Chief, Fisheries Economics Office, National Marine Fisheries Service, Southeast Regional Office, NOAA advises that there is and will be a continuing need for graduates trained in natural resource economics.

Consultant Ronald Cummings stated that a critical shortage in well-trained ENR economists is unquestionable. He has heard similar expressions from agencies that he has recently worked with such as the United States Environmental Protection Agency, Fish and Wildlife, the United States Geological Survey, the Corps of Engineers, the Bureau of Reclamation, and the General Account Office (GAO). The GAO evaluates the use of public funds and the performance of federal programs, while also providing analytical, investigative and legal services in order to support Congress in its policy formulation and decision making processes. He noted in his report that he has also received many inquiries from colleagues in other universities regarding their search for qualified people in this area.

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

Other economic Ph.D. programs exist in Florida; however the proposed emphasis on ENR economics is unique because it is not offered elsewhere as a doctoral field of study in the state. Although there is a new 03.0204 CIP Code for Natural Resources Economics, the University chose to implement the program under the 45.0601 General Economics CIP Code. This decision was made in part because the program will be housed in the economics department, not environmental science or natural resources. It was also determined that the 03 CIP would not position the program to develop other areas of emphasis in economics as it matured.

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 enrollment estimates for the program are based on several factors. In year 1, eight students will enter the Ph.D. program and these are expected to have baccalaureate training in economics, but not graduate training. In fact, no graduate students will be allowed to transfer from master's degree programs into the Ph.D. program in it first year of implementation. This restriction is imposed so that courses planned for years 2-4 in the Ph.D. curriculum will not have to be offered in Year 1 of implementation (a cost saving and development strategy). Beginning in year 2, students enrolled in the M.A.A.E degree will be allowed to transfer into the Ph.D. program. There are currently 13 full-time students admitted to the M.A.A.E degree program for fall 2003 and a similar number of M.A.A.E. students are anticipated to enter the program in fall 2004. The Department expects to receive about 100 applications to the Ph.D. program each year. About 30 of these students will be offered admission and it is anticipated that about 8 students per year will enroll. The proposed program is expected to be smaller in size than other economics doctoral programs because of the tightly focused emphasis on ENR economics and the size of the faculty available to train doctoral students.

The proposed Ph.D. will place special emphasis on recruiting women, minorities, and persons with disabilities. The following strategies will be used to recruit a diverse population for the program. (1) Contact leading African-American and women's colleges and universities, (2) work closely with minority student offices in targeted universities, (3) announce the program in appropriate professional organizations of African-Americans, Hispanics, women and other minorities, (4) target minority students through faculty contacts at peer institutions and conferences, (5) monitor and report effect of pre-application screening on enrollments of minorities, disabled, and international students, (6) offer competitive multiyear graduate stipends to qualified students, (7) prepare grant proposals to foundations and agencies seeking funds in support of underrepresented groups (9) enhance mentoring programs to reduce inter-group retention rate disparities.

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
In the fifth year, support will come from the College of Business Administration, departmental funds, and contracts and grants. Also by the fifth year, the program will generate enrollment revenues estimated at $151,965. New faculty in the 4th and 5th year will be coming from new general revenue funds. The per FTE cost for year 1 is $53,342 and the cost per FTE for year 5 is $30,781. The 2002-2003 SUS average cost per FTE for the 45 CIP is $28,845.

Consultant Ronald Cummings noted that the proposed budget was not unreasonable. He stated it relied a bit heavily on grant research, but that such reliance appeared justified given the level of grant research that the faculty brought to the university.

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
No potential negative impacts on existing programs are expected from the implementation of this program. Existing faculty members are currently teaching eight of the twelve required doctoral course offerings as well as the master's electives. Doctoral teaching assistants will teach introductory economics. Teaching assistants will be mentored and supervised by regular faculty. The proposed Ph.D. will be coordinated with the Ph.D. in Business Administration. Currently, the Department of Economics offers six doctoral courses in this program. Three economics doctoral courses offered to the Business Ph.D. students may be taken as electives by economics doctoral students. The new program will not negatively impact the Business Ph.D. program, and is in fact expected to enhance the rigor of the economics offerings for business students.

Evidence that the academic unit(s) associated with this new degree have been productive in teaching, research, and service
Each faculty member is assigned to a track in the Faculty Workload Assignment Plan. The teaching load ranges from 30% time commitment (3 courses per academic year) in Track F to an 80% time commitment in Track A (8 courses per academic year). The research assignment varies accordingly from 10% time commitment to 50%. All faculty members have a 10% professional service commitment. Forty-two percent of the faculty taught 7 or 8 classes, while forty-six percent taught 3 or 4 courses. The teaching workloads will not change with the advent of the new Ph.D. program. With 31 faculty on the department teaching staff (including two administrators who do not teach full time) student credit hours taught per faculty member in

2002-03 were calculated at 1176.6 per year. Currently there are 114 undergraduate majors pursuing either the B.S.B.A. or B.A. degree and 62 students who have chosen to minor in economics, and 33 undergraduate economics degrees were conferred in 2002-03.

In 2003 the economics faculty (including ENR faculty) published 25 articles and collectively held research contracts exceeding $2.3 million. The project sponsors included the National Science Foundation, the U.S. Environmental Protection Agency, the U.S. Department of Agriculture, the Sea Grant Program, and the Florida Department of Environmental Protection. During the last five years current members of the Department have presented seminars at numerous U.S. and foreign universities and research institutes. The Department has been active in professional service. Members of the Department have served on USEPA panels, NSF, NIH and USEPA proposal review panels, and have been extensively involved in the peer review and publication process. The faculty also serves as members or chairs of key university and colleges committees (i.e. Undergraduate Program Review, Promotion and Tenure, Senate governance and search committees). Several economics faculty have received teaching, research, and service awards over the past few years.