

**BOARD OF GOVERNORS  
STATE UNIVERSITY SYSTEM OF FLORIDA  
NEW DOCTORAL DEGREE PROPOSAL STAFF ANALYSIS**

**Program:** Ph.D. in Geosciences  
**Institution:** Florida Atlantic University  
**Staffed By:** Danielle Duffourc

**CIP Code:** 40.0699  
**Proposed Implementation Date:** Fall 2008  
**Initial Review Date:** 4/25/08      **Last Update:** 10/06/08

**Estimated Costs:**

	Total	% & \$ Current Reallocated	% & \$ New Recurring	% & \$ New Non- Recurring	% & \$ C&G	Cost per FTE	SUS 06-07 Average Cost per FTE
Year 1	\$310,602	81% \$252,602	13% \$40,000	0% \$0	6% \$18,000	\$32,511	\$27,825 40 CIP
Year 5	\$1,134,698	26% \$292,602	28% \$316,128	5% \$60,718	41% \$465,250	\$18,341	

**Projected FTE and Headcount are:**

	Student Headcount	Student FTE
First Year	16	9
Second Year	31	18
Third Year	42	25
Fourth Year	51	31.5
Fifth Year	58	36.5

*On March 29, 2007, the Florida Board of Governors approved BOG Regulation 8.011, which sets forth criteria for implementation and authorization of new doctorates by the Board of Governors, as well as criteria for implementation and authorization of Bachelor's, Master's and Specialist degrees by Boards of Trustees. The following staff analysis is an assessment of how well the university meets BOG Accountability and Readiness criteria for implementation of this degree program.*

**Proposal Page Numbers:**

INTRODUCTION		ACCOUNTABILITY		READINESS				
Program Description	System Analysis	Overall	Budget	Mission and Strength	Program Quality	Curriculum	Faculty	Resources
1	4	7	18	26	33	34	46	51

## **A. Program Description:**

Florida Atlantic University (FAU) proposes to offer a Doctor of Philosophy (Ph.D.) in Geosciences. Geosciences is the study of the earth as a series of interrelated systems and processes. The proposed degree program will provide students with the opportunity to conduct advanced research and experience cross-disciplinary technical training.

The proposed doctorate will require 90 hours beyond the baccalaureate level or 60 hours beyond the master level, including dissertation credit. The curriculum includes course work in the geosciences as well as ecology and conservation biology, chemistry, anthropology and urban and regional planning. Areas of program emphasis include geographic information systems, remote sensing, geovisualization, geomatics, marine geology, geophysics, and coastal and environmental engineering.

The Department of Geosciences currently offers undergraduate and master's degrees in geography and geology. The goal of the Ph.D. in Geosciences is the production of highly trained individuals in advanced technology and field applications.

## **B. System-Level Analysis and Evaluation in accordance with BOG Regulation 8.011:**

This proposal states that the Ph.D. in Geosciences adheres to the State University System (SUS) strategic plan by providing access to and production of degrees, meeting statewide professional and workforce needs, building world-class academic programs and research capacity, meeting community needs and fulfilling unique institutional responsibilities. If implemented, this program would be unique within the SUS.

Need and demand presented in the proposal hinges on the need for more highly trained individuals in the geosciences by state and federal employers in the area, as well as other local agencies and environmental consulting firms. With regard to the need for geoscientists with doctoral-level training, the 2007 occupation projections published by the Florida Agency for Workforce Innovation classifies geoscientists, environmental scientists and hydrologists as professions that generally require a Bachelor's degree. Further, the U. S. Department of Labor states:

"A bachelor's degree is adequate for a few entry-level positions, but most geoscientists need a master's degree in geology or earth science. A master's degree is the preferred educational requirement for most entry-level research positions in private industry, Federal agencies, and State geological surveys. A Ph.D. is necessary for most high-level research and college teaching positions, but it may not be preferred for other jobs." (<http://www.bls.gov/oco/ocos288.htm>).

With regard to institutional strengths, FAU currently offers master's degrees in geography and geology. Faculty slated to implement this program are currently teaching in existing programs at the university. FAU is also located on the coast and has strong ties with local oceanographic research facilities. The university has consulted experts, both academics and practitioners, in the construction of this program leading to the development of a practitioner-based doctorate.

Such experts include Assistant State Geologist Jonathan Arthur and Professors Jerry Ingalls and John Bender from UNC-Charlotte. According to the UNC-Charlotte Web site, Professor Ingalls specializes in urban and political geography, while Professor Bender studies mid-ocean volcanic processes. The curriculum and research requirements for this doctorate seem to be consistent with the Ph.D. in Geosciences offered at the University of Texas at Dallas. Enrollment in FAU's existing geography and geology programs is as follows:

GEOGRAPHY	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Beginning Graduate	17	24	20	21	16	20	21	18	16	14
Lower-Division Undergraduate	2	1	8	3	7	3	5	3	3	3
Upper-Division Undergraduate	60	48	41	49	36	25	18	31	27	35
<b>Total</b>	<b>79</b>	<b>73</b>	<b>69</b>	<b>73</b>	<b>59</b>	<b>48</b>	<b>44</b>	<b>52</b>	<b>46</b>	<b>52</b>

GEOLOGY	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Beginning Graduate	20	17	16	15	12	16	18	15	15	11
Lower-Division Undergraduate	5	5	2	2	7	5	6	3	2	7
Upper-Division Undergraduate	34	38	38	34	28	17	25	28	27	31
<b>Total</b>	<b>59</b>	<b>60</b>	<b>56</b>	<b>51</b>	<b>47</b>	<b>38</b>	<b>49</b>	<b>46</b>	<b>44</b>	<b>49</b>

As evidenced in the above tables, enrollment is growing in the bachelor's degree programs in geography and geology as enrollment in the master's degree programs is dropping. This raises concerns about the ability of the proposed doctoral program to reach enrollment goals. For the 2007-08 school year, doctoral-level enrollment in SUS geology programs is as follows:

GEOLOGY	UF	FSU	USF	FIU
Full-Time Students	14	16	19	42
Part-Time Students	3	2	7	23
<b>Total</b>	<b>17</b>	<b>18</b>	<b>26</b>	<b>65</b>

Three of the four programs offered in the SUS have significantly lower enrollment numbers than FAU is projecting, and all of them have a significantly higher proportion of full-time students. The part-time/full-time dichotomy is an important one when considering that the Council of Graduate Schools (CGS) has recently taken up a Ph.D. completion initiative examining why some students move through doctoral programs rapidly while others languish for a decade or more. Part-time students are at a disadvantage in terms of the 10-year doctoral completion time frame referenced by the CGS. If these students are less likely to complete the program, the university's cost per degree is inflated.

FAU has emphasized in this proposal the importance placed on geosciences by the National Science Foundation (NSF) and the ability of the university to attract NSF grant money through the implementation of a Ph.D. in Geosciences. The NSF currently funds \$23.7M in Geosciences research in Florida. The only NSF funding in geosciences currently available to FAU is delivered through the Harbor Branch Oceanographic Institution. Of the \$1,134,698 expected in education and general (E&G) and contracts and grants (C&G) in year five, 41% (\$465,250) depends on the attainment of C&G funding, most of which would be NSF geosciences funding, and 28% (\$316,128) on new enrollment growth dollars. The 2000-01 program review for the

Department of Geography and Geology at FAU showed grant expenditures of \$295,000, and a ratio of external grants to state research funds of 2.02.

According to the proposal, it is expected that the quantity and consistency of funds (from C&G and enrollment growth) will expand as the program and research activities develop. If the department does not meet either enrollment or C&G goals, they are not likely to grow the program as expected. However, because faculty and staff salaries have been reallocated and remain fairly stable over the first five years, the program would be of relatively low cost to the state. Most of the needed resources appear to be in place regardless of additional funding attained.

### **C. Assessment of the University Review Process in accordance with BOG Regulation 8.011:**

*Due to the system of stair step accountability set in place by the Board of Governors in Regulation 8.011, it is now incumbent upon University Board of Trustees to verify that all doctoral programs coming before the Board of Governors have met the requirements of the regulation. The following is an assessment of the university review process to ensure that all criteria set forth have been considered by the university prior to submission to the Board of Governors office.*

#### **ACCOUNTABILITY**

*Check 'yes' or 'no' box, and make comments beneath criterion as appropriate.*

**1. Overall** - *The proposal is in the correct format, includes all necessary signatures, and contains complete and accurate tables for enrollment projections, faculty effort, and the proposed budget.*

YES NO

**The proposal has been approved by the university board of trustees and includes all required signatures.** The proposal was approved by the Florida Atlantic University Board of Trustees at their March 19, 2008 meeting. The proposal was signed by the department chair, the dean of the college, the associate provost for academic budgets, the associate provost for enrollment management, the dean of graduate studies, the president of the faculty senate, the provost and the president prior to Board of Trustees approval.

**The university has provided a proposal written in the standard SUS format which addresses new academic program approval criteria outlined in BOG Regulation 8.011.**

**The university has provided complete and accurate projected enrollment, faculty effort, and budget tables that are in alignment with each other.**

- The university has included a statement in the proposal signed by the equity officer as to how this proposal will meet the goals of the university's equity accountability plan.** The proposal was signed by Paula Behul, the Director of Equal Opportunity Programs on November 13, 2007.

*2. Budget – The proposal presents a complete and realistic budget for the program consistent with university and BOG policy, and shows that any redirection of funding will not have an unjustified negative impact on other needed programs.*

YES NO

- The University Board of Trustees has approved the most recent budget for this proposal.** The submitted budget was approved by the University Board of Trustees at the same time that the proposal was approved.

- The university has reviewed the budget for the program to ensure that it is complete and reasonable, and the budget appears in alignment with expenditures by similar programs at other SUS institutions.** The proposal shows that \$252,000 of the program's year 1 funding has been redirected from other departments. This leaves a \$40,000 new funding requirement.

- In the event that resources within the institution are redirected to support the new program, the university has identified this redirection and determined that it will not have a negative impact on undergraduate education, or the university has provided a reasonable explanation for any impact of this redirection.** The proposal shows that \$40,000 in assistantship funding will be redirected from the master's program to the doctorate in year one. The department expects that this redirection will lead to increased research grant funding, and increased research opportunities for master's students.

### READINESS

*Check 'yes' or 'no' box, and make comments beneath criterion as appropriate.*

*3. Program Quality – The proposal provides evidence that the university planning activities have been sufficient and responses to any recommendations to program reviews or accreditation activities in the discipline pertinent to the proposed program have been addressed.*

YES NO

- The university has followed a collaborative planning process for the proposed program in accordance with policies and procedures adopted by the University Board of Trustees.** The Ph.D. Planning committee met weekly to discuss this proposal, explored names for the degree, generated

community interest in the degree, and reviewed and selected criteria for doctoral faculty status and cognate faculty status. The geosciences faculty approved the curriculum, admissions requirements and degree requirements of the program. The Department of Geosciences approved the proposal and finalized the degree name. The Florida Atlantic University Board of Trustees approved the proposal for submission to the Board of Governors.

- An external consultant has reviewed the proposal and supports the department's capability of successfully implementing this new program.** The proposal was reviewed by Dr. Jerry Ingalls and Dr. John Bender from UNC-Charlotte, who state that the process used in establishing the Ph.D. is sound and the faculty are capable of implementing this program. At the time that this staff analysis was conducted, the program review was in the process of being finalized. Diane Alperin has been contacted and should send this report soon.
- The university has found the level of progress that the department has made in implementing the recommendations from program reviews or accreditation activities in the discipline pertinent to the proposed program to be satisfactory.** The proposal explains that the Department of Geography and Geology was reviewed in 2001. This review indicated that the department was doing well in teaching, research and service given its size. In 2004, the department became the Department of Geosciences and made major changes to the mission, goals and curriculum to tighten the focus and become more competitive in grant and research areas. There have been no reviews since this restructuring.
- The university has analyzed the feasibility of providing all or a portion of the proposed program through distance learning.** The proposal discusses the possibility of conducting courses which utilize connections with research entities out of state through distance learning. Courses will primarily be conducted face-to-face at the Boca Raton campus initially and at the Davie campus as the geosciences faculty grows.
- If necessary, the university has made allowances for licensure and legislative approval to be obtained in a timely manner.** This step is not necessary for the proposed program.

*4. Curriculum - The proposal provides evidence that the university has evaluated the proposed curriculum and found that it describes an appropriate and sequenced course of study, and that the university has evaluated the appropriateness of specialized accreditation for the program.*

YES NO

- The university has reviewed the curriculum and found that the course of study presented is appropriate to meet specific learning outcomes and industry driven competencies discussed in the proposal.** The department created a Geosciences Professional Advisory Board to address industry driven competencies through the fine tuning of the curriculum and the degree program in general. This board is composed of three professional geoscientists from the local area.
- The university anticipates seeking accreditation for the proposed doctoral program, or provides a reasonable explanation as to why accreditation is not being sought.** Accreditation will not be sought. The proposal states that there are several learned societies but no formal accreditation boards for degree programs in geography and geology.

*5. Faculty – The proposal provides evidence that the university is prepared to ensure a critical mass of faculty will be available to initiate the program based on estimated enrollments, and that faculty in the aggregate have the necessary experience and research activity to sustain a doctoral program.*

YES NO

- The university has reviewed the evidence provided and found that there is a critical mass of faculty available to initiate the program based on estimated enrollments.** There are 16 faculty in the geosciences department and 18 cognate faculty from anthropology, biological sciences, and urban and regional planning.
- The university has reviewed the evidence provided and found that the faculty in aggregate have the necessary experience and research activity to sustain the program.** The proposal reviews the credentials of all faculty and openly addresses that the only instructor with an M.A. will be the one teaching a 5000-level course in Geographic Information Systems.
- The university has reviewed the evidence provided and found the academic unit(s) associated with this new degree to be productive in teaching, research, and service.** The 2001 program review found the Department of Geography and Geology, which became the Department of Geosciences in 2004, to be productive in teaching, research, and service.
- If appropriate, the university has committed to hiring additional faculty in later years, based on estimated enrollments.** The proposal expresses a plan to add three additional geosciences faculty by year 5 of the program, but

states that these faculty are not necessary for program implementation.

**6. Resources** – *The proposal provides evidence that the university has ensured the available library volumes and serials; classroom, teaching laboratory, research laboratory, office space, equipment, clinical and internship sites, fellowships, scholarships, and graduate assistantships will be sufficient to initiate the program, and that if applicable, funding has been secured to make more resources available as students proceed through the program..*

YES NO

- The university has provided a signed statement from the Library Director verifying that the library volumes and serials available are sufficient to initiate the program.** The proposal provides journal and database listings, and an expectation that \$20,000 in new library resources will be needed in year five. The Library Director has signed the proposal as required by BOG Regulation 8.011.
- The university has ensured that the physical space necessary for the proposed program, including classrooms, laboratories and office space, is sufficient to initiate the program.** The proposal provides a list of all space currently available to the Department of Geosciences and the square footage of each space.
- The university has ensured that necessary equipment is available to initiate the program.** The proposal provides the inventory of all equipment currently available through various departments to implement the doctoral program, and demonstrates an expectation that \$175,000 in new equipment will be required by year five.
- The university has ensured that fellowships, scholarships, and graduate assistantships are sufficient to initiate the program.** The proposal converts existing half-time assistantships currently going to masters students to full-time scholarships for doctoral students at a cost of \$240,000 in year five. In addition, the department has worked with two coastal foundations to secure two \$1,000 scholarships.
- If applicable, the university has ensured that the department has arranged a suitable number of clinical and internship sites.** The proposal demonstrates longstanding ties to the community which enable student internships.