

**Florida Atlantic University
Department of Geosciences
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Review Team:

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THE EXTERNAL REVIEW PROCESS

This report on the FAU Department of Geosciences is based on a review of the material sent to the team (the Department's self-study document) and a site visit on February 23 and 24, 2015. The team of Dr. Craig Allan, Dr. Burrell Montz, and Dr. Michael Harris met with:

- Department faculty
- Russell Ivy, Interim Dean and Associate Provost
- Ingrid Johanson, Associate Dean,
- Evonne Rezler, Assistant Dean
- Camille Coley, Associate Vice President for Division of Research
- Ed Pratt, Dean of Undergraduate Studies
- Michele Hawkins, Associate Provost
- Susan Fulks, Associate Dean of the Graduate College
- Debra Szabo, Assistant Director of the Graduate College
- Charles Roberts, Associate Professor and Interim Chair of Geosciences
- Graduate and undergraduate students

The team was charged with advising the Department on how to advance to the "next level" and includes an assessment of the areas addressed in the self-study that the team believes will lead to the most improvement as well as a list of recommendations, in the form of an action plan that should be considered to move the program to that next level. In addition, the Department of Geosciences asked the Review Team to address six specific questions. Our responses to those questions and the recommendations stemming from them are best presented in the context to which they most specifically apply: the mission and goals of the department, the undergraduate program, the graduate program, and collaborations with other units and entities..

MISSION AND GOALS

According to the Self-Study document: *The Mission of the Department is to provide students with a high quality scientific education and expose them to professional practices and research centered on Earth Systems Science, Human-Environmental Interactions, and Geospatial Information Sciences. The Department aims for excellence in teaching, research and creative activity, and strives to service the university, local, regional, and global communities through its research, degree programs, certificates, course offerings, professional training, mentoring, outreach, and creativity.*

While it is recognized that mission statements are, of necessity, rather broad, they nonetheless provide a foundation for defining a way forward and guiding decision-making. As such, this statement reflects how the Department sees itself, but it requires that the faculty reflect on how the degrees, course requirements, and faculty interests align with the three areas that are defined as central to the Department. While the degree and certificate programs reflect two of the three areas: human-environmental interactions and geospatial information sciences, the degrees are very traditional geography and geology degrees. With the exception of the PhD in Geosciences the integration in an Earth Systems Science focus seems to be missing in the Department's degree programs. In fact, a geography student can earn a degree without taking a geology course, no geography courses are counted toward a BA geology degree and one GIS course is required for the BS in Geology (with one geography course as an option). Thus, the integration that is intended in a Department of Geosciences with the mission statement above is missing in the undergraduate and Masters degree programs. Specific recommendations are provided in each relevant section below, but the Review Team recommends that the Department focus on its mission statement to guide decisions on programmatic and curricular changes.

At the same time, the range of expertise and research interests in the Department reflect the mission statement very well, with the caveat that the loss of two human/social science geographers to administration has taken much of the human out of Human-Environmental Interactions. Even with this, faculty expertise in the Department is very focused on Earth Systems Science and Human-Environmental Interactions. This positions the Department very well to contribute to two of the three university themes identified in the Department's Self-Study: Marine and Coastal Issues and Contemporary Societal Challenges.

Recommendations in the sections below have direct application to the Mission Statement and once the Department decides the appropriate responses to those recommendations, the Mission Statement should be revisited.

UNDERGRADUATE PROGRAMS

The Department of Geosciences currently offers undergraduate degree programs leading to a B.A. or B.S. degree with a major and/or honors in either Geology or Geography. Minors in Geography, Geology and Geographic Information Science and a Certificate Program in Geography are also offered by the department.

Strengths (Current Programs)

Geology- The self-study data provided to the Review Team indicates that the Geology program is providing similar coursework as compared to their peer and aspirational Geology programs and these course offerings meet the criteria for coursework included in the National Association of the State Board of Geologists (ASBOG) Fundamentals of Geology (FG) examination. However, the committee has no information as to whether the frequency of current course offerings is sufficient for students to gain adequate coursework to meet the ASBOG requirement in a two or 4 year graduation cycle. The Department appears committed to providing a substantive field experience for its majors through its current junior (GLY4750) and senior field camp (GLY 4790) offerings. This coursework is soon to be supplemented by additional

coursework focusing on Coastal Geology and the Hydrogeology of south Florida. These substantive field-based educational experiences are an attractive aspect of the Geoscience program and the majors who met with the Review Team all commented that they loved this aspect of the program. Most students that the Review Team met with felt that the faculty were dedicated to their educational experience, made themselves available, and they appreciated their one on one interaction with them.

Geography- The data reported by the Department of Geosciences indicate that FAU's current geography program is relatively strong in GIS coursework but offers less course offerings in the areas of urban/social geography and to a lesser degree environmental coursework as compared to aspirational and peer institutions. An examination of the GIS coursework indicates that FAU students are receiving a well-rounded technical degree incorporating all the elements offered by similar undergraduate GIS programs. The environmentally focused Geography coursework complements the Geology program's course offerings, providing classes specifically related to the natural environment of south Florida. The commitment of the Department to move much of their Geography, and in particular their GIS, coursework to an on-line format is particularly striking. The Review Team was very impressed with the technical capabilities to both produce and support e-learning coursework housed within the Department of Geosciences. The Department appears to be in a position to deliver its Geography degree in an entirely on-line format in the near future. The ability to provide on-line coursework has greatly leveraged the Department's ability to offer the Geography degree program during a period of declining faculty numbers. The current interim Chair, Dr. Charles Roberts, reports that student satisfaction responses are in general very high for the on-line courses and typically exceed the scores for face-to-face classes. The Department also appears to have provided a layered in-person and on-line graduate student protocol to ensure course support well beyond that normally provided during face-to-face classroom meetings in conjunction with regular faculty office hours. Unfortunately, no Geography majors were available to meet with the Review Team.

Areas for Improvement (Current Programs)

Geology- The Review Team only has two years of enrollment data available to them in the current self-study: 2011-2012 and 2012-13 where 83 and 72 Geology majors were enrolled, respectively. Although Geology is a relatively small program in the College of Science at FAU, this is a respectable number of majors given the size of the Geology faculty (6) contributing to the program. Of future concern is the looming retirement of at least one senior Geologist in 2015 and, if not replaced, the ability of the Department to continue to offer a comprehensive Geology degree is jeopardized. It is not clear that the department could increase its number of majors without concurrent increases in tenure line faculty, particularly with its current model of program delivery. Graduation rates from the Geology BA and BS degree ranged from 3 to 18 students for the period 2008-2014. The self-study also reports that full time first time in college students should be able to graduate in four years and transfer students in two years. As reported by the Department, both classes of students typically persist much longer in the program with 47% of first time College students graduating by six years with 26% still registered in the program at that time. The self-study speculates that many of these students are part time, but no data is presented to support this contention. An examination of the student diversity statistics contained in the self-study reveals that the Department's Geology majors are relatively gender balanced with racial minorities underrepresented in comparison to the FAU student body as a whole.

A tour of the facilities in the Geosciences Department revealed that teaching classroom space was at a premium. The microscope teaching lab space appeared cramped and inadequate as did the storage space for the hydrogeology equipment. It is difficult to see how the Geology program could expand beyond its current numbers in its current instructional format given the currently available lab-teaching classroom space. Another limitation to the program brought to the attention of the Review Team was the lack of any institutional motor pool to support its extensive field offerings. Students and faculty lamented the fact that the logistics required to organize and carry out its current field program were difficult, owing to the lack of a university motor pool.

Geography- As with the BS Geology, the Review Team only has two years of enrollment data available to them in the current self-study: 2011-2012 and 2012-13 where 54 and 67 Geography majors were enrolled, respectively. Although Geography is also a relatively small program in the College of Science, this is a respectable number of majors for the size of the Geography faculty (5) contributing to the program. Both the Geography and Geology faculty contribute a significant number of FTEs owing to the Department's involvement in lower division IFP coursework and their participation in a variety of environmental coursework options. Of imminent concern to the program is the loss of two human/social science geographers to senior administration and the move of a senior GIS scientist to the position of department chair. In order to continue to offer the Geography degree, the Department has or is in the process of moving the majority of its degree program to an on-line only format. Without replacing these Geography faculty, it is unclear how long the Department could provide a viable Geography curriculum even via an on-line format. Graduation rates from the Geography BA and BS degree ranged from 6 to 23.5 students for the period 2008-2014. As for Geology, the self-study also reports that full time first time in college students should be able to graduate in four years and transfer students in two years. An examination of the student progression and graduation data reported by the Department indicate that very few first time College students enter the Geography program, and the Geography degree program is overwhelmingly populated with transfer students. The graduation and progression data for transfer students are similar to those reported for the Geology degree programs, a 49% graduation rate at four years with 33% of the students persisting in the program. An examination of the student diversity statistics contained in the self-study reveals a similar student makeup as the Geology degree programs.

Recommendations

Recommendations related to increasing the visibility of the Department of Geosciences programs to incoming majors

The lack of visibility is a common fact of life for Geography and Earth Science programs across the country. The Review Team believes that the goal of raising the visibility of the Geosciences Department to the public and university population and ultimately becoming more of a destination program for majors will require a multifaceted approach to be realized.

Marketing

The Department needs to come up with a common vision or theme around which they can coalesce and brand themselves. In reviewing the Department's self-study, meeting with faculty, administrators and students, it is very evident that this unit currently behaves as two distinct

units, Geography (now GIS dominated) and Geology, rather than a Department of Geosciences with a unified vision. To underscore this, all of the undergraduate Geology majors referenced the Department of “Geology” rather than the Department of Geosciences. The long term health of the Department of Geosciences is dependent upon its coming together to form a common curricular vision that will differentiate itself and be attractive to majors in the 21st century. It is the suggestion of the Review Team that the core mission of this unit should focus on examining the human environmental interactions related to the Everglades, urban and coastal marine continuum of south Florida. In reviewing the current curriculum offerings in the College of Science, it is hard to determine where an incoming undergraduate student would actually go to study the environment of south Florida at FAU, particularly at the undergraduate level. The Review Team believes that the Department should make every effort to capture and brand itself with the key words: “environmental science,” “environmental studies,” “social and environmental sustainability science,” and “human-environmental interactions” in their marketing and in particular their web presence. The regional dynamic of South Florida should also be emphasized. The department’s name “Geosciences” is also in some ways tricky to brand. This may be an acceptable moniker around which the Geology and Geography faculty can coalesce, but the Review Team wonders what this term actually means to an incoming undergraduate student. Finally, the Department’s web presence, although well organized and informative, is quite static aside from one NBC news clip. It is suggested that the Department consider producing and embedding more “testimonials” from students, alumni and key faculty as to why prospective students should consider FAU’s Geoscience programs. For the purpose of recruitment and reporting, the Department should collect job placement statistics on graduates, and if at all possible from majors who leave the program.

Undergraduate Curriculum

The Review Team believes that the Department should seriously consider the realignment of its undergraduate and graduate degree granting programs. Unless a significant number of new faculty lines are forthcoming, it does not seem that the traditional BA and BS Geography degrees are viable in the long term. Instead, the Review Team recommends developing hybrid BA and BS Geoscience degrees that focus on the mission statement of the department: human-environmental interactions, earth systems science and geospatial information science. The two prioritized position hires listed in the self-study related to sustainability science and coastal urban hazards and restoration would contribute significantly to the human-environmental aspects of a new curriculum. Owing to the requirements of the ASBOG FG test requirements and the Geology program’s relatively healthy enrollments, it is recommended that the BS Geology program continue, but the BA Geology program be discontinued due to declining enrollments. The Review Team also strongly suggests that future hires be made to strategically move the Department forward towards the themes listed in the unit’s mission statement rather than to a particular degree program. Whichever degree revisions are decided upon by the Department, it is strongly recommended that the Department revise its current standing committee structure and establish a single undergraduate curriculum committee for the entire department.

The Review Team was impressed with the level of commitment that the department expressed towards the field component of its various undergraduate programs. Likewise, the undergraduate and graduate students who met with the Review Team described their enthusiasm for the field experiences currently offered by the department. However, it is the observation of the Review

Team that the current field course offerings are largely dependent upon the efforts of one or two faculty members and are not sustainable in the long term unless new faculty lines in Geology are forthcoming and those new faculty are committed to a traditional Geology field experience model. The current model precludes the involvement of other faculty in the department whose expertise could provide students with more diversified field experiences that are tailored to the skillset required for the practicing environmental geoscientist in the south Florida job market. Our interactions with the graduate students that we met with underscored this point, where all expressed concerns for opportunities missed due to a program siloed within traditional Geology and Geography disciplines. The current Geology summer field camp also represents a significant time and monetary commitment on the part of Geology majors. Given the size of the department, it must come to some rationalization as to the need of a traditional summer field camp geared to mapping the geology of the western U.S. vs. the realities of the job market of southern Florida and which best serves the majority of its students.

An examination of the degree requirements for Geology programs in the Southeast reveals that most recommend and some do require a summer field camp experience for students pursuing a Professional Geology certification. However, there is no such requirement beyond 30 semester hours of core Geology coursework required from a certified Geology program to qualify for the new postgraduate Florida Geologist in Training certification or to qualify to take the exam in most other southeast states (NC, TN, GE, SC.) with only Alabama specifically requiring a 6 hour Field Geology experience in order to qualify to sit for the PG for that state. Currently the summer FAU field camp is offered every other year and is a requirement for students to graduate. In talking with students, it is evident that several Geology undergraduates have recently either attended the University of Florida's field camp or been held up for a year until they were able to attend the FAU field camp and graduate. It is the Review Team's view that the department should seriously consider making the summer field camp optional for its Geology majors and encourage students who are interested in the PG certification to participate in the summer field programs of other, larger in-state schools.

Receptor programs like Geography and Geology are very dependent upon recruiting majors from large section general education classes or special themed elective courses like the "Blue Planet" and "Human Environmental Interactions." The department is well underway to moving a significant portion of its undergraduate curriculum, particularly in the areas of Geography and GIS, to an online only format. Although the Department is to be commended for committing to developing a quality online course experience, the Review Team has questions as to whether online coursework can attract majors to the same degree as face-to-face instruction. A significant driver for this online move is due to an overstretched faculty and the need to offer graduate coursework for the newly added PhD program, the interdisciplinary Environmental Sciences MS degree and to provide time for faculty to pursue their individual research programs. The Review Team has concerns that too much of the Department's potential recruiting coursework is now fully online and will result in fewer majors choosing the Geology and Geography degrees. It is suggested that the Department strive to offer a more balanced mix of online, hybrid and face-to-face course offerings.

Undergraduate Advising

The Department should conduct an analysis to identify where their current majors come from. Are they primarily transfer students, or students who arrive as freshmen and then stumble into the program after taking one or two elective courses? To increase the Department's visibility to transfer students, the obvious approach is to formally develop articulation agreements with local community colleges to provide a pipeline of students into the FAU Geoscience program with the programs aligned enough for transfers to graduate in two years after arriving at FAU. A prime example would be Palm Beach State's Environmental Science and Technology program. It would seem that a desirable Community College/FAU partnership could also be constructed for the GIS program where none exists today. The Department should gather information about their majors who arrived as freshman at FAU. Did these students transfer from different programs (e.g. Engineering or Biology) or remain undeclared until declaring their major as Geology or Geography? If key departments can be identified as donor units, the Department of Geosciences should work with advisors of those units to increase the level of awareness of the opportunities in the Geosciences for potential majors. Finally, the Department should attempt to maximize its presence at university career days and during organized pre-enrollment university tours.

GRADUATE PROGRAMS

The current graduate degrees offered by the Geosciences Department include MA Geography and MS Geology degrees and a PhD in Geosciences.

Strengths of Current Programs

MS Geology - FAU's MS Geology curriculum compares quite favorably with in-state and out of state peer institutions. The program has similar degree requirements, includes thesis and non-thesis options and appears to be efficiently delivered; only six faculty support the program. Coursework delivered by the Geoscience faculty also contributes significantly to the interdisciplinary MS in Environmental Sciences degree program. Although no numbers were presented, the Department's self-study reports that its students actively present and participate in national and regional Geoscience professional meetings and contribute to publications in peer reviewed national and regional journals. The Review Team was only able to talk with one MS student during our visit, but that student was excited about her research and the interactions and direction that she was receiving from her advisory committee.

MA Geography - An examination of the MA curriculum reveals that the Department offers a well-balanced curriculum with a range of coursework offered in the key focus areas of Environmental, Geospatial Sciences and Human/Social Geography. Many of the MA programs of their peer institutions have only one focus area, Environmental or Human/Social Geography. The fact that FAU is able to offer a relatively comprehensive MA program with only seven faculty (three of them being part time owing to administrative appointments) as well as their undergraduate program is through their investment in on-line coursework. In addition to the Department offering a traditional thesis option, the Department offers a non-thesis option (as do their in-state peer institutions). This is likely an attractive option for part time and non-traditional students in the south Florida job market. As is the case with the MS program, no summary statistics related to student scholarship were presented in the Department's self-study report. The

report suggests that MA students actively present and participate in national and regional Geography professional meetings and contribute to publications in peer reviewed national and regional journals. The Review Team was only able to talk with one MA student during our visit but that student was also excited about her research project and pleased with her interactions with her advisory committee.

PhD Geosciences - The PhD in Geosciences is a relatively new program, admitting its first class of students in 2009. The PhD is a novel interdisciplinary, professionally oriented degree program combining the expertise of both the Geography and Geology faculty within the Department of Geosciences with coursework available in the areas of environmental science, ecology and conservation biology, ocean engineering, urban and regional planning, civil and geomatics engineering, chemistry and earth sciences. Doctoral students specialize in one of three areas of study: hydrology and water resources, urban development and sustainability and cultural and spatial ecology. The department reports a capacity of 19 full-time students on teaching assistantships. Research assistantships supported by grants and contracts are also available and are dependent upon the external grant writing success of faculty. An examination of the admissions and graduation data reveals a growing program with 27 PhD candidates currently enrolled, with seven of those students enrolled on a part time basis. The first graduations from the program (two) occurred in 2012 and four students graduated in both 2013 and 2014. An examination of the placement data reveals that graduates are competing successfully for both tenure track positions in academia and private sector employment.

Areas for Improvement (Current Programs)

MS Geology, MA Geography and PhD Geosciences - The graduation rates from 2009 to 2014 averaged just over four MS Geology students a year for that period and five students a year for the period 2001-2014. The graduation rates from 2009 to 2014 averaged just over three MA Geography students a year for that period and approximately 4.5 students a year for the period 2001-2014. The self-study reports that in recent years, the MA program has significantly downsized and MS Geology graduation rates have declined, owing to the Department's decision to redirect most existing TA resources to support the new PhD in Geosciences program. The self-study also reports that prior to the creation of the PhD in Geosciences, the Master's TA funding levels for both of the Department's Master's programs were not competitive with other in-state schools. The stipends are approximately one-half of nearby FIU's stipends and provide only partial tuition and fee waivers (80%) and no health insurance coverage, whereas 100% tuition and fees waivers and health insurance are covered by other in-state schools. As a result, both programs are now more than ever dependent upon part time students and TA funding is only sporadically available when surplus PhD TA support exists. The institutional decision to encourage a Masters "degree on the way" for its PhD students may improve the numbers on paper for both Masters degree programs but only masks the non-competitiveness of graduate student support for both programs in relation to other in-state programs. It is difficult to see how both programs can sustain themselves even in the short term if more students cannot be attracted into the programs.

Our discussion with graduate students from both Masters programs and two Geosciences PhD students revealed several commonalities and concerns. The students from the two Masters programs lamented the fact that there was very little interaction between the Geology and

Geography programs and that they felt that they were missing out in terms of coursework and faculty interactions that would enhance their graduate education. There was great concern about faculty who not been replaced when they moved to senior administrative positions and when faculty participated in research sabbatical leaves. In particular, students mentioned the human/social geography program, where two human/social geographers were currently serving in part time administrative assignments and a third was participating in a sabbatical research leave, leaving one human/social geographer to interact with. They also mentioned that, during the next academic year, two environmental/geology faculty will be participating in academic leaves, thus limiting their participation in the graduate program. More than one student expressed 1) the concern that not enough graduate courses were being offered each semester and 2) the desire for more interdisciplinary coursework. Multiple students also expressed the concern about creeping increases in on line coursework and that their current TA duties in support of these courses might not prepare them for teaching opportunities at other academic institutions.

All graduate students interviewed expressed concern over the lack of financial support offered by both Master's degree programs and to some degree the PhD program in relation to comparable in-state programs. Of particular concern was the lack of health care coverage and on-campus graduate student and spousal student housing which forced students into costly and time consuming commutes in order to locate in safe and affordable accommodations. In addition to this, three of the five graduate students interviewed by the review team stated that in order to carry out their thesis research they had been forced to take out significant unsubsidized personnel loans in order to support equipment needs and logistics for their individual research projects. It is the unanimous consensus of the Review Team that these financial shortcomings must be addressed by FAU's administration.

Recommendations

Program Alignment- The Review Team recommends that the Department consider merging the MA Geography and the MS Geology degrees into a single MS in Geosciences degree patterned after the PhD in Geosciences. The current Masters degree programs appear to be in decline even while FAU as a whole is expanding. This decline is in part related to the diversion of TA funding to the Geosciences PhD program, but the reduction of tenure line faculty support is also a contributing factor. A combined degree program would allow students to more easily fashion their program of study and research projects to take full advantage of the expertise of the faculty within the Geoscience Department. The combined degree should contain a concentration or track related to Geology, but the admission criteria for the program should not be so restrictive to require a Geology degree to enter the program. Currently, the Geology degree with a field cam requirement appears to limit prospective students who are well qualified to participate in the environmental consulting field in the south Florida job market.

The Geosciences Department currently contributes significant coursework and supervises students within the interdisciplinary Environmental Sciences MS, sees itself as a significant contributor to the proposed interdisciplinary MS degree in Coastal and Marine Science and is considering the creation of an MS in GISciences. The Review Team has some concerns that the sheer number of MS degree programs somewhat related to earth and environmental sciences and sustainability science is splintering the focus of the Geosciences Department and might be

confusing to prospective students. Healthier enrollment numbers and a more visible degree program might be realized by packaging these degree programs under an interdisciplinary MS Geosciences degree housed within the Geosciences Department. For the purpose of recruitment and reporting, the Department should collect scholarly productivity and job placement statistics on all graduates.

Graduate Student Support - A clear area of need is for the FAU administration to increase the level of graduate student support. This is identified in the Department's self-study and the Review Team found FAU's administrators were well aware of the problem. In addition to the well identified concerns related to TA stipends, tuition and fee waivers and health care, the Review Team found that the lack of affordable on-campus housing for graduate and married students and the lack of subsidized shuttle transportation between the Davie and Boca Raton campuses were of major concern to graduate students. Aside from increases in institutional funding, the Department should seek to supplement current TA funding with increased levels of external funding through faculty research grants and paid private/public sector internship opportunities.

COLLABORATION WITH OTHER FAU UNITS

Strengths/Opportunities

There is strong collaboration between the Department and other entities on campus. These interactions allow faculty to work with students from various departments, and they allow students to understand better what the Geosciences have to offer. Geosciences faculty contribute to the BS in Geomatics Engineering and the MS in Environmental Science. The extent to which students take advantage of the courses that the Department offers in these programs is not clear, but these relationships provide an opportunity for collaborative teaching and research, and for bringing additional students to the Geosciences. At the same time, there is a tension that can exist when Geoscience courses are seen solely as service courses for these programs and not as core courses. This is less a problem with the MS in Environmental Science where Department faculty are well represented on Program Committees.

The Department has a long history of collaboration with the Center for Environmental Studies, with the founding director being a member of the Department (now Professor Emeritus) and the new Director also having his personnel berth in the Department. This long-standing relationship continues to offer opportunities for collaborations, both with respect to courses and undergraduate research opportunities. The CES Director is proposing courses on various aspects of sustainability, which will be on-line courses, centered around a theme of sustainability science. The Department is well placed to both assist with these courses and to benefit from them.

There has also been increasing interaction among Department faculty and FAU's Harbor Branch Oceanographic Institute. In its strategic plan for 2012-2017, Harbor Branch included an initiative to strengthen relationships with other FAU sites. Geosciences faculty have taken advantage of what Harbor Branch offers, and more is planned. This facility, though centered on oceanographic research, provides opportunities for collaborations on coastal initiatives as well.

Department faculty have much to contribute in terms of both courses and research to the MS in Coastal and Marine Science that is due to be available in the next academic year. The Department's three focal areas, Earth Systems Science, Human-Environmental Interactions, and Geospatial Information Sciences, complement this degree program, and there are already graduate courses in the Department, in both Geography and Geology, that would fit very well within its curriculum.

Recommendations

Each of the collaborations described above provides opportunities for the Department, but it is important that taking advantage of them does not supplant other priorities and further stretch the faculty. Instead, efforts need to be made to build on these collaborations to insure that potential synergies can be gained that benefit all involved. This requires faculty to consider how the various collaborative opportunities can be used to benefit the Geosciences curriculum, both in the classroom and the field, as well as research opportunities for both students and faculty. It is recommended, therefore, that a core group of faculty across the sub-disciplinary areas in the Department evaluate the opportunities, benefits and costs of various existing and potential collaborations, in order to optimize departmental resource allocations (credit hours, faculty time, student engagement, etc.). As part of this, the Review Team recommends establishing more formal relationships with FAU's School of Urban and Regional Planning. Among other benefits, such a collaboration may provide a way forward to support the Department's mission to provide coursework and research opportunities in the area of Human Environmental interactions.

COLLABORATION AND OUTREACH OUTSIDE FAU

Strengths/Opportunities

Community engagement is listed as one of FAU's university wide goals but this was one area that received little attention in the self-study report for the Geosciences Department. In this section of the self-study report, significant participation in the Science Olympiad and three or four Geoscience sponsored or organized events each year (no details given) were listed. Increasing the level of the Department's community engagement provides a prime opportunity to raise the Department's visibility in the South Florida Region. A core mission of the unit focusing on examining the human environmental interactions related to the Everglades, and the urban and coastal marine continuum of south Florida would seem to position the Department well to increase its outreach and visibility in the region. Further, given that graduates of the Geosciences program appear to obtain a variety of positions in the private and public sectors, there is an opportunity to build on these relationships for greater outreach and visibility.

Recommendations

It is recommended that the department aggressively pursue formal internship opportunities for undergraduate and graduate students with a variety of firms and agencies. Although time consuming, the establishment of a formal internship program would serve as an important recruiting tool for the department and raise its profile in the region. Ultimately, a successful internship program should result in increased graduate placement success, a broader funding base of student support for both undergraduate and graduate students and increased research and contract opportunities. The Department of Geosciences website lists an advisory board of three

members, perhaps the board can be used to assist the Department in kick starting an internship initiative.

CONCLUSION

The Review Team believes that the Department of Geosciences has significant strengths that can be more fully realized by closer integration within the Department. The faculty are strong in all areas and greater collaboration in degree programs within the Department will allow students to benefit from the range of expertise available. There are many opportunities for faculty and students to benefit from a focus on regional environmental, coastal, and urban issues and stronger within department collaboration has the potential to lead to significant synergies, as well as to contribute to the Department's recognition in the region. There are numerous tangible (i.e., research opportunities, funded internships) and intangible (i.e., great name recognition) benefits to be gained from this. At the same time, only some of this can be gained from a fully on-line curriculum.

In order for the Department to meet its mission and to contribute to the goals of FAU, there is a pressing need to strengthen the human geography component with new hires. There are wonderful opportunities for both teaching and research that focuses on human-environmental interactions, but human geography faculty numbers have been decimated in recent years. Emphasis must be on this in much needed up-coming hires.

LIST OF RECOMMENDATIONS

This list includes specific recommendations described in greater detail above. We encourage faculty and administrators to review these recommendations in light of the greater descriptive detail offered in the body of the report. The following action items are those that the Review Team recommends that the Department of Geosciences and FAU consider in order to move the Department to the next level and maximize the considerable potential within this unit.

1. The Department must develop a common vision or theme around which the faculty can coalesce and brand themselves that forms a common curricular vision that will differentiate itself and be attractive to majors in the 21st century.
2. The Department should try to capture and brand itself with the key words: "environmental science," "environmental studies," "social and environmental sustainability science," and "human-environmental interactions" in their marketing
3. Current Faculty shortages in the Geosciences Department need to be addressed by FAU's administration. The Department should focus on and prioritize new faculty hires to take advantage of the teaching and research opportunities associated with human environmental interactions related to the Everglades, and the urban and coastal marine continuum of south Florida.
4. The Department should consider the realignment of its undergraduate and graduate degree granting programs by developing hybrid BA and BS Geoscience degrees that focus on the mission statement of the department. It is recommended the continue the BS Geology program but discontinue the BA Geology program
5. The review team strongly recommends that the Department revise its current standing committee structure and establish a single undergraduate and graduate curriculum committee for the entire department

6. The Review team recommends that the Department make the summer field camp optional for its Geology majors but encourage their participation in other in-state field camp opportunities for students with career aspirations requiring the field camp experience.
7. The Department should strive to offer a more balanced mix of online, hybrid and face-to-face course offerings, particularly in its GIS and Geography coursework options while considering which Geology and Earth Science course offering could be best served by moving to an on line format.
8. At the graduate level the Department should consider merging the MA Geography and the MS Geology degrees into a single MS in Geosciences degree patterned after the PhD in Geosciences.
9. In order to raise the Department's profile and broaden and supplement the financial support for both undergraduate and graduate students, the Review Team recommends that the Department aggressively pursue formal internship opportunities for students with a variety of private and public sector firms and agencies
10. The Department should try to make its web presence less static and include testimonials from students, alumni and key faculty as to why prospective students should consider FAU's Geoscience programs
11. The Department should collect job placement and scholarly productivity statistics on graduates in both undergraduate and graduate programs for use in recruiting and reporting purposes
12. The Department should identify where the current majors come from to focus recruitment efforts in these areas and also collect information as to why some students persist and fail to complete their degree programs.
13. The Department should pursue formal articulation agreements with local community colleges to provide a seamless pipeline for transfer students wishing to pursue BA and BS degrees in the Department of Geosciences.
14. The Geosciences Department needs to seriously evaluate the opportunities, benefits and costs of various existing and potential collaborations within FAU, in order to optimize departmental resource allocations
15. The Department should consider establishing more formal relationships with FAU's School of Urban and Regional Planning and working with that unit to advance the Human-Interactions component of the Department's mission statement.