COLUMBUS STATE UNIVERSITY

REVIEW OF ENVIRONMENTAL SCIENCE PROGRAM

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REVIEW TEAM:

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EXECUTIVE SUMMARY

Columbus State University's Master of Science in Environmental Science (ENVS) program provides a two-year curriculum that offers advanced training, education and research opportunities to post-baccalaureate science students through evening and weekend classes in Biology, Chemistry, Ecology, and Geology and Anthropology, in both thesis and non-thesis degree tracks. Graduates have found employment as environmental professionals in local, state, and federal environmental resource agencies; in the private sector as environmental consultants; or enter doctoral programs in environmental science or related fields at other universities.

A periodic review of the ENVS program was conducted on January 14, 2011 during a one-day site visit to Columbus State University by a three-person review team. The team consisted of Dr. B. Graeme Lockaby, Associate Dean for Research at Auburn University; Dr. Rob McDowell, Director of the Environmental Policy Program in the UGA Carl Vinson Institute of Government; and Mr. Hugh Westbury, CIV US Army IMCOM, Fort Benning, GA. The review team met with ENVS faculty members Roger Brown, Warren Church, Troy Keller, and William Frazier. Dr. Frazier is the Acting Director of the ENVS Program. The review team also met privately with a group of eleven students, Dr. David Laroue, Dean of the College of Letters and Sciences, and other faculty during a tour of the facilities in the Chemistry, Biology, and Geology and Anthropology Departments. In late December 2010, the review team each received a copy of the "2010-2011 ENVS Comprehensive Program Review Self Study".

During the site visit, the review team gathered information on faculty and student opinions and attitudes; the quality and amount of office, lab, and classroom space; the organization and operation of the ENVS program and its role within the University; the relationship of the Department with the surrounding community; and the relationship between students and faculty. Basic departmental information such as the number of students, graduation and retention rates, faculty qualifications, etc. was provided by the ENVS Program Self Study document. At the end of the site visit, the review team reviewed their experience and notes, and agreed to develop a report based on their findings and the Self Study report. This document reflects those findings and is accompanied by a "Comprehensive Program Review Evaluation" on a form provided by the ENVS program.

The review team was generally very impressed with the Program, the students, faculty, and facilities. The breadth and appropriateness of the curriculum, enthusiasm of the students, and enthusiasm of the faculty stood out significantly. Most categories listed on the Comprehensive Program Review Evaluation received scores of "very strong" or "above average". Problems and concerns that were identified, and which could threaten the quality, productivity, and viability of the program were identified as well. These problem areas were principally in the areas of teaching load, gradate stipend, organizational structure, space, and a low profile for the ENVS Program. Recommendations for improvement in these areas have been provided by the review team and are included in this report.

Assessment of Quality

Teaching

A number of attributes of the ENVS program are conducive to high quality education. These include well qualified and highly motivated faculty, small class sizes, the availability of a diverse range of expertise and resources within the scope of environmental science, and opportunities for cross – disciplinary fertilization through the Colloquia Series.

The Committee was impressed with the seriousness of commitment, enthusiasm, and quality of the faculty associated with the program. They are uniformly eager to work with their students, including in their spare time, and are open to innovative approaches to teaching. Furthermore, many of the faculty have outstanding records of service and teaching, including a number of them who have received university and professional awards for teaching and faculty service.

Both students and faculty mentioned small class sizes as an advantage and strong mechanism for effective teaching. The opportunities for one-on-one and small group discussions abound and are clearly utilized to the fullest extent. Although faculty numbers are small, the existence of the ENVS program at the juncture of several departments enables the breadth of expertise to be outstanding.

Recommendations for improving program quality

Building upon the current seminar series, an ENVS Lecture Series could be developed to include a wider array of nationally and internationally prominent speakers. This would afford students rare opportunities in a small group setting to interact with prominent scientists and educators who otherwise might be difficult to approach at larger venues. This idea would require additional funding that might be derived from endowment sources.

A significant challenge facing the ENVS Program is the limited amount of dedicated laboratory space and equipment. Many, if not most, of the labs are under the management of individual academic departments and are thus constantly in use for classes in those departments. The review committee was impressed with the high quality of the lab space, lab samples, and analytical equipment present, but was equally struck by its limited availability to the ENVS program. Considering the importance of lab work and experience to the environmental profession, expanding the availability of lab space for the ENVS Program should be a priority. For example, some space in the Lenoir Annex is currently being used for storage, and could be converted to lab space or graduate student offices and cubicles.

In addition, educational opportunities would be enhanced if travel funds were available to send graduate students to regional, national, and perhaps even international scientific conferences.

The motivation and inspiration that might be afforded by such exposure would yield many benefits to the students involved and to the success of the ENVS program. As is the case with the Lecture Series, these funds might be an appropriate goal for a highly targeted development effort.

The Review Committee agrees with the ENVS goal of entering into association with the Gulf Coast section of the Cooperative Ecosystem Studies Units (CESU). This association would be consistent with the program's cross-disciplinary research, and its desire to collaborate with other universities.

Assessment of Productivity

Program productivity was assessed in terms of standard academic metrics such as enrollment, number of degrees awarded, retention rates, learning indicators, graduation rates, and cost effectiveness.

Enrollment

Records indicate that enrollment trends are very positive as evidenced by a doubling of graduate students in 2008 as the non-thesis option was introduced. Since 2005, there has been a 167% rise in enrollment and, if a professional tract is developed as planned, this trend will likely continue and expand. Given current trends in natural resources issues and management, environmental science degrees will remain highly attractive to new graduate students and, consequently, CSU is in an optimum position to expand their share of the graduate student market.

Degrees awarded

The number of degrees awarded is following the same trend as enrollment, i.e. 233% increase over the last 5 years. Once again, the advent of the non-thesis option was a very positive, contributing factor.

Retention

Although the percentage of students retained (60-75%) is slightly lower than that of some other programs at CSU, this should not be cause for concern. It may reflect a high degree of program rigor, a factor which can generate pride among students and faculty within a program. Alternatively, given the harsh economic conditions of the last few years and low stipends offered within the program, lower retention could reflect students departing in an effort to secure jobs. Also, as pointed out in the Self-Study, the specific causes of students exiting should be examined to ascertain driving factors and/or patterns.

Learning indicators

Graduate students are tested for general knowledge before being approved for graduation.

Graduation rates

Numbers appear low but this may be an artifact of the use of older data which do not reflect current trends.

Cost effectiveness

It is clear that costs per credit hour, whether measured in terms of total or state funding, have decreased markedly over the course of the last 5 years. This is because credit hour production and the number of majors have increased proportionally more than state and total funding. Such trends reflect cost efficiency and suggest that additional funding investments to boost enrollment will yield further reductions in costs per credit hour and additional increases in cost efficiency.

Recommendations for improving program productivity –

See Final Recommendations.

Assessment of Program Viability

Program viability was assessed in terms of instructor quality and their record of scholarship and service, the breadth of the curriculum, the relevance of the curriculum to the career needs and opportunities of the students, and other academic measures such as enrollments, graduation rates, and the geographic area from which students are drawn. The standard academic metrics of enrollment, graduation, and retention rates were discussed above and will not be mentioned in this section.

The Environmental Sciences Program rated its viability as very strong. Furthermore, the Program intends a broad series of initiatives to increase its viability.

The quality of the faculty in terms of their service to the students and University, their scholarship, and their teaching skills is very high and argues for the continued viability of the Program. The academic credentials of the faculty measured in terms of publications, grants, and awards are impressive. Significantly, four of the faculty have received awards for teaching and advising. Students were very complimentary of the faculty's willingness to engage and support students' efforts and careers, their approachability, and their willingness to devote much of their personal time to students.

The breadth of the curriculum is especially impressive, covering almost all of the major topics and issues that graduates will encounter in their professional lives. This includes courses in non-scientific matters such as land use and waste management, and environmental law and regulations. The majority of environmental careers will encounter require knowledge of those issues, and graduates of the Program will be more qualified than their counterparts from other programs where these courses are not offered or are not emphasized. The students felt that the curriculum met their career needs, although they did express concern over some duplication in the course material. One of the more impressive aspects of the curriculum, and the structure of the entire Program, is its linkage (unique in Georgia) between multiple departments. As with the

quality of the faculty, the broad curriculum argues well for the continued viability of the Program.

Challenges to program viability

1) Teaching loads - In spite of the high quality of the faculty, their teaching responsibilities are very high, causing a necessary de-emphasis on funded research. In spite of their dedication to the students, the faculty feel that they receive no credit for the time they spend advising and mentoring them. Also, the students felt that the high teaching loads have led to an excessive emphasis on undergraduate teaching as opposed to graduate student advising. The impediments to research and graduate student support are significant threats to the viability of any graduate program.

2) Stipends - The stipends offered to graduate students are extraordinarily low (approximately $3000), and therefore not competitive. Many students are forced to obtain outside employment, which has a notoriously bad effect on graduation rates in any graduate program. Most significantly, the un-competitive stipends will greatly discourage potential new students. This is one of the most serious threats to the long-term viability of the Program.

3) Program imbalance - In spite of the collaboration between three departments, most of the students (approximately 80%) are biology students (i.e. emphasizing biology or taking biology classes), 10-15% are geology students, and only 5-10% are chemistry students. This gives the appearance that the Program is essentially a sub-discipline of the Biology program. Not only will this have the possible effect of discouraging future geology and chemistry students, but it may present challenges to leadership and management *vis* resource allocation, course scheduling, and collaboration. It could also negatively affect the campus-wide visibility of the Environmental Sciences Program if it is consistently associated with the Biology department.

Final Recommendations

1) Graduate stipends - As indicated in the Self-Study, the review committee concurs that current levels of stipends are low and non-competitive with current amounts at some other, potentially competing institutions. We recommend increasing the size and number of stipends through a development campaign targeted at graduate fellowship acquisition for the ENVS program. We further recommend that this be made a top priority for the CSU and College development program.
2) Space and facilities - The review team visited many of the current laboratories associated with the ENVS program and found those to be crowded both from the perspective of faculty / student use as well as equipment placement. Apart from hindering program development through constriction of productivity, potential graduate students will gain a negative impression of the program when viewing the overcrowding. We recommend that Rm 163A in Lenoir Hall and the area currently used for storage on the east end of the Lenoir Annex be converted to cubicle and research work space for graduate students.

3) In order to mentor higher numbers of graduate students, some relief from heavy undergraduate teaching loads should be made available for those faculty involved in the graduate program. One obvious source for this relief may be teaching load buy-outs from the use of grant or endowment funds. However, the review committee recognizes the complexity of replacing teachers associated with upper level courses and suggests that a plan be developed for overcoming such obstacles.
4) One of the primary obstacles to increased enrollment is the low profile of the ENVS program on campus and within the region. CSU has an outstanding 'product' in the ENVS program and one which can be sold widely in the graduate student recruitment marketplace. However, that product must be advertised and marketed in order to reap full benefits to CSU.
5) There is a strong need to develop a clear administrative structure for the ENVS program. At present, the program exists as a component of several departments, a situation that restricts both the operation and profile of the program. We recommend that the ENVS program be constituted as a center headed by a director who reports directly to the Dean of the College.
6) The graduate students with whom the review committee met were very pronounced in praising the efforts of the faculty. The primary suggestion from the students' input was that their advising might be made more effective if a major advisor was assigned to each student at the onset of the student's entry into the program rather than at the time of project selection.
7) While there are strong indications that graduate student mentoring is taken into account in promotion and tenure decisions at the College level, the extent of that consideration at the University level is unclear to faculty. We recommend that, as CSU moves forward to increase graduate enrollment on campus, a promotion and tenure workshop should be organized by the Provost's office to communicate the role of graduate mentoring in the P&T process.