IV. Program Evaluation

1. Overall Comments on existing program

The Environmental Sciences Institute at Florida A&M University is a uniquely successful, well-designed and generally well-run program. It was created by building on the traditions in the field to create a model for future environmental science programs that was very innovative when it started and is still among the leadership wave for programs of this type. Its relative success is striking given the small size of the faculty, the short time since its creation and the modest resources that have been invested compared to some of the similar programs in the field. It is distinctive in having a strong emphasis on science, offering degrees at all three levels, B.S., M.S. and Ph.D., specific and successful communication requirements and a very effective set of connections to Federal agencies. Despite the small size, the moderately large number of African-American graduates are probably the largest contribution to the diversity of this field of any U.S. institution.

One key thing to recognize is that this program has the correct structure to be a leading program in the field. This structure and the level of accomplishment in the first decade position it well in the field. However, they also provide a framework for growth, both within the institution and in the larger field. The specific recommendations will cover a range of ways that the program can be improved, both by no-cost initiatives by the faculty and institution and through additional investments. However, the most important opportunity to evaluate, in the opinion of the author of the review, is how to use the unique capabilities of this program and its faculty to help improve the entire university. FAMU has an excellent opportunity to take the specific strengths of this program and use them as a model for program enhancements in many other areas, both environmental and outside of this field.

The program also has some very real challenges and weaknesses. These are generally related to the small size, unique and poorly defined identity within the institution and to resource limitations. There are also some very real issues with the academic culture that can arise within a very small group. These create a special obligation on the leaders of the program to take practical steps to resolve these issues, steps that would not have as much of a profile in a larger unit.

The strengths and weaknesses identified in this report form the informational basis on which the specific recommendations of the reviewer are based (see summary and the formal recommendations section at the end of this document.). Some of these are also specifically addressed within the evaluation sections.
2. **Appropriateness of program goals and objectives and student learning outcomes**

The program goals are well defined and fully appropriate. The mission statement is a succinct and comprehensive summary of those goals and objectives and seems to clearly guide the faculty and leaders of the program. It is an expansive set of goals that are similar to those of leading programs at other institutions when they are the comprehensive “home” of environmental programs across the institution.

The anticipated student outcomes that are inherent in the goals and objectives are fully appropriate for a university environmental science program. They also seem to be largely realized in practice.

The boldness of the vision and goals points to one of the key issues that arose within the review. At FAMU, it is not clear exactly what structural role the Environmental Sciences Institute plays. It is an independent unit that is not a part of any of the established schools. It is not a department, but its size is more consistent with that role. It is not a school, but its scope, mission and structure are more consistent with that role. This ambiguous role is not an inherent danger to the success of the program, but the recommendation of this report is that it be elevated to a school for both consistency with the rest of the institution and to realize some of the larger opportunities moving forward.

3. **Appropriateness of admissions and graduation requirements**

The admissions and graduation requirements seem appropriate. A degree in environmental science is broadly valuable to students and society and setting a standard for entry into the undergraduate program that was different from the rest of the university would be counter-productive. For the graduate program, the minimum standards are fully appropriate. It is clear that some students come to the ESI programs from very non-traditional backgrounds and, thus, have somewhat lower GRE scores than might be expected given the high level of research effort and accomplishment that will be expected of them in the program. However, as discussed elsewhere in this review, the actual quality of the students that participated in the review process was extremely high. This was a combination of the skills that they brought into the program and those that they learned while students within the program.

The graduation requirements for undergraduate students are appropriate and fully consistent with the standards in the field. It is not common to require every undergraduate student to complete a research experience to graduate. During the review, there was a reasonable level of discussion about the extent to which this requirement slowed the path to graduation or was a failure-point on that path. It did not seem that this was a problem and that the faculty and leadership were able to accommodate all of the research experience requirements of the undergraduate population. Having this requirement makes for a higher quality program at the place that it matters the most, the level of accomplishment by the student when they have the most experience in the field. Thus, it should be retained and the time that the faculty must spend to create and mentor these undergraduate research experiences should be factored into the assessments of their workloads.
The graduation requirements for the M.S. and Ph.D. programs are appropriate. There is an emphasis on producing very research-active graduates and the graduation requirements reflect that at both levels. If a non-thesis M.S. or M.A. were ever added in the future, this would have to be carefully interwoven into the culture of the current group of students so that it did not become a diluted version of the same degree. The leadership of ESI are rightfully concerned that their students are often judged by a different standard than students from other institutions and their emphasis on ensuring a higher standard of accomplishment to build a very high program reputation is warranted. That said, one of the signs of success in the current program may be a real incentive to expand to include students with more of a policy or business interest and carefully done, a non-thesis degree could be one mechanism for building a larger student body in this area.

The Ph.D. program requires two semesters of teaching as a teaching assistant, one presentation at a scientific meeting and submission of at least one manuscript for publication in the refereed literature before the student can graduate. This is an excellent set of additional requirements beyond the normal course, exam and dissertation requirements. Teaching is an excellent and complementary activity in an environmental degree and the program may even want to consider slightly enlarging that requirement and providing training in teaching. Balancing teaching and research is an important part of the lives of students who go on to faculty positions. Teaching also prepares environmental degree holders for the broad discussion of the technical material at the heart of the field with communities of intelligent people who do not have that technical background. The requirements to present at meetings and submit a paper before the dissertation are also excellent and should be maintained in the program.

4. Appropriate number of credit hours for degrees

The number of credit hours for each degree is fully appropriate. If anything, the course requirements for the Ph.D. are higher than is typical at other institutions. At the University of Southern California, a Ph.D. program generally requires 60 units of which 24-30 are courses and seminars and the balance thesis units. For a science-rich, interdisciplinary degree as described here, the higher number of required courses is probably appropriate, but the program leaders and faculty should be careful to not make the course load so high that it interferes with the research needs of the students and extends beyond the number of courses that can be offered by the small faculty.

5. Appropriateness of curriculum and learning outcomes

The curriculum seems excellent as described in the course descriptions. The students take a blend of rigorous natural science and math courses, appropriate social science courses, thesis units and a very appropriate mix of other undergraduate breadth requirements. For the undergraduates, the communication courses at the beginning and thesis courses at the end help to produce students with a distinctive set of skills that exceed the norm in the field. This is a very desirable addition and it shows in the capabilities of the students.