I. EXECUTIVE SUMMARY:
The External APR Team was impressed by the dedication of the faculty of the Geographic Science Program to teaching and serving the college and university, their success in building a rigorous academic program, and their effectiveness in engaging the students in their education. The commitment of the faculty to the provision of quality programming was demonstrated in the sincere faculty responses to the 1999 APR report. For example, efforts have been made to address curriculum weaknesses, the program continues to identify career opportunities in the job market that are relevant to Geographic Science students and feels obliged to produce an increasing number of students to meet the needs of the field.

The program continues to be a good university citizen in its provision of the well-sought after G GEOG 200 (Global Geography) General Education Cluster Four offering, and it feels obligated to grant overrides to IDLS and ISS students whose program requirements include Geographic Science courses.

In the process of responding to these demands, while still committed to the provision of high standard of academic and professional training for students in the discipline, the faculty members in this small academic program have ended up teaching large classes and carrying overloads relative to the university average and to comparable geography programs. The External APR team saw faculty frustration as stemming from the history of the former Department of Geography as well as the outcome of successful programming. It is from this perspective that the External APR Team assessed the Internal Self-Study Report (ISSR) “focus” areas that the Program of Geographic Sciences must be helped to craft an effective program mission, evaluate the academic structure and related faculty roles, review the curriculum, provide strategies to attract female and minority students, and to evaluate Geographic Science in the manner it serves the home academic department, the college, and the university while faculty engage responsible teaching and meet acceptable standards of research.

II: EXTERNAL REVIEW TEAM:
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III: PROCESS:
The External Review Team comprised two members from JMU Colleges external to the Geographic Science Program, and three members, external to the University and with geographical expertise. The Geographic Science Internal Self-Study Report (ISSR) was made available to the External Review Team electronically on 10 February 2012. The on-site meeting took place 25-27 March 2012.

At the first Team meeting on 25 March 2012, members met with the Senior Vice President of Academic Affairs for an introduction and orientation to the process. Subsequently, the Team discussed the ISSR in detailed, followed by a dinner meeting with members of the Geographic Science Program, the Chair of Department of ISAT, and Dean of CISAT.

26 March 2012 was organized as a day for in-depth interviews and conversations with members of the administration and program faculty. The Team had separate meetings with ISAT Department Chair, followed by three sessions with Geographic Science faculty focusing on the place of the program within the department and college, the Geographic Science curriculum, as well as staffing and resources relevant to the program. There were also meetings with the Dean of CISAT, the Interim Provost, Geographic Science students, as well as an assessment team from CARS. The Team was able to use these conversations to clarify information from the Self-Study report that informed our conversation. Discussion among members of the External Review Team continued over dinner.

The External APR Team held a three-hour session on the morning of 27 March 2012 to formulate recommendations to be included in this written report. The outline of key issues to be included in the final report was developed into a PowerPoint presentation in an exit interview that was attended by the Interim Provost, CISAT Dean, ISAT Chair, and Faculty members of the Program in Geographic Science.

IV) ACADEMIC STRUCTURE AND RECOMMENDATIONS
The APR Team reassures faculty members of Geographic Science that the senior administration (as represented by the leadership of the Department of ISAT, the Office of CISAT Dean, and the Office of the Provost) recognizes the quality research, teaching and service in which program had been engaged.

The program’s “distributed leadership” administrative model has proved very successful in recent years. The APR team believes that this strategy has allowed all faculty members to invest in the transformation of the program, and has fostered program cohesion. It has also resulted in tangible benefits to students in terms (see Section VI (E), The Capstone). In addition, the Team sees the shared leadership as having been critical in the process of responding to the APR recommendations, as well as ensuring equity in distributing service responsibilities in the program.
Nevertheless, the distributed leadership model of running the day-to-day affairs of the program may be hard to sustain as the heavy service burden has the potential to overwhelm faculty, resulting in burnout, confused lines of communication with the Department Chair and College Dean, and reduced effectiveness of teaching, research, and even service.

It is the recommendation of the External APR Team that:

- While the “distributed leadership” might serve the program well during the initially conversations on the APR report, faculty should strategize about an administrative style that will be consistent with and embedded in the “pathway” suggested for the curriculum review section of this report.
- Also, a respected member of the program should be identified and designated as program representative to the higher administration of the department and the college. Such a person will be the program advocate and liaison.

V) MISSION, OBJECTIVES AND RECOMMENDATIONS
The Internal Self-Study Report (ISSR) notes that because Geographic Science has “historical lack of autonomy,” and because many faculty members are relatively new to the program, program-specific goals and objectives aligned with the program mission have not been developed. Instead, the program has ascribed to the department goals and objectives of ISAT while tentatively outlining a number of guiding principles.

To develop clear goals and objectives that can be measured, the program must have a concise mission statement. We see this articulated in p. 77 of the ISSR: that,

“This mission of the Geographical Sciences Program at JMU is to prepare students to be confident in their abilities as geographers and to equip them with the skills to succeed in graduate programs and the job market.”

- It is the recommendation of the External APR Team, that this statement be adopted in place of the current catalog.
- In the conversation with representative from CARS, it was suggested that the number of goals and objectives could be reduced in order to increase the effectiveness of the assessment.
- If a “pathways” model is adopted for the curriculum (see Section VI), the goals and objectives should be refined to reflect the expectations of the various “pathways.”

VI) CURRICULUM REVIEW and RECOMMENDATIONS
The current curriculum requirements in the Geographic Science (GS) program include eight core geography courses (25 credits) and additional coursework for each of the two concentrations: Applied Geographic Information Science (AGIS) and Environmental Conservation, Sustainability, and Development (ECSD). For the AGIS concentration,
there are three additional course requirements (9 credits), one cognate course (3 credits), and three AGIS elective courses (9 credits). For the ECSD concentration, there are two additional required courses (6 credits), one cognate course (3 credits), and four elective courses (12 credits). The final requirement for all GS majors is the capstone project (6 credits). In total, GS majors must complete 52 credit hours, most of which do not overlap with general education courses (with the exception of MATH 200: Statistics).

Overall, the committee felt that the current curriculum is rigorous and well-designed to prepare students for jobs and graduate programs in geography. However, the design may be unsustainable for the number of faculty and resources currently available in the program. To address this problem, the committee feels that faculty should prioritize several key areas: restructuring core requirements, exploring the “pathways” model, examining general education requirements, focusing upper-division courses, and revising the capstone project.

A) Core requirements
The committee felt that the large number of core requirements contributes to faculty stress and burnout. Restructuring the core could allow faculty more time to focus on offering more consistent upper-division courses. A few specific recommendations on the core include:

• Move towards 3–4 core courses, with the following goals:
  ▫ Focus students on the major themes within the discipline.
  ▫ Provide the basic information students need to choose a particular focus area within the discipline.
• Examine the core for areas of overlap that may currently exist, and development of prerequisites to avoid such overlap.
• Assess past restructuring efforts and evaluate relevance to the discipline and to the department.

B) Pathways versus Concentrations
The faculty has proposed a “pathways” model to replace the current concentrations. Within this model, the students would take a smaller number of core courses, followed by a series of courses designed around a single pathway (i.e. focus area within geography). For example, faculty members have suggested pathways might include earth observation, biogeography, and urban geography/planning (among others). The proposed “pathways” model seems to have several major benefits:

• Pathways could be designed to define the major specialty areas within geography, and thereby potentially:
  ▫ Contribute to awareness of the GS program on campus, by increasing visibility through “branding” specializations within the discipline.
  ▫ Attract students at earlier academic levels because of more easily recognizable terminology
• The pathways model may provide students with a more structured curriculum.
Pathways could provide a logical structure around which faculty could organize lower and upper division courses.

Each pathway could potentially culminate in a capstone seminar course, thus ensuring that students would be able to explore a capstone within their area of interest.

The review committee feels that this pathways model may make the curriculum more sustainable in the face of limited teaching resources. It will be important, however, to keep the number of pathways limited, and focused on the program’s strengths.

C) General Education
Currently, the GS program offers one general education course (GGEOG 200, Global Geography), which is not a requirement within the GS major. After speaking with students, it became clear that many of them were introduced to the major through this general education course, making it a ripe recruiting ground for lower-level students. Specific recommendations include:

• Consider including GGEOG 200 in the core curriculum.
  ◦ Could provide an incentive for quality lower-level students to pick up the major.
  ◦ Could work to incorporate general education more smoothly into the primary teaching responsibilities of faculty.

• Explore the possibility of adding a physical geography course to General Education Cluster Three.
  ◦ Since teaching general education classes requires a major teaching commitment, it makes sense to concentrate the program’s service teaching in the core focus area for the program.
  ◦ The committee recommends engaging in conversations with the Cluster Three Committee before focusing too much time and energy on a formal proposal.

D) Focusing upper-division courses and cross-listing/collaboration
The faculty expressed concern over not being able to consistently offer upper-division courses to both GS majors and students in other programs and minors. This problem seems to stem in part from faculty being over-burdened by teaching the large numbers of core courses. While the current list of elective and upper-division courses is impressive, the review committee recommends focusing these courses more towards faculty specialty areas and less towards a perceived obligation to provide for the needs of other programs. This recommendation comes with a caveat that the review committee may not be fully aware of all obligations that the GS program currently faces. Specific recommendations include:

• Focus upper-division courses around specific faculty specialty areas.
• Review course sequencing and consider the potential for enforcing prerequisites for courses.
• Actively seek to cross-list and collaborate with related departments and programs (e.g. ISAT, biology, political science, etc.), which could benefit:
  ◦ Students (by providing more options for mid- and upper-division courses)
Faculty (by easing the burden of teaching so many courses and by building stronger relationships with other programs)

E) Capstone Project
The GS capstone project is a three-semester, six-credit hour sequence of courses: GEOG 390 Research Design (1 credit hour), GEOG 490 Senior Research or Field Practicum (3 credit hours), and GEOG 496 Senior Thesis (2 credit hours). The capstone is built around custom-developed projects for each student or small groups of students. Each student or group of students identifies a specific advisor to work with, and all faculty members are involved in advising capstone projects. The projects are substantive, and the extended period of time involved allows for refinement and adaptation of the project over time. The capstone experience includes a highly successful student research day. Student satisfaction with the project is high; students appreciated the chance to apply their learning in a context where they could develop solutions to problems, integrate their knowledge across the syllabus, and generate tangible research results. Notably, students identified the capstone as one of the distinctive strengths of the GS degree.

Despite all these positive aspects, the capstone does not appear to be sustainable as currently instituted. The GS program has a large number of majors – both in absolute numbers (156 students), and relative to the number of faculty – resulting in a large advising load for each faculty member. Because the capstone is run over two academic years, at times the number of concurrent students in the capstone sequence may be very high. As a consequence, faculty members are spending up to 10 hours per week advising capstone projects. Unfortunately, this heavy load is not part of the faculty work assignment in terms of class load, and therefore, this load is over and above the standard teaching assignment.

The challenge therefore is to draw on the strengths of the capstone, while at the same time develop a new capstone that is in line with current resources. The committee suggests the following should be considered:

• A senior-level capstone class might be developed, where the capstone advising is incorporated within a single class, rather than being the focus of one-on-one faculty advising over an extended period.
• Faculty teaching credit for the capstone advising should be an important component of any modifications to the capstone structure.
• If the pathways model for concentrations is developed, a capstone class could be developed for each pathway.
• The use of internships as capstone experiences could be expanded.
• Study abroad could also be formalized as an alternative capstone experience.

VII) STAFFING REVIEW AND RECOMMENDATIONS
The GS program has demonstrated the need for additional faculty. The program has more majors than any geography program in Virginia, despite having a relatively small number of faculty members. Demand for geography courses at all levels is high, because the program does a large amount of service teaching, including a General Education class
(GEOG 200) and courses that support other majors. The program is also successful in many other ways: the curriculum is rigorous; student satisfaction is high; job placement is excellent; the program has an exemplary assessment program; and the group has put aside past differences to develop a cohesive unit that is willing to institute innovations to enhance the future prospects of the program. The GS program is also notable for its ambitious goals for continued growth in the program, and desire to contribute to the intellectual environment of the university.

The growth in majors and teaching has been achieved in part through the ISAT departmental resources, particularly through the teaching of geography courses by ISAT faculty members. However, as ISAT teaching demands have grown, these faculty members have not always been available for continued teaching. In addition, the GS program has expressed concern about non-specialists teaching advanced geography courses. Adjuncts have filled part of the teaching gaps; however, finding local adjuncts with geography credentials has been challenging. Course overloads have been another partial solution, although this can only be done sparingly, since the other demands on faculty members are high.

Administration at the departmental, college, and provost level all recognized these successes of the GS program. Consequently, there was general acknowledgement that the program potentially deserved additional resources to relieve current shortages. Unfortunately, however, budget constraints and other administrative priorities suggest that new tenure track lines are unlikely in the short term. The committee therefore makes the following staffing recommendations:

- Staffing needs are critical for this program.
- Sustaining a high quality program will require cooperation between the program and the administration to find creative solutions to staffing shortages.
- On-line courses may make it possible to hire adjuncts from a larger geographic pool than the local region (e.g. extending the potential pool to Washington DC).
- Visiting scholars, international faculty, and Fulbright scholars may also help provide teaching, and at the same time contribute to the internationalization of the institution.
- Staffing alone cannot solve the current problem of excessive demands on faculty members; focusing the curriculum and thereby reducing the overall number of courses offered, and addressing other issues such as the heavy capstone burden, are required in order to provide a comprehensive solution.
- Increased use of adjuncts may be part of the solution to staffing shortage. However:
  - The proportion of part time and temporary instructors should be kept low, in order to maintain quality and consistency in the program.
  - Adjuncts do not usually contribute to the service load of the department (particularly committee work and student advising), and this should be borne in mind in considering the appropriate staffing levels.
  - The program might consider developing a program whereby ABD students from nearby PhD programs are hired on one-year contracts. This will require
working with the Dean and Department Chair to commit funds sufficiently in advance for such an appointment, and developing relationships with PhD programs in the region.

VIII) CAMPUS IDENTITY AND RECOMMENDATION
The Geographic Science Program is involved in a number of campus-wide activities, but its visibility to others in the university seems to be limited. Geographic Science current offer of General Education GGE0G 200 brings visibility to the program. The earlier recommendation for consideration to creating a Cluster Three Geographical Sciences course (see Section VI (C)) will contribute to enhancing the visibility of the program. However, we encourage such exploration to include consultation with the cluster coordinator before proceeding too far in the proposition. The Program should also understand the impact this course may have for the existing program offerings.

The program has courses in various minors in the university. Such examples include Interdisciplinary Liberal Studies (IdLS) and Interdisciplinary Social Science (ISS) which are designed to prepare elementary and secondary school-teachers respectively. Furthermore, the program has courses included in environmental, cultural and international minors. The program should consider carefully having some seats in selected courses for these minors so as to bring different students into classes. In the case of IdLS students, many of whom are females, this would bring some diversity to geography classes as well as different perspectives. At the same time, however, we caution that the number of overrides granted must be controlled so as not to create excessive overload for faculty.

The previously suggestion to allow cross-listing of courses (see General Education) also has the advantage of enhancing students’ awareness of Geographic Science and its connection to related disciplines.

The committee believes the administration should advocate for the Geographic Science program as new programs and/or minors are considered at the university where geography can add resources to the program/minor.

The team encourages the placement of a sign outside the HHS building that identifies the Geographic Science program, and that some signs or banners should be placed within the building as well to bring visibility to Geographical Sciences.

In addition, it would be prudent to have Geographic Science office space that is contiguous or clustered together (now and in the future) to help maintain program visibility and faculty collegiality.

Faculty should ensure that all Geographic Science information in the catalog is accurate. For example, though the minors are appropriately listed in the catalog, the Geographic Science BS does not seem to be listed in the catalog index. Furthermore, there are errors in the index for the pagination that affect the immediate availability of information about the program.
Additionally, faculty should consider developing key phrases or brief descriptions of the existing two concentrations within the major or the recommended “pathways” to better “market” or “brand” the program. Such labeling could be placed on the program’s website and in print literature to better identify the program to those outside geography.

In addition, the External Team suggests that the current ECSD concentration be renamed or appropriately worked into the “pathways.”

The robust student population of Geographic Science majors and the recent rise in those numbers indicates that students do find the program. Once in the major these students find it to their liking and are very pleased by the level of faculty engagement. Several current majors stated that they became interested in the program when they took GGEOG 200 to fulfill a General Education requirement. Thus, this course is a viable introduction to Geographic Science and a recruitment opportunity for geography courses.

Again, the students are important advocacy group in bringing information about Geographic Science to the JMU population. It is the recommendation of the committee that student and alumni participation in the program’s awareness drive could be a very effective way to enhance interest in the program.

IX ASSESSMENT AND RECOMMENDATIONS
The Center for Assessment & Research Studies (CARS) professionals reported positively on Geographic Science’s assessment instrument. They noted that Geographic Science has had very strong test that evaluated effectively the six major objectives of the program. CARS ranked GS assessment results as among the top 10 percent of the University. This is very good news.

The CARS professionals did indicate that the evaluation of the sub-objectives using the current test is not as reliable as for the objectives, in part possibly just due to the unavoidable fact that the sub-objectives have fewer associated questions in the evaluative instrument than the objectives. If the program wishes to have more consistent and reliable results for sub-objectives -- and if there is time and inclination --, CARS is willing to work with Geographic Science to “tweak” the assessment test. Nevertheless, the existing test remains very strong. The Geographic Science faculty has already made excellent use of assessment results to inform curricular decisions as well as modifying the teaching of certain material. The integration of assessment results with curriculum changes is to be applauded, as few departments or programs have undertaken this task.

Recommendations
• Continue current assessment instrument to track student development in program.
• Continue integrating assessment results to inform teaching and curriculum.
• Consider refining some items to address sub-objective points.

X) RESOURCES AND RECOMMENDATIONS
It was reported in the ISSR that many technological improvements have been made since the fall of 1999. The most significant changes were represented in Table 9 and Appendices 2 and 3 of the Report. The technological changes included the provision of computers and LCD projectors in all classrooms, addition of GPS receivers, additional storage spaces on Geographic Science servers from 4 GB to 630 GB, and the increase in memory of GS computers from 128 to 512 Mb. These positive changes notwithstanding, and especially as the number of students at the University and in the discipline increases, it is still important that additional resources expectations are met. These will include the following:

- It is recommended again that the faculty offices be clustered together and adjoined to allow efficient consultation among faculty and students.
- There should be sufficient software licenses available to allow students to access the software remotely while the instructional lab is in full session.
- Computers need to be equipped with sufficient memory and processing power to run the high-end software used in geospatial analysis. Meeting this aim is by definition a moving target, thus a plan should be developed to ensure that instructional computers are upgraded on a regular cycle.
- The ancillary lab should be equipped with the standard software and any additional geospatial/remote sensing software used for research.
- In the long-term, dual monitors should be available where space allows. These should be on all of the workstations in the Ancillary Lab.
- The computers in the ancillary lab should have the best available platforms, with high-end processors and additional RAM for these applications.
- Still in the long-term, additional Lab space must be provided to allow enough space in the ancillary lab to permit students to work in a quiet environment, while conducting research on complex projects.

**XI) STRATEGIC PLANS**

In the ISSR, faculty asked that a professional advisor be provided as a means of reducing workload. While some programs are known to have access to such support, faculty in the Geographic Science program must be aware that the students greatly appreciate direct contact with their instructional advisors. Replacing faculty with professional advisors may undermine this connection with the students.

In the short-term, the program should revisit the mission statement, the goals and objectives as commented upon in the report.

The core curriculum and the “pathway” concept should be examined and its ability to bring focus to the program assessed.

An appropriate faculty leader/liaison to advocate and communicate program needs to the ISAT chair and College dean must be devised.

In the intermediate period, adding new General Education course(s) may present challenges to the current instructional faculty, but may be feasible, were the core curriculum be adjusted.
Furthermore, while the committee evaluated the program’s curriculum to be very strong and also saw some benefits in the establishment of a Graduate Program, this is a very ambitious undertaking. There are qualified faculty members to teach graduate students but the program would require a great deal of additional resources that are not currently available. The idea must be considered as a long-term objective.

Faculty should build on their successful efforts in developing a rigorous program. Doing so will require that faculty ensure that future efforts remain focused, that the core curriculum is preserved, and that the group remains collegial and mutually supportive, whilst adapting the program to ensure that it retains a central place in the proposed new college during the transition period.