

**FIVE-YEAR REVIEW OF THE
MASTER OF GEOGRAPHIC INFORMATION SCIENCES (MGIS):
SUSTAINABILITY MANAGEMENT PROGRAM**

Department of Geography
University of Washington

Conducted for the Graduate School of the University of Washington
by:

Jeffrey Hou (Chair)
Professor and Chair, Landscape Architecture
University of Washington, Seattle

Ali Modarres
Professor and Director, Urban Studies
University of Washington, Tacoma

Allan W. Shearer
Associate Professor, School of Architecture
Co-director, Center for Sustainable Development
The University of Texas at Austin

November 7, 2016

SUMMARY

The Master of Geographic Information Systems (MGIS) Program is a fee-based program housed within the Department of Geography at the University of Washington (UW). The program was approved in 2010 and began enrolling students in 2011. This report has been prepared as part of a program review required for new programs after five years of operation at UW. In preparation for the review, the MGIS program completed a self-study report which included results of a student survey. The site visit occurred on October 17-18, 2016. The first day included meetings with Department Chair Lucy Jarosz, Program Director Tim Nyerges, and Associate Director Suzanne Withers. The review committee also met with current part-time faculty, two departmental faculty (who are not part of the MGIS program), program staff, departmental staff, and McKay Caruthers, administrative director of Professional and Continuing Education, responsible for administering fee-based programs. The committee also had a Skype meeting with current students and recent graduates of the MGIS program. The second day included discussion of findings with department and program representatives as well as representatives from the Provost's office, Graduate School, Faculty Senate and the College of Arts and Sciences.

Based on the review of the self-study report and information gathered during the site visit, the committee is satisfied with the program's quality, mission, educational value and role within the university and community. It's the committee's unanimous recommendation that the MGIS receives continuing status and is included in the Department of Geography review in 2017-2018. The following outlines the committee's detailed assessments of the program including its strengths, issues and concerns, as well as suggestions for the program and for support from the university.

PROGRAM STRENGTHS

The MGIS has a number of unique strengths in terms of the current context of the profession, the way its curriculum is designed, how the program is managed, and the value for the students.

1. **Growing field** – The program addresses a growing area of research and practice on pressing issues facing cities and regions around the world. The timing of the program is excellent given the rise in interest in applying computational technologies to address complex challenges related to coupled human-natural systems. This interest is evidenced by funding opportunities offered through organizations such as the National Science Foundation and National Academies of Science and by the creation of other applied GIS and Geodesign programs at other R1 and AAU schools.
2. **Strong program focus** -- The program has a strong and clear focus on the intersection of GIS and sustainability science and management. Articulated in the self-study report and reinforced in interviews during the visit, the focus is unique among peer programs in the country, which tend to focus only on the technical aspect of GIS, and less on the substantive issues of sustainability and resilience that are increasingly part of discussions about the built environment. This particular focus appears to attract students and is embraced by them. It sets the program apart from typical technical training and makes it a true graduate degree program with conceptual, theoretical, and academic rigor as well as practical applications.
3. **Faculty, staff, and program leaders** – The program leaders, faculty and staff have demonstrated a strong commitment to the program and a high level of expertise and competence in the field. Dr. Timothy Nyerges, the program's director, has been a leading voice in Geodesign education.

Faculty members offer expertise from a variety of perspectives that contribute to a broad view of sustainability. Staff have displayed considerable understanding in the goals of the program and the workings of the University of Washington. The level of commitment is apparent in the significant effort on the part of the program leaders to have the program hit the ground running and become financially viable in a short amount of time. It is also reflected in the strong vision for the program focusing on sustainability science and management.

4. **Positive student feedback** – The committee is impressed with the strong positive feedback from current and past students who participated in a Skype call and from the student survey conducted in 2015. Overall, students and graduates of the program feel that the program has provided them with the skills and knowledge that they had hoped to acquire. This core educational mission of the program is highly valued by MGIS students. In addition, they find the faculty and staff to be responsive, in contrast with their experience with some online programs elsewhere. While it can no longer be said that remote learning or digitally delivered courses are "new," it remains the case that not all institutions or programs are as adept at helping students increase their knowledge, develop skills, and plan their careers as they are with in-residence programs. MGIS faculty and staff have implemented protocols and practices to ensure that students receive personalized attention. MGIS students and alumni reported great satisfaction with these aspects of the program.
5. **Curriculum** – The 9-course sequence with skill-building courses in the first year and application-focused courses in the second year is clear and well organized. The self-study report concisely described the intentions of each course and the logic of the sequence was clear. The curriculum is economical with regard to student time and available resources. Based on the self-study report and discussions with faculty, each course asks students to broaden their theoretical or conceptual understandings of GIS and sustainability and develop skills with using current commercial and open-source software. The result is a curriculum that provides a platform for immediate or short-term job placement and long-term career development. MGIS is uniquely positioned to distinguish itself as a program focusing on sustainability science and decision-making, particularly during the second year.
6. **Unique hybrid model** -- The hybrid model contributes to community building and peer learning among the students. A challenge of on-line education is the development of a peer community. Based on conversations with faculty and staff, the on-campus meetings are intended to foster relationships with the university (as a place) and the students, between the program and the students, and among the students. Based on conversations with the students, these gatherings are successful.
7. **Capstone project** -- The Capstone project that pairs teams of students with a community partner on a real-life problem provides an excellent an experience that prepares students well for transition into practice. The range of projects is suitably varied and accommodates a different professional interests and career goals. Students commented on their positive experience with the Capstone project, through which they were able to work with community partners/clients on real-life programs.
8. **Informal peer learning** -- Students find informal communication among peers outside class time contributes to their learning. One of the key achievements of this program is its ability to create a cohort feeling among students, despite its online nature. Students commented on their

positive experience working and interacting with each other, faculty, and staff throughout the program. This positive experience may not be a substitute for daily in-person interaction, but it enables students to achieve a positive degree of peer-mentoring potential, while becoming aware of each other's projects and their respective technical and conceptual challenges with specific projects.

9. **Appropriate regional focus** -- The regional focus is an excellent way to use the Puget Sound area as a laboratory for addressing contemporary environmental and sustainability challenges facing a growing region. Even though some students are not from the Puget Sound Region, most graduates of the program expressed a positive experience working on projects within a region with multiple sustainability challenges and opportunities. They felt that the region is a perfect laboratory for practicing the education they have received. Given the commonality of a number of sustainability issues in various geographies, the knowledge gained through MGIS is equally applicable elsewhere.

ISSUES AND CONCERNS

At the same time, the MGIS also faces a number of issues that reflect structural barriers within the university and challenges facing a relatively small department/program, as well as the design of the program.

1. **Faculty and staff sustainability** -- As a program that bridges academic preparation with professional knowledge and practice, the MGIS takes advantage of both tenured faculty in the Department of Geography and professionals in the community who are hired as part-time lecturers. The combination of tenured faculty and part-time lecturers with professional knowledge and experience is ideal for a program like MGIS. However, there are a few factors that challenge the long-term sustainability of this model. First, the College currently sets the pay rate for part-time lecturer which is low relative to the qualification of the professionals who teach as part-time lecturers. The intention and desire to hire at the PhD or PhC level (according to the self-study report) for part-time lecturers sets a high bar for such position. It's also unlikely that these individuals will stay on as part-time lecturers for an extended period. As a fee-based program, the two tenured faculty teach in the program through a buyout from the Geography department. This puts strain on a small department like Geography that is already short of full-time teaching staff and also faculty to perform service duties in the department.
2. **Faculty teaching and mentoring** -- As a program that depends significantly on part-time teaching staff, more mentoring is needed for part-time staff without extended teaching experience to ensure that they perform well and enhance the learning experience for students. While course evaluations by the students indicate an overall high level of satisfaction, there is evidence that classes taught by part-time instructors are not as successful as those taught by full-time faculty. Also, having one part-time faculty member teach four courses in a 9-course program does not seem to be in accordance with the program's goal of offering perspectives on issues related to sustainability and on techniques to address problems. The assignment does not offer students with adequate exposure to a range of knowledge and expertise.
3. **Structural barriers** -- A structural disconnect seems to exist between the fee-based MGIS and the state-supported in-residence program, in terms of faculty involvement, student interactions, etc. A lack of community among students in the two programs can be expected, since they have

no common classes and do not share a common space. The occasions when MGIS students come to campus happen when the in-residence students are on break (an understandable logistical necessity). The cause for this situation among the faculty is more difficult to identify. Based on discussions with faculty in both programs, it may be related to negative perceptions about or unwillingness to (1) teach on-line courses and/or (2) teach in fee-based education. An additional reason for the disconnect may reflect differences of mission. In general, it can be said that it is the mission of academic programs, such as the Department of Geography, is to expand knowledge. While it can be said that the MGIS program also aims to make such contributions, it is also akin to a professional degree program that focuses on developing the next generation of practitioners.

4. **Program leadership** -- The program is likely to face uncertainty as program leadership changes in the future. Given the combination of strong senior leadership, a relatively small faculty that relies heavily on part-time instructors, and a disconnect with the larger in-residence geography program, it is reasonable and, we believe, necessary to begin a discussion about how functional and curricular continuities with regard to program goals might be maintained in an anticipated transition to new leadership.
5. **Program revenue** -- The program currently generates rather modest revenue relative to the effort required to operate and manage the program; rising costs compared with flat-lining of revenue over time. In the relative near-term, revenues can be increased by matriculating additional qualified students; however, goals for the quality of education place a ceiling on the total number of students in a cohort. When the upper threshold is reached, additional revenues will have to come through tuition increases or alternative sources of revenue.
6. **Externality cost** -- The program generates an additional burden on department staff and faculty, in handling program coordination, appointments, student support, teaching evaluations, etc. The Department of Geography lost a staff position during the previous round of budget cuts. It also has a limited number of faculty who can perform service in the department due to service commitments at the school and university levels. With these limited resources, serious attention needs to be given to a strategic and equitable relationship between MGIS, as a fee-based graduate program, and the Geography Department and its state-supported degree programs.
7. **Financial barriers for students** -- Barriers to financial aid for MGIS students, specifically GO-MAP, presents challenges to non-traditional and underrepresented students. While this is mainly an issue for Continuum Education to investigate, increasing diversity within the program will require a full assessment of potential financial support for current and future student populations. The university's involvement in this area is important. Given the number of current fee-based programs, it may be necessary to assess existing practices and assisting programs such as MGIS with additional opportunities to provide access to students who could benefit from this education. This would fit well within the university's mission of access and excellence.
8. **On-site requirement** -- On-site requirements can be challenging for out-of-state students. However, that does not seem to be a major deciding factor in attracting students. One of the on-site modules was seen by students as unnecessary and could be made optional. At the same time, local students could be brought to campus a few more times, while enabling out-of-state students to join via Skype and other communication technologies. Students expressed interest in having more of a UW experience. They also wished to be included in

invitations for on-campus events, such as lectures. Students who do not live locally could potentially listen to the lectures online, if they are made available via video streaming or taped lectures.

9. **Student advising** -- At this point, MGIS and many of its functions, including advising, seem to operate in isolation. In addition to the dis-connectivity challenges that the practice creates, it provides little opportunity for professional development of the MGIS advisor and further engagement of the program with the department and the university. In addition, students would like to have more counseling in career-advising and job placement. This is a highly desirable service for a state-supported, as well as a fee-based program. We encourage the MGIS faculty and staff to fully consider this request as a part of their regular planning for the program.
10. **Advisory board** -- The role of the advisory board is unclear. MGIS faculty and staff need to decide whether an advisory board is necessary and if so, decide on the size, membership, mission and the nature of its contribution to the program.

SUGGESTIONS FOR THE PROGRAM

The suggestions below are primarily meant to address the issues and concerns outlined above.

1. **Develop a long-term strategic plan in the department that takes MGIS into consideration and addresses issues of integration and structural disconnect.** Based on the last two sections and throughout our visit, we became aware of the nature of connectivity and dis-connectivity between MGIS and the Geography Department. Creating a fee-based program that is connected with Continuum Education, but operated within a state-supported department, creates challenges related to staffing, managing the intellectual content of the program, decision-making processes, and reporting mechanisms. This structural issue can easily affect how faculty, staff and students experience this program. This equally affects the department and the nature of its relationship with the MGIS program. After all, the Geography Department does not have a large number of faculty members and only limited staff. Three faculty members are heavily involved with institutional service and institution-building efforts, leaving the Department with fewer faculty members than appear in the books. Given the occasion of this review and the Department's upcoming strategic planning process, we recommend that the final plan fully consider the nature of its relationship with the MGIS program, addressing issues of integration and structural connection.
2. **Develop a strategic plan within the program that considers future leadership succession and transition.** Reflecting on the previous issues, it is also equally important for the MGIS program to develop its own parallel strategic plan that considers future leadership, succession and transition. While highly dedicated, the current staffing of the program is not sustainable. One of the leading faculty members is nearing retirement age and the total time dedicated to the operation of this program by both faculty members is not sustainable. A strategic plan that fully considers a rational/scaled relationship between MGIS and the Department of Geography and staffing requirements for the operation of MGIS (including needed faculty/instructors) needs to be developed. This document should provide a clear road map for the MGIS program and the Department. This plan should also consider the financial health of the program without understaffing it.

3. **Identify and learn from successful and comparable programs on campus.** The MGIS is currently the only fee-based and hybrid online program offered through the Department of Geography. The program was started without prior experience and knowledge. To consider the long-term development and sustainability of the program, it may be helpful to learn from successful and comparable programs on campus about their “best practices” in terms of teaching, student support, etc. There are a number of them in operation that should be able to offer alternative operational models applicable to MGIS.
4. **Engage in more active recruitment to grow the applicant pool and student enrollment.** The MGIS has set a goal of getting 75 applications each year from which up to 25-30 students can be accepted into the program. The current enrollment ranges between 14-24 (except the first year with 13). There is clearly room for higher enrollment, which is critical financially for the program. Given the recent financial shortfall, it may be necessary for the program to increase the number of students it admits. This should increase the revenue adequately without significantly affecting the quality of the program and the current student experience. The revenue is important to provide the necessary support for students, staff and faculty. To reach the desirable level of enrollment, more active recruitment efforts are necessary. So far, the program has relied primarily on PCE for “high-level” marketing and advertisement. To engage in more active recruitment, other strategies need to be developed and implemented, which may involve participation in career fairs both locally and nationally at conferences.
5. **Consider tradeoffs between the hybrid model and online instruction in future program development.** Given the interest of some students in having a few more on-campus experiences, we encourage the leadership to consider the potential for having additional activities during both years, at least for those who are willing to come to campus. While they enjoy the freedom of online education, the hybrid model seems to be favored by a number of students.
6. **Support faculty development and mentoring, especially part-time lecturers with limited teaching experience.** It may not be possible to assume that part-time instructors, especially those who work primarily in professional practice, will have been adequately prepared to teach students at the graduate level. To the degree that the program continues to rely upon part-time instructors, development of teaching skills is critical.
7. **Consider early start for the Capstone project.** Students in general would like to have a slightly longer time to work on their capstone project. One quarter seems limiting based on student feedback. Perhaps the capstone selection process could occur at the end of the quarter, just before students actually take the course or even earlier—such as during the second campus visit—to allow students the opportunity to think about the skills they will need to complete the work. This and any other practice that could increase the length of the capstone project could potentially improve the student experience and their satisfaction with the final product.
8. **Provide more support for career counseling and job placement opportunities.** As mentioned above, a number of students would like to receive more support from the program in this regard.
9. **Formalize the sustainability concept in course descriptions and publicity materials; communicate the regional focus of the program in a way that has broad implications for other areas in the world.** While we learned about these issues while at UW Seattle, this information does not readily come across from the website or printed promotional material. It should be

emphasized/highlighted more.

10. **Introduce students to concepts presented in the second year during the first year.** A few students told us that the content of the courses in the second year came across as more abstract. A solution to this problem could be better content integration between the first and second years. One way to achieve this is to explicitly introduce some of the sustainability science and decision making concepts during the first year courses. This will give students the needed vocabulary/language and help ready them for the second year (i.e., a more transparent scaffolding)
11. **Consider other program enhancements.** Students enjoyed the few opportunities they get to come to campus. Enhance the student experience by making guest lectures and other events accessible online. Ideally, the program and department would live broadcasts during which on-line students might be able to join resident audiences in asking questions. The capability to offer streaming or download-able presentations would also help to allow for sharable and shared experience.
12. **Clarify the role of the advisory board and formalize meetings or other activities.** We understand while advisory boards for fee-based programs are not required, they are common. The current MGIS advisory board members offer what might be considered ad hoc counsel on curricular matters with regard to applied geographic information science and systems. Given ever-advancing knowledge and rapidly changing technology, this advice may continue to be needed. At present and as the program continues to mature, other kinds of advice such as related to fundraising, alumni relations, etc. may become increasingly important.

SUGGESTIONS FOR SUPPORT FROM THE UNIVERSITY

To overcome some of the current challenges, support is needed from the university in the following ways.

1. **Provide the department and the program with support in conducting unit-level strategic planning.** The university should value the contribution of the MGIS program and the supportive role the department has played, while remaining cognizant of the challenges they both face. As they engage with their strategic plans and fully consider some of the structural challenges and integration opportunities, the university should provide them with the support and resources needed to develop and implement their strategic plans.
2. **Coordinate sharing of lessons and “best practices” among comparable, fee-based and online programs across the campus, including MGIS.** The university should create and coordinate workshop(s) for all fee-based programs to come together and share their experiences, challenges, and best practices. This is an important step toward creating better functioning and integrated programs throughout the UW system.
3. **Consider greater flexibility in the qualifications and pay rates for new hires to address the specific staffing need.** In order for the program to become more sustainable, reasonable costs of recruiting, mentoring and retention of faculty and staff need to be considered, while paying attention to the issue of equity between MGIS and the department. Whether PhDs, PhCs, or professional practitioners, instructors in this program should be hired with the specific mission

and adequate/equitable pay rates in mind.

4. **Consider greater flexibility in setting the program fee for students.** As the cost of the program has increased (and will continue to increase), student fees have remained flat. While we do not advocate fee increases, we believe the university needs to assess current fees, and compared to other fee-based programs, determine whether MGIS tuition is adequate for its financial sustainability.