

## **Final Assessment Report and Implementation Plan**

Periodic Program Review (PPR)

### **Spatial Analysis (MSA)**

Last Updated: February 11, 2020

In accordance with the University Institutional Quality Assurance Process (IQAP), this final assessment report provides a synthesis of the external evaluation and the internal response and assessments of the graduate program in Spatial Analysis (MSA). This report identifies the peer review identified strengths of the program, together with opportunities for program improvement and enhancement, and it sets out and prioritizes the recommendations that have been selected for implementation.

The report also includes an Implementation Plan that identifies who will be responsible for approving the recommendations set out in the final assessment report; who will be responsible for providing any resources entailed by those recommendations; any changes in organization, policy or governance that will be necessary to meet the recommendations and who will be responsible for acting on those recommendations; and timelines for acting on and monitoring the implementation of those recommendations.

#### **EXECUTIVE SUMMARY**

The Master of Spatial Analysis (MSA) program is a unique degree program that is academically rigorous yet professionally oriented. It is a 12-month graduate program with a 16-20 month thesis option.

Through project-based courses, a practicum placement, and a major research paper (MRP) or thesis, students learn to think geographically and to master Geographic Information Systems (GIS) to support operational and strategic decision-making in government and industry. The program specializes in three

fields of study: (1) business/commercial applications; (2) physical/environmental geography and landscape analysis; and (3) social and community information analysis. The MSA is proud of itself being one of Ryerson's first three graduate programs established in 2000. The first cohort of MSA students (class 2001) were also the first-ever to graduate with a graduate degree from Ryerson University. The MSA program has its academic home in the Department of Geography and Environmental Studies, Faculty of Arts. The MSA program is currently supported by 21 core faculty members in the Department of Geography and Environmental Studies, plus a number affiliated faculty members and two part-time instructors from other programs and faculties.

The program has been successful in preparing graduates for professional careers in a diverse range of fields that require the use of spatial analysis. As of October 2016, there were 298 alumni who graduated from the MSA program since 2001, of which 187 graduated between 2009 and 2016, after the last program review. Based on the graduate survey conducted in 2016 and the employment data collected from 187 graduates of the program since 2008, about half of the graduates are employed in the business intelligence area, 11% in the environment field and health and community field, respectively, 7% in policing, and 9% in high education such as PhD students, post-doc fellows or professors. Those in non-academic areas are employed in a variety of roles, including (GIS, business, risk, research, real estate, crime) analyst, consultant, manager, Director, Senior Associate, Geologist, GIS Superintendent, Policy Planner, Criminal Intelligence Analyst, planner, Co-Ordinator Systems & Statistics, Vice Present Research.

The MSA program has a number of core strengths. The practicum is identified as one of them, providing applied learning and "real world" experience, industry engagement, networking opportunities, and links to potential employers. The faculty are seen as a core asset of the program, with expertise in a range of geographical applications, applied research in various fields, as well as experience and wide connections with business, industry, non-for-profit and government agencies. Other strengths of the program relate to the dedicated lab and software, the emphasis on data analytics, and the extent to which students are prepared for future employment. The major research paper (MRP) and the thesis option (16-20 months) is also seen as a valuable component for those students to gain deeper research, writing and methodological experiences in research. All of these strengths contribute to students graduating "job ready", with a network of alumni and professional contacts, and the transferable skills required to work in the field, across all sectors of society.

The program is faced with a number of challenges. Student financial support has been identified as a key obstacle in academic progress as revealed in the CGPSS. While the recent graduate survey indicated an overall satisfaction with the financial support received in the program, there were concerns about the limited financial support for thesis students entering their second year as well as international students. In the last 3 years, the program has lost two key MSA faculty members (one to a university in the U.S., the other to a different faculty within Ryerson). This has negatively affected MSA teaching, student supervision, and research activities. Appointments in their areas of expertise are needed to ensure program continuity and stable growth. There have been an increasing number of competing graduate programs developed within and outside of Ryerson. In the next 3-5 years, the MSA will consider developing further strategies to enhance the visibility of the program and recruit talented domestic and international students. While the program has a dedicated computer lab, there is challenge associated with the limited lab space and small number of work stations relative to the number of students. Students in the physical geography and environment fields are also challenged by the lack of dedicated lab space, facilities and storage room. These challenges are outlined in the developmental plan of the report. They provide directions and guidelines for exploring key initiatives over the next 3-5 years.

Despite these challenges, the MSA program is well-positioned to continue its successful trajectory in the coming years. The faculty members and students are the strongest assets to the program, which will ensure a sustained high-level research productivity and teaching excellence. The MSA program is well-regarded in the industry by current employers, and the demand for MSA graduates is anticipated to grow further in the future. Student satisfaction is high overall. The MSA will remain to be a unique graduate program to provide solid training to highly qualified professionals in the spatial analysis and related fields.

#### **PERIODIC PROGRAM REVIEW AND PEER REVIEW TEAM**

The graduate program in Spatial Analysis (MSA), Faculty of Arts, submitted a Self-Study Report to the Yeates School of Graduate Studies that outlined program descriptions and learning outcomes, an analytical assessment of the program, program data including data from student surveys and the standard data packages. Course outlines and CVs for full-time faculty members were also appended.

The appraisal committee spent two days at Ryerson. The visit included interviews with the University and Faculty Administration including the Provost and Vice-President Academic, Faculty of Arts Associate Dean, Vice-Provost and Dean Yeates School of Graduate Studies (YSGS); Associate Dean YSGS, Graduate Program Director of the Graduate Program, and meetings with Faculty, a group of current students, and support staff.

The Peer Review Team (PRT) for the Periodic Program Review (PPR) of the graduate program in Spatial Analysis (MSA) consisted of Dr. Cynthia Brewer (The Pennsylvania State University), Dr. Yuhong He (University of Toronto - Mississauga), and Dr. Ahmed Shaker (Ryerson University).

The PRT site visit was conducted on June 20-21, 2019. The PRT report was communicated to the Associate Dean, YSGS on July 22, 2019 and the response to the report from the graduate program and Faculty was communicated on December 2, 2019.

## **PROGRAM STRENGTHS, WEAKNESSES, AND OPPORTUNITIES**

The Peer Review Team identified program strengths, weaknesses and opportunities for program improvement and enhancement, outlined below.

### **Strengths**

The PRT notes a variety of strengths throughout this report, including innovative program structure, strong linkages to professional networks, high-quality tenure-line faculty ranging in career stage (new to established scholars), and access to up-to-date computing resources. The small cohort each year creates a community and the program makes a good effort to build and connect the group to alums and work opportunities through a variety of in-person events such as a reception for practicum hosts. The topic of the degree remains a strong and growing area of employment and the large-city Toronto location of Ryerson aids connection to a vibrant range of employers.

### **Weaknesses**

The time when terms like 'spatial analysis' is attractive to applicants may be passing with the rise of 'data science,' which at Ryerson seems centered in the Faculty of Science. Likewise, spatial

environmental study emphases may be shifting to Science with a strong EnSciMan program. It is important for the department/program to collaborate and encourage its MSA offerings be shared to bring geospatial approaches to these groups rather than trying to separate themselves or compete with them for students and applicants. As noted above, core courses are due for updates and perhaps a fresh set of instructors.

Teaching assistant commitments are not made until two weeks into a semester by the Faculty of Arts which removes these funds as a recruiting tool for good applicants, in the manner that other universities use TAs. This lack of student funding reduces the competitiveness of the program.

Social media efforts appear to be initiated by individual professors--more coordinated and comprehensive outreach through numerous mechanism can be effective in recruiting applicants and company/agency participation for practicum experiences.

### **Opportunities**

A key opportunity is to expand application and research emphases to new areas in geospatial sciences to keep pace with and have alumni lead changes in data-intensive workplace innovation.

In the MSA, 79% of students are from Ontario universities, but there is high demand from international applicants for study in areas of geospatial analysis and data science. Ryerson's limit on the program of funding 20 entering students a year, pegged to Ontario residents only, hinders growth of the program.

Examining ways to have the program partly benefit from higher tuition charged to grads not from Canada would offer an opportunity for MSA growth and filling a larger number of diverse spatial analysis course offerings. Similarly, adding a graduate certificate in geospatial analysis that is attractive to grads in complementary Ryerson programs in environmental and big-data focused social topics would bring larger class participation that supports more offerings and generates direct income to Geography that can be used to improve facilities and computing.

## **PRT RECOMMENDATIONS**

The PRT made a total of 8 recommendations: 4 Academic and 4 Administrative and Financial Recommendations. The PRT cited several strengths of the graduate program in Spatial Analysis in their report along with several recommendations, which are listed below.

### **Academic Recommendations**

1. Curriculum improvement I: Increasing the level of each of four core courses.
2. Curriculum improvement II: Consider publishable manuscript as the culminating project.
3. Curriculum improvement III: Introduce potential supervisors and projects to MSA students early on for the thesis option.
4. Consider potential synergy and strategy to distinguish and expand the MSA program (including exploring a graduate certificate and potential cross-listings).

### **Administrative and Financial Recommendations**

5. Student recruitment: Increase outreach to the many undergraduate programs. Provision of funds for an RA for outreach purposes.
6. Offer funding support strategies for graduate students.
7. Renovation of the MSA grad lab.
8. Faculty appointments. Women faculty are not proportionately represented in the department or the program. Also consider hiring faculty from complementary areas of study to expand rather than reinforce program offerings and emphases.

## Summary of PRT Recommendations with Graduate Program, Faculty Dean, and YSGS Responses + Implementation Plan

### ACADEMIC RECOMMENDATIONS

Recommendation	MSA Response	Faculty Arts Response	Action Items	Lead(s)	Timeline	YSGS Response
1. Curriculum improvement I: Increasing the level of each of four core courses.	Agree, and committed to a process of curricular renewal that will encompass a reimagined delivery of core coursework, including ways to deliver remedial material, and expanded choices in electives. Changes approved by October 2020 could be implemented for the MSA cohort starting in September 2021 (full program response on page 3 of its response to the PRT report).	We are pleased to see and support the review and renewal of curriculum, modes of delivery, etc. to enhance the student experience. The timeline seems well thought out and reasonable.	Will be discussed at the MSA faculty meeting and the MSA council meeting to make changes to the course syllabus and increase the level of the four courses	GPD and the Executive Committee	Winter 2020/Fall 2020	YSGS supports the Program and Faculty responses.  YSGS notes that any curriculum modifications need to be carried out in accordance with Ryerson University Policy 127. YSGS encourages the Program to contact the Associate Dean, Programs in YSGS to discuss the process.
2. Curriculum improvement II: Consider publishable manuscript as the culminating project.	Agree to clarify and define the parameters of an MRP and distinguish clearly from thesis. Despite advantages of individual pathways, acknowledge too much variability from one student to another (full program response on page 4 of its response to the PRT report).	This is a sound recommendation and thoughtful program response. Finding the proper balance between choice for individual and diverse learning pathways and clarity and uniformity of expectations is very important.	At the late summer orientation, the GPD will encourage more students and faculty supervisors to consider this option and format to disseminate research results in academic journals.	GPD and the Executive Committee	Summer/Fall 2020	YSGS notes that manuscript-style theses are possible and are already an option in several programs. YSGS encourages the Program to speak with the YSGS Associate Dean, Programs to discuss this issue.
3. Curriculum improvement III: Introduce potential supervisors and projects to MSA students early on for the thesis option.	Agree and understand advantages in choosing thesis option earlier. Underway: preliminary project proposal workshop early in October 2019, for all students to determine viability of thesis option, doubling as a preliminary planning step for MRP students, too (full program response on page 4 of its response to the PRT report).	We applauded the prompt and appropriate action taken by the program on this matter.	At the late summer orientation, the GPD will encourage more students to consider the thesis option. The GPD will work with YSGS and Faculty of Arts for additional resources to support the thesis students.	GPD	Summer Fall 2020	YSGS supports the Program and Faculty responses.
4. Consider potential synergy and strategy to distinguish and expand the MSA program (including exploring	This recommendation conflates two separate issues. First, will consult with Dean and Vice-Provost Grad Studies about Grad Certificate. But, such	We agree with the program's response and look forward to further discussions on potential collaborations, particularly in	This will be discussed at the planned MSA faculty and council meetings in the W2020 semester.	GPD	Winter 2020	YSGS supports the Program and Faculty responses.  YSGS encourages the Program

<p>a graduate certificate and potential cross-listings).</p>	<p>certificate would not likely be taken on top of other full-time grad programs the way the reviewers are suggesting. However, agree to potential collaboration with cognate grad programs in cross-enrolling or cross-listing electives (full program response on page 5 of its response to the PRT report).</p>	<p>regards to cross-listing electives.</p>				<p>to explore potential cross-listings of courses with other programs. As noted above, any curriculum modifications need to be carried out in accordance with Ryerson University Policy 127.</p> <p>YSGS notes that new programs, including Professional Master's Diplomas (i.e., graduate certificates) must be developed in accordance with Ryerson University Policy 112. YSGS encourages the Program to consult with the YSGS Associate Dean, Programs on this issue if it is interested in moving forward with a new program.</p>
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ADMINISTRATIVE AND FINANCIAL RECOMMENDATIONS

Recommendation	MSA Response	Faculty Arts Response	Action Items	Lead(s)	Timeline	YSGS Response
<p>5. Student recruitment: Increase outreach to the many undergraduate programs. Provision of funds for an RA for outreach purposes.</p>	<p>Agree a wider range of student backgrounds would expand the pool of potential applicants and enhance student experience. MSA Executive will pursue some preliminary new avenues for outreach immediately, with a view for a more systematic approach in Fall 2020, pending proper resourcing and planning (full program response on page 2 of its response to the PRT report).</p>	<p>The Associate Dean, Grad Studies is in discussions with all Arts grad programs to update program brochures and organize an Arts Grad Fair to help recruit a wider pool of potential students.</p>	<p>Action has been taken in the W2020 semester. A poster with essential program information was created and sent to the Canadian Association of Geographers mailing list; all geography department chairs in Canadian universities, and five undergraduate programs at Ryerson university. (No funding is provided for this purpose yet.)</p>	<p>GDP and the Executive Committee</p>	<p>Winter 2020</p>	<p>YSGS supports the Program and Faculty responses.</p> <p>YSGS also notes that it has recently expanded its recruitment efforts. YSGS returned to graduate fairs in Southern Ontario this fall, has increased its marketing budget, is working with University Relations to update its marketing campaign, and will explore other opportunities to increase the visibility of graduate studies at Ryerson.</p>
<p>6. Offer funding support strategies for graduate students.</p>	<p>Agree in goal of dramatically enhanced funding and support for thesis students, but defend continuing support of MRP students. All students need better funding in RA and GA work, for example. Appreciate recent infusion of graduate scholarship funding from the Provost, School of Graduate Studies, and Dean of Arts (full program response on page 5 of its response to the PRT report).</p>	<p>We agree with the program's response underscoring the need to support MRP students. We remain committed to supporting all graduate students when financially feasible to do so.</p>	<p>Will be working with YSGS and the Faculty of Arts on this</p>	<p>GPD</p>	<p>Winter 2020</p>	<p>YSGS supports and commends the Program's and Faculty's efforts to pursue options for improved funding packages for all students.</p> <p>YSGS notes that the university recently invested substantial funds in graduate scholarships through the creation of the Ryerson Graduate Scholarships and the distribution of YSGS carry-forward funds in June 2019. YSGS will continue to advocate for increased funding for graduate students.</p>

Recommendation	MSA Response	Faculty Arts Response	Action Items	Lead(s)	Timeline	YSGS Response
7. Renovation of the MSA grad lab.	Agree to better match student needs and more varied uses. Modest solutions underway (electric outlet placements; some lockers), but also reiterate that a more significant renovation of the lab will require external support (full program response on page 6 of its response to the PRT report).	We are pleased to read that there are short-term, modest solutions being implemented and agree that a longer-term solution will require external support. We welcome ideas and plans but are limited by financial considerations and restrictions on space.	Modest solutions will be implemented in Summer of 2020; will be working with YSGS and the Faculty of Arts on more significant renovation of the lab.	GPD	Summer 2020 and Summer 2021	YSGS supports the Program and Faculty responses.
8. Faculty appointments. Women faculty are not proportionately represented in the department or the program.  Also consider hiring faculty from complementary areas of study to expand rather than reinforce program offerings and emphases.	Agree gender diversity in the department's faculty is a priority. Will aim to recruit staff and supporting instructors more widely (full program response on page 6 of its response to the PRT report).	The Dean of Arts is committed to supporting the hiring of women and other diverse groups. We are supporting the program's efforts to increase diversity by approving a new Indigenous tenure stream hire for 2019-2020.	DHC will discuss this and identify the area of specialization; the department chair will work with Office of the Dean of Arts to secure hiring positions	GDP, DHC and department chair	Winter 2021	The hiring of new RFA faculty is outside of YSGS's purview. YSGS encourages the Program to continue to work with the Faculty of Arts on issues related to its faculty complement. YSGS supports the Program and Faculty efforts to increase diversity in their hires.

A report on the progress of these initiatives will be provided in the Follow-up Report which will be due in one year from the date of Senate approval.