Institutional Effectiveness
2024-2025

Program: Professional Science PSM
College and Department: College of Interdisciplinary Studies, Professional Studies
Contact: Samantha Allen
Mission:

The mission of the Professional Science Master's in Environmental Informatics (PSM-EI) program is to prepare graduates with advanced expertise in geographic information systems (GIS), spatial analysis, remote sensing, policy analysis, and environmental management. By integrating technical coursework with business and statistics, the program equips students with interdisciplinary skills to address complex environmental challenges. The program fosters collaboration across academic disciplines and provides flexible learning formats to meet the needs of diverse students and working professionals.

Attach Curriculum Map (Educational Programs Only):
Attached Files: See Appendix 1

Learning Outcome 1.1

Define Outcome:
Students will have the ability to apply GIS and statistical tools to manage spatially distributed environmental data to aid in decision making.

Assessment Methods:
Internship report by student; internship supervision evaluation.

- Internship Written Report by Student: During the internship, students will be working in an industry, utilizing knowledge and concepts learned from the curriculum to produce deliverables, which will be presented in writing and during an oral examination. The oral examination and 3 written reports will be evaluated by the graduate student's advisory committee to assess whether the student has mastered program and concentration learning outcomes.
- Internship Supervisor Evaluation: Internship employers will provide a written evaluation of respective intern's performance in achieving designated deliverables.

Criteria for Success (Thresholds for Assessment Methods):
The PSM-EI program has set a goal for all students to collectively be a 4.0 out of 5 or above on their supervisor evaluations.

Any student that gets marked average or below will have individual review discussion with the faculty or graduate committee

Link to 'Tech Tomorrow' Strategic Plan:

1.A Experiential Learning,2.A Technology Infused Programs,2.B Research, Scholar, Intellect, and Creativity

Results and Analysis:
The industry supervisor evaluations generally indicated good student mastery of GIS and statistical tools. For example, one evaluation stated that the student "..performed exceptionally". One student evaluation scored below the 4.0 goal.

Table 1.1 Summary of industry supervisor evaluations for seven PSM-Environmental Informatics students who graduated during the 2024-2025 academic year.

Intern attribute	Number of ratings per category (out of four students)					
	Excellent	Very good	Average	Below average	Very poor	N/A
Attitude	6	0	1	0	0	0
Initiative	5	1	0	0	1	0
Maturity and poise	5	1	0	1	0	0
Ability to learn	6	0	1	0	0	0
Quality of work	5	1	1	0	0	0
Quantity of work	4	2	0	1	0	0
Dependability	6	0	0	1	0	0
Relations with others	6	1	0	0	0	0
Judgment	5	2	0	0	0	0
Attendance	7					0
Punctuality	7					0
Overall performance	6	0	0	1	0	0

Use of Results to Improve Outcomes:

The program is improving the PSM-EI student experience by implementing an annual student meeting and orientation to discuss internship expectations and requirements.

In regards to the internship course, a recently proposed a change to the internship course will allow the course to be flexible of 1, 2, or 3 credit hours, with the ability to spread over multiple semesters, as appropriate. In the first credit hour of the Internship, the students will complete newly developed Online Learning Modules and Orientation in preparation of the internship with their chosen agency to improve the likelihood of a successful internship experience.
Implementing the use of ILearn to set deadlines and paperwork submissions for students in the

Internship course will allow faculty and students to easily see learning modules, professional development resources, frequently asked questions and stay organized with outstanding course and paperwork requirements. These changes were put into place during this academic year and have been implemented for the first time in Spring 2025. We anticipate these changes will help avoid average or below average internship experiences.

A summative assessment assignment has been developed and added to the Fundamentals of Environmental Spatial Analysis course to better assess student progress toward the learning outcome for future cohorts.

Learning Outcome 1.2

Define Outcome:
Students will demonstrate the skills to understand, analyze, and interpret data independently.

Assessment Methods:
Internship report by student; internship supervision evaluation.

- Internship Written Report by Student: During the internship, students will be working in an industry, utilizing knowledge and concepts learned from the curriculum to produce deliverables, which will be presented in writing and during an oral examination. The oral examination and 3 written reports will be evaluated by the graduate student's advisory committee to assess whether the student has mastered program and concentration learning outcomes.
- Internship Supervisor Evaluation: Internship employers will provide a written evaluation of respective intern's performance in achieving designated deliverables.

Criteria for Success (Thresholds for Assessment Methods):
One question on the evaluation asked supervisors to rate their level of agreement on a series of statements regarding student performance for the following statement: "Demonstrate an ability to work independently."

Any student that gets marked average or below will have individual review discussion with the faculty or graduate committee.

Link to 'Tech Tomorrow' Strategic Plan:
1.A Experiential Learning,2.B Research, Scholar, Intellect, and Creativity

Results and Analysis:
Supervisor evaluations indicated that the students were able to work independently. One question on the evaluation asked supervisors to rate their level of agreement on a series of statements regarding student performance. For the following statement, "Demonstrate an ability to work independently," four out of the seven supervisors evaluations received marked strongly agreed. One supervisor did not complete this part of the evaluation form. One supervisor marked agree, while one marked strongly disagree. In a similar fashion, supervisors comments described their interns as having "the ability to work independently, manage time and provide updates", however, one supervisor noted in their evaluation the student needed to "ask more questions" and would have liked to see their "skills applied to their work".

Use of Results to Improve Outcomes:

In regards to the internship course, a recently proposed a change to the internship course will allow the course to be flexible of 1, 2, or 3 credit hours, with the ability to spread over multiple semesters, as appropriate. In the first credit hour of the Internship, the students will complete newly developed Online Learning Modules and Orientation in preparation of the internship with their chosen agency to improve the likelihood of a successful internship experience.

It is the goal of the new course structure that expectations for self-initiative and expectations will be further described earlier on in the students' academic program, improving internship success.

Additional mentorship was given for the student scoring below the intended threshold.

Learning Outcome 2.1

Define Outcome:
Students will demonstrate the ability to integrate business management concepts with environmental information to manage environmental systems.

Assessment Methods:
Internship report by student; internship supervision evaluation.

- Internship Written Report by Student: During the internship, students will be working in an industry, utilizing knowledge and concepts learned from the curriculum to produce deliverables, which will be presented in writing and during an oral examination. The oral examination and 3 written reports will be evaluated by the graduate student's advisory committee to assess whether the student has mastered program and concentration learning outcomes.
- Internship Supervisor Evaluation: Internship employers will provide a written evaluation of respective intern's performance in achieving designated deliverables.

Criteria for Success (Thresholds for Assessment Methods):
The PSM-EI program has set a goal for all students to collectively be a 4.0 out of 5 or above on their supervisor evaluations.

Supervisor comments regarding the student's ability to integrate business and leadership related skills to their internship experience are reviewed by the student's advisor.

Link to 'Tech Tomorrow' Strategic Plan:
1.A Experiential Learning,2.B Research, Scholar, Intellect, and Creativity

Results and Analysis:
Supervisors commented on how the students used business-related skills to enhance their effectiveness. One supervisor wrote that the intern was able to use their skills to "distill and communicate complex information". Another noted a student's "discipline and professionalism, making him a leader among his peers". The students' advisory committees oversaw the students' inclusion of business components to the internship projects, which is a required component of the final report and capstone presentation to which all students must adhere.

Use of Results to Improve Outcomes:

In regards to the internship course, a recently proposed a change to the internship course will allow the course to be flexible of 1, 2, or 3 credit hours, with the ability to spread over multiple semesters, as appropriate. In the first credit hour of the Internship, the students will complete newly developed Online Learning Modules and Orientation in preparation of the internship with their chosen agency to improve the likelihood of a successful internship experience. Modules on applying their business and leadership skills to their internship experience will be included. These changes have been implemented during the Spring 2025 semester for students graduating in the 2025-2026 academic year.

Learning Outcome 2.2

Define Outcome:
Students will communicate effectively in oral and written formats.

Assessment Methods:
Internship report by student; internship supervision evaluation.

- Internship Written Report by Student: During the internship, students will be working in an industry, utilizing knowledge and concepts learned from the curriculum to produce deliverables, which will be presented in writing and during an oral examination. The oral examination and 3 written reports will be evaluated by the graduate student's advisory committee to assess whether the student has mastered program and concentration learning outcomes.
- Internship Supervisor Evaluation: Internship employers will provide a written evaluation of respective intern's performance in achieving designated deliverables.

Criteria for Success (Thresholds for Assessment Methods):
Two questions on the evaluation asked supervisors to rate their level of agreement on a series of statements regarding student performance for the following statements: "Deliver effective oral presentations" and "Produce effective written communications".

Any student that gets marked neutral or below will have individual review discussion with the faculty or graduate committee.

Link to 'Tech Tomorrow' Strategic Plan:
2.B Research, Scholar, Intellect, and Creativity

Results and Analysis:
The seven graduating students defended and presented their internship projects to their graduate advisory committees and other stakeholders, including internship supervisors and other personnel from the internship agencies. The students also completed written internship project reports. All students passed their internship "defenses" and their committees approved their project reports, generally indicating successful communication skills.

All seven supervisors submitted student evaluations; however, one evaluation form did not complete the page regarding communication skills. For written communications, four of the six supervisors strongly agreed and one agreed, one noted unknown; for oral presentations, four

strongly agreed, one agreed, and one disagreed. It is uncommon for PSM students to have a disagreement for oral presentations; however, similar patterns have been seen in years past for the other students.

Use of Results to Improve Outcomes:
Oral and written communication professional development modules will be included in the Online Learning Modules for the Internship course.

A disagree on presentation skills is uncommon for PSM students, however, it is the goal of the new Internship structure that students will have ample time to devote to their internship experience. The student noted had a rushed timeline to complete the internship. It is the goal for the students to secure their internship earlier in their degree program to provide a more effective learning experience and opportunity for growth and feedback, as needed.

Summative Evaluation:

- We had one evaluation that scored lower on their internship supervisor evaluation. It helped highlight the need for changes in the set up of the Internship course, allowing for students to take a variable number of hours for their internship course, from 1-3 hours, with all students being required to take a total of 3 credit hours of internship. This change has gone into effect this year, and we hope that it will allow for earlier mentorship and planning for the internship experience. We hope this change will allow for a better internship experience overall.
- PSM-EI students generally have had an excellent internship experience. However, we would like to be able to have additional times for students to receive feedback or faculty mentorship prior to the internship experience. A yearly student meeting was implemented this year, and was well received to provide student guidance, networking and provide an overview of internship expectations and opportunities.
- A yearly meeting was implemented, however, in the 2025-2026 academic school year, the PSM program aims to complete a graduate student handbook that would allow students an improved understanding of program requirements and internship expectations prior to the internship experience at the end of their program of study.

List of Appendices:
Appendix 1: Curriculum Map

Appendix 1: Curriculum Map

Professional Science Master's, Environmental Informatics					
Course	Title	Learning Outcomes			
		1.1 Apply GIS and statistical tools to manage spatially distributed environmental data to aid in decision making	1.2 Understand, Analyze and interpret data independently	2.1 Integrate business management concepts with environmental information to manage environmental systems	2.2 Communicate effectively in oral and written formats
BMGT 6200	Organizational Leadership			**x**	**x**
ESS 6510	Programming GIS	**x**			
ESS 6520	Environmental Informatics Python Applications and Machine Learning	**x**	**x**		**x**
ESS 6910	Internship	**x**	**x**	**x**	**x**
EVSS 6010	Environmental Social Policy				**x**
GEOG 5410	Remote Sensing	**x**			
GEOG 5650	Environmental Applications of GIS	**x**			
MATH 6070	Applied Linear Statistical Methods I	**x**	**x**		
MATH 6470	Environmental Statistics	**x**	**x**		
MKT 6100	Strategic Marketing			**x**	**x**
Electives	(various course titles)	**x**	**x**	**x**	**x**