FRESHWATER SCIENCES, MS

The School of Freshwater Sciences offers unique graduate programs designed to provide students with advanced training in four key areas: Water Policy and Economics, Water Ecosystems and Human Health, Great Lakes Research and Management, and Water, Weather, and Climate. These interconnected fields combine biological, physical, technological, and policy perspectives to tackle the most pressing environmental challenges.

Master of Science (MS) Tracks

Aquatic Science (Professional) Track

Become a freshwater expert capable of solving complex environmental problems and protecting vital water resources. Through hands-on fieldwork, lab training, and an internship, students gain practical experience in areas like fish health and management, water quality monitoring, ecosystem analysis, and environmental health. This immersive approach equips students with the skills needed to address real-world challenges in freshwater systems. Students in the professional program are not supported by assistantships.

Aquatic Science (Thesis) Track

Students interested in research, water ecology, and developing innovative solutions, the thesis track provides an interdisciplinary, research-focused education. Students work closely with faculty to conduct original research, develop new technologies, and contribute to advancing freshwater science. Students in the thesis program must secure a faculty advisor who will serve as the major professor and provide a graduate assistantship.

Water Policy (Professional) Track

Become a leader in water policy by analyzing scientific and economic data to create policies that address environmental challenges. This program equips students with the skills needed to work in policy consulting and environmental management. Students gain real-world experience through a practicum in water policy and an internship. Students in the professional program are not supported by assistantships.

Water Policy (Thesis) Track

For those interested in water economics and policy, the thesis track offers an interdisciplinary approach, preparing students for careers in research, industry, or further PhD studies. Students will work with experts to conduct original research and develop impactful water policies. Students in the thesis program must secure a faculty advisor who will serve as the major professor and provide a graduate assistantship.

Doctor of Philosophy (PhD) Program

The PhD in Freshwater Sciences focuses on interdisciplinary research and provides the training necessary for a career in academia, research, or industry. All graduates secure jobs in water-related fields, often leading groundbreaking research that shapes water policy and management. Doctoral students will work alongside top freshwater scientists, contributing to important research while focusing on a specific area of study. Students in the PhD program must secure a faculty advisor who will serve as the major professor and provide a graduate assistantship.

At the School of Freshwater Sciences, students gain the skills, knowledge, and experience to drive real-world solutions for freshwater challenges. Join a community of passionate scholars and make a lasting impact on the world's most vital resource.

Admission Requirements

Application Deadlines

Application deadlines vary by program, please review the application deadline chart (http://uwm.edu/graduateschool/program-deadlines/) for specific programs. Other important dates and deadlines can be found by using the One Stop calendars (https://uwm.edu/onestop/dates-and-deadlines/).

Admission

An applicant must meet Graduate School requirements (http://uwm.edu/graduateschool/admission/) plus these departmental requirements to be considered for admission to the program:

- A minimum GPA of 3.0.
- Three letters of recommendation from persons familiar with the applicant's scholarship and/or research potential.
- Submission of a Reason Statement. Statements are used to determine the appropriateness of your educational and professional goals and serves as an example of your ability to express yourself in writing.

Refer to the tracks below for prerequisite coursework recommendations and additional admission requirements.

MS Aquatic Science (Professional)

Prerequisite Coursework

The following prerequisites are strongly recommended:

1. At least one semester coursework in three of the following at the college level: chemistry, biological sciences, physics, and calculus.
2. One additional semester of chemistry, biological sciences, or physics.

Admission will be considered based upon the applicant's academic and/or professional background, proposed course of study, and possible additional coursework once in the degree program, should important preparatory gaps be identified.

Other Admission Requirements

- A bachelor's degree in biology, chemistry, economics, geosciences, mathematics, physics, public policy, or other appropriate natural science, social science or engineering discipline.

MS Aquatic Science (Thesis)

Prerequisite Coursework

The following prerequisites are strongly recommended:

1. At least one semester coursework in three of the following at the college level: chemistry, biological sciences, physics, and calculus.
2. One additional semester of chemistry, biological sciences, or physics.

Admission will be considered based upon the applicant's academic and/or professional background, proposed course of study, and possible additional coursework once in the degree program, should important preparatory gaps be identified.

Other Admission Requirements

- A bachelor's degree in biology, chemistry, economics, geosciences, mathematics, physics, public policy, or other appropriate natural science, social science or engineering discipline.
- Strongly recommended: Submission of scores on the General Test of the Graduate Record Examination (http://uwm.edu/graduateschool/admission/#gre).

MS Water Policy (Professional)

Prerequisite Coursework

The following prerequisites are strongly recommended:

1. At least one semester coursework in three of the following at the college level: chemistry, biological sciences, microeconomics, statistics, political science, and advanced algebra or calculus.
2. One additional semester of statistics, microeconomics, geographic information system, chemistry, or biological sciences.

Admission will be considered based upon the applicant's academic and/or professional background, proposed course of study, and possible additional coursework once in the degree program, should important preparatory gaps be identified.

Other Admission Requirements

- A bachelor's degree in economics, environmental policy, political science, public policy, journalism/communications, biology, or other appropriate natural science, social science, or engineering discipline.

MS Water Policy (Thesis)

Prerequisite Coursework

The following prerequisites are strongly recommended:

1. At least one semester coursework in three of the following at the college level: chemistry, biological sciences, physics, calculus, microeconomics, statistics, political science or advanced algebra.
2. One additional semester of chemistry, biological sciences, physics, microeconomics, Geographic information systems, or statistics.

Admission will be considered based upon the applicant's academic and/or professional background, proposed course of study, and possible additional coursework once in the degree program, should important preparatory gaps be identified.

Other Admission Requirements

- A bachelor's degree in biology, chemistry, economics, geosciences, mathematics, physics, public policy, or other appropriate natural science, social science or engineering discipline.
- Strongly recommended: Submission of scores on the General Test of the Graduate Record Examination (http://uwm.edu/graduateschool/admission/#gre).

Credits and Courses

MS Aquatic Science (Professional)

The minimum degree requirement for the MS Aquatic Science (Professional) track is 32 graduate credits.

Code	Title	Credits
Required		
FRSHWTR 502G	Aquatic Ecosystem Dynamics	3
FRSHWTR 513G	Field Experimentation and Analysis in Freshwater Sciences	3
FRSHWTR 514G	Analytical Techniques in Freshwater Sciences	3
FRSHWTR 585G	Applied Water Statistics and Data Manipulation [1]	3
FRSHWTR 810	Professional Development for Water Leaders	3
FRSHWTR 890	Science Communication	3
FRSHWTR 900	Colloquium in Freshwater Sciences	1
Choose one of the following:		3
FRSHWTR 471G	Introduction to Sensing Networks	
FRSHWTR 506G	Environmental Health of Freshwater Ecosystems	
FRSHWTR 510G	Economics, Policy and Management of Water	
Electives		
Select 9 credits in consultation with the students major advisor		9
Graduate Internship		
FRSHWTR 980	Graduate Internship	1
Total Credits		**32**

[1] ATM SCI 500 can be substituted if FRSHWTR 585 is not being offered.

Additional Requirements

Major Professor as Advisor

Upon admission to the program, each student in the professional track will be assigned an initial advisor based on their background. The initial advisor will provide counseling to the students and help to identify goals and objectives of their graduate education. Students should identify their permanent advisor during the first semester in the program. The advisor will oversee the student's internship.

A plan of study is required and planned by the student in consultation with their advisor and the internship coordinators of the program. The plan of study identifies the planned courses and timeline for completion of the degree coursework and internship.

Internship

All students in the professional science track are required to participate in an internship research experience, generally between the first and second years of the program. Internship experiences focus on complex regional, national, and global water problems and often involve authentic, practical problems in the field. The program coordinators provide resources and internship opportunities with industry, government, and non-profit organizations. It is the responsibility of the student and advisor to identify the internship and the direct supervisor within a specific organization and submit a proposal that identifies goals and objectives of the internship. Proposals will be reviewed and approved by the advisor. Alternatively, a group project may occur in lieu of an internship and should provide students with training and experience in performing professional-level work that involves managing group dynamics and applying technical expertise to solve complex, multidisciplinary water-related problems.

Time Limit

The student must complete all degree requirements within seven years of initial enrollment.

MS Aquatic Science (Thesis)

Minimum degree requirement is 31 graduate credits.

Code	Title	Credits
Required Courses		
FRSHWTR 890	Science Communication	3
FRSHWTR 900	Colloquium in Freshwater Sciences	1
Choose three of the following:		9
FRSHWTR 502G	Aquatic Ecosystem Dynamics	
FRSHWTR 506G	Environmental Health of Freshwater Ecosystems	
FRSHWTR 585G	Applied Water Statistics and Data Manipulation [1]	
FRSHWTR 510G	Economics, Policy and Management of Water	
Choose one of the following:		3
FRSHWTR 513G	Field Experimentation and Analysis in Freshwater Sciences	
FRSHWTR 514G	Analytical Techniques in Freshwater Sciences	
Electives		
Select 9 credits in consultation with the students major advisor		9
Master's Research, Thesis, or Seminar Credits		
FRSHWTR 985	Master's Research and Thesis	6
or FRSHWTR 512G	Freshwater Sciences Practicum:	
Total Credits		**31**

[1] ATM SCI 500G can be substituted if FRSHWTR 585G is not being offered.

Additional Requirements

Major Professor as Advisor

Students in the thesis track must be accepted by a faculty member who will serve as the initial major professor, and be primarily responsible for matriculation. Acceptance or agreement by a faculty member does not constitute formal acceptance into the School of Freshwater Sciences. Prospective thesis-track students are strongly encouraged to communicate with the prospective major professors early in the admission process. A plan of study is required that identifies the planned courses and timeline for completion of the degree. For the thesis track, this includes coursework and proposed research and is planned by the student in consultation with the major professor and must be approved by the Thesis Advisory Committee.

Thesis Advisory Committee

The membership of the Thesis Advisory Committee should be established by the end of the student's first semester. The Committee must consist of three members including the M.S. student's advisor as chair (or co-advisors as co-chairs who are graduate faculty members from the School of Freshwater Sciences) and at least two additional members, one of whom must come from outside the student's research focus. Consideration will be given to the inclusion of one external, non-UWM member of the committee. If included as part of the committee, this person would participate in the thesis defense examination. The Committee must meet at least once a year to monitor the student's academic and research progress.

Proposal Defense and Preliminary Oral Examination

The student must complete a formal oral defense of their written thesis proposal. This defense should be made before the end the third semester and will also serve as the preliminary oral examination. The Thesis Committee decides by simple majority whether the student passes, fails, or must repeat the examination or defense. At the discretion of the Committee, a student who fails the defense or examination may be allowed one additional attempt at successful completion.

Thesis

The thesis is conducted with oversight from the student's Advisory Committee. The thesis research is expected to be of a caliber sufficient for publication in a peer-reviewed journal. Satisfactory completion of the thesis, including successful defense, is required for graduation. Up to six credits may be awarded for thesis research.
Please see the Graduate School thesis and dissertation formatting requirements (https://uwm.edu/graduateschool/gradresources/thesis-and-dissertation-formatting/) for further information.

Thesis Defense

The thesis defense is a public presentation of the thesis research followed by an oral defense administered by the Advisory Committee.

Time Limit

All degree requirements must be completed within five years of initial enrollment.

MS Water Policy (Professional)

The minimum degree requirement for the MS Water Policy (Professional) track is 32 graduate credits.

Code	Title	Credits
Required		
FRSHWTR 510G	Economics, Policy and Management of Water	3
FRSHWTR 585G	Applied Water Statistics and Data Manipulation [1]	3
FRSHWTR 781	Water Law for Scientists and Policy Makers	3
FRSHWTR 810	Professional Development for Water Leaders	3
FRSHWTR 890	Science Communication	3
FRSHWTR 900	Colloquium in Freshwater Sciences	1
Choose one of the following:		3
FRSHWTR 471G	Introduction to Sensing Networks	
FRSHWTR 502G	Aquatic Ecosystem Dynamics	
FRSHWTR 506G	Environmental Health of Freshwater Ecosystems	
Electives		
Select 12 credits in consultation with the students major advisor		12
Graduate Internship		
FRSHWTR 980	Graduate Internship	1
Total Credits		**32**

[1] ATM SCI 500G can be substituted if FRSHWTR 585G is not being offered.

Additional Requirements

Major Professor as Advisor

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MS Water Policy (Thesis)

Minimum degree requirement is 31 graduate credits.

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Required Courses		
FRSHWTR 585G	Applied Water Statistics and Data Manipulation [1]	3
FRSHWTR 781	Water Law for Scientists and Policy Makers	3
FRSHWTR 890	Science Communication	3
FRSHWTR 900	Colloquium in Freshwater Sciences	1
Choose one of the following:		3
FRSHWTR 471G	Introduction to Sensing Networks	
FRSHWTR 502G	Aquatic Ecosystem Dynamics	
FRSHWTR 506G	Environmental Health of Freshwater Ecosystems	
FRSHWTR 583G	Cost-Benefit Analysis for Environmental Resource Decisions	
Master's Research, Thesis, or Seminar Credits		
FRSHWTR 985	Master's Research and Thesis (Up to 6 credits)	6
or FRSHWTR 512G	Freshwater Sciences Practicum:	
Electives		
Select 12 credits in consultation with the students major advisor		12
Total Credits		**31**

[1] ATM SCI 500G can be substituted if FRSHWTR 585G is not being offered.

Additional Requirements

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Time Limit

All degree requirements must be completed within five years of initial enrollment.

Freshwater Sciences MS Learning Outcomes

Students graduating from the Freshwater Sciences, MS program will be able to:

- **Communicate** a broad knowledge of various sciences, technologies, and management issues to facilitate interdisciplinary approaches to solving problems related to freshwater.
- **Collaborate** with natural scientists, engineers, social scientists, managers, business leaders, policy makers, and the public.

Accelerated Program Option

This program is offered as part of an accelerated graduate program. For more information, see Accelerated Graduate Degrees (https://catalog.uwm.edu/opportunities-resources/accelerated-graduate-degrees/).