ENVIRONMENTAL SCIENCE AND POLICY, MS

Banner Code: SC-MS-EVSP

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This master's program meets the increasing need for trained environmental professionals who can address the problems of land and water management, land use and urbanization, wetland loss, microbial ecology, bioremediation, conservation biology, and ecosystem preservation. These professionals will also contribute to the analysis and resolution of global problems such as deforestation, insufficient world food supplies, population growth, planetary health, and global climate change/warming. Areas of specific departmental focus include ecosystems, conservation, environmental biocomplexity, molecular ecology, sustainability science, environmental policy and management, and human/environmental interactions.

Environmental problems are defined in the real world and do not necessarily conform to traditional academic disciplines. As such, solutions require creative combinations of diverse interests and subjects. Effective training requires rigorous, problem-focused transdisciplinary action in a setting in which research is an essential element supporting instruction.

This has been designated a Green Leaf program (http://catalog.gmu.edu/student-services/green-leaf-programs-courses/).

Admissions & Policies

Admissions

University-wide admissions policies can be found in Graduate Admissions Policies (http://catalog.gmu.edu/admissions/graduate-policies/). Additionally, information on the admission of international students can be found in Admission of International Students (http://catalog.gmu.edu/admissions/international-students/).

To apply for this program, please complete the George Mason University Admissions Application (https://www2.gmu.edu/admissions-aid/apply-now/).

Eligibility

Applicants should hold a bachelor's degree from an institution of higher education accredited by a Mason-recognized U.S. institutional accrediting agency or international equivalent with a GPA of 3.00 in natural or Earth sciences, engineering, resource planning, environmental studies, or a field that leads to an environmental focus.

Applicants should have taken at least two semesters of chemistry and three semesters of biology, including a course in ecology. Applicants who lack this coursework should contact the graduate coordinator's office for advice. Successful completion of a two-semester sequence of introductory graduate-level environmental chemistry and biology courses can be used to satisfy the biology and chemistry prerequisites for admission. These introductory courses would be in addition to the requirements for the degree.

Application Requirements

Applicants should submit the following:

- Completed George Mason University George Mason University Admissions Application (https://www2.gmu.edu/admissions-aid/apply-now/).
- Three letters of recommendation, including at least one from a former professor or, if not available, from someone with a PhD.
- The GRE is required.
- Statement of interest indicating: Desired concentration, potential areas of environmental focus/research interest, interactions with potential faculty advisors, and career goals.
- Contact a potential George Mason faculty advisor (appropriate for research interests). An endorsement letter from the potential advisor must be sent to the Department of Environmental Science and Policy (http://catalog.gmu.edu/colleges-schools/science/environmental-policy/)'s graduate office; the availability of an advisor in the student's area of interest is a prerequisite for admission.

Policies

For policies governing all graduate programs, see AP.6 Graduate Policies (http://catalog.gmu.edu/policies/academic/graduate-policies/).

Course Selections

Some program requirements may be fulfilled by completing courses from a variety of academic units at Mason. A student's course selections should reflect a coherent individual program focus, which is stated and briefly described in the program of study. Course selections should also support the research component of the student's degree program (if applicable) and should be developed in close consultation with the supervisory committee. The supervisory committee approves a coursework program (the program of study) individually for each student.

In special cases, the graduate program director may permit the substitution of an alternative course in place of a required one.

Supervisory Committee

Students must form a supervisory committee and submit a program of study to the graduate coordinator for approval within the first 9 credits of coursework or by the end of the second semester, whichever comes first.

The supervisory committee consists of the advisor and at least two other members, chosen in consultation with the advisor, and must conform to AP.6.9 Requirements for Master's Degrees (http://catalog.gmu.edu/policies/academic/graduate-policies/#ap-6-9).

Requirements

Degree Requirements

Total credits: 33

This is a Green Leaf program.

Students should refer to Admissions & Policies for specific policies related to this program.

Students may select for their degree to culminate in either a research project (3 credits) or a thesis (3-6 credits). The concentration credit amount requirements below are directly related to this selection of either a research project or thesis.

Students in all of the concentrations will complete the concentration's requirements and the research requirement with a minimum of 33 credits.

Core Courses

Code	Title	Credits
Science Courses		
Choose 3 credits from the following:		3
EVPP 518	Conservation Biology	
EVPP 607	Fundamentals of Ecology	
EVPP 648	Population Ecology	
Statistics Courses		
Choose 3 credits from the following:		3
EVPP 632	Qualitative Research Methods for Environmental Scientists	
EVPP 651	Multivariate Data Analysis for Ecology and Environmental Science	
SOCI 620	Methods and Logic of Social Inquiry	
STAT 554	Applied Statistics I	
Policy Courses		
Choose 3 credits from the following:		3
EVPP 524	Introduction to Environmental and Resource Economics	
EVPP 608	Introduction to Environmental Social Science	
EVPP 635	Environment and Society	
EVPP 642	Environmental Policy	
Science and Policy Courses		
Choose 3 credits from the following:		3
EVPP 505	Selected Topics in Environmental Science (When the topic is "Evidence-based Policymaking: Using the Environmental Sciences for Governance")	
EVPP 670	Environmental Law	
Seminar Courses		
EVPP 692	Master's Seminar in Environmental Science and Public Policy	1
EVPP 991	Advanced Seminar in Environmental Science (When the topic is: Experimental Design for Environmental Scientists)	2
Research Requirement		**3-6**
The research requirement may be satisfied in one of two ways: A research project or a formal thesis. The depth and sophistication of the research differs between the two options. The thesis normally involves original research with independent acquisition and interpretation of data, with the goal of peer-reviewed publication. Projects are generally less extensive and can include a broader range of activities. Choose from one of the following:		
Research Project Option		
Students fulfilling the research requirement with the project option register for EVPP 798 Master's Research Project in Environmental Science and Public Policy and are required to take a comprehensive examination covering knowledge mastered throughout the program of study. This examination includes both a written and an oral component and is administered by the student's supervisory committee.		
EVPP 798	Master's Research Project in Environmental Science and Public Policy (3 credits)	
Thesis Option		
Students fulfilling the research requirement with the thesis option register for EVPP 799 Master's Thesis in Environmental Science and Public Policy, present their results in a public seminar, and defend their thesis before their supervisory committee. Students will be graded "Satisfactory/No Credit" on the research requirement.		
EVPP 799	Master's Thesis in Environmental Science and Public Policy (3-6 credits)	
Electives		
If necessary, students must take additional electives or concentration courses to bring the degree total to 33 credits. These courses must be approved by the student's supervisory committee and outlined on the student's program of study.		
Total Credits		18-21

Aquatic Ecology Concentration (AQEC)

This concentration will provide students with a well-grounded master's in the study of aquatic environments such as lakes, streams, watersheds, and estuaries. Emphasis is placed on food webs, biogeochemical cycles, water quality, habitat characteristics, and life histories of aquatic organisms. Students will become proficient with research tools including literature review, field and laboratory methods, and analytical tools as well as applications to management issues.

Aquatic Science

Code	Title	Credits
EVPP 550	Waterscape Ecology and Management	3
EVPP 581	Estuarine and Coastal Ecology	3
Choose 3-6 credits from the following:		3-6
EVPP 519	Marine Mammal Biology and Conservation	
EVPP 521	Marine Conservation	
EVPP 536	The Diversity of Fishes	
EVPP 545	Principles of Environmental Toxicology	
EVPP 549	Marine Ecology	
EVPP 563	Coastal Morphology and Processes	
EVPP 608	Introduction to Environmental Social Science	
EVPP 619	The Challenge of Biodiversity	
EVPP 623	Translating Environmental Policy into Action	
EVPP 635	Environment and Society	
EVPP 641	Environmental Science and Public Policy	
EVPP 642	Environmental Policy	
EVPP 643	Microbial Ecology	

EVPP 646	Wetland Ecology and Management	
EVPP 648	Population Ecology	
CLIM 512	Physical Oceanography	
Choose 3 credits from the following:		3
EVPP 515	Molecular Environmental Biology I	
EVPP 555	Lab in Waterscape Ecology	
EVPP 582	Estuarine and Coastal Ecology Laboratory	
EVPP 615	Molecular Environmental Biology II	
EVPP 647	Wetland Ecology Lab and Field	
EVPP 651	Multivariate Data Analysis for Ecology and Environmental Science	
GGS 653	GIS Analysis and Application	
STAT 554	Applied Statistics I	
Total Credits		12-15

Conservation Science and Policy Concentration (COSP)

This concentration is designed to foster an interdisciplinary, research-oriented degree focusing on the conservation of threatened species and habitats, integrating biological sciences and the human dimensions of conservation practice.

Students may take courses offered by the Department of Environmental Science and Policy (http://catalog.gmu.edu/colleges-schools/science/environmental-policy/) and other departments, including CONS courses which are offered through the Smithsonian Mason School of Conservation (http://catalog.gmu.edu/colleges-schools/interdisciplinary-programs-courses/smithsonian-mason-school-conservation/). This unique partnership with the Smithsonian-Mason School of Conservation (SMSC) in Front Royal, Virginia offers students hands-on education in cutting-edge conservation science and human dimensions through residential, intensive classes. SMSC is renowned for its conservation research and training of conservation practitioners around the world and instructors for these classes are drawn from SMSC's conservation scientists and other experts from around the world.

Code	Title	Credits
EVPP 637	Human Dimensions of Climate Change	3
Choose 3 credits from the following:		3
EVPP 518	Conservation Biology	
EVPP 619	The Challenge of Biodiversity	
EVPP 621	Overview of Biodiversity Conservation	
Choose 3 credits from the following:		3
EVPP 505	Selected Topics in Environmental Science (When the topic is "Evidence-based Policymaking: Using the Environmental Sciences for Governance")	
EVPP 529	Environmental Science Communication	
Choose 3-6 credits from the following:		3-6
EVPP 515	Molecular Environmental Biology I	
EVPP 527	Conservation Medicine	
EVPP 560	Infectious Diseases of Wildlife	
EVPP 607	Fundamentals of Ecology	
EVPP 615	Molecular Environmental Biology II	
EVPP 620	Development of U.S. Environmental Policies	
EVPP 623	Translating Environmental Policy into Action	
EVPP 648	Population Ecology	
GGS 553	Geographic Information Systems	
Total Credits		12-15

Environmental Science and Policy Concentration (EVSP)

The Environmental Science and Policy concentration is the largest within the master's and serves as a home for a broad array of research foci. It encourages an independent and creative approach to the development of curricula that reside in the general field of environmental science and policy.

Code	Title	Credits
Choose at least 3 credits from the following:		3
EVPP 527	Conservation Medicine	
EVPP 532	Animal Behavior	
EVPP 543	Tropical Ecosystems	
EVPP 648	Population Ecology	
Choose at least 3 credits from the following:		3
EVPP 531	Land-use Modeling Techniques and Applications	
EVPP 650	Ecosystem Analysis and Modeling	
STAT 525	Nonparametric Statistics and Categorical Data Analysis	
STAT 535	Analysis of Experimental Data	
Choose 6-9 credits from the following:		6-9
EVPP 521	Marine Conservation	
EVPP 533	Energy Policy	
EVPP 542	Urban Ecosystems Processes	
EVPP 550	Waterscape Ecology and Management	
EVPP 560	Infectious Diseases of Wildlife	
EVPP 619	The Challenge of Biodiversity	
EVPP 622	Management of Wild Living Resources	
EVPP 623	Translating Environmental Policy into Action	
EVPP 641	Environmental Science and Public Policy	
EVPP 677	Applied Ecology and Ecosystem Management	
Total Credits		12-15

Communication for Environmental Science, Policy, and Human Behavior (CESP)

The ability to communicate underlies all successful human cooperation. With the growth of anthropogenic global threats such as biodiversity loss and climate change, communication that supports environmental knowledge formation, policy, and behavior change is needed more than ever. Two courses in the concentration from the department, supplemented by those across the university, will allow students to focus on one of these topics. Other classes aside from the core courses may be substituted as needed.

Code	Title	Credits
EVPP 505	Selected Topics in Environmental Science (When the topic is "Evidence-based Policymaking: Using the Environmental Sciences for Governance")	3
EVPP 529	Environmental Science Communication	3

Choose 3-6 credits from one of the following groupings:		3-6
Policy and Governance Grouping		
EVPP 575	Global Biodiversity Governance	
COMM 637	Risk Communication	
GOVT 510	American Government and Politics	
PUAD 540	Public Policy Process	
Behavior Change Grouping		
COMM 637	Risk Communication	
COMM 660	Climate Change and Sustainability Communication Campaigns	
COMM 670	Social Marketing	
COMM 706	Strategic Communication	
Science in Society Grouping		
COMM 602	Theories and Research of Mass Communication	
COMM 639	Science Communication	
COMM 642	Science and the Public	
COMM 735	Crisis Communication	
Choose at least 3 credits from the following:		3
GGS 553	Geographic Information Systems	
GGS 681	Social Media Analysis	
COMM 650	Research Methodologies in Communication	
COMM 775	Media Content Analysis	
EDRS 811	Quantitative Methods in Educational Research	
EDRS 827	Introduction to Measurement and Survey Development	
POGO 511	Introductory Data Analysis for Policy and Government	
POGO 646	Policy and Program Evaluation	
PSYC 557	Psychometric Methods	
PSYC 611	Advanced Statistics	
PUBP 704	Statistical Methods in Policy Analysis	
SOCI 620	Methods and Logic of Social Inquiry	
SOCI 631	Survey Research	
Total Credits		12-15

Environment and Management Concentration (EVM)

This concentration combines the managerial and administrative skills developed in a traditional master of public administration degree program with the scientific knowledge and understanding normally found in a master of science degree. It is especially meant for individuals working in or aspiring to work as managers in the environmental field in government or private industry.

Code	Title	Credits
EVPP 641	Environmental Science and Public Policy	3
EVPP 677	Applied Ecology and Ecosystem Management	3
Choose 3 credits from the following:		3
EVPP 638	Corporate Environmental Management and Policy	
PUAD 502	Administration in Public and Nonprofit Organizations	
Choose 3-6 credits from the following:		3-6
EVPP 505	Selected Topics in Environmental Science (When the topic is "Evidence-based Policymaking: Using the Environmental Sciences for Governance")	
EVPP 524	Introduction to Environmental and Resource Economics	
EVPP 525	Economics of Human/Environment Interactions	
EVPP 529	Environmental Science Communication	
EVPP 533	Energy Policy	
EVPP 542	Urban Ecosystems Processes	
EVPP 545	Principles of Environmental Toxicology	
EVPP 550	Waterscape Ecology and Management	
EVPP 560	Infectious Diseases of Wildlife	
EVPP 620	Development of U.S. Environmental Policies	
EVPP 646	Wetland Ecology and Management	
GGS 553	Geographic Information Systems	
Total Credits		12-15

Energy and Sustainability Policy and Science (ESPS)

Many mid-level energy and sustainability positions in the public and private sectors require multidisciplinary grounding in science, policy, and methods. To provide such a foundation, this concentration combines the scientific knowledge normally acquired through a Master of Science degree with development of relevant policy and methods skills.

Code	Title	Credits
Required Foundation		
EVPP 533	Energy Policy	3
Choose one from the following:		3
EVPP 534	Food-Energy-Water Nexus	
GGS 507	Geographic Approaches for Sustainable Development	
Science		
Choose one from the following:		3
EVPP 542	Urban Ecosystems Processes	
EVPP 677	Applied Ecology and Ecosystem Management	
GEOL 521	Geology of Energy Resources	
PHYS 581	Topics in Renewable Energy	
CEIE 501	Sustainable Development	
CEIE 550	Environmental Engineering Systems	
CEIE 634	Geoenvironmental Design	
CEIE 690	Topics in Civil Engineering	
CEIE 742	Water Resources Engineering II: Water Resource Systems	
Policy and Methods Electives		
Choose 1 or 2 from the following: [1]		3-6
EVPP 505	Selected Topics in Environmental Science (When the topic is "Energy Law & Regulation," or "Fundamentals of Environmental GIS" (EVPP 505 can be taken twice if these two topics are taken separately))	

EVPP 534	Food-Energy-Water Nexus	
EVPP 503	Field Mapping Techniques	
or GEOL 553	Field Mapping Techniques	
EVPP 638	Corporate Environmental Management and Policy	
EVPP 650	Ecosystem Analysis and Modeling	
CSS 645	Spatial Agent-Based Models of Human-Environment Interactions	
GGS 507	Geographic Approaches for Sustainable Development	
ECON 695	Special Topics in Economics	
NUTR 608	Perspectives on Food Security	
NUTR 630	Global Nutrition	
Total Credits		12-15

[1] Choose courses that have not already been taken.

Conservation Medicine & Planetary Health Concentration (CMPH)

Conservation Medicine and Planetary Health (CMPH) are emerging disciplines that address complex health problems that follow disturbances to the Earth's natural systems requiring transdisciplinary collaborations, systems thinking, and adaptive management approaches to health and ecology. Conservation Medicine evolved from the singular key principle that *health connects all species in the planet.* Planetary Health is focused on characterizing the human health impacts of anthropogenic disruptions of Earth's natural systems. The CMPH concentration will provide training in quantitative and qualitative research methods and expand the student's ability to think outside of the box and work beyond traditional disciplinary silos to address complex health issues rooted in ecological principles.

Code	Title	Credits
Students should complete the Required Foundation and choose either the Conservation Medicine or the Planetary Health areas of focus.		
Required Foundation		
EVPP 505	Selected Topics in Environmental Science (When the topic is "Planetary Health")	3
EVPP 527	Conservation Medicine	3
EVPP 677	Applied Ecology and Ecosystem Management	3
Areas of Focus		**3-6**
Conservation Medicine		
Choose 3-6 credits from the following:		
EVPP 545	Principles of Environmental Toxicology	
EVPP 560	Infectious Diseases of Wildlife	
EVPP 651	Multivariate Data Analysis for Ecology and Environmental Science	
EVPP 575	Global Biodiversity Governance	
BIOD 609	Biodefense Strategy	
GGS 540	Health Geography	
GCH 604	Fundamentals of Epidemiology and Biostatistics	
CLIM 690	Scientific Basis of Climate Change	
PUAD 630	Emergency Planning and Preparedness	
Planetary Health		
Choose 3-6 credits from the following:		
EVPP 525	Economics of Human/Environment Interactions	
EVPP 528	Planetary Health	
EVPP 529	Environmental Science Communication	
EVPP 542	Urban Ecosystems Processes	
EVPP 610	Bioremediation: Theory and Applications	
EVPP 637	Human Dimensions of Climate Change	
EVPP 642	Environmental Policy	
COMM 735	Crisis Communication	
GCH 543	Global Health	
NUTR 630	Global Nutrition	
Total Credits		12-15

Accelerated Master's

Bachelor's Degree (selected)/ Environmental Science and Policy, Accelerated MS

Overview

This bachelor's/accelerated master's degree program allows academically strong undergraduates with a commitment to advance their education to obtain a Green Leaf-designated (http://catalog.gmu.edu/student-services/green-leaf-programs-courses/) bachelor's degree and the Environmental Science and Policy, MS (https://catalog.gmu.edu/colleges-schools/science/environmental-policy/environmental-science-policy-ms/) degrees within an accelerated timeframe. Upon completion of this 141 credit accelerated program, students will be exceptionally well prepared for entry into their careers or into a doctoral program in the field or in a related discipline.

Students are eligible to apply for this accelerated program once they have earned at least 60 undergraduate credits and can enroll in up to 18 credits of graduate coursework after successfully completing 75 undergraduate credits. This flexibility makes it possible for students to complete a bachelor's and a master's in five years.

For more detailed information, see AP.6.7 Bachelor's/Accelerated Master's Degrees (http://catalog.gmu.edu/policies/academic/graduate-policies/#ap-6-7). For policies governing all graduate degrees, see AP.6 Graduate Policies (http://catalog.gmu.edu/policies/academic/graduate-policies/). For more information on undergraduates enrolling in graduate courses, see AP.1.4.4 Graduate Course Enrollment by Undergraduates (https://catalog.gmu.edu/policies/academic/registration-attendance/#text).

Admission Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Graduate Admission Policies (http://catalog.gmu.edu/admissions/graduate-policies/) section of this catalog.

Important application information and processes for this accelerated master's program can be found here (https://www2.gmu.edu/admissions-aid/how-apply/accelerated-masters/).

The GRE exam is not required for this accelerated master's program.

Students should submit three letters of recommendation (at least one from a former professor or someone with a PhD), a recent resume, a statement of interest/research goals and interests (including information on the candidate's proposed MS research), and a letter from their advisor (see Graduate Advisor section below) stating that the advisor agrees to take on the candidate as an MS student, how the candidate would be a good fit for them and why candidate's research topic would be suitable.

Students with an overall GPA of at least 3.20 who are pursuing any Green Leaf-designated (http://catalog.gmu.edu/student-services/green-leaf-programs-courses/) major or minor may apply to this accelerated master's program after completing two semesters of chemistry (including CHEM 211 General Chemistry I (Mason Core) (http://catalog.gmu.edu/mason-core/) and CHEM 212 General Chemistry II (Mason Core) (http://catalog.gmu.edu/mason-core/) and three semesters of biology, including a course in ecology, or the equivalent, for example:

Code	Title	Credits
Select one of the following options:		13
Option 1:		
BIOL 213	Cell Structure and Function	
BIOL 214	Biostatistics for Biology Majors	
BIOL 308	Foundations of Ecology and Evolution	
Option 2:		
EVPP 210	Environmental Biology: Molecules and Cells	
EVPP 301	Environmental Science: Biological Diversity and Ecosystems	
EVPP 302	Environmental Science: Biomes and Human Dimensions	
EVPP 305	Environmental Microbiology Essentials	
EVPP 306	Environmental Microbiology Essentials Laboratory	
Option 3:		
CONS 401	Conservation Theory	
CONS 402	Applied Conservation	
6 credits of BIOL or CONS electives		

Graduate Advisor

By at least the beginning of their senior year, students should seek out a faculty member in the Department of Environmental Science and Policy (http://catalog.gmu.edu/colleges-schools/science/environmental-policy/#facultytext) who is willing to serve as their advisor. This advisor will aid the student in choosing the appropriate graduate courses to take and help to prepare the student for graduate studies. Admission into a research-oriented master's concentration is dependent upon securing the agreement of a faculty advisor. Faculty from a variety of departments and colleges at George Mason University (called "program faculty") can serve as master's advisors. Potential students are encouraged to speak with the graduate program coordinator in the department to obtain guidance on this issue.

Accelerated Option Requirements

After the completion of 75 undergraduate credits, students may complete 3 to 12 credits of graduate coursework that can apply to both the undergraduate and graduate degrees.

In addition to applying to graduate from the undergraduate program, students in the accelerated program must submit a bachelor's/accelerated master's transition form (available from the Office of the University Registrar (https://registrar.gmu.edu/forms/)) to the College of Science's Office of Academic and Student Affairs (https://cos.gmu.edu/about/contact-us/) by the last day to add classes of their final undergraduate semester. Students should enroll for courses in the master's program in the fall or spring semester immediately following conferral of the bachelor's degree, but should contact an advisor if they would like to defer up to one semester.

Students must maintain an overall GPA of 3.00 or higher in all graduate coursework and should consult with their faculty advisor to coordinate their academic goals.

Reserve Graduate Credits

Accelerated master's students may also take up to 6 graduate credits as reserve graduate credits. These credits do not apply to the undergraduate degree, but will reduce the master's degree by up to 6 credits. With 12 graduate credits counted toward the undergraduate and graduate degrees plus the maximum 6 reserve graduate credits, the credits necessary for the graduate degree can be reduced by up to 18.

Graduate Course Suggestions

The following list of suggested courses is provided for general reference. To ensure an efficient route to graduation and post-graduation readiness, students are strongly encouraged to meet with an advisor before registering for graduate-level courses.

Code	Title	Credits
EVPP 518	Conservation Biology	3
EVPP 529	Environmental Science Communication	3
EVPP 621	Overview of Biodiversity Conservation	3
EVPP 635	Environment and Society	3