The Graduate Program in Environmental Science (GPES) offers M.S., M.P.S. and Ph.D. degrees. GPES was created in the early 1970s as a unique response to the emerging institutional and analytical challenges of developing environmental problems. The program, which draws upon faculty from throughout the College, emphasizes a multidisciplinary social and natural science approach to environmental understanding and stewardship. It maintains a strong academic orientation, facilitating student and faculty engagement of fundamental environmental challenges such as resource utilization and sustainability, the uses and limits of scientific prediction, risk and sustainability, the uses and limits of scientific prediction and risk analysis, and a holistic concern for the health of the environment within a number of Areas of Study that cut across traditional departmental and disciplinary boundaries. Students select an Area of Study at the time of application for admission to the program.

Requirements

The academic requirements of the Graduate Program in Environmental Science (GPES) are designed to provide graduates with a sound preparation to meet the rapidly evolving challenges of the field as leading scholars and professionals. Programmatic requirements constitute a framework which includes a comprehensive core foundation emphasizing theory, issues and methods; extended knowledge within an area of study; and a synthesis experience.

Entering students should be adequately prepared to engage graduate level work in the program. The following undergraduate courses are pre- or co-requisites for all master’s students: statistics, ecology and microeconomics or environmental economics. Courses in political science are strongly recommended.

In addition, students should have an academic background and/or work experience related to the selected Area of Study (AOS). Wherever possible, deficiencies should be made up prior to matriculation.

TOP Master of Science (M.S.)

The Master of Science degree is designed as a two-year experience culminating in the defense of a master’s thesis. The total number of credits required is 36.

Core Requirements

The core of applied science includes 3 credits of social science, courses (credit-hour requirements vary with area of study) is required 3 credits of natural science, and in addition, a total of six 3 credits of hours is required in research methods courses. The GPES website lists courses options which satisfy have been pre-
approved to satisfy these requirements are designated by the area of study faculty. The student’s Steering Committee may approve different courses to meet these requirements.

**Area-of-Study Requirements**

A minimum of 15 credit hours of courses (excluding ENS 899) is required in the area of study, as determined by the major professor and area-of-study faculty. Areas-of-study subcommittees maintain advising lists of courses pre-approved to satisfy the 15-credit area-of-study requirement. The student’s major professor or Steering Committee may designate approve additional courses. Five study areas are available to M.S. students: environmental policy and democratic processes, environmental and community land planning, environmental systems and risk management, water and wetland resource studies, and environmental communication and participatory processes.

**Thesis Requirements**

A minimum of six credit hours of research is required resulting in a document master’s thesis that clearly demonstrates graduate-level accomplishments in the chosen field of study of the student, followed by a defense examination. Students must have an approved thesis proposal.

**TOP Master of Professional Studies (M.P.S.)**

- [www.esf.edu/environmentalscience/graduate/mps.htm](http://www.esf.edu/environmentalscience/graduate/mps.htm)

The Master of Professional Studies degree is a 30-credit-hour experience aimed at professional applications of environmental knowledge.

**Core Requirements**

A total of 21 credit hours is required. The Core includes at least 3 credit hours in applied social science courses, 3 credit hours in environmental policy and regulation, and democratic processes. In addition, a total of six credit hours is required in environmental science, and 3 credit hours emphasizing applications of technical knowledge.

**Area of Study Requirements**

A minimum of 15 credit hours of coursework is required in the chosen area of study, as determined by the major professor and study area faculty. Students select a study area at the time of application for admission to the program.

Eight study areas are available to M.P.S. students:

- Biophysical and Ecological Economics
- Coupled Natural and Human Systems
- Ecosystem Restoration
- Environmental Communication and Participatory Processes
- Environmental and Community Land Planning
- Environmental Monitoring and Modeling
Environmental Policy and Democratic Processes
Water and Wetland Resource Studies

Synthesis Requirements
Students select either an internship for three to six or more credit hours or prepare a synthesis paper for three credit hours. All students must present a capstone seminar in their final semester. The remaining credits are for free electives. No terminal comprehensive examination is required.

Applicants with a minimum of three years of post-baccalaureate, full-time professional experience directly related to the intended area of study may apply for six credit hours of advanced standing in the program, reducing their degree requirements to 303 credit hours. Partial credit for experience cannot be awarded. When awarded for prior work experience, the six credit hours are applied toward the synthesis requirement.

Doctor of Philosophy (Ph.D.)

www.esf.edu/environmentalscience/graduate/phd.htm

The Ph.D. program provides a unique opportunity to develop environmental policy-related research projects that cut across disciplinary or departmental boundaries within a strong college community of environmental analysts and to draw upon the expertise of scholars at Syracuse University. The requirements for each student are individually tailored and approved by the student’s Steering Committee. Entering students are required to complete the equivalent of the GPES master's core either from prior graduate study or coursework taken within the first year of residency. A master's degree is required prior to matriculation in the Area of Study for Environmental and Natural Resources Policy applicants are expected to have completed a master's research thesis.

TOP  Graduate Areas of Study

www.esf.edu/environmentalscience/graduate/areas.htm

TOP  Biophysical and Ecological Economics (M.S., M.P.S., Ph.D.)

www.esf.edu/environmentalscience/graduate/bee.asp

Students in the Biophysical and Ecological Economics (BEE) study area develop an understanding of environmental problems and solutions through analyses of the relations between the human economy of goods and services and the biophysical economy of networks of energy and material resource flows. Drawing on insights from social and physical sciences, BEE helps students to develop critical thinking, intellectual approaches, measurement tools and modeling skills for analyzing increasingly important topics in environment and natural resource science and policy. Specific course work in biophysical and ecological economics is supplemented by course work in ecology, resource management, environmental economics, policy analysis and others.
Coupled Natural and Human Systems (M.S., M.P.S., Ph.D.)

The Coupled Natural and Human Systems (CNHS) area of study fosters interdisciplinary research and scholarship that explicitly integrates the social and biophysical dimensions of environmental issues using a systems approach. Our research addresses the challenges of sustaining natural and social capital during the Anthropocene—the current era in which humans shape all major Earth system processes. Drawing on diverse backgrounds, CNHS students and faculty recognize humans as integral components of ecosystems and seek to understand their interactions and dynamics of change at multiple scales. Faculty mentors form collaborative and cross-disciplinary teams to advise CNHS students based on their wide range of expertise and experiences. An emphasis is placed on research and graduate training experience with applications to emerging sustainability issues in real-world settings.

Ecosystem Restoration (M.S., M.P.S., Ph.D.)

The ecosystem restoration study area focuses on the technical, biogeochemical, ecological and cultural aspects of rehabilitating and restoring degraded ecosystems, habitats and landscapes. The program is designed for graduate students who wish to take an interdisciplinary approach to ecosystem restoration, have access to multidisciplinary expertise, and develop advanced knowledge of ecological engineering, conservation biology, restoration ecology, forest and habitat restoration, landscape ecology and eco-cultural restoration to address complex environmental problems. Current research includes urban ecology and renewal, aquatic restoration, invasive species, agroforestry, brownfields, traditional ecological knowledge and the spatial monitoring, modeling and analysis of integrated ecological processes. Field sites and study areas are located throughout the world and involve a wide variety of ecosystems, cultures and landscapes. Specific course work in ecosystem restoration is supplemented by courses offerings in science, engineering, mathematics, natural resources, and environmental and social policy.

Environmental Communication and Participatory Processes (M.S., M.P.S., Ph.D.)

This study area addresses the communicative dynamics of the formation of attitudes. It includes decision making, public policy, public participation, campaign development, organizational effectiveness, and conflict prevention and resolution, which all hinge on the ability of participants to communicate and use information effectively, strategically and ethically. GPES students with this option will be prepared to enter diverse arenas of industry, non-government organizations and government structures well equipped to facilitate and participate in effective interactions among individual citizens, non-government organizations, publics, agencies, bureaucracies, scientists and others. They will have the skills and knowledge that will allow them to choose the more appropriate and effective
process structures and strategies to reach objectives.

**TOP Environmental and Community Land Planning (M.S., M.P.S., Ph.D.)**

- [www.esf.edu/environmentalscience/graduate/eclp.asp](http://www.esf.edu/environmentalscience/graduate/eclp.asp)

The program is designed for students with social science, natural science, engineering, or design backgrounds who are interested in an interdisciplinary and integrative program. Some students have majors in interdisciplinary programs in urban studies or environmental studies. Students develop an understanding and knowledge of development processes, natural systems and governmental planning and regulation. They develop a capacity to analyze environmental and community land planning problems and to form imaginative solutions. Skills obtained include preparation of land and environmental databases, plans, policies and implementation programs.

**TOP Environmental Monitoring and Modeling (M.S., M.P.S., Ph.D.)**

- [www.esf.edu/environmentalscience/graduate/emm.asp](http://www.esf.edu/environmentalscience/graduate/emm.asp)

This study area focuses on multidisciplinary approaches to measuring and modeling environmental systems and processes. Students address pressing environmental problems in an integrative manner by taking advantage of a broad range of faculty expertise, a variety of course offerings related to the environment and access to advanced field equipment, study sites and computational hardware. Current research in this area includes sustainable development, air quality, water resources, biogeography, terrestrial and aquatic ecosystems, climate and anthropogenic change, forest biometrics and energy systems. Specific course work in environmental monitoring and modeling is supplemented by courses offerings in the fields of science, engineering, mathematics, natural resources and environmental and social policy.

**TOP Environmental and Natural Resources Policy (Ph.D.)**

- [www.esf.edu/environmentalscience/graduate/enrp.asp](http://www.esf.edu/environmentalscience/graduate/enrp.asp)

The Ph.D. degree requires a minimum of sixty (60) total graduate credit hours (ESF policy). A total of forty-eight (48) hours in graduate coursework are required, of which twenty-four (24) credit hours must be taken in residence at ESF. In addition, Ph.D. students must complete at least twelve (12) credit hours of thesis research credit (FOR 999 or ENS 999: Doctoral Dissertation, corresponding to the departmental affiliation of your major professor). You will develop your program of study to satisfy the coursework requirements in consultation with your major professor and steering committee.

Coursework should provide a coherent body of theory, a set of appropriate methods to test that theory, and should focus on an important area of application beyond the specific work done for the graduate degree (see handbook for further guidance in coursework).

**TOP Environmental Policy and Democratic Processes (M.S., M.P.S.)**

- [www.esf.edu/environmentalscience/graduate/epdp.asp](http://www.esf.edu/environmentalscience/graduate/epdp.asp)
The focus of this study area is on developing new understanding of public participation in environmental decision making, against the backdrop of environmental policy making and program implementation. Particular attention is given to (a) the variety of organizations involved in participation, which generally are the institutions and agencies of government, citizen-based non-governmental organizations and the business or industrial sector; (b) the availability and utility of environmental information for these groups; and (c) the participation and integration of all informed stakeholders into environmental decision making. This tripartite scheme of organizations, information and participation frames student programs of study and suggests important directions for student and faculty research efforts.

**Water and Wetland Resource Studies (M.S., M.P.S., Ph.D.)**

- [www.esf.edu/environmentalscience/graduate/wwrs.asp](http://www.esf.edu/environmentalscience/graduate/wwrs.asp)

The water and wetland resources area of study develops an understanding of technical, social and institutional aspects of water resources management, mitigation and restoration. Individual students may emphasize scientific or social subject areas but all study in both areas. Scientific aspects include the basic physical, chemical and biological interactions occurring in water resources systems. The social aspects are concerned with planning, regulation, law and institutions and management of water and wetland resources. Water serves as a focus for graduate study in water and related land resources management and water pollution and water quality control.

**Recommended coursework includes:**

- **Physical sciences:** civil engineering, geology, geomorphology, hydrology, meteorology, environmental engineering, soils, water chemistry, hydrogeology, hydrogeochemistry and geographic information systems;

- **Biological sciences:** ecology, entomology, fisheries biology, forestry, microbiology, water quality and limnology; and

- **Social sciences:** administration, economics, government, history, law, ethics, philosophy and policy.