# Environmental Sciences Major: Soil and Watersheds Option (B.S.)

https://colsa.unh.edu/natural-resources-environment/program/bs/environmental-sciences-major-soil-watersheds-option

## Description

The College of Life Sciences and Agriculture (COLSA) and the College of Engineering and Physical Sciences (CEPS) jointly offer a bachelor of science degree in environmental sciences. Environmental science is an interdisciplinary field concerned with the interaction of biological, chemical, and physical processes that shape the environment, and control the response of natural systems to human activities. Students graduating with a degree in environmental sciences will have an understanding of these interacting processes, experience working in interdisciplinary teams to apply this understanding, and the ability to communicate effectively with both scientific and lay audiences. While in this program, students will acquire significant experience with field, laboratory, and analytical methods appropriate for employment in professional environmental science positions as well as a basic understanding of environmental policy. The University of New Hampshire is a recognized leader in environmental sciences research, and the environmental sciences program capitalizes on faculty expertise in this area. Program faculty emphasize teaching and research in the areas of biogeochemical cycling, environmental chemistry, ecosystem science, global change, hydrology, plant ecology, soil science, and water resource management among many other fields.

Employment opportunities include environmental consulting firms; educational facilities (e.g., science centers), environmental monitoring laboratories (e.g., water treatment plants, the Environmental Protection Agency), government agencies (e.g., the U.S. Geological Survey, Bureau of Land Management, Natural Resource Conservation Service), university and government research laboratories, and nongovernment environmental organizations. The environmental sciences program also constitutes an excellent preparation for graduate programs in several areas relating to the environment.

The Program has four options, and specific course requirements for the major vary by option. The ecosystems and soils and watersheds options are both managed by the Department of Natural Resources and the Environment in COLSA, and the geosystems and hydrology options are both managed by Earth Sciences in CEPS.

## Requirements

### Scope of the Major: Introduction - 3 Courses

- **NR 400**: Professional Perspectives in Natural Resources (9 credits)
- **NR 403**: Introduction to Environmental Science
- **NR 435**: Contemporary Conservation Issues and Environmental Awareness
- **or NR 437**: Principles of Sustainability

### The Scientific Basis: Foundation - 7 Courses

- **CHEM 403**: General Chemistry I
- **BIOL 412**: Introductory Biology: Evolution, Biodiversity and Ecology
- **CHEM 405**: Chemical Principles for Engineers
- **CHEM 411**: Introductory Chemistry for Life Sciences

### Earth and its Systems: Core - 6 Courses

<table>
<thead>
<tr>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td><strong>ESCI 401</strong>: Dynamic Earth</td>
<td>4</td>
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<tr>
<td><strong>ESCI 402</strong>: Earth History</td>
<td>4</td>
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<tr>
<td><strong>ESCI 409</strong>: Geology and the Environment</td>
<td>4</td>
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### Earth Science

- **ESCI 534**: Techniques in Environmental Sciences (4 credits)
- **ESCI 777**: GIS for Earth & Environmental Sciences (4 credits)
- **GEOG 571**: Applied Geospatial Techniques (4 credits)
- **NR 757**: Remote Sensing of the Environment (4 credits)
- **NR 778**: Remote Sensing Earth & Environmental Sciences (4 credits)
- **NR 797**: Environmental Modeling (4 credits)
- **NR 713**: Quantitative Ecology (4 credits)

### Environmental Science

- **ESCI 414**: Applied Biostatistics I (4 credits)
- **ESCI 425**: Statistical Methods and Applications (4 credits)

### Electric

- **ESCI 401**: Dynamic Earth (4 credits)
- **ESCI 402**: Earth History (4 credits)
- **ESCI 409**: Geology and the Environment (4 credits)

### Human Dimensions

- **NR 602**: Natural Resources and Environmental Policy (4 credits)
- **NR 662**: Environmental Policy, Planning and Sustainability in New Zealand (4 credits)
- **NR 507**: Introduction to our Energy System and Sustainable Energy (4 credits)
- **NR 784**: Sustainable Living - Global Perspectives (4 credits)

### Environmental Toolkit: Methods - 2 Courses

Select two courses from the following:

- **ESCI 534**: Techniques in Environmental Sciences
- **ESCI 777**: GIS for Earth & Environmental Sciences
- **GEOG 571**: Applied Geospatial Techniques
- **NR 757**: Remote Sensing of the Environment
- **NR 778**: Remote Sensing Earth & Environmental Sciences
- **NR 797**: Environmental Modeling
- **NR 713**: Quantitative Ecology

### Soil and Watershed Systems (Advanced Topics - 5 courses = 20 credits)

- **NR 761**: Environmental Soil Chemistry (4 credits)
- **NR 706**: Soil Ecology (4 credits)
- **NR 783**: Watershed Water Quality Management (4 credits)

### Ecosystems

- **NR 730**: Terrestrial Ecosystems (4 credits)
- **NR 751**: Aquatic Ecosystems (4 credits)
- **NR 661**: Restoration Ecology and Ecosystem Management in New Zealand (4 credits)

### Biogeochemistry

- **NR 744**: Biogeochemistry (4 credits)
- **ESCI 643**: Biogeochemical Cycles in the Earth System (4 credits)

### Advanced Soils and Watersheds

- **NR 743**: Ecology and Society in a Changing Arctic (3 credits)
- **ESCI 654**: Fate and Transport in the Environment (4 credits)
- **ESCI 705**: Principles of Hydrology (4 credits)
- **ESCI 710**: Groundwater Hydrology (4 credits)
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- or ESCI 747 Aqueous Geochemistry
- or CEE 796 Special Topics
- or CEE 754 Engineering Hydrology

Integration and Research (The Capstone Experience) 2-3

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
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<tbody>
<tr>
<td>NR 663</td>
<td>Applied Directed Research in New Zealand</td>
<td>4</td>
</tr>
<tr>
<td>or NR 786</td>
<td>Leadership for Sustainability</td>
<td></td>
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<tr>
<td>or NR 795</td>
<td>Investigations</td>
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<tr>
<td>or NR 799</td>
<td>Honors Senior Thesis</td>
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Capstone: NR 663 (EcoQuest Senior Year) (WII), or NR 786, or NR 795, or NR 799, or approved research experience, or approved internship. Every student must complete a capstone experience senior year, or during the summer before senior year if at least 90 credit hours have been completed.

NR 701 - Preparation for Capstone (1 credit, pass/no credit) is offered every spring. While not required for graduation, it is recommended for second semester juniors who need guidance in terms of developing a capstone project and completing the Capstone Contract.

a. A Contract form provided by the Program must be completed and signed by the student, the adviser, the program coordinator, and the capstone mentor (faculty or off-campus) before the capstone experience by the end of Junior Year.

b. A signed Capstone Experience Evaluation form must be handed in to your advisor by the end of Senior year in order to graduate.

Individualization Your Education (19 Credits)

Program Advisors will help students select additional courses from across the campus that relate to the student’s areas of intellectual interest, and assist with the completion of minors, dual major, study abroad programs, research projects, internships, etc.

| Total Credits | 92-93 |

1. NR 706 or NR 761 if not already taken.
2. Many students enroll in the EcoQuest program (a study abroad opportunity in New Zealand), which satisfies the policy requirement, and capstone requirement if taken senior year.
3. NR 791 Preparation for Capstone - is offered every spring. While not required for graduation, it is recommended for second semester juniors who need guidance in terms of developing a capstone project and completing the Capstone Contract.