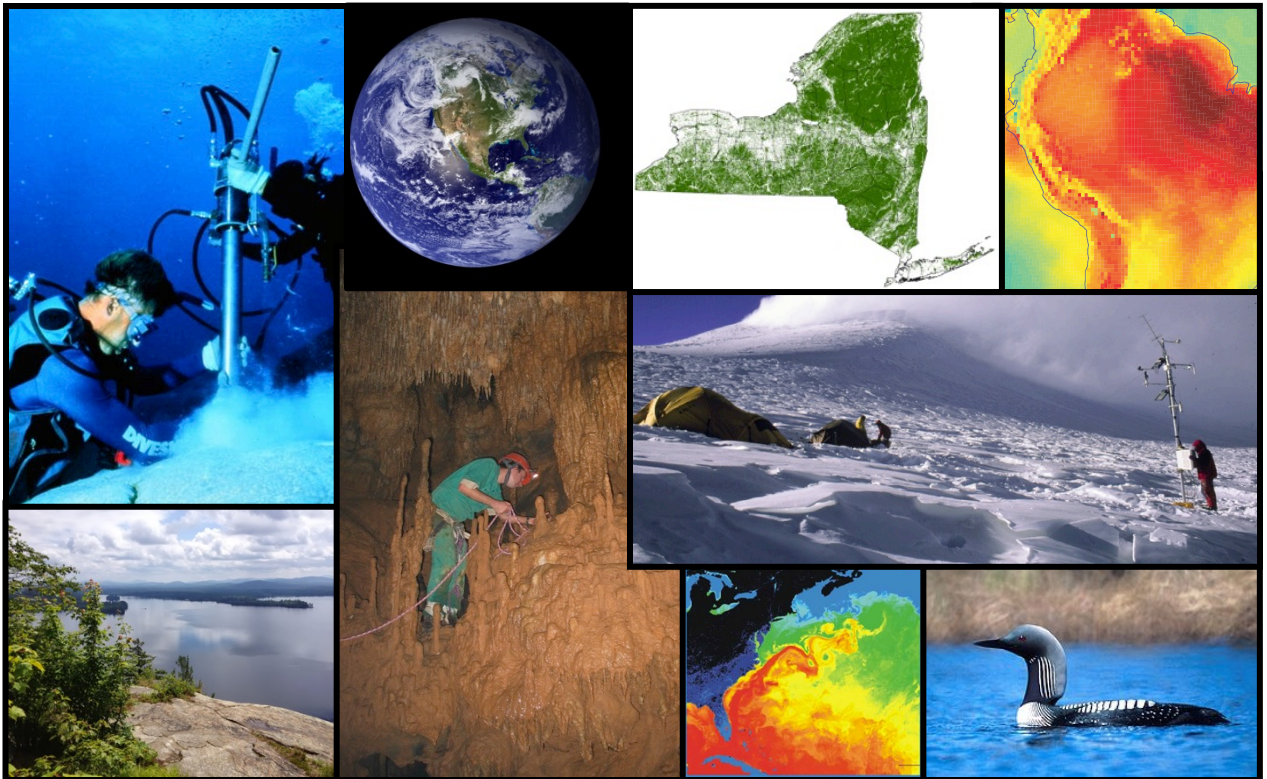




UNIVERSITY AT ALBANY  
State University of New York

Bachelor of Science in Interdisciplinary Studies with a Concentration in  
**ENVIRONMENTAL SCIENCE**



*in the*

*Department of Atmospheric and  
Environmental Sciences*

<http://www.albany.edu/atmos/>

# Bachelor of Science in Interdisciplinary Studies with a Concentration in Environmental Science

**Environmental issues are some of the greatest challenges we face as human society.** There is increasing demand for environmental scientists to confront these challenges. Environmental science encompasses the Earth's oceans, atmosphere, surface, and interior as well as how these physical components of the Earth system interact with life (ecology) and human society. Environmental science plays a central role in major current national and world issues (climate change, sustainability, energy, water resources, and biodiversity).

In the **Department of Atmospheric and Environmental Sciences (DAES)** students gain strong and multifaceted education in environmental science. They build a strong foundation in the fundamental basic sciences that govern environmental phenomena. Students gain hands-on experience taking environmental measurements and using software and statistics to unlock the secrets of environmental data.

Coursework is taught by 20 full time faculty and staff members, most of who are active and prominent researchers in their fields of study. Faculty and staff members pride themselves in their teaching and several have won national teaching awards.

## Research and Teaching Facilities

**ETEC building:** Work is underway on a new home for DAES. The new \$184 million Emerging Technology and Entrepreneurship (ETEC) building will house DAES starting in 2021. It will have state of the art teaching and research facilities. ETEC will be shared with the Atmospheric Science Research Center, NYS Mesonet, and College of Emergency Preparedness, Homeland Security and Cybersecurity.



**Maproom:** DAES houses an electronic "map room" for interactive display of meteorological and environmental data



**Field trip and fieldwork destinations:** Class trips and fieldwork opportunities take advantage of many fantastic nearby environmental sites including: The Albany Pine Bush, The New York State Museum, Thacher State Park, Huyck Preserve, and more!



Thacher State Park

**Whiteface Mtn. Observatory:** The UAlbany Atmospheric Sciences Research Center (ASRC) operates an observation center atop Whiteface Mountain in the Adirondacks, measuring chemical species, cloud properties, acid precipitation, and aerosol content.



# Curriculum

Environmental Science is interdisciplinary, tying together knowledge from many areas to understand the world around us. Majors start by building a solid foundation in basic science. In junior and senior years, curriculum is tailored to specific student interests and goals.

Students choose from four areas of specialization:

Geography

Sustainability Science & Policy

Ecosystems

Climate Change

Sample four-year plan for an ENV major.

required classes listed in bold (credits in parentheses)

## Semester 1

**MAT 112:** Calculus I (4)  
**CHM 120:** General Chemistry I (3)  
**CHM 124:** General Chemistry Lab I (1)  
**BIO 130:** General Biology: Molecular/Cell (3)  
 Elective/University Gen. Ed. Requirement

## Semester 3

**PHY 140:** Physics I (3)  
**ENV 221:** Understanding the Earth (3)  
**BIO 201:** Intro. Biology lab I (1)  
**ATM 210:** Atmospheric Structure/Circulation (3)  
 Elective/Gen-ed

## Semester 5

**ENV 302:** Ocean Science (3)  
**BIO 330:** Principles of Ecology & Evolution (3) Specialization requirement  
 Elective/Gen-ed  
 Elective/Gen-ed

## Semester 7

Specialization requirement  
 Specialization elective  
 Specialization elective  
 Elective / Internship / Research

## Semester 2

**ENV 105&106:** Intro. Environmental Science & Lab (4)  
**CHM 121:** General Chemistry II (3)  
**CHM 125:** General Chemistry Lab II (1)  
**BIO 131:** General Biology: Ecology/Evolution (3)  
 Elective/Gen-ed

## Semester 4

**BIO 202:** Intro. Biology lab II (1)  
**ENV 315:** Environmental Stats. & Computation (4)  
 Specialization requirement  
 Elective/Gen-ed  
 Elective/Gen-ed

## Semester 6

**ENV 327:** Meteorological and Envi. Measurement (3)  
 Specialization requirement  
 Specialization requirement  
 Elective/Gen-ed  
 Elective/Gen-ed

## Semester 8

**ENV 490:** Major Topics in Environmental Science (3)  
 Specialization elective  
 Specialization elective  
 Elective / Internship / Research

Requirements for environmental science specializations (students pick one)

**Geography (22 credits):**

### Required courses (10 credits)

**GOG/USP 220:** Introductory Urban Geography  
**GOG 290:** Introduction to Cartography  
**GOG 496/USP 456:** Geographic Information Systems (GIS)

### Sample Electives (choose 12 credits)

GOG 330: Principles of Environmental Management  
 GOG 344: World Population  
 GOG 354: Environment & Development  
 GOG 375: Methods of Urban Analysis  
 GOG 414: Computer Mapping  
 GOG 430: Environmental Planning  
 GOG 460: People, Place, and Power  
 GOG 484/5: Remote Sensing I/II  
 ENV 250: Environmental Sustainability  
 ENV 404: The Adirondack Environment  
 ATM 301: Surface Hydrology and Hydrometeorology  
 ATM 405: Water and Climate Change

**Sustainability Science and Policy (21 credits):**

### Required courses (9 credits)

**ATM 304:** Air Quality  
**ENV 250:** Environmental Sustainability  
**RPOS 399:** Topics in Political Science and/or Public Policy

### Sample Electives (choose 12 credits)

ANT 418: Culture, Environment, and Health  
 ATM 405: Water and Climate Change  
 ATM 413: Weather, Climate, and Societal Impacts  
 BIO 311: World Food Crisis  
 ENV 404: The Adirondack Environment  
 GOG 220: Introductory Urban Geography  
 GOG 344: World Population  
 GOG 430: Environmental Planning  
 RPAD 366: International Environmental Policy  
 HSPH 321: Global Environmental Issues and Their Effect on Human Health  
 HSPH 323: Environmental Laboratory Perspectives in Public Health  
 HSPH 332: Epidemiology and Biostatistics

**Ecosystems (22 credits)**

### Required (10 credits)

**BIO 212:** Introductory Genetics  
**BIO 327:** Experimental Ecology  
**BIO 401:** Ecology

### Sample Electives (choose 12 credits)

ANT 418: Culture, Environment, and Health  
 ANT 419: Human Evolutionary and Environmental Physiology  
 ATM 301: Surface Hydrology and Hydrometeorology  
 BIO 329: Genetics of Human Disease  
 BIO 402: Evolution  
 ENV 250: Environmental Sustainability  
 ENV 404: The Adirondack Environment  
 GOG 407: Biogeography  
 GOG 424: Landscape Ecology  
 GOG 433: Urban Ecology  
 GOG 496: Geographic Information Systems  
 HSPH 321: Global Environmental Issues and Their Effect on Human Health

**Climate Change (21 credits):**

### Required (12 credits)

**ATM 306:** Climate Variability and Change  
**ATM 405:** Water and Climate Change  
**ENV 415:** Climate Laboratory  
**ENV 450:** Paleoclimatology

### Sample Electives (choose 9 credits)

ATM 301: Hydrology and Hydrometeorology  
 ATM 304: Air Quality  
 ATM 307: Introduction to Atmospheric Chemistry  
 ATM 335: Meteorological Remote Sensing  
 ATM 413: Weather, Climate Change, and Societal Impacts  
 ATM 414: Air Pollution Meteorology  
 ENV 404: The Adirondack Environment  
 RPAD 366: International Environmental Policy  
 RPOS 266: International Political Economic Science  
 HSPH 321: Global Environmental Issues and Their Effect on Hu

# Internship and Research Opportunities

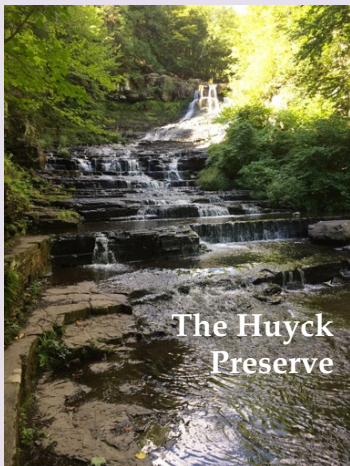
## Internships:

DAES students have many nearby opportunities for **paid and volunteer internships and seasonal jobs**, all of which can provide students with a valuable learning experience and credit towards the major. Some examples are:

- **NY State Department of Environmental Conservation** is the state agency tasked with protecting and enhancing the environment of New York.
- **NY State Museum** houses a wealth of artifacts on the ecology, geology, anthropology, and culture of the state.
- **New York State Mesonet** is a network of 126 environmental stations across the state based on the UAlbany campus.
- **Albany Pine Bush Preserve Commission** protects and manages open space and wildlife at the one of the best remaining examples of an inland pine barrens ecosystem in the world
- **Huyck Preserve and Biological Research Station** is a non-profit organization with over 2,000 acres of forest, field, and wetland habitat. It is dedicated to research, education, recreation, and conservation.



## *New York State Mesonet internship*



The Huyck Preserve



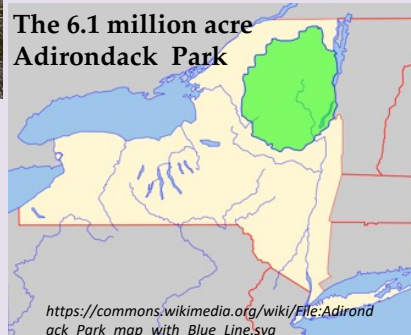
The NYS Museum

CC-BY-SA-3.0/Matt H. Wade at Wikipedia



The endangered Karner Blue Butterfly (found at Albany Pine Bush)

U.S. Fish & Wildlife Service National Digital Library



The 6.1 million acre Adirondack Park

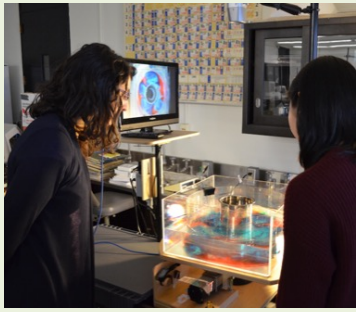
[https://commons.wikimedia.org/wiki/File:Adirondack\\_Park\\_map\\_with\\_Blue\\_Line.svg](https://commons.wikimedia.org/wiki/File:Adirondack_Park_map_with_Blue_Line.svg)

## Research:

Many students work on a research project (for credit) with a faculty member during their junior or senior year. Research ideas may come directly from faculty, but students often come up with their own ideas that fit with a specific faculty member's research interests.

## Some recent undergraduate research projects include:

- "Geospatial Energy and Life Cycle Assessment of Oscillating Water Column Systems in the Northeast"
- "Exploring Bird Evolution: An Ornithology Lesson for Middle and High School Students"
- "The impact of ENSO and AMO on selected glaciers in the Andes of South America"



**Hand-on education:**  
*simulating atmospheric and oceanic flows in a rotating tank, drying soil samples, launching a weather balloon.*

### Honors Program:

Students with a cumulative GPA of at least 3.25, and 3.5 in the major, are eligible to apply for a B.S. with honors in environmental science. Students must complete 83-84 credits including two semesters of Undergraduate Research (ENV 498) leading to an undergraduate thesis and oral presentation.

### Extra-curricular activities:

There are hundreds of campus groups where you can meet up with others that share your interests, including a number of sustainability and environmental campus groups:

- **The UAlbany Outdoors Club**
- **UAlbany Students for Sustainability**
- **UAlbany Grow Green**

Many of our students also volunteer at the annual DAES Family Earth Day event.

### Minors:

While adding a minor isn't required for ENV majors, it is a great way to diversify your education and learn extra skills that make you more attractive to future employers. Some common minors among environmental science majors include:

- **Sustainability**
- **Informatics**
- **Atmospheric Science**
- **Geographic Information Systems (Certificate)**

... although dozens of other possibilities exist as well.

### Careers:

Many of our undergraduate degree recipients continue their education in graduate school in areas such as environmental engineering, law, teaching, geography/GIS, climate science, or ecology. There are also a significant number of jobs available to students with Bachelor's degrees. Some of the more common jobs are in:

- Environmental monitoring (air & water quality)
- Environmental consulting
- Renewable energy
- Environmental instrumentation
- Environmental policy
- Environmental education



Volunteers at our annual "Family Earth Day" event



Students hard at work in the map room

# Faculty Research Interests and Contact Information

**Lance F. Bosart**, Distinguished Research Professor (Ph.D., MIT)  
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*Synoptic meteorology and the weather-climate interface*

**Kristen Corbosiero**, Associate Professor (Ph.D., University at Albany)  
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*Tropical cyclones and lightning*

**Aiguo Dai**, Professor (Ph.D., Columbia Univ.)  
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*Climate change and the global water cycle*

**Oliver Elison Timm**, Associate Professor (Ph.D. Univ. of Kiel)  
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*Paleoclimatology and regional climate change*

**Robert Fovell**, Professor (Ph.D., Univ. of Illinois)  
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*Numerical weather prediction and mesoscale meteorology*

**Aubrey Hillman**, Assistant Professor (Ph.D., University of Pittsburgh)  
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*Paleoclimatology using lake sediments*

**Daniel Keyser**, Research Professor (Ph.D., Pennsylvania State Univ.)  
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*Synoptic-dynamic meteorology*

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*Synoptic meteo. and troposphere-stratosphere interaction*

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*Mountain meteorology and mesoscale meteorology*

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*Past changes in ocean and climate systems*

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*Planetary-scale climate dynamics*

**Paul E. Roundy**, Professor (Ph.D., Pennsylvania State Univ.)  
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*Tropical atmospheric waves and midlatitude interaction*

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*Tropical cyclones and mesoscale meteorology*

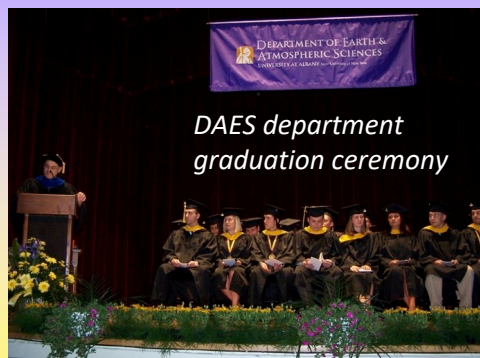
**Christopher D. Thorncroft**, Professor and ASRC Director (Ph.D., University of Reading)  
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*West African monsoon and African easterly waves*

**Ryan Torn**, Professor and Dept. Chair (Ph.D., Univ. of Washington)  
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*Predictability, data assimilation, and mesoscale meteorology*

**Kevin R. Tyle**, Manager of Departmental Computing (M.S., University at Albany)  
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*Big data, and meteorological data visualization*

**Mathias Vuille**, Professor (Ph.D., Univ. of Bern)  
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*Tropical paleoclimatology and climate change*

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*Remote sensing and land-climate interactions*



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