

JANUARY 2012

CONNECTIONS

Issue Topic:

VOLUME 6: ISSUE 1

Environmental Studies in the USA



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In This Issue:

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Note from the Editor:

The twenty-first century will see the need to address a host of pressing environmental concerns, including climate change, water scarcity, and biodiversity loss, to name just a few. Tackling these issues will require globally focused scholars and practitioners who have been trained in an array of diverse disciplines, everything from biology to economics to business management. Environmental studies programs in the United States, which are interdisciplinary in nature, provide international students not only with a broad base of skills and knowledge but also with the flexibility to pursue environmental issues that are particularly relevant to their places of origin.

This issue provides information about the wealth of disciplines and career paths available to students in environmental studies programs. Angela Kuhne, the Director of Admissions & Financial Aid at the Yale School of Forestry & Environmental Studies, leads off by offering a comprehensive overview of the numerous degree options available to both undergraduate and graduate students. Then, Adam Ancira, the Recruiting and Admissions Coordinator at the School of Natural Resources and Environment at the University of Michigan, documents the varied career paths that a degree in environmental studies opens up. Finally, *Connections* interviews Professor Willis Weight, the Director of the Environmental Studies Program at Carroll College, for an inside perspective on what students should look for in an environmental studies program.

This issue is also accompanied by a PowerPoint presentation entitled "Environmental Studies in the USA." To find this PowerPoint and others, please visit the *Connections* section on the EducationUSA website.

I'm looking forward to meeting with many of you at the EducationUSA East Asia & Pacific Conference in Malaysia in late March. Please feel free to pull me aside there to discuss how we can continue to make *Connections* relevant to your advising centers. And, as always, please feel free to email me if you have any suggestions for upcoming issues of the journal.

– Luke Eplin, *Connections*
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Environmental Studies in the United States: Undergraduate and Graduate Degree Options

By Angela Kuhne

Feature

Environmental studies is a burgeoning field that exposes students to a wide variety of disciplines. “Environmental” careers are now found in numerous employment sectors, including business, engineering, law, economics, government, public health, architecture and design, chemistry, biotechnology, energy, manufacturing, nongovernmental organizations, education, and media. Graduates of environmental studies programs may find jobs with their country’s government, a local not-for-profit organization, a multinational corporation, or organizations such as the United Nations. Below, I describe some of the options available for undergraduate and graduate studies in the environmental field.

Undergraduate Study

At the undergraduate level, baccalaureate degrees are four years in length, and there are four common degree options: Bachelor of Arts (BA), Bachelor of Science (BS), Bachelor of Forestry (BF), and Bachelor in Engineering. Within these degrees, there are a number of typical majors in the environmental sector: environmental studies, environmental science, ecology, forestry, and natural resource management. In addition, students can specialize in any number of areas, such as sustainable development, economics, forest ecology, wildlife management, climate science, energy, environmental policy, ecosystems management, environmental design, or ethics. The options for an environmental focus are broad and are often related to many traditional majors such as biology, political science, or engineering.

Bachelor of Arts (BA)

Bachelor of Arts programs typically require general education courses in the humanities, sciences, social sciences, and mathematics.

These courses are combined with environmentally related coursework in a student’s chosen major. Often the BA will prepare students for entry-level career positions in most sectors except for scientific research. The BA will also prepare students for further study, usually at the master’s level, in social and behavioral sciences.

Bachelor of Science (BS)

Bachelor of Science programs commonly focus on the biological and physical sciences, but it is also possible to complete a BS in subjects such as natural resource economics. These degrees require students to complete a research or thesis project in order to graduate. This degree is well-suited for students who are interested in pursuing a research-based master’s degree program or a Ph.D. in the future.

Bachelor of Forestry (BF)

The Bachelor of Forestry prepares students to manage and develop forest resources from an economic, recreational, and/or ecological viewpoint. BF programs often require extensive field experience and research outside of the classroom. The Society of American Foresters (SAF) certifies forestry and forest resource degrees at U.S. colleges and universities. It is important to look for SAF accreditation if you are considering forestry education or a forestry career in the United States (www.eforester.org).

Bachelor of Engineering (BE)

The Bachelor of Engineering is a less common degree in the United States, though it’s an increasingly viable option. Environmental engineering is a newer field of study within the engineering arena. This degree focuses on responses to environmental pollution and emphasizes such categories as safe drinking water, hazardous waste management, air and water quality, energy, waste treatment and disposal, or industrial environmental issues. (It is also common for students to pursue a BS degree with an engineering focus.)

Notes on Applying for an Undergraduate Degree

While the application process varies from institution to institution in the U.S., there are certain commonalities. Most undergraduate programs hope to see the following from international student appli-

Yale School of Forestry & Environmental Studies

<http://environment.yale.edu>

The overarching mission of the Yale School of Forestry & Environmental Studies (F&ES) is to prepare new leadership and create knowledge to sustain and restore the long-term health of the biosphere and the well-being of its people. Established in 1901, F&ES is the oldest continuously operating forestry program in the United States, but the school has diversified and expanded over its 110-year history to become a “global” school of the environment. More than 120 courses are offered per year to 300 master’s (MEM, MESC, MF, MFS) and 75 Ph.D. students. Approximately 25 percent of F&ES students are non-U.S. citizens, and alumni are found all over the world. F&ES is a community of bright and passionate people from a variety of academic and professional backgrounds who come to study, engage, and discuss numerous topics in the environmental and forestry fields. For more information, please contact fesinfo@yale.edu.

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cations: excellent high school transcripts with a mixture of classes in the sciences, social sciences, mathematics, and potentially languages and the arts; strong writing abilities demonstrated in a personal statement or statement of purpose; solid scores on the SAT or ACT; and evidence of extracurricular or volunteer activities (environmentally related activities would be a plus for these programs). International students whose first language is not English may also need to provide TOEFL or IELTS scores.

Graduate Study

Graduate study in the United States is typically divided into two categories: terminal/professional or research degrees. A terminal or professional degree typically means that students will move directly into the workforce upon completion of the degree, as opposed to continuing on to receive a Ph.D. or additional degree. Additionally, these degrees will often require a capstone or master's project instead of a traditional thesis and are two years in length. Common terminal/professional degrees are as follows:

Master of Environmental Management (MEM)

The Master of Environmental Management is one of the most common and popular "environmental" graduate degrees in the U.S. The purpose is to provide students with a scientific understanding of ecological and social systems that in turn can be applied in a policy or management context. It requires coursework from the biological, physical, and social sciences, with a focus on the complex relationships among science, management, and policy. This degree prepares students for careers in environmental policy and analysis, green business, design and planning, conservation, education, consulting, and journalism. MEM programs often require an internship or other professional experience as part of the learning process.

Master of Forestry (MF)

The Master of Forestry is the first true conservation-based degree offered in the United States. This degree is designed for individuals who want to study forest resource management and policy, and aims to train students for the administration and management of forested lands. Careers in forestry are wide-ranging, and can include areas such as forest science, urban forestry, forest conservation, forest ecology, forest biology, wildfire & fuels management, environmental technology, biotechnology, wood and paper sciences, timberland investment, wood chemist, and forest pathologist. It is important to look for programs accredited by the Society of American Foresters (www.eforester.org).

Master of Public Administration (MPA)

The Master of Public Administration in Environmental Policy is designed to train public managers and policy-makers to better understand and manage environmental problems. Graduates are

Online Resources for Environmental Studies



Council of Environmental Deans & Directors (CEDD)
<http://ncseonline.org>

Society of American Foresters
www.eforester.org

US Green Building Council
www.usgbc.org

International Society of Industrial Ecology
www.is4ie.org

Net Impact
<http://netimpact.org>

National Environmental Health Science & Protection Accreditation Council
www.ehacoffice.org

United Nations Environment Programme
www.unep.org

U.S. Environmental Protection Agency
www.epa.gov

prepared for careers in local, state/provincial, or national government agencies, as well as in nonprofit organizations and intra-governmental organizations where they work to design effective programs and implement policies. These programs integrate skill-based learning in public policy, management, and environmental affairs.

Other Degrees Options

Other typical environmental graduate degrees include the Master of Arts, Master of Environmental Science & Management, Master of Environmental Studies, Master of Environmental Design, Master of Landscape Architecture, and Master of Environmental Planning.

The following concurrent or joint degrees are relatively common, especially with professional master's degree programs: architecture, business administration, design, economics, education, engineering, international relations, law, public health, public policy, religion, or urban planning. Joint degree programs are often completed in a compressed timeframe so that students can graduate with both degrees more quickly.

Research-based Graduate Degrees

Research degrees can focus on bio-physical science, social science, or policy issues, and require comprehensive exams and/or an extensive written thesis or dissertation.

At the master's level, there are a number of research-based degrees that have similar academic requirements: Master of Science (MS), Master of Environmental Science (MES or MESC), and Master of Forest Science (MFS). These degrees are designed for students to contribute toward basic or applied knowledge by conducting scientific research focused on their specific area of interest within the environmental sector. In most cases students are required to complete courses in research methodology, data analysis, and/or experimental design along with elective courses. Additionally, they are encouraged to complete independent research in conjunction with a faculty member or of their own design. These degrees are two to three years in length and require comprehensive exams or a research thesis.

Doctor of Philosophy (Ph.D.)

The Ph.D. is the most advanced academic degree offered in the environmental field and is focused on a specific student's area of study. The degree is typically completed in three to six years, and trains individuals in research, scientific methodology, and may also include teaching pedagogy. Students are often required to complete teaching and research fellowships, in addition to regular courses and the dissertation. Graduates often find careers in research and academia or in leadership positions in both the public and private sectors.

Notes on Applying for a Graduate Degree

A baccalaureate-level degree is required in order to enter a graduate degree program within the United States. Some universities will accept three-year degrees from places in Europe and India, while others require a four-year degree for admissions purposes. Additionally, some Ph.D. programs encourage applications from individuals with a master's degree while others will take students directly from an undergraduate program.

The application requirements for master's and doctoral programs in the environmental field vary by university and specific degree, but many universities have the following common requirements: 1) résumé/curriculum vitae, 2) personal statement or statement of purpose, 3) letters of recommendation (professional or academic), 4) transcripts from each college/university attended, and 5) standardized test scores (GRE, GMAT, LSAT). International students for whom English is not a native language (or formal language of university education) are also required to submit TOEFL or IELTS scores. Additional materials may include a writing sample (preferably a published article or academic research paper), diversity statement, design portfolio (for architecture or environmental design programs), or interview.

Admission to graduate degree programs can be very competitive. Each university has its own targets, but typically committees hope

to see a GPA at the 3.00 threshold. For English language ability, the most competitive programs will require a minimum TOEFL iBT score of 100 or a Band 7.0 on the IELTS. But for many schools, the review process goes beyond a specific GPA or GRE score. A well-written, concise, and thorough personal statement is the strongest tool applicants have in their portfolio.

Angela Kuhne is the Director of Admissions & Financial Aid at the Yale School of Forestry & Environmental Studies.

STUDENT INTERVIEW

Name: Taís Pinheiro
Place of Origin: Brazil
Institution: Yale
School of Forestry & Environmental Studies



What advice do you have for international students who are thinking about applying to an environmental studies program in the U.S.?

First, talk to professionals who are knowledgeable about the process of applying. Second, apply as early as you can. More generally, environmental studies is interdisciplinary, so make sure that you choose a program that is strong in your disciplinary interest, or consider one that offers a joint degree.

What is unique about your institution's environmental studies program?

In a bright group of people, competition is natural. However, I have found at the Yale School of Forestry and Environmental Studies a collaborative spirit that drives us together as both colleagues and professionals, which in turn strengthens our efforts to become better people in a more sustainable society.

What do you hope to do with your degree once you return to your home country?

In Brazil, we have an outstanding diversity of natural resources and a unique society that is inherently collaborative. Therefore, I feel responsible to contribute to the development of my country. My long-term goal is to help small companies in Brazil find sustainable, inter-corporate solutions

The Many Career Paths That Environmental Studies Opens Up

By Adam Ancira

Feature

The need for thoughtful, well-trained scholars and practitioners to address environmental sustainability has never been greater. Climate change, biodiversity loss, habitat fragmentation, urbanization, water scarcity, desertification, poverty—these are only a few of the global problems that the next generation of environmental leaders will need to tackle this century. These problems are complex, multidimensional, and interdisciplinary. They will require knowledge of a variety of disciplines, including environmental science, management, policy, economics, public health, law, and design. As such, students who graduate with degrees in environmental studies will be uniquely prepared to address these problems based on the broad base of knowledge and skills that they acquire in their studies.

Because environmental studies is a field that encompasses numerous disciplines, the career paths available to graduates are varied and dependent on a student's individual focus and interests. Most environmental studies programs, including the School of Natural Resources and Environment (SNRE) at the University of Michigan, place great emphasis on interdisciplinary research. As a result, graduates of those programs are better equipped to work across disciplines and to speak the language of ecologists, economists, political scientists, engineers, social scientists, and business people. These programs prepare students to work within and move among the worlds of academia, business, nonprofits, and governments.

At SNRE, where I am the Recruiting and Admissions Coordinator, we embrace this approach to environmental studies. We have natural science faculty working side by side with environmental policy and landscape design experts. Through interdisciplinary learning that can include systems modeling, engineering, geographic information systems, and economic analysis, our students are exposed to the scientific underpinnings of environmental problems and work to formulate solutions that are technically, economically, and socially feasible. Similar to other environmental programs throughout the U.S., our graduates find careers within private and public corporations and work to transform not only how businesses think about environmental sustainability but also how they practice it. (For more information about our programs, please visit: www.snre.umich.edu/degree_programs.)

A graduate's career choice depends on his or her area of focus within environmental studies. For example, a student with an interest in conservation biology will most likely seek a different career path than one with an interest in environmental policy. What follows are descriptions of the academic concentrations available at SNRE, which are representative of the concentrations that are available in higher education institutions across the nation, and how each prepares students for environmental careers.

Behavior, Education and Communication

Finding solutions requires an understanding of how individuals

and organizations think, what they care about, what motivates them, how they communicate, and the conditions under which they behave most reasonably and creatively. In the behavior, education and communication field of study, students examine the beliefs and behaviors of individuals and groups and study how they both recognize environmental issues and motivate themselves to take action. Students learn how to provide a conceptual psychological framework for addressing these issues through educational and informational venues like classrooms, museums, and ecology centers.

This field of study equips students with the educational background and skills needed to become effective, innovative environmental educators, policy-makers, planning analysts, or sustainability advocates who develop programs and facilitate decision-making about important natural resource and environmental issues. Many graduates find employment with nongovernmental organizations while others serve as green-building consultants or environmental educators.

Conservation Ecology

Regardless of the region of the planet, the need for novel ecological approaches has never been greater, whether for the management of wildlands and aquatic ecosystems or for the maintenance of terrestrial ecosystems. Conservation Ecology reflects the realities of today's scientific world, in which cross-discipline fluency is required. This field of study combines basic knowledge from the ecological sciences and other disciplines to drive environmental problem solving. It is particularly important for international students who will need to address the complex mix of issues related to the conservation of biodiversity and the management of ecosystems in their places of origin.

Conservation ecology prepares students to work for a variety of organizations focused on areas such as research, management, restoration, consulting, and education. They are also prepared to fill specific positions such as fisheries biologists, limnologists, ecologists, remote-sensing specialists, wetlands ecologists, and natural

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resource managers. In addition, graduates also may consider working in the nonprofit sector, where ecologists, urban foresters, and habitat-restoration specialists are needed.

Environmental Informatics

In recent decades, environmental research, planning, and management have grown increasingly reliant on computer-based approaches. The environmental informatics field of study focuses on analytical and computer-based methods in the study and management of natural resources and the environment. Through the environmental informatics field of study, you can prepare for a wide range of careers in academic research or professional environmental management. Recently, a U.S. Department of Labor study cited geo-technologies as one of three major areas where future job growth will outstrip demand.

Graduates use the knowledge and skills acquired to become remote sensing specialists, refuge managers, or environmental consultants with private firms, nonprofit organizations, and major research universities. In addition, environmental informatics can enhance the skill set of mid-career professionals because it represents an emerging set of tools that facilitate study and management of trans-disciplinary problems.

Environmental Justice

Students interested in environmental justice study the causes and consequences of inequitable distributions of environmental benefits and hazards, methods for researching environmental justice issues, and strategies for formulating policies. This field of study enables students to acquire an interdisciplinary perspective on natural resource and environmental issues, and is often combined with a study of law. Students can leverage their knowledge and skills to pursue careers at governmental environmental agencies, environmental consulting firms, conservation organizations, environmental justice organizations, and law firms. They also are employed as international environmental journalists and as grant writers in the public and private sectors.

Environmental Policy and Planning

Students who focus on environmental policy and planning have the opportunity to build professional skills by learning how to design and implement effective policies and plans while considering the human and institutional behaviors that underlie environmental problems. International students that choose to focus in this area often find work as policy analysts, advocates, and program managers in their country's government, or in consulting firms and nonprofit environmental organizations.

Other career options span the range of geographic scales, from community-based conservation and state-level environmental man-

agement to policy-making in international institutions such as the United Nations Development Programme and the World Wildlife Fund.

Sustainable Systems

Both developed and developing nations face ever-growing challenges to meet basic human needs in a sustainable manner. As such, it is necessary for students across the globe to examine ways to enable technology and enterprise to enhance the sustainability of systems that provide mobility, shelter, sustenance, communication, and recreation. Students who focus on sustainable systems develop either strong business or engineering backgrounds and are able to pursue careers involving engineering and product development, management consulting, and strategic and sustainability planning. They also work in the public sector with federal agencies; state or municipal governmental units; or nonprofit groups, such as the Environmental Defense Fund or the Natural Resources Defense Council.

Terrestrial Ecosystems

There are many disciplines involved in the study of terrestrial ecosystems, including plant ecology, biogeochemical cycling and modeling, landscape ecology, spatial analysis, and the management of forest and agro-forestry systems. As such, graduates with interests in this area are often employed in a variety of occupations focused on research, management, restoration, consulting, and education pertaining to a wide range of forest ecosystems in the governmental and private sectors. Graduates also find employment at botanical gardens and arboretums or at private consulting firms.

Conclusion

As this brief overview attests, careers in environmental studies offer something for everyone.

Conservation involves biology and ecology. Environmental policy and planning incorporates business and management skills. Environmental justice involves skills required to mobilize and inform communities. And all of these areas and more are applicable in a global context, as environmental leaders collaborate on a wide range of pressing issues. As such, there has never been a more exciting time to pursue a career related to environmental studies.

Adam Ancira is the Recruiting and Admissions Coordinator at the School of Natural Resources and Environment at the University of Michigan.

Interview: A Conversation with Professor Willis Weight of Carroll College

Feature

Connections interviewed Dr. Willis Weight PE, Director of the Environmental Studies Program at Carroll College, to provide readers with an inside perspective on environmental studies programs in the United States. Dr. Weight earned his Ph.D. in Mathematical Geology, and has had a private consulting business since 1989 that specializes in groundwater issues. He has taught environmental engineering courses at Carroll College for the past four years. He shares with Connections his thoughts on the importance of water management systems across the world and the flexibility that environmental studies programs should offer students.

Can you talk about the environmental studies program at Carroll College: how it's structured, its strengths, and the sorts of careers that students generally pursue after they've graduated?

At Carroll College, there are two areas of focus in our environmental studies program: a science track and a policy/project-management track. In both tracks, there's a core set of classes that all students take, which will allow them to build a solid and broad knowledge base in the discipline. After all, our policy students will need a background in science to advance in their careers, and vice versa. But beyond that, the electives are based on the interests of the students. For example, students interested in a career in conservation or wildlife management can specialize in biology, while those interested in toxicology can take additional chemistry courses. For the policy/project-management track, many of our students specialize in business or accounting so that they will be able to manage an NGO or work in governmental agencies. Besides the strength of our specialized subject areas of biology, water resources, and public health, Carroll features small class sizes where students conduct hands-on learning and have a personal rapport with professors.

What would you say are the advantages of enrolling in an environmental studies program?

A clear advantage of environmental studies programs in general is that they expose students to a wide variety of disciplines and skills. Because of this, students should make sure that the programs that they apply to are strong in their particular areas of interest. This often takes a bit of research. If I can use Carroll College as an example, in both the science and policy/project management tracks we have strong curricula for students interested in public and community health. We offer great hands-on field experiences in the surrounding community, and we bring in professionals from both the public and private sectors to share their expertise in public health. So this would be something that students could find through some preliminary research.

In addition to being a professor, you're a practicing hydrogeologist. Can you talk a little about your own research and practices and why they would be important to international students looking to enroll in environmental studies programs?

Internationally, water is an extremely precious resource. If countries around the world don't have good management practices in place, then they may be contaminating their water supplies inadvertently. So studying hydrology for international students is crucial in order for them to understand how water systems operate in their respective countries. I bring many years of experience to the classroom in water-resource development and management, and what I've found is that it's best to give students a practical problem where they have to use real data, such as measuring the direction of groundwater flow, testing public lakes for pathogens, or things that they would do if they held a position in industry.

My philosophy is to prepare students to go back to their places of origin and immediately go to work there on water-related concerns.

What advice would you give international students who are interested in environmental studies programs in the United States?

If international students are aware of what sort of environmental issues exist in their countries and which of these they're personally interested in, then they'll be able to find programs that are particularly strong in these subject areas. If they're really interested in water issues or energy or climate change, then they need to look for programs that will offer them good training in these areas. But beyond that, they should search for programs that offer both strong classroom experiences and hands-on learning opportunities that will allow them to tackle problems directly in the field. These are the sorts of programs that will best prepare them for the workforce.

More information can be found about Carroll's Environmental Studies Program at: www.carroll.edu/academics/enviro/index.cc

Those interested in pictures of the field experiences students participate in can click on the PDF link: Learning Hands-On at: www.carroll.edu/academics/engineering/civilenv/index.cc

