

# Environmental Science and Studies

Environmental scholars and geographers seek a holistic understanding of the Earth that links natural processes with human activities. How do we shape the Earth, and how does the Earth shape us? Unique tools of the trade include Geographic Information Systems (GIS) and Global Positioning Systems (GPS) to visualize human and natural phenomena. We emphasize applied learning at all levels (field studies, study abroad, internships, and service-learning projects) with an interdisciplinary curriculum spanning the College of Arts and Sciences and with links to the School of Business and the College of Law. Career opportunities for graduates are as diverse as the planet itself. Examples include public and private sector employment, urban planning, international development, wildlife conservation, geospatial analysis, environmental policy, environmental education, and resource management, among others. Students may not pursue the B.A. and B.S. degrees simultaneously.

More information can be found online at <http://www.stetson.edu/artsci/environmental-science-and-studies/>

## Learning Outcomes

Student learning outcomes describe what students know, understand and are able to do as a result of completing a degree program. The learning outcomes for these programs are:

### Environmental Science

1. Understand the basics of ethical models and employ them in evaluating contemporary environmental problems
2. Apply evidence-based, natural science principles to environmental decision-making
3. Evaluate environmental issues within the context of relevant environmental policies
4. Use appropriate quantitative and spatial tool kits to analyze environmental data
5. Communicate about environmental issues with clear and technically correct language in appropriate styles and formats for their audience
6. Integrate perspectives from two or more disciplines to explore complex environmental problems and solutions
7. Apply appropriate scientific and policy solutions to solve complex problems about species and habitat conservation
8. Apply appropriate physical science and policy principles to analyze environmental issues
9. Apply appropriate geospatial tools to analyze environmental data

### Environmental Studies

1. Understand the basics of ethical models and employ them in evaluating contemporary environmental problems
2. Apply evidence-based, natural science principles to environmental decision-making
3. Evaluate environmental issues within the context of relevant environmental policies
4. Use appropriate quantitative and spatial tool kits to analyze environmental data

5. Communicate about environmental issues with clear and technically correct language in appropriate styles and formats for their audience
6. Integrate perspectives from two or more disciplines to explore complex environmental problems and solutions
7. Critique, apply or develop relevant policies and economic principles related to the environment
8. Use a creative medium to communicate scientifically accurate, environmental messages
9. Analyze the interactions between humans and their environment

## Majors

### Majors in Environmental Science and Studies

- Bachelor of Arts in Environmental Studies (<http://catalog.stetson.edu/undergraduate/arts-sciences/environmental-science-studies/environmental-studies-ba/>)
- Bachelor of Science in Environmental Science (<http://catalog.stetson.edu/undergraduate/arts-sciences/environmental-science-studies/environmental-science-bs/>)

## Minors

### Minor in Environmental Studies - 5 Units

Code	Title	Units
ENSS 140P	Introduction to Environmental Science and Studies	1
Select one of the following:		1
ENSS 218	Environmental Law & Policy	
ENSS 319	Water Policy	
Select one of the following:		1
PHIL 317V	Environmental Ethics	
ENSS 219	Ethics for Environmental Professionals	
ENSS 201	Introduction to Maps and Geographic Information Systems	1
One approved elective from any ENSS courses		1
<b>Total Units</b>		<b>5</b>

## Advising Course Plans

### Advising Course Plans

- Environmental Science Major (<http://catalog.stetson.edu/undergraduate/arts-sciences/environmental-science-studies/environmental-science-plan/>)
- Environmental Studies Major (<http://catalog.stetson.edu/undergraduate/arts-sciences/environmental-science-studies/environmental-studies-plan/>)

## Faculty

### Core Faculty:

Abbott, J. Anthony  
*Professor of Environmental Science and Studies, 2005*  
 B.S., M.A., University of Georgia  
 Ph.D., University of Minnesota - Twin Cities

Anderson, Wendy B.

*Professor of Environmental Science and Studies, 2014*

B.S., M.S., Baylor University

Ph.D., Vanderbilt University

Cramer, Sarah E.

*Assistant Professor of Sustainable Food Systems, 2018*

B.A., Truman State University

M.P.H., University of Missouri

Evans, Jason M.

*Executive Director of the Institute for Water and Environmental Resilience*

*Associate Professor of Environmental Science and Studies, 2014*

B.A., New College of Florida

M.S., Ph.D., University of Florida

Johnson, Asal

*Associate Professor of Public Health and of Environmental Science and Studies, 2014*

B.S., Azad University

M.A., University of Tehran

M.P.H., Georgia Southern University

Ph.D., Florida State University

Tanner, Benjamin

*Associate Professor and Chair of Environmental Science and Studies, 2016*

B.A., Florida State University

M.S., University of Maine

Ph.D., University of Tennessee

*Contributing Faculty:* C. Bennington (Biology); S. Choi (Communication and Media Studies); P. Croce (History); C. de Bodisco (Economics); T. Farrell (Biology); M. Gibbs (Biology); T. Grubbs (Chemistry); M. Hall (Philosophy); R. Indralingam (Chemistry); J. Jett (Biology); P. May (Biology); H. Price (Chemistry); K. Reiter (History); K. Riggs (Physics); D. Sutherland (Religious Studies); K. Work (Biology); J. York (Chemistry).

## Courses

### **ENSS 112P. Environmental Science and Society. 1 Unit.**

This course explores the natural and social science principles that define the interface between humans and natural systems. It emphasizes the principles of ecology and earth science, and cultural, political and economic forces that inform sustainable use of food, water, and energy. Lab and field activities provide experiences where students investigate human impacts on natural systems. Can be used to satisfy Physical and Natural World or Personal and Social Responsibility. Offered every semester.

### **ENSS 140P. Introduction to Environmental Science and Studies. 1 Unit.**

This course explores the natural and social science principles that define the interface between humans and natural systems. It emphasizes the principles of ecology and earth science, and cultural, political and economic forces that inform sustainable use of food, water, and energy. Lab and field activities provide experiences where students investigate human impacts on natural systems.

### **ENSS 141P. Environmental Science: Methods and Practice. 1 Unit.**

This is the foundation course required for all Majors and Minors in Environmental Science and Studies. Lectures, readings, field work, and writing intensive laboratory exercises provide students with a detailed introduction into core topic areas that include geospatial analysis, water and soil chemistry, natural resource conservation, environmental policy, cultural geography, and environmental communication. Prerequisite: ENSS 140P or permission of instructor. Can be used to satisfy Physical and Natural World or Personal and Social Responsibility. Writing Enhanced course. Offered every semester.

### **ENSS 175. Environmental Fellows Practicum. 0.0 Units.**

Selected students will develop environmental leadership, research, and activism skills through applied projects with faculty oversight and in conjunction with other university offices and organizations. Participation in the Center for Community Engagement, the Environmental Working Group, and regular communication with Student Government Association representatives is required. Permission of instructor required.

### **ENSS 180. Environmental Elective. 0.75 to 1 Units.**

### **ENSS 190. Special Topics. 1 Unit.**

### **ENSS 201. Introduction to Maps and Geographic Information Systems. 1 Unit.**

Maps have evolved from etchings that predate written language into dynamic digital apps linked with real time data. This course introduces the student to Geographic Information Systems (GIS) through active production of digital maps. You will learn how to upload primary data and access online data to make attractive, content-rich maps to be embedded in a webpage or device app. This introductory course is appropriate for non-majors and to prepare for further GIS work in ENSS courses. Offered every fall.

### **ENSS 204S. Environmental Geography of Latin America. 1 Unit.**

A regional survey of Latin America with emphasis on the interaction of peoples with landscapes. Latin American worldviews and cultures, both native and contemporary, are contextualized within geologic, biotic, and climatic systems.

### **ENSS 211V. Weather and Climate. 1 Unit.**

This course focuses on Stetson's Environmental Responsibility Value. Analysis of the systems forming weather and climate. Topics in the course include the origin of winds and pressure systems, the fundamental role of water in energy transfer and storm formation, cyclogenesis, hurricanes and other extreme weather, and anthropogenic climate change. Activities and concepts covered will include interpretation of weather station models (symbols), identification of atmospheric properties, use of adiabatic lapse rate to predict cloud height and precipitation events, cloud identification, analysis of frontal movement, electromagnetic radiation and the atmospheric energy balance, identification of greenhouse gas emissions and their role in altering the global energy balance.

### **ENSS 218. Environmental Law & Policy. 1 Unit.**

The course introduces legal requirements and policy framework for United States environmental law. It focuses on major federal laws such as the Clean Air Act, the Clean Water Act, the Endangered Species Act, the National Environmental Policy Act and constitutional issues, plus state and local implementation measures. Subject matter includes air and water pollution, wetlands, toxic and solid waste, trade, energy, sustainability and growth management regulations. Offered every semester.

**ENSS 219. Ethics for Environmental Professionals. 1 Unit.**

This course provides an overview of moral frameworks and ethical codes that guide the practice of environmental professionals. Core content includes critical exploration of terms such as "objectivity," "neutrality," "expertise," "evidence," "advocacy," "rigor," and "inclusion" that characterize almost all debates and decisions about environmental issues. These themes will be explored through deep engagement with various case study dilemmas involving complex intersections of science, law, policy, politics, religion, and economics.

**ENSS 230. Introduction to Geology. 1 Unit.**

This course examines the earth, the materials that make up the earth, and how these materials came to be where they are. Students will explore earth materials as well as interior and surficial earth processes through a variety of approaches in classroom, laboratory, and field settings. Analytical and investigative skills are emphasized. Offered every fall.

**ENSS 275. Environmental Fellows Practicum. 0.0 Units.**

Selected students will develop environmental leadership, research, and activism skills through applied projects with faculty oversight and in conjunction with other university offices and organizations. Participation in the Center for Community Engagement, the Environmental Working Group, and regular communication with Student Government Association representatives is required. Permission of instructor required.

**ENSS 285. Independent Study. 0.5 or 1 Units.**

An intermediate level course taken independently from an instructor that is not part of the regular course schedule. May be repeated for credit. No prerequisites. Permission of instructor required.

**ENSS 290. Special Topics in Environmental Science. 1 Unit.**

A specialty course taught at the intermediate level on a one-time basis. May be repeated for credit. No prerequisites.

**ENSS 301. Geographic Information Systems and Science. 1 Unit.**

Application of computer mapping platforms, techniques, data management, and data analysis. Assignments emphasize mapping with quantitative datasets, symbolic logic (e.g., Boolean Logic and Set Algebra), and spatial integration of raster and vector file formats. Includes a lecture and weekly laboratory component. Prerequisites: ENSS 201 or permission of instructor. Offered every spring.

**ENSS 302. Field Methods. 1 Unit.**

The measurement and analysis of geographic phenomena in the field. Students learn the principles of sampling and the use of specialized equipment (GPS, surveying instruments). Prerequisite: ENSS 141P.

**ENSS 310V. Cultural and Political Ecology. 1 Unit.**

This course focuses on Stetson's Environmental Responsibility Value. An interdisciplinary approach to understanding the tensions between economic development and management of natural environments. The course emphasizes the dynamic (dialectical) influences of humans and environment on each other. The concept of nature is questioned while we explore various paradigms for understanding the effects of economic development and underdevelopment on natural systems. An international context is stressed. Prerequisite: ENSS 140P or ENSS 141P or FOOD 101S or INSU 201H or ECON 104S or Permission of Instructor. Writing Enhanced course. Offered every fall.

**ENSS 312. Biogeography. 1 Unit.**

An examination of the distribution patterns of plants and animals and the environmental and cultural influences responsible for them during the quaternary period (the last two million years). Emphasis is on natural plant communities and the impact of humans on them. Prerequisite: ENSS 141P or BIOL 112P or BIOL 142P.

**ENSS 313. The World's Population. 1 Unit.**

A study of the spatial structure of the population of the developed and underdeveloped worlds, population movements, differentials in population structure among places, and current and future problems in the relationship between population and resources at a global scale.

**ENSS 314. Modern Urban America. 1 Unit.**

An analysis of the evolution of the modern urban landscape in North America, with particular emphasis on the changes in architecture, technology, planning and society during the period 1880 to the present.

**ENSS 315V. Sustainability Studies. 1 Unit.**

This course focuses on Stetson's Environmental Responsibility Value. Strategies and metrics for assessing and maintaining production systems that can be perpetuated through time in terms of resource management, economic yield, and quality of life. Junior Seminar.

**ENSS 316V. Leadership for a Sustainable Future. 1 Unit.**

This course focuses on Stetson's Environmental Responsibility Value. Based on a foundation in environmental science and ethics, students develop a skill set for envisioning, implementing and maintaining tangible solutions to local and global environmental issues within organizations, including energy efficiency, water conservation, and waste reduction strategies. Students develop financial arguments for sustainability projects; practice skills to facilitate internal communication and public relations; and develop strategic planning skills.

**ENSS 317V. Global Perspectives of Food Production. 1 Unit.**

This course focuses on Stetson's Human Diversity Value. The character of food production systems from the global to local and organic to industrial are contrasted. Historical production regimes are juxtaposed with modern farming regimes around the world with special attention to the origins of agriculture, the development of modern technologies, and the economic forces related to food production. Junior Seminar.

**ENSS 318V. Seeds of Equity. 1 Unit.**

This course focuses on Stetson's Social Justice Value. This course explores historical and current issues of race, class, and gender in food and agriculture. It will primarily focus on the unique food and agriculture context of the United States. Issues of access, power, privilege, and equity will be addressed within the realms of agricultural production, food preparation and consumption. Students will critically reflect on their own backgrounds, identities, roles, and responsibilities as participants in the agri-food system. Junior Seminar.

**ENSS 319. Water Policy. 1 Unit.**

The course introduces the basic interdisciplinary study of water policy including its history, framework of water law and the role of science. There will be strong emphasis on Central Florida case studies such as springs, rivers, estuaries, water supply and wetlands. Topics include Clean Water Act, public trust doctrine, eastern vs. western water law, Everglades, and endangered species.

**ENSS 320. Environmental Planning. 1 Unit.**

The course introduces the basic subject matter of modern environmental planning. It will focus on local government requirements for land use planning and zoning, and state and federal requirements for resource protection. Topics include comprehensive plans and zoning, innovative planning techniques, geographic information systems modeling, greenways, sustainable development, green infrastructure, smart growth, habitat conservation plans, environmental impact statements, historic preservation, and policy framework.

**ENSS 325. Climate Adaptation and Planning. 1 Unit.**

This course builds upon consensus projections of climate change impact to explore, analyze, and evaluate contemporary adaptation and planning responses within human society. Assignments emphasize integration of geographic information systems (GIS), quantitative scenario planning, and critical reasoning about uncertainty and trade-offs.

**ENSS 330. Wetlands Systems. 1 Unit.**

An examination of wetlands and their associated environmental issues. Topics include wetland definitions and identification, wetland hydrology and soils, their biological properties, what functions they serve, how we derive environmental information from them, and what the societal issues are concerning wetlands and their preservation. Hands-on exploration and field study is emphasized. Prerequisite: ENSS 141P or ENSS 230 or BIOL 244.

**ENSS 331. Envir Geology Appalachian Mtns. 1 Unit.**

This field course explores the origin and characteristics of topography, geology, and landscapes of the Southern Appalachians in the context of the environmental issues affecting the region. The course provides an overview of the natural history of the region for introductory and advanced students and involves visiting several sites along a transect through the Southern Appalachians with emphasis on the Great Smoky Mountains National Park, the Blue Ridge Parkway, and the Nantahala National Forest. The course involves extensive camping and hiking. Prerequisite: ENSS 112P or ENSS 141P, or ENSS 230 or ENSS 335 or BIOL 244.

**ENSS 335. Geomorphology. 1 Unit.**

An examination of landscape form and processes with an emphasis on environmental issues. Topics include mapping, weathering and soils, geomorphic hydrology, stream channels, karst geomorphology, drainage basins, wind as a geomorphic agent, coastal geomorphology, glacial geomorphology, geomorphology and climate, humans as a geomorphic agent, and landscape evolution. Hands-on exploration and field study is emphasized.

**ENSS 345Q. Statistics for Environmental Professionals. 1 Unit.**

The course is designed to introduce statistical techniques used in quantitative analysis in environmental and bio-science research. Students will be introduced to concepts such as measures of central tendency, variability, causality and statistical techniques including: t tests (independent & dependent samples), Analysis of variance, Chi-square, correlation, and regression. Students will also develop skills to use statistical software such as SPSS. The course will focus on application and interpretation of statistical techniques.

**ENSS 355. Environmental Activism. 1 Unit.**

The course is an interdisciplinary survey of environmental activism including its history, political organization, legal approaches, and stakeholder involvement in environmental policy. The course explores the spectrum of environmental organizations, their strategies, tactics, and programs. We will explore how public policy is influenced by citizens and environmental organizations and explore the manner in which the environmental movement has expanded globally.

**ENSS 375. Environmental Fellows Practicum. 0.0 Units.**

Selected students will develop environmental leadership, research, and activism skills through applied projects with faculty oversight and in conjunction with other university offices and organizations. Participation in the Center for Community Engagement, the Environmental Working Group, and regular communication with Student Government Association representatives is required. Permission of instructor required.

**ENSS 385. Independent Study. 0.5 or 1 Units.**

An advanced level course taken independently from an instructor that is not part of the regular course schedule. May be repeated for credit. Permission of instructor required.

**ENSS 390. Special Topics in Environmental Science. 1 Unit.**

A specialty course taught at the advanced level on a one-time basis. May be repeated for credit. Permission of instructor required.

**ENSS 395. Teaching Apprenticeship. 0.5 Units.**

Opportunity for a student to assist a professor and students in a course that that the student has already taken. Pass/Fail only. Permission of instructor required. Credit does not count toward the major.

**ENSS 397. Earth Science Internship. 0.5 or 1 Units.**

Pass/Fail course. Students explore earth science in an applied setting, working with a professional outside Stetson. Typically, this internship requires about 10 hours a week or approximately 140 hours for the semester; half-unit internships require 70 hours for the semester. Specific requirements will be presented by way of a contract signed by the student. Basic expectations include a journal, research paper, or appropriate work product, and a letter of evaluation from the site supervisor. Prerequisites: Permission of department chair and instructor, major or minor status, and junior or senior standing. May be repeated for credit with permission of the department head, but a maximum of one unit may be applied to the major or minor. Enrollment in an internship course requires students to attend an orientation prior to beginning work at their internship site. For more information regarding internship orientations, please contact Career & Professional Development at [career@stetson.edu](mailto:career@stetson.edu) or 386-822-7315.

**ENSS 398. Geographic Information Systems Internship. 0.5 to 1 Units.**

This internship course is designed for those pursuing professional and practical experience with a local agency involved in applied geographic information, mapping sciences and/or database management. Prerequisites: ENSS 301 and permission of the instructor. May be repeated for credit with permission of the department head, but a maximum of one unit may be applied to the major or minor. Enrollment in an internship course requires students to attend an orientation prior to beginning work at their internship site. For more information regarding internship orientations, please contact Career & Professional Development at [career@stetson.edu](mailto:career@stetson.edu) or 386-822-7315.

**ENSS 401. Environmental Management Internship. 1 Unit.**

Pass/Fail course. This applied internship course is designed for those majors pursuing further professional and practical experience with a local agency involved in environmental management and natural resource conservation. Any faculty member teaching in the Environmental Science program may agree to supervise an internship. The structure of the internship is determined by the instructor. Prerequisite: ENSS 301 and permission of the instructor. May be repeated for credit with permission of the department head, but a maximum of one unit may be applied to the major or minor. Enrollment in an internship course requires students to attend an orientation prior to beginning work at their internship site. For more information regarding internship orientations, please contact Career & Professional Development at [career@stetson.edu](mailto:career@stetson.edu) or 386-822-7315.

**ENSS 402. Landscape Ecology. 1 Unit.**

Landscape ecology uses multi-layered analysis of geospatial patterns to develop inferences about the abundance, distribution, persistence, and movement of materials and organisms across the environment. Assignments synthesize field data collection and geospatial modeling, while emphasizing the integration of appropriate quantitative methods and effective map visualizations when answering landscape ecology questions. Prerequisites: ENSS 141P, ENSS 301 and BIOL 243Q.

**ENSS 410. Global Change. 1 Unit.**

The 21st century is defined by the accelerating effects of growing human resource use. Global change is heightened as people become increasingly interconnected, hastening the movement of people and goods around the world and reshaping habitats. In this course, students will study the patterns of global change through four different themes: globalization, climate change, biodiversity loss, and land use and land cover change. Students will study the existing patterns of change, including the economic impacts, and explore possible future trajectories with an eye to developing solutions from a business perspective. Prerequisites: ENSS 218 or Permission of Instructor.

**ENSS 418. Energy Management and Policy. 1 Unit.**

This course provides a critical understanding of energy resources and the importance of energy markets and utilization in supporting modern economies. Topics will include power generation and distribution, transportation, and the environmental consequences of using energy. It will also explore how energy resource availability and costs are regulated by international agreements, and national, state, and local government agencies to support a healthy economy and environment. Prerequisite: ENSS 218.

**ENSS 475. Environmental Fellows Practicum. 0.0 Units.**

Selected students will develop environmental leadership, research, and activism skills through applied projects with faculty oversight and in conjunction with other university offices and organizations. Participation in the Center for Community Engagement, the Environmental Working Group, and regular communication with Student Government Association representatives is required. Permission of instructor required.

**ENSS 485. Independent Study. 0.5 or 1 Units.**

An advanced level course taken independently from an instructor that is not part of the regular course schedule. May be repeated for credit. Permission of instructor required.

**ENSS 490. Special Topics in EnvSci. 1 Unit.**

A specialty course taught at the advanced level on a one-time basis. May be repeated for credit. Permission of instructor required.

**ENSS 497. Research Proposal. 0.5 Units.**

Taken in spring of the junior year, a research proposal is written and defended prior to undertaking senior research. Prerequisite: ENSS 201 or ENSS 301. Writing-intensive course. Offered every spring.

**ENSS 498. Senior Research Project. 1 Unit.**

Initiated with a proposal in the junior year, the senior research project is completed by December of the senior year. In this capstone of the undergraduate experience in environmental science and studies, students are trained to become research colleagues. Most projects are completed under the supervision of a Stetson faculty member, but off-campus mentors also are acceptable. Prerequisite: ENSS 497. Offered every fall.

**ENSS 499. Senior Seminar. 0.5 Units.**

Completion or written and oral presentation of methods, results, and interpretation of senior research. Prerequisite: ENSS 498. Offered every spring.

## Faculty

### Professor

Wendy Anderson  
Professor and Chair, Environmental Science and Studies

J. Anthony Abbott  
Professor of Environmental Science and Studies