A. Mission and Purpose of the Environmental Science Program

The Environmental Science (ES) Program at Florida Atlantic University is a university-wide interdisciplinary program administered by the Charles E. Schmidt College of Science. A standing Program Committee composed of faculty representing colleges across the university is responsible for academic oversight of the ES Program. Courses in the ES Program curriculum are taught by faculty from multiple departments in every college of the university. Undergraduate ES students earn the Environmental Science Certificate in conjunction with a baccalaureate degree from any FAU college. Graduate students earn the Master of Science in Environmental Science degree under the supervision of ES Graduate Faculty appointed in a wide range of departments. The ES Program also administers a graduate certificate in Environmental Restoration, and the Environmental Science concentration of the Integrative Biology PhD degree.

Environmental Science Program Mission

The mission of the Environmental Science Program at Florida Atlantic University is to educate and support students who are motivated to reach the highest level of professional achievement in environmental science, and to facilitate a robust research climate for faculty and students. The undergraduate program promotes a broad, integrated understanding of the interdependencies of humans and their environment and prepares students for diverse career paths related to environmental science. At the graduate level, the ES Program fosters leadership and provides students with in-depth knowledge and training in the natural and social sciences, preparing them to develop and implement solutions to complex environmental problems.
Environmental Science Program Academic Goals

The ES Program will provide students a foundational understanding of the inter-related disciplines that pertain to environmental issues through an interdisciplinary core curriculum at both the undergraduate and graduate level. To meet this goal, the ES Program requires all students to complete core courses that emphasize the inter-connectedness of the natural and social sciences. Upon completion of coursework, students should be able to form and identify conceptual linkages across disciplinary boundaries, and utilize multiple perspectives of diverse disciplines in addressing environmental issues.

The ES Program will develop students’ professional skills in Environmental Science, through a flexible curriculum that accommodates a broad range of student goals and interests. To meet this goal, courses in the ES Program curriculum are organized around interdisciplinary focal areas in the natural and social sciences. Courses offered within this framework include: traditional lecture-style, e-learning lab, and field courses; special topics courses that introduce students to the latest theories, methods, and emerging issues; professional certifications; seminar series; experiential learning through thesis research, directed independent study (DIS), and internship programs. Through this framework, students will gain proficiency in the application of scientific principles such as, critical thinking, experimental design, synthesis, and quantitative analysis, as well as a sense of professional responsibility and integrity.

The ES Program will prepare students to meet the real-world challenges they will face as environmental professionals and citizens through experiential learning and faculty mentoring. To meet this goal, student education in the ES Program capitalizes on the research strengths and experience of the FAU faculty and the close connection to the diverse community of Environmental Scientists in South Florida. Students conduct and publish research in their field of interest under the guidance of experienced faculty. The ES Program supports both undergraduate and graduate student research that is relevant, novel and applicable to solving critical environmental problems. By fostering external partnerships (NGOs, local, state, federal agencies), the ES Program provides faculty and students access to sources of funding, specialized services and equipment, as well as the opportunity for direct engagement with the public, private organizations, and environmental decision-makers. By linking the practice and application of environmental science, The ES Program ensures students develop professional skills in: Communication of science to a variety of audiences; Development and maintenance of professional collaborations; Ethical obligations to the scientific community and society; Technical proficiency within the field.

The ES Program will produce students with the skills required for professional positions within the field of environmental sciences in the public or private sector and/or continued graduate education.

Undergraduate Student Goals

Undergraduate students will understand and be able to apply the following core concepts to the analysis of environmental issues; 1) Fundamental principles in the natural and social sciences; 2) Basic interactions between social and natural systems; 3) Processes and feedbacks that govern complex dynamic systems; 4) Major challenges in human-environment interactions. Using these core concepts, undergraduate students will be able to effectively communicate and apply critical thinking and analytic skills to problem solving in environmental science and demonstrate proficiency in practical skills related to environmental science.
**Graduate Student Goals**
Both thesis and non-thesis graduate students will demonstrate a broad understanding of the multidisciplinary field of environmental science and in-depth knowledge of their area of specialty. They will be able to use scientific research methods, perform analyses of scientific data and critically evaluate and communicate research findings. They will demonstrate professional skills in environmental science, as evidenced by scholarly interactions with professionals in the field, including participation in professional organizations, workshop and conference participation.
Graduate students enrolled in the thesis option will be able to conduct original research and perform in-depth analysis, as demonstrated by successful completion of a Master’s Thesis. Specifically, students will demonstrate: 1) current knowledge of their field of study and the ability to critically review and interpret scientific literature 2) the ability to develop a hypothesis, design and execute scientific experiments, and draw logical conclusions from data and 3) the ability to write scientific reports and communicate effectively in scholarly presentations.

Student Goals in the Environmental Science Program are linked to the following elements of FAU’s Strategic Plan:

**Goal 1: Enrich the Educational Experience**

**Goal 1, Objective 2: Strengthen and expand graduate programs**

**Goal 1, Objective 4: Support an organizational culture in which all units are dedicated to student success**

**Goal 2: Inspire Research, Scholarship and Creative Activity**

**Goal 2, Objective 1: Increase scholarship and creativity**

**Goal 2, Objective 3: Enhance the regard and visibility of our research, scholarship and creativity**

**Goal 2, Objective 4: Strengthen and support interdisciplinary research and its visibility in the University**

**Goal 2, Objective 5: Involve students at all levels in research, scholarship and creative activity**

**Goal 3: Increase FAU’s Community Engagement**

**Goal 3, Objective 1: Enrich the educational and cultural experiences for students, faculty and the surrounding communities**

**Goal 3, Objective 2: Increase the number of community partnerships**

**Goal 3, Objective 3: Focus on the unique opportunities of FAU’s stewardship of place**

**Goal 3, Objective 4: Focus resources on increasing FAU’s support to the communities it serves**
B. Previous External Reviews

The last self-study and review of the Environmental Science Program was done in Spring 2009. At that time a total of 13 students were enrolled in the ES Master’s Program and the ES Program was entering a phase of rapid growth spurred by a broad range of important changes that had been recently implemented by Dr. Dale Gawlik, who became Director of the ES program in 2007. These changes included: significant revisions of the graduate curriculum and the introduction of a non-thesis degree option; establishment of new partnerships and collaborations with outside organizations and agencies to provide support for student research, including a $500,000 Fellowship Initiative with the National Park Service; broadening faculty participation in governance through the formation of standing Admissions and Program committees; broadening the range of academic units from which faculty participating in the program are drawn, hosting of regular workshops and a seminar series; expanding and updating the ES web site to disseminate timely information and facilitate interaction of faculty and staff with prospective and current students. Beginning in 2009, the ES Program took on the additional responsibility for oversight and assessment of the undergraduate Environmental Science Certificate Program.

C. Instruction

Baccalaureate Programs: Undergraduate Certificate in Environmental Science

Prior to 2009, when the Environmental Science Program took on oversight of the Environmental Science Certificate, there were no student learning outcomes (SLOs). The Environmental Science Program Committee developed program goals, defined new student learning outcomes for the ES Certificate, and put in place a new assessment plan beginning in 2009-2010. Implementation of the new assessment plan proved problematic; the interdisciplinary nature of the Certificate program, and the procedures in place for awarding the ES Certificate, made it difficult to identify students until just before or after graduation, so reliable assessment results could not be obtained. In 2014 the ES Program Committee recommended major changes to the Certificate curriculum, adding a capstone course and introducing a core requirement in statistics. These changes, which will be effect for Fall 2015, will ensure that all ES Certificate students can meet the SLOs and facilitate the implementation of program assessment.

Student Learning Outcomes – Undergraduate Certificate Program

SLO 1: Critical Thinking and Communication

Students will be able to effectively communicate and apply critical thinking and analytic skills to problem-solving in environmental science, drawing on a broad understanding of the processes and feedbacks involved in the interaction of social systems and ecosystems.

Assessment Method

Students submit a paper that identifies a clear issue in environmental science, examines the relevant facts, and proposes a scientifically defensible solution. The paper is assessed using the attached rubric.

Implementing Strategy

All students must take a core course that emphasizes the interactions of social systems and ecosystems. As a requirement for the core course, students submit a written in-depth review and analysis, and propose a solution, to a problem related to the interaction between social systems and ecosystems. These written assignments are assessed by the instructor using a rubric to assess written communication, critical thinking, analysis and synthesis skills. The ES Program committee has also approved changes to the curriculum that include the introduction of a capstone course, beginning in Fall 2015, that will directly assess this outcome.
**Criterion for Success**
At least 75% of ES Certificate students will meet or exceed expectations for all communication and critical thinking/analysis skills, as specified in the assessment rubric.

**SLO 2: Core Principles in Environmental Science**
Students will understand and be able to apply the following core concepts to the analysis of environmental issues: 1) Fundamental principles in the natural and social sciences 2) Basic interactions between social systems and ecosystems 3) Processes and feedbacks that govern complex dynamic systems 4) Major problems and issues in human-environment interactions

**Assessment Method**
The map of assessment criteria addressed in individual courses offered in the ES Certificate curriculum will be compared with the actual courses chosen by ES Certificate students. Statistical analyses will be done to determine whether the courses taken by students are meeting outcome criteria.

**Implementing Strategy**
The ES Program has created a course map that links these outcome criteria to the course learning objectives that are assessed by individual courses in ES Certificate curriculum. Implementation of this strategy will be facilitated by changes in the ES Certificate curriculum, effective Spring 2015, that will allow the ES Program staff to identify students prior to graduation.

**Assessment Method**
The map of assessment criteria addressed in individual courses offered in the ES Certificate curriculum will be compared with the actual courses chosen by ES Certificate students. Statistical analyses will be done to determine whether the courses taken by students are meeting outcome criteria.

**Criterion for Success**
All students earning the ES Certificate will take one or more courses in which the outcome criteria are covered and assessed

**SLO 3: Practical Skills**
Students will demonstrate proficiency in practical skills related to a field of environmental science.

**Implementing Strategy**
Students are given the opportunity, through their academic courses and programs within the ES Program, to participate in laboratory classes, internships, academic service learning projects, professional conferences or workshops, or Directed Independent Study research, in the field of environmental science. The ES Program committee has also approved changes to the curriculum that include the introduction of a capstone course, beginning in Spring 2015 that will directly assess this outcome.

**Assessment Method**
The ES Certificate curriculum requires students to demonstrate practical academic experience (laboratory classes, internships, academic service learning projects, professional conferences or workshops, Directed Independent Study) in the field of environmental science.

**Criterion for Success**
All students will successfully complete at least one laboratory class, internship, academic service learning project, professional conference or workshop, or Directed Independent Study project, in the field of environmental science.

**Assessment of SLOs and Program Improvement – Undergraduate Certificate Program, 2013-2014**

**SLO 1: Critical Thinking and Communication**
Data Summary: Analysis and Evaluation, 2013-2014
This element of the Undergraduate ES Certificate Assessment Plan has been eliminated as part of a major revamping of the Undergraduate ES Certificate Program. The previous structure of the program did not allow the ES Program to identify ES Certificate students at the time they were enrolled in the core course. Because these core courses were large, multi-section courses, each taught in different departments, tracking the very small percentage of students who eventually applied for and earned the ES Certificate was not practicable, and results are not available for 2013-2014.

Program Improvement, 2013-2014
In recognition of the need to ensure that all students in the ES Certificate Program achieve this outcome, a capstone course, that specifically addresses and assesses this outcome, has been added to the ES Certificate curriculum. This capstone course and the associated changes to the ES Certificate Program are expected to go into effect beginning Spring 2015.

SLO 2: Core Principles in Environmental Science
Data Summary: Analysis and Evaluation, 2013-2014
The procedures for assessing this element of the Undergraduate ES Certificate Assessment Plan have been revised as part of a program review that led to a major revamping of the Undergraduate ES Certificate Program. The previous structure of the program did not allow the ES Program to identify many ES Certificate students until the semester they graduated, or in some cases, after graduation. This meant that the course mapping for recipients of the Certificate could not practically be kept up-to-date, and results are not available for 2013-2014.

Program Improvement, 2013-2014
As part of major revisions to the undergraduate ES Certificate program made as a result of the program review of previous assessment results, a requirement for a capstone course has been added to the curriculum that will allow the ES Program to identify students prior to graduation. Revisions have also been made to the ES Certificate website and the ES Blackboard community, and the ES Program has worked with advisors in the College of Science to ensure that students understand the application and verification procedures.

SLO 3: Practical Skills
Data Summary: Analysis and Evaluation
Assessment of this element of the Undergraduate ES Certificate Assessment Plan will begin in Spring 2015, with the introduction of the new capstone course; results are not available for 2013-2014.

Program Improvement
As a result of the program review based on previous assessment results, a capstone course that specifically addresses and assesses this outcome has been added to the ES Certificate curriculum for Spring 2015 to ensure that all students in the ES Certificate Program achieve this outcome.

i. State-approved prerequisites
The Environmental Science Certificate is designed to enhance a student’s major program of study and does not qualify as a degree. Therefore, lower level pre-requisites are not enforced by the Environmental Science Program but are instead enforced by the University and/or the students’ major program or department. All of FAU’s baccalaureate programs require core curriculum courses as specified by the Florida State University System’s Intellectual Foundations Program (IFP). All of FAU’s IFP courses are thoroughly reviewed by the University’s Core Curriculum Committee for compliance with the State University Systems’ requirements per regulation 6.017. A list of FAU’s core curriculum requirements can be found at http://www.fau.edu/uas/pdf/2014_2015/IFP-Curriculum.pdf.
ii. Limited access
The Environmental Science Certificate program is open to all students who have the necessary pre-
requisites to progress through the course requirements for the certificate. Course pre-requisites are
specified in the University catalog (http://www.fau.edu/academic/registrar/FAUcatalog/scienceDES.php).

iii. Admissions criteria
There are no admission requirements for the Environmental Science Certificate Program. Any FAU
student is eligible to participate in the program. The ES Certificate is awarded only in conjunction with a
Baccalaureate degree from FAU.

iv. Enrollment information
Since the Environmental Science Certificate Program is not housed within a department or program and
is open to all FAU students, it is challenging to track detailed enrollment statistics. Enrollment in the
courses that lead to the certificate is tracked by the departments and programs that administer those
courses. However, there are no courses that are open only to students who are participating in the
Certificate Program and historically there have not been any courses that all certificate students are
required to take; therefore, course enrollment does not directly correlate to enrollment in the
certificate program.
We have also recently made curriculum changes that we believe will be helpful in this regard. Effective
Spring 2015 all new Environmental Science Certificate students will be required to take a senior-level
capstone course, Critical Thinking in Environmental Science (EVS 4021). This will be the first time the
Environmental Science Certificate Program has included a course that is required for all students. Having
this required course will enable us to clearly identify and assess students who are working toward the
certificate.

v. Average class size and faculty/student ratio
Class size and faculty/student ratio are tracked by the departments and programs that offer courses
which are part of the Environmental Science Certificate Program. Historically, the only core requirement
for the Environmental Science Certificate was that students had to take either Environment and Society
(EVR 2017) or Issues in Human Ecology (PCB3352). (As described below, beginning in Spring 2015 the
core requirements for the certificate will change.) Between the spring of 2009 and the fall of 2014, the
average enrollment for EVR 2017 was 43 students, and the average enrollment for PCB 3352 was 48
students.

vi. Curriculum
The Environmental Science Certificate curriculum draws from courses across multiple colleges and
departments at FAU to ensure that students gain basic knowledge and skills in the interdisciplinary field
of environmental science. The ES Certificate is awarded only in conjunction with a baccalaureate degree
from FAU, and all students must complete a total of 18 credits from these areas:
One course from each of three core areas
1. Human Environmental Interactions
2. Statistics/Quantitative Methods
3. Environmental Science Capstone
One course from three of five focus areas
1. Biology
2. Chemistry,
3. Earth Science,
4. Human-Environmental Interactions,
5. Geographic Information Science.

This curriculum for the ES Certificate was approved for the 2015-2016 FAU Catalog. The full list of
courses in the ES Certificate core areas and focus areas is in Appendix A.

Nationally, many universities offer an undergraduate certificate in Environmental Studies, but the
undergraduate certificate in Environmental Science is much less common. The ES Certificate at FAU
differs from a typical Environmental Studies Certificate in requiring a core course in quantitative
methods and statistical analysis. Among state universities in Florida, only FAU offers an undergraduate
Environmental Science Certificate. Florida International University offers an undergraduate certificate in
Environmental Studies; other state universities in Florida, including FIU, offer baccalaureate degrees in
Environmental Science or Environmental Studies but do not have an undergraduate certificate program.
Nationally, several comparable and aspirational programs offer undergraduate certificates or minors in
environmental science or environmental studies that are similar to the ES certificate; these programs
also divide credit requirements between core and elective courses. The number of required core credits
varies from 3-6, and total credits vary from 15-21.

Requirements for comparable and aspirational certificate programs listed below are shown in the
following table.

- Ohio University, Environmental Studies Certificate
- University of Nevada, Las Vegas, Environmental Science Minor
- Florida International University; Environmental Studies Certificate
- University of Wisconsin, Madison; Environmental Studies Certificate
- University of Colorado, Boulder; Certificate in Environment, Policy and Society

### Minimum credit requirements for similar undergraduate certificates at other institutions.

<table>
<thead>
<tr>
<th>Certificate Type</th>
<th>FAU</th>
<th>Ohio U</th>
<th>UNLV</th>
<th>FIU</th>
<th>UW Madison</th>
<th>U Colorado Boulder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparable/Aspirational</td>
<td>Env. Science</td>
<td>Env. Studies</td>
<td>Env. Science Minor</td>
<td>Env. Studies</td>
<td>Env. Studies</td>
<td>Env., Policy and Society</td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
<td>18</td>
<td>21</td>
<td>18</td>
<td>15</td>
<td>18</td>
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<tr>
<td>Core</td>
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<td>3</td>
<td>3</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Electives</td>
<td>9</td>
<td>12</td>
<td>18</td>
<td>12</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>Senior Capstone</td>
<td>3</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**vii. Internships, practicum, study abroad, field experiences**

Many undergraduates in the ES Certificate Program are introduced to internship opportunities through
interaction with ES faculty who offer Directed Independent Study courses that are tied to internships
with community partners. These include unpaid internships with Broward County Environmental
Protection and Growth Management, Florida Fish and Wildlife Conservation Commission, Jonathan
Dickinson State Park, South Florida Water Management District, and the Palm Beach County
Department of Environmental Resources Management. Since 2013, three ES Certificate students have
won paid summer internships with the Arthur R. Marshall Foundation for the Everglades.
Most students in the upper division ES Certificate core course take advantage of the opportunity to gain field experience and Academic Service Learning credit through practical collaborative projects with community partners including Boca Raton Housing Authority, Broward County Environmental Protection and Growth Management, Florida Fish and Wildlife Conservation Commission, Gumbo Limbo Nature Center, Jonathan Dickinson State Park, Palm Beach County Department of Environmental Resources Management, and Pine Jog Environmental Education Center.

viii. Pedagogy/pedagogical innovations
With the exception of the new senior capstone course, which will first be offered in the spring of 2015, the pedagogical methods employed in the various classes that are part of the Environmental Science certificate are monitored by the programs and departments offering those courses. However, the Environmental Science Program Committee reviews the syllabi of courses to make sure that both the course content and instructional methods are in keeping with the mission of the Environmental Science program before approving them as optional courses for the certificate. Although we do not specifically track pedagogy or pedagogical innovations, the Environmental Science Program and its faculty are committed to providing students opportunities to engage in critical thinking, observation, and data thinking and analysis. The following are a few examples of teaching excellence and innovation in some of the courses that are part of the Environmental Science certificate.

- The following courses include an enhanced undergraduate research project. The instructors of these courses have received internal grants to develop and assess the success of these undergraduate research projects.
  - Issues in Human Ecology, PCB 3352
  - Critical Thinking in Environmental Science, EVS 4021 (the new ES capstone course)
  - Biogeography, GEO 4300
  - Human-Environment Interactions in South Florida, GEA 4275
  - Hydrogeology, GLY 4822

- The following classes include an academic service learning project.
  - Issues in Human Ecology, PCB 3352
  - Critical Thinking in Environmental Science, EVS 4021
  - Human-Environment Interactions in South Florida, GEA 4275

- The Environmental Science Program, together with the Department of Geoscience and the Department of Biology, has established environmental monitoring stations on the ecological preserve on our Boca Raton campus (https://www.sites.google.com/site/drtararootshomepage/reach). These environmental monitoring sites serve as a field lab for the following courses.
  - Issues in Human Ecology, PCB 3352
  - Critical Thinking in Environmental Science, EVS 4021
  - Human-Environment Interactions in South Florida, GEA 4275
  - Hydrogeology, GLY 4822

- Water Resources (GEOC 4280), which became a fully online course in 2013, received Quality Matters (QM) certification after being peer reviewed to ensure the course meets the QM benchmarks for quality online instruction. (https://www.qualitymatters.org/)

ix. Scope of institutional contributions
As an interdisciplinary program that does not have direct oversight for any courses except the new senior capstone course, this section of the self-study has only limited relevance to the Environmental
Science Certificate program. The new ES Certificate capstone course, Critical Thinking in Environmental Science, was created by the ES Program (in part as a means of identifying our students and assessing their progress) and is taught by ES faculty. The ES Program also provides research mentoring opportunities for undergraduates through its graduate-undergraduate mentoring program.

**x. Student profile**
The Environmental Science program does not track this information. Statistics about student diversity, age, gender, etc. are tracked by degree-offering departments and programs rather than interdisciplinary certificate programs.

**xi. Advising procedures**
All undergraduate students receive advising centrally through University Advising Services (UAS) in their first and second years (up to 45 credits).

It is challenging to advise ES Certificate students who are matriculated in a variety of departments throughout several colleges. Currently, we rely heavily on the ES web page (http://www.science.fau.edu/biology/envirosci/undergraduate.html), the Program Coordinator and college-level academic advisors to advise students. Both the ES web page and college academic advisers encourage students to enroll in the Environmental Science Blackboard community, which we use to routinely communicate with students. However, due largely to the interdisciplinary nature of the certificate program, a large proportion of students who are participating in the Environmental Science certificate program self-advice.

The ES web page (http://www.science.fau.edu/biology/envirosci/undergraduate.html) and college-level academic advisors inform students that they must ask an advisor or the ES Program Coordinator to enroll them in the Environmental Science Blackboard community. Students then submit the application for the ES Certificate through the Blackboard site. This procedure was developed to allow the ES Program to track students who are pursuing the ES Certificate. However, we have found that students still very frequently self-advice, complete all the courses required for the certificate, and submit the ES application during the semester they graduate. Thus many students earn the certificate without us being able to track their progress through the program. To improve communication with students and encourage students to participate in the Blackboard community and to submit their application early, we plan to 1) work with the departments/instructors of core courses to announce these procedures every semester, and 2) in addition to the college-level academic advisors, ask department-level academic advisors to inform students of these procedures.

**xii. Licensure rates (if applicable)**
Not applicable.

**xiii. Placement rates/employment profile**
Not applicable: This information is tracked by degree-offering departments and programs rather than by the Environmental Science certificate program.

**xiv. Retention rates**
Not applicable; this information is tracked by degree-offering departments and programs rather than by the Environmental Science certificate program.
xv. Graduation rates
Figure 1 shows the number of students that have received the Environmental Science Certificate from Spring 2009 through Spring 2014.

![Figure 1: Environmental Science Certificates Awarded](image)

xvi. Student recruitment
The Environmental Science website and college and department academic advisors are the primary means used to recruit students into the Environmental Science Certificate Program. Students in colleges and departments across the university enroll in ES Certificate courses to meet the requirements for their major, and many instructors in these courses advise and recruit students. In 2014 the ES Program also began hosting a weekly graduate-undergraduate round table in collaboration with the FAU chapter of SEEDS, the undergraduate organization of the Ecological Society of America; this informal gathering held at the Boca Raton campus helps to enhance interaction between undergraduates and ES graduates students and helps to recruit students interested in the ES Certificate program.
Graduate Programs: Master of Science in Environmental Science

In 2010-2011 the Environmental Science Program Committee defined new student learning outcomes (SLOs) for ES graduate students that reflected the new program goals, particularly for non-thesis students, and developed a new assessment plan in the context of the new learning outcomes that used appropriate tools and methods and implemented sustainable practices. The ES Program Committee reviews SLOs and assessment results annually and makes recommendations for program improvement.

Student Learning Outcomes – Master’s Program

SLO 1: Professional Activities
Students will demonstrate substantial professional skills in environmental science, as evidenced by scholarly interactions with professionals in the field, including participation in professional organizations and activities such as scholarly presentations, workshop participation, and conference attendance.

Implementing Strategy
Information on student participation in professional societies and organizations, scholarly interaction with faculty, and participation in professional workshops and conferences, is collected by means of an online survey that is completed by students each academic year.

Assessment Method
The analyses and summary of the percentage of students reporting participation in specific professional activities is reviewed annually by the Environmental Sciences Program Committee, which makes specific recommendations for improving students’ acquisition of professional skills.

Criterion for success
1) Participation in professional organizations:
90% of MS students will participate in one or more professional organizations
2) Interaction with faculty:
90% of students will interact with faculty weekly or more often.
3) Participation in workshops and conferences:
90% of students will present their thesis or DIS research at one or more workshops or conferences

SLO 2: Original Thesis Research
Students enrolled in the thesis option will be able to conduct original research and perform in-depth analysis, as demonstrated by successful completion of a Master’s Thesis. Specifically, students will demonstrate:
1) current knowledge of their field of study and the ability to critically review and interpret scientific literature.
2) the ability to develop hypothesis, design and execute scientific experiments, and draw logical conclusions from data.
3) the ability to write scientific reports and communicate same effectively in oral presentations.

Implementing Strategy
Overall evaluation of student thesis work in the ES Program is performed by the thesis committee and departmental graduate coordinator in accordance with the guidelines of the academic department of the faculty advisor. A thesis committee reviews the thesis proposal and thesis defense presentations, which are open to all faculty. The advanced procedural and technical skills of the student are evaluated and reported by the thesis committee in accordance with the guidelines of the academic department of each student’s faculty advisor.

Each member of the Thesis Committee will submit a written evaluation of the thesis proposal and defense to the ES Program Coordinator, utilizing the assessment forms downloaded from the
Environmental Sciences website. The evaluations are reviewed by the ES Program Director and the standing Program Committee.

Assessment Method
Assessment of Thesis Proposal: During the first year, each student writes a thesis proposal and presents a proposal seminar that is open to all faculty. Each member of the Thesis Committee evaluates the proposal by a 3-pt scale (1=below expectation, 2= Meets expectation; and 3 = Exceeds expectation) for the following criteria:
1) Scientific Merit of Study
2) Adequacy of literature review
3) Ability to create testable hypothesis and define objectives
4) Soundness of research methods, including procedure for data analysis
5) Oral communication and seminar
Assessment of Thesis Defense: During the last semester of study, each student submits a final written thesis and presents a thesis defense seminar. Each member of the Thesis Committee evaluates the thesis by a 3-pt scale (1=below expectation, 2= Meets expectation; and 3 = Exceeds expectation) for the following criteria:
1) Scientific Merit of Study
2) Critical analysis of literature in the field
3) Hypothesis and extent to which objectives are accomplished
4) Scope and quality of data collected and its presentation
5) Intellectual merit of data interpretation and analysis
5) Potential for journal publication from the work
Criterion for success
Success criterion for thesis proposal:
100% of all students will achieve a score of 2.5 or better on the thesis proposal evaluation.
Success criterion for thesis defense:
100% of all students will achieve a score of 2.5 or better on the thesis defense evaluation.

SLO 3: Employment after Graduation
Students will demonstrate the skills required to successfully compete for professional positions in the workforce by gaining employment in a field of environmental sciences-related field in the public or private sector.
Implementing Strategy
The ES Program maintains contact with students after graduation through faculty advisors and annual email surveys.
Assessment Method
An system for collection and tracking post-graduation placement data (career path after leaving FAU) through email surveys is maintained by Environmental Science faculty and staff
Criterion for success
At least 90% of students that seek employment in the discipline are able to obtain appropriate employment within one year.

SLO 4: Critical Thinking and Communication
Students will demonstrate a broad understanding of the multidisciplinary field of environmental science and in-depth knowledge of their area of interest. They will be able to perform analyses of scientific data and research methods, critically evaluate research findings, and communicate effectively with colleagues in their field.
**Implementing Strategy**
All students must take the Environmental Sciences Colloquium course during two fall semesters. As a requirement for this course, students submit weekly summaries of the scientific seminar presentations and provide in-depth critical reviews of three presentations. These written assignments are assessed by the instructor according to rubric approved by the Environmental Sciences Program Committee.

**Assessment Method**
Students' written reviews of the seminar presentations will be assessed using a rubric that evaluates communication, critical thinking, and synthesis skills.

**Criterion for success**
At least 80% of students will meet or exceed all expectations, as specified in the assessment rubric.

**Assessment of SLOs and Program Improvement – Master’s Program, 2013-2014**

**SLO 1: Professional Activities**

**Data Summary: Analysis and Evaluation**
Of the 10 students responding to the annual assessment survey:

1) 70% participated in one or more professional organizations. 10% participated in a professional club at FAU and 60% participated in a professional club outside FAU.
2) 70% interacted with their advisor weekly or more often.
3) 90% of students attended a workshop or conference. at FAU. Only 70% attended a workshop or conference outside FAU.

The success criteria were not met for two components of this outcome, however, the level of student compliance with the requirement to complete the annual survey was extremely low (45%), making it difficult to draw valid conclusions from the results. Since failure to complete the survey is in itself indicative of low student engagement in the program, the level of success for this outcome is likely to be even lower among the students who did not take the survey.

**Program Improvement**
The ES has implemented three program improvements to increase student success for this outcome:

1) Increase engagement of first-year students in professional interactions. Beginning in 2014-2015, all ES students will be required to present a poster at the ES Retreat. The ES Program now holds its Annual Retreat in conjunction with the Graduate and Professional Student Association Research Day at FAU. In the past, only second-year thesis students were required to present a poster at the ES Retreat. In the future, first-year non-thesis students will present a poster of their proposed DIS project, second-year non-thesis students will present a poster of their Directed Independent Study (DIS) project results, and first-year thesis students will present a poster of their proposed thesis research. ES faculty judge the posters in the thesis and DIS categories, and winners receive funding for travel to a scientific conference or membership in a professional society.

2) Increase student completion of the assessment survey. The low level of student compliance with email requests to complete the assessment survey has been a perennial problem. Currently, the survey is conducted by an email request to students explaining the purpose of the survey and providing a link to SurveyMonkey. In the future, completion of the survey will be a requirement in the ES Colloquium course that all ES students must take during the fall semester. The survey results will remain anonymous, but students must complete the survey through Blackboard as part of their grade for the course. ES staff will do a short in-class presentation about the objectives of the survey and its role in program improvement and student success.

3) Increase student interaction with faculty. The introduction in Spring 2014 of the requirement that non-thesis ES students complete a DIS project under the direction of an ES faculty member is expected to increase the interaction of non-thesis students with faculty.
**SLO 2: Original Thesis Research**

*Data Summary: Analysis and Evaluation*

1) 100% of 8 students achieved a score of 2.5 or better on their thesis proposal evaluation.
2) 100% of 4 students achieved a score of 2.5 or better on their thesis proposal evaluation.

*Program Improvement*

No specific program improvements are planned for this outcome.

**SLO 3: Employment after Graduation**

*Data Summary: Analysis and Evaluation*

100% of 12 students who graduated from Fall 2012 through Summer 2013 found employment in the field or entered a PhD or professional program within one year after graduation.

Among 15 students graduating less than one year ago (from Fall 2013 through Summer 2014), 10 students had found employment in the field, 2 had entered Ph.D. programs, and 3 were seeking employment. Of the students who had found employment, 3 were employed part-time by choice.

*Program Improvement*

No program improvement related to this outcome is planned at this time.

**SLO 4: Critical Thinking and Communication**

*Data Summary: Analysis and Evaluation*

100% of students met or exceeded expectations for communication, critical thinking and synthesis.

First-year students scored significantly lower (p=0.045) than second-year students in communications skills (5.0±0.46 and 6.8±0.60, respectively).

First-year students also scored significantly lower (p=0.037) than second-year students in communications skills (4.9±0.58 and 6.7±0.52, respectively).

These results support the expectation that the ES Program will improve students' critical thinking and communication skills.

*Program Improvement*

The introduction of the requirement that first-year students participate actively in the Annual ES Retreat by presenting a poster of their thesis or research proposal is expected to improve student skills in communication and critical thinking.

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**i. Limited access**

To be considered for admission to the master’s degree program in Environmental Sciences, applicants must meet the following minimal requirements:

- Have an earned bachelor degree from a regionally accredited college or university or the international equivalent.
- Have a cumulative grade point average of 3.0 or greater over the past 60 credit hours. This could include graduate-level coursework.
- Have a Graduate Record Examination (GRE) score of at least 151 on the verbal test and 148 on the quantitative test from the past five years. The admissions committee evaluates the scores on each test individually, not cumulatively. Prior to the change in the GRE test in 2011 a cumulative score of 1000 was the benchmark minimum standard.

**ii. Admissions criteria**

The Environmental Science (MS) graduate program seeks to provide advanced education to highly qualified graduate students. Admission to the ES master’s program is competitive and applicants are evaluated on several factors that collectively indicate their potential for scholarly and professional
success. To be considered for full acceptance into the master’s degree program in Environmental Sciences, applicants minimally must:

- Have an earned bachelor degree from a regionally accredited college or university or the international equivalent.
- Complete the Environmental Science graduate study application.
- Submit a 1-2 page typed personal statement of research/career objectives as they relate to environmental sciences.
- Have a cumulative grade point average of 3.0 or greater over the past 60 credit hours. This could include graduate-level coursework.
- Have a Graduate Record Examination (GRE) score of at least 151 on the verbal test and 148 on the quantitative test from the past five years. The admissions committee evaluates the scores on each test individually, not cumulatively. Prior to the change in the GRE test in 2011 a cumulative score of 1000 was the benchmark minimum standard.
- Have two letters of recommendation from previous professors, employers, or someone otherwise qualified to evaluate the applicant’s potential for academic work in environmental science.
- Have a support letter from a sponsoring faculty member who is a member of the ES graduate faculty indicating his/her willingness to advise the applicant.

For applicants that are graduates of foreign colleges or universities they must provide an official certified transcript that indicates the nature/scope of his or her academic training.

For applicants with a native language other than English, they must submit a Test of English as a Foreign Language (TOEFL score of 500 or iBT score of 61).

Applicants are accepted as either Thesis or Non-thesis option. The minimum standards for the two options are the same, but the offer of teaching assistantships and fellowships (see Student Recruitment) is limited to students in the Thesis option. This creates some competition, making higher scores and support of a sponsoring faculty member of greater import.

The requirement for a sponsor letter makes it necessary for most students to communicate with a faculty member beforehand and secure their support. This process represents a type of pre-selection before the ES admissions committee considers an application. For students applying for the Thesis Option, that faculty-level pre-selection generally requires a mutual research interest between the faculty sponsor and the applicant as well as sufficient resources to initiate the research.

### iii. Enrollment information

Enrollment in the ES graduate program increased from 2010 through to a peak of 36 students in 2012-2013. Enrollment has since declined to 26-27 students for the past two academic years (Figure 2). This decline in enrollment is not due to a decrease in the number of applicants, nor to any decrease in applicant quality. Applicant number, in fact, has remained relatively steady over the past 5 years, with a mean of 22 applications per year and 17 accepted for a mean rate of 77% of applicants accepted into the program. Applicants in 2014 in fact were a record 26. The disparity lies in the declining number of students accepted who then choose to enroll at FAU (Figure 3). Over the period 2010 – 2013, 64-74% of applicants accepted into the graduate program enrolled at FAU. In 2013 that fraction declined to 50% and was only 42% in 2014. Unfortunately, we are losing some of our top applicants, who are choosing other schools over FAU.
Students have told their potential sponsors in the graduate program that teaching assistantships at other schools are more attractive, especially as the cost of living in Boca Raton is high. An investigation by the ES Program Committee into other state universities in Florida revealed that FAU is non-competitive neither with stipends nor benefits, and this shortcoming is considerably more pronounced for the MS stipends compared to College of Science PhDs.
The Center for Environmental Studies gave the ES Program an additional $20K for this academic year to disburse as the Program Committee saw fit. The Committee approved the division of the additional funds to supplement the three top students, with the remainder going to student recruitment. This was a one-time benefit however, and there is no guarantee that additional monies will be forthcoming.

The test scores of graduate students enrolling in the program have increased over the past five years as demonstrated by the average GRE scores of accepted and enrolled graduate students from 2010-2014 (Figure 4, all scores expressed on the newer GRE scale, 2014 concordance table). Over the past 5 years average GRE scores were 155 on the verbal test (67th percentile) and 151 on the quantitative test (44th percentile). The average undergraduate GPAs of accepted/enrolled cohorts for the 5 years ranged from 3.3 to 3.4. ES faculty have discussed raising the admission standards a bit further, but without

### MS stipends, tuition waivers, and benefits at FAU compared to other state universities in Florida

<table>
<thead>
<tr>
<th>University</th>
<th>MS Stipend</th>
<th>months</th>
<th>Tuition waiver</th>
<th>Health insurance</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAU</td>
<td>9,636</td>
<td>9</td>
<td>100% (in-state)</td>
<td>No</td>
</tr>
<tr>
<td>FIU</td>
<td>15,000</td>
<td>12</td>
<td>9cr/sem.</td>
<td>75% of cost</td>
</tr>
<tr>
<td>USF</td>
<td>18,600</td>
<td>9</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>UF</td>
<td>18,000</td>
<td>9</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>FSU</td>
<td>20,000</td>
<td>12</td>
<td>100%</td>
<td>$900 supp.</td>
</tr>
<tr>
<td>UCF</td>
<td>10,000</td>
<td>9</td>
<td>100%</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Figure 4: Average GRE scores of incoming graduate students
commensurate support we doubt that the program can continue to improve and sustain or increase enrollment numbers.

\textbf{iv. Average class size and faculty/student ratio}

Graduate classes at FAU are generally small, allowing for extensive interactions with students and enhancing discussion and student-faculty interactions. While Dashboard indicators for the ES Program class size and student/faculty ratio are not available, we obtained enrollment data for courses in the six core areas of the ES Program (Figure 5). Although class size ranges up to 27, most have 10-15 students, with an average of 11 students. The ES Colloquium, which is required of all students in the program, typically has 20-25 students.

\textbf{v. Curriculum}

The curriculum draws from courses across multiple colleges to ensure students receive broad training in the environmental sciences. The MS degree requires a minimum of 36 credits, with at least 22 from a set of core courses in six subject areas: Chemistry, Geographic Information Science, Modeling, Conservation and Ecology, and Policy and Planning. Students must take one course from at least four of these core subject areas. The detailed curriculum can be found in Appendix B. The expected duration of the program is two years.

Students must also take at least two semesters of Environmental Science Colloquium (EVS 6920, 1 credit per semester). The broad goals of the ES Colloquium are to develop critical thinking and communication skills in the context of a variety of topics in environmental research and management fields.

The MS Thesis program requires 6-12 thesis research credits (EVS 6971) in addition to presentation of a thesis proposal and defense. The non-thesis program requires the same minimum of 22 credits from core courses, and only 6 elective credits may be taken outside the core subject areas. Non-thesis students must also complete 3 directed independent study credits (EVS 6905).

Credit requirements for similar programs are listed in the table below. The specific degree programs are

- George Mason University, MS in Environmental Science & Policy
- University of Nevada Las Vegas, MS in Environmental Science
- Florida A&M University, MS in Environmental Sciences
• Florida Gulf Coast University, MS in Environmental Science
• University of Florida, MS in Interdisciplinary Ecology
• Louisiana State University, MS in Environmental Sciences

Comparable programs also divide credit requirements between core and elective courses; however, the number of required core courses varies widely (9-31 credits). FAU sits approximately in the middle of this distribution and is similar to our aspirational programs. Some programs (e.g., George Mason, UF) require all students to take a small number of specific courses in research methods and statistics. Like FAU, four of the six similar programs require at least one seminar/colloquium course.

| Minimum credit requirements for FAU and comparable Environmental Science Masters programs |
|-----------------------------------------------|-------------------|-------------------|-----------------|-----------------|-----------------|-----------------|
|                                             | FAU               | George Mason comp | UNLV comp       | FAMU comp       | FGCU comp       | UF asp          |
| Comparable/Aspirational                      | Total             | Core              | Thesis/Research | Seminar/Colloquium |
| FAU                                          | 36                | 22                | 6               | 2                |
| George Mason comp                             | 33                | 21                | 3               | 1                |
| UNLV comp                                     | 33                | 9                 | 6               | 1                |
| FAMU comp                                     | 36                | 31                | 0               | 1                |
| FGCU comp                                     | 36                | 16                | 6               | 2                |
| UF asp                                        | 36                | 18                | 0               | 2                |
| Louisiana State asp                           | 36                | 24                | 6               | 1                |

**vi. Internships, practicum, study abroad, field experiences**

The Environmental Science Program promotes internships for its students because internships are a form of experiential learning where students learn by doing. South Florida is rich in institutions involved in resource management and research so it is an ideal place to have students engaged in experiential learning as part of their academic studies. Since 2010, ES students have interned at private consulting companies, state agencies (the South Florida Water Management District and the FL DEP), national agencies (FWS, EPA), county resource management agencies (Palm Beach, Broward County) and nearby parks and wildlife reserves (Everglades, Big Cypress, state, local).

A new (summer 2014) study-abroad program will now be available to ES students. FAU recently concluded arrangements, originated by 2 members of the ES Graduate faculty, in which the Tropical Forestry Research Institute (TFRI) in Guangzhou, China will provide funds for students to conduct a portion of their research at the TFRI. This collaboration will benefit students at FAU who are interested in mangrove ecology.

Field experiences are an important part of the ES curriculum. The courses take advantage of the varied environment around South Florida, from the Everglades to the ocean, and from estuaries to urban areas and most are in the Conservation and Ecology core subject area (e.g. Flora of South Florida, Marine Ecology, Marine Invertebrate Zoology, Natural History of the Indian River Lagoon).

**vii. Pedagogy/pedagogical innovations**

The Environmental Science Program combines traditional classroom learning with experiential learning in South Florida highly varied ecosystems and urban landscapes, in the form of field trips, field work and research experience for both thesis and non-thesis students. South Florida is rich in institutions involved in resource management and environmental research so it is an ideal place to engage students in experiential learning through internships as part of their academic studies; internships may also lead to future employment.
The Environmental Sciences Colloquium (seminar series), in turn, brings experts from both the surrounding areas and outside of South Florida to FAU, broadening students perspectives beyond that of the FAU faculty. For example, in the last two years the ES Colloquium has hosted speakers from various agencies with presentations on wildlife management (US Fish & Wildlife Service), science communication (Patricia & Philip Frost Museum of Science), and climate change impacts (Smithsonian Environmental Research Center). The ES Colloquium also sponsors academic research seminars by faculty from universities in Florida and out of state.

Several of our most highly attended core courses, including the ES Colloquium, must be taught by video conference due to the distributed campus environment at FAU. These courses are broadcast from the originating campus to the Davie, Boca, Jupiter, and Harbor Branch campuses, as needed and include both seminars and lecture format classes. Broadcasting courses allow students in the ES Program (and others) to schedule necessary courses despite the distances between campuses. The video conference system also provides an important link between students and faculty throughout the program. Recent updates to the system have made this more effective, though distance teaching still occasionally poses challenges. For example, sound quality and dropped connections are problems on the technology side; student reticence with microphones and lack of the instructor's physical presence are pedagogical challenges.

Special courses and workshops are also designed for ES students, though students, faculty, and professionals outside of FAU also may benefit. For example, in 2012, about 17 FAU ES and Biology students, most of whom are studying avian ecology, were trained on how to capture invasive Burmese pythons, common to the southern regions of the Everglades. Because many of the students conduct research in the Everglades, it’s not unusual for them to encounter the non-venomous pythons; learning to safely remove these reptiles benefits both the students and the environment.

In an academic setting, the ES Program has run four, multi-day statistics and modelling workshops for researchers and students from throughout South Florida (2009-2013, another is currently in the planning stages). These workshops bring in outside experts to present an intensive workshop on a particular topic. In 2013 the ES workshop was presented by Dr. Robert M. Dorazio, US Geological Survey, on the use of Bayesian statistical methodologies in analyses of biological data using the R statistical program.

Where appropriate, e-learning is also a part of the ES curriculum; as the Geographic Information Systems courses are computer-intensive rather than field-oriented, they are taught exclusively on-line. Other courses, while not e-learning, provide practical instruction and experience in relevant computer programs and computer modeling, including statistics and hydrology courses.

At the end of each academic year, the ES Program sponsors an Annual Environmental Science Retreat. This is intended to develop a sense of collegiality among ES students, who are scattered across multiple campuses and thus rarely meet as a cohesive group. All ES master’s students present posters of their work, and both an outside speaker and an alumnus are selected to present talks, thus allowing students to get additional perspectives on the professional world to which many ES graduates aspire.

viii. Scope of institutional contributions

The six core subject areas in the Environmental Science Program include courses from multiple schools/colleges/departments, including Biology, Chemistry, Geosciences, Urban and Regional Planning, Women’s Studies, and Philosophy. Although most of these courses were not in general created by the ES Program, ES graduate students interact extensively across these departments. The Environmental Science Colloquium was created by the ES Program (in part as a means of assessing our students’
progress); however, this course also serves to fulfill seminar requirements for students in the Biological Sciences MS Program and the Integrative Biology PhD Program.

Two certificate programs are available to graduate students in the Environmental Science Program. The ES Program offers the Environmental Restoration certificate for graduate students who wish to pursue an environmental restoration position upon graduation or for professionals looking to increase their knowledge base, advance professionally or change careers. The certificate is interdisciplinary, drawing on courses from environmental science, geosciences, biology, urban and regional planning and civil engineering. The certificate also includes considerable opportunity for experiential learning in the form of course field trips to actual restoration projects; internship opportunities with local, state and federal agencies conducting restoration; and primary research experiences with future, ongoing and recent environmental restoration projects in South Florida. These opportunities also provide the prospect of meeting, networking and interacting with professionals from public and private environmental restoration organizations.

The certificate consists of a minimum of 21 credits, including three core courses, one internship or DIS resulting in the completion of a restoration-related project, completion of a manuscript of publishable quality and colloquium presentation based on the internship/DIS project, and three electives chosen from the two elective foci (both elective foci: Ecology, and Planning and Engineering, must be represented). The three core courses include Environmental Restoration, Restoration Implementation and Management and Conservation Biology. All courses must be completed with a grade of “C” or better to be counted toward the certificate.

As Geographic Information Science is one core subject area available to ES students, students in that core area may obtain the Geographic Information Systems Certificate. The Geographic Information Systems (GIS) certificate for graduate students is not an ES-specific certificate, but is offered jointly by the Department of Geosciences and the School of Urban and Regional Planning in the College for Design and Social Inquiry. Graduate students who complete the program with a grade of "B" or better in each course are entitled to receive the certificate. Nine credits (3 courses) of core material are required plus an additional 6 credits (2 of 3 possible courses) of the student’s choosing. The GIS courses are taught exclusively on-line.

ix. Student profile

Demographics

FAU has long ranked as the most racially, ethnically and culturally diverse institution in Florida’s State University System. In 2014, minority students make up 47 percent of the 30,000-member student body. FAU ranks 93rd in the nation for conferring graduate degrees to all minorities combined, who represent 35 percent of the total number of graduates; FAU ranks 90th in the nation for conferring graduate degrees to African-American students and 57th in the nation for conferring graduate degrees to Hispanic students, who account for 14 percent of the total number of graduates. Students in the ES Program are less ethnically diverse, with white students making up 80% and 83% of the ES graduate population in 2011 and 2012, respectively, the only years for which FAU provided Dashboard Indicators. Hispanic students comprised 17% and 14% of the student body in those years, with African-American and Asian/Pacific Islanders making up 3% each. The ES Program is thus comparable to or better than the overall graduate program in the College of Science, where 3% of the overall graduate student body was African-American and 6% Hispanic in 2012-2013 (the only year for which Dashboard Indicators were available). While this is positive in that it shows the ES Program is attractive on a national scale, it does suggest that more effort could be made to recruit from the highly diverse local student body, both from FAU and the surrounding urban areas.
The male/female ratio for the COS in 2012-2013 was 50/50 overall. The ES graduate program is weighted slightly towards women; the graduate student body was 56% and 58% female in 2011 and 2012, respectively.

Support
Thesis students are supported primarily by way of graduate Teaching Assistantships (TAs); some ES students may also be supported by a Research Assistantship through their advisor. Two incoming students were supported by RAships in 2012, for example, while 4 of 15 incoming students in the fall of 2014 are on RAs. Not all incoming students request TA support, and students in the Thesis track are given priority for TAships while students admitted “conditionally” are also not offered guaranteed TA support initially (though if successful in the program they will be considered for future TA positions). The ES Program is now granted 11.5 positions per academic year and 4-5 each summer; this represents an increase from 9 that were available through most of the time prior to the 2010 academic year. Support has been augmented over the last few years by scrambling to find TA positions in Chemistry or Biology.

Teaching assignments are generally in the department of which the student’s advisor is a member. Since FAU has multiple campuses with varying undergraduate populations (and thus differing numbers of TA opportunities), efforts are made to match the graduate student’s primary campus with TA opportunities. To accommodate students at Harbor Branch Oceanographic Institution (HBOI), arrangements were made for teaching positions at the nearby Indian River State College (IRSC), where students are considered affiliate faculty and receive the same pay for a semester of teaching as they would at FAU. FAU has generally approved tuition waivers for those students in our program with support from IRSC.

Recent efforts by the ES Program Director have resulted in additional RAships being made available through the Everglade Fellowships funded by the National Park Service. The first round of funding was $500,000 and established in 2009. A second round of funding was $100,000 and initiated in 2014. The FAU Environmental Science Everglades Fellowship Initiative is funded by the National Park Service to facilitate restoration of the Everglades ecosystem with the objectives of:
1. Producing high quality publishable scientific papers that provide guidance for the restoration of the Everglades ecosystem.
2. Provide support and training for outstanding fellows to conduct research that is pertinent to the science, management, or policy needs of National Park Service or other U.S. Department of Interior agencies in South Florida.
3. Fostering synergistic collaborations among faculty and students in the FAU Environmental Science Program and staff at the National Park Service.

While the work must be relevant to the restoration of the greater Everglades ecosystem, it can be done on any Department of Interior lands in South Florida including Everglades National Park, Big Cypress National Preserve, Biscayne National Park, Dry Tortugas National Park, and the A.R.M. Loxahatchee National Wildlife Refuge. The initial fellowship program offered a significant boost to the ES Program in terms of the quality of students that it attracted and the breadth of faculty that began their participation in the Program. The former College of Science Dean helped the Director secure the initial fellowship grant by meeting with National Park Service administrators and signaling that FAU was ready to invest in training and research for Everglades science. Surprisingly, within a year the upper university administration publically announced a shift in its environmental research emphasis to a climate science initiative, effectively ending the considerable momentum that had been achieved in making FAU known for developing a science initiative that closely matched the research needs of the $8 billion Everglades restoration effort. An attempt to regain this momentum has only recently emerged through efforts by the current Dean of the College of Science to signal a renewed interest by FAU in training students and conducting research that meets the needs of the Park Service and other agencies involved in the management and restoration of South Florida’s aquatic ecosystems.

Scholarly Activity
Over the past 5 years, the ES Program has worked to increase student scholarly activity and in particular to increase interactions with ES professionals. To track scholarly activities, a Blackboard survey was developed that all students now take annually during the fall semester ES graduate colloquium. The analyses and summary of the percentage of students reporting participation in specific professional activities is reviewed annually by the Environmental Sciences Program Committee.

The ES Program Committee established the following criteria for success 1) Participation in professional organizations by at least 90% of MS students 2) 90% of students will interact with faculty weekly or more often. 3) Participation in workshops and conferences: 90% of students will present their thesis or DIS research at one or more workshops or conferences.

Originally, the criteria were not met successfully for two components; however, the level of student compliance with the requirement to complete the annual survey was extremely low (45%), making it difficult to draw valid conclusions from the results. Since failure to complete the survey is in itself indicative of low student engagement in the program, the level of success for this outcome may have been even lower among the students who did not take the survey.

Of the 10 students responding to the initial annual assessment survey:

1) 70% participated in one or more professional organizations. 10% participated in a professional club at FAU and 60% participated in a professional club outside FAU.
2) 70% interacted with their advisor weekly or more often.
3) 90% of students attended a workshop or conference at FAU. 70% attended a workshop or conference outside FAU.
Seven ES thesis students published their work in peer-reviewed journals during 2010-2014, and several more have submitted manuscripts currently under review. ES students have presented locally at the Florida Chapter of the Wildlife Society, Arthur R. Marshall National Wildlife Refuge Symposia and Greater Everglades Ecosystem Restoration conferences. Students attend national and international meetings as well, including the International Sea Turtle Symposium, the Ecological Society of America annual meeting, Wildlife Society Annual meeting, Society for Freshwater Science annual meeting, and the Society of Wetland Scientists annual meeting.

The ES has implemented three program improvements to increase student scholarly activity and engagement:

1. Increase engagement of first-year students in professional interactions. Beginning in 2014-2015, all ES students will be required to present a poster at the Annual ES Retreat. The ES Program now holds its Annual Retreat in conjunction with the Graduate and Professional Student Association Research Day at FAU. In the past, only second-year thesis students were required to present a poster at the ES Retreat. In the future, first-year non-thesis students will present a poster of their proposed DIS project, second-year non-thesis students will present a poster of their Directed Independent Study (DIS) project results, and first-year thesis students will present a poster of their proposed thesis research. ES faculty judge the posters in the thesis and DIS categories, and winners receive funding for travel to a scientific conference or membership in a professional society.

2. Increase student completion of the assessment survey. The low level of student compliance with email requests to complete the assessment survey has been a perennial problem. Previously, the survey was conducted by an email request to students explaining the purpose of the survey and providing a link to SurveyMonkey. Currently, completion of the survey will be a requirement in the ES Colloquium course that all ES students must take during the fall semester. The survey results will remain anonymous, but students must complete the survey through Blackboard as part of their grade for the course. ES staff do a short in-class presentation about the objectives of the survey and its role in program improvement and student success.

x. Advising procedures
Applicants who receive acceptance letters must sign and return offer letters indicating their acceptance of the offer to the ES Program and the Graduate College. Throughout their degree students are expected to meet with their ES faculty advisor regularly, but also at the start of each semester to review the expectations for progress towards the degree. Specific semester-by-semester expectations and documentation requirements can be found online through the FAU Blackboard system.

All graduate students must develop and submit a Plan of Study by the end of their second semester. Students admitted to the Thesis Option are expected to form a thesis committee by the end of their first semester. In consultation with their major advisor the student is expected to submit and defend a Thesis Proposal by the end of their second academic semester. Students in the Non-Thesis Option must meet with their faculty sponsor and develop a plan for their independent research project by the end of the second semester.

Students are expected to maintain a GPA of 3.0 or higher throughout their course of study. Students falling below 3.0 will require evaluation by the ES Program Director and their major advisor.
may be required to complete an Academic Progression Plan to clarify the expectations given the deficiency. If sufficient improvement is not made the student may be dismissed from the program.

In the semester of intended graduation (the fourth academic semester), students must submit an application for degree and, when needed, a revision to the Plan of Study.

**xi. Licensure rates (if applicable)**
Not Applicable

**xii. Placement rates/employment profile**
The ES graduate program currently consists of thesis and non-thesis Masters degrees (an Environmental Science track as part of FAU’s Integrative Biology PhD program is currently under consideration by the administration). Non-thesis students completing the program are qualified for positions in the environmental sciences related to permitting, regulation, monitoring, policy formulation or other duties that do not require experience in scientific research. Students who plan to pursue a career in research choose the thesis option, which qualifies them for research positions at various governmental and non-governmental agencies or for additional training in a doctoral program.

The 2009 assessment and program review identified student tracking as an area where improvement was needed in the ES Program, and the Program Committee has implemented a policy to enhance the tracking of students post-graduation. The ES Program Assistant and Coordinator collect Information on student employment after graduation by multiple means: direct communication with alumni who provide the ES Program with their email addresses, online sources (LinkedIn and Facebook), and student advisors who remain in contact with their former students. Information is maintained for five years after graduation and is compiled in a spreadsheet. Beginning in 2015, an alumni page will be maintained on the ES website.

![Figure 7: ES MS Program Post-Graduation Employment](image)

Over the past 5 years, students have been employed in federal, state, and local agencies, as teachers in primary and secondary schools, with private companies in related fields, and have gone on to doctoral or professional programs. The placement rates and employment profile are detailed in Figure 7.
xiii. Retention rates
Forty-five graduate students were enrolled in the ES MS program that could have realistically graduated with MS degrees during this review period (i.e., enrollment from 2008-2012). Of the forty-five (45) students four (4) left the program for personal or medical reasons. The five year retention rate in the graduate program for the period was 91%.

xiv. Graduation rates
As of this review the ES Program offers two-year thesis or non-thesis Master of Science degrees. Of the 41 students first enrolled from 2008-2012, 39 had been awarded MS degrees as of Summer 2014, of which 30 were MS thesis degrees and 9 were MS non-thesis degrees, and 2 students had not yet graduated. Students can graduate in fall, spring or summer semesters. The number of degrees awarded has increased for four consecutive years (Figure 8) but the graduation data for the current academic year 2014-2015 is not yet available. The 39 graduates were advised by 20 different major professors housed in Biological Sciences (Boca, Davie, and Harbor Branch faculty), Geosciences, the Honors College, Chemistry and the Center for Environmental Studies.

Figure 8: MS degrees awarded by year

xv. Student recruitment
Passive recruitment of graduate students arises by use of the Environmental Science Program website, advertisement to FAU undergraduates through coursework/research in allied fields and the websites of individual faculty.

Active recruitment occurs as members of the faculty with active research programs search for graduate students nationally or internationally through discipline-specific channels. The ES Program has a limited number of teaching assistantships (11.5 academic year stipends with tuition waivers) to offer to the top applicants. Applicants must meet or exceed the minimum GRE and GPA standards and be deemed good prospects in other respects (letters, experience, personal statement) to receive committed support for two years.
Additional sources of support have been used to recruit top students, including Fellowship Programs from the U.S. National Park Service, internships with the South Florida Water Management District, a new Fellowship Program in partnership with the Center for Environmental Studies (FAU) and Research Assistantships offered by participating ES graduate faculty with their own grants. In addition, a Provost Fellowship consisting of a one-time offer of $2500 is offered to the top recruit each year when the fellowship is available.

A limited number of the top applicants that are not local are provided travel reimbursements for campus/lab visits with recruitment fellowship funds provided by the Provost’s Office.

**Faculty**

*1. Administrative structure*

The administrative structure of the Environmental Science Program consists of a Program Director and a Program Coordinator with faculty appointments in the CES College of Science, and a part-time Program Assistant with a staff position in the CES College of Science.

*2. Faculty profile*

The Environmental Science Program is an interdisciplinary program. It is currently comprised of 42 faculty members representing approximately 12 different departments throughout FAU and other affiliate faculty. A central institutional database for ES faculty does not currently exist. Therefore, to the extent possible, ES staff track this information independently.

Faculty summary:
- **Biology:** (18) 42%,  **Geosciences:** (11) 25%,  **Harbor Branch:** (3) 7%,  **Honors College:** (3) 7%,
- Others (1) 2.3% each: Chemistry, Anthropology, Mathematics, URP, CMS, CEGE, CES
- 30 Male: 70%
- 13 Female: 30%

**Faculty in the Environmental Science Program**

**Bold type** indicates faculty who have sponsored one or more ES MS students since 2009.

<table>
<thead>
<tr>
<th>Last Name</th>
<th>First Name</th>
<th>Diversity</th>
<th>Rank</th>
<th>Department</th>
<th>Academic Specialties</th>
<th>Full-time /Part-time</th>
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<tbody>
<tr>
<td>Baldwin</td>
<td>John</td>
<td>M</td>
<td>Full</td>
<td>Biology</td>
<td>Conservation Biology</td>
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</tr>
<tr>
<td>Benscoter</td>
<td>Brian</td>
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<tr>
<td>Brooks</td>
<td>Randy</td>
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<tr>
<td>Comas</td>
<td>Xavier</td>
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<td>Dawson-Scully</td>
<td>Kenneth</td>
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<td>Biology</td>
<td>Neurobiology of cellular stress and neuroprotection</td>
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<tr>
<td>Detwiler</td>
<td>Kate</td>
<td>F</td>
<td>Assistant</td>
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<td>Primate hybridization and speciation</td>
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<tr>
<td>Devlin</td>
<td>Donna</td>
<td>F</td>
<td>Assistant</td>
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<tr>
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<td>Donna</td>
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<td>Research Professor</td>
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<td>Dorn</td>
<td>Nathan</td>
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<tr>
<td>Esiobu</td>
<td>Nwadiuto</td>
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<td>Fadiman</td>
<td>Maria</td>
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<td>Evelyn</td>
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<td>Gawlik</td>
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<td>Full &amp; Program Director</td>
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<tr>
<td>Haky</td>
<td>Jerry</td>
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<tr>
<td>Hanisak</td>
<td>Dennis</td>
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<td>Hanson</td>
<td>Howard</td>
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<td>Hughes</td>
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<tr>
<td>Ivy</td>
<td>Russ</td>
<td>M</td>
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<td>Stephen</td>
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<tr>
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<td>Marguerite</td>
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<td>Scott</td>
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<td>Meerhoff</td>
<td>Daniel</td>
<td>M</td>
<td>Full</td>
<td>CEGE</td>
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<td>Sarah</td>
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<td>Mitsova</td>
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<td>Moore</td>
<td>Jon</td>
<td>M</td>
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<tr>
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<td>Erik</td>
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<tr>
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<td>Greg</td>
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<tr>
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<td>Anton</td>
<td>M</td>
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<td>Last Name</td>
<td>First Name</td>
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<td>Rank</td>
<td>Department</td>
<td>Academic Specialties</td>
<td>Full-time /Part-time</td>
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<tr>
<td>Owen</td>
<td>Virginia</td>
<td>F</td>
<td>Scientist, Program Coordinator</td>
<td>Biology</td>
<td>Landscape &amp; Community Ecology, Invasion Biology</td>
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<tr>
<td>Petuch</td>
<td>Ed</td>
<td>M</td>
<td>Full</td>
<td>Geosciences</td>
<td>The geology, biostratigraphy, and invertebrate paleontology of the Floridian Peninsula</td>
<td>Full-time</td>
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<tr>
<td>Polsky</td>
<td>Colin</td>
<td>M</td>
<td>Director CES Full Geosciences</td>
<td>CES</td>
<td>Human Dimensions of Global Environmental Change</td>
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<tr>
<td>Proffitt</td>
<td>Ed</td>
<td>M</td>
<td>Associate Biology</td>
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<tr>
<td>Qian</td>
<td>Lianfen</td>
<td>F</td>
<td>Full</td>
<td>Mathematics</td>
<td>time series analysis and regression modeling, survival analysis, environmental statistics</td>
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<tr>
<td>Roberts</td>
<td>Charles</td>
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<td>Associate Geosciences</td>
<td>Geosciences</td>
<td>Extracting thematic information from remotely sensed imagery</td>
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<tr>
<td>Root</td>
<td>Tara</td>
<td>F</td>
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<td>Geosciences</td>
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<tr>
<td>Santaniello</td>
<td>Neil</td>
<td>M</td>
<td>Instructor CMS</td>
<td>Environmental Journalism</td>
<td></td>
<td>Full-time</td>
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</tbody>
</table>
iii. Faculty teaching load
Not applicable; courses in the ES Program curricular are taught by faculty in the departments that offer these courses.

iv. Summary of faculty research productivity
The ES Program does not have faculty lines and there is no institutional-level tracking of grant funding awarded to ES faculty. ES staff independently tracks grant funding received by ES faculty (Figure 9) to understand their level of research activity and to identify research strengths that will shape the future directions of the program.

<table>
<thead>
<tr>
<th>Last Name</th>
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<th>Department</th>
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</tr>
<tr>
<td>Wetterer</td>
<td>James</td>
<td>M</td>
<td>Full</td>
<td>Honors Col</td>
<td>Biogeography, ecology, and environmental impact of ants,</td>
<td>Full-time</td>
</tr>
<tr>
<td>Wyneken</td>
<td>Jeanette</td>
<td>F</td>
<td>Associate</td>
<td>Biology</td>
<td>Integrative biology</td>
<td>Full-time</td>
</tr>
<tr>
<td>Xie</td>
<td>Zhixiao</td>
<td>M</td>
<td>Full</td>
<td>Geosciences</td>
<td>spatial temporal GIS analysis, environment health, invasive species</td>
<td>Full-time</td>
</tr>
<tr>
<td>Zhang</td>
<td>Xing-Hai</td>
<td>M</td>
<td>Associate</td>
<td>Biology</td>
<td>Plant molecular biology and biotechnology</td>
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</tr>
</tbody>
</table>

**Figure 9: ES Faculty Extramural Grant Funding**
ES faculty publications are heavily focused on research questions related to wetlands and estuaries. This area of strength was the basis for focusing research in the ES Program on the big questions related to restoration and management of wetland and estuarine ecosystems that closely match government funding mechanisms; wetland loss, hydrologic alterations, invasive species, contaminants including nutrients, and climate change.

In 2010, the ES Program established the Greater Everglades Research Initiative (GERI) based on an interdisciplinary framework that is now widely recognized as the most effective way to conduct research for ecosystem restoration and management. GERI brings together FAU faculty and collaborators based on their relevance to a problem at hand, not by the subject of their academic training. GERI offers one of the few tangible mechanisms for reaching across disciplines, agencies, and ecosystems to solve human-caused problems. The ecosystems addressed by GERI fall roughly along an elevation gradient from the human-wetland interface to freshwater wetlands, estuaries, coastal waters, and coral reefs.

**Figure 10: ES Faculty GERI Publications, 2010-2014**

![Chart showing GERI publications from 2010 to 2014, categorized by topic: Coastal Wetland/Estuary, Hydrologic Alterations, Water Contaminants, Invasive Species, Climate Change.]

**v. Strategic planning for hires**
Not applicable; the ES Program does not have faculty lines and does not influence hires.

**vi. Abbreviated faculty CVs**
Abbreviated CVs for ES faculty are in Appendix C.

**D. Research**

**i. Review of Part II of the Department Dashboard Indicators**
Not applicable; the ES Program does not have faculty lines.

**ii. Interdisciplinary efforts and community engagement efforts**
Environmental Science is an archetype of an interdisciplinary field, comprised of 42 FAU faculty from nine departments across six colleges, with the Davie campus as the core. Additionally, ES faculty actively collaborate with local, state and federal agencies and governments, and NGOs addressing critical environmental issues (listed below). External agency personnel also actively participate in the ES Program as affiliate faculty in supervising and participating on graduate student committees.

*External Organizations Affiliated with FAU Environmental Science*  
International  
Universidade Federal de Mato Grosso do Sul, Brazil
Tropical Forestry Research Institute, Guangzhou, China

National
A.R.M. Loxahatchee National Wildlife Refuge
Everglades National Park
Big Cypress National Preserve
US Environmental Protection Agency
US Fish & Wildlife Service
US National Park Service
US Geological Survey
US Army Corp of Engineers
US Department of Energy
US Bureau of Land Management
US Bureau of Indian Affairs
National Science Foundation
NOAA
NASA
SeaGrant

State
South Florida Water Management District
St. Johns River Water Management District
Florida Fish and Wildlife Conservation Commission
Florida Department of Environmental Protection
Jonathan Dickinson State Park

Regional & Non-Profit
Palm Beach County Department of Environmental Resources Management
Broward County Environmental Protection and Growth Management
Broward County Climate Change Task Force
Lee County Natural Resources Division
Loxahatchee River District
Martin County Utilities Department
Monroe County Department of Environmental Resources Management
Miami-Dade County Environmental Resources Management
South Plantation High School Everglades Magnet Program
Arthur R. Marshall Foundation
Everglades Foundation
The Nature Conservancy

Academic Institutions
Nova Southeast Oceanographic Center
University of Florida
University of South Florida
Florida International University
University of Central Florida
University of Miami
University of North Carolina Wilmington
University of Georgia (Odum School of Ecology)

Corporate
Coastal Education and Research Foundation, Inc.
Ecology and Environment, Inc.
iii. Establishment of goals for research
- Increase ES faculty external grant funding and support of ES students with RAs
- Better incorporate the marine researchers and marine topics into research focused on wetlands and estuaries, and coral reefs.
- Develop the Davie campus as an Everglades Research hub with a focus on restoration and management of coastal and wetland ecosystems and the coupled natural-human systems research.

To that end it is necessary to strengthen the depth of program expertise through targeted cluster hires, which will enhance the ES Program’s value to external partners, research productivity, and academic programs.

iv. Assessment of how well goals are being met
The enhancement of research conducted by ES faculty is assessed by the levels of scientific publication, funding of external awards, and collaborative relationships with external partners.

E. Service/Community Engagement for Department/School

i. Community engagement
The ES Program is strongly committed to community service and outreach. Its primary goals in this area include knowledge dissemination and public service through internships, outreach, academic service learning, and mentoring. Over the years, the program has developed active and mutually beneficial relationships with government agencies and local and regional organizations providing FAU students with opportunities to gain hands-on learning and working experience. Service activities have also contributed to addressing various environment-related problems and needs in local communities and broader regions.

ii. Review of Part III of the Departmental Dashboard indicators for Department/School
Not applicable

iii. Establishment of goals for service
The ES Program has established the following goals for service:
- Dissemination of research outcomes and activities to the public and decision-makers is a core component of the ES Program efforts in community service. The program has already established a strong record of organizing and hosting workshops and technical meetings on a variety of environmental topics including the restoration of the Everglades National Park. As part of these efforts, the program has built strong institutional relationships with local governments, regional authorities and federal agencies.
- The ES Program has a strong commitment to providing public service through student internships with federal, state and local agencies and organizations. The internships offer opportunities for FAU students to collect data, participate in research and monitoring efforts, learn new skills, obtain experience, and provide various type of support to environment-related institutions and projects. Thus, the ES Program, its faculty and students have become a resource
for local communities, government agencies, and local businesses in their efforts to find innovative environmental solutions.

- The ES Program also engages in community outreach efforts through volunteering of student and faculty time to meeting with the public and participating in community events.

- Academic service learning and community-based research
- Mentoring (K-12)
- Strong website presence

**iv. Assessment of how well goals are being met**
Faculty in the ES Program contribute to an extensive list of community engagement and service activities, including participation in community lecture series, serving on community advisory boards, mentoring K-12 students in environmental education programs, judging at science fairs, organizing community workshops, engaging K-12 and undergraduate students in Citizen Science Programs, contributing to the annual High School Science Olympiad at FAU, serving as officers and board members of professional societies. This culture of service is communicated in turn to ES students, who actively seek volunteer opportunities in government agencies and non-profit community organizations.

**F. Other Program Goals for School or College**

- Facilitate multi- and interdisciplinary environmental initiatives across the university and with external agencies to increase extramural funding for FAU faculty.
• Establish FAU as an institution of academic excellence in environmental research and outreach to engage stakeholders from local to international scales
• Provide a cohesive message and branding to increase the visibility of FAU environmental activities and attract high-caliber students and faculty that will advance the role of FAU in South Florida.
• Improve educational programs and learning outcomes that prepare our students for more advanced study and/or an increased rate of placement in environmental professions.
• Facilitate the growth of FAU’s capacity for environmental initiatives by pooling intellectual and educational resources as well as facilities that can easily be shared, rather than duplicated, across multiple programs.
• Create a broader range of opportunities for undergraduate ES students to build research and inquiry skills through sustainable strategies tied to integration with a culture of community service:
  – develop a peer mentoring program for undergraduate ES research that engages graduate and advanced undergraduates
  – create long-term Community-Based Research Academic Service Learning (ASL) courses in Environmental Science
  – include a community-based research component in the ES Certificate capstone course
  – create standard requirements for Directed Independent Study (DIS) research for the ES Certificate curriculum that are directly linked to Distinction Through Discovery Student Learning Outcomes for undergraduate research

Initial progress toward achieving this goal was enabled by an internal Distinction Through Discovery grant that funded stipends for graduate and advanced undergraduate peer mentors for 2013-2015. This grant enabled more than 80 undergraduate students in ES core courses to participate in community-based research with six community organizations during 2013-2014. Funding for laboratory and field supplies from the C.E.S. College of Science also increased the ability of ES faculty to offer undergraduates the opportunity to engage in experiential learning and conduct meaningful research in academic courses and through directed independent study, attracting undergraduates with an interest in Environmental Science at an early stage of their studies.

G. Strengths and Opportunities That Support Achievement of Program Goals

The Environmental Sciences program has a variety of strengths and opportunities to achieve program goals. These include:

Strengths:
• Faculty has considerable academic and research experience with the aquatic ecosystems in the Greater Everglades region, including Florida Bay, Caloosahatchee Estuary, Indian River Lagoon, the freshwater Everglades and the human interactions with these ecosystems
• A close connection to agencies involved in the restoration and management of the Greater Everglades ecosystem, including the estuaries and water quality issues
• Growing interest of undergraduate and graduate students in environmental issues
• Large and diverse urban population with interest in environmental issues
• Interdisciplinary curriculum of core courses at both undergraduate and graduate level
• Participation of faculty from a broad range of academic units (currently 11 colleges, centers, and institutes).
• Flexible curriculum allows for broad range of backgrounds and interests in natural and social sciences
• Wide variety of courses, including traditional, e-learning, and distance learning classroom and lab; seminar series, and courses with extensive field components.
• Experiential learning through MS thesis research and directed independent study (DIS), including an emphasis on undergraduate research (Office of Undergraduate Research and Inquiry, FAU-OURI)
• Already established relationships with local, state, and national governing bodies, including Water Management Districts, National and State Parks, and the US Geological Society
• Well-developed infrastructural support for research and education in environmental science at FAU facilities:
  - Boca Raton and Davie Campus Research Greenhouses
  - Boca Raton Campus Environmental Monitoring Field Sites used for teaching
  - Davie Everglades Research Center
  - Davie Water Quality Laboratory
  - DuPuis Environmental Management Area
  - Gumbo Limbo Environmental Complex
  - Harbor Branch Oceanographic Institute
  - Pine Jog Environmental Education Center
  - Riverwoods Field Laboratory

Opportunities:
• FAU strategic plan to increase research in environmental and coastal science
• FAU is reaching a critical mass of environmental activities in many academic units that could be reorganized to more effectively market its considerable, but currently diffuse, environmental research and education capabilities.
• Desire by federal and state agencies involved in restoration and management of wetlands and estuaries in the greater Everglades ecosystem for local universities to increase research expertise and workforce development that meets their needs.
• Expanding human population in South Florida generating need for more environmental professionals
• Unique opportunities for the study of coupled natural-human systems research in South Florida’s extensive wetland, estuary and coral reef ecosystems.
• Opportunities to study aspects of restoration and management of aquatic ecosystems, including oceanography, water quality, hydrology, biogeochemical cycling, invasive species, harmful algal blooms, GIS, environmental chemistry, hydrology, urban and regional planning
• Cooperation with local, state and federal agencies and NGOs in addressing environmental issues and policy development
• Education and outreach to public through various media in South Florida
• Collaboration with researchers at other universities and institutions in South Florida, e.g. University of Miami, Florida International University, University of South Florida, Nova, Smithsonian Institution, as well as the wider Caribbean region (Bonaire, Bahamas, Bermuda, Martinique)
• Developing global collaborations including the Tropical Forestry Research Institute (TFRI) in Guangzhou, China, which will provide funds for students to conduct a portion of their research
at the TFRI and a recently developed agreement with the Universidade Federal de Mato Grosso do Sul, Brazil.

- Approval of Integrative Biology ES (IBES) track for doctoral students to emphasize environmental sciences within the FAU IB program will allow us to conduct more in depth, longer term research as well as attract high caliber students

**H. Weaknesses and threats that impede program progress for School or College**

- Small graduate stipends and lack of benefits (weak support) relative to the south Florida cost of living and compared to other Universities in the region make it difficult to attract and matriculate top graduate students.
- The relatively small number of ES faculty and breadth of expertise is a limitation to further growth and the ability of the program to build and maintain research relationships with non-university partners.
- The lack of input/authority over faculty hires in participating departments (e.g., Biology, Geosciences) limits the growth and research capacities of the ES Program; faculty are awarded to, and chosen by, departments rather than interdisciplinary programs.
- The dispersed campus structure and the dispersion of ES students from Fort Pierce to Davie limit interactions among students and do not allow for effective peer to peer mentoring.
- Upper division courses with labs (i.e., research/field experiences) for undergraduates interested in environmental science are lacking. Courses are often limited to summer sessions because the primarily tenure-track research faculty members offering the courses are teaching larger required lectures for their home department during their 9-month appointment. As a result, these course offerings are often unpredictable and fluctuate depending on faculty research obligations during the summer session.
- Insufficient number of administrative, research, and teaching support personnel. These limited positions are often shared among multiple departments with individual job descriptions that would more appropriately be allocated to multiple personnel.
- Excessive administrative burden placed on faculty.
- No administrative support or physical presence at central Boca campus
- Lack of understanding in Sponsored Research of funding modes and agencies other than major federal funding programs (e.g., NSF and NIH)
- The lack of proximate research facilities (especially experimental) limits the breadth of research avenues.
- Limited research facilities and faculty restricts availability and range of advanced course offerings, limiting opportunities for hands-on coursework for graduate and undergraduate students (*especially in Davie*).
- Lack of program-specific recurring funds to support preliminary studies in the development of larger research projects or programs.
- Lack of integration at the level of the University with other regional universities, research agencies, or educational venues.
- Lack of marketing of FAU as a destination for students interested in a career in environmental science at the BS, MS, and PhD levels, as well as the expertise at FAU as a resource for regional and national stakeholders.
- No undergraduate degree in Environmental Science that would meet the growing demand and could provide a conduit of top students into the ES graduate program.
Other Potential threats

In the past there has been a lack of coordination and shared focus between ES faculty and other environment-themed programs at FAU. Several satellite campuses, such as Davie and Harbor Branch Oceanographic Institute at FAU (HBOI), are becoming known primarily for their environmental emphasis; however, few of these units have cross connections and there is no core environmental unit around which all others are organized to project an accurate representation of the depth and diversity of environmental activities at FAU. As a result, outside agencies, which fund a great deal of FAU’s environmental research, tend to underestimate the collective environmental capabilities of FAU.

There appears to be a bias against graduate education at the level of the Master program in favor of PhD programs, both in general among Universities nationally and specifically at FAU. While this may be unintentional and driven more by the proximate return on investment of time and resources on the part of the advisor and the metrics used for various institutional rankings and evaluations, it nonetheless has an ultimate detrimental effect on the potential for student success and its reflection on FAU. The labor market in environmental fields is oversaturated by an abundance of PhDs and a dearth of long-term employment opportunities for PhD level applicants. However, there is increasing demand for applicants with advanced training in the field without the need for a PhD. Master’s degree programs produce these technically savvy personnel and provide both student and supervisor the opportunity to assess interest and potential success in future doctoral study. FAU should embrace the opportunity to produce this highly-sought workforce, which will benefit the University’s reputation and facilitate greater future advancement.

Our society is increasingly environmentally conscious (and active!), but not more scientific. This produces pressure to become more of a general environmental studies program. Institutional movement towards a general education program in environmental issues would weaken our focus on practical and conceptual scientific training, placing our graduates at a disadvantage as they enter the workforce and diminish the value of the degree programs to the labor market and research partners.

I. Resource analysis for School or College

The ES Program budget includes a half-time (12 month) for a Program Assistant at the Davie campus, and 11 months of support (9-month contract with 2 months supplement) for a Director, and 9 months of support for a Program Coordinator at the Boca Raton campus. In addition there are funds for Teaching assistantships (9-11.5) and general operating funds. The latter go toward an annual retreat to bring all ES students and faculty together in one place for one day per year, a statistics workshop, recruitment activities such as paying for student visitation of campus, and for Director travel to market the program locally and nationally.

In 2010 the university faced a budget shortfall (Fig. 11), which the Dean of the College of Science directed disproportionately toward Research Centers and Academic Programs, including the ES Program. By 2014 the funding for student teaching stipends was restored to pre-2010 levels but operational funds have continued to slide, despite the increase in student enrollment and need to offer increased student services. As the budget was reduced, the ES Program continued to grow to its current level as the second largest MS program in the College of Science and reportedly the largest interdisciplinary program at FAU. This has occurred with remarkably few direct resources to the ES Program because it is “value added” to faculty and administration in other departments. If FAU is interested in following its
strategic plan and enhancing interdisciplinary research, then the ES Program may offer a cost-effective way to launch that effort.

Figure 11: Trends in total budget and enrollment

<table>
<thead>
<tr>
<th>Fiscal year</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
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<tbody>
<tr>
<td>$ Greenhouse</td>
<td>19,242</td>
<td>17,170</td>
<td>2,000</td>
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<tr>
<td>$ Operating</td>
<td>10,000</td>
<td>9,520</td>
<td>4,000</td>
<td>9,377</td>
<td>8,000</td>
<td>7,000</td>
<td>7,000</td>
</tr>
<tr>
<td>$ MS TAs Spr/Fall*</td>
<td>86,130</td>
<td>86,130</td>
<td>86,130</td>
<td>86,130</td>
<td>86,130</td>
<td>81,906</td>
<td>110,814</td>
</tr>
<tr>
<td>Total ES budget</td>
<td>115,372</td>
<td>112,820</td>
<td>92,130</td>
<td>97,507</td>
<td>96,130</td>
<td>89,156</td>
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<tr>
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<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>8.5</td>
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<tr>
<td># MS TAs Summer</td>
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<td>0</td>
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<td>4</td>
<td>4</td>
<td>6</td>
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<tr>
<td>ProgDir</td>
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<td>11 mo</td>
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<tr>
<td>ProgCoord</td>
<td>12 mo @</td>
<td>12 mo @</td>
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<tr>
<td>ProgAsst</td>
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<td>@ 0.5</td>
<td>@ 0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
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<td>35</td>
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</table>

*Summer TA support is not included in regular budget but funded by Dean depending on summer budget

**Support for a number of MS, PhD, Post-docs and interns was provided by a $500,000 grant to DEG from Nat. Park Service for Everglades Fellowship Program 2009-2011.

***The majority of students at HBOI are supported by TAs through Indian River State College.

Currently the size of the ES Program is limited by the number of faculty who can take on additional graduate students. The quality of the program is also becoming limited by the operational funds that have not kept up with enrollment and do not allow for activities that can provide ES students dispersed across multiple campuses with a sense of belonging to a cohort. Enriching the special events and providing offerings beyond courses and thesis research will help to alleviate that weakness.
Finally, the amount of time the Director devotes to the ES Program has steadily increased as the program has grown and matured. The initial notion of supplementing the Director’s faculty contract with 2 months of salary is now out of line with the size and trajectory of the program. Given the amount of communication and coordination that must be done across departments in FAU and among the various government agency partners, the position is more suited to a 12-month contract with a 50% administration load.

J. Future directions for School or College

- **Cross-list departmental courses contributing to the Environmental Science Program graduate and undergraduate degree/certificate programs.** By providing a parallel ‘EVS’ course distinction, the contribution of existing environmental program students to course enrollment can be tracked and quantified to indicate targets for inclusion and the University-wide FTE impact of environmental programs without impacting performance metrics of the course host department.

- **Work with the FAU Development Office to increase the visibility of the Environmental Science Program and FAU capabilities and achievements.** Showcasing FAU environmental programs on the FAU homepage, and at meetings, workshops, and conference exhibits will increase the recognition of FAU locally and nationally. Development of existing and new contacts with regional stakeholders with shared values will establish FAU as an option for future collaboration, providing opportunity for external research funding, involvement of FAU faculty, staff and students with regional partners.

- **Create incentives to increase faculty involvement in environmental initiatives.** Internal funding programs for pilot research projects or professional development would spur collaboration among FAU participants, improve chances of external support, and improve the quality of educational opportunities at FAU. Continuing education or other fee-based activities by participating faculty can be developed to generate funds for these initiatives. Return of a portion of indirect costs from external funds secured through proposals initiated by ES and CES participants can also be a source for initiative funding, providing an incentivized, positive feedback between program participation and internal support.

**Questions for Reviewers**

- **What kind of incentives can be created for departments to include interdisciplinary program needs when making strategic faculty hires?** A mechanism for interdisciplinary programs like the ES Program to influence departmental faculty hires could provide a way to strategically build a faculty that meets the needs of a broader FAU environmental community.

- **What are the most effective strategies for building deeper faculty expertise on wetland and estuary restoration and management?**
  - Align expertise of new faculty hires to research opportunities
  - Establish Visiting Fellows program
  - Seek cluster hires
  - Fund an Endowed Chair in Environmental Science

- **How can the FAU administration most effectively help the ES Program attract top-tier graduate students?**
  - Increase graduate stipends
  - Fund prestigious Student Fellowships
• Should the ES Program evaluate the feasibility of a BS in Environmental Science?
• Should the ES Program evaluate the feasibility of a PhD in Environmental Science, using the PhD in Integrative Biology with emphasis in Environmental Science as a model?
• How can the FAU administration help the ES Program broaden faculty participation in the program?

K. Student Feedback

The Environmental Science Program places a high value on student feedback for program improvement, and the Assessment Plan for student learning developed by the ES Program in 2010 for the graduate program explicitly seeks student feedback (Appendix D). Overall, ES graduate students who completed the survey have indicated that they are very satisfied or satisfied with their experience in the program. However, student surveys have helped to identify areas were improvement was needed. Since 2010 a number of program improvements have been initiated in response to student feedback:

Availability of Courses
Limited course offerings was a common student complaint. Since the ES Program does not have faculty lines, and does not determine course schedules, our ability to directly address this problem was limited. However, the Program Committee added a large number of regularly offered courses after 2010, and removed courses that were offered infrequently or irregularly in their departments. In addition, the ES website now offers a list of expected course availability for future semesters that students can use as a planning tool.

Multiple Campuses
In response to student concerns about the extensive commuting required to attend courses, the ES curriculum now includes a wide variety of courses, in addition to the ES Colloquium course, that are video-conferenced to all three campuses.

Oral Communication and Professional Networking
Many ES students indicated that they felt poorly prepared for oral communication and professional networking in their field. To address this shortcoming, the ES Program created the ES Colloquium course that brings together all ES students in a seminar setting where they have an opportunity to practice their oral communication skills and interact with their peers and guest speakers. An Annual ES Retreat, attended by ES faculty and students and invited speakers, was also established as a venue for students to present their own work and interact with faculty in an informal setting.

In the ES Certificate Program, obtaining student feedback was not possible in the past. However, this will be addressed as part of the assessment for the new ES Certificate Capstone course through a survey similar to the survey used for graduate student assessment.
Environmental Science Program

Academic Program Review
Self-Study Report Appendices

Program: Environmental Science Program

Program Director/ Coordinator Name: Dale Gawlik / Dianne Owen

Program Self-Study Contact: Dale Gawlik / Dianne Owen

Self-Study Contact Email: dgawlik@fau.edu / downen@fau.edu

Self-Study Contact Phone Number: 561-297-0873 / 561-297-0873

Appendix A: Undergraduate Environmental Science Certificate Curriculum
Appendix B: Master of Science in Environmental Science Curriculum
Appendix C: Abbreviated Environmental Science Faculty CVs
Appendix D: Environmental Science Graduate Student Survey; 2013-2014
APPENDIX A - UNDERGRADUATE ENVIRONMENTAL SCIENCE CERTIFICATE CURRICULUM

The certificate consists of 18 credits. All students must complete the following requirements:

1. All students must take one course from the three core areas below.

<table>
<thead>
<tr>
<th>Human-Environmental Interactions Core (choose one of the following)</th>
<th></th>
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<tbody>
<tr>
<td>Environment and Society</td>
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<td>Issues in Human Ecology</td>
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<td>Introduction to Biostatistics</td>
<td>STA 3173 3</td>
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<td>Experimental Design and Statistical Inference</td>
<td>PSY 3234 3</td>
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<td>Quantitative Methods</td>
<td>GEO 4022 3</td>
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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Critical Thinking in Environmental Science</td>
<td>EVS 4021 3</td>
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2. All students must take one course from three of the five focus areas listed below. These include Biology, Earth Science, Human-Environmental Interactions, Geographic Information Science and Chemistry.

<table>
<thead>
<tr>
<th>Biology</th>
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<tbody>
<tr>
<td>Vascular Plant Anatomy</td>
<td>BOT 3223 2</td>
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<tr>
<td>Vascular Plants Lab</td>
<td>BOT 3223L 2</td>
</tr>
<tr>
<td>Marine Botany</td>
<td>BOT 4404 2</td>
</tr>
<tr>
<td>Marine Botany Lab</td>
<td>BOT 4404L 2</td>
</tr>
<tr>
<td>Biodiversity</td>
<td>BSC 1011 3</td>
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<tr>
<td>Biodiversity Lab</td>
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<td>General Microbiology</td>
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<td>Marine Biodiversity</td>
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<td>Marine Biodiversity Lab</td>
<td>OCB 4032L 1</td>
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<tr>
<td>Marine Biology</td>
<td>OCB 4043 2</td>
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<tr>
<td>Marine Biology Field Studies and Lab</td>
<td>OCB 4043L 2</td>
</tr>
<tr>
<td>Marine Microbiology and Molecular Biology</td>
<td>OCB 4525 3</td>
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<tr>
<td>Marine Microbiology and Molecular Biology Lab</td>
<td>OCB 4525L 1</td>
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<tr>
<td>Marine Ecology</td>
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<td>Marine Science</td>
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<td>Genetics</td>
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<td>Principles of Ecology</td>
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<td>Evolution</td>
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<td>Comparative Animal Physiology</td>
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<td>Functional Biology of Marine Animals</td>
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<td>Functional Biology of Marine Animals Lab</td>
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<td>Comparative Vertebrate Morphogenesis</td>
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**Earth Science**

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<tr>
<td>Environmental Issues in Atmospheric and Earth Science</td>
<td>ESC 3704</td>
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<tr>
<td>Introduction to Physical Geography</td>
<td>GEO 2200C</td>
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<tr>
<td>Biogeography</td>
<td>GEO 4300</td>
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<tr>
<td>Physical Geology/Evolution of the Earth</td>
<td>GLY 2010C</td>
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<tr>
<td>The History of the Earth and Life</td>
<td>GLY 2100</td>
<td>3</td>
</tr>
<tr>
<td>Geology of Florida</td>
<td>GLY 3155C</td>
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</tr>
<tr>
<td>Paleontology</td>
<td>GLY 3603C</td>
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<tr>
<td>Coastal and Marine Science</td>
<td>GLY 3730</td>
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<tr>
<td>Mineralogy and Crystal Chemistry</td>
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<td>Environmental Geochemistry</td>
<td>GLY 4241</td>
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<tr>
<td>Petrology of Igneous and Metamorphic Rocks</td>
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<td>Structural Geology</td>
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<tr>
<td>Solid Earth Geophysics</td>
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<td>Stratigraphy and Sedimentation</td>
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<td>Geomorphology</td>
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<td>Field Methods</td>
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<td>Hydrogeology</td>
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<td>Engineering Geology</td>
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<td>Field Experience</td>
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<td>Weather and Climate</td>
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**Human-Environmental Interactions**

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<td>Culture and Ecology</td>
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<td>Primate Behavior</td>
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<td>Principles and Methods of Environmental Education</td>
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<td>Justice, Health and the Environment</td>
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<td>Planning and Growth Management</td>
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<td>Sustainable Cities</td>
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<td>Environmental Planning Methods</td>
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<td>Remote Sensing of the Environment</td>
<td>GIS 4035C</td>
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<td>Digital Image Analysis</td>
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<tr>
<td>Principles of Geographic Information Systems</td>
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<td>Geovisualization and GIS</td>
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<td>Contemporary Chemical Issues</td>
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<td>General Chemistry 1</td>
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<td>Environmental Chemistry</td>
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APPENDIX B - MASTER OF SCIENCE IN ENVIRONMENTAL SCIENCE CURRICULUM

Thesis Option
A student curriculum consists of a minimum of 36 credits taken in the following four categories:

Core Subject Areas: 22-28 credits from the core subject areas with at least one course from four different core subject areas.

Electives: No more than 6 credits of electives taken outside the core areas will be counted toward the degree, and no more than 6 credits may be 4000-level courses. No more than 3 credits of Directed Independent Study may be counted toward this degree.

Thesis: 6-12 credits (EVS 6971).
Colloquium: 2 credits or more.

Non-Thesis Option
A student curriculum consists of a minimum of 36 credits taken in the following four categories:

Core Subject Areas: 25-31 credits from the core subject areas with at least one course from four different core subject areas.

Directed Independent Study: 3 credits (EVS 6905) required. Up to 3 additional credits may be taken as electives.

Electives: No more than 6 credits of electives taken outside the core areas will be counted toward the degree.

Colloquium: 2 credits or more.

<table>
<thead>
<tr>
<th>Colloquium</th>
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</thead>
<tbody>
<tr>
<td>Environmental Sciences Colloquium Series (May be taken more than once.)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Core Subject Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry</td>
</tr>
<tr>
<td>Chemistry for Environmental Scientists</td>
</tr>
<tr>
<td>Environmental Geochemistry</td>
</tr>
<tr>
<td>Geographic Information Systems</td>
</tr>
<tr>
<td>Introduction to GIS in Planning</td>
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<tr>
<td>Principles of Geographic Information Systems</td>
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<tr>
<td>Applications in Geographic Information Systems</td>
</tr>
<tr>
<td>Programming in Geographic Information Systems</td>
</tr>
<tr>
<td>Remote Sensing of the Environment</td>
</tr>
<tr>
<td>Digital Image Analysis</td>
</tr>
<tr>
<td>Course Title</td>
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<tr>
<td>-----------------------------------------------------------</td>
</tr>
<tr>
<td>Advanced Remote Sensing</td>
</tr>
<tr>
<td>Hyperspectral Remote Sensing</td>
</tr>
<tr>
<td>Topics in Geoinformation Science</td>
</tr>
<tr>
<td><strong>Modeling</strong></td>
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<tr>
<td>Modeling Groundwater Movement</td>
</tr>
<tr>
<td>Ecological Modeling</td>
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<tr>
<td>Ecological Theory</td>
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<tr>
<td><strong>Statistics</strong></td>
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<tr>
<td>Environmental Design and Biometry</td>
</tr>
<tr>
<td><strong>Conservation and Ecology</strong></td>
</tr>
<tr>
<td>Biogeography</td>
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<tr>
<td>Plants And People</td>
</tr>
<tr>
<td>Environmental Restoration</td>
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<tr>
<td>Flora of South Florida</td>
</tr>
<tr>
<td>Flora of South Florida Lab</td>
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<tr>
<td>Coastal Plant Ecology</td>
</tr>
<tr>
<td>Coastal Plant Ecology Lab</td>
</tr>
<tr>
<td>Conservation Biology</td>
</tr>
<tr>
<td>Marine Ecology</td>
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<tr>
<td>Advanced Ecology</td>
</tr>
<tr>
<td>Marine Ecology Lab and Field Studies</td>
</tr>
<tr>
<td>Scientific Communication</td>
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<tr>
<td>Freshwater Ecology</td>
</tr>
<tr>
<td>Freshwater Ecology Lab</td>
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<tr>
<td>Symbiosis</td>
</tr>
<tr>
<td>Environmental Physiology</td>
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<tr>
<td>Marine Geology</td>
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<tr>
<td>Advanced Topics in Applied, Coastal and Hydrogeology</td>
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<tr>
<td>Course Title</td>
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<tr>
<td>--------------------------------------------------------------</td>
</tr>
<tr>
<td>Regolith Geology</td>
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<tr>
<td>Coastal Environments</td>
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<tr>
<td>Shore Erosion and Protection</td>
</tr>
<tr>
<td>Global Environmental Change</td>
</tr>
<tr>
<td>Environmental Geophysics</td>
</tr>
<tr>
<td>Methods in Hydrogeology</td>
</tr>
<tr>
<td>Natural History of the Indian River Lagoon</td>
</tr>
<tr>
<td>Marine Global Change</td>
</tr>
<tr>
<td>Seminar in Ichthyology</td>
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<tr>
<td>Marine Invertebrate Zoology</td>
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<tr>
<td>Marine Invertebrate Zoology Lab</td>
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<tr>
<td>Natural History of Fishes</td>
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<tr>
<td>Natural History of Fishes Lab</td>
</tr>
<tr>
<td>Seminar in Avian Ecology</td>
</tr>
<tr>
<td><strong>Policy and Planning</strong></td>
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<tr>
<td>Human-Environmental Interactions</td>
</tr>
<tr>
<td>Culture, Conservation and Land Use</td>
</tr>
<tr>
<td>Geographic Analysis of Population</td>
</tr>
<tr>
<td>Coastal Hazards</td>
</tr>
<tr>
<td>Introduction to Transportation Planning</td>
</tr>
<tr>
<td>Environmental Analysis in Planning</td>
</tr>
<tr>
<td>Environmental Policy and Programs</td>
</tr>
<tr>
<td>Sustainable Cities</td>
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<tr>
<td>Urban and Regional Theory</td>
</tr>
<tr>
<td>Women, Environment, Ecofeminism, Environmental Justice</td>
</tr>
<tr>
<td>Environmental Philosophy</td>
</tr>
</tbody>
</table>
CURRICULUM VITAE

JOHN D. BALDWIN PH.D.

Professor
Department of Biological Sciences
Charles E. Schmidt College of Science
Florida Atlantic University – Davie Campus

Davie West Bldg. Rm. 438
3200 College Ave, Davie, FL 33314
Phone: (954) 236-1151
Email: jbaldwin@fau.edu
Webpage: www.science.fau.edu/biology/faculty/baldwin

Professional Preparation
Post-Doctoral Researcher, 1997 – 1998, Dept. Fisheries and Aquatic Sciences, School Forest Resources and Conservation, University of Florida, Gainesville, Florida
Ph.D., Cell and Developmental Biology, 1997. Div. Biological Sciences, University of California, Davis
B.S., Zoology, 1988. Department of Zoology, University of Maryland, College Park

Appointments
2014 – Present  Professor, Department of Biological Sciences, Charles E. Schmidt College of Science, Florida Atlantic University
2014 – Present  Associate Director, Center for Environmental Studies, Charles E. Schmidt College of Science, Florida Atlantic University
2004 – 2014  Associate Professor, Department of Biological Sciences, Charles E. Schmidt College of Science, Florida Atlantic University
2011– 2012  Interim-Director, Environmental Sciences Program, Charles E. Schmidt College of Science, Florida Atlantic University
2009 – 2010  Research Fellow, (Sabbatical), South Florida Natural Resource Center, Everglades and Dry Tortugas National Park, NPS, DOI, Homestead, FL
1998 – 2004  Assistant Professor, Department of Biological Sciences, Charles E. Schmidt College of Science, Florida Atlantic University

Selected Peer-Reviewed Publications


**Selected Other Publications or Products/Grants**


**Synergistic Activities**

Baldwin, J.D. Wildlife Species as Ecological Indicators for Everglades Restoration. Rural Sustainable Development International Congress - Savannas and Wetlands, Universidade Federal de Mato Grosso do Sul, Campo Grande, Mato Grosso do Sul, Brazil. April 1-5, 2012. *(Invited speaker)*


**Collaborators and Other Affiliations**


**Courses Taught**

*Undergraduate Courses Taught*

BCH 3033 Biochemistry I, BCH 3034 Biochemistry II, BCH 3103 Biochemistry Laboratory, BSC 3036 Genetics, BSC 4930 Ichthyology, OCB 4043 Marine Biology, OCB 4043L Marine Biology
Field Studies, OCB 4633 Marine Ecology, OCB 4633L Marine Ecology Lab, ZOO 2203 Invertebrate Zoology, ZOO 2203L Invertebrate Zoology Lab, Directed Independent Studies

**Graduate Courses Taught**
ZOO 6456 Natural History of Fishes, ZOO 6456L Natural History of Fishes Lab, ZOO 6459 Seminar in Ichthyology, BSC 6936 Molecular Ecology

**Community Engagement or Outreach**
2014 – pres. Board of Directors, South Plantation High School, Environmental Magnet Program
ABBREVIATED FACULTY CV (MAXIMUM 2 PAGES)

BRIAN WILLIAM BENSCOTER

Professional Preparation
Southern Illinois University-Carbondale    Plant Biology    Ph.D., 2007
Villanova University    Biology    M.S., 2002
Villanova University    Biology    B.S., 2000

Appointments
2014-present National Academies Education Fellow in the Life Sciences
2013-2014 Researcher of the Year (Asst. Professor), Florida Atlantic University
2014-present Chair-Elect, Society of Wetland Scientists Peatland Section
2013-2014 Chair, Society of Wetland Scientists Biogeochemistry Section
2010-present Assistant Professor of Plant Ecology, Florida Atlantic University
2008-2010 Post-Doctoral Associate, University of Guelph
2007-2008 Post-Doctoral Associate, Michigan State University
2003-2006 Science To Achieve Results (STAR) Fellow, US Environmental Protection Agency

Selected Peer-Reviewed Publications

Selected Other Publications or Products/Grants
Synergistic Activities

- Past-Chair, Society of Wetland Scientists, Biogeochemistry Section.
- Chair-Elect, Society of Wetland Scientists, Peatland Section
- Mentor, Society of Wetland Scientists, Undergraduate Diversity Program
- In the past 4 years, attendance at 17 technical workshops and 9 professional conferences, with over 28 presentations by members of my research lab.

Collaborators and Other Affiliations

Vanessa Bailey, Department of Energy
Ben Bond-Lamberty, Department of Energy
Laura Bourgeau-Chavez, Michigan Tech Research Institute
Rod Chimner, Michigan Tech University
Greg Corace, US Fish and Wildlife
William DeGroot, Canadian Forest Service
Mike Falkowski, Michigan Tech University
Michael Flannigan, University of Alberta & Canadian Forest Service
Nancy French, Michigan Tech Research Institute
Rebekah Gibble, US Fish and Wildlife
Evan Kane, Michigan Tech University
Eric Kasischke, University of Maryland
Robert Keane, US Forest Service
Paul Morris, McMaster University
Thomas Pipker, University of British Columbia
James Reardon, US Forest Service
Alistar Smith, US Forest Service
David Sumner, US Geological Survey
Tiffany Troxler, Florida International University
Merritt Turetsky, University of Guelph
Shawn Urbanski, US Forest Service
J. Michael Waddington, McMaster University
Jon Wallace, US Fish & Wildlife Service
B. Mike Wotton, University of Toronto & Canadian Forest Service

Courses Taught

Department of Biological Sciences, Florida Atlantic University
- BOT 5155 & 5155L Flora of South Florida & Lab, Spring 2011
BIOGRAPHICAL SKETCH

Xavier Comas
Department of Geosciences, Florida Atlantic University, 3200 College Ave, DW - 330
Davie, Florida 33314

A. PROFESSIONAL PREPARATION

• Postdoctoral:
  
  University of Maine (Orono, ME), Environmental Geophysics, September 2006-August 2007

• Postdoctoral:
  
  Rutgers University (Newark, NJ), Environmental Geophysics, September 2005-September 2006

• Graduate:
  
  Rutgers University (Newark, NJ), Environmental Geophysics, PhD, 2005

• Undergraduate:
  
  Universitat de Barcelona (Spain), Geology, BS, 2000

B. APPOINTMENTS

• 05/22/13-present: Associate professor of Geophysics, Department of Geosciences, Florida Atlantic University, Boca Raton

• 08/01/07-05/22/13: Assistant professor of Geophysics, Department of Geosciences, Florida Atlantic University, Boca Raton

C. SELECTED PEER-REVIEWED PUBLICATIONS


D. SELECTED OTHER PUBLICATIONS OR PRODUCTS/GRANTS


E. SYNERGISTIC ACTIVITIES

• Fall Meeting Program Representative of the American Geophysical Union (AGU) Near-Surface (NS) Focus Group, January 2013-present.
• Near Surface Geophysics (FG) Fellows Committee, American Geophysical Union (AGU), February 2013-present
• Editor of the American Geophysical Union (AGU) Near-Surface (NS) Focus Group newsletter, January 2010-January 2013.
• Convener, “Near Surface Geophysics General Contributions”, American Geophysical Union (AGU), Annual Fall Meeting 2013 and 2014, San Francisco, CA, USA
• Convener and co-convener of more than 10 sessions at the AGU Annual Fall Meeting in San Francisco, CA between 2007-2014.
• Reviewer for several panels including DOE’s Terrestrial Ecosystem Science and NSF’s hydrological Science.

F. Collaborators and other affiliations

• Collaborators and co-Editors: Dr. Andrew Baird (University of Leeds, UK); Dr. Lisa Belyea (Queen Mary, University of London, UK); Dr. Brian Benscoter (Florida Atlantic University); Dr. Ronnie Best (USGS); Dr. Andrew Binley (Lancaster University, UK); Dr. Nigel Cassidy (Keele University, UK); Dr. Jeff Chanton (Florida State University); Dr. Kevin Cunningham (USGS); Dr. Don DeAngelis (USGS); Dr. Vic Engel (Everglades National Park); Dr. Paul Glaser (Univ. Minnesota); Dr. Angela Harris (University of Manchester, UK); Dr. Ross Hinkle (University of Central Florida); Dr. Harry Jol (University of Madison-Wisconsin); Dr. Nick Kettridge (McMaster University); Dr. Agus Kristijono (BPPT, Indonesia); Dr. Randall Kolka (US Forest Service); Dr. Dimitrios Ntarlagiannis (Rutgers University); Dr. Andrew Reeve (University of Maine); Dr. Len Scinto (Florida International University); Dr. Nana Sudiana (BPPT, Indonesia); Dr Lee Slater (Rutgers University); Dr Michael Sukop (Florida International University); Dr David Sumner (USGS); Dr. Maria Strack (University of Calgary); Dr. Jan van der Kruk (Forschungszentrum, Germany); Dr. Mike Waddington (McMaster University); Dr Matthew Warren (US Forest Service).
• Research affiliate, Carbonate Aquifer Characterization Laboratory (CACL), U.S. Geological Survey
• Faculty affiliate, Environmental Sciences Program, Florida Atlantic University

G. Courses taught

• FAU, Department of Geosciences: GLYC6934: Environmental Geophysics; GLYC6934: Ground Penetrating; GLYC6934: Wetlands Geosciences, GLYC4451: Solid Earth Geophysics, GLYC4700: Geomorphology; GLYC4400: Structural Geology; GLYC4790: Senior Field Camp; GLY 4750: Field Methods,
• Rutgers University, Department of Earth Environmental Sciences: 460:34186: Environmental Disasters; 460:103:01: Planet Earth,

H. Community Engagement or Out-reach

• Co-convener, “Peatland Geophysics” (workshop funded by the National Science Foundation), University of Maine, Orono, ME, June 11-15, 2007.
• Co-convener, “Collaborative Workshop: Developing a Carbon Budget for the Greater Everglades ecosystem in a Changing Climate”, (partially funded by Department of Energy), Florida Atlantic University, Davie, FL, June 11-12, 2011.
ABBREVIATED FACULTY CV (MAXIMUM 2 PAGES)
KEN DAWSON-SCULLY

Professional Preparation

Post-Doctoral Fellow
University of Toronto (UTM), Mississauga, Ontario
Completed 2008

Ph.D.
University of Toronto
Department of Physiology
Completed 2003

M.Sc.
Queen’s University
Department of Biology
Completed 1998

B.Sc. (Hon.)
Queen’s University
Department of Biology
Completed 1996

Appointments

2014-present
Associate Professor, tenured
Florida Atlantic University
Department of Biological Sciences
Jupiter, FL 33458 USA

2008-2014
Assistant Professor, tenure track
Florida Atlantic University
Department of Biological Sciences
Jupiter, FL 33458 USA

Selected Peer-Reviewed Publications (most recent five from the last 7 years)


Impact Factor (2010) 5.560


Impact Factor (2010) 4.411


Impact Factor (2010) 3.1


Times Cited: 3; Impact Factor (2010) 4.411
Selected Other Publications or Products/Grants  
(MOST RECENT FIVE FROM THE LAST 7 YEARS)

Research Grants Received

Current:

Eco Neurologics Inc., Neuroprotection via the PKG Pathway (2013-2018)  
$353,000
Lead Investigator: Ken Dawson-Scully

Synergistic Activities

Editorships and Editorial Boards
Review Editor: Frontiers in Genomic Physiology, 2012-2013

Journals
- Genes, Brain and Behaviour
- Integrative and Comparative Biology
- Journal of Comparative Physiology A
- Journal of Insect Behavior
- Journal of Neurogenetics
- Journal of Neurophysiology
- Journal of Neuroscience
- Journal of Visual Experimentation
- Neuroscience
- PLoS ONE
- Reproductive Toxicology

 Agencies
- Natural Science and Engineering Research Council of Canada NSERC, 2014
- National Aeronautics and Space Administration NASA, 2013, 2014
- Swiss National Science Foundation SNSF, 2012
- Canadian Foundation for Innovation CFI, 2010
- National Science Foundation NSF, 2008, 2009

COLLABORATORS AND OTHER AFFILIATIONS
2013-present  
Affiliate Assistant Professor, Department of Chemistry and Biochemistry, FAU, Boca Raton, FL
2012-present  
Visiting Investigator, The Scripps Research Institute, Dept. of Metabolism and Aging, Jupiter FL
2010-present  
Affiliate Assistant Professor, Biomedical Sciences, College of Medicine, FAU, Boca Raton, FL

Courses Taught

BSC 6936: Advanced Neurophysiology, Spring 2012, 2013 (co-Instructor)
PSB 6345: Neuroscience 1, Fall 2010, Fall 2011, Fall 2012, Fall 2013 (co-Instructor)
BSC 6905: Neuroscience Journal Club, Summer 2010, Summer 2011 (co-Instructor)
BSC 6905: Neuroscience Seminar, Fall 2009, Fall 2010, Spring 2011 (co-Instructor)
BSC 4917/4918 Honors Research/Thesis Program: Spring 2009, Fall 2009, Spring 2010, Fall 2010, Spring 2011, Fall 2011 (co-Instructor)
BSC 4930/6936: Cellular Neuroscience and Disease, Fall 2008, Fall 2009 (co-Instructor)

H. Community Engagement or Out-reach

Community/Guest Non-Research Lectures
2013  
Waterford Community Center, Jupiter, FL
2013  
Academic Leadership Symposium, Scripps Research Institute, FL
2012  
Choosing Academia over Industry, Scripps Research Institute, FL
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
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<tbody>
<tr>
<td>2011</td>
<td>Protecting the effects of Stroke through the use of the fruit fly, Boca Raton Rotary Club.</td>
</tr>
<tr>
<td>2011</td>
<td>Protecting the effects of Stroke through the use of the fruit fly, The Boca Thinkers Club, Boca Raton FL.</td>
</tr>
<tr>
<td>2008-2012</td>
<td>Introduction to research in the Dawson-Scully lab, Biomedical Freshmen, FAU.</td>
</tr>
<tr>
<td>2008-2012</td>
<td>Introduction to research in the Dawson-Scully lab, Premedical Students, FAU.</td>
</tr>
<tr>
<td>2010</td>
<td>CMBB last minute class filler: Anoxia research and Drosophila, FAU.</td>
</tr>
<tr>
<td>2010</td>
<td>Cellular Neuroscience and Disease: 1 week of basic neurophysiology lectures, FAU.</td>
</tr>
</tbody>
</table>
Curriculum Vitae
Donna Jeanne Devlin
Florida Atlantic University
(772) 242-2206
ddevlin@fau.edu

Degrees Earned:

Ph.D. 2004 Biology. University of Louisiana at Lafayette, Lafayette, LA

B.S. 1993 Geology. University of South Florida, Tampa, FL

Professional Experience:

April 2005-Present. Research Associate Professor, Department of Biological Sciences, Florida Atlantic University


1987-1990. Artificial Reef Program Coordinator. Collier County Natural Resources Management Department, Naples, FL.

1984-1986. Associate Scientist - polychaete ecology and systematics, Mote Marine Laboratory, Sarasota, FL.

Publications:


Coldren G., C.E. Proffitt, D. J. Devlin Species Diversity And Life Stage Lead To Deviations From Predictions Of The Stress Gradient Hypothesis In A Mixed Mangrove - Salt Marsh System. In internal review.


Book Chapter
Upland Plants, Ferns In Rookery Bay Field Guide, Rookery National Estuarine Research Reserve, Florida
Department of Natural Resources and National Oceanic and Atmospheric Administration

Grants
National Science Foundation EPSCoR 2010 Genetic Structure of Two Mangrove Species in the Virgin Islands and Florida. Collaborators Drs. Alice Stafford, C Edward Proffitt.


Courses Taught
Ecology Seminar, Marine Invertebrate Zoology (Graduate and Undergraduate levels) Florida Atlantic University
Co-taught Marine Ecology (Graduate level) Florida Atlantic University
Co-taught Coastal Restoration and Conservation Ecology (Graduate level) Florida Atlantic University
Co-taught Community Genetics
Oceanography, Indian River State College

Synergistic Activities:
Reviewer: Climate Change, Hydrobiologia, Marine Environmental Research, Wetlands, Biological Journal of the Linnean Society
Journal of Tropical Plant Biology Mississippi-Alabama Sea Grant Consortium Grants, Louisiana Board of Regents Grants, National Science Foundation

Co-authored and promoted the Agreement of Cooperation between Florida Atlantic University and Research Institute for Tropical Forestry, China

Hosted two graduate students in 2012 supported by European Union Grants from Institute of Forest Growth and Computer Science, Technische Universitat Dresden at HBOI-FAU

Hosted one graduate student 2013 supported by a European Union Grant from Université Libre de Bruxelles – ULB, Campus du Solbosch at HBOI-FAU.

Smithsonian Research Associate 2005-Present

Mentor Summer 2014 Miami Dade College STEM Summer Interns (8) in Forest Ecology at St. Thomas University

Treasurer, Southeastern Research Society (SEERS) (Affiliate Society of Coastal and Estuarine Research Federation: CERF) 2008-2010

Organized Special Session on Climate Change, SEERS Meeting 2009, Tampa Bay, Florida
Member, National Estuaries Program/Florida Department of Environmental Protection Indian River Lagoon Spoil Island Restoration Committee. This committee helps to guide restoration by DEP on spoil islands in the Indian River Lagoon.

Member, Environmental Protection Agency (EPA) Coastal Wetlands Review Team, SE Region

Experimental Design and Statistics Advisor to Indian River Lagoon Aquatic Preserve

Participated in COSEE Florida (NSF) Science Communication Boot Camp

Collaborators:


Community Engagement Out-reach

Worked with teachers and students at Frances K. Sweet Elementary Magnet School, a predominantly minority school to teach students and teachers about mangrove ecology and research, including organizing field trips and teaching students to tag and measure plants and record data for field experiments.

Work with undergraduate students at Indian River State College instructing them in laboratory and field techniques.

Work with undergraduates from Miami Dade College

Work with undergraduates from St Thomas University

Teach Mangroves in the Indian River Lagoon, ORCA Outreach Program
Curriculum Vitae 2014

NATHAN J. DORN
Associate Professor
Department of Biological Sciences
Florida Atlantic University
Davie, FL 33314
ndorn1@fau.edu

PREPARATION:
Ph. D.   2003  Michigan State University, East Lansing, MI
Zoology and Ecology Evolution and Behavior (dual)
B. S.    1997  Calvin College, Grand Rapids, MI
Biology

APPOINTMENTS:
2005-2011  Assistant Professor
Department of Biological Sciences, Florida Atlantic University, Davie, FL
2004-2005  Visiting Research Associate
Southeast Environmental Research Center, FIU, Miami, FL
I.  2003-2004  Postdoctoral Researcher
Department of Biological Sciences, Florida International Univ. Miami, FL

RECENT PUBLICATIONS (*STUDENT AUTHORS):
Knorp*, N. E. & N. J. Dorn. 2014. Dissimilar numerical responses of macroinvertebrates to disturbance
from drying and predatory sunfish. Freshwater Biology 59: 1378-1388.
albus) populations. Waterbirds 37: 19-29.
Dorn, N. J. 2013. Consumptive effects of crayfish limit snail populations. Freshwater Science 32: 1298-
1308.
Bransky*, J. W. & N. J. Dorn. 2013. Prey use of three wetland sunfishes: effects of ontogeny, gape size
nesting together in the Florida Everglades. Waterbirds 35: 154-159.

ADDITIONAL PRODUCTS (PUBLICATIONS & GRANTS):
Kellogg*, C. M. & N. J. Dorn. 2012. Consumptive effects of fish reduce wetland crayfish recruitment and
Ibis (Eudocimus albus) chicks: prey composition depends on recent hydrologic conditions. Ibis
153: 323-335.
Dorn, NJ. Primary Investigator - Wildlife and Nutrient Cycling Review. $6,000.00. (Jan. 2013- June 2013
South Florida Water Management District)
Dorn, NJ Primary Investigator - Experimental Examination of the Predator-Release Hypothesis on
Wading Bird Supercolony formation in the Florida Everglades. $149,966.00. (2010-2013, South
Florida Water Management District)
Dorn, NJ Primary Investigator - Habitat suitability models for Everglades and Slough Crayfish. $10,000.00
SYNERGISTIC ACTIVITY:
Research/Scientific Community:
- Editorial Board Member for *Southeastern Naturalist* (2013-present)
- Peer Reviewer: 25 manuscripts (2008-2014)
- External Reviewer: NSF full proposal (2014)

*University and College*
- Member of Institutional Animal Care and Use Committee (2011-2014)
- Member of IACUC subcommittee; Wildlife use protocol development (2013-2014)
- Member of search committee for University Attending Veterinarian (2012)
- Chair of Graduate Admissions for the Environmental Sciences Program (2009-present)
- Member for Behavioral Ecologist faculty Search Committee (2014)
- Poster evaluator for College Research Day and ES Retreat (2014)
- Internal Review of Faculty Promotion Package (2013)

COLLABORATORS:
M. I. Cook, Ph.D. South Florida Water Management District
D. E. Gawlik, Ph.D. Florida Atlantic University

COURSES TAUGHT (2008-2014)
*Undergraduate-level:* Principles of Ecology (3 cr., 9X), Freshwater Ecology (3 cr., 1X), Freshwater Ecology lab (1 cr., 1X), Invertebrate Zoology (3 cr., 1X), Invertebrate Zoology lab (1 cr., 1X).

*Graduate-level:* Advanced Ecology (3 cr., 7X), Ecological Research Seminar (1 cr., 12X; co-led).

OUTREACH:
- Presentation/tour guide at the Loxahatchee Impoundment Landscape Assessment
- Constructed/edited Ecology questions for local Science Olympiad.
A. Professional Preparation

Post-Doctoral  Molecular biology and Biotechnology, Massachusetts Institute of Technology (MIT), Cambridge, MA USA. Boris Magasanik Laboratory.

Ph.D.  Microbiology, University of Louvain, Louvain-la-Neuve, Belgium. (Grand Distinction with Honors)

Post Grad Cert.  Agronomy (Tissue Culture & Plant pathology) University of Louvain, Belgium.

M.Sc.  Environmental Microbiology, University of Ife, Ile-Ife Nigeria. (Best graduating post-graduate student award)

B.Sc. (Hons.)  Microbiology, University of Benin, Benin City, Nigeria (Second Class Upper Division)

B. Appointments

Biotech Consultant  2013 Summer. National Biotechnology Development Agency (NABDA)

Professor  2013 - Microbiology and Biotechnology, Biological Sciences Department, Florida Atlantic University.

Senior Science Advisor  2011- Present, United States Department of State, Washington DC (Jefferson Science Fellow)

Director  2010 – Present, Microbial Biotechnology Lab., Florida Atlantic Univ.

Assoc. Professor  2003 – 2012, Dept. of Biological Sciences, Florida Atlantic University.

Professor  2009 – Present (Adjunct position) Nnamdi Azikiwe University, Nigeria

Chair  2008 – 2012, Biological sciences department; Learning Assessment Committee, Florida Atlantic University.

Graduate Faculty  2005 – Present, Florida Atlantic University

Visiting Professor  Summer 2008, UNESCO / TWAS, Italy

Visiting Research Professor  2005-2006, Environmental Health Sciences Department, School of Public Health Dept., University of Georgia, Athens. (1 Term sabbatical)

C. Selected Peer-Reviewed Publications


D. Selected Other Publications or Products/Grants

$1,478,514.00 2014 – 2016 (Co-PI) COMESA. Promotion and Improvement of Climate Smart Agriculture in Zambia through Optimized Legume-Based Agroforestry

$ 3000.00 2013- 2014 (PI) FAU Broward Undergraduate Research Grant and Faculty development (with Sarah Kudman undergraduate)

$ 50,000.00 2012 – 2013 (PI) World Bank through MAUTECH. Research skills in molecular biology, plant tissue culture and environmental biotechnology

A World Bank Funded Training for Scientists from the Center of Excellence for Environmental Biotech, University of Maiduguri and its affiliates.

$3000.00 2012 – 2013 (PI) FAU Broward Undergraduate Research Grant and Faculty development (with Hedson Desir)

$1000.00 2013 – 2014 Broward Mentor Professional Development Award: In recognition of efforts to promote and mentor undergraduate research

$17,500.00 2012- 2014 (Co-PI) MAUTECH (World Bank), Nigeria. Enhancement of desirable agricultural traits through plant biotechnology. Zhang X. (PI): A collaboration between FAU and MAUTECH.

Project Reports

Esiobu N. 2008 Evaluation of sporicidal properties of novel antimicrobial formulations (A Report)

E. Synergistic Activities
* World Bank funded Centre of Excellence for Sustainable Environmental University of Maiduguri, Nigeria
* COMACO, Zambia – Agroforestry and soil conservation
* Ebonyi State University – Multi-disciplinary research skill training

F. Collaborators and Other Affiliations
National Biotech Devt Agency, NABDA; University of Maiduguri, University of Ebonyi State etc

G. Courses Taught
BSC 6390 Integrative Biology (Co-Teach as needed)
BSC 6905 Directed Independent studies
BSC 6936 Advanced Microbiology
BSC 5936 Environment and Health
BSC 4905 Directed Independent Studies
BSC 4403L Biotechnology Labs I
MCB 4203 Medical Bacteriology
MCB 4603 Microbial Ecology
MCB 4503 Virology
BSC 4303 Intermediate Microbiology Labs (now replaced by Biotech Lab 1)
MCB 3020(L) General Microbiology and Labs

H. Community Engagement or Out-reach
* Jefferson Science Fellow --- US State Department
* Senior Vice President, Palm Beach-Broward Chapter of US National Committee on UN Women
* American Society for Microbiology
* Faculty mentor
* Intl. Advisory Board member, FUTY and Technical Advisory Board, Biotech Center Ebonyi
* Editorial Board member and reviewer for grants and journal articles
BIOGRAPHICAL SKETCH

Dale E. Gawlik

Professional Preparation

University of Wisconsin Stevens Point B.S. 1984
Winthrop College M.S. 1988
Texas A&M University Ph.D. 1994

Appointments

2007-present  Director, Environmental Science Program, Florida Atlantic University
2013-present  Professor, Department of Biological Sciences, Florida Atlantic University
2008-2013  Associate Professor, Department of Biological Sciences, Florida Atlantic University
2003-2008  Assistant Professor, Department of Biological Sciences, Florida Atlantic University
1994-2003  Senior Environmental Scientist, Everglades Division, South Florida Water Management District
1994  Tom Slick Senior Graduate Fellow, Texas A&M University
1993-1994  Postdoctoral Research Associate, Texas A&M University
1990-1993  Graduate Research Assistant, Texas A&M University
1990  Research Supervisor, Environmental Labs Inc.
1988-1989  Biologist, Environmental Labs Inc.
1987-1988  Biological Consultant, Savannah River Ecology Laboratory
1985-1987  Graduate Research Assistant, Winthrop College
1985  Wildlife Technician, U.S. Fish & Wildlife Service, Northern Prairie Wildlife Research Center

Selected Peer-Reviewed Publications (five recent)


Other publications or grants (five recent)

- Everglades Fellowship Program at Florida Atlantic University. Dale E. Gawlik, funded $100,000 by National Park Service, 2013-2016.
- Wood stork use of roadway corridor features in South Florida. D. E. Gawlik, funded $462,855 by Florida Department of Transportation, 2013-2016
• Postdoctoral investigator program in marine science, engineering and technology: effects of nutrient enrichment on wading bird habitat in the Great White Heron National Wildlife Refuge, lower Florida Keys. B. Lapointe and D. E. Gawlik, funded $112,640 by Harbor Branch Oceanographic Institute at Florida Atlantic University, 2012-2014.
• Dry season prey concentrations. D. E. Gawlik, funded $608,064 by U.S. Army Engineer Corp of Engineers Research and Development Center, 2012-2015.

Synergistic Activities

• Councilor, Association of Field Ornithologists, 2013-2016.
• Science Advisory Committee, Gulf Coast Bird Observatory, Lake Jackson, Texas, 2012 – present.
• Reviewer, Biological Status Review of Florida’s Threatened Species Program, Florida Fish and Wildlife Conservation Commission, 2010.
• Dissertation Reviewer, University of New South Wales, Sydney, Australia, 2010.
• Panelist, Oil and Gas Impacts in the Big Cypress Ecosystem. The Everglades Foundation, 2009 -2010

Collaborators and other affiliations

• Peter Frederick, University of Florida, Gainesville, FL
• Frank Mazzotti, University of Florida, Davie, FL
• Arnold van der Valk, Iowa State University, Ames, IA
• Joel Trexler, Florida International University, Miami, FL

Courses Taught

• Conservation Biology (PCB 6045) Developed new graduate course on the principles of Conservation Biology. Format is lecture, team projects, guest speakers, paper discussions, and a field trip.
• Seminar in Emerging Topics in Avian Ecology (Zoo 6544C) Developed new graduate course focusing on recent topics in the literature. Format is student-led discussion with introductory and synthesis lectures by the instructor.
• Principles of Ecology (PCB 4043). Taught this existing large enrollment undergraduate course required for biology majors. Format is lecture with three simulation model exercises done in teams.

Outreach

• Gawlik, D.E. 2012. Habitat selection and behavior of Wood Storks and their kin in South Florida. Meeting of the South Florida Association of Environmental Professionals, Fort Lauderdale, FL.
• Gawlik, D.E. 2012. Wading birds in Florida: cream skimmers and crumb pickers. Treasure Coast Birding Festival, Vero Beach, FL.
**Professional Preparation**


**Graduate Certificate**, Environmental Studies, Florida Atlantic University, Boca Raton, Florida. August 2006.


**Appointments**

**Associate Scientist and Faculty**, Geosciences, FAU, Boca Raton, Florida. August 2013 to present.

**Assistant Scientist and Faculty**, Geosciences, FAU, Boca Raton, Florida. August 2006 to August 2013.

**Graduate Program Director**, Geosciences, FAU, Boca Raton, Florida. August 2011 to present.


**Selected Peer-Reviewed Publications**


**Selected Other Publications or Products/Grants**

**FAU QEP Distinction Through Discovery Curriculum grant**, “Expanding the Student-Centered Undergraduate Research Culture Across the Curriculum”. 2013.


Lewis, S., Hindle, T., and Peterson, C. “Using GIS to investigate environmental factors contributing to the presence of an
endangered plant (*Campanula robinsiae*).” 75th Anniversary Meeting of the Florida Academy of Sciences Florida Institute of Technology, Melbourne, Florida. March 2011

**Remote Education and Assessment of Critical Habitats (REACH),** Florida Atlantic University technology grant, 2011-2014.


**FAU interdisciplinary Cross-College Research Pre-Proposal on Climate Change,** FAU Division of Sponsored Research, 2010.

**Earth System Science Education Alliance partnership,** a National Science Foundation GEO-Teach project, funded through the Institute for Global Environmental Strategies. 2007 – 2009.

**Synergistic Activities**

- CEL1001R: eLearning Designer/Facilitator and Quality Matters Certification
- SEDAAG annual meeting, Southeastern Division of the Association of American Geographers
- Teaching with Technology Showcase, FAU Center for Teaching and Learning
- ESSEA annual meeting, Earth System Science Education Alliance
- Faculty Learning Community, Advanced Topics Online Teaching/Learning, member
- Citrix virtualization seminar “From Wow to How”
- GIS Expo
- Faculty Learning Community, Sustainable Pedagogy, Facilitator,
- Web conference on developing a Carbon Action Plan for universities
- Faculty Learning Community, Challenges and Opportunities to Distance Learning
- Teaching Learning Center and The Center for Civic Engagement and Service workshop

**Collaborators and Other Affiliations**

- SouthEastern Division of Association of American Geographers
- Florida Society of Geographers’ (FSG) webmaster
- FAU Geosciences GIS Center
- FAU Conservation committee
- FAU Sustainability committee

**Courses Taught**

- GEA 6277 - Human-Environmental Interactions, 2009 to present.
- GEA 4275 - Human-Environmental Interactions in South Florida, 2009 to present.
- ESC 2070 – The Blue Planet, 2007-present.

**Community Engagement or Out-reach**

Science Olympiad judge
Graduate Research Day poster judge
Invited panel judge for student projects in EGN 2935,
Invited speaker for EGN 2935, Sustainability Leadership in Engineering
Focus the Nation conference steering committee,
Represented FAU at the non-profit organization Hurricane Warning! at the Disaster Survival House
Co–coordinator and presenter for the South Broward High School GIS field trip to FAU.
Coordinated and conducted a 5th grade
ABBREVIATED FACULTY CV
Stephen M. Kajiura, Ph.D. Associate Professor
Biological Sciences, Florida Atlantic University, Boca Raton, FL 33431 USA
www.science.fau.edu/sharklab

A. Professional preparation
University of California at Irvine  Ecology & Evolution  Postdoc, 2002-2003
University of Hawaii at Manoa  Zoology  PhD, 2001
Florida Institute of Technology  Marine Biology  MS, 1994
University of Guelph  Marine Biology  Honours BSc, 1991

B. Appointments
2010-present  Associate professor, Biological Sciences, Florida Atlantic University
2003-2010  Assistant professor, Biological Sciences, Florida Atlantic University

C. Selected Peer-Reviewed Publications (5 most recent)


D. Selected Other Publications


E. Synergistic Activities (past 5 years)
Supervised 5 PhD students, 3 MS students, 2 non-thesis MS students, 2 post-doctoral researchers, 8 undergraduate DIS students. Served on 6 MS committees, 4 PhD committees. Presented 22 invited seminars, 9 conference presentations, 26 co-authored conference presentations. Peer-reviewed 61 journal manuscripts, invited to participate in 4 scientific workshops, have 1 patent pending.

F. Collaborators and Other Affiliations (past 5 years)

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<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
<th>Name</th>
<th>Affiliation</th>
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<tbody>
<tr>
<td>CN Bedore</td>
<td>Duke University</td>
<td>JH Long</td>
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<td>LJ Macesic</td>
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<td>SP Collin</td>
<td>University of Western Australia</td>
<td>JW Mandelman</td>
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<td>DM McComb</td>
<td>Ocean First Institute</td>
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<td>A Hansen</td>
<td>University of Colorado</td>
<td>ME Porter</td>
<td>Florida Atlantic</td>
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<tr>
<td>LL Harris</td>
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<td>AM Siciliano</td>
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<td>NS Hart</td>
<td>University of Western Australia</td>
<td>AP Summers</td>
<td>University of</td>
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<td>IR Tibbetts</td>
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<td>RE Hueter</td>
<td>Mote Marine Laboratory</td>
<td>TC Tricas</td>
<td>University of Hawaii</td>
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<td>LK Jordan</td>
<td>UCLA</td>
<td>BE Wueringen</td>
<td>University of Western Australia</td>
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<tr>
<td>ER Loew</td>
<td>Cornell University</td>
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G. Courses Taught
<table>
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<tr>
<th>Undergraduate</th>
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<tr>
<td>Evolution</td>
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<td>Fishes</td>
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<tr>
<td>Evolution in Society</td>
<td>Computer Graphics for Biologists</td>
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<tr>
<td>Human Anatomy</td>
<td>Elasmobiotherapy</td>
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<tr>
<td>Directed Independent Study</td>
<td>Integrative Biology I</td>
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</table>

**H. Community Engagement or Out-reach (past 5 years)**

Provided on-camera appearances or technical consultation for 8 television documentaries. Provided interviews for numerous print and online media outlets locally, nationally, and internationally.
CURRICULUM VITA MARGUERITE KOCH-ROSE
Florida Atlantic University; Department of Biological Sciences
Aquatic Plant Ecology Laboratory (APEL)
777 Glades Road, Boca Raton, FL 33431-0991
Phone: (561) 297-3325; Fax: (561) 297-2749; email: mkoch@fau.edu
http://www.science.fau.edu/biology/koch/
https://www.facebook.com/FauAquaticPlantEcologyLab

A. Professional Preparation
Ph. D., Marine Biology and Fisheries, 1996. Rosenstiel School of Marine and
Atmospheric Sciences, University of Miami, Miami, Florida.
Graduate Exchange Scholar, 1988-1989. Geography Department, University of
M.S., Marine Sciences, 1988. Marine Sciences Department, Center for Wetland
Resources, Louisiana State University, Baton Rouge, Louisiana.
Coral reef ecology, 1983. West Indies Laboratory, Fairleigh Dickinson
University, St. Croix, West Indies.
B.S., Biology, 1981. Biology Department, Tulane University, New Orleans, LA.

B. Appointments
C. 2008-present  Professor: Biological Sciences Department, Florida Atlantic University,
Boca Raton, FL.
D. 2001-2008  Associate Professor: Biological Sciences Department, Florida Atlantic
University, Boca Raton, FL.
E. 1996-2000  Assistant Professor: Biological Sciences Department, Florida Atlantic
University, Boca Raton, FL.
F. 1993-1996  Research Associate: Rosenstiel School of Marine and Atmospheric Sciences
(RSMAS), University of Miami, Miami, FL.
Department, South Florida Water Management District, West Palm Beach, FL.
I. 1985-1988  Research Assistant: Center for Wetland Resources, Louisiana State
University, Baton Rouge, LA.
J. 1985  Research Assistant: University of Washington, Seattle, WA.

C. Selected Peer-Reviewed Publications
(2014) Climate Change Projected Effects on Coastal Foundation Communities of the
Greater Everglades using a 2060 Scenario: Need for a New Management Paradigm.
Journal of Environmental Management. DOI: 10.1007/s00267-014-0375-y

Strazisar, T., Koch, M., Madden, C. Seagrass (Ruppia maritima L.) (2014) Life history
transitions in response to salinity dynamics along the Everglades-Florida


D. Selected Other Publications or Products/Grants

Ruppia maritima Seed Bank Reassessment Following Large Reproductive Events in the Mangrove Transition Zone and Florida Bay. SFWMD PI: $20,000. 2014.


FAU Climate Change Initiative Priority Theme: Research, Engineering and Adaptation to a Changing Climate: FAU. PI: $500,000. 2009-2014.

Seagrass research in Florida Bay in support of ecosystem models and restoration: 2009. SFWMD. PI: $300,000.


E. Synergistic Activities
Developing seagrass ecosystem model with colleagues at South Florida Water Management District to define water regulation schedules to Florida Bay

F. Collaborators and Other Affiliations
Collaborating with the Central Caribbean Research Center (CCMI) to develop their ocean acidification coral reef research program.

G. Courses Taught
Undergraduate: Ecology, Marine Botany Graduate: Climate Change, Marine Ecosystem Management, Coastal Plant Ecology

H. Community Engagement or Out-reach
Actively giving oral presentations and seminars to local community organizations and educational institutions on Climate Change and Ocean Acidification to promote a greater awareness of this topic.
CURRICULUM VITAE: BRIAN EDWARD LAPOINTE

PROFESSIONAL PREPARATION

Boston University     Biology    B.S.  1973
University of Florida     Environmental Sciences  M.S. 1979
University of South Florida    Biology    Ph.D.  1982

APPOINTMENTS

2007-present  Research Professor, Harbor Branch Oceanographic Institute, Florida Atlantic University
2006-2007   Senior Scientist, Harbor Branch Oceanographic Institution
2004-2006 Adjunct Professor, Department of Oceanography, Florida State University
1999-present Adjunct Research Scientist, Bigelow Laboratory for Ocean Sciences
1988-1990 Director of Marine Conservation, Florida Keys Land & Sea Trust
1986-1996 Adjunct Assistant Professor, Rosenstiel School of Marine and Atmospheric Sciences, University of Miami
1985-2006 Associate Scientist, Harbor Branch Oceanographic Institution
1983-1985 Assistant Scientist, Harbor Branch Oceanographic Institution
1977-1982 Research Assistant, Skidaway Institute of Oceanography
1973-1977 Research Assistant, Woods Hole Oceanographic Institution

Selected Peer-Reviewed Publications


SELECTED OTHER PUBLICATIONS OR PRODUCTS/GRANTS


SYNERGISTIC ACTIVITIES

Editorial Board of Harmful Algae (2005-present)
Board of Advisors, Arthur Marshall Foundation (2006-present)
Reviewer for Journal of Experimental Marine Biology & Ecology, Marine Ecology Progress Series, Global Change Biology, Estuarine, Coastal and Shelf Science, Estuaries & Coasts, Aquatic Botany

COLLABORATORS AND OTHER AFFILIATIONS

Peter Bell, University of Queensland; Bill Louda, Florida Atlantic University; Chuanmin Hu, University of South Florida; Brian Barnes, University of South Florida; Jun Zhao, University of South Florida; Mark and Diane Littler, Smithsonian Institution; Mike Risk, McMaster University; Owen Sherwood, University of California, Santa Cruz; Chris Langdon, University of Miami; Larry Brand, University of Miami; Michael Mallin, University of North Carolina; Chris Gobler, Stony Brook University; Mingshin Jiang, Florida Atlantic University; Dennis Hanisak, Florida Atlantic University.

Courses Taught

Marine Pollution

Community Engagement or Out-reach

Frequent public lectures, multi-media outreach
LOUDA, J. WILLIAM


APPOINTMENTS: SCIENTIST EMERITUS (FAU; 4/14 – PRESENT); SENIOR SCIENTIST (FAU; 4/08-4/14); ASSOCIATE SCIENTIST (FAU - 1/03-4/08) ASSISTANT SCIENTIST (FAU- 7/99-1/03); ADJUNCT PROFESSOR / RESEARCH ASSOCIATE / SENIOR LABORATORY SPECIALIST (FAU-1/78-7/99)

SELECTED PEER-REVIEWED PUBLICATIONS:

SELECTED OTHER PUBLICATIONS OR PRODUCTS/GRANTS:
Biosketch:
Scott H. Markwith, Associate Professor

Professional Preparation:
• Ph.D., Biogeography, University of Georgia, May 2007.
• M.S., Biogeography, University of Georgia, December 2001.
• B.A., Physical Geography, University of Mary Washington, May 1997.

Appointments:
• Associate Professor, Department of Geosciences and Environmental Science Program, Florida Atlantic University, August 2007 – Present.

Selected Peer Reviewed Publications:

Selected Other Publications:

Synergistic Activities:
• Development and oversight of FAU’s Environmental Restoration Certificate program.
• Organization of the Spring 2011 1st International Forum for Environmental Issues for the Encontro Regional de Estudantes de Engenheiro Ambiental - EREEAMB, Marabá, Pará, Brazil, involving FAU and Universidade do Estado do Pará.
• Session Organizer and Chair for Biogeography and Geomorphology Specialty Groups Paper Session at the Association of American Geographers Annual Meeting in Washington D.C., Session Title: Environmental Restoration Research, Spring 2010.
• Development of TETRASAT, a program specifically designed to analyze genetic diversity and differentiation among populations with allotetraploid microsatellite data.
• Editorial board membership of both Freshwater Biology and Southeastern Naturalist.

Collaborators and Other Affiliations:

Collaborators:
• Steve Bousquin, South Florida Water Management District
• Vanessa da Cunha, Universidade Federal de Mato Grosso do Sul
• Sharon Ewe, Ecology and Environment, Inc.
• Stevee Kennard, Kaiser University
• David Leigh, University of Georgia
• Garren Mezza, Patch Market Garden
• Dean Monette, Florida Atlantic University
• Juliao de Souza, Universidade Federal de Mato Grosso do Sul

Graduate Advisor:
• Kathleen C. Parker, Emeritus Professor, University of Georgia

Thesis and Dissertation Advisees (Total advised = 4 Ph.D. and 2 Master’s; Committees = 2 Ph.D. and 9 Master’s):

Ph.D.
• Dean Monette, Fall 2009 – Present
• Danielle Romais, Fall 2012 – Present
• Alana Edwards, Fall 2012 – Present
• Anthony Planas, Fall 2014 – Present

Master’s
• Stevee Norman, Environmental Sciences Program, Spring 2011 – Spring 2013
• Garren Mezza, Environmental Sciences Program, Fall 2010 – Fall 2012

Courses Taught:
• Introduction to Physical Geography, GEO 2200, Fall 2009 – 2013, Summer 2014.
• Seminar in Geographic Methodology, GEO 6117, Fall 2008, Spring 2010.
• Restoration Implementation and Management, EVR 6358, Spring 2013, 2014.

Community Engagement or Outreach:
• Science Olympiad Judge, Spring 2008.
ABBREVIATED FACULTY CV (MAXIMUM 2 PAGES)
DANIEL E. MEEROFF, PH.D., E.I.

PROFESSIONAL PREPARATION

Undergraduate Institution
- Florida Institute of Technology, Bachelor of Science in Environmental Science (05/1995)

Graduate Institution
- University of Miami, Master of Science in Civil Engineering (08/1997)
- University of Miami, Ph.D. in Civil Engineering, Environmental Engineering Emphasis (12/2001)

Postdoctoral Institution

Professional Licensure
- Engineer Intern, State of Florida Board of Professional Engineers, License #: 1100003721 (09/1998)

APPOINTMENTS

- Professor (August 2014 – Present)
  Florida Atlantic University, Dept. of Civil, Environmental & Geomatics Engineering, Boca Raton, FL.
- Associate Chair of the Department (October 2013 – Present)
  Florida Atlantic University, Dept. of Civil, Environmental & Geomatics Engineering, Boca Raton, FL.
- Associate Professor with Tenure (August 2008 – Present)
  Florida Atlantic University, Dept. of Civil, Environmental & Geomatics Engineering, Boca Raton, FL.
- Assistant Professor (August 2003 – July 2008)
  Florida Atlantic University, Dept. of Civil Engineering, Boca Raton, FL.
- Director, Laboratories for Engineered Environmental Solutions (Lab.EES) (August 2003 – Present)
  Florida Atlantic University, Dept. of Civil Engineering, Boca Raton, FL.
  University of Miami, Dept. of Civil, Architectural & Environmental Engineering, Coral Gables, FL.
  University of Miami, Dept. of Civil, Architectural & Environmental Engineering, Coral Gables, FL.
  Florida Governmental Utility Authority, Tallahassee, FL.
  Montgomery Watson, Inc., Sunrise, FL.

Selected Peer-Reviewed Publications (most recent five from the last 7 years)


Selected Other Publications or Products/Grants (most recent five from the last 7 years)


**SYNERGISTIC ACTIVITIES**
- Development of middle school curriculum for STEM magnet schools, Broward County School Board.
- Expanding the student-centered undergraduate research culture across the curriculum.
- Development of learning-centered assessment tools in undergraduate engineering classes.
- Assessment of writing across the curriculum measures in junior level engineering laboratory coursework.
- Use of co-curricular activities to promote undergraduate research

**COLLABORATORS AND OTHER AFFILIATIONS**

Collaborators and Co-Editors:
Sharon Long, University of Wisconsin; Ali Zilouchian, FAU; Tim Townsend, University of Florida; John Schert, Hinkley Florida Center for Solid and Hazardous Waste Management; Kiran Tota-Maharaj, University of Dundee; F. Bloetscher, FAU; Tom Carsey, National Oceanographic and Atmospheric Administration; John Proni, Florida International University; D.V. Reddy, FAU, Jennifer Peluso, FAU; Kathy Dunn, FAU; Mirya Holman, FAU; Patrica Heydet-Kirsch, FAU; Donna Chamely-Wilik, FAU; Len Berry, FAU; Jim Murley, FAU

Graduate Advisors and Postdoctoral Sponsors
J.D. Englehardt, University of Miami; T.D. Waite, Ferrate Technologies; Helena Solo-Gabriele, University of Miami

Thesis Advisor and Postgraduate-Scholar Sponsor
*Total 22 graduate students advised and 1 postgraduate scholar*

F. Morin (Lyonnaise de Eaux), F. Gasnier (Lyonnaise de Eaux), T. Bocca (Cepemar Brasil), A. McBarnette (Montgomery Watson Harza), F. Youngman (Bohler Engineering), A. Albasri (2014), K. Kohn (2014), J. Bobsein (South Florida Water Management District), Amy Sirmans (St. Johns Water Management District)

**Courses Taught**

EGN2095-Engineering Chemistry (eLearning), EGN2095L-Engineering Chemistry Laboratory, ENV3011C-Environmental Science/Engineering with Laboratory, ENV4514-Water and Wastewater Technology, ENV3001L-Chemistry for Engineers Laboratory, CGN4803C-Civil Engineering Design 1, CGN4804C-Civil Engineering Design 2, ENV4001-Introduction to Environmental Engineering and Science, ENV6507-Wastewater Engineering (FEEDS), ENV6418-Water Supply and Treatment (FEEDS), ENV6668-Env. Systems and Processes (FEEDS)

**Community Engagement or Out-reach**

- **FDEP Green Lodging Program Assessor** (2006 – Present)
- **Member, FS/AWWA Research Advisory Committee.** (April 2006 – Present)
- **Member, FS/AWWA Biological Contaminants Committee,** (March 2006 – Present)
• Member, *FS/AWWA Water Quality Division Laboratory Services Steering Committee*, (November 2005 – Present)

• Committee Member, *Pollution Prevention Coalition Awards Committee* (August 26, 2005 – Present)
ABBREVIATED FACULTY CV
Sarah L. Milton, Ph.D.

PROFESSIONAL PREPARATION
Post-doctoral Fellow: Florida Atlantic University 1995-1996: Anoxia and Physiology
Ph.D.(1994), University of Miami Rosenstiel School of Marine and Atmospheric Science,
Miami, Florida; Marine Biology and Fisheries (Biological Oceanography).

APPOINTMENTS
2011- Associate Professor, Biological Sciences, Florida Atlantic University
2006-2011 Assistant Professor, Biological Sciences, Florida Atlantic University
2005- Joint appointment, Assistant Professor, Dept of Biomedical Science, FAU
2005-2006 Visiting Assistant Professor, Biological Sciences, Florida Atlantic University
1996-2005 Research Assistant Professor and Adjunct Lecturer, Florida Atlantic University
1996-1997 Adjunct Lecturer, Palm Beach Community College
1995-1996 Postdoctoral Fellow, Florida Atlantic University
1994-1995 Senior Biologist, Evans Environmental and Geological Science and Management, Inc, Miami FL
1992 – 1996 Adjunct Lecturer, Florida Atlantic University

Selected Peer-Reviewed Publications

GRANTS
National Oceanic and Atmospheric Administration Milton (PI) 9/1/11 – 8-31/15
ECOHAB: Brevetoxin metabolism and physiology - a freshwater model of morbidity in endangered sea turtles $643,000

American Federation of Aging Research Milton (PI) 7/1/08 – 12/31/10
Methionine sulfoxide reductase A and resistance to oxidative damage in an animal model of aging without senescence $60,000

NIH – NIA Milton (PI) 8/01/09-7/31/11
Molecular mechanisms of oxidative stress resistance in an animal model of aging without senescence $213,413
Caribbean Conservation Corp  Milton (PI)  6/1/10 – 5/31/11
Quantifying the energetic cost of disorientation in loggerhead (*Caretta caretta*) and green (*Chelonia mydas*) hatchlings  $15,957

Morris Animal Foundation  Milton (PI)  12/1/10 – 11/30/12
Determination of Innate Immune Function in the Loggerhead (*Caretta caretta*) and Green (*Chelonia mydas*) Sea Turtle by Flow Cytometry  $25,202

SYNERGISTIC ACTIVITIES
Symposium Chair:  Anatomy, Physiology, and Health.  33\textsuperscript{rd}, 34\textsuperscript{th}, 35\textsuperscript{th} Annual Symposium on Sea Turtle Biology, 2013, 2014, 2015
Reviewer: textbooks and numerous journals

2013  Univ. of Miami RSMAS: Coming Full Circle: Sea turtles to stroke research and back again. Invited talk
2011  Tenth International Congress of Neuroethology, University of Maryland, MD. Adaptations for long term anoxia tolerance reduce oxidative stress in the freshwater turtle *Trachemys scripta*. Invited talk

COLLABORATORS AND OTHER AFFILIATIONS
NOAA, Georgia Aquarium, Florida Fish and Wildlife Service, Mote Marine Laboratory

Courses Taught
Comparative Animal Physiology plus Lab (UG), Anatomy and Physiology (UG), Environmental Physiology (G), Marine Animal Physiology (G). Seminar in Marine Research (G), Seminar In Hypoxia (G). Respiratory Physiology (Med), Renal Physiology (Med)

Community Engagement or Out-reach
Classroom presentation (x2) on sea turtle biology and anoxia tolerance: Palmer Trinity High School, Miami, FL March, 2014
Jon A. Moore

Mailing Address: Florida Atlantic University
Wilkes Honors College
5353 Parkside Drive
Jupiter, FL 33458

Phone: (561) 799-8025
E-mail: jmoore@fau.edu

a. Education

Univ. Arizona  Geosciences    B.S., 1983
Univ. Arizona  Ecology & Evolutionary Biology  B.S., 1983
Yale University  Biology     M.S., 1987
Yale University  Biology     Ph.D., 1993

b. Appointments (academic or professional appointments)

2013-present, Professor of Biology, Wilkes Honors College, Florida Atlantic University
2005-2013, Associate Professor of Biology, Wilkes Honors College, Florida Atlantic University
2000-2005, Assistant Professor of Biology, Wilkes Honors College, Florida Atlantic University

1994-1997, Lecturer, Department of Ecology and Evolutionary Biology, Yale University

c. Research & Professional Experience

1995-pres. Participant on 22 oceanographic research cruises
2013-pres. Consultant, IUCN Caribbean Fishes Red List Assessment, Port of Spain, Trinidad
2012-pres. Director at Large, Board of Directors, Florida Native Plant Society
2011-pres. Consultant, Water Column Technical Working Group, NOAA Natural Resources
Damage Assessment, New Orleans, LA
1995-pres. Coordinator (no.158), Fishbase online database of fish taxonomy and ecology, expert
for 8 families of Ateleopodiformes, Beryciformes, and Stephanoberyciformes fishes.
1994-pres. Curatorial Affiliate, Division of Vertebrate Zoology, Peabody Museum of Natural
History, Yale University, New Haven, CT.
2011-2012 Guest Editor, Northeastern Naturalist journal
2000-2010 Collaborator, Census of Marine Life, Census of Seamounts and Gulf of Maine projects
2000-2009 Board of Directors, Member, Loggerhead Marinelife Center, Juno Beach, FL
2003-2005 Contract Author, United Nations Food and Agriculture Organization, for FAO Species
Identification Guide for Fishery Purposes, Eastern Central Atlantic
2001-2004 Associate Editor, Journal of Northwest Atlantic Fishery Science.

d. Selected Publications (undergraduate and graduate student names are in bold)

marine biodiversity hotspots on patterns of range evolution: evidence from the Holocentridae
(squirrelfishes and soldierfishes). Evolution.

Dornburg, A., J. P. Townsend, B. Spriggs, R. I. Eytan, J. A. Moore, P. C. Wainwright, A. Lemmon,
E. Lemmon, and T.J. Near. In press. Phylogenomic informativeness facilitates resolution of the
sister lineage of percomorph fishes with an anchored hybrid enrichment dataset. Molecular
Biology and Evolution.

Moore, J. A. and A. Dornburg. 2014. Ingestion of fossil seashells, stones, and small mammal bones
by gopher tortoises (Gopherus polyphemus) in South Florida. Bull. Peabody Museum of


e. Mentoring (undergraduate and graduate students)
Honors thesis supervisor for 60 bachelors honors theses and second reader for additional 32 honors theses. Supervisor for 7 M.S. students, committee member for 5 others. Committee member for 3 Ph.D. students.
ERIK G. NOONBURG, ABBREVIATED FACULTY CV

PROFESSIONAL PREPARATION


APPOINTMENTS

2006-2012. Assistant Professor, Dept. of Biological Sciences, FAU.
2012-present. Associate Professor, Dept. of Biological Sciences, FAU.

SELECTED PEER-REVIEWED PUBLICATIONS


SELECTED OTHER PUBLICATIONS OR PRODUCTS/GRANTS


SYNERGISTIC ACTIVITIES

COLLABORATORS AND OTHER AFFILIATIONS

Recent collaborators:
V. Naudot, Dept. of Mathematical Sciences, FAU
J. Byers, Odum School of Ecology, U. of Georgia
J. Shima, School of Biological Sciences, Victoria University of Wellington, New Zealand
S. Swearer, Dept. of Zoology, U. of Melbourne, Australia

Courses Taught

EVS 6920 Environmental Sciences Colloquium
PCB 6406 Ecological Theory
BSC 6937 Ecology Research Seminar
STA 3173 Introduction to Biological Statistics

Community Engagement or Out-reach

Science Communication Fellow, Patricia & Phillip Frost Museum of Science
Curriculum Vitae

Virginia Dianne Owen

Environmental Science Program
Department of Biological Sciences
Florida Atlantic University
777 Glades Road
Boca Raton, FL 33431

Office: (561)-297-0873
Cell: (954) 592-4280
FAX: (561) 297-2749
E-mail: dowen@fau.edu

PROFESSIONAL PREPARATION

• B.S. (1976) University of Florida, Department of Zoology, Gainesville, FL, Major: Zoology

• Ph.D. (1983) University of Lausanne, Department of Biochemistry, Lausanne, Switzerland with Certification in Biochemistry (1979) and Human Physiology (1978)

  Dissertation title: Integration and Expression of Mouse Mammary Tumor Virus


PROFESSIONAL APPOINTMENTS

Florida Atlantic University, Boca Raton, FL

• Coordinator, Environmental Science Program, July 2006 – present.

• Research Scientist, Biological Sciences, Florida Atlantic University, Boca Raton, FL, August 2014 – present.

• Research Associate, Department of Biological Sciences, May 2000 – June 2006.

• Visiting Professor of Biology, Division of Science, College of Liberal Arts, August 1999-May 2000.


Stranahan High School, Science Magnet Program, Broward County, FL


Department of Wildlife Ecology and Conservation, University of Florida, Davie, FL


Securities Research and Management, Inc., Fort Lauderdale, FL


Swiss Institute of Experimental Cancer Research, Genetics Division, Lausanne, Switzerland


SELECTED PUBLICATIONS AND PRESENTATIONS


**FUNDED RESEARCH**
Topographic Models of Everglades Tree Islands, $49,815. South Florida Water Management District, 2009-2010.


**PROFESSIONAL AFFILIATIONS**
Society of Human Ecology, Member 2011-present
Florida Exotic Pest Plant Council: Secretary 2004-2009, Treasurer 2009-present
The Wildlife Society, Member 2012-present

**COMMUNITY ENGAGEMENT AND SYNERGISTIC ACTIVITIES**

Faculty Mentor, Academic Service Learning Courses and Volunteer Programs
Elementary Student STEM Program in the Community Garden; 2011-present
Alternative Spring Break, Collier-Seminole State Park; 2014
Citizen Science Program Jay Watch, Jonathan Dickinson State Park; 2012-2013
Broward County Gopher Tortoise Monitoring; 2013-present
Pine Jog Environmental Education Center, Invasive Species Management, 2012-present
COLIN D. POLSKY, PHD

Professional Preparation
The University of Texas at Austin B.S., B.A., 1994 (Mathematics, Humanities, French)
The Pennsylvania State University M.S., 1998; Ph.D., 2002 (Geography)
Harvard University Postdoctoral Fellow, 2001-03 (Science & International Affairs)

Appointments
Director, Center for Environmental Studies, and Professor of Geosciences, Florida Atlantic University, 2014 – present; Associate Professor, Clark University School of Geography, 2009 – 2014; Associate Dean for Undergraduate Research and Active Pedagogy, Clark University, 2010 – 2012; Assistant Professor, School of Geography, 2003 – 2009

Selected Relevant Products (five maximum)

Other Selected Products (five maximum)

*Indicates student co-author

Current and Recent Synergistic Activities
2. PI, NSF projects: REU Site, CNH, LTER Social Science Supplement. Responsibilities include strategizing &
executing research in multi-site, multi-disciplinary teams, and managing & recruiting local team of ~30 people
per year, on topics of socio-ecological dimensions of suburbanization.
3. co-PI, NSF projects: ULTRA-ex, MACRO-BIO, PIE-LTER, DMUU, RCN: exploring Metro Boston current and future
suburban ecologies in multiple US metropolitan areas.
4. Committee Member: National Academies of Science/National Research Council (NAS/NRC), Committee on
Strategic Directions for the Geographical Sciences in the Next Decade, February 2008 – April 2010.
5. Associate Dean, Clark University, 2011–2012: co-leader for the development and implementation of new
campus-wide, team-based undergraduate research programs.

Collaborators and Other Affiliations (past 48 months)
Alber, Merryl, U. of Georgia; Assefa, Sarah (undergrad co-author, present location unknown); Bettez, Neil, Cary
Institute; Brumand, Jaleila, Arizona St U; Butler Harrington, Lisa, Kansas State U.; Cavender-Bares, J., U. Minnesota;
Chang, Heejun, Portland St. U.; Christensen, L., current affiliation unknown; Clark, William C., Harvard University;
Comrie, Andrew, U. of Arizona; Corell, Robert, American Meteorological Society/Heinz Center; Del Vecchio, Kate
(undergrad co-author, present location unknown); DeLauer, Verna, Clark U.; Denhart, Lillie, Clark U; Easterling,
William, The Pennsylvania State University; Eckley, N., current affiliation unknown; Garvoille, Rebecca, Florida
International U; Giner, Nicholas, Clark U; Gober, Pat, Arizona St U.; Groffman, P.M., Cary Institute; Grove, J.
Hopkinson, Charles, University of Georgia; Kasperson, Roger, Clark University; Larson, Kelli, Arizona State
University; Martin, Deborah, Clark U; Merner, Laura, U.-Maryland, Baltimore County; Morse, Jen, Cary Institute;
Neff, Rob, University of Maryland-Baltimore County; Nehring, Abbie, Bard College at Simon's Rock; Neil, Chris,
MBI; Nelson, Kristen, U. Minnesota; Nicolson, Craig, U. Mass.-Amherst; Ogden, Laura, Florida International
University; O'Neil-Dunne, Jarlath, U. Vermont; Onsted, Jeff, Florida International University; Pataki, Diane, U.
Utah; Patt, Tony, Potsdam Institute for Climate Impact Studies (Germany); Pontius, R. Gil, Clark U.; Pulsipher, A.,
current affiliation unknown; Rogan, John, Clark U.; Roy Chowdhury, Rinku, Indiana University; Runfola, Dan Miller,
National Center for Atmospheric Research, CU-Boulder; Ryan, Robert, U. Mass.-Amherst; Schiller, Andrew, current
affiliation unknown; Schroeter, Dagmar, Potsdam Institute for Climate Impact Studies (Germany); Shandas, Vivek,
Portland St. U.; Sorrensen, Cindy, Texas Tech U.; Steele, Meredith, Duke U.; Strauss, Eric, Boston College; Tuler,
Seth, Social and Environmental Research Institute; Turner, Billie, Arizona St. U.; Vorosmarty, Charles, University of
New Hampshire; Warren, Paige, U. Mass.-Amherst; Webler, Tom, Social and Environmental Research Institute;
Wollheim, Wil, University of New Hampshire; Yarnal, Brent, The Pennsylvania State University.

Graduate Advisor: Professor William E. Easterling, III, The Pennsylvania State University
Postdoctoral Advisors: Professor William C. Clark, Harvard University, Dr. Robert W. Corell, American
Meteorological Society/Heinz Center

Theses Advised (last 5 years; 15 total):
N. Giner (PhD, Clark U. Geography); D. Runfola (PhD, Clark U. Geography; now at CU-Boulder); S. Danielson (PhD,
Clark U. Geography; now at Slippery Rock U.); H. Pearsall (PhD, Clark U. Geography; now at Temple U.); C. Guido
(MA, Clark U. Environmental Science & Policy); D. Greene (MA, Clark U. Environmental Science & Policy); J. Bowen
(MA, Clark U. Environmental Science & Policy); M. Gonzales (MA, Clark U. Environmental Science & Policy); D.
Gedenberg (MA, Clark U. Environmental Science & Policy); A. Guha (MA, Clark U. Geography); T. Hill (BA, Clark U.
Environmental Science & Policy; now at Yale U.); K. Del Vecchio (BA, Clark U. Environmental Science & Policy); L.
DeVeber (BA, Clark U. Geography); N. Rao (BA, Clark U. Economics; now at U. Maryland); S. Nelson (BA, Clark U.
Geography)
C. Edward Proffitt

PROFESSIONAL PREPARATION

Ph.D., Biology, 1983. University of South Florida, Tampa, FL.
M.S., Biology, 1977. East Carolina University, Greenville, NC.

APPOINTMENTS (MOST RECENT THREE)

April 2005 - Present. Associate Professor, Department of Biological Sciences, Florida Atlantic University located at Harbor Branch Oceanographic Institution campus, Ft. Pierce, FL.
May 1995 – June 1998. Director, Louisiana Environmental Research Center, McNeese State University, Lake Charles, LA.

Selected Peer-Reviewed Publications
Proffitt, C.E. and S.E. Travis. 2014. Red Mangrove Fitness and Climate Change: Roles of Stress, Outcrossing, and Mutation Rate. Evolutionary Ecology.

SELECTED OTHER PUBLICATIONS OR PRODUCTS/GRANTS
FIO grant to study oysters in the wake of the BP Deepwater Horizon oil spill. Paper in prep.
NOAA Stimulus funding through Martin County to study oyster population and associated invertebrate restoration in the St. Lucie estuary. Paper listed below currently in review. E. Salewski is former FAU ES grad student.

NSF-EpSCOR project with A. Stafford (University of Virgin Islands) and D. Devlin (FAU) to study population genetics of red mangroves using microsatellite markers. J.P. Kennedy (Devlin, major advisor) did work for masters degree on this topic. Journal article in prep.

SYNERGISTIC ACTIVITIES
I teach a graduate class in Experimental Design and Biometry and have organized several statistical Workshops for FAU, for example, Model Selection and Multi-model Inference [David Anderson, instructor]; and, Structural Equation Modeling [Jim Grace, instructor]. I have consulted on biometry and design for Applied Biology, Inc. and aided numerous faculty and students with design and analysis.
I am one of two members of the Benthic Ecology Working Group of International Council for the Exploration of the Sea (ICES). The Zettler et al. journal article listed above comes from this association.

I was until recently an Associate Editor of the journal WETLANDS.

**COLLABORATORS AND OTHER AFFILIATIONS**

Affiliate Scientist with the Smithsonian Marine Station.

D.J. Devlin, Florida Atlantic University  
I. Feller, Smithsonian Environmental Research Center  
S. Chapman & A. Langley, Villanova University  
K. McKee, USGS National Wetlands Research Center  
B. Middleton, USGS National Wetlands Research Center  
S. Travis, University of New England - Maine  
E. Milbrandt, Marine Research Lab, Sanibel-Captiva Conservation Foundation  
A. Stafford, University of the Virgin Islands

**Courses Taught**

Experimental Design and Biometry (graduate)  
Advanced Analysis of Biological Data (graduate)  
Marine Ecology (graduate & undergraduate [Semester-by-the-Sea program])  
Scientific Communications (graduate)  
Coastal and Marine Restoration Ecology (graduate)  
Marine Community Dynamics (graduate)  
Genetic Ecology (graduate)

**Community Engagement or Outreach**

Occasional lectures in HBOI Ocean Science Lecture Series for the general public  
Seminar to the Florida Association of Environmental Professionals
ABBREVIATED FACULTY CV (MAXIMUM 2 PAGES)
LIANFEN QIAN

PROFESSIONAL PREPARATION
1996/08 Ph.D. in Statistics, Michigan State University, East Lansing, MI.
1989/05 M.S. in Statistics, Hangzhou University, Zhejiang, China.
1984/05 B.S. in Mathematics, Dept. of Math., Zhejiang University (Xixi Campus)

APPOINTMENTS
2002-present Professor/Associate Professor, Dept of Mathematical Sciences and Environmental Science Program, FAU.
1996-2002 Assistant Professor, Department of Mathematical Sciences and Environmental Science Program, FAU.
1993-1996 Research, Teaching Assistant and Statistical Consultant, Department of Statistics and Probability, Michigan State University (MSU)
1991-1993 Teaching Assistant, Department of Mathematics, MSU.
1984-1991 Lecturer, Department of Mathematics, Zhejiang University (Xixi Campus).

(Selected) Publications (last 7 years)


**GRANTS (PROPOSALS AND FUNDED) (LAST 7 YEARS)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Grant Description</th>
<th>Amount</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>Simons Foundation Collaboration Grants for Mathematicians, $35,000</td>
<td></td>
<td>rejected</td>
</tr>
<tr>
<td>2013</td>
<td>FAU Technology Fee Project Proposal, jointly with Lee, Roger and Emily, $73,230</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>USA DOD contract grant for bacteria gene functionality classification project, $5,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>Helped on NCCI research fund for ¼ RA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SYNERGISTIC ACTIVITIES**

2013-2014 Proposal to build the undergraduate major in Statistics and working on international partner programs for both undergraduate and graduate students.

**COLLABORATORS AND OTHER AFFILIATIONS**

- Collaborators:
  - Statisticians: Drs. Hira Koul, Donatas Surgailis, Raymond Carroll, Suojing Wang, Zhongwu Cai, Qiman Shao, Tze-Leung Lai, Soyoung Ryu, Heirich Niederhausen, Wei Zhang, Yunxia Li, Hongwei Long, Jose Correa, Zhihua Liu, Fazhe Chang
  - Engineers: Taghi Khoshgoftaar, Qingchuan Yao, Mohammad Ilyas, Sam Hsu
  - Biologists: Guri Roesijadi, Zhongwei Li, Dan Austin
  - Social Scientist: Naelys Diaz.

(Selected) Courses Taught (last 7 years)

- **Undergraduate Statistics Courses Taught:**
  - STA 2023 Introductory Statistics
  - STA 4102 Computational Statistics
  - STA 4442 Probability and Statistics
  - STA 4032 Probability and Statistics for Engineers

- **Graduate Statistics Courses Taught:**
  - STA 5195/4906 Biostatistics
  - STA 6446 Regression Analysis
  - STA 6857/4930 Applied Time Series
  - STA 6208/4930 Applied Statistical Methods
  - STA 6907 Internship
  - STA 6907 Analysis of Categorical Data (DIS)
  - STA 6907 Survival Analysis and Clinical Trials (DIS)

- **Others Courses:**
  - MAT 7980 Dissertation
  - MAT 6971 Master’s Thesis

**Community Engagement or Out-reach**

- Reviewer for the American Mathematics Reviews, Technometrics and many statistical journals.
- Statistical consultant for students and researchers from Florida Atlantic University and the community.
- Undergraduate advisor for Statistics minor and certificate programs
• Board Member of CASEC: Chinese Association of Science Economics & Culture of South Florida, 2011-Present
• Principal of CCSSF-PBC: The Contemporary Chinese School of South Florida -- Palm Beach Campus, 2011-Present
Vitae

Charles E. Roberts  Date of Birth:   April 3, 1953
Place of Birth: Houston, Texas

Degrees:

    “Textural Analysis of Urban Thematic Mapper Data.”
    “From Parkway to Freeway: Roadside Design before the Interstate, 1858-1956”.
A.B. (Geography/Anthropology) Vassar College, 1983.
    “Farmland Preservation in the Northeast.”

Appointments:

First Year at FAU:  Fall 1990
Tenured and Promoted to Associate Professor, 1996
Promoted to Associate Dean of Graduate Studies,
Charles E. Schmidt College of Science, 2011
Appointed to Interim Chair, Geosciences, Fall 2013

Selected Peer Reviewed Publications


Delahunty, J.L, Phelps, Jack, Roberts, Charles and Sawicki, Ben,
2010  Quantification of Historical Urban Growth in a Dallas Suburb Southwestern Geographer.

Mary Beth Crile and Charles Roberts,
2009 Paleoterrain Model of the Yamato Marsh, Palm Beach County, Florida,

J.L.Delahunty, Charles Roberts, Gullian Breary,
2009 Arvida and the Planned Sprawl of West Boca Raton,Florida

Xie, Zhou, Charles Roberts and Brian Johnson

Edward J. Petuch and Charles E. Roberts,
2007 The Geology of the Everglades and Adjacent Areas, CRC Press; Boca Raton

Selected Other Publications or Products/Grants

2008 “Nearshore Reef Analysis and Quantification project” $58,000. Funded
Teaching Experience  Undergraduate Courses:

Map Analysis and GIS (now online, both graduate and undergraduate versions)
Geovisualization and Geographic Information Systems
Remote Sensing of the Environment (online now, both undergraduate and graduate versions)
Digital Image Analysis (online now, both undergraduate and graduate versions)
Introductory Physical Geography, emphasizing water resource issues
Field methods in the Mapping Sciences
Geography Field Camp
Regional Geography of U.S. and Canada
Urban Geography (online now)
American Cultural Landscapes (online now)
Human-Environmental Interactions in south Florida
Art, Architecture and Environment: The Cultural Landscape of Venice

Graduate Courses:

Cultural Geography Seminar, Field Camp, Advanced Remote Sensing, Research in the Geoscience
Human-Environmental Interactions. Historical Preservation

Synergistic Activity

Department Level
GIS Lab and Center Director, 1992-1996, 2006-2011
Graduate Program Chair 1991-1999
Graduate Program Coordinator 2006-2011
Chair, College of Science graduate programs committee, 2006-2013
Science representative of the University Graduate Programs committee, 2006-2013

Contributions to New Program Creation and Implementation

Development of a PSM in GIS (in process)
Development of an MS in Coastal and Marine Science (in process)
Updated the Environmental Science MS degree, University
Environmental Certificate, Biology
GIS certificate, Geography
Advanced GIS certificate, Geoscience
Medical Physics Minor, Physics
PSM in Medical Physics, Physics
PSM in Business Biotechnology, Biology-Business College
Neuroscience Graduate Certificate, Complex Systems program
Geoscience PhD, Geosciences

College Level Committee Membership
Public Intellectuals PhD committee, Arts and Humanities, 1999
Graduate Environmental Certificate committee, Arts and Humanities, 1999
Graduate curriculum committee chair, 2006-2008, College of Science
Undergraduate curriculum committee, 2001-2006, College of Science
Environmental Science MS degree (college wide) curriculum chair
Strategic Planning Committee, 2011-2012
University Level Committee Membership

Member and Chair University, Environmental Affairs Committee, 1992-1996
Science representative, University Graduate Council, 2006-present
Science representative, University Graduate Programs Council, 2006-present
Provost Committee on SACS Credentialing, 2012-2013
Provost Strategic Planning committee 2011-2012, 2012-2013
Graduate College Academic Affairs Committee, 2009-2014
TARA L. ROOT, PH.D.
Associate Professor, troot@fau.edu, https://www.sites.google.com/site/drtararootshomepage/

PROFESSIONAL PREPARATION

- Ph.D. in Geology, August 2005
  Minor in Environmental Chemistry and Technology
  University of Wisconsin-Madison
- M.S. in Geology, December 2000
  University of Wisconsin – Madison
- B.S. in Geological Engineering, June 1998
  Colorado School of Mines – Golden, Colorado

APPOINTMENTS

- Associate Professor and supervisor of Water Analysis Lab, August 2013– Present
  Department of Geosciences, FAU
- Assistant Professor, August 2006 – August 2013
  Department of Geosciences, FAU
- Visiting Assistant Professor, August 2005 – August 2006
  Department of Geosciences, FAU
- Graduate Teaching Assistant/Research Assistant, August 2002-August 2004
  Department of Geology and Geophysics, University of Wisconsin – Madison
- Fellow, September 1999 – August 2002
  U.S. Department of Energy, Office of Civilian Radioactive Waste Management Fellowship
  Program at the University of Wisconsin – Madison (included three months of research at Los Alamos National Laboratory, NM)

Selected Peer-Reviewed Publications (Bold font indicates student author)


SELECTED OTHER PUBLICATIONS OR PRODUCTS/GRANTS


Funding period: Fall 2013 – Spring 2015
Funding source: FAU Distinction through Discovery Program
Funding amount: $20,000
Co-Principal Investigator: Remote education and assessment of critical habitats
Funding period: 2010-2013
Funding source: FAU Technology Fee Program
Award amount: $74,155
Principle investigator: Earth systems science teacher education at FAU.
Funding period: June 2007 – October 2009
Funding agency: Institute for Global Environmental Strategies
Award amount: $40,000

**SYNERGISTIC ACTIVITIES**

*Selected Service:*
Chair, FAU Environmental Sciences Undergraduate Curriculum Committee (2013-present)
Member, FAU Environmental Sciences Program Committee (2011-present)
Member, FAU Dept. of Geosciences, Geology Curriculum Committee (2006 – present)
FAU excellence and innovation in undergraduate teaching award (2013)
President South Florida Hydrologic Society (2012-2013)
Faculty advisor for 1) FAU’s Chapter of Sigma Gamma Epsilon, Earth Sciences Honor Society (2006-present), 2) FAU’s student chapter of the American Institute of Professional Geologists (present)
Campus representative for Geologic Society of America (2008-present)

**COLLABORATORS AND OTHER AFFILIATIONS** (AFFILIATION = FAU UNLESS OTHERWISE NOTED)

*Collaborators and co-editors:*
Dr. Len Berry, Dr. Fred Bloetscher, Dr. Evelyn Frazer, Nicole Hernández Hammer, Dr. Tobin Hindle, Dr. Marguerite Koch-Rose, Tina Kuhn (unaffiliated), Dr. Dianna Mitsova-Boneva, Dr. Dianne Owen, Dr. Jorge Restrepo, Lisa Survis, Dr. Ramesh Teegavarapu, Dr. Caiyun Zhang

*Graduate advisor:*
Dr. Jean Bahr (University of Wisconsin – Madison)

*M.S. advisees and committee participation* (15 total): Dominick Antolino (USGS), Brain Banks (USGS), Carrie Beaudreau (USGS & FAU), Keren Bolter, Eric Carlson (USGS), Heather D’Antonio, Michelle Infande (Palm Beach County Water Utilities) Siana Lakhan, Zach Mester, Garren Mezza (Patch Market), Elizabeth Quinn (SFWMD), Corrie Rainyn, (DDS Inc.), Lisa Survis, Richard Westcott (USGS & FAU), William Wright, Tania Leung

*Ph.D. advisees and committee membership* (5 total): Troy Bernier, Keren Bolter, Rachelle Grein, Greg Mount (Indiana University of Pennsylvania), Lisa Survis

**Courses Taught**

<table>
<thead>
<tr>
<th>Course</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogeology (GLY 4822)</td>
<td>Engineering Geology (GLY 4830)</td>
</tr>
<tr>
<td>Benchmark Developments in Hydrogeology (GLY 6897)</td>
<td>Hydrogeology Methods (GLY 6838)</td>
</tr>
<tr>
<td>Env. Issues in Atmos. &amp; Earth Sci (ESC 3704)</td>
<td>Water Resources (GEOC 4280)</td>
</tr>
<tr>
<td>Earth Science for Educators I (ESC 6206)</td>
<td>Geology Field Methods (GLY 4750)</td>
</tr>
</tbody>
</table>

**Community Engagement or Out-reach**

Suncoast High School, Riviera Beach, FL, Career Showcase (2013, 2014)
Volunteered for GetWet, a high school program designed to inform students about private well drinking water quality (2012, 2014)
Judge for Science Olympiad (2011, 2012)
Abbreviated C. V.

David Lewis Warburton

Professional Preparation

Undergraduate Study - UNIVERSITY OF CALIFORNIA, San Diego, California - B.A. degree awarded June, 1969.
Major: Chemistry  Minor: History of Science/Economics

Major: Geochemistry
Major Professor: Professor Stefan Hafner

Appointments:

Assistant and Associate Professor of Geology, FLORIDA ATLANTIC UNIVERSITY, Boca Raton, Florida, September 1975- present.

Assistant Chairperson, Department of Geosciences, FLORIDA ATLANTIC UNIVERSITY, Boca Raton, Florida, January 2005 - present.

Selected Peer-Reviewed Publications

None

Selected Other Publications or Products/Grants


Synergistic Activities

Academic Advisor, B.A. and B.S. Geology Degrees

Collaborators or Other Affiliations

Planning Committee, International Limnogeology Congress 6 (ILIC6)

Webmaster, GSA Limnogeology Division

Courses Taught (last 7 years)

Physical Geology/Evolution of the Earth (GLY 2010) - Su08, Su09, Su10, Su11, Su12, Su13, Su14

Geology of the National Parks - Water, Waves, and Caves (GLY 3165) - F11
Environmental Issues in Earth and Atmospheric Sciences (EVR 3019, later ESC 3704) - F08, F09, F10, S12, S12, F12

Mineralogy and Crystal Chemistry (GLY 4200C) - S09, F09, F10, F11, F12, F13, F14

Environmental Geochemistry (GLY 4240 or 4241) - F08, S11, F14

Petrology of Igneous and Metamorphic Rocks (GLY 4310) - S08, S10, S11, S12, S13, S14

Field Methods (GLY 4750) - S08, S09, S13

Environmental Geochemistry, graduate (GLY 5243) - S11, F14

Advanced Environmental Geochemistry (GLY 6246) - S10, F13

Global Environmental Change (GLY 6746) S14

Geosciences Colloquium Series (GEO 6920) - F12, S13

Legend: F = Fall, S = Spring, Su = Summer, digits refer to 20xx, where xx are digits shown

Community Engagement or Outreach

Liaison, Canaveral Mineral and Gem Society
James K. Wetterer
Wilkes Honors College, Florida Atlantic University, 5353 Parkside Drive, Jupiter, FL 33458
Phone: (561) 799-8648; FAX: (561) 799-8602; e-mail: wetterer@fau.edu

EDUCATION

UNIVERSITY OF WASHINGTON, Seattle, WA, 9/83 - 8/88

MICHIGAN STATE UNIVERSITY, East Lansing, MI, 9/81 - 9/83
M.S., Zoology: Ecology; Advisors: Earl E. Werner and Donald J. Hall.

CORNELL UNIVERSITY, Ithaca, NY, 9/76 - 5/79

WORK EXPERIENCE

FLORIDA ATLANTIC UNIVERSITY, Wilkes Honors College
8/04 - present: Professor
7/98 - 7/04: Associate Professor
9/03 - 1/04 & 5/04 - 8/04: Fulbright Scholar; Ants of Trinidad and Tobago

COLUMBIA UNIVERSITY, Department of Earth and Environmental Science
7/96 - 6/98: Assistant Professor

WHEATON COLLEGE, Department of Biology
8/94 - 6/96: Visiting Assistant Professor

HARVARD UNIVERSITY, Museum of Comparative Zoology
8/91- 6/94: Post-doctoral Fellow; Behavior, ecology, and evolution of fungus-growing ants
Advisors: Edward O. Wilson, Naomi Pierce, and Richard Lewontin

PRINCETON UNIVERSITY, Department of Ecology and Evolutionary Biology
7/89 - 7/91: Research Associate; Ecology and evolution of leaf-cutting ants
Advisor: Stephen Hubbell

VANDERBILT UNIVERSITY, Department of Psychology
9/88 - 7/89: Post-doctoral Fellow; Visual psychophysics of fish and horseshoe crabs
Advisor: Maureen K. Powers

CURRENT RESEARCH INTERESTS

Biogeography, ecology, and environmental impact of ants
Biogeography and ecology of West Indian ants
Distribution, impact, and control of exotic ants
Impact of exotic ants on hatching sea turtles in Florida

RECENT GRANTS

(Co-PI: R.R. Snelling).
RECENT PUBLICATIONS


JEANETTE WYNEKEN

Department of Biological Sciences    Office Phone: (561) 297-0146
Florida Atlantic University    Fax: (561) 297-2749
777 Glades Road    E-mail: jwyneken@fau.edu
Boca Raton, Florida 33431-0991USA http://www.science.fau.edu/biology/faculty/wyneken.html

**a. Professional Preparation**

<table>
<thead>
<tr>
<th>Institution</th>
<th>Major</th>
<th>Degree</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illinois Wesleyan University</td>
<td>Biology</td>
<td>B.A.</td>
<td>1978</td>
</tr>
<tr>
<td>University of Illinois</td>
<td>Biology</td>
<td>Ph.D.</td>
<td>1988</td>
</tr>
</tbody>
</table>

**b. Appointments**

- 2014 - present Professor, Dept. of Biological Sciences, Florida Atlantic University, Boca Raton, FL
- 2006-2014: Assoc. Prof., Dept. of Biological Sciences, Florida Atlantic University, Boca Raton, FL
- 2000-2006:  Assist. Prof., Dept. of Biological Sciences, Florida Atlantic University, Boca Raton, FL
- 2002-2005: Graduate Research Faculty, Duke University Marine Laboratory, Beaufort, NC

**c. Products**

**RECENT PEER-REVIEWED PUBLICATIONS** 51 papers published


**OTHER SIGNIFICANT PUBLICATIONS**


**- Sole-authored books (2)**


- Co-edited books (3)


- Book chapters (peer-reviewed - 9) 3 recent


d. Synergistic Activities
I have more than a decade of experience as advisor to graduate students (Masters and doctoral advisor) in Biological Sciences, and have served on graduate committees of students in Biological sciences, Integrative Biology, and Environmental Sciences at FAU; I served on a number of thesis and dissertation committees at other major US and foreign institutions, occasionally as co-advisor. I have more than 25 years of experience studying the morphology, ecology, behavior, and physiology of reptiles and particularly, marine turtles. These studies have resulted in a number of very successful collaborations.

I integrate my research into my classes including Biology of Sea Turtles, Comparative Vertebrate Morphogenesis, Research in Marine Biology seminar, and Marine Conservation Biology. Each year I give 4-8 general and professional lectures in reptile anatomy and physiology, sea turtle biology, oceans and climate, marine dispersal, and conservation. I provided my expertise as science advisor for Turtle: Incredible Journey, a feature length film, National Geographic Magazine’s feature on leatherback turtles, and Inside Nature’s Giants (TV4, UK).

e. Thesis Advising
Total graduate students 25 graduate students (1 Ph.D, [3 current Ph.D.], 24 M. Sci., and 1 Post-doctoral scholar. Recent graduates –Past 5 years: Justin Perrault Ph.D., 2013; Micah Rogers 2013 (environmental consulting, Reno, NV); Rachel Welicky M. Sci. 2010 (Arkansas State University); Erin Dougherty 2009 (Robeson Community College); Jeremy R. Conrad 2008 (U.S. Fish and Wildlife Service); Post doctoral associate: Angela Rivera 2011 (Harvard University).
ZHIXIAO XIE

PROFESSIONAL PREPARATION

- Peking University: Geography, B.S. 1990
- Chinese Academy of Sciences: Ecology, M.S. 1993
- State University of New York at Buffalo: Computer Science, M.S. 2002
- & Engineering: Geography, Ph.D. 2002

APPOINTMENTS

- 2014-present: Associate Dean for Research and Partnership Initiatives, College of Science, Florida Atlantic University
- 2014-present: Professor, Department of Geosciences, Florida Atlantic University
- 2009-2014: Associate Professor, Department of Geosciences, Florida Atlantic University
- 2003-2009: Assistant Professor, Department of Geosciences, Florida Atlantic University
- 2002-2003: Visiting Assistant Professor, Department of Geography and Urban Planning, Temple University

Selected Peer-Reviewed Publications


SELECTED OTHER PUBLICATIONS OR PRODUCTS/GRANTS


SYNERGISTIC ACTIVITIES

- Extensive experiences in diverse large-scale spatial modeling. Started Cellular Automata modeling in early 1990s (won the best paper award in the 3rd Chinese National Land Resource Symposium), key modeler in a NGA funded image retrieval system, leading modeler in USGS
Everglades-wide surface water modeling system, and leading modeler in network-based cluster analysis and modeling system.

- PIs and Co-PIs for multiple interdisciplinary research and teaching grants, sponsored by USGS, NPS, FFWC, FHI, and etc. Established collaborations with scientists from diverse disciplines including Biology, Computer Science, Ecology, Environmental Sciences, and Urban Planning.

- Associate Dean for Research and Partnership Initiatives, College of Science, Florida Atlantic University

- Director of Center of GIS sited in Geosciences Department, Florida Atlantic University

- Chair of Master Researcher Committee in the College of Sciences, Florida Atlantic University

- Chair of College Graduate Curriculum Committee in the College of Sciences, and College Representative in the University Graduate Program Committee and the University Graduate Council, Florida Atlantic University

- Editorial Advisory Board member of the *ISPRS Journal of Photogrammetry and Remote Sensing*.


- An invited reviewer for NSF proposals, FFWC proposal, and reviewed papers for multiple national/international journals.

**COLLABORATORS AND OTHER AFFILIATIONS**

- Brian Johnson, Florida Atlantic University
- Dale Gawlik, Florida Atlantic University
- Caiyun Zhang, Florida Atlantic University
- Len Berry, Florida Atlantic University
- Zhongwei Liu, University of Nevada
- John W. Jones, the USGS
- Aaron L. Higer, Florida Atlantic University
- Pamela A. Telis, the USGS
- L. Pearlstine, National Park Services

**Courses Taught**

- Advanced Topics in Geographic Information Systems
- Applications of Geographic Information Systems
- Programming in Geographic Information Systems
- Internet Geographic Information Systems
- Advanced Remote Sensing
- Principles of Geographic Information Systems
- Spatial Data Analysis

**Community Engagement or Out-reach**

- 2014 Participant in FAU Harbor Branch IRL Observatory Science and Technology Advisory Committee meetings, July 29, 2014. FAU HBOI, FL
- 2009 Co-presenter in one of the UNESCO Lectures (organized by USGS), June 10-11, 2009, Davie, FL
ABBREVIATED FACULTY CV

XING-HAI ZHANG

A. PROFESSIONAL PREPARATION

University of Calgary, Canada          Plant Molecular biology
Ph.D.                  1994
Michigan Technological University, USA  Plant Molecular biology  Post-doctoral
1994-1996

B. APPOINTMENTS

2009-present Associate professor, Department of Biological Sciences, Florida Atlantic University, FL.
2003-2009 Assistant professor, Department of Biological Sciences, Florida Atlantic University, FL.
1997-2003 Research associate, USDA, Photosynthesis Unit/University of Illinois, Department of Crop Sciences, Urbana, IL.

C. SELECTED PEER-REVIEWED PUBLICATIONS


D. SELECTED OTHER PUBLICATIONS OR PRODUCTS/GRANTS


E. SYNERGISTIC ACTIVITIES
2007-present  Mentor, NSF Undergraduate Research and Mentoring program at FAU.
2009  Judge, Science Olympiad (cell biology), regional, South Florida.
2007  Mentor, High School eCybermission Internship (US Army).

F. COLLABORATORS AND OTHER AFFILIATIONS
George Bowes, University of Florida, Gainesville, FL.
Vincent L. Chiang, North Carolina State University, Raleigh, NC.
C.C. Chinnappa, University of Calgary, Calgary, Canada.
Nwadiuto Esiobu, Florida Atlantic University, Davie, FL.
Marguerite Koch, Florida Atlantic University, Boca Raton, FL.
Shili Miao, South Florida Water Management District, West Palm Beach, FL.
Archie R. Portis, USDA, Urbana.
Cliff Ross, University of North Florida, Jacksonville, FL.
Ronald Sederoff, North Carolina State University, Raleigh, NC.
Herbert Weissbach, Florida Atlantic University, Jupiter, FL.
Jack Widholm, University of Illinois, Urbana, IL.

G. COURSES TAUGHT
Genetics (PCB 3603), 2014
Principle of Plant Physiology (BOT 4503/BSC 6936), 2004-2014
Plant Physiology Laboratory (BOT 4503L/BSC 6936), 2004-2014

H. COMMUNITY ENGAGEMENT OR OUT-REACH
2012-present  adviser, Biotechnology program, Spanish River High School, Boca Raton, FL.
Reviewer for “Plant Molecular Biology Reporter”, “Applied Biochemistry and Biotechnology”,
“Molecular Biotechnology”, “Plant Growth Regulation”, “Archives of Biochemistry and Biophysics”,
“International Journal of Plant Sciences”, “Biological Invasions” and other journals.
1) What is your overall assessment of your courses during the academic year?

- Answered: 10
- Skipped: 0

<table>
<thead>
<tr>
<th>Answer Choices</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very satisfied</td>
<td>20.00%</td>
</tr>
<tr>
<td>Somewhat satisfied</td>
<td>60.00%</td>
</tr>
<tr>
<td>Somewhat disappointed</td>
<td>10.00%</td>
</tr>
<tr>
<td>Very disappointed</td>
<td>0.00%</td>
</tr>
<tr>
<td>NA</td>
<td>10.00%</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
</tr>
</tbody>
</table>

2) How often did you interact with your faculty advisor during the academic year?

- Answered: 10
- Skipped: 0

<table>
<thead>
<tr>
<th>Answer Choices</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>10.00%</td>
</tr>
<tr>
<td>Weekly</td>
<td>60.00%</td>
</tr>
<tr>
<td>Monthly</td>
<td>20.00%</td>
</tr>
<tr>
<td>Once</td>
<td>0.00%</td>
</tr>
<tr>
<td>Never</td>
<td>10.00%</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
</tr>
</tbody>
</table>
3) What is your assessment of your overall interaction with your faculty advisor this academic year?

- Answered: 10
- Skipped: 0

<table>
<thead>
<tr>
<th>Answer Choices</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very satisfied</td>
<td>70.00%</td>
</tr>
<tr>
<td></td>
<td>7</td>
</tr>
<tr>
<td>Somewhat satisfied</td>
<td>20.00%</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Somewhat disappointed</td>
<td>10.00%</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Very disappointed</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td>NA</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
</tr>
</tbody>
</table>
4) Please rate how well your experience so far in the ES Program has prepared you to:

- Answered: 10
- Skipped: 0

<table>
<thead>
<tr>
<th>Activity</th>
<th>Very well</th>
<th>Fairly well</th>
<th>Adequately</th>
<th>Poorly</th>
<th>N/A</th>
<th>Total</th>
<th>Average Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effectively convey information in writing</td>
<td>30.00%</td>
<td>50.00%</td>
<td>20.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>10</td>
<td>1.90</td>
</tr>
<tr>
<td>Effectively convey information orally</td>
<td>30.00%</td>
<td>30.00%</td>
<td>30.00%</td>
<td>10.00%</td>
<td>0.00%</td>
<td>10</td>
<td>2.20</td>
</tr>
<tr>
<td>Think logically/resolve analytical problems</td>
<td>40.00%</td>
<td>30.00%</td>
<td>30.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>10</td>
<td>1.90</td>
</tr>
<tr>
<td>Apply research skills</td>
<td>40.00%</td>
<td>30.00%</td>
<td>30.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>10</td>
<td>1.90</td>
</tr>
<tr>
<td>Apply ethical standards of discipline</td>
<td>30.00%</td>
<td>50.00%</td>
<td>20.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>10</td>
<td>1.90</td>
</tr>
<tr>
<td>Present work at conferences with confidence</td>
<td>50.00%</td>
<td>20.00%</td>
<td>20.00%</td>
<td>0.00%</td>
<td>10.00%</td>
<td>10</td>
<td>1.67</td>
</tr>
<tr>
<td>Submit work for publication with confidence</td>
<td>50.00%</td>
<td>10.00%</td>
<td>20.00%</td>
<td>0.00%</td>
<td>20.00%</td>
<td>10</td>
<td>1.63</td>
</tr>
<tr>
<td>Network with others in the profession</td>
<td>30.00%</td>
<td>30.00%</td>
<td>20.00%</td>
<td>20.00%</td>
<td>0.00%</td>
<td>10</td>
<td>2.30</td>
</tr>
</tbody>
</table>
5) How would you assess the following based on your experience so far in the ES Program?

- Answered: 10
- Skipped: 0

<table>
<thead>
<tr>
<th>Category</th>
<th>Very satisfied</th>
<th>Somewhat satisfied</th>
<th>Somewhat dissatisfied</th>
<th>Very dissatisfied</th>
<th>N/A</th>
<th>Total</th>
<th>Average Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability of academic advising.</td>
<td>70.00%</td>
<td>20.00%</td>
<td>10.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>10</td>
<td>1.40</td>
</tr>
<tr>
<td>Helpfulness of academic advising.</td>
<td>60.00%</td>
<td>30.00%</td>
<td>10.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>10</td>
<td>1.50</td>
</tr>
<tr>
<td>Availability of career advising.</td>
<td>10.00%</td>
<td>50.00%</td>
<td>20.00%</td>
<td>0.00%</td>
<td>20.00%</td>
<td>10</td>
<td>2.13</td>
</tr>
<tr>
<td>Helpfulness of career advising.</td>
<td>11.11%</td>
<td>44.44%</td>
<td>33.33%</td>
<td>0.00%</td>
<td>11.11%</td>
<td>9</td>
<td>2.25</td>
</tr>
<tr>
<td>Opportunities to interact with ES Faculty.</td>
<td>50.00%</td>
<td>40.00%</td>
<td>10.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>10</td>
<td>1.60</td>
</tr>
<tr>
<td>Opportunities for graduate assistantships.</td>
<td>50.00%</td>
<td>30.00%</td>
<td>10.00%</td>
<td>0.00%</td>
<td>10.00%</td>
<td>10</td>
<td>1.56</td>
</tr>
<tr>
<td>Availability of financial support.</td>
<td>50.00%</td>
<td>50.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>10</td>
<td>1.50</td>
</tr>
<tr>
<td>Adequacy of financial support.</td>
<td>40.00%</td>
<td>50.00%</td>
<td>0.00%</td>
<td>10.00%</td>
<td>0.00%</td>
<td>10</td>
<td>1.80</td>
</tr>
<tr>
<td>Availability of the courses you wanted.</td>
<td>10.00%</td>
<td>30.00%</td>
<td>50.00%</td>
<td>10.00%</td>
<td>0.00%</td>
<td>10</td>
<td>2.60</td>
</tr>
<tr>
<td>Availability of courses at the campus you wanted.</td>
<td>10.00%</td>
<td>20.00%</td>
<td>60.00%</td>
<td>10.00%</td>
<td>0.00%</td>
<td>10</td>
<td>2.70</td>
</tr>
<tr>
<td>Availability of courses at the times you wanted.</td>
<td>0.00%</td>
<td>50.00%</td>
<td>50.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>10</td>
<td>2.50</td>
</tr>
<tr>
<td>Availability of research facilities.</td>
<td>Very satisfied</td>
<td>Somewhat satisfied</td>
<td>Somewhat dissatisfied</td>
<td>Very dissatisfied</td>
<td>N/A</td>
<td>Total</td>
<td>Average Rating</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>----------------</td>
<td>-------------------</td>
<td>----------------------</td>
<td>-------------------</td>
<td>------</td>
<td>--------</td>
<td>----------------</td>
</tr>
<tr>
<td>30.00%</td>
<td>60.00%</td>
<td>10.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>10</td>
<td>1.80</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The quality of research done in the ES Program.</th>
<th>Very satisfied</th>
<th>Somewhat satisfied</th>
<th>Somewhat dissatisfied</th>
<th>Very dissatisfied</th>
<th>N/A</th>
<th>Total</th>
<th>Average Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>40.00%</td>
<td>50.00%</td>
<td>10.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>10</td>
<td>1.70</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opportunity for research experience or application of practical skills.</th>
<th>Very satisfied</th>
<th>Somewhat satisfied</th>
<th>Somewhat dissatisfied</th>
<th>Very dissatisfied</th>
<th>N/A</th>
<th>Total</th>
<th>Average Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>40.00%</td>
<td>50.00%</td>
<td>10.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>10</td>
<td>1.70</td>
<td></td>
</tr>
</tbody>
</table>

6) Please indicate:

- Answered: 10
- Skipped: 0

<table>
<thead>
<tr>
<th>Answer Choices</th>
<th>Average Number</th>
<th>Total Number</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responses</td>
<td>0</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>How many clubs or organizations do you participate in at FAU.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Responses | 1 | 12 | 10 |
| How many outside professional organizations do you belong to. |

| Responses | 1 | 13 | 10 |
| How many conferences and workshops have you attended this semester. |

Total Respondents: 10
7) What semester/year do you expect to graduate?

- Answered: 10
- Skipped: 0

<table>
<thead>
<tr>
<th>Answer Choices</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>- 2014 Spring</td>
<td>60.00%</td>
</tr>
<tr>
<td></td>
<td>6</td>
</tr>
<tr>
<td>- 2014 Summer</td>
<td>20.00%</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td>- 2014 Fall</td>
<td>10.00%</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>- 2015 Fall</td>
<td>10.00%</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
</tr>
</tbody>
</table>

8) After graduation, do you expect to be employed in:

- Answered: 10
- Skipped: 0

<table>
<thead>
<tr>
<th>Answer Choices</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>- a government agency</td>
<td>70.00%</td>
</tr>
<tr>
<td></td>
<td>7</td>
</tr>
<tr>
<td>- a state or local corporation</td>
<td>50.00%</td>
</tr>
<tr>
<td></td>
<td>5</td>
</tr>
<tr>
<td>- a national/multi-national corporation</td>
<td>20.00%</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td>- a non-profit organization</td>
<td>50.00%</td>
</tr>
<tr>
<td></td>
<td>5</td>
</tr>
<tr>
<td>- K-12 education</td>
<td>10.00%</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>- a teaching college</td>
<td>10.00%</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>- a research college</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

Total Respondents: 10
9) What do you expect your annual salary to be after graduation?

- Answered: 10
- Skipped: 0

<table>
<thead>
<tr>
<th>Answer Choices</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $30,000</td>
<td>30.00% 3</td>
</tr>
<tr>
<td>$30,000-45,000</td>
<td>50.00% 5</td>
</tr>
<tr>
<td>$46,000-60,000</td>
<td>20.00% 2</td>
</tr>
<tr>
<td>$60,000-80,000</td>
<td>0.00% 0</td>
</tr>
<tr>
<td>More than $80,000</td>
<td>0.00% 0</td>
</tr>
</tbody>
</table>

Total 10

10) Do you have any comments about how your experience so far in the ES Program could be improved?