

## **Bahamian Conservation Biology Summer 2019**

*6-credit study abroad field course focused on the ecology,  
evolution, and conservation of aquatic ecosystems in The Bahamas*

Directors: Dr. Brian Langerhans, Dr. Nils Peterson

Field Location: Andros Island, The Bahamas

BIO 495 (Ecological and Evolutionary Dimensions of Conservation Biology in the Bahamas, 3 cr.)

FW 445 (Human Dimensions of Conservation Biology in the Bahamas, 3 cr.)

### **Course Goals:**

1. Learn fundamental concepts regarding ecological and evolutionary processes operating within the three primary aquatic ecosystems in the Bahamas
2. Evaluate the importance, procedures, and scientific foundations for conservation and management initiatives in the Bahamas
3. Learn field-based research methods and techniques
4. Conduct research project addressing important and unanswered questions, and write scientific paper describing results and implications

**Resources:** Readings, assignments, relevant links, etc. will be available on the class website at <http://gambusia.zo.ncsu.edu/bahamas.html>. Check the website frequently for updates and changes. Answers to general study abroad questions about class credit, rules, and regulations can be found on the SAO website at <http://studyabroad.ncsu.edu>.

**Overview:** The program comprises two separate 3-credit courses, but is taught as one comprehensive unit. The entire program lasts 10 weeks, including time prior to the trip (outside readings, research proposal), 2 weeks in the field, and time after the trip (data submission, research papers). Activities required before and after the trip can be conducted electronically.

**Research Projects:** Each student will be assigned to a team of multiple students. The team will conduct one of several potential projects (examples below). All students will learn the basic techniques required for all projects conducted during the course, and all students will work in all ecosystems during the course. However, each team will focus nearly exclusively on their project for approximately one week of the time abroad, working intensively to accomplish the research goals. Much of the work required before, during, and after our time on Andros will relate to these specific research projects. While we will aid in the study design and methodology (to facilitate appropriate methods for a successful project), the implementation and eventual success of the projects rest in the hands of each team. Each project investigates a novel research question that has never been addressed before, with the end goal being a quality research paper capable of being published in a peer-reviewed scientific journal. All projects are comparative or experimental studies that require data collection in the field to test fundamental hypotheses related to the ecology, evolution, and conservation of Bahamian aquatic ecosystems.

### ***Preliminary project topic examples:***

1. Inland Blue Holes: effects of predator presence on aggression behaviors
2. Tidal creeks: effects of human-induced habitat change on diel behavioral patterns
3. Human dimensions: impacts of marine protected areas on Androsians

***Project components:***

1. Literature Review: a list of readings will be assigned, but you will be expected to find and review (many) additional sources of primary literature related to your topic.
2. Proposal: you will be required to summarize the current state of knowledge regarding your topic, identify intriguing and untested hypotheses regarding your topic, and explain how you will test those hypotheses.
3. Field Research: you will conduct a field research project based on methodology described in your proposal (and subsequent modifications).
4. Data Analysis: you will statistically analyze your data to generate the fundamental results of your project.
5. Write a Scientific Paper: you will write a scientific paper based on your research findings after you return from Andros.

***Tentative Schedule:***

May 13: assigned readings and project topics posted on course webpage; complete assigned readings; based on the readings and your research interests, submit your preferred research project by 5pm on May 15 (sooner the better). Project assignment will be based on student preference and project logistics.

May 16: project and team assignments posted on the course webpage by morning; extended reading lists for each project posted on course webpage (you are responsible for reading those associated with your assigned project, and finding more literature)

May 16-18: write research proposal as a team

May 18: rough draft of research proposal due by 5pm

May 19: receive comments on rough draft, begin revising proposal

May 20-25: revise research proposal as a team

May 20: depart for Andros Island, The Bahamas!

May 25: final research proposal due, team proposal presentations that evening (~10 min)

May 25-26: revise proposal and methodology based on comments as needed

May 26-June 3: conduct research projects!

June 14: final data sets and statistical results due

June 15 – 28: work on finalizing all results, structuring paper, literature review, etc.

June 28: paper outline / rough draft and final organized data sets and final statistical results, tables, and figures due

July 12: Research Paper Draft 1 Due

July 26: Final Research Paper Due

Completion and credits assigned if/when papers have addressed all concerns noted on edited drafts. Last day for submission of final revisions is July 31.

**Grading:**

- Research Proposal: 20%
- Fieldwork Participation, Responsibility, Collegiality (professor evaluation): 20%
- Fieldwork Participation, Responsibility, Collegiality (peer evaluation): 20%
- Data Organization and Submission, Research Paper Rough Draft: 20%
- Research Paper: 20%

**Preliminary list of some major trip activities other than research projects:**

- Orientation
- Lectures and discussions in classroom prior to visiting field sites

- Visit inland blue holes, underwater observations, abiotic data-collection techniques, underwater survey methods, fish collection methods, evaluate some effects of predator-prey coevolution in these isolated systems
- Visit tidal creeks, above-water fish density survey methods, underwater community survey methods, assess some impacts of human-induced fragmentation on these systems
- Visit coral reefs and marine blue holes, underwater community survey methods, fish identification, assess effects of anthropogenic disturbance on these systems
- Visit cultural localities
- Each team gives presentation of their research plan to class