



THE DARTMOUTH OFF-CAMPUS PROGRAM IN TROPICAL BIOLOGY

<http://biology.dartmouth.edu/foreign-studies-program>

Overview

Dartmouth's Tropical Biology Program (Bio FSP) is an intensive, 10-week research-oriented program in ecological and evolutionary biology, offered in Central America and the Caribbean each winter quarter. The first 6-7 weeks are spent in Panama and Costa Rica at 4-5 field research stations, some of which are operated by the Organization for Tropical Studies (OTS), a consortium of Latin American and North American universities devoted to tropical research and education. These stations and other field sites provide access to lowland rain forest, seasonally dry deciduous forests, montane cloud forests, and high elevation paramo, as well as to tropical agricultural and forestry operations. Within each of these remarkably different ecosystems, students conduct original ecological research on questions of their choosing. This is in concert with learning to see, identify, and understand the breathtaking biological diversity. The final third of the program is in the Cayman Islands, at the Little Cayman Research Center. There the focus is on marine biology, especially coral reef ecology. Students conduct research in sea grass meadows and plankton and fish communities. Habitats are shallow patch reefs and the fringing reef, from its crest to about 60 feet depth. We use small boats, snorkeling and SCUBA to access these habitats.

Program Format

The Tropical Biology Program exposes students to a diversity of tropical environments. They study theory, research design, hypothesis testing, quantitative methods and strong inference while conceiving and conducting research projects that draw on the inspiring ecosystems in which we are living. At the field sites, our daily schedule includes hikes, lectures, and laboratories designed to facilitate the research projects that constitute the majority of our time. Students become familiar with the flora, fauna and functional complexity of tropical ecosystems. Applying the scientific inquiry process to these systems is a demanding, creative, and ultimately very satisfying experience. Students develop capacity to organize observations, formulate testable hypotheses and develop data collection protocols to address the research questions with quantitative rigor. They learn to work both independently and cooperatively, and to present seminars and write scientific papers. The development of students' scientific skills is demonstrated in the book that we publish each year with the 30-40 research papers that are written, reviewed, and revised in the format of primary literature in ecology and evolutionary biology: "Dartmouth Studies in Tropical Biology" is published annually, and is available online, and in the Biology Department.

The tempo of the Program is fast and the work intensive. Course participants (students, graduate student TAs, and faculty) are all engaged with our work from dawn to dusk, and into the evenings. Evenings are a mix of faculty lectures, student seminar presentations (on their research results), student critiques of papers from the literature, and data analysis. Everyone is fully immersed in the work, especially in the development and execution of student research projects. The field station setting allows for scheduling of class activities to fit biological rhythms, rather than academic conventions. As a

result, we are able to take advantage of such activities as studying the ecology of birds and primate at dawn; bats, tapirs, and katydids in the evening; and coral reef fauna at night.

Selection of Students

Most participants in the Program are in their junior or senior year. Students in all majors are eligible to participate, as long as they have the prerequisites (see below). Selection of students is based on their motivation for in-depth learning in ecology, as demonstrated in their lab/field courses and research experience as well as academic performance. All applicants are interviewed by the faculty teaching in the program. The prerequisites for participating in the program are BIOL 16 (Ecology) and one additional course in ecology or evolutionary biology. Prospective students are encouraged to take BIOL 16 prior to interviews in the previous winter. Additional preparatory course work can be during the ensuing spring, summer, and fall terms.

The course size is 15 students.

Teaching Faculty and Graduate TAs

The program is taught by three Dartmouth biology faculty, who rotate over the term, each of whom stays with the group for approx. 4 weeks. The current Biology FSP Director is Matt Ayres. Faculty currently teaching in the program, listed with their research interests, are: Matt Ayres (plant-animal interactions, physiological and population ecology); Mark Laidre (evolutionary ecology and animal behavior); Hannah ter Hofstede (bat ecology, animal communication, coevolution of predator-prey interactions); and Celia Chen (aquatic and marine ecology, ecotoxicology).

The teaching staff also includes two Ph.D. students drawn from Dartmouth's graduate program in Ecology, Evolution, Ecosystems and Society (EEES). The Ph.D. students are part of the group from beginning to end and make priceless contributions to the program.

Finances

As usual for Dartmouth off-campus programs, the base costs for participating students are the same as they would pay on campus. The additional costs for this Program are chiefly (1) air travel to and from Costa Rica and Little Cayman and (2) equipment for snorkeling and (and, optionally, SCUBA).

Summary

The Dartmouth Tropical Biology Program encourages students to reach beyond their familiar surroundings and consider the broad organizing principles of environmental and evolutionary biology. For many students, the Tropical Biology Program is a capstone experience and highlight of their Dartmouth education, and one that helps them to make choices for further study and professional training. Typical quotes from student evaluations include: "Best term ever", "... one of the most amazing experiences I have ever had.", "...incredibly satisfying and rewarding", "The best experience of my academic career at Dartmouth."