Amanda Lu

Students Experience Tropical Biodiversity Firsthand

Whether netting birds in Panama, searching out reptiles in Costa Rica or diving for sea stars, the 2012 spring break took students into the field to experience what they could never learn through textbooks and museum specimens alone.

Three classes from the Organismic and Evolutionary Biology department—taught largely by MCZ faculty-curators—offered all-expense-paid trips for their undergraduate and graduate students. For some, it was their first journey out of the country. For most, it was their initial exposure to the diverse environments of the Neotropical region—rainforest, cloudforest, savannah, coastal wetlands—or distinctive marine habitats like mangrove forests and coral reefs.

Even though specimens from the MCZ collections are studied in classroom settings, observing a live animal's behavior in its natural habitat is an entirely different experience. Seeing species alive and up close facilitates the learning process, bringing scientific terms and phylogenetic groups figuratively and literally to life.

Experiences in the field also engender a deeper understanding of—and sense of awe for—these rapidly disappearing ecosystems. The spring field trips will convince some students to choose an OEB concentration, attend graduate school in some area of comparative biology, or become committed environmentalists. Regardless of their future career paths, these trips imbue students with respect for the planet's biodiversity and ignite their conservation ethic.

Gonzalo Giribet

Thomas Dai

Observing Amphibians and Reptiles in Costa Rica

OEB 167: Herpetology took 21 students to Costa Rica's La Selva Biological Station, operated by the Organization of Tropical Studies; Veragua Rainforest Station, an ecotourist educational facility; and Pacuare Nature Reserve on the northeastern coast of Costa Rica. Professors **James Hanken** and **Jonathan B. Losos** led the trip, assisted by teaching fellow **Alexis Harrison** and Losos lab members **Martha Muñoz**, **Ambika Kamath** and **Katie Boronow**.

Connie Lee

Before departing for Costa Rica, Professors Hanken and Losos charged their students with the task of becoming "resident experts" in specific reptile and amphibian species. On daily hikes, students shared information about their organisms once they were encountered in the field. Sightings of crocodiles, caiman and sea turtles were especially prized, but so were rare species of frogs, snakes and lizards such as *Corytophanes*, a hard-to-find arboreal lizard.

"The herpetological diversity of Costa Rica is astonishing, and even in a week, we were able to see an enormous variety of reptiles and amphibians," says Prof. Losos. "Students had varying opinions about what constituted the highlight, but the nesting sea turtles seem to have made a deep impression on many, and most loved the arboreal herpetological prospecting by zipline."

Birding in Panama

This experience introduced 12 students of *OEB 190: Biology and Diversity of Birds* to the rich diversity of Neotropical birds, improved their abilities to locate and identify birds in the field and exposed them to a new array of habitats and a different culture. Professor **Scott V. Edwards** was assisted by two teaching fellows—**Dr. Frank Rheindt** and **Maude Baldwin**—and Euclides Campos, a Panamanian expert bird guide. Rheindt and Campos showed the group an incredible number of species—more than 200—over the course of the trip.

Days typically began with the pre-sunrise "dawn chorus" when bird activity is highest. Students continued birding throughout the day, experiencing the Canal Zone rainforest, mid- and high-elevation cloudforest, savannah and coastal wetlands. During periods of lower bird activity, the class toured research facilities; observed and assisted in mist-netting, the primary method of catching birds in ornithological research; and visited nearby towns. Species sighted included the spectacular Resplendent Queztal, a large bird with a metallic green back and extremely long tail streamers; antbirds; toucans; hummingbirds; and the Three-wattled Bellbird. The students were treated to a rare occurrence in field research when they were able to observe the Bellbirds courting and mating in the wild.

"Witnessing the diversity of the Neotropics is an eye-opening experience for many biologists," says Maude Baldwin. "Viewing the region's diversity through the lens of its avifauna, under the guidance of some of the most knowledgeable people in the world on Panamanian birds, was an incredible experience for the students and teaching staff alike."

Collecting Invertebrates in Panama

The goal for *OEB 51: Biology and Evolution of Invertebrate Animals* was to show the 14 students the sheer abundance and diversity of invertebrate animals in the wild and how these animals function and behave in their natural settings. Professor **Gonzalo Giribet** and Associate Professor Cassandra G. Extavour led the trip, assisted by two teaching fellows, Ben Ewen-Campen and **Gisele Kawauchi**.

Gonzalo Giribet

Each day, the group traveled by boat to a variety of habitats that included coral reefs, mangroves, muddy sediment, sandy-bottom habitats and rock walls. Students, equipped with full-body wetsuits and snorkels, experienced a dizzying array of animal life in marine habitats covered in live sponges, corals, brittle stars, sea urchins and other species too numerous to mention.

Gonzalo Giribet

Students were initially introduced to the most abundant and charismatic of the marine invertebrates—enormous sea stars, brightly colored sea anemones and coral reef species—and then tried to identify as many organisms as possible from different invertebrate phyla, including the small and the difficult-to-classify. During the week they spent hours collecting live animals to examine at the well-equipped laboratory facilities at the Smithsonian Tropical Research Institute in Bocas del Toro. Students especially liked the incredible out-of-this-world plankton creatures, consisting largely of larval forms of many animals that look nothing like the final forms of the adults.

"Observing invertebrate phyla in their natural habitat revealed behavior, distribution and beauty in a way that a fact sheet never could," says **Inanna Carter**, Class of 2014. "Being out in the field gave us passion and energy for dissecting specimens in the lab and learning about them in the classroom. Our enthusiasm followed us back to Harvard, and even spread to my other classes and experience of Harvard as a whole."

Glenna Clifton