



Researching in Costa Rica

by Matt Thomas '00

Waking up to howler monkeys greeting the morning, hiking past colorfully plumed toucans flying through the trees, and looking out for poisonous vipers winding through the forest, Rachel Oien '13 was part of an immersive research experience in the cloud forest of Costa Rica in the summer of 2012. Oien was one of 12 students selected to participate in a summer REU—Research Experiences for Undergraduates—that takes students to the Texas A&M University Soltis Center for Research and Education near the Monteverde Forest in central Costa Rica.

“The students will be investigating how the vegetation, moisture content, and soil composition in a tropical cloud forest interact, from the scale of an individual leaf to the entire forest,” said Texas A&M geography professor Chris Houser, principal investigator for the National Science Foundation-funded program.





Oien and the other students of the summer REU class were prepared for the experience in a two-week introduction at Texas A&M. During this time, they met with faculty mentors to produce research proposals, prepared equipment for their experiments, and participated in seminars on research methods and field safety.

After arriving in Costa Rica, the students set up monitoring stations and began collecting field data. Each of their projects contributed to the understanding of the water budget of a watershed in the forest. Outside of their own projects, the students also received lectures from participating faculty in hydrology, biogeography, climatology, geomorphology, and ecohydrology to help them understand the dynamics of the cloud forest.

“My portion of the water budget research project [centered] on soils and mapping the depth to the saprolitic tuff within the watershed,” Oien said. “It [was] very physically demanding work, repelling down 30 to 55 degree slopes in the mountainous rainforest while manually auguring a meter into the soil to acquire 100 different sample cores.”

Houser says that scientists know that cloud-forest vegetation plays an important role in absorbing water from clouds, but the amount of moisture absorbed and its impact on the rest of the water cycle is less understood. The students investigated some areas untouched by humans and other sites that have been logged or completely cleared, allowing them to investigate the role of vegetation.

“This 250-acre site allows the students to research the effects that changes in climate and in land have on the water cycle,” Houser said.

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The students’ research also provided a valuable service to the local Costa Rican communities. Since cloud forests exist near the top of Costa Rican watersheds, an understanding of the role of vegetation in the water cycle will help predict the availability of water downstream where most people live. It also will help identify how human activities have changed the cloud forest and if these activities have a negative affect on local development.

The students were in Costa Rica until July 22, after which they returned to Texas A&M for two weeks to complete their analysis and present their findings at a dedicated research symposium. This was the second year of a three-year program bringing undergraduates to the Monteverde Forest. Charles William Soltis and his wife Wanda established the Soltis Center to provide international experiences for students while protecting the unique ecological setting and creating preservation

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awareness.

“One of the best things about this internship [was] the Soltis Center,” Oien said. “Not only [did] we live in a beautiful cloud forest, the Center is phenomenal and include[d] two different labs that enable us to process all our field work in Costa Rica. This research experience, the people and environment of Costa Rica have been unforgettable.”

Matt Thomas is the Director of Media Relations and Internal Communication at Gustavus Adolphus College. After graduating from Gustavus in 2000 with degrees in Communication Studies and History, Thomas worked mainly as a sports journalist in the western suburbs of Minneapolis before returning to Gustavus in 2007.