**Program Description**

This was the first year of a 10 week REU program hosted by Texas A&M University at the newly constructed Silsits Center for Research and Education in Central Costa Rica. The broad objective of the REU program is to quantify the hydrologic and biogeochemical fluxes in the watershed of a tropical montane cloud forest (TMCF). To achieve this objective, the faculty mentors identified research needs in the following areas:

- Climate feedback with cloud forest
- Boundary layer properties in and above canopy
- Fluid of water in response to forest structure
- Biogeochemical dependence on hydro-meteorology

Students worked with their faculty mentors in Texas for 2 weeks before leaving for the field for 6 weeks. Faculty mentors worked with their students in the field for up to 2 weeks before allowing the students to take full control and responsibility of their research. The PI remained with the students for the entire 6 week period in Costa Rica.

**Research Clusters**

Student projects were initially defined by faculty and used for recruitment purposes. Students had the opportunity to refine and modify the research project to match their strengths and interests. Students were part of 5 research clusters involving 10 faculty mentors:

- Leaf to Stand Transpiration Estimates (3 students, 5 faculty)
- 3D structure of a cloud forest (3 students, 2 faculty)
- Soil-atmospheric exchange (2 students, 2 faculty)
- Atmospheric structure (1 student, 2 faculty)
- Climate variability (3 students, 4 faculty)
- Fog and cloud formation (3 students, 2 faculty)

Several of the faculty mentors and students were part of multiple research clusters and students completed an individual project within that group. Use of research clusters allowed for intensive field work and facilitated creation of social networks.

**Challenges of this first REU Abroad**

Running a REU in a foreign country has its challenges. Some of these were easy to anticipate, others were not:

- Unusually dry and sunny conditions
- Much higher frequency of snakes
- Last minute change in luggage restrictions
- Equipment held hostage in customs
- Remoteness of site
- Midnight premiere of Harry Potter in San Jose

One of the greatest challenges of a REU abroad is overcoming student perception that the field experience is a study abroad. While the focus of the program is very clearly on physical processes in a cloud forest, the students expected a greater "tourist" element.

Allowing the students more freedom to explore the country was limited by the remoteness of the center and the staggered faculty presence and activity. While the staggered faculty travel created overlap it also meant that students were always 'on' with new faculty fresh and eager to get to work.

**Research Products from Year 1**

Preliminary results reveal a strong diurnal cycle in evapotranspiration, gas flux and boundary layer development superimposed across an elevation gradient and change in forest structure. Students were required to develop a research proposal, 2 page research summary and a poster to be presented at a research symposium with other REUs at Texas A&M University. The students and faculty in the field to lead research cluster also anticipate 2 technical papers and a sap-flow research paper to be submitted for publication in spring 2012.

**Changes for Next Year**

One of the objectives for next year is to connect with faculty and students from the University of Costa Rica to increase scientific and cultural exchange with local partners. In addition we also plan to:

- Focus on closing the water budget for a watershed
- Create greater connection between clusters
- Increase diversity of applicants

**Student Feedback**

Student perceptions of the REU program were documented by K. Lemmons using the ethnographic methods of participant observation, semi-structured interviews, focus groups, and pre- and post-questionnaires as part of his dissertation research on the benefits of study abroad programs.

The students expressed the advantages gained through this REU as:

- Opportunity to work in a 'jungle'
- Ability to work and gain experience with state of the art technology alongside recognized scientists
- Training to implement and use current technology and fieldwork methods the students expressed the great experience gained through conducting individual and independent research

The relationship with the faculty mentor was also the greatest influence on their experience and whether they would continue to conduct research and pursue a graduate degree.