

## Statement of Interest:

The REU at the Smithsonian Tropical Research Institute appeals to me because it combines some of my diverse interests in biogeochemistry, molecular biology and ecology. I am drawn to the unique research opportunities offered by the Institute and the fascinating biota and culture of the region.

I am prepared to live and work in a tropical environment. I am currently living in Ecuador this semester with a host family, studying at a local university, and doing plant research as part of a study abroad program. My Spanish and my knowledge of the climate, region and culture are improving.

In terms of fieldwork, I am willing to face any obstacles that a tropical environment presents. Working at Prince William Forest National Park in Virginia, one of our many jobs was to GPS/GIS map and then eradicate wisteria, tree-of-heaven, and other invasive plant species in various sites throughout the park. This involved donning a full protective suit, gloves, goggles, and a 30-pound sprayer backpack, and hiking offtrail in the middle of the day, spraying and sawing down the invaders. Virginia summers are often over 90°F, and the protective gear made it hotter. We faced various biological nemeses; I stepped on both a wasp nest and a seed tick nest, and none of my comrades fared much better. On the bright side, working in a team was fun, and our crew of ghostbusters managed to spray all of the sites that the park's head biologist had wanted us to spray that summer. Through that experience, I learned valuable lessons about perseverance and hydration that I think will carry over to tropical fieldwork.

I am excited about the "Microbial control of tropical forest soil carbon storage under elevated temperature" project, led by Andrew Nottingham, Benjamin Turner, et al. I work in a plant molecular biology lab at Brown where I run PCR and qPCR reactions and use other molecular biology techniques. I also just took an upper-level seminar class, Terrestrial Biogeochemistry and the Functioning of Ecosystems, in which we covered production, decomposition, and cycling of N and P before moving on to discuss the global C, N and P cycles. This class not only taught me about how elements and nutrients move through ecosystems and soils, but also about the need to figure out what feedbacks constrain the amount of anthropogenic carbon that can be stored by terrestrial ecosystems in the coming years, and how much will remain in the atmosphere contributing to further warming. In class, we actually discussed some of Jerry Melillo's papers and then travelled to Harvard Forest to see his heated plots firsthand. I was really intrigued and I think that it would be awesome to work on this project.

The "Effect of fungal inoculation on seed viability and persistence in soil" project, led by Jim Dalling, would be amazing. I am enthusiastic about plant research, and I have experience with staining and microscopy techniques. Since I currently know a lot about pollen biology, it would be great to learn about seed biology and get a perspective on

another part of the plant life cycle. I also think that fungi-plant interactions are interesting. I am willing to work long, hard hours in order to get good data.

I would also be really happy investigating “The role of soil resources, belowground functional traits and species diversity in fine root biomass production in a tropical rainforest” with Andy Jones. As previously mentioned, I love plants and biogeochemistry. I also understand how crucial it is to understand belowground productivity, since ANPP is not always an accurate estimate of NPP. Also, I have a strong academic background in genetics and evolutionary biology, which would help with the DNA sequencing portion of the project.

Any of these projects would help me synthesize my academic work in various fields of biology, and doing an in-depth research project of this nature will give me insight into my future research interests and career goals. I think that, with my dedication and enthusiasm, I will contribute a lot to an STRI team.

#### Statement on Challenges:

I have been fortunate in that I am in good health and have opportunities to travel and receive a great education. This past semester was my most difficult; I faced a foot injury (recovered), a mix-up at the study abroad office, tough classes, and my family’s imminent move from Indiana to Connecticut. I am thankful for my friends and family, who I could count on when I needed them.