**Project Summary**

*Overview* - Landscapes evolve through interactions between ecosystem and geomorphic processes that mediate the production, removal, and redistribution of material. Although climate may exert a primary control on these interactions, recent works suggests that soil fertility may place important, yet rarely studied, controls on landscape evolution. ***The proposed work*** ***will investigate the relationship between soil fertility, stand-level distribution of biomass to roots and shoots, and landsliding under different temperature and precipitation conditions in the Sierra de Las Minas, Guatemala***. This proposal extends our knowledge on landslides and carbon cycling and seeks to test the *overall hypothesis* that variation in soil fertility inherited from different parent materials influences the partitioning of biomass between roots and shoots with consequences on slope stability and soil development. Variation in precipitation and temperature, however, may change the magnitude and direction of the observed differences. The proposed work is organized around three specific aims and corresponding hypotheses: 1) *Examine the relationship between soil fertility and vegetation attributes that influence slope stability*, 2) *Investigate differences in soil development trajectories in landslides underlain by different parent materials*, and 3) *Evaluate the role of different soil fertility - plant interactions on landsliding*. The aims will be developed through the combination of Geographic Information Systems and Remotely Sensed Data-GIS/RS, fieldwork, tree-ring studies, biogeochemical and geochronological analyses, and modeling. Restrepo has conducted extensive work in the Sierra de Las Minas (SLM) to quantify the distribution of landslides and their role on carbon cycling - the proposed work seeks to understand the links between ecosystem and geomorphic processes that influence landscape evolution.

*Intellectual Merit* - As the understanding of the importance of plants in driving landscape evolution has progressed, so too has the understanding of the controls on the distribution of biomass across broad environmental gradients. The *intellectual merit* of the *proposed* the *proposed work is that it will integrate basic ecosystem theory - biomass partitioning between roots and shoots - into an understanding of landscape evolution.* As such, this work will be of interest to a wide range of scholars and practitioners, including those interested in landform evolution, ecosystem and landscape development, carbon cycling, and sustainability and restoration of tropical mountainous regions subjected to landslide hazard.

*Broader Impacts* - The main broader impacts of the proposed work will be its contribution to the engagement of women and underrepresented minorities in research and outreach in a highly interdisciplinary project. This project will also contribute to the development of international collaborations and expertise and provide for the dissemination of new knowledge, including implications for landscape evolution, ecosystem functioning, and natural hazard studies, as well as for management of tropical mountainscapes. Students are likely to come from institutions within the Island, including UPR-RP a majority, minority institution. As part of the project, students will contribute to data collection, become exposed to numerous approaches and concepts, develop their quantitative and communication skills, and explore career options. Guatemalan students will be approached to discuss options for completing their work within the project. Similarly, schoolchildren and youth living in the aldea Santa Rosalia of the SLM will be engaged in the project through several activities aimed at reconnecting them with their surroundings while learning about ecological and geomorphic processes and developing quantitative skills. This proposal brings together collaborators from Guatemala, Switzerland, and the continental US who will interact in multiple ways; the field campaigns will become the venue for direct interactions whether in the field or laboratory (Centro de Estudios Ambientales y de Diversidad-CEA). For students and postdocs the SLM has been and will continue to be a fertile ground for learning diverse field techniques, developing GIS/RS skills, handling difficult living conditions, gaining international experience, and becoming culturally sensible. Dissemination of the work will take place at multiple levels. Participants, including students and postdocs, in addition to presenting their work at scientific meetings and preparing manuscripts, will be coached to communicate their work to local authorities, NGO park rangers, universities, and communities - both ladino and Maya Q’eqchi’.