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"Using Research Experiences in Bio   and

Tropical forests are one of the most critical biogeographic zones for global nutrient cycling, yet, deforestation, other poor land management, and extreme weather events are significantly altering these forests, resulting in significant damage to approximately 40% of tropical forests. The impacts of these disturbances include a rise in greenhouse gas levels, shifts in biodiversity, and altering the efficiency of carbon and nitrogen utilization and incorporation into the biota. The soil microbial communities are a critical component for the health of these forests, playing important roles in nutrient cycling and influencing plant community composition, which, together, drive the planets nutrient cycle processes. As such, understanding how these two communities will respond to environmental damage and restoration practices is a critical research area for predicting future ecosystem function and climate feedbacks. This intro course undergraduate research experience in Microbial Ecology was designed to help address this research area by having students develop research hypotheses, questions, and projects using existing soil ecosystem data on carbon and nitrogen, DNA sequence-based microbial community taxonomic data, and DNA-based functional gene analysis to assess how land management, climate change, or other environmental disturbances might be influencing these factors under different disturbance conditions in forests in Costa Rica.