

Influence of landscape and reach-scale variables on aquatic community structure in tropical island streams

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Abstract. As part of a biocomplexity project in Puerto Rico, we use river and road networks to understand the interactions between stream biota, the physical environment, and human activity. Our goal is to determine how physical and anthropogenic landscape and reach-scale variables influence patterns of aquatic biodiversity in tropical island streams. We sampled fishes and decapods at 24 sites in two watersheds and used a geographic information system (GIS) to generate landscape variables for each site. All fishes, except the goby *Sicydium plumieri*, were limited to areas in the drainage below waterfalls. Conversely, decapod species richness and abundance was higher above waterfalls, which may be a result of predator avoidance. Pool length and grain size were also important in determining the distributions of some organisms. There were no patterns evident between species richness and anthropogenic factors. Because land cover is spatially autocorrelated (i.e. agricultural and urban land covers occur at elevations below the Caribbean National Forest), it is difficult to tease apart some of the human-induced landscape influences. The location of waterfalls is the single most important factor in structuring fish and decapod communities in these watersheds.