

USING GEOMORPHOLOGICAL VARIATION TO
PREDICT LOCAL BIODIVERSITY

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ABSTRACT

A fundamental goal of many conservation activities is protection of lands that support high diversity ecological communities. In many circumstances, rapid assessment of potential biodiversity of an area is required and the luxury of an expensive and sometimes arduous field survey is not possible. The purpose of this research was to determine if variation in the geomorphology of a region can be used to predict biological diversity of woody plant species. Using a geographic information system (GIS), I derived an index to reflect spatial variation in slope, aspect, soil solum depth, soil texture and soil drainage class for each of 234 2 ha plots in the research forest at the W. Alton Jones campus of the University of Rhode Island. All plots share a common climatic regime and history of disturbance. The most recent major natural disturbances have been a hurricane in 1938, a wildfire in 1942, and massive defoliation by gypsy moths (*Lymantria dispar*) in the early 1980's. I used the line intercept and point-quarter methods to quantify the diversity of woody vegetation in 20 of the 30 plots with the highest geomorphological variation and 20 of the 30 plots with the lowest geomorphological diversity. In every plot, shrub diversity was greater than tree diversity. Mean values for all measures of woody plant diversity (except tree evenness) were significantly greater in plots with high geomorphological diversity.