

Forest Land Classification Using Isoclustering and Rule-based Approaches: An Exploratory Analysis

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Forest land (site) classification is widely used by forest managers to subdivide forest land to logical segments (landtypes), each having similar productivities for the particular timber species. Forest land classification is often based on variables such as physiographic, climate, geology, topography, soil, and vegetation. In the past, forest land classification and mapping have often relied on the expert experience and through manual processes. We tested the possibility of classifying the forest landtype associations and landtypes in the Mid-Cumberland Plateau of Jackson County of northern Alabama based on the GIS and remote sensing approaches. We tested the consistency of the computer generated forest land classification maps with the base map developed by an expert of forest land classification. We used elevation to separate the two landtype associations occurred at the study area and achieved 92% agreement. Land classes generated by isoclustering method with five variables: elevation, slope, aspect, soil texture, and soil types had low agreement with the base map. The rule-based model using the expert classification criteria with three variables: degree of drainage, distance to stream, and shape of land unit, in addition to the five variables used with isoclustering, was also not effective (20% agreement). We modified the expert criteria based on the observations of relationship between GIS data features and landtypes and communications with the expert. We also merged some small and less significant landtypes. The agreement between computer generated classification map and the base map was increased to 80%. We are currently exploring other approaches, such as statistical modeling and neural network, for the forest land classification.

Keywords: Forest land classification, GIS and remote sensing, Mid-Cumberland Plateau

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