

APPLICATION OF A DIGITAL TERRAIN MODEL FOR FOREST
LAND CLASSIFICATION AND SOIL SURVEY

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ABSTRACT

Land characterization and classification is central to sound natural resource management. Forest land classifications usually lack sufficient detail, are not scale-adjustable, and are limited in scope and applications for the spectrum of relevant management decisions. Two alternatives for forest land classification have been proposed: a multi-factor ecological land classification system (ECS) and a soil survey approach that is more geomorphic-based, comprehensive and forestry oriented than traditional classifications. Landforms influence important site factors, are easily observable features, and are relatively stable in the landscape, so are a logical base for land classification systems.

Geographic Information Systems (GIS) was used with Digital Elevation Models (DEM's) to produce Digital Terrain Models (DTM's) in the Missouri Ozarks. Terrain models produced from several DEM sources were evaluated for their accuracy in predicting slope, aspect and landforms on a 3691 ha area. The DEM's created from USGS hypsography were most accurate. Slope classes were correctly identified in 71.6% and aspect classes in 84.6% of observations. A rule-based approach to classifying landforms agreed with a field survey on 71.2% of the calibration site and 64.3% of the test site. A soil-geomorphic-ecological approach using terrain modeling proved to be an accurate, consistent, efficient and cost-effective method.