

LAND COVER OF VIRGINIA FROM LANDSAT THEMATIC

MAPPER IMAGERY

By

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(ABSTRACT)

Knowledge of land cover is important in a variety of natural resources applications. This knowledge becomes more powerful within the spatial analysis capabilities of a geographic information system (GIS). This thesis presents a digital land cover map of Virginia, produced through interpretation of 14 Landsat Thematic Mapper (TM) scenes, circa 1991-1993.

The land cover map, which has a 30m pixel size, was produced entirely with personal computers. Hypercluster aggregation, an unsupervised classification method, was used when hazy and mountainous conditions were not present. A haze correction procedure by Lavreau (1991) was used, followed by a supervised classification on coastal areas. An enhanced supervised classification, focusing on topographic shading, was performed in the mountains. Color infrared photographs, digital maplets, expert knowledge, and other maps were used as training data. Aerial videography transects were flown to acquire reference data.

Due to the spatial inaccuracies inherent in the videography reference data, only homogeneous land cover areas were used in the accuracy assessment. The results of the overall accuracy for each scene determined the ordering of scenes within the statewide land cover mosaic (i.e., scenes with higher accuracy had a higher proportion of area represented). An accuracy assessment was then performed on the statewide land cover mosaic. An overall accuracy of 81.8% and a Kappa statistic of 0.81 resulted. A

discussion of potential reasons for land cover class confusion and suggestions for classification improvements are presented.

Overall deciduous forest was the most common land cover in Virginia. Herbaceous areas accounted for 20% of the land area, which was the second largest. Mixed forest and coastal wetlands were the cover types with the least area, each under 3%.

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