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COMPARISON OF VEGETATION CLASSES IN THE  
GREAT DISMAL SWAMP USING TWO INDIVIDUAL  
LANDSAT IMAGES AND A TEMPORAL COMPOSITE

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ABSTRACT

The Great Dismal Swamp on the Virginia/North Carolina border has highly diverse vegetation, largely due to past alteration by lumbering, fire and drainage. Vegetation maps are presently being completed using National Aeronautics and Space Administration high and low altitude color infrared photographs and 1:100,000 and 1:24,000 scale black and white orthophoto bases. Having mapped the vegetation to the required precision for management needs, we are now evaluating the application potential of Landsat data to provide a cost-effective, repetitive information source for future monitoring and map revision.

Three data sets were prepared for analysis using two Landsat scenes (Image #1583-15100, February, 1974; Image #1637-15085, April, 1974) which were geometrically corrected, resampled and temporally registered by the Jet Propulsion Laboratory. All four bands were used to analyze individual dates; bands 5 and 7 for each date were used to analyze the temporal composite.

Each of the three data sets provides information on specific aspects of vegetation classification. In addition, comparison of the individual dates and the temporal composite allows further interpretation beyond the information provided by individual analyses.

Using February data, three evergreen classes may be separated; pine, Atlantic white cedar and the dense evergreen shrub community. Deciduous classes may be divided only on the basis of the ground cover: heavy evergreen understory, sparse (mostly deciduous) understory or standing water. No deciduous canopy species can be identified with February data.

Using April data, the boundaries of the pine and cedar classes become less distinct. The evergreen shrub class remains well-defined. Deciduous canopy species may be separated in areas where one species predominates.

By comparing the April and February data, stands of cypress can be identified. The overlap between pine and evergreen understory in February data can be resolved in April by leaf-out of deciduous canopy.

The temporally registered data gives classes much closer in areal extent and location to the classes mapped at 1:100,000 scale from color infrared photographs. The area classified as deciduous over standing water is almost identical to that mapped as cypress/tupelo. The pine, cedar and evergreen shrub categories separate extremely well. A large deciduous class can be identified as mostly maple with some yellow poplar, sweet gum and tupelo. In addition, a class consisting of broad-leaved evergreen shrubs, trees and vines could only be separated using the temporal data.

No single data set provided adequate information for vegetative classification in the Great Dismal Swamp. Seasonal and temporal comparisons provide approximately 70% of the desired precision in vegetative boundary determination and class separation.