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LANDSAT IMAGE ANALYSIS FOR TERRAIN INVESTIGATIONS

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A study was conducted to evaluate terrain conditions in the vicinity of Daytona Beach, Florida to facilitate selection of suitable landfill sites. LANDSAT computer compatible tapes (CCT's) were analyzed using various techniques available on the General Electric IMAGE 100 system. Atmospheric haze correction was performed by normalizing the hazy images to a standard spectral reflectance which was obtained for the Atlantic Ocean in the winter season scenes. Histogram analyses and the Image 100 (non-parametric) cellular, or parallelepiped, classification techniques were used to develop the bias necessary for atmospheric haze correction and also to establish the water signatures.

Various preprocessing techniques such as channel ratioing, normalization, and principle components (spectral) transformation were tested with split screen displays of scenes from different dates. This display format combined with channel and theme swapping between the quadrants was used for signature analysis and comparison. Slight shifts in registration affected the reliability of signatures developed from these techniques.

The most viable approach appeared to be the use of training sites for the development of reliable themes. Signatures were established for various categories in the different test scenes. Swamp and poorly drained areas with minimal vegetative cover were easily delineated for the different time periods, with some exceptions. Hardwood swamps containing bay, maple, and cabbage palm intermixed with cypress produced substantial shifts in the IR bands during the photo-synthesizing period. Flatwoods, planted pine, turkey oak, and the sandy ridge areas were not sufficiently separable spectrally to pro-

vide meaningful delineation. Lightly vegetated sandy soils did depict the lineation of relic beach ridges and other sandy, well drained zones.