

Reprinted from

**Symposium on
Machine Processing of
Remotely Sensed Data**

June 21 - 23, 1977

The Laboratory for Applications of
Remote Sensing

Purdue University
West Lafayette
Indiana

IEEE Catalog No.
77CH1218-7 MPRSD

Copyright © 1977 IEEE
The Institute of Electrical and Electronics Engineers, Inc.

Copyright © 2004 IEEE. This material is provided with permission of the IEEE. Such permission of the IEEE does not in any way imply IEEE endorsement of any of the products or services of the Purdue Research Foundation/University. Internal or personal use of this material is permitted. However, permission to reprint/republish this material for advertising or promotional purposes or for creating new collective works for resale or redistribution must be obtained from the IEEE by writing to pubs-permissions@ieee.org.

By choosing to view this document, you agree to all provisions of the copyright laws protecting it.

ANALYSIS AND LOCATION OF A FORESTLAND IN WESTERN MASSACHUSETTS FOR A DIRECT INPUT TO THE RESOURCE ANALYSIS PROCEDURE

GILES T. RAFSNIDER

USDA Forest Service, Upper Darby, Pennsylvania

ROBERT ROGERS AND ANTHONY MORSE III

Bendix Aerospace Systems Division, Ann Arbor, Michigan

LANDSAT computer compatible tapes (CCTs) were processed on the Bendix Multispectral Data Analysis System (MDAS) to produce digital files of forest resources in the western Massachusetts counties of Berkshire, Hampshire, Hampden, and Franklin. Data within the files have a north-south grid orientation, and are re-sampled to a 45 second by 60 second angular grid using nearest neighbor technique. Each file is keyed to a 7½ minute quadrangle and is directly compatible with the Resource Analysis Procedure (RAP).

RAP is a system designed to identify resource production levels, allocate available resources, and geographically locate and simulate the impact of resource exploitation. It is designed to produce maps and graphs at a cost low enough for everyday use by a variety of potential users. The linking of LANDSAT with RAP is an advance in analytical capabilities to include direct use of satellite data for resource analysis.

Processing of LANDSAT data included nonlinear geometric control of portions of two LANDSAT scenes that include 63 7-½ min quadrangles, and identification of 5 Level 1 and 10 Level 2 categories of land cover. "Ground truth" for categorization consisted of 1:24,000 scale land cover maps produced by Massachusetts Map Down. The maps show 104 land cover/land use types that were manually interpreted from 1:12,000 scale photography taken in 1972.

The two major problems encountered in the project were severe banding in the raw data, and difficulty in deftly separating hardwood from mixed wood. Sixty cycle banding is common in the more recent LANDSAT I imagery, and is especially pronounced in forested areas.

Separating hardwood and mixed proved to be unreliable because the variation in radiance resulting from uneven illumin-

ation of the hilly terrain was greater than the variation in radiance between hardwood and mixed wood stands. Separation of softwood from hardwood and mixed wood was made with confidence.