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QUARTERLY PROGRESS REPORT

FOR

LANDSAT-4 IMAGE DATA QUALITY ANALYSIS

FOR PERIOD INCLUDING

NOVEMBER 10, 1983 - FEBRUARY 9, 1984

NASA CONTRACT NAS5-26859

(E84-10134) LANDSAT-4 IMAGE DATA QUALITY  
ANALYSIS Quarterly Progress Report, 10 Nov.  
1983 - 9 Feb. 1984 (Purdue Univ.) 4 p  
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### Introduction

This report covers research carried out on Landsat-4 data under NASA Contract NAS5-26859 for the period November 10, 1983 through February 9, 1984. The primary activity in this period was completion of analysis items needed for a comprehensive paper discussing the results of the study to date. Work on a layered classifier experiment continued to complete a comparison of Thematic Mapper classification results.

### Problems

No data on contractual problems occurred during the period.

### Publications

A paper was prepared and submitted to IEEE Transactions on Geoscience and Remote Sensing, entitled "Landsat-4 MSS and Thematic Mapper Data Quality and Information Content Analysis." It is to be published in the May 1984 issue.

### Recommendations

No recommendations are made in this report.

### Funds Expended

The funds expended in the project are reported periodically by the Purdue University Office of Contract and Grant Business Affairs to the sponsor on NASA Form 533M. These are issued monthly. Specific disclosure of funds expended in this report is not a policy of the University.

### Significant Results

In the previous quarter, comparative evaluation was made of classification performance using point classifiers for TM and MSS data. Additional work has been performed using the contextual classification program 3ECHO and principal components point classification on TM data. The results for the two new cases are listed in the table below along with the results for the three cases listed in the previous report.

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Classification Accuracy and CPU Time Comparison on Test Data in the Des Moines Area.

Scene ID: 40049-16264

CLASS	TM GML Per-Point Classifier (All 7 Bands) <u>%Correct</u>	TM GML Per-Point Classifier (Best 4 Bands) <u>%Correct</u>	TM SECHO Classifier (All 7 Bands) <u>%Correct</u>	MSS GML Per-Point Classifier (All 4 Bands) <u>%Correct</u>
Forest	99.0	97.1	100.0	91.2
Corn	92.0	76.8	97.7	30.8
Soybeans	100.0	99.8	100.0	99.3
Bare Soil	99.7	99.0	100.0	55.6
Grass	96.8	87.6	98.1	1.9
Water	100.0	96.8	100.0	98.9
Urban	91.7	99.9	95.8	50.2
OVERALL	95.7	92.6	97.9	67.4

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Note that the SECHO results are better than any of the other cases. This indicates that the use of spatial in conjunction with spectral data is significant even though there is some blurring of spatial structure with the SECHO algorithm. The principal component result is unexpected as previous experience has shown that the PC result should be better than the result for the same number of features of the original data,. The reason for this is not known and this result is being investigated further.