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Contract No. NAS5-20915
Investigation No. 22280
Title: Use of LANDSAT imagery for wildlife habitat mapping in northeast
and east central Alaska
TYPE II: Progress Report

- A. Problems: Failure of NASA and EROS Data Center, U.S.G.S., to reach agreement in a timely manner on provisions for supply of LANDSAT data to the contractor impeded initial progress. These problems now seem to be resolved.
- B. Accomplishments: A data file search resulted in selection of five LANDSAT scenes for analysis. These are: 1029-20383, 1408-20435, 1734-20471, 1768-20432, and 1422-20203. Of these, digital tapes were on hand at the University of Alaska for scenes 1029-20383 and 1408-20435. Digital tape format data for the remaining three scenes were ordered from EROS Data Center in March.

Experimental design/data processing specifications were formulated during January and six facilities were invited to submit bids for data processing. Two of these, Bendix Aerospace Systems Division of Ann Arbor, Michigan and ESL, Inc. of Sunnyvale, California, responded with bids. The low bid was submitted by ESL, Inc. and that firm was awarded the data processing contract.

Methods -- The experimental design utilizes a four phase approach namely, clustering, classification, definition, and thematic interpretation.

The clustering phase involves 2% random sampling of the LANDSAT data to be analysed. These data are processed with an iterative spatial and spectral cluster routine using three standard deviation criteria.

The classification phase involves use of the resulting clusters as training sets for data classification using a maximum likelihood algorithm. Interim data products include Dicomedcompatible feature classified digital tapes, 1:63,360 scale feature classified, geometrically corrected, line printer maps, and 1:18,500 scale feature

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(E75-10367) USE OF LANDSAT IMAGERY FOR
WILDLIFE HABITAT MAPPING IN NORTHEAST AND
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Univ., Fairbanks.) 4 p HC \$3.25 CSCI 06C

classified, geometrically corrected, line printer maps. The line printer maps are for use in the definition phase and the digital tape products are for use in generation of final products.

The definition phase involves ground truth definition of the classification results. Homogenous areas of specific cluster classes are identified on the 1:18,500 line printer outputs. Ten randomly selected points are plotted within these areas and quantitative data describing the vegetation is obtained at those points. To facilitate geographic location, positive transparencies of USGS maps have been prepared to printout scale. These transparencies are overlaid and registered to the line printer output. The 1:18,500 scale output is utilized in obtaining ground data while the 1:63,360 output is utilized for collection of aerial reconnaissance data.

Following cluster-class definition/thematic interpretation will be formulated. Each class will be evaluated in terms of habitat value for moose. Based upon these evaluations, a color coded habitat map will be produced from the classified digital tapes. The digital tapes, however, will continue to remain available for subsequent revisions to the analysis or alternate thematic analyses.

Results (not "significant" yet) -- Portions of scenes 1029-20383 and 1408-20435 were processed at ESL in Sunnyvale during April and May. Total processing comprises a composite total equivalent to about 1.3 scenes. The iterative clustering technique produced 26 classes for scene 1408-20435 and 27 classes for scene 1029-20383.

During the latter part of May, ground truth areas for class definition were selected and transparent map overlays were prepared. The field effort was initiated in early June and will continue until early September. To date, activities have been confined to ground data sampling but emphasis will shift to aerial reconnaissance and photography during the seasonal period of the LANDSAT images being utilized (late August - early September).

Sixteen of the 26 classes for scene 1408-20435 have been defined and these correspond to discrete well defined feature types. With the exception of three water classes, the remaining classes defined thus far all have significantly different value in terms of moose habitat. For example, one class is mixed spruce, another is mature birch with and alder understory, still another is mid-successional birch, etc.

Similarly, 5 of 27 classes have been defined for scene 1029-20382. These also correspond to discrete, well-defined feature types.

Proposed Activity -- In late August - early September, thematic evaluations will be finalized and final products prepared as soon as possible. These may be available for use by the management agency within the next year.

After the above has been accomplished, a data file search will be initiated to identify suitable 1975 LANDSAT imagery covering the southwest portion of Game Management Unit 20. This area includes Mount McKinley National Park. One scene has been identified and tentatively selected for analysis. However, it is not a very desirable choice because extensive scattered cumulus clouds are present. If more suitable data is obtained in 1975, it will be analysed instead.

During late Fall or early Winter, scenes 1734-20471, 1768-20342, and 1422-20203 will be processed along with the scene finally selected for the southwestern region.

C. None

D. None

E. None

F. Estimated \$19,000

| G. | Value of Data Allowed | Value of Data Ordered | Value of Data received |
|----|-----------------------|-----------------------|------------------------|
| | LANDSAT 2400.00 | - | 790.00 |
| | CCT 2600.00 | 400.00 | 400.00 |

(as of June 30)

H. N.A.

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