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**APPLICATION OF LANDSAT IMAGERY IN LAND USE INVENTORY
AND CLASSIFICATION IN NEBRASKA**

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Marvin P. Carlson and Paul M. Seevers
Conservation and Survey Division
University of Nebraska-Lincoln
Lincoln, Nebraska 68588

Type II Report for Period September 10, 1975 to December 10, 1975

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Prepared for
GODDARD SPACE FLIGHT CENTER
Greenbelt, Maryland 20771

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PREFACE

This report covers the contract period September 10, 1975 to December 10, 1975, for the investigation evaluating the application of LANDSAT imagery in land use inventory and classification in Nebraska (Marvin P. Carlson, Principal Investigator, NAS5-20814).

During this reporting period LANDSAT data of usable quality has been received for the test areas. Color infrared aerial photography has also been received for the September 25 and 26, 1975 flights. Quality of the photographic products was excellent. Evaluation of the film for use in land use classification will be required, due to the late date of the flight with regard to crop growing season.

Indexing and filing of imagery and aerial photography is continuing. All growing season imagery has been received, and selection of computer compatible tapes for the test sites can proceed. Level 2 land use classification will proceed as soon as photography is indexed and evaluated.

MAIN TEXT

- A. Problems Due to grounding of NASA Houston RB-57 aircraft, uncertainty of acquisition of fall flights for the test areas was not resolved until late in the growing season. Telephone communication with Houston flight control during mid September indicated the possibility of coverage later in the month.

Our judgment at that time was that October 1 would be the absolute latest acceptable date for coverage. This date was quoted, indicating that it would be well into the late stages of crop maturity and that the probability of killing frosts increased to above 50 percent at about mid-September. Therefore, flights at the late date proposed would likely present problems if useable and may have been entirely unusable.

Coverage of the Lower Niobrara Natural Resources District was acquired by NASA Houston P-3 medium altitude aircraft on September 25, 1975. Quality of the photography was excellent. The larger scale of the September photography, as compared to the spring photography, will present no specific problem. Assessment of the photography for interpretation indicated that the vegetation was beyond optimum infrared response. Based on ground truth data evaluation, it is felt that the photography can be used to accomplish the land use interpretation by modification of the typical spring-fall crop appearance relationships. Additional tonal similarities not normally experienced in earlier coverage are present which may lower accuracy slightly.

The time frame for our receipt of coverage was approximately 60 days. Microfilm of the mission data was received in about 30 days. Order processing and film duplication at the EROS Data Center took about 30 days also.

Coverage of the Upper Niobrara-White Natural Resources District was acquired by NASA Moffett U-2 aircraft on September 26, 1975. Notification of completion of coverage was received by telephone within a week of the flight date. No further notification or microfilm of the mission data have been received as of this date. Our telephone inquiry to Moffett Field confirming the data had been forwarded to the EROS Data Center enabled us to order the coverage approximately November 15, 1975. It was indicated to us that the Moffett Photo facility did not have the capability for producing microfilm, so current acquisition procedures could not be followed.

A portion of the test area along the northern edge approximately 8 miles wide and the entire length of the test area was not obtained. Examination of the spring photography indicated that the area missed was approximately 90 percent rangeland and would present a minimum of problem in interpretation to utilize only the spring flight for the missing area. Preliminary evaluation of the data indicates it is usable for the land use classification project.

Acquisition time for the data from time of flight to receipt of photography from EROS Data Center was approximately 75 days.

- B. Accomplishments All LANDSAT imagery and aerial photography received has been satisfactorily indexed and filed. Ease of accessibility has facilitated evaluation by remote sensing personnel.

Review of the current standing order imagery request with the EROS Data Center was reviewed to determine if it is realistic relative to needs and use of data users. No adjustments were made at this time, but it was determined that periodic reviews should continue to be conducted.

The September 25 and 26, 1975, color infrared aerial photography received has been indexed and filed. Comparison of ground truth data with photography has been initiated. Preliminary evaluation of the photography indicates that the data of the 26th is usable for land use classification with a minimum of problem for the missing areas previously mentioned. The data of the 25th is also usable with a small loss in accuracy due to loss of infrared response of crops.

A briefing session and workshop on imagery acquired to date was conducted for selected staff of a co-investigating agency (Natural Resources Commission) to anticipate additional potential applications.

Staff from the Nebraska Remote Sensing Center attended the First Annual William T. Pecora Memorial Symposium at Sioux Falls, South Dakota, October 28-31, 1975. Input regarding possible use of remote sensing data in Nebraska for additional mineral and mineral fuel exploration was obtained.

- C. Significant Results No significant results were obtained during this reporting period.
- D. Publications No publications resulted from the project during this reporting period.
- E. Recommendations No recommendations are suggested at this time.