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

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Type II Report for Period Sept. 10, 1976 to Dec. 10, 1976

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Prepared for
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16. Abstract Computer compatible tapes have been received and preliminary evaluations made of data for eastern test area. Comparisons show Landsat CCT Data agree with high altitude aircraft color infrared photography for determining surface areas of water bodies. Positive transparencies present inconsistency problems. Center pivot irrigation systems can be inventoried from Landsat positive transparencies in a timely and cost effective manner.			
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Figure 2. Technical Report Standard Title Page

PREFACE

This report covers the contract period September 10, 1976 to December 10, 1976 for the investigation evaluating the application of Landsat imagery in land use inventory and classification in Nebraska (Marvin P. Carlson, Principal Investigator, NAS5-20814).

Computer compatible tapes have been received for the test area where Level II classification has been completed. Preliminary data extraction for test areas suggests multitemporal comparisons will result in at least portions of the Level II data.

Comparison of Landsat data and color infrared aerial photography for monitoring changes in surface areas of lakes in the western test area show the Landsat data to yield valid information.

Inventory of center pivot irrigation systems by optical enlargement of positive transparencies of Landsat data is being carried on in a routine manner. Data for the current year (1976) were determined for the entire state in approximately three months following receipt of all necessary imagery.

MAIN TEXT

- A. Problems Progress continues to be made regarding placing the Digital Image Rectification System package on line. We do not anticipate that it will present a major delay in data evaluation, however.

B. Accomplishments Computer compatible tapes have been received for the Lower Niobrara Natural Resources District. Level II land use classification has been completed for the area. Utilizing readily recognizable ground features, data comparisons suggest that the multitemporal approach will yield some portion of Level II data. Similar radiance levels for multiple categories will affect the accuracy level of automatic classification. Interpreter interaction with the classification process will raise the accuracy level. The preliminary investigation also suggests that interpreter interaction with ratioing of radiance levels of multitemporal data may also provide additional classification accuracy.

Preliminary evaluation of Landsat data was also carried out to determine its usefulness in monitoring changes in surface areas of lakes in the western test area. Comparison of data of equivalent time frame of areas of lakes determined from high altitude aircraft color infrared photography with areas determined by Band 7 computer compatible tape data show good agreement. Evaluation of enlargements of positive transparencies for the same date as the computer compatible tapes shows that area measurement cannot be as consistently accurate utilizing the positive transparencies. Apparently the extreme contrast between the water bodies and their surrounding area causes a 'bleeding' effect in the production of the positive transparencies. This 'bleeding' effect causes an indistinct boundary for the water body. Inter-

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pre-ter decision as to the exact boundary for the water body creates an inconsistency in area measured. It is anticipated that this phenomenal would affect electronic density slicing for area measurement in essentially the same manner.

Inventory of center pivot irrigation systems for the state of Nebraska from Landsat positive transparencies is being carried out in a routine manner. Optical enlargement of the positive transparencies through a Bausch and Lomb Zoom Transfer Scope and superimposing of the image on a 1:250,000 topographic sheet allows for accurate placement of systems geographically as well as creating a numerical count. Inventory of the current year (1976) was completed in about three months following receipt of all necessary imagery. Use of Landsat data allows this data to be accumulated in a relatively short time frame. Since this type of inventory has never been attempted in any other way it is difficult to judge the advantage of Landsat data over conventional means of inventory. It is likely that this inventory would not be attempted in any systematic manner if Landsat data were not available.

Remote Sensing Center personnel attended the conference on Data Processing at the Jet Propulsion Laboratory, California Institute of Technology, Pasadena California in December.

- C. Significant Results Center pivot irrigation systems can be inventoried from Landsat data in a timely and cost effective manner.
- D. Publications No publications resulted from the project during this reporting period.