Type II Progress Report:

Period June 1 to August 31, 1975

Earth Resources Evaluation for New Mexico by LANDSAT-2

(Follow-on Investigation #23370)

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NASA Contract No. NAS5-20916

Introduction

The objective of this study, as outlined in the original proposal, can be briefly described as an evaluation of the use of LANDSAT-2 data in conjunction with supplementary photos, maps, and field investigations as an aid in managing the natural resources of New Mexico. Emphasis is on the study of mineral resources, geologic structures, landforms, and land-use surveys.

The P. I. was changed at the end of the reporting period from Karl Vonder Linden to David Tabet since Dr. Vonder Linden is no longer involved with the LANDSAT investigation. Sandra Feldman left the investigation during the reporting period for a six month leave of absence. Her work will be continued by Linda Love of the Technology Application Center in Albuquerque.

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Accomplishments

In early June, Michael Inglis and David Tabet attended the NASA sponsored Earth Resources Survey Symposium held in Houston, Texas. Michael Inglis and David Tabet also attended a meeting in Santa Fe, New Mexico with representatives of the Federation of Rocky Mountain States and representatives from various federal, state, and local agencies to discuss the participation or cooperation of the various agencies in a computerized LANDSAT-2 land-use mapping project of four quadrangles that is being conducted by the Federation and the New Mexico State Bureau of Mines and Mineral Resources. Cooperation in this project has come from the U. S. Bureau of Land Management, the New Mexico State Planning Office, Natural Resources Division, and the City of Santa Fe Planning Office. Work on the Bureau of Mines state-wide land-use map, being done by visual methods, has continued and a land-use map of the state should be completed by the end of the next reporting period.

In the meantime, work has progressed on the application of LANDSAT data to mineral exploration in the Middle Rio Grande Valley with the visual study of black and white and color composite LANDSAT-1 images of the area and the making of a lineament map of the area at a scale of 1:1, 000, 000. This map was compared with the available geologic maps and aerial photos of the area; localities of known mineralization were also noted. Field checking of the lineaments not found on the published geologic maps was put off awaiting the arrival of photos from a high altitude mission flown over the area on May 7, 1975.

Problems in processing the film delayed the arrival of the prints and transparencies until after the end of August.

A structural study of the Mogollon-Datil volcanic field of southwestern New Mexico using LANDSAT imagery was also begun with special emphasis placed on identifying circular features, possible cauldron complexes or buried stocks that may have acted as sources for mineralizing fluids. This work, an extension of the Middle Rio Grande project, will hopefully provide a structural framework for mineral exploration in this remote, geologically complex region.

Significant Results

The Middle Rio Grande project has not yet progressed to the point where mineral exploration sites can be chosen; however, there does appear to be some correlation between the known structure and mineral deposits and the LANDSAT lineament map. Interestingly, a circular feature identified in the southern Magdalena Mountains on LANDSAT-1 imagery agrees well with the location of a newly proposed cauldron complex according to Charles Chapin (personal communication).

Several recognized and unrecognized circular features have been identified on LANDSAT-1 imagery of the Mogollon-Datil volcanic field. A check of the aeromagnetic maps available for that part of New Mexico found that the circular features on the LANDSAT imagery showed up as areas of generally high magnetic intensity.

Publications and Talks

No papers have been published or talks given during this reporting period.

LANDSAT and Aircraft Imagery

At present, 42 scenes have been received since the initiation of the contract, providing us with fair to excellent coverage of about 40% of the State of New Mexico. The area outlined by the revised coordinate specifications on our order has caused us to receive a number of images, falling within the southern part of the coverage area, providing coverage of western Texas and Mexico, but not of New Mexico. It would be preferable to have the present four coordinates further revised to the following ones:

Latitude	Longitude
37° 00' N	103° 00' W
37° 00' N	109° 05' W
31° 25' N	109° 05' W
31° 25' N	108° 20' W
31° 75' N	108° 20' W
31° 75' N	106° 45' W
32° 00 N	106° 45' W
32° 00 N	103° 00' W

Contact color prints and transparencies were ordered for the whole roll of film taken during the high altitude flight over the Middle Rio Grande Valley on May 7, 1975. Problems with processing of the film delayed the arrival of the imagery ordered until September 12, 1975. The color transparencies are of good quality, but the color prints are being returned to the EROS Data Center to see if something can be done about the dark quality of the photos.

Data Use

	LANDSAT Acct. #G23370	Aircraft Acct. #GW3370
originally allowed	$1900	$1045
recent allotment	+$3400	+ NA
orders received	-$ 418	-$ 664
balance	$4882	$ 381