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An Interdisciplinary Analysis of Multispectral  
Satellite Data for Selected Cover Types in  
the Colorado Mountains, Using Automatic Data  
Processing Techniques.

EREP S398

Monthly Progress Report for February 1974

NASA Contract NAS 9-13380

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E74-10376) AN INTERDISCIPLINARY ANALYSIS  
OF MULTISPECTRAL SATELLITE DATA FOR  
SELECTED COVER TYPES IN THE COLORADO  
MOUNTAINS, USING AUTOMATIC DATA PROCESSING  
(Purdue Univ.) 5 p HC \$4.00 CSCL 08F

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Unclas  
G3/13 00376

B. Recommendations

None

C. Expected Accomplishments

Film from SL-1/SL-3 will be sent to Mead Technology in Dayton, Ohio for digitization. After digitization a comparison will be made among the various bands of digitized photography and the MSS data.

D. Significant Results

One of the most important aspects of satellite imagery for geologic investigations is the synoptic view of the earth's surface. Large scale features, which were not apparent from photomosaics, geologic and topographic maps and other relatively large scale images, become apparent in some cases and plausible in others. One capability which has been recognized by many geologists working with space photography is the ability to see linear features and alignments which were previously not apparent. To the exploration geologist, major lineaments seen on satellite images are of particular interest. Levandowski, et al, (1973) and Badgely (1962) believe these major lineaments represent deep fractures in the crust which have controlled the tectonics of an area.

With this in mind a portion of ERTS frame 1407-17193 (3 Sept. 1973) was used for mapping lineaments (Figure 1) and producing an iso-lineament intersection map (Figure 2). SKYLAB photography over the area of prime interest could not be utilized as planned for this portion of the study due to snow cover on the SL-2 frames and cloud cover on the SL-3 frames. Once the lineaments were mapped, a grid with 2.5 km spacing was overlaid on the map and the lineament intersections occurring within each grid square were counted and the number plotted in the center of the grid square. These numbers were then contoured producing a contour map of equal lineament intersection, i.e. an iso-lineament intersection map.

It is believed that the areas of high intersection concentration would be the most favorable area for ore mineralization if favorable host rocks were also present. These highly fractured areas would act as conduits for carrying the ore forming solutions to the site of deposition in a favorable host rock. Two of the six areas of high intersection concentration on the iso-lineament intersection map are over areas of present or past mining camps and small claims are known to exist near the others. These areas would be prime target areas for future mineral exploration using geophysical and geochemical exploration techniques.

MONTHLY PROGRESS REPORT  
For February 1974

A. Overall Status and Progress to Date

A.1 Conferences with personnel of potential user agencies have established several affirmative working relationships. The Photo and Mapping Division and the Multiple Use Division of Region 2, U.S. Forest Service indicated a strong interest in evaluating information derived from SKYLAB data. Of particular interest is the San Juan Mountain area where development pressures are increasing and other land-use policies are being examined. Several additional meetings to discuss current remote sensing data analysis capabilities were planned for March.

The Denver Service Center of the National Park Service is currently involved with long-range planning for Mesa Verde National Park. This national park was included in the coverage of the S-190B by SL-2 on June 5, 1973. The interdisciplinary planning team for Mesa Verde N. P. stated that they would like to be involved in a cooperative effort to evaluate SKYLAB data. Again several meetings were planned for March.

Vegetation maps for the following U.S.G.S. quadrangles have been completed by INSTAAR.

SL-2 Site

Pagosa Peak  
Pagosa Springs  
Oakbrush Ridge  
Chris Mountain  
Bear Mountain  
Devil Mountain  
Granite Peak  
Baldy Mountain

SL-3 Site

Weminuche Pass

A.2 Digital magnetic tapes from the MSS of the NC-130 (Mx 247, 4 August 1973) were received on 1 February 1974. Six portions of flightlines were included in the data order. Reformatting of the tapes from the bulk to LARSYS 3 format will be finished during March. Preliminary data analysis procedures will include a channel evaluation and feature selection study.

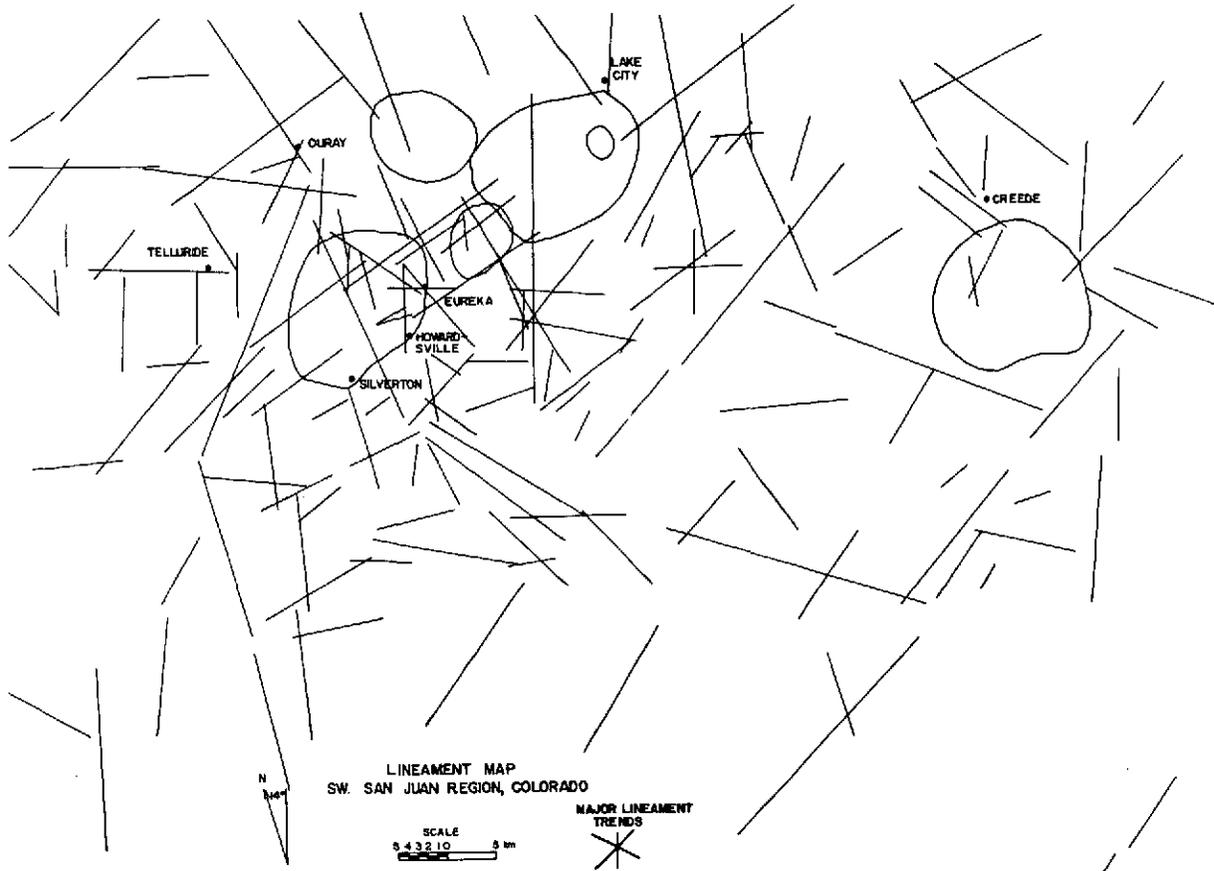


Figure 1

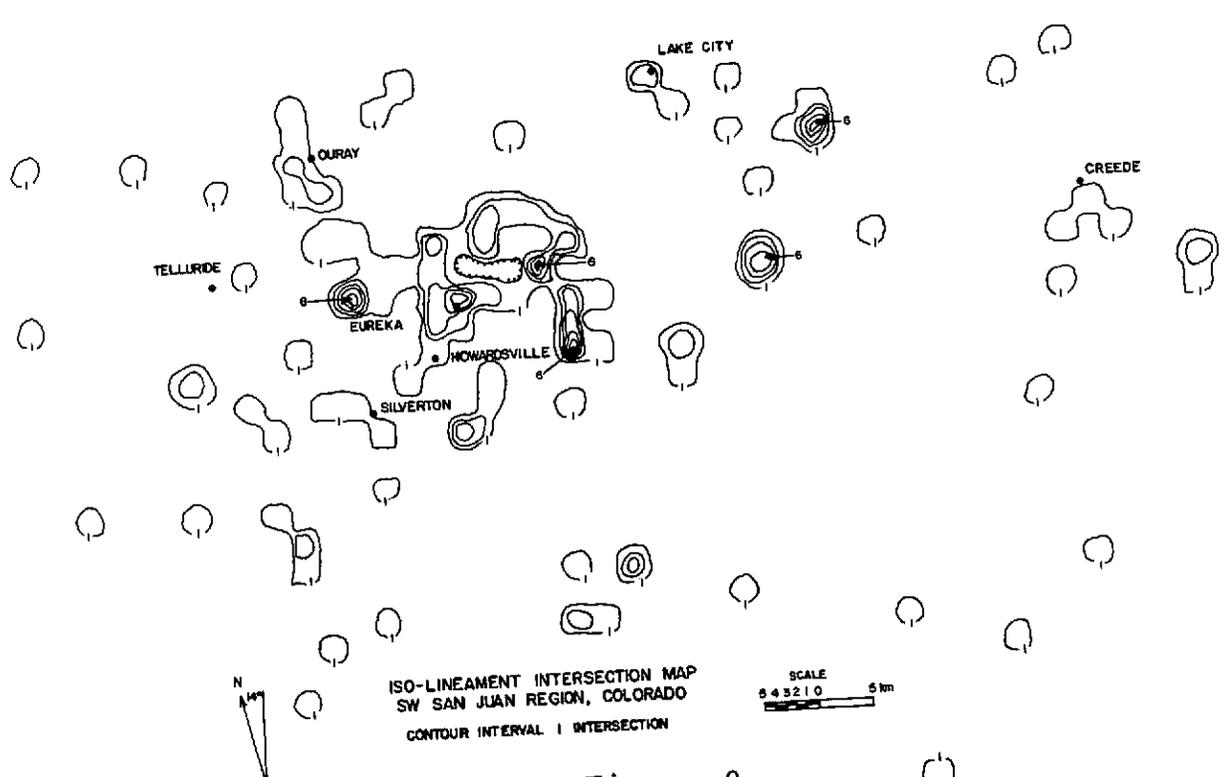


Figure 2

E. Summary Outlook

The project is continuing with a skeleton crew. Personnel additions will be made on April 1, 1974.

Harry Hitchcock will be traveling to Mesa Verde in early March to work with National Park Service personnel on evaluating current classification results, verify photo interpretation of S-190B photography, and plan future cooperative efforts.

F. Travel Summary

Dr. R. M. Hoffer traveled to Denver, Colorado on February 18-21, 1974 in conjunction with an ERTS contract. He discussed user agency applications of remote sensing data, including SKYLAB MSS data and photography, with the U.S. Forest Service and the National Park Service personnel.