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Johnson Space Center  
Houston, Texas

From: Colorado School of Mines  
Department of Geology

Subject: Progress Letter Report for period 1 July 1973 to  
31 July 1973

Title: Geologic and Mineral and Water Resources Investigations  
in Western Colorado, Using Skylab EREP Data (Contract  
No. NAS 9-13394, Proposal No. EREP 380)

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#### INTRODUCTION

The primary objective of the CSM Skylab Program is to analyze EREP data for geologic information. To this end, the research has been subdivided into the following tasks:

- Task I. The PI shall assist NASA/MSC in mission planning activities related to the proposed investigation.
- Task II. The investigator will screen all EREP data obtained over Colorado and will select frames for detailed study.
- Task III. The investigator will prepare photogeologic maps using selected S-190 photographs, and will analyze them to determine what geologic information may be contained in them.
- Task IV. The geological interpretations obtained in task 3 will be compared to interpretations obtained from S-192 imagery, and to interpretations made from ERTS-I imagery.
- Task V. The geological interpretations will be verified by means of interpretation of aerial photographs, published geological reports, and field observations.
- Task VI. The investigator will prepare recommendations for the optimum type, scale, and resolution of imagery to be used for studies of regional geology and exploration for mineral deposits and water resources.

#### Past Month's Activities

EREP data product requirements were defined and transmitted to

E73-10918) GEOLOGIC AND MINERAL AND  
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Progress Letter Report, 1-31 (Colorado  
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the PIMO.

Work continued on the final geologic map and report of the Bonanza Regional Geology Test Site. The final product is now about 75% complete.

Investigation proceeded on making a photo-mosaic of the relief maps of Colorado. Several problems of technique have been overcome and a final product is forthcoming.

Evaluation of ERTS imagery over Skylab tracks in Colorado continued. Comparison of a regional map of Eocene faulting and drainage in the intersection of Skylab Tracks 30 and 48 with image interpretation revealed that approximately 50 percent of the mapped features were expressed as linears.

The study of shadow enhancement of linears continued with extension of the theory of D.U. Wise and application to photographs of selectively illuminated relief maps. Most interesting are the aligned, discontinuous linears revealed subparallel to the illumination direction. The topography underlying the segments often is not as strongly parallel, and the associated linears will not persist at other illumination directions. The problem was further studied by producing a map of randomly generated linears and evaluating the significance of the trends. Several trends were apparent to the eye and were generally mildly significant in the statistical test.

#### Planned Activities for Current Month

Progress of Skylab 3 will be monitored, with input to PIMO where appropriate.

Skylab 2 data will be indexed and screened, as received, and geologic photointerpretation will begin.

The BRGTS study will continue toward completion.

The study of lineaments and geologic fracture patterns will continue, probably with the initial correlation to EREP photography.

Travel

No travel costs were incurred during July.

Planned travel for August consists of one trip by PI to the San Juan (Tracks 34, 30) field area.

*Daniel H. Knepper for*

Keenan Lee

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