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DETECTION AND MAPPING OF MINERALIZED AREAS IN  
THE CORTEZ-UINTA BELT, UTAH-NEVADA, USING  
COMPUTER-ENHANCED ERTS IMAGERY

TYPE II PROGRESS REPORT

(E76-10410) DETECTION AND MAPPING OF  
MINERALIZED AREAS IN THE CORTEZ-UINTA BELT,  
UTAH-NEVADA, USING COMPUTER-ENHANCED ERTS  
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A. Problems.

Estimates of surface mineralogy have been made for approximately 75 percent of the samples collected at field spectrometric sites. However, refinement of the surface composition determinations is proving quite difficult. The main problems are the fine grained textures of the surface materials, thinness of surface coatings, and mixing of some species.

Attempts to determine the areal distribution of vegetation is being hampered by the lack of high resolution photographs of most of the test sites. This problem may be alleviated, however, if the anticipated photographs from the 24-channel flights are acquired.

B. Accomplishments.

1. The geometric inadequacies of most film recording devices have been a serious problem for analyzing color-ratio composites at large scales. This problem now appears to have been resolved by using a Geospace 34/10 recorder to generate 28/30 inch ratio images, which can be registered pixel by pixel.

2. X-ray and thin section studies of spectrometric samples are approximately 75 percent complete.

3. Detailed analyses of color-ratio composites of half of the test sites are underway.

### C. Significant Results.

Although MSS color-ratio composite images are being widely employed for reconnaissance mapping of limonitic altered rocks and soils, their value for detailed mapping is commonly limited by inadequate registration of the ratio images. The most obvious means of obtaining the necessary spatial precision is to play back selected parts of the scene at large scales. However, this approach requires repetitive digital computer as well as photographic processing, thereby substantially increasing the total processing cost.

Another approach, which is being evaluated as part of this experiment, utilizes large-scale black-and-white ratio images with high geometric precision. These images, made by a Geospace 34/10 processor at a 28x30 inch format or approximately 1:300,000 scale, have a precision of .005 inch across the diagonals. Evaluation of a color-ratio composite image of south-central Nevada (scene ID E1072-18001) using ratio images recorded at this scale shows that the respective pixels are registered throughout the scene. Thus, reconnaissance mapping can be carried out for the entire scene at 1:300,000 scale and then at larger scales by analyzing photographic enlargements of the original color-ratio composite image. The advantages of this approach are elimination of repetitive computer processing and considerable flexibility as to specific scales. Analysis of the test sites selected for this experiment will be conducted using these high-precision color-ratio composite images at scales ranging from 1:1,000,000 to 1:62,500.