

T-65553

United States
Department of the Interior
Geological Survey

July - August 1973

Skylab Report: "Remote Sensing Geophysics from Skylab" #487

Previous Status

E73-10998
CR-133779

On June 3 Skylab collected data on track 6 over our revised test site in Nevada. On June 5th and 6th the NASA aircraft flew the Skylab ground track. The mission was supported by extensive ground and aircraft measurements by the USGS including aerial oblique and ground stereo photography, ground moisture content measurements, aircraft and ground radiometer measurements, sample collection and detailed field examination during the week of June 4th.

Progress during July

The aircraft data was received including:

70 mm photography - 4 AMPS bands

- color

- color IR

9" photography - color

- color IR

thermal imagery - daytime

- nighttime

Initial screening of this data was performed and it was judged good for geologic analysis. The data was cataloged and plotted on base maps together with the oblique 35 mm color photos obtained on our overflights. Selected AMPS frames were chosen for more detailed analysis which appear to contain both altered zones and diverse rock types. These frames will be processed by digitizing the scene brightness and color compositing the ratios of several bands to enhance subtle differences

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(E73-10998) REMOTE SENSING GEOPHYSICS
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in color which may be associated with difference in composition and mineralization. Similar analysis is planned for the Skylab data when received.

Progress during August

Skylab data from the June Overflight has been received including:

1) S190A - 4 AMPS bands

- color

- color IR

2) S192 - bands 2, 7, and 11

The Skylab data was cataloged, enlargement prints were made of the color frames and photogeologic comparison was begun using both aircraft and satellite multispectral and thermal data to assess their quality and to select optimum target areas for detailed analysis.

A new computer thermal model was also developed which will result in a significant reduction in computer processing time to map thermal inertia differences. Current plans are to apply the model to selected units which are displayed in the day and night aircraft thermal images.

During this month Larry York, NASA/JSC visited us to discuss the current status of the Skylab experiment.

Problems

1. The failure, so far, to obtain usable thermal data from S192 is a major disappointment. Skylab would have provided a significant improvement in spatial resolution (80 m) over currently available satellite thermal data (Nimbus IV - 8 km; NOAA II - 900 m; Nimbus V - 600 m.) Only NOAA II is currently collecting data and so far we have

not been able to obtain digital data. A major part of our experiment involves thermal inertia mapping from space, for discrimination of geologic materials and recognition of rock types which are important host rocks for mineralization. The lack of usable thermal data will have a significant impact on our analysis.

2. No S190B data was acquired during the Skylab pass over our site. This may limit the photogeologic analysis for rock type discrimination.

3. The 35 mm format of the S192 bands limits their usefulness. (The scan line at this scale are roughly 2 μ m). We plan to do photographic enlargement for our analysis purposes - hopefully without introducing significant distortions.

Requirements

We wish to request the remaining bands of S192 (bands 1, 3, 4, 5, 6, 8, 9, 10, 12) for analysis of rock type discrimination and recognition of mineralization zones due to spectral reflectance contrast. Band 12 should be particularly interesting since we have recognized reflection anomalies in volcanic units on previously acquired aircraft data in this spectral region.

Financial Report

	July	August	(September-estimate)
labor (prof)	6247	3123	3123
(clerical)	125	125	125
supplies	500	500	500
computer	300	500	500
travel & field	1200	-	-
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Total	8372	4248	4248

First Quarter Total (estimate) = \$16,868