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GEOLOGIC APPLICATION OF THERMAL INERTIA IMAGING USING HCMM DATA

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16. Abstract

During the April-June 1980 quarter of the JPL/HCMM Investigation the majority of HCMM data tapes required for the study was received and preliminary processing done. Several additional areas of interest were chosen and tapes ordered. Upper air data for days of satellite coverage were received for incorporation into JPL models. A thermal inertia image of one data set was created and further processing produced images on which areas of altered rock at one test site were identified and various sedimentary units at another site were distinguished.

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Introduction

The JPL/HCMM Investigation is a study of the feasibility of using thermal inertia, inferred from remotely sensed temperature data, to complement Landsat reflectivity data for reconnaissance geologic mapping and mineral exploration.

During the April-June 1980 quarter of this investigation the bulk of ordered HCMM data tapes was received and processed and a thermal inertia image of one data set was made. Additional areas of interest were identified on the HCMM photographic products and data tapes for these areas were ordered. During analysis of selected subareas various sedimentary rock units were distinguished in the Death Valley, California test site and areas of altered rock identified in the cuprite/Goldfield, Nevada test site.

Problems

None

Accomplishments and Significant Results

The bulk of HCMM data tapes, ordered during previous quarters, has been received, logged and images created. These images are now being evaluated and subareas are being chosen for further processing and calculation of thermal inertia using JPL models. A thermal inertia image using the July 17, 1978 data set, including HCMM and ground truth data, has been made of the Goldfield, Nevada test site.

Several additional data tapes have been ordered of areas of interest identified on the HCMM (quick look) photographic products. These include the San Rafael Swell area in Utah where considerable geologic remote sensing has already been done using other types of data.

Additionally, upper air data for all the dates of interest have been acquired from the National Climatic Center, Ashville, North Carolina and will be incorporated into the JPL models.

Interactive processing was used to choose subareas of the July 17 and 22, 1978 data sets. Hard copy prints were made and on these areas of altered rock in the Goldfield/Cuprite, Nevada test site were identified and various sedimentary units in the Death Valley, California test site were distinguished.

Presentations

Michael Abrams attended the HCMM Investigators Program Review at Goddard Space Flight Center on June 16, 17, 1980 and presented a progress report on the JPL/HCMM Investigation to date. He reported on investigations relating thermal inertia derived from HCMM data to rock type discrimination, measurements obtained with the new thermal inertia meter, and progress on the thermal inertia modeling studies.

Programs for Next Reporting Interval

During the next quarter acquisition of all necessary and appropriate data and its preliminary processing will be completed. A comprehensive study and analysis of the geologic application of all acquired HCMM data will continue.

Recommendations

None

Conclusions

None