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II

HCMM TYPE II REPORT (NOVEMBER 1, 1977) 7.8-10036

CR-155258

A. TITLE: APPLICATION OF HCMM SATELLITE DATA TO MINERAL EXPLORATION

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E. PERIOD: JULY 1-OCTOBER 31, 1977

******* TEN (10) COPIES TO BE MAILED TO TECHNICAL MONITOR

(E78-10036) APPLICATION OF HCMM SATELLITE DATA TO MINERAL EXPLORATION Progress Report, 1 Jul. - 31 Oct. 1977 (Stanford Univ.) 5 p HC A02/MF A01 CSCL 08G

N78-13508

Unclas
G3/43 00036

HCM_014

A. PROBLEMS

U-2 PHOTOGRAPHY : The quality of the B & W, multiband photography positive copies received by us is really so poor as to be essentially useless.

The format of these films is with FOUR lens images on a single 9 X 9 inch width of film. This set of positives has two of the lenses out of focus (#2 and #3) so that their images are badly blurred. Whether this is in the original film transport, or in the subsequent production of the positives, is not clear. In addition the positives are often spotted, from what seems to have been scratches or dirt on the negatives, and that also leads to their poor quality.

I would prefer to have the negatives examined closely (especially #13 and 26 over my target), to ascertain if better quality transparency prints can be made, before I work with them any further.

B. ACCOMPLISHMENTS

See text.

C. SIGNIFICANT RESULTS

See text

D. PUBLICATIONS

None.

E. RECOMMENDATIONS

None

F. DATA UTILITY

Too early to say as yet.

HCMM TYPE II PROGRESS REPORT

S. E. Marsh
M. Keller
W. Kowalik
R. J. P. Lyon

October, 19, 1977

1. WORK ACCOMPLISHED

Field measurements coincident with U-2 and P3(MMS)data acquisition were made August 8-9, 1977 at two specific sites near Yerington, Nevada. Our research objectives were to investigate the relationship of thermal parameters (to define rock density), for mineral exploration. The mission was designed to correlate overflight data over Yerington to three local ground calibration sites, and thence to further test the validity of our thermal models.

In order to meet these objectives many types of data were collected every 30 minutes over a 24 hour period. Temperatures of the soil surface were measured using thermal-couple sensors, and PRT-4, and PRT-5 radiation temperatures were recorded. The field team also recorded soil temperatures at various depths, net radiation, and radiant flux incident upon the ground surface. Exotech (LandSat band) radiometers were employed to measure surface albedo. Other data described the local meteorological conditions included the air temperature just above the soil-air interface and approximately one meter above the soil, near surface humidity, wind velocity, and percent cloud cover. Soil moisture samples were taken at depths corresponding to soil temperature probes.

A. MAIN DUMP SITE (ANACONDA WEED HEIGHTS MINE)

The main data recording station was located on the Anaconda Co.'s waste rock dump south of the Yerington open-pit near a level access road. The station was located on uniformly crushed rock (now with a consistancy similar to that of poor grade concrete), covering about 0.5 sq. miles. No vegetation was visible on or near the dump site. Two sets of temperature probes were placed beneath the surface, and

for each. PRT-5 measurements were made to determine the surface temperatures.

B. LEACH POND SITE (ANACONDA WEED HEIGHS MINE)

Additional measurements were made at a large, water-filled leach pond near the dump site. Two recording thermometers were used to record the temperature of the leach water continuously during the 24 hour data collection period.

One probe was placed 4 inches from the bottom of the pond approximately 10 to 15 feet away from a large outlet pipe from which the flow was heavy but nearly constant. The second probe was placed 5 inches from the pond bottom in a calmer area away from any constant flow. Both probes were mounted in separate wood blocks and both placed a few feet from the shore.

In addition, at the Main Dump site a well insulated wooden box, (18"x18"x18"), was filled with dry Ottawa sand which has known thermal parameters, including thermal inertia. Temperature measurements of the surface and at various depths were recorded during the 24-hour period.

C. MACARTHUR SITE (ANACONDA, NORTH PROSPECT)

The second recording station was located at the Anaconda Co.'s Macarthur prospect on a desert wash covered with sparse vegetation. Similar measurements as recorded at the dump site were again made at this site, which was about 4 miles north of the others.

2. CONTINUING RESEARCH

Field measurements coincident with acquisition of the P3(MMS) scanner data will be used to correlate the known thermal conditions and properties at the test sites to the surrounding areas. The data collected from the "sandbox" (with a known thermal inertia) will be used to verify recorded or assumed meterological conditions.

The acquired data can thus be used with the our thermal property

models available at Stanford to check their veracity and reproducibility. Ultimately we wish to determine if these models can be used in a predictive mode for thermal property determinations.

3. DATA RECEIVED TO OCTOBER 20, 1977

U-2: calibrated thermal and visible HCMR data
Flight 18 2132-2138
19 1136-1142
IIS, Multiband, B/W Photography 2 flight lines
(VERY POOR QUALITY, out of focus on two sets of lenses)

P3-MMS: Visicorder paper products
Paper Strip Charts
Lo5-4000496 and 497
Lo5-4000498 and 499
Zeiss color positive film (EXCELLENT QUALITY)
Mission 366 Roll 11 Frames 103-203

4. DATA RECORDS REQUESTED AT OCTOBER 20, 1977

P3 (MMS) DIGITAL DATA TAPES, FOR SIX CHANNELS AT LEAST,

GMT	220:10:18:00	to	10:21:45	03:45 minutes
	:10:30:37	to	10:34:20	03:43
	:22:15:34	to	22:19:16	03.42
	:22:29:20	to	22:33:00	03:40