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URBAN AND REGIONAL LAND USE ANALYSIS: CARETS AND CENSUS CITIES EXPERIMENT PACKAGE

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MONTHLY PROGRESS REPORT

Harry F. Lins, Jr.
U.S. Geological Survey
Geography Program
Reston, Virginia 22092

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Principal Investigator
Robert Alexander
U.S. Geological Survey
Reston, Virginia 22092

NASA Technical Monitor
John T. Wheeler
Technology Utilization Officer
NASA-Manned Spacecraft Center
Houston, Texas 77058

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a. Overall status, including problem areas and significant progress to data:

a.1. CARETS--Land use analysis: No change

a.2. CARETS--Land use climatology: Since the last reporting period data from the S-192 system has, at long last, begun to arrive. To date we have received the S055-4 false color image of band 13 and the S051-3 tapes. A "quick-look," qualitative evaluation of the false color image was performed. At first glance the scene did not appear to contain very much information. However, under magnification considerable detail became evident. Eight colors describe the scene. In order of increasing temperatures they are black, blue, green, red, cyan, magenta, yellow, and white. The following table presents apparent color/land use associations for thermal band, SL3, August 5, 1973.

Color	PCM Counts Low	PCM Counts High	Apparent Associated Land Use
White	156	255	- primarily associated with urban areas - prevalent in agricultural regions
Yellow	151	155	- primarily associated with agricultural land - prevalent along the urban-rural fringe - distributed throughout the Chesapeake Bay with considerable concentrations in the Patapsco River (Sparrows Point-Rivera Beach), Magothy River and the Potomac River - found to a lesser extent in forested regions
Magenta	146	150	- primary color of the Chesapeake Bay - some association with forested areas
Cyan	141	145	- distributed throughout Chesapeake Bay - associated with clouds or perhaps cloud shadows - associated with forests, especially along ridge lines
Red	136	140	- appears to be a part of clouds or the ground beneath or through the clouds - cloud shadow
Green	131	135	- associated with thin, partially transparent clouds

Color	PCM Counts Low	PCM Counts High	Apparent Associated Land Use
Blue	126	130	- part of cloud structure - seems to be associated with clouds thin enough to permit identification of the color of the ground below, but not thin enough to determine the land use below
Black	0	125	- associated entirely with clouds and contrails

The land use associations presented above were derived from comparison of the false color scene to S-190A and S-190B photos obtained simultaneously on the 5th of August 1973 S/L3 pass. In spite of the general association of false-color renditions (PCM counts) of the thermal data with generalized water and land cover types, the image displays a great deal of intermixture of color values within each known major cover type. Whether this "graininess" represents a true rendition of the microstructure of ground temperature or a large noise factor remains to be determined; advice on how to estimate noise levels in the S-192 data is sought from the knowledgeable NASA engineers.

More importantly now, however, has been the arrival of the computer-compatible tapes. Several options for reading the tapes are being investigated and at the present time it appears most likely that we will utilize the computer center here at the Survey's National Center. Earth Satellite Corporation, another Skylab investigator in the Washington area has developed a software package for reading and manipulating the tapes, which would be available on either a rental or purchase basis. The purchase of the software could be made either with or without the documentation. At this writing, we are considering which data processing option to pursue.

One problem, discovered during the screening of the S055-4 image, was that Loch Raven Reservoir, the ground calibration site, was just outside the field-of-view of the scanner. Apparently the actual ground track and swath location differed slightly from pre-mission information. We therefore have no calibration data. However, the possibility exists that temperature data were acquired within the sensor's FOV on August 5 by other investigators, not directly associated with the Skylab project. This possibility is being investigated at the present time. If no data are found to exist there are still a couple of options available. One would be to use Pease's calibration method based on a gray body model utilizing radiosonde data. Another would be to take the data collected at Loch Raven and to correlate it with one of the other reservoirs within the sensor's FOV, after running a few temperature correlations between the two water bodies.

assumption

a.3. Census Cities: No change.

b. Recommendations concerning decision and/or actions required to ensure attainment of the experiment's scientific objectives: Upon examination of the S055-4 data it was realized that the distribution of PCM count intervals was such that intraurban thermal discrimination was lost. It would be helpful to have more temperature discrimination capability for intraurban land uses. In consideration of this fact we would like to investigate the possibilities of obtaining a similar false color scene consisting of different PCM count intervals. The recommended constituent breakdown would be as follows:

Color	PCM counts	
	Low	High
White	171	255
Yellow	166	170
Magenta	161	165
Cyan	156	160
Red	151	155
Green	146	160
Blue	141	145
Black	0	140

This option should provide much greater intraurban thermal discrimination.

c. Expected accomplishments during the next report periods: It now appears that analysis of the tape data should begin by next report period. The only problem which may retard some of the work is the loss of the surface calibration data. However, as stated before alternatives have been formulated which sould provide adequate data.

d. Significant results and their relationship to practical applications or operational problems: No change.

e. Summary outlook for the remaining effort to be performed: No change.

f. Travel summary and plans: None.

Approved:

Robert H. Alexander

Robert H. Alexander
Principal Investigator
Skylab/EREP Investigation No. 469