INVESTIGATION OF SKYLAB DATA

EREP No. 472-2

February 1974

NASA 9-13332

Principal Investigations Management Office

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Monthly Plans and Progress Report

Contract NAS 9-13332

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The analysis of S-190B imagery for the August 5th SKYLAB pass over Michigan has continued since the preliminary impressions on interpretability given in the last progress report. The additional work has largely confirmed the tentative conclusions drawn at that time.

We have found that corn appears in this imagery with two different color signatures. One signature is brownish-green, which we tentatively attribute to fields that are in the tassel stage. This signature can be distinguished quite readily, especially if the field is relatively large. The other signature is medium green, which we tentatively attribute to corn that is more juvenile. This latter signature cannot be separated from other heathy herbaceous vegetation with any consistency. The categories which we judge as being interpretable and have used in the tests are as follows: (1) bare soil, (2) forest, (3) stubble, (4) uncut but senescent herbaceous vegetation, (5) healthy (green) herbaceous crops and grasses, (6) corn with brownish-green signature. Due to the two corn signatures on this imagery, category 5 also includes corn. The results of a test on approximately 4,000 acres are given in table 1.

The overall tendency to underestimate acreage is attributed to limitations of resolution along the boundaries of fields. However, the greater tendency to underestimate on forested areas is probably due to bias on the part of the interpreter. The forest type is one of the easiest to distinguish, but the stands are often irregular in shape. This irregularity has likely been the source of bias through underestimation of partial cells on the acreage grid. This question will be explored farther. The overall accuracy of interpretation for the categories listed exceeds 90%. However, the inability to separate green, herbaceous crops in juvenile stages on the conventional color film imposes some limitations for early forecasting of crop acreage. As mentioned in the last report, we are eager to examine the imagery obtained later in the season to see what additional differences in signature develop at crop maturity.

Table 1. Results of interpretation test on August 5th SKYLAB S-190B imagery over Michigan.

Category	Total acres by ground truth	Total acres by estimate	No. of fields	No. of errors in identification	% accuracy in ident.	% accuracy in acreage	Average error in acreage
Bare soil	229.7	234.6	18	1	95	98	+ 0.2
Forest	648.2	536.0	23	1	96	83	- 4.9
Stubble	291.8	281.2	17	5	70	96	- 0.7
Senesc. Veg.	63.4	62.0	3	0	100	98	- 0.4
Crop/grass	1974.2	1845.6	93	14	85	93	- 1.4
Corn	803.4	731.7	31	5	85	91	- 2.3
Totals	4010.7	3691.1	185	26	86	92	- 2.0