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Type I Progress Report No. 3 (March 1 - April 30, 1973)

Inventory and Monitoring of Natural Vegetation and Related Resources in an Arid Environment by the Use of ERTS-A Imagery (Proposal No. 311)

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None

The following comments with regard to accomplishments are referenced by objective numbers corresponding to those given in NASA Contract Number NAS5-21831, Task 1, Statement of Work - Objectives.

Objective 1. The essence of this objective is to assess the relative amounts of interpretive detail associated with several types of remote sensing imagery. A procedure has been developed involving image groupability testing. Images are chosen of subjects of interests, however the sorting is accomplished by photo interpreters who are not aware of the image-subject relationships being tested. Images are then grouped on the basis of their inherent characteristics rather than according to interpretations of what they represent. Testing materials have been prepared from color composite photographic renditions of ERTS-1 data, Apollo 6, and Gemini IV space photography, and from panchromatic 1:35,000 aerial photography. These materials represent macrorelief and vegetation subjects. Testing has been initiated using 14 interpreters.

Objective 2. Terrain feature variable-vegetation relationships have continued with the additional consideration of soil color (hue, value, chroma). (Others already considered were elevation, macrorelief, slope angle, aspect, landform, parent material, solar radiation, and drainage density.) Computer assisted analysis has been completed, and interpretation of results is now underway.

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Objective 4. Vegetation type distributions have been plotted on transparent overlays for a photo mosaic of the Tucson test site. The plots of known locations of vegetation types provides the basis for image selection for densitometric analysis of multistage ERTS-1 imagery. The densitometric work has recently been initiated.

Objective 6. Results from the work with space imagery described under Objective 1 will contribute to selection of appropriate stratification procedures of space imagery for multistage sampling.

Objective 7. Arrangements have been made with personnel of the Forestry Remote Sensing Laboratory, University of California, Berkeley, to use their data processing facilities. Three dates of ERTS-1 MSS CCT's have been sent there for preanalysis processing. In preparation for the first set of analyses, ground truth familiarization is being carried out. The purpose is twofold: first, to select candidate training sets for the classification program, and second, to have sufficient material in hand to interpret and evaluate the results of the computer analyses. Known sample locations of vegetation types are evaluated for selection in terms of variability in aerial photo image characteristics. Final selection of vegetation types and training sets will be made in the initial phase of computer analysis.

Investigation activity during this reporting period continues into the next period. None of the activities were carried to conclusion; there are, therefore, no significant results to report at this time.

The following presentation was made during the reporting period.

"Natural Vegetation Inventory." Paper presented by Barry J. Schrupf at Agriculture, Forestry, Range Session, ERTS-1 Symposium, New Carrollton, Maryland, March 5-9, 1973.

The "image groupability testing," briefly discussed under Objective 1 in section "d" of this report, is a procedure which should enable a more efficient achievement of Objective 1 than the procedure of map production originally proposed. The "groupability" procedure provides test results

which can be compared from among interpreters in a more easily understood fashion, than could the results from mapping. Therefore, vegetation maps may not have to be produced in achieving the purposes of Objective 1.

There are no changes in our standing order forms.

(none included)

30 January 1973