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EREP QUARTERLY PROGRESS REPORT  
1 July 1973 to 31 October 1973  
PLANNING APPLICATIONS IN EAST CENTRAL FLORIDA

EXPERIMENT PROPOSAL NO. 385

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BREVARD COUNTY PLANNING DEPARTMENT

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EREP PROGRESS REPORT

Covering the period 1 July 1973 to 31 October 1973

PLANNING APPLICATIONS IN EAST CENTRAL FLORIDA

Proposal No. 385

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## COMPUTER PROGRAMMING

An EREP practice tape has been received, and the necessary format modifications have been made to make it compatible with our existing programs, which have been developed for use with ERTS data. Programs with which the practice tape has been checked are:

### Data printout

This program provides a listing of the data in radiance units. Options are the tabulation of data grouped by band or all bands together. Beginning and ending scan lines and elements are specified.

### Density-sliced map

This program performs density-slicing for a given band into as many as eight levels and maps the levels in designated printer characters. The positions and widths of the levels are selected by the user.

### Histograms

This program generates histograms of the frequencies of occurrences of the various radiance values (expressed in sensor counts) over the sector of the scene which is under study. The user selects the bands to be checked and the beginning and ending lines and elements of the region to be covered. The resulting histograms may be presented in linear or logarithmic form.

### Ratios

Ratios of the radiances of any two bands can be computed and mapped or presented as a histogram for a designated sector. The

histogram is presented in logarithmic form, i.e., the logarithm of the number of occurrences is plotted against the ratio values.

#### PRELIMINARY OBSERVATIONS

70 mm. S190 A photography and 4½ inch S190 B photography has been received and given preliminary evaluation. Detailed study is pending receipt of 9 inch copies of the photography.

A 3.5X enlargement of one color ir frame, which was distributed in advertising material by Eastman Kodak, has been used to prepare a preliminary land use map of that particular area on a mylar overlay, as shown in Figure 1. The classification system is that developed by Anderson, Hardy, and Roach<sup>1</sup> with a few additions appropriate to this area bearing letter designations. The categories included in this map are listed in Table 1.

Viewing of the 70 mm. film from S190 A and the 4½ inch film from S190 B at 12X magnification, leads to the following preliminary observations:

#### Color IR

Should be useful to David Cox of the Florida Game and Fresh Water Fish Commission (G&FWFC) in a planned study of the diversion of water from the headwaters of the St. Johns River, as it shows the locations of canals and drained fields.

Gives a good indication of the area under development in Port Malabar, where extensive landgrading is under way.

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<sup>1</sup>James R. Anderson, Ernest E. Hardy, and John T. Roach  
A Land-Use Classification System for Use with Remote-Sensor Data  
U. S. Geological Survey Circular 671 (1972)

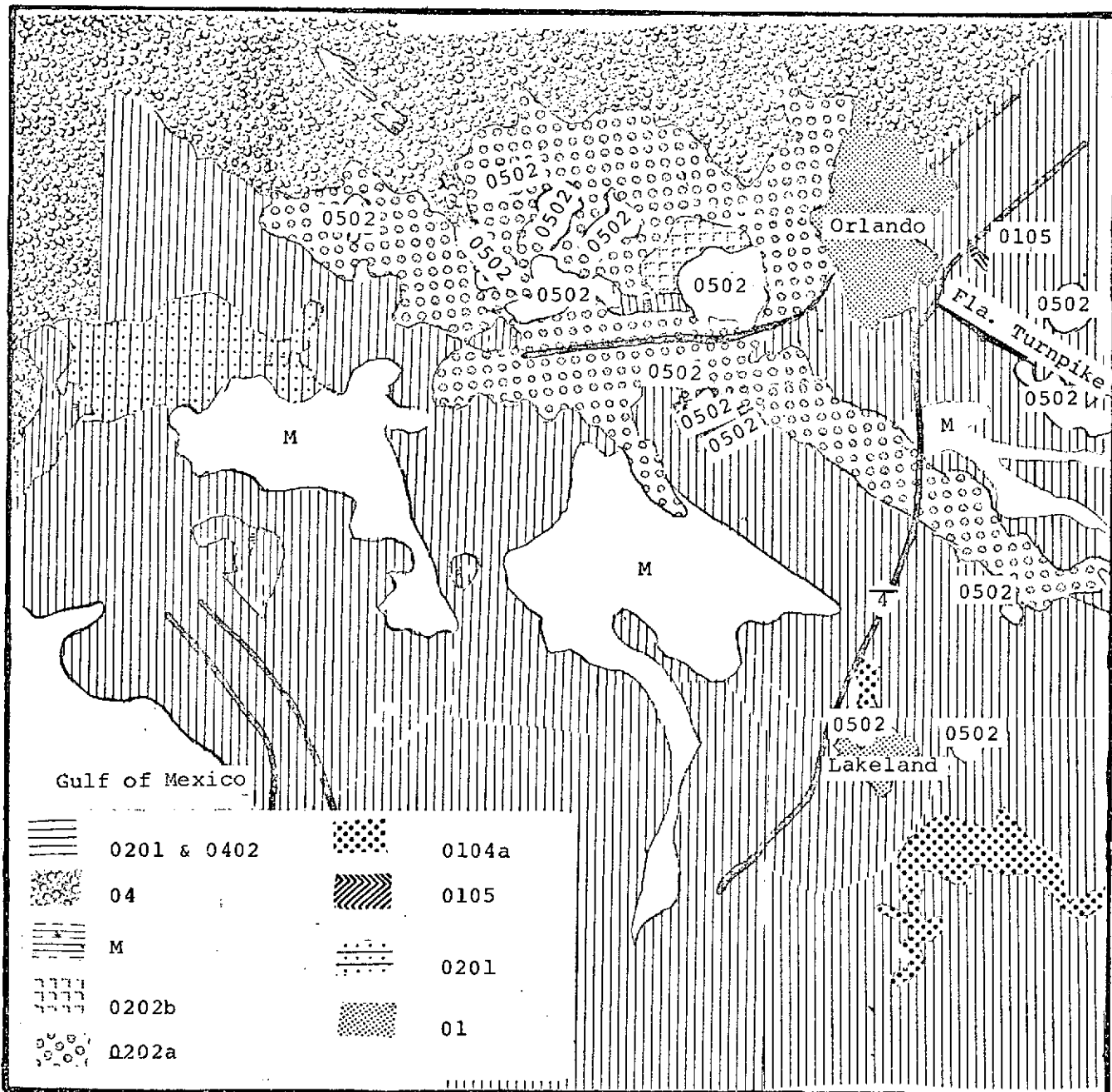


Figure 1 - Preliminary Land Use Map

- 01. Urban and built-up land
  - 04. extractive
    - a. phosphate mines
  - 05. transportation
  
- 02. Agricultural
  - 1. cropland and pasture
  - 2. orchards, groves, bush fruits, vineyards, and horticultural areas
    - a. primarily citrus
    - b. muck farms (vegetables)
  
- 04. Forest land
  - 02. evergreen (pine)
  
- 05. Water
  - 02. lakes
  - 05. other (Gulf of Mexico)
  
- M. Marsh

Table 1  
Land-use categories

Gives a good picture of the outline of the southern part of Melbourne. The northern part of Melbourne is cloud-covered.

Gives an excellent picture of Orlando, showing the major sectors of commercial development and some indication of a large-area vegetation pattern within the city which has not been noticed by this observer heretofore.

Clearly shows the phosphate mines in the Lakeland area.

The Green Swamp, a region of special concern at this time, is shown more clearly than by any other means.

The "new city" of Poinciana, currently under development, is clearly shown.

Individual citrus groves can be seen.

### Color

Good outlines of urban areas (Orlando, Lakeland, Eustis, Winter Garden) are seen. Some individual streets are visible. In the more extensive urban areas, such as Orlando, commercial and residential patterns can be observed.

In addition to Green Swamp, a swampy area known as Gulf Hammock, near the Gulf of Mexico, is clearly seen, with a clearly outlined shape having a long narrow extension in a general northward direction.

The area between the Suwannee River and the extension of Gulf Hammock is particularly interesting, as it shows a pattern of farm fields, many of which have high reflectance. This is an area of small, diversified farms, including vegetable and tobacco farming.

0.5-0.6 $\mu$  band

Gives good urban and other land use information.

Individual streets can be seen with some difficulty at 12X magnification.

0.6-0.7 $\mu$  band

This band gives excellent urban information.

Residential areas often are characterized by street patterns.

0.7-0.8 $\mu$  band

Sizeable cities (Orlando, Lakeland) appear slightly darker than their surroundings.

Citrus region appears lighter than surrounding regions.

0.8-0.9 $\mu$  band

This band provides information much like ERTS band 7 but with better resolution.

It provides excellent delineation of water areas and some vegetation information.



## S190B PHOTOGRAPHY

This photography is particularly well suited for urban observation. Individual streets and large buildings can be seen. Commercial patterns are visible.

River drainage patterns are shown well.

Individual citrus groves can be seen.

## SIGNIFICANT RESULT: ALGAL BLOOM OBSERVATION

It is well known that Lake Apopka and three lakes downstream of it (Dora, Eustis, and Griffin) are in an advanced state of eutrophication with high algal concentrations, sometimes described as "permanent blooms." This feature has shown up consistently on ERTS images in the form of a characteristic water color for those lakes, as distinguished from other lakes in the region. As expected, EREP photographs also show a characteristic color for those lakes. What was not expected is that Lake Griffin shows a clear pattern of this coloration: a pattern that one would expect for an algal bloom in approximately the southern half of the lake and a lower algal concentration in the northern portion, with circulation patterns visible at the interface. G&FWFC personnel familiar with that lake<sup>2</sup> believe that the photograph does, indeed, show an algal bloom. They report that the algal concentration often is significantly higher in the southern portion of the lake.

What the photograph shows that was not otherwise known is the

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<sup>2</sup>Smokie Holcomb and Homer Royals  
G&FWFC Laboratory, Eustis

pattern of the algal bloom. To obtain a comparable representation of this pattern by sampling, would require an excessive number of sampling stations. This effect shows up most clearly on the green band (0.5-0.6 $\mu$ ), but can be seen on all of the visible band photographs.

A similar, but less pronounced, effect is seen in Lake Tohopekaliga. G&FWFC personnel stationed at Kissimmee<sup>3</sup> report that there was an algal bloom on that lake at the time of the EREP pass and that its extent corresponded approximately to that shown on the photograph (0.5-0.6 $\mu$  band). Again, the EREP photograph gives information about the extent of the bloom that could not be obtained practically by sampling.

ERTS images give some indication of this algal distribution on Lake Griffin in some cases, but are inconclusive. ERTS digital tapes have not yet been examined for this effect, but this will be done.

G&FWFC agents<sup>2,3</sup> have agreed to take samples in Lakes Griffin and Tohopekaliga at the time of the next EREP pass if another one is made of this area.

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<sup>3</sup>William Wegener and Vince Williams, Kissimmee