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CENTRAL ATLANTIC REGIONAL ECOLOGICAL TEST SITE: A PROTOTYPE REGIONAL ENVIRONMENTAL INFORMATION SYSTEM

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a. Central Atlantic Regional Ecological Test Site: A Prototype Regional Environmental Information System. (ERTS-A ~~Proposal No. 56~~ SR 125)

b. IN-~~125~~ 002

c. Statement and explanation of any impedance.

Our first ERTS I data for CARETS was received on October 25, 1972. We are receiving the data in the form of 70 mm film chips, both positive and negative. Imagery in this format is sufficient for regional overview and identification of major features. However, for identification and mapping of Level I land use and land use change, we need some form of color-combined view plus the highest possible resolution, since it is clear from our examination of the first data that we are going to be working toward the limits of resolution of the image. Images that we have seen from other sources that have received special processing are superior to the film chips that we are receiving. We require an early critique of the problem of how to improve the quality of the imagery that is deliverable to the Principal Investigator. Our budget estimate will have to be considerably changed if we are to have to spend large amounts of money for precision photo processing to bring the data that we work with up to its full resolution capability. I think the basic problem here is the difference between what can be done on a routine basis for normal delivery to the investigator and what can be done with special attention precision photo processing to improve the quality of the data.

A serious problem is the lack of complete 1972 underflight coverage from either the RB-57 or the U-2. Our preliminary examination of the ERTS data indicates that the underflight data is absolutely required, at least until we learn more how to use and interpret the ERTS data. Furthermore, it was requested in our original request for the CARETS program. Some of the data from the RC-10 for the central part of the region has been delivered to us. This provides adequate coverage for less than 50% of the CARETS region. We urgently need photography for the remaining uncovered area and request that steps be taken quickly to obtain it.

d. Accomplishments during the reporting period and those planned for the next period.

Upon receipt of the first ERTS imagery we began immediately a detailed examination of it and a formulation of procedures to be used in both routine and non-routine analysis of the data. Routine analysis would encompass those procedures that would be applied to every ERTS image that we receive, for example, overall examination of image quality, location with respect to the CARETS planning regions, identification of major geographic features, and an attempt to separate and map the categories of the Level I land use classification. Non-routine or special procedures would include, for example, determination of unusual or ephemeral environmental conditions as noted in the imagery, identification of areas suspected of undergoing significant land use change, and the selection of areas for more detailed specialized computer processing at a later date. A report on our examination of the first CARETS ERTS

image, covering the northwestern portion of CARETS, is in draft form, and will be submitted within the next reporting period. In addition we did considerable experimentation with the I^2S viewer, our only means of examining the ERTS data in a multispectral mode, and found that this enhances the interpretability of the imagery. We also experimented with enlarger viewers with capability of much greater enlargement than the I^2S. Some combination of these two types of devices would be extremely valuable, mainly one which has both the multispectral capability and a zoom or projection enlargement capability greater than the I^2S.

e. Scientific results and practical applications. (Category 2A):

A preliminary study on the capabilities of ERTS data in land use mapping and change detection has revealed that Level I (of the USGS-GAP land use classification system) land use mapping can be performed and that in some cases land use changes can be identified. Land use interpretation was accomplished with the aid of a film projection viewer and the I^2S Additive Color Viewer. The projection viewer enlarged the 70 mm MSS data 10 times and this enlargement served as the land use map base. While many land use determinations could be made using this instrument a more preferable method, from an interpretation standpoint, was using the I^2S viewer. By varying the filters and illumination of each spectral band it was possible to better distinguish urban areas and transportation routes. Also it enabled the toning down of signatures such as cropland and forests which on many color infrared

composite photographs were washed out with strong red tints. In summary, it appears that ERTS imagery is useful not only for Level I mapping at scales of 1:250,000 or smaller, but also for monitoring agricultural changes and locating areas of construction, when such land uses approach an area of approximately two hectares.

f. Published reports or talks.

NONE

g. Recommendations for improvement.

Recommend color additive composites be made for improved ability to extract land use information.

h. A major change in the Standing Order form.

Request MSS data to support this investigation due to the lack of RBV data. Color additive composites would greatly enhance interpretation and give the most benefits to the investigation.

i. ERTS image description forms:

N.A.

j. Data request forms submitted:

None.

k. Status of data collection platforms (if applicable):

N.A.