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Investigation title: Observation of Plant Growth and Annual Flooding in the Inland Delta of the Niger River, Republic of Mali, West Africa (SR368 - GSFC PI ID UN431).

Problems: Requested changes in the standing order submitted in November 1972 has been neither implemented nor denied at this time. Additional coverage was requested to obtain observations of large-scale geologic structures which are apparently the controlling regional hydrological phenomena. 9 x 9-inch transparencies and prints are required for mosaicing and producing diazo color composites.

Accomplishments: Application of change detection procedures have been successful in observing changes in vegetation, water level, soil moisture, field use schedules and burning of fields in southern portions of the test site.

Analysis of lineaments in available imagery has been correlated with field work published by others, particularly with regard to fracture orientations along the Niger River course and measured orientations of fracture systems in the Bandiagara and Homburi highlands adjacent to the Niger River. Through ERTS-1 observations we have been able to extend the delineation of fracture systems throughout southern Mali. In the next period, viewing will be supplemented by mapping at 1:100,000 scales. (We have projected images at 1:20,000 but find that about 1:30,000 is our limit.)

Observation of thematic changes represents a first attempt to use any methodology for this purpose. It is difficult therefore to

place a cost benefit on this procedure at this time.

An investigation cost benefit has been realized in processing 9 x 9" images into color composites. Using polyester base diazo materials (discounted from 25¢ per piece), a very flexible and reasonably reproducable technique has been worked out as follows. Subtractive colors (magenta, cyan, and yellow) are used for B/W for a time related to the image density. [This time can be easily calibrated by observing the grey level of the most important features in the image and exposing according short times for thin images and long times (minutes) for dense images.] Equipment is available for fully satisfactory exposure and printing for less than $400. The diazo prints are very quickly and easily registered. Analysis is straight forward using any normal projection system. 70 mm slide composites of diazo prints transparencies are also very satisfactory, but more difficult to register. Thus, one prepares the diazo prints, registers them and places in a conventional glass slide holder (70 mm) for normal projection.

Standing order forms (revised) were submitted in November 1972, but action has yet to be taken on these requests.