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QUARTERLY REPORT

Skylab EREP Project 9670

NAS 9-13342

THE HYDROLOGY OF PREHISTORIC FARMING
SYSTEMS IN A CENTRAL ARIZONA ECOTONE

Principle Investigator: George J. Gumerman
Prescott College
Prescott, Arizona 86301

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The following statement is a quarterly report on EREP Project 9670, contract number NAS 9-13342, entitled "The Hydrology of Prehistoric Farming Systems in a Central Arizona Ecotone", for the quarter ending December 31, 1973. A Quarterly Financial Report accompanies this statement.

In our Milestone Report we suggested that the major items to be accomplished during this reporting period would include the following:

Ground truth survey to determine:

- a) The extent and types of prehistoric water control systems in the test area;
- b) The limits and types of vegetation communities in the test area;
- c) The drainage patterns in the test area;
- d) Test excavations to delimit the types of water control devices present.

Additionally, we suggested that small aircraft overflights of the study area would be undertaken to determine secondary drainage patterns and the extent of water control systems.

We cannot report successful completion of these quarterly objectives in this statement. Many unforeseen factors have hindered some of our investigations. These will be explained below.

Early in November we began receiving the 9" x 9" blowups of the S-190A and S-192 photographs of the test area. We have been informed that the S-190B photographs will not be available

due to technical difficulties. We have also received electromagnetic scanning data.

These photographs are currently being studied by all those participating in the project. Analyses are not yet complete. The major reason for not having completed these analyses revolves around not receiving photographs from the U-2 overflights carried out over the area in June. The Biologists, Archaeologists, and Geologists involved with the project all need these photographs in order to make comparisons with the very high altitude Skylab photographs and the very low altitude photographs we have taken with small aircraft. Upon receipt of the U-2 photographs analysis will be completed.

We can report that all ground truth surveys involving Archaeologists and Biologists have recently been completed. At the close of the last reporting period it was suggested that ground truth surveys would be concentrated in selected drainages of the test area. With regards to the biological work this pattern was followed. Dr. R. Roy Johnson and his biology students are currently analyzing the biological data recovered during the ground truth surveys. This analysis will include vegetation maps of selected drainages as well as a compendium of flora and fauna currently inhabiting the test area. Dr. Johnson's photographic analysis is not yet complete and will be submitted with the final report.

The Archaeologists on the project completed ground truth surveys in selected drainage areas, and as a control device a

number of sections outside the selected drainages were surveyed completely. Further, test excavations were undertaken at four sites in the test area and in many water control and agricultural systems.

In this regard, the Archaeologists have completed their objectives for this reporting period. We now have data to determine the extent and types of prehistoric water control systems in the test area. We have found that there is a shift in water control strategies from the Upper Sonoran to the Lower Sonoran life zones. This shows up particularly well in the ecotone which falls geographically between the two zones and incorporates elements of both within one environment.

The hydrological studies have been hampered in two ways. One (the non-appearance of requested U-2 overflight photographs) has already been cited. Perhaps more importantly at this stage is the extent to which the hydrological ground truth survey has been delayed due to lack of rain. The test area has had only three days of rain since the end of July. These drought conditions have caused drainages which might normally be running to be completely dry. While it is not an absolute necessity that drainages be running for the hydrological work to be carried out, it is necessary that they have been running in the very recent past. This criteria has never been met. Consequently, important measurements necessary for the completion of the hydrological work have not been taken. Dr. Brew plans to continue the hydrological survey during the winter months when the likelihood

of precipitation is greater.

Although we have been hampered somewhat by situations beyond our control we expect to complete our work on schedule. During the next reporting quarter the ground truth work of the hydrologists will certainly continue. Further test excavations will be undertaken by the archaeologists, and the receipt of the requested U-2 overflight photographs will enable us to fully analyze our photographic data. Beyond this, we plan to begin laboratory analysis of the archaeological, hydrological, and geological data. We may also utilize further low altitude overflights to refine our preliminary impressions of the secondary drainage patterns and the extent of water control systems.

Specialized analyses of material will include:

- a) Pollen analyses, in an effort to determine what plants were being exploited prehistorically;
- b) Vegetal identification of macroscopic vegetal material to assist in determining floral exploitation;
- c) Bone identification to enable us to say something about prehistoric faunal populations;
- d) Obsidian hydration dating to place our data in a tighter chronological framework.

In general, our summary outlook for the remaining two periods has not changed significantly from that contained in our Milestone Report.

The three Archaeologists involved in the project were all

able to travel to the annual meetings of the American Anthropological Association in New Orleans. Although no formal papers were presented, informal discussions with other members of the profession helped us publicize the project and NASA's part in it. We are currently planning an interdisciplinary symposium on our work in the test area for presentation at the Society for American Archaeology meetings to be held in Washington, D.C., in early May.