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PLAN FOR THE UNIFORM MAPPING OF EARTH RESOURCES AND  
ENVIRONMENTAL COMPLEXES FROM SKYLAB IMAGERY

EREP INVESTIGATION #510

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OVERALL STATUS

Natural Vegetation Analog Study

A 1:500,000 print of Skylab III S190A color infrared transparency film has been made which covers many of the vegetation-environmental analogs in the Colorado Plateau test area (#108226).

Numerous sample sites (approximately 125 acres in size) for 17 vegetation-environmental analogs have been plotted on the print. The analogs identified for interpretation testing are listed in Table I along with the range of the type. If the analog is listed as an interregional analog, it occurs in sufficient numbers and size in the Sierra-Lahontan test area to be useful in interregional testing of the analog concept. If the analog is listed as "intraregional," this signifies one of the following: either (a) the dominant species of that plant community do not range into the Sierra-Lahontan test area, (b) the species characteristic of the plant community in the Colorado Plateau test area occurs in the Sierra-Lahontan area but is not the dominant constituent of that plant community, (c) the analog occurs in the Sierra-Lahontan test area but the communities are too small in aerial extent to be feasible for testing on photographic products, or (d) the analog occurs in the Sierra-Lahontan area but was not covered on the Skylab III imagery.

Table I

Vegetation-Environmental Analogs Plotted on Skylab III S190A Imagery of  
The Colorado Plateau Test Area

<u>Analog</u>	<u>Description</u>	<u>Range</u>
<u>Atriplex</u> Shrublands	Semidesert saltbush dominated shrublands ( <u>Atriplex confertifolia</u> , <u>A. corrugata</u> , and <u>A. nuttallii</u> ). <u>Artemisia spinescens</u> , <u>Sporobolus airoides</u> , and <u>Hilaria jamesii</u> are important constituents.	Intraregional
Greasewood Shrublands	Greasewood ( <u>Sarcobatus vermiculatus</u> ) is the dominant plant. Various annuals are locally abundant as is big sagebrush, bud sagebrush and other alkali-tolerant shrubs.	Interregional
Riparian Cottonwood Forests	Various species of cottonwoods ( <u>Populus</u> ) are dominant along streams, with willows commonly associated.	Interregional
Big Sagebrush Shrublands	Shrub-steppe vegetation at 6500' to 7000' elevation. Dominated by big sagebrush ( <u>Artemisia tridentata</u> ).	Interregional
Cabled Pinyon-juniper Woodlands	Areas where woody overstory vegetation has been destroyed by man and seeded to range grasses. Big sagebrush is often dominant at these sites.	Intraregional
Sparse Pinyon-Juniper Woodlands	Mixed woodlands of pinyon-pine ( <u>Pinus monophylla</u> ) and Utah juniper ( <u>Juniperus osteosperma</u> ) with cover values of <25% for the woody component. Low sagebrush, bluegrass are common understory components.	Interregional
Dense Pinyon-juniper Woodlands	Mixed woodlands of pinyon pine and Utah juniper with cover values of >40%. Mountain brush ( <u>Amelanchier</u> , <u>Symphoricarpos</u> , <u>Prunus</u> ) commonly occur.	Interregional

Table I (cont'd.)

<u>Analog</u>	<u>Description</u>	<u>Range</u>
Pinyon-juniper/ Oakbrush Woodlands	Mixed woodlands of pinyon pine and Utah juniper with oakbrush ( <u>Quercus gambelii</u> ) dominant in the understory.	Intraregional
Oakbrush Woodlands	Dense woodlands of Gambel's oak generally of low stature. Interspersed with small grass openings.	Intraregional
Ponderosa Pine Forests	Forests dominated by ponderosa pine ( <u>Pinus ponderosa</u> ) in the tree layer and Gambel's oak in the understory.	Interregional
Aspen Forests	Forests dominated by aspen ( <u>Populus tremuloides</u> ). These occur on middle mountain slopes from 8000' to 9500' elevation. A luxuriant tall forb understory commonly occurs.	Interregional
Grassy Meadows	Mesic grass meadows occurring in openings within the aspen forest and oakbrush woodlands. Elksedge ( <u>Carex geyeri</u> ) and fescuegrass ( <u>Festuca</u> spp.) are dominant.	Intraregional
Sedge Meadows	Hydrophytic vegetation occurring along floodplains and lakeshores. Dominated by various species of sedge ( <u>Carex</u> ), rushes ( <u>Juncus</u> ) and grasses.	Interregional
Subalpine Aspen Forests	Aspen forests at 9500 to 10,500 feet elevation in steep subalpine mountainous terrain.	Interregional
Mixed Spruce- fir/Aspen Forest	Spruce-fir forest mixed with various amounts of aspen. Occur in montane to subalpine areas. Aspen is seral in these localities.	Intraregional
Spruce-fir Forest	Forests codominated by Engelmann spruce ( <u>Picea engelmannii</u> ) and subalpine fir ( <u>Abies lasiocarpa</u> ).	Intraregional

Table I (cont'd.)

<u>Analog</u>	<u>Description</u>	<u>Range</u>
Alpine Tundra-Rocklands	Alpine rocklands with sparse cover of arctic-alpine cushion, dwarf-shrub plants.	Interregional

Several analogs will be included in this analysis which were snowcovered on the Skylab II imagery of 6 June 1973. These analogs are: spruce-fir forests (Picea engelmannii-Abies lasiocarpa), high elevation aspen (Populus tremuloides) forests, and alpine tundra-rockland analogs.

It is determined necessary to treat high elevation aspen (i.e., clones occurring at or above 10,000 feet elevation) separately from lower elevation aspen due to the large difference in phenological development between the two ecosystems. Growth and development of this species varies directly with time since release from the snowpack. On the date of the Skylab III overpass in Colorado the lower elevation aspen had been released from the snowpack for 75 to 110 days whereas the subalpine stands of aspen were in early stages of development (i.e., 30 to 55 days after release from snowpack).

Many other analogs have progressed to a highly favorable stage of development for differentiation on the Skylab III S190a imagery.

#### Rice Analog Studies

During the last reporting period minimal effort was expended on the rice analog studies for the following reasons.

1. The extension of the contract period, due to imagery shortages, with no increase of funding level has caused a shifting of proposed work schedules to later dates.
2. SL3 imagery comparable to SL2 has not been received as yet and further work on the single date imagery would be redundant and certainly wasteful in terms of the multirate potential of the Skylab project.

## PLANS FOR NEXT REPORTING PERIOD

Photo interpretation testing of Skylab III 190A imagery in the Colorado Plateau test area will be accomplished. A dichotomous key to analog vegetative characteristics will be prepared along with image identification criteria. A print of Skylab III 190A color infrared imagery of the Sierra-Lahontan test area will be made for similar testing in that area once the usable S190A transparencies are received.

Test results will be compared with results obtained for the Skylab II imagery testing in the Colorado Plateau test area. Due to the orbit shift from Skylab II to Skylab III, the semidesert annual analog is not well represented on the Skylab III imagery and will be deleted from analysis.

## TRAVEL PLANS

No travel is planned to the natural vegetation test areas.

## PERSONNEL

No changes in personnel have occurred since the last reporting period.

## PROBLEMS

The successful completion of our analysis of the interregional analog concept hinges, in part, directly on the quality of the Skylab III 190A imagery as discussed in Report #12. To enable quantitative analysis of interregional analogs, the four black-and-white film types are most critical.

Skylab III 190B film (11 August 1973, Roll 84) of the Sierra-Lahontan test area was received incomplete. Frames 84-001 through 84-004 inclusive were received but do not cover the Sierra-Lahontan test area. Frames 84-005 through 84-015 inclusive will be needed to cover the Sierra-Lahontan test area.

Unexplained color quality problems were experienced with Skylab III S190A data. Examples were returned to Johnson Space Center to see if color balance could be adjusted to permit interregional comparisons. No response to date.

S192 data have not been received but selections were made from the screening film and an order placed for 40 seconds of data. The S192 color composite promised to us many months ago is likewise not received.