

"Made available under NASA sponsorship  
in the interest of early and wide dis-  
semination of Earth Resources Survey  
Program information and without liability  
for any use made thereof."

E7.3 10562

CR-131861

MONTHLY PLANS AND PROGRESS REPORT

Title: Plan for the Uniform Mapping of Earth Resources and  
Environmental Complexes from Skylab Imagery

Progress Report No. 3

Period Covered: 1 April 1973 to 30 April 1973

Contract: NAS9-13286 EREP Investigation #510

EarthSat Project: G-089

MAJOR ACCOMPLISHMENTS

Aerial photos taken in the Louisiana rice test area have been processed and cataloged. Maps have been made of test farm boundaries from these photos for use by project field personnel in defining exact boundaries of test fields.

Flight lines for EarthSat photo coverage of test areas have been located to correspond with designated test areas and the coverage to be provided by NASA aircraft and Skylab coverage.

For the wildland test areas in Colorado and California/Nevada, ERTS additive color photos have been made for use in delineating environmental complexes in anticipation of receiving EREP data. The uniform mapping legend being prepared for use in both ERTS and Skylab investigations has been tested in a preliminary fashion on selected ERTS images. Based on those findings the legend is being modified slightly (Table 1). We are prepared to apply this legend as soon as EREP photos are available to us.

Arrangements have been completed with cooperating ground personnel at each agricultural test site to provide data at critical times on

E73-10562) PLAN FOR THE UNIFORM MAPPING  
OF EARTH RESOURCES AND ENVIRONMENTAL  
COMPLEXES FROM SKYLAB IMAGERY Monthly  
Progress Report, 1-30 Apr. (Earth  
Satellite Corp.) 9 p HC \$3.00 CACL 08B  
N73-23434  
Unclas  
G3/13 00562

crop cultural practices. In the wildland areas cooperators have been alerted on the progress of the Skylab mission and will be available as needed on critical matters relating to ground observation.

#### PROBLEMS

We have encountered no significant problems to date.

#### PLANS FOR NEXT REPORTING PERIOD

All supporting data and preparations for receipt of EREP photos will be reviewed including position of test sites, ground data collecting forms, personnel assignments for data passes, aircraft mission plans and support to PIMO.

Ground and flight crews will be dispatched to test areas prior to the scheduled data pass. Observations will be made of soil and vegetation conditions in each area and documentary ground and aerial photos will be taken of dynamic conditions and features.

#### SUMMARY OUTLOOK

It is recognized that there will be extended periods of time when no EREP data will be taken during which time ground conditions will be changing as the growing season progresses, both in the wildland and agricultural areas. We will supplement the EREP coverage by ERTS-1 images, NASA high flight photos and our own aircraft photos as well as ground observation. By this method we will be able to evaluate the utility of EREP photos not only in relation to other data systems, but hopefully as if it were the only system available.

## TRAVEL PLANS

Visits to each test site will be made to coincide with EREP data passes which are scheduled as follows:

Davis/Biggs	May 18, 1973
Tahoe/Lahontan	May 18, 1973
Colorado Plateau	May 26, 1973
Louisiana Coastal Plan	June 1, 1973

The project aircraft will visit each site on the day of the data pass to obtain aerial photos.

## PERSONNEL

No change.

TABLE 1

LEGEND CLASSES FOR ECOLOGICAL & CROP ANALOGUE STUDY<sup>1/</sup>

Primary Classes

- 100 - BARREN LANDS (<5% vegetation cover, other than crop fallow)
- 200 - WATER RESOURCES (free water surfaces)
- 300 - NATURAL VEGETATION
- 400 - CULTURAL VEGETATION
- 500 - AGRICULTURAL CROP AND IDLE LAND
- 600 - URBAN AND INDUSTRIAL LAND
  
- 900 - OBSCURED LAND (not visible, atmospheric obstruction)

Subclasses, Secondary and Tertiary

100 - BARREN LAND Subclasses

- 110 - Playas, dry or intermittent lake basins
- 120 - Aeolian barrens (other than beaches)
- 121 - Dunes
- 122 - Sandplains
- 123 - Blowouts
- 130 - Rocklands
  
- 131 - Bedrock outcrops (intrusive & erosion-bared strata)
- 132 - Extrusive igneous (lava flows, pumice, cinder and ash)
- 133 - Gravels, stones, cobbles & boulders (usually transported)
- 134 - Scarps, talus and/or colluvium (system of outcropping strata)
- 135 - Patterned rockland (nets or stripes)
  
- 140 - Shore-lines, beaches, tide flats and river banks
- 150 - Badlands (barren silts and clays, related metamorphic rocks)
- 160 - Slicks (saline, alkali, soil structural, non-playa barrens)
- 170 - Mass movement
- 180 - Man-made barrens
- 190 - Undifferentiated complexes of barren lands

200 - WATER RESOURCES Subclasses

- 210 - Ponds, lakes and reservoirs
  
- 211 - Natural lakes and ponds
- 212 - Man-made reservoirs and ponds
  
- 220 - Water courses
  
- 221 - Natural (rivers and creeks)
- 222 - Man-made (canals, ditches and aqueducts)

---

<sup>1/</sup>Adapted from Poulton, et al. 1973. Work in progress. Oregon State University, Corvallis

Subclasses, Secondary and Tertiary (continued)

- 230 - Springs, seeps, and wells
- 240 - Lagoons and bayous
- 250 - Estuaries
- 260 - Coves and Bays
- 270 - Oceans, seas and gulfs
- 280 - Snow and ice

- 281 - Ephemeral
- 282 - Permanent (snow fields and glaciers)

290 - Undifferentiated complexes of water resources

300 - NATURAL VEGETATION Subclasses

(For quick-look mapping of gross vegetational differences on CIR imagery)

- 301 - Vegetation density, vigor and growth high
- 302 - " " " " " moderate
- 303 - " " " " " low
- 304 - Vegetation present but largely dormant

(For identification of mapped vegetational delineations or ground locations)

- 310 - Herbaceous types (w/ or w/o platyphyllous succulents or low shrubs)
  - 311 - Lichen, cryptogam & related communities
  - 312 - Prominently annuals (grass-forb-succulents; usually grass aspect)
  - 313 - Forb types (broad-leaved forb aspect)
  - 314 - Bunchgrass steppe (tussock grass)
  - 315 - Sodgrass and mixed sodgrass-bunchgrass steppe and prairie
  - 316 - Meadows (Graminaceous/Cyperaceous)
  - 317 - Graminaceous Marshes (Panicums, Setaria, etc.)
  - 318 - Tule Marshes (Cyperaceae, Juncaginaceae, Typhaceae, etc.)
  - 319 - Undifferentiated complexes of herbaceous types
- 320 - Shrub-scrub types
  - 321 - Microphyllous, non-thorny scrub
  - 322 - Microphyllous thorn scrub
  - 323 - Succulent and cactus scrub
  - 324 - Halophytic shrub
  - 325 - Shrub steppe (single species or simple mixtures of shrubs with a prominent herbaceous ground layer)
  - 326 - Sclerophyllous scrub
  - 327 - Macrophyllous shrub
  - 328 - Microphyllous, dwarf shrub
  - 329 - Undifferentiated complexes of shrub-scrub types

Subclasses, Secondary and Tertiary (continued)

330 - Savanna-like types

- 331 - Tall shrub-scrub
  - 332 - Broad-leaved tree
  - 333 - Coniferous tree
  - 334 - Mixed tree
  - 335 - Broad-leaved tree
  - 336 - Coniferous tree
  - 337 - Mixed tree
  - 338 -
  - 339 - Undifferentiated complexes of savanna-like types
- } Over low herb
- } Over low shrub

340 - Forest and Woodland types

- 341 - Needleleaf forests and woodlands
- 342 - Broadleaved (Hardwood) forests and woodlands
- 343 - Needleleaf Broadleaf Mixed forests and woodlands
- 349 - Undifferentiated complexes of forest and woodland types

Subclasses, Quaternary

311-318 - (Currently under development)

324 - Halophytic shrub

- 324.1 - Saltsage (*Atriplex*) dominant types
- 324.2 - Hopsage (*Grayia*) dominant types
- 324.3 - Greasewood (*Sarcobatus*) dominant types
- 324.4 - Winterfat dominant types
- 324.5 - Blackbrush (*Coleogyne*) dominant types
- 324.6 -

325 - Shrub steppe

- 325.1 - Low sagebrush types
- 325.2 - Tall sagebrush types
- 325.3 - Silver sagebrush types
- 325.4 - Rabbitbrush types
- 325.5 -
- 325.6 -
- 325.7 - Mixed Shrub Steppe (*Artemisia* prominent with *Purshia*, *Symphoricarpos*, *Amelanchier*, *Coleogyne*)
- 325.8 -
- 325.9 - Undifferentiated complexes of shrub steppe

326 - Sclerophyllous scrub

- 326.1 - Live oak scrub or "chaparral"
- 326.2 - Manzanita scrub or "chaparral"
- 326.3 - Snowbrush scrub or "chaparral"
- 326.4 - Curl-leaf mountain mahogany shrub
- 326.5 - Chamise shrub types

Subclasses, Quaternary (continued)

327 - Macrophyllous shrub

- 327.1 - Oak shrub (*Q. gambellii*)
- 327.2 - Maple shrub
- 327.3 - Snowbrush, Hawthorn, Cherry, Rose shrub
- 327.4 - Physocarpus/Oceanspray shrub
- 327.5 - Willow/Alder/Birch shrub
- 327.6 -
- 327.7 -

331-337 - (Currently under development)

341-343 - (Currently under revision)

400 - CULTURAL VEGETATION ("Permanent" cover types)

- 410 - Cultural herbaceous types
- 420 - Cultural shrub/scrub types
- 430 - Cultural savanna-like types
- 440 - Cultural forest and woodland types

490 - Undifferentiated cultural vegetation

(Tertiary levels same as under 300ds.)

500 - AGRICULTURAL PRODUCTION

- 510 - Field crops
- 511 - Cereal and grain crops
  - 511.6 - Rice
- 520 - Vegetable and truck crops
- 530 - Tree, shrub, and vine crops
- 540 - Pasture
- 550 - Horticultural specialties
- 560 - Non-producing fallow, transition, or entrapped land
- 570 - Agricultural production facilities
- 580 - Aquaculture
- 590 - Other agricultural uses

600 - URBAN

- 610 - Residential
- 620 - Commercial and services
- 630 - Institutional
- 640 - Activity centers and areas
- 650 - Industrial
- 660 - Transportation, communications, and utilities
- 670 - Resource extraction
- 680 - Open space
- 690 - Undifferentiated urban

900 - OBSCURED LAND

- 910 - Clouds and fog
- 920 - Smoke, haze
- 930 - Dust, sand storms
- 940 - Smog

## LANDFORM COMPLEXES

### MACRORELIEF

- 1.0 - Flat lands (Prominent slopes <10%)
  - 1.1 - Non-dissected
  - 1.2 - Dissected
- 2.0 - Moderately undulating to rolling lands (Slopes 10 - 25%)
  - 2.1 - Non-dissected
  - 2.2 - Dissected
- 3.0 - Hilly lands (Slopes <25%, <1,000' relief, smooth slopes, simple drainage systems)
- 4.0 - Mountainous lands (Slopes, relief, and complexity greater than in 3.0)

### LANDFORM FEATURES

- 1.0 - Depressional or wet lands, non-riparian
  - 1.1 - Intertidal zone
  - 1.2 - Swamps and marshes
  - 1.3 - Seasonally ponded basin
- 2.0 - Bottomlands, riparian
  - 2.1 - Stringer or narrow bottomlands
  - 2.2 - Wide valley bottoms, substantial flood plains
  - 2.3 - Seasonal streambeds and washes
- 3.0 - Planar surfaces
  - 3.1 - Fans and bajadas
  - 3.2 - Terraces
  - 3.3 - Gently undulating to rolling uplands, plateaus, table-lands and mesas
  - 3.4 - Pediments
- 4.0 - Aeolian featured landscapes
- 5.0 - Slope Systems (Slope classes according to the following table, class is the one-hundredths 0.OX digit).

#### Slope Range %

#### Slope Class Digit

#### Simple Slope Systems

0 - 5	.01
5+ - 15	.02
15+ - 30	.03
30+ - 50	.04
50+ - 100	.05
<100	.06

Slope Range %

Slope Class Digit

Complex Slope Systems

0 - 30	.07
0 - 50	.08
0 - 100+	.09

The 0.X digit in each case is reserved for landform feature subclass. The slope classes may be added to any appropriate landform feature class by the notation 0.OX, e.g., 4.03; 6.08; 3.22.