PROGRESS REPORT

for

OHIO SKYLAB EREP INVESTIGATION

NASA LeRC Contract NAS3-19521

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Principal Investigator: Mr. Paul Baldridge

Reporting Period: April - May, 1975

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OVERALL PROGRAM STATUS

Delays in finalizing the Skylab contract have placed critical time constraints on accomplishing the numerous technical and administrative activities contained in the program's 3 tasking efforts. Since all proposed activities must be accomplished within approximately 4 months, major attention is being given to insuring that planned activities are accomplished as close as possible to the schedule developed in the attached milestone plan.

Since initiation of the Skylab program in April, effort expended has gone toward:(1) developing the detailed milestone plan, (2) assembling the data bases required to support each task, (3) coordinating with all participating user agencies and personnel (State, county, and local), and (4) refining data analysis plans and final product formats for each of the 3 task areas.

Prior coordination of the attached (but slightly revised) milestone plan and initial discussion of project status occurred during the meeting at LeRC between Mr. Paul Goesling and Mr. John Jack on May 12, 1975.

A brief summary of major activities accomplished and in progress for each of the three technical tasks follows. Also, potential problem areas that could perturb critical task scheduling are also identified. This is followed by a section noting significant results and a final section containing a summary outlook with appropriate recommendations.

TASK PROGRESS SUMMARIES

Task 1. Technical and Economic Comparison of Skylab and Aircraft Surface Mining and Reclamation Data.

General Status and Major Accomplishments

Technical progress on this task has been close to that projected in the detailed milestone plan (see attached). However, coordination activities among state user participants have not progressed accordingly. Major task accomplishments during this initial reporting period include:

- The collation of available Skylab, aircraft and ground truth data for the various watershed study site possibilities has been completed.
- The above analysis resulted in the selection of watershed #16 (in Hocking, Athens, Vinton and Meigs counties) and watershed #46 in Southeastern Coshocton County as optimum study sites.
- Data analysis procedures for this task have been developed.
- Arrangements for Battelle analysts to utilize aircraft photography and equipment available at the Ohio Department of Natural Resources have been completed.

Planned Activities

As noted in the milestone plan, major effort planned for June involves completing most of the data analysis activities and some portions of the cost analysis and user assessment activities.

Potential Problem Areas

During May, several meetings were planned among appropriate Battelle, Department of Natural Resources, and Department of Economic and Community Development personnel, but were cancelled for various reasons. It is imperative that this initial meeting of task participants be held as soon as possible so that: (1) final agreement can be reached on watershed areas for analysis, (2) user priorities and data requirements can be established, and (3) user views as to final product preferences can be solicited.

Task 2. Assessment of Timber Resources in Northeast Ohio Using Skylab Data.

General Status and Major Accomplishments

Activities on this task have progressed essentially as scheduled. During this reporting period the following task activities were achieved:

- The initial meeting of the task participants was held on April 15, 1975, at Battelle's Columbus Laboratories. Principal participants included Mr. David Hinson, Crossroads Resource Conservation and Development Coordinator; Mr. James Ball, Ohio Division of Forestry; Mr. Paul Goesling, Ohio Department of Economic and Community Development; and, the staff of Battelle's Remote Sensing Applications Laboratory. Topics discussed and results achieved during the meeting included:
  (a) Exposure of the user agency (Crossroad R C&D) to Skylab imagery and data analysis procedures.
  (b) Exchange of information and ideas relating to the timber resources of Trumbull, Mahoning and Columbiania, Ohio counties.
  (c) Establishment of specific task requirements, data base needs, product formats, and assignment of responsibilities.

The task participants agreed to designate three, one hundred acre study sites (one in each of the three counties) as training sites and agreed to a working map scale of 1" = 1 mile.

- A follow-up meeting was held on May 14, 1975, at Battelle-Columbus Laboratories to further coordinate research activities and procedures. Participants at this meeting included Mr. Ernest Gebhert, Mr. Byron Kent, and Mr. James Ball of the Ohio Division of Forestry; Mr. Paul Goesling of the Ohio Department of Economic and Community Development; and the staff of Battelle's Remote Sensing Applications Laboratory.
- Specific types of forestry data requested to be assessed during the study include tree species, size and conditions.
- A data base of the forestry resources of the study area has been acquired and organized which includes available Skylab and aircraft data, USGS 1:24,000 topographic map sheets, and other publications.
- The data analysis procedures have been revised and finalized.
- An aerial and ground truth survey to acquire first hand knowledge of the study area and to acquire additional Color IR photography of selected tree stands was undertaken on May 27, 1975, utilizing a State of Ohio aircraft.

Planned Activities

Task activities planned to be initiated or continued during June include the following:

- Completion of study site inventories
- Preparation of a measurement matrix of forestry features
- Preparation of thematic maps for the study sites and counties
- Cost analysis activities
- Continued interaction with user personnel.

Potential Problem Areas

No potential problems exist at this time.

Task 3. Utilization and Assessment of Skylab and Aircraft Data Relating to the Encroachment on Prime Agricultural Lands by Urban Growth in Central Ohio.

General Status and Major Accomplishments

During this reporting period the following specific activities were completed:

- An initial meeting of task participants was held on May 19, 1975, at Battelle-Columbus Laboratories. Participants included Mr. William Harper, City of Columbus; Mr. Robert Winterhalter, Mid-Ohio Regional Planning Commission; Mr. Paul Goesling, State of Ohio; and, Mr. George Wukelic, Mr. Joe Stephan, and Mr. Harry Smail of Battelle-Columbus Laboratories. Topics discussed at this meeting included the nature of the task, data analysis procedures, size of the study area, size of agricultural parcels, and product format. It was agreed that the study area would encompass the Mid-Ohio planning area and major transport[illegible] corridors to adjacent cities, the size of agricu[illegible] parcels would be 30 acres or larger, and that the product mapping would be done at a scale of 1" = 4 miles.
- Available Skylab and aircraft data have been assembled and organized. Additional data base materials of the study area have and are being received and reviewed.
- Data analysis procedures have been reviewed and finalized.

Planned Activities

As indicated on the milestone chart, major activities to be initiated and/or continued in June include:

- Acquisition of additional data base materials as needed, specifically soil maps and summaries of the applications for agricultural land assessments.
- The analysis of urban encroachment on agricultural land in the study area.
- Cost analysis activities.
- User agency interaction and assessment activities.

Potential Problem Areas

No major potential problem areas can be identified at this time which may hinder the achievement of the experiments' scientific goals.

SIGNIFICANT RESULTS

None.

SUMMARY OUTLOOK AND RECOMMENDATIONS

Delays in finalizing contractual procedures have significantly reduced the total time available for completing the program. Successful completion of all proposed activities will require continued and full cooperation of all participants. With the exception of the initial meeting of all participants on the Surface Mining Task, all planned tasking activities have progressed as scheduled. No recommendations are considered necessary at this time.

TASK ACTIVITIES

TASK 1 SURFACE MINING	APRIL	MAY	JUNE	JULY	AUGUST	COMMENTS
Coordination Activities:						
• Identification/meeting of major participants		▲				
• Exchanges between user/technical personnel		Δ - - - - - - - - - - - -▲				
• Product review/discussions				Δ- - -▲		
Technical Analysis Activities:						
• Collate available Skylab, aircraft and ground truth data	Δ- - - - -▲					
• Develop/test data analysis plan		Δ- - - - - - - - - ▲				
• Select watersheds to be analyzed		Δ- - - - - - - - ▲				
• Analyze gross and detailed features			Δ- - - - - - ▲			
• Prepare Matrix			Δ- - - - - - ▲			
• Evaluate accuracies			Δ- - - - - ▲			
• Prepare map products			Δ - - - - - ▲			
• Prepare final report input/summary				Δ- - - -▲		
Cost Analysis Activities						
• Establish cost figures for Ohio Land Reborn Study			Δ- - - - - ▲			
• Tabulate time-cost figures for one watershed analysis			Δ- - - -▲			
• Determine cost-benefit			Δ- - - - - ▲			
• Summarize Cost-findings				Δ- - - -▲		
User Assessment Activities						
• Identify State interests/needs		Δ- - - - - ▲				
• Evaluate user implications of technical and cost results			Δ- - - - - - - - ▲			
• Prepare final report input				Δ- - - - - ▲		

DETAILED MILESTONE PLAN FOR OHIO SKYLAB FOLLOW-ON PROGRAM (NAS3-19521)

TASK ACTIVITIES

TASK 2 - NE OHIO TIMBER INVENTORY TASK

Activity	APRIL / MAY / JUNE / JULY / AUGUST	COMMENTS
Coordination Activities:		
• Initial meeting of participants (at BCL)	▲	
• Site visit/reconnaissance	Δ- - - - - - - - ▲	
• User-Tech. Data exchanges	Δ- - - - - - - - - - - - - - - -▲	
• Product discussions	Δ- - - - - - - - - -▲	
• Final Report coordination	Δ- - - - - - - - - -▲	
Technical Analysis Activities:		
• Organize available Skylab/AC data	▲	
• Acquire base maps/AC data as required	Δ- - - - - - - - - -▲	
• Develop/Test correlative data analysis plan	Δ- - - - - - - - - -▲	
• Prepare Measurement matrix (spectral region vs. forestry feature(s))	Δ- - - - - - - -▲	
• Prepare thermatic maps:		
for study sites	Δ- - - --▲	
for entire counties	Δ- - - - - -▲	
• Complete study site inventories	Δ- - - - - - - - ▲	
• Evaluate	Δ- - - - - -▲	
• Complete comprehensive (total county) inventories	Δ- - - - - ▲	
• Prepare summary of results for report	Δ- - -▲	
Cost Analysis Activities:		
• Develop cost analysis plan/methodology	Δ- - - - - - -▲	
• Prepare time/cost data	Δ- - - - - -▲	
• Evaluate cost benefit Skylab vs conventional approach	Δ- - - - - -▲	
• Prepare Summary for report	Δ- - -▲	
User Assessment Activities:		
• Develop field-check plan	Δ- - -▲	
• Execute field check to verify inventory data — study sites	Δ- - -▲	
counties	Δ- - - -▲	
• Evaluate map value	Δ- - - - ▲	
• Evaluate usefulness of inventory data	Δ- - - - ▲	
• Summarize user views for final report	Δ- - - - ▲	

DETAILED MILESTONE PLAN FOR OHIO SKYLAB FOLLOW-ON PROGRAM (NAS3-19521)

TASK ACTIVITIES

	APRIL	MAY	JUNE	JULY	AUGUST	COMMENTS
TASK 3 - CENTRAL OHIO AGRICULTURAL LAND ENCROACHMENT						
Coordination Activities:						
• Arrange initial meeting of all participants		▲				
• Review Mid-Term results			▲			
• Review program review/report evaluation				Δ- - - - - -▲		
Technical Analysis Activities:						
• Organize available Skylab/AC data	▲					
• Acquire additional data base as needed		Δ- - - - - - -▲				
• Develop and test data analysis plan		Δ- - ▲				
• Define product format(s)		Δ- - - - - - -▲				
• Undertake Franklin Co.-Mid-Ohio Analysis		Δ- - - - - - - - -▲				
• Compare Skylab-Aircraft accuracies			Δ- - - -▲			
• Prepare final product and report summary			Δ- - - - - -▲			
Cost Analysis Activities:						
• Develop cost analysis plan/methodology		▲				
• Collate Time-Cost data (Tech. & user)		Δ- - - - - - -▲				
• Evaluate Cost-Benefit Skylab vs AC			Δ- - - - -▲			
• Prepare summary for report				Δ- -▲		
User Assessment Activities:						
• Evaluate results and methodology implications to urban, regional and state needs			Δ- - - - - - -▲			
• Summarize user views for final report				Δ- - -▲		
TASK 4 - REPORTING						
Reporting Activities:						
• Develop/Submit Milestone Plan	Δ- - - - - -▲					
• Oral Progress Reports		▲		▲	▲	
• Monthly Progress Report			▲	▲		
• Advance Reports of Significant Results	------	As Developed		------		
• Draft Final Report					▲	
• Final Report						▲