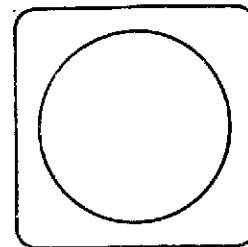


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EARTH SATELLITE CORPORATION  
(EarthSat)



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February 26, 1974

ERTS Program Manager  
Code ER  
NASA Headquarters  
Washington, D.C. 20546

Re: Contract No. NAS5-21795 GFSC ID ST 355

Gentlemen:

The Indiana Geological Survey and Earth Satellite Corporation (Earth-Sat) are pleased to submit a progress report for the period of January 1, 1974 to March 1, 1974. To facilitate, for review by NASA, a consistent summary format has been adopted for month-to-month reporting.

- A. TITLE: Study of Application of ERTS-A Imagery to Fracture-Related Mine Safety Hazards in the Coal Mining Industry.
- B. PRINCIPAL INVESTIGATOR: Dr. Charles E. Wier (SR #325)
- C. CO-PRINCIPAL INVESTIGATOR: Dr. Frank J. Wobber
- D. PRINCIPAL CONTRIBUTORS: Dr. Charles E. Wier  
Dr. Frank J. Wobber  
Mr. Orville R. Russell  
Mr. Roger V. Amato  
Mr. Thomas V. Leshendok
- E. SUMMARY OF ACCOMPLISHMENTS:

This is the last Type I report to be submitted as part of the experiment.

All analytical work has been completed, the various map products are in the final stages of preparation as is the final report draft.

E74-10336)	STUDY OF APPLICATION OF	N74-18012
ERTS-A IMAGERY TO FRACTURE-RELATED MINE		
SAFETY HAZARDS IN THE COAL MINING		
INDUSTRY Progress Report, 1 (Earth		Unclas
Satellite Corp.) 5 p HC \$4.00 CSCL 08I	63/13	00336

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ERTS Program Manager  
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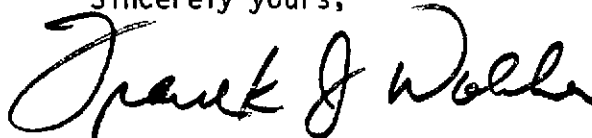
The contract add-on for a coal mine refuse inventory of the Indiana coal fields, commenced in the latter part of November, was completed and delivered by 15 February. These map products incorporated a tabulation which identified the mine refuse sites by section, township and range, size, and an estimate of reclamation costs.

These maps were delivered to the Governor of Indiana, the Division of Reclamation, the Indiana Coal Association and selected coal companies.

F. SIGNIFICANT RESULTS

The Mine Refuse Inventory Maps were prepared in response to a need by both the State and the coal industry. The lack of information on the scope of the problem handicapped all people concerned in drafting realistic legislation for a severance tax on coal production to raise funds for restoration of refuse sites. The inventory was conducted rapidly and economically, and demonstrated the benefits which can be derived through remote sensing methods.

Sincerely yours,



Frank J. Wobber  
New Business Development

FJW/ec

TASK	STATUS	COMMENTS
PHASE III CONTINUING DATA ANALYSIS		
1.0	CONTINUE APPLICATION OF ERTS-1/ AIRCRAFT TO MINING-ENVIRONMENT STUDIES	COMPLETE National prototype for mined land inventory has been prepared (Vincennes Quadrangle, Indiana).
2.0	ESTABLISH FRACTURE VALIDATION SYSTEM	COMPLETE The preliminary validation system has been revised and is being applied to all imagery analysis
3.0	CONDUCT DETAILED ANALYSIS OF ERT-1/ AERIAL PHOTOGRAPHY	COMPLETE High altitude (1:120,000 scale) aerial photography and all ERTS-imagery have been analyzed. Analysis of photography from NASA Aircraft Mission No. 210 and 230 plus U-2 Flight No. 73-008 is completed.
4.0	CONSOLIDATE FRACTURE DATA	COMPLETE The consolidation of fracture data. (reduce overlays, etc. to common base) is completed.
5.0	COMPARE UNDERGROUND AVAILABLE MINE ACCIDENT DATA TO FRACTURE ZONES	COMPLETE Attention is being given to the Thunderbird Mine in Sullivan County where considerable fault and roof fall data has been assembled by the Principal Investigator. The Kings Station Mine has been examined and an underground visit made to collect data.
6.0	DELIMIT HAZARDOUS ZONES IN ACTIVE/ ANTICIPATED COAL MINING AREAS	COMPLETE Several potentially hazardous areas were predicted in the Kings Station Mine preliminary to a mine visit. A visit to the mine showed good correlation.

TASK	STATUS	COMMENTS	
PHASE III (Cont'd)			
6.1	ESTABLISH CRITERIA FOR DETERMINING HAZARDOUS ZONES	COMPLETE	Areas of numerous joint intersections and high density of fractures have been established as the criteria for high hazard zones.
6.2	PREPARE MAP OF EVALUATION OF HAZARDOUS ZONES	COMPLETE	Five (5) test mine areas have been selected for detailed fracture analysis and mapping at a scale of 1:24,000. Mapping is complete.
7.0	DEVELOP PROTOTYPE MINE SAFETY INFORMATION NETWORK		
7.1	VISIT MINE OPERATORS DISCUSS APPLICATIONS OF HAZARDS DATA	COMPLETE	All of the underground mining companies active in Indiana have been visited and the problems discussed.
7.2	ESTABLISH FORMAT FOR MINE SAFETY DATA DISTRIBUTION	UNDERWAY	No single agency in the Indiana State structure authorizes underground mining. Discussions are being held to determine the best agency through which mine safety data should be distributed.
7.3	DISTRIBUTE MINE HAZARDS MAP		

TASK	STATUS	COMMENTS	
PHASE III (Cont'd.)			
8.0	PREPARE FINAL REPORT AND TECHNICAL BRIEFS	UNDERWAY	Final report is being prepared.
9.0	PREPARE COAL INDUSTRY TECHNICAL SEMINAR PROGRAM	UNDERWAY	Discussions are underway with the National Coal Association to conduct a short seminar relating to the accomplishments of this program. The seminar is tentatively scheduled for the October 1974 "Coal and the Environment" meeting to be held in Louisville, KY.